Site Investigation Work Plan
Union Gap Substation
Union Gap, Washington

Prepared for

PacifiCorp

825 NE Multnomah, Suite 1500, Portland, OR

August 2007

Prepared by

CH2MHILL

Contents

Section		Page
Introduction		**1-1**
1.1	Project Scope and Objectives	1-1
Work Plan Approach		**2-1**
2.1	Task Descriptions	2-1
2.2	Sample location	2-1
2.3	Sample Analysis	2-2
2.4	Project Schedule	2-2
Data Quality Objectives		**3-1**
3.1	Quality Objectives and Criteria for Measurement Data	3-1
3.2	Measurement Performance Criteria	3-2
3.3	Reporting Levels and Method Detection Limits	3-2
3.4	Screening Levels	3-3
3.5	Analytical Laboratory	3-3
Field Activities		**4-1**
4.1	Direct Push Technology Soil Borings	4-1
4.2	Groundwater Sampling	4-1
4.3	Soil Sampling	4-2
4.4	Borehole Abandonment	4-3
4.5	Investigation Derived Waste	4-3
Field Operations Documentation		**5-1**
5.1	Field Logbook and Sampling Sheets	5-1
5.2	Chain-of-Custody	5-1
5.3	Sample Packaging and Shipment	5-1
Quality Assurance Measures		**6-1**
References		**7-1**

Appendices

A Laboratory Report for PCB Sampling
B Applied Science Laboratory's Washington Accreditation

Tables

Sampling Rational 2-1
Site Investigation Schedule 2-2
Data Quality Objectives 3-1
Target Reporting levels and Method Detection Limits 3-2
Site Investigation Screening levels 3-3
Groundwater Samples – Methods, containers and holding times 4-2
Soil Samples – Methods, containers and holding times 4-2

SECTION 1

Introduction

While conducting clean-up activities around a recently discovered leaking transformer at the Union Gap Substation, PacifiCorp crews encountered the groundwater interface. This raised concerns that this release may have impacted the shallow groundwater. A soil sample was collected and tested for Polychlorinated Biphenyls (PCBs) which proved to be non-detect. The final laboratory report is provided in Appendix A. The focus of this investigation is to identify if any impacts to shallow groundwater has occurred as a result of this release.

This Site Investigation (SI) Work Plan was prepared to identify the nature and extent of groundwater contamination that may have been caused by the oil spill at the Union Gap Substation.

Tasks to be completed under this work plan include:

- Groundwater sample collection from direct push temporary well points
- Visual and olfactory field screening for petroleum contamination of soil, soil sampling for PCBs, and soil sample collection for total petroleum hydrocarbons (TPH) if field screening indicates contamination.

1.1 Project Scope and Objectives

The objective of this work plan is to provide a work approach and field instructions for sampling activities at the Union Gap Substation. Sampling activities will include the collection of six groundwater samples from six boreholes. Three boreholes will be located directly around the area of known release. Three additional bore holes will be located farther away from the known release site (Figure 1). Three soil samples will be collected from the three boreholes directly around the area of known release at the groundwater interface to be tested for PCBs.

Once the tasks listed in this work plan are complete, a technical memorandum will be written to summarize field activities.

SECTION 2

Work Plan Approach

2.1 Task Descriptions

This work plan was written with the intent to collect the necessary data to delineate possible impacts to the groundwater from the release of TPH at the site. This work plan includes the following tasks:

Task 1: Collect groundwater samples from direct push soil borings. Groundwater samples will be sent to an environmental laboratory and analyzed for petroleum hydrocarbons.

Task 2: Visual and olfactory field observations for petroleum contamination of soil will be made during drilling. If soil contamination is encountered, a soil sample will be collected and analyze for petroleum hydrocarbons. This observational approach will be used to collect samples in areas with the highest likelihood of detecting contamination, if present.

