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# **TECHNICAL MEMORANDUM**

Date:	February 27, 2014
То:	Steve Teel - Department of Ecology
From:	David Dinkuhn, PE
Subject:	Draft Data Gap Sampling Report
cc:	Kip Summers, City of Olympia
Project Number:	233-1577-038 (03/01)
Project Name:	Solid Wood Incorporated Site - RI/FS and IA

# SOLID WOOD INCORPORATED SITE - DRAFT RI/FS DATA GAP SAMPLING REPORT

This technical memorandum presents the results of data gap sampling conducted over several field efforts at the Solid Wood Incorporated Site in located in Olympia, Washington (Figure 1). Sampling was performed to fill data gaps as part of the site's ongoing Remedial Investigation/Feasibility Study (RI/FS). All work was conducted according to Addendum No. 5 Revision 1 (Parametrix 2012), Addendum No. 6 (Parametrix 2013a), and Addendum No. 8 (Parametrix 2013b) to the project's RI/FS work plan (Parametrix 2008).

# BACKGROUND

In 2004, Parametrix performed a Phase I Environmental Site Assessment (ESA) for the site (Parametrix 2004a) which was followed by a Phase II ESA (Parametrix 2004b). An additional Phase II ESA was performed in 2007 along the former Burlington Northern Santa Fe (BNSF) rail spur located at the site (Parametrix 2007). The majority of surface and subsurface contamination associated with the findings in these reports has been investigated sufficiently for the purposes of the RI/FS or cleaned up during a 2009 Interim Action (Parametrix 2010). However, four site areas were identified by the Washington State Department of Ecology (Ecology) as data gaps requiring further investigation. These areas consist of:

# Oil Stain

During the Phase I ESA site reconnaissance (Parametrix 2004), an oil stain was observed on the asphalt parking area adjacent to the east side of the former Solid Wood facility foundation (Figure 2). The stain, which was several feet in diameter, had not been investigated previously during the RI and was targeted for investigation as part of the data gap sampling.

# Rail Spur Surface Soils

Surface soils in the vicinity of the former rail spur adjacent to the former Solid Wood Inc. facility were suspected of containing carcinogenic polycyclic aromatic hydrocarbons (cPAHs) associated with creosote-treated rail ties used in the construction of the spur. As an example, subsurface soil samples collected from three soil borings (SB-26, SB-29, and SB-30; Figure 2) located beside the rail spur contained cPAHs in excess of screening levels

selected for the RI (Parametrix 2008). Data gap sampling was conducted to investigate the horizontal extent of potential cPAHs contamination in surface soil adjacent to the rail spur.

# Metals in Groundwater and Seeps

An Interim Action (IA) was performed at the site in the summer of 2009, during which several hot spot areas of soil contamination were excavated and removed. The excavated hot spots included soils at the former wood burner location, which contained metals and dioxins at concentrations above screening/remedial levels. Three monitoring wells (MW-08 through MW-10; Figure 3) were installed in the vicinity of the former wood burner for the purpose of monitoring down gradient groundwater for metals following the hot spot removal. The results of an initial four quarters of testing showed that copper and nickel concentrations in samples from all three wells consistently exceeded screening levels. Two nearby groundwater seeps (Seeps 4 and 5) and West Bay surface water sampling stations (SW01 through SW03) were also monitored for metals during the initial quarterly sampling events. The seeps were monitored because copper and nickel concentrations in excess of screening levels had been detected during previous RI sampling at these locations. The purpose of monitoring marine surface water was to evaluate the possibility that metals in marine water from West Bay were impacting the groundwater and seep samples. This would occur due to the mixing of marine water and fresh groundwater in the shallow groundwater aquifer adjacent to the shoreline. The results of the initial sampling showed that copper and nickel concentrations consistently exceeded screening levels in samples from all locations, including the surface water samples from West Bay. However, copper and nickel concentrations in marine water were consistently at or above concentrations in samples from the wells and seeps, indicating that the source of the copper and nickel is marine water. If the source of the copper and nickel was groundwater, the metals concentrations in adjacent marine water would be much lower than groundwater since groundwater entering West Bay mixes with and is diluted by the marine water. Data gap sampling, which consisted of two quarters of additional sampling at all locations, was conducted to provide additional data in order to confirm the initial sampling results.

# Sediment Station SD-33 Delineation

Several sediment sampling events were conducted during the RI to delineate potential impacts from site activities and/or creosote treated piling. Limited locations of petroleum impacted sediments were identified including sediment station SD-33 (Figure 3). Data gap sampling was conducted to delineate the horizontal extent of petroleum hydrocarbon contamination at this sediment station.

# DATA GAP SAMPLING ACTIVITIES AND RESULTS

# Oil Stain

The oil stain was located in the field on September 27, 2012 using 2004 site reconnaissance photos and visual observations. On the same day, a single boring (SB-47) was advanced to four feet below ground surface (bgs) at the stain location using a truck-mounted direct push drilling rig. Two soil samples were collected from two different depths, 1-and 3.5-feet below ground surface (bgs) from the boring. The soil samples were submitted for laboratory analysis for contaminants of concern (COCs) associated with waste oil. A summary of analytical results is presented in Table 1, which shows that both soil samples collected from SB-47 exceeded the screening level of 2,000 milligrams per kilogram (mg/kg) for lube oil. No other constituents were detected above their corresponding screening levels. A log of the SB-47 is provided in Attachment 1, and laboratory reports and a data validation memorandum are provided in Attachment 2.

A follow-up test pit investigation was performed on January 15, 2013 to delineate the horizontal and vertical extent of the lube oil. A backhoe with a pavement breaker was used to excavate a 9-foot by 15.5-foot test pit down to 5 feet bgs at the SB-47 location (Figure 2). A strong petroleum odor was observed in sidewall soils between 0.5 to 3 feet bgs, with a mild petroleum odor between 3 to 5 feet bgs. At 5 feet bgs, soils at the bottom of the excavation

exhibited a clear change of type and color with no petroleum odor. Soil sample TPBT1 was collected from this depth at the bottom of the pit and analyzed for diesel and lube oil. Test results for TBTP1 (Table 1) indicate that diesel and lube oil are not present at concentrations above the screening level at the base of the test pit. Note that no samples were collected from the sidewalls of the pit due to the apparent presence of contamination. Soil excavated from the test pit was hauled offsite and disposed of at a permitted landfill, following which the test pit was backfilled with clean fill. A test pit log and analytical results for this follow-up investigation are included in Attachments 1 and 2.

A third sampling event was conducted on November 7, 2013 to delineate the horizontal extent of contamination around the test pit. Soil probes were installed in grid pattern around the test pit as shown on Figure 4. Soil samples were taken at depths corresponding to the location most likely to be contaminated based on field observations. If no apparent contamination was observed, samples were collected at the water table depth. Thirteen samples (SB-48 through SB-60) were collected and analyzed for diesel and lube oil. Lube oil was detected at concentrations exceeding the screening level samples from SB-48 and SB-59 (Table 2). Sampling results were used to delineate the approximate horizontal extent of soil contamination as shown on Figure 4. Contaminated soil within the footprint shown on Figure 4 is anticipated to occur within a 1- to 2- foot thick layer between the depths of 5 to 7 feet bgs. This zone likely reflects the zone of water table fluctuation at this location. Logs of the soil borings are presented in Attachment 1.

In addition to the soil samples, two groundwater samples (SB-52 and SB-53) were collected and analyzed for diesel and lube oil to assess down gradient impacts to groundwater. Groundwater samples were collected from the probes using a peristaltic pump; pumped groundwater was allowed to purge until relatively free of sediment before samples were collected. Diesel and lube oil were detected in the sample from SB-53 at concentrations below the screening levels (Table 3). This sample was re-analyzed using silica-gel cleanup to remove naturally-occurring organics which may have originated from organic soils (such as peat). Note that peat was observed in several borings, including SB-53. Diesel and lube oil were not detected in the re-analyzed sample.

# Rail Spur Surface Soils

A total of fourteen soil samples were collected along the rail spur on September 27, 2012 (Figure 2). Of the fourteen samples, six were collected in surface soils from 0 to 6 inches bgs (SB-33, SB-37 through SB-40, and SB-46). The remaining eight locations (SB-34 through SB-36 and SB-41 through SB-45) were sampled using a probe rig to advance borings through asphalt and concrete pavement present at the sampling locations. Samples from these borings were collected immediately below surficial layers of either asphalt and concrete debris or coarse gravel fill without sufficient fines to sample. Sample depths ranged from 1- to 2- feet bgs. All samples were submitted for analysis for cPAHs. None of the samples exceeded the screening levels for cPAHs (Table 4). Sampling/boring logs for the samples are provided in Attachment 1.

# Metals in Groundwater and Seeps

Two consecutive quarterly sampling events were conducted in July and October 2012. Groundwater samples were collected from monitoring wells MW-08 through MW-10, surface water stations SW-01 through SW-03, and groundwater seeps 4 and 5 (Figure 3).

Groundwater samples were collected on July 3 and October 25, 2012 using a peristaltic pump and low-flow purging/sampling techniques. Prior to sampling, the wells were purged until measured water quality parameters stabilized according to criteria established in the RI/FS Work Plan (Parametrix 2008). Upon stabilization, groundwater samples were collected into the appropriate laboratory-provided containers.

The surface water and seep samples were collected on the same dates as the groundwater samples during a low slack tide. A tide chart has been provided for reference for both sampling dates (Attachment 3). Surface water

samples were collected by submerging the appropriate sample containers into the surface water at near-shore locations where the surface water was approximately 1-foot deep. Care was taken to prevent loss of preservative.

Seep samples were collected from shallow depressions excavated in the beach sediment at each seep location. Turbid water created by the excavation activities was allowed to dissipate until the water in the depressions appeared visually clear. Seep samples were collected by submerging the appropriate sample containers below the surface of the water in the depressions. Care was taken not to introduce sediments into the samples and to avoid the loss of preservative from the containers.

Water quality parameter measurements were collected during purging of the monitoring wells and following sampling at the seep and surface water locations (Tables 5 and 6). Field data sheets from both sample collection dates are presented in Attachment 1. In addition to sample collection, the depth to groundwater was measured in each well for both sampling events to provide data used to develop inferred elevation contours as shown on Figures 5 and 6. The measurements were collected within a 1-hour period to give a representative snapshot of groundwater elevations. The figures also show inferred groundwater flow directions based on the elevation contours.

All samples were submitted for analysis of total and dissolved copper and nickel, chloride, dissolved organic carbon (DOC), salinity, and total dissolved solids (TDS).

Results for the monitoring well samples (Table 7) show that both total and dissolved copper and nickel concentrations exceeded screening levels in all three wells during both the July and October 2012 sampling events. Total and dissolved nickel also exceeded RLs in the seeps (Table 8). The concentrations detected are relatively consistent with those measured during the initial four quarterly monitoring events in 2010. To illustrate this, charts of copper and nickel concentrations versus time are provided on Figures 7 through 10.

Surface water samples were collected from West Bay to assess the possibility that copper and nickel concentrations detected in the wells and seeps reflected area background conditions in marine waters adjacent to the site. As shown in Table 8 and Figures 7 through 10, total and dissolved copper and nickel concentrations detected in the surface water samples were similar to or higher than concentrations detected in the wells and seeps. Note that samples SW01, SW02, and SW03 were collected at low slack tide from near-shore locations situated approximately 100 feet, 1,600 feet, and 400 feet respectively from the former wood burner location.

Marine surface water quality is relevant to the quality of the well and seep samples since the near-shore groundwater in the wells and seeps consists of a mixture of marine and freshwater. The ratio of mixture is illustrated by the concentrations of chloride measured in the seep and groundwater samples – 1,100 to 14,000 milligrams per liter (mg/L); typical seawater has a chloride concentration of on the order of 19,000 mg/L. Typical background chloride concentrations in groundwater are on the order of 100 mg/L (USGS 2011). The measured chloride concentrations suggest that well and seep samples consisted of 17 to 50 percent seawater in July and 7 to 74 percent seawater in October. Note that chloride in the West Bay surface samples ranged from 7,700 to 13,000 mg/L over that same timeframe, reflecting the effect of freshwater input from sources such as the Deschutes River.

Plots of total and dissolved copper versus chloride are provided on Figures 11 and 12. Linear regression trend lines were added to the data series to illustrate concentration trends. If marine water is the source of the copper, we would expect copper concentrations to increase with increasing amounts of marine water in the samples (as indicated by increasing chloride concentrations). As shown, a clear trend of increasing copper concentrations with increasing chloride may be observed from the plotted data. Conversely, if the copper source were groundwater, we would expect to see decreasing copper concentrations as chloride concentrations increase; instead, the data show an opposite trend.

Figures 13 and 14 show that, like copper, total and dissolved nickel concentrations generally increase with increasing chloride concentrations.

# Sediment Station SD-33 Delineation

Additional delineation of the area downslope and cross slope from sediment station SD-33 was conducted on July 19, 2012. Sediment stations were established on an approximate 10- to 20-foot grid down and cross slope from SD-33 by physical measurement at low tide (Figure 3). One sample from the top 10 centimeters (cm) was collected at each of the eight locations, SD-34 through SD-41. Sediment was collected using disposable polyethylene scoops and bowls and thoroughly homogenized. Large debris, rocks, wood, and shells were removed from the sample prior to filling laboratory provided containers. A physical description of the sediment from each of the sample locations was documented on field data sheets included in Attachment 1.

All samples were submitted for analysis for diesel and lube oil. In accordance with the Data Gap SAP, only the three samples closest to SD-33 (SD-34 through SD-36) were analyzed initially. Following receipt of results, the remaining five samples were also analyzed since the initial three samples exceeded the 100 mg/kg screening level for petroleum. All eight locations exceeded the screening level. Results are summarized in Table 9.

# CONCLUSIONS

The results of the data gap sampling reported here will be incorporated into the overall RI results and factored into the Feasibility Study to be developed for the site (as appropriate). The following conclusions pertain only to the sufficiency of the RI efforts conducted to date for each investigated area.

## Oil Stain

The sampling efforts conducted have successfully delineated the extent of the lube oil impacts to soil and groundwater at this location. It is noted that the limits of contaminated soil were not fully delineated to the north of the oil stain in the vicinity of SB-59. However, the lube oil concentration detected in SB-59 is relatively low and it is anticipated that the contamination extends only a short distance to the north of the boring location. This limit could easily be verified by sampling during clean up excavation activities (if excavation is the selected cleanup action). Therefore, further investigation work at the oil stain location is not warranted.

# Rail Spur Soils

The rail spur soil sampling results clearly establish that surface and near surface soils beyond the immediate vicinity of the rail spur are not impacted by cPAHs. Therefore, further investigation work to delineate the horizontal extent of cPAHs contamination is not warranted. If future cleanup actions include a soil cap over the rail spur, the results of the data gap sampling may be used to establish the horizontal cap limits.

# Metals in Groundwater and Seeps

The data gap sampling conducted for groundwater, seeps, and marine water confirmed the results of the initial sampling. The copper and nickel concentrations in wells MW-08 through MW-10 and seeps 4 and 5 clearly reflect area background conditions in West Bay. It is therefore concluded that the monitoring completed to date in wells MW-08 through MW-10 and seeps 4 and 5 is sufficient for the purposes of the RI/FS and that further monitoring is not warranted.

#### Sediment Station SD-33 Delineation

Data gap sampling did not successfully delineate the extent of petroleum contamination above the 100 mg/kg screening level in the vicinity of station SD-33. Therefore, additional delineation sampling is warranted for the RI.

## REFERENCES

- Parametrix. 2004a. West Bay Phase I Environmental Site Assessment Port of Olympia Property. Prepared for City of Olympia Parks, Arts, and Recreation Department. June.
- Parametrix. 2004b. West Bay Phase II Environmental Site Assessment. Prepared for City of Olympia Parks, Arts, and Recreation Department. June.
- Parametrix. 2007. West Bay Rail Spur Phase II Environmental Site Assessment Report. Prepared for City of Olympia Parks, Arts, and Recreation Department. December.
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- Parametrix 2010. Solid Wood Incorporated Site (West Bay Park) Interim Action Report Revision 1. Prepared for the City of Olympia Parks, Arts, and Recreation Department. September.
- Parametrix. 2011a. Technical memorandum: Solid Wood Incorporated Site Quarter 8 Groundwater Results, December 2010. Prepared for City of Olympia Parks, Arts, and Recreation Department. February 1.
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- Parametrix. 2012. Technical memorandum: Solid Wood Incorporated Site RI/FS and IA Work Plan Addendum No. 5 – Data Gap Sampling and Analysis Plan Revision 1. Prepared for City of Olympia Parks, Arts, and Recreation Department. June 25.
- Parametrix. 2013a. Technical memorandum: Solid Wood Incorporated Site RI/FS and IA Work Plan Addendum No. 6 – Additional Oil Stain Investigation Sampling and Analysis Plan. Prepared for City of Olympia Parks, Arts, and Recreation Department. January 14.
- Parametrix. 2013b. Technical memorandum: Solid Wood Incorporated Site RI/FS and IA Work Plan Addendum No. 8 – Oil Stain Soil Probe Investigation Sampling and Analysis Plan. Prepared for City of Olympia Parks, Arts, and Recreation Department. August 7.
- USGS. 2011. ca.water.usgs.gov/archive/fact\_sheets/b07/up.html

#### Figures

- 1 Site Plan and Surface Water Sampling Locations
- 2 Rail Spur Surface Soil and Oil Stain Sample Locations
- 3 Surface Water, Seep, Groundwater, and Sediment Sample Locations
- 4 Oil Stain Soil Probe Investigation Sampling Locations
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- 6 Potentiometric surface, Oct 2012
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- 9 Dissolved Nickel Results Chart
- 10 Total Nickel Results Chart
- 11 Dissolved Copper vs Chloride Chart
- 12 Total Copper vs Chloride Chart
- 13 Dissolved Nickel vs Chloride Chart
- 14 Total Nickel vs Chloride Chart

## Tables

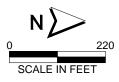
- 1 Oil Stain Soil Sample Results
- 2 Oil Stain Soil Sample Results
- 3 Oil Stain Groundwater Sample Results
- 4 Rail Spur Sample Results
- 5 Final Water Quality Parameters for July 2012
- 6 Final Water Quality Parameters for October 2012
- 7 Groundwater Results
- 8- Surface Water and Seep Results
- 9 Sediment Sample Results

#### Attachments

- 1 Boring and Field Logs
- 2 Data Review Memoranda and Laboratory Reports
- 3 Tide Charts



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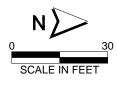
LEGEND

SURFACE WATER SAMPLE LOCATION

Figure 1 Solid Wood Incorporated Site (West Bay Park) Olympia, Washington Site Plan and Surface Water Sampling Locations



