Technical Memorandum

Environmental Resources Management

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Subject:	Phase II Environmental Site Assessment Results and Recommendations, Blue Heron Mill, Oregon City, Oregon

This memorandum summarizes the Phase II Environmental Site Assessment (ESA) activities undertaken at the Blue Heron Mill in Oregon City, Oregon, (the Site) in accordance with the ERM-West (ERM) proposal to Metro dated 18 April 2012 and scope of work identified in the Work Order for Phase II ESA services dated 5 September 2012. This document presents the assessment results and provides recommendations for Metro's consideration.

The Phase II ESA sampling rationale and approach were presented to, and discussed with, Metro and the Oregon Department of Environmental Quality (ODEQ) in a 23 July 2012 meeting/conference call held at ERM's Portland office. Follow-up email correspondence provided responses to agency comments and additional clarification regarding details of the proposed sampling locations and collection methods, analytical testing methods, laboratory reporting limits, and potentially applicable screening criteria (E. Ipsen [ERM] to M. Romero [ODEQ] on 24 August, and 12 September, 2012). The scope of work was modified to incorporate several of ODEQ's comments. The presentation and email correspondence is included in Appendix A.

All work activities were completed in compliance with the Environmental Consultant Personal Services Agreement between ERM and Metro (Metro Contract No. 931306).

INTRODUCTION AND BACKGROUND

Project Description

Metro is considering acquisition of the Blue Heron Mill property, a former paper mill located in Oregon City, Oregon. ERM has been engaged by Metro to provide advice and environmental consulting services while Metro contemplates acquisition of the property, negotiates environmental

agreements, and pursues closure of the acquisition, if applicable. As part of its environmental due diligence, Metro contracted ERM to perform historical research and a Phase II ESA of the subject site[1]. This memorandum has been prepared to provide results of Phase II ESA activities.

Purpose

Environmental due diligence is a recommended, and often required, component of property transaction evaluation in order to adequately assess potential or perceived environmental concerns or liability associated with a subject property. Previous studies of the subject site, or areas within the subject site, including a Phase I ESA, have identified several Recognized Environmental Conditions (RECs), as defined in ASTM E 1527-05, in conjunction with areas at the Site. Many of these are based on the facility operations where hazardous materials were used or stored as well as the historical nature of long-term industrial use. As such, these RECs may reflect general practices rather than specific or certain events or conditions that may have occurred at the Site. Completion of site reconnaissance, with collection and analysis of environmental samples from precise areas with perceived or potential impacts from past land use and operations, allows for a comprehensive and reasonable assessment of environmental risk.

Background

The Blue Heron Mill is the site of a former paper manufacturing facility located in the northern area of the Oregon City business/industrial area. The Site is on the southwest bank of the Willamette River, immediately downstream of Willamette Falls (Figure 1). The falls are located at approximately river mile (RM) 26.5, with an approximate 40-foot drop in the river elevation. The Blue Heron Mill facility is comprised of an approximate 23- acre parcel of land situated on a relatively flat area between the Willamette River and a basalt bluff to the south/southeast. The facility is bounded by the Willamette River to the west/northwest, Oregon City's business district to the northeast, and a railroad line and McLoughlin Boulevard (US Route 99E), followed by a basalt bluff, to the south and southeast.

[1] A formal Phase I ESA has not been prepared by ERM for the subject site on behalf of Metro. However, many of the historical research activities usually performed as part of a Phase I ESA have been performed and the results of those activities are presented in this memorandum.

The Site includes up to 40 buildings associated with paper manufacturing such as process buildings; storage buildings; a boiler plant; maintenance, auto, welding, carpentry, and millwright shops; and offices. Other Site features include a wastewater primary clarifier, holding tanks for various process chemicals and paper stock, wood chip silos, and power substations. An active rail line and various spurs are present at the Site. The majority of the Site is covered by buildings or asphalt/concrete surfaces. The current site layout is shown in Figure 2.

The Site is directly underlain by basalt bedrock with areas of historical grading and filling completed to facilitate the large, flat property parcel. Groundwater is relatively shallow across much of the Site with an inferred flow to the northwest based on the local topography and adjacent surface water body.

Dating back to the early to mid-1800s, the Site was developed with residences, commercial buildings, and industrial businesses. Industrial uses included a paper mill, saw mill, flour mill, and woolen mill. Construction of the first paper mill in Oregon at the Site was begun in 1866 near the current Mill #2 and Mill #3 buildings on the Site. For over a century, paper mill operations continued at the Site with supporting property acquisitions and infrastructure improvements. From 1908 through 1932, Hawley Pulp and Paper operated wood pulping and paper manufacturing activities at the Site. The company was sold twice, in 1932 and 1948, but continued to operate under the Hawley name. In 1961, the owner, Times Mirror Corporation, changed the company name to Publishers Paper. It operated as Publishers Paper from 1961 through 1986 when it was purchased by the Jefferson Smurfit Corporation (Smurfit). Smurfit owned and operated the mill from 1986 through 2000. Blue Heron Paper Company purchased the Site in 2000 and operated from May 2000 until February 2011, when it ceased operations.

Significant process operations carried out at the Site historically included: paper manufacturing, pulp manufacturing, pulp bleaching, steam plant operations, wastewater handling, and storm water management.

Currently, salvaging operations are being undertaken at the site to extract salvageable equipment and materials.

Based on the Site's use as a large-scale heavy industrial facility with a significant time period of operations, a thorough review of available information was completed in order to adequately assess and identify potential environmental concerns necessitating further evaluation. A list of the documents reviewed by ERM is provided in Appendix B. The scope of work for the Phase II ESA activities was defined based on this

information as well as discussions and correspondence with Metro and the ODEQ. The presentation and email correspondence presenting the sampling rationale and approach including details of the proposed sampling locations and collection methods, analytical testing methods, laboratory reporting limits, and potentially applicable screening criteria are included in Appendix A.

The storm water system for the facility drains to the two pump stations before being pumped to the pipe tunnel and then to the clarifier. Water is then pumped from the clarifier to the off-site treatment lagoon (on the opposite bank of the Willamette River at an upstream property currently not included in the Site or Phase II ESA) before discharging to the Willamette River.

SCOPE OF WORK

The scope of work included sampling of several types of media and specific areas of interest. The conceptual sampling strategy is illustrated in Figure 3. Sampling within the various areas depended upon the individual area's historical operations and associated suspected or known contaminants. Table 1 identifies areas of potential environmental concern based on a review of available information and Table 2 depicts the sampling rationale and approach and provides a summary of site media/feature, type of sample, purpose, constituents of interest (COIs), specific sampling locations, and additional notes. Sampling locations are shown on Figure 4 and the scope of work and rationale for each of the areas is summarized in the following sections. The conceptual sampling strategy and approach, sampling locations, and corresponding laboratory analyses have been reviewed by the ODEQ and the sampling scope was modified to incorporate several of ODEQ's comments.

A limited screening for asbestos was completed to assess possible impacts of ongoing salvage and demolition activities occurring at the Site; this included analytical testing of samples collected from the storm water system and tailrace solids. This assessment did not include a hazardous building materials survey of any of the facility structures. Additionally, the scope of services did not include an assessment of indoor air quality, outdoor air emissions, radon, lead paint, mold, building materials survey for asbestos containing material (ACM), PCB ballast, or wetlands.

Upland Soil, Water, and Solids Sampling

Upland soil, water, storm water solids, and tailrace solids samples were collected for laboratory analysis of contaminants. Sample locations are

presented in Figure 4. A sampling matrix summarizing the samples and analyses performed is presented in Table 3. Activities performed as part of this task included:

- Drilling 11 boreholes and collecting one soil sample from each borehole;
- Collection of four water and four solids samples from the storm water system;
- Collection of three water and five solids samples from the tailraces. Shallow solids samples from Tailrace 2 were composited prior to laboratory analysis;
- Collection of two groundwater samples from boreholes and three seep water samples; and
- Laboratory analysis of the samples for the constituents listed in Table 3.

Intake Basin Sediment Sampling

Sediment samples from the Intake Basin were collected for laboratory analysis of contaminants. Sample locations are presented in Figure 4. A sampling matrix summarizing the samples and analyses performed is presented in Table 3. Activities performed as part of this task included:

- Collection of three surface sediment samples (0 to 0.5 feet below sediment surface [bss], i.e. below mudline) and three sediment cores with collection of four subsurface sediment samples to a maximum depth of 3.0 feet bss; and
- Laboratory analysis of the samples for the constituents listed in Table 3.

FIELD INVESTIGATION

The investigation was performed in accordance with applicable regulations and generally accepted environmental science and engineering practices. This section describes the field methods used during the investigation.

Preliminary Planning

ERM prepared a site-specific Health and Safety Plan (HASP) for field personnel as required by the Occupational Safety and Health Administration (OSHA) for personnel performing work associated with hazardous substances. The HASP was designed to protect personnel from potential and known hazards at the Site during field activities.

ERM and Metro identified the areas of potential concern during preliminary conversations and site visits.

Before drilling, a One-Call Utilities Notification was conducted and a private utility locator assessed each proposed boring location for buried utilities. A few proposed locations were in close proximity to identified underground utilities and, as such, were relocated.

Sampling Activities

Specific soil sampling locations were selected during a previous site reconnaissance. Each location was screened for buried utilities in accordance with ERM's standard subsurface clearance (SSC) procedures. This included 'clearing' the first four feet below ground surface (bgs) with a hand auger. Soil borings were advanced using a hand auger and a direct push drill rig (below 4 feet bgs). Storm water and tailrace solids were collected with hand tools. Surface sediment samples were collected from the Intake Basin using a ponar-type grab sampler and sediment cores were advanced using a vibracore deployed from a marine research vessel equipped for scientific sampling. Sampling locations are shown on Figure 4.

On 7 and 15 September 2012, under the supervision of ERM, 11 soil borings were completed at the Site to depths ranging from 1.5 to 17.5 feet bgs. Two of the borings (F38-01 and TD-01) encountered groundwater and were advanced so that representative groundwater samples were obtained. Cascade Drilling L.P. of Clackamas, Oregon was contracted to advance the borings using direct push drilling technology.

The borings were advanced using a truck-mounted direct push drilling rig equipped with a 5-foot long, 2-inch outside diameter (OD) Macrocore sampler and hydraulically-driven steel rods. The soil boring installations, soil types encountered, and field screening results observed are summarized on Table 4. Boring logs are provided in Appendix C.

The boring installation work was performed by an Oregon-bonded and licensed monitoring well contractor. The boring installations were completed in accordance with the Oregon Groundwater Law (Oregon

Revised Statute [ORS] Chapter 537) and the Rules for Construction and Maintenance of Monitoring Wells and Other Holes in Oregon (Oregon Administrative Rules [OAR] Chapter 690, Division 240).

Following completion of the drilling activities, the borings were backfilled with bentonite chips to within 6-inches of the ground surface. The bentonite chips were then hydrated by adding potable water and were allowed to set up. Additional bentonite chips and water were added as needed. The borings were then finished to grade with asphalt or concrete to match the surrounding ground surface.

Storm water and tailrace solids samples were collected using decontaminated hand tools. Multiple aliquots were collected at each sample location in order to provide sufficient volume of material for analysis. One tailrace solid sample was composited in accordance with Table 3 (the 0 to 0.5 foot bgs interval collected at TR2-02 and TR2-03).

On 14 September 2012, under the supervision of ERM, three surface sediment samples (0 to 0.5 feet bss) and three sediment cores were advanced in the Intake Basin to depths ranging from 3.1 to 3.3 feet bss. Gravity Environmental L.L.C. of Fall City, Washington was contracted to advance and collect the sediment cores using a marine research vessel.

Soil, Solids, and Sediment Sample Collection and Screening Procedures

Soil, solids, and sediment samples were field screened for evidence of possible contamination with discrete samples collected from each core or grab sample for potential laboratory analysis based on the prescribed sampling approach, the results of field screening, or changes in subsurface conditions (i.e. lithologic contacts or depth with respect to the groundwater interface). Shallow soil samples from the boreholes were collected using a decontaminated hand auger (from 0-4 feet bgs). Deeper soil and subsurface sediment samples were collected in disposable acrylic or acetate core sleeves and storm water and tailrace solids were collected with decontaminated hand tools. Surface sediment samples from the Intake Basin were collected with a decontaminated ponar-type grab sampler.

Upon collection, each sample was immediately placed in clean, laboratory provided 8-ounce glass sample jars and capped with a Teflon-lined lid. The sample jars were then labeled and transferred to a chilled container for shipment to the analytical laboratory. Standard sampling protocols, including the use of chain-of-custody documentation, were followed for the sampling procedures.

The soil samples were classified according to the Unified Soil Classification System (USCS) and field-screened for the presence of potential contamination by visual, olfactory, sheen test, and headspace vapor methods. Screening for the presence of organic vapors was conducted by the headspace method using a photo-ionization detector (PID) equipped with a 10.6 ev lamp. Immediately following collection of the sample, approximately five grams of disaggregated soil was placed into a sealed plastic bag. The sample was then agitated to break up any large pieces of soil. After an approximate 10-minute stabilization time, the PID probe was inserted into the bag and a measurement was then recorded. The results of the headspace screening are recorded in parts per million (ppm) on the boring logs (Appendix C) and summarized on Table 4. The headspace method results should be considered a qualitative indicator of possible contamination and should be used for relative comparison purposes only.

The types of subsurface soils beneath the Site were highly variable, likely due to the historical grading that has occurred at the facility during its development and operation. Subsurface materials encountered were predominantly fill material underlain by shallow basalt bedrock.

Water Sample Collection Procedures

Groundwater samples were collected from two of the borings (F38-01 and TD-01) with a temporary well point installed in the borehole. The samples were collected using a disposable 1-inch diameter 0.010-inch slotted PVC screen and casing. The screen intervals for borings F38-01 and TD-01 were each set at depths of 5 to 10 feet bgs and 3 to 8 feet bgs, respectively.

Upon installation, the temporary well points were allowed to equilibrate for approximately 10 minutes. Then the depth to water inside the well casing was gauged relative to the ground surface using a water level probe. Groundwater was observed at depths ranging from 5 to 6 feet bgs. The measured depth to groundwater at each location is included on the boring logs in Appendix C.

Groundwater purging and sampling was conducted using a peristaltic pump and new, dedicated polyethylene tubing. Prior to sample collection, the well point was purged until turbidity decreased (approximately 1-liter).

Grab samples of seep water, storm water, and tailrace surface water were collected directly into sample containers.

Volatile organic compound (VOC) sample containers were completely filled such that no headspace was present that would allow for the loss of volatiles. The sample containers were then labeled and transferred to a chilled container for shipment to the analytical laboratory. Standard sampling protocols, including the use of chain-of-custody documentation, were followed for the sampling procedures.

Decontamination Procedures

Soil and groundwater samples were collected using a combination of dedicated, single-use equipment and decontaminated, reusable equipment. Dedicated, single-use sampling equipment included nitrile gloves, laboratory-provided sample jars, new acrylic or acetate sleeves for soil and sediment cores, PVC well screen and casing, and new polyethylene tubing for groundwater samples. Reusable sampling equipment included drilling rods and a Macrocore sampler. The reusable equipment was decontaminated using a steam pressure washer with potable water prior to use, and between boring locations, to prevent cross-contamination.

Investigation Derived Waste

Soil cuttings and water generated from the drilling and sampling activities were placed in Department of Transportation (DOT) approved 55-gallon drums, labeled, and stored in a secure location on site. Disposal of investigation derived waste (IDW) at an approved facility has not yet occurred.

ANALYTICAL TESTING

The soil, solids, sediment, and water samples collected during the investigation were submitted to ALS Laboratories, Inc. (ALS) located in Kelso, Washington for analysis. Chain-of-custody procedures were followed from sample collection to sample analysis.

Analytical Methods

Chemical analyses varied depending on the Site feature, associated COIs, media type, and sample location. The conceptual sampling strategy and sampling rationale and approach for the Phase II ESA are shown on Figure 1 and Table 2, respectively, with a detailed sampling matrix presented on Table 3. The samples were analyzed by the following methods, in accordance with Table 3:

- Total Metals by EPA Method 6000/7000 Series
- Total Petroleum Hydrocarbons (TPH) by NW Methods
- Volatile Organic Compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260C
- Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082A
- Asbestos by Polarized Light Microscopy (PLM) ALS ENV004

Analytical Results

Results of the analytical testing are summarized in Tables 5 through 13, separated by the different media sampled. The laboratory analytical reports and chain-of-custody documentation for the sampling activities are included in Appendix D. The sampled media and corresponding analytical data results summary tables are identified below.

- Upland Soil - Tables 5 and 6
- Storm Water and Tailrace Solids - Tables 7 and 8
- Storm Water and Tailrace Water - Tables 9 and 10
- Groundwater and Seep Water - Table 11
- Intake Basin Sediment - Tables 12 and 13

ERM performed a limited data quality and any necessary qualifiers were applied following the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review,* October 1999, the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004, and the *USEPA National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs)*, September 2005. The data validation memorandum is included in Appendix E.

No data were determined to be unusable. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically-defensible documents.

SCREENING CRITERIA EVALUATION

The analytical results from sampling were compared with screening criteria appropriate for use in evaluating properties for human health and ecological risk in this region of the U.S. These criteria are used for site "screening" to help identify areas, contaminants, and conditions at a site that may require further evaluation. Screening criteria are not de facto cleanup standards and should not be applied as such. Detected concentrations above screening criteria may warrant additional evaluation of the potential risks to human or ecological health by contaminants depending on the intended use of the subject property.

Based on the Site's current and historical land use as an industrial property, and for the purposes of this Phase II ESA, continued industrial or commercial land use was assumed. Assumed current and future receptors include occupational workers, construction workers, and excavation workers. Additionally, due to the low potential yield, groundwater was assumed to not be used for beneficial use (i.e. human consumption).

Residential screening values were not used in this evaluation. Typical risk pathways included in residential screening values include consumption of groundwater, incidental ingestion of soil, and indoor air vapor intrusion. Based on ERM's understanding of potential future residential development of the property, none of these risk pathways are potentially complete for the following reasons:

- As discussed above, beneficial use of groundwater is not likely to include consumption due to low yield of the water bearing zone;
- ERM understands that potential future on-site residences (if constructed) would be unlikely to include ground level gardens or yards, making ingestion of soil an incomplete pathway; and
- ERM understands that potential future on-site residences (if constructed) would not be constructed at ground level, making vapor intrusion an incomplete pathway.

The Intake Basin sediments, storm water, and tailrace water do have the potential to impact aquatic organisms; therefore, ecological risk and applicable human health risk screening criteria were included for these media.

The screening criteria used in this screening evaluation include the following:

- ODEQ Risk-Based Concentrations (RBCs) from the Risk-Based Decision Making (RBDM) for the Remediation of Petroleum-Contaminated Sites (ODEQ, 2003) and RBC Table Update, June 2012, for Occupational, Construction Worker, and Excavation Worker receptors.
    - Exposure pathways applied include:
        - Soil - Soil Ingestion/Dermal Contact/Inhalation, Volatilization to Outdoor Air, Vapor Intrusion to Buildings;
        - Groundwater - Volatilization to Outdoor Air, Vapor Intrusion to Buildings, and Groundwater in Excavations.
- National Recommended Water Quality Criterion (NRWQC), Aquatic Life Criteria Tables 20 and 33A and Human Health Criteria Table 40, approved by EPA on 17 October 2011.
    - This includes both human health risk through consumption of organisms, and freshwater Ambient Water Quality Criteria (AWQC) (acute and chronic exposure).
- Sediment Bioaccumulation Levels provided in ODEQ Guidance for Assessing Bioaccumulative Chemical of Concern in Sediment, Updated 3 April 2007.
    - Receptors include:
        - Birds, mammals, and fish (as individual and population);
        - Humans (general, and subsistence).

The detections of metals in soil, and storm water and tailrace solids samples were also compared to the ODEQ default background concentrations for metals in Oregon (ODEQ, 2002). Metals concentrations detected in Intake Basin sediment were compared to the freshwater background levels provided in the Sediment Bioaccumulation Guidance (ODEQ, 2007). Screening criteria are not considered exceeded when detected concentrations are equal to or below established regional background levels.

Each of the analytical data summary tables listed above in Section 4.2 show the most stringent of the applicable screening criteria, as well as

available background levels, to allow for a conservative screening of detected constituents.

If constituents were detected at concentrations exceeding the most stringent screening level value (SLV), they are highlighted orange in Tables 5 through 13. Exceeding constituents are then compared to the specific exposure pathways/scenarios/receptors identified above in a separate table. This allows for a more detailed understanding of site risk and should be coupled with an understanding of the Site's potential exposure pathway conceptual site model. Additionally, screening level exceedance quotients (EQs) were calculated to aid in qualifying, or prioritizing, areas with detected constituents above the referenced screening criteria. Screening level EQs are calculated using the following equation:

$$Screening\ Level\ EQ = \frac{Detected\ Constituent\ Concentration}{Screening\ Criteria}$$

There is no stead-fast rule or guidance in qualifying detected concentrations using screening level EQs. Knowledge of the contaminant properties, site conditions, frequency of detection, background levels, typical industrial concentrations, and other lines of evidence need to be considered as well.

The screening results by constituent suite, grouped by the sample media are presented in the following sections below.

Upland Soil, Storm Water Solids, and Tailrace Solids

Tables 5 and 7 summarize the upland soil and storm water and tailrace solids analytical data, respectively. Samples with orange highlighting have detections exceeding the lowest SLV, and these concentrations are further evaluated in Tables 6 and 8 (for upland soil and storm water and tailrace solids, respectively).

During collection of storm water and tailrace solids samples, floating oil was observed in several of the storm water features and tailraces.

Metals

Figure 5 shows the analytical results for metals in upland soil, and storm water and tailrace solids. Arsenic was detected at concentrations above SLVs at three upland soil sampling locations (F18-01, F38-01 and F42-01) and two tailrace solids locations (TR1-01 and TR2-02/03 [composite]). The regional background concentration for arsenic is 7 milligrams per kilogram (mg/kg). The concentration of arsenic in all soil and solids

samples can be reasonably considered within background levels, with the exception of three samples.

The sample from F18-01(near Building 18 Mill O) contained an arsenic concentration of 50.2 mg/kg and a screening level EQ of 29.5.

Solids samples from Tailraces 1 and H also contained arsenic at concentrations above the most stringent SLVs. Samples TR01-1 and TR2-02/03 (composite) resulted in concentrations of 17.9 (EQ of 10.5) and 7.6 mg/kg (EQ of 4.5), respectively.

Two locations detected elevated concentrations of lead above the SLVs: F21-01 (Building 22/Millwright Shop, near a former fuel storage area) at a concentration of 1,480 mg/kg (EQ = 1.9), and F38-01 (Building 38 /Welding Shop, near a former fuel UST) at a concentration of 3,300 mg/kg (EQ = 4.1).

TPH

Figure 6 shows the analytical results for TPH in upland soil, and storm water and tailrace solids. There were no detected concentrations above the screening criteria.

VOCs

Figure 7 shows the analytical results for VOCs in upland soil, and storm water and tailrace solids. There were no detected concentrations above the screening criteria.

SVOCs

Figure 8 shows the analytical results for SVOCs in upland soil, and storm water and tailrace solids. One sample, F07-01 (near the 4th Street rail spur), contained concentrations of three polycyclic aromatic hydrocarbon (PAH) constituents above the SLVs. These were benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene at concentrations of 11, 2.9, and 5.2 mg/kg, respectively. The highest screening level EQ was for benzo(a)pyrene at 10.7.

Benzo(a)pyrene was also detected in one of the tailrace solids samples (TR-02) above screening criteria. The concentration was 0.46 mg/kg (EQ = 1.7). Tailrace 2 is located between two rail spurs.

PCBs

Figure 9 shows the analytical results for PCBs in upland soil, and storm water and tailrace solids. Two storm water system solids samples contained concentrations of total PCBs above the most stringent SLV: Pump Station 2 (PS2-01) and the Pipe Tunnel (F53-01) has PCB concentrations of 2.9 (EQ = 4.1) and 0.89 mg/kg (EQ = 1.3), respectively.

Dioxins/Furans

Figure 10 shows the analytical results for dioxins / furans in upland soil, and storm water and tailrace solids. Dioxins and furans were detected at all of the storm water and tailrace solids locations sampled. All but two samples exceeded the screening criteria with calculated 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxicity equivalency quotients (TEQs) for the locations with SLV exceedances ranging from 18.63 (EQ = 1.2) to 84.04 nanograms per kilogram (ng/kg) (EQ = 5.6). The highest concentrations were located in Tailrace 2 (at sample TR2-02) and the Pipe Tunnel (sample F53-01); both are locations where there is potential for contaminant accumulation in the solids.

Asbestos

One upland soil sample location and all solids samples collected within the storm water system and tailraces were analyzed for the presence of asbestos. The upland location, F18-01 (Building 18 Mill O), and storm water and tailrace solids analyzed did not have detectable concentrations of asbestos.

Storm Water, Tailrace Water, Groundwater and Seeps

Table 9 summarizes the storm water and tailrace water analytical data and provides the initial screening of detected concentrations to the most conservative applicable SLV. Samples with orange highlighting have detections exceeding the lowest SLV and these results are further evaluated in Table 10.

Table 11 summarizes the groundwater and seep analytical data and provides the initial screening of detected concentrations to the most conservative applicable SLV. There were no detected concentrations of constituents above the screening criteria in any groundwater or seep water samples.

During groundwater sampling, a sheen was observed on the purge water from TD-01, no abnormal odors or sheen were observed at F-38-01.

Additionally, during collection of storm water and tailrace water samples, floating oil was observed in several of the storm water features and tailraces.

Metals

Figure 11 shows the analytical results for metals in storm water, tailrace water, groundwater and seeps. Several metals were detected in storm water and tailrace water at concentrations above the most stringent screening criteria, including arsenic, cadmium, copper, and zinc. Arsenic was detected in surface water collected from Tailrace 2 (sample TR2-02) at a concentration of 3.5 micrograms per Liter (µg/L) (EQ = 1.7). The detected concentration of cadmium in this sample was 1.14 µg/L (EQ = 1.0). Copper was detected at concentrations above the most stringent screening criteria at the Pipe Tunnel, Pump Stations 1 and 2, and Tailraces 2 and H. The concentrations at these locations ranged from 20.8 (EQ = 1.2) to 84.6 µg/L (EQ = 7.1) (Pump Station 2).

Samples from the Pipe Tunnel (sample F53-01) and Pump Station 2 (sample PS2-01) revealed concentrations of zinc in water above the most stringent SLV. The sample collected from Pump Station 2 contained a concentration of 119 µg/L (EQ = 1.1) and the duplicate sample collected at the Pipe Tunnel had a concentration of 833 µg/L (EQ = 7.6).

TPH

Figure 12 shows the analytical results for TPH in storm water, tailrace water, groundwater and seeps. There were no detected concentrations above the screening criteria.

VOCs

Figure 13 shows the analytical results for VOCs in storm water, tailrace water, groundwater and seeps. There were no detected concentrations above the screening criteria.

SVOCs

Figure 14 shows the analytical results for SVOCs in storm water, tailrace water, groundwater and seeps. There were no detected concentrations above the screening criteria.

Intake Basin Sediment

Table 12 summarizes the Intake Basin sediment analytical data and provides the initial screening of detected concentrations to the most conservative applicable SLV. Samples with orange highlighting have detections exceeding the lowest SLV and these concentrations are further evaluated in Table 13.

Metals

Figure 15 shows the analytical results for metals in Intake Basin sediments. There were no detected concentrations above the screening criteria.

SVOCs

Figure 16 shows the analytical results for SVOCs in Intake Basin sediments. There were no detected concentrations above the screening criteria.

PCBs

Figure 17 shows the analytical results for PCBs in Intake Basin sediments. There were no detected concentrations above the screening criteria.

Dioxins/Furans

Figure 18 shows the analytical results for dioxins/ furans in Intake Basin sediments. Dioxins/furans were detected at all of the Intake Basin sediment sampling locations. All sediment samples contained calculated TCDD TEQ concentrations exceeding the most stringent screening criteria. Table 13 provides a detailed summary of the resulting TEQ values for each sediment sample location and compares these to human health and ecological screening values. Calculated TEQs range from 0.211 to 6.78 ng/kg. For human health, screening level EQs ranged from 23.2 to 6,162. For ecological health, screening level EQs ranged from 1.0 to 130.4.

Reporting Limits

For some of the chemicals analyzed, the laboratory reporting limits (RLs) or method detection limits (MDLs) were higher than the screening criteria. These occurrences are highlighted grey in the tables; these are only presented in the summary tables when the constituent was detected in other samples within the media group, otherwise they are not presented in the tables. Reasons for laboratory RLs or MDLs above the screening

criteria include: the limits of the selected analytical methods, sample matrix interference, high concentrations of target or non-target compounds, and laboratory equipment calibration. This does not necessarily indicate a screening criterion exceedance. The analytical methods selected were typical for conducting environmental site assessments and were previously reviewed by the ODEQ.

CONCLUSIONS AND RECOMMENDATIONS

The previous sections of this memorandum present the findings of this Phase II ESA of the Site. Conclusions from this ESA are presented below:

Upland Soil

In general, while there are a few specific areas with contaminants detected at concentrations above applicable SLVs, the upland soils at the Site appear to pose low risk to human health, assuming a future use of the site for commercial or industrial purposes.

Arsenic concentrations detected at F18-01(near Building 18 Mill O) resulted in a screening level EQs of 29.5 and are slightly elevated from background[2] (7 mg/kg). This sample was collected from the crawl space below Building 18 and consisted of fill material that appeared to be demolition debris, containing bricks and pieces of metal. Given the limited extent of this fill material and the lack of apparent source of arsenic, this result does not appear to merit additional investigation at this time.

Lead concentrations exceeding the SLVs were observed at F21-01 (Building 22/Millwright Shop, near a former fuel storage area) and F38-01 (Building 38 /Welding Shop, near a former fuel UST). The screening level EQs for these samples are 1.9 and 4.1, respectively. These observed lead concentrations may be associated with the historical use of these areas for fuel storage. However, the TPH concentrations in these samples were below the applicable screening criteria, indicating that potential impacts of historical petroleum releases, if any, from these former fuel storage areas are limited. Based on the low screening criteria EQs and limited potential source areas, the concentrations of lead in soil do not appear to merit additional investigation at this time.

Several PAHs were detected above SLVs at F07-01 (near the 4th Street rail spur). The highest screening level EQ was for benzo(a)pyrene at 10.7. PAHs are commonly associated with treated railroad ties and other rail activity. If rail use is planned in the future use of the Site, and this rail spur is to remain intact, the presence of these compounds at these concentrations likely does not necessitate further assessment.

One upland soil sample, F18-01 (Building 18 Mill O), was analyzed for the presence of asbestos to evaluate possible impacts related to ongoing

[2] Default Background Concentrations for Metals in Oregon Soils: ODEQ, 2002. Memo from Toxicology Workgroup.

salvage and demolition activities. Asbestos was not detected in this sample.

Soil and groundwater samples collected from the Truck Dump area (TD-01 and TD-02) contained TPH at concentrations slightly below the screening criteria. During the sampling activities significant soil staining and sheen on the groundwater were observed. The detected TPH may be a result of historical release(s) from the former fuel and oil storage in this area. Due to the limited number of sampling locations (two) and significant depth of soil, there is a potential that impacted soil and groundwater may be present at concentrations exceeding applicable screening criteria within this area.

Storm Water and Tailrace Water and Solids

In general, the characterization of associated solids and water detected common industrial storm water contaminants and while some of these were above SLVs, none were at concentrations indicating significant concern.

Arsenic was detected in Tailraces 1 and H solids at concentrations above the most stringent SLVs and slightly above the regional background concentration (7 mg/kg). The highest screening level EQ of 10.5 was at Tailrace 1. Due to the low screening level EQs and low exceedance of background, these results do not appear to merit additional investigation at this time.

One PAH (Benzo[a]pyrene) was detected in one of the tailrace solids samples above screening criteria at TR2-02. The corresponding screening level EQ was 1.7. Tailrace 2 is situated between two rail spurs and this contaminant may be present due to the presence of treated rail ties or the presence of asphalt throughout the facility. Due to the low screening level EQ, this detected concentration does not necessitate additional assessment.

PCBs were detected in two storm water system solids samples above the most stringent SLVs: Pump Station 2 (sample PS2-01) and the Pipe Tunnel (sample F53-01) with screening level EQs of 4.1 and 1.3, respectively. Floating oil was observed in several of the storm water features and tailraces during sample collection activities. The PCB impacts may be due to historical releases of PCB-containing oil from electrical infrastructure at the site, or the recently reported release of oils to the storm water system during current salvage operations. The detected concentrations are low and do not appear to warrant additional investigation at this time.

Dioxins/furans were detected in storm water and tailrace samples at concentrations above the SLVs, but within typical background ranges. A September 2011 Washington Department of Ecology study of urban surface soil from various Seattle neighborhoods found calculated TCDD TEQ concentrations in urban soils ranged from 1.66 to 114.65 ng/kg with an average concentration of 19.08 ng/kg[3]. The TCDD TEQ results for storm water and tailrace solids ranged from 1.79 to 84.0 ng/kg and are within the range of background concentrations. These concentrations present a low risk given the ubiquitous nature of these persistent contaminants in the environment. There are numerous regional sources of dioxins/furans and the concentrations found may be the result of atmospheric deposition.

Samples of solids collected from the storm water system and tailraces were analyzed for the presence of asbestos to evaluate if ongoing salvage and demolition activities may be causing impacts to the Site. Asbestos was not detected in the storm water and tailrace solids samples.

Arsenic and cadmium concentrations detected in tailrace water have low screening level EQs and do not appear to warrant additional assessment.

Copper and zinc were detected in the storm water and tailrace water samples with screening level EQs ranging from 1.1 to 7.6. The metals are found in typical roofing materials which may be in use at the site and are commonly identified in industrial storm water systems. Additionally, it was noted during water sample collection that metal cuttings/shavings from salvaging operations were present in the storm water system structures. These metals cuttings/shavings could be contributing to detected metals concentrations. Due to the low screening level EQs, common source materials, and potential contributions from metal debris in the sampling locations, the detected concentrations of copper and zinc in storm water and tailrace water do not appear to warrant additional assessment.

Groundwater and Seeps

Groundwater and seep sampling at the site did not indicate any detected concentrations above applicable SLVs for the analyzed constituents.

[3] Urban Seattle Area Soil Dioxin and PAH Concentrations Initial Summary Report, Washington Department of Ecology, Publication no. 11-09-049, September 2011.

Intake Basin Sediment

All constituents analyzed in the Intake Basin sediment samples were either not detected, or detected at concentrations below the applicable SLVs except for dioxins/furans. Dioxins/ furans were detected at all of the Intake Basin sediment sampling locations with calculated TCDD TEQs ranging from 0.211 to 6.78 ng/kg. A 2008 study undertaken in Puget Sound was completed to assess non-urban background concentrations of dioxins/furans in surface sediment to support the Dredged Material Management Program (DMMP). Results of the study found calculated TEQ concentrations in surface sediment ranged from 0.01 to 11.90 ng/kg[4]. As part of the 2008 EPA Site Inspection (SI) completed by Ecology and Environment, sediment samples were collected downstream, adjacent to, and upstream of the Site in order to evaluate possible impacts to the river from Site operations. The results of dioxin/ furan analysis indicated calculated TEQs ranging up to 2.16 ng/k g. Concentrations of dioxins/ furans detected in Intake Basin sediment are considered within background ranges.

As discussed above, there are numerous regional sources of dioxins/furans and the concentrations detected in Intake Basin sediment may be the result of atmospheric deposition and upstream sources. Since this area of the Site was used to channel water for operational use, and the facility has not discharged waste water or storm water to this area, it is unlikely the Site is the source of these contaminants in sediment.

Recommendations

Based on the preceding information, ERM recommends the following:

- Development of a conceptual site model (CSM) to support future development plans for the Site. This will identify relevant exposure pathways and exposure scenarios and will further assist in defining areas and conditions of potential risk to future human health and ecological receptors.

- Removal and proper management of accumulated solids from the storm water system, tailraces, and other site features prior to acquiring the property. Best management practices (BMPs) for maintenance of storm water conveyance systems should be followed including catch basin and line cleaning.

[4] Puget Sound Sediment PCB and Dioxin 2008 Survey, Dredged Material Management Program (DMMP), September 11, 2008.

- Work with ODEQ to ensure ongoing salvaging activities are completed following industry BMPs to reduce the potential for impacts to the environment (i.e. releases of contaminants to upland soil, the storm water system, tailraces, surface water, or adjacent sediments).

- Additional investigation, including soil and groundwater sampling, in the area near the Truck Dump to confirm that former fuel and oil storage activities have not impacted the Site.

- Development of a Soil Management Plan (SMP) for the site. A SMP will provide information to site managers and developers regarding the management of soil during and after site development. The SMP will also identify procedures if contaminated soil is encountered during future site development activities, including material handling (segregating, stockpiling, covering), characterization, and disposal or reuse options.

Upon completion of a conceptual site model, areas with detected contaminants should be screened against criteria applicable to the proposed or intended land use. Additionally the limits of contamination in shallow soils should be further defined to aid the evaluation of potential land use and/or limit the amount of material that may need to be removed and disposed of off-site. These tasks may help alleviate potential schedule delays and limit costs associated with Site development.

FIGURES

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Figure 2 Site Layout

Figure 3 Conceptual Sampling Strategy

Figure 4 Phase II Sample Locations

Figure 5 Metals Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids

Figure 6 TPH Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids

Figure 7 VOC Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids

Figure 8 SVOC Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids

Figure 9 PCB Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids

Figure 10 Dioxin/Furan Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids

Figure 11 Metals Concentrations in Storm Water, Tailrace Water, Groundwater, and Seeps

Figure 12 TPH Concentrations in Storm Water, Tailrace Water, Groundwater, and Seeps

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Table 5 Upland Soil Analytical Results

Table 6 Analytes with Detections above Screening Criteria, Upland Soil

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APPENDICES

Appendix A – Phase II ESA Conceptual Approach

Appendix B – Reference Documents

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Figures

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 01 Site Location.mxd Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03

Legend

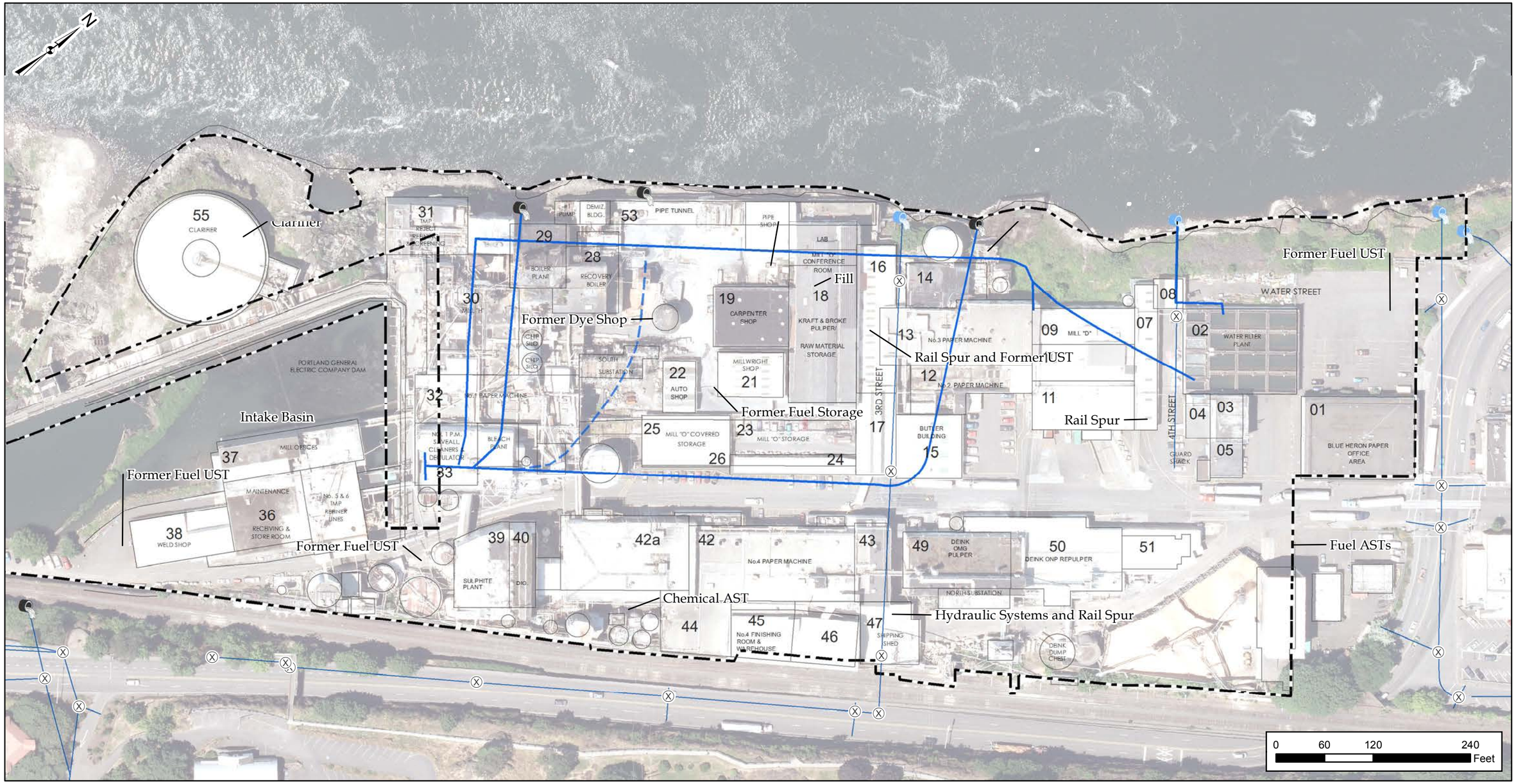
Blue Heron Site Boundary

Figure 1
Site Location
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 02 Site Layout.mxd

Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



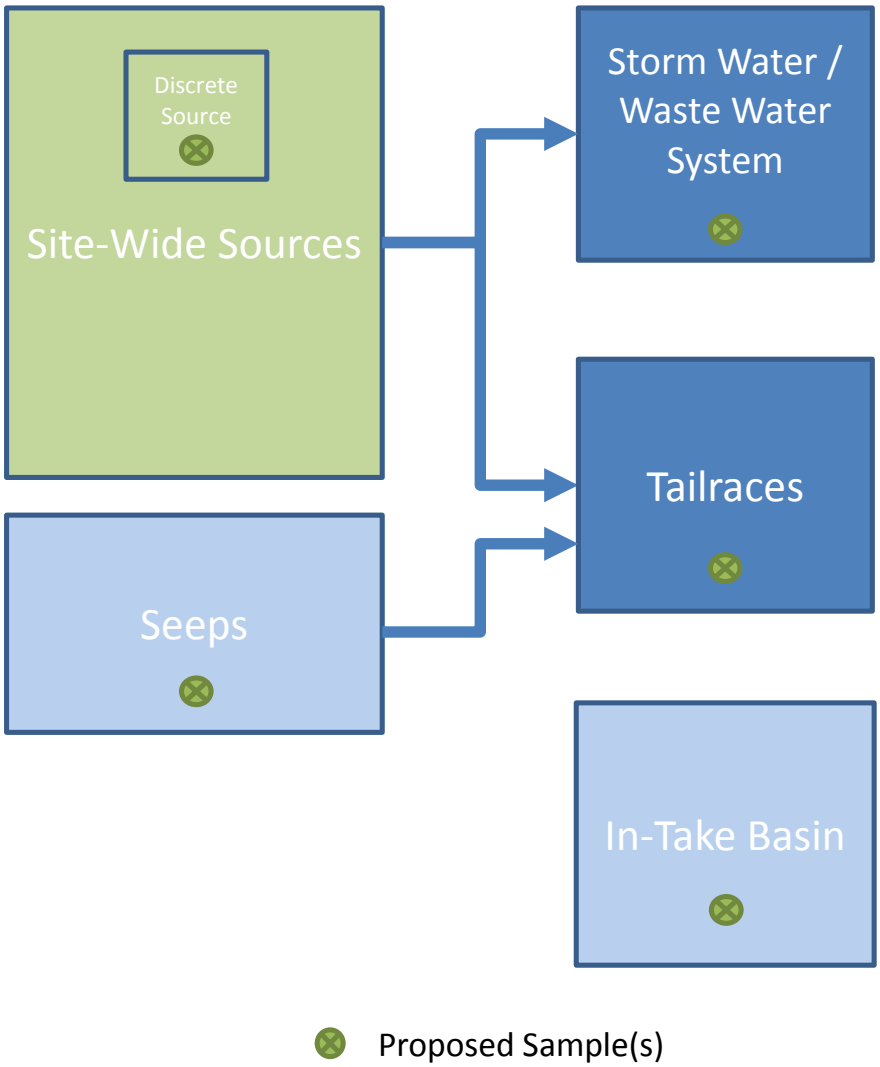
Legend

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Oregon City Outfall (active)
- Outfall (abandoned)
- Tailrace (Approximate)

Figure 2
Site Layout
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204

Figure 3
Conceptual Sampling Strategy
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building



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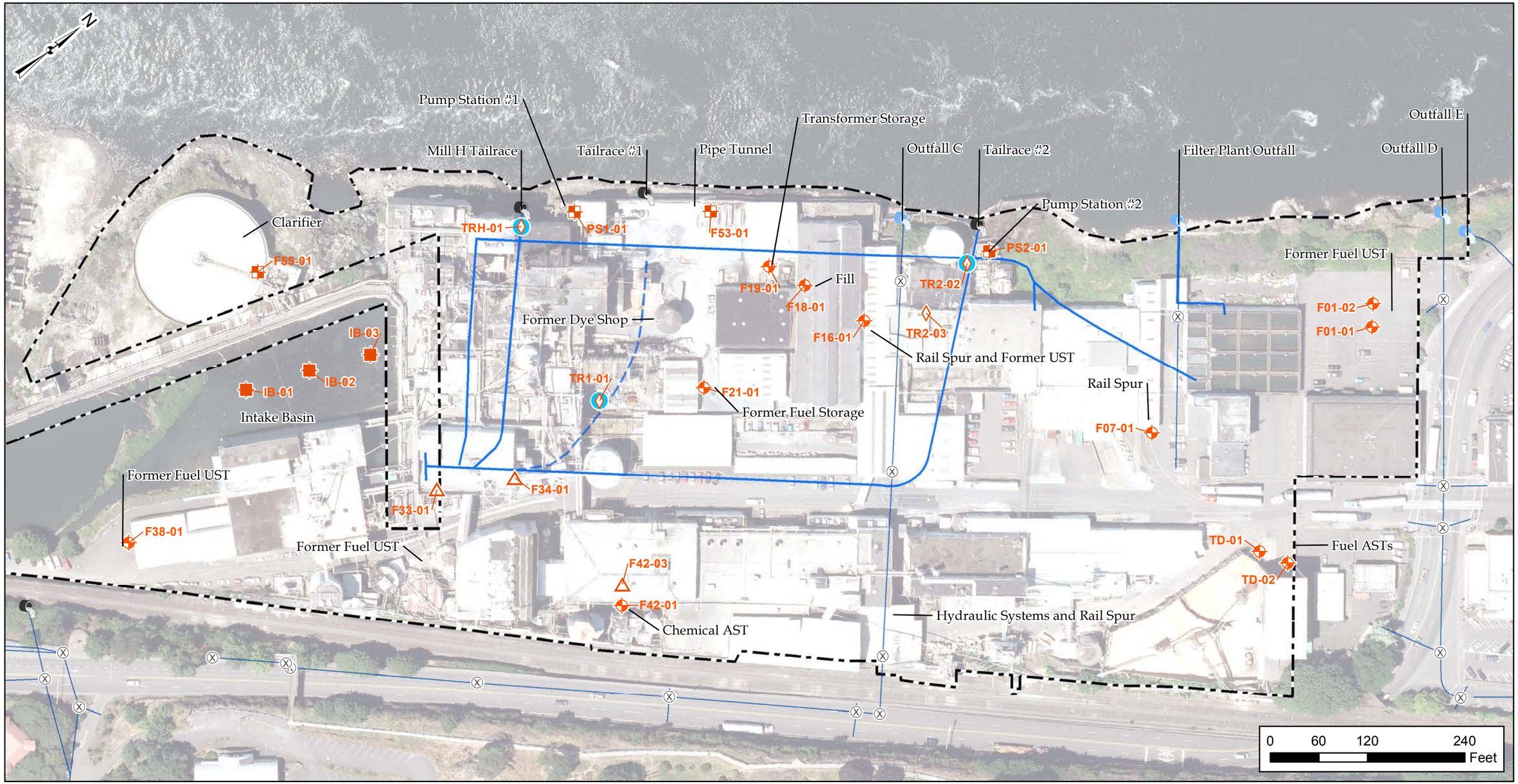

Legend

Phase II ESA Sample Locations

- Soil, Fill, and Groundwater (if present)
- Seep
- Stormwater and Solids
- Intake Basin
- Tailrace Solid Locaiton for Compositing
- Tailrace Solid and Water Location
- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Oregon City Outfall (active)
- Outfall (abandoned)
- Tailrace (Approximate)

Figure 4

Phase II Sample Locations
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204
ERM.

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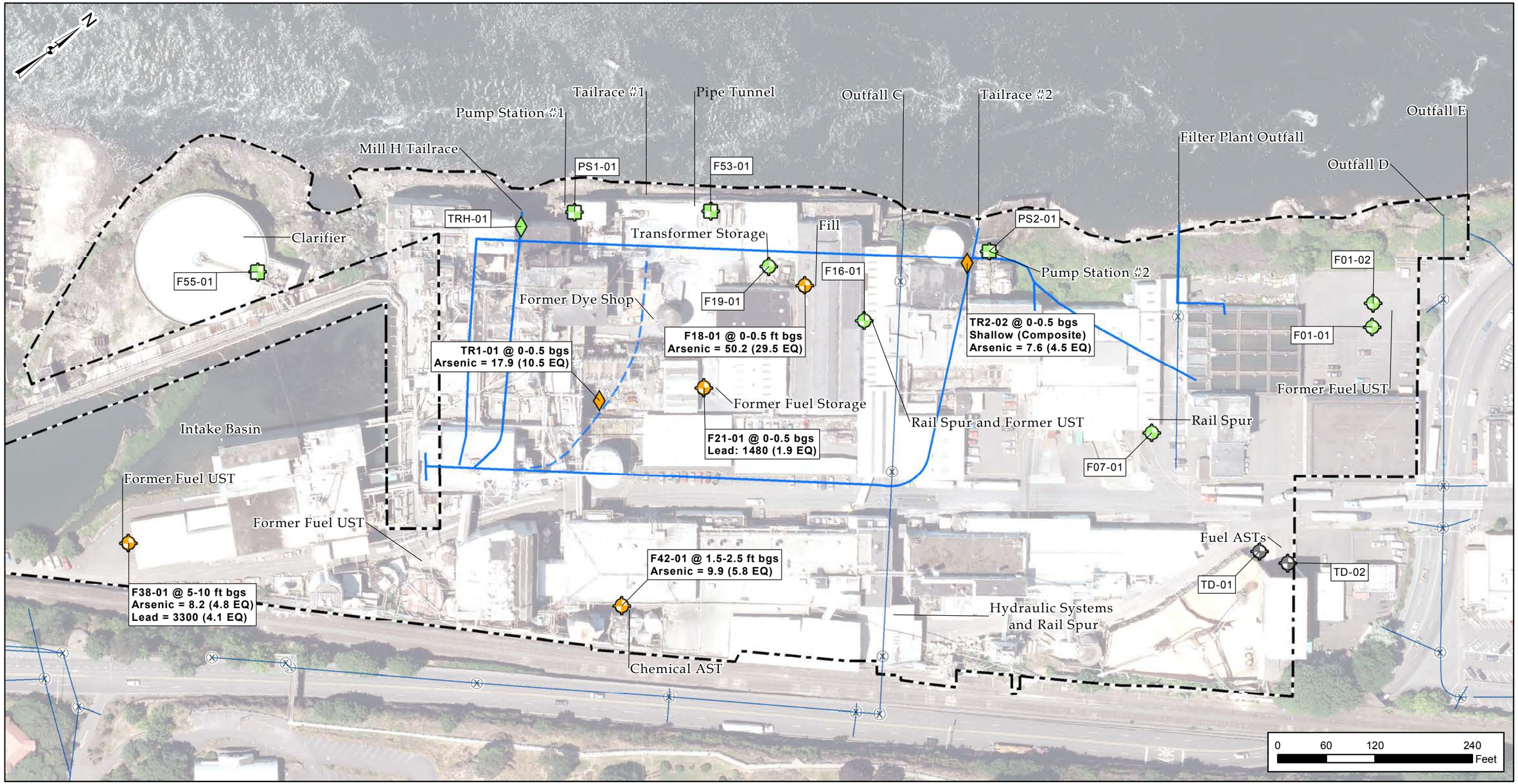
Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Legend

Metals Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Soil Sample
- Storm Water Solids Sample
- Tailrace Solids Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

- All results given in mg/kg.
- Result shown for only samples with exceedance of SLV.
- Screening criteria are derived from the Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational, Construction Worker, and Excavation Worker receptors.
- Screening criteria are not considered exceeded when results are equal to or below established regional background levels.
- EQ = Exceedance Quotient
- SLV = Screening Level Value
- bgs = Below ground surface

Figure 5

Metals Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204
ERM.