Task 3: Collect three PCB soil samples from three of the direct push soil borings. Soil samples will be collected from the three borings closest to the release site at the groundwater interface and sent to an environmental laboratory and analyzed for PCBs.

2.2 Sample location

Proposed sample locations are present in Figure 1. Sample locations were selected to identify the nature and extent of impact this release had on the shallow groundwater. The direction of groundwater flow in this area is unknown. As a result the sample locations were selected to establish two rings around the release site. Three samples are close to the release site and three are farther out. The rational for each sample point is presented in Table 2-1. The actual sample locations may be moved due to physical obstacles and health and safety concerns.

TABLE 2-1
Sampling Rational
PacifiCorp Union Gap Substation

Sample point	Rational
1, 2, and 3	Identify groundwater conditions and soil PCB concentrations close to the spill site
4, 5, and 6	Identify groundwater conditions down gradient from the spill site

2.3 Sample Analysis

The sample collected from the spill site was found to be non-detect for Polychlorinated Biphenyl (PCBs). A copy of this laboratory report is included in Appendix A. Three additional soil samples will be collected to confirm these findings. Groundwater will be analyzed for total petroleum hydrocarbons (TPH) in the diesel and heavy oil range by method NWTPH-Dx.

2.4 Project Schedule

The fieldwork described in this document will be scheduled after the Washington Department of Ecology's (DOE) review and approval of this Work Plan. It is anticipated that the fieldwork will be completed within 20 days of work plan approval. Assuming standard laboratory turnaround, a technical memorandum describing sample results should be available with in 60 days of completing the fieldwork.

Table 2-2 provides a schedule for the implementation of the work plan fieldwork and the submittal of the data report. The schedule begins with DOE's approval of this document.

TABLE 2-2
Site Investigation Schedule
PacifiCorps

Task	Start Date	Duration (days)
Conduct Fieldwork	Approval of the Work Plan Addendum	20
Prepare Technical Memorandum	Completion of Fieldwork	60

SECTION 3

Data Quality Objectives

3.1 Quality Objectives and Criteria for Measurement Data

The objectives of this investigation include the following:

- Groundwater sampling
  - Obtain data, with which to delineate and assess the possible impacts to the shallow groundwater resulting from this release of petroleum hydrocarbons.
- Soil boring field screening and soil sampling
  - Obtain data to further delineate potential extent of possible historic releases of petroleum hydrocarbons and polychlorinated biphenyls.

These project objectives have been used to develop specific data quality objectives (DQOs) comprising both qualitative and quantitative statements that describe the type and quality of data needed: (1) to determine the current state of potential contaminant distribution; and (2) to assess the potential for contaminants to be released from the site. The DQO processes used for this project are in general accordance with the U.S. Environmental Protection Agency's (EPA) QA/G4 guidance (EPA, 2000) and apply the seven-step DQO development process. The DQOs provide a basis for the investigation activities to be performed, and ensure that data collected during the investigation will be of a quality acceptable for their intended use. The DQOs and associated investigation activities established for the site are presented in Table 3-1.

TABLE 3-1
Data Quality Objectives
PacifiCorps

Media of Interest	Data Quality Objective	Investigation Activity	Constituents
Groundwater	Obtain data, with which to delineate and assess the possible impacts to the shallow groundwater due to this release of TPH.	Collect groundwater samples from seven locations (1 up gradient location, 1 at known release site, and 5 down gradient locations).	TPH-Dx
Soil	Obtain data to delineate potential contamination related to possible historic releases of TPH and PCBs.	Collect three samples at the groundwater interface for PCB analysis. Conduct visual and olfactory field screening of soil borings. If field screening indicates contamination, collect a sample for submittal to laboratory.	PCBs TPH-Dx

3.2 Measurement Performance Criteria

Project DQOs require that certain measurement performance criteria be met, including the following:

- Peer and senior review of data and documents
- Quality control standards
- Management controls

The analytical data will undergo three levels of review—an initial review by the laboratory analyst or a peer analyst, a second review by the laboratory Quality Assurance Manager, and a final data quality review by the CH2M HILL project chemist.