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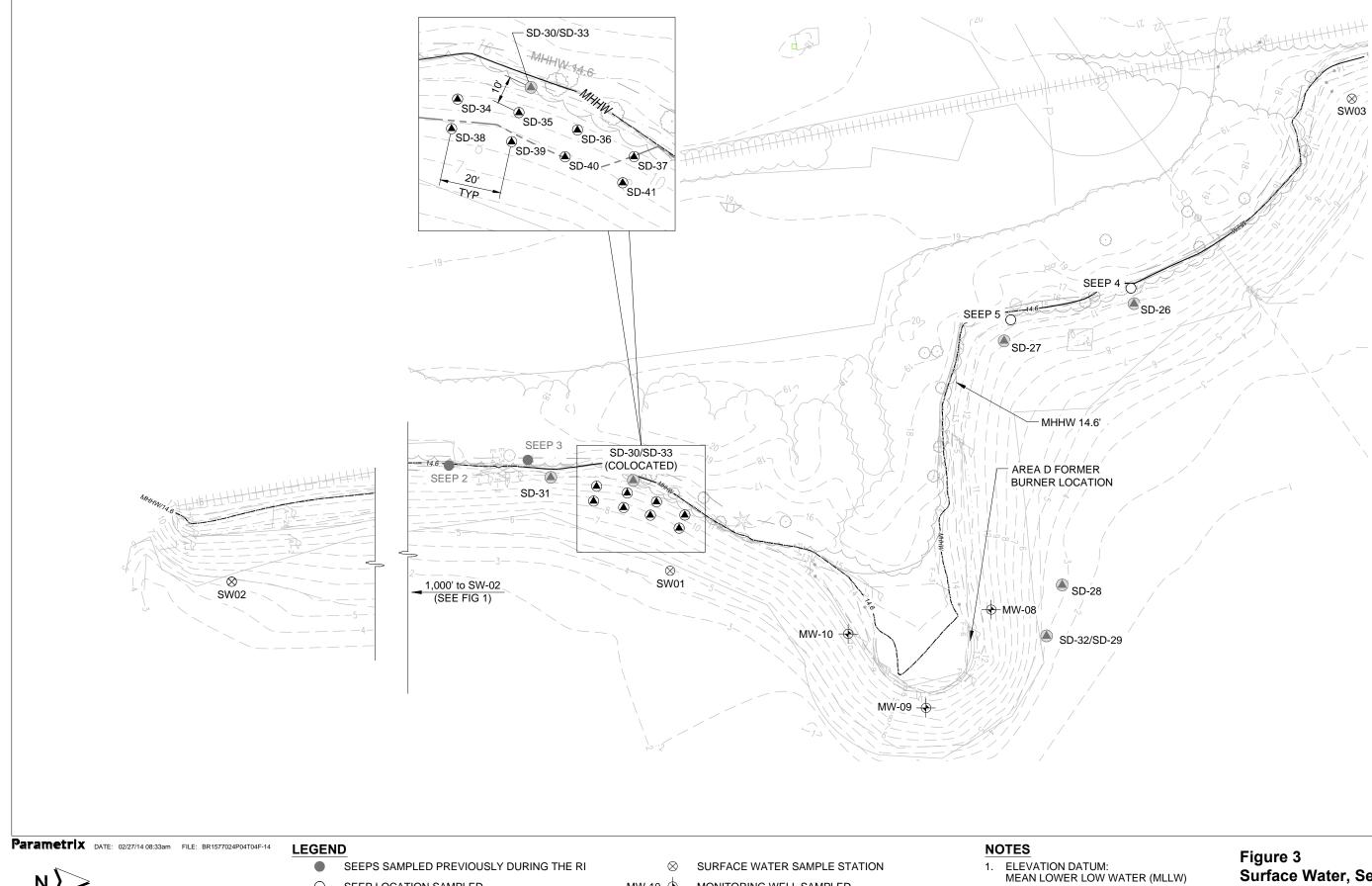
#### LEGEND

- WBGP 2004 GEOPROPE SAMPLING LOCATIONS WBTP 🖲
  - 2004 TEST PIT SAMPLING LOCATION
  - PMX PHASE II ESA/RIFS SAMPLING LOCATION
  - MONITORING WELL

- PORT OF OLYMPIA TEST PIT LOCATION •
- SOIL BORING LOCATION WHERE SOIL CONCENTRATIONS EXCEED SCREENING LEVELS FOR PAHS DURING PREVIOUS RI SAMPLING
- RAIL SPUR SOIL SAMPLE LOCATION
- OIL STAIN SOIL SAMPLE LOCATION

- SS SURFACE SOIL SAMPLING LOCATION
- SOIL BORING LOCATION SB

## Figure 2 Rail Spur Surface Soil and Oil Stain Sample Locations Solid Wood Incorporated Site (West Bay Park) Olympia, Washington



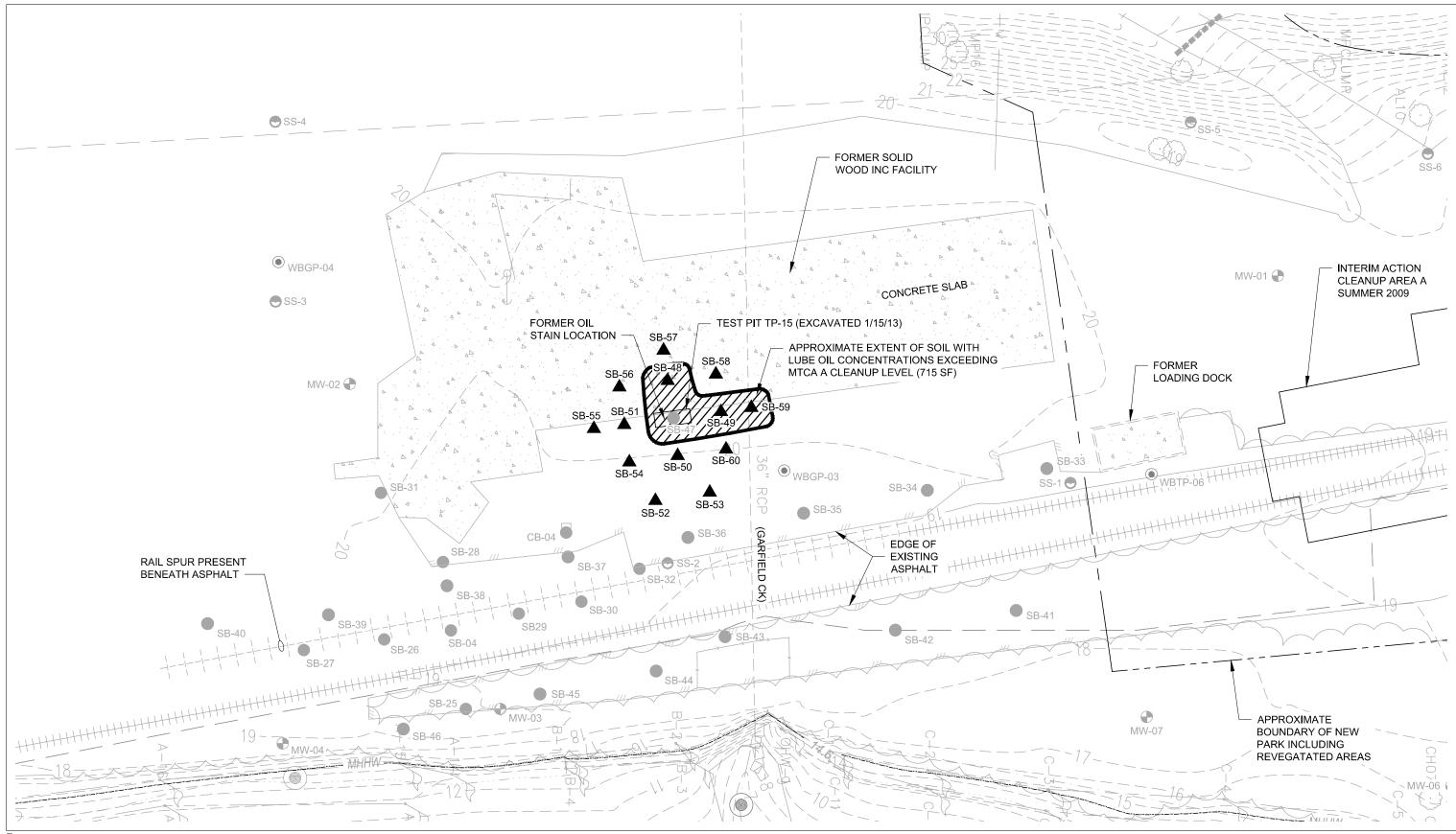
- Ο SEEP LOCATION SAMPLED
- SEDIMENT SAMPLED PREVIOUSLY DURING RI
- MW-10 🕀 -MONITORING WELL SAMPLED
  - ۲ SEDIMENT SAMPLE LOCATION

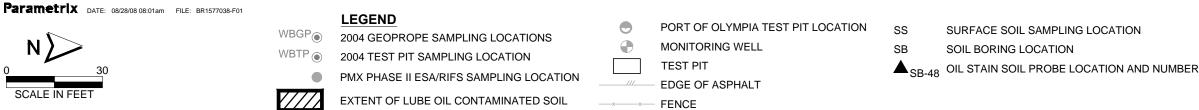
- 2. TOPOGRAPHY SHOWN BASED ON PRE-PARK CONSTRUCTION CONDITIONS.



Surface Water, Seep, Groundwater, and Sediment Sample Locations Solid Wood Incorporated Site

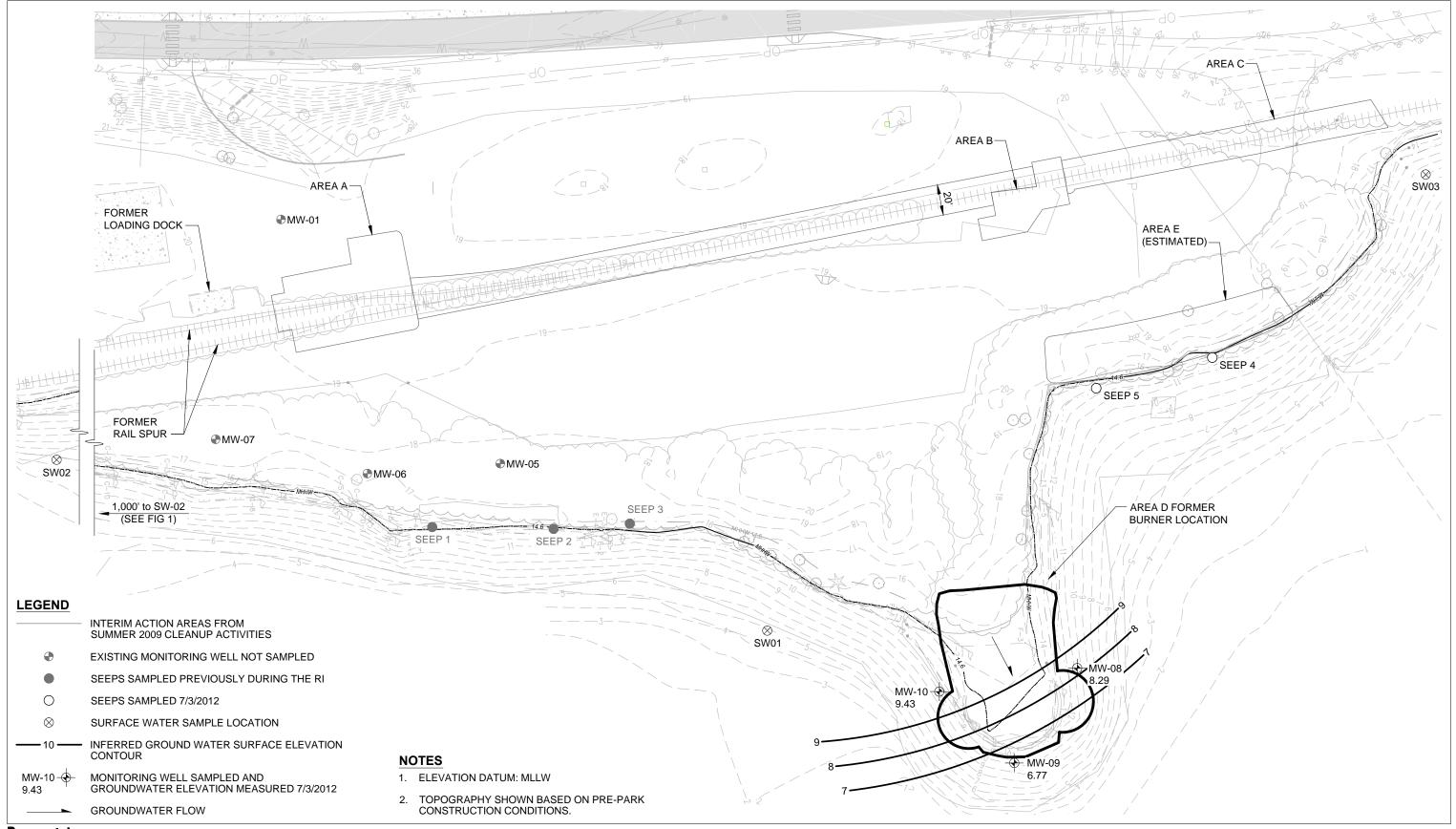
(West Bay Park) Olympia, Washington





# Figure 4 **Oil Stain Soil Probe Investigation**

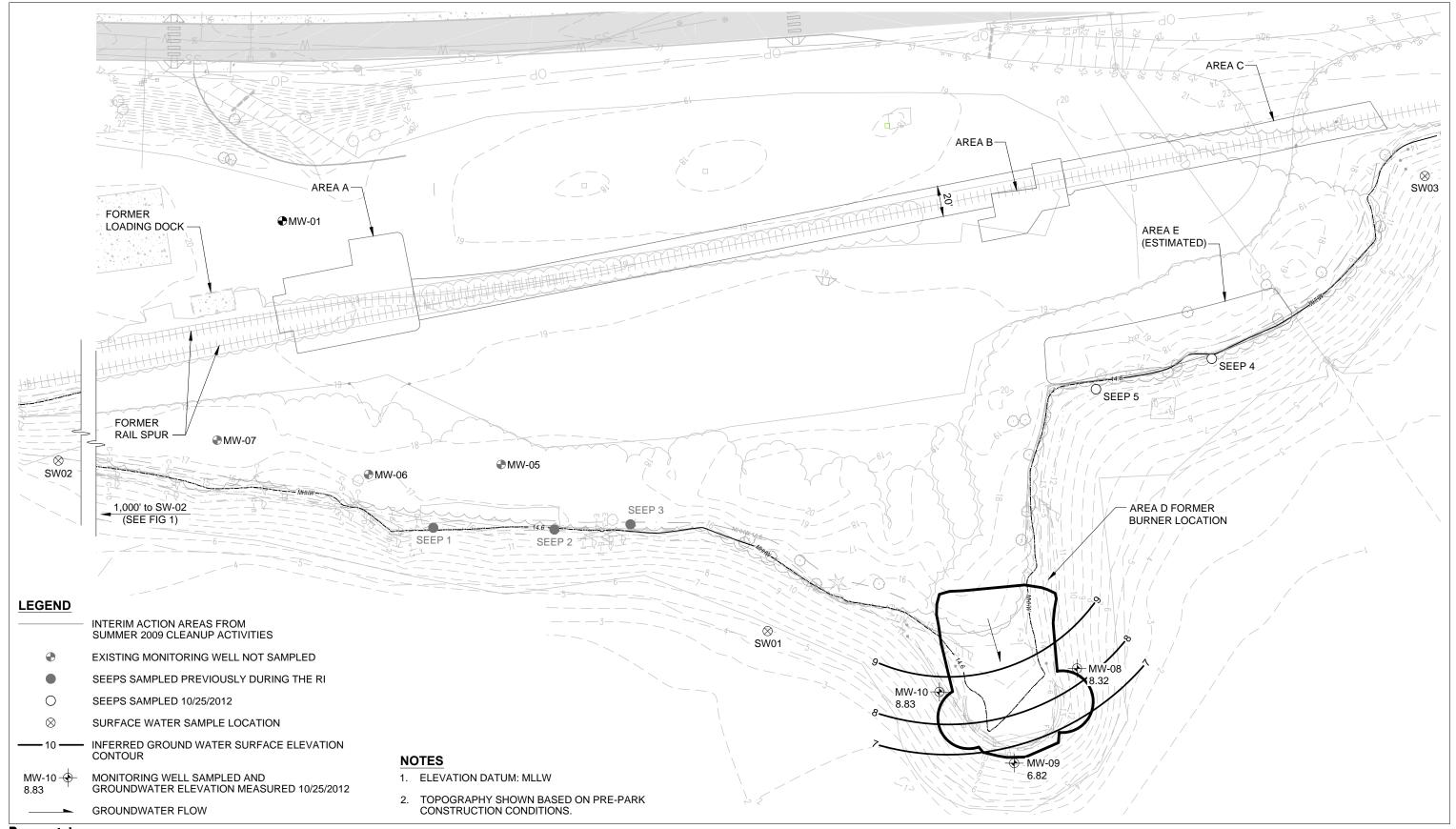
Sampling Locations Solid Wood Incorporated Site (West Bay Park) Olympia, Washington



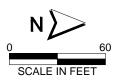
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# Figure 5 Potentiometric Surface July 2012

Solid Wood Incorporated Site (West Bay Park) Olympia, Washington

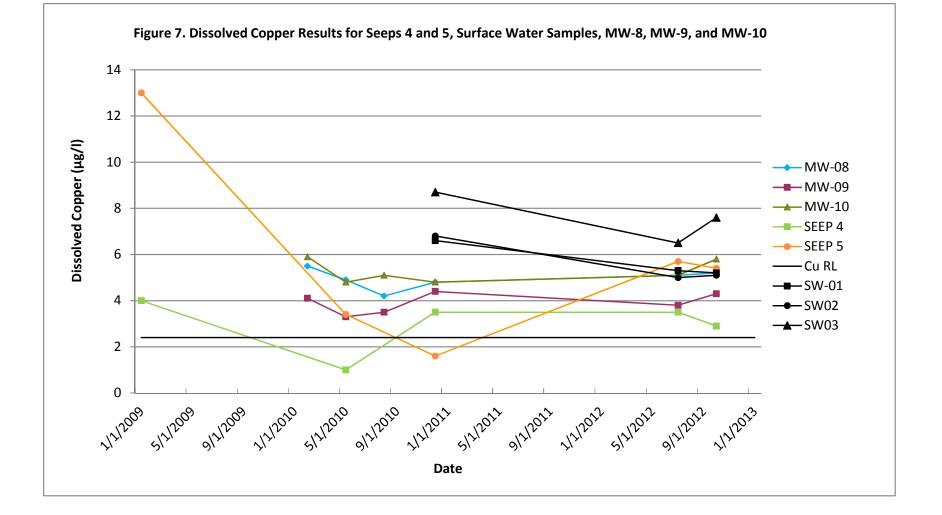


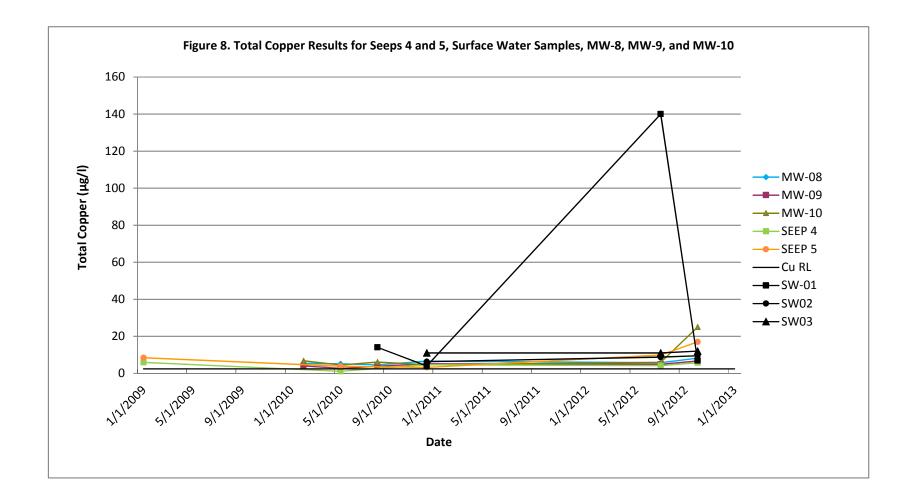
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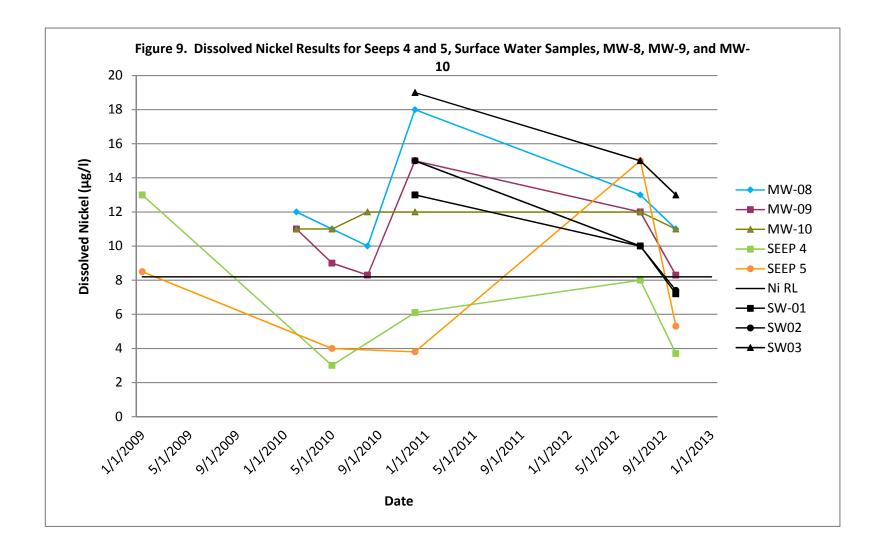


