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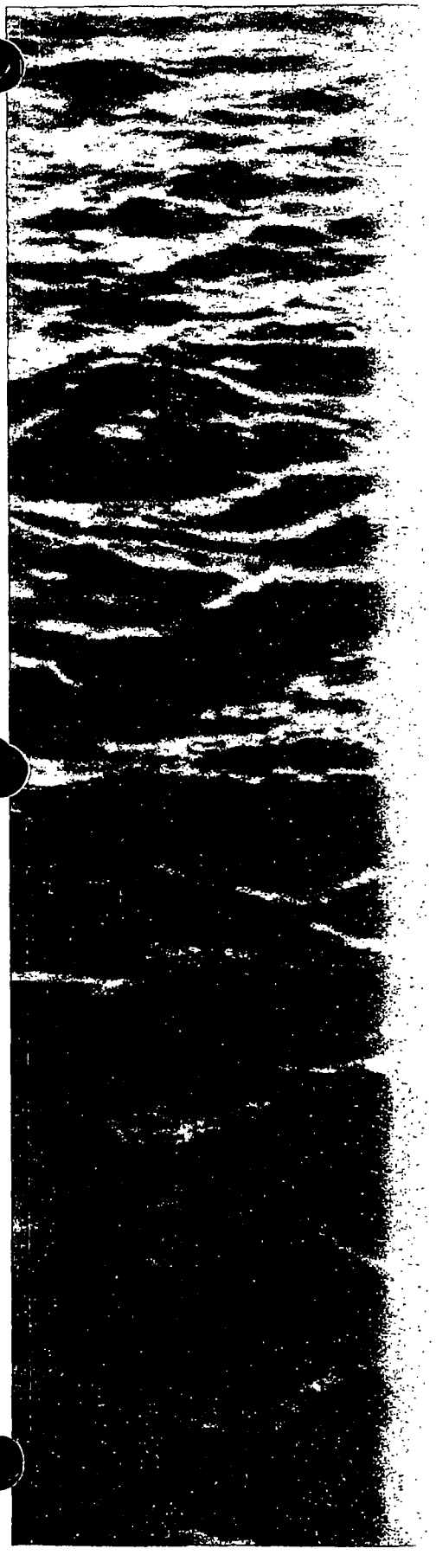

SAMPLING RESULTS REPORT IN SUPPORT OF THE PRELIMINARY ASSESSMENT OF THE BRIX MARITIME COMPANY FACILITY

Prepared for:
Brix Maritime

Prepared by:
Anchor Environmental
and
Hahn & Associates

September 2001

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1 INTRODUCTION

This report presents the results of the soil and groundwater sampling and analysis program conducted in May-June 2001 at the Brix Maritime Company (Brix Maritime) property located at 9030 Northwest St. Helens (Site) (Figure 1). The sampling and analysis program was undertaken to fulfill requests by the Oregon Department of Environmental Quality (DEQ) for additional information on the potential presence of constituents in soils and groundwater on the Site as described in DEQ's letter to Brix Maritime dated December 19, 2000. DEQ stated in 1999, and on numerous occasions since that time, that the primary purpose of the information and sampling requests was to determine whether the Site might be a source of constituents to the river. The sampling results discussed in this report augment and should be read in conjunction with existing information on the Site already provided to DEQ in the Expanded Preliminary and Supplemental Preliminary Assessments (Anchor 2000) conducted by Brix Maritime in February 2000 and October 2000, respectively.

This report includes a general review of site characteristics and history in Section 2 (Background). Detailed background and site information can be found in the Supplemental Preliminary Assessment (Anchor 2000). Sampling and analytical methods and results are presented in Sections 3, 4, and 5. DEQ also requested in the December 19, 2000 letter that Brix Maritime present additional information on any hazardous materials at the Site. Section 6 provides a description of materials used and/or generated at the Site. Based on the sampling results presented in Section 5, a risk assessment for upland human health following DEQ Guidance (DEQ 1999) is presented in Section 7. Section 8 provides a conservative preliminary risk screening of nearshore groundwater constituent concentrations to determine whether these concentrations might pose potential risks to river receptors. Site and chemical-specific characteristics are also evaluated in Section 8 to determine whether the Site is a source of constituents to the river. Conclusions are presented in Section 9.

The Supplemental Preliminary Assessment, the Expanded Preliminary Assessment, and this report together fulfill Brix Maritime's agreement to perform a preliminary assessment under its December 1999 Voluntary Cleanup Letter Agreement with DEQ. These reports, taken together, satisfy and/or exceed the requirements for a preliminary

assessment as defined by OAR 340-122-0115(41) and provide the information described in DEQ guidance. When read together, these reports conclude that past and present operations at the Site do not pose a risk to present and future public health, safety, welfare and the environment, that the Site is not a source to the river, and that no additional investigation or remedial action is required.

2 BACKGROUND

2.1 Site Description

2.1.1 Site Location

The Site is located at 9030 NW St. Helens Road, Portland, Oregon, Township 1 North, Range 1 West, Section 11, Tax Lot 800. The Site is bordered to the northeast by the Willamette River, to the southwest by railroad tracks and NW St. Helens Road, to the northwest by a bulk fuel storage facility, and to the southeast by industrial use property (Figure 2).

2.1.2 Site Features

The Site consists of approximately 3.7 acres with two primary structures: an office building and a maintenance building. A covered "work barge" associated with the property is moored on the Willamette River. The topography at the Site is generally level with elevations of approximately 30 feet above mean sea level (msl) at the southwest property boundary to 20 feet msl at the top of the river bank in the northeast portion of the property. The Site is entirely developed and covered with asphalt, concrete, or buildings, with the exception of a steep riverbank sloping down to the Willamette River that is protected by rip-rap.

2.1.3 Site History

Information on the history of the Site is included in the Supplemental Preliminary Assessment Summary Report (Anchor 2000). However, some information in the report requires clarification on the ownership and operation of the Site. The property was vacant and undeveloped prior to 1979, at which time Brix Maritime, a Delaware corporation, developed the property for use as a dispatch and coordination office for a tugboat fleet. In 1993, Brix Maritime became a wholly-owned subsidiary of Foss Maritime Company, a Washington corporation. Brix Maritime continues to own and operate the property under a license allowing Brix Maritime to use the Foss name. Foss Maritime Company does not own or operate the property, although the Foss name is displayed at the

Site under the license granted to Brix Maritime[1]. The use of the property has remained the same since site development; it is currently, and has always been, used for tug mooring, maintenance, fueling, and crew rotation.

2.2 Regulatory History

Prior to 1998, the regulatory history for the Site is limited to issues related to the permitting, construction and decommissioning of the several Underground Storage Tanks (USTs) used to hold light petroleum products including diesel, gasoline, and lubrication oil. In 1993, a release was reported to DEQ related to these USTs and a soil remediation was undertaken. Brix Maritime's policy is to report any and all spills observed in or near the river regardless of the source. As a result, several spills and sheens have been reported in the vicinity of the property, including those observed coming from the City of Portland's storm water outfall at the Site, many of which were not associated with Brix Maritime's property or its operations. The City outfall is a potential source of petroleum constituents typical of urban runoff.

In 1998, the Site was identified by the DEQ as a potential source of constituents to the Willamette River sediments based on the Portland Harbor Study (EPA 1998). Since that time, the following information requests and submittals were made regarding the potential presence of constituents at the Site and whether any such constituents pose a risk to public health, safety, welfare or the environment or are a source to river sediments:

1) March 3, 1999 – DEQ requested information on the Site
2) March 31, 1999 – Brix Maritime provided the requested information
3) November 19, 1999 – DEQ requested that Brix Maritime enter into a Voluntary Cleanup Letter Agreement to perform a preliminary assessment
4) December 1999 – Brix Maritime agreed to perform a preliminary assessment and initiated an Expanded Preliminary Assessment
5) February 2000 – Brix Maritime submitted the Expanded Preliminary Assessment (Anchor 2000)

[1] The use of the Foss name under license to Brix has previously caused confusion over the ownership and operation of the Site. The Site is operated by Brix Maritime and record title to the property comprising the Site remains in Brix Maritime's name.

6) April 20, 2000 – DEQ requested additional information
7) October 2000 – Brix Maritime submitted a Supplemental Preliminary Assessment with additional information (Anchor 2000)
8) December 19, 2000 – DEQ requested yet another round of information on hazardous materials used or generated at the Site and site sampling
9) January 17, 2001 – Brix Maritime advised DEQ that they had received a general notice letter from EPA and were participating in efforts to address the Portland Harbor Superfund site
10) May 2001 – Brix Maritime submitted a Work Plan to DEQ for on-site sampling
11) Late May-Early June 2001 – Brix Maritime conducted extensive sampling of soils and groundwater at the Site (sampling plan described in HAI 2001)
12) June 27, 2001 – Brix Maritime met with DEQ to present the preliminary results of the on-site sampling program

DEQ stated in 1999, and on numerous occasions throughout the above requests, that the primary purpose of the information and sampling requests was to determine whether the Site might be a source of constituents to the river. Some of the information summarized and collected since 1999 has been relevant to the site history and subsequent remediation of the soils around USTs. However, at no time has Brix Maritime requested or sought official closure of either existing or previously removed USTs. All investigations have been conducted with the sole purpose of answering DEQ's questions regarding the Site as a potential source to the Willamette River.

2.3 Previous Reporting Results

The primary reports submitted to DEQ regarding the Site as a potential source to the river were the Expanded Preliminary Assessment and the Supplemental Preliminary Assessment (Anchor 2000). The Expanded Preliminary Assessment presented existing information on USTs, outfalls, adjacent site uses, and nearby Willamette River sediment quality and evaluated the potential pathways to the river. It was concluded from this information that potential pathways to the river do not exist.

The Supplemental Preliminary Assessment examined the site history, potential chemical sources, and potential pathways to the river in more detail as requested by DEQ. This report further supported the conclusions of the previous report. In particular, it was found that there was no soil or groundwater contamination that had any reasonable prospect of migrating to the river via ground or surface water. Further, previous releases associated with the USTs had been localized to upland soils, which were the subject of soil remediation activities undertaken in 1993. Again, it was concluded that further investigations of the Site as a potential source to the Willamette River were not warranted.

2.4 Existing Sediment Quality Data

As noted above, the Expanded and Supplemental Preliminary Assessments (Anchor 2000) concluded that the Site was not a source to river sediments. Further, the Expanded Preliminary Assessment reviewed the sediment concentrations of polycyclic aromatic hydrocarbons (PAHs) in nearby river sediments and DEQ evaluations, and found that this information does not indicate the Site is a source.

Sediment PAH concentrations were screened against National Oceanic and Atmospheric Administration (NOAA) Upper Effects Thresholds (UETs), which are set at 5,300 and 6,500 µg/kg for Low molecular weight PAHs (or LPAHs) and High molecular weight PAHs (or HPAHs), respectively. Similarly, total PAH (TPAH) concentrations were compared to consensus-based sediment quality guidelines developed by MacDonald et al. (2000), which include a Threshold Effects Concentration (TEC) and Probable Effects Concentration (PEC) set at 1,610 and 22,800 µg/kg TPAH, respectively.

The discussion of these sediment quality guidelines does not imply any form of agreement with technical basis by which they were developed or agreement with the spatial extent of sediments that may require cleanup or form the basis of Natural Resource Damage claim. These sediment guidelines are being used for screening level purposes only.

The closest available downstream surface sediment sampling site (SD052) had concentrations of LPAHs at 803 µg/kg and HPAHs at 3,907 µg/kg, which are well below the UETs. Station SD052 is just downstream of the northeast corner of the Site. If the Site were or had been a source of PAHs, this station would be an ideal location for detection of these sources. That is, stations further downstream would less likely to be affected by any potential source from the Site and more likely to be affected or influenced by other sources along the shoreline.

In addition, the types and proportions of PAHs (e.g., ratio of LPAHs to HPAHs) present in sediments downstream of the Site (with SD052 being most applicable) are not characteristic of petroleum sources at the Site. Two general sources of PAHs in urban environments are widely recognized:

Pyrogenic – having an origin associated with significant heating or organic matter. This process results in PAH mixtures enriched in higher molecular weight compounds. Examples include by-products of coal gasification and coal tar distillation, fuel combustion products found in urban runoff and fallout, and fires. Urban runoff is a significant source of pyrogenic PAHs to urban waterways and is associated with outfalls that discharge urban storm water runoff from non-point sources in watersheds.

Petrogenic – having origin associated with crude oil or refined petroleum products. These PAH mixtures are enriched in lower molecular weight compounds. Examples include crude oil, bunker C, diesel fuel, gasoline, and incomplete combustion residues of these fuels.

In terms of the volume and use of materials at the Site, petrogenic PAHs (primarily from lubrication oil, diesel fuel, and to a lesser extent gasoline) would be the most likely constituents that could be associated with past and present operations at the Site. Petrogenic PAHs tend to be dominated by LPAHs, particularly 2- and 4-ring PAHs (Battelle 1998). The typical ratio of LPAH/HPAH in petrogenic materials ranges from 4 (bunker C) to 846 (gasoline), with crude oil having a ratio of approximately 25 (Battelle 1998). However, pyrogenic PAHs (those from

combustion, fire, or coal conversion) have LPAH/HPAH ratios that range from 0.02 (pitch) to 2.7 (creosote) (Battelle 1998).

The LPAH/HPAH ratio at SD052, just downstream of the Site, is 0.2. This ratio is not indicative of petrogenic sources of PAHs. Rather, this ratio appears to be more consistent with the ratio typically found for urban storm water runoff and/or other pyrogenic sources.

2.5 UST Operational and Release History

2.5.1 Operational History

Five USTs are known to have been used at the Site, two of which were decommissioned by removal (USTs #1 and #2) in December 1998. The five USTs were installed in 1979 in a single tank nest located adjacent to the maintenance building (Figures 2 and 3). The DEQ Facility Identification Number is #7374. The five USTs included two 20,000-gallon capacity diesel fuel tanks (UST #4 and UST #5), two 6,000-gallon capacity lubrication oil tanks containing 30-weight and 40-weight oil, respectively (UST #1 and UST #3), and one 2,000-gallon capacity gasoline tank (UST #2). All of the tanks and piping were constructed of single-wall steel at the time of installation.

USTs #1, #3, #4, and #5 were piped to the covered maintenance barge to service watercraft. Transfer pipes ran underground from the UST system, daylighted along the riverbank, and ran directly over water to the work barge. UST #2 had been utilized for refueling of company vehicles; all piping to this tank ran underground to a fuel dispenser located adjacent to the west corner of the maintenance building.

In 1998, Ulrich Industrial Coatings decommissioned USTs #1 and #2 by removal and upgraded USTs #3, #4, and #5. During these activities, the fueling lines were re-routed to their current configuration (Figure 4). The UST permitting and decommissioning documentation, as well as the UST upgrade documentation, are attached to the Supplemental Preliminary Assessment as Appendix E and F, respectively (Anchor 2000).

2.5.2 Release History

Two releases of petroleum products have been documented at the Site, both relating to the UST system, which were reported under DEQ leaking UST File No. 26-93-0009.

In 1993, a lubricating oil release was reported to DEQ relating to a hole discovered in a 30-weight lube oil transfer line next to the UST nest. At that time, soil removal activities were conducted and approximately 60 feet of each of the steel UST product lines were removed and replaced with fiberglass piping (Hahn and Associates, Inc. [HAI] 1993a). Approximately 50 cubic yards of soil were removed during the excavation activities. Subsurface investigations conducted by HAI (HAI 1993b) in the vicinity of the tank nest detected gasoline, diesel, and oil-range petroleum hydrocarbons in soil; however groundwater was not tested at the time. A total of 13 soil borings (B-1 through B-13; Figure 4) were installed at the Site; the results of soil testing relating to the 1993 soil removal and subsurface investigations are detailed in the Supplemental Preliminary Assessment (Anchor 2000)

In 1998, during tank upgrading activities, petroleum-hydrocarbons were encountered in soil potentially due to an overfill at either UST No. 4 or No. 5; however, the specific tank was not documented. Soil samples were not collected to confirm the observed findings but the potential release was reported to DEQ.

3 FIELD METHODS

Subsurface soils and groundwater sampling was conducted throughout the Site in May 2001 to provide additional information to DEQ that confirms that the Site is not (and has not been) a potential source of constituents to the river.

3.1 Push Probe Installation

Sampling followed the procedures in the investigation Work Plan (HAI 2001). Seventeen push probe borings (B-14 through B-30) were installed during the investigation of the UST area to depths ranging from 4 to 32 feet below ground surface (bgs) (Figure 4). Groundwater samples were collected from six of the borings (B-14, B-15, B-17, B-18, B-19, and B-20). A groundwater sample was attempted at B-16, however the boring was dry.

Borings B-14 through B-20 were installed surrounding the UST and piping areas to characterize the extent of potential petroleum compounds in soil and to sample groundwater for the presence of petroleum compounds. Push probe locations B-19 through B-26 were placed in close proximity to UST and piping areas to better define the vertical extent of petroleum impacted soil, and to collect risk parameter data. Borings B-27 through B-29 were located in previously-identified and remediated release areas to better define the vertical extent of potential petroleum compounds in soil and to collect "worst case" samples for a risk parameter analysis. Since the locations of B-27, B-28, and B-29 were located in areas of current operating USTs and piping, these areas were excavated by hand to uncover tank piping, prior to initiating push probe sampling. Based on field screening observations, one additional push probe (B-30) was installed southwest of B-21 at the former gasoline dispenser area to further characterize field-identified potential petroleum impacts.

The push probes were installed by Geo-Tech Explorations, Inc. (Geo-Tech) of Tualatin, Oregon. Because of limited access at the Site due to low overhead in the on-site structure, one push probe boring (B-26) was installed by a hand-operated Bosch Roto-Hammer® hydraulic hammer unit. The remaining sixteen push probe borings were installed by Geo-Tech with a truck-mounted Geo-Probe Systems®

hydraulic hammer unit equipped with a 1.5-inch outside diameter (OD) hydraulically-driven steel rod.

Following completion of the sampling activities, the borings were backfilled with granular bentonite to within one foot of the ground surface and brought to grade with concrete or asphalt to match the surrounding land surface.

3.2 Soil Sampling Activities

Continuous soil cores were collected from the Roto-Hammer boring using a 1.0-inch OD stainless steel sampler with Teflon-lined sleeve that was advanced 2 feet into the undisturbed soils. Continuous soil cores were collected from Geo-Probe borings using a 2-inch OD stainless-steel Macrocore device utilizing a disposable polyvinyl chloride (PVC) sleeve that was advanced 4 feet into the undisturbed soils. Soil samples for analysis were collected from cores at approximate 2- to 4-foot intervals.

Upon collection, each soil sample was immediately placed in a 9-ounce sample jar 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 all sampling procedures. The properties of each soil core were noted by an HAI scientist in the field. A summary of the May 2001 push probe installations is included as Table 1; and the boring logs are included in Appendix A. Boring logs for B-1 through B-13 installed during the April 1993 subsurface investigation are also included in Appendix A.

Each soil core was screened in the field for the presence of constituents by the visual, olfactory, sheen, and headspace vapor methods. The presence of sheen was assessed by placing clean tap water in a black pan and introducing approximately 5 grams of disaggregated soil to the water. Screening for the presence of organic vapors was conducted by the headspace method using a photoionization detector (PID) equipped with a 10.6 ev lamp. Immediately following the collection of the sample, approximately 4 ounces of soil were placed in a one-quart plastic bag and sealed. The sample was set aside for a 20-minute stabilization period, whereupon the

detector probe was inserted through the seal into the bag to collect the headspace sample. The results of the headspace screening are recorded on the boring log in parts per million (ppm). The results of the headspace method were used for qualitative screening purposes only.

3.3 Groundwater Sampling Activities

Groundwater samples were collected from temporary well points installed in B-14, B-15, B-17, B-18, B-19, and B-20 (Figure 4). Groundwater was not encountered in recoverable quantities at B-16, and only very low quantities were encountered at B-14. To collect the groundwater samples, a 4-foot section of 1-inch OD, 0.010-inch slotted, stainless steel well screen was set beneath the groundwater level. Specifically, well screens were placed across a depth interval of 24 to 28 feet bgs in all probes sampled, with the exception of B-14 where the screen was placed across a depth interval of 28 to 32 feet bgs.

The well points were typically purged of one liter of water or purged dry prior to sampling. The water samples were collected with disposable polyethylene bailer tubing for volatile compounds and a vacuum pump for PAHs and dissolved (field filtered) lead. Sampling containers were completely filled such that no headspace was present that would allow for the loss of volatile compounds. The sample bottles were then labeled and transferred to a chilled container for shipment to the analytical laboratory.

Following completion of the water sampling activities, the temporary well point was removed, and the boring abandoned.

3.4 Decontamination Procedures

Soil sampling equipment was decontaminated between soil samples with a detergent wash followed by a double-rinse with potable water. All push probes, including temporary well point screens, were steam-cleaned between probe locations to prevent cross-contamination.

Reusable groundwater sampling equipment was decontaminated between groundwater samples by steam-cleaning. Where new disposable equipment was used for sample collection, decontamination was not necessary.

4 ANALYTICAL METHODS

The soil and groundwater samples were transported to Environmental Services Laboratory, Inc. of Portland, Oregon for analytical testing. Selected soil samples were analyzed per the Work Plan (HAI 2001) for the following parameters:

- Gasoline-Range Total Petroleum Hydrocarbons (TPH) - NW TPH-Gx
- Diesel-Range TPH - NW TPH-Dx
- Oil-Range TPH - NW TPH-Dx
- Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) - EPA 8260B or 8021
- Volatile Organic Compounds (VOCS) - EPA 8260B
  - methyl-tert-butyl-ether (MTBE)
  - ethylene dibromide (EDB)
  - ethylene dichloride (EDC)
  - 1,2,4-trimethylbenzene (1,2,4-TMB)
  - 1,3,5-TMB
  - iso-propylbenzene
  - n-propylbenzene
  - naphthalene
- PAHs - EPA 8270 SIM
- Total Lead - EPA 6010.

Selected groundwater samples were analyzed per the Work Plan (HAI 2001) for all of the same parameters analyzed in soils (using the same methods) except gasoline, diesel, and oil range TPH.

5 RESULTS AND DISCUSSION

The results of the analytical testing for soil samples from the 1993 test pit and subsurface investigation activities are summarized on Tables 2 and 3, and for the 2001 subsurface investigation are summarized on Tables 4 and 5. The results of the analytical testing of the groundwater samples are summarized in Table 6. The laboratory reports and chain-of-custody documentation for soil and groundwater samples are in Appendices B and C, respectively.

5.1 Subsurface Conditions

As observed during the January test pit investigation as well as April 1993 and May 2001 subsurface investigations, the shallow soils at the Site are composed typically of gravel with varying mixtures of sand and silt (Gravel Fill Unit) from the surface to depths of approximately 1 to 6 feet bgs. Underlying the Gravel Fill, sands and silty sands (Sand Fill Unit) were observed to depths of between 20 and 25 feet bgs where a native silty clay (Silty Clay Unit) was encountered to the maximum depth of subsurface investigation at approximately 32 feet bgs. A native sand zone was observed beneath the Silty Clay Unit at some locations (B-19, B-22, and B-26). Concrete and gravel fill material was observed in four borings (B-1, B-8, B-18, and B-26) that were installed inside the maintenance building. The concrete material at B-1 and B-8 prevented investigations deeper than 5 feet bgs.

During the April 1993 subsurface investigation, groundwater was observed at depths between 23.5 and 26 feet bgs. During the May 2001 subsurface investigation, groundwater was encountered at depths between 23 and 32 feet bgs; no groundwater was found to be perched in the Sand Fill Unit. Based on groundwater contaminant plume distribution (see Section 5.3), the direction of net groundwater flow beneath the site is inferred to be toward the northeast.

5.2 Soil Sample Results

5.2.1 Total Petroleum Hydrocarbons

The investigation activities conducted at the Site detected gasoline-range, diesel-range, and oil-range petroleum hydrocarbons in soils at selected locations at depths of 3 to at least 24.5 feet bgs. Detected gasoline concentrations range

between 1.14 to 2,000 ppm (Tables 3 and 4). Combined diesel and oil-range petroleum hydrocarbons ranged between 49 and 53,000 ppm (Tables 2, 3, and 4).

The testing results suggest two areas where petroleum hydrocarbons were detected: the former gasoline dispenser area and the former oil pipeline area. The analytical results indicate the presence of gasoline in soil is laterally and vertically defined and limited to an area in the immediate vicinity of the former gasoline dispenser, a small portion of which may extend beneath the west corner of the maintenance building. Field screening and analytical results indicate the extent of diesel-range and oil-range petroleum hydrocarbons are laterally and vertically defined and located in the vicinity of the former oil pipeline area (Figure 5). Petroleum hydrocarbon impacts appear to have been limited to shallower subsurface soils located in the Gravel Fill and Sand Fill Units at the Site.

5.2.2 Petroleum Constituents

Gasoline petroleum constituents (BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, n-propylbenzene, and iso-propylbenzene) and additives (MTBE, EDB, EDC, and lead) were compared to DEQ's most conservative Risk-Based Concentrations (RBCs) for occupational pathways (OAR 340-122-0244) as outlined in the DEQ Risk-Based Decision Making (RBDM) guidance document (ODEQ 1999). Likewise, diesel and oil-range petroleum constituents (PAHs) were also compared to DEQ occupational RBCs.

Gasoline petroleum constituents were generally not detected in the "worst case" soil sample from the gasoline dispenser area, with the exception of certain VOCs in two borings (B-21 @ 5.0 feet and B-25 @ 6.0 feet bgs), and total lead in all samples where analyzed. Where detected, VOC constituents were below their respective lowest occupational RBCs with the exception of benzene, which was detected at 5.2 ppm (B-21 @ 5.0 feet bgs). This is not surprising since this sample contained the highest gasoline concentration (1,370 ppm) detected at the site during the May 2001 sampling event. PAHs were not detected in the four soil samples analyzed for these constituents. Although total lead was detected at

concentrations ranging from 3.03 to 4.4 ppm, these concentrations are considered to be representative of natural background levels.

Petroleum constituents detected above the most-stringent occupational and trench worker RBCs were carried forward for further evaluation based on DEQ reasonably-likely land use exposure pathways. Discussion of reasonably-likely soil exposure pathways is presented in Section 7.2.

5.3 Groundwater Sample Results

Groundwater sample results for applicable petroleum constituents and additives (BTEX, 1,2,4-TMB, 1,3,5-TMB, n-propylbenzene, iso-propylbenzene, MTBE, EDB, EDC, PAHs and lead) were compared to DEQ's most conservative RBCs for occupational pathways. Petroleum constituents were detected in 5 of 7 groundwater samples analyzed (Table 6; Figure 6). Benzene, iso-propylbenzene, n-propylbenzene, 1,2,4-TMB, 1,2,5-TMB, naphthalene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene were detected above their most-stringent occupational RBCs at B-17 and B-18 only. The vast majority of the detections above RBCs occurred at B-17. Petroleum constituents detected above the most-stringent occupational RBCs were carried forward for further evaluation based on reasonably-likely groundwater exposure pathways. Discussion of reasonably-likely groundwater exposure pathways is presented in Section 7.2.

6 HAZARDOUS MATERIALS INFORMATION

In response to the Supplemental Preliminary Assessment (letter dated December 19, 2000), DEQ made several comments requesting additional information on the potentially hazardous materials used and generated on the Site. Waste paint and oil are the only potentially hazardous materials that have been generated at the Site between the time of site development in 1979 and the time Brix Maritime became a wholly-owned subsidiary of Foss Maritime Company. Currently, Brix Maritime implements strict inventory controls to ensure that all paint purchased at the Site is used and no waste paint is generated. The only potentially hazardous material generated by Brix Maritime, since it became a wholly-owned subsidiary of Foss Maritime, is waste oil. The information requested is contained in the following sections.