All documents pertaining to the quality standards of the project will be drafted and reviewed internally by CH2M HILL staff with relevant technical experience. The Project Manager also will review all project deliverables prior to submittal to the client.

All analytical data must meet the quality control measures set forth in the applicable SOPs, and the applicable analytical methods. If these standards are not met, the data will be qualified appropriately during the data review process. In cases where the data are deemed of insufficient quality to satisfy project DQOs, the data will be rejected and will not be used to support project decisions.

While performing field activities, the Field Team Leader (FTL) will manage the field activities to ensure that procedures in this Work Plan are being followed.

3.3 Reporting Levels and Method Detection Limits

Table 3-2 shows the target reporting level and the laboratory reported method detection limits for each target compound.

TABLE 3-2
Target Reporting levels and Method Detection Limits
PacifiCorp Union Gap

Method	Constituent	CAS	Units	RL	MDL[1]
Soil					
NWTPH-DX	TPH-Diesel	TPH-Diesel	mg/kg	50.0	1.294
NWTPH-Gx	TPH-Gasoline	TPH-Gasoline	mg/kg	20.0	0.03088
NWTPH-Rx	TPH-Oil	TPH-Oil	mg/kg	100	1.204
PCBs SW8082	Aroclor-1016	12674-11-2	mg/kg	0.050	0.002905
PCBs SW8082	Aroclor-1221	11104-28-2	mg/kg	0.050	0.01
PCBs SW8082	Aroclor-1232	11141-16-5	mg/kg	0.050	0.005157
PCBs SW8082	Aroclor-1242	53469-21-9	mg/kg	0.050	0.00179
PCBs SW8082	Aroclor-1248	12672-29-6	mg/kg	0.050	0.001801
PCBs SW8082	Aroclor-1254	11097-69-1	mg/kg	0.050	0.001191
PCBs SW8082	Aroclor-1260	11096-82-5	mg/kg	0.050	0.001077

TABLE 3-2
Target Reporting levels and Method Detection Limits
PacifiCorp Union Gap

Method	Constituent	CAS	Units	RL	MDL[1]
Groundwater					
NWTPH-DX	TPH-Diesel	TPH-Diesel	ug/L	100	2.98
NWTPH-Gx	TPH-Gasoline	TPH-Gasoline	ug/L	100	20.27
NWTPH-Dx	TPH-Oil	TPH-Oil	ug/L	100	18

mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
RL = reporting level
MDL = method detection limit
[1] Stated MDLs from Applied Sciences Laboratory

3.4 Screening Levels

Once the data has successfully passed the DQOs the results will be compared to the preliminary screening levels presented in Table 3-3.

TABLE 3-3
Site Investigation Screening levels
Union Gap Substation

	MTCA Standard Formula and Table Values*	
Constituent	Groundwater Method A - Table Value (ug/L)	Soil Industrial (mg/kg)
Polychlorinated Biphenyl (PCB)	Not tested	10
Diesel Range hydrocarbons (TPH- Dx)	500	2,000

*For preliminary screening purposes only.

3.5 Analytical Laboratory

All analytical work for this project will be conducted by the Applied Sciences Laboratory (ASL). This lab is accredited in accordance with NELAC and is accredited by the State of Department of Ecology to perform analyses for the parameters listed in table 3-2 presented above. The full list of analytical methods that ASL is accredited to perform by DOE is presented in Appendix B.

SECTION 4

Field Activities

The purpose of this section of the Work Plan is to detail the procedures that will be followed when implementing the field activities.

4.1 Direct Push Technology Soil Borings

Soil boring will be drilled using direct-push technology. Prior to drilling soil boring, CH2M HILL will initiate an underground utility locate. All public utilities will be contacted by the Utility Notification Center and will be required to mark any utilities in the work area.