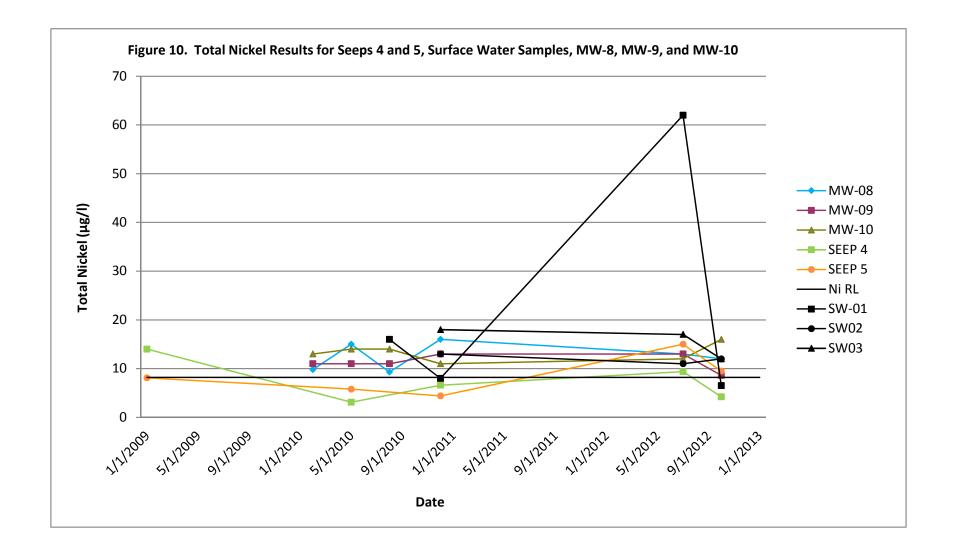
# Figure 6 Potentiometric Surface October 2012

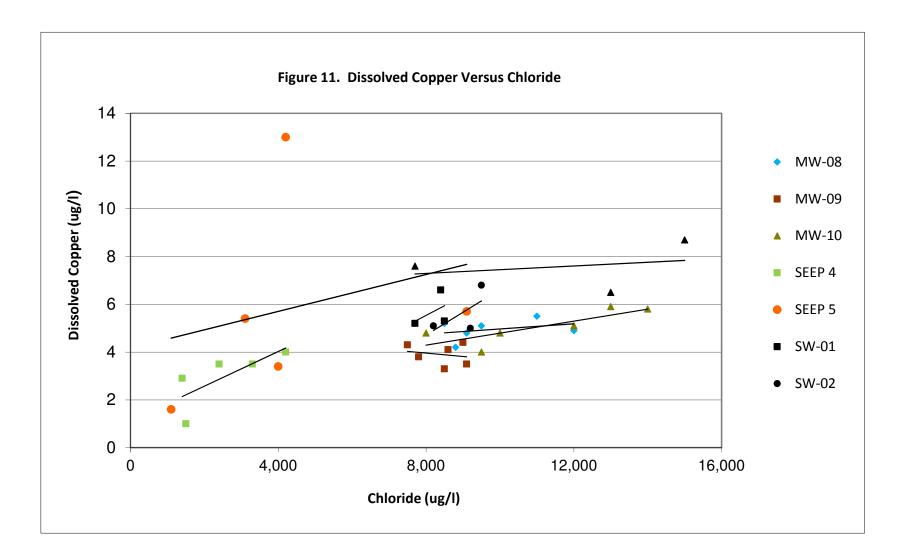
Solid Wood Incorporated Site (West Bay Park) Olympia, Washington

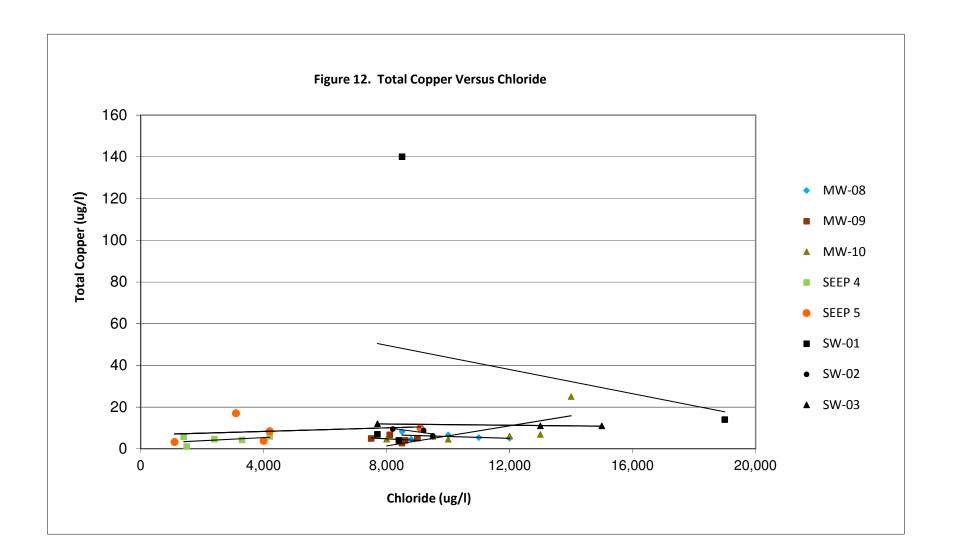


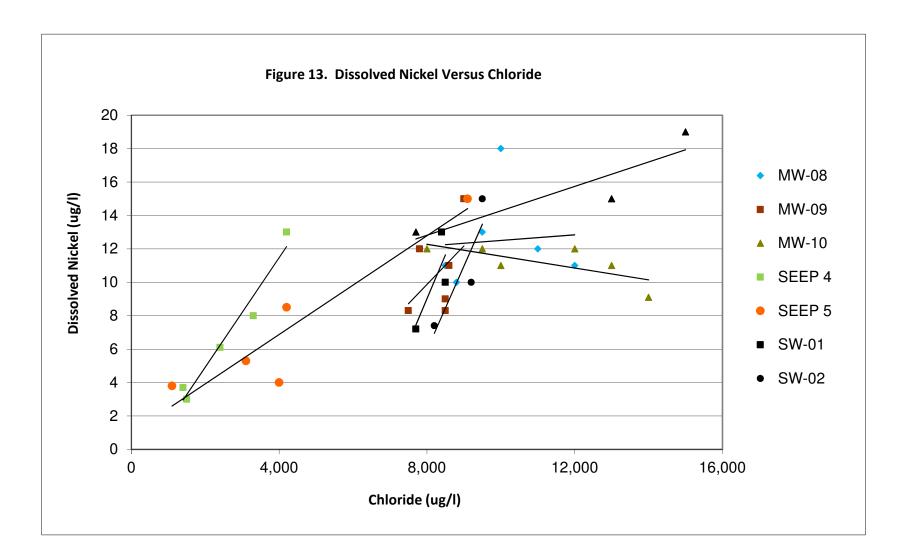


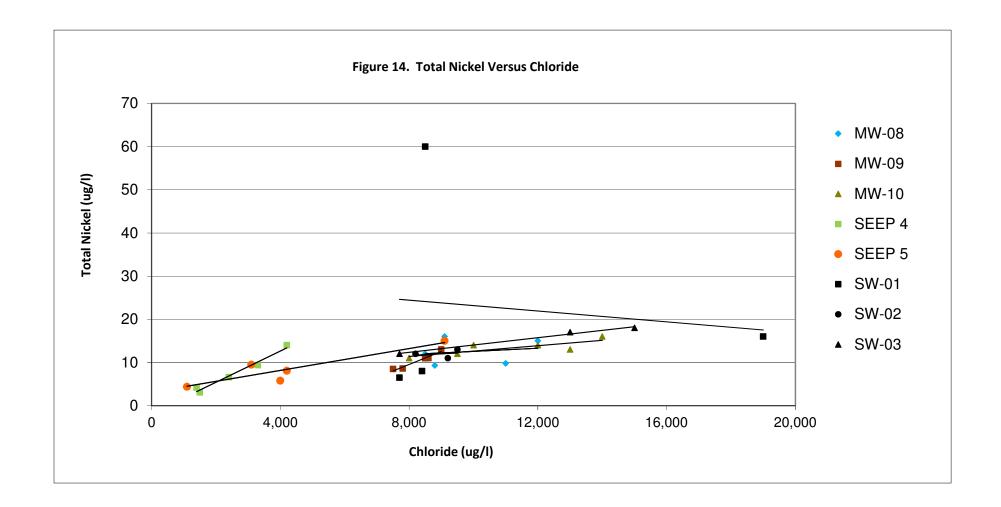












		Sample No.	SB47	SB47	SB47(dup)	TPBT1	TPBT1(dup)
		Sample Depth (ft):	1.0	3.5	3.5	5.0	5.0
		SL	9/27/12	9/27/12	9/27/12	1/15/13	1/15/13
TOTAL PETROLEUM HYDROCARBONS							
Diesel Range Organics	mg/kg	2000	360 U	1500 U	600 U	39 U	39 U
Lube Oil Range Organics	mg/kg	2000	11,000	17,000	16,000	200	200
Gasoline Range Organics	mg/kg	100	5.1 U	5.5 U	5.0 U		
METALS							
Arsenic	mg/kg	20	11 U	11 U	11 U		
Cadmium	mg/kg	2	0.53 U	0.55 U	0.54 U		
Chromium	mg/kg	2000	20	25	34		
Lead	mg/kg	250	6.0	5.5 U	5.4 U		
Mercury	mg/kg	2	0.27 U	0.27 U	0.27 U		
VOLATILE ORGANIC COMPOUNDS <sup>1</sup>							
Acetone	mg/kg	-	0.071	0.066	0.069		
2-Butanone	mg/kg	-	0.012	0.013	0.015		
o-Xylene	mg/kg	9	0.0017 U	0.0010	0.0011 U		
Toluene	mg/kg	7	0.0084 U	0.038	0.038		
POLYCHLORINATED BIPHENYLS							
All Aroclors - non-detect	mg/kg	-	U	U	U		
CARCINOGENIC POLYNUCLEAR AROMATI	CHYDROC	ARBONS					
Benzo(a)anthracene	mg/kg	-	0.036 U	0.036 U	0.036 U		
Chrysene	mg/kg	-	0.036 U	0.036 U	0.036 U		
Benzo(b)fluoranthene	mg/kg	-	0.036 U	0.036 U	0.036 U		
Benzo(k)fluoranthene	mg/kg	-	0.036 U	0.036 U	0.036 U		
Benzo(a)pyrene	mg/kg	0.1	0.036 U	0.036 U	0.036 U		
Indeno(1,2,3-cd)pyrene	mg/kg	-	0.036 U	0.036 U	0.036 U		
Dibenzo(a,h)anthracene	mg/kg	-	0.036 U	0.036 U	0.036 U		
Total cPAHs as Benzo(a)pyrene <sup>2</sup>	mg/kg	0.1	0.0272 U	0.0272 U	0.0272 U		

Notes:

- No comparative value established.

-- Not analyzed.

<sup>1</sup> Only detects listed.

<sup>2</sup> Total of individal cPAHs multipled by benzo(a)pyrene toxcity equivalency factor - half the practical quantitation limit was used for non-detect values.

cPAHs Carcinogenic polycyclic aromatic hydrocarbons.

ft Feet.

mg/kg Milligrams per kilogram.

SL Screening level established in the RI/FS Work Plan.

U Analyte not detected above given practical quantitation limit.

					Tabl	e 2. Oil Stain	Soil Sample	e Results							
	Sample No.	SB48	SB49	SB50	SB51	SB52	SB53	SB54	SB55	SB56	SB57	SB58	SB59	SB59 (dup)	SB60
Sam	ple Depth (ft):	7.0	6.0	6.0	7.0	7.0	7.0	6.5	7.0	1.0	8.0	7.0	6.0	6.0	7.0
	SL	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13	11/7/13
TOTAL PETROLEUM HYDR	OCARBONS														
Diesel Range Organics	mg/kg 2000	680 U	48 U	36 U	27 U	41 U	59 U	65 U	60 U	42 U	42 U	60	150 l	U 30 U	35 U
Lube Oil Range Organics	mg/kg 2000	12,000	530	150	55 U	89	360	390	1,100	210	210	480	3,200	420	92
Notes															
fi	Feet.														

mg/kg Milligrams per kilogram.

SL Screening level established in the RI/FS Work Plan.

U Analyte not detected above given practical quantitation limit.

	Table 3. Oil Stain Groundwater Sample Results														
		Sample No.	SB52	SB52 (dup)	SB53	SB53 <sup>1</sup>									
		SL	11/7/13	11/7/13	11/7/13	11/7/13									
TOTAL PETROLEUM HYDROCARBONS															
Diesel Range Organics	mg/L	0.5	0.26 L	0.26 U	0.46	0.26 U									
Lube Oil Range Organics	mg/L	0.5	0.41 L	0.41 U	0.48	0.41 U									

Notes:

1 Silica gel cleanup performed.

ft Feet.

mg/L Milligrams per liter.

SL Screening level established in the RI/FS Work Plan.

U Analyte not detected above given practical quantitation limit.

						Т	able 4. Rail Sp	our Sample Re	sults								
		Sample No.	SB33	SB34	SB35	SB36	SB37	SB38	SB39	SB40	SB40(dup)	SB41	SB42	SB43	SB44	SB45	SB46
		Sample Depth (ft):	0.5	1.5	1.5	1.5	0.5	0.5	0.5	0.5	0.5	1.0	2.0	1.5	1.0	1.5	0.5
PARAMETERS	Units	Date Sampled:	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12	9/27/12
		SL															
CARCINOGENIC POLYCYCLIC AF	ROMATIC H	IYDROCARBONS															
Benzo(a)anthracene	mg/kg	-	0.0070 U	0.0070 U	0.0070 U	0.10	0.0069 U	0.0072 U	0.0069 U	0.0072 U	0.0073 U	0.0093	0.0073 U	0.020	0.0070 U	0.0071 U	0.022
Chrysene	mg/kg	-	0.034	0.0070 U	0.0070 U	0.087	0.015	0.017	0.011	0.013	0.013	0.036	0.0073 U	0.039	0.0070 U	0.014	0.062
Benzo(b)fluoranthene	mg/kg	-	0.038	0.0070 U	0.0070 U	0.045	0.010	0.019	0.011	0.012	0.014	0.066	0.0073 U	0.026	0.0070 U	0.0071 U	0.083
Benzo(k)fluoranthene	mg/kg	-	0.0088	0.0070 U	0.0070 U	0.041 U	0.0069 U	0.0072 U	0.0069 U	0.0072 U	0.0073 U	0.015	0.0073 U	0.0070 U	0.0070 U	0.0071 U	0.018
Benzo(a)pyrene	mg/kg	0.1	0.0095	0.0070 U	0.0070 U	0.041 U	0.0073	0.0072 U	0.0069 U	0.0072 U	0.0073 U	0.023	0.0073 U	0.023	0.0070 U	0.0071 U	0.039
Indeno(1,2,3-cd)pyrene	mg/kg	-	0.013	0.0070 U	0.0070 U	0.041 U	0.0069 U	0.0072 U	0.0069 U	0.0072 U	0.0073 U	0.031	0.0073 U	0.015	0.0070 U	0.0071 U	0.020
Dibenzo(a,h)anthracene	mg/kg	-	0.0070 U	0.0070 U	0.0070 U	0.041 U	0.0069 U	0.0072 U	0.0069 U	0.0072 U	0.0073 U	0.012	0.0073 U	0.0070 U	0.0070 U	0.0071 U	0.0074
Total cPAHs as	mg/kg	0.1	0.0165	0.0053 U	0.0053 U	0.042	0.0223	0.0525	0.0495	0.0517	0.0066	0.0367	0.0055 U	0.0333	0.0053 U	0.0055	0.0547
Benzo(a)pyrene <sup>1</sup>																	

Notes:

- No comparative value established.

<sup>1</sup> Total of individal cPAHs multipled by benzo(a)pyrene toxcity

equivalency factor - half the PQL was used for non-detect values.

cPAHs Carcinogenic Polycyclic Aromatic Hydrocarbons.

ft Feet.

mg/kg Milligrams per kilogram.

SL Screening level established in the RI/FS Work Plan.

U Analyte not detected above given practical quantitation limit.

Location ID	Date/Time	pH (units)	Conductivity (S/m)	Dissolved Oxygen (mg/l)	Temperature (ºC)	Turbidity (NTU)	Redox (mV)
MW-08	7/3/12 @ 1228	7.00	7.15	0	14.65	120	-360
MW-09	7/3/12 @ 1128	7.06	6.28	0	13.66	19.6	-377
MW-10	7/3/12 @1023	6.59	7.25	0	14.69	24.0	-255
SW-01	7/3/12 @ 0925	6.84	6.88	6.70	15.06	>1000*	47
SW-02	7/3/12 @ 0905	6.63	6.91	7.64	14.18	206	-2
SW-03	7/3/12 @ 0850	6.06	9.58	5.92	14.20	203	-17
SEEP-4	7/3/12 @ 1330	7.59	3.31	0.95	13.60	>1000**	-138
SEEP-5	7/3/12 @ 1315	7.49	6.98	4.92	16.09	72.7	-52

# Table 5. Final Water Quality Parameters for July 2012

Notes:

S/m = siemens per meter.

mg/l = milligrams per liter.

<sup>o</sup>C = degrees Celsius.

NTU = nephelometric turbidity units.

mV = millivolts.

% = percent.

\* = Outgoing tide caused significant turbidity.

\*\* = Bivalves in excavated depression caused turbidity.

Location ID	Date/Time	pH (units)	Conductivity (mS/m)	Dissolved Oxygen (mg/l)	Temperature (ºC)	Turbidity (NTU)	Redox (mV)
MW-08	10/25/12 @ 1026	8.75	35.9	0	13.25	4.1	-325
MW-09	10/25/12 @ 0919	8.74	30.6	0	14.41	0.3	-337
MW-10	10/25/12 @ 0823	7.83	45.5	0	14.02	6.2	-244
SW-01	10/25/12 @ 1300	8.00	28.7	9.88	11.41	5.9	-1
SW-02	10/25/12 @ 1240	7.83	47.4	7.73	12.03	5.2	11
SW-03	10/25/12 @ 1220	7.89	48.4	7.85	11.54	13.4	-17
SEEP-4	10/25/12 @ 1130	8.01	51.5	0.98	13.12	460	-109
SEEP-5	10/25/12 @ 1200	8.20	13.8	3.46	12.37	245	-87

# Table 6. Final Water Quality Parameters for October 2012

Notes:

mS/m = millisiemens per meter.

mg/l = milligrams per liter.

<sup>o</sup>C = degrees Celsius.

NTU = nephelometric turbidity units.

mV = millivolts.

% = percent.

\* = turbidity meter malfunction, water was clear.