6.1 Conditionally Exempt Small Quantity Generator Status

In 1994, Brix Maritime disposed of old paint that had been accumulating at the Site over the years, prior to Brix Maritime becoming a wholly-owned subsidiary of Foss Maritime, at an off-site disposal facility. As a result of that one disposal event, it was listed as Conditionally Exempt under the Resource, Conservation and Recovery Act (RCRA). To Brix Maritime's knowledge, hazardous wastes have not been generated since site development in 1979 and, except for the waste paint disposed of in 1994, Brix Maritime is not and has not been a generator under RCRA, conditionally exempt or otherwise.

Brix Maritime does not handle, store, treat, generate or dispose of hazardous waste at the Site. Currently, Brix Maritime implements rigorous inventory control and procedures to control the use and distribution of paint on vessels. All paint purchased for use is used in its entirety with no waste generated. Brix Maritime does not foresee any changes to its operations at the Site that would necessitate a return to or need for generator status in the future.

6.2 Types of Materials Used on Site

The primary materials stored and used on site are diesel fuel and lubrication oil (new and waste). The storage and recycling of these products is discussed in detail in the Supplemental Preliminary Assessment Summary Report. Table 7 summarizes

the types, storage locations, and average quantities of various others materials used in small quantities on site. These include: hydraulic fluid, antifreeze, paint, and paint thinner, gasoline, kerosene, Nalcool, 40 weight oil, and AC 500 (an acid based cleaner). All of these materials are stored in doors and/or undercover to prevent any exposure to rain or storm water runoff. All of these materials are properly used and disposed of to prevent contamination to soils and surface waters. In many cases, these materials are used in their entirety so that disposal is not required including paints, diesel fuel, gasoline, and cleaners. Excess kerosene and oils are recycled.

6.3 Lubrication Operations

Waste lubrication oil at the facility is currently pumped on board the shop barge, where an aboveground oil/water separating system is used. Oil that is not mixed with water is pumped directly into the waste oil tank on site. The bilge/oily water is pumped into an aboveground oil/water separating tank where the oil is separated from the water. Separated water is pumped into the city sewer. The volume of this water is not tracked. The waste oil tanks are pumped out on an average of approximately once a month, yielding about 2000 gallons each time. Waste oil is trucked off-site for recycling.

6.4 Drum Storage

Drums of lube oil for two vessels are delivered to the Site on a periodic basis. The drums are delivered, emptied for use in the vessels and then picked up within a few days by the vendor for reuse. Emptied drums are stored indoors until they are picked up by the vendor. Occasionally, a drum of kerosene is delivered and used on the Site in the shop and is usually returned within a couple of days of purchase. A total of approximately 170 lube oil and kerosene drums are received and returned to vendors per year. Used oil filters are placed in sealed drums and are under cover at all times. These drums are periodically picked up for recycling. Approximately 4 to 5 oil filter drums are present on site at any one time.

6.5 Discussion

The only potentially hazardous materials generated on the Site in any substantial quantities are waste oil and water separated from bilge/waste oil. Because waste oil

is recycled and water is pumped to the city sewer, there is little if any potential for loss of these materials to either the Site or the river. As discussed in Section 2.4, the materials on site are all relatively light weight petroleum products that cannot be a source of higher weight PAHs (which typically come from pyrogenic sources) found in river sediments.

7 RISK-BASED UPLAND EVALUATION

A risk-based evaluation was conducted for the Site according to DEQ's Risk-Based Decision Making (RBDM) guidance document (ODEQ 1999) to determine potential human health risks associated with petroleum impacts to the property. The evaluation is organized and presented under the following primary headings: beneficial use evaluation (Section 7.1), conceptual site exposure model (Section 7.2), and risk evaluation (Section 7.3).

7.1 Beneficial Use Evaluation

7.1.1 Reasonably-Likely Land Uses

The approximately 3.7-acre property is zoned as "IH" for Heavy Industrial. The property has two overlay zones: interim resource protection zone (i) and scenic resource (s). With respect to current uses, the Site is wholly operated by Brix Maritime. Surrounding adjacent properties are zoned "IH" Heavy Industrial with an "i" overlay. There is no reason to believe the Site or adjoining property uses will change in the future. Accordingly, industrial use is carried forward in the risk evaluation as the current reasonably-likely and future land use for the property.

7.1.2 Reasonably-Likely Beneficial Uses of Groundwater

Currently, tap water at the subject property and adjoining properties is supplied by the City of Portland. No water wells are present on the subject property. Given the historical presence of municipal water service for this area of Portland, it is unlikely that any water wells are in use by nearby properties for domestic purposes. According to the property owner, groundwater at the Site is not expected to be used in the future.

Hahn and Associates, Inc. (HAI) conducted a water well inventory for the area within a one-half-mile radius of the Site to determine the usage of groundwater. The search area was not extended across the Willamette River to the northeast since this feature is considered a hydrogeologic boundary. The well inventory was based on well logs filed with the Oregon Water Resources Department (OWRD). The search of the OWRD well log database was conducted using the

OWRD's Web-based GRID query. A door-to-door survey was not conducted to identify undocumented water wells.

One water well was identified within a one-half mile of the Site that was installed for domestic consumptive purposes. The well was installed in 1990 and is located approximately 2,000 feet southwest (up-gradient) of the Site (Appendix D). The well was installed to a depth of 530 feet bgs with a static water level recorded at 450 feet bgs. Based on the well's distance and up-gradient location, it is unlikely that this well could be impacted by the Site. Based on the preceding, the use of groundwater as a drinking water source will not be carried forward in the risk evaluation.

7.2 Conceptual Site Exposure Model

The conceptual site exposure model for the Site was developed based on the current and future reasonably-likely land and groundwater uses identified for the Site and surrounding properties as discussed in Section 7.1.

The conceptual site exposure model describes the migration pathways and exposure scenarios (potentially exposed populations and exposure routes) through which humans may be exposed to constituents of potential concern at the Site. No exposure, and thus no potential for risk, exists unless an exposure pathway is complete. The site exposure model presented herein is based on the identified soil and groundwater conditions, as well as current and reasonably-likely future land uses and beneficial uses of groundwater within the locality of the Site.

7.2.1 Constituent Sources and Exposure Media

The release mechanism at the Site relates to two primary impacted areas: the former gasoline dispenser and former underground oil pipeline. The residual petroleum-impacted soil is present at depths of approximately 3.0 to 24.5 feet bgs. For purposes of this risk evaluation, the identified exposure media are surface soil (0 to 3.0 feet bgs), subsurface soil, and groundwater.

7.2.2 Constituents of Potential Concern

Benzene, detected at 5.2 ppm (B-21 @ 5.0 feet bgs), was the only petroleum constituent in soil that exceeds the most-stringent RBCs for occupational exposure. Concentrations of lead appear to be representative of natural background levels. For example, it is worth noting that the 90th percentile background concentration reported for lead in Clark County, Washington is 24 ppm and for the entire state of Washington is 17 ppm (Ecology 1994). This would indicate that lead concentrations at the Site are well below commonly found background levels of lead in soils. Benzene and lead are carried forward for risk evaluation.

Groundwater constituents that were detected above their most-stringent occupational RBCs include benzene, iso-propylbenzene, n-propylbenzene, 1,2,4-TMB, 1,2,5-TMB, naphthalene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene. Accordingly, these constituents in groundwater are carried forward for risk evaluation.

7.2.3 Exposure Pathway Analysis

Nine exposure pathways for soil and groundwater, as outlined in the DEQ RBDM guidance document (ODEQ 1999), were evaluated for applicability to the Site, including:

- Soil
  1) Surface soil ingestion, dermal contact, and inhalation
  2) Volatilization to outdoor air
  3) Vapor intrusion into buildings
  4) Leaching to groundwater

- Groundwater
  5) Groundwater ingestion
  6) Groundwater volatilization to outdoor air
  7) Groundwater vapor intrusion into buildings
  8) Ingestion and inhalation from tap water
  9) Groundwater in excavation.

Table 8 lists the various exposure pathways/receptor scenarios that were evaluated for the Site, and briefly explains the rationale for the selection or exclusion of each exposure pathway. Since the beneficial land use evaluation indicates the current and reasonably likely future land uses within the vicinity of the subject property to be industrial, the occupational receptor scenario was utilized for the applicable exposure pathways. In addition, the excavation worker scenario was included for soil only due to the relatively shallow depth of some detected constituents in soils (i.e., about 3 foot bgs). Groundwater was not included in the excavation worker scenario since it is too deep (over 23.5 feet bgs) for excavation worker exposure. All exposure pathways involving groundwater ingestion were eliminated since petroleum constituents in groundwater at the Site are not deemed to reasonably likely impact current or future beneficial uses of groundwater for consumptive purposes. As shown in Table 8, the following six exposure pathways/receptor scenarios were retained for further evaluation:

- Soil
  1) Surface soil ingestion, dermal contact, and inhalation by an occupational worker
  2) Surface soil ingestion, dermal contact, and inhalation by an excavation worker
  3) Volatilization to outdoor air for an occupational receptor
  4) Vapor intrusion into buildings for an occupational receptor

- Groundwater
  5) Groundwater volatilization to outdoor air for an occupational receptor
  6) Groundwater vapor intrusion into buildings for an occupational receptor.

7.3 Risk Evaluation

The evaluation of potential unacceptable risks at the Site was conducted by comparing the maximum detected concentration for each constituent of potential concern to the RBCs for each of the six exposure pathways/receptor scenarios

identified for the Site. Use of the maximum detected concentration at the Site provides for a conservative evaluation against the RBCs. The results of this comparison are shown on Tables 9 and 10 for soil and groundwater, respectively.

The concentration of benzene detected in soil at one location (B-21 @ 5.0 feet bgs) exceeds one applicable pathway "Vapor Intrusion into Buildings" for an occupational receptor. However, there are no basements on site or plans to construct any such structures. Consequently, the actual risk from vapor intrusion into site buildings is likely less than assumed using this screening process. The remaining five exposure pathway/receptor scenarios do not present a risk. Groundwater constituent concentrations do not exceed RBCs for any of the identified applicable exposure pathways.

Conservatively assuming a radial extent of 12 feet and a vertical extent of 15 feet, the volume of soil that could contain benzene at levels above the Vapor-Intrusion-into-Buildings RBC is estimated to be approximately 125 cubic yards. The area of soil impacts that exceed risk-screening levels is limited to an area beneath the former location of the fuel dispenser, which is located approximately 15-20 feet from the southwestern property boundary.

8 RIVER SOURCE EVALUATION

As discussed in the previous section, petroleum-related constituents are present in small areas of soils and groundwater on the Site. This section addresses whether this information might indicate the potential for these constituents to enter the river in substantial concentrations. To address this question, a preliminary and conservative risk screening was conducted (Section 8.1). This risk screening does not account for site-specific conditions or fate/transport processes of any kind (e.g., attenuation or dilution prior to contact with receptors). For the constituents that passed through this conservative screening, site-specific conditions and fate/transport processes were evaluated to determine the likelihood that these constituents might enter the river at concentrations of potential concern (Sections 8.2 –8.5).

8.1 Risk Screening

A risk screening was conducted that focused on potential pathways to the river and receptors that would be present in the river.

8.1.1 Pathways to River – Conceptual Model

The primary potential pathway for constituents in soils to reach the river would be via desorption/dissolution to groundwater and transport via groundwater to the river. It is also possible that constituents in soils could be eroded or washed by storm water and deposited in the river. However, three factors make this pathway unlikely. One, all detected constituents were in samples that are 3 feet or more below the ground surface and would not be exposed to storm water. Two, most of the Site is impervious surfaces, which prevents direct interaction of soils and storm water. Three, there are no industrial activities occurring on uncovered portions of the Site that are exposed to storm water or that would come into contact with rainwater flowing across or onto the mostly-paved Site.

Constituents in soils could also volatilize to the air. However, only a tiny fraction of any volatilized constituents would be expected to be transported to the river, and this cannot be considered a significant pathway.

Finally, groundwater could seep to the surface and flow into the river. However, there is no evidence of any groundwater seepage on the level portions of the Site. Groundwater seepage at the riverbank can be considered essentially the same pathway as groundwater transport directly to the river and is evaluated in that way below.

8.1.2 River Receptors

Both aquatic life and wildlife utilize the river to varying degrees and are potential receptors for any constituents that enter the river (after mixing, dilution, and oxidation with river water). People who incidentally or intentionally consume water and aquatic life from the river are also potential receptors.

8.1.3 Toxicity Assessment

The following ambient water quality criteria and guidelines (in the form of concentrations), which are protective of both aquatic ecosystems and human health, were used for the toxicity assessment::

1) USEPA (1999) National Recommended Water Quality Criteria for the protection of aquatic life and human health
2) USEPA (2000) Drinking Water Standards (Maximum Contaminant Levels) for the protection of human health
3) Oregon Water Quality Criteria (OAR 340-041, Table 20) for the protection of aquatic life[2]

In addition, literature reported aquatic life toxicity data were also used. These data were obtained from freshwater bioassay information available through USEPA (2001) ECOTOX Database.

[2] The State of Oregon adopted the 1986 version of the National Water Quality Criteria under OAR 340-041-445(2)(p)(B). Consequently, the 1999 National criteria are more recent and are used for all human health based comparisons. However, some aquatic life criteria that were present in the 1986 version of the National Water Quality Criteria were rescinded in the 1999 National criteria. Where no other criteria were available, 1986 aquatic life criteria (still applicable under Oregon law) were used in the risk screening.

8.1.4 Exposure Assessment

This risk screening utilizes an overly conservative approach to exposure that ignores fate and transport processes and thereby over-estimates any risks to public health and the aquatic environment. Groundwater samples were taken throughout the Site. Two locations (B-15 and B-17) were immediately adjacent to the shoreline (Figure 4). Constituent concentrations in these samples would be most indicative of any constituent concentrations available to enter the river via groundwater transport. All but a few constituents were undetected in groundwater samples from B-15. Since the groundwater sample from B-17 had higher constituent concentrations than any constituents detected in any of the other nearshore groundwater samples, concentrations of constituents from the groundwater sampled at B-17 were used in the risk screening.

Even though B-17 is located along the shoreline, it is still approximately 45 feet (horizontal distance) from the typical waterline in the Willamette River (Figure 4). Therefore, groundwater at 24 to 28 foot bgs (the sampled interval at B-17) still must travel through a considerable amount of soil before entering the river. Given the locations of residual soil impacts at the Site, groundwater constituent concentrations traveling from B-17 to the river would be expected to be further attenuated before entering the river. In addition, once groundwater leaves the soil zone and enters the river, constituent concentrations would be further diluted by the relatively large volume of water flowing in the river.

Although further attenuation and then dilution is likely to occur before any river receptors would contact any groundwater-transported constituents, the undiluted and unattenuated concentrations observed in the groundwater sample from B-17 were used in the risk screening. This is clearly an overly conservative approach, which will overestimate any risks that might actually occur in the river.

8.1.5 Risk Screening Results

The undiluted constituent concentrations observed in the groundwater sample from B-17 were compared to the surface freshwater toxicity values discussed in Section 8.1.3. This comparison is summarized in Table 11.

In some cases, no applicable water quality criteria or toxicity values were found for some constituents including MTBE, EDB, and EDC, which were all undetected in B-17 groundwater. Also, lead was sampled but was not detected in the B-17 groundwater sample. These undetected constituents were not examined further.

Table 11 presents the hazard quotient for each constituent, which is the observed concentration divided by the toxicity value. In this case, the lowest applicable toxicity value was used to calculate the hazard quotient. Hazard quotients greater than one indicate a potential risk (assuming the lowest toxicity value is the most applicable to this situation).

Remembering the conservative nature of this risk screening, the following nine constituents were above a criterion or toxicity value:

- Benzene
- Ethylbenzene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Chrysene
- Indeno(1,2,3-cd)pyrene

All but one of these constituents exceeded a criterion based solely on the human health consumption of fish and/or water. Benzo(g,h,i)perylene exceeds an aquatic toxicity value only slightly (hazard quotient of 1.4).

8.2 Applicability of Screening Criteria to Site Specific Conditions

Because aquatic life criteria/toxicity values are not exceeded (with one very minor exception), the potential risks found in this analysis are driven entirely by comparison to USEPA human health water quality criteria. These criteria all assume consistently high levels of consumption of water and fish residing in the affected water body by people over an entire lifetime. While these criteria assumptions may be appropriate when applied to some surface waters and/or drinking water, they are likely inappropriate for this reach of the Willamette River.

8.2.1 Drinking Water Comparisons

For example, drinking water standards assume that a person would drink 2 liters per day from the affected water body for their entire life. This means someone would have to drink 2 liters of water taken from the river bottom near the Site daily for an entire lifetime (or about 730 liters/yr). Realistically, water consumption from the river will only be through incidental contact and ingestion during swimming or similar recreational activities. Standard EPA consumption rates for this type of scenario is about 50 ml per hour with about 18 hours exposure per year (or 0.9 liters per year) (USEPA 1997). Thus, drinking water MCLs are more than 800 times too conservative for this situation. The greatest exceedance for any constituent above the MCL is benzene, which was present at only 25 times the MCL in groundwater. Thus, it is extremely unlikely that any of these constituent concentrations (even undiluted and unattenuated) pose a risk to people via incidental ingestion of river water. Constituents exceeding the risk screening based on water consumption only are not evaluated further in this document.

8.2.2 Fish Consumption Comparisons

Seven of the constituents found in the risk screening process were screened in because they exceeded the USEPA criteria based on the consumption of fish and water (both items together) over a lifetime. For organic constituents with any potential to bioaccumulate in the aquatic food chain, these EPA human health criteria are determined almost entirely by the fish portion of the diet (rather than

the water portion). That is, a relatively small portion of a person's daily dose of any bioaccumulative constituent comes from the water portion of their diet.

The default assumption for existing National water quality criteria is a fish consumption rate of 6.5 grams per day for a lifetime. Fish meal sizes can vary considerably, but the reported national average is about 126 grams per meal (USEPA 1997). Accordingly, the standard EPA approach assumes that someone would catch and eat approximately 19 meals of fish annually from the site in question. Consequently, the following series of assumptions are needed in order for the standard EPA criteria to be applicable to this situation:

- People must obtain 19 or more meals of fish from directly in front of the Site
- This rate of consumption of fish from in front of the Site must occur for an entire lifetime
- The fish caught and consumed must have spent their entire lives directly in front of the Site.

While it is possible that people may eat this number of fish meals annually from this industrial stretch of the Willamette River, it is extremely unlikely that as many as 19 meals per year would come from directly in front of the Site. It is even more unlikely that such a consumption rate would be maintained for a lifetime. Finally, the home ranges of almost all sport fish in the Willamette River are likely to be much larger than the area directly in front of the Site.

8.3 Fate and Transport Issues

The above discussion supports the conclusion that, even assuming no attenuation or dilution of groundwater concentrations, risks are extremely unlikely to river receptors. However, the likelihood of risks is even less when the attenuation processes are considered. This section discussed attenuation processes. The next section discusses dilution processes.

As stated above, groundwater constituents measured in boring B-17 would have to travel through approximately 45 feet of soil before reaching the river. Major factors

affecting attenuation of organic constituents in groundwater moving through soils are:

- Partitioning rate of the constituent to soil (primarily governed by the organic carbon partitioning coefficient or K_{oc} for the constituent)
- Solubility of the constituent in water
- Degradation rates of constituents (related to oxidation conditions)
- The porosity of the soil and the rate of groundwater flow.

Approximate K_{oc}, solubility, and degradation values for the constituents passing through the risk screening process for the fish consumption pathway are shown in Table 12.

All of the PAHs (all constituents in Table 12 except benzene) have very high organic carbon partitioning coefficients and very low solubilities in water. This indicates that they will readily adsorb to soils and are not easily transported in groundwater. The attenuation of these constituents in soils, even over very small distances, would be substantial in nearly all circumstances.

Benzene has a high solubility and low organic carbon partitioning constant, indicating that it has the potential for groundwater transport. However, the soil partitioning of benzene is measurable and would be expected to reduce these constituent concentrations to some extent over the distances to the river. It is also important to note that benzene has a relatively high aerobic degradation half life (20 days; Table 12). However, aerobic conditions probably only occur within groundwater very close to the riverbank. The anaerobic half-life for benzene has been reported in the 720 days range (HSDB 2001).

The groundwater flow velocity for the Sand Unit water bearing zone at other nearby sites along the Willamette River has been reported (HAI 1998) in the 0.007 to 0.13 foot per day range. This would mean that groundwater at B-17 would take anywhere from 1 to 16 years to reach the riverbank.

All of these fate and transport parameters indicate that the PAH concentrations would be severely reduced during transport to the riverbank where dilution processes would occur (discussed below). Benzene concentrations would likely also be reduced during transport to the river, mainly due to degradation, but probably not to the same degree as the PAHs.

8.4 Exposure at Point of Compliance

The above discussion considers the changes in groundwater concentrations due to attenuation processes that are likely from B-17 to the riverbank. This section considers the final step in the exposure pathway, which is the concentration of any constituents in the river at the point of compliance for river receptors. Just as an outfall to a river is diluted by the flow in the river, any constituents from groundwater that exit the riverbank will be diluted to some extent in the river. All detailed risk assessments of discharges to river systems evaluate the important effects of dilution. If any constituents present are diluted to below applicable toxicity values within a reasonably small zone, then the actual risks to river receptors can be considered negligible. The acceptable size of such a zone may be determined by the habits and exposure patterns of receptors in question (e.g., fish or recreational fishers) or mixing zone regulations/policies for the applicable jurisdiction.

A general estimate of the expected dilution can be obtained by comparing the groundwater flow rates from the Site to those in the river. Groundwater flows can be estimated by determining the cross sectional area over which the contaminated groundwater might be discharged into the river and multiplying by the groundwater flow velocity discussed above (0.007 to 0.13 foot/day). The linear shoreline extent of groundwater impacts is not completely characterized by the one sample at B-17. However, for purposes of this evaluation, it can be conservatively estimated that groundwater impacts extend 45 feet on either side of the B-17 sample (or about 90 feet)[3]. The vertical extent of groundwater impacts can be very conservatively estimated to be about 10 feet due to the likely low permeability of the

[3] Boring B-16 is 45 feet distant from B-17 toward the north and did not contain sufficient groundwater for sampling. Therefore, the overall assumption of 90 linear feet of potentially contaminated groundwater discharge appears conservative.

silt layer below the sand layer. This results in a 900 square foot cross section of river bank, which multiplied by maximum groundwater velocity of 0.13 foot/day yields a maximum groundwater flow rate of about 0.001 cubic feet per second (cfs). Extreme low flow condition for the Willamette River at the USGS Portland gauge station is about 6,000 cfs (USGS 2001).

Of course, the actual dilution characteristics of the river would be dependent on the tidal and river current conditions immediately adjacent to the Site. However, regardless of the specific dilution patterns at any one moment, it is clear that the discharge from groundwater would be extremely small in comparison to the volumes of water available for dilution at any one time, and that substantial dilution would be provided over very short distances in nearly all circumstances.

8.5 Source Evaluation Conclusions

As discussed above, the risk screening is very conservative, yielding results that overestimate any risks that may actually occur in the river. A realistic consideration of the other site-specific, fate/transport, and dilution factors relevant to this Site supports the conclusion that risks to river receptors from any of the constituent concentrations found in the groundwater are exceedingly unlikely.

Even if one compares the highest hazard quotient for any constituent (i.e., benzene with a hazard quotient of 104 for fish consumption) to the estimated level of conservatism associated with each assumption, the risks for benzene are very approximately overestimated as follows:

- Fish consumption rate – 10 times overestimated (i.e., 2 rather than 18 fish meals annually from in front of the Site)
- Fish bioconcentration – 2 times (i.e., conservatively estimate recreational fish spend 50 percent of their time rather than 100 percent in front of the Site)
- Degradation/attenuation – 5 times (i.e., limited but measurable attenuation and degradation during transport to river)

- Dilution effect on bioconcentration – 50 times (i.e., fish would actually be exposed on a continual basis to highly diluted concentrations of constituents in the river)[4].

Factoring all these overestimated assumptions together, the hazard quotient for benzene should be divided by about 5,000 (at a minimum), yielding a hazard quotient of about 0.02. That is, the risk from benzene in groundwater to river receptors (specifically human health consumption of fish) is about 2 percent of the level of potential concern. The risk from other constituents, such as PAHs, are expected to be much lower due to their lower hazard quotients and more favorable fate/transport characteristics.

Risks for other receptors in the river would be even lower given the hazard quotients for any constituents do not exceed values of:

- 25 for benzene for human water consumption
- 1.4 for benzo(g,h,i)perylene for aquatic life.

[4] It could be argued that there is considerable room for upward revision of these estimates. In particular, the dilution estimate (dilution factor of 50) is still extremely conservative given the 6 orders-of-magnitude difference between groundwater and river flows. In addition, if the upper bound estimates of groundwater velocities are correct (e.g., about 16 years for groundwater to reach the shoreline), then anaerobic degradation of benzene during transport to the river would reduce benzene concentrations by a factor of about 250 rather than the factor of 5 shown above.

9 CONCLUSIONS

9.1 Upland Soils and Groundwater

Following DEQ guidance (ODEQ 1999), there are no upland risks from residual petroleum related impacts to soils and groundwater. Based on these findings no further characterization or remediation of soils and groundwater is necessary.

9.2 River Source Evaluation

The primary goal of this sampling effort was to determine whether upland areas of the Site might be a source of constituents to the river at concentrations of potential concern. Careful evaluation of the sampling results indicates that risks to river receptors from the observed constituent concentrations in groundwater and soil are negligible. Therefore, the Site is not a source of constituents to the river.

This conclusion is further supported by the fact that the river sediments contains ratios of LPAHs to HPAHs that are indicative of general urban storm water inputs, which are generally dominated by pyrogenic sources of PAHs. The petrogenic materials used on the Site (i.e., oils, diesel, and gasoline) cannot be the source of the PAH mixtures observed in river sediments.

Given this evidence, no further remediation or investigation of groundwater or soils for the purposes of determining potential sources to the river is warranted. For similar reasons, the Preliminary Assessment, particularly for the purposes of source identification and as documented by the Expanded Preliminary Assessment Summary Report, the Supplemental Preliminary Assessment Report, and this report and their respective appendices, can be considered complete and no further submittals of information are necessary to satisfy Brix Maritime's agreement to perform a preliminary assessment.