Soil boring locations will be located using a hand held global positioning service (GPS) device accurate to sub-meter. The precise location of these boreholes may be modified in the field based on physical barriers to sampling. All changes will be documented in the field notebook and the GPS position will be collected at the actual location of the soil boring.

A total of seven soil borings are expected to be advanced and lithology logged at each boring. Borings will be advanced to the depth of the groundwater table (approximately 10 feet bgs). Soils will be field screened by the sheen test. The presence of obvious staining, odor, free product, and other factors will be noted after soil is extracted from the boring. Boring logs will indicate the presence of readily observable indications of contamination (obvious staining, odor, free product, and other factors).

4.2 Groundwater Sampling

Six groundwater samples, one from each borehole, will be collected and submitted to the laboratory. Groundwater samples will be collected from an extendable stainless steel sampling screen. A temporary 1-inch monitoring well may be used if site conditions dictate (slow groundwater recharge, clay/silt smearing/plugging extendable screen).

The groundwater samples will be collected using low flow sampling techniques. Groundwater in each boring will be purged at a rate less than 0.5 liter per minute using a peristaltic pump and clean, disposable, down-hole tubing. Each boring will be purged for a minimum of 3 well casings prior to sample collection. Water samples will be analyzed for TPH by method NWTPH-Dx. Nitrile gloves will be discarded and a new set of gloves will be used for each sample.

The analytical methods, sample volumes, sample preservative and sample hold times are presented in Table 4-1.

TABLE 4-1
Groundwater Samples – Methods, containers and holding times
PacifiCorp Union Gap Substation

Analysis	Method	Jar Size	Jar Type	Preservative	Holding Time
TPH	NWTPH-Dx	1 liter	Amber glass	Cool (4°C)	7 days

4.3 Soil Sampling

A total of three soil samples will be collected at the groundwater interface and submitted for analytical testing for PCBs. These three samples will be collected from the three borings closest to the release site.

In addition to the PCB samples, soils will be field screened using the sheen test. The sheen test will consist of taking an aliquot of soil and placing it into a zip-lock bag. Clean water will be added to the bag and the contents mixed thoroughly. The surface of the water will than be observed for indications of a petroleum sheen. If contamination is observed within soil borings, up to a total of four TPH soil samples will be collected where obvious staining is encountered. If no obvious staining or other signs of contamination is encountered, then TPH soil samples will not be collected.

Soil samples will be analyzed for PCBs and/or TPH-Dx. These samples will be homogenized in a clean stainless steel bowl, and a clean stainless steel spoon will be used to place the sample into pre-labeled, laboratory-supplied jars as indicated in Table 4-2. Jars will be filled to minimize void space. Visible rocks and twigs will be discarded. The analytical methods, sample volumes, sample preservative and sample hold times are presented in Table 4-2.

TABLE 4-2
Soil Samples – Methods, containers and holding times
PacifiCorp Union Gap Substation

Analysis	Method	Jar Size	Jar Type	Preservative	Holding Time
PCB	SW8270	4 oz.	glass	Cool (4°C)	14 days[1]/40 days[2]
TPH	NWTPH-Dx	4 oz.	glass	Cool (4°C)	14 days[1]/40 days[2]

[1] Days from sampling to extraction
[2] Days from extraction to analysis

4.4 Borehole Abandonment

Borings will be abandoned in accordance with WAC 173-160-381 after completing sampling. If temporary wells are installed, the well materials will be removed from the subsurface immediately after groundwater sample collection. The borehole will be backfilled with unhydrated bentonite chip (designed for decommissioning and within industry tolerance for dry western sodium bentonite) followed by water to hydrate bentonite chip.

4.5 Investigation Derived Waste

The investigation derived waste (IDW) generated during the field investigation will be containerized, labeled, and temporarily stored in a secure location. The containers will be labeled indicating "IDW pending laboratory analysis", date filled, client name, and contents.