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 06 Soil TPH.mxd

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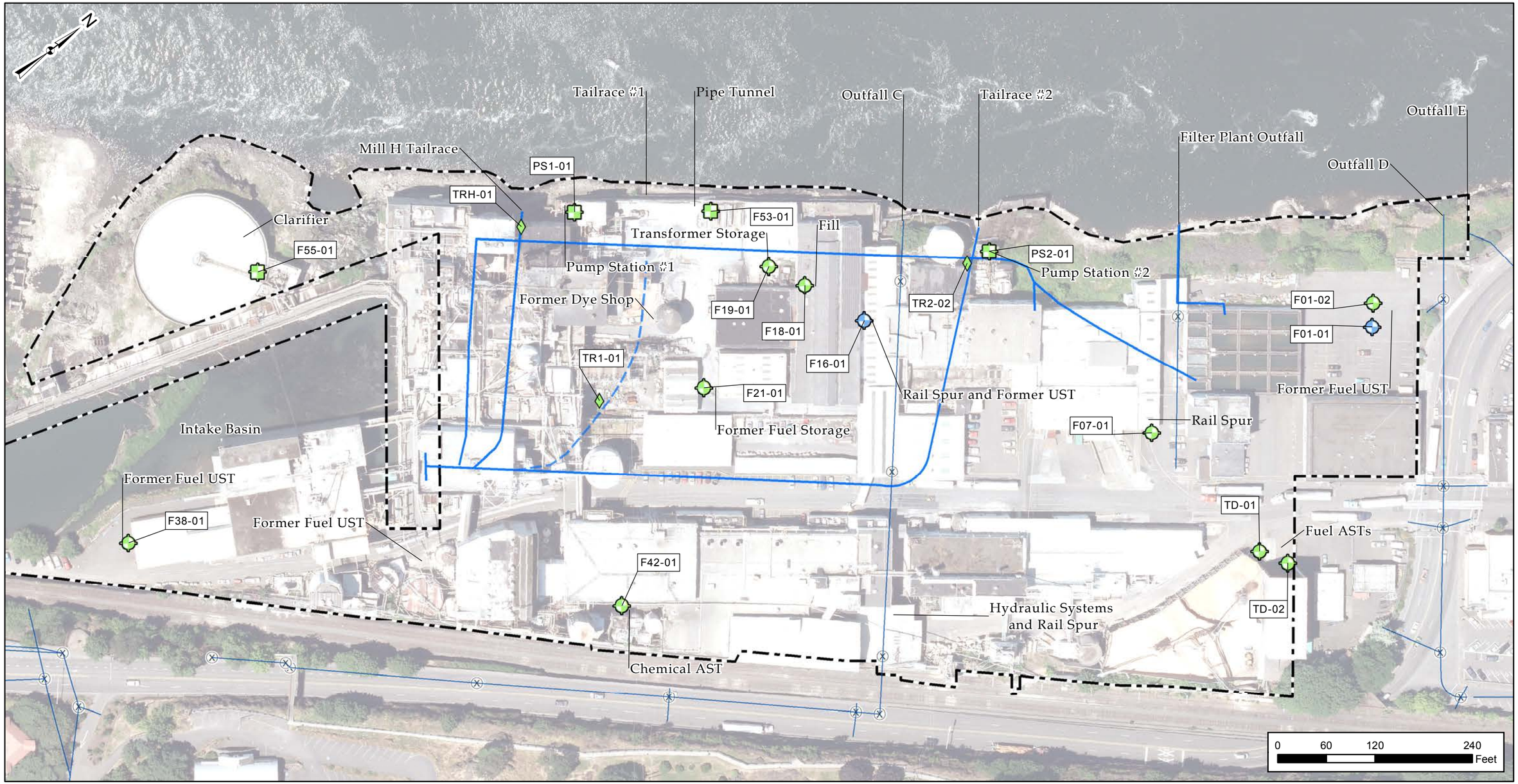

Legend

TPH Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Soil Sample
- Storm Water Solids Sample
- Tailrace Solids Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

- All results given in mg/kg.
- Result shown for only samples with exceedance of SLV.
- Screening criteria are derived from the Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational, Construction Worker, and Excavation Worker receptors.
- TPH = Total Petroleum Hydrocarbons
- SLV = Screening Level Value

Figure 6

TPH Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids
Phase II ESA
Blue Heron Site
Oregon City, Oregon

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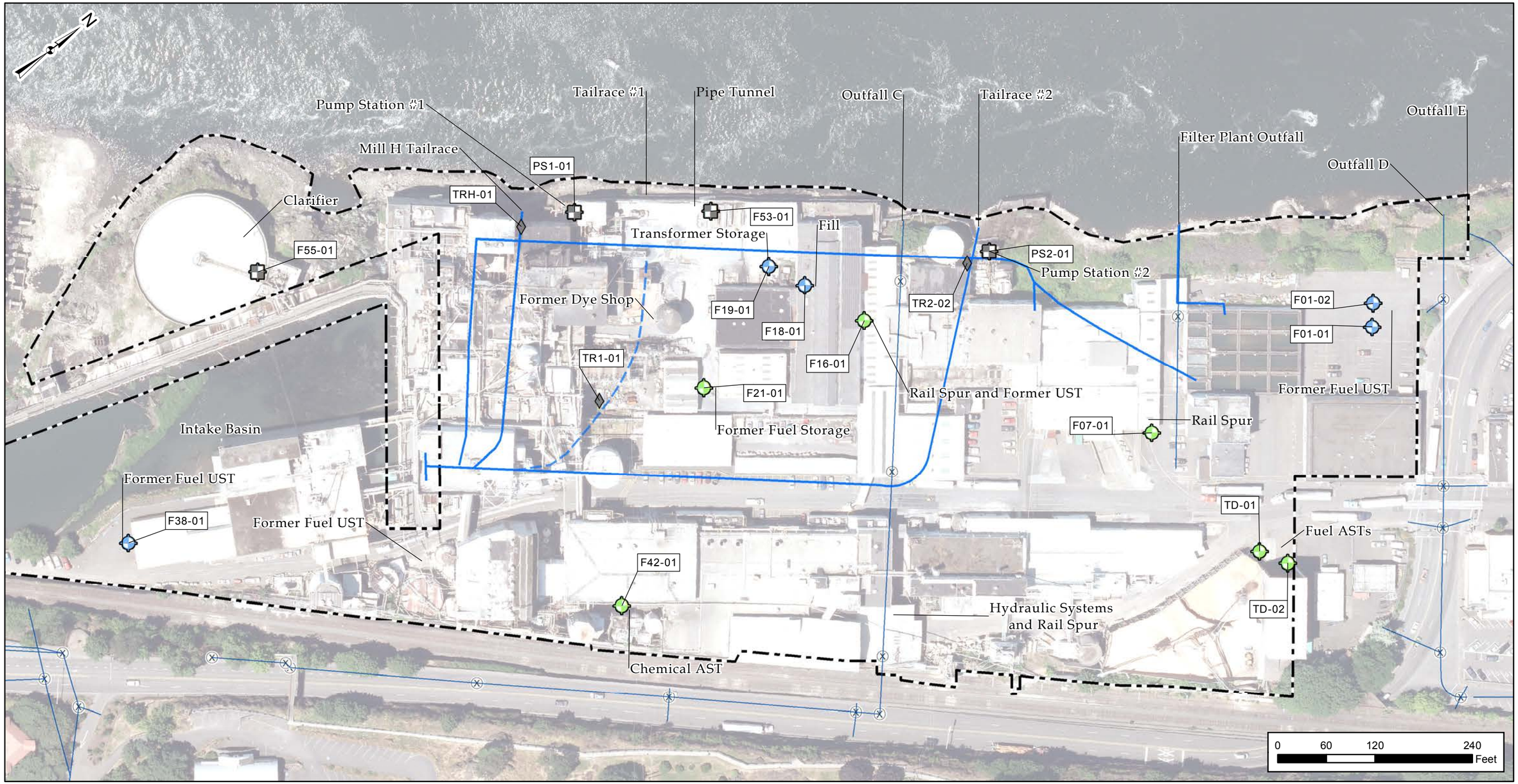
File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 07 Soil VOCs.mxd

Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Legend

VOC Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Soil Sample
- Storm Water Solids Sample
- Tailrace Solids Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

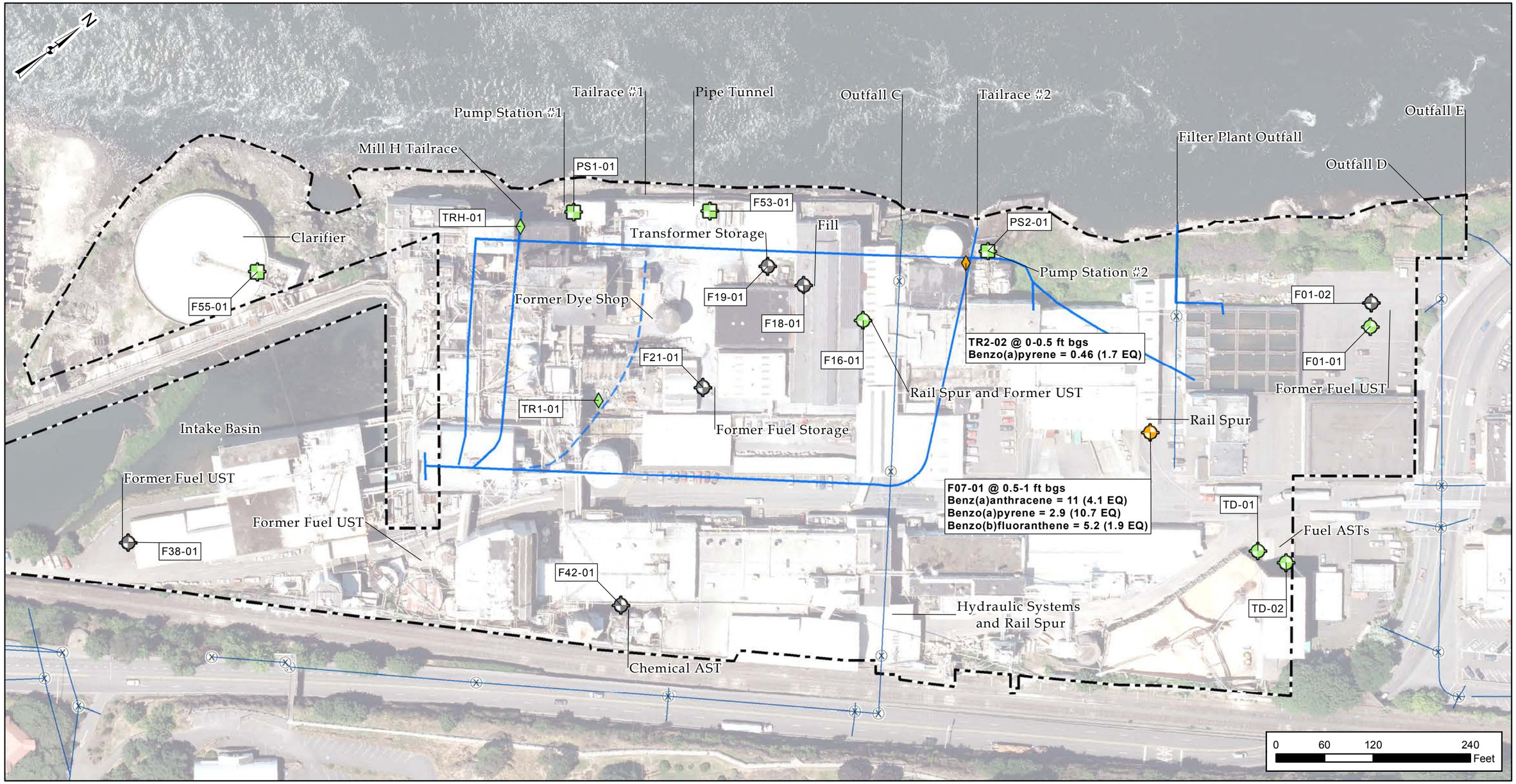
Notes:

- All results given in mg/kg.
- Result shown for only samples with exceedance of SLV.
- Screening criteria are derived from the Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational, Construction Worker, and Excavation Worker receptors.
- VOC = Volatile Organic Compound
- SLV = Screening Level Value

Figure 7

VOC Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204



Legend

SVOC Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Soil Sample
- Storm Water Solids Sample
- Tailrace Solids Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

- All results given in mg/kg.
- Result shown for only samples with exceedance of SLV.
- Screening criteria are derived from the Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational, Construction Worker, and Excavation Worker receptors.
- SVOC = Semivolatile Organic Compound
- EQ = Exceedance Quotient
- bgs = Below ground surface
- SLV = Screening Level Value

Figure 8

SVOC Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204
ERM.

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 09 Soil PCBs.mxd

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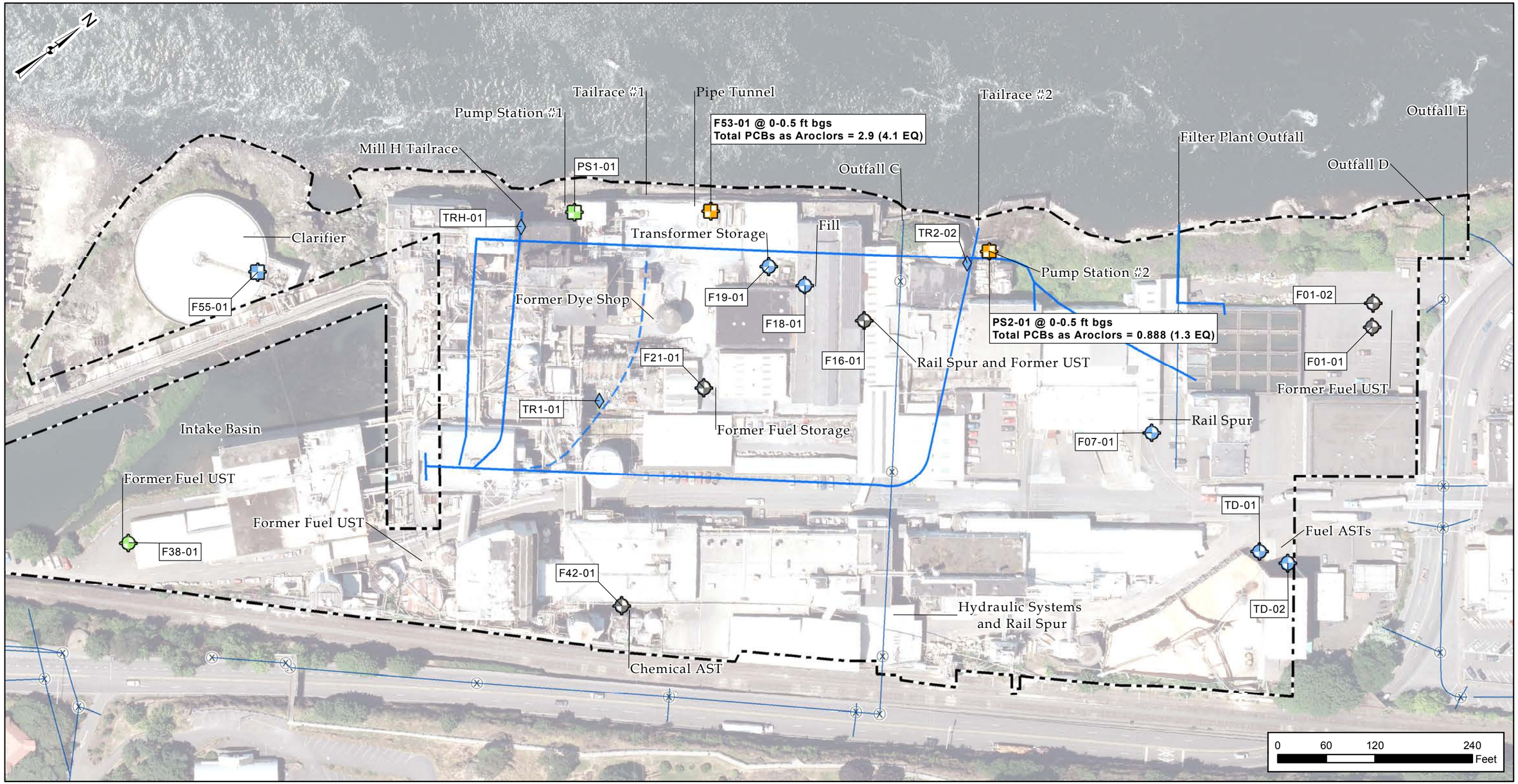

Legend

PCB Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Soil Sample
- Storm Water Solids Sample
- Tailrace Solids Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

- All results given in mg/kg.
- Result shown for only samples with exceedance of SLV.
- Screening criteria are derived from the Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational, Construction Worker, and Excavation Worker receptors.
- PCB = Polychlorinated Biphenyl
- EQ = Exceedance Quotient
- bgs = Below ground surface
- SLV = Screening Level Value

Figure 9

PCB Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204
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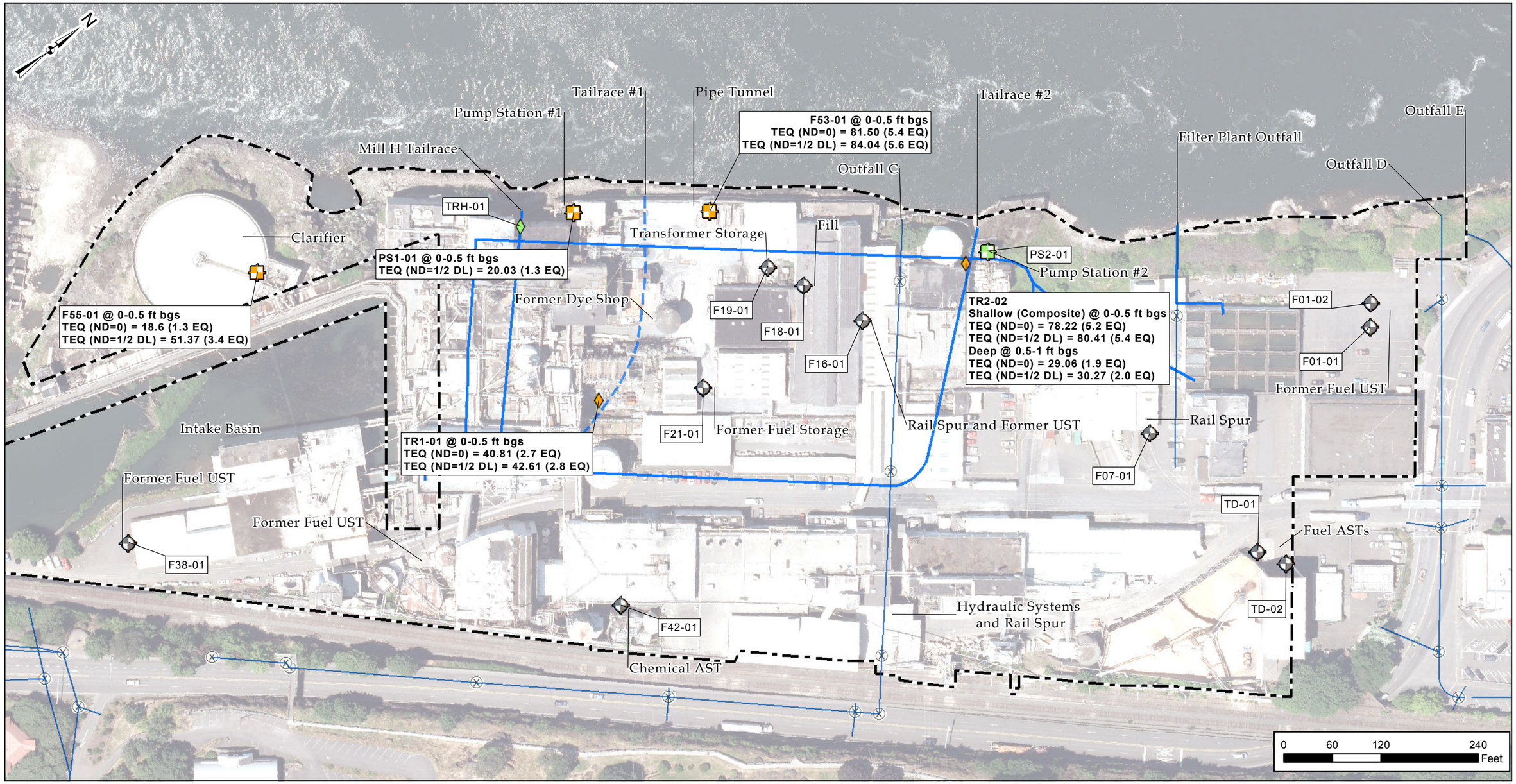
File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 10 Soil Dioxins-Furans.mxd

Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Legend

Dioxins and Furans Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Soil Sample
- Storm Water Solids Sample
- Tailrace Solids Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

- All results given in ng/kg.
- Result shown for only samples with exceedance of SLV.
- Screening criteria are derived from the Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational, Construction Worker, and Excavation Worker receptors.
- TEQ (ND=0) = Calculated toxic equivalency quotient, not detected isomer concentrations equal to 0.
- TEQ (ND=1/2 DL) = Calculated toxic equivalency quotient, not detected isomer concentrations equal to half the detection limit.
- EQ = Exceedance Quotient
- bgs = Below ground surface
- SLV = Screening Level Value

Figure 10

Dioxin/Furan Concentrations in Upland Soil, Storm Water Solids, and Tailrace Solids
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
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Portland, Oregon 97204
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File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 11 Water Metals.mxd

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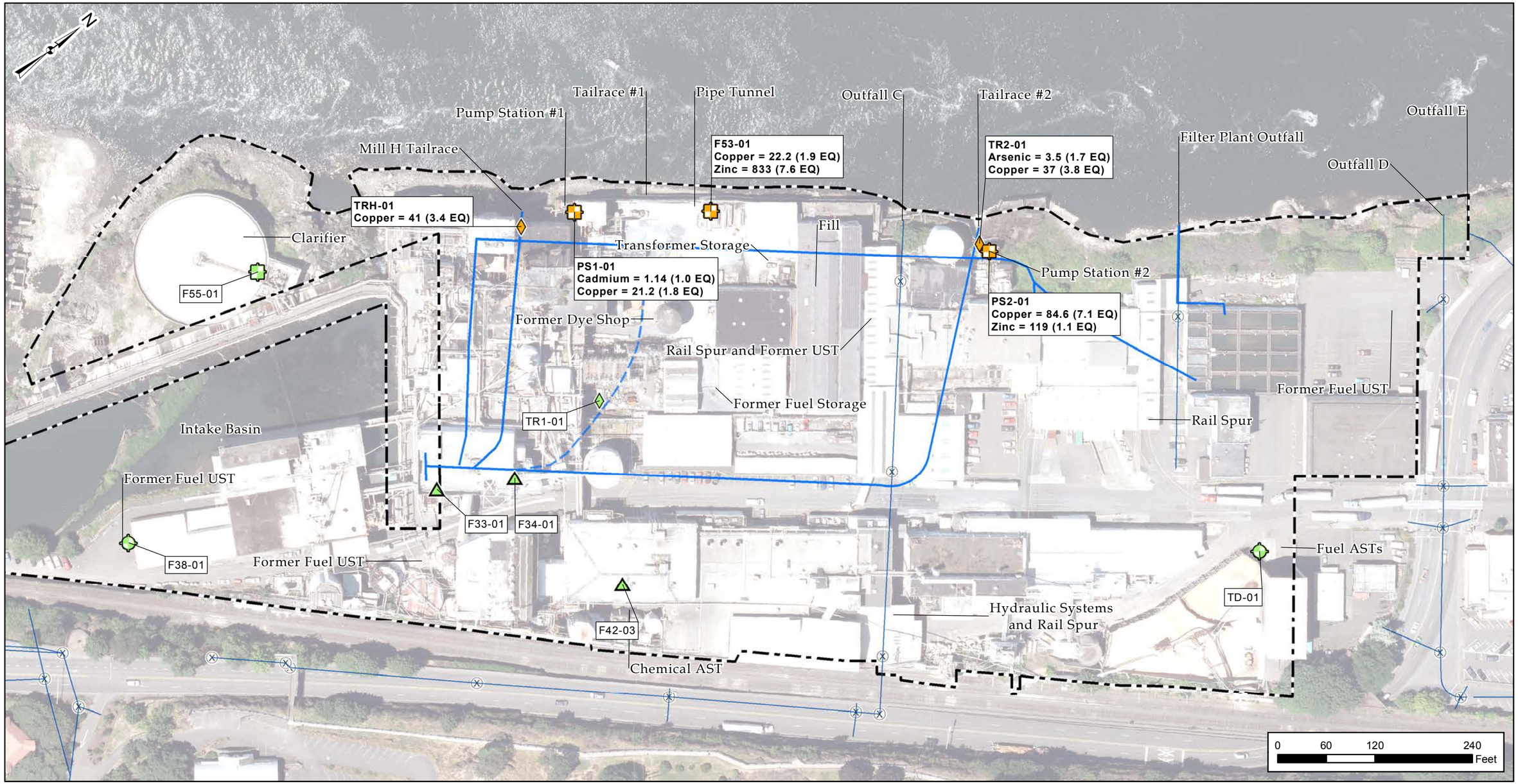


Legend

Metals Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Groundwater Sample
- Seep Sample
- Storm Water Sample
- Tailrace Water Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

- All results given in µg/L.
- Result shown for only samples with exceedance of SLV.
- Storm water/Tailrace water: screening criteria are derived from the Aquatic Life Criteria Tables 20 and 33A and Human Health Criteria Table 40, approved by EPA on 17 October 2011.
  Groundwater/Seeps: screening criteria are derived from Oregon DEQ
- Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012.
- EQ = Exceedance Quotient
- SLV = Screening Level Value

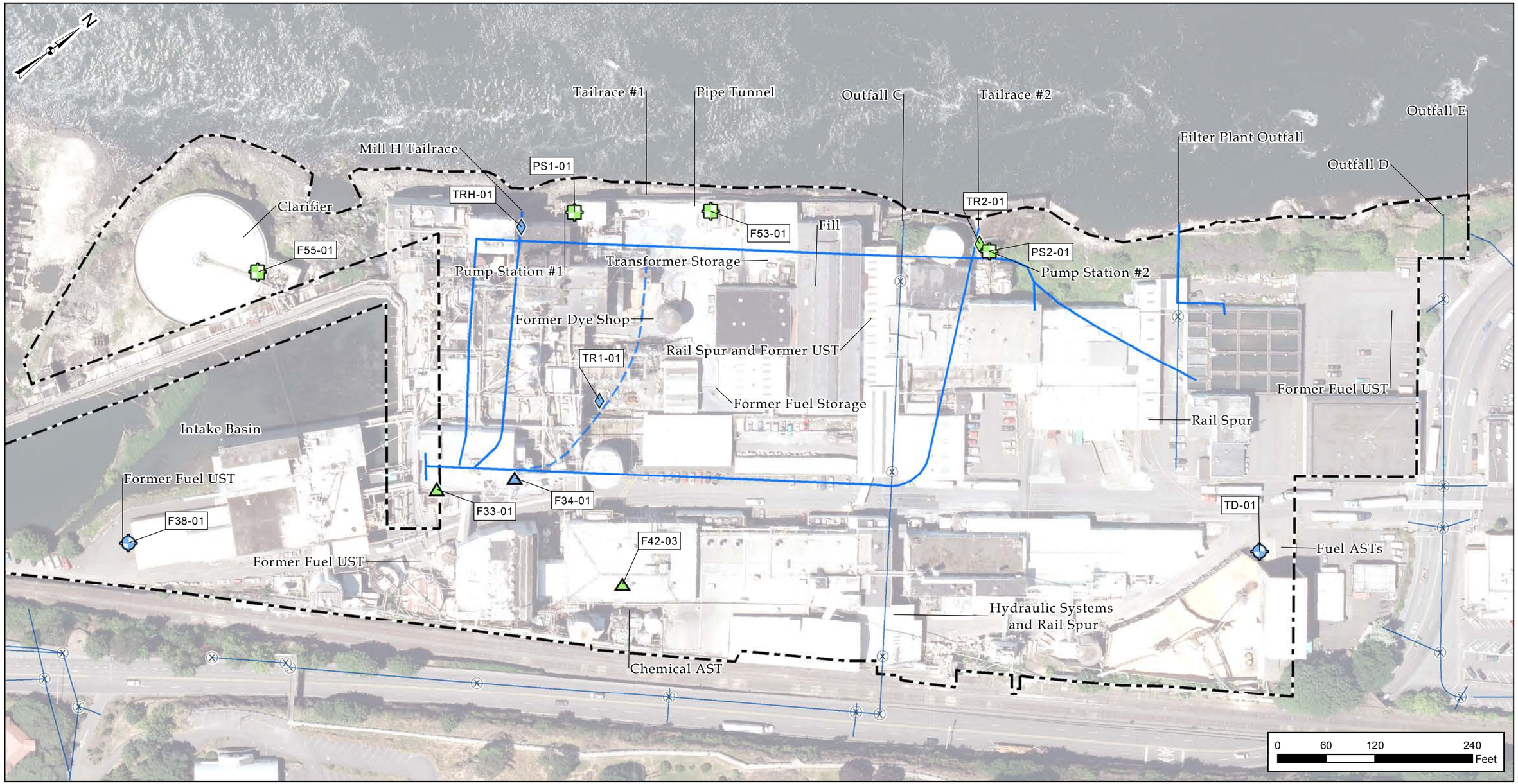
Figure 11

Metals Concentrations in Storm Water, Tailrace Water, Groundwater, and Seeps
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204
ERM.

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 12 Water TPH.mxd

Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Legend

Total Petroleum Hydrocarbon Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Groundwater Sample
- Seep Sample
- Storm Water Sample
- Tailrace Water Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

- All results given in µg/L.
- Result shown for only samples with exceedance of SLV.
- Storm water/Tailrace water: screening criteria are derived from the Aquatic Life Criteria Tables 20 and 33A and Human Health Criteria Table 40, approved by EPA on 17 October 2011.
  Groundwater/Seeps: screening criteria are derived from Oregon DEQ
- Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012.
- TPH = Total Petroleum Hydrocarbons
- EQ = Exceedance Quotient
- SLV = Screening Level Value

Figure 12

TPH Concentrations in Storm Water, Tailrace Water, Groundwater, and Seeps

Phase II ESA

Blue Heron Site

Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 13 Water VOCs.mxd

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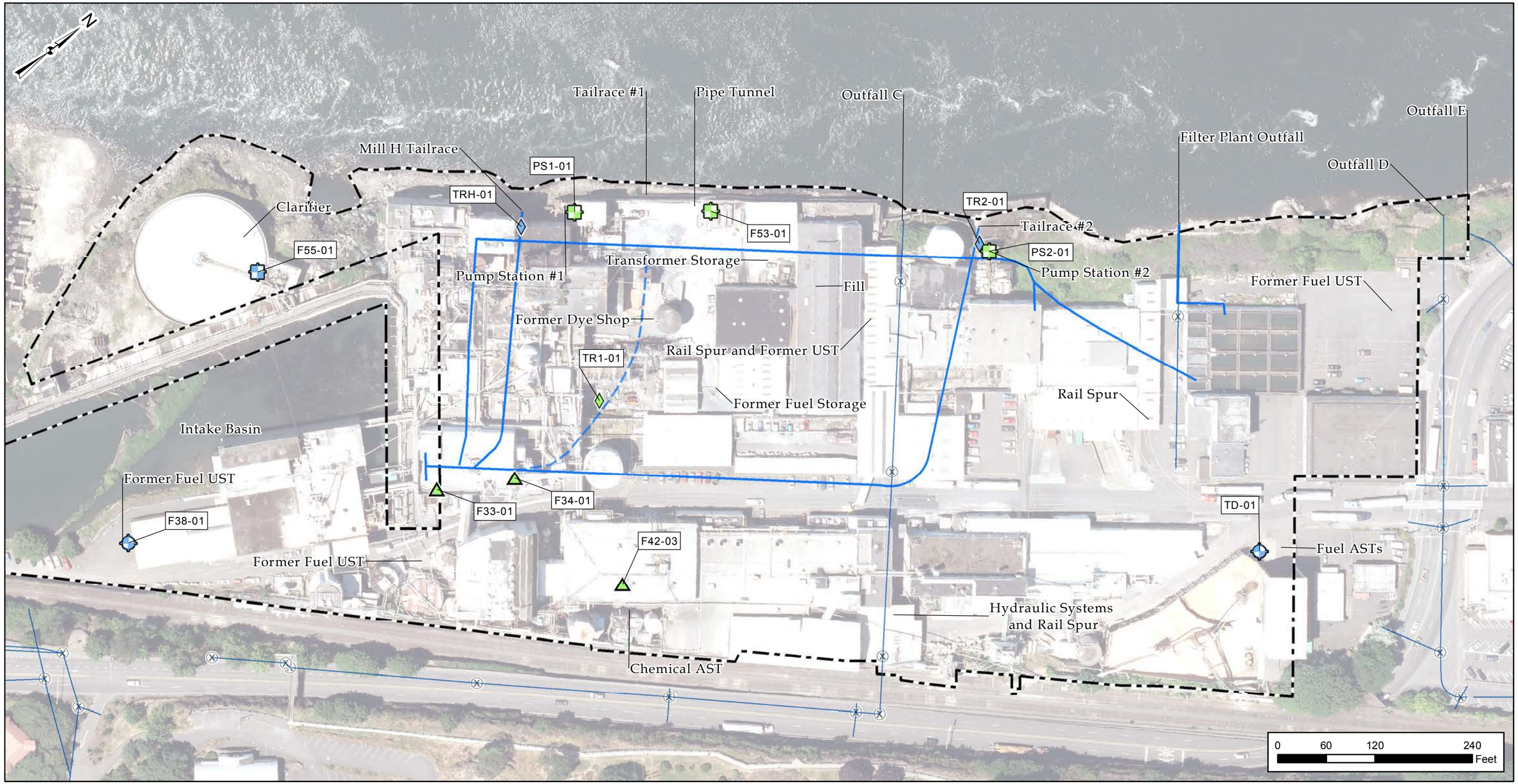


Legend

Volatile Organic Compound Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Groundwater Sample
- Seep Sample
- Storm Water Sample
- Tailrace Water Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

- All results given in µg/L.
- Result shown for only samples with exceedance of SLV.
- Storm water/Tailrace water: screening criteria are derived from the Aquatic Life Criteria Tables 20 and 33A and Human Health Criteria Table 40, approved by EPA on 17 October 2011.
  Groundwater/Seeps: screening criteria are derived from Oregon DEQ
- Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012.
- VOC = Volatile Organic Compound
- EQ = Exceedance Quotient
- SLV = Screening Level Value

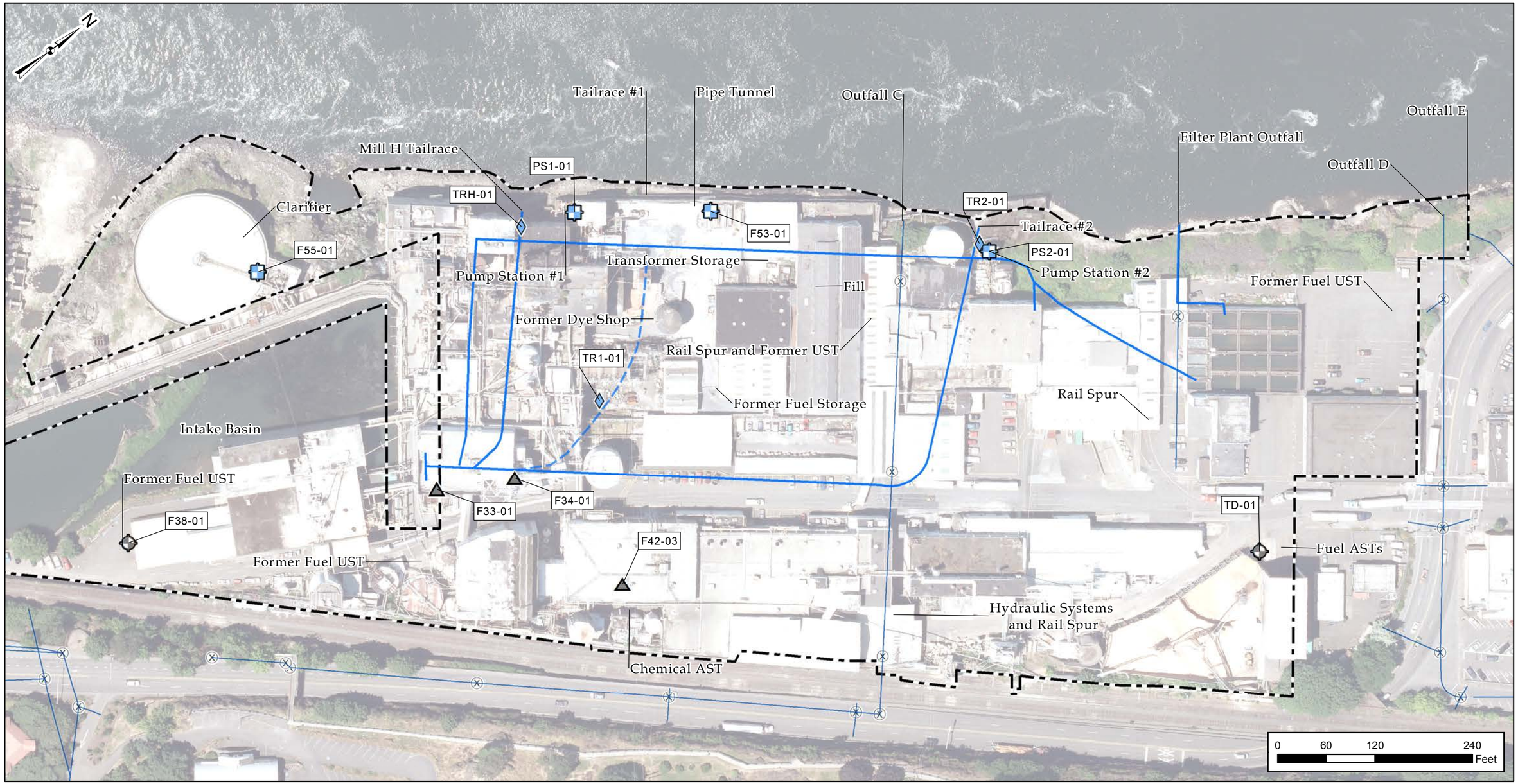
Figure 13

VOC Concentrations in Storm Water, Tailrace Water, Groundwater, and Seeps
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204
ERM.

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 14 Water SVOCs.mxd

Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Legend

Semivolatile Organic Compound Results

- Detected above applicable screening criteria
- Detected below applicable screening criteria
- Not Detected
- Not Analyzed

Sample Type

Colored by Result

- Groundwater Sample
- Seep Sample
- Storm Water Sample
- Tailrace Water Sample

- Blue Heron Site Boundary
- Oregon City Storm Sewer Line
- Manhole
- Tailrace (Approximate)

Notes:

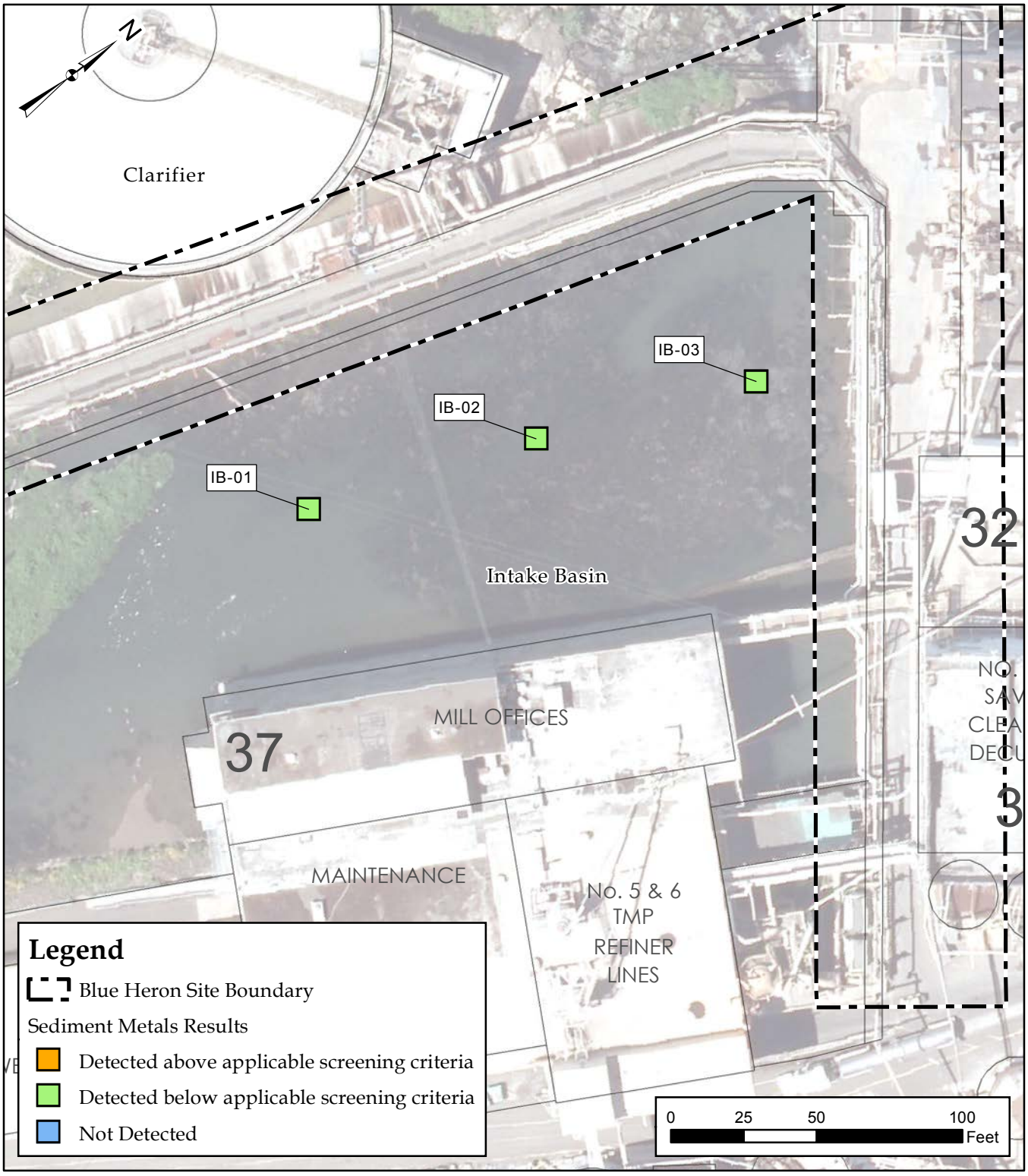
- All results given in µg/L.
- Result shown for only samples with exceedance of SLV.
- Storm water/Tailrace water: screening criteria are derived from the Aquatic Life Criteria Tables 20 and 33A and Human Health Criteria Table 40, approved by EPA on 17 October 2011.
  Groundwater/Seeps: screening criteria are derived from Oregon DEQ
- Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012.
- SVOC = Semivolatile organic compound
- EQ = Exceedance Quotient
- SLV = Screening Level Value

Figure 14

SVOC Concentrations in Storm Water, Tailrace Water, Groundwater, and Seeps
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 15 IntakeBasin Metals.mxd Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Notes:

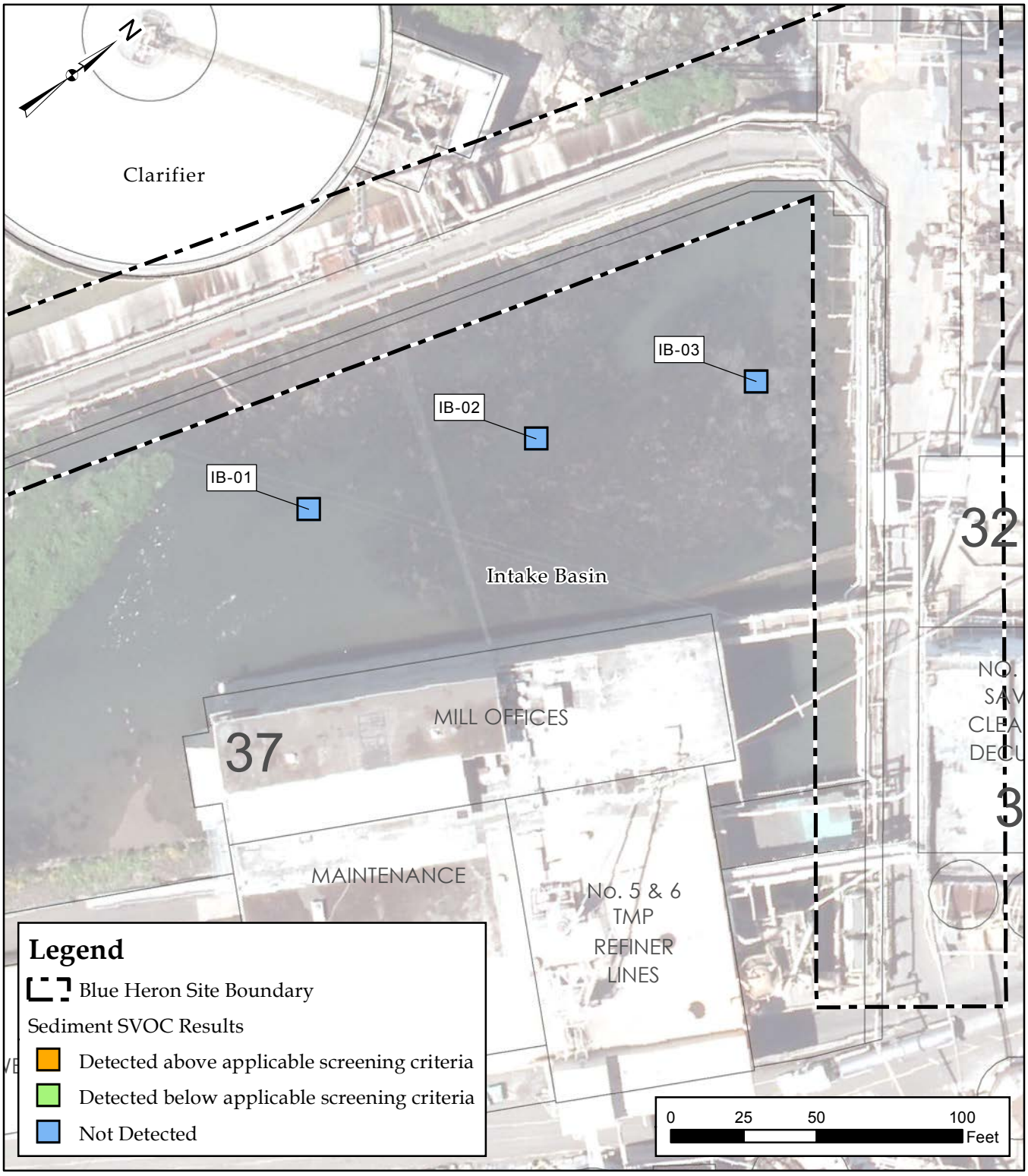
- Screening criteria are derived from Sediment Bioaccumulation Levels provided in ODEQ Guidance for Assessing Bioaccumulative Chemical of Concern in Sediment, Updated April 3, 2007
- Screening criteria are not considered exceeded when results are equal to or below established regional background levels.