#### Table 7. Groundwater Results

		ocation ID				MW-08	40/0/408				0/0/4 08			MW-09		- 10 / 1 0		40/05/408			E /0 /4 0 <sup>8</sup>	MW	-		7/0/4 08	
ANALYTE	Date Units	Sampled SL	2/3/10	5/3/10	8/23/10	12/2/10	12/2/10 <sup>a</sup>	7/3/12	10/25/12	2/3/10	2/3/10 <sup>ª</sup>	5/3/10	8/23/10	8/23/10 <sup>ª</sup>	12/2/10	7/3/12	10/25/12	10/25/12 <sup>ª</sup>	2/3/10	5/3/10	5/3/10 <sup>ª</sup>	8/23/10	12/2/10	7/3/12	7/3/12 <sup>ª</sup>	10/25
TAL METALS	Units	3L																								
Antimony	ua/l	6 <sup>b</sup>	6U	0.50U	0.50U	0.50U	0.50U			6U	6U	0.50U	0.50U	0.50U	0.50U				6U	0.50U	0.50U	1.3U	0.50U			
Arsenic	µg/l	5	6.5U	1.8U	2.0U	1.0U	1.0U			5U	5U	0.50U 0.50U	1.2U	2U	1.0U				7.5U	2.0U	2.5U	4.0U	1.2U			
Beryllium	µg/l	4 <sup>0</sup>	4U	0.50U	0.50U	0.50U	0.50U			30 4U	30 4U	0.50U 0.50U	0.50U	0.50U	0.50U				4U	0.50U	0.50U	4.00 0.50U	0.50U			_
Cadmium	µg/l	5	40 5U	0.50U	0.50U	0.50U	0.50U 0.50U			40 5U	40 5U	0.50U 0.50U	0.50U	0.50U 0.50U	0.50U 0.50U				40 5U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U			
Chromium	µg/l	50	50U	1.3	1.3	1.1	1.6			50U	50U	0.98	0.89	1.0	1.7				50U	1.4	1.4	1.3	1.4			
Copper	µg/l	2.4 <sup>c</sup>	5.4	5.1	4.6	4.8	6.6	5.7	8.2	4	3.4	2.7	3.6	3.8	5.1	4.9	6.7	5.7	6.8	4.5	4.5	6.1	4.6	5.9	6.0	
Lead	µg/l	2.4 8.1 <sup>c</sup>	8U	0.50U	4.0 0.50U	4.0 0.50U	0.50		0.2	4 8U	8U	0.50U	0.50U	0.50U	0.50U	4.5			8U	4.5 0.50U	0.50U	0.50U	0.50U			4
Mercury	µg/l	0.025 <sup>°</sup>	0.038U	0.025U	0.025U	0.025U	0.025U			0.038U	0.038U	0.025	0.025U	0.025U	0.025U				0.038U	0.025U	0.025U	0.025U	0.025U			
Nickel	µg/l	8.2 <sup>c</sup>	9.8	15	9.3	16	14	13	12	11	11	11	9.8	11	13	13	8.6	8.5	13	14	13	14	11	12	13	
Selenium	µg/l	50 <sup>₽</sup>	50U	8.0U	9.3 20U	10U	14 10U			50U	50U	1.6U	9.8 18U	15U	10U			0.0	50U	2.5U	4.5U	24U	10U	12		
Silver	µg/l	1.9 <sup>c</sup>	1.9U	0.50U	0.50U	0.50U	0.50U			1.9U	1.9U	0.50U	0.50U	0.50U	0.50U				1.9U	0.50U	4.50 0.50U	1.3U	0.50U			
Thallium	µg/l	0.47 <sup>c</sup>	0.45U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U			0.45U	0.45U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U				0.45U	0.50U 0.50U	0.50U 0.50U	0.50U	0.50U 0.50U			
Zinc	µg/l	81 <sup>°</sup>	80U	18	18J	7.0	12			80U	80U	8.7	9.8J	4.7J	6.8				80U	12	11	11J	6.8			
SOLVED METALS	µg/l	01	000	10	100	7.0	12			000	000	0.7	9.00	4.75	0.0				000	12		115	0.0			
Antimony	ua/l	6 <sup>D</sup>	6U	0.50U	0.50U	0.50U	0.50U			6U	6U	0.50U	0.50U	0.50U	0.50U				6U	0.50U	0.50U	1.3U	0.50U			
Arsenic	µg/l	5	8U	1.4U	1.2U	1.0U	1.0U			6U	5U	0.50U 0.50U	1.2U	1.2U	1.0U				7.5U	0.50U 0.50U	2.2U	3.5U	1.0U			
Beryllium	µg/l	.5 ⊿¤	4U	0.50U	0.50U	0.50U	0.50U			4U	30 4U	0.50U 0.50U	0.50U	0.50U	0.50U				4U	0.50U 0.50U	0.50U	0.50U	0.50U			
Cadmium	μg/l μg/l	- -	40 5U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U			40 5U	40 5U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U				40 5U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U	0.50U 0.50U			
Chromium		5 50	50U	0.66	1.1	1.2	1.1			50U	50U	0.50U 0.50U	0.75	0.300	1.1				50U	0.300	0.66	1.4	1.5			
Copper	µg/l	2.4 <sup>c</sup>	5.5	4.9	4.2	4.8	4.4	5.1	5.2	4.1	3.4	3.3	3.5	3.4	4.4	3.8	4.3	4.4	5.9	4.8	4.5	5.1	4.8	5.1	4.0	:
Lead	µg/l	8.1 <sup>c</sup>	8U	4.9 0.50U	4.2 0.50U	4.0 0.50U	0.50U		J.Z	4.1 8U	8U	0.50U	0.50U	0.50U	0.50U		4.5	4.4	8U	4.0 0.50U	0.50U	0.50U	0.50U		4.0	
Mercury	µg/l	0.025 <sup>°</sup>	0.038U	0.025U	0.025U	0.025U	0.025U			0.038U	0.038U	0.025U	0.025U	0.025U	0.025U				0.038U	0.025U	0.025U	0.025U	0.025U			
Nickel	µg/l	8.2 <sup>c</sup>	12	11	10	18	18	13	11	11	8.9	9.0	7.8	8.3	15	12	8.3	8.6	11	11	10	12	12	12	9.1	
Selenium	µg/l µg/l	50 <sup>₽</sup>	50U	6.0U	24U	10U	12U			50U	50U	2.0U	18U	16U	10U			0.0	50U	5.0U	4.0U	27U	10U		J.1	
Silver	μg/l	1.9 <sup>c</sup>	1.9U	0.50U	0.50U	0.50U	0.50			1.9U	1.9U	0.50U	0.50U	0.50U	0.50U				1.9U	0.50U	4.00 0.50U	1.3U	0.50U			
Thallium	μg/l	0.47 <sup>c</sup>	0.45U	0.50U	0.50U	0.50U	0.50U			0.45U	0.45U	0.50U	0.50U	0.50U 0.50U	0.50U				0.45U	0.50U	0.50U	0.50U	0.050U			
Zinc	μg/l	81 <sup>°</sup>	80U	15	5.9	6.1	5.4			80U	80U	6.3	4.5	4.1	3.5				80U	8	11	4.8	4.3			
	µg/i	01	000	10	0.0	0.1	0.4			000	000	0.5	7.5	7.1	0.0				000	0		4.0	4.0			
Chloride	ma/l	_	11,000	12,000	8,800	9,100	10,000	9,500	8,500	8,600	8,400	8,500	9,100	8,500	9,000	7,800	7,500	8,100	13,000	10,000	9,600	12,000	8,000	9,500	9,000	14
DOC	mg/l mg/l	_			100J	83	92	5.1	5.7	0,000		0,500	3,100 72J	120J	9,000 100	3.7	4.0	3.9			3,000	38J	76	5.3	5.3	1-
TDS	mg/l	-						17,000	17,000							14,000	13,000	13,000						17,000	17,000	23
Salinity	a/ka	-						13.90	15.84							11.79	12.14	11.91						14.04	14.04	1
24	5' ''9																									

<sup>c</sup> = Surface water applicable or relevant and appropriate requirement (ARAR).

*italics* = PQL exceeds screening level.

J= Analyte was detected. The reported concentration should be considered an estimate. mg/l = milligrams per liter.

µg/l = micrograms per liter.

U = Not detected at given practical quantitation limit (PQL).

-- = Not analyzed.

# Table 8. Surface Water and Seep Results

	Lo	ocation ID		SV	V01			SW02			SW03				SEEP 4					SEEP 5		
ANALYTE	Date	Sampled	8/23/10	12/2/10	7/3/12	10/25/12	12/2/10	7/3/12	10/25/12	12/2/10	7/3/12	10/25/12	1/14/09	5/3/10	12/2/10	7/3/12	10/25/12	1/14/09	5/3/10	12/2/10	7/3/12	10/25/12
	Units	RL																				
TOTAL METALS		_																				
Antimony	µg/l	6 <sup>D</sup>	1.3U										5.6U	0.50U				5.6U	0.50U			
Arsenic	µg/l	5	6U	1.0U			1.0U			2.5U			3.3U	1.6	1.0U			3.3U	1.2	1.1		
Beryllium	µg/l	4 <sup>b</sup>	0.50U										4.0U	0.50U				4.0U	0.50U			
Cadmium	µg/l	5	0.50U										4.4U	0.50U				4.4U	0.50U			
Chromium	µg/l	50	3.2										11U	1.0				11U	1.4			
Copper	µg/l	2.4 <sup>c</sup>	14	4.0	140	6.9	6.3	8.8	9.5	11	11	12	5.9	1.1	4.6	4.2	5.7	8.4	3.8	3.2	9.9	17
Lead	µg/l	8.1 <sup>c</sup>	1.1										1.1U	0.50U				1.1U	0.57			
Mercury	µg/l	0.025 <sup>c</sup>	0.025U										0.125U	0.025U				0.125U	0.025U			
Nickel	µg/l	8.2 <sup>c</sup>	16	8.0	60.0	6.5	13	11	12	18	17	12	14	3.1	6.6	9.4	4.2	8.1	5.8	4.4	15.0	9.5
Selenium	µg/l	50 <sup>0</sup>	25U										28U	1.0U				28U	1.0U			
Silver	µg/l	1.9 <sup>c</sup>	1.3U										1.9U	0.50U				1.9U	0.50U			
Thallium	µg/l	0.47 <sup>c</sup>	0.50U										0.47U	0.50U				0.47U	0.50U			
Zinc	µg/l	81 <sup>c</sup>	6.3U										69U	5.0				69U	5.0			
DISSOLVED METALS																						
Antimony	µg/l	6 <sup>¤</sup>											5.6U	0.50U				5.6U	0.50U			
Arsenic	µg/l	5		1.0U			1.0U			3.0U			3.3U	1.7	1.0U			3.3U	1.3	1.5		
Beryllium	µg/l	4 <sup>b</sup>											4.0U	0.50U				4.0U	0.50U			
Cadmium	µg/l	5											4.4U	0.50U				4.4U	0.50U			
Chromium	µg/l	50											11U	0.75				11U	0.55			
Copper	µg/l	2.4 <sup>c</sup>		6.6	5.3	5.2	6.8	5.0	5.1	8.7	6.5	7.6	4.0	1.0	3.5	3.5	2.9	13	3.4	1.6	5.7	5.4
Lead	µg/l	8.1 <sup>c</sup>											1.1U	0.50U				1.1U	0.50U			
Mercury	µg/l	0.025 <sup>c</sup>											0.125U	0.025U				0.125U	0.025U			
Nickel	µg/l	8.2 <sup>c</sup>		13	10	7.2	15	10	7.4	19	15	13	13	3.0	6.1	8.0	3.7	8.5	4.0	3.8	15	5.3
Selenium	µg/l	50 <sup>0</sup>											28U	1.0U				28U	1.2U			
Silver	µg/l	1.9 <sup>c</sup>											1.9U	0.50U				1.9U	0.50U			
Thallium	µg/l	0.47 <sup>c</sup>											0.47U	0.50U				0.47U	0.50U			
Zinc	µg/l	81 <sup>c</sup>											69U	2.6				69U	3.5			
GENERAL CHEMISTRY																						
Chloride	mg/l	-	19,000	8,400	8,500	7,700	9,500	9,200	8,200	15,000	13,000	7,700	4,200	1,500	2,400	3,300	1,400	4,200	4,000	1,100	9,100	3,100
DOC	mg/l	-	23J	14	2.4	2.1	13	2.3	2.0	17	2.5	1.7			65	3.9	3.4			31	4.7	6.1
TDS	mg/l	-				13,000			17,000			25,000					3,100					6,500
Salinity	g/kg	-				11.32			15.00			20.80					2.61					5.41
Notes:																		•				

Notes:

<sup>a</sup> = Duplicate sample.

<sup>b</sup> = State and federal groundater maximum contaminant level (MCL).

<sup>c</sup> = Surface water applicable or relevant and appropriate requirement (ARAR).

*italics* = PQL exceeds screening level.

J= Analyte was detected. The reported concentration should be considered an estimate. g/l = grams per liter.

DOC Dissolved Organic Carbon.

SL = Screening level.

µg/l = micrograms per liter.

U = Not detected at given practical quantitation limit (PQL).

-- = Not analyzed.

		Table 9	. Sediment	Sample Res	ults						
	•			· · · /	SD36	SD37	SD38	SD39	SD40	SD41 0.5	
Units			7/19/12	7/19/12	7/19/12	7/19/12	7/19/12	7/19/12	7/19/12	7/19/12	
IS	02										
	1	100.11									
mg/kg	100 <sup>1</sup>	180 0	45 U 310	120	51 0	64 380	140	190	380	61 320	
mg/kg	100 <sup>1</sup>	1680 U	355	158	571	444	175	232	446	381	
	Sa Units IS mg/kg mg/kg	Sample Depth (ft): Units Date Sampled: SL IS mg/kg 100 <sup>1</sup> mg/kg 100 <sup>1</sup>	Sediment Sample No.         SD34           Sample Depth (ft):         0.5           Units         Date Sampled:         7/19/12           SL         SL           IS         mg/kg         100 <sup>1</sup> 180         U           mg/kg         100 <sup>1</sup> 1500         1500	Sediment Sample No. SD34         SD35           Sample Depth (ft):         0.5         0.5           Units         Date Sampled:         7/19/12         7/19/12           SL         IS         mg/kg         100 <sup>1</sup> 180         U         45         U           mg/kg         100 <sup>1</sup> 1500         310	Sediment Sample No.         SD34         SD35         SD35(dup)           Sample Depth (ft):         0.5         0.5         0.5           Units         Date Sampled:         7/19/12         7/19/12         7/19/12           SL           IS         mg/kg         100 <sup>1</sup> 180         45         U         38         U           mg/kg         100 <sup>1</sup> 1500         310         120         120	Sample Depth (ft): 0.5         0.5 <th colsp<="" td=""><td>Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37           Sample Depth (ft):         0.5         0.5         0.5         0.5         0.5         0.5           Units         Date Sampled:         7/19/12</td><td>Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38           Sample Depth (ft):         0.5</td><td>Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38         SD39           Sample Depth (ft):         0.5</td><td>Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38         SD39         SD40           Sample Depth (ft):         0.5</td></th>	<td>Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37           Sample Depth (ft):         0.5         0.5         0.5         0.5         0.5         0.5           Units         Date Sampled:         7/19/12</td> <td>Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38           Sample Depth (ft):         0.5</td> <td>Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38         SD39           Sample Depth (ft):         0.5</td> <td>Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38         SD39         SD40           Sample Depth (ft):         0.5</td>	Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37           Sample Depth (ft):         0.5         0.5         0.5         0.5         0.5         0.5           Units         Date Sampled:         7/19/12	Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38           Sample Depth (ft):         0.5	Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38         SD39           Sample Depth (ft):         0.5	Sediment Sample No.         SD34         SD35         SD35(dup)         SD36         SD37         SD38         SD39         SD40           Sample Depth (ft):         0.5

Notes:

- No comparative value established.

<sup>1</sup> Ecology screening concentration for sediments applicable to the sum of the diesel range organics and lube oil range organics results.

<sup>2</sup> Sum of diesel and lube oil results. Practical quantitation limit used for non detect analytes.

ft Feet.

mg/kg Milligrams per kilogram.

SL Screening level.

U Analyte not detected above given practical quantitation limit.

Attachment 1 Boring and Field Logs

5160 US PER SHE 06120 54 20 1030 0650 600 0815 E E B 1ntr ता n D 0800 8 0810 Anthon - Li Linde Weather . w 50°F fagen Activities: Collect surface soils along Project / Client oil string area Conject vis so-sento-1005, Field due Collect WB-50-5838-0005 Collect WB-50-5839-0005 Collect WB do 5823-0005 Anive a stre to get ice Anive a site, K-planty) onsite Civil KID to not arte open Accident in 45, Inoffit delay Cellect MB SO -SB 40 -0005 Lo Frante Cullect MB-50-5837-0005 Walk location's , set up AMIGN (ESN) rathic branks continue to site B ECN. WAR Has 1 ante open 1455 Collect WB-SD-SB42-0020 Project / Client Willit Bild 251 I Stal 22 1575 Clamp 1585 EN brighte, stake limburs 1420 Collect WB-SO-SB45-0015 1410 Collect MB-50-5847-1035 1405 Collect WB-SU-SB47-0010 320 Collect MB - 50 - 5834 - 0015 5835 mas conject mb-su-sbuff-doid 345 Collect WB-50-5836-0015 5834 5333 and get eners points Collect & WB - 50- 5846-0005 Collect MB+S0-5835+0015 (Lunpha, wh reld divplicates Collect WB-SD-SB43-0015 10712º

States CHAS -HASS St St 92 SH CO 年 SS SB38 ter Project / Client 5837 the 5830 -ocation Ulymphill, WH "14.50,50,41.N" "140, 60° ENIN WD0 \$143.9" "8"Etr.HS"ECIM "5"19,500EthN "8"Etr.HS"ECIM "C' 20, 50 alth 1,8'10, ED othN 1.40, E0, E0, LAN 14, 20, 20 Lth Neigh Bein M122,24,44.3" 1150, 20 ath 8 thits BEIN eltech. G OINI Project / Client 1600 Kip (city on enterts check bryings with duill via via Kip, 1545 Din tample (ESU) White Entrin 1150 Deve DIPHUX) matter, 555 Dom (ESN) officitie anner in SB35, Tor much land rinsks to advance tor much lange Milling discuss apprach with we Entry 1255 Prip to bernos Simple antion Kits to Ariscuss barrys wetter te Entry 120 Deve D. 1011 min care I hand angest VIMMPAL THURSDAY STRATURA to see If we're done just Wertzen - WH musite

								BORING/WELL CO	NSTR	UCTI	ON LOG
PRO.	IECT N	UMBER		22	33-	15	77	-037 BORINGWELL NUMBER # S	B33		
	IECT N		W	203	1B	AsA_	Par	DATE COMPLETED 9/27/1			
LOC	TION	01	ym	P	111,	MA		TOTAL DEPTH OF BORING	.5		
	RDINA'		147	-up	3101	1.3'	<u>' W</u>	$122^{\circ}34^{\circ}44.9^{\circ}$ initial water level $\sum 140^{\circ}$			
		ETHOD	-	N/	<u>1</u>			STATIC WATER LEVEL			
		METHO		Ň		DA		LOGGED BY L. LINCE	NIA	- <u>~</u>	
		.cvA11		1			,	TOP OF CASING ELEVATION		·	
(mq	S 11S	ERY ss)	Ö.	Ł	Ŧ,	ហ	GRAPHIC LOG	DESCRIPTION	I		
PID (ppm)	BLOW	RECOVERY (inches)	SAMPLE ID	EXTENT	DEPTH (ft.)	U.S.C.S.	THIC	SOIL: Group Name, Group Symbol, Color, Plasticity, Grain Si	ze, DI (;;)	WEL	L DIAGRAM
Ē			SA				4+	Moisture Content, Density/Compaction, Miscellaneous			
		46		X		ml		Silt, ML, dk brn, NP, dry, 1005e, N2570 sm-lggravel rounded to ang fill, no odor	•		- B
	-							12590 sm-lagravel rounded to ang	nav, ]		ductionale
								-fill, no oddy			dirt back
						•		WB-SD-SB33-0005 C 1030			
					- 5 -			· · · ·	- 5 -		
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NNY											
	1				25			Continued Next Page	25		