The approximate volume of IDW expected to be generated will consist of ~15-gallons of soil, up to 15 gallons of purge and rinse water.

Once laboratory results are received, data will be used to profile and dispose of the IDW at an appropriate disposal facility.

SECTION 5

Field Operations Documentation

5.1 Field Logbook and Sampling Sheets

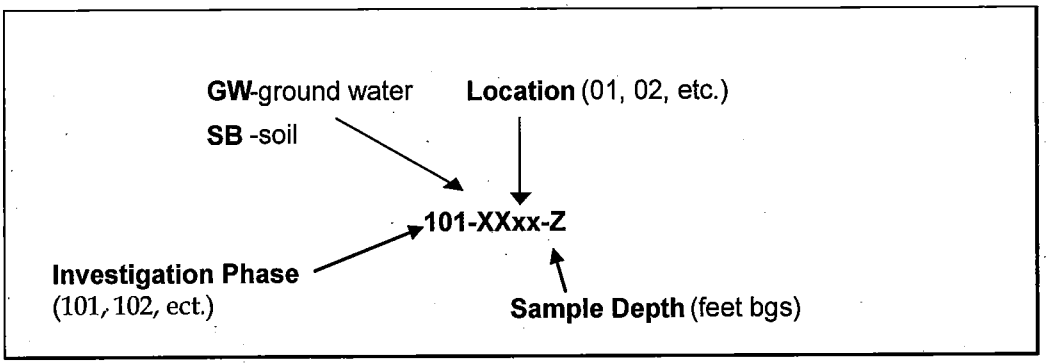
Data collection activities will be recorded in the field logbook. Activities will be described with sufficient detail to allow field events to be reconstructed without relying on memory. Modifications to the field sampling protocols should be documented in the field logbook. Entries will be made in ink and no erasures will be allowed. If an incorrect entry is made, the information will be crossed out with a single strike mark, initialed, and dated.

A soil boring log (Attachment B) will be completed for each probe location. The logs will contain information on the texture, structure, and composition of the soil encountered at the probe location. The relative proportion of gravel, sand, and fines (silt and clay) will be estimated and classified in general accordance with ASTM visual manual method to further characterize the lithology at each site. Other information, such as sample depth, color, density, moisture content, recovery, and visual presence of organic matter, as well as field screening observations (staining, odor, free product) will also be noted.

5.2 Chain-of-Custody

Field personnel will be responsible for the care and custody of samples until they are properly transferred to a laboratory courier, shipping company, or the laboratory. Field personnel will maintain custody records for every sample collected. Sample Identification

Sample labels will use the following format for sample identification:



5.3 Sample Packaging and Shipment

Sample jars will be placed immediately in Ziploc® plastic bags and then into a cooler with ice to maintain sample temperature at or below 4 degrees Celsius (°C). The sample location and time and date of sampling will be recorded in the field notebook using sample identification protocol identified in Section 5.3.

SECTION 6

Quality Assurance Measures

The quality of all analytical data shall be assessed to ensure that the data quality objectives for this project have been achieved. The accuracy, precision, and completeness of the analytical data will conform to the project quality controls.

All generated analytical data will be checked and reviewed at the laboratory by the analyst generating the data and by an experienced data reviewer before the data are released to CH2M HILL.

The analyst will review the data to ensure that:

- Sample preparation information is correct and complete.
- Sample analysis information is correct and complete.
- The appropriate analytical procedures were followed.
- Analytical results are correct and complete.
- QC samples are within established control limits.
- Documentation is complete.

The CH2M HILL data reviewer will review the data package to ensure that:

- Calibration data are scientifically sound and appropriate.
- Qualitative and quantitative results are correct.
- Documentation is complete.
- The data package is complete and ready for document archiving.