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TABLES

Table 1
Summary of Push Probe Installations - May 2001

Boring Number	Location	Install Date	Total Depth (feet bgs)	Install Method	Groundwater Data Summary		
					Depth Encountered (feet bgs)	Screen Interval (feet bgs)	Sample No.
B-14	River bank area	29-May-01	32.0	Push Probe	32.0	28-32	29-108
B-15	River bank area	29-May-01	28.0	Push Probe	26.5	24-28	29-104
							29-105
B-16	River bank area	29-May-01	28.0	Push Probe	-	24-28	Dry
B-17	River bank area	29-May-01	28.0	Push Probe	28.0	24-28	29-109
B-18	Beneath Maintenance Building	29-May-01	28.0	Push Probe	26.5	24-28	29-107
B-19	West of UST area	24-May-01	28.0	Push Probe	23.0	24-28	24-102

Table 1
Summary of Push Probe Installations - May 2001

Boring Number	Location	Install Date	Total Depth (feet bgs)	Install Method	Groundwater Data Summary		
					Depth Encountered (feet bgs)	Screen Interval (feet bgs)	Sample No.
B-20	North of UST area	24-May-01	28.0	Push Probe	27.0	24-28	24-103
B-21	Next to former fuel pump	24-May-01	24.0	Push Probe	-	-	-
B-22	West of UST and north of soil removal areas	24-May-01	28.0	Push Probe	-	-	-
B-23	Northwest of UST area	24-May-01	28.0	Push Probe	-	-	-
B-24	East of UST area	25-May-01	28.0	Push Probe	-	-	-

Table 1
Summary of Push Probe Installations - May 2001

Boring Number	Location	Install Date	Total Depth (feet bgs)	Install Method	Groundwater Data Summary		
					Depth Encountered (feet bgs)	Screen Interval (feet bgs)	Sample No.[1]
B-25	South of soil removal area	25-May-01	24.0	Push Probe	-	-	-
B-26	South of soil removal area	25-May-01	24.0	Roto-Hammer	-	-	-
B-27	In soil removal area	25-May-01	4.0	ost Hole Digge	-	-	-
B-28	In soil removal area	25-May-01	28.0	Push Probe	-	-	-
B-29	Decommissioned UST area	25-May-01	28.0	Push Probe	-	-	-
B-30	West of former fuel pump	24-May-01	24.0	Push Probe	-	-	-

Note: bgs = below ground surface
ppm = parts per million

1 = Sample No. prefix is 5074-0105
2 = 0.5 feet of asphalt or concrete was present at the surface of each push probe

Table 1
Summary of Push Probe Installations - May 2001

Boring Number	Bottom Sample Depth (feet bgs)	Sample No.[1]	Soil Data Summary: Soil Strata (feet bgs) Top	Bottom	Soil Type[2]	Field Screening Results: Odor	Visual	Sheen Test	Headspace (ppm)
B-14			0.5	1.0	Gravel (GP)	-	-	-	-
	4.0	29-084	1.0	4.0	Sand with trace Silt (SP)	no	no	no	36.5
	8.0	29-085	4.0		Sand (SP)	no	no	no	11.2
	12.0	29-086				no	no	no	24.9
	16.0	29-087				no	no	no	19.2
	20.0	29-088				no	no	no	6.1
	23.0	29-089		23.0		no	no	no	12.0
	28.0	29-090	23.0	32.0	Silty Clay (CL)	no	no	no	3.2
B-15			0.5	2.0	Gravel with some Sand (GP)	-	-	-	-
	4.0	29-091	2.0	6.0	Sand with Silt (SM)	no	no	no	0.8
	8.0	29-092	6.0		Sand (SP)	no	no	no	1.5
	12.0	29-093				no	no	no	2.0
	16.0	29-094				no	no	no	2.1
	20.0	29-095				no	no	no	1.6
	24.0	29-096		25.0		no	no	no	1.4
	25.0	29-097	25.0		Silty Clay (CL)	no	no	no	2.4
	28.0	29-098		28.0		no	no	no	0.6
B-16			0.5		Gravely Sand with some Silt	-	-	-	-
	4.0	29-099		6.5		no	no	no	3.2
	8.0	29-201	6.5		Sand (SP)	no	no	no	4.2
	12.0	29-202				no	no	no	6.0
	16.0	29-203				no	no	no	7.7
	20.0	29-204				no	no	no	-
	23.5	29-205				no	no	no	13.2
	24.5	29-206		24.5		no	no	no	13.3
	27.0	29-207	24.5	28.0	Silty Clay (CL)	no	no	no	9.6
B-17			0.5		Gravely Sand with some Silt	-	-	-	-
	4.0	29-215		4.5		yes	no	no	6.9
	8.0	29-216	4.5		Sand (SP)	yes	no	no	6.5
	12.0	29-217				yes	no	no	10.6
	16.0	29-218				yes	no	no	9.2
	20.0	29-219				yes	no	no	13.4
	23.0	29-220		23.0		yes	no	no	123.
	27.0	29-221	23.0	28.0	Silty Clay (CL)	no	no	no	8.8
B-18			0.5	1.0	Gravel (GP)	-	-	-	-
	4.0	29-208	1.0		Sand (SP)	no	no	no	1.2
	8.0	29-209				yes	no	yes	3.0
	12.0	29-210				yes	no	no	3.5
	16.0	29-211				yes	no	no	5.5
	20.0	29-212				yes	no	no	8.5
	24.0	29-213		24.0		yes	no	no	4.8
	28.0	29-214	24.0	28.0	Silty Clay (CL)	no	no	no	3.1
B-19			0.5		Sand (SP)	-	-	-	-
	4.0	24-021		5.0		no	no	no	3.3
	7.0	24-022	5.0	7.0	Silty Sand (SM)	no	no	no	5.0

Table 1
Summary of Push Probe Installations - May 2001

Boring Number	Bottom Sample Depth (feet bgs)	Sample No.[1]	Soil Data Summary: Soil Strata (feet bgs) Top	Bottom	Soil Type[2]	Field Screening Results: Odor	Visual	Sheen Test	Headspace (ppm)
	10.0	24-023	7.0		Sand (SP)	yes	no	no	16.1
	14.0	24-024				yes	no	no	28.1
	15.5	24-025				yes	no	no	23.8
	19.0	24-026				yes	no	no	27.1
	21.5	24-027		21.5		no	no	no	29.5
			21.5	25.5	Silty Clay (CL)	-	-	-	-
	26.0	24-028	25.5	28.0	Sand (SP)	no	no	no	18.2
B-20			0.5	1.5	Gravely Sand with some Silt	-	-	-	-
	3.0	24-029	1.5		Sand (SP)	no	no	no	3.1
	7.0	24-030				no	no	no	2.7
	11.0	24-031				no	no	no	3.6
	15.0	24-032				no	no	no	5.4
	19.0	24-033		20.5		no	no	no	6.0
	23.0	24-034	20.5	24.5	Clayey Sand (SC)	no	no	no	4.2
	27.0	24-035	24.5	28.0	Silty Clay (CL)	no	no	no	1.1
B-21	3.0	24-001	0.5		Sand (SP)	yes	yes	yes	718.
	5.0	24-002				yes	yes	yes	1,572.
	10.0	24-003				yes	yes	yes	42.6
	14.0	24-004				yes	yes	yes	18.5
	18.0	24-005		21.0		yes	yes	yes	13.7
	23.0	24-006	21.0		Silty Clay (CL)	no	no	no	6.9
	23.0	24-006		24.0		no	no	no	6.9
B-22			0.5	2.0	Silty Sand with trace Gravel (SM)	-	-	-	-
	4.0	24-013	2.0		Sand (SP)	no	no	no	2.0
	7.0	04-014				yes	yes	yes	22.8
	10.0	24-015				yes	yes	yes	8.2
	15.5	24-016				yes	yes	yes	53.3
	19.0	24-017		21.0		yes	yes	yes	67.0
	22.0	24-018	21.0	22.5	Silty Sand with trace Clay and Organics (SM)	no	no	no	7.3
	25.0	24-019	22.5	25.5	Silty Clay (CL)	no	no	no	3.7
	27.0	24-020	25.5	28.0	Sand (SP)	no	no	no	2.5
B-23	3.0	24-036	0.5		Sand (SP)	no	no	no	1.3
	7.0	24-037				no	no	no	1.9
	11.0	24-038				no	no	no	1.0
	15.0	24-039				no	no	no	0.2
	19.0	24-040				no	no	no	1.6
	23.0	24-041		23.0		no	no	no	1.6
	27.0	24-042	23.0	28.0	Silty Clay (CL)	no	no	no	0.3
B-24			0.5	2.0	Gravely Sand with some Silt	-	-	-	-
	3.0	25-043	2.0		Sand (SP)	no	no	no	23.8
	7.0	25-044				no	no	no	47.1
	11.0	25-045				no	no	no	42.9
	15.0	25-046				no	no	no	41.8
	19.0	25-047				no	no	no	19.3
	23.5	25-048		23.5		no	no	no	26.1

Table 1
Summary of Push Probe Installations - May 2001

Boring Number	Bottom Sample Depth (feet bgs)	Sample No.[1]	Soil Data Summary: Soil Strata (feet bgs) Top	Bottom	Soil Type[2]	Field Screening Results: Odor	Visual	Sheen Test	Headspace (ppm)
	27.0	25-049	23.5	28.0	Silty Clay (CL)	no	no	no	15.8
B-25	4.0	25-077	0.5	4.0	Sand (SP)	no	no	no	0.4
	6.0	25-078	4.0	7.0	Silty Sand (SM)	no	no	no	0.6
	10.0	25-079	7.0		Sand (SP)	no	no	yes	0.9
	12.0	25-080				no	no	yes	1.1
	16.0	25-081				no	no	no	0.0
	20.0	25-082				no	no	no	0.7
	23.0	25-083		23.0		yes	no	no	154.
	-	-	23.0	24.0	Silty Clay (CL)	yes	no	no	-
B-26			0.5	1.0	Gravel (GP)	-	-	-	-
	2.0	25-051	1.0		Sand (SP)	no	no	no	0.6
	4.0	25-052				no	no	no	1.3
	6.0	25-053				no	no	no	2.1
	8.0	25-054				no	no	no	3.9
	10.0	25-055				no	no	no	3.2
	12.0	25-056				no	no	no	3.0
	14.0	25-057				no	no	no	4.2
	16.0	25-058				no	no	no	4.6
	18.0	25-059				yes	no	no	13.4
	20.0	25-060		20.5		yes	no	no	8.5
	22.0	25-061	20.5	23.5	Silty Clay (CL)	no	no	no	0.0
	24.0	25-062	23.5	24.0	Sand (SP)	no	no	no	0.1
B-27			0.5	1.5	Gravel (GP)	-	-	-	-
	3.0	25-050	1.5	4.0	Sand (SP)	no	no	no	6.1
B-28	4.0	25-069	0.5		Sand (SP)	no	no	no	25.3
	6.0	25-070				yes	yes	yes	28.1
	9.0	25-071				yes	yes	yes	58.8
	12.0	25-072				yes	yes	yes	76.5
	16.0	25-073				yes	yes	yes	79.2
	20.0	25-074				yes	yes	yes	31.2
	23.0	25-075		23.0		yes	yes	yes	43.2
	27.5	25-076	23.0	28.0	Silty Clay (CL)	no	no	no	7.1
B-29	7.0	25-063	0.5		Sand (SP)	no	no	no	0.0
	12.0	25-064				no	no	no	4.7
	15.0	25-065				yes	no	no	3.3
	19.0	25-066				yes	no	no	5.8
	23.0	25-067		23.0		yes	no	no	2.9
	27.0	25-068	23.0	28.0	Silty Clay (CL)	no	no	no	1.1
B-30	2.0	24-007	0.5		Silty Sand with some Gravel (SM)	no	no	no	3.9
	5.0	24-008		5.5		yes	no	no	7.4
	10.0	24-009	5.5		Sand (SP)	yes	no	no	4.6
	14.0	24-010				yes	no	no	4.7
	19.0	24-011		19.0		yes	no	no	4.3
	23.0	24-012	19.0	24.0	Silty Clay (CL)	no	no	no	1.1

Table 2
Summary of Analytical Results for Soil Samples - January 1993 Test Pit Investigation

Sample Number	Date Sampled	Sample Location	Depth'	Analytical Results in mg/kg (ppm)			
				Oregon DEQ Methods			
				Gasoline	TPH-HCID Diesel	Oil	TPH-418.1 M Diesel/Oil
2279-01	26-Jan-93	Test Pit (east wall)	6.0	ND>20	Detected	Detected	451
2279-02	26-Jan-93	Test Pit (floor)	12.0	ND>20	Detected	Detected	39,700
2279-03	27-Jan-93	Test Pit (north wall)	6.0	-	-	-	10,800
2279-04	27-Jan-93	Test Pit (west wall)	6.0	-	-	-	161
2279-05	27-Jan-93	Test Pit (south wall)	6.0	ND>20	Detected	Detected	58
2279-06	27-Jan-93	Trench (at dispenser)	3.0	ND>20	Detected	Detected	6,290
2279-07	27-Jan-93	Trench (20 feet north of dispenser)	3.0	ND>20	Detected	Detected	26,100
2279-08	27-Jan-93	Trench (40 feet north of dispenser)	3.0	ND>20	ND>50	Detected	53,400
2279-09	27-Jan-93	Trench (60 feet north of dispenser)	3.0	ND>20	ND>50	Detected	49

NOTE: - - not analyzed
DEQ - Oregon Department of Environmental Quality
mg/kg - milligrams per kilogram
ND - not detected above detection limit indicated
ppm - parts per million
TPH - total petroleum hydrocarbons

Table 3
Summary of Analytical Results for Soil Samples - January 1993 Subsurface Investigation

Soil Boring Number	Sample Number*	Date Sampled	Depth (feet)	Analytical Results in mg/kg (ppm)				
				Oregon DEQ Methods				
				TPH-HCID			TPH-G	TPH-418.1
				Gasoline	Diesel	Oil	Gasoline	M Oil
B-2	15-003	15-Apr-93	10.5	ND>20	ND>50	ND>100	-	-
B-2	15-005	15-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-2	15-006	15-Apr-93	25.5	ND>20	ND>50	ND>100	-	-
B-3	15-010	15-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-3	15-011	15-Apr-93	25.5	ND>20	ND>50	ND>100	-	-
B-4	15-015	15-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-5	15-018	15-Apr-93	10.5	ND>20	ND>50	ND>100	-	-
B-5	15-020	15-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-6	15-022	15-Apr-93	10.5	ND>20	ND>50	ND>100	-	-
B-6	15-023	15-Apr-93	15.5	ND>20	ND>50	ND>100	-	-
B-7	15-027	15-Apr-93	10.5	Detected	ND>50	ND>100	270	-
B-7	15-028	15-Apr-93	15.5	Detected	ND>50	ND>100	2,000	-
B-7	15-029	15-Apr-93	20.5	-	-	-	13	-
B-9	16-004	16-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-10	16-008	16-Apr-93	20.5	ND>20	ND>50	ND>100	-	-
B-11	16-011	16-Apr-93	15.5	ND>20	ND>50	ND>100	-	-
B-12	16-016	16-Apr-93	15.5	ND>20	ND>50	ND>100	-	-
B-13	16-020	16-Apr-93	10.5	ND>20	ND>50	Detected	-	200

NOTE:
- - not analyzed
DEQ - Oregon Department of Environmental Quality
mg/kg - milligrams per kilogram
ND - not detected above detection limit indicated
ppm - parts per million
TPH - total petroleum hydrocarbons
* - sample number prefix 2289-9304

Summary of Analytical Results for Soil Samples - May 2001 Subsurface Investigations

Soil Boring Number	Sample Number	Sample Date	Sample Depth (feet bgs)	Analytical Results - mg/kg (ppm)							
				NW Methods				EPA 8021	EPA 8260 Total	EPA 8270 Total	EPA 6010
				HCID	TPH-Gx	TPH-Dx		Total BTEX	VOCs	PAHs	Total
				Gas, Diesel, Oil	Gasoline	Diesel	Oil	(Table E)	(Table E)	(Table E)	Lead
B-16	29-202	29-May-01	12.	-	-	ND>21.7	ND>54.3	-	-	-	-
	29-206	29-May-01	24.5	-	ND>0.704	ND>28.2	121.	-	-	-	-
B-17	29-217	29-May-01	12.	-	-	ND>21.5	ND>53.8	-	-	-	-
	29-220	29-May-01	23.	-	10.9	ND>22.0	ND>54.9	-	-	-	-
B-18	29-211	29-May-01	15.5	-	ND>0.532	ND>21.3	ND>53.2	-	-	-	-
	29-213	29-May-01	24.	-	1.14	ND>24.7	ND>61.7	-	-	-	-
B-19	24-025	24-May-01	15.5	-	ND>0.500	-	-	-	-	-	-
	24-027	24-May-01	21.5	-	ND>0.617	ND>24.7	ND>61.7	ND	-	-	-
B-20	24-034	24-May-01	23.	-	ND>0.641	ND>26.0	ND>64.9	-	-	-	-
B-21	24-002	24-May-01	5.	Gasoline	1,370.	ND>24.7	ND>61.7	-	255.7	-	4.4
	24-005	24-May-01	18.	-	ND>0.543	-	-	ND	-	-	-
	24-006	24-May-01	23.	-	ND>0.667	ND>26.7	ND>66.7	-	-	-	-
B-22	24-014	24-May-01	7.	-	-	ND>23.5	ND>58.8	-	-	-	-
	24-016	24-May-01	15.5	-	61.3	-	-	-	-	-	-
	24-018	24-May-01	22.	-	1.31	62.6 [3]	166. [4]	-	-	-	-
B-23	24-041	24-May-01	23.	-	ND>0.617	ND>24.7	ND>61.7	-	-	-	-
B-24	25-048	25-May-01	23.5	-	ND>0.649	ND>26.0	ND>64.9	-	-	-	-
	25-049	25-May-01	27.	-	ND>0.758	ND>30.3	ND>75.8	-	ND	ND	3.27
B-25	25-078	25-May-01	6.	-	ND>0.704	ND>28.2	ND>70.4	-	ND	ND	3.75
	25-080	25-May-01	12.	-	ND>0.595	ND>23.8	ND>59.5	-	-	-	-
B-26	25-053	25-May-01	6.	-	ND>0.568	460.	1,360.	-	-	-	-
	25-059	25-May-01	18.	-	ND>0.543	ND>21.7	ND>54.3	-	-	-	-
	25-061	25-May-01	22.	-	ND>0.694	ND>27.8	ND>69.4	-	-	-	-

Table 4
Summary of Analytical Results for Soil Samples - May 2001 Subsurface Investigations

Soil Boring Number	Sample Number [1]	Sample Date	Sample Depth (feet bgs)	Analytical Results - mg/kg (ppm)							
				NW Methods				EPA 8021	EPA 8260 Total	EPA 8270 Total	EPA 6010
				HCID	TPH-Gx	TPH-Dx		Total BTEX	VOCs	PAHs	Total
				Gas, Diesel, Oil	Gasoline	Diesel	Oil	(Table E)	(Table E)	(Table E)	Lead
B-27	25-050	25-May-01	3.	-	ND>0.562	468. [3]	6,010.	ND	ND	ND	-\
B-28	25-070	25-May-01	6.	-	0.829	560.	8,330.	ND	ND	ND	3.03
	25-072	25-May-01	12.	-	4.24	2,340. [3]	22,200.	-	-	-	-
	25-075	25-May-01	23.	-	4.61.	2,070. [3]	19,900.	-	-	-	-
B-29	25-065	25-May-01	15.	-	ND>0.543	ND>21.7	ND>54.3	-	-	-	-
	25-067	25-May-01	23.	-	ND>0.617	ND>24.7	ND>61.7	-	-	-	-
B-30	24-008	24-May-01	5.	-	ND>0.617	-	-	-	-	-	5.89
	24-010	24-May-01	14.	-	ND>0.543	-	-	-	-	-	-
		Reference Level [2]		#	40.	500.	500.	varies	varies	varies	#

Note:
- - = not analyzed
- # = reference level not established
- bgs = below ground surface
- EPA = U.S. Environmental Protection Agency
- HCID = hydrocarbon identification
- mg/kg = milligrams per kilogram
- 1 = Sample prefix: 5074-0105
- 2 = Reference Level based on Level 2 Soil Matrix Value (OAR 340-122-0325)
- 3 = Hydrocarbon pattern not typical of diesel
- 4 = Hydrocarbon pattern not typical of oil
- ND = not detected above detection limit
- NW = Northwest Method
- PAHs = polynuclear aromatic hydrocarbons
- ppm = parts per million
- TPH = total petroleum hydrocarbons
- VOCs = volatile organic compounds

Table 5
Summary of Analytical Results for Soil Samples - Petroleum Constituents

Analytical Methods and Parameters	Analytical Results, mg/kg (ppm)							Reference Levels mg/kg (ppm)
Boring Number	B-19	B-21		B-24	B-25	B-27	B-28	Lowest RBC Occupational Pathway
Sample Depth (feet bgs)	21.5	5.0	18.0	27.0	6.0	3.0	6.0	
Sample Number[1]	24-027	24-002	24-005	25-049	25-078	25-050	25-070	
Sample Date	24-May-01	24-May-01	24-May-01	25-May-01	25-May-01	25-May-01	25-May-01	
Northwest Methods								
Gasoline by NW TPH-Gx	ND>0.617	1,370.	ND>0.543	ND>0.758	ND>0.704	ND>0.562	0.829	#
Diesel by NW TPH-Dx	ND>24.7	ND>25.7	-	ND>30.3	ND>28.2	468.	560.	#
Oil by NW TPH-Dx	ND>61.7	ND>61.7	-	ND>75.8	ND>70.4	6,010.	8,330.	#
Diesel+Oil -->	ND	ND	-	ND	ND	6,478.	8,890.	#
Total Lead by EPA 6010 [3]	-	**4.4**	-	**3.28**	**3.75**	-	**3.03**	1.5
VOCs by EPA Method 8260B or 8021								
Benzene	ND>0.00309	**5.2**	ND>0.00272	ND>0.005	ND>0.005	ND>0.005	ND>0.005	0.1
Toluene	ND>0.00309	ND>0.025	ND>0.00272	ND>0.005	ND>0.005	ND>0.005	ND>0.005	31,000.
Ethylbenzene	ND>0.00309	23.4	ND>0.00272	ND>0.005	ND>0.005	ND>0.005	ND>0.005	47,000.
Xylenes	ND>0.00926	134.9	ND>0.00815	ND>0.010	ND>0.010	ND>0.005	ND>0.010	63,000.
Naphthalene	-	11.1	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	270.
MTBE (methyl tert-butyl ether)	-	ND>0.25	-	ND>0.010	ND>0.010	ND>0.01	ND>0.010	0.16
EDB (1,2-dibromoethane)	-	ND>0.025	-	ND>0.005	ND>0.005	-	ND>0.005	1.90E-05
EDC (1,2-dichloroethane)	-	ND>0.025	-	ND>0.005	ND>0.005	-	ND>0.005	0.013
iso-Propylbenzene	-	2.58	-	ND>0.005	0.013	ND>0.005	ND>0.005	300.
n-Propylbenzene	-	11.1	-	ND>0.005	0.021	ND>0.005	ND>0.005	2,900.
1,2,4-Trimethylbenzene	-	59.8	-	ND>0.005	ND>0.005	ND>0.005	ND>0.005	720.
1,3,5-Trimethylbenzene	-	18.7	-	ND>0.005	ND>0.005	ND>0.005	ND>0.005	65.
PAHs by EPA 8270								
Benzo (a) anthracene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	2.7
Benzo (a) pyrene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	0.27
Benzo (b) fluoranthene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	2.7
Benzo (ghi) perylene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	#
Benzo (k) fluoranthene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	27.
Chrysene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	270.
Dibenzo (ah) anthracene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	0.27
Indeno (1,2,3-cd) pyrene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	
Acenaphthene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	25,000.
Acenaphthylene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	#
Anthracene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	180,000.
Fluoranthene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	29,000.

Table 5
Summary of Analytical Results for Soil Samples - Petroleum Constituents

Analytical Methods and Parameters	Analytical Results - mg/kg (ppm)							Reference Levels mg/kg (ppm)
Boring Number	B-19	B-21		B-24	B-25	B-27	B-28	Lowest RBC[2] Occupational Pathway
Sample Depth (feet bgs)	21.5	5.0	18.0	27.0	6.0	3.0	6.0	
Sample Number[1]	24-027	24-002	24-005	25-049	25-078	25-050	25-070	
Sample Date	24-May-01	24-May-01	24-May-01	25-May-01	25-May-01	25-May-01	25-May-01	
Fluorene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	23,000.
Phenanthrene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	#
Pyrene	-	-	-	ND>0.050	ND>0.050	ND>0.050	ND>0.050	21,000.
Total PAHs -->	-	-	-	ND	ND	ND	ND	#

Note:

# = reference level not established
bgs = below ground surface
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected above detection limit ind
OAR = Oregon Administrative Rules
PAHs = polynuclear aromatic hydrocarbon
ppm = parts per million
VOCs = volatile organic compounds

1- Sample prefix: 5074-0105
2 = Reference Level based on lowest DEQ Risk-Based Concentration (RBC) for occupational pathways (OAR 340-122-0244)
3 = Total lead concentrations detected at this site appear to be consistent with naturally occuring concentrations for this area

Bold = Concentration in excess of reference level

Table 6
Summary of Analytical Results for Groundwater Samples - May 2001 Subsurface Investigation

Analytical Methods and Parameters	Analytical Results ug/l (ppb)							Reference Levels ug/l (ppb)
Boring Number	B-14	B-15	B-15 duplicate	B-17	B-18	B-19	B-20	Lowest RBC[2] Occupational Pathway
Screen Interval (feet bgs)	28-32	24-28	24-28	24-28	24-28	24-28	24-28	
Sample Number[1]	29-108	29-104	29-105	29-109	29-107	24-102	25-103	
Sample Date	29-May-01	29-May-01	29-May-01	29-May-01	29-May-01	24-May-01	25-May-01	
Dissolved Lead by EPA 6010	-	ND>5.00	-	ND>5.00	ND>5.00	ND>5.00	ND>5.00	15.
VOCs by EPA 8260B								
Benzene	ND>1.00	ND>1.00	ND>1.00	**125.**	ND>1.00	ND>1.00	ND>1.00	1.
Toluene	2.06	ND>1.00	ND>1.00	6.2	ND>1.00	ND>1.00	ND>1.00	1,000.
Ethylbenzene	ND>1.00	ND>1.00	ND>1.00	723.	ND>1.00	ND>1.00	ND>1.00	1,800.
Xylenes	ND>2.00	ND>2.00	ND>2.00	420.4	ND>2.00	ND>2.00	ND>2.00	2,000.
Naphthalene	-	ND>0.100	-	**65.1**	ND>0.111	ND>0.118	ND>0.118	8.7
MTBE (methyl-t-butyl ether)	2.39	ND>2.00	ND>2.00	ND>2.00	ND>2.00	ND>2.00	ND>2.00	20.
EDB (1,2-dibromoethane)	ND>1.00	ND>1.00	ND>1.00	ND>1.00	ND>1.00	ND>1.00	ND>1.00	1.40E-03
EDC (1,2-dichloroethane)	ND>1.00	ND>1.00	ND>1.00	ND>1.00	ND>1.00	ND>1.00	ND>1.00	0.32
iso-Propylbenzene	ND>1.00	ND>1.00	ND>1.00	**115.**	ND>1.00	ND>1.00	ND>1.00	100.
-Propylbenzene	ND>1.00	ND>1.00	ND>1.00	**420.**	ND>1.00	ND>1.00	ND>1.00	100.
2,4-Trimethylbenzene	ND>1.00	ND>1.00	ND>1.00	**627.**	ND>1.00	ND>1.00	ND>1.00	23.
1,3,5-Trimethylbenzene	ND>1.00	ND>1.00	ND>1.00	**190.**	ND>1.00	ND>1.00	ND>1.00	23.
PAHs by EPA 8270								
Benzo (a) anthracene	-	ND>0.100	-	**0.295**	**0.189**	ND>0.118	ND>0.118	0.17
Benzo (a) pyrene	-	ND>0.100	-	**0.316**	**0.467**	ND>0.118	ND>0.118	0.017
Benzo (b) fluoranthene	-	ND>0.100	-	**0.2**	**0.311**	ND>0.118	ND>0.118	0.17
Benzo (ghi) perylene	-	0.13	-	0.284	0.778	ND>0.118	ND>0.118	#
Benzo (k) fluoranthene	-	ND>0.100	-	0.221	0.3	ND>0.118	ND>0.118	1.7
Chrysene	-	ND>0.100	-	0.347	0.3	ND>0.118	ND>0.118	17.
Dibenzo (ah) anthracene	-	ND>0.100	-	ND>0.105	ND>0.111	ND>0.118	ND>0.118	0.017
Indeno (1,2,3-cd) pyrene	-	ND>0.100	-	**0.242**	**0.578**	ND>0.118	ND>0.118	0.17
Acenaphthene	-	ND>0.100	-	0.947	0.189	0.424	ND>0.118	620.
Acenaphthylene	-	ND>0.100	-	0.232	ND>0.111	ND>0.118	ND>0.118	#
Anthracene	-	ND>0.100	-	0.326	ND>0.111	ND>0.118	ND>0.118	43.