Figure 15

Metals Concentrations in Intake Basin Sediments
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 16 IntakeBasin SVOCs.mxd Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Notes:

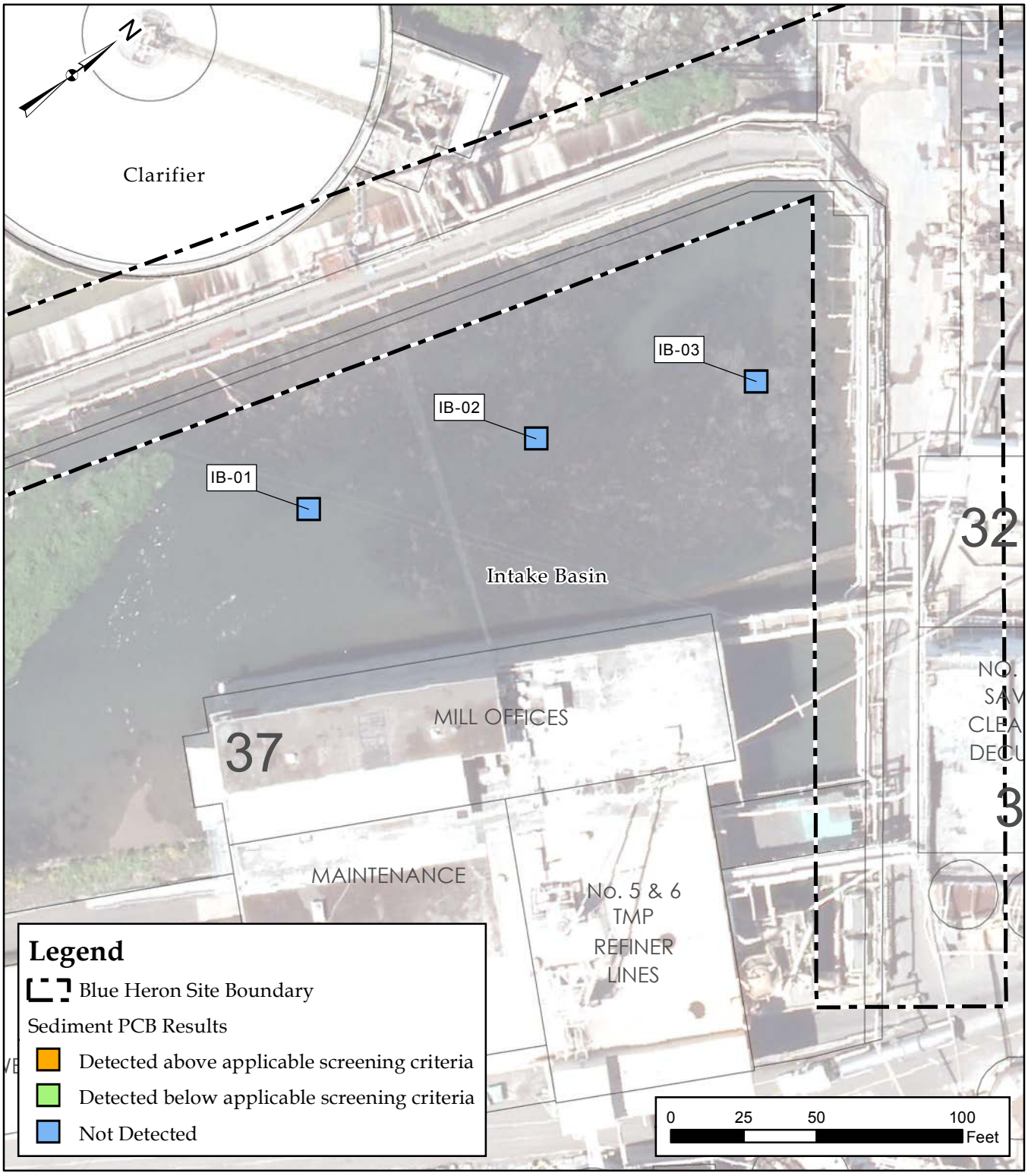
- Screening criteria are derived from Sediment Bioaccumulation Levels provided in ODEQ Guidance for Assessing Bioaccumulative Chemical of Concern in Sediment, Updated April 3, 2007
- SVOC = Semivolatile organic compounds

Figure 16

SVOC Concentrations in Intake Basin Sediments
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 17 IntakeBasin PCBs.mxd Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Notes:

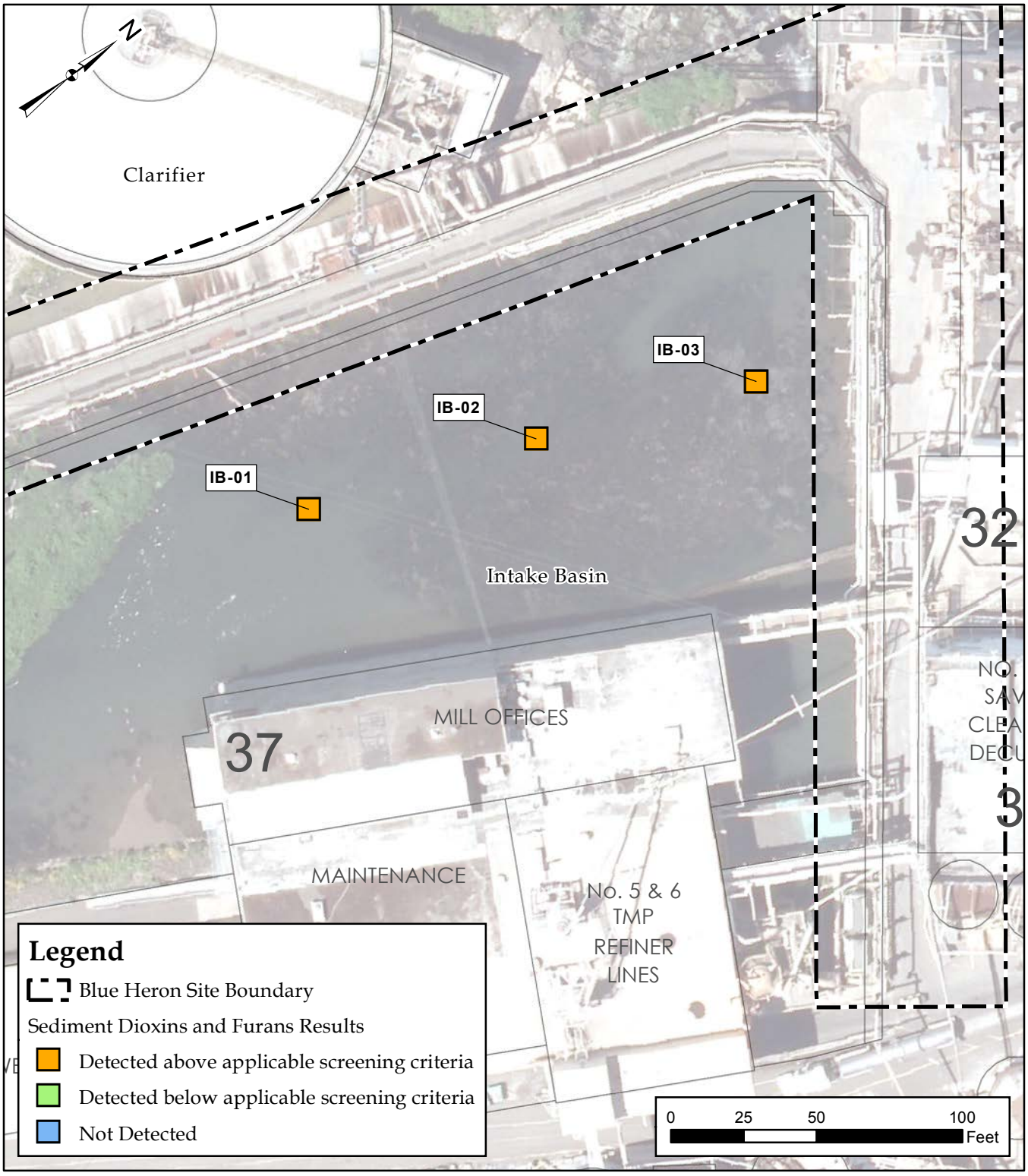
- Screening criteria are derived from Sediment Bioaccumulation Levels provided in ODEQ Guidance for Assessing Bioaccumulative Chemical of Concern in Sediment, Updated April 3, 2007
- PCB = Polychlorinated biphenyl

Figure 17

PCB Concentrations in Intake Basin Sediments
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204
ERM.

File: F:\Projects\0170026_Metro Blue Heron\GIS\Report Figures\Fig 18 IntakeBasin Dioxin Furans.mxd Drawn By: Alex Kirk Date: 11/6/2012 Project: 0170026.03



Notes:

- Screening criteria are derived from Sediment Bioaccumulation Levels provided in ODEQ Guidance for Assessing Bioaccumulative Chemical of Concern in Sediment, Updated April 3, 2007
- Please see Table 13 for screening criteria evaluation.

Figure 18

Dioxin/Furan Concentrations in Intake Basin Sediments
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204

Tables

Table 1

Areas of Potential Environmental Concern

Phase II Environmental Site Assessment

Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
1	Blue Heron Paper Office Area	1967 105 x 140	North Parking Lot	Former vehicle repair garage and service station 1943-1956 and Tire Sales in 1959; fuel Tanks and hydraulic systems	Soil, Groundwater	Petroleum hydrocarbons, Solvents, PCBs	3 - Soil/Fill 4 - Groundwater (if present)
			Elevator, mechanical room.	Hydraulic system	Soil, Groundwater	Petroleum hydrocarbons, PCBs	3 - Soil/Fill 4 - Groundwater (if present)
2	Water Filter Plant - Settling Basin and Pump House	1953 37 x 105 PH	Second Floor Transformer (2), filtration system ASTs, Basement Pump room	Electrical systems, Chemical storage, petroleum, Metals, Sodium Bromide, Sodium Hypochlorite, Alum	Storm water, and Sediment	Petroleum hydrocarbons, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces
2a	Fire Hall - Annex	1981 37 x 20	None	N/A	N/A	N/A	N/A
3	Filter Control Building	1965 41 x 65	None	N/A	N/A	N/A	N/A
4	Fire Hall	1981 37 x 45	None	N/A	N/A	N/A	N/A
5	Office and First Aid Building	1965 41 x 47	None	N/A	N/A	N/A	N/A
6	Guard Shack		None	N/A	N/A	N/A	N/A
7	4th Street Building (covered platform south)		Loading platform	Hydraulic systems	Storm water and Sediment	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
8	4th Street Building (covered platform west)		None	N/A	N/A	N/A	N/A
9	Warehouse No. 3 (Rail Car Loading)	1913 40 x 127	Basement	Elevator, 10k gallon Mineral Oil AST NW Exterior, Hydraulic systems	Soil, Groundwater	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
10	No. 3 Finishing Building	1913 54 x 125 (basement)	Basement	Hydraulic systems	Soil, Groundwater	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
11	Mill "B" Warehouse (No. 2 Finishing Building)	1913 54 x 125	None	N/A	N/A	N/A	N/A
12	Number "2" Paper Machine	1913 43 x 185	Basement	Hydraulic systems, Dye, Radiation Source	Soil, Fill, Groundwater, Storm water, and Sediment	Petroleum hydrocarbons, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
13	Number "3" Paper Machine	1913 58 x 185	Basement	Hydraulic systems, Dye, Transformers, Radiation Source	Soil, Fill, Groundwater, Storm water, and Sediment	Petroleum hydrocarbons, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present) 5 - Seeps

Table 1

Areas of Potential Environmental Concern

Phase II Environmental Site Assessment

Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
14	Sub Station - North	48 x 53	Second Floor	Transformer	Waste water	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
	Sub Station - Southwest	30 x 43	Second Floor	Transformers	Waste water	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
	Sub Station - Southeast	20 x 57	Second Floor	Transformers	Waste water	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
	Chemical and Tote Storage		First Floor	Felt Wash, Slimicide, Caustic, Kerosene, Hydraulic systems	Soil, Fill, Groundwater, Storm water, and Sediment	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
15	Butler Building (equipment. storage)	81 x 83	None	N/A	N/A	N/A	N/A
16	West	46 x 66	Driveway and Rail Spur	Former UST (not previous sampled), Ties and spills	Soil, Fill, Groundwater	Arsenic, Copper, Chromium, SVOCs.	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	West-center	20 x 44					
	East-center	35 x 58					
	East	40 x 55					
17	3rd Street Building (Covered Shipping Area)	1960 50 x 110	Rail Spur	Ties and spills	Soil, Fill, Groundwater	Arsenic, Copper, Chromium, SVOCs.	1 -Storm Water / Waste Water System 2 - Tailraces
18	Mill "O" Lab	1918, 78 x 160, Canopy to west	Basement	Fill and water under building	Soil, Fill, Groundwater	Petroleum hydrocarbons, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Mill "O" Conference Room						
	Mill "O" Craft and Broke Pulper						
	Mill "O" Raw Material Storage	1918 83 x 83					
19	Carpenter Shop	1901 70 x 99	Former Wool Carbonizing Area, West Transformer Storage Area	Acid storage, Dyes, Transformers (exterior)	Soil, Fill, Groundwater	Metals (chromium, copper), Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
20	Pipe Shop	1988 45 x 60	None	N/A	N/A	N/A	N/A
21	Millwright Shop	1962 55 x 80	Main floor, ground surface	Former potential UST (not previous sampled) , and former petroleum ASTs for boiler system.	Soil, Fill, Groundwater	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
22	Auto Shop	1960 40 x 63	Main floor, ground surface	Former boiler system. Former Dye House	Soil, Fill, Groundwater	Metals (chromium, copper)	1 -Storm Water / Waste Water System 2 - Tailraces

Table 1
Areas of Potential Environmental Concern
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
23	Mill "B" Storage - West	60 x 240 (Former Oregon City Woolen Mill Buildings)	None	N/A	N/A	N/A	N/A
24	Mill "B" Storage - East			N/A	N/A	N/A	N/A
25	Mill "O" Storage - Interior			N/A	N/A	N/A	N/A
26	Mill "O" Storage - Exterior			N/A	N/A	N/A	N/A
27	South Substation (Electric Center)	1956-1969 30 x 60	Entire substation	Transformers (14)	Soil, Fill, Groundwater	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
28	Recovery Boiler	1956-1969 83 x 120	Second Floor	Boiler	Waste water	Metals	1 -Storm Water / Waste Water System 2 - Tailraces
29	Mill "G" Boiler Plant		Second Floor	Boilers (6), High density Stock and brightening tower to south, Boiler Chemicals	Waste water	Metals	1 -Storm Water / Waste Water System 2 - Tailraces
30	Mill "H"	1956-1969 100 x 132	Second Floor	Transformer (1) NW corner, Radiation Source	Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
	Mill "H" TMP Area		Second Floor	Hydraulic systems, Hazardous waste storage area, Sodium Hydrosulfite, Sulfuric Acid,	Waste water	Petroleum, PCBs, Solvents, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
	Mill "H" DeInk Area		SE corner roof	Transformer (1)	Storm water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
31	TMP Reject Refining and Screening	1970 70 x 75	W center wall, Tailrace under building	Transformer (1) W center wall, Fill and water under building	Soil, Fill, Groundwater, Sediment, Surface Water	Petroleum, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces
	Refiner Line No. 4	1977 25 x 55					
	Addition	1979 25 x 70					
32	No. 1 Paper Machine	1917 43 x 203	Fill and water under building	Historical uses, Fill and water under building, Radiation Source	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces 5 - Seeps
33	No. 1 Save-All Cleaners & Desiccator (Screen Room & DeInk)	1917 78 x 78	First Floor, Basement	Transformer (2) SE Corner, Elevator, two pulp ASTs to east. Fill and water under building, laurylphosphonic acid, Surfactant, Oil, Filler, Felt Wash, Slimicide, Caustic, Kerosene, Urea.	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, , Metals	1 -Storm Water / Waste Water System 2 - Tailraces
34	Bleach Plant (De-Ink Plant)	1960 54 x 57	First Floor, Basement	Transformer (1) NW Corner, 64k Fuel Oil AST SE corner exterior, Bleach Tower and Caustic Tower to N. ext., Fill and water under building	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces

Table 1
Areas of Potential Environmental Concern
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
35	Rewind Building	1962 30 x 70 c, 17 x 42 n, 24 x 24 s	First Floor, Basement	Hi Density Stock AST to N exterior. Caustic and bleach ASTs to south. Fill and water under building	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
36	Mill "E" Maintenance Shops		First Floor, Water beneath building	Transformer (1) NE ext. Corner and SW corner. Oil Room NW Corner. Former debarker and chipper for pulp manufacturing. Water from intake basin under building. Hydraulic systems. Former UST (not previous sampled) on south side of Weld Shop. Radiation Source	Soil, Fill, Groundwater, Sediment, Surface Water	Petroleum, PCBs, Solvents, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Mill "E" Receiving and Store Room						
	Mill "E" No. 5 & 6 TMP Refiner Lines	130 x 57					
37	Mill "E" Mill Offices						
38	Weld Shop	54 x 57					
39	Sulfite Plant (Mill C)	65 x 115	Basement	Process waste, Sodium Bisulfite.	Soil, Fill, Groundwater, Waste water	Sulphur, pH,	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present). 5 - Seeps
40	DIG (Digester Building)	32 x 102	Ground floor Exterior, Basement	Petroleum AST east exterior	Soil, Fill, Groundwater, Waste water	Sulphur, pH,	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present) 5 - Seeps
41	No. 4 Save-All		Basement	Process waste (Adjacent to former Boiler Building)	Soil, Fill, Groundwater, Waste water	Metals	1 -Storm Water / Waste Water System 2 - Tailraces
42	No. 4 Paper Machine	1927 72 x 302	Basement	Transformer (1) E wall, Hydraulic systems, Elevator, Radiation Source	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
42a	No. 4 Paper Machine	1927 67 x 80	Basement	Transformer (1) S wall., Elevator, Hydraulic systems, chemical storage east exterior, laurylphosphonic acid, Surfactant, Oil, Filler, Felt Wash, Slimicide, Caustic, Kerosene, Silicate, Sulfuric Acid, Corrosion inhibitor, Dye, Radiation Source	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
43	No. 4 Paper Addition	1977 25 x 96	Basement	Hydraulic systems	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
44	No. 4 Finishing Room & Warehouse - South	1924 36 x 67	First Floor	Hydraulic systems, former chemical storage	Soil, Groundwater, Waste water	Petroleum, PCBs, Solvents, Metals	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
45	No. 4 Finishing Room & Warehouse - Central	1924 67 x 202	First Floor	Elevator	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces

Table 1
Areas of Potential Environmental Concern
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
46	No. 4 Finishing Room & Warehouse - North		First Floor	Hydraulic systems	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
47	Shipping Shed	59 x 80	First Floor	Hydraulic systems	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
48	North Substation		Ground surface	Transformers (11)	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
49	Deink ONG Pulper (Mill B)	1928 66 x 143	Current chemical storage	Chemicals collected during plant deconstruction. Laurylphosphonic Acid, Surfactant, Hydrogen Peroxide, Caustic, Silicate, Radiation Source.	Waste water	Petroleum hydrocarbons, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces
50	Deink ONG Repulper	80 x 100	Current chemical storage	Chemicals collected during plant deconstruction. Used Oil.	Waste water	Petroleum hydrocarbons, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces
51	Chip and Sawdust Silo	35 x 67	None	N/A	N/A	N/A	N/A
52	Dam		None	N/A	N/A	N/A	N/A
53	Pipe Tunnel		Entire Tunnel	Facility drainage	Storm water, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	1 -Storm Water / Waste Water System
	DeMiz Building		Main Floor	Hydraulic systems, Chemical storage (Defoamer)	Waste water		1 -Storm Water / Waste Water System 2 - Tailraces
	#1 Pump Station		Sediment trap	Storm water, and sediment	Storm water, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	1 -Storm Water / Waste Water System
54	Clarifier Pump House		Entire Building	Hydraulic systems, Electrical systems	Storm water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
55	Clarifier		Bottom of Clarifier	Facility drainage	Storm water, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	1 -Storm Water / Waste Water System
56	Sulfuric Acid AST		Exterior	Paint, Sulfuric Acid	Storm water	Lead	1 -Storm Water / Waste Water System 2 - Tailraces
57	Aboveground Storage Tanks		Exterior	Paint, Hydrogen Peroxide, Caustic, Sulfuric Acid, Silicate	Storm water	Lead	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)

Table 1
Areas of Potential Environmental Concern
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
	Site-wide		Buildings and ground surface	Facility drainage	Surface, Fill, Groundwater, Storm water	Asbestos, Metals (Lead, Zinc)	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Intake Basin		Sediment	Upstream Sources	Sediment	Petroleum, PCBs, Solvents, Metals, Asbestos	6 - In-Water Sediment
	Tailrace 1		North of No. 1 Paper Machine	Facility leaks and groundwater drainage	Storm water, groundwater, soil, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	2 - Tailraces
	Tailrace 2		Below No. 3 Paper Machine	Facility leaks and groundwater drainage	Storm water, groundwater, soil, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	2 - Tailraces
	Mill H Tailrace		Below Mill H	Facility leaks and groundwater drainage	Storm water, groundwater, soil, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	2 - Tailraces
	#2 Pump Station		Sediment trap	Facility drainage	Storm water, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	1 -Storm Water / Waste Water System
	Former Fuel Oil AST (319,200 gallons)		None	N/A	N/A	N/A	N/A
	Oil Dock		None	N/A	N/A	N/A	N/A
	Truck Dump	1968 37 x 108	Ground surface, Basement	Transformers (3) Fuels ASTs, Hydraulics	Soil, Fill, Groundwater	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Rail Spurs		Ground surface, subsurface	Ties, spills	Soil, Fill, Groundwater	Arsenic, Copper, Chromium, SVOCs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Former MgO AST		Ground surface, subsurface	Previously used as a Fuel AST for Sulfate Plant Boilers	Soil, Fill, Groundwater	Petroleum	1 -Storm Water / Waste Water System 2 - Tailraces
	Water Supply well Near 56	Near SW corner of former MgO AST	None	N/A	N/A	N/A	N/A

Information sources: Site Observations, Sanborn Maps, Historical Aerial Photographs, Historical Topographic Maps, City Directories, IRI Mill Layout Drawing, Waste Water Treatment System Drawing, Major Bulk Chemicals, Waste & Oil Mill Locations, Chemical and Raw Material Storage Map

Table 2
Sampling Rationale and Approach
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

No.	Media/Feature	Type of Sample	Purpose	COIs	Sample Location(s)	Notes
1	Storm Water / Waste Water System	Bedded Sediment	Evaluate potential releases of COIs site wide.	- Metals, including mercury (at some locations) - TPH - SVOCs - PCBs - Dioxins/Furans - Asbestos	- Pump Station #1 - Pump Station #2 - Pipe Tunnel - Clarifier	Composite samples; collect multiple depth intervals (where available) to evaluate recent and historical releases; collection of samples dependent upon presence of sufficient sediment to sample and safe access to allow sampling.
		Water	Evaluate potential releases of COIs site wide; evaluate potential releases from site via storm water.	- Metals, including hexavalent chromium and mercury (at some locations) - TPH - VOCs - SVOCs	- Pump Station #1 - Pump Station #2 - Pipe Tunnel - Clarifier	Sample of standing water in collection structure.
2	Tailraces	Bedded Sediment	Evaluate potential releases from site that are not being captured by storm water system.	- Metals, including mercury - TPH - SVOCs - PCBs - Dioxins/Furans - Asbestos	- Mill H Tailrace - Tailrace #1 - Tailrace #2	Collect multiple depth intervals(where available) to evaluate recent and historical releases; collection of samples dependent upon presence of sufficient sediment to sample and safe access to allow sampling.
		Water	Evaluate potential releases from site that are not being captured by storm water system.	- Metals, including hexavalent chromium and mercury (at some locations) - TPH - VOCs - SVOCs	- Mill H Tailrace - Tailrace #1 - Tailrace #3	Collect samples of surface/standing water within tailraces.
3	Soil / Fill	Solid	Evaluate potential releases from discrete site features; evaluate fill characteristics.	- Metals (some locations) - TPH - VOCs - SVOCs (some locations) - PCBs (some locations) - Asbestos (some locations)	Locations related to current and former tanks, transformers (in use and decommissioned), fill, and railroad spurs (ballast and other sources).	Sample where possible; soil/fill may not be present at all locations.
4	Groundwater	Water	Evaluate potential releases from discrete site features; evaluate groundwater quality both on-site and upgradient.	- Metals - TPH - VOCs - SVOCs	Locations related to current and former tanks, transformers (in use and decommissioned), fill, and railroad spurs (ballast and other sources).	Sample if groundwater encountered during soil sampling; groundwater not expected to be observed in shallow soil/fill.
5	Seeps	Water	Evaluate groundwater quality both on-site and upgradient.	- Metals - TPH - VOCs - SVOCs	Locations throughout site (No. 1 Paper Machine and Bleach Plant, east of Sulphate Plant by RR tracks).	Sample where possible; some seeps may not have sufficient flow to allow sampling.
6	Intake Basin Sediment	Bedded Sediment	Evaluate sediment quality on submerged portion of subject parcel.	- Metals - SVOCs - PCBs - Dioxins/Furans	Various locations in in-take basin.	Surface and subsurface samples.

Notes:

COIs - Constituents of interest
SVOCs - Semi-volatile organic compounds
VOCs - Volatile organic compounds
PCBs - Polychlorinated biphenyls

Table 3
Sampling Matrix
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Site Feature	Proposed Sample Location	Sampling Method / Notes	Sample ID	Sample Depth (feet bgs or feet bss)	Sample Type Grab/ Composite	Media	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn)	Hg	Cr VI	TPH	VOCs	SVOCs	PCB Aroclors	Dioxins/ Furans	Asbestos
							EPA 6020A	EPA 7470A/7471B	EPA 7195/ 7191A	NWTPH-Dx, Gx	EPA 8260C	EPA 8270D	EPA 8082A	EPA 8290A	ALS Laboratory Internal Method ENV004
Building 01 UST	F01-01	Direct push drill rig.	F01-01-9.5-10.5	9.5-10.5	Grab	Soil/Fill	X			X	X	X			
Building 01 UST	F01-02	Hand auger.	F01-02-1-2	1-2	Grab	Soil/Fill	X			X	X				
Building 01 UST	F01-03	Not completed, no indication of UST from GPR results.													
Truck Dump	TD-01	Direct push drill rig.	TD-01-4.5-6	4.5-6	Grab	Soil/Fill				X	X	X	X		
		Temp well with peristaltic pump.	TD-01-GW-090712	3-8	Grab	Groundwater	X			TPH-g only[2]	X	X			
	TD-02	Direct push drill rig.	TD-02-6.5-8	6.5-8	Grab	Soil/Fill				X	X	X	X		
Building 07/Spur	F07-01	Hand auger.	F07-01-0.5-1.0	0.5-1.0	Grab	Soil/Fill	X			X	X	X	X		
Building 16-17/Spur	F16-01	Hand auger, direct push drill rig.	F16-01-3-4	3-4	Grab	Soil/Fill	X			X	X	X			
			F16-01-15.5-16.5	15.5-16.5	Grab	Soil/Fill	X			X	X	X			
Building 16/UST	F16-02	Not completed, railroad ballast/shallow bedrock.													
Building 18 Mill O	F18-01	Hand auger.	F18-01-0-0.5	0-0.5	Grab	Soil/Fill	X			X	X		X		X
Building 19	F19-01	Hand auger.	F19-01-0.5-1.5	0.5-1.5	Grab	Soil/Fill	X			X	X		X		
Building 22/Millwright Shop	F21-01	Hand auger.	F21-01-0.5-2.0	0.5-2.0	Grab	Soil/Fill	X			X	X				
Building 28/Frmr Dye Shop	F28-01	Not completed, subsurface concrete structure.													
Building 38-Welding/UST	F38-01	Direct push drill rig.	F38-01-Soil-5-10	5-10	Grab	Soil/Fill	X			X	X		X		
		Temp well with peristaltic pump.	F38-01-GW-090712	5-10	Grab	Groundwater	X			X	X				
Building 42/Chemical Storage	F42-01	Hand auger.	F42-01-1.5-2.5	1.5-2.5	Grab	Soil/Fill	X			X	X				
Building 46/Shipping Shed	F47-01	No recovery, railroad ballast/shallow bedrock.													
Feature 57/Fuel AST	F57-01	Not completed, shallow bedrock.													
Pipe Tunnel	F53-01	Hand tools.	F53-01-0-0.5-091412	0-0.5	Grab	Storm Water Solids	X			X		X	X	X	X
		Direct/grab.	F53-01-SW-091412	Storm Water	Grab	Storm Water	X		X	X	X	X			
		Direct/grab.	DUP-01-SW-091412	Storm Water	Grab	Storm Water	X		X	X	X	X			
Pump Station #1	PS1-01	Hand tools.	PS1-01-0-0.5-091412	0-0.5	Grab	Storm Water Solids	X			X		X	X	X	X
		Direct/grab.	PS1-01-SW-091412	Storm Water	Grab	Storm Water	X		X	X	X	X			
Pump Station # 2	PS2-01	Hand tools.	PS2-01-Shallow	0-0.5	Grab	Storm Water Solids	X			X		X	X	X	X
		Direct/grab.	PS2-01-SW-090812	Storm Water	Grab	Storm Water	X			X	X	X			
Clarifier	F55-01	Hand tools.	F55-01-0-0.5-091412	0-0.5	Grab	Storm Water Solids	X	X		X		X	X	X	X
		Direct/grab.	F55-01-SW-091412	Storm Water	Grab	Storm Water	X	X	X	X	X	X			
Tailrace 1	TR1-01	Hand tools.	TR1-01-0-0.5-091512	0-0.5	Grab	Tailrace Solids	X	X		X		X	X	X	X
		Direct/grab.	TR1-01-SW-091412	Surface Water	Grab	Tailrace Water	X	X	X	X	X	X			
Tailrace 2	TR2-02,TR2-03	Hand tools.	TR2-SHALLOW	0-0.5	Composite	Tailrace Solids	X	X		X		X	X	X	X
		Hand tools, collected at location TR2-02	TR2-02-DEEP	0.5-1.0	Grab	Tailrace Solids	X	X		X		X	X	X	X
		Direct/grab.[1]	TR2-01-SW-091412	Surface Water	Grab	Tailrace Water	X		X	X	X	X			
Tailrace H	TRH-01	Hand tools.	TRH-01-0-0.5	0-0.5	Grab	Tailrace Solids	X	X		X		X	X	X	X
		Direct/grab.	TRH-01-SW-091412	Surface Water	Grab	Tailrace Water	X	X	X	X	X	X			
Bleach Plant Seep	F33-01	Direct/grab.	F33-01-SP-091512	Seep Water	Grab	Seep Water	X			X	X	X			
	F34-01	Direct/grab.	F34-01-SP-091512	Seep Water	Grab	Seep Water	X			X	X	X			
Upgradient Seep	F42-03	Direct/grab.	F42-03-SP-091512	Seep Water	Grab	Seep Water	X			X	X	X			
Possible Tailrace H Seep	F32-01	Not completed, no access.													
Paper Machine 3 Seep	F13-01	Not completed, no access.													
Paper Machine 3 Seep	F13-02	Not completed, no access.													
Intake Basin	IB-01	Ponar-type grab sampler.	IB-01-0-6inch-091412	0-0.5	Grab	Intake Basin Sediment	X					X	X	X	
		Vibracore.	IB-01-2.5-3.0-091412	2.5-3.0	Grab	Intake Basin Sediment	X					X	X	X	
	IB-02	Ponar-type grab sampler.	IB-02-0-6inch-091412	0-0.5	Grab	Intake Basin Sediment	X					X	X	X	
		Vibracore.	IB-02-2.5-3.0-091412	2.5-3.0	Grab	Intake Basin Sediment	X					X	X	X	
	IB-03	Ponar-type grab sampler.	IB-03-0-6inch-091412	0-0.5	Grab	Intake Basin Sediment	X					X	X	X	
		Vibracore.	IB-03-1.5-2-091412	1.5-2	Grab	Intake Basin Sediment	X					X	X	X	
		Vibracore.	IB-03-3.5-4.0-091412	2.5-3.0	Grab	Intake Basin Sediment	X					X	X	X	
Total Number of Samples							**38**	**8**	**7**	**32**	**25**	**33**	**21**	**15**	**9**

Notes & Key:

[1] Sample mis-labeled as "TR2-01" on COC and in laboratory reports.

[2] Sample not analyzed for TPH-d; sample volume unavailable due to slow recharge rate.

bgs = below ground surface
bss = below sediment surface
EPA = United States Environmental Protection Agency
GPR = Ground-penetrating radar
NWTPH = Northwest Method Total Petroleum Hydrocarbons
PCB = Polychlorinated biphenyls
SVOCs = Semivolatile organic compounds
TPH = Total petroleum hydrocarbons
TPH-d = Diesel-range total petroleum hydrocarbons
TPH-g = Gasoline-range total petroleum hydrocarbons
UST = Underground storage tank
VOCs = Volatile organic compounds

Notes & Key (continued):

As = Arsenic
Cd = Cadmium
Cr = Chromium
Cr VI = Hexavalent chromium
Cu = Copper
Hg = Mercury
Ni = Nickel
Pb = Lead
Zn = Zinc

Soil and groundwater sample location
Storm water and storm water solids sample location
Seep water sample location
Surface water and solids sample location
Intake basin sediment sample location

Table 4
Boring Log Summary
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Boring	Total Depth of Boring (feet bgs)	Drilling Method	Soil Data Summary						
			Soil Interval (feet bgs of feet bss)		USCS Soil Type	Field Screening Results			
			From	To		Odor	Sheen	Discoloration	PID Results (ppm)
F01-01	10.5	Hand Auger Direct Push	0.0	0.25	Asphalt.	no	no	no	--
			0.25	3.0	SILTY GRAVEL WITH SAND (GM): grey, fine gravel, fine to coarse sand, well-graded, angular, dry. Fill material.	no	no	no	--
			3.0	10.5	POORLY-GRADED SAND (SP): dark brown, fine, poorly-graded, slightly moist, increasing to moist with depth. At 9.5 feet bgs, as above except with laminations of silty sand. At 10 feet bgs, as above except very moist.	no	no	no	3 0 0 1.6
F01-02	2	Hand Auger	0.0	0.25	Asphalt.	no	no	no	--
			0.25	0.5	Crushed rock. Grey, fine to coarse sand and fine gravel.	no	no	no	--
			0.5	2.0	WELL-GRADED SAND WITH GRAVEL (SW): brown, fine to medium sand, fine gravel, well-graded, moist. Fill material.	no	no	no	--
F07-01	1	Hand Auger	0.0	0.25	Asphalt.	no	no	no	--
			0.25	1.0	SILTY GRAVEL WITH SAND (GM): dark grey, gravel with silt and sand, some wood, hydrocarbon odor, slightly moist.	yes	no	no	--
F16-01	17.5	Hand Auger Direct Push	0.0	0.5	Concrete.	no	no	no	--
			0.5	15.5	SILTY SAND (SM): dark brown, fine sand, some fine gravel, slightly moist. Brick fragments at 5 feet bgs. At 8 feet bgs, as above except fine to medium sand, no gravel, moist. At 12 feet bgs, as above except orangish-brown. At 15 feet bgs, as above except wet.	no	no	no	0.9 0.5 0.9 0.4 0.3
			15.5	16.5	WELL-GRADED GRAVEL (GW): olive grey, fine gravel, some fine to coarse sand, wet.	no	no	no	0
			16.5	17.5	SILTY GRAVEL WITH SAND (GM): olive grey, fine to coarse gravel, fine to coarse sand, well-graded, dry.	no	no	no	0
F18-01	0.5	Hand Auger	0.0	0.25	Concrete	no	no	no	--
			0.25	0.5	POORLY GRADED SAND (SP): brown, fine sand, some silt, with brick and concrete fragments, dry. Fill material.	no	no	no	--
F19-01	1.5	Hand Auger	0.0	0.5	Asphalt.	no	no	no	--
			0.5	1.5	WELL-GRADED GRAVEL (GW): fine to coarse gravel, few to little fines, very poorly sorted, no staining, no odor, moist.	no	no	no	--
F21-01	2	Hand Auger	0.0	0.5	Asphalt.	no	no	no	--
			0.5	2.0	WELL-GRADED SAND (SW): dark brown, medium to very coarse sand, coarse gravel, poorly sorted, no odor, no staining, moist.	no	no	no	--
F38-01	10	Hand Auger Direct Push	0.0	0.5	Asphalt with multiple lifts.	no	no	no	--
			0.5	3.5	WELL-GRADED GRAVEL (GW): dark brown, fine to coarse gravel, cobbles, few clay, few silt, subangular to subrounded gravel, poorly sorted, no staining, no odor, moist. At 2 feet bgs, many 4- to 5-inch diameter cobbles.	no	no	no	0.1 1.0
			3.5	5.0	No recovery due to soft fill with large rocks.	no	no	no	--
			5.0	10.0	Fill material. Sand and gravel, medium to very coarse sand, fine to coarse gravel, saturated, dark grey staining, no odor. Poor recovery.	no	no	yes	3.6
F42-01	2.5	Hand Auger	0.0	0.4	Concrete with rebar.	no	no	no	--
			0.4	1.0	Fill Material. Rocks and concrete rubble.	no	no	no	--
			1.0	2.5	WELL-GRADED GRAVEL (GW): dark brown, fine to coarse sand, fine to coarse gravel, few clay, very poorly sorted, dark staining, no odor, moist. Increased clay with depth from few to little.	no	no	yes	0.4

Table 4
Boring Log Summary
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Boring	Total Depth of Boring (feet bgs)	Drilling Method	Soil Data Summary						
			Soil Interval (feet bgs of feet bss)		USCS Soil Type	Field Screening Results			
			From	To		Odor	Sheen	Discoloration	PID Results (ppm)
TD-01	8	Hand Auger Direct Push	0.0	0.75	Asphalt.	no	no	no	--
			0.75	1.5	Fill material. Wood, bricks, ash, sand and gravel, no odor, no staining, dry.	no	no	no	0.2
			1.5	2.5	CLAYEY SAND (SC): dark brown, very fine to medium sand, some fill material, very poorly sorted, no odor, moist. Small amount of fill.	no	no	no	--
			2.5	7.0	WELL-GRADED SAND (SW): grey, fine to medium sand, moderately sorted, no odor, no staining, moist. At 6 feet bgs, as above except with sheen and petroleum odor.	no	no	no	0.1 0.3 0.2
			7.0	8.0	Clayey SAND (SC), coarse, medium gravel, poorly sorted. At 7.8 feet bgs, as above except fine to coarse, rounded gravel.	yes	yes	yes	--
TD-02	9	Hand Auger Direct Push	0.0	0.5	Asphalt.	no	no	no	--
			0.5	1.0	POORLY-GRADED SAND (SP): brown, fine to coarse sand, poorly sorted, no odor, no staining, increased moisture with depth from dry to moist.	no	no	no	--
			1.0	6.5	CLAYEY SAND (SC): brown, fine to coarse sand, poorly sorted, no odor, no staining, moist. At 4.0 feet bgs, as above except very fine to medium sand, with trace cobbles.	no	no	no	0.4 0.4 0.5
			6.5	7.0	SANDY LEAN CLAY (CL): very fine to medium sand, low plasticity, soft, grey staining, petroleum odor, moist.	yes	no	yes	--
			7.0	8.0	POORLY-GRADED SAND (SP): very fine to coarse sand, very poorly sorted, grey staining, petroleum odor, moist.	yes	no	yes	74.2
			8.0	9.0	POORLY-GRADED SAND WITH GRAVEL (SP): brown, fine to coarse sand, fine to coarse gravel, very poorly sorted, grey staining, petroleum odor, moist.	yes	no	yes	--
IB-01	3.1	Ponar Vibracore	0.0	0.4	ORGANIC SOIL (OH): dark brown, with woody debris, no odor, no staining.	no	no	no	--
			0.4	3.1	POORLY GRADED SAND WITH SILT (SP): dark brown, fine grain, no odor and no staining. Woody debris at 1.7 feet bgs. Layer of fine sand at 2.5 feet bgs.	no	no	no	--
IB-02	3	Ponar Vibracore	0.0	0.4	ORGANIC SOIL (OH): dark brown, with woody debris, no odor, no staining.	no	no	no	--
			0.4	3.0	POORLY GRADED SAND WITH SILT (SP-SM): dark brown, fine sand, no odor, no staining. Layer of woody debris at 1.7 feet bgs. Layer of fine sand at 2.5 feet bgs.	no	no	no	--
IB-03	3.3	Ponar Vibracore	0	0.4	ORGANIC SOIL (OH): dark brown, with woody debris, no odor, no staining.	no	no	no	--
			0.4	3.3	POORLY GRADED SAND WITH SILT (SP): dark brown, fine grain, no odor, no staining. Layer of woody debris at 1 foot bgs. Layer of fine grain sand at 1.5 feet bgs.	no	no	no	--

Notes:
bgs = below ground surface
bss = below sediment surface
PID = photo-ionization detector
ppm = part per million
USCS = Unified Soil Classification System

Table 5

Upland Soil Analytical Results
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Site Feature		Building 01 UST		Building 07 / Spur	Building 16-17 / Spur		Building 18 Mill O	Building 19	Building 22 / Millwright Shop	Building 38-Welding / UST	Building 42 / Chemical Storage	Truck Dump		Most Conservative Screening Criteria[1]	Regional Background Levels[2]
Location		F01-02	F01-01	F07-01	F16-01		F18-01	F19-01	F21-01	F38-01	F42-01	TD-01	TD-02		
Sample ID		F01-02-1-2	F01-01-9.5-10.5	F07-01-0.5-1.0	F16-01-3-4	F16-01-15.5-16.5	F18-01-0-0.5	F19-01-0.5-1.5	F21-01-0.5-2.0	F38-01-Soil-5-10	F42-01-1.5-2.5	TD-01-4.5-6	TD-02-6.5-8		
Sample Date		9/7/12	9/7/12	9/7/12	9/7/12	9/7/12	9/15/12	9/7/12	9/7/12	9/7/12	9/7/12	9/7/12	9/7/12		
Sample Depth (ft bgs)		1-2	9.5-10.5	0.5-1.0	3-4	15.5-16.5	0-0.5	0.5-1.5	0.5-2.0	5-10	1.5-2.5	4.5-6	6.5-8		
Constituent	**CAS Number**														
Total Metals by EPA Method 6000/7000 Series (mg/kg)															
Arsenic	7440-38-2	**2.2**	**1.9**	**1.4**	**2**	**0.9**	**50.2**	**4.7**	**6.5**	**8.2 J**	**9.9**			1.7	7.0
Cadmium	7440-43-9	**0.15**	**0.27**	**0.16**	**0.09**	**0.19**	**0.24**	**0.24**	**11.1**	**0.29**	**1.02**			150	1
Chromium	7440-47-3	**13.7 J+**	**18.6 J+**	**163 J+**	**15.2 J+**	**25.8 J+**	**26.2**	**18.8 J+**	**195 J+**	**17.5 J+**	**16.3 J+**			-	42
Copper	7440-50-8	**19.8**	**20.4**	**35.1**	**20.9**	**32.7**	**31.9**	**45.3**	**225**	**109 J**	**206**			12000	36
Lead	7439-92-1	**36.7**	**6.5**	**14**	**71.2**	**28.3**	**53.2**	**38.7**	**1480**	**3300**	**367**			800	17
Nickel	7440-02-0	**17.9**	**26.5**	**24.4**	**20.1**	**16.5**	**21.2**	**17.6**	**172**	**13.2 J**	**63.2**			6100	38
Zinc	7440-66-6	**49.4**	**133**	**57.7**	**64.6**	**107**	**118**	**117**	**3150**	**73.4**	**381**			-	86
Total Petroleum Hydrocarbons (TPH) by NW Methods (mg/kg)															
Gasoline Range Organics	GRO	< 5.9	< 6.2	**11 NJ**	< 5.9	< 7.2	< 5.7	< 5.9	< 5.7	< 7	< 6.8	< 7	**400 NJ**	13000	-
Diesel Range Organics	DRO	**52 NJ**	< 29	**2200 NJ**	< 28	< 33	**30 NJ**	< 280	< 550	**50 NJ**	**42 NJ**	**290 NJ**	**2000 NJ**	23000	-
Oil Range Organics	RRO	**750 NJ**	< 120	**7400 NJ**	< 120	< 130	**210 NJ**	**1700 NJ**	**4600 NJ**	**220 NJ**	**230 NJ**	**1400 NJ**	**9300 NJ**	40000	-
Volatile Organic Compounds (VOCs) by EPA Method 8260C (mg/kg): Detected Compounds Only															
1,2,4-Trimethylbenzene	95-63-6	< 0.023	< 0.024	< 0.22	< 0.023	< 0.026	< 0.022	< 0.022	< 0.022	< 0.026	< 0.025	< 0.025	**21**	1000	-
1,3,5-Trimethylbenzene	108-67-8	< 0.023	< 0.024	< 0.22	< 0.023	< 0.026	< 0.022	< 0.022	< 0.022	< 0.026	< 0.025	< 0.025	**7.5**	3100	-
Acetone	67-64-1	< 0.023	< 0.024	< 2.2	< 0.023	**0.073**	< 0.022	< 0.022	< 0.022	< 0.026	**0.034**	**0.05**	< 3	-	-
Benzene	71-43-2	< 0.0056	< 0.0058	< 0.055	< 0.0056	< 0.0064	< 0.0053	< 0.0055	< 0.0055	< 0.0065	< 0.0062	< 0.0061	**0.19**	1.2	-
Ethylbenzene	100-41-4	< 0.0056	< 0.0058	< 0.055	< 0.0056	< 0.0064	< 0.0053	< 0.0055	< 0.0055	< 0.0065	< 0.0062	< 0.0061	**0.25**	12	-
Isopropylbenzene (Cumene)	98-82-8	< 0.023	< 0.024	< 0.22	< 0.023	< 0.026	< 0.022	< 0.022	< 0.022	< 0.026	< 0.025	< 0.025	**0.53**	24000	-
m,p-Xylenes	179601-23-1	< 0.0056	< 0.0058	< 0.055	< 0.0056	< 0.0064	< 0.0053	< 0.0055	< 0.0055	< 0.0065	< 0.0062	< 0.0061	**12**	19000	-
Naphthalene	91-20-3	< 0.023	< 0.024	**7.7**	< 0.023	< 0.026	< 0.022	< 0.022	< 0.022	< 0.026	< 0.025	< 0.025	**2.4**	-	-
n-Propylbenzene	103-65-1	< 0.023	< 0.024	< 0.22	< 0.023	< 0.026	< 0.022	< 0.022	< 0.022	< 0.026	< 0.025	< 0.025	**3.1**	-	-
o-Xylene	95-47-6	< 0.0056	< 0.0058	< 0.055	< 0.0056	< 0.0064	< 0.0053	< 0.0055	< 0.0055	< 0.0065	< 0.0062	< 0.0061	**6.2**	19000	-
sec-Butylbenzene	135-98-8	< 0.023	< 0.024	< 0.22	< 0.023	< 0.026	< 0.022	< 0.022	< 0.022	< 0.026	< 0.025	< 0.025	**0.45**	-	-
Tetrachloroethene (PCE)	127-18-4	< 0.0056	< 0.0058	< 0.055	< 0.0056	< 0.0064	< 0.0053	< 0.0055	**0.0061**	< 0.0065	< 0.0062	< 0.0061	< 0.075	36	-
Toluene	108-88-3	< 0.0056	< 0.0058	< 0.055	< 0.0056	< 0.0064	< 0.0053	< 0.0055	< 0.0055	< 0.0065	< 0.0062	< 0.0061	**0.1**	24000	-
Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D (mg/kg): Detected Compounds Only															
2-Methylnaphthalene	91-57-6		< 2.3	**21**	< 2.3	< 2.6						< 2.5	**6.6**	-	-
4-Methylphenol	106-44-5		< 2.3	**0.15 j**	< 2.3	< 2.6						< 2.5	< 2.5	-	-
Acenaphthene	83-32-9		< 2.3	**32**	< 2.3	< 2.6						< 2.5	< 2.5	19000	-
Acenaphthylene	208-96-8		< 2.3	**0.75 j**	< 2.3	< 2.6						< 2.5	< 2.5	-	-
Anthracene	120-12-7		< 2.3	**18**	< 2.3	< 2.6						< 2.5	< 2.5	93000	-
Benz(a)anthracene	56-55-3		< 2.3	**11**	< 2.3	< 2.6						< 2.5	< 2.5	2.7	-
Benzo(a)pyrene	50-32-8		< 2.3	**2.9**	< 2.3	< 2.6						< 2.5	< 2.5	0.27	-
Benzo(b)fluoranthene	205-99-2		< 2.3	**5.2**	< 2.3	< 2.6						< 2.5	< 2.5	2.7	-
Benzo(g,h,i)perylene	191-24-2		< 2.3	**0.55 j**	< 2.3	< 2.6						< 2.5	< 2.5	-	-
Benzo(k)fluoranthene	207-08-9		< 2.3	**1.5 j**	< 2.3	< 2.6						< 2.5	< 2.5	27	-
Chrysene	218-01-9		< 2.3	**9.2**	< 2.3	< 2.6						< 2.5	< 2.5	250	-
Dibenz(a,h)anthracene	53-70-3		< 2.3	**0.22 j**	< 2.3	< 2.6						< 2.5	< 2.5	0.27	-
Dibenzofuran	132-64-9		< 2.3	**21**	< 2.3	< 2.6						< 2.5	< 2.5	-	-
Diethyl Phthalate	84-66-2		**0.13 j**	**0.15 j**	< 2.3 U	< 2.6 U						**0.14 j**	**0.16 j**	-	-
Dimethyl Phthalate	131-11-3		< 2.3	< 2.2	< 2.3	< 2.6						< 2.5	**0.63 j**	-	-
Fluoranthene	206-44-0		< 2.3	**70**	**0.091 j**	< 2.6						< 2.5	< 2.5	8900	-
Fluorene	86-73-7		< 2.3	**33**	< 2.3	< 2.6						< 2.5	< 2.5	12000	-
Indeno(1,2,3-cd)pyrene	193-39-5		< 2.3	**0.69 j**	< 2.3	< 2.6						< 2.5	< 2.5	2.7	-
Naphthalene	91-20-3		< 2.3	**18**	< 2.3	< 2.6						< 2.5	**2.5**	23	-
Phenanthrene	85-01-8		< 2.3	**120**	**0.085 j**	< 2.6						< 2.5	**0.1 j**	-	-
Pyrene	129-00-0		< 2.3	**39**	< 2.3	< 2.6						< 2.5	< 2.5	6700	-
Polychlorinated Biphenyls (PCBs) by EPA Method 8082A (mg/kg)															
Aroclor 1016	12674-11-2			< 0.054			< 0.054	< 0.056		< 0.064		< 0.063	< 0.063	-	-
Aroclor 1221	11104-28-2			< 0.11			< 0.11	< 0.12		< 0.13		< 0.13	< 0.13	-	-
Aroclor 1232	11141-16-5			< 0.054			< 0.054	< 0.056		< 0.064		< 0.063	< 0.063	-	-
Aroclor 1242	53469-21-9			< 0.054			< 0.054	< 0.056		< 0.064		< 0.063	< 0.063	-	-
Aroclor 1248	12672-29-6			< 0.054			< 0.054	< 0.056		< 0.064		< 0.063	< 0.063	-	-
Aroclor 1254	11097-69-1			< 0.054			< 0.054	< 0.056		**0.088**		< 0.063	< 0.063	-	-
Aroclor 1260	11096-82-5			< 0.054			< 0.054	< 0.056		< 0.064		< 0.063	< 0.063	-	-
Total PCBs as Aroclors				< 0.11			< 0.11	< 0.12		**0.088**		< 0.13	< 0.13	0.7	-
Asbestos by ALS Laboratory Internal Method ENV004															
Asbestos (total)	1332-21-4						ND								

Notes:

[1] Screening criteria are derived from Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012. Risk Based Decision Making Action Levels are screened among three pathways - Soil Ingestion/Dermal Contact/Inhalation, Volatilization to Outdoor Air, Vapor Intrusion to Buildings

[2] Default Background Concentrations for Metals in Oregon Soils: DEQ, 2002. Memo from Toxicology Workgroup. Default Background Concentration for Metals. October 28. Media = soil

Screening criteria are not considered exceeded when results are equal to or below established regional background levels.

- = Applicable screening criteria for this constituent are not available.

< = Constituent was not detected above the laboratory MDL or MRL (constituent-dependant). Applicable reporting limit provided.

Bold = The analyte was detected above the applicable reporting limit.

Empty cells = Constituent not analyzed.

ft bgs = feet below ground surface

MDL = Method detection limit

MRL = Method reporting limit

mg/kg = micrograms per kilogram

ND = Not detected

ng/kg = nanograms per kilogram

= Detected concentration exceeds one or more sceening criteria.

= Analyte not detected, but MDL exceeds one or more screening criteria.

Laboratory Data Qualifiers:

j = The value reported is below the laboratory reporting limit and should be considered an estimate.