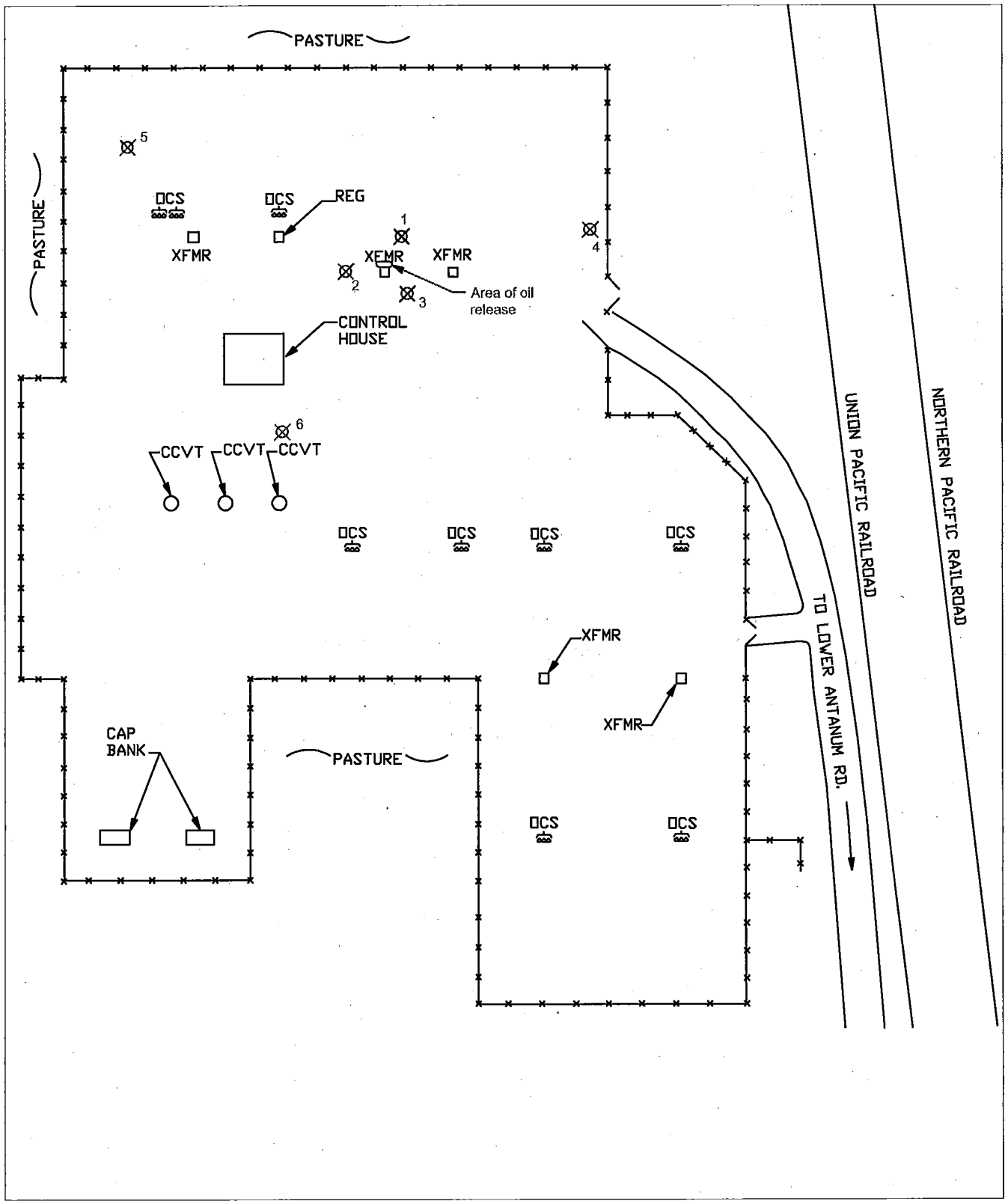
SECTION 7

References

U.S. Environmental Protection Agency (EPA). 2000. *Guidance for the Data Quality Objectives Process*. EPA/600/R-96/055.