Table 6
Summary of Analytical Results for Groundwater Samples - May 2001 Subsurface Investigation

Analytical Methods and Parameters	Analytical Results ug/l (ppb)							Reference Levels ug/l (ppb)
Boring Number	B-14	B-15	B-15 duplicate	B-17	B-18	B-19	B-20	Lowest RBC[2] Occupational Pathway
Screen Interval (feet bgs)	28-32	24-28	24-28	24-28	24-28	24-28	24-28	
Sample Number[1]	29-108	29-104	29-105	29-109	29-107	24-102	25-103	
Sample Date	29-May-01	29-May-01	29-May-01	29-May-01	29-May-01	24-May-01	25-May-01	
Fluoranthene	-	0.14	-	0.811	0.4	0.129	ND>0.118	1,800.
Fluorene	-	ND>0.100	-	0.674	ND>0.111	ND>0.118	ND>0.118	410.
Phenanthrene	-	0.11	-	1.51	0.278	0.165	ND>0.118	#
Pyrene	-	0.26	-	1.04	0.611	0.306	ND>0.118	1,300.
Total PAHs	-	0.64	-	7.445	4.401	1.024	0.	#

Note:

# = Reference Level not established
bgs = below ground surface
EPA = U.S. Environmental Protection Agency
ND = not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppb = parts per billion
VOCs = volatile organic compounds

1- Sample prefix: 5074-0105
2 = Reference Level based on lowest DEQ Risk-Based Concentration (RBC) for occupational pathways (OAR 340-122-0244)

Bold = Concentrations in excess of lowest DEQ RBC for occupational pathways

Table 7
List of Materials Stored and Used on Site

Material	Location	Average Quantities On Hand
Hydraulic Fluid	Warehouse	40 gallons
Antifreeze	Storage room in warehouse	12 gallons
Paint/Thinner	Warehouse in cage	80 gallons
Gasoline	Located in flammable storage locker outside south entrance of warehouse	20 gallons
Kerosene	Stored in shop barge in parts cleaner	55 gallons
Nalcool	Warehouse	40 gallons
40 wt Oil	Warehouse	40 gallons
AC 500 (Acid-based cleaner)	Storage room in warehouse	16 gallons

Table 8
Conceptual Site Exposure Model

Medium	Exposure Pathway	Receptor Scenario	Pathway Retained	Rational
Soil	Surface Soil Ingestion, Dermal Contact, and Inhalation	Residential	No	Land use is zoned as industrial; residential usage is not reasonably likely
		Occupational	Yes	Soil impacts are present in upper 3 feet of soil
		Excavation Worker	Yes	Soil impacts are present within the depths of potential excavation activities
	Volatilization to Outdoor Air	Residential	No	Land use is zoned as industrial; residential usage is not reasonably likely
		Occupational	Yes	Impacted soils are present beneath the site
	Vapor Intrusion into Buildings	Residential	No	Land use is zoned as industrial; residential usage is not reasonably likely
		Occupational	Yes	Impacted soils are present adjacent to and beneath a site structure
	Leaching to Groundwater	Residential	No	Use of groundwater for consumptive purposes is not reasonable likely
		Occupational	No	Use of groundwater for consumptive purposes is not reasonable likely
Groundwater	Groundwater Ingestion	Residential	No	Use of groundwater for consumptive purposes is not reasonable likely
		Occupational	No	Use of groundwater for consumptive purposes is not reasonable likely
	Groundwater Volatilization to Outdoor Air	Residential	No	Land use is zoned as industrial; residential usage is not reasonably likely
		Occupational	Yes	Groundwater impacts are present beneath the site
	Groundwater Vapor Intrusion to Buildings	Residential	No	Land use is zoned as industrial; residential usage is not reasonably likely
		Occupational	Yes	Groundwater impacts are present beneath the site structure
	Ingestion and Inhalation from Tapwater	Residential	No	Use of groundwater for consumptive purposes is not reasonable likely
		Occupational	No	Use of groundwater for consumptive purposes is not reasonable likely
	Groundwater in Excavation	Excavation Worker	No	Groundwater is below the depth (minimum 23.5 feet bgs) of typical construction excavation

Note: bgs = below ground surface

Table 9
Risk Evaluation of Soil

Medium	Soil – mg/kg (ppm)					
	DEQ Risk-Based Concentration (RBC)					
Exposure Pathway	Ingestion, Dermal Contact, and Inhalation		Volatilization to Outdoor Air	Vapor Intrusion into Buildings	Maximum Detected Concentration in Soil at the Site	Comparison to Risk-Based Concentration
Receptor Scenario	Occupational	Excavation Worker	Occupational	Occupational		
Contaminant of Potential Concern						
Benzene	29.	1,100.	21.	**0.5**	5.2	**Exceeds**
Lead	1,000.	1,000.	a	a	4.4	Below

Note: DEQ = Oregon Department of Environmental Quality
mg/kg = milligrams per kilogram
ppm = parts per million

a = This constituent cannot create an unacceptable risk by this pathway; free product has not been detected at the site.

Table 10
Risk Evaluation for Groundwater

Medium	Groundwater – ug/l (ppb)			
	DEQ Risk-Based Concentration (RBC)		Maximum Detected Concentration in Groundwater at the Site	Comparison to Risk-Based Concentration
Exposure Pathway	Volatilization to Outdoor Air	Vapor Intrusion into Buildings		
Receptor Scenario	Occupational	Occupational		
Contaminant of Potential Concern				
Benzene	5,800.	1,200.	125.	Below
Naphthalene	a	a	65.1	Below
iso-Propylbenzene	a	a	115.	Below
n-Propylbenzene	a	a	420.	Below
1,2,4-Trimethylbenzene	a	a	627.	Below
1,3,5-Trimethylbenzene	a	18,000.	190.	Below
Benz[a]anthracene	a	a	0.295	Below
Benzo[a]pyrene	a	a	0.467	Below
Benzo[b]fluoranthene	a	a	0.311	Below
Indeno[1,2,3-cd]pyrene	a	a	0.578	Below

Note: DEQ = Oregon Department of Environmental Quality
ND = not detected above detection limit indicated
ppb = parts per billion
ug/l = micrograms/liter

a = This constituent cannot create an unacceptable risk by this pathway; free product has not been detected at the site.

Comparison of Groundwater Sampling Results to Applicable Surface Freshwater Criteria and Toxicity Values

Chemical	B-17 Groundwater Concentration (ug/L)		Federal and State* Water Criteria: Health USEPA 1999 Fish/Water Consumption (ug/L)	Health USEPA Drinking Water MCL (ug/L)	Aquatic Life Oregon Acute (ug/L)	Aquatic Life Oregon Chronic (ug/L)	USEPA ECOTOX Database: Aquatic Life Lowest Database Value (ug/L)	No. of Freshwater Database Reports	Species Reported for Lowest Value	No. of Criteria/ Values Exceeded	Highest Hazard Quotient
Benzene	125		**1.2**	**5**	5300	N/AV	1000	129	rotifer	2	104
Toluene	6.2		6800	1000	17500	N/AV	1000	186	water flea	0	0.01
Ethylbenzene	723		3100	**700**	32000	N/AV	1000	71	green algae	1	1.03
Xylenes	420.4		N/AV	10000	N/AV	N/AV	1000	194	water flea	0	0.42
1,2-dichloroethane	1	ND	0.38	N/AV	118000	20000	N/AV	0	NA	0	0.00
Isopropylbenzene	115		N/AV	N/AV	N/AV	N/AV	1400	28	water flea	0	0.08
n-propylbenzene	420		N/AV	N/AV	N/AV	N/AV	1550	4	rainbow trout	0	0.27
1,2,4-Trimethylbenzene	627		N/AV	N/AV	N/AV	N/AV	7720	1	minnow	0	0.08
1,3,5-Trimethylbenzene	190		N/AV	N/AV	N/AV	N/AV	400	11	water flea	0	0.48
Benzo(a)anthracene	0.295		**0.0044**	N/AV	N/AV	N/AV	1.8	3	water flea	1	67
Benzo(a)pyrene	0.316		**0.0044**	**0.2**	N/AV	N/AV	1.5	17	water flea	2	72
Benzo(b)fluoranthene	0.200		**0.0044**	N/AV	N/AV	N/AV	N/AV	0	NA	1	45
Benzo(ghi)perylene	0.284		N/AV	N/AV	N/AV	N/AV	**0.2**	1	water flea	1	1.42
Benzo(k)fluoranthene	0.221		**0.0044**	N/AV	N/AV	N/AV	1.4	1	water flea	1	50
Chrysene	0.347		**0.0044**	N/AV	N/AV	N/AV	0.7	1	water flea	1	79
Dibenzo(ah)anthracene	0.105	ND	0.0044	N/AV	N/AV	N/AV	N/AV	0	NA	0	0.00
Indeno(123cd)pyrene	0.242		**0.0044**	N/AV	N/AV	N/AV	N/AV	0	NA	1	55
Acenaphthene	0.947		1200	N/AV	1700	520	60	34	midge	0	0.02
Acenaphthylene	0.232		N/AV	N/AV	N/AV	N/AV	N/AV	0	NA	0	0.00
Anthracene	0.326		9600	N/AV	N/AV	N/AV	1	61	mosquito	0	0.33
Fluoranthene	0.811		300	N/AV	3980	N/AV	4	83	water flea	0	0.20
Fluorene	0.674		1300	N/AV	N/AV	N/AV	212	15	water flea	0	0.00
Naphthalene	65.1		N/AV	N/AV	2300	620	110	86	rainbow trout	0	0.59
Phenanthrene	1.51		N/AV	N/AV	N/AV	N/AV	19	48	rainbow trout	0	0.08
Pyrene	1.04		960	N/AV	N/AV	N/AV	4	13	water flea	0	0.26
TPAH	72.65		N/AV	N/AV	N/AV	N/AV	NA	NA	NA	N/AV	NA

*1986 version of Federal Water Quality Criteria are adopted by State of Oregon under OAR 340-41-445(2)(p)(B). Federal 1999 criteria for human consumption of fish and water are shown instead of older human health criteria shown in Oregon regulations.

CCC - Criteria Continous Concentration ("Chronic")

MCL - Maximum Contaminant Level

N/AV - Information Not Available

NA - Not Applicable

ND - Not Detected

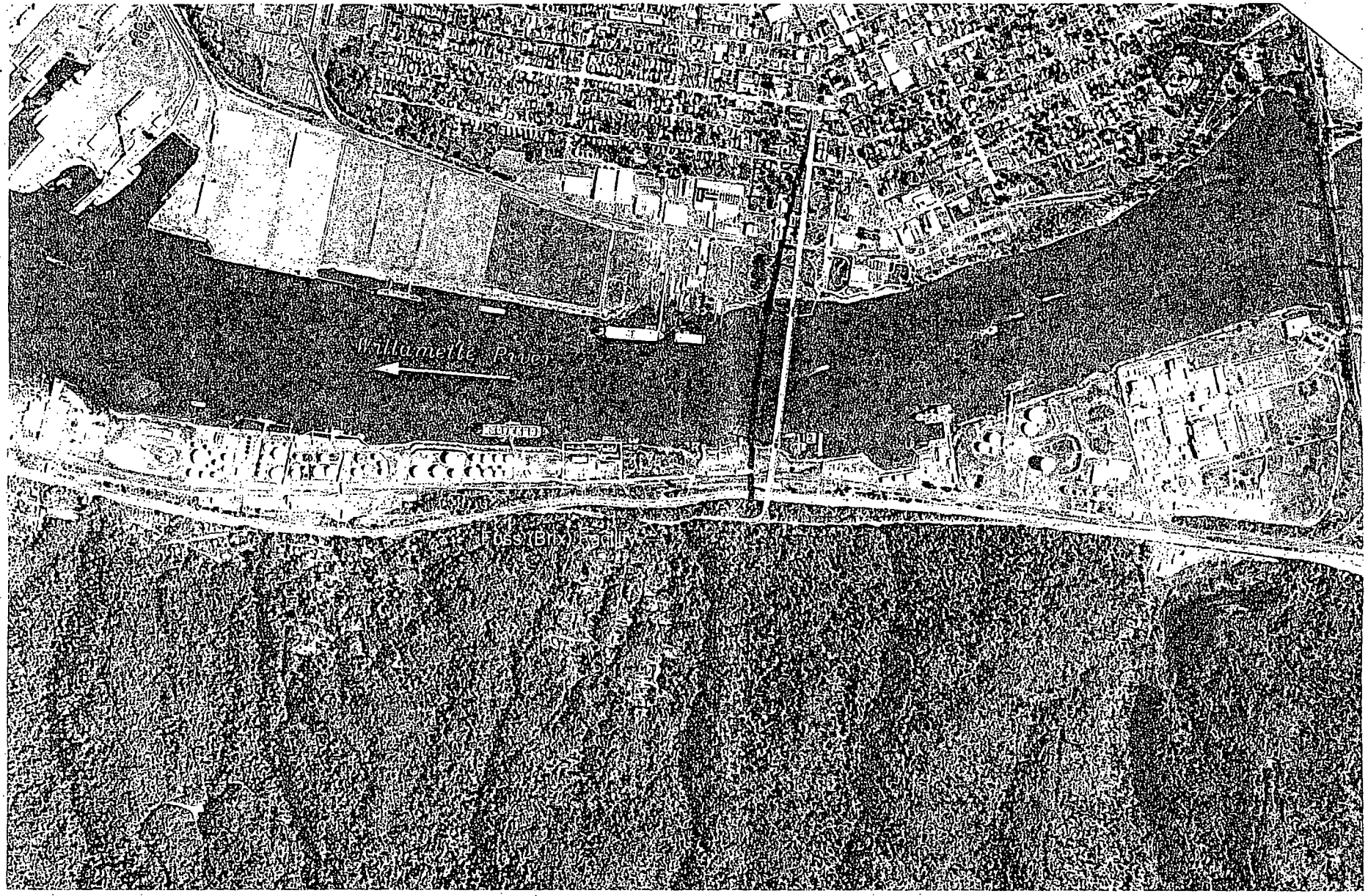
TPAH - Total Polycyclic Aromactic Hydrocarbons

Table 12
Fate/transport parameters for chemicals exceeding risk screening

Chemical	Log Organic Carbon Partitioning Coefficient (Koc)	Approximate Mid-Range Aerobic Half-life (days)	Solubility in Water (mg/L)
Benzene	1.77	20	1780
Benzo(a)anthracene	5.60	200	0.0094
Benzo(a)pyrene	6.01	200	0.0016
Benzo(b)fluoranthene	6.09	800	0.0015
Benzo(k)fluoranthene	6.09	800	0.0015
Chrysene	5.60	N/AV	0.002
Indeno(123cd)pyrene	6.54	1,200	0.062

Sources:
Koc - USEPA 1996
Half life & solubility - HSDB 2001

FIGURES



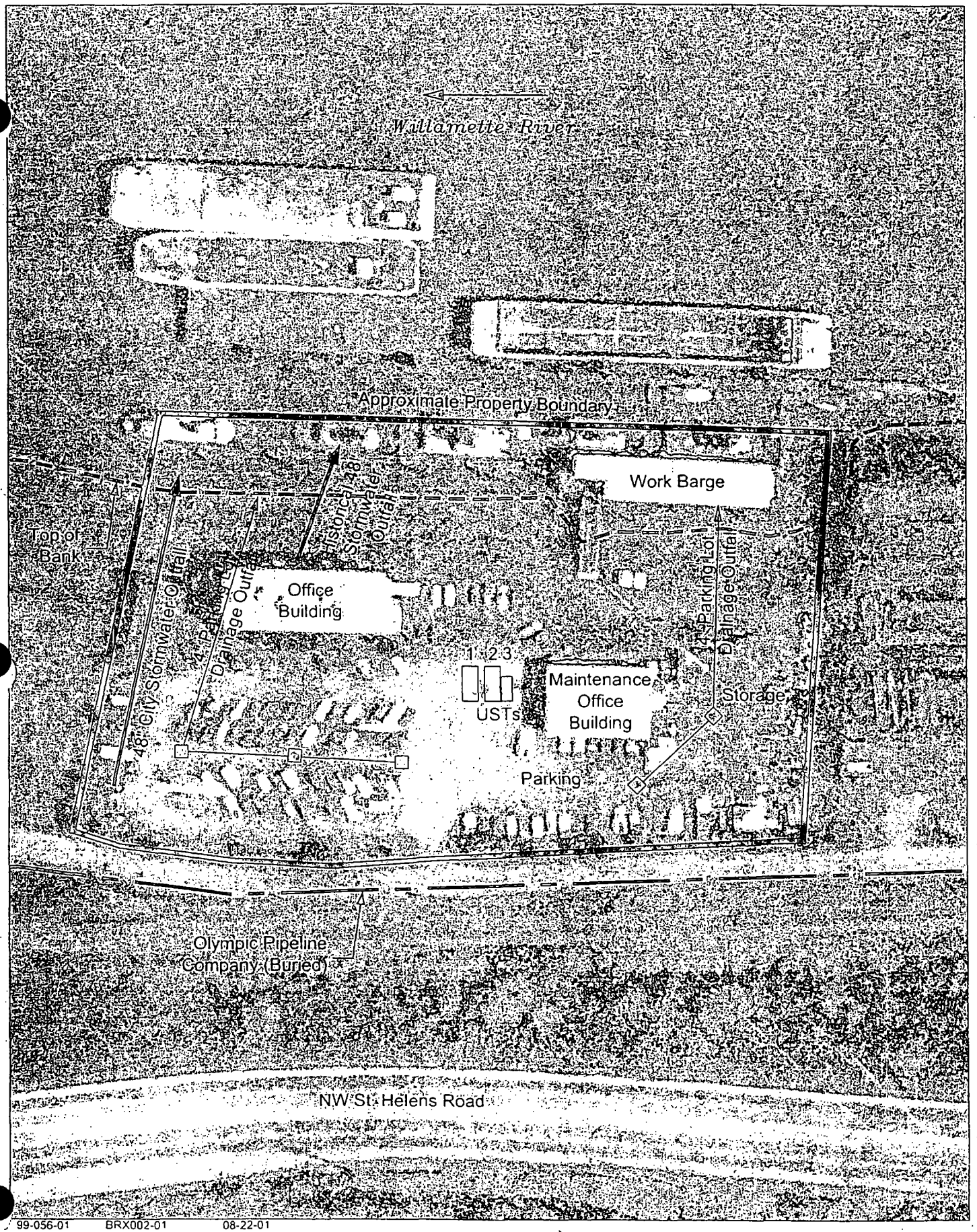
99-056-01 BRX002-01 08-22-01

ANCHOR ENVIRONMENTAL, L.L.C.

0 1300
Scale In Feet

Source: Aerial photograph acquired from the Metro Data Resource Center, Oregon, 1997.

Figure 1
Site Location



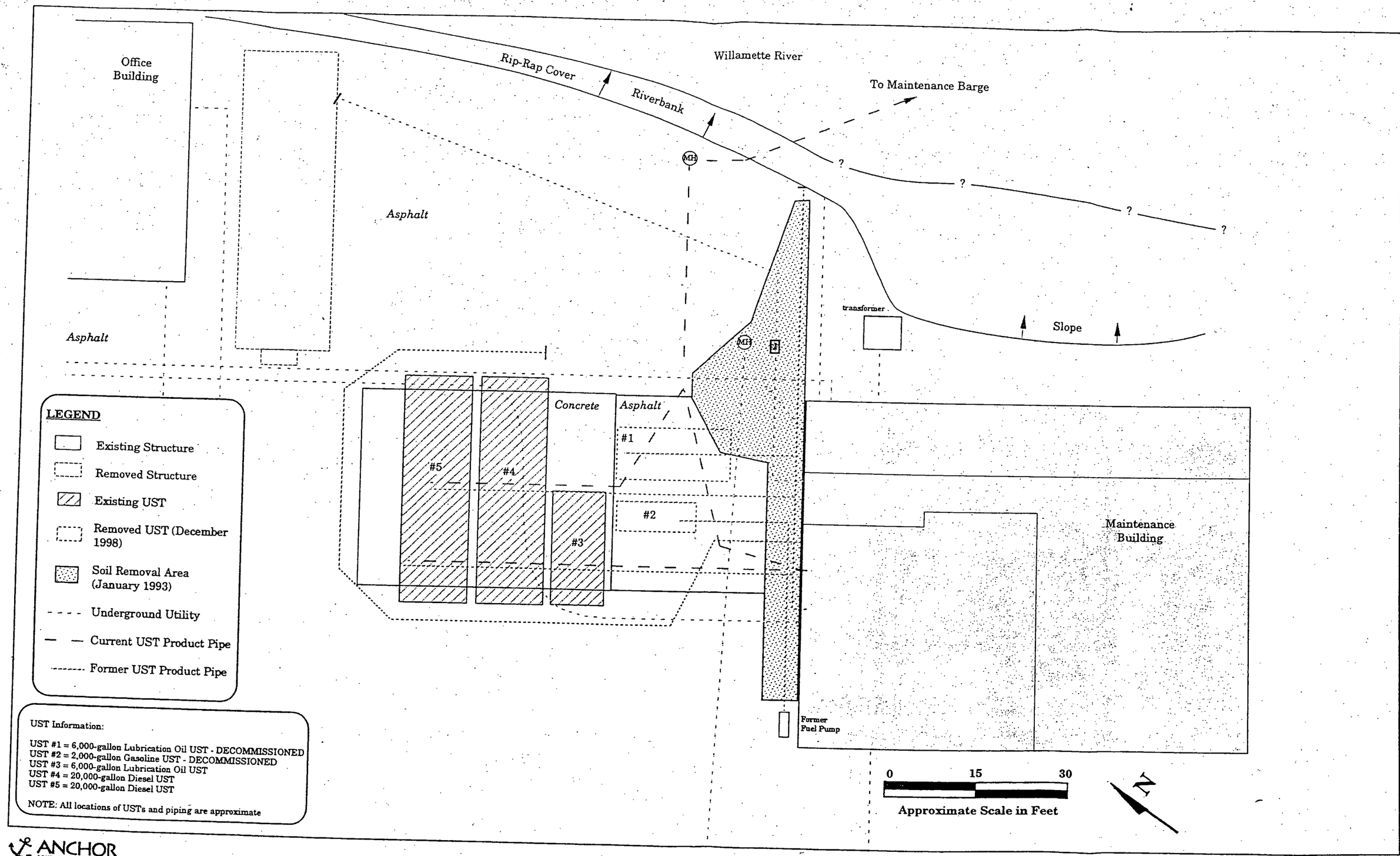
99-056-01 BRX002-01 08-22-01

ANCHOR ENVIRONMENTAL, L.L.C.

Source: Aerial photograph acquired from WAC. Corp. 1991.