BORING/WELL CONSTRUCT         PROJECT NUMBER       333-1577-037       BORING/WELL CONSTRUCT         PROJECT NAME       WULLA BALL MML       DATE COMPLETED       7/271/2         LOCATION       OLIMMATHA       MA       DATE COMPLETED       7/271/2         LOCATION       OLIMMATHA       MA       DATE COMPLETED       7/271/2         CORDINATES       MITAL WATER LEVEL & MA       STATE COMPLETED       7/271/2         CORDINATES       MITAL WATER LEVEL & MA       STATE COMPLETED       7/271/2         CORDINATES       MITAL WATER LEVEL & MA       STATE COMPLETED       7/271/2         CORDINATES       MITAL WATER LEVEL & MA       STATE COMPLETED       7/271/2         CORDINATES       MITAL WATER LEVEL & MA       STATE COMPLETED       7/4         CORDINATES       MITAL WATER LEVEL & MA       STATE COMPLETED       7/4         STATE COMPLETED       MITAL WATER LEVEL & MA       STATE COMPLETED       7/4         CROUND ELEVATION       STATE COMPLETED       STATE COMPLETED       1/4       1/4         GROUND ELEVATION       STATE COMPLETED       LINN & GROUND COLOR, Plasticity, GRUE SER, WA       1/4       1/4         GROUND ELEVATION       STATE COMPLETED       STATE COMPLETED       1/4       1/4       1/4					<u></u>		1C=	K, 11	trix	net	ran	Pa
3448 3448 			3 <b>4</b>	BORING/WELL NUMBER $\#$ SB DATE COMPLETED $\frac{9/27/1}{127/1}$ TOTAL DEPTH OF BORING $\frac{4}{19}$ INITIAL WATER LEVEL $\Sigma$ $\frac{N/A}{1}$ STATIC WATER LEVEL $\Sigma$ $\frac{N/A}{2}$ LOGGED BY $\underline{1}$ $\underline{1}$ $\underline{1}$ $\underline{1}$ $\underline{1}$ $\underline{1}$	122°54'44.5"	W W Cpp	3.03.8" ect Pn Split 9	E700 Dir		TES IETHO METH	ECT N TION DINA ING M PLING	PROJ LOCA COOI DRILI SAMI
3448 	WELL DIAGRAM	WEL.	DEPTH (ft.)	up Symbol, Color, Plasticity, Grain Size, Density/Compaction, Miscellaneous	SOIL: Group Name, Gro	RAPHIC LOG	DEPTH (ft.) U.S.C.S.	SAMPLE IU. EXTENT	(mcnes) SAMPLE (D.	RECOVERY (inches)	BLOW COUNTS	PID (ppm)
Continued-Next-Page	dirt and benomite backfill			- 0015 cted C 1.5 ft, shallower nich matrix was able ed immediately utty Wbble.	DE-brn black Gravel, GF, 2 MAST, loose WB-SO-SB31 Sample colle depth at w to be samp below aspt				ł8	34 <sub>48</sub>		

	Pa	ran	net	rix,		AC.	i i i i			· · · · · · · · · · · · · · · · · · ·			
										BORING/WELL C	ONSTR	UCTION LOG	
	PROJECT NUMBER 233-1577-037 PROJECT NAME WELCH BALL PML						-15	77	-037	BORING/WELL NUMBER #SB35			
							ØIA_	Par	12				
:	LOCATION 01/11/103 03:03.4" W122 54-44.4"					1.07		TOTAL DEPTH OF BORING					
			**	~	<u>1</u>	VO CU VOIT	Dra	1 da	5-5444.4	INITIAL WATER LEVEL		· · · · · · · · · · · · · · · · · · ·	
	BRILLING METHOD DIVER MGh SAMPLING METHOD CAPIT GOV GROUND ELEVATION V2D FF				+0	200		STATIC WATER LEVEL X N LOGGED BY V. WNW	<u> 1 M</u>				
					2 A	1.		TOP OF CASING ELEVATION	NIA				
	1	, vi	ВY	0	F	_		DOG	DESCRIPTION				
	PID (ppm)	BLOW	RECOVERY (inches)	SAMPLE ID	EXTENT	DEPTH (ft.)	U.S.C.S.	GRAPHIC LO		oup Symbol, Color, Plasticity, Grain	Size, H	WELL DIAGRAM	
	ЪГ	ыщы С	REC (ir	SAN	Ê	۵	, i	GRAF	Moisture Content	t, Density/Compaction, Miscellaneou	is D		
	2						₩. 		concrete \$ Ast	shalt rubblelfill 0-1	.54		
			40 0		W		<i>`</i>		DK brn aspha	tiogravel, asphalt/or	gantic T		
			1748		X		Gw						
					Δ				M some cand,	gray, NP, sm-ly rom monst, loose, no od	went -	- 8	
						5-	•		, , , , , , , , , , , , , , , , , , , ,		-5-		
											- 5	dirtond	
									WB-SI-SB35	5-0015 C1310		bentonite	
									Sample colle	cted c 1.5ft, shall	owerst	protefill	
									acoth at v	which matrix was			
						10			able to be a	sampled immedia	teller 10		
				2					below north	net rubble			
						_				•			
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BWC BL													
a						25	]		Cor	tinued Next Poge	-25	PAGE 1 OF I	

Parametrix, li	nc.		
PROJECT NUMBER PROJECT NAME WILL LOCATION UMMM COORDINATES NUT 0: DRILLING METHOD DIV SAMPLING METHOD S GROUND ELEVATION		DATE COMPLETED $9/27/1$ TOTAL DEPTH OF BORING $4$ INITIAL WATER LEVEL $V/P$ STATIC WATER LEVEL $N/P$ LOGGED BY $V$ $V$ $M$	STRUCTION LOG
PID (ppm) BLOW COUNTS RECOVERY (inches) SAMPLE ID. EXTENT	H (;;) U U U HAVE U U U HAVE SOIL: Group Name, G Moisture Conter	roup Symbol, Color, Plasticity, Grain Size, it, Density/Compaction, Miscellaneous	
BWC BLANK 21419	-5- Fill Dr. brn asphil Dr. brn asphil Dr. brn sand odr. motet. -5- Asphalt & 0 Creation-etri WB-SO-SB3 Sample coll Shallower Nathr wa Immediate rnbble. -15- -20-	Matt mbble fill D-1.5 ft tic gravel y asphultic oda- M gravel, mild polydeum loose, NP, Tugs wel mixed with eated wood Ble-0015 C 1345 sected C 1.5 ft, t depth at which IS able to be sumpled ly below asphalt	5 - dirt and bentmitu backefill

PROJ LOCA COOF DRILL SAMF	ECT N. TION IDINAT ING M PLING I	01	4m 4m 470	N/A	-15 3/11/1 12.7" 1	Park Vid	DATE COMPLETED $\frac{9/27/19}{100000000000000000000000000000000000$	337-	
PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT DEPTH	U.S.C.S.	GRAPHIC LOG	DESCRIPTION SOIL: Group Name, Group Symbol, Color, Plasticity, Grain Size, Moisture Content, Density/Compaction, Miscellaneous	DEPTH (ft.)	WELL DIAGRAM
		6/6			- Cam		PR ballarst with silt, Gm, dk-brn, NP, fist-sized ballarst Msmaller angular & rounded sm-lg gravel, drg, harat compact, no oder, occassione bark & compact, no oder, occassione		dirt backfil
				- 5			WB-SD-SB37-0005 C1045	- 5	
					-				
•					•			15	
					-			  20	
BLANK 2/4/99					-				

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PROJ LOCA COOI DRILL SAMI	ect n Tion Rdina Ling m Pling I	01		22 27 20 20 20 20 20 20 20 20 20 20 20 20 20	;		F7 Par M	DATE COMPLETED $\frac{9/27/12}{12}$ TOTAL DEPTH OF BORING 0.5 INITIAL WATER LEVEL $\Sigma$ N/A STATIC WATER LEVEL $\Sigma$ N/A LOGGED BY Lindle	38 ft		ON LOG
PID (ppm)	ÉLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft.)	U.S.C.S.	<b>GRAPHIC LOG</b>	DESCRIPTION SOIL: Group Name, Group Symbol, Color, Plasticity, Grain Size, Moisture Content, Density/Compaction, Miscellaneous	DEPTH (ft.)	WEL.	L DIAGRAM
BWC BLANK 2/4/99		96			-10	Gm		RR ballast vi sitt, Gm+ cobbie, dk bro, NP, cobbie to small grave from ned to anymer, Am, hard a compact, no ollor, bark a occassional clam shell WB-SD-SB38-0005 C 1100			airt backfil

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	Pa	ran	leti	rix,	1	nc.					. <u></u>			
	PROJ LOCA COOF DRILL SAMI	ECT NI ECT NA TION RDINAT ING M PLING I	ES CHART		2 CORPANY	33- 1B 03'	15 844 15/14 15/15	7-7 Par	-037- 12- 122054'43.8"	BORING/WELL CONSTRUCTION LOC BORING/WELL NUMBER # $SB39$ DATE COMPLETED $9/2F/12$ TOTAL DEPTH OF BORING $0.577$ INITIAL WATER LEVEL $\Sigma$ $N/A$ STATIC WATER LEVEL $\Sigma$ $N/A$ LOGGED BY $1.1000$ TOP OF CASING ELEVATION $N/A$				
, ,	PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft.)	U.S.C.S.	GRAPHIC LOG	DESCRIPTION SOIL: Group Name, Gr Moisture Content	oup Symbol, Color, Plasticity, Grain Siz t, Density/Compaction, Miscellaneous	. а ОЕРТН (ft.)	WEL	L DIAGRAM	
			90		X		Gm		bm, NP, CA to nounded, C no oder, bar	1 sitt#gravel, Gm, dk ble to sm gravel, angul Iry, havd & compact, & common 9-0005 C 1110	5		durt backfill	
BWC BLANK 2/4/99									Cor	<del>Ninued-Next-Page</del>		,	PAGE 1 OF f	

	Pal	ran	leti	ŕľx,	Îź	IC.			······································						· · · · · · · · · · · · · · · · · · ·
	PROJI LOCA COOP DRILL SAMP	ECT NATION TION IDINAT ING MI PLING M	01		23 14 19 S	4 1A	15 14 01.5	F7 Par	-037- 12- 122054:438"	BORING/WELL I DATE COMPLET TOTAL DEPTH INITIAL WATER STATIC WATER LOGGED BY	NUMBER # TED 42 OF BORING LEVEL 22 R LEVEL 22 LEVEL 22	SB4 9711/2 0.5 1917 1917 1917 1917			ON LOG
,	PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft.)	U.S.C.S.	GRAPHIC LOG	DESCRIPTION SOIL: Group Name, Gro Moisture Content,	oup Symbol, Color , Density/Compact	, Plasticity, Gra tion, Miscellane	in Size, eous	DEPTH (ft.)	WEL	L DIAGRAM
BWC BLANK 2/4/99			6/6			-10	Gr		RR Ballast n NP, Crobble r hand, nr od WB-SD-SB4P WB-SD-SB4P	- DDD5- Q - IDD5- Q	112D 125, field				dirt backfill
ալ						L		1	<u>C07</u>	tinued Next-Page	F	1			PAGE 1 OF

	Pa	ran	net	rix,	1	nc.			· · · · · · · · · · · · · · · · · · ·	1991 - En En En Franzis - 1993 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1	······································			
										BORING/	NELL CO	ISTR	UCT	ION LOG
	PRO.	IECT N	UMBE	R <u></u>	22	33	-15	77	037	BORING/WELL NUI	00	41		
		IECT N	(5)	1/4		A E	MA	W	N-	DATE COMPLETED	9/27/1	2		
		ATION RDINA				1/1, 0 62	101L	. ] #	W122"54"43.9"	TOTAL DEPTH OF	- t- t- t-	1	·····	
			IETHOI		Di	191	FPA	15h	V	INITIAL WATER LE		4 A	<u> </u>	·
	SAM	PLING I	METH		2	2 Pl	ifl	ppl	m	1	inde	<u>rı</u>		
	GROU	JND EL	EVAT	ION _	`	~'2	DA			TOP OF CASING E	EVATION	NA		
	Î.	0	Ϋ́	ġ				00	DECOUDTION				·	
	(mqq) Ole	BLOW	RECOVERY (inches)	SAMPLE ID	EXTENT	DEPTH (ft.)	U.S.C.S.	GRAPHIC LO	DESCRIPTION SOIL: Group Name, Gro	oun Symbol, Color, Di	osticity Oscia Dia-	EPTH (ft.)	WE	LL DIAGRAM
	Ы		REO (ir	SAN	â		5	GRAP	Moisture Content	, Density/Compaction,	Miscellaneous	, <u> </u>		
					11		Fill		Asphalt rubble			· ·		
			4/48		V		Gm		Gravel, Gm, 0	range brn, e	SP, mek-		,	X
			5		I				-ly rounded.	to angular, s	Wose, dry,	nøðø	a	X
									de orange har	1200 with Ni	odabart			
									annal tam, Annat loose	my NP:	men-la			T XI
						- 5 -			Fritist MUSE		. 0	- 5		dirtand
									WB-50-5B1	41-00100-	1505			bentonite
														packfill
									Sample collect	ted or 1A,	shallower	# -		
							•		depth at v	which math	ix was			
						-10-			able to be	sampled in	nmediatel	-10-		
									able to be below aspl	ult rubbly	2.	1		
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Parametrix, Inc. **BORING/WELL CONSTRUCTION LOG** 233-1577-037 PROJECT NUMBER SB42 BORING/WELL NUMBER # BAIN PARK 9 PROJECTINAME 27/12 DATE COMPLETED LOCATION TOTAL DEPTH OF BORING 03.7" W122 541438 COORDINATES NULL DRILLING METHOD STATIC WATER LEVEL SAMPLING METHOD LOGGED BY GROUND ELEVATION IΑ TOP OF CASING ELEVATION **BRAPHIC LOG** RECOVERY (inches) BLOW P(D (ppm) DESCRIPTION U.S.C.S. DEPTH (ft.) SAMPLE | EXTENT DEPTH (ft.) WELL DIAGRAM SOIL: Group Name, Group Symbol, Color, Plasticity, Grain Size, Moisture Content, Density/Compaction, Miscellaneous Amonilly Apphalt 0-leinches 36/48 Gravel, GW, ak pro, NP, large, arg 12050, no odav, no fines Cirowil, Sim dk brn, NP, sin-med, Gw en drix, loose, nu oder, fines pregent PI People with anowell Gw Growel, southe as above 5 5 divit and bentmite WB-SD-SB42-0020 C 1455 backfill Sumple whether a 2A. shallowerst depth at which matrix was able to be campled immediately below asphult mobile clue to lack of fines 10 in matrix labove 2.ft matrix was too large to sample) 15 -20 -20 BLANK 25Gontinued Next Pag PAGE 1 OF

BORING/WELL CONSTRUCTION LOG PROJECT NUMBER	P	aran	net	rix,	. 1	nc.						
Image: State of the state o	PRO LOC CO DRI SAI	DJECT N CATION DRDINA LLING W WPLING	AME 		V		-15 MA 32" PV + 27	Wia	$\begin{array}{c} -037 \\ \hline 12 \\ \hline $	343		ON LOG
10     10     10       10     10	PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft.)	U.S.C.S.	2	SOIL: Group Name, Group Symbol, Color, Plasticity, Grain Size.	DEPTH (ft.)	WEL	L DIAGRAM
	WC BLANK 2/4/59		38 46				Gw		Gravel, GW, Brn, NP, Med to by rounded to anginiar, dry, loose, neodor Asphalt & gravel Mix, asphaltic ody WB-SO-SB43-0015 C 4445 Sample collected C 1.5AT, shillor Aerth at which matrix was able to be campled immediated below asphalt rubble.		1	bentonite

Para	met	rix,	Inc	U				
PROJECT PROJECT LOCATION COORDINJ DRILLING SAMPLING GROUND F	NAME		PDVA.	577- Ban WA 29" 2 Pv 2 Pv 2 St	037 Pank W 193 5443.6 MM 2000 T	BORING/WELL BORING/WELL NUMBER DATE COMPLETED 9 TOTAL DEPTH OF BORING NITIAL WATER LEVEL STATIC WATER LEVEL LOGGED BY 101/01/01/01/01/01/01/01/01/01/01/01/01/	# 57844 27/12 4-97 N/A N/A N/A VCE	
PID (ppm) BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT DEPTH (ft.)	U.S.C.S.	DESCRIPTION DESCRIPTION SOIL: Group Name, C Moisture Conte	Group Symbol, Color, Plasticity, Gr nt, Density/Compaction, Miscellar	ain Size, Laud	WELL DI <mark>AG</mark> RAM
	4948			GM	Ciravel, Gw. 1 <u>Arg. 2005</u> , n Gravel, Gm, 1 2005, no of large grow WB-SD-SB Somple Cr Aepth at able to be below acopt of fines in Mothix was	ete riverle/fill D-leinch 2m, NP, large, rom 2 vaar or fines 2m, NP, sm-med, W, fines present el C 4 ft 44-0010 C 1435 Mected C 1 ft, Sh which watrix van semple R immedia with riverble due to vivetivix (above 1 tob Groff to San	allower s -10- tely At	Airt an Deritori Dirolefi

Parametrix, Inc. BORING/WELL CONSTRUCTION LOG 33-1577-037 PROJECT NUMBER SBUS BORING/WELL NUMBER Weist Bars Parte PROJECT NAME DATE COMPLETED LOCATION TOTAL DEPTH OF BORING NH 03'02.7" M22 54'43.5" COORDINATES INITIAL WATER LEVEL  $\Sigma$ YAW Argit DRILLING METHOD STATIC WATER LEVEL SAMPLING METHOD mit LOGGED BY 1MA GROUND ELEVATION TOP OF CASING ELEVATION NIA GRAPHIC LOG RECOVERY (inches) BLOW PID (ppm SAMPLE II U.S.C.S. DESCRIPTION DEPTH (ft.) EXTEN' DEPTI-SOIL: Group Name, Group Symbol, Color, Plasticity, Grain Size, Moisture Content, Density/Compaction, Miscellaneous WELL DIAGRAM ASSTRAK MEDIE D-LEINCHES Fill 48/48 army, aw, brn gray, NP, large, angular arg, loose, no odor or fines GW 61 GN Gravel, Gm, bringray, NP, sm-med, angular, ary, loose, no oder, finespresent Gm GW Cirowel, GW, gray to dk-gray black, SP. - Parny, rounded, drn, loose, asphattic odar 5 dirt and bentimit Gravel, GM, brn, NP. sm-med, dy. Loose, slight a spheltic odor. backfill Growel, GW, Same as asphaltic growel above 1Ô 10 WB-58-5845-0015 15 Sample collected C 1.5 A, shallowers depth at which matrix was able to be campled immediately below asphalt rupple and to lack of fines in mother 20 -20 Capove 1.5 A matrix was too twop to sample). 25Continued Next Perro

Pa	aran	net	rix,	1	nc.					<b></b>	
PRC	DJECT N DJECT N ATION			22	33- 1-B	-15 114 10/A	F7 Pari		B44 2-		ON LOG
COC DRI SAN	ordina" Lling M Apling I	TES		7	JA YA	2.2" Ft	W	122°54′43,2″ INITIAL WATER LEVEL Z N/2 STATIC WATER LEVEL Z N/2 LOGGED BY LLAND	}		
GRO	DUND EL	.EVATI	ON _	 	~19			TOP OF CASING ELEVATION	V/A		
PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft.)	U.S.C.S.	GRAPHIC LOG	DESCRIPTION SOIL: Group Name, Group Symbol, Color, Plasticity, Grain Siz Moisture Content, Density/Compaction, Miscellaneous	DEPTH (ft.)	WEI	L DIAGRAM
	· .	66		X		m		Sitt, ML, light orange byn, NP, fine to med, dry, loose, extremely light weight, bark remnants, no odar			dirt backfil
					- 5 -			WB-50-584-6-0005 C1135	- 5 -		
					  	-			- 15-		
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Pa	ran	net	rix,		nc.	5		,,, _,, _	······································			
PRO. LOC/ COO DRIL SAM	iect n Ject n Ation Rdina Ling m Pling Und El	AME OL TES IETHOI METHO		2200	33- 1 E 1/1, 1/1, 1/1, 1/2, 1/2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2	-15 MA 13.11 1 Pi 1 C 1 C	<u>15h</u>	-037 12 122°54'44.8" 2 700	BORING/WELL BORING/WELL NUMBER DATE COMPLETED	# SB47 27/12 4/7 N/A N/A N/A		ON LOG
PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft.)	U.S.C.S.	<b>GRAPHIC LOG</b>	DESCRIPTION SOIL: Group Name, Gro Moisture Content,	up Symbol, Color, Plasticity, G Density/Compaction, Miscellar	rain Size, neous	WEL	L DIAGRAM
BWC BLANK 2/4/99		uu uu				Gr		mild petrolen WB-SO-SB4 WB-SO-SB4 WB-SO-SB1 Sample colle depth at M Wole to be below asp Sample coll area of m	e 0-6 inmes pringray, NP, dry, um bitty m oder c3,5Pt 7-0010 C1355 FT-0035 C1409 HT-1035 C1410 oted CIPT, Shall Mich Motrix V Sampted inme clipted C 3.5 Ft ild petroleum i	        		airtand bentonite backfill