ERM Data Qualifiers:

J = Detected sample result qualified as estimated

J+ = Detected sample result qualified as estimated and biased high

NJ = Estimated value

U = Sample result qualified as nondetected

Table 6
Analytes with Detections above Screening Criteria
Upland Soil
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Constituent of Interest	Site Feature	Location	Sample ID	Sample Date	Sample Depth (ft bgs)	Concentration	Regional Background Levels[1]	Screening Criteria[2]									
								Ingestion, Dermal Contact, and Inhalation						Volatilization to Outdoor		Vapor Intrusion into Buildings	
								Occupational		Construction Worker		Excavation Worker		Occupational		Occupational	
								SL	*EQ*	*SL*	*EQ*	*SL*	*EQ*	*SL*	*EQ*	*SL*	*EQ*
Total Metals by EPA Method 6000/7000 Series (mg/kg)																	
Arsenic	Building 18 Mill O	F18-01	F18-01-0-0.5	9/15/2012	0-0.5	**50.2**	7	1.7	29.5	13	3.9	370		-		-	
	Building 38-Welding / UST	F38-01	F38-01-Soil-5-10	9/7/2012	5-10	**8.2**	7	1.7	4.8	13		370		-		-	
	Building 42 / Chemical Storage	F42-01	F42-01-1.5-2.5	9/7/2012	1.5-2.5	**9.9**	7	1.7	5.8	13		370		-		-	
Lead	Building 22 / Millwright Shop	F21-01	F21-01-0.5-2.0	9/7/2012	0.5-2.0	**1480**	17	800	1.9	800	1.9	800	1.9	-		-	
	Building 38-Welding / UST	F38-01	F38-01-Soil-5-10	9/7/2012	5-10	**3300**	17	800	4.1	800	4.1	800	4.1	-		-	
Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D (mg/kg)																	
Benz(a)anthracene	Building 07 / Spur	F07-01	F07-01-0.5-1.0	9/7/2012	0.5-1.0	**11**	-	2.7	4.1	21		590		-		-	
Benzo(a)pyrene	Building 07 / Spur	F07-01	F07-01-0.5-1.0	9/7/2012	0.5-1.0	**2.9**	-	0.27	10.7	2.1	1.4	59		-		-	
Benzo(b)fluoranthene	Building 07 / Spur	F07-01	F07-01-0.5-1.0	9/7/2012	0.5-1.0	**5.2**	-	2.7	1.9	21		590		-		-	

Notes:

[1] Default Background Concentrations for Metals in Oregon Soils: DEQ, 2002. Memo from Toxicology Workgroup. Default Background Concentration for Metals. October 28. Media = soil

[2] Screening criteria are derived from Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012.

- = Indicates applicable screening criteria for this constituent are not available.

Bold = The analyte was detected above the applicable reporting limit.

EQ = Exceedance quotient

ft bgs = feet below ground surface

mg/kg = milligrams per kilogram

SL = Screening level

= Detected concentration exceeds one or more sceening criteria; screening criteria exceeded are shaded.

Screening Level Exceedance Quotient Key:

= Indicates detected concentration exceeds screening criteria by a factor between 1 and 5.

= Indicates detected concentration exceeds screening criteria by a factor between 5 and 10.

= Indicates detected concentration exceeds screening criteria by a factor above 10.

Table 7

Storm Water and Tailrace Solids Analytical Results
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Site Feature		TEFs	Pipe Tunnel	Clarifier	Pump Stations		Tailraces				Most Conservative Screening Criteria[1]	Regional Background Levels[2]
Location			F53-01	F55-01	PS1-01	PS2-01	TR1-01	TR2-02	TR2-02/03 (composite)	TRH-01		
Sample ID			F53-01-0-0.5-091412	F55-01-0-0.5-091412	PS1-01-0-0.5-091412	PS2-01-Shallow	TR1-01-0-0.5-091512	TR2-02-DEEP	TR2-SHALLOW	TRH-01-0-0.5		
Sample Date			9/14/12	9/14/12	9/14/12	9/8/12	9/15/12	9/8/12	9/8/12	9/15/12		
Sample Depth (ft bgs)			0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.5-1.0	0-0.5	0-0.5		
Constituent	**CAS Number**											
Total Metals by EPA Method 6000/7000 Series (mg/kg)												
Arsenic	7440-38-2		**6.9**	**3.8**	**1.7**	**3.6**	**17.9**	**5.9**	**7.6**	**2**	1.7	7.0
Cadmium	7440-43-9		**1.28**	**0.81**	**0.6**	**0.39**	**7.5**	**0.61**	**1.4**	**0.22**	150	1
Chromium	7440-47-3		**36.1**	**22.9**	**59.2**	**19.9 J+**	**175**	**42.3 J+**	**31 J+**	**22.2**	-	42
Copper	7440-50-8		**210**	**227**	**245**	**105**	**348**	**114**	**190**	**99.6**	12000	36
Lead	7439-92-1		**54.9**	**26.3**	**159**	**31.2**	**717**	**62.8**	**57.6**	**28.1**	800	17
Mercury	7439-97-6			**0.9**			**0.47**	**1.43**	**2.2**	**0.08**	93	0.07
Nickel	7440-02-0		**38**	**21.5**	**69.2**	**22.5**	**44.8**	**39**	**33.8**	**21.7**	6100	38
Zinc	7440-66-6		**937**	**476**	**349**	**374**	**360**	**279**	**332**	**147**	-	86
Total Petroleum Hydrocarbons (TPH) by NW Methods (mg/kg)												
Gasoline Range Organics	GRO		**75 NJ**	**180 NJ**	**50 NJ**	**120 NJ**	< 34	**23 NJ**	**55 NJ**	**19 NJ**	13000	-
Diesel Range Organics	DRO		**4200 NJ**	**6900 NJ**	**8100 NJ**	**2300 NJ**	**950 NJ**	**990 NJ**	**2000 NJ**	**2000 NJ**	23000	-
Oil Range Organics	RRO		**14000 NJ**	**15000 NJ**	**17000 NJ**	**12000 NJ**	**4200 NJ**	**6400 NJ**	**9100 NJ**	**5200 NJ**	40000	-
Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D (mg/kg): Detected Compounds Only												
1,4-Dichlorobenzene	106-46-7		< 1.7	< 3.2	< 3.4	**0.31 j**	< 1.2	< 4.8	< 12	< 0.54	17	-
2-Methylnaphthalene	91-57-6		< 1.7	< 3.2	< 3.4	**1.4 j**	< 1.2	< 4.8	< 12	< 0.54	-	-
4-Methylphenol	106-44-5		< 1.7	< 3.2	< 3.4	**3.3**	< 1.2	< 4.8	< 12	< 0.54	-	-
Acenaphthene	83-32-9		< 1.7	< 3.2	< 3.4	**0.4 j**	< 1.2	**0.34 j**	< 12	< 0.54	19000	-
Aniline	62-53-3		< 5.1	< 9.6	< 11	< 9.6	< 3.6	**3.5 j**	**19 j**	< 1.7	-	-
Anthracene	120-12-7		< 1.7	< 3.2	< 3.4	< 3.2	< 1.2	**0.37 j**	< 12	< 0.54	93000	-
Benz(a)anthracene	56-55-3		< 1.7	< 3.2	< 3.4	< 3.2	< 1.2	**0.32 j**	< 12	< 0.54	2.7	-
Benzo(a)pyrene	50-32-8		< 1.7	< 3.2	< 3.4	< 3.2	< 1.2	**0.46 j**	< 12	< 0.54	0.27	-
Benzo(b)fluoranthene	205-99-2		< 1.7	< 3.2	< 3.4	< 3.2	< 1.2	**0.94 j**	< 12	< 0.54	2.7	-
Bis(2-ethylhexyl) Phthalate	117-81-7		**7.1**	**15**	**19**	**56**	**1.6**	**44**	**4.6 j**	**4.4**	150	-
Butyl Benzyl Phthalate	85-68-7		< 1.7	< 3.2	< 3.4	**0.5 j**	< 1.2	< 4.8	< 12	< 0.54	-	-
Chrysene	218-01-9		< 1.7	< 3.2	< 3.4	< 3.2	< 1.2	**0.23 j**	< 12	< 0.54	250	-
Dibenzofuran	132-64-9		< 1.7	< 3.2	< 3.4	**0.26 j**	< 1.2	< 4.8	< 12	< 0.54	-	-
Diethyl Phthalate	84-66-2		< 1.7	< 3.2	< 3.4	**0.65 j**	< 1.2	**0.27 j**	< 12	< 0.54	-	-
Dimethyl Phthalate	131-11-3		< 1.7	< 3.2	< 3.4	< 3.2	< 1.2	< 4.8	**0.59 j**	< 0.54	-	-
Di-n-butyl Phthalate	84-74-2		< 1.7	< 3.2	< 3.4	**0.51 j**	< 1.2	< 4.8	< 12	< 0.54	-	-
Fluoranthene	206-44-0		< 1.7	< 3.2	< 3.4	**0.26 j**	< 1.2	**1.6 j**	< 12	< 0.54	8900	-
Fluorene	86-73-7		< 1.7	< 3.2	< 3.4	**0.34 j**	< 1.2	**0.33 j**	< 12	< 0.54	12000	-
Naphthalene	91-20-3		< 1.7	< 3.2	< 3.4	**3.9**	< 1.2	< 4.8	< 12	< 0.54	23	-
Phenanthrene	85-01-8		< 1.7	< 3.2	< 3.4	**0.7 j**	< 1.2	**1.3 j**	< 12	< 0.54	-	-
Pyrene	129-00-0		< 1.7	< 3.2	< 3.4	**0.25 j**	< 1.2	**1.5 j**	< 12	< 0.54	6700	-
Polychlorinated Biphenyls (PCBs) by EPA Method 8082A (mg/kg)												
Aroclor 1016	12674-11-2		< 0.34	< 0.64	< 0.23	< 0.081	< 0.24	< 0.12	< 0.29	< 0.11	-	-
Aroclor 1221	11104-28-2		< 0.68	< 1.3	< 0.45	< 0.17	< 0.48	< 0.24	< 0.57	< 0.22	-	-
Aroclor 1232	11141-16-5		< 0.34	< 0.64	< 0.23	< 0.081	< 0.24	< 0.12	< 0.29	< 0.11	-	-
Aroclor 1242	53469-21-9		< 0.34	< 0.64	< 0.23	**0.49**	< 0.24	< 0.12	< 0.29	< 0.11	-	-
Aroclor 1248	12672-29-6		**2.9**	< 0.64	**0.37**	< 0.081	< 0.24	< 0.12	< 0.29	< 0.11	-	-
Aroclor 1254	11097-69-1		< 0.34	< 0.64	< 0.23	**0.31**	< 0.24	< 0.12	< 0.29	< 0.11	-	-
Aroclor 1260	11096-82-5		< 0.34	< 0.64	< 0.23	**0.088**	< 0.24	< 0.12	< 0.29	< 0.11	-	-
Total PCBs as Aroclors			**2.9**	< 1.3	**0.37**	**0.888**	< 0.48	< 0.24	< 0.57	< 0.22	0.70	-
Dioxins and Furans by EPA Method 8290A (ng/kg)												
2378-TCDD	1746-01-6	1	< 3.38 U	< 6.41	< 2.24	< 0.804	< 2.39	< 1.21 U	< 2.82 U	< 1.08	15.0	-
12378-PeCDD	40321-76-4	1	**3.66 j**	< 32.1 U	< 11.2	< 4.02	**3.18 j**	**2.09 j**	**8.72 j**	**0.417 j**	-	-
123478-HxCDD	39227-28-6	0.1	**9.37 j**	< 32.1 U	< 11.2	< 4.02	**6.16 j**	**2.27 j**	**9.8 j**	< 5.39 U	-	-
123678-HxCDD	57653-85-7	0.1	**54.3**	< 32.1 U	< 11.2 U	< 4.02 U	**65.2**	**36.3**	**140**	**4.81 j**	-	-
123789-HxCDD	19408-74-3	0.1	**22.1**	**11.8 j**	**4.18 j**	**2.38 j**	**21.8**	**9.51**	**17.3**	< 5.39 U	-	-
1234678-HpCDD	35822-46-9	0.01	**1160**	**1230**	**580 J**	**38.7**	**1340**	**1230**	**2800**	**112**	-	-
OCDD	3268-87-9	0.0003	**12200**	**10200 J**	**4160 J**	**374**	**12400 J**	**18900 eJ**	**48100 eJ**	**1810**	-	-
2378-TCDF	51207-31-9	0.1	**7.2**	**4.14 j**	**5.08**	**3.84**	**6.87**	**8.09**	**9.33**	< 1.08 U	-	-
12378-PeCDF	57117-41-6	0.03	**9.87 j**	< 32.1 U	< 11.2	< 4.02	**6.6 j**	**1.52 j**	**4.75 j**	**1.57 j**	-	-
23478-PeCDF	57117-31-4	0.3	**46.2**	< 32.1 U	< 11.2	< 4.02	**7.71 j**	**2.02 j**	**4.68 j**	**1.21 j**	-	-
123478-HxCDF	70648-26-9	0.1	**211**	**8.42 j**	**2.08 j**	**3.05 j**	**24.7**	**8.53**	**17.1**	**7.22**	-	-
123678-HxCDF	57117-44-9	0.1	**84.4**	< 32.1 U	< 11.2 U	**1.28 j**	**12.7**	< 6.05 U	**8.85 j**	**2.01 j**	-	-
123789-HxCDF	72918-21-9	0.1	< 16.9	< 32.1	< 11.2	< 4.02	< 12	< 6.05	< 14.1	< 5.39 U	-	-

Site Feature		TEFs	Pipe Tunnel	Clarifier	Pump Stations		Tailraces				Most Conservative Screening Criteria[1]	Regional Background Levels[2]
Location			F53-01	F55-01	PS1-01	PS2-01	TR1-01	TR2-02	TR2-02/03 (composite)	TRH-01		
Sample ID			F53-01-0-0.5-091412	F55-01-0-0.5-091412	PS1-01-0-0.5-091412	PS2-01-Shallow	TR1-01-0-0.5-091512	TR2-02-DEEP	TR2-SHALLOW	TRH-01-0-0.5		
Sample Date			9/14/12	9/14/12	9/14/12	9/8/12	9/15/12	9/8/12	9/8/12	9/15/12		
Sample Depth (ft bgs)			0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.5-1.0	0-0.5	0-0.5		
Constituent	**CAS Number**											
234678-HxCDF	60851-34-5	0.1	**60.1**	< 32.1 U	< 11.2 U	**1.3 j**	**15.3**	**6.49**	**20.6**	**3 j**	-	-
1234678-HpCDF	67562-39-4	0.01	**280**	**78.7 J**	**37.6 J**	**8.39**	**255 J**	**99.9**	**300**	**36.9**	-	-
1234789-HpCDF	55673-89-7	0.01	**63**	< 32.1	< 11.2	**1.85 j**	**7.93 j**	**6.08**	< 14.1 U	**2.91 j**	-	-
OCDF	39001-02-0	0.0003	**495**	**163**	**162**	**13.7**	**337**	**567**	**757**	**63.6**	-	-
Total TCDD	41903-57-5		**0.957 j**	< 6.41	**1.94 j**	< 0.804	**1.66 j**	**36.9**	**75.8**	< 1.08	-	-
Total PeCDD	36088-22-9		**11.3 j**	**4.27 j**	**2.72 j**	< 4.02	**21**	**43.3**	**69.1**	**0.749 j**	-	-
Total HxCDD	34465-46-8		**246**	**205**	**65.7**	**14.5**	**343**	**284**	**522**	**21.4**	-	-
Total HpCDD	37871-00-4		**2290**	**2370**	**1080**	**82.1**	**3080**	**3290**	**5750**	**227**	-	-
Total TCDF	30402-14-3		**113**	**10.1**	**6.63**	**7.02**	**28.5**	**22.6**	**24.7**	**2.15**	-	-
Total PeCDF	30402-15-4		**436**	**32.9**	**2.16 j**	**5.32**	**124**	**43.2**	**139**	**13.2**	-	-
Total HxCDF	55684-94-1		**905**	**146**	**30.8**	**17**	**447**	**192**	**789**	**109**	-	-
Total HpCDF	38998-75-3		**749**	**230**	**98.4**	**22.6**	**699**	**498**	**1170**	**134**	-	-
Calculated TEQ (ND=0)[3]			**81.5**	**18.6**	**8.61**	**1.79**	**40.8**	**29.1**	**78.2**	**4.61**	15.0	-
Calculated TEQ (ND=1/2 DL)[3]			**84.0**	**51.4**	**20.0**	**5.47**	**42.6**	**30.3**	**80.4**	**6.01**	15.0	-
Asbestos by ALS Laboratory Internal Method ENV004												
Asbestos (total)	1332-21-4		ND	ND	ND	ND	ND	ND	ND	ND	-	-

Notes:

[1] Screening criteria are derived from Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012. Risk Based Decision Making Action Levels are screened among three pathways - Soil Ingestion/Dermal Contact/Inhalation, Volatilization to Outdoor Air, Vapor Intrusion to Buildings

[2] Default Background Concentrations for Metals in Oregon Soils: DEQ, 2002. Memo from Toxicology Workgroup. Default Background Concentration for Metals. October 28. Media = soil
Screening criteria are not considered exceeded when results are equal to or below established regional background levels.

[3] TEQ = Toxicity Equivalency Quotient to 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD). Only positively identified compounds are included in TEQ calculation.
TEF = Toxicity Equivalency Factors (Van den Berg et al. 2006. The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds, ToxSci Advance Access, 7 July 2006).

- = Applicable screening criteria for this constituent are not available.
< = Constituent was not detected above the laboratory MDL or MRL (constituent-dependant). Applicable reporting limit provided.
Bold = The analyte was detected above the applicable reporting limit.
Empty cells = Constituent not analyzed.
ft bgs = feet below ground surface
MDL = Method detection limit
MRL = Method reporting limit
mg/kg = micrograms per kilogram
ND = Not detected
ng/kg = nanograms per kilogram
= Detected concentration exceeds one or more sceening criteria.
= Analyte not detected, but MDL exceeds one or more screening criteria.

Laboratory Data Qualifiers:
j = The value reported is below the laboratory reporting limit and should be considered an estimate.

ERM Data Qualifiers:
J = Detected sample result qualified as estimated
J+ = Detected sample result qualified as estimated and biased high
NJ = Estimated value
U = Sample result qualified as nondetected

Table 8
Analytes with Detections above Screening Criteria
Storm Water and Tailrace Solids
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Constituent of Interest	Site Feature	Location	Sample ID	Sample Date	Sample Depth (ft bgs)	Concentration	Regional Background Levels[1]	Screening Criteria[2]									
								Ingestion, Dermal Contact, and Inhalation						Volatilization to Outdoor Air		Vapor Intrusion into	
								Occupational		Construction Worker		Excavation Worker		Occupational		Occupational	
								SL	*EQ*	*SL*	*EQ*	*SL*	*EQ*	*SL*	*EQ*	*SL*	*EQ*
Total Metals by EPA Method 6000/7000 Series (mg/kg)																	
Arsenic	Tailraces	TR1-01	TR-01-0-0.5-091512	9/15/2012	0-0.5	**17.9**	7	1.7	10.5	13	1.4	370		-		-	
		TR2-02/03 (composite)	TR2-SHALLOW	9/8/2012	0-0.5	**7.6**	7	1.7	4.5	13		370		-		-	
Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D (mg/kg)																	
Benzo(a)pyrene	Tailraces	TR2-02	TR2-02-DEEP	9/8/2012	Deep	**0.46**		0.27	1.7	2.1		59		-		-	
Polychlorinated Biphenyls (PCBs) by EPA Method 8082A (mg/kg)																	
Total PCBs as Aroclors	Pipe Tunnel	F53-01	F53-01-0-0.5	9/14/2012	0-0.5	**2.9**		0.7	4.1	7.5		210		-		-	
	Pump Stations	PS2-01	PS2-01-Shallow	9/8/2012	0-0.5	**0.888**		0.7	1.3	7.5		210		-		-	
Dioxins and Furans by EPA Method 8290A (ng/kg)																	
Calculated TEQ (ND=0)[3]	Pipe Tunnel	F53-01	F53-01-0-0.5	9/14/2012	0-0.5	**81.50**		15	5.4	150		4200		-		-	
	Clarifier	F55-01	F55-01-0-0.5-091412	9/14/2012	0-0.5	**18.63**		15	1.2	150		4200		-		-	
	Tailraces	TR1-01	TR1-01-0-0.5-091512	9/15/2012	0-0.5	**40.81**		15	2.7	150		4200		-		-	
		TR2-02	TR2-02-DEEP	9/8/2012	0.5-1.0	**29.06**		15	1.9	150		4200		-		-	
		TR2-02/03 (composite)	TR2-SHALLOW	9/8/2012	0-0.5	**78.22**		15	5.2	150		4200		-		-	
Calculated TEQ (ND=1/2 DL)[3]	Pipe Tunnel	F53-01	F53-01-0-0.5	9/14/2012	0-0.5	**84.04**		15	5.6	150		4200		-		-	
	Clarifier	F55-01	F55-01-0-0.5-091412	9/14/2012	0-0.5	**51.37**		15	3.4	150		4200		-		-	
	Pump Stations	PS1-01	PS1-01-0-0.5-091412	9/14/2012	0-0.5	**20.03**		15	1.3	150		4200		-		-	
	Tailraces	TR1-01, TR1-02	TR1-01-0-0.5-091512	9/15/2012	0-0.5	**42.61**		15	2.8	150		4200		-		-	
		TR2-02	TR2-02-DEEP	9/8/2012	0.5-1.0	**30.27**		15	2.0	150		4200		-		-	
		TR2-02/03 (composite)	TR2-SHALLOW	9/8/2012	0-0.5	**80.41**		15	5.4	150		4200		-		-	

Notes:

[1] Default Background Concentrations for Metals in Oregon Soils: DEQ, 2002. Memo from Toxicology Workgroup. Default Background Concentration for Metals. October 28. Media = soil

[2] Screening criteria are derived from Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012.

[3] TEQ = Toxicity Equivalency Quotient to 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD). Only positively identified compounds are included in TEQ calculation. Toxicity equivalency factors provided in previous table.

- = Indicates applicable screening criteria for this constituent are not available.

Bold = The analyte was detected above the applicable reporting limit.

EQ = Exceedance quotient

ft bgs = feet below ground surface

mg/kg = milligrams per kilogram

SL = Screening level

ng/kg = nanograms per kilogram

= Detected concentration exceeds one or more sceening criteria; screening criteria exceeded are shaded.

Screening Level Exceedance Quotient Key:

= Indicates detected concentration exceeds screening criteria by a factor between 1 and 5.

= Indicates detected concentration exceeds screening criteria by a factor between 5 and 10.

= Indicates detected concentration exceeds screening criteria by a factor above 10.

Table 9

Storm Water and Tailrace Water Analytical Results
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Site Feature		Pipe Tunnel		Clarifier	Pump Stations		Tailraces			Most Conservative Screening Criteria[1]
Location		F53-01	F53-01	F55-01	PS1-01	PS2-01	TR1-01	TR2-02[2]	TRH-01	
Sample ID		F53-01-SW-091412	DUP-01-SW-091412	F55-01-SW-091412	PS1-01-SW-091412	PS2-01-SW-090812	TR1-01-SW-091412	TR2-01-SW-091412	TRH-01-SW-091412	
Sample Date		9/14/12	9/14/12	9/14/12	9/14/12	9/8/12	9/14/12	9/14/12	9/14/12	
Constituent	**CAS Number**									
Total Metals by EPA Method 6000/7000 Series (µg/L)										
Arsenic	7440-38-2	**1.6**	**1.5**	**1.2**	**1.3**	**2**	**1.6**	**3.5**	**0.5**	2.1
Cadmium	7440-43-9	**0.15**	**0.21**	**0.08**	**1.14**	**0.39**	**0.11**	**0.14**	**0.14**	1.1
Chromium	7440-47-3	**1.4**	**1.3**	**1.6**	**1**	**4.2**	**0.5**	**4.9**	**0.6**	-
Copper	7440-50-8	**22.2**	**20.8**	**9**	**21.2**	**84.6**	**7.4**	**37**	**41**	12
Lead	7439-92-1	**4.97**	**9.13**	**1.16**	**1.74**	**7.32**	**1.75**	**1.66**	**2.95**	-
Nickel	7440-02-0	**23.2**	**21.5**	**24.4**	**15.9**	**37.1**	**6**	**38.7**	**6.9**	140
Zinc	7440-66-6	**415**	**833**	**26.7**	**36.7**	**119**	**15.8**	**86**	**27.7**	110
Hexavalent Chromium	18540-29-9	< 2	< 2	< 2	< 2		< 2	< 2	< 2	-
Mercury	7439-97-6			< 0.2			< 0.2		< 0.2	0.012
Total Petroleum Hydrocarbons (TPH) by NW Methods (µg/L)										
Gasoline Range Organics	GRO	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	-
Diesel Range Organics	DRO	**280 NJ**	**500 NJ**	**460 NJ**	**410 NJ**	**60000 NJ**	< 260	**6100 NJ**	< 260	-
Oil Range Organics	RRO	< 490	**830 NJ**	< 530	< 500	**130000 NJ**	< 510	**3300 NJ**	< 520	-
Volatile Organic Compounds (VOCs) by EPA Method 8260C (µg/L): Detected Compounds Only										
1,2,4-Trimethylbenzene	95-63-6	< 2	< 2	< 2	< 2	**11**	< 2	< 2	< 2	-
1,3,5-Trimethylbenzene	108-67-8	< 2	< 2	< 2	< 2	**3.1**	< 2	< 2	< 2	-
Chloroform	67-66-3	**0.97**	**0.98**	< 0.5	**1.2**	**0.68**	**1.4**	< 0.5	< 0.5	74
Ethylbenzene	100-41-4	< 0.5	< 0.5	< 0.5	< 0.5	**1.5**	< 0.5	< 0.5	< 0.5	160
m,p-Xylenes	179601-23-1	< 0.5	< 0.5	< 0.5	< 0.5	**9.4**	< 0.5	< 0.5	< 0.5	-
Naphthalene	91-20-3	< 2	< 2	< 2	< 2	**7.4**	< 2	< 2	< 2	-
o-Xylene	95-47-6	< 0.5	< 0.5	< 0.5	< 0.5	**6**	< 0.5	< 0.5	< 0.5	-
Toluene	108-88-3	< 0.5	< 0.5	< 0.5	< 0.5	**1.3**	< 0.5	< 0.5	< 0.5	720
Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D (µg/L): Detected Compounds Only										
No Compounds Detected										

Notes:

[1] Criteria are derived from the Aquatic Life Criteria Tables 20 and 33A and Human Health Criteria Table 40, approved by EPA on 17 October 2011.

[2] Sample labeled as "TR2-01" on COC and in laboratory reports.

- = Applicable screening criteria for this constituent are not available.

< = Constituent was not detected above the laboratory MDL or MRL (constituent-dependant). Applicable reporting limit provided.

Bold = The analyte was detected above the applicable reporting limit.

Empty cells = Constituent not analyzed.

MDL = Method detection limit

MRL = Method reporting limit

µg/L = Micrograms per liter

= Detected concentration exceeds one or more sceening criteria.

= Analyte not detected, but MDL exceeds one or more screening criteria.

ERM Data Qualifiers:

NJ = Estimated value

Table 10
Analytes with Detections above Screening Criteria
Storm Water and Tailrace Water
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Constituent of Interest	Site Feature	Location	Sample ID	Sample Date	Concentration	Screening Criteria[1] (µg/L)							
						Human Health (Consumption)				Freshwater AWQC			
						Water + Organism		Organism Only		Acute		Chronic	
						SL	*EQ*	*SL*	*EQ*	*SL*	*EQ*	*SL*	*EQ*
Total Metals by EPA Method 6000/7000 Series (µg/L)													
Arsenic	Tailraces	TR2-02[2]	TR2-01-SW-091412	9/14/2012	**3.5**	2.1	1.7	2.1	1.7	-		-	
Cadmium	Pump Stations	PS1-01	PS1-01-SW-091412	9/14/2012	**1.14**	-		-		3.9		1.1	1.0
Copper	Pipe Tunnel	F53-01	F53-01-SW-091412	9/14/2012	**22.2**	1300		-		18	1.2	12	1.9
		F53-01	DUP-01-SW-091412	9/14/2012	**20.8**	1300		-		18	1.2	12	1.7
	Pump Stations	PS1-01	PS1-01-SW-091412	9/14/2012	**21.2**	1300		-		18	1.2	12	1.8
		PS2-01	PS2-01-SW-090812	9/8/2012	**84.6**	1300		-		18	4.7	12	7.1
	Tailraces	TR2-01	TR2-01-SW-091412	9/14/2012	**37**	1300		-		18	2.1	12	3.1
		TRH-01	TRH-01-SW-091412	9/14/2012	**41**	1300		-		18	2.3	12	3.4
Zinc	Pipe Tunnel	F53-01	F53-01-SW-091412	9/14/2012	**415**	2100		2600		120	3.5	110	3.8
		F53-01	DUP-01-SW-091412	9/14/2012	**833**	2100		2600		120	6.9	110	7.6
	Pump Stations	PS2-01	PS2-01-SW-090812	9/8/2012	**119**	2100		2600		120		110	1.1

Notes:

[1] Criteria are derived from the Aquatic Life Criteria Tables 20 and 33A and Human Health Criteria Table 40, approved by EPA on 17 October 2011.

[2] Sample labeled as "TR2-01" on COC and in laboratory reports.

- = Indicates applicable screening criteria for this constituent are not available.

Bold = The analyte was detected above the applicable reporting limit.

EQ = Exceedance quotient

µg/L = Micrograms per liter

SL = Screening level

= Detected concentration exceeds one or more sceening criteria; screening criteria exceeded are shaded.

Screening Level Exceedance Quotient Key:

= Indicates detected concentration exceeds screening criteria by a factor between 1 and 5.

= Indicates detected concentration exceeds screening criteria by a factor between 5 and 10.

= Indicates detected concentration exceeds screening criteria by a factor above 10.

Table 11

Groundwater and Seep Analytical Results
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Site Feature		Groundwater		Seep Water			Most Conservative Screening Criteria[1]
		Building 38-Welding/UST	Truck Dump	Building 33 / No. 1 Paper Machine & Bleach Plant		Building 42 / Chemical Storage	
Location		F38-01	TD-01	F33-01	F34-01	F42-03	
Sample ID		F38-01-GW-090712	TD-01-GW-090712	F33-01-SP-091512	F34-01-SP-091512	F42-03-SP-091512	
Sample Date		9/7/12	9/7/12	9/15/12	9/15/12	9/15/12	
Sample Depth (ft bgs)		5-10	3-8	Surface	Surface	Surface	
Constituent	**CAS Number**						
Total Metals by EPA Method 6000/7000 Series (µg/L)							
Arsenic	7440-38-2	**2.3**	**11.6**	**2.9**	**2.7**	**9.7**	5800
Cadmium	7440-43-9	< 0.02	< 0.02	**0.47**	**0.12**	**5**	57000
Chromium	7440-47-3	< 0.2	**0.9**	**10.2**	< 2 U	**35.2**	-
Copper	7440-50-8	**0.9**	**0.4**	**34.8**	**11.3**	**1310**	5000000
Lead	7439-92-1	**4.67**	**0.09**	**40.1**	**8.67**	**283**	-
Nickel	7440-02-0	**1.1**	**6.1**	**30**	< 4 U	**120**	12000000
Zinc	7440-66-6	**1.5**	**2**	**84.5**	**20.4**	**1220**	-
Total Petroleum Hydrocarbons (TPH) by NW Methods (µg/L)							
Gasoline Range Organics	GRO	< 250	< 250	< 250	< 250	< 250	13000
Diesel Range Organics	DRO	< 250	na	< 270	< 250	**8500 NJ**	23000
Oil Range Organics	RRO	< 490	na	**910 NJ**	< 500	**31000 NJ**	40000
Volatile Organic Compounds (VOCs) by EPA Method 8260C (µg/L): Detected Compounds Only							
Carbon Disulfide		< 0.5	< 0.5	< 0.5	< 0.5	**1**	-
Chloroform		< 0.5	< 0.5	< 0.5	**2.2**	< 0.5	720
Ethylbenzene		< 0.5	< 0.5	**2.3**	< 0.5	< 0.5	4400
m,p-Xylenes		< 0.5	< 0.5	**10**	< 0.5	< 0.5	23000
o-Xylene		< 0.5	< 0.5	**2.8**	< 0.5	< 0.5	-
Toluene		< 0.5	< 0.5	**9.4**	**1.1**	**0.93**	210000
Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D (µg/L): Detected Compounds Only							
Bis(2-ethylhexyl) Phthalate	117-81-7		< 9.5	< 10	< 12	**21**	-

Notes:

[1] Screening criteria are derived from Oregon DEQ Risk Based Decision Making for the Remediation of Petroleum Impacted Sites for Occupational and Construction Worker receptors, June 2012.
Risk Based Decision Making Action Levels are screened among three pathways - Volatilization to Outdoor Air, Vapor Intrusion to Buildings, and Groundwater in Excavations

- = Applicable screening criteria for this constituent are not available.

< = Constituent was not detected above the laboratory MDL or MRL (constituent-dependant). Applicable reporting limit provided.

Bold = The analyte was detected above the applicable reporting limit.

na = Not analyzed. Sample volume unavailable due to slow recharge rate.

ft bgs = feet below ground surface

MDL = Method detection limit

MRL = Method reporting limit

µg/L = Micrograms per liter

ERM Data Qualifiers:

NJ = Estimated value

U = Sample result qualified as nondetected

Table 12
Intake Basin Sediment Analytical Results
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Site Feature		TEFs	Intake Basin							Most Conservative Screening Criteria[1]
Location			IB-01		IB-02		IB-03			
Sample ID			IB-01-0-6inch-091412	IB-01-2.5-3.0-091412	IB-02-0-6inch-091412	IB-02-2.5-3.0-091412	IB-03-0-6inch-091412	IB-03-1.5-2-091412	IB-03-3.5-4.0-091412	
Sample Date			9/14/12	9/14/12	9/14/12	9/14/12	9/14/12	9/14/12	9/14/12	
Sample Depth (ft bss)			0-0.5	2.5-3.0	0-0.5	2.5-3.0	0-0.5	1.5-2	2.5-3.0	
Constituent	CAS Number									
Total Metals by EPA Method 6000/7000 Series (mg/kg)										
Arsenic	7440-38-2		**2.4**	**2.8**	**2.4**	**3.2**	**2.8**	**2.1**	**2.7**	7
Cadmium	7440-43-9		**0.12**	**0.18**	**0.1**	**0.21**	**0.12**	**0.11**	**0.17**	1
Chromium	7440-47-3		**24.5**	**31.1**	**22.8**	**33.1**	**26.6**	**21.4**	**29**	-
Copper	7440-50-8		**26.7**	**38.7**	**22**	**42.8**	**28.2**	**21.4**	**36.1**	-
Lead	7439-92-1		**8.78 J**	**10.5**	**5.42**	**11.6**	**6.59**	**5.61**	**10**	17
Nickel	7440-02-0		**23.5**	**26.1**	**23.4**	**26.7**	**24.6**	**23.6**	**24.2**	-
Zinc	7440-66-6		**67.5**	**85.2**	**61.2**	**90.9**	**69.9**	**58.2**	**79.4**	-
Semivolatile Organic Compounds (SVOCs) by EPA Method 8270D (mg/kg): Detected Compounds Only										
No Compounds Detected										
Polychlorinated Biphenyls (PCBs) by EPA Method 8082A (mg/kg)										
Aroclor 1016	12674-11-2		< 0.089	< 0.089	< 0.078	< 0.09	< 0.084	< 0.069	< 0.084	-
Aroclor 1221	11104-28-2		< 0.18	< 0.18	< 0.16	< 0.18	< 0.17	< 0.14	< 0.17	-
Aroclor 1232	11141-16-5		< 0.089	< 0.089	< 0.078	< 0.09	< 0.084	< 0.069	< 0.084	-
Aroclor 1242	53469-21-9		< 0.089	< 0.089	< 0.078	< 0.09	< 0.084	< 0.069	< 0.084	-
Aroclor 1248	12672-29-6		< 0.089	< 0.089	< 0.078	< 0.09	< 0.084	< 0.069	< 0.084	-
Aroclor 1254	11097-69-1		< 0.089	< 0.089	< 0.078	< 0.09	< 0.084	< 0.069	< 0.084	-
Aroclor 1260	11096-82-5		< 0.089	< 0.089	< 0.078	< 0.09	< 0.084	< 0.069	< 0.084	-
Total PCBs as Aroclors			< 0.18	< 0.18	< 0.16	< 0.18	< 0.17	< 0.14	< 0.17	4.80E-05
Dioxins and Furans by EPA Method 8290A (ng/kg)										
2378-TCDD	1746-01-6	1	< 0.898	< 0.885	< 0.773	< 0.914 U	< 0.852	< 0.699	**0.628 j**	0.0011
12378-PeCDD	40321-76-4	1	< 4.49	**0.492 j**	< 3.86	< 4.57 U	< 4.26	< 3.5	< 4.22 U	0.034
123478-HxCDD	39227-28-6	0.1	< 4.49	**0.542 j**	< 3.86	< 4.57 U	< 4.26	< 3.5	< 4.22 U	0.34
123678-HxCDD	57653-85-7	0.1	**1.07 j**	**4.97**	< 3.86	**6.08**	**1.33 j**	**0.751 j**	**8.18**	0.34
123789-HxCDD	19408-74-3	0.1	< 4.49	< 4.42 U	< 3.86	< 4.57 U	< 4.26	**0.486 j**	**3.92 j**	0.34
1234678-HpCDD	35822-46-9	0.01	**19.5**	**46.3**	**14.5**	**76.9**	**21.1**	**17.3**	**70.4**	85
OCDD	3268-87-9	0.0003	**137**	**375 J**	**116**	**665 J**	**161**	**145**	**573**	2800
2378-TCDF	51207-31-9	0.1	< 0.898	**4.04**	< 0.773	**3.98**	< 0.852	< 0.699	**3.57**	0.094
12378-PeCDF	57117-41-6	0.03	< 4.49	< 4.42	< 3.86	**0.44 j**	< 4.26	< 3.5	< 4.22 U	0.31
23478-PeCDF	57117-31-4	0.3	< 4.49	< 4.42	< 3.86	< 4.57	< 4.26	< 3.5	< 4.22 U	0.0037
123478-HxCDF	70648-26-9	0.1	< 4.49	**0.65 j**	< 3.86	**0.987 j**	**0.558 j**	**0.24 j**	< 4.22 U	0.34
123678-HxCDF	57117-44-9	0.1	< 4.49	**0.598 j**	< 3.86	< 0.788 U	**0.25 j**	**0.141 j**	**0.963 j**	0.34
123789-HxCDF	72918-21-9	0.1	< 4.49	< 4.42	< 3.86	< 4.57	< 4.26	< 3.5	< 4.22	0.34
234678-HxCDF	60851-34-5	0.1	< 4.49	**0.615 j**	< 3.86	**0.956 j**	**0.368 j**	< 3.5	**0.941 j**	0.34
1234678-HpCDF	67562-39-4	0.01	< 4.49 U	**5.92**	**2.81 j**	**10.1**	**4.41**	< 3.5 U	< 9.33 U	85
1234789-HpCDF	55673-89-7	0.01	< 4.49	< 4.42	< 3.86	< 4.57	**0.432 j**	< 3.5	< 4.22	85
OCDF	39001-02-0	0.0003	**11.6**	**22.4**	**10.6**	**42.6**	**17.6**	**16.1**	**33.7**	2800
Total TCDD	41903-57-5		**1.22**	**0.89**	**0.782**	< 0.914	**1.3**	< 0.699	**2.85**	-
Total PeCDD	36088-22-9		< 4.49	**0.492 j**	< 3.86	**1.24 j**	< 4.26	**0.308 j**	**4.39**	-
Total HxCDD	34465-46-8		**1.83 j**	**34.5**	< 3.86	**40.6**	**6.46**	**4.53**	**55.6**	-
Total HpCDD	37871-00-4		**36.9**	**99.4**	**29.9**	**167**	**43.9**	**33.3**	**147**	-
Total TCDF	30402-14-3		< 0.898	**8.2**	< 0.773	**12.2**	< 0.852	< 0.699	**6.82**	-
Total PeCDF	30402-15-4		< 4.49	**4.86**	**1.36 j**	**7.74**	**1.41 j**	**0.931 j**	**7.83**	-
Total HxCDF	55684-94-1		**2.48 j**	**13.1**	**1.53 j**	**18.9**	**6.93**	**3.26 j**	**18.6**	-
Total HpCDF	38998-75-3		**7.67**	**20.8**	**8.63**	**36.1**	**15.4**	**7.25**	**22.5**	-
Calculated TEQ (ND=0)[2]			**0.347**	**2.27**	**0.211**	**2.30**	**0.564**	**0.383**	**3.27**	0.0011
Calculated TEQ (ND=1/2 DL)[2]			**5.22**	**3.91**	**4.57**	**6.47**	**4.50**	**3.66**	**6.78**	0.0011

Notes:

[1] Screening criteria are derived from Sediment Bioaccumulation Levels provided in ODEQ Guidance for Assessing Bioaccumulative Chemical of Concern in Sediment, Updated April 3, 2007.

[2] TEQ = Toxicity Equivalency Quotient to 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD). Only positively identified compounds are included in TEQ calculation.

TEF = Toxicity Equivalency Factors (Van den Berg et al. 2006. The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds, ToxSci Advance Access, 7 July 2006).

- = Applicable screening criteria for this constituent are not available.

< = Constituent was not detected above the laboratory MDL or MRL (constituent-dependant). Applicable reporting limit provided.

Bold = The analyte was detected above the applicable reporting limit.

ft bss = feet below sediment surface

MDL = Method detection limit

MRL = Method reporting limit

mg/kg = micrograms per kilogram

ng/kg = nanograms per kilogram

= Detected concentration exceeds one or more sceening criteria.

= Analyte not detected, but MDL exceeds one or more screening criteria.

Laboratory Data Qualifiers:

j = The value reported is below the laboratory reporting limit and should be considered an estimate.

ERM Data Qualifiers:

J = Detected sample result qualified as estimated

U = Sample result qualified as nondetected

Table 13
Analytes with Detections above Screening Criteria
Intake Basin Sediment
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Constituent of Interest	Site Feature	Location	Sample ID	Sample Date	Sample Depth (ft bss)	Concentration	Screening Criteria[1]															
							Birds				Mammals				Fish				Humans				Inorganic Background
							Individual		Population		Individual		Population		Freshwater		Marine		General		Subsistence		Freshwater	
							SL	EQ	SL	EQ	SL	EQ	SL	EQ	SL	EQ	SL	EQ	SL	EQ	SL	EQ	SL	EQ
Dioxins and Furans by EPA Method 8290A (ng/kg)																								
Calculated TEQ (ND=0)[2]	Intake Basin	IB-01	IB-01-0-6inch-091412	9/14/2012	0-0.5	**0.347**	0.7		3.5		0.052	6.7	1.4		0.56		0.56		0.0091	38.1	0.0011	315.1	-	
		IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**2.27**	0.7	3.2	3.5		0.052	43.7	1.4	1.6	0.56	4.1	0.56	4.1	0.0091	250.0	0.0011	2068.1	-	
		IB-02	IB-02-0-6inch-091412	9/14/2012	0-0.5	**0.211**	0.7		3.5		0.052	4.1	1.4		0.56		0.56		0.0091	23.2	0.0011	191.9	-	
		IB-02	IB-02-2.5-3.0-091412	9/14/2012	2.5-3.0	**2.30**	0.7	3.3	3.5		0.052	44.1	1.4	1.6	0.56	4.1	0.56	4.1	0.0091	252.3	0.0011	2087.1	-	
		IB-03	IB-03-0-6inch-091412	9/14/2012	0-0.5	**0.564**	0.7		3.5		0.052	10.8	1.4		0.56	1.0	0.56	1.0	0.0091	61.9	0.0011	512.4	-	
		IB-03	IB-03-1.5-2-091412	9/14/2012	1.5-2	**0.383**	0.7		3.5		0.052	7.4	1.4		0.56		0.56		0.0091	42.1	0.0011	348.3	-	
		IB-03	IB-03-3.5-4.0-091412	9/14/2012	2.5-3.0	**3.27**	0.7	4.7	3.5		0.052	62.9	1.4	2.3	0.56	5.8	0.56	5.8	0.0091	359.5	0.0011	2974.0	-	
Calculated TEQ (ND=1/2 DL)[2]	Intake Basin	IB-01	IB-01-0-6inch-091412	9/14/2012	0-0.5	**5.22**	0.7	7.5	3.5	1.5	0.052	100.4	1.4	3.7	0.56	9.3	0.56	9.3	0.0091	573.4	0.0011	4743.8	-	
		IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**3.91**	0.7	5.6	3.5	1.1	0.052	75.2	1.4	2.8	0.56	7.0	0.56	7.0	0.0091	429.8	0.0011	3555.3	-	
		IB-02	IB-02-0-6inch-091412	9/14/2012	0-0.5	**4.57**	0.7	6.5	3.5	1.3	0.052	88.0	1.4	3.3	0.56	8.2	0.56	8.2	0.0091	502.6	0.0011	4157.7	-	
		IB-02	IB-02-2.5-3.0-091412	9/14/2012	2.5-3.0	**6.47**	0.7	9.2	3.5	1.8	0.052	124.4	1.4	4.6	0.56	11.6	0.56	11.6	0.0091	711.1	0.0011	5882.8	-	
		IB-03	IB-03-0-6inch-091412	9/14/2012	0-0.5	**4.50**	0.7	6.4	3.5	1.3	0.052	86.6	1.4	3.2	0.56	8.0	0.56	8.0	0.0091	495.0	0.0011	4094.6	-	
		IB-03	IB-03-1.5-2-091412	9/14/2012	1.5-2	**3.66**	0.7	5.2	3.5	1.0	0.052	70.3	1.4	2.6	0.56	6.5	0.56	6.5	0.0091	401.7	0.0011	3322.8	-	
		IB-03	IB-03-3.5-4.0-091412	9/14/2012	2.5-3.0	**6.78**	0.7	9.7	3.5	1.9	0.052	130.4	1.4	4.8	0.56	12.1	0.56	12.1	0.0091	744.9	0.0011	6162.2	-	
2378-TCDD	Intake Basin	IB-03	IB-03-3.5-4.0-091412	9/14/2012	2.5-3.0	**0.628**	0.7		3.5		0.052	12.1	1.4		0.56	1.1	0.56	1.1	0.0091	69.0	0.0011	570.9	-	
12378-PeCDD	Intake Basin	IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**0.492**	21		110		1.5		42		17		17		0.27	1.8	0.034	14.5	-	
123478-HxCDD	Intake Basin	IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**0.542**	420		2100		15		420		34		34		2.7		0.34	1.6	-	
123678-HxCDD	Intake Basin	IB-01	IB-01-0-6inch-091412	9/14/2012	0-0.5	**1.07**	2100		11000		15		420		1700		1700		2.7		0.34	3.1	-	
		IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**4.97**	2100		11000		15		420		1700		1700		2.7	1.8	0.34	14.6	-	
		IB-02	IB-02-2.5-3.0-091412	9/14/2012	2.5-3.0	**6.08**	2100		11000		15		420		1700		1700		2.7	2.3	0.34	17.9	-	
		IB-03	IB-03-0-6inch-091412	9/14/2012	0-0.5	**1.33**	2100		11000		15		420		1700		1700		2.7		0.34	3.9	-	
		IB-03	IB-03-1.5-2-091412	9/14/2012	1.5-2	**0.751**	2100		11000		15		420		1700		1700		2.7		0.34	2.2	-	
		IB-03	IB-03-3.5-4.0-091412	9/14/2012	2.5-3.0	**8.18**	2100		11000		15		420		1700		1700		2.7	3.0	0.34	24.1	-	
123789-HxCDD	Intake Basin	IB-03	IB-03-1.5-2-091412	9/14/2012	1.5-2	**0.486**	210		1100		15		420		1700		1700		2.7		0.34	1.4	-	
		IB-03	IB-03-3.5-4.0-091412	9/14/2012	2.5-3.0	**3.92**	210		1100		15		420		1700		1700		2.7	1.5	0.34	11.5	-	
2378-TCDF	Intake Basin	IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**4.04**	5.9		30		4.3		120		95		95		0.77	5.2	0.094	43.0	-	
		IB-02	IB-02-2.5-3.0-091412	9/14/2012	2.5-3.0	**3.98**	5.9		30		4.3		120		95		95		0.77	5.2	0.094	42.3	-	
		IB-03	IB-03-3.5-4.0-091412	9/14/2012	2.5-3.0	**3.57**	5.9		30		4.3		120		95		95		0.77	4.6	0.094	38.0	-	
12378-PeCDF	Intake Basin	IB-02	IB-02-2.5-3.0-091412	9/14/2012	2.5-3.0	**0.440**	59		300		14		400		95		95		2.6		0.31	1.4	-	
123478-HxCDF	Intake Basin	IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**0.650**	210		1100		15		420		170		170		2.7		0.34	1.9	-	
		IB-02	IB-02-2.5-3.0-091412	9/14/2012	2.5-3.0	**0.987**	210		1100		15		420		170		170		2.7		0.34	2.9	-	
		IB-03	IB-03-0-6inch-091412	9/14/2012	0-0.5	**0.558**	210		1100		15		420		170		170		2.7		0.34	1.6	-	
123678-HxCDF	Intake Basin	IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**0.598**	210		1100		15		420		170		170		2.7		0.34	1.8	-	
		IB-03	IB-03-3.5-4.0-091412	9/14/2012	2.5-3.0	**0.963**	210		1100		15		420		170		170		2.7		0.34	2.8	-	
234678-HxCDF	Intake Basin	IB-01	IB-01-2.5-3.0-091412	9/14/2012	2.5-3.0	**0.615**	210		1100		15		420		170		170		2.7		0.34	1.8	-	
		IB-02	IB-02-2.5-3.0-091412	9/14/2012	2.5-3.0	**0.956**	210		1100		15		420		170		170		2.7		0.34	2.8	-	
		IB-03	IB-03-0-6inch-091412	9/14/2012	0-0.5	**0.368**	210		1100		15		420		170		170		2.7		0.34	1.1	-	
		IB-03	IB-03-3.5-4.0-091412	9/14/2012	2.5-3.0	**0.941**	210		1100		15		420		170		170		2.7		0.34	2.8	-	

Notes:

[1] Screening criteria are derived from Sediment Bioaccumulation Levels provided in ODEQ Guidance for Assessing Bioaccumulative Chemical of Concern in Sediment, Updated April 3, 2007

[2] TEQ = Toxicity Equivalency Quotient to 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD). Only positively identified compounds are included in TEQ calculation. Toxicity equivalency factors provided in previous table.

- = Indicates applicable screening criteria for this constituent are not available.

Bold = The analyte was detected above the applicable reporting limit.

EQ = Exceedance quotient

ft bss = feet below sediment surface

SL = Screening level

ng/kg = nanograms per kilogram

= Detected concentration exceeds one or more sceening criteria; screening criteria exceeded are shaded.

Screening Level Exceedance Quotient Key:

= Indicates detected concentration exceeds screening criteria by a factor between 1 and 5.