Figures

8/6/07



Base file from PacifiCorp

N

0 60

SCALE IN FEET

LEGEND:

⊠ Proposed sample location

FIGURE 1
Proposed Sample Locations
Union Gap Substation

PacifiCorp
Union Gap, Washington

CH2MHILL

\\rosa\proj\PacifiCorp\CAD\UnionGap\251356.dwg

APPENDIX A

Laboratory Report for PCB Sampling

PCB (EPA Method 600/4-81-045) TEST REPORT 08/03/2007

1620

PACIFIC POWER & LIGHT
1101 N. 16TH AVE
YAKIMA WA 98907
Attn: PAUL HARRIS/SCOTT ROBERTSON

JACO ANALYTICAL, Inc.
103 12th Ave SW
EPHRATA WA 98823
WA LAB ID#: C256

Report #: 22E02317

Date received: 08/02/2007 Date analyzed: 08/03/2007

Refer to Customer Chain of Custody for date and time of sample collection. Please contact the laboratory at 509-754-5725 if you have any questions.

UTILITY SERIAL NO.	COMPANY #	MISC.	AROCLOR	ug/g	JAL #
	T600 300	RUSH SOIL		ND	E22D0562
	T600 310	RUSH SOIL		ND	E22D0563

Report #: 22E02317 Page 1 of 1 Number of samples: 2

Walter Parks, Director

APPENDIX B

Applied Science Laboratory's Washington Accreditation

Scope of Accreditation

CH2M Hill Applied Sciences Laboratory - Corvallis

Corvallis, OR

is accredited by the State of Washington Department of Ecology to perform analyses for the parameters listed below using the analytical methods indicated. This Scope of Accreditation may apply to any of the following matrix types: non-potable water, drinking water, solid and chemical materials, and air and emissions. Accreditation for all parameters is final unless indicated otherwise in a note. Accreditation is for the latest version of a method unless otherwise specified in a note. EPA refers to the U.S. Environmental Protection Agency. SM refers to American Public Health Association's publication, Standard Methods for the Examination of Water and Wastewater, 18th, 19th or 20th Edition, unless otherwise noted. ASTM stands for the American Society for Testing and Materials. PSEP stands for Puget Sound Estuary Program. Other references are detailed in the notes section.

Matrix Type/Parameter Name	Reference	Method Number	Notes
Drinking Water			
Bromate	EPA	300.0	10,12
Bromide	EPA	300.0	10
Chlorate	EPA	300.0	10
Chloride	EPA	300.0	10
Chlorite	EPA	300.0	10
Nitrate	EPA	353.2	10
Nitrite	EPA	353.2	10
Orthophosphate	EPA	300.0	10
Perchlorate	EPA	314.0	10
pH	EPA	150.1	10
Solids, Total Dissolved	SM	2540 C	10
Specific Conductance	SM	2510 B	10
Total Organic Carbon	SM	5310 D	10
Turbidity	SM	2130 B	10
Calcium	EPA	200.7	10
Copper	EPA	200.7	10
Manganese	EPA	200.7	10
Silicon	EPA	200.7	10
Zinc	EPA	200.7	10

Matrix Type/Parameter Name	Reference	Method Number	Notes
Haloacetic Acids	SM	6251 B	10
Regulated VOCs	EPA	524.2	10
Trihalomethanes	EPA	524.2	10
Unregulated VOCs	EPA	524.2	10
Vinyl Chloride	EPA	524.2	10
Non-potable Water			
Biochemical Oxygen Demand, BOD/CBOD	SM	5210 B	10
Bromate	EPA	300.0	10,12
Chemical Oxygen Demand (COD)	EPA	410.4(7.3)	10
Chlorate	EPA	300.0	10
Chlorite	EPA	300.0	10
Dissolved Oxygen	SM	4500-O G	10
Hexane Extractable Material	EPA	1664	10
Nitrate	EPA	353.2	10
Nitrite	EPA	353.2	10
Orthophosphate	EPA	300.0	10
pH	EPA	150.1	10
Solids, Total Dissolved	SM	2540 C	10
Solids, Total Suspended	SM	2540 D	10
Specific Conductance	SM	2510 B	10
Sulfide	SM	4500-S2 F	10
Total Organic Carbon	SM	5310 D	10
Turbidity	SM	2130 B	10
Calcium	EPA	200.7	10
Copper	EPA	200.7	10
Manganese	EPA	200.7	10
Zinc	EPA	200.7	10
Atherinops affinis (West Coast)	EPA	1006.0	6,8
Caenorhabditis elegans	ASTM	E 2172	11
Caenorhabditis elegans	WDOE	04-09-044	11

