

APPENDIX A
SEPTEMBER 2008 PORT UPLANDS AREA SUPPLEMENTAL SOIL INVESTIGATION

INTRODUCTION

This appendix presents the results of a supplemental soil investigation completed by the Port of Anacortes (the “Port”) in September 2008 at the Port Uplands Area of the Former Scott Paper Mill Site (the “Site”) in Anacortes, Washington. The soil investigation supplements previous soil sampling performed at the Port Uplands Area as part of the site-wide remedial investigation (RI). The scope and results of the RI are documented in the RI report (GeoEngineers et al. 2008). The supplemental soil investigation was conducted in accordance with the Supplemental Soil Investigation Sampling and Analysis Plan (SAP) approved by the Washington State Department of Ecology (Ecology) on September 2, 2008 (GeoEngineers 2008).

OBJECTIVES

The supplemental soil investigation had two main objectives:

1. Provide data to refine estimates of the extent of soil contamination and the areas potentially requiring cleanup at the Port Uplands Area. Because of existing data gaps, there was some uncertainty regarding the extent of soil contamination that was identified during the RI.
2. Provide data to evaluate the potential waste designation of lead-impacted soil that may be removed during future cleanup actions. Toxicity characteristic leaching procedure (TCLP) testing was performed on selected soil samples to support the evaluation of soil disposal options and costs during remedial design.

FIELD PROGRAM

Twenty-five soil borings (GEI-1 through GEI-25) were completed at the Port Uplands Area on September 8, 9, and 10, 2008. Twenty-two of these borings were proposed in the SAP. Three borings (GEI-23, GEI-24, and GEI-25) were added to the scope based on conditions encountered in the field (two were step-out borings, and the third was intended to augment a nearby boring that had poor sample recovery). Figure A-1 shows the approximate locations of the soil borings. The boring locations were measured in the field using a portable Trimble® global positioning system instrument.

The soil borings were completed by Cascade Drilling of Woodinville, Washington, using a direct-push drilling rig. A small, mobile attachment to the drilling rig was used to advance boring GEI-22 due to limited access at this location. The borings were advanced to depths between 6 and 14 feet below ground surface (bgs). An attempt was made to collect continuous soil cores at each location for lithologic description and initial field screening; however, subsurface conditions precluded continuous core sampling at some locations. Soil observations and field screening data recorded on boring logs included soil lithology (color, grain size, moisture content, etc.), results of sheen testing, and results of headspace organic vapor screening using a photoionization detector (PID). Field screening procedures are described in the SAP. The boring logs are contained in Attachment 1.

SOIL SAMPLING

Soil sampling was conducted according to the procedures described in the SAP. Soil obtained from each target depth interval was placed in a decontaminated stainless steel bowl and mixed with a stainless steel spoon. Particles of wood, gravel, and other material larger than approximately 2 millimeters in size were removed from the mixed soil sample. A subsample of the mixed soil was placed in a laboratory-supplied glass sample jar, and the filled sample jar was stored in a cooler with ice. Remaining soil in the stainless steel bowl was then field-screened for organic vapors using a PID.

The stainless steel bowl and spoon were decontaminated prior to obtaining each sample by washing with an aqueous solution of Alconox[®] detergent and rinsing with distilled water. Soil cuttings and decontamination water were placed in two 55-gallon drums. The drums were marked and staged near the southeastern corner of Parcel 1.

WATER SAMPLING

Two water samples were collected for chemical analysis during the supplemental soil investigation. One groundwater grab sample was collected from boring GEI-24 to assess petroleum hydrocarbon concentrations in groundwater near the southeastern corner of the Seafarers' Park Building. This sample was obtained using a peristaltic pump, and was collected in laboratory-supplied sample containers. In addition, one equipment rinsate blank (field quality control sample) was collected to assess the effectiveness of the equipment decontamination procedure. The rinsate blank was obtained by swirling a small amount of distilled water in the decontaminated stainless steel mixing bowl, and then slowly pouring the water into laboratory-supplied sample containers.