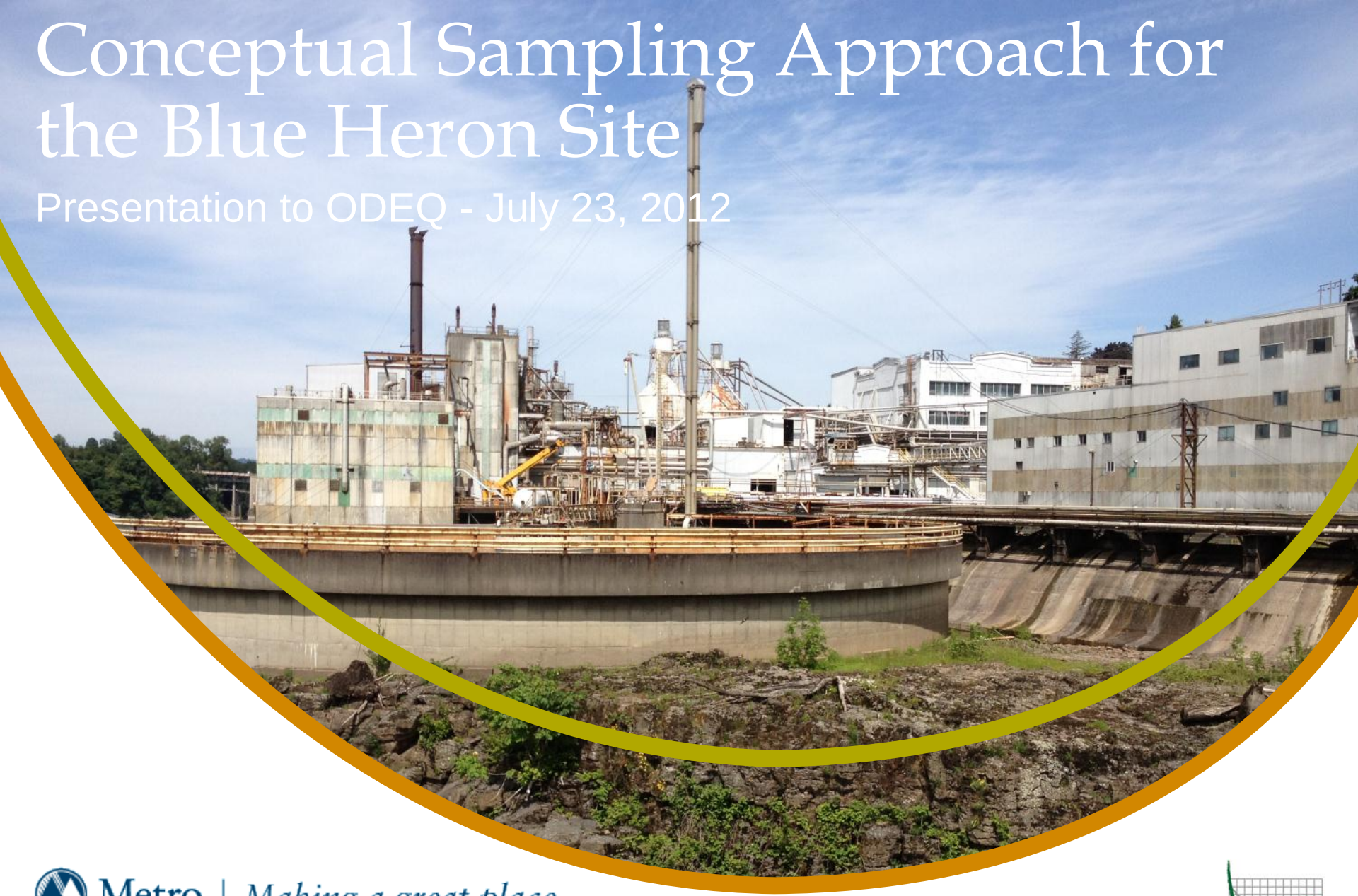
= Indicates detected concentration exceeds screening criteria by a factor between 5 and 10.

= Indicates detected concentration exceeds screening criteria by a factor above 10.

Appendix A
Phase II ESA Conceptual Approach

Conceptual Sampling Approach for the Blue Heron Site

Presentation to ODEQ - July 23, 2012



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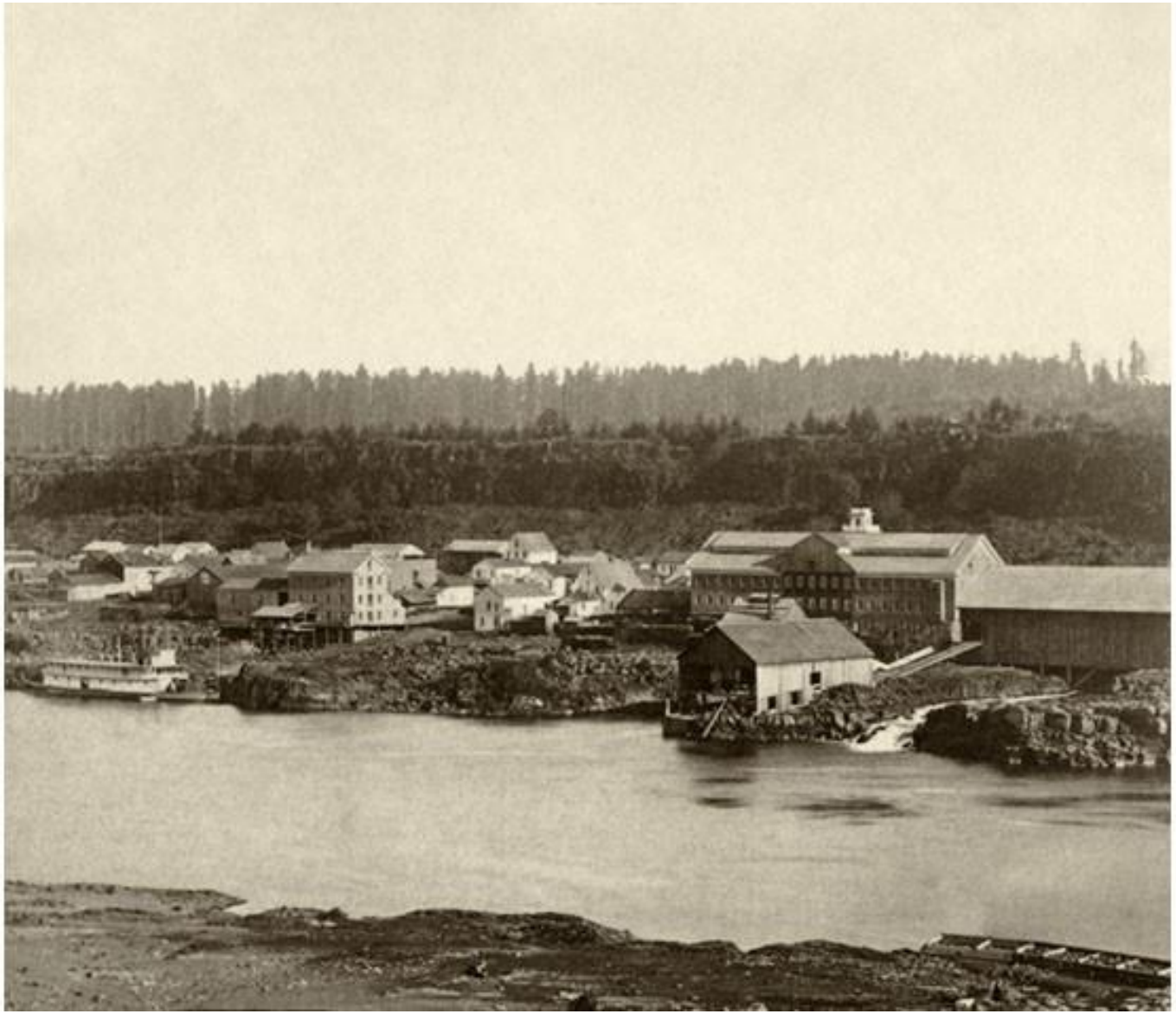
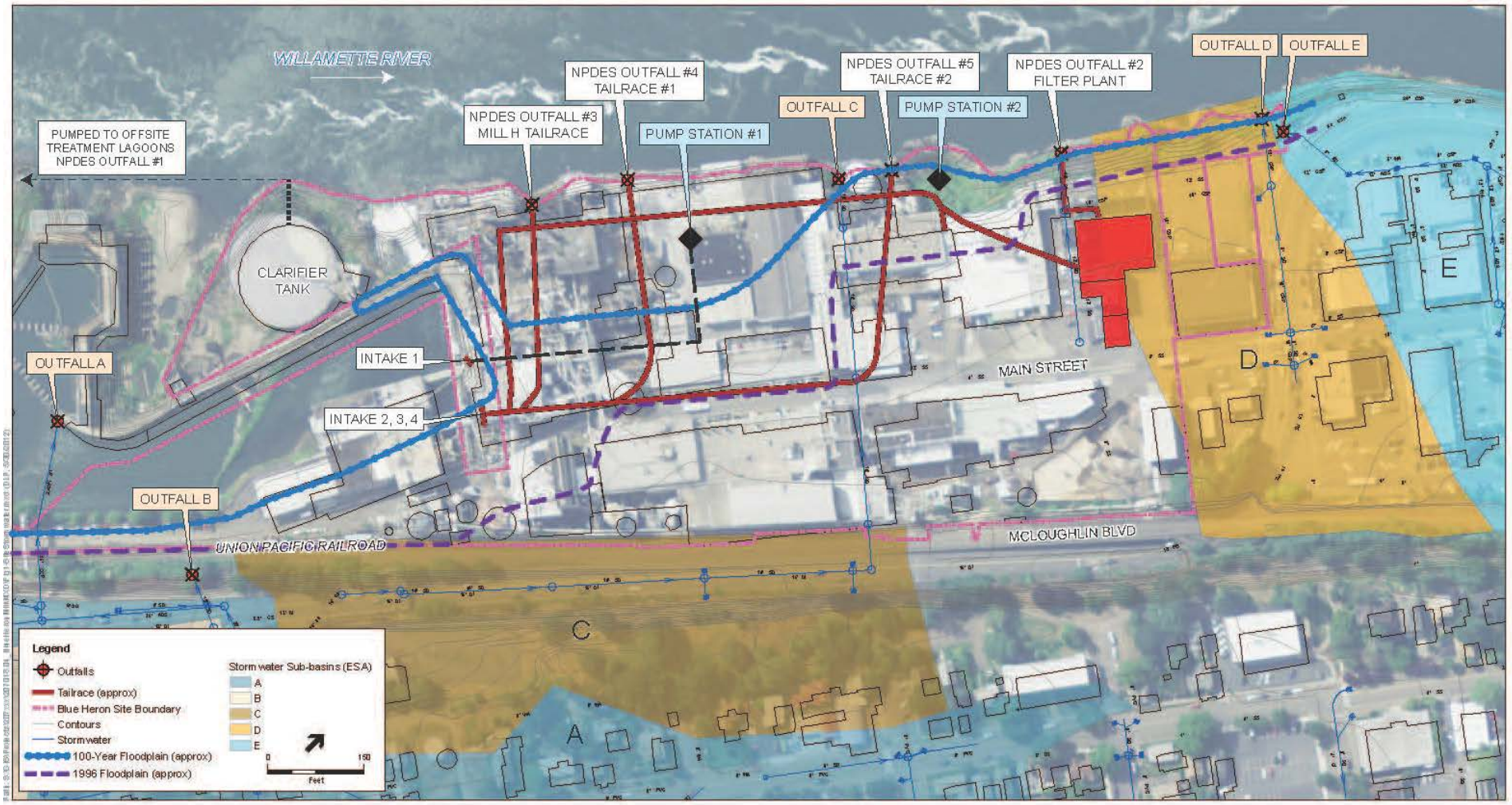
Physical Setting



Water Management at the Site



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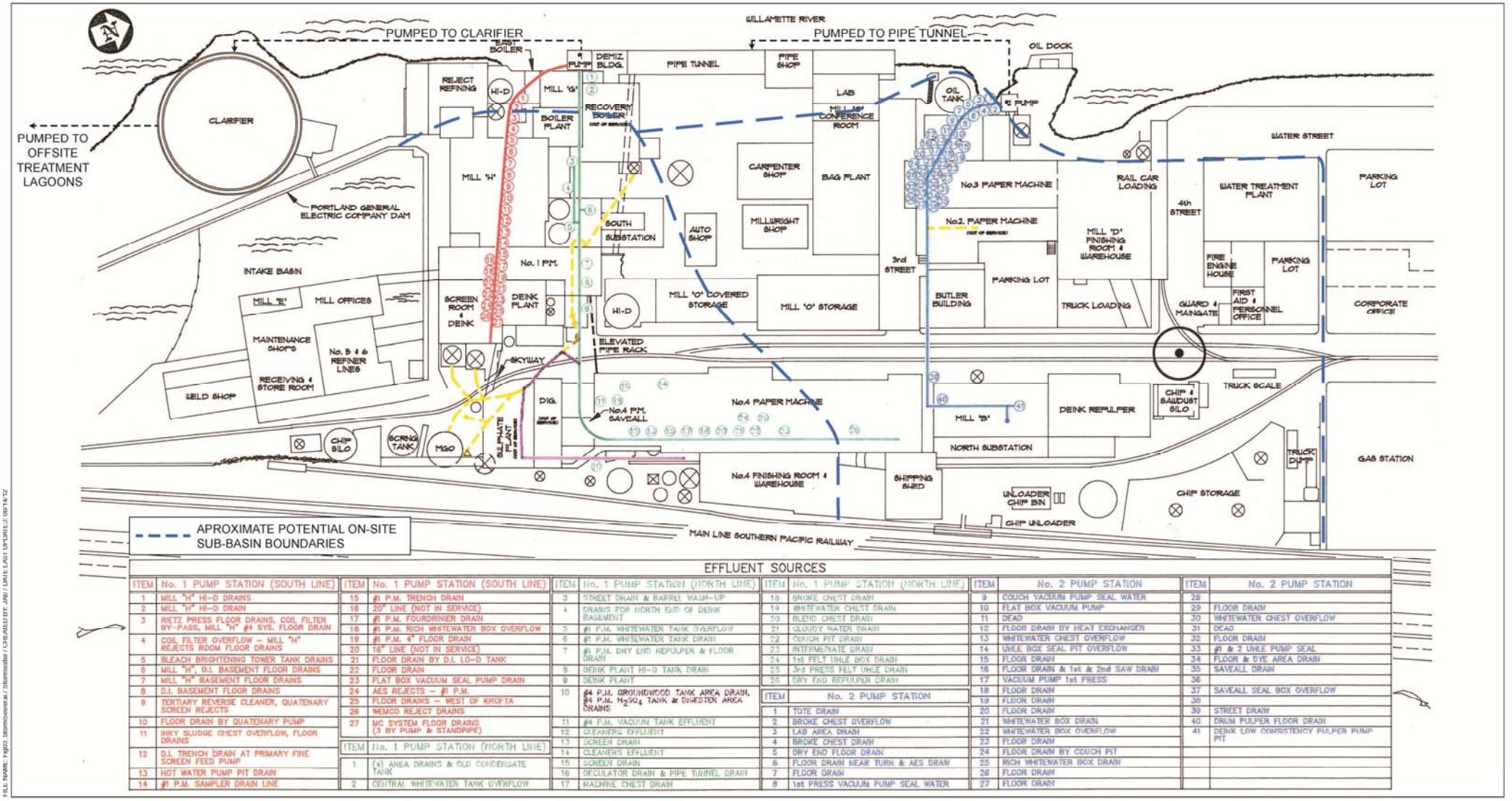
Water Management at the Site (cont)



EFFLUENT SOURCES

ITEM	No. 1 PUMP STATION (SOUTH LINE)
1	MILL "H" HI-D DRAINS
2	MILL "H" HI-D DRAIN
3	RIETZ PRESS FLOOR DRAINS, COIL FILTER BY-PASS, MILL "H" #4 SYS. FLOOR DRAIN
4	COIL FILTER OVERFLOW – MILL "H" REJECTS ROOM FLOOR DRAINS
5	BLEACH BRIGHTENING TOWER TANK DRAINS
6	MILL "H", D.I. BASEMENT FLOOR DRAINS
7	MILL "H" BASEMENT FLOOR DRAINS
8	D.I. BASEMENT FLOOR DRAINS
9	TERTIARY REVERSE CLEANER, QUATENARY SCREEN REJECTS
10	FLOOR DRAIN BY QUATENARY PUMP
11	INKY SLUDGE CHEST OVERFLOW, FLOOR DRAINS
12	D.I. TRENCH DRAIN AT PRIMARY FINE SCREEN FEED PUMP
13	HOT WATER PUMP PIT DRAIN
14	#1 P.M. SAMPLER DRAIN LINE

ITEM	No. 1 PUMP STATION (SOUTH LINE)
15	#1 P.M. TRENCH DRAIN
16	20" LINE (NOT IN SERVICE)
17	#1 P.M. FOURDRINIER DRAIN
18	#1 P.M. RICH WHITEWATER BOX OVERFLOW
19	#1 P.M. 4" FLOOR DRAIN
20	16" LINE (NOT IN SERVICE)
21	FLOOR DRAIN BY D.I. LO-D TANK
22	FLOOR DRAIN
23	FLAT BOX VACUUM SEAL PUMP DRAIN
24	AES REJECTS – #1 P.M.
25	FLOOR DRAINS – WEST OF KROFTA
26	WEMCO REJECT DRAINS
27	MC SYSTEM FLOOR DRAINS (3 BY PUMP & STANDPIPE)

ITEM	No. 1 PUMP STATION (NORTH LINE)
1	(4) AREA DRAINS & OLD CONDENSATE TANK
2	CENTRAL WHITEWATER TANK OVERFLOW

ITEM	No. 1 PUMP STATION (NORTH LINE)
3	STREET DRAIN & BARREL WASH-UP
4	DRAINS FOR NORTH END OF DEINK BASEMENT
5	#1 P.M. WHITEWATER TANK OVERFLOW
6	#1 P.M. WHITEWATER TANK DRAIN
7	#1 P.M. DRY END REPULPER & FLOOR DRAIN
8	DEINK PLANT HI-D TANK DRAIN
9	DEINK PLANT
10	#4 P.M. GROUNDWOOD TANK AREA DRAIN, #4 P.M. H_2SO_4 TANK & DIGESTER AREA DRAINS
11	#4 P.M. VACUUM TANK EFFLUENT
12	CLEANERS EFFLUENT
13	SCREEN DRAIN
14	CLEANERS EFFLUENT
15	SCREEN DRAIN
16	DECULATOR DRAIN & PIPE TUNNEL DRAIN
17	MACHINE CHEST DRAIN

ITEM	No. 1 PUMP STATION (NORTH LINE)
18	BROKE CHEST DRAIN
19	WHITEWATER CHEST DRAIN
20	BLEND CHEST DRAIN
21	CLOUDY WATER DRAIN
22	COUCH PIT DRAIN
23	INTERMEDIATE DRAIN
24	1st FELT UHLE BOX DRAIN
25	3rd PRESS FELT UHLE DRAIN
26	DRY END REPULPER DRAIN

ITEM	No. 2 PUMP STATION
1	TOTE DRAIN
2	BROKE CHEST OVERFLOW
3	LAB AREA DRAIN
4	BROKE CHEST DRAIN
5	DRY END FLOOR DRAIN
6	FLOOR DRAIN NEAR TURN & AES DRAIN
7	FLOOR DRAIN
8	1st PRESS VACUUM PUMP SEAL WATER

ITEM	No. 2 PUMP STATION
9	COUCH VACUUM PUMP SEAL WATER
10	FLAT BOX VACUUM PUMP
11	DEAD
12	FLOOR DRAIN BY HEAT EXCHANGER
13	WHITEWATER CHEST OVERFLOW
14	UHLE BOX SEAL PIT OVERFLOW
15	FLOOR DRAIN
16	FLOOR DRAIN & 1st & 2nd SAW DRAIN
17	VACUUM PUMP 1st PRESS
18	FLOOR DRAIN
19	FLOOR DRAIN
20	FLOOR DRAIN
21	WHITEWATER BOX DRAIN
22	WHITEWATER BOX OVERFLOW
23	FLOOR DRAIN
24	FLOOR DRAIN BY COUCH PIT
25	RICH WHITEWATER BOX DRAIN
26	FLOOR DRAIN
27	FLOOR DRAIN

ITEM	No. 2 PUMP STATION
28	
29	FLOOR DRAIN
30	WHITEWATER CHEST OVERFLOW
31	DEAD
32	FLOOR DRAIN
33	#1 & 2 UHLE PUMP SEAL
34	FLOOR & EYE AREA DRAIN
35	SAVEALL DRAIN
36	
37	SAVEALL SEAL BOX OVERFLOW
38	
39	STREET DRAIN
40	DRUM PULPER FLOOR DRAIN
41	DEINK LOW CONSISTENCY PULPER PUMP PIT

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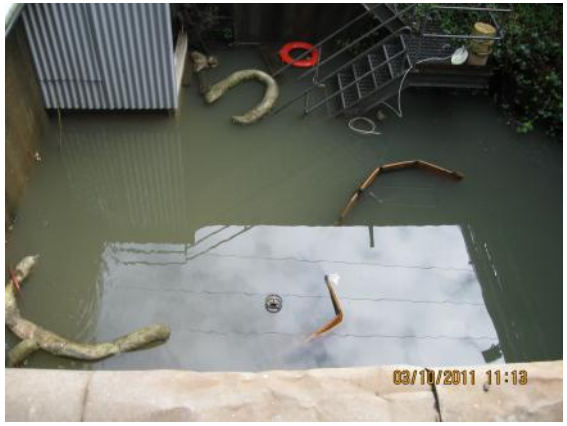
Tailraces


10/19/2011 13:44


03/10/2011 10:53


03/10/2011 11:17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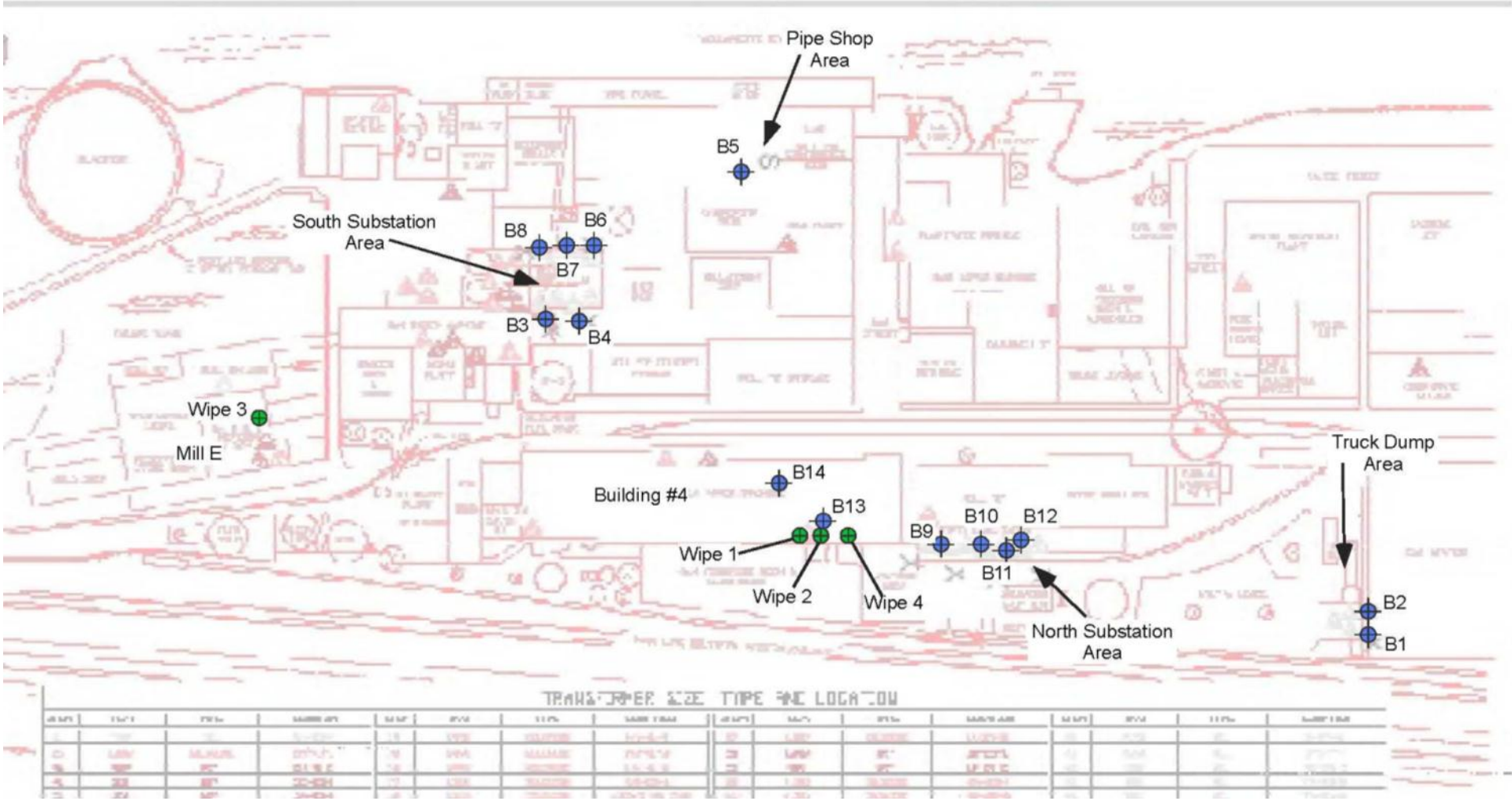
Storm Water System

Seeps

In-Take Basin

Examples of Potential Sources

Previous Investigations – PCB Sampling



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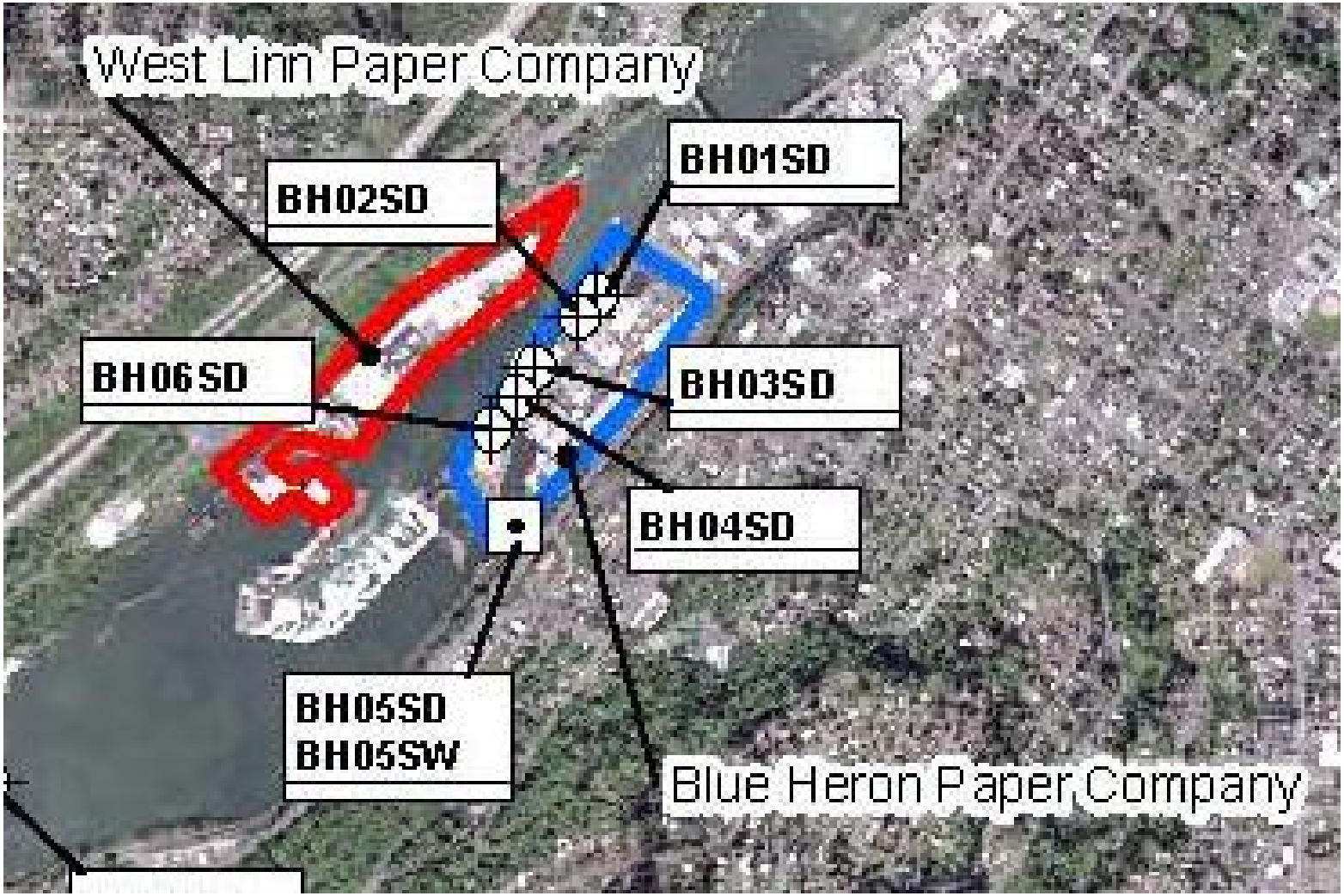
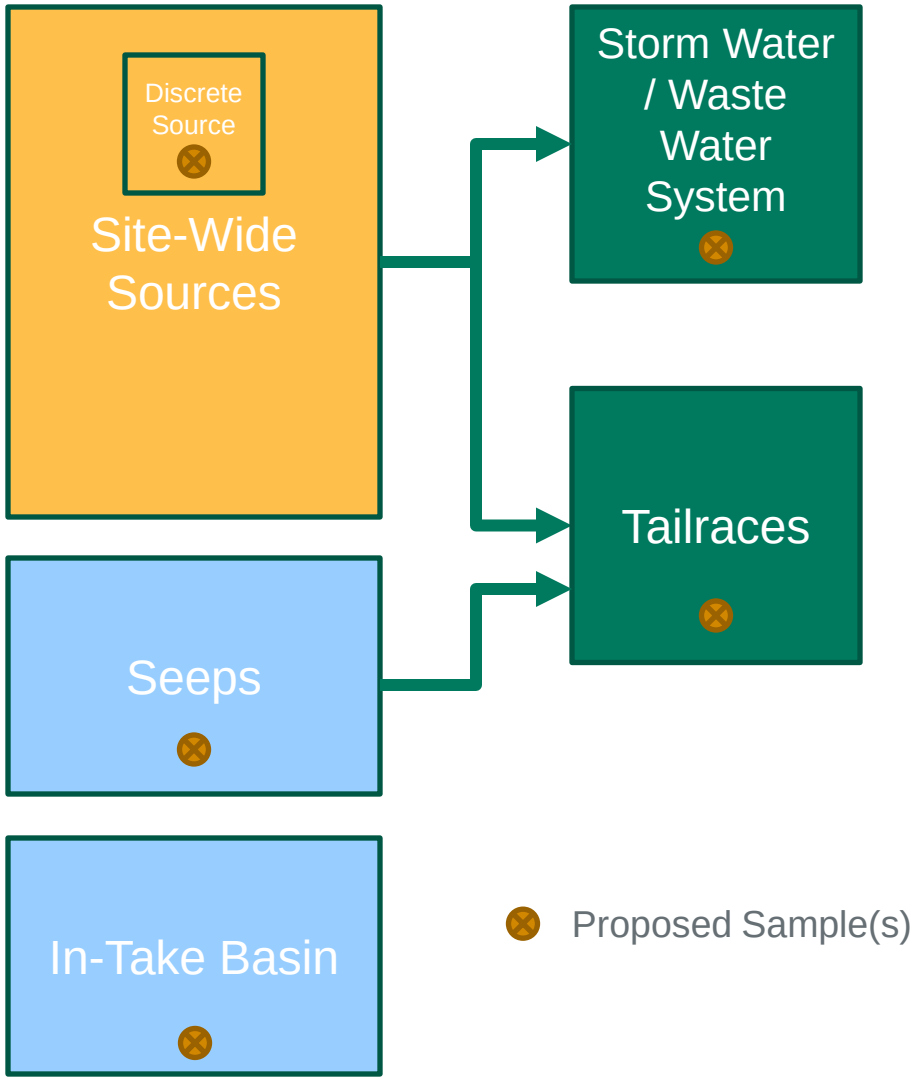
Previous Investigations – EPA SI



Conceptual Sampling Strategy



Handouts

Table 1 – Area by area summary of potential areas of concern

Table 2 – Summary of proposed sampling by media type

Figure 1 – Preliminary sampling locations

Note: Sampling at all proposed sampling locations will likely not be possible (due to lack of media to sample, access issues, etc.)

Figure 1 – Proposed Sampling Locations

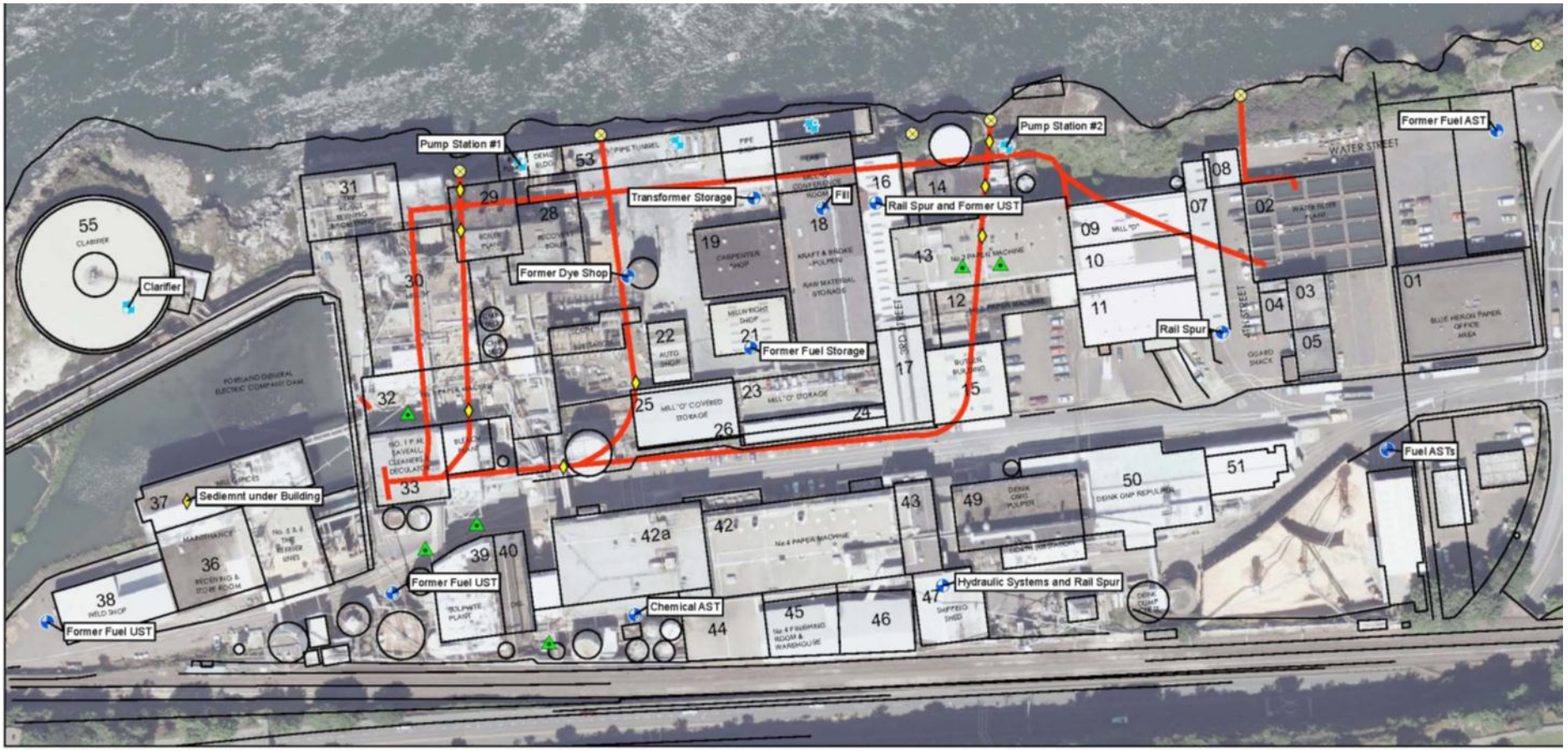


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Table 1
Potential Areas of Environmental Concern
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
1	Blue Heron Paper Office Area	1967 105 x 140	North Parking Lot	Former vehicle repair garage and service station 1943-1956 and Tire Sales in 1959; fuel Tanks and hydraulic systems	Soil, Groundwater	Petroleum hydrocarbons, Solvents, PCBs	3 - Soil/Fill 4 - Groundwater (if present)
			Elevator, mechanical room.	Hydraulic system	Soil, Groundwater	Petroleum hydrocarbons, PCBs	3 - Soil/Fill 4 - Groundwater (if present)
2	Water Filter Plant - Settling Basin and Pump House	1953 37 x 105 PH	Second Floor Transformer (2), filtration system ASTs, Basement Pump room	Electrical systems, Chemical storage, petroleum, Metals, Sodium Bromide, Sodium Hypochlorite, Alum	Storm water, and Sediment	Petroleum hydrocarbons, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces
2a	Fire Hall - Annex	1981 37 x 20	None	N/A	N/A	N/A	N/A
3	Filter Control Building	1965 41 x 65	None	N/A	N/A	N/A	N/A
4	Fire Hall	1981 37 x 45	None	N/A	N/A	N/A	N/A
5	Office and First Aid Building	1965 41 x 47	None	N/A	N/A	N/A	N/A
6	Guard Shack		None	N/A	N/A	N/A	N/A
7	4th Street Building (covered platform south)		Loading platform	Hydraulic systems	Storm water and Sediment	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
8	4th Street Building (covered platform west)		None	N/A	N/A	N/A	N/A
9	Warehouse No. 3 (Rail Car Loading)	1913 40 x 127	Basement	Elevator, 10k gallon Mineral Oil AST NW Exterior, Hydraulic systems	Soil, Groundwater	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
10	No. 3 Finishing Building	1913 54 x 125 (basement)	Basement	Hydraulic systems	Soil, Groundwater	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
11	Mill "B" Warehouse (No. 2 Finishing Building)	1913 54 x 125	None	N/A	N/A	N/A	N/A
12	Number "2" Paper Machine	1913 43 x 185	Basement	Hydraulic systems, Dye, Radiation Source	Soil, Fill, Groundwater, Storm water, and Sediment	Petroleum hydrocarbons, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
13	Number "3" Paper Machine	1913 58 x 185	Basement	Hydraulic systems, Dye, Transformers, Radiation Source	Soil, Fill, Groundwater, Storm water, and Sediment	Petroleum hydrocarbons, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present) 5 - Seeps
14	Sub Station - North	48 x 53	Second Floor	Transformer	Waste water	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
	Sub Station - Southwest	30 x 43	Second Floor	Transformers	Waste water	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
	Sub Station - Southeast	20 x 57	Second Floor	Transformers	Waste water	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces

Table 1
Potential Areas of Environmental Concern
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
	Chemical and Tote Storage		First Floor	Felt Wash, Slimicide, Caustic, Kerosene, Hydraulic systems	Soil, Fill, Groundwater, Storm water, and Sediment	Petroleum hydrocarbons, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
15	Butler Building (equipment. storage)	81 x 83	None	N/A	N/A	N/A	N/A
16	West	46 x 66	Driveway and Rail Spur	Former UST (not previous sampled), Ties and spills	Soil, Fill, Groundwater	Arsenic, Copper, Chromium, SVOCs.	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	West-center	20 x 44					
	East-center	35 x 58					
	East	40 x 55					
17	3rd Street Building (Covered Shipping Area)	1960 50 x 110	Rail Spur	Ties and spills	Soil, Fill, Groundwater	Arsenic, Copper, Chromium, SVOCs.	1 -Storm Water / Waste Water System 2 - Tailraces
18	Mill "O" Lab	1918, 78 x 160, Canopy to west	Basement	Fill and water under building	Soil, Fill, Groundwater	Petroleum hydrocarbons, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Mill "O" Conference Room						
	Mill "O" Craft and Broke Pulper						
	Mill "O" Raw Material Storage	1918 83 x 83					
19	Carpenter Shop	1901 70 x 99	Former Wool Carbonizing Area, West Transformer Storage Area	Acid storage, Dyes, Transformers (exterior)	Soil, Fill, Groundwater	Metals (chromium, copper), Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
20	Pipe Shop	1988 45 x 60	None	N/A	N/A	N/A	N/A
21	Millwright Shop	1962 55 x 80	Main floor, ground surface	Former potential UST (not previous sampled) , and former petroleum ASTs for boiler system.	Soil, Fill, Groundwater	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
22	Auto Shop	1960 40 x 63	Main floor, ground surface	Former boiler system. Former Dye House	Soil, Fill, Groundwater	Metals (chromium, copper)	1 -Storm Water / Waste Water System 2 - Tailraces
23	Mill "B" Storage - West	60 x 240 (Former Oregon City Woolen Mill Buildings)	None	N/A	N/A	N/A	N/A
24	Mill "B" Storage - East			N/A	N/A	N/A	N/A
25	Mill "O" Storage - Interior			N/A	N/A	N/A	N/A
26	Mill "O" Storage - Exterior			N/A	N/A	N/A	N/A
27	South Substation (Electric Center)	1956-1969 30 x 60	Entire substation	Transformers (14)	Soil, Fill, Groundwater	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
28	Recovery Boiler	1956-1969 83 x 120	Second Floor	Boiler	Waste water	Metals	1 -Storm Water / Waste Water System 2 - Tailraces

Table 1
Potential Areas of Environmental Concern
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
29	Mill "G" Boiler Plant	1956-1969 85 x 120	Second Floor	Boilers (6), High density Stock and brightening tower to south, Boiler Chemicals	Waste water	Metals	1 -Storm Water / Waste Water System 2 - Tailraces
30	Mill "H"	1956-1969 100 x 132	Second Floor	Transformer (1) NW corner, Radiation Source	Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
	Mill "H" TMP Area		Second Floor	Hydraulic systems, Hazardous waste storage area, Sodium Hydrosulfite, Sulfuric Acid,	Waste water	Petroleum, PCBs, Solvents, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
	Mill "H" DeInk Area		SE corner roof	Transformer (1)	Storm water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
31	TMP Reject Refining and Screening	1970 70 x 75	W center wall, Tailrace under building	Transformer (1) W center wall, Fill and water under building	Soil, Fill, Groundwater, Sediment, Surface Water	Petroleum, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces
	Refiner Line No. 4	1977 25 x 55					
	Addition	1979 25 x 70					
32	No. 1 Paper Machine	1917 43 x 203	Fill and water under building	Historical uses, Fill and water under building, Radiation Source	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces 5 - Seeps
33	No. 1 Save-All Cleaners & Desiccator (Screen Room & DeInk)	1917 78 x 78	First Floor, Basement	Transformer (2) SE Corner, Elevator, two pulp ASTs to east. Fill and water under building, laurylphosphonic acid, Surfactant, Oil, Filler, Felt Wash, Slimicide, Caustic, Kerosene, Urea.	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, , Metals	1 -Storm Water / Waste Water System 2 - Tailraces
34	Bleach Plant (De-Ink Plant)	1960 54 x 57	First Floor, Basement	Transformer (1) NW Corner, 64k Fuel Oil AST SE corner exterior, Bleach Tower and Caustic Tower to N. ext., Fill and water under building	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
35	Rewind Building	1962 30 x 70 c, 17 x 42 n, 24 x 24 s	First Floor, Basement	Hi Density Stock AST to N exterior. Caustic and bleach ASTs to south. Fill and water under building	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
36	Mill "E" Maintenance Shops		First Floor, Water beneath building	Transformer (1) NE ext. Corner and SW corner. Oil Room NW Corner. Former debarker and chipper for pulp manufacturing. Water from intake basin under building. Hydraulic systems. Former UST (not previous sampled) on south side of Weld Shop. Radiation Source	Soil, Fill, Groundwater, Sediment, Surface Water	Petroleum, PCBs, Solvents, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Mill "E" Receiving and Store Room						
	Mill "E" No. 5 & 6 TMP Refiner Lines	130 x 57					
37	Mill "E" Mill Offices						
38	Weld Shop	54 x 57					
39	Sulfite Plant (Mill C)	65 x 115	Basement	Process waste, Sodium Bisulfite.	Soil, Fill, Groundwater, Waste water	Sulphur, pH,	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present). 5 - Seeps

Table 1
Potential Areas of Environmental Concern
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
40	DIG (Digester Building)	32 x 102	Ground floor Exterior, Basement	Petroleum AST east exterior	Soil, Fill, Groundwater, Waste water	Sulphur, pH,	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present) 5 - Seeps
41	No. 4 Save-All		Basement	Process waste (Adjacent to former Boiler Building)	Soil, Fill, Groundwater, Waste water	Metals	1 -Storm Water / Waste Water System 2 - Tailraces
42	No. 4 Paper Machine	1927 72 x 302	Basement	Transformer (1) E wall, Hydraulic systems, Elevator, Radiation Source	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs, Metals	1 -Storm Water / Waste Water System 2 - Tailraces
42a	No. 4 Paper Machine	1927 67 x 80	Basement	Transformer (1) S wall., Elevator, Hydraulic systems, chemical storage east exterior, laurylphosphonic acid, Surfactant, Oil, Filler, Felt Wash, Slimicide, Caustic, Kerosene, Silicate, Sulfuric Acid, Corrosion inhibitor, Dye, Radiation Source	Soil, Fill, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
43	No. 4 Paper Addition	1977 25 x 96	Basement	Hydraulic systems	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
44	No. 4 Finishing Room & Warehouse - South	1924 36 x 67	First Floor	Hydraulic systems, former chemical storage	Soil, Groundwater, Waste water	Petroleum, PCBs, Solvents, Metals	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
45	No. 4 Finishing Room & Warehouse - Central	1924 67 x 202	First Floor	Elevator	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
46	No. 4 Finishing Room & Warehouse - North		First Floor	Hydraulic systems	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
47	Shipping Shed	59 x 80	First Floor	Hydraulic systems	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
48	North Substation		Ground surface	Transformers (11)	Soil, Groundwater, Waste water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
49	Deink ONG Pulper (Mill B)	1928 66 x 143	Current chemical storage	Chemicals collected during plant deconstruction. Laurylphosphonic Acid, Surfactant, Hydrogen Peroxide, Caustic, Silicate, Radiation Source.	Waste water	Petroleum hydrocarbons, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces
50	Deink ONG Repulper	80 x 100	Current chemical storage	Chemicals collected during plant deconstruction. Used Oil.	Waste water	Petroleum hydrocarbons, PCBs, Metals, Asbestos	1 -Storm Water / Waste Water System 2 - Tailraces
51	Chip and Sawdust Silo	35 x 67	None	N/A	N/A	N/A	N/A
52	Dam		None	N/A	N/A	N/A	N/A

Table 1
Potential Areas of Environmental Concern
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
	Pipe Tunnel		Entire Tunnel	Facility drainage	Storm water, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	1 -Storm Water / Waste Water System
53	DeMiz Building		Main Floor	Hydraulic systems, Chemical storage (Defoamer)	Waste water		1 -Storm Water / Waste Water System 2 - Tailraces
	#1 Pump Station		Sediment trap	Storm water, and sediment	Storm water, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	1 -Storm Water / Waste Water System
54	Clarifier Pump House		Entire Building	Hydraulic systems, Electrical systems	Storm water	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces
55	Clarifier		Bottom of Clarifier	Facility drainage	Storm water, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	1 -Storm Water / Waste Water System
56	Sulfuric Acid AST		Exterior	Paint, Sulfuric Acid	Storm water	Lead	1 -Storm Water / Waste Water System 2 - Tailraces
57	Aboveground Storage Tanks		Exterior	Paint, Hydrogen Peroxide, Caustic, Sulfuric Acid, Silicate	Storm water	Lead	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Site-wide		Buildings and ground surface	Facility drainage	Surface, Fill, Groundwater, Storm water	Asbestos, Metals (Lead, Zinc)	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Intake Basin		Sediment	Upstream Sources	Sediment	Petroleum, PCBs, Solvents, Metals, Asbestos	6 - In-Water Sediment
	Tailrace 1		North of No. 1 Paper Machine	Facility leaks and groundwater drainage	Storm water, groundwater, soil, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	2 - Tailraces
	Tailrace 2		Below No. 3 Paper Machine	Facility leaks and groundwater drainage	Storm water, groundwater, soil, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	2 - Tailraces
	Mill H Tailrace		Below Mill H	Facility leaks and groundwater drainage	Storm water, groundwater, soil, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	2 - Tailraces
	#2 Pump Station		Sediment trap	Facility drainage	Storm water, and sediment	Petroleum, PCBs, Solvents, Metals, Dioxins/Furans, Asbestos	1 -Storm Water / Waste Water System
	Former Fuel Oil AST (319,200 gallons)		None	N/A	N/A	N/A	N/A
	Oil Dock		None	N/A	N/A	N/A	N/A
	Truck Dump	1968 37 x 108	Ground surface, Basement	Transformers (3) Fuels ASTs, Hydraulics	Soil, Fill, Groundwater	Petroleum, PCBs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)

Table 1
Potential Areas of Environmental Concern
Blue Heron Mill Site and Main Office Building

Feature No.	Feature Name	Date and Size	Area of Environmental Concern	Description of Possible Source	Media Potentially Impacted (Sediment, Soil, Storm water, Surface Water, or Groundwater)	Potential Constituents of Interest	Proposed Phase II Sampling to Evaluate (see Table 2)
	Rail Spurs		Ground surface, subsurface	Ties, spills	Soil, Fill, Groundwater	Arsenic, Copper, Chromium, SVOCs	1 -Storm Water / Waste Water System 2 - Tailraces 3 - Soil/Fill 4 - Groundwater (if present)
	Former MgO AST		Ground surface, subsurface	Previously used as a Fuel AST for Sulfate Plant Boilers	Soil, Fill, Groundwater	Petroleum	1 -Storm Water / Waste Water System 2 - Tailraces
	Water Supply well Near 56	Near SW corner of former MgO AST	None	N/A	N/A	N/A	N/A

Information sources: Site Observations, Sanborn Maps, Historical Aerial Photographs, Historical Topographic Maps, City Directories, IRI Mill Layout Drawing, Waste Water Treatment System Drawing, Major Bulk Chemicals, Waste & Oil Mill Locations, Chemical and Raw Material Storage Map

Table 2
Conceptual Approach
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

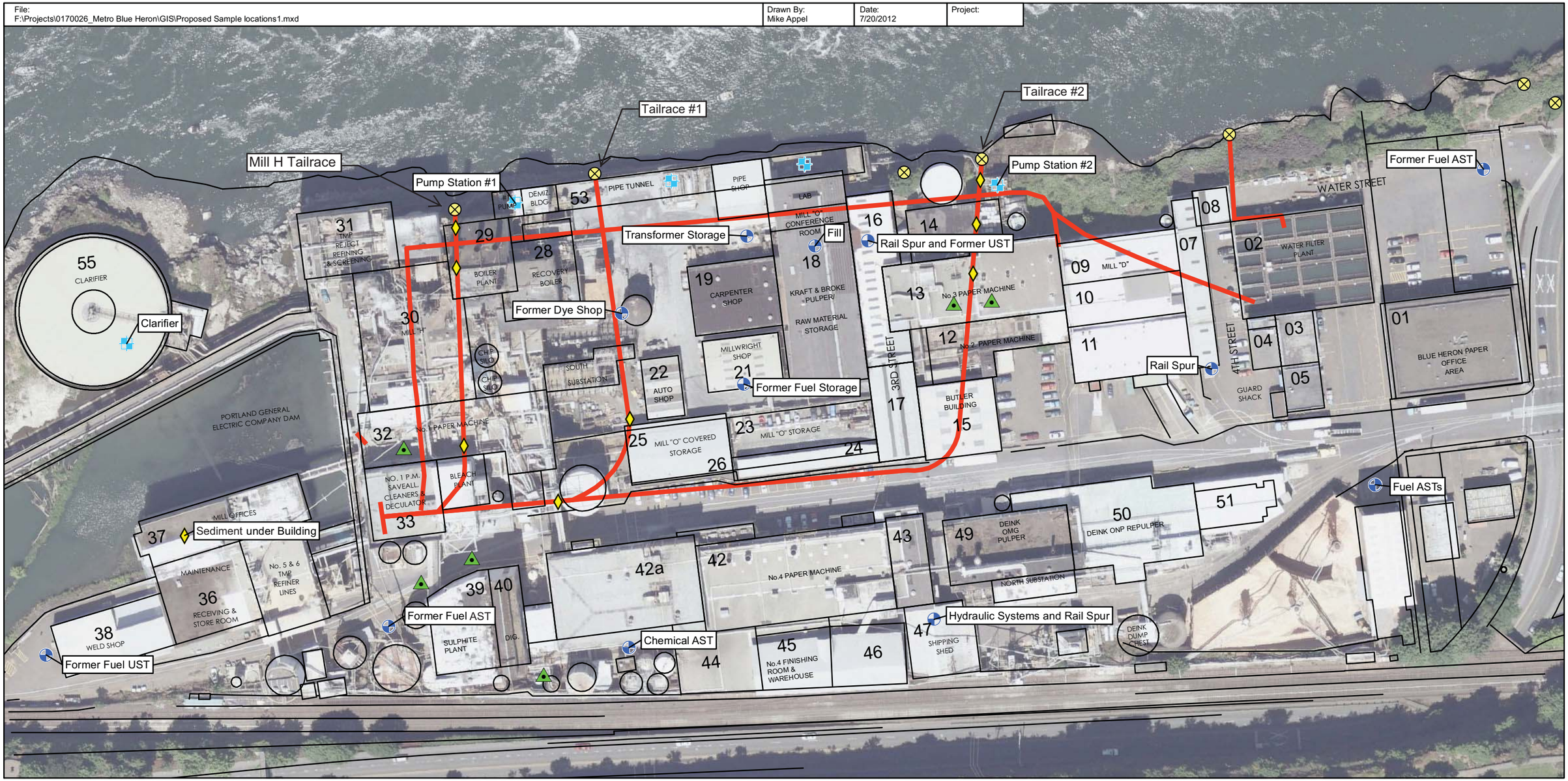
No.	Media/Feature	Type of Sample	Purpose	COIs	Sample Location(s)	Notes
1	Storm Water / Waste Water System	Bedded Sediment	Evaluate potential releases of COIs site wide	- VOCs - SVOCs - Metals - PCBs - Dioxins/Furans - Asbestos	- Pump Station #1 - Pump Station #2 - Pipe Tunnel - Clarifier	Composite samples; collect multiple depth intervals (if possible) to evaluate recent and historical releases; collection of samples dependent upon presence of sufficient sediment to sample and safe access to allow sampling
		Water	Evaluate potential releases of COIs site wide; evaluate potential releases from site via storm water	- VOCs - SVOCs - Metals, including hexavalent chromium - PCBs	- Pump Station #1 - Pump Station #2 - Pipe Tunnel - Clarifier	Sample of standing water in collection structure; collection of water during a storm event unlikely given time constraints and dry season.
2	Tailraces	Bedded Sediment	Evaluate potential releases from site that are not being captured by storm water system	- VOCs - SVOCs - Metals - PCBs - Dioxins/Furans - Asbestos	- Mill H Tailrace - Tailrace #1 - Tailrace #2	Samples to be collected on both sides of the tailrace dams; multiple depth intervals (if possible)
		Water	Evaluate potential releases from site that are not being captured by storm water system	- VOCs - SVOCs - Metals, including hexavalent chromium - PCBs	- Mill H Tailrace - Tailrace #1 - Tailrace #3	
3	Soil / Fill	Solid	Evaluate potential releases from discrete site features; evaluate fill characteristics	- VOCs - SVOCs - Metals (some locations) - TPH (some locations) - PCBs (some locations) - Asbestos (some locations)	~12 locations throughout site (see figure); locations related to current and former tanks, transformers (in use and decommissioned), fill, and railroad spurs (ballast and other sources)	Sample where possible; soil/fill may not be present at all locations
4	Groundwater	Water	Evaluate potential releases from discrete site features; evaluate groundwater quality both on-site and upgradient	- VOCs - SVOCs - Metals, including hexavalent chromium (some locations) - TPH (some locations)	~12 locations throughout site (see figure); locations related to current and former tanks, transformers (in use and decommissioned), fill, and railroad spurs (ballast and other sources)	Sample if groundwater is encountered during soil sampling; groundwater not expected to be observed in shallow soil/fill
5	Seeps	Water	Evaluate groundwater quality both on-site and upgradient	- VOCs - SVOCs - Metals, including hexavalent chromium - PCBs? - Dioxins/Furans (bleach plant only)?	Approximately 6 seeps in 4 locations throughout site (No. 1 Paper Machine, west of Sulphate Plant, east of Sulphate Plant by RR tracks, No. 3 Paper machine)	Sample where possible; some seeps may not have sufficient flow to allow sampling

Table 2
Conceptual Approach
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

No.	Media/Feature	Type of Sample	Purpose	COIs	Sample Location(s)	Notes
6	In-Water Sediment	Bedded Sediment	Evaluate sediment quality on submerged portion of subject parcel	- VOCs - SVOCs - Metals - PCBs - Dioxins/Furans	Various locations in in-take basin; exact number of samples TBD	Surface and subsurface samples; specific sampling intervals TBD

Legend:
COIs - Constituents of interest
SVOCs - Semi-volatile organic compounds
VOCs - Volatile organic compounds
PCBs - Polychlorinated biphenyls

File:	Drawn By:	Date:	Project:
F:\Projects\0170026_Metro Blue Heron\GIS\Proposed Sample locations1.mxd	Mike Appel	7/20/2012	



Legend

Proposed Phase II ESA Sample Locations

- Soil and Groundwater
- Seep
- Stormwater and Sediment
- Tailrace/Intake Basin Surface Water and Sediment
- Outfall (Abandoned)
- Tailrace (Approximate)

N

0 100 200 Feet

DRAFT

Aerial: ESRI Online Imagery Server, June 15, 2009

Figure 1
Proposed Sample Locations
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204
ERM.