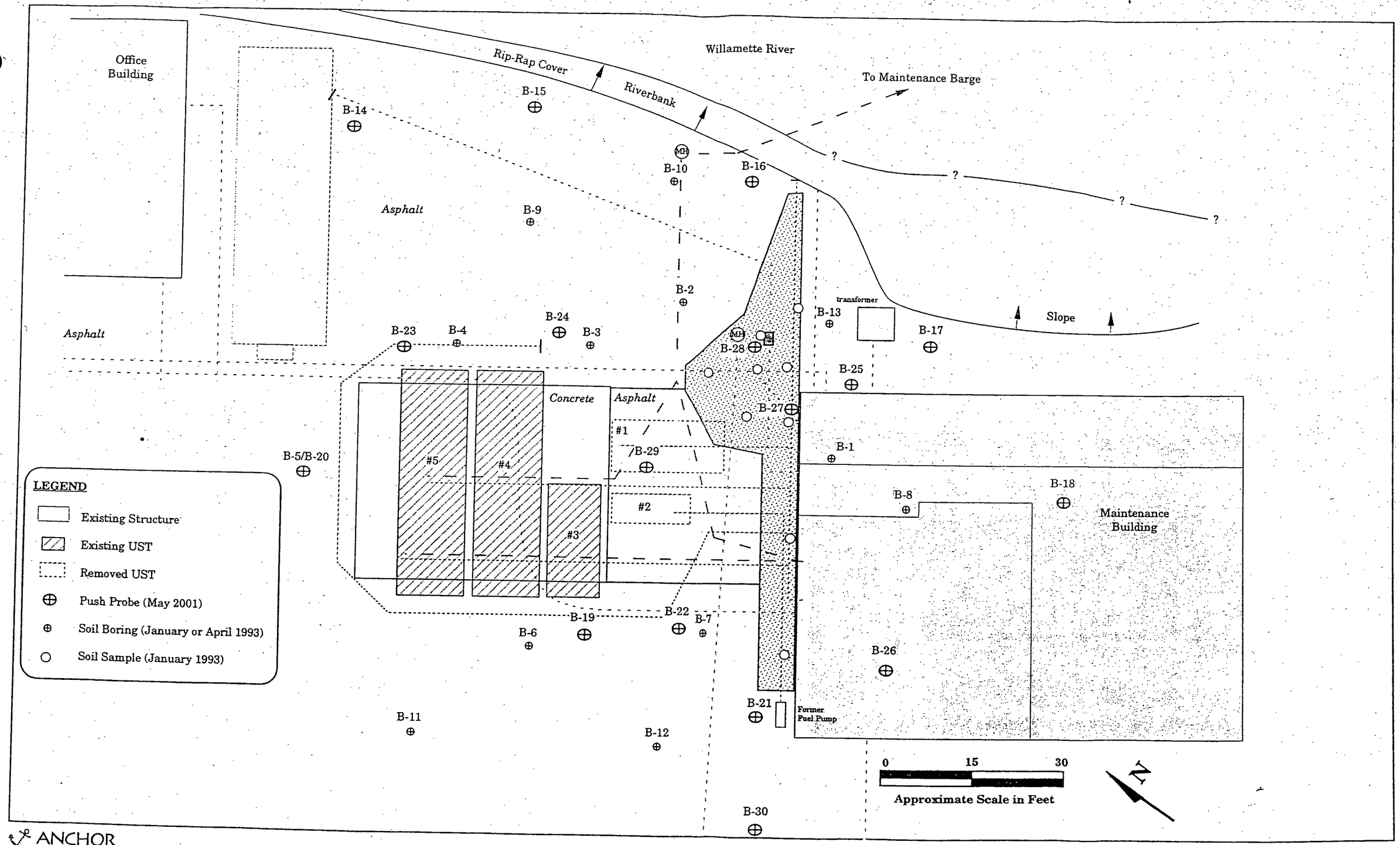
0 100
Scale in Feet

Figure 2
Site Map



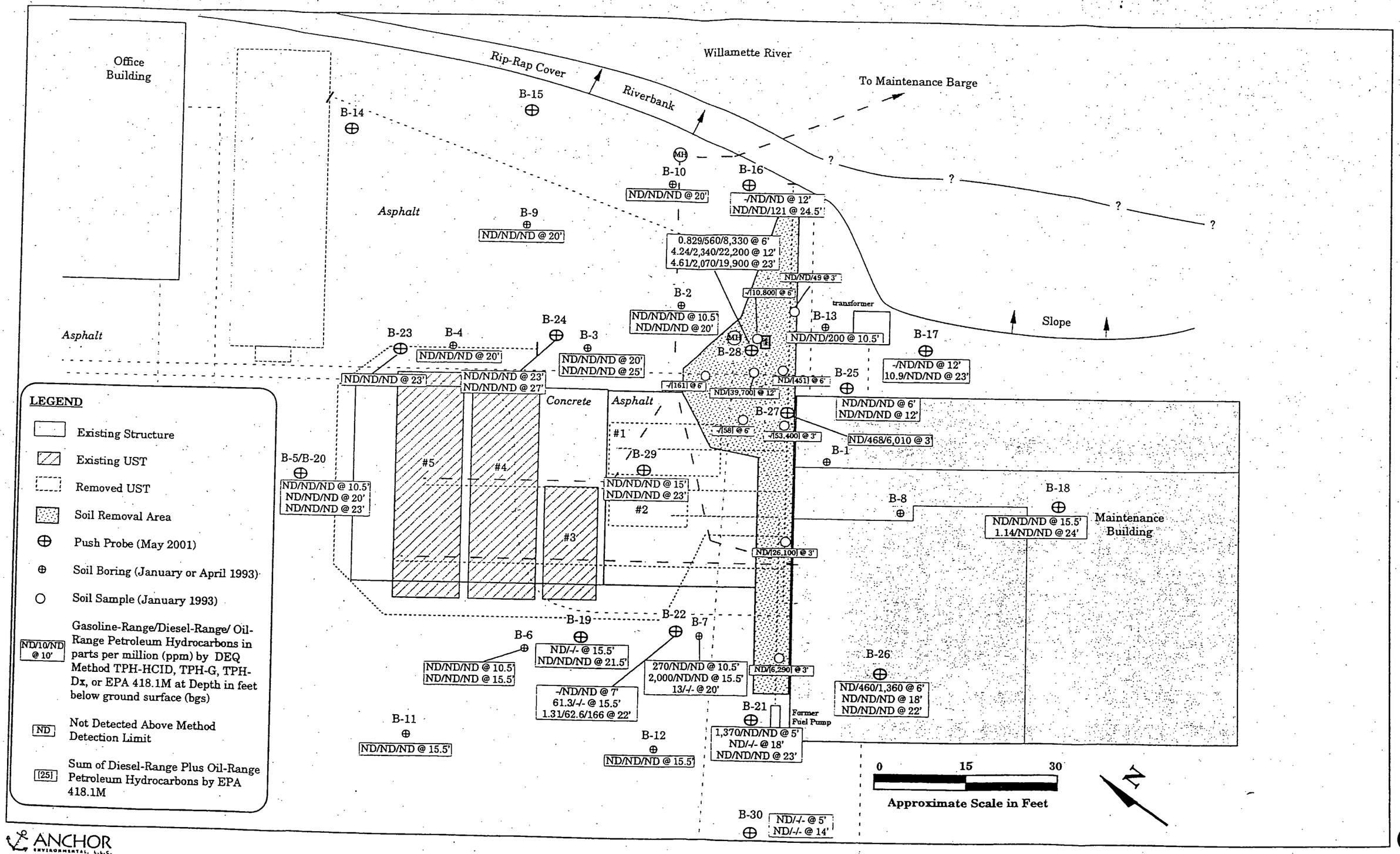
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3
Underground Storage Tank Area Map



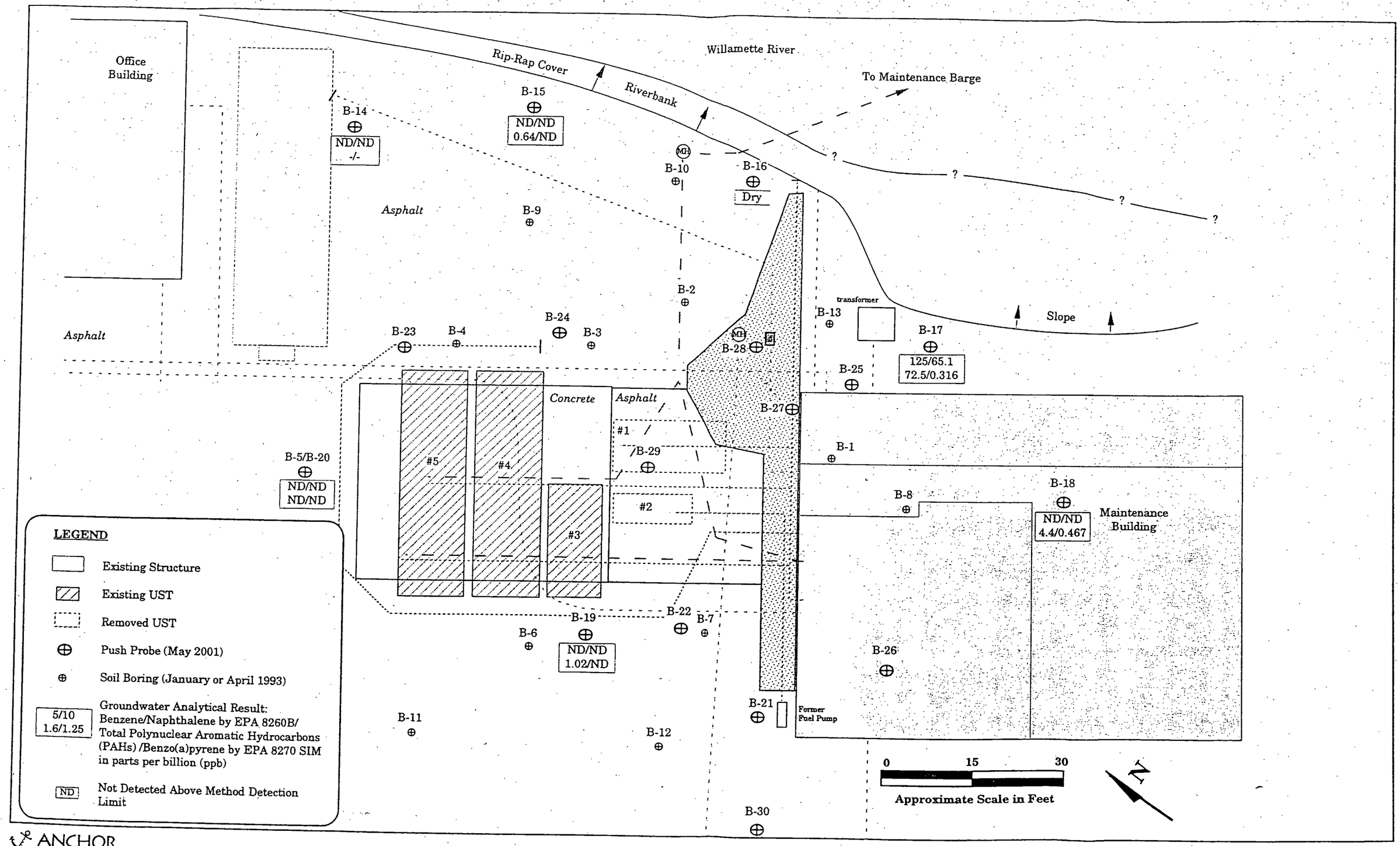
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 4
Sample Location Map



ANCHOR ENVIRONMENTAL, L.L.C.

Figure 5
Petroleum Hydrocarbons in Soil



ANCHOR ENVIRONMENTAL, L.L.C.

Figure 6
Petroleum Constituents in Groundwater

APPENDIX A

SOIL BORING LOGS

KEY TO BORING LOGS

Soil classification in this report is based upon visual and manual field observations which include moisture, consistency, plasticity and grading estimates and should not be construed to imply field or laboratory testing unless presented herein. Soils are classified in accordance with the Unified Soil Classification System. Stratigraphic boundaries are approximate representations only. No warranty is provided as to the continuity of soil strata between borings.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COURSE GRAINED SOILS	GRAVELS	Clean Gravels With Little or No Fines	GW	Well Graded Gravels, Gravel-Sand Mixtures
	More Than Half the Course Fraction is Larger Than No. 4 Sieve Size		GP	Poorly Graded Gravels, Gravel-Sand Mixtures
		Gravels With Over 12% Fines	GM	Silty Gravels, Poorly Graded Gravel-Sand-Silt Mixtures
			GC	Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
More Than Half is Larger Than #200 Sieve	SANDS	Clean Sands With Little or No Fines	SW	Well Graded Sands, Gravelly Sands
	More Than Half the Course Fraction is Smaller Than No. 4 Sieve Size		SP	Poorly Graded Sands, Gravelly Sands
		Sands With Over 12% Fines	SM	Silty Sands, Poorly Graded Sand-Silt Mixtures
			SC	Clayey Sands, Poorly Graded Sand-Clay Mixtures
FINE GRAINED SOILS	SILTS AND CLAYS		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands, or Clayey Silts with Slight Plasticity
	Liquid Limit Less Than 50%		CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
			OL	Organic Clays and Organic Silty Clays of Low Plasticity
More Than Half is Smaller Than #200 Sieve	SILTS AND CLAYS		MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
	Liquid Limit Greater Than 50%		CH	Inorganic Clays of High Plasticity, Fat Clays
			OH	Organic Clays of Medium to High Plasticity, Organic Silts
HIGHLY ORGANIC SOILS			Pt	Peat and Other Highly Organic Soils

LEGEND FOR BORING LOGS

- Blank Casing
- Slotted Screen
- Cement Grout
- Concrete
- Bentonite
- Sand Pack
- Fill Material

ABBREVIATIONS

NA	Not Applicable
ND	Not Detected Above Detection Limit
NS	Not Sampled
PCBs	Polychlorinated Biphenyls
ppm	Parts Per Million
SPT	Standard Penetration Test
▽	Measured Static Water Level in Well
▼	Estimated Water Level During Drilling

434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING NUMBER B-1

HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch Split Spoon		
DRILLING METHOD:	2-inch ID Hollow Stem Auger	Time: 1730	Time: 1830
EQUIPMENT TYPE	2-inch ID Minuteman		
DRILLER:	R. Crisman	Date: 14-Apr-93	Date: 14-Apr-93
DRILLING CONTRACTOR:	Crisman Drilling		

PROJECT:
Brix Maritime Company
1030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	5-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Surveyed

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS (ppm)	SPT (blows/0.5 feet)	SAMPLE INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Concrete	Concrete
Bentonite Chips							2		GP	Silty GRAVEL - Brown, moist, loose, non-plastic, poorly graded, no petroleum odor or stain
							3			
							4		SP	SAND - brown, moist, moderately dense, non-plastic, poorly graded, no petroleum odor or stain (concrete fill)
							5			
							6			
							7			Boring abandoned due to auger refusal - concrete fill was observed in sand to 5.0 feet bgs
							8			Boring terminated at 5.0 feet - 4/14/93 Boring abandoned with 3/4-inch Bentonite Chips - 4/14/93
							9			
							10			Materials: 3/4 bags 3/4-inch Bentonite Chips
							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING NUMBER B - 2

PROJECT:	HAI LOGGER:	Guy H. Tanz	DRILL START
x Maritime Company	SAMPLING METHOD:	2 5/8-inch OD Split Spoon	DRILL FINISH
30 NW St. Helens Road	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 930
Portland, Oregon	EQUIPMENT TYPE	Canterra CT-250	Time: 1030
PROJECT #: 2289	DRILLER:	M. Reniker	Date: 15-Apr-93
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	Date: 15-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2			
							3		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							4			
							5			
					4	100				
	15-001	945	3.7	NA	9	100	6		SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
					19	100	7			
					9	80	8			SAND - as above, no petroleum odor or stain
	15-002	950	3.8	NA	12	100				
					12	100	9			
							10			
					7	80			SP	SAND - as above, no petroleum odor or stain
	15-003	1005	3.9	ND	7	100	11			
					5	100	12			
							13			
							14			
							15			
					3	100			SP	SAND - as above, strong petroleum odor and black stain
	15-004	1010	4.1	NA	4	100	16			
					6	100	17			
							18			
							19			
Bentonite Chips							20			

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Portland, Oregon
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PROJECT:
Maritime Company
5[illegible]0 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

SOIL BORING NUMBER B - 2

HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 930	Time: 1030
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					8	100			SP	SAND - brown, moist, medium dense, non-plastic, slightly graded, strong petroleum odor and black stain
	15-005	1020	4.1	ND	13	100	21			
					11	100				
							22			
							23			
							24	4/15/93		
							25			
					4	100			CL	Silty CLAY - gray, wet, stiff, medium plastic, poorly graded, no petroleum odor or stain
	15-006	1030	4.2	ND	5	100	26			
					8	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

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SOIL BORING NUMBER B - 3

HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1030	Time: 1115
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
Prix Maritime Company
30 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2			
							3		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							4			
							5			
					4	80			SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-007	1030	4.3	NA	8	100	6			
					20	100	7			
							8			
							9			
Bentonite Chips							10			
					4	100			SP	SAND - as above, no petroleum odor or stain
	15-008	1035	3.4	NA	5	100	11			
					5	100	12			
							13			
							14			
							15			
					4	20			SP	SAND - as above, strong petroleum odor and black stain
	15-009	1040	4.5	NA	4	100	16			
					8	100	17			
							18			
							19			
							20			

434 NW Sixth Avenue
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SOIL BORING NUMBER B - 3

HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1030	Time: 1115
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
ix Maritime Company
30 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					10	100			SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, strong petroleum odor and black stain
	15-010	1050	4.2	ND	10	100	21			
					5	100	22			
							23			
							24			
							25	4/15/93		
					2	100			CL	Silty CLAY - gray, wet, stiff, medium plastic, poorly graded, no petroleum odor or stain
	15-011	1100	4.1	ND	3	100	26			
					5	100	27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

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SOIL BORING NUMBER B - 4

HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1130	Time: 1220
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
'x Maritime Company
30 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					4	20			SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-012	1130	3.7	NA	10	100	6			
					10	100	7			
							8			
							9			
Bentonite Chips							10			
					8	100			SP	SAND - as above, no petroleum odor or stain
	15-013	1140	3.5	NA	9	100	11			
					9	100	12			
							13			
							14			
							15			
					12	100			SP	SAND - as above, no petroleum odor or stain
	15-014	1150	3.9	NA	13	100	16			
					12	100	17			
							18			
							19			
							20			

HAIN & ASSOCIATES, INC.
434 NW Sixth Avenue
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SOIL BORING NUMBER B - 4

HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1130	Time: 1220
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT: Maritime Company
9000 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					10	20			SP	SAND - brown/gray, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-015	1158	4.4	ND	11	100	21			
					9	100				
							22			
							23			
							24	4/15/93		
							25			
					0	100			CL	Silty CLAY - gray, wet, soft, medium plastic, poorly graded, no petroleum odor or stain
	15-016	1205	3.7	NA	1	100	26			
					1	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

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SOIL BORING NUMBER B - 5

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1315	Time: 1405
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
x Maritime Company
030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					4	0			SP	SAND - brown, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-017	1327	2	NA	6	80	6			
					6	100	7			
							8			
Bentonite Chips							9			
							10			
					6	0			SP	SAND - as above, no petroleum odor or stain
	15-018	1333	1.8	ND	11	100	11			
					14	100	12			
							13			
							14			
							15			
					6	0			SP	SAND - as above, no petroleum odor or stain
	15-019	1339	2.2	NA	8	100	16			
					12	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.
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SOIL BORING NUMBER B - 5

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1315	Time: 1405
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
t Maritime Company
0 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					4	20				
	15-020	1345	2.1	ND	6	100	21		SP	SAND - brown/gray, medium dense, non-plastic, slightly graded, no petroleum odor or stain
					7	100				
							22			
							23			
							24			
							25			
							26			Boring terminated at 20.0 feet - 4/15/93 Sampled to 21.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							27			
							28			Materials: 10 bags 3/4-inch Bentonite Chips
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAIN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING NUMBER B - 6

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1420	Time: 1515
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
[redacted] Maritime Company
9050 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					2	0			SP	SAND - brown, moist, very loose, non-plastic, poorly graded, no petroleum odor or stain
	15-021	1425	2.7	NA	1	20	6			
					1	100	7			
							8			
							9			
Bentonite Chips							10			
					2	0			SP	SAND - as above, gray, petroleum odor and stain
	15-022	1431	2.4	ND	1	100	11			
					2	100	12			
							13			
							14			
							15			
					9	0			SP	SAND - as above, medium dense, petroleum odor and stain
	15-023	1437	2.5	ND	11	20	16			
					15	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
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SOIL BORING NUMBER B - 6

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1420	Time: 1515
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
ix Maritime Company
030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					3	0			SP	SAND - gray, moist. loose, non-plastic, poorly graded, slight petroleum odor and stain
	15-024	1445	2.3	NA	3	100	21			
					4	100				
							22			
							23	4/15/93		
							24			
							25			
					3	0			CL	Silty CLAY - gray, wet, firm, medium plastic, poorly graded, possible petroleum odor and stain
	15-025	1456	2.2	NA	4	100	26			
					4	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
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SOIL BORING NUMBER B - 7

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1530	Time: 900
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 15-Apr-93	Date: 16-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
x Maritime Company
30 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS TPH-G (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					5	0			SP	SAND - gray, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	15-026	1535	7.9	NA	6	100	6			
					5	100	7			
							8			
Bentonite Chips							9			
							10			
					12	0			SP	SAND - as above, dense, petroleum odor and stain
	15-027	1543	53	270	20	80	11			
					18	100	12			
							13			
							14			
							15			
					7	0			SP	SAND - as above, petroleum odor and stain
	15-028	1550	755	2,000	8	100	16			
					11	100	17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
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SOIL BORING NUMBER B - 7

PROJECT:	HAI LOGGER:	Jeff W. Doss	DRILL START
ix Maritime Company	SAMPLING METHOD:	2 5/8-inch OD Split Spoon	DRILL FINISH
30 NW St. Helens Road	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1530
Portland, Oregon	EQUIPMENT TYPE	Canterra CT-250	Time: 900
PROJECT #: 2289	DRILLER:	M. Reniker	Date: 15-Apr-93
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	Date: 16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS TPH-G (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					3	80			SP	SAND - gray, moist, medium dense, non-plastic, poorly graded, slight petroleum odor and stain
	15-029	1555	183	13	3	100	21			
					5	100				
							22	4/15/93	CL	Silty CLAY - gray, wet, stiff, medium plastic, poorly graded, possible petroleum odor and stain
							23			
							24			
							25			
					3	0			CL	Silty CLAY - as above, no petroleum odor and stain
	15-030	1605	NS	NA	5	0	26			
					6	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/15/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							31			
							32			Materials: 15 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
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SOIL BORING NUMBER B-8

HAI LOGGER:	Guy H. Tanz	DRILL START	DRILL FINISH
SAMPLING METHOD:	1 5/8-inch Split Spoon		
DRILLING METHOD:	2-inch ID Hollow Stem Auger	Time: 1830	Time: 1930
EQUIPMENT TYPE	2-inch ID Minuteman		
DRILLER:	R. Crisman	Date: 15-Apr-93	Date: 15-Apr-93
DRILLING CONTRACTOR:	Crisman Drilling		

PROJECT:
Maritime Company
[illegible]0 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	5-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Surveyed

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS (ppm)	SPT (blows/0.5 feet)	SAMPLE INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Concrete	Concrete
Bentonite Chips							2			
							3		GP	Silty GRAVEL with some Sand - Brown, moist, loose, non-plastic, poorly graded, no petroleum odor or stain (concrete fill)
							4			
							5			
							6			Boring abandoned due to auger refusal - concrete fill was observed in sand to 4.5 feet bgs
							7			Boring terminated at 4.5 feet - 4/15/93 Boring abandoned with 3/4-inch Bentonite Chips - 4/15/93
							8			
							9			Materials: 3/4 bags 3/4-inch Bentonite Chips
							10			
							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING NUMBER B - 9

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon	Time: 942	Time: 1035
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Date: 16-Apr-93	Date: 16-Apr-93
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker		
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
: Maritime Company
030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					8	0			SP	SAND - brown, moist, dense, non-plastic, poorly graded, no petroleum odor or stain
	16-001	954	6.2	NA	14	40	6			
Bentonite Chips					19	100	7			
							8			
							9			
							10			
					13	20			SP	SAND - as above, no petroleum odor or stain
	16-002	1004	4.8	NA	17	100	11			
					20	100	12			
							13			
							14			
							15			
					12	100			SP	SAND - as above, no petroleum odor or stain
	16-003	1012	6.7	NA	12	100	16			
					13	100	17			
Bentonite Chips							18			
							19			
							20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
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SOIL BORING NUMBER B - 9

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
EQUIPMENT TYPE	Canterra CT-250	942	1035
DRILLER:	M. Reniker	Date:	Date:
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

PROJECT:
: Maritime Company
030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					9	20				
	16-004	1022	4.7	ND	8	100	21		SP	SAND - brown, moist to wet, dense, non-plastic, poorly graded, no petrloeum odor or stain
					8	100				
							22			
							23			
							24			
							25			Boring terminated at 20.0 feet - 4/16/93 Sampled to 21.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							26			Materials: 10 bags 3/4-inch Bentonite Chips
							27			
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

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SOIL BORING NUMBER B - 10

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1048	Time: 1138
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 16-Apr-93	Date: 16-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
x Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete									Asphalt	Asphalt
							1			
							2		GP	Silty GRAVEL with some Sand - brown/gray, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					11	0			SP	SAND - brown/gray, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	16-005	1055	NS	NA	9	0	6			
					9	50				
							7			
							8			
							9			
Bentonite Chips							10			
					10	20			SP	SAND - as above, brown, no petroleum odor or stain
	16-006	1102	4.5	NA	13	100	11			
					14	100				
							12			
							13			
							14			
							15			
					11	20			SP	SAND - as above, no petroleum odor or stain
	16-007	1110	4.9	NA	13	100	16			
					14	100				
							17			
							18			
Bentonite Chips							19			
							20			

HAHN & ASSOCIATES, INC.
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PROJECT:
: Maritime Company
30 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

SOIL BORING NUMBER B - 10

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
EQUIPMENT TYPE	Canterra CT-250	1048	1138
DRILLER:	M. Reniker	Date:	Date:
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					10	50				
	16-008	1118	5.1	ND	13	100	21		SP	SAND - brown/gray, moist to wet, medium dense, non-plastic, slightly graded, no petroleum odor or stain
					11	100				
							22			
							23			
							24			
							25			Boring terminated at 20.0 feet - 4/16/93 Sampled to 21.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							26			Materials: 11 bags 3/4-inch Bentonite Chips
							27			
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER	B - 11		
	HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
x Maritime Company	DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time:	Time:
9030 NW St. Helens Road	EQUIPMENT TYPE	Canterra CT-250	1150	1245
Portland, Oregon	DRILLER:	M. Reniker	Date:	Date:
PROJECT #: 2289	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	16-Apr-93	16-Apr-93

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown/gray, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					1	100			SP	SAND - gray, moist, medium dense, non-plastic, poorly graded, no petroleum odor or stain
	16-009	1200	5.1	NA	2	0	6			
					9	20	7			
							8			
							9			
Bentonite Chips							10			
					8	100			SP	SAND - as above, gray, no petroleum odor or stain
	16-010	1207	6.2	NA	10	100	11			
					10	100	12			
							13			
							14			
							15			
					8	0			SP	SAND - as above, possible petroleum odor and stain
	16-011	1213	5.7	ND	8	20	16			
					7	100	17			
							18			
							19			
							20			

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SOIL BORING NUMBER B - 11

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1150	Time: 1245
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 16-Apr-93	Date: 16-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
x Maritime Company
0030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					6	100				
	16-012	1219	4.4	NA	4	100	21		SP	SAND - gray, moist, medium dense, non-plastic, poorly graded, slight petroleum odor and stain
					5	100				
							22		CL	Silty CLAY - gray, moist, stiff, medium plastic, poorly graded, no petroleum odor or stain
							23	4/16/93		
							24	▼		
							25			
					3	0			CL	Silty CLAY - as above, wet, no petroleum odor or stain
	16-013	1227	4.8	NA	4	100	26			
					4	100				
							27			
							28			
							29			
							30			Boring terminated at 25.0 feet - 4/16/93 Sampled to 26.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							31			
							32			Materials: 12 bags 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

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SOIL BORING NUMBER B - 12

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1304	Time: 1345
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 16-Apr-93	Date: 16-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
Maritime Company
30 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2		GP	Silty GRAVEL with some Sand - brown, moist, medium dense, non-plastic, slightly graded, no petroleum odor or stain
							3			
							4			
							5			
					4	20			SP	SAND - gray, moist, loose, non-plastic, poorly graded, no petroleum odor or stain
	16-014	1310	4.8	NA	5	100	6			
					5	100	7			
							8			
							9			
Bentonite Chips							10			
					10	0			SP	SAND - as above, medium dense, possible petroleum odor and stain
	16-015	1317	7	NA	13	100	11			
					12	100	12			
							13			
							14			
							15			
					8	100			SP	SAND - as above, slight petroleum odor and stain
	16-016	1325	7.1	ND	11	100	16			
					13	100	17			
Bentonite Chips							18			
							19			
							20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
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SOIL BORING NUMBER B - 12

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 5/8-inch OD Split Spoon		
DRILLING METHOD:	4 1/4-inch ID Hollow Stem Auger	Time: 1304	Time: 1345
EQUIPMENT TYPE	Canterra CT-250		
DRILLER:	M. Reniker	Date: 16-Apr-93	Date: 16-Apr-93
DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

PROJECT:
x Maritime Company
030 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	10-inch OD
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS HCID (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
					1	100				
	16-017	1333	5.3	NA	4	100	21		CL	Silty CLAY - gray/brown, moist to wet, stiff, non-plastic, poorly graded, no hydrocarbon odor or stain
					8	100				
							22			
							23			
							24			
							25			Boring terminated at 20.0 feet - 4/16/93 Sampled to 21.5 feet Boring abandoned with 3/4-inch Bentonite Chips - 4/16/93
							26			
							27			Materials: 11 bags 3/4-inch Bentonite Chips
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

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SOIL BORING NUMBER B-13

HAI LOGGER:	Jeff W. Doss	DRILL START	DRILL FINISH
SAMPLING METHOD:	2 1/4-Inch OD Hand Auger	Time: 1345	Time: 1440
DRILLING METHOD:	2 1/4-Inch OD Hand Auger	Date: 16-Apr-93	Date: 16-Apr-93
EQUIPMENT TYPE	2 1/4-Inch OD Hand Auger		
DRILLER:	Jeff W. Doss		
DRILLING CONTRACTOR:	Not Applicable		

PROJECT:
: Maritime Company
0 NW St. Helens Road
Portland, Oregon
PROJECT #: 2289

BORING DIAMETER:	2 1/4 Inches
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Surveyed