Matrix Type/Parameter Name	Reference	Method Number	Notes
Ceriodaphnia dubia	ASTM	E 1706	
Ceriodaphnia dubia	EPA	2002.0	2,8,10
Ceriodaphnia dubia	EPA	1002.0	3,8,10
Cyprinodon variegatus	EPA	2004.0	4,8,10
Cyprinodon variegatus	EPA	1004.0	4,8,10
Dangerous Waste Static Salmonid	WDOE	80-12 Part A	
Daphnia magna	EPA	2021.0	2,8,10
Daphnia pulex	EPA	2021.0	2,8,10
Dendraster excentricus (West Coast)	EPA	1008.0	6,8,10
Hyalella azteca	ASTM	E 1706	
Hyalella azteca	EPA	100.1	5
Menidia beryllina	EPA	1006.0	4,8,10
Menidia spp.	EPA	2006.0	4,8,10
Microtox	SDI	Microtox	1
Microtox, Saline Extract	PSEP	1995	
Microtox, WDOE Sediment	WDOE	03-09-043 SubApp B	7
Mysidopsis bahia	EPA	1007.0	4,8,10
Mysidopsis bahia	EPA	2007.0	4,8,10
Oncorhynchus mykiss	EPA	2019.0	2,8,10
Pimephales promelas	EPA	2000.0	2,8,10
Pimephales promelas, Chronic	EPA	1000.0	3,8,10
Pimephales promelas, Teratogenicity	EPA	1001.0	3,8,10
Selenastrum capricornutum	EPA	1003.0	3,8,10
Strongylocentrotus purpuratus (WC)	EPA	1008.0	6,8,10
Solid and Chemical Materials			
Polychlorinated Biphenyls	EPA	8082	10,12
Total Pet Hydrocarbons - Diesel	WDOE	NWTPH-Dx	9,10
Total Pet Hydrocarbons - Gasoline	WDOE	NWTPH-Gx	9,10
Volatile Organic Compounds	EPA	8260	10

Matrix Type/Parameter Name	Reference	Method Number	Notes

Accredited Parameter Note Detail

(1) SDI. Azur Microtox. (2) USEPA. "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms." EPA-821-R-02-012. Fifth Edition. Oct 2002. (3) USEPA. "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms." EPA-821-R-02-013. Fourth Edition. Oct 2002. (4) USEPA. "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms." EPA-821-R-02-014. Third Edition. Oct 2002. (5) USEPA. "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates." EPA 600/R-99/064. March 2000. (6) USEPA. "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms." EPA 600/R-95/136. Aug 1995. (7) Washington Dept of Ecology Modification of PSEP Microtox method. WDOE 03-09-43, Subappendices B & C. 2003. (8) Meets requirements of "Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria." Washington Dept of Ecology Pub No WQ-R-95-80, Rev June 2005. (9) WDOE. "Total Petroleum Hydrocarbon Methods." June 1997. (10) Accreditation based in part on recognition of the lab's ORELAP accreditation. (11) Interim accreditation pending on-site review of testing capability. (12) Provisional pending submission of "Acceptable" PT results.

Authentication Signature

June 25, 2007
Date

Stewart M. Lombard, Lab Accreditation Unit Supervisor