From:	Erik Ipsen
To:	ROMERO Mike (ROMERO.Mike@deq.state.or.us)
Cc:	"Hope Whitney"; Claudia Powers (ckp@aterwynne.com); Brendan Robinson; Kim Marcus; Greg Menen
Subject:	RE: Blue Heron Mill Site Phase 2 Sampling - DEQ comments
Date:	Friday, August 24, 2012 9:58:52 AM
Attachments:	image001.jpg Potential Sample Locations082312.pdf Table 3_Sample Matrix_08 24 12.pdf image002.jpg

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Hi Mike –

Once again, I wanted to thank you for your comments on the conceptual Phase II sampling approach at the Blue Heron site. We have reviewed your comments, prepared brief responses (provided below), and modified the sampling scope accordingly.

Attached are the deliverables that were promised at our meeting on July 23: a table providing details of the proposed sampling, and a detailed figure showing all proposed sampling locations. As discussed in the responses below, we will be providing a table summarizing the proposed laboratory reporting limits and the potentially applicable screening levels next week.

Please let Hope Whitney at Metro or me know if you have any questions or comments. Our tentative schedule is to conduct field work starting on September 7.

Regards – Erik

General Comments

1. *The Phase 1 Environmental Site Assessment report was not provided and DEQ did not review it. However, the general outline of proposed sampling in Phase 2 appears to be an effort focused on the most obvious areas of concern based on operational history and previous investigations. Overall, the proposed effort should be effective in identifying the most probable environmental concerns at the property. The selected analytes and contaminants of interest (COIs) listed in Table 1 and 2 are appropriate based on the information provided.*

   Comment noted. Metro appreciates ODEQ's expedited and useful review of the proposed sampling activities.

2. *Details of sampling methods, analytical methods and screening level values (SLVs) that analytical results will be compared to were not provided at the time of these comments. DEQ understands that a table detailing this will be provided to DEQ for input during the 2nd week of August. DEQ recommends that Metro and ERM develop a simple conceptual site model (CSM) to use in identifying potential exposure pathways and to determine the appropriate screening levels for the analytical data. SLVs for both ecological and human health receptors should be used where appropriate. See http://www.deq.state.or.us/pubs/reports.htm#Cleanup for guidance documents that can help in developing a CSM and screening levels. In particular, see the Risk-Based Decision Making document and the risk assessment guidance documents for the SLVs.*

   A table providing additional details of the proposed Phase II sampling, including analytical

methods, is attached to this email. A table summarizing proposed reporting limits and potentially applicable screening levels will be transmitted to ODEQ when complete (anticipated next week). Metro and ERM are currently evaluating ODEQ's recommendation to prepare a simple conceptual site mode. Issues being weighed are available time, resources, and existing site information, as well as the importance of having this information at this stage of the project. In addition, possible end uses of the property (and hence, future receptors) are still uncertain and being evaluated. Metro will transmit the CSM to ODEQ if and when one is prepared.

3. *Stormwater management for the site will change and likely return to specific discharges from the site once the connection to the lagoons is severed. While a stormwater permit may not be required at the property in the future, consideration of potential environmental impacts related to stormwater will be useful in Metro's assessment of the site. It is obvious that some of the rationale in the proposed sampling is focused on this pathway and that actual stormwater samples may not be collected because of the seasonal timing of the sampling. DEQ's stormwater guidance for evaluating stormwater at upland sites located at http://www.deq.state.or.us/lq/cu/stmwtrguidance.htm contains useful information especially in screening and comparison tools that may help during this assessment.*

   Comment noted. ERM is familiar with this guidance and has incorporated the principles behind it into the proposed sampling.

4. *If not already done in the Phase 1 ESA, an assessment of the locations and amounts of solids/soil accumulation at the site should be prepared and its potential for exposure to erosion or stormwater runoff discussed. This information can be used to determine sampling locations and help in the development of the CSM. This, coupled with site analytical data, will also help in the evaluation of potential future risks at the site after the tailraces are disconnected. A good understanding of stormwater drainage directions and patterns may also help in the evaluation of potential risks.*

   The amount of solids accumulation in the features to be sampled (i.e., pump stations, pipe tunnel, clarifier, and tailraces) will be performed as part of Phase II sampling, to the extent possible. A comprehensive evaluation of storm water solids accumulation at the site is beyond the current due diligence scope of work being executed at the site. An evaluation of the current storm water drainage system and options for future management is currently being performed by Metro.

5. *It is important to note that DEQ's Water Quality Division is currently working with the site trustee to close out the NPDES permit at this property. A requirement of this closeout will be to remove solids from the tailraces on site. Details of the solids removal have not yet been determined. While Phase 2 sampling calls for some sampling of the tailraces, additional tailrace sampling locations could provide additional data that may better inform the future tailrace cleanout.*

   The main purpose of the tailrace sampling is to evaluate potential releases from the upland property to the tailraces as a means of evaluating possible spills and releases on the upland property. The proposed sampling (i.e., collection and analysis of composite samples from each tailrace) is appropriate to meet this due diligence sampling objective. While Metro understands that data collected as part of this Phase II may be useful in informing cleanout of the tailraces, and will share the results with the trustee, the purpose of the sampling from

Metro's perspective, is not to characterize the accumulated solids in the tailraces for purposes of evaluating removal and management options.

6. *Based on the proposed sample locations in Figure 1, it does not appear that an investigation or survey is planned for the northern waterfront area north of pump station #2 up to the northernmost property boundary during this phase of work. It is not clear if this area was assessed in the Phase 1 ESA. This area appears to be well vegetated, has a natural shoreline and at least three historic outfalls. DEQ suggests that Metro/ERM consider some sort of assessment or survey of the area during this phase of work that focuses on current conditions, apparent runoff patterns, evidence of historic industrial use and any obvious environmental issues in the area. This information may prove useful to Metro in future considerations.*

   This area was assessed as part of the historical research of the site, which admittedly has not been shared with DEQ yet. Again we appreciate DEQ reviewing Metro's preliminary materials. Based on documents, historical aerials, and other information reviewed by ERM to date, there is no evidence of historical industrial activity in this area, and therefore no sampling in this area is proposed. In addition, due to the rocky nature of the area, it is not clear that sufficient soil is present to allow sampling. As mentioned above, an evaluation of the current storm water drainage system and options for future management is currently being performed by Metro.

7. *The conceptual approach detailed in Table 2 does not include pesticides as a contaminant of interest (COI) at the site. Pesticide use was fairly common during the operational period of the facility and they are typically screened for in stormwater and soil evaluations. Consider analyzing appropriate media such as tailrace solids and soil/fill locations for bioaccumulative pesticides such as DDT unless specific knowledge of pesticides not being used on site exists.*

   The historical information reviewed by ERM to date does not indicate that there was widespread use of pesticides, although it is suspected that pesticides were used at the site consistent with typical industrial facilities. Pesticides are a ubiquitous constituent on both industrial properties, and in the Willamette River. As such, Metro does not believe that collection of these data are necessary at this stage for purposes of conducting environmental due diligence at the site. The need for these data will be re-evaluated as Metro's evaluation of the property progresses.

Specific Comments

1. *Table 1 list spills under description of a possible source in a few of the numbered features. It is not clear what is known about these spills which makes evaluating the potential COIs for those areas (features) difficult.*

   The potential spills referenced in Table 1 are associated with the rail spurs and would include typical petroleum products, lubricants, and/or solvents. There is no available information specifically referencing spills along these rails spurs. Rather, the proposed sampling is based on ERM's experiences on other similar industrial facilities. Samples from rail spur areas are proposed for analysis of TPH, VOCs, SVOCs, metals, and PCBs.

2. *Radiation source is listed as a possible source under several of the numbered features, but radionuclides are not listed under the potential COIs and are not included in the proposed*

analytes in Table 2.

The radiation source mentioned in Table 1 is a Measurex 2002 scanning sensor (see photo below). The equipment is self-contained, located inside a building, and appeared to be in good condition. No releases from the equipment are suspected, and therefore no sampling is proposed at this time.

3. *Features No. 16 and 17 lists USTs, rail ties and spills as possible sources, but Table 1 does not list petroleum and PCBs as potential COIs for these areas. However, Table 2 does indicate that PCBs and petroleum will be sampled for in the area. Rail ties may also include pentachlorophenol in addition to arsenic, copper and chromium. Consider adding this analyte to the mix.*

   As mentioned above, samples from rail spur areas are proposed for analysis of TPH, VOCs, SVOCs (including pentachlorophenol), metals, and PCBs.

4. *Acid and caustic compounds are listed as possible sources in several features (2,30,33,34 35, 49, 56,57) yet only feature no. 39 has pH listed as a potential COI. Table 2 does not include pH in the COI or analyte list. pH is most likely to have effects on metals so at least be sure that this potential correlation is represented in the sampling plan.*

   As ODEQ correctly notes, pH impacts most notably affect metals concentrations. Analysis of metals is proposed for all but two of the Phase II samples.

5. *The May 24th, 2011 soil investigation summary prepared by Bridgewater Group, Inc for Blue Heron Paper Company identified at least one area of PCB contamination in surficial soils in the former south substation area. It doesn't appear that this Phase 2 sampling effort is addressing that area unless the soil and groundwater sample near the former dye shop on Figure 1 is intended to capture it. The Bridgewater report does not include any narrative on the site conditions or the extent of soil in that area. If not addressed in the Phase 1, consider evaluating the site conditions at that are as described in general comment no. 4 during this phase of work.*

   Site conditions have been evaluated through several site visits and inspections, and more recently, a geophysical survey to evaluate the present of soil/fill for sampling. The Bridgewater investigation appears to have done a reasonably good job of delineating potential PCB impacts in soil from current and historical transformers at the site. However, there was only one sample collected from the old transformer storage area northwest of Building 19. Because this area is probably the most likely to have impacts from old transformers, Metro is proposing another sample in this area to confirm Bridgewater's findings.

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Partner

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Begin forwarded message:

From: ROMERO Mike <ROMERO.Mike@deq.state.or.us>
Date: August 6, 2012 10:32:03 AM PDT
To: Hope Whitney <Hope.Whitney@oregonmetro.gov>
Cc: SVETKOVICH Christine <SVETKOVICH.Christine@deq.state.or.us>
Subject: Blue Heron Mill Site Phase 2 Sampling - DEQ comments

Hope,

In accordance with the agreement between DEQ and Metro to provide technical consultation and review of investigation plans, DEQ has reviewed the material presented by ERM describing the proposed Phase 2 sampling at the former Blue Heron Paper Mill. Our observations and comments are summarized for your consideration below:

General Comments

1. The Phase 1 Environmental Site Assessment report was not provided and DEQ did not review it. However, the general outline of proposed sampling in Phase 2 appears to be an effort focused on the most obvious areas of concern based on operational history and previous investigations. Overall, the proposed effort should be effective in identifying the most probable environmental concerns at the property. The selected analytes and contaminants of interest (COIs) listed in Table 1 and 2 are appropriate based on the information provided.

2. Details of sampling methods, analytical methods and screening level values (SLVs) that analytical results will be compared to were not provided at the time of these comments. DEQ understands that a table detailing this will be provided to DEQ for input during the 2nd week of August. DEQ recommends that Metro and ERM develop a simple conceptual site model (CSM) to use in identifying potential exposure pathways and to determine the appropriate screening levels for the analytical data. SLVs for both ecological and human health receptors should be used where appropriate. See

http://www.deq.state.or.us/pubs/reports.htm#Cleanup for guidance documents that can help in developing a CSM and screening levels. In particular, see the Risk-Based Decision Making document and the risk assessment guidance documents for the SLVs.

3. Stormwater management for the site will change and likely return to specific discharges from the site once the connection to the lagoons is severed. While a stormwater permit may not be required at the property in the future, consideration of potential environmental impacts related to stormwater will be useful in Metro's assessment of the site. It is obvious that some of the rationale in the proposed sampling is focused on this pathway and that actual stormwater samples may not be collected because of the seasonal timing of the sampling. DEQ's stormwater guidance for evaluating stormwater at upland sites located at http://www.deq.state.or.us/lq/cu/stmwtrguidance.htm contains useful information especially in screening and comparison tools that may help during this assessment.

4. If not already done in the Phase 1 ESA, an assessment of the locations and amounts of solids/soil accumulation at the site should be prepared and its potential for exposure to erosion or stormwater runoff discussed. This information can be used to determine sampling locations and help in the development of the CSM. This, coupled with site analytical data, will also help in the evaluation of potential future risks at the site after the tailraces are disconnected. A good understanding of stormwater drainage directions and patterns may also help in the evaluation of potential risks.

5. It is important to note that DEQ's Water Quality Division is currently working with the site trustee to close out the NPDES permit at this property. A requirement of this closeout will be to remove solids from the tailraces on site. Details of the solids removal have not yet been determined. While Phase 2 sampling calls for some sampling of the tailraces, additional tailrace sampling locations could provide additional data that may better inform the future tailrace cleanout.

6. Based on the proposed sample locations in Figure 1, it does not appear that an investigation or survey is planned for the northern waterfront area north of pump station #2 up to the northernmost property boundary during this phase of work. It is not clear if this area was assessed in the Phase 1 ESA. This area appears to be well vegetated, has a natural shoreline and at least three historic outfalls. DEQ suggests that Metro/ERM consider some sort of assessment or survey of the area during this phase of work that focuses on current conditions, apparent runoff patterns, evidence of historic industrial use and any obvious environmental issues in the area. This information may prove useful to Metro in future considerations.

7. The conceptual approach detailed in Table 2 does not include pesticides as a contaminant of interest (COI) at the site. Pesticide use was fairly common during the operational period of the facility and they are typically screened for in stormwater and soil evaluations. Consider analyzing appropriate media such as tailrace solids and soil/fill locations for bioaccumulative pesticides such as DDT unless specific knowledge of pesticides not being used on site exists.

Specific Comments

1. Table 1 list spills under description of a possible source in a few of the numbered features. It is not clear what is known about these spills which makes evaluating the potential COIs for those areas (features) difficult.

2. Radiation source is listed as a possible source under several of the numbered features, but radionuclides are not listed under the potential COIs and are not included in the proposed analytes in Table 2.

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5. The May 24th, 2011 soil investigation summary prepared by Bridgewater Group, Inc for Blue Heron Paper Company identified at least one area of PCB contamination in surficial soils in the former south substation area. It doesn't appear that this Phase 2 sampling effort is addressing that area unless the soil and groundwater sample near the former dye shop on Figure 1 is intended to capture it. The Bridgewater report does not include any narrative on the site conditions or the extent of soil in that area. If not addressed in the Phase 1, consider evaluating the site conditions at that are as described in general comment no. 4 during this phase of work.

Feel free to contact me if you or ERM have any questions regarding these comments.

Mike

Michael Romero
Northwest Region Cleanup Section
(503) 229-5563

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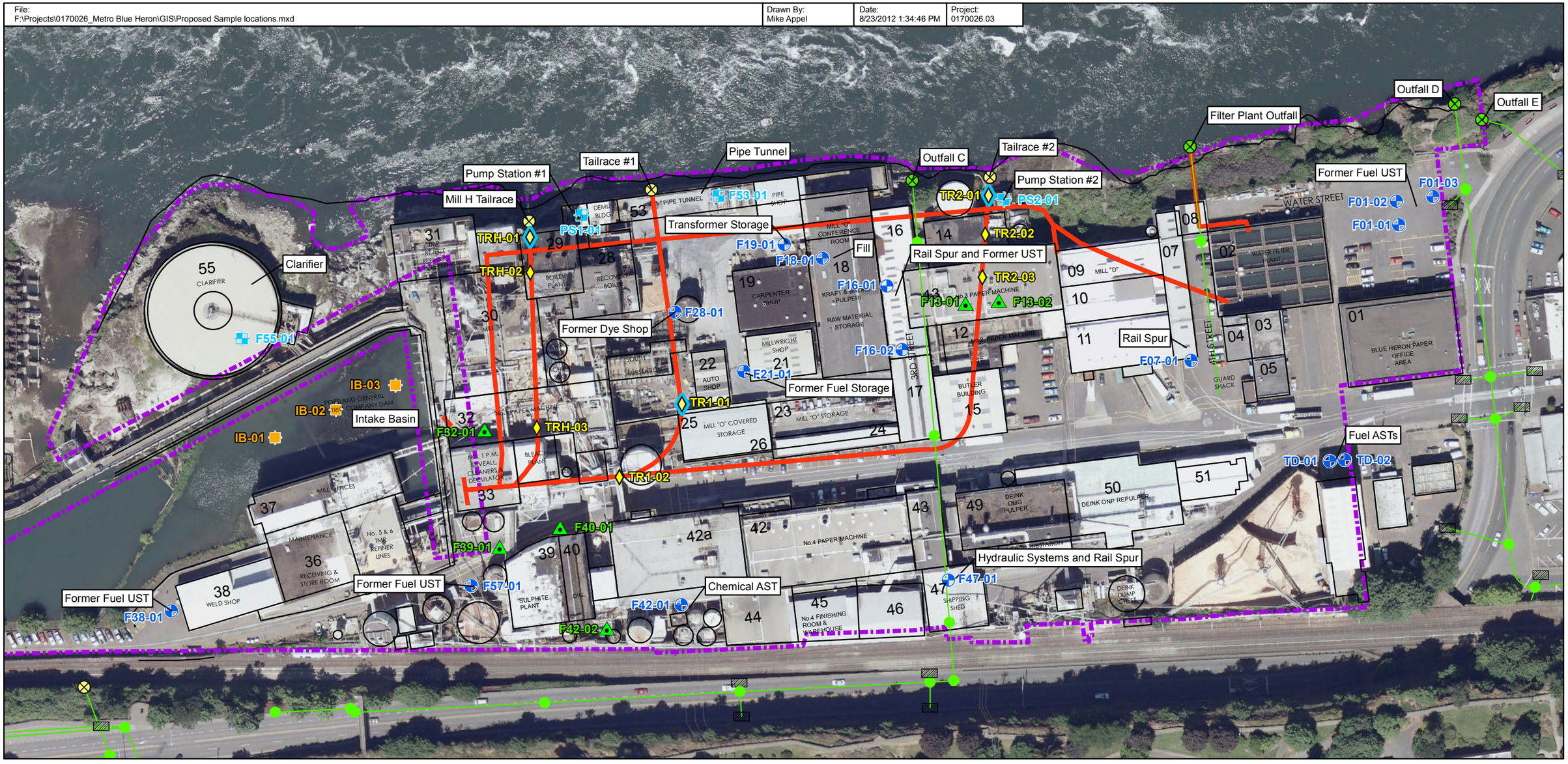
File:
F:\Projects\0170026_Metro Blue Heron\GIS\Proposed Sample locations.mxd

Drawn By:
Mike Appel

Date:
8/23/2012 1:34:46 PM

Project:
0170026.03



Legend

Proposed Phase II ESA Sample Locations

- Soil and Groundwater
- Seep
- Storm Water and Storm Water Solids
- Intake Basin Sediment
- Tailrace Solids (Composite Sample)
- Tailrace Water
- Outfall (abandoned)
- Oregon City Outfall (active)
- Oregon City Storm Sewer
- Tailrace (Approximate)
- Blue Heron Site Boundary

0 120 240 Feet

DRAFT

Figure 1
Proposed Sample Locations
Phase II ESA
Blue Heron Site
Oregon City, Oregon

Environmental Resources Management
1001 SW 5th St, Suite 1010
Portland, Oregon 97204

Table 3
Sample Matrix
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Site Feature	Sample Location	Sample ID	Sample Depth	Sample Type Grab/ Composite	Media	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn)	Hg	Cr VI	Asbestos	TPH	PCB Aroclors	Dioxins/ Furans	VOCs	SVOCs
						USEPA 6010B/6020	USEPA 7470A/7471A	USEPA 3060A/ 7196A	USEPA 600	NWTPH-Dx, Gx	USEPA 8082B	AXYS Method	USEPA 8260C	USEPA 8270D/ 8270-SIM
Building 01 UST	F01-01	F01-01-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	X
Building 01 UST	F01-02	F01-02-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	
Building 01 UST	F01-03	F01-03-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	
Truck Dump	TD-01	TD-01-Soil	0 to refusal	Grab	Soil/Fill					X	X		X	X
Truck Dump	TD-02	TD-02-Soil	0 to refusal	Grab	Soil/Fill					X	X		X	X
Building 07/Spur	F07-01	F07-01-Soil	0 to refusal	Grab	Soil/Fill	X				X	X		X	X
Building 16-17/Spur	F16-01	F16-01-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	X
Building 16/UST	F16-02	F16-02-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	X
Building 18 Mill O	F18-01	F18-01-Soil	0 to refusal	Grab	Soil/Fill	X			X	X	X		X	
Building 19	F19-01	F19-01-Soil	0 to refusal	Grab	Soil/Fill	X				X	X		X	
Building 22/Millwright Shop	F21-01	F21-01-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	
Building 28/Frmr Dye Shop	F28-01	F28-01-Soil	0 to refusal	Grab	Soil/Fill	X		X		X	X		X	X
Building 38-Welding/UST	F38-01	F38-01-Soil	0 to refusal	Grab	Soil/Fill	X				X	X		X	
Building 42/Chemical Storage	F42-01	F42-01-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	
Building 46/Shipping Shed	F47-01	F47-01-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	X
Feature 57/Fuel AST	F57-01	F57-01-Soil	0 to refusal	Grab	Soil/Fill	X				X			X	X
Pipe Tunnel	F53-01	F53-01-Shallow	0 to 6 inches	Grab	Storm Water Solids	X			X	X	X	X		X
Pipe Tunnel		F53-01-Deep	Bottom 6 inches	Grab	Storm Water Solids	X			X	X	X	X		X
Pipe Tunnel		F53-01-SW	Storm Water	Grab	Storm Water	X		X		X			X	X
Pump Station #1	PS1-01	PS1-01-Shallow	0 to 6 inches	Grab	Storm Water Solids	X			X	X	X	X		X
Pump Station #1		PS1-01-Deep	Bottom 6 inches	Grab	Storm Water Solids	X			X	X	X	X		X
Pump Station #1		PS1-01-SW	Storm Water	Grab	Storm Water	X		X		X			X	X
Pump Station # 2	PS2-01	PS2-01-Shallow	0 to 6 inches	Grab	Storm Water Solids	X			X	X	X	X		X
Pump Station # 2		PS2-01-Deep	Bottom 6 inches	Grab	Storm Water Solids	X			X	X	X	X		X
Pump Station # 2		PS2-01-SW	Storm Water	Grab	Storm Water	X				X			X	X
Clarifier	F55-01	F55-01-Shallow	0 to 6 inches	Grab	Storm Water Solids	X	X		X	X	X	X		X
Clarifier		F55-01-Deep	Bottom 6 inches	Grab	Storm Water Solids	X	X		X	X	X	X		X
Clarifier		F55-01-SW	Storm Water	Grab	Storm Water	X	X	X		X			X	X
Bleach Plant Seep	F39-01	F39-01-SP	Seep Water	Grab	Seep Water	X				X			X	X
Bleach Plant Seep	F40-01	F40-01-SP	Seep Water	Grab	Seep Water	X				X			X	X
Upgradient Seep	F42-02	F42-01-SP	Seep Water	Grab	Seep Water	X				X			X	X
Possible Tailrace H Seep	F32-01	F32-01-SP	Seep Water	Grab	Seep Water	X				X			X	X
Paper Machine 3 Seep	F13-01	F13-01-SP	Seep Water	Grab	Seep Water	X				X			X	X
Paper Machine 3 Seep	F13-02	F13-02-SP	Seep Water	Grab	Seep Water	X				X			X	X
Tailrace 1	TR1-01, TR1-02	TR1-Shallow	0 to 6 inches	Composite	Tailrace Solids	X	X		X	X	X	X		X
Tailrace 1		TR1-Deep	Bottom 6 inches	Composite	Tailrace Solids	X	X		X	X	X	X		X
Tailrace 2	TR2-01, TR2-02, TR2-03	TR2-Shallow	0 to 6 inches	Composite	Tailrace Solids	X	X		X	X	X	X		X
Tailrace 2		TR2-Deep	Bottom 6 inches	Composite	Tailrace Solids	X			X	X	X	X		X
Tailrace H	TRH-01, TRH-02, TRH-03	TRH-Shallow	0 to 6 inches	Composite	Tailrace Solids	X			X	X	X	X		X
Tailrace H		TRH-Sdeep	Bottom 6 inches	Composite	Tailrace Solids	X			X	X	X	X		X
Tailrace 1	TR1-01	TR1-01-SW	Surface Water	Grab	Tailrace Water	X	X	X		X			X	X
Tailrace 2	TR2-01	TR2-01-SW	Surface Water	Grab	Tailrace Water	X		X		X			X	X
Tailrace H	TRH-01	TRH-01-SW	Surface Water	Grab	Tailrace Water	X	X	X		X			X	X
Intake Basin	IB-01	IB-01-Shallow	0 to 6 inches	Grab	Intake Basin Sediment	X					X	X		X
Intake Basin		IB-01-Deep	Bottom 6 inches	Grab	Intake Basin Sediment	X					X	X		X
Intake Basin	IB-02	IB-02-Shallow	0 to 6 inches	Grab	Intake Basin Sediment	X					X	X		X
Intake Basin		IB-02-Deep	Bottom 6 inches	Grab	Intake Basin Sediment	X					X	X		X
Intake Basin	IB-03	IB-03-Shallow	0 to 6 inches	Grab	Intake Basin Sediment	X					X	X		X
Intake Basin		IB-03-Deep	Bottom 6 inches	Grab	Intake Basin Sediment	X					X	X		X
Total Number of Samples						**47**	**8**	**7**	**15**	**43**	**27**	**20**	**29**	**42**

Notes & Key:

bgs = below ground surface
AXYS Method = USEPA Method 1613B (i.e., AXYS MLA-017)
NWTPH = Northwest Method Total Petroleum Hydrocarbons
PCB = Polychlorinated Biphenyls
SIM = Selective Ion Method for polycyclic aromatic hydrocarbons
SVOCs = Semivolatile Organic Compounds (phenols, phthalates, polycyclic aromatic hydrocarbons)
TPH = Total Petroleum Hydrocarbons
USEPA = United States Environmental Protection Agency
UST = Underground Storage Tank

Notes & Key (continued):

As Arsenic
Cd Cadmium
Cr Chromium
Cu Copper
Hg Mercury
Ni Nickel
Pb Lead
Zn Zinc
Cr VI Hexavalent Chromium

Soil and Groundwater sample location. If impacts to soil are observed during field activities, additional soil samples will be collected from the zone of impact and appropriate analyses selected to characterize the observed impacts.
Storm Water and storm water solids sample location
Seep water sample location
Surface water and solids sample location
Intake basin sediment sample location

From:	Erik Ipsen
To:	ROMERO Mike (ROMERO.Mike@deq.state.or.us)
Cc:	Hope Whitney (Hope.Whitney@oregonmetro.gov); Claudia Powers (ckp@aterwynne.com); Brendan Robinson; SVETKOVICH Christine
Subject:	Reporting Limits and Preliminary Screening Values for Blue Heron Phase II ESA Sampling
Date:	Wednesday, September 12, 2012 3:23:03 PM
Attachments:	Tables 4A_Preliminary Water Screening Level Values_2012 09 12.pdf Tables 4B_Preliminary Solid Screening Level Values_2012 09 12.pdf

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Mike –

As requested, please find attached tables summarizing the reporting limits and preliminary screening values for the Blue Heron Phase II ESA Sampling. Please let me know if you have any questions.

Sampling began last Friday/Saturday and will conclude (hopefully) this Friday/Saturday. Sediment sampling in the in-take basin is scheduled for Friday. Overall, ee have been able to get samples, but it has been a bit slow as was expected.

One thing I wanted to alert you to: while sampling Pump Station No. 2, the sampling team noticed free product over the standing water in the pump station. The team believes it might be from a hydraulic oil spill that occurred recently at the site. I understand you might already be aware of this release. We have not yet sampled the pipe tunnel, pump station No. 2, or the clarifier, so are not aware if free product is present in those features.

Please let me know if you have any questions.

Regards - Erik

Erik Ipsen, PE
Partner

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Table 4A

Proposed Analytes, Preliminary Screening Levels, and Laboratory Limits- Water
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Constituent	CAS Number	USEPA Analytical Method	Sample Quantitation Limit	Method Detection Limit	Groundwater[1]			Storm Water and Tailrace Water[2]			
					Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Groundwater in Excavation	Human Health (Consumption)		Freshwater AWQC	
					Occupational	Occupational	Construction & Excavation Worker	Water + Organism	Organism Only	Acute	Chronic
Metals											
Arsenic	7440-38-2	6020A	0.5	0.1	-	-	5,800	2.1	2.1	-	-
Cadmium	7440-43-9	6020A	0.02	0.005	-	-	57,000	-	-	3.9	1.1
Chromium	7440-47-3	6020A	0.2	0.04	-	-	-	-	-	-	-
Copper	7440-50-8	6020A	0.02	0.1	-	-	5,000,000	1300	-	18	12
Lead	7439-92-1	6020A	0.02	0.005	-	-	-	-	-	-	-
Nickel	7440-02-0	6020A	0.2	0.03	-	-	1.2E+07	140	170	1400	160
Zinc	7440-66-6	6020A	0.5	0.2	-	-	-	2100	2600	120	110
Hexavalent Chromium	18540-29-9	7196A	50	20	-	-	8,700	-	-	-	-
Hexavalent Chromium-LL	18540-29-9	7196A	50	4	-	-	8,700	-	-	-	-
Mercury	7439-97-6	7470A	0.2	0.02	-	-	-	-	-	2.4	0.012
Volatile Organic Carbons (VOCs)											
1,1,1,2-Tetrachloroethane	630-20-6	8260C	0.5	0.11	-	-	-	-	-	-	-
1,1,1-Trichloroethane (TCA)	71-55-6	8260C	0.5	0.075	-	-	1,100,000	-	-	-	-
1,1,2,2-Tetrachloroethane	79-34-5	8260C	0.5	0.16	-	-	-	0.12	0.40	-	-
1,1,2-Trichloroethane	79-00-5	8260C	0.5	0.14	19,000	8,800	990	0.44	1.6	-	-
1,1-Dichloroethane	75-34-3	8260C	0.5	0.077	-	-	4,300,000	-	-	-	-
1,1-Dichloroethene	75-35-4	8260C	0.5	0.08	-	340,000	43,000	230	710	-	-
1,1-Dichloropropene	563-58-6	8260C	0.5	0.089	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	87-61-6	8260C	2	0.11	-	-	-	-	-	-	-
1,2,3-Trichloropropane	96-18-4	8260C	0.5	0.2	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	120-82-1	8260C	2	0.096	-	-	-	6.4	7.0	-	-
1,2,4-Trimethylbenzene	95-63-6	8260C	2	0.069	-	-	1,700	-	-	-	-
1,2-Dibromo-3-chloropropane	96-12-8	8260C	2	0.2	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	106-93-4	8260C	2	0.1	960	690	28	-	-	-	-
1,2-Dichlorobenzene	95-50-1	8260C	0.5	0.12	-	-	37,000	110	130	-	-
1,2-Dichloroethane (EDC)	107-06-2	8260C	0.5	0.08	9,500	3,800	630	0.35	3.7	-	-
1,2-Dichloropropane	78-87-5	8260C	0.5	0.095	-	-	-	-	-	-	-
1,3,5-Trichlorobenzene	108-70-3	8260C	5	0.11	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	108-67-8	8260C	2	0.089	-	-	-	-	-	-	-
1,3-Dichlorobenzene	541-73-1	8260C	0.5	0.1	-	-	-	80	96	-	-
1,3-Dichloropropane	142-28-9	8260C	0.5	0.14	-	-	-	-	-	-	-
1,4-Dichlorobenzene	106-46-7	8260C	0.5	0.12	20,000	5,700	1,500	16	19	-	-
2,2-Dichloropropane	594-20-7	8260C	0.5	0.06	-	-	-	-	-	-	-
2-Butanone (MEK)	78-93-3	8260C	20	1.9	-	-	-	-	-	-	-
2-Chlorotoluene	95-49-8	8260C	2	0.1	-	-	-	-	-	-	-
2-Hexanone	591-78-6	8260C	20	2.7	-	-	-	-	-	-	-
4-Chlorotoluene	106-43-4	8260C	2	0.13	-	-	-	-	-	-	-
4-Isopropyltoluene	99-87-6	8260C	2	0.06	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	108-10-1	8260C	20	2.6	-	-	-	-	-	-	-
Acetone	67-64-1	8260C	20	3.3	-	-	-	-	-	-	-
Benzene	71-43-2	8260C	0.5	0.062	-	-	-	-	-	-	-

Constituent	CAS Number	USEPA Analytical Method	Sample Quantitation Limit	Method Detection Limit	Groundwater[1]			Storm Water and Tailrace Water[2]			
					Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Groundwater in Excavation	Human Health (Consumption)		Freshwater AWQC	
					Occupational	Occupational	Construction & Excavation Worker	Water + Organism	Organism Only	Acute	Chronic
Bromobenzene	108-86-1	8260C	2	0.12	-	-	-	-	-	-	-
Bromochloromethane	74-97-5	8260C	0.5	0.16	-	-	-	-	-	-	-
Bromodichloromethane	75-27-4	8260C	0.5	0.091	9,300	5,600	450	-	-	-	-
Bromoform	75-25-2	8260C	0.5	0.16	1,100,000	1,100,000	14,000	-	-	-	-
Bromomethane	74-83-9	8260C	0.5	0.1	170,000	36,000	1,200	-	-	-	-
Carbon Disulfide	75-15-0	8260C	0.5	0.069	-	-	-	-	-	-	-
Carbon Tetrachloride	56-23-5	8260C	0.5	0.096	5,400	790	1,700	0.1	0.16	-	-
Chlorobenzene	108-90-7	8260C	0.5	0.11	-	-	10,000	0.000081	0.000081	2.4	0.0043
Chloroethane	75-00-3	8260C	0.5	0.16	-	-	2,400,000	-	-	19	11
Chloroform	67-66-3	8260C	0.5	0.072	5,500	1,200	720	74	160	-	-
Chloromethane	74-87-3	8260C	0.5	0.068	2,100,000	320,000	22,000	0.31	1.3	-	-
cis-1,2-Dichloroethene	156-59-2	8260C	0.5	0.067	-	-	24,000	-	-	-	-
cis-1,3-Dichloropropene	10061-01-5	8260C	0.5	0.18	-	-	-	0.30	2.1	-	-
Dibromochloromethane	124-48-1	8260C	0.5	0.14	-	-	-	-	-	-	-
Dibromomethane	74-95-3	8260C	0.5	0.15	-	-	-	-	-	-	-
Dichlorodifluoromethane	75-71-8	8260C	0.5	0.13	-	-	-	-	-	-	-
Ethyl Ether	60-29-7	8260C	1	0.075	-	-	-	-	-	-	-
Ethylbenzene	100-41-4	8260C	0.5	0.05	41,000	7,400	4,400	160	210	-	-
Hexachlorobutadiene	87-68-3	8260C	2	0.11	-	-	-	0.36	1.8	-	-
Isopropylbenzene	98-82-8	8260C	2	0.051	-	-	-	-	-	-	-
m,p-Xylenes	179601-23-1	8260C	0.5	0.11	-	-	23,000	-	-	-	-
Methylene Chloride	75-09-2	8260C	2	0.1	-	-	-	4.3	59	-	-
Naphthalene	91-20-3	8260C	2	0.88	16,000	10,000	500	-	-	-	-
n-Butylbenzene	104-51-8	8260C	2	0.054	-	-	-	-	-	-	-
n-Propylbenzene	103-65-1	8260C	2	0.054	-	-	-	-	-	-	-
o-Xylene	95-47-6	8260C	0.5	0.074	-	-	-	-	-	-	-
sec-Butylbenzene	135-98-8	8260C	2	0.062	-	-	-	-	-	-	-
Styrene	100-42-5	8260C	0.5	0.089	-	-	160,000	-	-	-	-
tert-Butylbenzene	98-06-6	8260C	2	0.059	-	-	-	-	-	-	-
Tetrachloroethene (PCE)	127-18-4	8260C	0.5	0.099	-	32,000	33,000	0.24	0.33	-	-
Tetrahydrofuran	109-99-9	8260C	5	0.94	-	-	-	-	-	-	-
Toluene	108-88-3	8260C	0.5	0.054	-	-	210,000	720	1500	-	-
trans-1,2-Dichloroethene	156-60-5	8260C	0.5	0.072	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	10061-02-6	8260C	0.5	0.068	-	-	-	-	-	-	-
Trichloroethene (TCE)	79-01-6	8260C	0.5	0.1	19,000	3,300	3,000	1.4	3.0	-	-
Trichlorofluoromethane	75-69-4	8260C	0.5	0.12	-	340,000	160,000	-	-	-	-
Vinyl Chloride	75-01-4	8260C	0.5	0.075	6,800	910	1,200	0.023	0.24	-	-
Semivolatile organic carbons (SVOCs)											
1,2,4-Trichlorobenzene	120-82-1	8270D	10	0.36	-	-	-	6.4	7.0	-	-
1,2-Dichlorobenzene	95-50-1	8270D	10	0.43	-	-	37,000	110	130	-	-
1,2-Diphenylhydrazine	122-66-7	8270D	10	0.51	-	-	-	-	-	-	-
1,3-Dichlorobenzene	541-73-1	8270D	10	0.35	-	-	-	80	96	-	-
1,4-Dichlorobenzene	106-46-7	8270D	10	0.32	20,000	5,700	1,500	16	19	-	-
2,3,4,6-Tetrachlorophenol	58-90-2	8270D	10	0.55	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	95-95-4	8270D	10	0.38	-	-	-	330	360	-	-
2,4,6-Trichlorophenol	88-06-2	8270D	10	0.2	-	-	9,900	0.23	0.24	-	-
2,4-Dichlorophenol	120-83-2	8270D	10	0.3	-	-	-	-	-	-	-

Constituent	CAS Number	USEPA Analytical Method	Sample Quantitation Limit	Method Detection Limit	Groundwater[1]			Storm Water and Tailrace Water[2]			
					Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Groundwater in Excavation	Human Health (Consumption)		Freshwater AWQC	
					Occupational	Occupational	Construction & Excavation Worker	Water + Organism	Organism Only	Acute	Chronic
2,4-Dimethylphenol	105-67-9	8270D	10	0.26	-	-	-	76	85	-	-
2,4-Dinitrophenol	51-28-5	8270D	25	2.2	-	-	-	62	530	-	-
2,4-Dinitrotoluene	121-14-2	8270D	10	0.27	-	-	-	0.084	0.34	-	-
2,6-Dinitrotoluene	606-20-2	8270D	10	0.35	-	-	29,000	-	-	-	-
2-Chloronaphthalene	91-58-7	8270D	10	0.29	-	-	-	-	-	-	-
2-Chlorophenol	95-57-8	8270D	10	0.31	-	-	-	-	-	-	-
2-Methyl-4,6-dinitrophenol	534-52-1	8270D	25	2.1	-	-	-	-	-	-	-
2-Methylnaphthalene	91-57-6	8270D	10	0.24	-	-	-	-	-	-	-
2-Methylphenol	95-48-7	8270D	10	0.33	-	-	-	-	-	-	-
2-Nitroaniline	88-74-4	8270D	25	0.34	-	-	-	-	-	-	-
2-Nitrophenol	88-75-5	8270D	10	0.37	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	91-94-1	8270D	25	0.27	-	-	460	0.0027	0.0028	-	-
3-Nitroaniline	99-09-2	8270D	25	3.3	-	-	-	-	-	-	-
4-Bromophenyl Phenyl Ether	101-55-3	8270D	10	0.27	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	59-50-7	8270D	10	0.49	-	-	-	-	-	-	-
4-Chloroaniline	106-47-8	8270D	10	0.38	-	-	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	7005-72-3	8270D	10	0.28	-	-	-	-	-	-	-
4-Methylphenol	106-44-5	8270D	10	0.48	-	-	-	-	-	-	-
4-Nitroaniline	100-01-6	8270D	25	4	-	-	-	-	-	-	-
4-Nitrophenol	100-02-7	8270D	25	1.9	-	-	-	-	-	-	-
Acenaphthene	83-32-9	8270D	10	0.28	-	-	-	95	99	-	-
Acenaphthylene	208-96-8	8270D	10	0.24	-	-	-	-	-	-	-
Acetophenone	98-86-2	8270D	10	0.6	-	-	-	-	-	-	-
Aniline	62-53-3	8270D	25	0.49	-	-	-	-	-	-	-
Anthracene	120-12-7	8270D	10	0.61	-	-	-	2900	4000	-	-
Atrazine	1912-24-9	8270D	10	0.46	-	-	-	-	-	-	-
Benz(a)anthracene	56-55-3	8270D	10	0.59	-	-	9.1	0.000018	0.00002	-	-
Benzaldehyde	100-52-7	8270D	10	0.5	-	-	-	-	-	-	-
Benzo(a)pyrene	50-32-8	8270D	10	0.65	-	-	0.53	0.0013	0.0018	-	-
Benzo(b)fluoranthene	205-99-2	8270D	10	0.58	-	-	-	0.0013	0.0018	-	-
Benzo(g,h,i)perylene	191-24-2	8270D	10	0.81	-	-	-	-	-	-	-
Benzo(k)fluoranthene	207-08-9	8270D	10	0.83	-	-	-	0.0013	0.0018	-	-
Benzoic Acid	65-85-0	8270D	25	5.8	-	-	-	-	-	-	-
Benzyl Alcohol	100-51-6	8270D	10	0.38	-	-	-	-	-	-	-
Biphenyl	92-52-4	8270D	10	0.66	-	-	-	-	-	-	-
Bis(2-chloroethoxy)methane	111-91-1	8270D	10	0.28	-	-	-	-	-	-	-
Bis(2-chloroethyl) Ether	111-44-4	8270D	10	0.33	-	-	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	39638-32-9	8270D	10	0.31	-	-	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	117-81-7	8270D	10	1.9	-	-	-	-	-	-	-
Butyl Benzyl Phthalate	85-68-7	8270D	10	0.47	-	-	-	190	190	-	-
Caprolactam	105-60-2	8270D	10	0.58	-	-	-	-	-	-	-
Carbazole	86-74-8	8270D	10	0.36	-	-	-	-	-	-	-
Chrysene	218-01-9	8270D	10	0.79	-	-	-	0.0013	0.0018	-	-
Dibenz(a,h)anthracene	53-70-3	8270D	10	0.75	-	-	0.21	0.0013	0.0018	-	-
Dibenzofuran	132-64-9	8270D	10	0.33	-	-	-	-	-	-	-
Diethyl Phthalate	84-66-2	8270D	10	0.29	-	-	-	3800	4400	-	-
Dimethyl Phthalate	131-11-3	8270D	10	0.25	-	-	-	84000	110000	-	-

Constituent	CAS Number	USEPA Analytical Method	Sample Quantitation Limit	Method Detection Limit	Groundwater[1]			Storm Water and Tailrace Water[2]			
					Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Groundwater in Excavation	Human Health (Consumption)		Freshwater AWQC	
					Occupational	Occupational	Construction & Excavation Worker	Water + Organism	Organism Only	Acute	Chronic
Di-n-butyl Phthalate	84-74-2	8270D	10	0.65	-	-	-	400	450	-	-
Di-n-octyl Phthalate	117-84-0	8270D	10	0.63	-	-	-	-	-	-	-
Fluoranthene	206-44-0	8270D	10	0.65	-	-	-	14	14	-	-
Fluorene	86-73-7	8270D	10	0.32	-	-	-	390	530	-	-
Hexachlorobenzene	118-74-1	8270D	10	0.63	830	310	8.1	0.000029	0.000029	-	-
Hexachlorobutadiene	87-68-3	8270D	10	0.29	-	-	-	0.36	1.8	-	-
Hexachlorocyclopentadiene	77-47-4	8270D	10	1.2	-	-	-	30	110	-	-
Hexachloroethane	67-72-1	8270D	10	0.29	-	-	2,700	0.29	0.33	-	-
Indeno(1,2,3-cd)pyrene	193-39-5	8270D	10	0.68	-	-	-	0.0013	0.0018	-	-
Isophorone	78-59-1	8270D	10	0.25	-	-	-	27	96	-	-
Naphthalene	91-20-3	8270D	10	0.37	16,000	10,000	500	-	-	-	-
Nitrobenzene	98-95-3	8270D	10	0.57	-	-	-	14	69	-	-
N-Nitrosodimethylamine	62-75-9	8270D	25	0.48	-	-	-	0.00068	0.30	-	-
N-Nitrosodi-n-propylamine	621-64-7	8270D	10	0.5	-	-	-	0.0046	0.051	-	-
N-Nitrosodiphenylamine	86-30-6	8270D	10	0.48	-	-	-	0.55	0.60	-	-
Pentachlorophenol	87-86-5	8270D	25	2.4	-	-	-	-	-	-	-
Phenanthrene	85-01-8	8270D	10	0.48	-	-	-	-	-	-	-
Phenol	108-95-2	8270D	10	0.32	-	-	-	-	-	-	-
Pyrene	129-00-0	8270D	10	0.73	-	-	-	290	400	-	-
Pyridine	110-86-1	8270D	25	7.5	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons											
Diesel Range Organics	68334-30-5	NWTPH-Dx	250	8.2	-	-	-	-	-	-	-
Gasoline Range Organics	8006-61-9	NWTPH-Gx	250	13	-	-	-	-	-	-	-

Notes:

Concentrations are listed in micrograms per liter (µg/L)
Shaded cells indicate that the screening level is less than the Sample Quantitation Limit.
1 = Risk Based Decision Making criteria
2 = Criteria are derived from the Aquatic Life Criteria Tables 20 and 33A and Human Health Criteria Table 40, approved by EPA on 17 October 2011.
AWQC = Ambient Water Quality Criteria from OAR 340-040 (2004)
DEQ = Oregon Department of Environmental Quality
MCL =Maximum Contaminant Level (USEPA. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. Sept 2008).
TEQ = Toxicity Equivalence Quotient