ABANDONMENT DETAILS	SAMPLE NUMBER	TIME	HEADSPACE (ppm)	LAB ANALYSIS 418.1M (ppm)	SPT (blows/0.5 feet)	SAMPLE INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Concrete							1		Asphalt	Asphalt
							2			
Bentonite Chips							3		GP	Silty GRAVELS - Brown, moist, loose, non-plastic, moderately graded, possible fill
							4			
							5			
	16-018	1402	4.5	NA			6		CL	Silty CLAY - gray, moist to wet, stiff, non-plastic, poorly graded, no petroleum odor or stain, sheen noticed on auger bit
							7			
	16-019	1415	6	NA			8		SM	Silty SAND - gray, moist, loose, non-plastic, poorly graded, no petroleum odor or stain, sheen still exists on auger bit
							9			
							10			
	16-020	1435	10.3	200			11			
							12			Boring terminated at 11.0 feet - 4/16/93 Sampled to 11.0 feet Boring abandoned with 3/4-inch Bentonite Chips- 4/16/93
							13			
							14			Materials: 3/4 bags 3/4-inch Bentonite Chips
							15			
							16			
							17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
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SOIL BORING/PROBE NUMBER B-14

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time: 7:43	Time: 15:40
EQUIPMENT TYPE	Geoprobe		
DRILLER:	Marcus Johnson	Date: 29-May-01	Date: 29-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

PROJECT:
ix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Asphalt
						100	1		GW	Gravel - brown, dry, medium dense, poorly graded, non-plastic,no petroleum odor, sheen, or discoloration
						100				
						100	2		SM	SAND with trace Silt - light gray, dry, medium dense, slightly graded, medium grained, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	3			
						100				
	084	7:47	36.5	-	▼	100	4			
						100			SP	SAND - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	5			
						100				
						100	6			
						100				
						100	7			
						100				
	085	7:56	11.2	-	▼	100	8		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	9			
						100				
						100	10		SM	SAND with trace Silt - light gray, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	11			
						100				
	086	8:04	24.9	-	▼	100	12		SP	SAND - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	13			
						100				
						100	14			
						100				
						100	15			
						100				
	087	8:14	19.2	-	▼	100	16		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	17			
						100				
						100	18			
						100				
						100	19			
						100			SP	SAND - as above, no petroleum odor, sheen, or discoloration
	088	8:23	6.1	-	▼	100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-14

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	7:43	15:40
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	29-May-01	29-May-01

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
						100				
						100	21			
						100				
						100	22			
						100			SP	SAND - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
	089	8:32	12	-		100	23			
						100			CL	Silty CLAY - light gray, moist, medium stiff, slightly plastic, no petroleum odor, sheen, or discoloration
						100	24			
						100				
						100	25			
						100				
						100	26			
						100				
						100	27			
						100				
	090	8:50	3.2	-		100	28		CL	Silty CLAY - as above, no petroleum odor, sheen, or discoloration
						100				
						100	29			
						100		5/29/01		
						100	30			ATTEMPTED GROUNDWATER SAMPLE Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 24 to 28 feet bgs. No water was encountered. Well point was removed and boring continued.
						100				
						100	31			
						100				
						100	32			
							33			
							34			GROUNDWATER SAMPLE Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 28 to 32 feet bgs. No water was initially encountered. After six hours of recharge, groundwater sample (#5074-010529-108) was collected with a vacuum pump and disposable tubing/check valve at 15:39 hours, 05/29/01. Well point was removed and the boring was abandoned.
							35			
							36			
							37			
							38			Boring terminated at 32 feet bgs Sampled to 28 feet bgs
							39			Boring abandoned with 3/4-inch Bentonite Chips
							40			

Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
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SOIL BORING/PROBE NUMBER B-15

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	9:25	11:23
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	29-May-01	29-May-01

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Asphalt
						100	1		GW	GRAVEL with some Sand - light brown, dry, medium dense, poorly graded, coarse grained, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
						100	3			
						100				
	091	9:30	0.8	-		100	4		SM	SAND with some Silt - light gray, dry, medium dense,slightly graded, medium grained, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	5			
						100				
						100	6			
						100			GW	GRAVEL with some Sand - light brown, medium dense, slightly graded, medium grained, non-plastic, no petroleum odor, sheen, or discoloration
						100	7			
						100			SP	
	092	9:37	1.5	-		100	8			SAND - light brown, moist, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	9			
						100				
						100	10			GRAVEL with some Sand - light brown, moist, medium dense, slightly graded, medium grained, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	11		GW	
						100				
	093	9:44	2.0	-		100	12		SP	
						100				SAND - light brown, moist, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	13			
						100				
						100	14			
						100				
						100	15			
						100			SP	SAND - as above, no petroleum odor, sheen, or discoloration
	094	10:00	2.1	-		100	16			
						100				
						100	17			
						100				
						100	18			
						100				
						100	19			SAND - as above, no petroleum odor, sheen, or discoloration
						100			SP	
	095	10:11	1.6	-		100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-15

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core	Time:	Time:
DRILLING METHOD:	Direct Push	9:25	11:23
EQUIPMENT TYPE	Geoprobe	Date:	Date:
DRILLER:	Marcus Johnson	29-May-01	29-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21		SP	SAND - light brown, moist medium dense, medium grained,poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	22			
						100				
						100	23			
						100				
	096	10:23	1.4	-		100	24	5/29/01	SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
	097	10:36	2.4	-		100	25			
						100				
						100	26			
						100				
						100	27		CL	Silty CLAY - light gray, moist to wet, stiff, slightly plastic, no petroleum odor, sheen, or discoloration
						100				
	098	10:37	0.6	-		100	28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 24 to 28 feet bgs. Following the removal of approximately 500 ml of water the well point was purged dry, after recharge, groundwater samples (#5074-010529-104 and 5074-010529-105) were collected with a vacuum pump and disposable tubing/check valve at 11:14 and 11:15 hours,respectively, 05/29/01. After sampling, the well point was removed and the boring was abandoned.

Boring terminated at 28 feet bgs
Sampled to 28 feet bgs
Boring abandoned with 3/4-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-16

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	9:25	11:23
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	29-May-01	29-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Asphalt
						100	1		SW	Gravely SAND with some Silt - light gray, moist, medium dense, poorly graded, medium grained, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
						100	3			
						100				
	099	11:35	3.2	-		100	4		SW	Gravely SAND with some Silt - as above, no petroleum odor, sheen, or discoloration
						100				
						100	5			
						100				
						100	6			
						100				
						100	7			
						100			SP	SAND - light brown, moist, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
	201	11:37	4.2	-		100	8			
3/8-inch Bentonite Chips						100				
						100	9			
						100				
						100	10			
						100			SM	Silty SAND - light gray, moist, medium dense, medium grained, slightly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	11			
						100				
	202	11:40	6.0	ND		100	12		SP	SAND - light brown, moist, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	13			
						100				
						100	14			
						100				
						100	15			
						100				
	203	11:44	7.7			100	16			
						100			SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100	17			
						100				
						100	18			
						100				
						100	19			
						100				
	204	11:52	-	-		100	20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-16

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time: 9:25	Time: 11:23
EQUIPMENT TYPE	Geoprobe		
DRILLER:	Marcus Johnson	Date: 29-May-01	Date: 29-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21		SP	SAND - light brown, moist, medium dense, medium grained, porrly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	22			
						100				
						100	23			
	205	12:01	13.2	-		100		5/29/01		
						100	24			SAND - as above, no petroleum odor, sheen, or discoloration
	206	12:10	9.6	ND/121		100				
						100	25			
						100				
						100	26			
						100				
	207	12:11	9.6			100	27		CL	Silty CLAY - light gray, very moist, stiff , no petroleum odor, sheen, or discoloration
						100				
						100	28			
							29			ATTEMPTED GROUNDWATER SAMPLE Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 24 to 28 feet bgs. No water was encountered. Well point was removed and boring abandoned. A groundwater sample could not be collected.
							30			
							31			
							32			Boring terminated at 28 feet bgs Sampled to 28 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-17

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time: 15:42	Time: 17:39
EQUIPMENT TYPE	Geoprobe		
DRILLER:	Marcus Johnson	Date: 29-May-01	Date: 29-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Asphalt
						100	1		SW	Gravely SAND with some Silt - light gray, moist, medium dense, well graded, medium grained, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
						100	3			
						100				
	215	15:47	6.9	-	▼	100	4			
						100				Gravely SAND with some Silt - as above, petroleum odor, no sheen, or discoloration
						100	5			
						100				
						100	6			
						100				
						100	7			
						100				
	216	15:50	6.5	-	▼	100	8		SP	SAND - light gray, moist, loose, poorly graded, medium grained, non-plastic, petroleum odor, no sheen or discoloration
3/8-inch Bentonite Chips						100				
						100	9			
						100				
						100	10			
						100				
						100	11			
						100				
	217	15:53	10.6	ND/ND	▼	100	12		SP	SAND - as above, petroleum odor, no sheen or discoloration
						100				
						100	13			
						100				
						100	14			
						100				
						100	15			
						100				
	218	16:01	9.2	-	▼	100	16		SP	SAND - as above, petroleum odor, no sheen or discoloration
						100				
						100	17			
						100				
						100	18			
						100				
						100	19			
						100				SAND - as above, petroleum odor, no sheen or discoloration
	219	16:12	13.4	-	▼	100	20		SP	

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

SOIL BORING/PROBE NUMBER B-17

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	15:42	17:39
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	29-May-01	29-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21			
						100			SP	SAND - light gray, moist , loose, medium grained, poorly graded, non-plastic, petroleum odor, no sheen or discoloration
						100	22			
						100				
	220	16:21	123	10.9/ND		100	23	5/29/01		
						100			CL	Silty CLAY - dark gray, moist, medium stiff, slightly plastic, petroleum odor, no sheen or discoloration
						100	24			
						100				
						100	25			
						100				
						100	26			
						100				
	221	16:35	8.8	-		100	27		CL	Silty CLAY - as above, no petroleum odor, sheen, or discoloration
						100				
						100	28			
							29			
							30			GROUNDWATER SAMPLE Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 24 to 28 feet bgs. Following the removal of approximately 500 ml of water the well point was purged dry, after recharge, groundwater sample (#5074-010529-109) was collected with a vacuum pump and disposable tubing/check valve at 17:35 hours, 5/29/01. After sampling, the well point was removed and the boring was abandoned.
							31			
							32			
							33			
							34			A sheen was noted on the groundwater sample
							35			
							36			
							37			Boring terminated at 28 feet bgs Sampled to 27 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-18

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	13:45	15:40
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	29-May-01	29-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Cement						100			Cement	Cement Floor
						100	1		GW	Pea GRAVEL - gray, dry, medium grained, poorly graded, dense , non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
						100	3			
						100				
	208	13:51	1.2	-		100	4		SP	SAND - light brown, dry, loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	5			
						100				
						100	6			
						100				
						100	7			
						100				
	209	13:56	3.0	-		100	8		SP	SAND - as above, petroleum odor, sheen, and discoloration
						100				
						100	9			
						100				
						100	10			
						100				
						100	11			
						100				
	210	14:01	3.5	-		100	12		SP	SAND - as above, slight petroleum odor, no sheen, and no discoloration
						100				
						100	13			
						100				
						100	14			
						100				
						100	15			
	211	14:11	5.5	ND/ND		100			SP	SAND - as above, slight petroleum odor, no sheen, and no discoloration
						100	16			
						100				
						100	17			
						100				
						100	18			
						100				
						100	19			SAND - as above, slight petroleum odor, no sheen or discoloration
						100			SP	
	212	14:19	8.5	-		100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-18

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	13:45	15:40
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	29-May-01	29-May-01

BORING DIAMETER: 2"
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21		SP	SAND - light gray, moist loose, medium grained, poorly graded, non-plastic, slight petroleum odor, no sheen or discoloration
						100				
						100	22			
						100				
						100	23			
						100		5/29/01		
	213	14:28	4.8	1.14/ND		100	24		SP	SAND - as above, slight petroleum odor, no sheen or discoloration
						100			CL	Silty CLAY - gray, moist, soft, slightly plastic, no petroleum odor, sheen, or discoloration
						100	25			
						100				
						100	26			
						100				
						100	27			
						100				
	214	0:00	3.1	-		100	28		CL	Silty CLAY - as above, no petroleum odor, sheen, or discoloration
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

<u>GROUNDWATER SAMPLE</u>
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 24 to 28 feet bgs. Following the removal of approximately 400 ml of water the well point was purged dry, after recharge, groundwater sample (#5074-010529-107) was collected with a vacuum pump and disposable tubing/check valve at 15:18 hours, 5/29/01. After sampling, the well point was removed and the boring was abandoned.

Boring terminated at 28 feet bgs
Sampled to 28 feet bgs
Boring abandoned with 3/4-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-19

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time: 13:45	Time: 15:40
EQUIPMENT TYPE	Geoprobe		
DRILLER:	Marcus Johnson	Date: 24-May-01	Date: 24-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1		GW	GRAVEL with some Sand - light brown, dry, medium dense, poorly graded graded, medium grained, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
						100	3			
						100			SP	
	021	11:36	3.3	-		100	4			SAND - light brown, moist, loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	5			
						100				
						100	6		SM	Silty SAND - light brown, moist, loose, medium grained, slightly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
	022	11:43	5.0	-		100	7			
						100				
						100	8			
						100				
						100	9			
						100				SAND - light brown, moist, loose, medium grained, poorly graded, non-plastic, petroleum odor, no sheen or discoloration
	023	11:51	16.1	-		100	10		SP	
						100				
						100	11			
						100				
						100	12			
						100				
						100	13			
						100				
						100	14			
						100				
						100	15			
	024	11:55	23.8	ND/-		100			SP	SAND - as above, petroleum odor, no sheen or discoloration
						100	16			
						100				
						100	17			
						100				
						100	18			
						100				
	026	12:03	27.1	-		100	19			SAND - as above, slight odor, no sheen or discoloration
						100				
						100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-19

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	13:45	15:40
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	24-May-01	24-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21	5/24/01	SP	SAND - light gray, very moist, loose, medium grained, poorly graded, non-plastic, slight petroleum odor, no sheen or discoloration
	027	12:14	29.5	ND/ND		100				
						100	22			
						100				
						100	23			
						100			CL	Silty CLAY - light gray, damp, stiff, slightly plastic, no petroleum odor, sheen, or discoloration
						100	24			
						100				
						100	25			
						100				
	028	12:29	18.2	-		100	26		SP	SAND - light gray, moist to wet, loose, medium grained, poorly graded, non-plastic, slight petroleum odor, no sheen or discoloration
						100				
						100	27			
						100				
						100	28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 24 to 28 feet bgs. Following the removal of approximately 500 ml of water the well point was purged dry, after recharge, groundwater sample (#5074-010524-102) was collected with a vacuum pump and disposable tubing/check valve at 13:48 hours, 5/24/01. After sampling, the well point was removed and the boring was abandoned.

Boring terminated at 28 feet bgs
Sampled to 26 feet bgs
Boring abandoned with 3/4-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-20

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	14:00	9:51
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	24-May-01	25-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1		SW	Gravely SAND with some Silt - light brown, moist loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
	029	14:04	3.1	-		100	3			SAND - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100			SP	
						100	4			
						100				
						100	5			
						100			SP	Gravely SAND with some Silt - light brown, damp, loose, medium grained, poorly graded, no petroleum odor, sheen, or discoloration
						100	6			
						100				
	030	14:08	2.7	-		100	7		SP	SAND - light gray, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	8			
						100				
						100	9			
						100				
						100	10			
						100				
	031	14:13	3.6	-		100	11		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	12			
						100				
						100	13			
						100				
						100	14			
						100				
	031	14:20	5.4	-		100	15		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	16			
						100				
						100	17			
						100				
						100	18			
						100				SAND - as above, no petroleum odor, sheen, or discoloration
	033	14:28	6.0	-		100	19		SP	
						100				
						100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-20

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	14:00	9:51
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	24-May-01	25-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100			SP	SAND - light gray, very moist, loose, medium grained, poorly graded, non-plastic, slight petroleum odor, no sheen or discoloration
						100	21			
						100				
						100	22			
						100				
	034	14:41	4.2	ND/ND		100	23	5/24/01	SC	Clayey SAND - light gray, moist, dense, medium grained, slightly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	24			
						100				
						100	25			
						100				
						100	26			
						100			CL	Silty CLAY - light gray, moist to wet, stiff, slightly plastic, no petroleum odor, sheen, or discoloration
	035	14:49	1.1	-		100	27			
						100				
						100	28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

GROUNDWATER SAMPLE
Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 24 to 28 feet bgs. Following the removal of approximately 200 ml of water the well point was purged dry, after recharge (overnight), groundwater sample (#5074-010525-103) was collected with a vacuum pump and disposable tubing/check valve at 09:47 hours, 5/25/01. After sampling, the well point was removed and the boring was abandoned.

Boring terminated at 28 feet bgs
Sampled to 27 feet bgs
Boring abandoned with 3/4-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-21

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time: 8:29	Time: 9:27
EQUIPMENT TYPE	Geoprobe		
DRILLER:	Marcus Johnson	Date: 24-May-01	Date: 24-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1			
						100			SP	SAND with trace Gravel - light brown/light gray, moist, medium dense, medium grained, poorly graded, non-plastic, petroleum odor, sheen, and discoloration
						100	2			
						100				
	001	8:40	718	-		100	3			
						100				
					▼	0	4			
						100				
	002	8:44	1,572	1,370/ND		100	5		SP	SAND with trace Gravel - as above, petroleum odor, sheen, and discoloration
						100				
						100	6			
						100				
						100	7			
						100				
					▼	100	8			
						100				
						100	9			
						100				
3/8-inch Bentonite Chips	003	8:49	42.6	-		100	10		SP	SAND - as above, petroleum odor, sheen, and discoloration noted
						100				
						100	11			
						100				
					▼	100	12			
						100				
						100	13			
						100				
	004	855	18.5	-		100	14		SP	SAND - as above, petroleum odor, sheen, and discoloration noted
						100				
						100	15			
						100				
					▼	100	16			
						100				
						100	17			
						100				
	005	9:03	13.7	ND/-		100	18		SP	SAND - as above, petroleum odor, sheen, and discoloration noted
						100				
						100	19			
						100				
					▼	100	20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-21

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	8:29	9:27
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	24-May-01	24-May-01

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100			Wood	Organics - wood
						100	21			
						100				
						100	22			
						100			CL	Silty CLAY - light gray, damp, stiff, no petroleum odor, sheen, or discoloration
	006	9:14	6.9	ND/ND		100	23			
						100				
						100	24			
							25			Groundwater not encountered
							26			Boring terminated at 24 feet bgs Sampled to 23 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							27			
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING/PROBE NUMBER B-22			
PROJECT: Brix Maritime Company 9030 NW St. Helens Road Portland, Oregon	HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
	SAMPLING METHOD:	4' Continous Core		
	DRILLING METHOD:	Direct Push	Time: 10:25	Time: 11:20
	EQUIPMENT TYPE	Geoprobe		
	DRILLER:	Marcus Johnson	Date: 24-May-01	Date: 24-May-01
PROJECT #: 5074	DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1		SM	Silty SAND with trace Gravel - light brown, moist, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
						100	3			
						100				
	013	10:30	2.0	-		100	4		SP	SAND - light brown, moist, loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	5			
						100				
						100	6			
						100				
	014	10:33	22.8	-/ND		100	7			SAND - as above, petroleum odor, sheen, and discoloration
						100			SP	
						100	8			
						100				
						100	9			
						100				
	015	10:38	8.2	-		100	10		SP	SAND - as above, petroleum odor, sheen, and discoloration
						100				
						100	11			
						100				
						100	12			
						100				
						100	13			
						100				
						100	14			
						100				
						100	15			
	016	10:44	53.3	61.3/-		100			SP	SAND - as above, petroleum odor, sheen, and discoloration
						100	16			
						100				
						100	17			
						100				
						100	18			
						100				
	017	10:51	67.0	-		100	19		SP	SAND - as above, petroleum odor, sheen, and discoloration
						100				
						100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-22

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	10:25	11:20
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	24-May-01	24-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100			SP	SAND - light brown, most, loose, medium grained, poorly graded, non-plastic, petroleum odor, sheen, and discoloration
						100	21			
						100				
	018	10:59	7.3	1.31/228		100	22		SM	Silty SAND with trace Clay and Organics - light gray, moist, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	23			
						100				
						100	24		CL	
						100				Silty CLAY - greenish-gray, moist, medium stiff, slightly plastic, no petroleum odor, sheen, or discoloration
	019	11:11	3.7	-		100	25			
						100				
						100	26			
						100				
	020	11:12	2.5			100	27		SP	SAND - light brown, moist, loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	28			
							29			Groundwater not encountered
							30			Boring terminated at 28 feet bgs Sampled to 27 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING/PROBE NUMBER B-23			
PROJECT: Brix Maritime Company 9030 NW St. Helens Road Portland, Oregon	HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
	SAMPLING METHOD:	4' Continous Core		
	DRILLING METHOD:	Direct Push	Time: 15:42	Time: 16:34
	EQUIPMENT TYPE	Geoprobe		
	DRILLER:	Marcus Johnson	Date: 24-May-01	Date: 24-May-01
PROJECT #: 5074	DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1			
						100				
						100	2			
						100				
	036	15:33	1.3	-		100	3		SP	SAND - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	4			
						100				
						100	5			
						100				
						100	6			
						100				
	037	15:35	1.9	-		100	7		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	8			
						100				
						100	9			
						100				
						100	10			
						100				
	038	15:40	1.0	-		100	11		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	12			
						100				
						100	13			
						100				
						100	14			
						100				
	039	15:51	0.2	-		100	15		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	16			
						100				
						100	17			
						100				
						100	18			
						100				
	040	16:00	1.6	-		100	19		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-23

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time: 15:42	Time: 16:34
EQUIPMENT TYPE	Geoprobe		
DRILLER:	Marcus Johnson	Date: 24-May-01	Date: 24-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100			SP	SAND - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	21			
						100				
						100	22			
						100				
	041	16:10	1.6	ND/ND		100	23			
						100			CL	Silty CLAY - gray, moist, medium stiff, slightly plastic, no petroleum odor, sheen, or discoloration
						100	24			
						100				
						100	25			
						100				
						100	26			
						100				
	042	16:22	0.3	-		100	27		CL	Silty CLAY - as above, no petroleum odor, sheen, or discoloration
						100				
						100	28			
							29			Groundwater not encountered
							30			Boring terminated at 28 feet bgs Sampled to 27 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-24

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	8:09	9:26
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	25-May-01	25-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1			
						100				
						100	2			
						100				
	043	8:16	23.8	-		100	3		SP	SAND - brown, moist, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
					▼	100	4			
						100				
						100	5			
						100				
						100	6			
						100				
	044	8:26	47.1	-		100	7		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
					▼	100	8			
						100				
						100	9			
						100				
						100	10			
						100				
	045	8:33	42.9	-		100	11		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
					▼	100	12			
						100				
						100	13			
						100				
						100	14			
						100				
	046	8:40	41.8	-		100	15		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
					▼	100	16			
						100				
						100	17			
						100				
						100	18			
						100				
	047	8:49	19.3	-		100	19			
						100				
					▼	100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-24

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	8:09	9:26
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	25-May-01	25-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100			SP	SAND - dark gray, moist, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	21			
						100				
						100	22			
						100				
						100	23			
	048	9:12	26.1	ND/ND		100			CL	Silty CLAY - light gray, very moist, medium stiff, slightly plastic, no petroleum odor, sheen, or discoloration
						100	24			
						100				
						100	25			
						100				
						100	26			
						100				
	049	9:21	15.8	ND/ND		100	27		CL	Silty CLAY - as above, no petroleum odor, sheen, or discoloration
						100				
						100	28			
							29			Groundwater not encountered
							30			Boring terminated at 28 feet bgs Sampled to 27 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-25

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time: 17:00	Time: 9:26
EQUIPMENT TYPE	Geoprobe		
DRILLER:	Marcus Johnson	Date: 25-May-01	Date: 25-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1		SP	SAND - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
						100	3			
						100				
	077	16:01	0.4	-		100	4			
						100				
						100	5			
						100			SM	Silty SAND - light gray, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
	078	16:05	0.6	ND/ND		100	6			
						100				
						100	7			
						100			SP	SAND - light gray, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	8			
						100				
						100	9			
						100				
	079	16:11	0.9	-		100	10			
						100				
						100	11			
						100			SP	SAND - as above, no petroleum odor, petroleum sheen, no discoloration
	080	16:12	1.1	ND/ND		100	12			
						100				
						100	13			
						100				
						100	14			
						100				
						100	15			
						100			SP	SAND - as above, no petroleum odor, petroleum sheen, no discoloration
	081	16:15	0	-		100	16			
						100			SM	Silty SAND - light gray, dry medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	17			
						100				
						100	18			
						100				
						100	19		SP	SAND - light gray, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
	082	16:28	0.7	-		100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-25

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	Geoprobe	17:00	9:26
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	25-May-01	25-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21		SP	SAND - light gray, moist, medium dense, medium grained, poorly graded, non-plastic, petroleum odor and sheen, no discoloration
						100				
						100	22			
						100				
	083	16:46	154	-		100	23			
						100			CL	Silty CLAY - light gray, very moist, medium stiff, slightly plastic, slight petroleum odor, no sheen or discoloration
						100	24			
							25			Groundwater not encountered
							26			
							27			Boring terminated at 24 feet bgs Sampled to 23 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-26

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	2' Continous Core		
DRILLING METHOD:	Direct Push	Time: 10:01	Time: 13:46
EQUIPMENT TYPE	Roto-hammer		
DRILLER:	Marcus Johnson	Date: 25-May-01	Date: 25-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
conctrete						100			Concrete	Concrete floor 4.0"
						100	1		GW	Gravel - brown, dry, medium dense, poorly graded, non-plastic,no petroleum odor, sheen, or
						100				
	051	10:07	0.6	-	▼	100	2			
						100			SP	SAND - light brown, dry, loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	3			
						100				
	552	10:20	1.3	-	▼	100	4		SM	Silty SAND - light gray, dry medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	5			
						100				
	053	10:40	2.1	ND/1,820	▼	100	6		SP	SAND - dark gray, dry, loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	7			
						100				
	054	11:06	3.9	-	▼	100	8			
						100				
						100	9			
						100				
	055	11:19	3.2	-	▼	100	10		SP	SAND - dark gray, dry, loose, medium grained, poorly graded, no petroleum odor, sheen, or discoloration
						100				
						100	11			
						100				
	056	11:36	3.0	-	▼	100	12			
						100				
						100	13			
						100				
	057	11:51	4.2	-	▼	100	14		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	15			
						100				
	058	12:07	4.6	-	▼	100	16			
						100				
						100	17			
						100				
	059	12:27	13.4	ND/ND	▼	100	18		SP	SAND - as above, slight petroleum odor, no sheen or discoloration
						100				
						100	19			
						100				
	060	12:48	8.5	-	▼	100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-26

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	2' Continous Core		
DRILLING METHOD:	Direct Push	Time: 10:01	Time: 13:46
EQUIPMENT TYPE	Roto-hammer		
DRILLER:	Marcus Johnson	Date: 25-May-01	Date: 25-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100			SP	
						100	21			Silty CLAY - light gray, wet, medium stiff, slightly plastic, slight petroleum odor, no sheen or discoloration
						100				
	061	13:09		ND/ND		100	22		CL	
						100				
						100	23			
						100				
	062	13:28	0.1			100	24		SP	SAND - dark gray, wet, loose, medium grained, poorly graded, non-plastic slight petroleum odor, no sheen or discoloration
							25			
							26			Groundwater not encountered
							27			Boring terminated at 24 feet bgs Sampled to 24 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-27