1430 545 1330 LEH I Project / Client UNINT BANG Alun WO & more examplement off bench brune to vehicle, Recieve brunets from - serves Sumples & timish whiting intally the costers, ice shopies Perieve brekets from - Devel Trena Filter swiftle water Deprint ande Ullann ML WA Infastier C1196/01 DBAS Conlect & put in bucket, begin DBAS Conlect A part in bucket, begin DBAS Conlect Augulicite it when the further DBAS Conlect Augulicite it when surple 3300 Project / Client With Buty COL 13 9450 Location ULANDA 2002 270 Anthor: L. Wold OUSD TEAM + IN code Merther: Friday cold v350F Onente: L. Under T. Langerth, Brant Activities: Dus tout put Annive a side, Kept Bread Buttill arrives on site, totait Bening treating aspirit Convete made Tom turning about with involvente breaker, tip A 115/13

mon careve Teel off-carte, be in mon careve Teel off-carte, be in buck-filling hole, plane about off-fill then dignight place from surface OPEN NA to sail 10 0920 Shave Teel & Kip on Site 0115 - North 88 Project / Client WEGT BAN Location Ulymphik, WA to call back but # disconnected, contract Myging with track is full A = 10ft Listance between 1201 Higging but want's concrete boken In towhite he parts, mark location In concrute preading State 語言 phone in the H224 一下町 5ft doep =--- extremeter excavation 0585-\* × tente Date 1115/13 - MAPAIX \* \* \* XX 1000 Project / Client Location E5 1045 FICK up ply word 1035 Finich bruch ling testpit Finich-puting up plywood these すす restate istit location thring in Exemption, ungrou Olympic, WA Shits How N 49020103 1200 57 47.4" 115/13 Seal -99

## Parametrix, Inc.

## **Test Pit Log**

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Depth (ft)	Soil Classification	Description	Remarks
		Asphalt Fill gravel, grav, NP, sm-lg, angular ecountace, rounded ~ depth, moist, loase, strong petroleum oder 0.5F4-54 Scrap metal & sprayer bar e 3F4	7-
5	sm	Copples (rounded) C 3-6ft in sundy matrix, mild potatenen oder, some brut	٤.
10		Bottom of hole c 5 ft c clear soil Color change 7 Satal Sina, ik brn, SP, sm. med, moist, froze, woody odor but no Petimeum odor, small roots, some Silt Sample collected C 5 ft WB-SD-TPBTI-0050 C 0840 also field duplicate WB-SD-TPBTI-0050 C 0845	type t

Parametrix, Inc.	
DRILLING METHOD PUSH PROBE	DATE COMPLETED 1-6-13
PID (ppm) PID (ppm)	. Group Symbol, Color, Plasticity, Grain Size, はデンタン WELL DIAGRAM
24/ 60 	OWN, N.P., GRAVEL-SAND, SE, SUBROUNDED ROCK, 2 , N.P., ORAVEL-SAND, MOIST, B ROUNDED ROCK 5 , SR AV, N.P. <del>LOOSE</del> -SMALL TO ORGANIC ODOR, (SRA SHELL) NOR AT 6'-7' SAMPLED -10- 

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				0.5.				BORING/V	VELL CO	NSTR	UCTIO	NLOG
PRO	JECT	NUMBI	SR _	233	157	76	38	BORINGWELLNUM		-49	00110	LUG
100	05011	AWIAEC			w00	D.	INC SITE	DATE COMPLETED	11-6-	12		
LOC	ATION	<u> </u>	) <u>E</u> 5]	r Ba	Y PA	RIL		TOTAL DEPTH OF B	ORING / (	,' )'		
1000	RDINA	TES _						INITIAL WATER LEV				
				Pusit				STATIC WATER LEV	/EL X			
1				PUSH				LOGGED BY	JALTER H	ARVB-	7	
GRU		LEVAT						TOP OF CASING ELE			/	
Ê	S	YH G	ğ		10	LOG	DESCRIPTION	-	·····		<i></i>	
PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID	EXTENT DEPTH (ft.)	U.S.C.S.	HC				DEPTH (ft.)	WELL DI	100414
1 1	<u> </u> 8	В В В Б Б	SAN		5	GRAPHIC LO	moladure Cotitett	oup Symbol, Color, Plas t, Density/Compaction, N	ticity, Grain Size, liscellaneous	DE		AGRAM
		244			SP		ASPHALT					
		24/		[\ /			SAND, SP, DARK	BROWN, NP, GRO	VEL TO SAND			
		/60		[ + V ]	1		MOIST, LOOSE,	SUBROUNDED ROCK	7			
				$+\Lambda$			BROWN-SAME	AJ ABOVE				-
								£.				
				-5-			GRAY - SAMEA	S ABOV Q		-5-	1.7	
					Sm	Ă	PARK BROWN, S	AND, SM, NP, SAN	NTO SILT	-5-		
		501					TEPTOTE PERONE,					
		160		ΓV.			GRAY, SAND, SM	, NP, SAND TO SIL	T, MEDIUM			
				ΓΛ-			PENSE,					
				-/ \-	а С	ļ	SAMPLED AT	,1 ×		-		
				L107			Juni-20 H	6		-10-		1
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Parame	trix, Inc.			~			
LOCATION COORDINATES DRILLING METHO	DEST BAY PA	BE	BORING/WELL CONSTRUCTION LC BORING/WELL NUMBER # SB-50 DATE COMPLETED 11-6-13 TOTAL DEPTH OF BORING 16' INITIAL WATER LEVEL & C' STATIC WATER LEVEL & C' STATIC WATER LEVEL & LOGGED BY WATER LEVEL TOP OF CASING ELEVATION				
PID (ppm) BLOW COUNTS RECOVERY (inches)	SAMPLE ID. EXTENT DEPTH (ft.) U.S.C.S.	DESCRIPTION DESCRIPTION SOIL: Group Name, G Moisture Conter	roup Symbol, Color, Plasticity, Grain Size, It, Density/Compaction, Miscellaneous				
48		SAND SP GRAY, MOIST, LOOSE, SAND, SM, DARK MOIST, MEDIUM P SANDIST, MEDIUM P SANDIST, MEDIUM P SANDIST, GRAY, M MEDIUM DENSE ORGANIE ODO	NG, SAND TO SILT, MO IST, ORGANIC MATTER (JEA SHELL) R				

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Pa	arai	net	trix	, In	C.							μ. Π	·
								BORING/WELL	CON	ISTR	UCTI		2
PRO	JECT !	VUMBI	IR	<u>233</u>	157	76	38	BORINGAVELL NUMBER	SR-	51	0011		3
ILU	JECIT	ANE		JYID	WOO	<u>D</u>	INC SITE	DATE COMPLETED 11-6-13					
LOC	ATION	<u>_ h</u>	)ES	TBA	HY PA	RIK		TOTAL DEPTH OF BORING					No.
000	RDINA	TES	Ξ										
					PRO								
1	ipling UND Ei				H PRO			LOGGED BY WALTE	RH	ARVB-	7		
			10N					TOP OF CASING ELEVATION			, 	· · · · · · · · · · · · · · · · · · ·	_
Î	2S	s)	ē	누ェ	6	Log	DESCRIPTION	3			<i>.</i> :	······	
PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID	DEPTH	(ft.) U.S.C.S.	HC HC		Olin Symbol Onlan Directory		DEPTH (ft.)	WELL	DIAGRAM	
ā	Ξō	BE	SA		, , , , , , , , , , , , , , , , , , ,	GRAPHIC LOG	Moisture Content	oup Symbol, Color, Plasticity, Gra Density/Compaction, Miscellane	in Size, ous	Ë,			
•				IN	SM		ASPHALT.						
		36,		[]	h		SAND, SM, BROWN	GRAY, NP, GRAVEL TO SA	٧٥,				
		10		$  + \rangle$	/ PT	1	MOIST, LOOSE, C		E.uc				
				F /			MOLIT, ORGANIC O	ROWN, NP, STETTOSA VERY DOR, DENSE	140				
					Sm			Y NP, SAND TO SILT					
				-5			MOIST, MEDIUM	DENSE, ORGANICUDOR		-5-	~		
		36/						DENSE, OROANIC ODOR					
		/60		I LV		<u>\</u>			ľ				
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				0.5.				BORING/WEL	L CO	NSTR	RUCI		ົດ
PRO	JECT I	NUMBI	ER	233	157	76	38	BORINGANELL NUMBER	"SR-	. 57			
I CRU	JEVII	VAIVIE		JAID	WOO	<u>D</u>	INC SITE	DATE COMPLETED 11-6-12					
LOC	ATION	<u> </u>	)ES.	T BA	Y PA	RIK		TOTAL DEPTH OF BORING					
000	RDINA	TES	-										
				PUS H				STATIC WATER LEVEL					
ł		METH LEVAT		PUSI	TPIC	DL		LOGGED BY WALT	TER H.	ARVE	7		
		LEVAI	10N					TOP OF CASING ELEVATION	ON	-			
find	N ITS	'ERY ss)	0.	12 F	s.	DO1	DESCRIPTION		· · · · · · · · · · · · · · · · · · ·		-		
PID (ppm)	BLOW	RECOVERY {inches}	SAMPLE ID	EXTENT DEPTH	U.S.C.S.	GRAPHIC LOG	SOIL: Group Name, Gr Moisture Content	oup Symbol, Color, Plasticity, C Density/Compaction, Miscella	Brain Size,	DEPTH (ft.)	WE	LL DIAGRAN	N
-				+	100	5	CONCRETE						
		48,		I A	/SP			IGRAY, NP, GRAVEL - SA	0.10				
		1		\/	-		MOIST, LOOSE	ANGULAR ROCK, ORG	₩.p				
		/60		I I X			ORGANIC ODOR		WC.	- 1			
				$    \rangle$				N		~ -			
				[ ]									
	ſ			5.	7				-	- 5			1
		La		I H ,	/		5		ļ				
	48 Sm y Sm, SmD, DA							BROWN, NP, SAND -SIL	۲. L				
	ł	60		ŀÅ	5m		MOIST, DENSE, ORGANIC ODOR	AT PEAT SANDMIX,					
				H			SM, SAND, GRAY	, NP, SAND-SILT, MO	IST				
				410-			MEDIUM DENSE, SO	ME SEASHELL (LAYE	SAS)	10			
							ORGANIC O DOR			-10			
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			2				SAMPLED at 7	) I	-	-			
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Param	etrix	, Inc.		·······			2		
PROJECT NA	ME <u>S</u> WES S THOD	DLID N T BAY PUSH 1	PARK PARK PROBE		BORING/WELL CONSTRUCTION L BORING/WELL NUMBER # SB- S3 DATE COMPLETED 11-6-13 TOTAL DEPTH OF BORING 16' INITIAL WATER LEVEL 7' STATIC WATER LEVEL 7' STATIC WATER LEVEL 7' LOGGED BY WATER LEVEL 7' TOP OF CASING ELEVATION				
PID (ppm) BLOW COUNTS	(inches) SAMPLE ID.	EXTENT DEPTH {ft.}	U.S.C.S. GRAPHIC LOG	DESCRIPTION SOIL: Group Name, Gr Moisture Conten	oup Symbol, Color, Plasticity, Grain Size, t, Density/Compaction, Miscellaneous	DEPTH {ft.}	WELL DIAGRAM		
48			N N	MOIST, LOOSE, ORGANIC O DOI SR.SANA, GRAY, NY MOIST, LOOSE, ORGANIC O DOI D.SM, SANA, DAR PEAT, MOIST, N ODOR SM, SANA, GRAY, N MEDIUM DENSE SAM PLED AT T COLLECTED A	N, NP, GRAVEL-SAND, SUBANGULAR ROCK, L D, GRAVEL-SAND, SUBANGULAR ROCK, L KBROWN, NP, SAND WITH MEDIUM DENSE, ORGANIC NP, SAND-SILT, MOIST, JEASHELL LAYELS WATER SAMPLE				

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LOCA COOF DRILL SAME	TION RDINA LING N PLING	TES	) <u>E</u> S	JAID	PRO	D RK BE	INC SITE	BORING/WELL CONSTRUCTION LO BORING/WELL NUMBER # SB-54 DATE COMPLETED 11-6-13 TOTAL DEPTH OF BORING 16' INITIAL WATER LEVEL & 6.5' STATIC WATER LEVEL & 6.5' STATIC WATER LEVEL & LOGGED BY WATER LEVEL TOP OF CASING ELEVATION				
(mqq) Old	BLOW COUNTS	RECOVERY {inches}	SAMPLE ID.	EXTENT DEPTH (ft.)	U.S.C.S.	<b>BRAPHIC LOG</b>	DESCRIPTION SOIL: Group Name, Gro Moisture Content	oup Symbol, Color, Density/Compactio	Plasticity, Grain S on, Miscellaneous	ize, DEPTH	WEL	L DIAGRAM
		48/60			SP SM		ASPHALT SP, SAND GRAY, I ORGANIC ODOR I SP, SAND, BROWN, ORGANIC ODOR J SM, SAND, DARKDI MOIST, SAND, DARKDI MOIST, SAND GRAY SHELL LAYERS, ORGANIC ODOR SAMPLED AT	NP, GRAVEL- LOOSE ROWN, NP, SA ILT, MEDIV NP, SAND MEDIVM DEG	NA - PEAT, M DENSE WITH , SH SEA			

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Paramet	rix, Inc.		13
PROJECT NAME	EST BAY PARK PUSH PROBE D PUSH PROBE	BORING/WELL CONSTRUC BORING/WELL NUMBER # SB-55 DATE COMPLETED 11-6-13 TOTAL DEPTH OF BORING 10' INITIAL WATER LEVEL 7' STATIC WATER LEVEL 7' LOGGED BY NATER HARVEY TOP OF CASING ELEVATION	
PID (ppm) BLOW COUNTS RECOVERY {inches}	Where the solution of the solu		ELL DIAGRAM
48, 60	$   \begin{array}{c}             Loose, O             Rock, So,             \begin{array}{c}             Sm, Sand, O             MEDIUMD,             Seashell,             \begin{array}{c}             Sm, Sand, O             MEDIUMD,             Seashell,             San PLED A            $	AY, NP, GRAVEL - SAND, MOIST, RGANIC, ODOR, SUBANGULAR ME BROWN SAND ORAY, NP, SAND-SILT, MOIST GNSE, ORGWAY CODDR, LATERS T 7' Continued Next Page Continued Next Page 	

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									BORINO	G/WELL CO	NSTE	NC.		00
PRO	JECT	NUMBI	er _	23	31	577	76	38	BORINGANELL		- 50	100		UG
1	02011	ANIMIC			PV	<u>v00</u>	D	NC SILL	DATE COMPLETED 11-6-13					
LOC	ATION	<u> </u>	)ES	Γļ	3A7	PA	RK		TOTAL DEPTH OF BORING					
COC	RDINA	TES								LEVEL 🕎 🔰				
	LING								STATIC WATER					
1	ipling UND E			PC	ISA	P ICU	DL			WALTER H	ARVE	7		
				<u> </u>					TOP OF CASING	BELEVATION				
(mq	W	/ERY es)	Ë D	NT	E,	s	DO1 :	DESCRIPTION	~		-	-		
PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID	EXTENT	DEPTH (ft.)	U.S.C.S.	GRAPHIC LOG	SOIL: Group Name, Group Name, Group Noisture Content	oup Symbol, Color, Density/Compacti	Plasticity, Grain Size	DEPTH (ft.)	WE	ELL DIAGRA	м
-			.0	┼┤		SP		CONCRET		on, miscellaneous				
		21			·\ /-	51	V	SP, SAND, BROW	N. NP. GRAV	6.1 ~ SA10				
		36,			V -			WEI, LOOSE, S	UB ROUNDED	Pac V c				
		160			$\Lambda$			ORGANIC ODOR						
					/ \				• • ÷					
						SM		SM, SANA GRAY, N	P. SAND-SIL	T mais T				
					- 5 - 7	SM		MEDIUM DENSE	VERY DUCT	- AD SLN	- 5			
					\/†	sm		O COLOR						
				-	1 1	ואיל		SMSAND, DARKBRO MEDIUM DENSE,	ORGENTS (NW)	-PEAT MOIST				
		48,		-	$\uparrow$			,		1				
		60			1		ĺ	SM, SAND, GRAY,						
		140		Ľ				MEDIVM DENSE	VERY WE	TAT 7'-8'	10			
							Ì	ORGANIC ODOR			-10			
								SAMPLED AT 1'						
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PROJECT NUMBER	233 1577 63 SOLID WOOD 11	8		NSTRUCTION LOG				
COORDINATES	PUSH PROBE PUSH PROBE		BORING/WELL CONSTRUCTION LO BORING/WELL NUMBER # SB-57 DATE COMPLETED 11-6-13 TOTAL DEPTH OF BORING 16' INITIAL WATER LEVEL \$ STATIC WATER LEVEL \$ LOGGED BYATER HARVEY TOP OF CASING ELEVATION					
PID (ppm) BLOW COUNTS RECOVERY (inches)	SAMPLE ID. EXTENT DEPTH (ft.) U.S.C.S. GRAPHIC LOG	DESCRIPTION SOIL: Group Name, Gro Moisture Content	oup Symbol, Color, Plasticity, Grain Size, Density/Compaction, Miscellaneous	표 · · · · · · · · · · · · · · · · · · ·				
34/60		LOOSE, ORGANIC SP, SAND GRAY, N LOOSE, & ORGAN ROCK. SM, SAND GRAY D SILT, MEDIUM E ALT, MEDIUM E ALT A LITTLE PEN M, SAND, GRAY, I DENSE, ORGANIC SAMPLED AT	P. GRAVEL -SAND, MOIST JIC ODOR, SUBANGULAN ARK BROWN, NP, SAND- SENSE, ORGANIC ODOR, AT NP, SAND-SILT, MEDIUM ODOR 8'					

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Parametrix, Inc.	*/
PHOJECTNAME JULID WOOD INC	BORING/WELL CONSTRUCTION LOG BORING/WELL NUMBER # SB-SB SITE DATE COMPLETED 11-6-13 TOTAL DEPTH OF BORING 16' INITIAL WATER LEVEL 7' STATIC WATER LEVEL 7' STATIC WATER LEVEL 10 LOGGED BY WATER LEVEL 10 TOP OF CASING ELEVATION
프 [6독] 옷꽃! 꾼 [편] 눈고 ! 것 ! 요 !	CRIPTION .: Group Name, Group Symbol, Color, Plasticity, Grain Size, Moisture Content, Density/Compaction, Miscellaneous
45 $45$ $10$ $-10$	ASPHALT/CONCRETE (AND, BROWN, NP, GRAVEL - SAND, MOIST SE. (and, DARK BROWN, SAND-SILT ALITTLE PRAT IT, MEDIUM DENSE SAND, 64AT, ISAND - SILT MOIST OUM DENSE ANIC OBOR (PLED AT 7' 

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								BORI	NG/WELL C	ONSTR	RUCI		)G
PRO	JECT	NUMBI	ER _	233	1577	<u>} 6</u>	38	BORING	ELL NUMBER # S	_			Ð
PRO	JECT I	NAME	<u></u> S	OLID	Wod	۵	INC SITE	DATE COMPLETED 11-6-13					
LOC	ATION	<u>_</u>	JE2	TBA	Y PA	RIC		TOTAL DEP	TH OF BORING	10'			
	RDINA							INITIAL WA		7 6			
				PUSH			· · · · · · · · · · · · · · · · · · ·	STATIC WA					
1	IPLING UND E			Pust	1 110	DL	· · · · · · · · · · · · · · · · · · ·		WALTER	HARVB	7		
		LEVAI					=	TOP OF CAS	SING ELEVATION		,		
Ê	2s	S RY	õ	L I	6 vi	LOG	DESCRIPTION				200		
PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID	EXTENT DEPTH	U.S.C.S.	HC		Our Sumbel O		ze, UEPTH	WE		4
<u>.</u>	-ō	RE(	SAP		5	GRAPHIC LOG	SOIL: Group Name, Gr Moisture Conten	t. Density/Comp	plor, Plasticity, Grain Si paction, Miscellaneous	ze, D=			
		1.00		IN	SP		SP S AS PHALT						
		48		$ \uparrow\rangle$	1 sp		SP, SAND, BROWN,	NT, 5A-0-6	RAVEL, MOIST,				
				V	/-		SPSAND, GRAY	NP SAND-(					
		60		IFΛ	-		SP,SAND, GRAY, LOOSE, SUBROUN	NDGR/SUBAN	OULAREACK	·			
					-								
				6-5-	SM		SMSAND, GRAY, 1 LOOSE MEDIUM	2-CLAC TU	ILT, MOIST,	-5-	1	8	
		48/		$  \rangle$	4]	<u>7</u>							
				ILV	5m		SM, SAND, DARK B	,	SPAD-SILT, MOIS				
		160		$   \wedge$			MEDIUM DENSE			1			
				[/\	SM		SM, SAND, GRAY, 1	VP. SAND -	SILT, MOIST,				
				$ 7\rangle$			MEDIUM DENSE.	)	) /				
				-10-						-10-			
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LOCATIC	NATES	) <u>E</u> 5 , , , , , , , , , , , , , , , , , , ,	PUSH	PROBE PROBE	<u>1 NS SITE</u> <u>2</u>	BORING/WELL ( BORING/WELL NUMBER DATE COMPLETED TOTAL DEPTH OF BORING INITIAL WATER LEVEL X STATIC WATER LEVEL X LOGGED BY	SB-60 6-13 16' 7'	,
PID (ppm) BLOW	COUNTS RECOVERY {Inches}	SAMPLE ID.	EXTENT DEPTH (ft.)			TOP OF CASING ELEVATION roup Symbol, Color, Plasticity, Grain It, Density/Compaction, Miscellaneou	Size, Hiday	WELL DIAGRAM
	48, 60			SP Sm <del>Y</del>	LOOSE, SUBROU SM, SOND, GRAY- MEDIUM DENSE, SM, SAND, GRAY, MEDIUM DENS SAMPLED A	BROWN, NP, SOND-SILT, MA A FEW SUBANGULAA ROOKS NP, SAND-SILT, MOIST SE		PAGE 1 DE