ANALYTICAL TESTING

The soil and water samples were submitted for chemical analysis to Analytical Resources, Inc. (ARI) in Tukwila, Washington, using standard chain-of-custody protocols. The soil samples were analyzed for one or more of the following parameters in accordance with the soil sampling and analysis matrix (Table 1) contained in the SAP:

- Diesel- and motor oil-range total petroleum hydrocarbons (TPH) by Ecology Method NWTPH-Dx.
- Total metals (arsenic, copper, lead and/or zinc) by U.S. Environmental Protection Agency (EPA) Method 6020. ARI subcontracted the metal analyses to Fremont Analytical, Inc. (Fremont) in Seattle, Washington.
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270C-SIM. ARI subcontracted some of the cPAH analyses to Fremont.
- Dioxins and furans by EPA Method 8290. ARI subcontracted the dioxin and furan analyses to Pace Analytical Services, Inc. in Minneapolis, Minnesota.
- Lead by TCLP, EPA Method 1311. ARI subcontracted the TCLP lead analyses to Fremont.

The groundwater grab sample (GEI24-W) was analyzed for diesel- and motor oil-range TPH. The rinsate blank sample (RINSATE) was analyzed for TPH, total metals, and cPAHs.

The analytical results for the soil samples collected at Parcels 1, 2, and 3 are summarized in Tables A-1, A-2, and A-3, respectively. The analytical results for the groundwater and rinsate blank samples are summarized in Table A-4. A data quality assessment summary is included in Attachment 2.

RESULTS

This section summarizes the physical characteristics of the soil encountered in the supplemental soil borings and the analytical testing results for soil and water samples.

SOIL PHYSICAL CHARACTERIZATION

Soil samples obtained from each boring were visually inspected and field-screened (sheen and headspace organic vapor screening) to identify potential soil contamination as described in the SAP. Soil descriptions and field screening results are summarized below.

Parcel 1

Three borings (GEI-15, GEI-18, and GEI-20) were advanced to depths of 6 to 10 feet bgs on Parcel 1. Soils generally consisted of approximately 5 to 10 feet of silty sand with gravel, interpreted as fill material. An approximately 1- to 3-foot-thick, dark grey to dark brown silt horizon was encountered between approximately 5 and 8 feet bgs at borings GEI-18 and GEI-20. At GEI-20, wood debris was encountered between approximately 8 and 9 feet bgs. Silty sand and gravelly sand were encountered below the silt horizon and wood debris.

No field screening evidence of potential soil contamination was observed in borings GEI-15, GEI-18, or GEI-20.

Parcel 2

Fifteen borings (GEI-1, GEI-2, GEI-6 through GEI-14, GEI-16, GEI-19, GEI-22, and GEI-23) were advanced to depths of 10 to 14 feet bgs on Parcel 2. Soils generally consisted of approximately 5 to 10 feet of silty sand with gravel (interpreted as fill material), underlain by up to 5 feet of dark brown silt with varying amounts of wood debris. Wood debris consisting of sawdust, wood chips, and shredded wood was encountered at approximately 10 feet bgs and deeper. A white, decomposed, sawdust-like material was noted between 9.5 and 10 feet bgs in borings GEI-8 and GEI-9, and between 2.5 and 6.5 feet bgs in boring GEI-19. At two locations where borings extended through the wood debris layer (borings GEI-7 and GEI-13), silt interpreted as native marine sediment deposits was encountered at a depth of approximately 13 to 14 feet bgs.

Evidence of potential petroleum contamination (petroleum-like odors and moderate to heavy sheens) was observed in borings GEI-5, GEI-6, GEI-14, GEI-21, GEI-23, and GEI-24. In general, the petroleum-like odors and sheens observed in these borings were present at depths ranging from 10 to 13 feet bgs in a sand and silt horizon overlying wood debris. Although three of these borings (GEI-5, GEI-21, and GEI-24) are located on Parcel 3, they are included in this Parcel 2 discussion because the area of petroleum contamination identified during the RI appears to be continuous in the northeastern portion of the Site, which includes parts of Parcels 2 and 3.

The white, decomposed, sawdust-like material encountered at depths between 2.5 and 10 feet bgs in borings GEI-8, GEI-9, and GEI-19 had a rancid odor. Field screening of this material did not yield evidence of potential contamination; no organic vapors or sheens were noted. However, a moderate to heavy sheen and petroleum-like odor were noted at approximately 4.5 to 5.5 feet bgs in GEI-9. This sheen and petroleum-like odor appeared to be associated with a thin (3-inch) horizon of black-stained wood debris.