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	3 ounce Stainless Steel Scoop		
DRILLING METHOD:	Post Hole Digger	Time:	Time:
EQUIPMENT TYPE	Post Hole Digger	10:00	11:39
DRILLER:	Jason M. Greifer	Date:	Date:
DRILLING CONTRACTOR:	Hahn and Associates, Inc.	25-May-01	25-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1		GW	Gravel - brown, dry, medium dense, coarse grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	2			
Sand						100			SP	
	050	11:32	6.1	ND/1,078		100	3			SAND - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100				
						100	4			

Groundwater not encountered

Boring terminated at 4 feet bgs
Boring abandoned with sand

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-28

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core	Time:	Time:
DRILLING METHOD:	Direct Push-Post Hole 0'-3'	10:40	15:51
EQUIPMENT TYPE	Geoprobe	Date:	Date:
DRILLER:	Marcus Johnson	25-May-01	25-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1			
						100			SP	SAND - light brown, dry, loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	2			
						100				
						100	3			
						100				
	069	15:01	25.3	-		100	4		SM	Silty SAND - as above, slight petroleum odor, no sheen or discoloration
						100				
						100	5			
						100				
	070	15:04	28.1	0.0829/8,890		100	6		SP	SAND - light brown, dry, loose, medium grained, poorly graded, non-plastic, petroleum odor, sheen, and discoloration
						100				
						100	7			
						100				
						100	8			
						100				
3/8-inch Bentonite Chips	071	15:08	58.8	-		100	9		SP	SAND - as above, petroleum odor, sheen, and discoloration
						100				
						100	10			
						100				
						100	11			
						100				
	072	15:09	76.5	4.24/24,540		100	12		SP	SAND - as above, petroleum odor, sheen, and discoloration
						100				
						100	13			
						100				
						100	14			
						100				
						100	15			
						100				
	073	15:13	79.2	-		100	16		SP	SAND - as above, petroleum odor, sheen, and discoloration
						100				
						100	17			
						100				
						100	18			
						100				
						100	19		SP	SAND - as above, petroleum odor, sheen, and discoloration
						100				
	074	15:18	31.2	-		100	20			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-28

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push-Post Hole 0'-3'	Time:	Time:
EQUIPMENT TYPE	Geoprobe	10:40	15:51
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	25-May-01	25-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21			
						100			SP	SAND - gray, most to wet, medium dense, medium grained, poorly graded, non-plastic, petroleum odor, sheen, and discoloration
						100	22			
						100				
	075	15:26	43.2	-		100	23			
						100			CL	Silty CLAY - light gray, moist, stiff, semi plastic, petroleum odor, sheen, and discoloration
						100	24			
						100				
						100	25			
						100				
						100	26			
						100				
						100	27		CL	Silty CLAY - as above, no petroleum odor, sheen, or discoloration
	076	15:41	7.1	-		100				
						100	28			
							29			Boring terminated at 28 feet bgs Sampled to 27.5 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-29

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push-Post Hole 0'-3'	Time:	Time:
EQUIPMENT TYPE	Geoprobe	10:20	14:57
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	25-May-01	25-May-01

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1		GW	Gravel - brown, dry, medium dense, well graded, 3/4 minus, no petroleum odor, sheen, or discoloration
						100				
						100	2			
						100				
						100	3			
						100			SP	SAND - light brown, dry, loose, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
						100	4			
						100				
						100	5			
						100				
						100	6			
						100				
	063	14:10	0.0	-		100	7		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	8			
						100				
						100	9			
						100				
						100	10			
						100				
						100	11			
						100				
	064	14:21	4.7	-		100	12		SP	SAND - as above, no petroleum odor, sheen, or discoloration
						100				
						100	13			
						100				
						100	14			
						100				SAND - as above, slight petroleum odor at 13', no petroleum sheen or discoloration
	065	14:28	3.3	ND/ND		100	15			
						100				
						100	16			
						100				
						100	17			
						100				
						100	18			
						100				SAND - as above, slight petroleum odor, no petroleum sheen or discoloration
	066	14:33	5.8	-		100	19		SP	
						100				
						100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-29

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push-Post Hole 0'-3'	Time:	Time:
EQUIPMENT TYPE	Geoprobe	10:20	14:57
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	25-May-01	25-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21			
						100				
						100	22			
						100			SP	SAND - dark gray, moist, medium dense, medium grained, poorly graded, non-plastic, slight petroleum odor, no petroleum sheen, and no discoloration
	067	14:41	2.9	ND/ND		100	23			
						100				
						100	24			
						100				
						100	25			
						100				
						100	26			
						100			CL	Silty CLAY - dark gray, wet, stiff, slightly plastic, no petroleum odor, sheen, or discoloration
	068	14:48	1.1	-		100	27			
						100				
						100	28			
							29			Boring terminated at 28 feet bgs Sampled to 27 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-30

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon
PROJECT #: 5074

		DRILL START	DRILL FINISH
HAI LOGGER:	Jason M. Greifer		
SAMPLING METHOD:	4' Continous Core		
DRILLING METHOD:	Direct Push-Post Hole 0'-3'	Time:	Time:
EQUIPMENT TYPE	Geoprobe	9:30	10:24
DRILLER:	Marcus Johnson	Date:	Date:
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.	24-May-01	24-May-01

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Asphalt						100			Asphalt	Ashpalt
						100	1			
						100			SP	Silty SAND with some Gravel - light brown, dry, medium dense, medium grained, poorly graded, non-plastic, no petroleum odor, sheen, or discoloration
	007	9:34	3.9	-		100	2			
						100				
						0	3			
						0				
						0	4			
						100			SP	Silty SAND with some Gravel - as above, slight petroleum odor, no sheen, and no discoloration
	008	9:40	7.4	ND/-		100	5			
						100				
						100	6			
						100				
						100	7			
						100				
						100	8			
						100				
						100	9			
						100			SP	Silty SAND with some Gravel - as above, slight petroleum odor, no sheen, and no discoloration
	009	9:48	4.6	-		100	10			
						100				
						100	11			
						100				
						100	12			
						100				
						100	13			
						100				
	010	9:54	4.7	ND/-		100	14		SP	Silty SAND with some Gravel - as above, slight petroleum odor, no sheen, and no discoloration
						100				
						100	15			
						100				
						100	16			
						100				
						100	17			
						100				
						100	18			
						100			SP	Silty SAND with some Gravel - as above, slight petroleum odor, no sheen, and no discoloration
	011	10:04	4.5	-		100	19			
						100				
						100	20			

3/8-inch Bentonite Chips

HAHN & ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING/PROBE NUMBER B-30

HAI LOGGER:	Jason M. Greifer	DRILL START	DRILL FINISH
SAMPLING METHOD:	4' Continous Core	Time:	Time:
DRILLING METHOD:	Direct Push-Post Hole 0'-3'	9:30	10:24
EQUIPMENT TYPE	Geoprobe	Date:	Date:
DRILLER:	Marcus Johnson	24-May-01	24-May-01
DRILLING CONTRACTOR:	Geo Tech Explorations, Inc.		

PROJECT:
Brix Maritime Company
9030 NW St. Helens Road
Portland, Oregon

PROJECT #: 5074

BORING DIAMETER:	2"
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULT TPH-G, Total TPH Dx (ppm)	CORE/SPT INTERVAL	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/8-inch Bentonite Chips						100				
						100	21			
						100				
						100	22			
						100				
	012	10:17	1.1	-		100	23		CL	Silty CLAY - light gray, moist, medium stiff, slightly plastic, no petroleum odor, sheen, or discoloration
						100				
						100	24			
							25			
							26			Groundwater not encountered
							27			Boring terminated at 24 feet bgs Sampled to 23 feet bgs Boring abandoned with 3/4-inch Bentonite Chips
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

APPENDIX B

LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION: MAY 2001 SOIL SAMPLES

Ard

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: ESL

Lab Project No.: 0105118

CHAIN OF CUSTODY

Chain of Custody No.: 1

Project Manager	Guy Tanz
Project No.	5074
Project Name	Brix Maritime Facility
Collected by	Jay Greifer

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both

Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N): ____
Appropriate Containers Used (Y or N): ____
Provide Verbal Results (Y or N): ____
Provide Preliminary Fax Results: ____

Sample Number Prefix: 5074-010524-

PLEASE CALL OR FAX TPH-GX RESULTS WHEN AVAILABLE — ADDITIONAL ANALYSES MAY FOLLOW.

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	HCID by NW TPH Hydrocarbon Identification	NW TPH-G	NW TPH-Dx	BTEX and naphthalene by EPA Method 8021B	BTEX, EDB, EDC, MTBE, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene, iso- and n-propylbenzene by EPA Method 8260B	Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM	Total Lead by EPA Method 6010/200.7	Dissolved Lead (FF) by EPA Method 6010/200.7	RUSH	Remarks
01	001	5/24/01	940	B21e 3	X			1										
02	002		944	5					*	*	*		*		*			
03	003		949	10														
04	004		955	14														
05	005		903	18						*								
06	006		914	23						*	*							
07	007		934	B30e 2														
08	008		940	5						*					*			
09	009		948	10														
10	010		954	14						*								
11	011		1004	19														
12	012		1017	23														
13	013		1030	B22e 4														
14	014		1033	7							*							
15	015		1038	10														
16	016		1044	15½						*								
17	017		1051	19														
18	018		1059	22						*	*							
19	019		1111	25														
20	020		1112	27														
21	021		1136	B19e 4														
22	022		1143	7														
23	023		1151	10														
24	024		1155	14														
25	025		1156	15½						*								
26	026		1203	19														

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAHN & ASSOC	5/25/01		GUY TANZ	HAI
GUY TANZ	HAI	5/25/01	1130	[signature]	ESL

Soil

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: ESL
Lab Project No.: 0105118

CHAIN OF CUSTODY

Chain of Custody No.: 2

Project Manager: Guy Tanz
Project No.: 5074
Project Name: Brix Manume Facility
Collected by: Jay Greifer

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N): ____
Appropriate Containers Used (Y or N): ____
Provide Verbal Results (Y or N): ____
Provide Preliminary Fax Results: ____

Sample Number Prefix: 5074-010524-

SEE NOTE PAGE 1.

Lab ID	Sample #	Date	Time	Sample Description	Soil	Water	Other	Number of Containers	HCID by NW TPH Hydrocarbon Identification	NW TPH-G	NW TPH-Dx	BTEX and naphthalene by EPA Method 8021B	BTEX, EDB, EDC, MTBE, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene, iso- and n-propylbenzene by EPA Method 8260B	Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM	Total Lead by EPA Method 6010/200.7	Dissolved Lead (TCLP) by EPA Method 6010/200.7	RUSH	Remarks
27	027	5/24/01	1214	B19e 21½	✓			1		*	*							
28	028		1229	1 26														
29	029		1404	B20e 3														
30	030		1408	7														
31	031		1413	11														
	032		1420	15														
33	033		1428	19														
34	034		1441	23						*	*							
35	035		1449	1 27														
36	036		1533	B23e 3														
37	037		1535	7														
38	038		1540	11														
39	039		1551	15														
40	040		1600	19														
41	041		1610	23						*	*							
42	042		1622	27														

Relinquished by	Company	Date	Time	Received by	Company
[illegible]	HAHN & ASSOC.	5/25/01	1130	GUY TANZ	HAI
GUY TANZ	HAI	5/25/01	1130	[illegible]	ESL

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

June 07, 2001

Mr. Guy Tanz
Hahn and Associates
434 NW Sixth Avenue
Suite 203
Portland, OR 97209
TEL: (503)796-0717
FAX (503) 227-2209

RE: 5074/Brix Maritime Facility Order No.: 0105118

Dear Mr. Guy Tanz,

Environmental Services Laboratory received 42 samples on 5/29/01 for the analyses presented in the following report.

The Samples were analyzed for the following tests:

GAS/BTEX, Soil (8015/8021)
HCID Soil (EPA 8015)
ICP Metals (EPA 6010B)
NWTPH-Dx Soil (EPA 8015)
PERCENT MOISTURE (SM 2540)
Volatiles by GC/MS (EPA 8260B)

There were no analytical problems encountered, and all data met laboratory QC criteria, unless noted in a Case Narrative. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

✓ Base Sample Report ✓ Method Blank Report ✓ Sample Duplicate Report
✓ Matrix Spike/Matrix Spike Duplicate Report ✓ Laboratory Control Spike/Spike Duplicate Report ✓ Continuing Calibration Verification Report ✓ Initial Calibration Verification Report

If you have any questions regarding these test results, please feel free to call.

Sincerely,

June 07, 2001

Mr. Guy Tanz
Hahn and Associates
434 NW Sixth Avenue
Suite 203
Portland, OR 97209
TEL: (503)796-0717
FAX (503) 227-2209

RE: 5074/Brix Maritime Facility

Order No.: 0105118

Dear Mr. Guy Tanz,

Nichole Karl
Project Manager

Nichole Karl

Technical Review

Keith Hunter

RECEIVED JUN 1 4 1999

Environmental Services Laboratory

Date: *13-Jun-01*

LIENT:	Hahn and Associates	Client Sample ID:	5074-010524-002
Lab Order:	0105118	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/24/01
Lab ID:	0105118-02A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HCID SOIL		**NW-TPH**				Analyst: **smc**
Oil	ND	123		mg/Kg-dry	1	5/30/01
Gasoline	DETECT	24.7		mg/Kg-dry	1	5/30/01
Diesel	ND	61.7		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	113.0	50-150		%REC	1	5/30/01
NWTPH-DX SOIL		**NW TPH-DX**				Analyst: **smc**
Diesel	ND	24.7		mg/Kg-dry	1	5/30/01
Oil	ND	61.7		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	93.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Gasoline	1370000.0	61700		µg/Kg-dry	500	5/29/01
Surr: Trifluorotoluene	117.1	50-150		%REC	500	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	19	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010524-002
Lab Order:	0105118	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/24/01
Lab ID:	0105118-02B	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 6010B**				Analyst: **lmc**
Lead	4.40	1.00		mg/Kg	1	6/1/01
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **tmh**
1,2,4-Trimethylbenzene	59,800	25.0		µg/Kg	25	5/30/01
1,2-Dibromoethane	ND	25.0		µg/Kg	25	5/30/01
1,2-Dichloroethane	ND	25.0		µg/Kg	25	5/30/01
1,3,5-Trimethylbenzene	18,700	25.0		µg/Kg	25	5/30/01
Benzene	5,200	25.0		µg/Kg	25	5/30/01
Ethylbenzene	23,400	25.0		µg/Kg	25	5/30/01
Isopropylbenzene	2,580	25.0		µg/Kg	25	5/30/01
m,p-Xylene	96,500	50.0		µg/Kg	25	5/30/01
Methyl tert-butyl ether	ND	50.0		µg/Kg	25	5/30/01
n-Propylbenzene	11,100	25.0		µg/Kg	25	5/30/01
Naphthalene	11,100	50.0		µg/Kg	25	5/30/01
o-Xylene	38,400	25.0		µg/Kg	25	5/30/01
Toluene	ND	25.0		µg/Kg	25	5/30/01
Surr: 4-Bromofluorobenzene	108.6	74-121		%REC	25	5/30/01
Surr: Dibromofluoromethane	98.2	80-120		%REC	25	5/30/01
Surr: Toluene-d8	105.0	81-117		%REC	25	5/30/01

Qualifiers:

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J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010524-005
Lab Order:	0105118	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/24/01
Lab ID:	0105118-05A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Benzene	ND	2.72		µg/Kg	1	5/31/01
Ethylbenzene	ND	2.72		µg/Kg	1	5/31/01
Toluene	ND	2.72		µg/Kg	1	5/31/01
Xylenes, Total	ND	8.15		µg/Kg	1	5/31/01
Gasoline	ND	543		µg/Kg	1	5/31/01
Surr: Trifluorotoluene	110.7	70-130		%REC	1	5/31/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	8	0.		wt%	1	6/4/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

LIENT:	Hahn and Associates	Client Sample ID:	5074-010524-006
Lab Order:	0105118	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/24/01
Lab ID:	0105118-06A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**NW TPH-DX**				Analyst: **smc**
Diesel	ND	26.7		mg/Kg-dry	1	5/30/01
Oil	ND	66.7		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	75.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Gasoline	ND	667		µg/Kg-dry	1	5/29/01
Surr: Trifluorotoluene	90.4	50-150		%REC	1	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	25	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010524-008
Lab Order:	0105118	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/24/01
Lab ID:	0105118-08A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 6010B**				Analyst: lmc
Lead	5.89	1.23		mg/Kg-	1	6/1/01
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: jlw
Gasoline	ND	617		µg/Kg-dry	1	5/29/01
Surr: Trifluorotoluene	88.2	50-150		%REC	1	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: etw
% Moisture	19	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010524-010
Lab Order:	0105118	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/24/01
Lab ID:	0105118-10A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: jlw
Gasoline	ND	543		µg/Kg-dry	1	5/29/01
Surr: Trifluorotoluene	91.3	50-150		%REC	1	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: etw
% Moisture	8	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

LIENT:	Hahn and Associates	**Client Sample ID:**	5074-010524-014
Lab Order:	0105118	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/24/01
Lab ID:	0105118-14A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**NW TPH-DX**				Analyst: **smc**
Diesel	ND	23.5		mg/Kg-dry	1	5/30/01
Oil	ND	58.8		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	84.0	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	15	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

IENT:	Hahn and Associates	Client Sample ID:	5074-010524-016
Lab Order:	0105118	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/24/01
Lab ID:	0105118-16A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Gasoline	61300.0	53800		µg/Kg-dry	500	5/29/01
Surr: Trifluorotoluene	101.9	50-150		%REC	500	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	7	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

IENT:	Hahn and Associates	**Client Sample ID:**	5074-010524-018
Lab Order:	0105118	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/24/01
Lab ID:	0105118-18A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**NW TPH-DX**				Analyst: **smc**
Diesel	62.6	27	AC	mg/Kg-dry	1	5/30/01
Oil	166.0	67.6	AD	mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	80.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Gasoline	1310.0	676		µg/Kg-dry	1	5/29/01
Surr: Trifluorotoluene	77.6	50-150		%REC	1	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	26	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010524-025
Lab Order:	0105118	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/24/01
Lab ID:	0105118-25A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Gasoline	ND	500		µg/Kg	1	5/29/01
Surr: Trifluorotoluene	90.0	50-150		%REC	1	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture		0.		wt%	1	5/30/01
% Moisture	8	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

LIENT:	Hahn and Associates	Client Sample ID:	5074-010524-027
Lab Order:	0105118	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/24/01
Lab ID:	0105118-27A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**NW TPH-DX**				Analyst: **smc**
Diesel	ND	24.7		mg/Kg-dry	1	6/4/01
Oil	ND	61.7		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	99.0	50-150		%REC	1	6/4/01
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Benzene	ND	3.09		µg/Kg-dry	1	5/31/01
Ethylbenzene	ND	3.09		µg/Kg-dry	1	5/31/01
Toluene	ND	3.09		µg/Kg-dry	1	5/31/01
Xylenes, Total	ND	9.26		µg/Kg-dry	1	5/31/01
Gasoline	ND	617		µg/Kg-dry	1	5/31/01
Surr: Trifluorotoluene	115.0	70-130		%REC	1	5/31/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	19	0.		wt%	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010524-034
Lab Order:	0105118	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/24/01
Lab ID:	0105118-34A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**NW TPH-DX**				Analyst: **smc**
Diesel	ND	26		mg/Kg-dry	1	6/4/01
Oil	ND	64.9		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	90.0	50-150		%REC	1	6/4/01
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Gasoline	ND	641		µg/Kg-dry	1	5/29/01
Surr: Trifluorotoluene	85.2	50-150		%REC	1	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	23	0.		wt%	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010524-041
Lab Order:	0105118	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/24/01
Lab ID:	0105118-41A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**NW TPH-DX**				Analyst: **smc**
Diesel	ND	24.7		mg/Kg-dry	1	6/4/01
Oil	ND	61.7		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	87.0	50-150		%REC	1	6/4/01
GAS/BTEX, SOIL		**EPA 8015/8021**				Analyst: **jlw**
Gasoline	ND	617		µg/Kg-dry	1	5/29/01
Surr: Trifluorotoluene	85.2	50-150		%REC	1	5/29/01
PERCENT MOISTURE		**SM2540**				Analyst: **etw**
% Moisture	19	0.		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **04 BG S-5/30/** Test Code: **8015/8021** Units: **µg/L** Analysis Date **5/29/01** Prep Date:
Client ID: **0105118** Run ID: **CRICK_010529A** SeqNo: **77825**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	500									
Trifluorotoluene	90.4	0	100	0	90.4%	50	150	0			

Sample ID: **MBlank** Batch ID: **04 BG S-6/4/0** Test Code: **8015/8021** Units: **µg/Kg** Analysis Date **5/31/01** Prep Date:
Client ID: **0105118** Run ID: **CRICK_010531A** SeqNo: **78281**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.5									
Ethylbenzene	ND	0.5									
Gasoline	ND	100									
Toluene	ND	0.5									
Xylenes, Total	ND	1.5									
Trifluorotoluene	112	0	100	0	112.0%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Method Blank

Sample ID: MBlank | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: | 0105118 | Run ID: HORATIO_010530A | SeqNo: 78091

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	1
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	10
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	49	0	50	0	98.0%	86	115	0
Dibromofluoromethane	49.1	0	50	0	98.2%	86	118	0
Toluene-d8	51.7	0	50	0	103.4%	88	110	0

Sample ID: MB-2759 Batch ID: 2759 Test Code: EPA 8015 Units: mg/Kg Analysis Date 5/30/01 Prep Date: 5/29/01
Client ID: 0105118 Run ID: BUTTERCUP_010530A SeqNo: 77967

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	20									
Oil	ND	50									
O-Terphenyl	54	0	50	0	108.0%	50	150	0			

Sample ID: MB-2762 Batch ID: 2762 Test Code: EPA 8015 Units: mg/Kg Analysis Date 5/30/01 Prep Date: 5/30/01
Client ID: 0105118 Run ID: BUDU_010530A SeqNo: 77995

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	50									
Gasoline	ND	20									
Oil	ND	100									
O-Terphenyl	96	0	100	0	96.0%	50	150	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

Sample ID: **MB-2766** Batch ID: **2766** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date **6/1/01** Prep Date: **5/31/01**
Client ID: **0105118** Run ID: **ICP_010601A** SeqNo: **78106**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	ND	1									
Chromium	ND	1									
Lead	ND	1									

Sample ID: **MB-2773** Batch ID: **2773** Test Code: **EPA 8015** Units: **mg/Kg** Analysis Date **6/4/01** Prep Date: **6/1/01**
Client ID: **0105118** Run ID: **BUTTERCUP_010604A** SeqNo: **78538**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	20									
Oil	ND	50									
O-Terphenyl	46	0	50	0	92.0%	50	150	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0105111-03A DUP** Batch ID: **04 BG S-5/30/** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/29/01** Prep Date:
Client ID: **0105118** Run ID: **CRICK_010529A** SeqNo: **77831**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	575	0	0	0.0%	0	0	0	0.0%	20	
Trifluorotoluene	104	0	115	0	90.7%	50	150	0	0.0%	20	

Sample ID: **0105118-41A DUP** Batch ID: **04 BG S-5/30/** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/29/01** Prep Date:
Client ID: **5074-010524-041** **0105118** Run ID: **CRICK_010529A** SeqNo: **77844**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	617	0	0	0.0%	0	0	0	0.0%	20	
Trifluorotoluene	102	0	123	0	83.2%	50	150	0	0.0%	20	

Sample ID: **0105118-27A DUP** Batch ID: **04 BG S-6/4/0** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/31/01** Prep Date:
Client ID: **5074-010524-027** **0105118** Run ID: **CRICK_010531A** SeqNo: **78285**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	3.09	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	3.09	0	0	0.0%	0	0	0	0.0%	20	
Gasoline	ND	617	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	3.09	0	0	0.0%	0	0	0	0.0%	20	
Xylenes, Total	ND	9.26	0	0	0.0%	0	0	0	0.0%	20	
Trifluorotoluene	140.7	0	123	0	114.4%	50	150	0	0.0%	20	

Sample ID: **0105131-29A DUP** Batch ID: **04 BG S-6/4/0** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/31/01** Prep Date:
Client ID: **0105118** Run ID: **CRICK_010531A** SeqNo: **78292**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	712.6	617	0	0	0.0%	0	0	1142	46.3%	20	T
Trifluorotoluene	712.6	0	593	0	120.2%	50	150	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: 0105121-07B DUP Batch ID: 05 8260 S-6/1 Test Code: EPA 8260B Units: µg/Kg Analysis Date 5/30/01 Prep Date:
Client ID: 0105118 Run ID: HORATIO_010530A SeqNo: 78095

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Benzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
m,p-Xylene	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Methyl tert-butyl ether	ND	10	0	0	0.0%	0	0	0	0.0%	20	
n-Propylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Naphthalene	ND	25	0	0	0.0%	0	0	0	0.0%	20	
o-Xylene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
4-Bromofluorobenzene	53.3	0	50	0	106.6%	74	121	0	0.0%	0	
Dibromofluoromethane	48.5	0	50	0	97.0%	80	120	0	0.0%	0	
Toluene-d8	52	0	50	0	104.0%	81	117	0	0.0%	0	

Sample ID: 0105118-02A DUP Batch ID: 2759 Test Code: EPA 8015 Units: mg/Kg-dry Analysis Date 5/30/01 Prep Date: 5/29/01
Client ID: 5074-010524-002 0105118 Run ID: BUTTERCUP_010530A SeqNo: 77973

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	24.7	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	61.7	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	48.15	0	61.7	0	78.0%	50	150	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Sample Duplicate

Sample ID: 0105125-06A DUP Batch ID: 2762 Test Code: EPA 8015 Units: mg/Kg-dry Analysis Date 5/30/01 Prep Date: 5/30/01
Client ID: 0105118 Run ID: BUDU_010530A SeqNo: 78008

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	73.5	0	0	0.0%	0	0	0	0.0%	20	
Gasoline	ND	29.4	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	147	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	141.2	0	147	0	96.0%	50	150	0	0.0%	0	

Sample ID: 0105118-08A DUP Batch ID: 2766 Test Code: EPA 6010B Units: mg/Kg Analysis Date 6/1/01 Prep Date: 5/31/01
Client ID: 5074-010524-008 0105118 Run ID: ICP_010601A SeqNo: 78112

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Chromium	15.1	1	0	0	0.0%	0	0	16.5	8.9%	20	
Lead	5.46	1	0	0	0.0%	0	0	5.89	7.6%	20	

Sample ID: 0105118-41A DUP Batch ID: 2773 Test Code: EPA 8015 Units: mg/Kg-dry Analysis Date 6/4/01 Prep Date: 6/1/01
Client ID: 5074-010524-041 0105118 Run ID: BUTTERCUP_010604A SeqNo: 78544

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	24.7	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	61.7	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	56.79	0	61.7	0	92.0%	50	150	0	0.0%	20	

Sample ID: 0105131-18A DUP Batch ID: 2773 Test Code: EPA 8015 Units: mg/Kg-dry Analysis Date 6/4/01 Prep Date: 6/1/01
Client ID: 0105118 Run ID: BUTTERCUP_010604A SeqNo: 78548

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	21.7	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	54.3	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	50.54	0	54.3	0	93.0%	50	150	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0105111-01A MS** Batch ID: **04 BG S-5/30/** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/29/01** Prep Date:
Client ID: **0105118** Run ID: **CRICK_010529A** SeqNo: **77828**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	3240	543	3260	0	99.4%	80	120	0			
Trifluorotoluene	498	0	543	0	91.7%	50	150	0			