Project Numbe Project Name Project Addres Client Name	West Bay Park	Date Location ympia Sampled Purged		17- Ner PF-1 Inde	
Casing Diamet	ter: 2"4"	_6"Other	X 34"		
Depth to Water Depth of Well Reference Poin Date/Time San	(feet) 13.05 nt (surveyors notch/etc) 1	Date Pu V Purge T	Vol. Meas.Method Irged Yime (from/to) ate (ml/min)	Meas cup/watch 7317 1207-1 300 mJ	228 Main
Purg	ge Volume Calculation: $(\pi r^2)$ ge Volume (gallons) for 2" = culated Purge Volume (gallo	= (0.16)(h)(#Cv); 4" =	= (0.653)(h)(#Cv); (	5" = (1.48)(h)(#C (gallons)	v)
	LEVEL $(units)$ ( $units$ )	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		VOL. al) 3,5 744 744 744 744 744 744 744 744 744 74
	Onsite Environme tody (yes/no) Yes	ental Date Se	ng Equipment ent to Lab 2C Sample Number		
Shipment Met Well Integrity	Good	mmmmt.	$\frac{1}{2} \int \frac{\partial h}{\partial x} dx = \int \frac{\partial h}{\partial x} dx$		eplacel

Project Number Project Name Project Address Client Name	233-1577-037 West Bay Park 900 West Bay Driv OPARD	ve, Olympia	Date Location Sampled By Purged By	7/3/11 Burn C.Line	2- gr Pt	- Mid	)
Casing Diameter	: 2"4"	6"	Other <u>X</u>	3/4"			
Depth to Water ( Depth of Well (fa Reference Point Date/Time Samp	eet) 13.5 (surveyors notch/etc		Purge Vol. Me Date Purged Purge Time (fr Flow Rate (ml	rom/to)	1eas cup/wa 7/3/17 1116-1 3/0 M	itch F 129. (MIK	
Purge	Volume Calculatior Volume (gallons) fo ated Purge Volume	or $2" = (0.16)(h)($	#Cv); 4" = (0.653	umes) 3)(h)(#Cv); 6" ge Volume (g	= (1.48)(h)( allons)	(#Cv)	
(2400 hr) LE	$\begin{array}{cccc} \text{ATER} & \text{pH} \\ \text{(units)} \\ (ft) & \pm 0.1 \\ \hline & & 77.06 \\ \hline & & 77.06 \\ \hline & & 77.07 \\ \hline & & 77.05 \\ \hline \end{array}$	() S/m) (1) ± 3% (0.32	DO TEMP mg/L) °C ≥10% 0.00 13.82 1.00 13.74 0.00 13.74 0.00 13.74 0.00 13.74 0.00 13.74 0.00 13.64	TURB. $\pm 10\%$ if $> 10$ NTU $\pm 60.2$ -444.8 -23.2 -23.2 -23.2 -23.2 -23.2 -23.2	(mV)	JM. VOL. (gal)	Sul 74.0 74.0 74.0 74.0 74.0 74.0 74.0
						· · · · · · · · · · · · · · · · · · ·	
Purge Equipmer Laboratory Chain-of-Custoo Shipment Metho	Onsite Envi ly (yes/no) Yes		Sampling Equ Date Sent to I Field QC San Split with (na	ab	SAMC _7/3/ 	-  2-  4_ 	
Well Integrity Remarks		monun	nent, lock	comple	d j velp	laced j Evel Hy nee	-pin.

Project Num Project Nam Project Addr Client Name	e West E ess 900 W	Bay Park est Bay Drive	, Olympia	·······	tion bled By ed By	Bn - Un - Un	© 9/3/1. mev P nele nele	9 7-5.	
Casing Diam	eter: 2"	4"	6"	Oth	er <u>k</u>	3/4"			
Depth to Wa Depth of We Reference Po Date/Time S	ll (feet)	1.65 9.20 prs notch/etc) 7/3/12	TOC 1025	Date	e Vol. Mea Purged e Time (frc Rate (ml/1	om/to)	Meas.cup 913/13 1005 300m//m	<del>2</del> -112-3	
Pi	irge Volume	e Calculation: e (gallons) for rge Volume (j	2" = (0.16)	(h)(#Cv); 4	" = (0.653)	mes) )(h)(#Cv); ( ge Volume	5" = (1.48) (gallons)	(h)(#Cv)	
TIME (2400 hr) 1005 1011 1014 1014 1014 1014 1020 1023	WATER LEVEL	pH (units) ± 0.1 6.58 6.58 6.58 6.58 6.58 6.59 6.59	COND (5/m) (5/m) (7)	DO (mg/L) ±10% 0.03 0.00 0.00 0.00 0.00 0.00 0.00	TEMP °C 14:79 14:68 14:71 14:75 14:75 14:70 14:70	TURB. ±10% if > 10 NTU 216 149 81.0 32.2 22.5 3.7.6 34.0	ORP (mV) ± 10 mV -2/5 -233 -233 -237 -237 -253 -253 -255	CUM. VOL. (gal)	Sal 44 74444444
Purge Equip Laboratory Chain-of-C Shipment M	ustody (yes/	Peristi Onsite Envir no) Yes CUMTEN		Dat Fiel				ne [3[1Э- qw-mwi Б/А	0-10
Well Integr Remarks Signature	ity G	MOR 2. CATTRI ANOLO	ded, y	vinter	<i>IN M</i> Page	min	of	eptinied	j-pl

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Form 02-EN-100/Rev. 10/02

Sampling Field Data Sheet Station #: SW ろりつ - DD Date: Project Number: VINE Client Name Project Names Sampled By: Project Address: TURBIDITY (Will) n<del>hosich</del> (±3%) TIME (2400 hr) pH (units) Ec (p DO (mg/L) (Visual)(mV) TEMPERATURE °C (±0.1) 15.16 1.88. 7 NUU 0.70 MZS 6.84 Sampling Equipment: 713/12 Ononte Date Sent to Lab: Laboratory: Yea Field QC Sample Number: Chain-of-Custody (yes/no): ΙĤ Convier Split With (names[s]/organization): Shipment Method: min - pa Remarks: DWW-10 U MW-DC SW Stairs mill Signature: \* outgoing tide caused significant turbidity. Page 1 of 1

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Form 02-EN-100/Rev. 10/02

Sampling Field Data Sheet	•
Station #: $SM2$	
Project Number: 233-1577-037 Date: 7/3/12-	
Nembor Dudle manne OPARD	
NIANA THE DEC.	
Project Address: MANT BALL DV Sampled By: L.M. UC	
Olympia, WA	Dra
TIME pH (units) Ec (uminos/cm 26°C) (a (20 br) (+0.1) (± 3%) TEMPERATURE °C DO (mg/L) (visual) (/// (visual) (// (visua)) (// (visua)) (// (visua)) (// (visua)) (// (visua)) (// (visu	SA((%)
TIME pH (units) EC ( $\mu$ mitosrem 25°C) TEMPERATURE °C DO (mg/L) (visual) ( $mV$ ) ( $mV$ ) (visual) ( $mV$ ) ( $mV$ ) ( $mV$ ) ( $mV$ ) (visual) ( $mV$ ) ( $m$	711.090
	× T.00
Sampling Equipment:	
Laboratory: ONTHE Date Sent to Lab: 73/12	
Chain-of-Custody (yes/no): Yes Field QC Sample Number: N/A	
Chambol Consider And	
Shipment Method:Split With (names[s]/organization):	•
Remarks:	
Remarks: MW-0A N C	
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Inote .	
Signature: JANNU	

. Page <u>1</u> of <u>1</u>

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Sampling Field Data Sheet Station #: SW 712/12 Date: Project Number: Client Name Project Name: Sampled By: Project Address: NΆ Sel (%), 4.0 WITH WRBIDITY (orisual) Sm Hoston 2 pH (units) (± 0.1) Ect TIME DO (mg/L) (visual mV TEMPERATURE °C (± 3%) 203 (2400 hr) ... 592 14-20 9.58 -17 6.06 0850 Sampling Equipment: 10 Ononte Date Sent to Lab: Laboratory: R N len Field GC Sample Number: Chain-of-Custody (yes/no): NA onwier Split With (names[s]/organization): Shipment Method: MW-M ( Remarks: 6 istand mw-08 • SW3 rewprint bootramp M Signature

Form 02-EN-100/Rev. 10/02

RAMETRIX			Form 02-EN-100/Rev. 10/02
	Sampling F	ield Data Sheet	Station #: Seep 4
roject Number: 2 roject Name: W roject Address: WE	33-1577-037 CA BAY PANE MA BAY DY	Date: 7/3/12 Client Name DPAR Sampled By: U.MY	D Ile
TIME pH (units) (2400 hr) ( $\pm$ 0.1) ( $\pm$ 3.30 $\underline{7.59}$	$E_{\text{c}}(\underline{\mu}\underline{\mu}\underline{h}\underline{h}\underline{h}\underline{h}\underline{h}\underline{h}\underline{h}\underline{h}\underline{h}h$	$\frac{13.60}{2.95}$	UNEWALLING (VIEWALLING) (VIEWAL
Sampling Equipment: Laboratory: Chain-of-Custody (yes/r Shipment Method:	)Ninte 10): Yeg Corwier	Date Sent to Lab: Field QC Sample Number: Split With (names[s]/organizati	
Remarks:	×		mmus
		SEEP4	boot
Signature:	zwill	epression caus	

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. Page <u>1</u> of <u>1</u>

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Sampling Field Data Sheet

Station #: SA 7 0 1577-037 Datė: Project Number: Var Client Name Project Names 0 Sampled By: **Project Address:** OR-P Cond Sm unhoelem 25°C) TURBIDITY (v<del>isual</del>)///j COLOR (visuel)(MV) TIME (2400 hr)... pH (units) Ec DO (mg/L) TEMPERATURE °C (± 3%) (± 0.1) 7,19 492 16:09 D.F 6.98 50 315 Sampling Equipment: 3/12 Date Sent to Lab: Laboratory: 45 Field QC Sample Number: Chain-of-Custody (yes/no): N IΔ owner Split With (names[s]/organization): Shipment Method: MW-07 Remarks: MW-08 GIM 0 SEEP 5 boot m Signature:

0750 Devent the Olympic State of Thronthan for Swipping & inc. . att 20 Activities: Convert Sw. an & Seeps Weither: Parths churthy ~ 55 of TOTAL CWINDER . Inthat: L. Linde a k think of Jumpuli, WA AMA Sont cig At ste, a Somerie to open actes CAPO temn L AWAY whe locked & 233-1577-037 Peret MM 2S and way be-Im A CORD A C15/2 t var

0800 "Tavics effice still inft open continue to wait, leftile juni c. Kin's divit phone to call back with contact to call back with contact to call back with contact to call back with contact to pron rate. to open rate. to open rate. To send smillional infit cend someonic visit open rate, suis we have to what away, continue to what open rate, suis we have the work, the key we can get a more the pren rate and the the work, the key we have the work, the surface water a swith with sim face water a swith with sim face water a swith with sim sim son soon see of the the far water a swith	82 Location Olymptil WA Date 7/3/12 Project / Client Wert Billy
1015 Set up to Sampling Wells 1015 Benin - Durining multip 1025 Called Sample a multip 1025 Called Sample a multip 1025 Called Augurate a multip 1025 Called Augurate a multip 1025 Called Augurate a multip 1120 Celled Augurate a multip 1120 Celled Sample a multip 1120 Celled Sample a multip 1120 Celled Sample a multip 1120 Celled Sample a multip 1207 Benin Durining multip Set up a multiple a multip 1207 Benin Durining multiple 1207 Benin Durining multiple 1208 Called Sample a multiplication 1209 Beterne and thom Lip 1315 Called Sample a Set 55 1300 Pecence and thom Lip	Location Nimmer, WA Date 7/3/12-8

1330 Collect sample custon foother who has annual late & will be about so mind with ready litto निक्त 1345 HA Project / Client ocation UWMA Bru TV VG LUNA Annas will return Kip winner takes any fuce waters renan les & consphere Sandiames thing buckets Her than 4210 Confler Project / Client Location . 1 9

Well #: <u>MW-08</u> Sample #: WB-GW-MW08- 0090

### Parametrix, Inc.

## **Groundwater Sampling Field Data Sheet**

Well Integrity Avoid Remarks What I vo in MM Signature AMAL	Purge EquipmentGeopump PeristalticLaboratoryOnsite EnvironmentalChain-of-Custody (yes/no)YesShipment MethodCourier	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Casing Diameter: 2" 4" 6"	Project Number233-1577-037 (03/02)Project NameWest Bay Final RJFSProject Address900 West Bay DriveClient NameOPARD
monwhent, missing 1 bett Page 1 of 1	Sampling EquipmentsameDate Sent to Lab10/26/12Field QC Sample NumberN/ASplit with (name(s)/organization)N/A	Atter (feet) $\overline{\partial} \cdot \sqrt{\partial}$ $\overline{\partial} \cdot \sqrt{\partial}$ Purge Vol. Meas. MethodMeas cup/watchPoint (surveyors patch/etc)TOCPurge Time (from/to) $\overline{10/25/12}$ $\overline{10/25/12}$ Purge Volume Calculation: $(\pi^2h)(7.48 \text{ gal/ft}^3)(\# \text{Casing volumes})$ Purge Time (from/to) $\overline{3.00} \times \sqrt{100}$ Purge Volume Calculation: $(\pi^2h)(7.48 \text{ gal/ft}^3)(\# \text{Casing volumes})$ Flow Rate $(ml/min)$ $\overline{3.00} \times \sqrt{100}$ Purge Volume Calculation: $(\pi^2h)(7.48 \text{ gal/ft}^3)(\# \text{Cv}); 4^n = (0.653)(h)(\# \text{Cv}); 6^n = (1.48)(h)(\# \text{Cv})$ Calculated Purge Volume (gallons) $\overline{3.00} \times \sqrt{100}$ Calculated Purge Volume (gallons) $\pm 3^{\circ}_{3}$ $\pm 3^{\circ}_{5}$ $\pm 3^{\circ}_{5}$ $\pm 3^{\circ}_{5}$ $2^{\circ}_{7}$ $\overline{3.83}$ $\overline{8.74}$ $\underline{3.64}$ $\underline{3.74}$ $\underline{3.12}$ $10^{\circ}_{1}$ $\underline{10}$ $\overline{3.44}$ $\underline{3.54}$ $\underline{0.00}$ $13.23^{\circ}_{1}$ $16^{\circ}_{1}$ $\underline{3.324}$ $\overline{3.44}$ $\underline{3.54}$ $\underline{0.00}$ $13.23^{\circ}_{1}$ $\underline{3.324}$ $\overline{3.44}$ $\underline{3.54}$ $\underline{0.00}$ $13.23^{\circ}_{1}$ $\underline{3.324}$ $\overline{3.54}$ $\underline{0.00}$ $13.23^{\circ}_{1}$ $\underline{3.324}$ $\underline{3.325}$ $\overline{3.44}$ $\underline{3.54}$ $\underline{0.00}$ $\underline{3.324}$ $\underline{3.325}$ $\overline{3.54}$ $\underline{0.00}$ $13.23^{\circ}_{1}$ $\underline{3.325}$ $\underline{3.325}$ $\overline{3.45}$ $\underline{0.00}$ $\underline{13.324}$ $\underline{1.0}$ $\underline{3.325}$ $\overline{3.44}$ $\underline{3.54}$ $\underline{0.00}$ $\underline{10}$ $\underline{3.325}$ $\underline{3.325}$ $\overline{3.44}$ $\underline{3.35}$ $\underline{3.34}$ $\underline{1.0}$ $\underline{3.325}$ $3.4$	Other x	Date10/25/12LocationBurner Point - northSampled ByL. LindePurged ByL. Linde

Well #: <u>MW-09</u> Sample #: WB-GW-MW09- OUN

### Parametrix, Inc.

**Groundwater Sampling Field Data Sheet** 

Well Integrity CUOR in WUMLIMENT, Marsing 1 Holt Remarks Afortein in WUMLIMENT, Page 1 or 1 Signature Applicate with the Communication of the 1 or 1	Purge EquipmentGeopump PeristalticSampling EquipmentsameLaboratoryOnsite EnvironmentalDate Sent to Lab10/26/12Chain-of-Custody (yes/no)YesField QC Sample NumberN/AShipment MethodCourierSplit with (name(s)/organization)N/A	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Casing Diameter: 2" 4" 6" Other x	Project Number Project Name233-1577-037 (03/02) West Bay Final RIFSDate Location10/25/12 Burner Point - east Sampled ByProject Address Client Name900 West Bay Drive 	Groundwater Sampling Flew Data Succe

Parametrix, Inc.