Table 4B

Proposed Analytes, Preliminary Screening Levels, and Laboratory Limits - Solids
Phase II Environmental Site Assessment
Blue Heron Mill Site and Main Office Building

Constituent	CAS Number	USEPA Analytical Method	Sample Quantitation Limit	Method Detection Limit	Intake Basin Sediment									Soil, Storm Water Solids, and Tailrace Solids						
					Birds		Mammals		Fish		Humans		Inorganic Background	Ingestion, Dermal Contact, and Inhalation				Volatilization to Outdoor Air		Vapor Intrusion into Buildings	
					Individual	Population	Individual	Population	Freshwater	Marine	General[a]	Subsistence[b]	Freshwater	Occupational	Construction Worker	Excavation Worker		Occupational		Occupational	
Metals																					
Arsenic	7440-38-2	6020A	0.5	0.06	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	7	2	13	370		-	NV	-	NV
Cadmium	7440-43-9	6020A	0.02	0.004	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	1	510	150	4,300		-	NV	-	NV
Chromium	7440-47-3	6020A	0.2	0.03	-	-	-	-	-	-	-	-	-	-	-	-		-		-	
Copper	7440-50-8	6020A	0.08	0.1	-	-	-	-	-	-	-	-	-	41,000	12,000	340,000		-	NV	-	NV
Lead	7439-92-1	6020A	0.05	0.009	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	17	800	800	800		-	NV	-	NV
Nickel	7440-02-0	6020A	0.2	0.03	-	-	-	-	-	-	-	-	-	20,000	6,100	170,000		-	NV	-	NV
Zinc	7440-66-6	6020A	0.5	0.2	-	-	-	-	-	-	-	-	-	-	-	-		-		-	
Mercury	7439-97-6	7471B	0.02	0.002	(c) (d)	(c) (d)	(c) (d)	(c) (d)	(c) (d)	(c) (d)	(c) (d)	(c) (d)	0.07	310	93	2,600		-	NV	-	NV
Hexavalent Chromium	18540-29-9	7196A	0.5	0.08	-	-	-	-	-	-	-	-	-	5.5	43	1200		-	NV	-	NV
Total Petroleum Hydrocarbons																					
Diesel Range Organics	68334-30-5	NWTPH-Dx	25	0.79	-	-	-	-	-	-	-	-	-	-	-	-		-		-	
Gasoline Range Organics	8006-61-9	NWTPH-Gx	5	1.5	-	-	-	-	-	-	-	-	-	-	-	-		-		-	
Volatile Organic Carbons (VOCs)																					
1,1,1,2-Tetrachloroethane	630-20-6	8260C	0.005	0.00011	-	-	-	-	-	-	-	-	-	-	-	-		-		-	
1,1,1-Trichloroethane (TCA)	71-55-6	8260C	0.005	0.00011	-	-	-	-	-	-	-	-	-	830,000	>Csat	430,000	>Csat	-	>Csat	-	>Csat
1,1,2,2-Tetrachloroethane	79-34-5	8260C	0.005	0.00013	-	-	-	-	-	-	-	-	-	-		-		-		-	
1,1,2-Trichloroethane	79-00-5	8260C	0.005	0.00015	-	-	-	-	-	-	-	-	-	25		290		8,100	>Csat	24	2.7
1,1-Dichloroethane	75-34-3	8260C	0.005	0.00012	-	-	-	-	-	-	-	-	-	200,000	>Csat	62,000	>Csat	-	>Max	-	>Max
1,1-Dichloroethene	75-35-4	8260C	0.005	0.00025	-	-	-	-	-	-	-	-	-	27,000	>Csat	12,000	>Csat	340,000	>Csat	-	>Csat	680	
1,1-Dichloropropene	563-58-6	8260C	0.005	0.00013	-	-	-	-	-	-	-	-	-	-		-		-		-	
1,2,3-Trichlorobenzene	87-61-6	8260C	0.02	0.00019	-	-	-	-	-	-	-	-	-	-		-		-		-	
1,2,3-Trichloropropane	96-18-4	8260C	0.005	0.00045	-	-	-	-	-	-	-	-	-	-		-		-		-	
1,2,4-Trichlorobenzene	120-82-1	8260C	0.02	0.00013	-	-	-	-	-	-	-	-	-	-		-		-		-	
1,2,4-Trimethylbenzene	95-63-6	8260C	0.02	0.000054	-	-	-	-	-	-	-	-	-	2,000	>Csat	2,000	>Csat	54,000	>Csat	1,000	1,000
1,2-Dibromo-3-chloropropane	96-12-8	8260C	0.02	0.0004	-	-	-	-	-	-	-	-	-	-		-		-		-	
1,2-Dibromoethane (EDB)	106-93-4	8260C	0.02	0.000094	-	-	-	-	-	-	-	-	-	0.68		8.1		230		0.65	0.14
1,2-Dichlorobenzene	95-50-1	8260C	0.005	0.000077	-	-	-	-	-	-	-	-	-	-		-		-		-	-
1,2-Dichloroethane (EDC)	107-06-2	8260C	0.005	0.00007	-	-	-	-	-	-	-	-	-	15		180		5,000	>Csat	15	0.59
1,2-Dichloropropane	78-87-5	8260C	0.005	0.00013	-	-	-	-	-	-	-	-	-	-		-		-		-	-
1,3,5-Trimethylbenzene	108-67-8	8260C	0.02	0.000092	-	-	-	-	-	-	-	-	-	10,000	>Csat	3,100	>Csat	86,000	>Csat	-	>Max	-	>Max
1,3-Dichlorobenzene	541-73-1	8260C	0.005	0.000094	-	-	-	-	-	-	-	-	-	-		-		-		-	
1,3-Dichloropropane	142-28-9	8260C	0.005	0.00012	-	-	-	-	-	-	-	-	-	-		-		-		-	
1,4-Dichlorobenzene	106-46-7	8260C	0.005	0.000086	-	-	-	-	-	-	-	-	-	63		1,200	>Csat	34,000	>Csat	36	17
2,2-Dichloropropane	594-20-7	8260C	0.005	0.000098	-	-	-	-	-	-	-	-	-	-		-		-		-	
2-Butanone (MEK)	78-93-3	8260C	0.02	0.0009	-	-	-	-	-	-	-	-	-	-		-		-		-	
2-Chlorotoluene	95-49-8	8260C	0.02	0.00012	-	-	-	-	-	-	-	-	-	-		-		-		-	
2-Hexanone	591-78-6	8260C	0.02	0.00093	-	-	-	-	-	-	-	-	-	-		-		-		-	
4-Chlorotoluene	106-43-4	8260C	0.02	0.000088	-	-	-	-	-	-	-	-	-	-		-		-		-	
4-Isopropyltoluene	99-87-6	8260C	0.02	0.000064	-	-	-	-	-	-	-	-	-	-		-		-		-	
4-Methyl-2-pentanone (MIBK)	108-10-1	8260C	0.02	0.0018	-	-	-	-	-	-	-	-	-	-		-		-		-	
Acetone	67-64-1	8260C	0.02	0.0029	-	-	-	-	-	-	-	-	-	-		-		-		-	
Benzene	71-43-2	8260C	0.005	0.000054	-	-	-	-	-	-	-	-	-	34		340		9,500	>Csat	50	1.2
Bromobenzene	108-86-1	8260C	0.005	0.000088	-	-	-	-	-	-	-	-	-	-		-		-		-	-
Bromochloromethane	74-97-5	8260C	0.005	0.00024	-	-	-	-	-	-	-	-	-	-		-		-		-	-
Bromodichloromethane	75-27-4	8260C	0.005	0.00016	-	-	-	-	-	-	-	-	-	15		210		5,800	>Csat	11	1.9
Bromoform	75-25-2	8260C	0.005	0.00014	-	-	-	-	-	-	-	-	-	240		2,400	>Csat	66,000	>Csat	550	550
Bromomethane	74-83-9	8260C	0.005	0.0002	-	-	-	-	-	-	-	-	-	710		330		9,200	>Csat	700	17
Carbon Disulfide	75-15-0	8260C	0.005	0.000092	-	-	-	-	-	-	-	-	-	-		-		-		-	-
Carbon Tetrachloride	56-23-5	8260C	0.005	0.000094	-	-	-	-	-	-	-	-	-	31		280		7,900	>Csat	65	1.6
Chlorobenzene	108-90-7	8260C	0.005	0.000065	-	-	-	-	-	-	-	-	-	8,300	>Csat	4,300	>Csat	120,000	>Csat	-	>Csat	-	>Csat
Chloroethane	75-00-3	8260C	0.005	0.00074	-	-	-	-	-	-	-	-	-	-	>Max	-	>Max	-	>Max	-	>Max	-	>Csat
Chloroform	67-66-3	8260C	0.005	0.00011	-	-	-	-	-	-	-	-	-	25		380		11,000	>Csat	17	0.41
Chloromethane	74-87-3	8260C	0.005	0.00018	-	-	-	-	-	-	-	-	-	25,000	>Csat	25,000	>Csat	700,000	>Csat	-	>Csat	300	
cis-1,2-Dichloroethene	156-59-2	8260C	0.005	0.00012	-	-	-	-	-	-	-	-	-	2,000	>Csat	620		17,000	>Csat	-	>Max	-	>Max
cis-1,3-Dichloropropene	10061-01-5	8260C	0.005	0.00013	-	-	-	-	-	-	-	-	-	-		-		-		-	
Dibromochloromethane	124-48-1	8260C	0.005	0.00018	-	-	-	-	-	-	-	-	-	-		-		-		-	

Constituent	CAS Number	USEPA Analytical Method	Sample Quantitation Limit	Method Detection Limit	Intake Basin Sediment									Soil, Storm Water Solids, and Tailrace Solids								
					Birds		Mammals		Fish		Humans		Inorganic Background	Ingestion, Dermal Contact, and Inhalation						Volatilization to Outdoor Air		Vapor Intrusion into Buildings	
					Individual	Population	Individual	Population	Freshwater	Marine	General[a]	Subsistence[b]	Freshwater	Occupational		Construction Worker		Excavation Worker		Occupational		Occupational	
Dibromomethane	74-95-3	8260C	0.005	0.00028	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Dichlorodifluoromethane	75-71-8	8260C	0.005	0.00012	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Ethylbenzene	100-41-4	8260C	0.005	0.000094	-	-	-	-	-	-	-	-	-	140		1,600	>Csat	44,000	>Csat	160		12	
Hexachlorobutadiene	87-68-3	8260C	0.02	0.0004	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Isopropylbenzene	98-82-8	8260C	0.02	0.000081	-	-	-	-	-	-	-	-	-	53,000	>Csat	24,000	>Csat	670,000	>Csat	-	>Csat	-	>Csat
m,p-Xylenes	179601-23-1	8260C	0.005	0.0001	-	-	-	-	-	-	-	-	-	25,000	>Csat	19,000	>Csat	540,000	>Csat	-	>Csat	-	>Csat
Methylene Chloride	75-09-2	8260C	0.01	0.00016	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Naphthalene	91-20-3	8260C	0.02	0.00013	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
n-Butylbenzene	104-51-8	8260C	0.02	0.000069	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
n-Propylbenzene	103-65-1	8260C	0.02	0.00013	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
o-Xylene	95-47-6	8260C	0.005	0.000081	-	-	-	-	-	-	-	-	-	25,000	>Csat	19,000	>Csat	540,000	>Csat	-	>Csat	-	>Csat
sec-Butylbenzene	135-98-8	8260C	0.02	0.000074	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Styrene	100-42-5	8260C	0.005	0.00014	-	-	-	-	-	-	-	-	-	120,000	>Csat	51,000	>Csat	-	>Max	-	>Csat	-	>Csat
tert-Butylbenzene	98-06-6	8260C	0.02	0.00014	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Tetrachloroethene (PCE)	127-18-4	8260C	0.005	0.00016	-	-	-	-	-	-	-	-	-	940	>Csat	9,100	>Csat	250,000	>Csat	-	>Csat	36	
Toluene	108-88-3	8260C	0.005	0.00015	-	-	-	-	-	-	-	-	-	77,000	>Csat	24,000	>Csat	680,000	>Csat	-	>Csat	-	>Csat
trans-1,2-Dichloroethene	156-60-5	8260C	0.005	0.00012	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
trans-1,3-Dichloropropene	10061-02-6	8260C	0.005	0.00011	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Trichloroethene (TCE)	79-01-6	8260C	0.005	0.00015	-	-	-	-	-	-	-	-	-	46		420		12,000	>Csat	96		2.7	
Trichlorofluoromethane	75-69-4	8260C	0.005	0.000085	-	-	-	-	-	-	-	-	-	120,000	>Csat	63,000	>Csat	-	>Max	-	>Csat	-	>Csat
Vinyl Chloride	75-01-4	8260C	0.005	0.00018	-	-	-	-	-	-	-	-	-	3.9		30		830		89		2.2	
Semivolatile organic carbons (SVOCs)																							
1,2,4-Trichlorobenzene	120-82-1	8270D	0.33	0.011	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
1,2-Dichlorobenzene	95-50-1	8270D	0.33	0.018	-	-	-	-	-	-	-	-	-	35,000	>Csat	19,000	>Csat	520,000	>Csat	-	>Csat	-	>Csat
1,2-Diphenylhydrazine	122-66-7	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
1,3-Dichlorobenzene	541-73-1	8270D	0.33	0.018	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
1,4-Dichlorobenzene	106-46-7	8270D	0.33	0.018	-	-	-	-	-	-	-	-	-	63		1,200	>Csat	34,000	>Csat	36		17	
2,3,4,6-Tetrachlorophenol	58-90-2	8270D	0.33	0.046	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2,4,5-Trichlorophenol	95-95-4	8270D	0.33	0.018	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2,4,6-Trichlorophenol	88-06-2	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	200		1,500		42,000	>Csat	-	NV	-	NV
2,4-Dichlorophenol	120-83-2	8270D	0.33	0.016	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2,4-Dimethylphenol	105-67-9	8270D	0.33	0.015	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2,4-Dinitrophenol	51-28-5	8270D	2	0.11	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2,4-Dinitrotoluene	121-14-2	8270D	0.33	0.015	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2,6-Dinitrotoluene	606-20-2	8270D	0.33	0.016	-	-	-	-	-	-	-	-	-	770	>Csat	240		6,600	>Csat	-	NV	-	NV
2-Chloronaphthalene	91-58-7	8270D	0.33	0.01	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2-Chlorophenol	95-57-8	8270D	0.33	0.0099	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2-Methyl-4,6-dinitrophenol	534-52-1	8270D	2	0.14	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2-Methylnaphthalene	91-57-6	8270D	0.33	0.011	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2-Methylphenol	95-48-7	8270D	0.33	0.017	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2-Nitroaniline	88-74-4	8270D	0.33	0.017	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
2-Nitrophenol	88-75-5	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
3,3'-Dichlorobenzidine	91-94-1	8270D	0.33	0.027	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
3-Nitroaniline	99-09-2	8270D	0.33	0.018	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
4-Bromophenyl Phenyl Ether	101-55-3	8270D	0.33	0.012	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
4-Chloro-3-methylphenol	59-50-7	8270D	0.33	0.017	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
4-Chloroaniline	106-47-8	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
4-Chlorophenyl Phenyl Ether	7005-72-3	8270D	0.33	0.016	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
4-Methylphenol	106-44-5	8270D	0.33	0.017	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
4-Nitroaniline	100-01-6	8270D	2	0.18	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
4-Nitrophenol	100-02-7	8270D	2	0.15	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Acenaphthene	83-32-9	8270D	0.33	0.013	-	-	-	-	-	-	-	-	-	61,000	>Csat	19,000	>Csat	520,000	>Csat	-	>Max	-	>Max
Acenaphthylene	208-96-8	8270D	0.33	0.016	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Acetophenone	98-86-2	8270D	0.33	0.023	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aniline	62-53-3	8270D	1	0.022	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Anthracene	120-12-7	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	310,000	>Csat	93,000	>Csat	-	>Max	-	>Max	-	>Max
Atrazine	1912-24-9	8270D	0.33	0.017	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Benz(a)anthracene	56-55-3	8270D	0.33	0.012	-	-	-	-	-	-	-	-	-	2.7		21	>Csat	590	>Csat	-	NV	-	NV
Benzo(a)pyrene	50-32-8	8270D	0.33	0.02	-	-	-	-	-	-	-	-	-	0.27		2.1		59	>Csat	-	NV	-	NV
Benzo(b)fluoranthene	205-99-2	8270D	0.33	0.017	-	-	-	-	-	-	-	-	-	2.7		21	>Csat	590	>Csat	-	>Csat	-	>Csat
Benzo(g,h,i)perylene	191-24-2	8270D	0.33	0.02	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Benzo(k)fluoranthene	207-08-9	8270D	0.33	0.019	-	-	-	-	-	-	-	-	-	27	>Csat	210	>Csat	5,900	>Csat	-	NV	-	NV
Benzaldehyde	100-52-7	8270D	0.33	0.021	-	-	-	-	-	-	-	-	-	-		-		-		-		-	

Constituent	CAS Number	USEPA Analytical Method	Sample Quantitation Limit	Method Detection Limit	Intake Basin Sediment									Soil, Storm Water Solids, and Tailrace Solids									
					Birds		Mammals		Fish		Humans		Inorganic Background	Ingestion, Dermal Contact, and Inhalation						Volatilization to Outdoor Air		Vapor Intrusion into Buildings	
					Individual	Population	Individual	Population	Freshwater	Marine	General[a]	Subsistence[b]	Freshwater	Occupational		Construction Worker		Excavation Worker		Occupational		Occupational	
Benzoic Acid	65-85-0	8270D	2	0.14	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Benzyl Alcohol	100-51-6	8270D	0.33	0.017	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Biphenyl	92-52-4	8270D	0.33	0.009	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Bis(2-chloroethoxy)methane	111-91-1	8270D	0.33	0.011	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Bis(2-chloroethyl) Ether	111-44-4	8270D	0.33	0.012	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Bis(2-chloroisopropyl) Ether	39638-32-9	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Bis(2-ethylhexyl) Phthalate	117-81-7	8270D	0.33	0.019	-	-	-	-	-	-	-	-	-	150	>Csat	1,200	>Csat	33,000	>Csat	-	NV	-	NV
Butyl Benzyl Phthalate	85-68-7	8270D	0.33	0.016	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Caprolactam	105-60-2	8270D	0.33	0.15	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Carbazole	86-74-8	8270D	0.33	0.011	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Chrysene	218-01-9	8270D	0.33	0.012	-	-	-	-	-	-	-	-	-	250	>Csat	2,100	>Csat	57,000	>Csat	-	>Csat	-	>Csat
Dibenz(a,h)anthracene	53-70-3	8270D	0.33	0.027	-	-	-	-	-	-	-	-	-	0.27		2.1		59	>Csat	-	NV	-	NV
Dibenzofuran	132-64-9	8270D	0.33	0.012	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Diethyl Phthalate	84-66-2	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Dimethyl Phthalate	131-11-3	8270D	0.33	0.016	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Di-n-butyl Phthalate	84-74-2	8270D	0.33	0.012	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Di-n-octyl Phthalate	117-84-0	8270D	0.33	0.024	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Fluoranthene	206-44-0	8270D	0.33	0.011	-	-	360	1,800	37	37	510	62	-	29,000	>Csat	8,900	>Csat	250,000	>Csat	-	>Max	-	>Max
Fluorene	86-73-7	8270D	0.33	0.013	-	-	-	-	-	-	-	-	-	41,000	>Csat	12,000	>Csat	340,000	>Csat	-	>Max	-	>Max
Hexachlorobenzene	118-74-1	8270D	0.33	0.015	-	-	-	-	61	61	0.019	0.0023	-	1.2		12		330		79		79	
Hexachlorobutadiene	87-68-3	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Hexachlorocyclopentadiene	77-47-4	8270D	0.33	0.012	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Hexachloroethane	67-72-1	8270D	0.33	0.022	-	-	-	-	-	-	-	-	-	90		970	>Csat	27,000	>Csat	-	>Csat	-	>Csat
Indeno(1,2,3-cd)pyrene	193-39-5	8270D	0.33	0.039	-	-	-	-	-	-	-	-	-	2.7	>Csat	21	>Csat	590	>Csat	-	NV	-	NV
Isophorone	78-59-1	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Naphthalene	91-20-3	8270D	0.33	0.014	-	-	-	-	-	-	-	-	-	23		580	>Csat	16,000	>Csat	99		99	
Nitrobenzene	98-95-3	8270D	0.33	0.026	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
N-Nitrosodimethylamine	62-75-9	8270D	2	0.3	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
N-Nitrosodi-n-propylamine	621-64-7	8270D	0.33	0.019	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
N-Nitrosodiphenylamine	86-30-6	8270D	0.33	0.018	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Pentachlorophenol	87-86-5	8270D	2	0.13	-	-	0.33	3.3	0.31	0.17	0.25	0.030	-	3.9		31		860		-	NV	-	NV
Phenanthrene	85-01-8	8270D	0.33	0.01	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Phenol	108-95-2	8270D	0.33	0.019	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Pyrene	129-00-0	8270D	0.33	0.014	-	-	18,000	90,000	1.9	1.9	380	47	-	21,000	>Csat	6,700	>Csat	190,000	>Csat	-	>Max	-	>Max
Pyridine	110-86-1	8270D	0.33	0.33	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
PCBs																							
PCBs (total as Aroclors)					0.057	0.17	0.044	0.084	0.022	0.047	0.00039	4.80E-05	-	0.70		7.5	>Csat	210	>Csat	-	>Csat	-	>Csat
Aroclor 1016	12674-11-2	8082A	0.1	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aroclor 1221	11104-28-2	8082A	0.2	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aroclor 1232	11141-16-5	8082A	0.1	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aroclor 1242	53469-21-9	8082A	0.1	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aroclor 1248	12672-29-6	8082A	0.1	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aroclor 1254	11097-69-1	8082A	0.1	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aroclor 1260	11096-82-5	8082A	0.1	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aroclor 1262	37324-23-5	8082A	0.1	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Aroclor 1268	11100-14-4	8082A	0.1	0.0061	-	-	-	-	-	-	-	-	-	-		-		-		-		-	
Dioxins and Furans																							
2378-TCDD	1746-01-6	8290	1.00E-06	5.88E-08	7.00E-07	3.50E-06	5.20E-08	1.40E-06	5.60E-07	5.60E-07	9.10E-09	1.10E-09	-	1.50E-05		1.50E-04		4.20E-03		-	>Csat	-	>Csat
12378-PeCDD	40321-76-4	8290	2.50E-06	4.82E-08	2.10E-05	1.10E-04	1.50E-06	4.20E-05	1.70E-05	1.70E-05	2.70E-07	3.40E-08	-	-		-		-		-		-	
123478-HxCDD	39227-28-6	8290	2.50E-06	4.66E-08	4.20E-04	2.10E-03	1.50E-05	4.20E-04	3.40E-05	3.40E-05	2.70E-06	3.40E-07	-	-		-		-		-		-	
123678-HxCDD	57653-85-7	8290	2.50E-06	4.25E-08	2.10E-03	1.10E-02	1.50E-05	4.20E-04	1.70E-03	1.70E-03	2.70E-06	3.40E-07	-	-		-		-		-		-	
123789-HxCDD	19408-74-3	8290	2.50E-06	4.47E-08	2.10E-04	1.10E-03	1.50E-05	4.20E-04	1.70E-03	1.70E-03	2.70E-06	3.40E-07	-	-		-		-		-		-	
1234678-HpCDD	35822-46-9	8290	2.50E-06	4.79E-08	5.30E-01	2.70E+00	3.90E-03	1.10E-01	4.30E-01	4.30E-01	6.90E-04	8.50E-05	-	-		-		-		-		-	
OCDD	3268-87-9	8290	5.00E-06	6.95E-08	5.30E+00	2.70E+01	1.30E-01	3.60E+00	4.30E+00	4.30E+00	2.30E-02	2.80E-03	-	-		-		-		-		-	
2378-TCDF	51207-31-9	8290	1.00E-06	5.62E-08	5.90E-06	3.00E-05	4.30E-06	1.20E-04	9.50E-05	9.50E-05	7.70E-07	9.40E-08	-	-		-		-		-		-	
12378-PeCDF	57117-41-6	8290	2.50E-06	3.96E-08	5.90E-05	3.00E-04	1.40E-05	4.00E-04	9.50E-05	9.50E-05	2.60E-06	3.10E-07	-	-		-		-		-		-	
23478-PeCDF	57117-31-4	8290	2.50E-06	3.88E-08	7.00E-07	3.50E-06	1.70E-07	4.70E-06	1.10E-06	1.10E-06	3.00E-08	3.70E-09	-	-		-		-		-		-	
123478-HxCDF	70648-26-9	8290	2.50E-06	3.40E-08	2.10E-04	1.10E-03	1.50E-05	4.20E-04	1.70E-04	1.70E-04	2.70E-06	3.40E-07	-	-		-		-		-		-	
123678-HxCDF	57117-44-9	8290	2.50E-06	3.35E-08	2.10E-04	1.10E-03	1.50E-05	4.20E-04	1.70E-04	1.70E-04	2.70E-06	3.40E-07	-	-		-		-		-		-	
123789-HxCDF	72918-21-9	8290	2.50E-06	4.18E-08	2.10E-04	1.10E-03	1.50E-05	4.20E-04	1.70E-04	1.70E-04	2.70E-06	3.40E-07	-	-		-		-		-		-	
234678-HxCDF	60851-34-5	8290	2.50E-06	3.67E-08	2.10E-04	1.10E-03	1.50E-05	4.20E-04	1.70E-04	1.70E-04	2.70E-06	3.40E-07	-	-		-		-		-		-	
1234678-HpCDF	67562-39-4	8290	2.50E-06	3.77E-08	5.30E-02	2.70E-01	3.90E-03	1.10E-01	4.30E-02	4.30E-02	6.90E-04	8.50E-05	-	-		-		-		-		-	

Constituent	CAS Number	USEPA Analytical Method	Sample Quantitation Limit	Method Detection Limit	Intake Basin Sediment									Soil, Storm Water Solids, and Tailrace Solids				
					Birds		Mammals		Fish		Humans		Inorganic Background	Ingestion, Dermal Contact, and Inhalation			Volatilization to Outdoor Air	Vapor Intrusion into Buildings
					Individual	Population	Individual	Population	Freshwater	Marine	General[a]	Subsistence[b]	Freshwater	Occupational	Construction Worker	Excavation Worker	Occupational	Occupational
1234789-HpCDF	55673-89-7	8290	2.50E-06	5.00E-08	5.30E-02	2.70E-01	3.90E-03	1.10E-01	4.30E-02	4.30E-02	6.90E-04	8.50E-05	-	-	-	-	-	-
OCDF	39001-02-0	8290	5.00E-06	6.44E-08	5.30E+00	2.70E+01	1.30E-01	3.60E+00	4.30E+00	4.30E+00	2.30E-02	2.80E-03	-	-	-	-	-	-
Total TCDD	41903-57-5	8290	1.00E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PeCDD	36088-22-9	8290	2.50E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total HxCDD	34465-46-8	8290	2.50E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total HpCDD	37871-00-4	8290	2.50E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total TCDF	30402-14-3	8290	1.00E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PeCDF	30402-15-4	8290	2.50E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total HxCDF	55684-94-1	8290	2.50E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total HpCDF	38998-75-3	8290	2.50E-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemisty																		
Asbestos	--	600	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: - = Not applicable or not available
Concentrations are listed in milligrams per kilogram (mg/kg)
Shaded cells indicate that the screening level is less than the Sample Quantitation Limit.
ODEQ = Oregon Department of Environmental Quality
RBDM = Risk Based Decision Making
Sediment Bioaccumulation Levels are collected from ODEQ *Guidance for Assessing Bioaccumulative Chemical of Concern in Sediment, Updated April 3, 2007*
Risk Based Decision Making Action Levels are screened among three pathways for Occupational and Construction Worker receptors - Soil Ingestion/Dermal Contact/Ingestion, Volatilization to Outdoor Air, Vapor Intrusion to Buildings
(a) Based on general/recreational fish ingestion rate of 0.0175 kg/day.
(b) Based on subsistence/ tribal fish ingestion rate of 0.1424 kg/day.
(c) Screen using either site specific or default regional background concentrations (shown in the column on the right in this table).
(d) Sites with mercury contamination should collect actual fish tissue data at the site. Site-specific conditions regulate the methylization process from sediment or water into aquatic receptors.
>Csat = The RBC exceeds the limit of three-phase equilibirum partioning
>Max = The RBC is greater than 100,000 mg/kg

Appendix B
Reference Documents

Appendix B - Refererence Documents

2011 Phase 2 - Aerated Stabilization Basin Site - West Linn	BlueHeronPaperPhaseIISiteAssessmentFinalReport.pdf"	
Asbestos Analysis - 2000	BLUE HERON - Asbestos Survey Feb-2000.pdf"	
Asset Info & Photos_Real Property	IRI Mill Layout Drawing (_20080331_0001).pdf"	
Asset Info & Photos_Real Property	Lagoon Property Photo, Maps & Misc Info.pdf"	
Asset Info & Photos_Real Property	Aerial Photo of Both Properties from Title Co.pdf"	
Asset Info & Photos_Real Property	Flyover Aerial Photo of Mill.jpg"	
Asset Info & Photos_Real Property	High Definition Overhead Photo of Mill - Metro - Summer 2005.pdf"	
Asset Info & Photos_Real Property	Historical Designation Report from 2002 - Part 2 (Photos).pdf"	
Asset Info & Photos_Real Property	Historical Designation Report from 2002.pdf"	
Draft Report re PCB Investigation - May 2011	Table - Results.pdf"	
Draft Report re PCB Investigation - May 2011	Figure - Sampling Locations.pdf"	
Draft Report re PCB Investigation - May 2011	Ld-BHPC Preliminary Soil Investigation.pdf"	
E&E Inc. Final Site Inspection - 12-11-08.pdf"		
EPA No Further Action Letter - Oct 2009.pdf"		
2011 Due Diligence Reports	AKS Report	113011 Blue Heron Final Report.pdf"
2011 Due Diligence Reports	BLUE HERON - Water Rights Determination Diagram - Legal.pdf"	
2011 Due Diligence Reports	HSW Email to Tony Konkol.Union Pacfic Maps Brock Nelson.pdf"	
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2011 Due Diligence Reports	US EPA No Further Action Letter.10.09.pdf"	
2011 Due Diligence Reports	WF-DEQ-401-complete.pdf"	
2011 Due Diligence Reports	AEI Environmental Site Assessment Phase I ESA (Mill Phase I).pdf"	
2011 Due Diligence Reports	AEI Property Photographs.pdf"	
2011 Due Diligence Reports	Asbestos Survey Blue Heron 02.2000.pdf"	
2011 Due Diligence Reports	Bridgewater Group Results of Preliminary Soil Investigation.pdf"	
2011 Due Diligence Reports	Ecology and Environment Final Blue Heron Site Inspection Report.pdf"	
2011 Due Diligence Reports	Ecology and Environment Final Blue Heron Site Inspection.pdf"	
2011 Due Diligence Reports	ERM Environmental Document Review.pdf"	
2011 Due Diligence Reports	Figure - Sampling Locations - Bridgewater Group Report.pdf"	
2011 Due Diligence Reports	OR DEQ National Polluntant Discharge Elimiation System Waste DischargeBlue Heron Permit Final.pdf"	
2011 Due Diligence Reports	OR DHS Letter - Amendment 32 Changes to Radioactive Materials License.pdf"	
2011 Due Diligence Reports	Paul Vandenberg BHPC Environmental Dcoument Review Memo.pdf"	
2011 Due Diligence Reports	Portland Harbor Natural Resource Trustee Council Preassessment Screen POrtland Harbor Superfund Site.pdf"	
2011 Due Diligence Reports	Site Maps and Aerial Photographs.pdf"	
2011 Due Diligence Reports	Title Reports and Exceptions	Vesting-2000029964.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #6.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #7.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #8.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #9.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #10.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #17.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #18.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #19.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #20.pdf"
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2011 Due Diligence Reports	Title Reports and Exceptions	Exception #36.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Exception #37.pdf"
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2011 Due Diligence Reports	Title Reports and Exceptions	Exception #40.pdf"
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2011 Due Diligence Reports	Title Reports and Exceptions	Exception #43.pdf"
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2011 Due Diligence Reports	Title Reports and Exceptions	Map 1.pdf"
2011 Due Diligence Reports	Title Reports and Exceptions	Map 2.pdf"
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2011 Due Diligence Reports	Title Reports and Exceptions	Map 7.pdf"
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Building Assessment Matrix	Template - WF Historical Asset Assessment.xlsx"	
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Building Snap Shot Forms	Sulphite Plant.docx"	
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Building Snap Shot Forms	Wollen Mill Foudations.docx"	
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GIS MAPS Summer 2011	Blue Heron Mill - Aerial Photo Map - 11x17L - 20110331.pdf"		
GIS MAPS Summer 2011	Blue Heron Mill - Aerial Photo Map - 24x36L - 20110325.pdf"		
GIS MAPS Summer 2011	Blue Heron Mill - Contour Map - 11x17L - 20110331.pdf"		
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GIS MAPS Summer 2011	Blue Heron Mill - Natural Resources Map - 11x17L - 20110331.pdf"		
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Oregon City - GIS	Blue Heron Storm Features.pdf"		
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Key Bankruptcy Docs & Orders	Disclosure Statement (latest version)	476 - Second Amended Disclosure Statement.pdf"	
Key Bankruptcy Docs & Orders	Petition & Schedules	BLUE HERON - 001 - Voluntary Petition.pdf"	
Key Bankruptcy Docs & Orders	Petition & Schedules	BLUE HERON - 003 - List of 20 Largest Creditors.pdf"	
Key Bankruptcy Docs & Orders	Petition & Schedules	BLUE HERON - 004 - List of Equity Security Holders.pdf"	
Key Bankruptcy Docs & Orders	Petition & Schedules	BLUE HERON - 005 - Corporate Ownership Statement.pdf"	
Key Bankruptcy Docs & Orders	Petition & Schedules	BLUE HERON - 060 - Missing documents - Schedules.pdf"	
Key Bankruptcy Docs & Orders	740 - Order re Sale of Inventory & Supplies.pdf"		
Key Bankruptcy Docs & Orders	782 - Order re Sale of Machinery, Fixtures, Equipment, Vehicles, and Furnishings.pdf"		
Lagoon Phase I & II - April 2008	Appendix A_Phase II ESA	Attachment A_Lab Analytical Reports	0803161.pdf"
Lagoon Phase I & II - April 2008	Appendix A_Phase II ESA	Attachment B_Data Validation Memo	M-DV-032708.doc"
Lagoon Phase I & II - April 2008	Appendix A_Phase II ESA	Attachment C_FSDSs	Soil FSDS.pdf"
Lagoon Phase I & II - April 2008	Appendix A_Phase II ESA	Attachment C_FSDSs	Water FSDS.pdf"
Lagoon Phase I & II - April 2008	Appendix A_Phase II ESA	Attachment D_Sampling Photographs	Photo Array 03.27.08.doc"
Lagoon Phase I & II - April 2008	Appendix A_Phase II ESA	Attachment E_Health and Safety Plan	Phase II HSP.rtf"
Lagoon Phase I & II - April 2008	Appendix A_Phase II ESA	Attachment F_Boring Logs	boring logs_032708.pdf"
Lagoon Phase I & II - April 2008	Appendix B_Resumes	St John, AM--2007.doc"	
Lagoon Phase I & II - April 2008	Appendix B_Resumes	Titkemeier, Kelly--2007.doc"	
Lagoon Phase I & II - April 2008	Appendix C_User Data Request	User Data Request BHPC1.pdf"	
Lagoon Phase I & II - April 2008	Appendix D_Title Report	Fig D-1_Taxlot IDs.pdf"	
Lagoon Phase I & II - April 2008	Appendix D_Title Report	N08-01806.pdf"	
Lagoon Phase I & II - April 2008	Appendix E_EDR Geocheck Report	2172082_2.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_2007_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1936_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1939_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1944_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1953_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1957_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1961_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1967_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1972_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1977_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1980_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1986_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1991_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_1996_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix F_Aerial Photographs	Fig_2002_Historic Aerial.pdf"	
Lagoon Phase I & II - April 2008	Appendix G_Sanborn Fire Insurance Maps	2172082_3.pdf"	
Lagoon Phase I & II - April 2008	Appendix H_Polk City Directories	21720824.pdf"	
Lagoon Phase I & II - April 2008	Appendix I_Prior Enviro Site Assessments	PQD0178Dioxin.pdf"	
Lagoon Phase I & II - April 2008	Appendix I_Prior Enviro Site Assessments	tef_values.pdf"	
Lagoon Phase I & II - April 2008	Appendix I_Prior Enviro Site Assessments	2006 LA soil sludge coc.pdf"	
Lagoon Phase I & II - April 2008	Appendix I_Prior Enviro Site Assessments	2006 LA soil sludge.pdf"	
Lagoon Phase I & II - April 2008	Appendix I_Prior Enviro Site Assessments	2006 Neauman soil sludge coc.PDF"	
Lagoon Phase I & II - April 2008	Appendix I_Prior EnviroSite Assessments	2006 Neauman soil sludge.pdf"	
Lagoon Phase I & II - April 2008	Appendix I_Prior Enviro Site Assessments	2007 sludge.pdf"	

Lagoon Phase I & II - April 2008 Appendix I_Prior Enviro Site Assessments biomonitoring services.pdf"
Lagoon Phase I & II - April 2008 Appendix I_Prior Enviro Site Assessments Blue Heron Permit Final.pdf"
Lagoon Phase I & II - April 2008 Appendix I_Prior Enviro Site Assessments Determination of PCDD.pdf"
Lagoon Phase I & II - April 2008 Appendix I_Prior Enviro Site Assessments expiremental sulphite waste liquor pond.pdf"
Lagoon Phase I & II - April 2008 Appendix I_Prior Enviro Site Assessments heron diox TEF.pdf"
Lagoon Phase I & II - April 2008 Appendix I_Prior Enviro Site Assessments heron diox TEF.xls"
Lagoon Phase I & II - April 2008 Appendix I_Prior Enviro Site Assessments pqd0178.PDF"
Lagoon Phase I & II - April 2008 Appendix J_Site Photographs Fig J1_Site Visit Photographs.pdf"
Lagoon Phase I & II - April 2008 Figures Fig3_Boring Locations.pdf"
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Lagoon Phase I & II - April 2008 Figures Fig ES-4_Boring Locations.pdf"
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Lagoon Phase I & II - April 2008 Tables Notes.xls"
Lagoon Phase I & II - April 2008 Tables Table 1-TEF.pdf"
Lagoon Phase I & II - April 2008 Tables Table 2-GW Data.pdf"
Lagoon Phase I & II - April 2008 Tables Table 3-GW Data.pdf"
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Lagoon Phase I & II - April 2008 Text Rd-Phase I ESA.pdf"
Mill Phase I - April 2008 1-Exec Summary - Phase I.pdf"
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Smurfit APA 1 - Asset Purchase Agreement BHP-Smurfit.pdf"
Smurfit APA 2 - Disclosure Schedules to APA - without employee data.pdf"
Smurfit APA 3 - Environmental Side Letter.pdf"
Smurfit APA 4 - Indemnification Side Letter.pdf"
Smurfit APA 5 - Promissory Note.pdf"
Smurfit APA 6 - Transition Services Agreement.pdf"
Smurfit APA 7 - Supply Agreement.pdf"
Smurfit APA 8 - Lease Agreement.pdf"
Smurfit APA 9 - Smurfit Employee Side Letter.pdf"
Smurfit APA Closing Documents List.pdf"
Survey_Mill 699-0010-GM-C-10131sht 1 RECORD of SURVEY MILL SITE (_20081003_0010).pdf"
Survey_Mill 699-0010-GM-C-10131sht 2 RECORD of SURVEY MILL SITE (_20081003_0011).pdf"
Survey_Mill 699-0010-GM-C-10131sht 3 RECORD of SURVEY MILL SITE (_20081003_0012).pdf"
Survey_Mill 699-0010-GM-C-10131sht 4 RECORD of SURVEY MILL SITE (_20081003_0013).pdf"
Survey_Mill 699-0010-GM-C-10131sht 5 RECORD of SURVEY MILL SITE (_20081003_0014).pdf"
Survey_Mill 699-0010-GM-C-10187 MILL LAND SURVEY PS 21487 (_20081003_0009).pdf"
Survey_Mill 699-0010-GM-C-10245 RECORD of SURVEY-PROPERTY LINE ADJUSTMENT for PGE (_20081003_0001).pdf"
Summary of tools.pdf"
Trustee's Title Report - 1st Rev - June 21, 2011.pdf"
V 2-1 - WF Historical Asset Assessment Matrix.pdf"
120524_Willamette Falls Site Access Standards.pdf"
Blue Heron Building Site Plan.pdf"
DE UCC results - BLUE HERON PAPER COMPANY.pdf"
Lagoon Chain of Title Report - April 2008.pdf"
Prelim Title - July 2005.pdf"
Snap Shot_Blue Heron Paper Office Building.docx"
699 - General Mill acltstk.dmp"
699 - General Mill plot.log"
699 - General Mill 699-0000-G-D-10800 #1 #3 #4 PM ROPE RUNS.dwg"
699 - General Mill 699-0000-GM-B-11217 MILL PAPER MAKING FLOW DIAGRAM.dwg"
699 - General Mill 699-0000-GM-D-06234 SNC OC MILL MAP.bak"
699 - General Mill 699-0000-GM-D-06234 SNC OC MILL MAP.DWG"
699 - General Mill 699-0000-GM-D-6234 BHP MILL MAP- B&W.DWG"
699 - General Mill 699-0000-GM-D-6234 BHP MILL MAP rev 4-color.DWG"
699 - General Mill 699-0000-GM-D-6234 BHP MILL MAP-color.DWG"
699 - General Mill 699-0000-GM-D-07486 CHEM & RAW MAT STORAGE MAP.dwg"
699 - General Mill 699-0000-GM-D-7486 CHEM_RAW MTRL STORAGE MAP.dwg"
699 - General Mill 699-0000-GM-D-7487 SHT1 AREA EVAC BASE MAP.dwg"
699 - General Mill 699-0000-GM-D-7487 SHT2 AREA EVAC BASE MAP.dwg"
699 - General Mill 699-0000-GM-D-7488 SHT1 FIRE SYSTEM MAP rev 7.dwg"
699 - General Mill 699-0000-GM-D-7488 SHT1 FIRE SYSTEM MAP.dwg"
699 - General Mill 699-0000-GM-D-7488 SHT2 FIRE SYSTEM MAP.dwg"
699 - General Mill 699-0000-GM-D-7488 SHT2 rev 7 FIRE & AMBULANCE PICK-UP MAP.dwg"
699 - General Mill 699-0000-GM-D-7489 AIR EMISSIONS MAP.dwg"

699 - General Mill	699-0000-GM-D-7490 RADIATION SOURCE MAP.dwg"
699 - General Mill	699-0000-GM-D-7490 rev 5 RADIATION SOURCE MAP.dwg"
699 - General Mill	699-0000-GM-D-7491 SAFETY SHWR & EYE WASH MAP.dwg"
699 - General Mill	699-0000-GM-D-7492 SEWER SYSTEM MAP.bak"
699 - General Mill	699-0000-GM-D-7492 SEWER SYSTEM MAP.dwg"
699 - General Mill	699-0000-GM-D-7493 MILL DRAINAGE MAP.dwg"
699 - General Mill	699-0000-GM-D-07509 CL CODED MAP COMP.MAINT MANAGE SYS (OBSOLETE).dwg"
699 - General Mill	699-0000-GM-D-10261 MILL E SECOND FLOOR OFFICES - PLAN.dwg"
699 - General Mill	699-0000-GM-D-10262 MILL E SECOND FLOOR OFFICES - NORTH PLAN rev1.bak"
699 - General Mill	699-0000-GM-D-10262 MILL E SECOND FLOOR OFFICES - NORTH PLAN rev1.dwg"
699 - General Mill	699-0000-GM-D-10262 MILL E SECOND FLOOR OFFICES - NORTH PLAN.DWG"
699 - General Mill	699-0000-GM-D-10263 MILL E 2ND FLOOR OFFICES - SOUTH rev1.bak"
699 - General Mill	699-0000-GM-D-10263 MILL E 2ND FLOOR OFFICES - SOUTH rev1.DWG"
699 - General Mill	699-0000-GM-D-10263 MILL E 2ND FLOOR OFFICES - SOUTH.DWG"
699 - General Mill	699-0000-GM-D-10851 SNC OC MILL MAP-TILE CHESTS & FILTER PLANT.dwg"
699 - General Mill	699-0000-GM-D-11045 sht 1 CORPORATE OFFICE BUILDING FLOOR PLAN - 1st FLOOR.dwg"
699 - General Mill	699-0000-GM-D-11045 sht 2 CORPORATE OFFICE BUILDING FLOOR PLAN - 2nd FLOOR.dwg"
699 - General Mill	699-0000-GM-D-11045 sht 3 CORPORATE OFFICE BUILDING FLOOR PLAN - BASEMENT.dwg"
699 - General Mill	699-0000-IP-D-10093 Effluent Spill Control System-No 1 & No 4 PM's Seal Water Collection P & ID.DWG"
699 - General Mill	699-0000-IP-D-10094 Effluent Spill Control System P & ID.DWG"
699 - General Mill	699-0000-P-B-10162 rev 1 WASTE WATER TREATMENT SYSTEM.dwg"
699 - General Mill	699-0000-P-B-10162 WASTE WATER TREATMENT SYSTEM.dwg"
699 - General Mill	699-0000-P-D-10697 SHT1 & 2 MILL UNDERGROUND PIPING GNRL LAYOUT rev1.dwg"
699 - General Mill	699-0000-P-D-10697 SHT1 & 2 MILL UNDERGROUND PIPING GNRL LAYOUT.dwg"
699 - General Mill	699-0000-P-D-10697 SHT1 & 2 MILL UNDERGROUND PIPING GNRL LAYOUTmod.dwg"
699 - General Mill	699-0001-GM-B-10151 MAJOR BULK CHEMICALS, WASTE & OIL MILL LOCATIONS.dwg"
699 - General Mill	699-0001-GM-D-10711 FLOOD INFO & ELEV FOR UPPER & LOWER WILLAMETTE.dwg"
699 - General Mill	699-0001-GM-D-10718 MILL AERIAL VIEW.dwg"
699 - General Mill	699-0010-GM-C-2430 LAND SURVEY- LAGOON- WEST LINN PS 21487 (20081003_0002.TIF).dwg"
699 - General Mill	699-0010-GM-C-10131 sht 1 RECORD of SURVEY- MILL SITE (20081003_010.TIF).bak"
699 - General Mill	699-0010-GM-C-10131 sht 1 RECORD of SURVEY- MILL SITE (20081003_010.TIF).dwg"
699 - General Mill	699-0010-GM-C-10131 sht 2 RECORD of SURVEY- MILL SITE (20081003_011.TIF).bak"
699 - General Mill	699-0010-GM-C-10131 sht 2 RECORD of SURVEY- MILL SITE (20081003_011.TIF).dwg"
699 - General Mill	699-0010-GM-C-10131 sht 3 RECORD of SURVEY- MILL SITE (20081003_012.TIF).bak"
699 - General Mill	699-0010-GM-C-10131 sht 3 RECORD of SURVEY- MILL SITE (20081003_012.TIF).dwg"
699 - General Mill	699-0010-GM-C-10131 sht 4 RECORD of SURVEY- MILL SITE (20081003_013.TIF).bak"
699 - General Mill	699-0010-GM-C-10131 sht 4 RECORD of SURVEY- MILL SITE (20081003_013.TIF).dwg"
699 - General Mill	699-0010-GM-C-10131 sht 5 RECORD of SURVEY- MILL SITE (20081003_014.TIF).bak"
699 - General Mill	699-0010-GM-C-10131 sht 5 RECORD of SURVEY- MILL SITE (20081003_014.TIF).dwg"
699 - General Mill	699-0010-GM-C-10132 sht 1 RECORD of SURVEY- LAGOON AREA (20081003_003.TIF).bak"
699 - General Mill	699-0010-GM-C-10132 sht 1 RECORD of SURVEY- LAGOON AREA (20081003_003.TIF).dwg"
699 - General Mill	699-0010-GM-C-10132 sht 2 RECORD of SURVEY- LAGOON AREA (20081003_004.TIF).bak"
699 - General Mill	699-0010-GM-C-10132 sht 2 RECORD of SURVEY- LAGOON AREA (20081003_004.TIF).dwg"
699 - General Mill	699-0010-GM-C-10132 sht 3 RECORD of SURVEY- LAGOON AREA (20081003_005.TIF).bak"
699 - General Mill	699-0010-GM-C-10132 sht 3 RECORD of SURVEY- LAGOON AREA (20081003_005.TIF).dwg"
699 - General Mill	699-0010-GM-C-10132 sht 4 RECORD of SURVEY- LAGOON AREA (20081003_006.TIF).bak"
699 - General Mill	699-0010-GM-C-10132 sht 4 RECORD of SURVEY- LAGOON AREA (20081003_006.TIF).dwg"
699 - General Mill	699-0010-GM-C-10132 sht 5 RECORD of SURVEY- LAGOON AREA (20081003_007.TIF).bak"
699 - General Mill	699-0010-GM-C-10132 sht 5 RECORD of SURVEY- LAGOON AREA (20081003_007.TIF).dwg"
699 - General Mill	699-0010-GM-C-10132 sht 6 RECORD of SURVEY- LAGOON AREA (20081003_008.TIF).dwg"
699 - General Mill	699-0010-GM-C-10132 sht 6 rev ! RECORD of SURVEY- LAGOON AREA (20081003_008.TIF).dwg"
699 - General Mill	699-0010-GM-C-10187 MILL LAND SURVEY PS 21487 (20081003_0009.TIF).dwg"
699 - General Mill	699-0010-GM-C-10245 RECORD of SURVEY- PROPERTY LINE ADJUSTMENT for PGE- (20081003_001.TIF).bak"
699 - General Mill	699-0010-GM-C-10245 RECORD of SURVEY- PROPERTY LINE ADJUSTMENT for PGE- (20081003_001.TIF).dwg"
699 - General Mill	699-0010-GM-C-10245 RECORD of SURVEY- PROPERTY LINE ADJUSTMENT for PGE- (20081003_001.TIG).bak"
699 - General Mill	699-0010-GM-D-10104 MILL MAP of TRAIN CROSSINGS.dwg"
699 - General Mill	699-0010-GM-D-10848 Y2K COMPLIANCE ZONES.dwg"
699 - General Mill	699-0010-GM-D-11208 sht 1 427 BLDG ASBESTOS SURVEY.dwg"
699 - General Mill	699-0010-GM-D-11208 sht 2 427 BLDG ASBESTOS SURVEY.dwg"
699 - General Mill	699-0010-GM-D-11208 sht 3 427 BLDG ASBESTOS SURVEY.dwg"
699 - General Mill	699-0010-GM-D-11300 IRI MILL LAYOUT DWG.dwg"
699 - General Mill	699-0020-GM-D-10104 MILL MAP - RAILROAD TRACKS & CROSSINGS.DWG"
699 - General Mill	699-0200-S-D-10778 SHT1 MILL ENTRANCE SIGN FRAME STRUCTURE.dwg"
699 - General Mill	699-0200-S-D-10778 SHT2 MILL ENTRANCE SIGN FRAME STRUCTURE.dwg"
699 - General Mill	699-1000-IP-B-02399 DEPT 699 AMMONIA SYS P&ID.dwg"
699 - General Mill	699-1200-I-D-07435 CLARIFIER EFFLUENT DISCHARGE SURGE VALVE PLAN & DETAILS.dwg"
699 - General Mill	699-1200-IP-D-10581 SHT1 MILLWIDE WW USAGES P & ID.dwg"
699 - General Mill	699-1200-IP-D-10581 SHT2 MILLWIDE Mill H & G WW USAGES P & ID.dwg"
699 - General Mill	699-1200-IP-D-10581 SHT3 MILLWIDE #1PM WW USAGES P & ID.dwg"
699 - General Mill	699-1200-IP-D-10581 SHT4 MILLWIDE #3PM WW USAGES P & ID.dwg"
699 - General Mill	699-1200-IP-D-10581 SHT5 MILLWIDE #4PM WW USAGES P & ID.dwg"
699 - General Mill	699-1600-PS-D-11289 MILL STEAM FLOW.bak"
699 - General Mill	699-1600-PS-D-11289 MILL STEAM FLOW.dwg"
699 - General Mill	699-2000-S-D-10156 EFF. CONTAIN UTILITY TUNNEL-Wall Opngs..DWG"
699 - General Mill	699-2000-S-D-10157 EFF. CONTAIN. UTILITY TUNNEL-Access Platform Plan.dwg"
699 - General Mill	699-2000-S-D-10158 EFF. CONTAIN UTILITY TUNNEL-Access Platform Sec. & Dtls.dwg"