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Well #: <u>MW-10</u> Sample #: WB-GW-MW10- ∂∂≪D

**Groundwater Sampling Field Data Sheet** 

Well Integrity <u>Autol</u> Remarks <u>AW/orkly</u> Signature <u>AMW</u>	Purge EquipmentGeopuinLaboratoryOnsite EChain-of-Custody (yes/no)YesShipment MethodCourier	Depth to Water (feet) Depth of Well (feet) Reference Point (surveyors notch/etc) TOC Date/Time Sampled $100-5/10-03$ Purge Volume Calculation: $(\pi r^2h)(7)$ Purge Volume (gallons) for $2^{12} = (0.7)$ Calculated Purge Volume (gallons) for $2^{12} = (0.7)$ Calculated Purge Volume (gallons) for $2^{12} = (0.7)$ 1000 hr) LEVEL (units) $\pm 0.1$ 2.400 hr) 1000 $2.4672.4002.4002.4002.4002.4002.4002.4672.472.467$	Casing Diameter: 2"4"	Project Number Project Name Project Address Client Name OPARD
IN MONTANIA	p Peristaltic nvironmental	$\begin{array}{c c} TOC \\ \hline U^{2}h)(7.48 \text{ gal/ft} \\ (\pi r^{2}h)(7.48 \text{ gal/ft} \\ 2^{2^{\prime\prime}} = (0.16)(h)(\# (16)(h)(\# (16)(h))) \\ gallons) \\ (m S/cm) \\ \pm 3\% \\ \pm 3\% \\ \pm 3\% \\ \pm 1 \\ 39, 9 \\ (1, 16)(h)(\# (16)(h)) \\ (1, 16)(h)(\# (16)(h)) \\ (1, 16)(h)(\# (16)(h)) \\ (1, 16)(h)(\# (16)(h)) \\ (1, 16)(h)(1, 16)(h) \\ (1, 16)(h)(1, 16)(h)(1, 16)(h)(1, 16)(h) \\ (1, 16)(h)(1, 16)(h)(1, 16)(h)(1, 16)(h)(1, 16)(h) \\ (1, 16)(h)(1, 16)$	6,,	
Page	Sampling Equipment same Date Sent to Lab Field QC Sample Number N/A Split with (name(s)/organization)	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		tion Burner Point - pled By L. Linde ed By L. Linde
of	same r <u>N/A</u> rization) <u>N/A</u>	$\frac{10/25/12}{D^{2}V^{2}} = (1.48)(h)(\#Cv)$ (gallons) $= 10 \text{ mV}$ (mV) (gallons) $= 10 \text{ mV}$ (gal) $= 2442$ $= 2442$ $= 2442$ $= 2444$ $= 3444$ $= 3.5 \text{ GeV}$	one oun function	south

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# Surface Water Sampling Field Data Sheet

Station #: SW1

Project Number: TIME (2400 hr) \300 Project Address: Project Name: **Client Name: Shipment Method:** Sampling Equipment: Remarks: Chain-of-Custody (yes/no): Laboratory: Signature: WE-SW-GWI-UDD C 1300 PH ±0.1 €./⑦ OPARD 900 West Bay Dr 233-1577-024 (03/02) West Bay Park Final RIFS Bur of Yes Courier **Onsite Environmental** Grab cond (ms/m) ±3% Ð 9.88 00 (mg/L) ±10% AN WIND Date: Location: Sampled By: Split With (names[s]/organization): Field QC Sample Number: Date Sent to Lab: (°C) 11.41 OL NUM O TURB ±10% if > 10 NTU 51 L. Linde 10/25/12 ٦ South of Burner Point Sample #: Stiff ORP (mV) ±10 mV WB-SW-SW1-0000 · SWI ZA N/A N/A 10/26/12 Salinity (%) 4 \*

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# Surface Water Sampling Field Data Sheet Station #:: SW2

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Signature: HANNE	Starry	e min-on No-Min e		Remarks: WB-SW-SWA-UDDD C 1240	Laboratory:Onsite EnvironmentalChain-of-Custody (yes/no):YesShipment Method:Courier	Sampling Equipment: Grab	TIME. $pH$ COND DO (units) (mS/m) (mg/L) (2400 hr) $\pm 0.1$ $\pm 3\%$ $\pm 10\%$ 7.63 $U7.4$ $7.73$	Client Name: OPARD	88	1	Project Number: 233-1577-024 (03/02)
	MATAU Trustle	3	Z		Date Sent to Lab:10/26/12Field QC Sample Number:N/ASplit With (names[s]/organization):N/A		TURB         ORP           TEMP $\pm 10\%$ if (mV)         Salinity           (°C)         > 10 NTU $\pm 10 \text{ mV}$ (%) $\beta - \vartheta 3$ $5, 2$ 1 $3, 1$		Sampled By: L. Linde	ion:	Date: 10/25/12

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# Surface Water Sampling Field Data Sheet

Station #: SW3

Project Number: TIME (2400 hr) **Client Name:** Project Address: Project Name: Sampling Equipment: Shipment Method: Chain-of-Custody (yes/no): Remarks: Laboratory: Stermal WB-5W-5W3-0000 C 1220 Silo pH (units) ±0.1 18. t 900 West Bay Dr 233-1577-024 (03/02) OPARD West Bay Park Final RIFS ILA RIO MANA Onsite Environmental Yes Courier Grab COND (mS/m) ±3% 46.4 DO (mg/L) ±10% 58.5 Date: Location: Sampled By: Field QC Sample Number: Date Sent to Lab: Split With (names[s]/organization): (°C) 11:54 TURB ±10% if > 10 NTU 13.4 L. Linde 10/25/12 Northern Project Boundary and the Sample #: ORP (mV) ±10 mV 44 Z WB-SW-SW3-0000 N/A WWW-05 N/A 10/26/12 punt Salinity (%) N

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Signature:

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## Seep Sampling Field Data Sheet

Station #: SEEP 4

Project Name: Project Number: Project Address: TIME (2400 hr) 1)のサ **Client Name:** Sampling Equipment: **Shipment Method:** Chain-of-Custody (yes/no): Remarks: Laboratory: Signature: WB-SEEP-SEEPY-6000 @ 1130 pH (units) ±0.1 8.01 900 West Bay Dr 233-1577-024 (03/02) West Bay Park Final RIFS OPARD Yes Grab Courier **Onsite** Environmental 513 COND (mS/m) ±3% MA DO (mg/L) ±10% 0.99 0 Date: Sampled By: Location: (°C) Field QC Sample Number: Date Sent to Lab: Split With (names[s]/organization): TURB ±10% if > 10 NTU SETT 4 OFF 10/25/12 L. Linde Northeast of SEEP 5 Sample #: WB-SEEP-SEEP4-000 Sign Z ORP (mV) ±10 mV -106 AO-MUN N/A N/A 10/26/12 Salinity (%) 0.3 Link

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### Seep Sampling Field Data Sheet

Station #: SEEP5

Signature:	WB-SE	Remarks:	Laboratory: Chain-of-Custody (yes/no): Shipment Method:	Sampling Equipment:	TIME (1 (2400 hr) ;	Client Name:	Project Address:	Project Name:	Designt Number	1 .
10 m	WB-SEEP. SEEPS-0000		(yes/no):	1	pH (units) ( 8.20	OPARD	900 West Bay Dr	West Bay Park Final F	0 7731 000	
Ma.	S- 1000 C		Onsite Environmental Yes Courier	Grab W/ PEY	COND (mS/m) ( 13.な ろ		ay Dr	West Bay Park Final RIFS	100/ 201 100	
	Miected C 1200			penietultic	DO (mg/L) ±10%				a	
	le 120		Date Sent to Lab: Field QC Sample Number: Split With (names[s]/orga		TEMP (°C) /2/3/		Sampled By:	Location:	Date:	
			Date Sent to Lab: Field QC Sample Number: Split With (names[s]/organization):		TURB ±10% if > 10 NTU = ±		L. Linde	Below tree, n	10/25/12	Sample #: \
	BORRES THE STREET		10/26/12 N/A m): N/A		0RP (mV) ±10 mV			Below tree, northeast of boat launch		WB-SEEP-SEEP5-0000
	dunes para				Salinity (%) <i>D</i> . <u>S</u>			t launch	• •	EP5-0000

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0850 5694 9630 40%0 SSE 5940 5445 0925 040 otro throw a ste set up Obas Dennet the sate ANATION - VI MOUL Project / Client UNUPT SMA NALAN: Location Wither : Conflort DW, SW & SHIPS Din holes tor seeps a let clair Beach purging murits Fishigh produced conject sumple. WB-GIV- MWHO-0080 Contect sample we an -now -0000 Sotrap a movil 040/185mV Jorss 6 during H+4.08 ms/cm TIME ONTH more locations, Set up & www-on DO 11.00 mall Kip Marte, Calibrate this be ANI TREEW 11 C115210 Location UUVin Project / Client のもの GOND SAMPS TAS-GM 130 250 1008 Bean Durang MW -08 300 0 1325 Prep the surface whiter sumpling R. CONTO LOCK NOT MARKE HD WWW - NK " SETTING 10125 Correct Tield Mudicate TANKS NOTING PRUGE DUCKOTS Clean up the for seed campling 10-01-60MW-MU-BM Send Springer to get pluge EINS & PLANNES HAVEN MB SEEP-SEEP4-0700 JUIN AND WB-GW-MWDR-0010 PMUM MB-GW-SWNP/2 C SW) 10-2-2-21-21-07-2-21-N Under Harry

1430 1330 िस्ट इस्ट 8 Location 0/1/ Project / Client Clean in & more earnight bench, burned to verifice prevence barenes from - service thera filter surface water Sumples & finish which have to totales, the shiples Letter Manufac Live 4 and Date 10/25/12 Project / Clien Location 97

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### PARAMETRIX

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	FIELD PARAMETERS SEDIMENT SAMPLING	Sample #: \$ <u>034</u>
Project Number:	233-1577-037	
Project Name:	Werst Brin RI/FS	
Project Address:	900 Wast Bay Dr	
Client Name:	City of DIMMPER Hurks	
Sample Location:	_ See Sketch	·
Date:	7/19/17	
Sampled By:	V. UNdel W. Harvey	
Depth of Sample (feet):	0-4"	
Date/Time Sampled:	7/19/12-1010	
Air temperature:	leor	
Weather Conditions:	Partly Cloudy	
PID Measurements (ppm):	NA	
Sample Number:	WB-SD-SD34-0050	
Sampled By:	- Unde/W. Harvey	
Laboratory:		
Chain-of-Custody (yes/no):		
Date Sent to Lab:		
Shipment Method:	CONVIEN	<b></b>
Remarks/Notes:		
Dark brown to black	4	>N
fy sediment m peta	dec, 5033	
oudssimm shell lan	mamnesel)	
franments, grass, à noord; intertidal, no o	5734	°
wood, intertidal, no o	da	
$\widehat{}$	ه ري که	Not to scale
Signature: A in Al	)	See Fig 2 SAP
Signature: <u>HAMAC</u>		DCartons Hollow
		Contour of Dead

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	FIELD PARAMETERS SEDIMENT SAMPLING	Sample #: <u>۲۵</u> 35	
Project Number:	233-1577-037		
Project Name:	WESTBAY RIJES		
Project Address:	900 WESTBAY DRIVE		
Client Name:	CITY OF OLYMPIA PARK	.\$	
Sample Location:	SEE SKETCH		
Date:	7-19-12		
Sampled By:	L. LINDE / W. HARVEY		
Depth of Sample (feet):	0-4"		
Date/Time Sampled:	7-19-12 1040		
Air temperature:	60°F	,	
Weather Conditions:	PARTLY CLOUDY		
PID Measurements (ppm):	NA		
Sample Number:	WB-SD-S035-1056		
Sampled By:	LILINDE   W HARVEY		
Laboratory:	ONSITE	m ji	
Chain-of-Custody (yes/no):	YES		
Date Sent to Lab:	7-20-12		
Shipment Method:	COURIER		
Remarks/Notes:		·····	
Dowe bon to black for	0 5Q7	$\rightarrow N$	
sediment w/ pebbles	1 × 5%	5	
Shell from a clama ma	Accel 8 5	ø st	
grass wood france wave			
grass, wood frags, was no oder, interstand	III),	ø Ö	
Field dupphicites	collected WB-SD-SD35-10	50 C1045 NOT to SC	ale
Signature:		Seefins	
		- locution	レラ トワリル
<b>)</b>		contou	1 C Del 1

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### FIELD PARAMETERS SEDIMENT SAMPLING

Sample #: <u>5036</u>

the state of the second s	
Project Number:	233-1577-037
Project Name:	WESTBAY RILFS
Project Address:	900 West Bay Dr
Client Name:	City of Origmpia Parks
Sample Location:	Seesketzk
Date:	7/19/12
Sampled By:	L. Lincle / W. Harvey
Depth of Sample (feet):	D-4"
Date/Time Sampled:	7/19/12 1100
Air temperature:	6DDF
Weather Conditions:	Partly Cloudy
PID Measurements (ppm):	NA
Sample Number:	WB-SD-SD36-0050
Sampled By:	L. Unde/ W. Hawey
Laboratory:	<u>Ononite</u>
Chain-of-Custody (yes/no):	<u> </u>
Date Sent to Lab:	
Shipment Method:	Count
Remarks/Notes:	
PK-brn the sediment	P, SD 348
PK-brn ty sediment	
drest, words oda	SD 30
grasses, no shell'	
dust, wordy odar grasses, no snell wotertradd	16 <i>P</i> 7 13
	, NØF
Signature:	
	2 NOT See -loca
	cont

	FIELD PARAMETERS SEDIMENT SAMPLING Samp	ole #: 503
Project Number:	233-1577-036037	
Project Name:	West Bay RI/FS	
Project Address:	900 Weast Bay Dr	
Client Name:	City of Olympith Huns	
Sample Location:	See staten	
Date:	7/19/12	
Sampled By:	_ L. unde W. Harvey	
Depth of Sample (feet):	D-4"	
Date/Time Sampled:	7/19/12 1135	
Air temperature:	~ LOOF	
Weather Conditions:	Partly Cloudy	
PID Measurements (ppm):	N/A) J	
	1	
Sample Number:	WB-SD-SD38-0050	
Sampled By:	L. Unde I W. Hanvey	
Laboratory:	Opente	
Chain-of-Custody (yes/no):	Yecz	
Date Sent to Lab:		
Shipment Method:	Convier	
Remarks/Notes:	<sub>5</sub> p33	
Black fy sed me		
wood chunck, san	dust mento = ~ mon	SD3
accacation of the and	numsi, prup = 50	ø
vunes what shell f	rag (clams)~500,	
occassional shell f wood oder, inter	tidal	ଜ
$ \rightarrow \rightarrow$	nNo	7 to scal
Signature:	1)	e Find
	Lp.	anone fili
-	Cø	ntow of k

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	FIELD PARAMETERS SEDIMENT SAMPLING	Sample #: 523
Project Number: Project Name: Project Address: Client Name: Sample Location: Date:	233-1577-037 West Bry RIAS 900 West Bry Dr City of Olympia Parks See Sketch 7/19/12	
Sampled By: Depth of Sample (feet): Date/Time Sampled: Air temperature:	L. Unde / W. Harvey D-4" 7/19/12 1310 V 100°F	
Weather Conditions: PID Measurements (ppm): Sample Number:	Davily Cloudy N/A WB-SD-SD30-0050	
Sampled By: Laboratory: Chain-of-Custody (yes/no): Date Sent to Lab:	Ves 7/20/12	
Shipment Method: Remarks/Notes: BLACK & gray sitt#fg Sediment, ocassional	. \$73 	3 ->N
Sediment, ocassional grass, pebbles, ~<5%, word, small shell for @ snrface, brine odds intertidal	14 , , , , , , , , , , , , , , , , , , ,	
Signature: HMM	l .	NA TO Scale See Fig & SA - locations follow Contour of be

	FIELD PARAME SEDIMENT SAM		Sa	mple #: 🖄	<u>)37</u>
Project Number:	2-33-1577-	037			
Project Name:	Werst Ban 1	RI/FS			
Project Address:	900 Weest	BanDr			
Client Name:	CHY of OI	nmida Fa	w/s		
Sample Location:	_ See sketc	h			
Date:	7/19/12				
Sampled By:	L.Undel W	.Harvey			
epth of Sample (feet):	D-4"			-	
Date/Time Sampled:	7/19/12	1120			
Air temperature:	~ 70°F		e		
Weather Conditions:	Snnny W/C	loudys			
PID Measurements (ppm):	NA				
ample Number:	WB-SD-SD39-	-0050	5		_
Sampled By:	L. Linde W.	Harvey			
_aboratory:	Onsite	J			
Chain-of-Custody (yes/no):	Yes				
Date Sent to Lab:	7/20/10				
Shipment Method:	Conrier		5		
Remarks/Notes:	- 98		22		
DK-bn a black fy s	silty		5033		Ð
sediment, snells			_		
cromon (clam & m	ussel)~1070	- f	ç	r. 8	
barnacles, NOTO WAT	d fra,				
brine edar, interti	0	، چ	<b>,</b> D31	IJ	8
	0			Not to	54
Signature:	Va-		E	see Fil	
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			-L 1	P.P. M.	5
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	FIELD PARAMETERS         SEDIMENT SAMPLING         Sample #:	
Project Number:	2-33-1577-037	
Project Name:	West BAY RIFS	
Project Address:	900 Wast Bry Dr	
Sample Location:	City of Olympia Parks See sketch	
Date:	7/19/12	
Sampled By:	L. Unde W. Harvey	
Depth of Sample (feet):	0-4"	
Date/Time Sampled:	7/19/12 1300	
Air temperature:	~70F	
Weather Conditions:	Sunny	
PID Measurements (ppm):	N/A J	
Sample Number:	WB-SD-SD40-0050	
Sampled By:	L. Linde I W. Harvey	
Laboratory:	Oncoîte	
Chain-of-Custody (yes/no):	Yes	
Date Sent to Lab:	7/20/10-	
Shipment Method:	Conrig	
Remarks/Notes:	1	
Black w/ rustyarea. fg sediment, pebble	S \$733	
for sediment, petitle	15	
in < 5% shell frags,		
<10% wood Chithck		$\overline{\ }$
mild petrojeum odor	- SD40	``
inter-tidal		
Signature:	le Not to scale See Fig 2 SAP	
	bench contour	~
	2-croci Cordowy	

	FIELD PARAMETERS SEDIMENT SAMPLING	Sample #: <u>\₽</u> ↓/
Project Number: Project Name: Project Address: Client Name: Sample Location: Date: Sampled By:	233-1577-037 Wecst Bry RI/FS 900 Werst Bay Dr City of Olympia Sée sketk 7/19/12 L. Linde/W. Hawey	
Depth of Sample (feet): Date/Time Sampled: Air temperature: Weather Conditions: PID Measurements (ppm):	D-4" 7/19/12 1235 ~70% Sunny 70% N/A	
Sample Number: Sampled By: Laboratory: Chain-of-Custody (yes/no): Date Sent to Lab: Shipment Method:	WB-SD-SD/1-0050 L.Linde / W.Harvey Onesite Yes Onesite Courrier	
Remarks/Notes: DK-Brn, Black fg silt Sediment, n 40% word enuncks, pulp & Sawdi Shell frags 5% [diam mild petroleum oc occassional, intert Signature:	st st, st, o o o o o o o o o o o o o	D'33 SD41 NA to scale See Fig 2 SAP locations for an Contour of beach

0870 Stap The tre & Di Marchen 0830 Stap The tre & Di Marchen 0830 Stap The tre & Di Marchen 1907 Di the Constre Schule 1907 Di the Stap Schule Stap 1907 Di the Stap Schule Stap 1908 Stap Schule Internationes 1909 The Stap Schule Internationes Monse Hinish lapers & sumpling field throws & not Gives Project / Client WWWWWWWWWWWWWWWWWWW Monthur: function Summing Ominte: L'Under, Mithavia (PMX) Apprinties: Enlect Sedument suge from each licetion start ANY Date TIA/12 85

SP34 SP34 SP35 SP35 SP37 SP39 SP39 SP40	N 47°03'07.7" N 47°03'07.9" N 47°03'08.1" N 47°03'08.3" N 47°03'08.3" N 47°03'07.7" N 47°03'07.9" N 47°03'08.0"	W 1220 54142,5" W 1020 54142,4" W 1020 541 42,4" W 1020 541 42,4" W 1020 541 42,3" W 1020 541 42,4" Sozar 5020 W 1020 541 42,4" Sozar 5020 Sozar 5020 Soza	Sp33
6041	N47°03'08.2"	WI2205442.2 \$\$	-erluni
Late Entry II 1310 Correct Sumple 1320 Channed Sp-Sp-28-0050 HV SN Flice Soils HV SN Flice Soils Soils HV SN Flice Soils Soils HV SN Flice Soils HV SN Flice	1130 Conjuect and W35 Conjuect and 1145 Break for 11 1145 Break for 11 1145 Break for 11 1135 Conjuect sta	e WB-SD-SD36-0050 1070 STANT CALLECTING Sol Ment 1045 CALLECT SAMPLE THE CALLECT MARKE WB-SD-SD34 COSD WB-SD-SD34 COSD WB-SD-SD34 COSD WB-SD-SD35-1050 WB-SD-SD35-1050 WB-SD-SD35-1050 NB-SD-SD35-1050	Location Olympy, WA Date 7/19/12. Project / Client Wilst Early

Location

Station

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Location \_\_\_\_\_

1430 aetil att 1330 Project / Client JWbyt BMX Location ULWMPLIL, WH D Third location south of tence is within tenced area around outfail the pritection, relocitle station the pritection, culient mutal tencing to culient mutal tencing to The southern Civalds & grownd feels soud for vehicle thatfic attempt to locate my 03 in minist to start marking eactage side of ferre to go annund See City Parts employee and it round arass is solut enough to the the town it, same off of the surface SOUN ALLANDURS Locate my of in blackternes Access onthe openin Ken Sinte og S' Widd for Same nertuines so Ander Mennue M Mentale around ettur collegte. Project / Client Whith Bay location BILY MATIN WA 455 Go back to vehicle to FF5 BIG1 いい showing ou that say we anownal converse which a to when the on estament locations traced on Will meet a office in ------out to consider cooler Sold Loud UNG Jattempt Finish monthing surface Depart suc Standay is opened と言子