699 - General Mill 699-2000-S-D-10159 EFF. CONTAIN UTILITY TUNNEL-Ladder Sec. & Dtls..dwg"
699 - General Mill 699-7000-EP-D-06235 SHT 1 (VOIDED) POWER DISTRIBUTION ONELINE.dwg"
699 - General Mill 699-7000-EP-D-06235 SHT 2 (VOIDED) POWER DISTRIBUTION ONELINE.dwg"
699 - General Mill 699-7000-EP-D-06235 SHT 3 (VOIDED) POWER DISTRIBUTION ONELINE.dwg"
699 - General Mill 699-7000-EP-D-06235 SHT 4 (VOIDED) POWER DISTRIBUTION ONELINE.dwg"
699 - General Mill 699-7000-EP-D-06235 SHT 5 (VOIDED) POWER DISTRIBUTION ONELINE.dwg"
699 - General Mill 699-7000-EP-E-10661 ONELINE MILL WIDE POWER DISTRIBUTION 4 plot version.dwg"
699 - General Mill 699-7000-EP-E-10661 ONELINE MILL WIDE POWER DISTRIBUTION.dwg"
699 - General Mill 699-9000-GM-D-07517-1 WATER RIGHTS DETERMINATION, CURRENT PROCESS WATER USAGE, BLOCK DIAGRAM.dwg"
699 - General Mill 699-9000-GM-D-07517-2 RIVER WATER INTAKE, CURRENT PROCESS WATER USAGE, BLOCK DIAGRAM.dwg"
699 - General Mill 699-9000-GM-D-07517-3 FILTERED WATER DISTRIBUTION, CURRENT PROCESS WATER USAGE, BLOCK DIAGRAM.dwg"
699 - General Mill 699-9000-GM-D-07517-4 EFFLUENT FLOWS CURRENT PROCESS WATER USAGE BLOCK DIAGRAM.dwg"
699 - General Mill 699-9000-GM-D-07517-4 EFFLUENT FLOWS, CURRENT PROCESS WATER USAGE, BLOCK DIAGRAM.dwg"
699 - General Mill 699-9000-GM-D-07518-1 WATER RIGHTS, CURRENT PROCESS & DIVERSION POINTS.dwg"
699 - General Mill 699-9000-GM-D-07518-2 WATER RIGHTS, CURRENT PROCESS ATMOSPHERIC LOSSES.dwg"
699 - General Mill 699-9000-GM-D-07518-3 WATER RIGHTS, CURRENT PROCESS WATER USAGE __ PEAK USAGE -- TANK FILL-UP.dwg"
699 - General Mill 699-9000-PS-B-11542 HEAT AND PWR BLNCE EXISITING ANUAL AVE.DWG"
699 - General Mill 699-9000-PS-B-11543 HEAT AND PWR BALNCE NO 5 TMP OFF PEAK HRS.dwg"
699 - General Mill 699-9000-PS-B-11544 HEAT AND PWR BALNCE NO 5 TMP 180 BDT ANNUAL AVE.dwg"
699 - General Mill 699-9000-PS-B-11545 HEAT AND PWR BALNCE FUTURE TURBINE GENERATOR ANNUAL AVE.dwg"
699 - General Mill 699-9105-EC-B-11727 EAST-WEST TRAVWELING WATER SCREEN MOTOR CONTROL.dwg"
699 - General Mill 699-9120-EM-B-11725 NORTH FISH SCREEN SHOWER PUMP.dwg"
699 - General Mill 699-9122-EM-B-11726 SOUTH FISH SCREEN SHOWER PUMP.dwg"
699 - General Mill 699-9600-CS-B-11492 LAB VIDEO CABLE RUN.dwg"
699 - General Mill 699-9600-CS-B-11873 ETHERNET NETWORK CABLE RUN.dwg"
699 - General Mill 699-9600-TS-D-10322 SHT2 PHONE SYSTEM MAP.bak"
699 - General Mill 699-9600-TS-D-10322-1 rev 1 MILL PHONE SYS MAP - INDEX.dwg"
699 - General Mill 699-9600-TS-D-10322-2 MILL PHONE SYS MAP - MISC LOCOs.dwg"
699 - General Mill 699-9600-TS-D-10323 PHONE SYSTEM MAP CORPORATE OFFICE BSMNT.dwg"
699 - General Mill 699-9600-TS-D-10323 rev2.dwg"
699 - General Mill 699-9600-TS-D-10324 PHONE SYSTEM MAP CORPORATE OFFICE 1ST FLR.dwg"
699 - General Mill 699-9600-TS-D-10324 rev 2.dwg"
699 - General Mill 699-9600-TS-D-10325 PHONE SYSTEM MAPS CORP OFFICE.dwg"
699 - General Mill 699-9600-TS-D-10326 PHONESYSTEM MAPS PERSONNEL, FIRST AID GUARD SHACK.dwg"
699 - General Mill 699-9600-TS-D-10327 PHONE SYSTEM MAP MILL E 4TH FLR.dwg"
699 - General Mill 699-9600-TS-D-10327 rev 2 PHONE SYSTEM MAP MILL E 4TH FLR.dwg"
699 - General Mill 699-9600-TS-D-10328 PHONE SYSTEM MAP MILL E 3RD FLR.bak"
699 - General Mill 699-9600-TS-D-10328 PHONE SYSTEM MAP MILL E 3RD FLR.dwg"
699 - General Mill 699-9600-TS-D-10329 PHONE SYSTEM MAP MILL E 2ND FLOOR SOUTH.bak"
699 - General Mill 699-9600-TS-D-10329 PHONE SYSTEM MAP MILL E 2ND FLOOR SOUTH.dwg"
699 - General Mill 699-9600-TS-D-10330 PHONE SYSTEM MAP MILL E 2ND FLOOR NORTH.dwg"
699 - General Mill 699-9600-TS-D-10330 rev 3 PHONE SYSTEM MAP MILL E 2ND FLOOR NORTH.dwg"
699 - General Mill 699-9600-TS-D-10331 PHONE SYSTEM MAP MILL E 1ST FLR.bak"
699 - General Mill 699-9600-TS-D-10331 PHONE SYSTEM MAP MILL E 1ST FLR.dwg"
699 - General Mill 699-9600-TS-D-10332 PHONE SYSTEM MAP #1PM.dwg"
699 - General Mill 699-9600-TS-D-10333 PHONE SYSTEM MAP #3PM.dwg"
699 - General Mill 699-9600-TS-D-10334 PHONE SYSTEM MAP #4PM.dwg"
699 - General Mill 699-9600-TS-D-10335 PHONE SYSTEM MAP MILL B DEINK.dwg"
699 - General Mill 699-9600-TS-D-10336 SHT1 PHONE SYSTEM MAP MILL H REFINING & DEINK.dwg"
699 - General Mill 699-9600-TS-D-10336 SHT2 PHONE SYSTEM MAP MILL H REFINING & DEINK.dwg"
699 - General Mill 699-9600-TS-D-10337 PHONE SYSTEM MAP MACHINE MILLWRIGHT SHOP.dwg"
699 - General Mill 699-9600-TS-D-10338 PHONE SYSTEM MAP MILL O.dwg"
699 - General Mill 699-9900-E-D-10019 TRANSFORMER SIZE&TYPE HAZ COMMUNICATION-MILL LOCATIONS rev1.dwg"
699 - General Mill 699-9900-E-D-10019 TRANSFORMER SIZE&TYPE HAZ COMMUNICATION-MILL LOCATIONS.dwg"
699 - General Mill 699-9900-PW-D-10831 FILTERED WATER, MILL, AERIAL VIEW.bak"
699 - General Mill 699-9900-PW-D-10831 FILTERED WATER, MILL, AERIAL VIEW.dwg"
699 - General Mill acltstk.dmp"
699 - General Mill plot.log"
Fig02_WaterManagement.pdf"

Appendix C
Boring Logs

ERM-West, Inc.
1001 S.W. 5th Avenue, Suite 1010
Portland, Oregon 97204
Telephone: 503-488-5282

F01-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 2 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Direct Push
AT TIME OF DRILLING ---
LOGGED BY B. Robinson **CHECKED BY** M. Appel
AT END OF DRILLING ---
NOTES Refusal at 10.5 feet due to basalt rock.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)
0.0				0.3 Asphalt.	
		GM		SILTY GRAVEL WITH SAND (GM): grey, fine gravel, fine to coarse sand, well-graded, angular, dry. Fill material.	
2.5				3.0	
		SP		POORLY-GRADED SAND (SP): dark brown, fine, poorly-graded, slightly moist, increasing to moist with depth.	
5.0					3
					0
7.5					0
10.0	F01-01-9.5-10.5 (1105)			At 9.5 feet bgs, as above except with laminations of silty sand.	
				At 10 feet bgs, as above except very moist.	1.6
				10.5	
				Bottom of borehole at 10.5 feet.	

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F01-02

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Hand Auger
AT TIME OF DRILLING ---
LOGGED BY B. Robinson **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 2 feet due to concrete slab.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
0.3				Asphalt.
0.5				Crushed rock. Grey, fine to coarse sand and fine gravel.
	F01-02-1-2 (1210)	SW		WELL-GRADED SAND WITH GRAVEL (SW): brown, fine to medium sand, fine gravel, well-graded, moist. Fill material.
2.0				

Bottom of borehole at 2.0 feet.

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F07-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Hand Auger
AT TIME OF DRILLING ---
LOGGED BY B. Robinson **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 1 foot due to wood and gravel ballast.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
			0.3	Asphalt.
	F07-01-0.5-1.0 (1340)	GM		SILTY GRAVEL WITH SAND (GM): dark grey, gravel with silt and sand, some wood, hydrocarbon odor, slightly moist.
			1.0	

Bottom of borehole at 1.0 feet.

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Portland, Oregon 97204
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F16-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 2 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Direct Push
AT TIME OF DRILLING ---
LOGGED BY B. Robinson **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 17.5 feet, possibly weathered basalt.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)
0.0					Concrete.	
					0.5	
					SILTY SAND (SM): dark brown, fine sand, some fine gravel, slightly moist.	0.9
2.5						0.5
	F16-01-3-4 (1550)					
		100				0.9
5.0					Brick fragments at 5 feet bgs.	
7.5		40	SM		At 8 feet bgs, as above except fine to medium sand, no gravel, moist.	0.4
10.0						
					At 12 feet bgs, as above except orangish-brown.	
12.5		60				0.3
15.0						

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CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 2 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Direct Push
AT TIME OF DRILLING ---
LOGGED BY B. Robinson **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 17.5 feet, possibly weathered basalt.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)
15.0						
		100	SM		SILTY SAND (SM): dark brown, fine sand, some fine gravel, slightly moist. *(continued)* At 15 feet bgs, as above except wet.	
	F16-01-15.5-16.5 (1555)		GW	15.5	WELL-GRADED GRAVEL (GW): olive grey, fine gravel, some fine to coarse sand, wet.	0
			GM	16.5	SILTY GRAVEL WITH SAND (GM): olive grey, fine to coarse gravel, fine to coarse sand, well-graded, dry.	0
17.5				17.5		

Bottom of borehole at 17.5 feet.

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F18-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/15/12 **COMPLETED** 9/15/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Grab Sample
AT TIME OF DRILLING ---
LOGGED BY B. Robinson **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION
0.0				0.3	Concrete.
		SP		0.5	POORLY GRADED SAND (SP): brown, fine sand, some silt, with brick and concrete fragments, dry. Fill material.

Bottom of borehole at 0.5 feet.

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F19-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Hand Auger
AT TIME OF DRILLING ---
LOGGED BY M. Appel **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 1.5 feet due to large 8-inch rocks throughout soil material.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
			0.5	Asphalt.
	F10-01:0.5-1.5 (1645)	GW	1.5	WELL-GRADED GRAVEL (GW): fine to coarse gravel, few to little fines, very poorly sorted, no staining, no odor, moist.

Bottom of borehole at 1.5 feet.

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F21-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Hand Auger
AT TIME OF DRILLING ---
LOGGED BY M. Appel **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 2.0 due to large rocks throughout soil material.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
			0.5	Asphalt.
	F19-01:0.5-2.0 (1715)	SW	2.0	WELL-GRADED SAND (SW): dark brown, medium to very coarse sand, coarse gravel, poorly sorted, no odor, no staining, moist.

Bottom of borehole at 2.0 feet.

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Telephone: 503-488-5282

F38-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION ---- **HOLE SIZE** 2 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Direct Push
▽ **AT TIME OF DRILLING** 5.32 ft
LOGGED BY M. Appel **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	WELL DIAGRAM
0.0				Asphalt with multiple lifts.		
				0.5		
		GW		WELL-GRADED GRAVEL (GW): dark brown, fine to coarse gravel, cobbles, few clay, few silt, subangular to subrounded gravel, poorly sorted, no staining, no odor, moist.	0.1	
2.5				At 2 feet bgs, many 4- to 5-inch diameter cobbles.		
				3.5	1	
				No recovery due to soft fill with large rocks.		
5.0				5.0		
				▽ Fill material. Sand and gravel, medium to very coarse sand, fine to coarse gravel, saturated, dark grey staining, no odor. Poor recovery.		
7.5	F38-01: 5-10 (1020)				3.6	Temporary well
10.0				10.0		

Bottom of borehole at 10.0 feet.

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F42-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Hand Auger
AT TIME OF DRILLING ---
LOGGED BY M. Appel **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 2.5 feet due to large rocks throughout.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)
0.0					
				0.4 Concrete with rebar.	
				1.0 Fill Material. Rocks and concrete rubble.	
	F42-01:1.5-2.5 (1500)	GW		WELL-GRADED GRAVEL (GW): dark brown, fine to coarse sand, fine to coarse gravel, few clay, very poorly sorted, dark staining, no odor, moist. Increased clay with depth from few to little.	0.4
2.5				2.5	

Bottom of borehole at 2.5 feet.

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IB-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/14/12 **COMPLETED** 9/14/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Gravity LLC
GROUND WATER LEVELS:
EQUIPMENT Vibracore
AT TIME OF DRILLING ---
LOGGED BY H. Seyl **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES mudline at 5 feet
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0			
		0.4	ORGANIC SOIL (OH): dark brown, with woody debris, no odor, no staining.
			POORLY GRADED SAND WITH SILT (SP): dark brown, fine grain, no odor and no staining.
			Woody debris at 1.7 feet bgs.
2.5			
	IB-01-GRAB-091412		Layer of fine sand at 2.5 feet bgs.
		3.1	

Bottom of borehole at 3.1 feet.

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IB-02

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/14/12 **COMPLETED** 9/14/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Gravity LLC
GROUND WATER LEVELS:
EQUIPMENT Vibracore
AT TIME OF DRILLING ---
LOGGED BY H. Seyl **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES mudline at 5.1 feet
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		OH		ORGANIC SOIL (OH): dark brown, with woody debris, no odor, no staining.
0.4		SP-SM		POORLY GRADED SAND WITH SILT (SP-SM): dark brown, fine sand, no odor, no staining.
				Layer of woody debris at 1.7 feet bgs.
2.5	IB-02-2.5-3.0-091412			Layer of fine sand at 2.5 feet bgs.
3.0				Bottom of borehole at 3.0 feet.

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IB-03

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/14/12 **COMPLETED** 9/14/12
GROUND ELEVATION _____ **HOLE SIZE** 4 inch
CONTRACTOR Gravity LLC
GROUND WATER LEVELS:
EQUIPMENT Vibracore
AT TIME OF DRILLING ---
LOGGED BY H. Seyl **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES mudline at 5.3 feet
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		OH		ORGANIC SOIL (OH): dark brown, with woody debris, no odor, no staining.
0.4				
		SP-SM		POORLY GRADED SAND WITH SILT (SP): dark brown, fine grain, no odor, no staining.
				Layer of woody debris at 1 foot bgs.
	IB-03-1.5-2.0-091412			Layer of fine grain sand at 1.5 feet bgs.
2.5				
	IB-03-3.5-4.0-091412			
3.3				

Bottom of borehole at 3.3 feet.

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TD-01

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION ---- **HOLE SIZE** 2 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Direct Push
▽ **AT TIME OF DRILLING** 5.85 ft
LOGGED BY M. Appel **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 8 feet due to basalt bedrock.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)	WELL DIAGRAM
0.0				Asphalt.		
				0.8		
				Fill material. Wood, bricks, ash, sand and gravel, no odor, no staining, dry.	0.2	
				1.5		
		SC		CLAYEY SAND (SC): dark brown, very fine to medium sand, some fill material, very poorly sorted, no odor, moist. Small amount of fill.		
2.5				2.5		
				WELL-GRADED SAND (SW): grey, fine to medium sand, moderately sorted, no odor, no staining, moist.	0.1	
5.0	TD-01: 4.4-6 (1220)	SW		▽ At 6 feet bgs, as above except with sheen and petroleum odor.	0.3	Temporary well
					0.2	
				7.0		
7.5		SC		CLAYEY SAND (SC): fine to coarse sand, very poorly sorted, grey staining to 7.8 feet bgs, petroleum odor, saturated.		
				8.0 At 7.8 feet bgs, as above except fine to coarse, rounded gravel.		

Bottom of borehole at 8.0 feet.

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TD-02

CLIENT Portland Metro
PROJECT NAME Blue Heron
PROJECT NUMBER 0170026
PROJECT LOCATION Oregon City
DATE STARTED 9/7/12 **COMPLETED** 9/7/12
GROUND ELEVATION _____ **HOLE SIZE** 2 inch
CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
EQUIPMENT Direct Push
AT TIME OF DRILLING ---
LOGGED BY M. Appel **CHECKED BY** B. Robinson
AT END OF DRILLING ---
NOTES Refusal at 9 feet due to fractured basalt bedrock.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE IDENTIFICATION	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)
0.0				Asphalt.	
0.5		SP		POORLY-GRADED SAND (SP): brown, fine to coarse sand, poorly sorted, no odor, no staining, increased moisture with depth from dry to moist.	
1.0				CLAYEY SAND (SC): brown, fine to coarse sand, poorly sorted, no odor, no staining, moist.	0.4
2.5		SC			
5.0				At 4.0 feet bgs, as above except very fine to medium sand, with trace cobbles.	0.4
6.5	TD-02: 5-8 (1135)				0.5
7.0		CL		SANDY LEAN CLAY (CL): very fine to medium sand, low plasticity, soft, grey staining, petroleum odor, moist.	
7.5		SP		POORLY-GRADED SAND (SP): very fine to coarse sand, very poorly sorted, grey staining, petroleum odor, moist.	74.2
8.0		SP		POORLY-GRADED SAND WITH GRAVEL (SP): brown, fine to coarse sand, fine to coarse gravel, very poorly sorted, grey staining, petroleum odor, moist.	
9.0				Bottom of borehole at 9.0 feet.	

Appendix D
Laboratory Analytical Reports

Appendix E
Data Validation Report

Memorandum

Environmental Resources Management

2875 Michelle Drive
Suite 200
Irvine, CA 92606
(949) 623-4700
(949) 623-4711 (fax)

To: Matt Mudge

Validator: Irene Lavigne

Date: 31 October 2012

Subject: Data Review of Blue Heron Mill Phase II Soil, Sediment, and Groundwater Samples Collected September 2012

Project Number: 0170026.12

Data Packages: ALS Group Data Packages K1209054, K1209255, and K1209289

The quality of the data was assessed and any necessary qualifiers were applied following the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review,* October 1999, the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004, and the *USEPA National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs)*, September 2005.

HOLDING TIME AND PRESERVATION EVALUATION

The samples were prepared and analyzed within the method-prescribed time period from the date of collection. The sample shipments were received at the laboratory within the method-prescribed preservation requirements. None of the data were qualified based on holding time or preservation exceedances.

BLANK EVALUATION

The method blank, trip blank, and rinsate blank sample results were nondetected for each of the target analytes with limited exceptions. Four samples were qualified as nondetected (U) based on associated blank detections. Additional sample data were not qualified on the basis of blank detections. Associated sample data were not qualified if the results were nondetected or if they exceeded five times the blank concentrations for organic compounds, or 10 times the blank concentrations for inorganic compounds. The blank detections and qualified sample data are shown in Table 1.

BLANK SPIKE EVAUATION

The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries were within the laboratory's limits of acceptance with limited exceptions. No sample data were qualified based on the LCS outliers. Data were not qualified if only one recovery in an LCS/LCSD pair exceeded control limits, or if the data could be verified using an associated, in-control matrix spike recovery. The LCS outliers are presented in Table 2.

MATRIX SPIKE EVALUATION

The matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the laboratory's limits of acceptance with a number of exceptions. Twelve detected sample results for chromium were qualified as estimated and biased high (J+) due to an associated MS recovery that exceeded the maximum acceptable limits. Additional recovery outliers did not result in qualification of sample data. Data were not qualified if only one recovery in a MS/MSD pair exceeded control limits, if only the relative percent difference (RPD) exceeded control limits, or if the concentrations of the unspiked samples were greater than four times the amount spiked. The MS outliers and associated, qualified data are listed in Table 2.

ESTIMATED MAXIMUM POSSIBLE CONCENTRATION

The laboratory identified a number of dioxin and furan results as estimated maximum possible concentrations (EMPC). An EMPC value is the maximum possible concentration of a compound that could be present in the sample. This classification is used when all of the identification criteria for a given dioxin or furan compound are not met. Sample data identified as EMPC by the laboratory were qualified as nondetected (U), as shown in Table 3.

SURROGATE EVALUATION

The surrogate recoveries were within acceptable limits with few exceptions. No qualifiers were applied to the data based on the surrogate outliers. Data were not qualified if only one surrogate for a semivolatile organic compounds analysis exceeded control limits, or if a sample was diluted by a factor of 10 times or more, resulting in dilution of the surrogate compounds to a point where they did not provide useful recovery information. The outlying surrogate recoveries are listed in Table 4.

LABELED COMPOUND EVALUATION

Carbon-13 labeled isotope recoveries were reported for each sample submitted for dioxin/furan analysis. The recoveries of 10 labeled CDD and CDF compounds is a measure of the effectiveness of the laboratory and method to extract the compounds of interest. Five samples had recoveries of various compounds that were below the minimum acceptable limits. Detected sample results for the corresponding compounds were qualified as estimated (J). The outlying isotope recoveries are shown in Table 5.

FIELD DUPLICATE EVALUATION

One sample was collected and analyzed in duplicate. ERM calculated the RPD between detected results. The USEPA has not established control criteria for field duplicate samples; therefore, sample data are not qualified on the basis of field duplicate imprecision. Detected duplicate results and calculated RPDs are presented in Table 6.

ANALYTICAL DUPLICATE EVALUATION

The laboratory prepared and analyzed a number of samples as analytical duplicates. ERM calculated the RPD between detected results. The RPDs were less than 20 percent, with few exceptions. The primary sample results for five samples were qualified as estimated (J) based on the RPD exceedances. The analytical duplicate sample results and calculated RPDs are listed in Table 6.

CALIBRATION RANGE EVALUATION

The laboratory noted two instances where the sample results exceeded the calibration range of the equipment. The sample results were qualified as estimated (J), and are shown in Table 7.

TPH EVALUATION

The laboratory noted that the chromatograms for a number of samples analyzed for diesel, residual, and gasoline range organics did not match the calibration standards for their respective compounds. The results for these samples were qualified as tentatively identified and estimated (NJ) as presented in Table 8.

OVERALL ASSESSMENT

No data were determined to be unusable. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically-defensible documents.

Table 1
Blank and Associated Suspect Sample Detections
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Blank ID	Associated Samples	Detected Compound	Reported Concentration	Report Limit	Units	ERM Qualifier
K1209054	K1209054-MB	NA	Zinc	0.9	0.5	mg/kg	--
K1209054	KWG1211060-10 MB	See below	Diethyl phthalate	0.024	0.34	mg/kg	--
K1209054	KWG1211060-10 MB	F16-01-3-4	Diethyl phthalate	0.11	2.3	mg/kg	2.3 U
K1209054	KWG1211060-10 MB	F16-01-15.5-16.5	Diethyl phthalate	0.11	2.6	mg/kg	2.6 U
K1209054	P160146 MB	NA	OCDD	0.463	5.0	ng/kg	--
K1209289	K1209289-MB	NA	Lead	0.070	0.040	mg/L	--
K1209289	RINSATE-091512	See below	Chromium	0.4	0.2	µg/L	--
K1209289	RINSATE-091512	F34-01-SP-091512	Chromium	2.0	0.2	µg/L	2.0 U
K1209289	RINSATE-091512	NA	Copper	0.4	0.1	µg/L	--
K1209289	RINSATE-091512	NA	Lead	0.11	0.02	µg/L	--
K1209289	RINSATE-091512	See below	Nickel	0.5	0.2	µg/L	--
K1209289	RINSATE-091512	F34-01-SP-091512	Nickel	4.0	0.2	µg/L	4.0 U
K1209289	RINSATE-091512	NA	Zinc	1.1	0.5	µg/L	--
K1209289	RINSATE-091512	NA	OCDD	18.9	61.0	pg/L	--
K1209289	EQ1200546-01 MB 09/27	NA	OCDD	34.6	50.0	pg/L	--
K1209289	EQ1200546-01 MB 09/27	NA	OCDF	5.88	50.0	pg/L	--
K1209289	EQ1200548-01 MB 10/03	NA	1,2,3,4,6,7,8-HpCDD	0.526	2.5	ng/kg	--
K1209289	EQ1200548-01 MB 10/03	NA	OCDD	4.33	5.0	ng/kg	--
K1209289	EQ1200548-01 MB 10/03	NA	1,2,3,4,6,7,8-HpCDF	0.244	2.5	ng/kg	--
K1209289	EQ1200548-01 MB 10/03	NA	OCDF	1.03	5.0	ng/kg	--
K1209289	EQ1200548-01 MB 10/03	NA	Total Hepta-Dioxins	1.07	2.5	ng/kg	--
K1209289	EQ1200548-01 MB 10/03	NA	Total Hepta-Furans	0.244	2.5	ng/kg	--
K1209289	EQ1200551-01 MB 10/05	NA	1,2,3,4,6,7,8-HpCDD	1.11	2.5	ng/kg	--
K1209289	EQ1200551-01 MB 10/05	NA	OCDD	6.81	5.0	ng/kg	--
K1209289	EQ1200551-01 MB 10/05	NA	1,2,3,4,6,7,8-HpCDF	0.190	2.5	ng/kg	--
K1209289	EQ1200551-01 MB 10/05	NA	OCDF	0.462	5.0	ng/kg	--

Table 1
Blank and Associated Suspect Sample Detections
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Blank ID	Associated Samples	Detected Compound	Reported Concentration	Report Limit	Units	ERM Qualifier
K1209289	EQ1200551-01 MB 10/05	NA	Total Hepta-Dioxins	2.19	2.5	ng/kg	--
K1209289	EQ1200551-01 MB 10/05	NA	Total Hepta-Furans	0.391	2.5	ng/kg	--

Data packages reviewed: K1209054, K1209255, K1209289

Key:
MB = Method blank
mg/kg = Milligrams per kilogram
ng/kg = Nanograms per kilogram
mg/L = Milligrams per liter
µg/L = Micrograms per liter
pg/L = Picograms per liter
U = Sample result qualified as nondetected
NA = Not applicable; associated sample data not affected
OCDD = Octachlorodibenzo-p-dioxin
OCDF = Octachlorodibenzofuran
HpCDD = Heptachlorodibenzo-p-dioxin
HpCDF = Heptachlorodibenzofuran

Table 2
Spike Recoveries Outside of Acceptable Limits
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Spike Sample ID	Associated Sample	Compound	Recovery (%)	Limit (%)	RPD	RPD Limit	Sample Result	ERM Qualifier
LCS/LCSD									
K1209054	KWG1210972-3	NA	Acetone	149	68-135	--	--	--	--
K1209289	KWG1211062 LCS/LCSD	NA	2-Nitrophenol	96/87	44-95	9	40	--	--
K1209289	KWG1211062 LCS/LCSD	NA	4-Chloro-3-methylphenol	104/101	44-101	4	40	--	--
MS/MSD									
K1209054	F38-01-SOIL-5-10S MS	See below	Chromium	138.9	75-125	--	--	--	--
K1209054	F38-01-SOIL-5-10S MS	F38-01-SOIL-5-10	Chromium	--	--	--	--	17.5	J+
K1209054	F38-01-SOIL-5-10S MS	F42-01-1.5-2.5	Chromium	--	--	--	--	16.3	J+
K1209054	F38-01-SOIL-5-10S MS	F19-01-0.5-1.5	Chromium	--	--	--	--	18.8	J+
K1209054	F38-01-SOIL-5-10S MS	F21-01-0.5-2	Chromium	--	--	--	--	195	J+
K1209054	F38-01-SOIL-5-10S MS	F01-01-9.5-10.5	Chromium	--	--	--	--	18.6	J+
K1209054	F38-01-SOIL-5-10S MS	F01-02-1-2	Chromium	--	--	--	--	13.7	J+
K1209054	F38-01-SOIL-5-10S MS	F07-01-0.5-1.0	Chromium	--	--	--	--	163	J+
K1209054	F38-01-SOIL-5-10S MS	F16-01-3-4	Chromium	--	--	--	--	15.2	J+
K1209054	F38-01-SOIL-5-10S MS	F16-01-15.5-16.5	Chromium	--	--	--	--	25.8	J+
K1209054	F38-01-SOIL-5-10S MS	TR2-02-DEEP	Chromium	--	--	--	--	42.3	J+
K1209054	F38-01-SOIL-5-10S MS	TR2-SHALLOW	Chromium	--	--	--	--	31	J+
K1209054	F38-01-SOIL-5-10S MS	PS2-01-SHALLOW	Chromium	--	--	--	--	19.9	J+
K1209054	F38-01-SOIL-5-10S MS	NA	Copper	557.8	75-125	--	--	4X	--
K1209054	F38-01-SOIL-5-10S MS	NA	Lead	5191.4	75-125	--	--	4X	--
K1209054	F07-01-0.5-1.0 MS/MSD	NA	Acenaphthene	27/61	30-113	18	40	--	--
K1209054	F07-01-0.5-1.0 MS/MSD	NA	Pyrene	5/95	26-130	39	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	Phenol	30/56	18-106	60	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	2-Chlorophenol	31/57	27-96	60	40	--	--

Table 2
Spike Recoveries Outside of Acceptable Limits
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Spike Sample ID	Associated Sample	Compound	Recovery (%)	Limit (%)	RPD	RPD Limit	Sample Result	ERM Qualifier
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	1,4-Dichlorobenzene	29/50	28-95	54	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	Hexachloroethane	27/50	25-102	60	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	N-Nitrosodi-n-propylamine	36/62	32-107	54	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	1,2,4-Trichlorobenzene	34/56	35-105	50	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	4-Chloro-3-methylphenol	46/74	34-100	47	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	2-Chloronaphthalene	37/59	37-110	48	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	Acenaphthene	44/67	30-113	43	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	4-Nitrophenol	34/69	12-141	68	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	2,4-Dinitrotoluene	48/72	36-127	41	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	Diethyl phthalate	51/78	23-131	43	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	4-Bromophenyl phenyl ether	46/78	45-109	53	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	Pentachlorophenol	41/81	10-135	67	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	Pyrene	46/83	26-130	59	40	--	--
K1209289	IB-03-3.5-4-091412 MS/MSD	NA	Benzo(a)pyrene	43/68	31-122	47	40	--	--

Data packages reviewed: K1209054, K1209255, K1209289

Key:
LCS/LCSD = Laboratory control sample/laboratory control sample duplicate
MS/MSD = Matrix spike/matrix spike duplicate
RPD = Relative percent difference
NA = Not applicable; associated samples not qualified
J+ = Detected sample result qualified as estimated and biased high
4X = Concentration of unspiked sample was greater than 4 times the amount spiked; no qualification required

Table 3
Estimated Maximum Possible Concentration
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Compound	Reported Concentration	Report Limit	Units	ERM Qualifier
K1209054	TR2-02-DEEP	2,3,7,8-TCDD	0.959	1.21	ng/kg	U
K1209054	TR2-02-DEEP	1,2,3,6,7,8-HxCDF	4.63	6.05	ng/kg	U
K1209054	TR2-SHALLOW	2,3,7,8-TCDD	1.05	2.82	ng/kg	U
K1209054	TR2-SHALLOW	1,2,3,4,7,8,9-HpCDF	8.12	14.1	ng/kg	U
K1209054	PS2-01-SHALLOW	1,2,3,6,7,8-HxCDD	1.17	4.02	ng/kg	U
K1209289	IB-01-6inch-091412	1,2,3,4,6,7,8-HpCDF	3.49	4.49	ng/kg	U
K1209289	IB-01-2.5-3-091412	1,2,3,7,8,9-HxCDD	2.13	4.42	ng/kg	U
K1209289	IB-02-2.5-3-091412	2,3,7,8-TCDD	0.512	0.914	ng/kg	U
K1209289	IB-02-2.5-3-091412	1,2,3,7,8-PeCDD	0.558	4.57	ng/kg	U
K1209289	IB-02-2.5-3-091412	1,2,3,4,7,8-HxCDD	0.732	4.57	ng/kg	U
K1209289	IB-02-2.5-3-091412	1,2,3,7,8,9-HxCDD	2.73	4.57	ng/kg	U
K1209289	IB-02-2.5-3-091412	1,2,3,6,7,8-HxCDF	0.788	4.57	ng/kg	U
K1209289	IB-03-3.5-4-091412	1,2,3,7,8-PeCDD	0.698	4.22	ng/kg	U
K1209289	IB-03-3.5-4-091412	1,2,3,4,7,8-HxCDD	0.672	4.22	ng/kg	U
K1209289	IB-03-3.5-4-091412	1,2,3,7,8-PeCDF	0.218	4.22	ng/kg	U
K1209289	IB-03-3.5-4-091412	2,3,4,7,8-PeCDF	0.507	4.22	ng/kg	U
K1209289	IB-03-3.5-4-091412	1,2,3,4,7,8-HxCDF	1.17	4.22	ng/kg	U
K1209289	IB-03-3.5-4-091412	1,2,3,4,6,7,8-HpCDF	9.33	4.22	ng/kg	U
K1209289	F55-01-0-0.5-091412	1,2,3,7,8-PeCDD	2.20	32.1	ng/kg	U
K1209289	F55-01-0-0.5-091412	1,2,3,4,7,8-HxCDD	3.24	32.1	ng/kg	U
K1209289	F55-01-0-0.5-091412	1,2,3,6,7,8-HxCDD	30.5	32.1	ng/kg	U
K1209289	F55-01-0-0.5-091412	1,2,3,7,8-PeCDF	2.22	32.1	ng/kg	U
K1209289	F55-01-0-0.5-091412	2,3,4,7,8-PeCDF	1.92	32.1	ng/kg	U
K1209289	F55-01-0-0.5-091412	1,2,3,6,7,8-HxCDF	3.28	32.1	ng/kg	U
K1209289	F55-01-0-0.5-091412	2,3,4,6,7,8-HxCDF	3.35	32.1	ng/kg	U
K1209289	F53-01-0-0.5-091412	2,3,7,8-TCDD	0.821	3.38	ng/kg	U
K1209289	P51-01-0-0.5-091412	1,2,3,6,7,8-HxCDD	9.89	11.2	ng/kg	U
K1209289	P51-01-0-0.5-091412	1,2,3,6,7,8-HxCDF	0.818	11.2	ng/kg	U
K1209289	P51-01-0-0.5-091412	2,3,4,6,7,8-HxCDF	1.29	11.2	ng/kg	U
K1209289	TRH-01-0-0.5	1,2,3,4,7,8-HxCDD	0.505	5.39	ng/kg	U
K1209289	TRH-01-0-0.5	1,2,3,7,8,9-HxCDD	0.909	5.39	ng/kg	U
K1209289	TRH-01-0-0.5	1,2,3,7,8,9-HxCDF	0.409	5.39	ng/kg	U
K1209289	TRH-01-0-0.5	2,3,7,8-TCDF	1.02	1.08	ng/kg	U
K1209289	IB-03-1.5-2-091412	1,2,3,4,6,7,8-HpCDF	2.71	3.50	ng/kg	U

Data packages reviewed: K1209054, K1209255, K1209289

Key:
ng/kg = Nanograms per kilogram
U = Nondetected
TCDD = Tetrachlorodibenzo-p-dioxin
HxCDF = Hexachlorodibenzofuran
HpCDF = Heptachlorodibenzofuran
HxCDD = Hexachlorodibenzo-p-dioxin
PeCDD = Pentachlorodibenzo-p-dioxin
PeCDF = Pentachlorodibenzofuran
TCDF = Tetrachlorodibenzofuran

Table 4
Surrogate Recovery Results Outside of Acceptable Limits
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Note	ERM Qualifier
K1209054	TD-02-6.5-8	DRO, RRO	n-Triacontane	6	50-150	SDO	--
K1209289	F53-01-0-0.5-091412	DRO, RRO	n-Triacontane	227	50-150	SDO	--
K1209289	F42-03-SP-091512	SVOC	2-Fluorobiphenyl	40	48-114	--	--

Data packages reviewed: K1209054, K1209255, K1209289

Key:
DRO = Diesel range organics
RRO = Residual range organics
SVOC = Semivolatile organic compounds
SDO = Surrogate diluted out of sample, no qualification required; Sample diluted by a factor of 10x or more

Table 5
Labeled Compound Recovery Results Outside of Acceptable Limits
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Method	Labeled Compound	Associated Compound	Recovery (%)	Limit (%)	ERM Qualifier
K1209054	PS2-01-SHALLOW	Dioxin/Furan	13C-1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDD	31	40-135	J
K1209289	IB-01-2.5-3-091412	Dioxin/Furan	13C-OCDD	OCDD	38	40-135	J
K1209289	IB-02-2.5-3-091412	Dioxin/Furan	13C-OCDD	OCDD	29	40-135	J
K1209289	F55-01-0-0.5-091412	Dioxin/Furan	13C-OCDD	OCDD	29	40-135	J
K1209289	F55-01-0-0.5-091412	Dioxin/Furan	13C-1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDF	39	40-135	J
K1209289	P51-01-0-0.5-091412	Dioxin/Furan	13C-1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDD	39	40-135	J
K1209289	P51-01-0-0.5-091412	Dioxin/Furan	13C-1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDD	39	40-135	J
K1209289	P51-01-0-0.5-091412	Dioxin/Furan	13C-OCDD	OCDD	32	40-135	J
K1209289	P51-01-0-0.5-091412	Dioxin/Furan	13C-1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDF	36	40-135	J
K1209289	TR1-01-0-0.5-091512	Dioxin/Furan	13C-OCDD	OCDD	33	40-135	J
K1209289	TR1-01-0-0.5-091512	Dioxin/Furan	13C-1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDF	38	40-135	J

Data packages reviewed: K1209054, K1209255, K1209289

Key:
13C = Carbon-13 labeled isotope
HxCDD = Hexachlorodibenzo-p-dioxin
OCDD = Octachlorodibenzo-p-dioxin
HpCDF = Heptachlorodibenzofuran
HpCDD = Heptachlorodibenzo-p-dioxin
J = Detected sample result qualified as estimated

Table 6
Duplicate Results and Calculated Relative Percent Differences
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Compound	Concentration		Report Limit	Units	RPD	ERM Qualifier
			Sample	Duplicate				
Field Duplicates								
K1209255	F53-01-SW-091412	Arsenic	1.6	1.5	0.5	µg/L	6.5	--
K1209255	F53-01-SW-091412	Cadmium	0.15	0.21	0.02	µg/L	33	--
K1209255	F53-01-SW-091412	Chromium	1.4	1.3	0.2	µg/L	7.4	--
K1209255	F53-01-SW-091412	Copper	22.2	20.8	0.1	µg/L	6.5	--
K1209255	F53-01-SW-091412	Lead	4.97	9.13	0.02	µg/L	59	--
K1209255	F53-01-SW-091412	Nickel	23.2	21.5	0.2	µg/L	7.6	--
K1209255	F53-01-SW-091412	Zinc	415	833	0.5	µg/L	67	--
K1209255	F53-01-SW-091412	DRO	280	500	250/260	µg/L	56	--
K1209255	F53-01-SW-091412	Chloroform	0.97	0.98	0.50	µg/L	1.0	--
Analytical Duplicates								
K1209054	TD-02-6.5-8	Total solids	79.6	79.9	0.01	%	0.38	--
K1209054	F01-01-9.5-10.5	Total solids	85.9	86.0	0.01	%	0.12	--
K1209054	F38-01-SOIL-5-10D	Arsenic	8.2	5.2	0.5	mg/kg	45	J
K1209054	F38-01-SOIL-5-10D	Cadmium	0.29	0.29	0.02	mg/kg	0	--
K1209054	F38-01-SOIL-5-10D	Chromium	17.5	28.4	0.2	mg/kg	47	J
K1209054	F38-01-SOIL-5-10D	Copper	109	195	0.1	mg/kg	57	J
K1209054	F38-01-SOIL-5-10D	Lead	3300	3850	101	mg/kg	15	--
K1209054	F38-01-SOIL-5-10D	Nickel	13.2	18.9	0.2	mg/kg	36	J
K1209054	F38-01-SOIL-5-10D	Zinc	73.4	77.3	0.5	mg/kg	5.2	--
K1209054	Batch Duplicate	Mercury	0.60	0.58	0.02	mg/kg	3.4	--
K1209054	Batch Duplicate	Arsenic	1.5	1.4	0.5	µg/L	6.9	--
K1209054	Batch Duplicate	Cadmium	0.16	0.16	0.02	µg/L	0	--
K1209054	Batch Duplicate	Chromium	1.0	1.1	0.2	µg/L	9.5	--
K1209054	Batch Duplicate	Copper	1.4	1.2	0.1	µg/L	15	--
K1209054	Batch Duplicate	Lead	3.73	3.60	0.02	µg/L	3.5	--
K1209054	Batch Duplicate	Nickel	2.2	2.1	0.2	µg/L	4.7	--
K1209054	Batch Duplicate	Zinc	12.24	12.70	0.5	µg/L	3.7	--
K1209255	Batch Duplicate	Arsenic	1.5	1.4	0.5	µg/L	6.9	--
K1209255	Batch Duplicate	Cadmium	0.2	0.16	0.02	µg/L	22	--
K1209255	Batch Duplicate	Chromium	1.0	1.1	0.2	µg/L	9.5	--
K1209255	Batch Duplicate	Copper	1.4	1.2	0.1	µg/L	15	--
K1209255	Batch Duplicate	Lead	3.7	3.6	0.02	µg/L	2.7	--
K1209255	Batch Duplicate	Nickel	2.2	2.1	0.2	µg/L	4.7	--
K1209255	Batch Duplicate	Zinc	12.2	12.7	0.5	µg/L	4.0	--
K1209289	IB-01-6inch-091412	Total solids	55.7	55.9	0.01	%	0.4	--
K1209289	TR1-01-0-0.5-091512	Total solids	21.6	19.4	0.01	%	11	--
K1209289	Batch Duplicate	Mercury	0.12	0.08	0.02	mg/kg	40	--

Table 6
Duplicate Results and Calculated Relative Percent Differences
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Compound	Concentration		Report Limit	Units	RPD	ERM Qualifier
			Sample	Duplicate				
K1209289	IB-01-6inch-091412	Arsenic	2.4	2.4	0.5	mg/kg	0	--
K1209289	IB-01-6inch-091412	Cadmium	0.12	0.12	0.02	mg/kg	0	--
K1209289	IB-01-6inch-091412	Chromium	24.5	24.3	0.2	mg/kg	0.8	--
K1209289	IB-01-6inch-091412	Copper	26.7	26.6	0.1	mg/kg	0.4	--
K1209289	IB-01-6inch-091412	Lead	8.78	6.51	0.05	mg/kg	30	J
K1209289	IB-01-6inch-091412	Nickel	23.5	23.0	0.2	mg/kg	2.2	--
K1209289	IB-01-6inch-091412	Zinc	67.5	67.6	0.5	mg/kg	0.1	--
K1209289	Batch Duplicate	Mercury	1.0	0.9	0.2	µg/L	11	--
K1209289	Batch Duplicate	Arsenic	1.5	1.4	0.5	µg/L	6.9	--
K1209289	Batch Duplicate	Cadmium	0.16	0.16	0.02	µg/L	0	--
K1209289	Batch Duplicate	Chromium	1.0	1.1	0.2	µg/L	10	--
K1209289	Batch Duplicate	Copper	1.4	1.2	0.1	µg/L	15	--
K1209289	Batch Duplicate	Lead	3.73	3.60	0.02	µg/L	3.5	--
K1209289	Batch Duplicate	Nickel	2.2	2.1	0.2	µg/L	4.7	--
K1209289	Batch Duplicate	Zinc	12.24	12.70	0.5	µg/L	3.7	--
K1209289	F18-01-0-0.5	DRO	29	29	27	mg/kg	0	--
K1209289	F18-01-0-0.5	RRO	210	210	110	mg/kg	0	--

Data packages reviewed: K1209054, K1209255, K1209289

Key:
RPD = Relative percent difference
mg/kg = Milligrams per kilogram
µg/L = Micrograms per liter
Batch = Sample was prepared using a non-client sample
DRO = Diesel range organics
RRO = Residual range organics
J = Detected sample result qualified as estimated

Table 7
Calibration Range Exceedances
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Compound	Reported Concentration	Units	ERM Qualifier
K1209054	TR2-02-DEEP	OCDD	18900 E	ng/kg	J
K1209054	TR2-SHALLOW	OCDD	48100 E	ng/kg	J

Data packages reviewed: K1209054, K1209255, K1209289

Key:
E = Sample concentration exceeded upper end of linear calibration range
ng/kg = Nanogram per kilogram
J = Detected sample result qualified as estimated

Table 8
TPH Results
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Compound	Reported Concentration	Units	ERM Qualifier	Notes
K1209054	PS2-01-SW-090812	DRO	60000	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209054	PS2-01-SW-090812	RRO	130000	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209054	F38-01-SOIL-5-10	DRO	50	mg/kg	NJ	Chromatographic pattern indicates presence of greater amount of heavier molecular weight constituents than the calibration standard
K1209054	F38-01-SOIL-5-10	RRO	220	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TD-02-6.5-8	DRO	2000	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TD-02-6.5-8	RRO	9300	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TD-01-4.5-6	DRO	290	mg/kg	NJ	Chromatographic pattern indicates presence of greater amount of heavier molecular weight constituents than the calibration standard
K1209054	TD-01-4.5-6	RRO	1400	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	F42-01-1.5-2.5	DRO	42	mg/kg	NJ	Chromatographic pattern indicates presence of greater amount of heavier molecular weight constituents than the calibration standard
K1209054	F42-01-1.5-2.5	RRO	230	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	F19-01-0.5-1.5	RRO	1700	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	F21-01-0.5-2	RRO	4600	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	F01-02-1-2	DRO	52	mg/kg	NJ	Chromatographic pattern indicates presence of greater amount of heavier molecular weight constituents than the calibration standard
K1209054	F01-02-1-2	RRO	750	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	F07-01-0.5-1.0	DRO	2200	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	F07-01-0.5-1.0	RRO	7400	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TR2-02-DEEP	DRO	990	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TR2-02-DEEP	RRO	6400	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TR2-SHALLOW	DRO	2000	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TR2-SHALLOW	RRO	9100	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	PS2-01-SHALLOW	DRO	2300	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	PS2-01-SHALLOW	RRO	12000	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TS-02-6.5-8	GRO	400	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	F07-01-0.5-1.0	GRO	11	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	TR2-02-DEEP	GRO	23	mg/kg	NJ	Chromatographic pattern does not match the calibration standard

Table 8
TPH Results
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Compound	Reported Concentration	Units	ERM Qualifier	Notes
K1209054	TR2-SHALLOW	GRO	55	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209054	PS2-01-SHALLOW	GRO	120	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209255	PS1-01-SW-091412	DRO	410	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209255	F53-01-SW-091412	DRO	280	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209255	DUP-01-SW-091412	DRO	500	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209255	DUP-01-SW-091412	RRO	830	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209255	F5S-01-SW-091412	DRO	460	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209255	TR2-01-SW-091412	DRO	6100	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209255	TR2-01-SW-091412	RRO	3300	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F42-03-SP-091512	DRO	8500	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F42-03-SP-091512	RRO	31000	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F33-01-SP-091512	RRO	910	µg/L	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F55-01-0-0.5-091412	DRO	6900	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F55-01-0-0.5-091412	RRO	15000	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F53-01-0-0.5-091412	DRO	4200	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F53-01-0-0.5-091412	RRO	14000	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	P51-01-0-0.5-091412	DRO	8100	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	P51-01-0-0.5-091412	RRO	17000	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	TR1-01-0-0.5-091512	DRO	950	mg/kg	NJ	Chromatographic pattern indicates presence of greater amount of heavier molecular weight constituents than the calibration standard
K1209289	TR1-01-0-0.5-091512	RRO	4200	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	TRH-01-0-0.5	DRO	2000	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	TRH-01-0-0.5	RRO	5200	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F18-01-0-0.5	DRO	30	mg/kg	NJ	Chromatographic pattern indicates presence of greater amount of heavier molecular weight constituents than the calibration standard
K1209289	F18-01-0-0.5	RRO	210	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	F55-01-0-0.5-091412	GRO	180	mg/kg	NJ	Chromatographic pattern does not match the calibration standard

Table 8
TPH Results
Soil, Water, and Sediment Samples Collected September 2012
Blue Heron Mill, Phase II ESA
Oregon City, Oregon

Lab Package	Sample ID	Compound	Reported Concentration	Units	ERM Qualifier	Notes
K1209289	F53-01-0-0.5-091412	GRO	75	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	P51-01-0-0.5-091412	GRO	50	mg/kg	NJ	Chromatographic pattern does not match the calibration standard
K1209289	TRH-01-0-0.5	GRO	19	mg/kg	NJ	Chromatographic pattern does not match the calibration standard

Data packages reviewed: K1209054, K1209255, K1209289

Key:
DRO = Diesel range organics
RRO = Residual range organics
GRO = Gasoline range organics
µg/L = Micrograms per liter
mg/kg = Milligrams per kilogram
NJ = Estimated value