Sample ID: **0105118-10A MS** Batch ID: **04 BG S-5/30/** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/29/01** Prep Date:
Client ID: **5074-010524-010** **0105118** Run ID: **CRICK_010529A** SeqNo: **77838**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	4360	543	4350	0	100.3%	80	120	0			
Trifluorotoluene	495	0	543	0	91.2%	50	150	0			

Sample ID: **0105118-05A MS** Batch ID: **04 BG S-6/4/0** Test Code: **8015/8021** Units: **µg/Kg** Analysis Date **5/31/01** Prep Date:
Client ID: **5074-010524-005** **0105118** Run ID: **CRICK_010531A** SeqNo: **78287**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	169	2.72	163	0	103.7%	85	115	0			
Ethylbenzene	169	2.72	163	0	103.7%	85	115	0			
Gasoline	3500	543	3260	0	107.4%	80	120	0			
Toluene	169	2.72	163	0	103.7%	85	115	0			
Xylenes, Total	512.5	8.15	489	0	104.8%	85	115	0			
Trifluorotoluene	587	0	543	0	108.1%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: 0105121-36B MS | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/Kg | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105118 | Run ID: HORATIO_010530A | SeqNo: 78098

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	238.5	5	250	0	95.4%	0	234	0			
Benzene	233.5	5	250	0	93.4%	37	151	0			
Chlorobenzene	266	5	250	0	106.4%	37	160	0			
Toluene	247	5	250	0	98.8%	47	150	0			
Trichloroethene	246	5	250	0	98.4%	71	157	0			
4-Bromofluorobenzene	276	0	250	0	110.4%	74	121	0			
Dibromofluoromethane	248	0	250	0	99.2%	80	120	0			
Toluene-d8	271	0	250	0	108.4%	81	117	0			

Sample ID: 0105118-02B MS | Batch ID: 2766 | Test Code: EPA 6010B | Units: mg/Kg | Analysis Date 6/1/01 | Prep Date: 5/31/01
Client ID: 5074-010524-002 | 0105118 | Run ID: ICP_010601A | SeqNo: 78109

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	41.9	1	50	0	83.8%	75	125	0			
Chromium	58.6	1	50	10.3	96.6%	75	125	0			
Lead	47.7	1	50	4.4	86.6%	75	125	0			

Sample ID: 0105118-02B MSD | Batch ID: 2766 | Test Code: EPA 6010B | Units: mg/Kg | Analysis Date 6/1/01 | Prep Date: 5/31/01
Client ID: 5074-010524-002 | 0105118 | Run ID: ICP_010601A | SeqNo: 78110

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	42	1	50	0	84.0%	75	125	41.9	0.2%	20	
Chromium	60.2	1	50	10.3	99.8%	75	125	58.6	2.7%	20	
Lead	48.4	1	50	4.4	88.0%	75	125	47.7	1.5%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS | Batch ID: 04 BG S-5/30/ | Test Code: 8015/8021 | Units: µg/Kg | Analysis Date 5/29/01 | Prep Date:
Client ID: 0105118 | Run ID: CRICK_010529A | SeqNo: 77845

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	813	500	800	0	101.6%	80	120	0			
Trifluorotoluene	91.8	0	100	0	91.8%	50	150	0			

Sample ID: LCS | Batch ID: 04 BG S-6/4/0 | Test Code: 8015/8021 | Units: µg/Kg | Analysis Date 5/31/01 | Prep Date:
Client ID: 0105118 | Run ID: CRICK_010531A | SeqNo: 78282

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	156.5	2.5	150	0	104.3%	85	115	0			
Ethylbenzene	157	2.5	150	0	104.7%	85	115	0			
Gasoline	4060	500	4000	0	101.5%	80	120	0			
Toluene	157	2.5	150	0	104.7%	85	115	0			
Xylenes, Total	478	7.5	450	0	106.2%	85	115	0			
Trifluorotoluene	550	0	500	0	110.0%	50	150	0			

Sample ID: LCS | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/Kg | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105118 | Run ID: HORATIO_010530A | SeqNo: 78092

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	225	5	250	0	90.0%	0	234	0			
Benzene	228	5	250	0	91.2%	37	151	0			
Chlorobenzene	236	5	250	0	94.4%	37	160	0			
Toluene	239	5	250	0	95.6%	47	150	0			
Trichloroethene	233	5	250	0	93.2%	71	157	0			
4-Bromofluorobenzene	261.5	0	250	0	104.6%	74	121	0			
Dibromofluoromethane	234.5	0	250	0	93.8%	80	120	0			
Toluene-d8	256.5	0	250	0	102.6%	81	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS-2759 | Batch ID: 2759 | Test Code: EPA 8015 | Units: mg/Kg | Analysis Date 5/30/01 | Prep Date: 5/29/01
Client ID: 0105118 | Run ID: BUTTERCUP_010530A | SeqNo: 77968

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	42.95	20	50	0	85.9%	70	130	0			

Sample ID: LCSD-2759 | Batch ID: 2759 | Test Code: EPA 8015 | Units: mg/Kg | Analysis Date 5/30/01 | Prep Date: 5/29/01
Client ID: 0105118 | Run ID: BUTTERCUP_010530A | SeqNo: 77969

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	43.9	20	50	0	87.8%	70	130	42.95	2.2%	20	

Sample ID: LCS-2766 | Batch ID: 2766 | Test Code: EPA 6010B | Units: mg/Kg | Analysis Date 6/1/01 | Prep Date: 5/31/01
Client ID: 0105118 | Run ID: ICP_010601A | SeqNo: 78107

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	47.5	1	50	0	95.0%	80	120	0			
Chromium	47.9	1	50	0	95.8%	80	120	0			
Lead	47.7	1	50	0	95.4%	80	120	0			

Sample ID: LCS-2773 | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/Kg | Analysis Date 6/4/01 | Prep Date: 6/1/01
Client ID: 0105118 | Run ID: BUTTERCUP_010604A | SeqNo: 78539

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	42.5	20	50	0	85.0%	70	130	0			

Sample ID: LCSD-2773 | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/Kg | Analysis Date 6/4/01 | Prep Date: 6/1/01
Client ID: 0105118 | Run ID: BUTTERCUP_010604A | SeqNo: 78540

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	49.15	20	50	0	98.3%	70	130	42.5	14.5%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 04 BG S-5/30/ | Test Code: 8015/8021 | Units: µg/L | Analysis Date 5/29/01 | Prep Date:
Client ID: 0105118 | Run ID: CRICK_010529A | SeqNo: 77826

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	847	500	800	0	105.9%	80	120	0			
Trifluorotoluene	84.4	0	100	0	84.4%	50	150	0			

Sample ID: CCV | Batch ID: 04 BG S-6/4/0 | Test Code: 8015/8021 | Units: µg/L | Analysis Date 5/31/01 | Prep Date:
Client ID: 0105118 | Run ID: CRICK_010531A | SeqNo: 78280

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	41.6	0.5	40	0	104.0%	85	115	0			
Ethylbenzene	41.9	0.5	40	0	104.8%	85	115	0			
Gasoline	1010	100	1000	0	101.0%	80	120	0			
Toluene	41.7	0.5	40	0	104.3%	85	115	0			
Xylenes, Total	127	1.5	120	0	105.8%	85	115	0			
Trifluorotoluene	107	0	100	0	107.0%	70	130	0			

Sample ID: CCV | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105118 | Run ID: HORATIO_010530A | SeqNo: 78090

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	104	1	100	0	104.0%	80	120	0			
1,2-Dichloropropane	110	1	100	0	110.0%	80	120	0			
Chloroform	101	1	100	0	101.0%	80	120	0			
Ethylbenzene	113	1	100	0	113.0%	80	120	0			
Toluene	108	1	100	0	108.0%	80	120	0			
Vinyl chloride	113	1.2	100	0	113.0%	80	120	0			
4-Bromofluorobenzene	51.3	0	50	0	102.6%	86	115	0			
Dibromofluoromethane	49.2	0	50	0	98.4%	86	118	0			
Toluene-d8	50.8	0	50	0	101.6%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2759 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105118 | Run ID: BUTTERCUP_010530A | SeqNo: 77965

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	421	20	400	0	105.3%	85	115	0			
Oil	417	50	400	0	104.3%	85	115	0			

Sample ID: CCV | Batch ID: 2759 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105118 | Run ID: BUTTERCUP_010530A | SeqNo: 77966

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	375	20	400	0	93.8%	85	115	0			
Oil	361	50	400	0	90.3%	85	115	0			

Sample ID: CCV | Batch ID: 2759 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105118 | Run ID: BUTTERCUP_010530A | SeqNo: 78068

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	434	20	400	0	108.5%	85	115	0			
Oil	442	50	400	0	110.5%	85	115	0			

Sample ID: CCV | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/4/01 | Prep Date:
Client ID: 0105118 | Run ID: BUTTERCUP_010604A | SeqNo: 78536

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	388	20	400	0	97.0%	85	115	0			
Oil	357	50	400	0	89.3%	85	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/4/01 | Prep Date:

Client ID: 0105118 | Run ID: BUTTERCUP_010604A | SeqNo: 78537

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	401	20	400	0	100.3%	85	115	0			
Oil	439	50	400	0	109.8%	85	115	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105118
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Initial Calibration Verification Standard

Sample ID: **ICVLOW** Batch ID: **2766** Test Code: **EPA 6010B** Units: mg/L Analysis Date **6/1/01** Prep Date: **5/31/01**

Client ID: **0105118** Run ID: **ICP_010601A** SeqNo: **78104**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	.485	0.002	0.5	0	97.0%	90	110	0			
Chromium	.476	0.005	0.5	0	95.2%	90	110	0			
Lead	.491	0.005	0.5	0	98.2%	90	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

Lab

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: ESL
Lab Project No.: 0105121

CHAIN OF CUSTODY

Chain of Custody No. 4

Project Manager	Guy Tanz
Project No.	5074
Project Name	Brix Maritime Facility
Collected by	Jay Greifer

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N)
Provide Preliminary Fax Results

Sample Number Prefix: 5074-010525 –

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	HCID by NW TPH Hydrocarbon Identification	NW TPH-G	NW TPH-Dx	BTEX and naphthalene by EPA Method 8021B	DTEX, EDB, EDC, MTBE, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene, iso- and n-propylbenzene by EPA Method 8260B	Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM	Total Lead by EPA Method 6010/200.7	Dissolved Lead (FF) by EPA Method 6010/200.7	RUSH	Remarks
-01	043	5-25-01	816	B24e 3	X			1										
-02	044		826	7														
-03	045		833	11														
-04	046		848	15														
-05	047		849	19														
-06	048		912	23½						*	*							
	049		921	27						*	*		*	*	*			
-08	050		1133	B27e 3														
-09	051		1007	B26e 2														
-10	052		1010	4														
-11	053		1040	6						*	*							
-12	054		1106	9														
-13	055		1119	10														
-14	056		1136	12														
-15	057		1151	14														
-16	058		1207	16														
-17	059		1227	18						*	*							
-18	060		1248	20														
-19	061		1309	22						*	*							
-20	062		1328	24														
-21	063		1416	B29e 7														
-22	064		1421	12														
-23	065		1428	15						*	*							
-24	066		1433	19														
-25	067		1441	23						*	*							
-26	065		1445	27														

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAHN & ASSOC	5/25/01	1600	Guy Tanz	HAI
Guy Tanz	HAI	5/29/01	1125	[signature]	ESL

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory ESL

Lab Project No. 0105121

CHAIN OF CUSTODY

Chain of Custody No. 62

Project Manager	Guy Tanz
Project No.	5074
Project Name	Brix Maritime Facility
Collected by	Jay Greifer

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both

Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N) ____
Appropriate Containers Used (Y or N) ____
Provide Verbal Results (Y or N) ____
Provide Preliminary Fax Results ____

Sample Number Prefix: 5074-010525-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	HCID by NW TPH Hydrocarbon Identification	NW TPH-G	NW TPH-Dx	BTEX and naphthalene by EPA Method 8021B	BTEX, EDB, EDC, MTBE, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene, iso- and n-propylbenzene by EPA Method 8260B	Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM	Total Lead by EPA Method 6010/200.7	Dissolved Lead (FF) by EPA Method 6010/200.7	RUSH	Remarks
-27	069	5-25-01	1501	B28C4	X			1										
-28	070		1504	6						*	*		*	*	*			
-29	071		1508	9														
-30	072		1509	12						*	*							
-31	073		1513	16														
-32	074		1518	20														
	075		1526	23						*	*							
-34	076		1541	27 1/2														
-35	077		1601	B25E4														
-36	078		1605	6						*	*		*	*	*			
-37	079		1611	10														
-38	080		1617	12						*	*							
-39	081		1615	16														
-40	082		1628	20														
-41	083		1646	23														

Relinquished by	Company	Date	Time	Received by	Company
[illegible]	HAHN & ASSOC	5/25/01	1600	GUY TANZ	HAI
GUY TANZ	HAI	5/29/01	1125	[illegible]	ESL

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

June 07, 2001

Mr. Guy Tanz
Hahn and Associates
434 NW Sixth Avenue
Suite 203
Portland, OR 97209
TEL: (503)796-0717
FAX (503) 227-2209

RE: 5074/Brix Maritime Facility Order No.: 0105121

Dear Mr. Guy Tanz,

Environmental Services Laboratory received 41 samples on 5/29/01 for the analyses presented in the following report.

The Samples were analyzed for the following tests:

- GAS/BTEX, Soil (8015/8021)
- ICP Metals (EPA 6010B)
- NWTPH-Dx Soil (EPA 8015)
- PAH BY SIM, Soil (8270-SIM)
- PERCENT MOISTURE (SM 2540)
- Volatiles by GC/MS (EPA 8260B)

There were no analytical problems encountered, and all data met laboratory QC criteria, unless noted in a Case Narrative. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

✓ Base Sample Report ✓ Method Blank Report ✓ Sample Duplicate Report
✓ Matrix Spike/Matrix Spike Duplicate Report ✓ Laboratory Control Spike/Spike Duplicate Report ✓ Continuing Calibration Verification Report ✓ Initial Calibration Verification Report

If you have any questions regarding these test results, please feel free to call.

Sincerely,

June 07, 2001

Mr. Guy Tanz
Hahn and Associates
434 NW Sixth Avenue
Suite 203
Portland, OR 97209
TEL: (503)796-0717
FAX (503) 227-2209

RE: 5074/Brix Maritime Facility

Order No.: 0105121

Dear Mr. Guy Tanz,
Nichole Karl
Project Manager

Nichole Karl

Technical Review

Keith Hunter

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010525-048
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-06A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	26.0		mg/Kg-dry	1	5/30/01
Oil	ND	64.9		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	93.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	649		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	84.8	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	23	0		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010525-049
Lab Order:	0105121	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/25/01
Lab ID:	0105121-07A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	30.3		mg/Kg-dry	1	5/30/01
Oil	ND	75.8		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	91.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	758		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	84.6	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	34	0		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010525-049
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-07B	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 6010B**				Analyst: lmc
Lead	3.28	1.00		mg/Kg	1	6/1/01
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: tmh
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	5/30/01
1,2-Dibromoethane	ND	5.00		µg/Kg	1	5/30/01
1,2-Dichloroethane	ND	5.00		µg/Kg	1	5/30/01
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	5/30/01
Benzene	ND	5.00		µg/Kg	1	5/30/01
Ethylbenzene	ND	5.00		µg/Kg	1	5/30/01
Isopropylbenzene	ND	5.00		µg/Kg	1	5/30/01
m,p-Xylene	ND	10.0		µg/Kg	1	5/30/01
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	5/30/01
n-Propylbenzene	ND	5.00		µg/Kg	1	5/30/01
Naphthalene	ND	25.0		µg/Kg	1	5/30/01
o-Xylene	ND	5.00		µg/Kg	1	5/30/01
Toluene	ND	5.00		µg/Kg	1	5/30/01
Surr: 4-Bromofluorobenzene	103.4	74-121		%REC	1	5/30/01
Surr: Dibromofluoromethane	99.8	80-120		%REC	1	5/30/01
Surr: Toluene-d8	104.0	81-117		%REC	1	5/30/01
PAH BY SIM, SOIL		**8270-SIM**				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	6/1/01
Acenaphthylene	ND	50.0		µg/Kg	1	6/1/01
Anthracene	ND	50.0		µg/Kg	1	6/1/01
Benz(a)anthracene	ND	50.0		µg/Kg	1	6/1/01
Benzo(a)pyrene	ND	50.0		µg/Kg	1	6/1/01
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	6/1/01
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Chrysene	ND	50.0		µg/Kg	1	6/1/01
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	6/1/01
Fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Fluorene	ND	50.0		µg/Kg	1	6/1/01
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	6/1/01
Naphthalene	ND	50.0		µg/Kg	1	6/1/01
Phenanthrene	ND	50.0		µg/Kg	1	6/1/01
Pyrene	ND	50.0		µg/Kg	1	6/1/01
Surr: 2-Fluorobiphenyl	81.0	30-115		%REC	1	6/1/01
Surr: 4-Terphenyl-d14	93.0	18-137		%REC	1	6/1/01
Surr: Nitrobenzene-d5	77.0	23-120		%REC	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

IENT:	Hahn and Associates	**Client Sample ID:**	5074-010525-053
Lab Order:	0105121	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/25/01
Lab ID:	0105121-11A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	460	22.7	AC	mg/Kg-dry	1	5/30/01
Oil	1,360	56.8	AF	mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	00.0	50-150	MI	%REC	1	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	568		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	83.5	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	12	0		wt%	1	5/30/01

lifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

.IENT:	Hahn and Associates	**Client Sample ID:**	5074-010525-059
Lab Order:	0105121	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/25/01
Lab ID:	0105121-17A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	21.7		mg/Kg-dry	1	5/30/01
Oil	ND	54.3		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	98.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	543		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	81.6	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	8.0	0		wt%	1	5/30/01

alifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

.IENT:	Hahn and Associates	**Client Sample ID:**	5074-010525-061
Lab Order:	0105121	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/25/01
Lab ID:	0105121-19A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	27.8		mg/Kg-dry	1	5/30/01
Oil	ND	69.4		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	89.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	694		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	80.5	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	28	0		wt%	1	5/30/01

lifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010525-065
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-23A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	21.7		mg/Kg-dry	1	5/30/01
Oil	ND	54.3		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	89.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	543		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	86.5	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	8.0	0		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010525-067
Lab Order:	0105121	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/25/01
Lab ID:	0105121-25A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	24.7		mg/Kg-dry	1	6/4/01
Oil	ND	61.7		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	102.0	50-150		%REC	1	6/4/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	617		µg/Kg-dry	1	5/31/01
Surr: Trifluorotoluene	84.2	50-150		%REC	1	5/31/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	19	0		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010525-070
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-28A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	560	256	AC	mg/Kg-dry	10	5/30/01
Oil	8,330	641	AF	mg/Kg-dry	10	5/30/01
Surr: O-Terphenyl	00.0	50-150	X	%REC	10	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	829	641		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	76.8	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	22	0		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010525-070
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-28B	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 6010B**				Analyst: lmc
Lead	3.03	1.00		mg/Kg	1	6/1/01
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: tmh
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	5/30/01
1,2-Dibromoethane	ND	5.00		µg/Kg	1	5/30/01
1,2-Dichloroethane	ND	5.00		µg/Kg	1	5/30/01
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	5/30/01
Benzene	ND	5.00		µg/Kg	1	5/30/01
Ethylbenzene	ND	5.00		µg/Kg	1	5/30/01
Isopropylbenzene	ND	5.00		µg/Kg	1	5/30/01
m,p-Xylene	ND	10.0		µg/Kg	1	5/30/01
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	5/30/01
n-Propylbenzene	ND	5.00		µg/Kg	1	5/30/01
Naphthalene	ND	25.0		µg/Kg	1	5/30/01
o-Xylene	ND	5.00		µg/Kg	1	5/30/01
Toluene	ND	5.00		µg/Kg	1	5/30/01
Surr: 4-Bromofluorobenzene	130.0	74-121	MI	%REC	1	5/30/01
Surr: Dibromofluoromethane	105.2	80-120		%REC	1	5/30/01
Surr: Toluene-d8	103.4	81-117		%REC	1	5/30/01
AH BY SIM, SOIL		**8270-SIM**				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	6/1/01
Acenaphthylene	ND	50.0		µg/Kg	1	6/1/01
Anthracene	ND	50.0		µg/Kg	1	6/1/01
Benz(a)anthracene	ND	50.0		µg/Kg	1	6/1/01
Benzo(a)pyrene	ND	50.0		µg/Kg	1	6/1/01
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	6/1/01
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Chrysene	ND	50.0		µg/Kg	1	6/1/01
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	6/1/01
Fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Fluorene	ND	50.0		µg/Kg	1	6/1/01
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	6/1/01
Naphthalene	ND	50.0		µg/Kg	1	6/1/01
Phenanthrene	ND	50.0		µg/Kg	1	6/1/01
Pyrene	ND	50.0		µg/Kg	1	6/1/01
Surr: 2-Fluorobiphenyl	85.0	30-115		%REC	1	6/1/01
Surr: 4-Terphenyl-d14	100.0	18-137		%REC	1	6/1/01
Surr: Nitrobenzene-d5	86.0	23-120		%REC	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

.IENT:	Hahn and Associates	Client Sample ID:	5074-010525-072
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-30A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: smc
Diesel	2,340	465	AC	mg/Kg-dry	20	5/30/01
Oil	22,200	1,160	AF	mg/Kg-dry	20	5/30/01
Surr: O-Terphenyl	00.0	50-150	X	%REC	20	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: jlw
Gasoline	4,240	581		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	103.2	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: etw
% Moisture	14	0		wt%	1	5/30/01

·lifiers:	ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
	J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
	B - Analyte detected in the associated Method Blank	E - Value above quantitation range
	* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010525-075
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-33A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	2,070	435	AC	mg/Kg-dry	20	5/30/01
Oil	19,900	1,090	AF	mg/Kg-dry	20	5/30/01
Surr: O-Terphenyl	00.0	50-150	X	%REC	20	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	4,610	543		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	123.6	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	8.0	0		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

ENT:	Hahn and Associates	Client Sample ID:	5074-010525-078
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-36A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	28.2		mg/Kg-dry	1	5/30/01
Oil	ND	70.4		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	82.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	704		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	81.4	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	29	0		wt%	1	5/30/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010525-078
Lab Order:	0105121	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/25/01
Lab ID:	0105121-36B	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 6010B**				Analyst: lmc
Lead	3.75	1.00		mg/Kg	1	6/1/01
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: tmh
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	5/30/01
1,2-Dibromoethane	ND	5.00		µg/Kg	1	5/30/01
1,2-Dichloroethane	ND	5.00		µg/Kg	1	5/30/01
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	5/30/01
Benzene	ND	5.00		µg/Kg	1	5/30/01
Ethylbenzene	ND	5.00		µg/Kg	1	5/30/01
Isopropylbenzene	13.2	5.00		µg/Kg	1	5/30/01
m,p-Xylene	ND	10.0		µg/Kg	1	5/30/01
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	5/30/01
n-Propylbenzene	20.5	5.00		µg/Kg	1	5/30/01
Naphthalene	ND	25.0		µg/Kg	1	5/30/01
o-Xylene	ND	5.00		µg/Kg	1	5/30/01
Toluene	ND	5.00		µg/Kg	1	5/30/01
Surr: 4-Bromofluorobenzene	110.3	74-121		%REC	1	5/30/01
Surr: Dibromofluoromethane	98.6	80-120		%REC	1	5/30/01
Surr: Toluene-d8	106.1	81-117		%REC	1	5/30/01
PAH BY SIM, SOIL		**8270-SIM**				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	6/1/01
Acenaphthylene	ND	50.0		µg/Kg	1	6/1/01
Anthracene	ND	50.0		µg/Kg	1	6/1/01
Benz(a)anthracene	ND	50.0		µg/Kg	1	6/1/01
Benzo(a)pyrene	ND	50.0		µg/Kg	1	6/1/01
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	6/1/01
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Chrysene	ND	50.0		µg/Kg	1	6/1/01
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	6/1/01
Fluoranthene	ND	50.0		µg/Kg	1	6/1/01
Fluorene	ND	50.0		µg/Kg	1	6/1/01
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	6/1/01
Naphthalene	ND	50.0		µg/Kg	1	6/1/01
Phenanthrene	ND	50.0		µg/Kg	1	6/1/01
Pyrene	ND	50.0		µg/Kg	1	6/1/01
Surr: 2-Fluorobiphenyl	84.0	30-115		%REC	1	6/1/01
Surr: 4-Terphenyl-d14	94.0	18-137		%REC	1	6/1/01
Surr: Nitrobenzene-d5	83.0	23-120		%REC	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010525-080
Lab Order:	0105121	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/25/01
Lab ID:	0105121-38A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	23.8		mg/Kg-dry	1	5/30/01
Oil	ND	59.5		mg/Kg-dry	1	5/30/01
Surr: O-Terphenyl	95.0	50-150		%REC	1	5/30/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	595		µg/Kg-dry	1	5/30/01
Surr: Trifluorotoluene	84.3	50-150		%REC	1	5/30/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	16	0		wt%	1	5/30/01

Qualifiers:

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* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

Sample ID: **MBlank** Batch ID: **04 BG S-6/1/0** Test Code: **8015/8021** Units: **µg/L** Analysis Date **5/30/01** Prep Date:

Client ID: **0105121** Run ID: **CRICK_010530A** SeqNo: **78072**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	500									
Trifluorotoluene	86.6	0	100	0	86.6%	50	150	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Method Blank

Sample ID: MBlank | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: HORATIO_010530A | SeqNo: 78091

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	1
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	10
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

trans-1,2-Dichloroethene	ND	1									
trans-1,3-Dichloropropene	ND	1									
Trichloroethene	ND	1									
Trichlorofluoromethane	ND	2									
Vinyl acetate	ND	1									
Vinyl chloride	ND	1.2									
4-Bromofluorobenzene	49	0	50	0	98.0%	86	115	0			
Dibromofluoromethane	49.1	0	50	0	98.2%	86	118	0			
Toluene-d8	51.7	0	50	0	103.4%	88	110	0			

Sample ID: **MB-2761** Batch ID: **2761** Test Code: **EPA 8015** Units: **mg/Kg** Analysis Date **5/30/01** Prep Date: **5/30/01**

Client ID: **0105121** Run ID: **BUTTERCUP_010530B** SeqNo: **77978**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	20									
Oil	ND	50									
O-Terphenyl	44	0	50	0	88.0%	50	150	0			

Sample ID: **MB-2766** Batch ID: **2766** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date **6/1/01** Prep Date: **5/31/01**

Client ID: **0105121** Run ID: **ICP_010601A** SeqNo: **78106**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	ND	1									
Chromium	ND	1									
Lead	ND	1									

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-2769** Batch ID: **2769** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date **6/1/01** Prep Date: **5/31/01**
Client ID: **0105121** Run ID: **HEISENBURG_010601A** SeqNo: **78171**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									
2-Fluorobiphenyl	455	0	500	0	91.0%	30	115	0			
4-Terphenyl-d14	515	0	500	0	103.0%	18	137	0			
Nitrobenzene-d5	360	0	500	0	72.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0105121-11A DUP** Batch ID: **04 BG S-6/1/0** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/30/01** Prep Date:
Client ID: **5074-010525-053** **0105121** Run ID: **CRICK_010530A** SeqNo: **78077**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	568	0	0	0.0%	0	0	0	0.0%	20	
Trifluorotoluene	87.4	0	114	0	76.9%	50	150	0	0.0%	20	

Sample ID: **0105121-33A DUP** Batch ID: **04 BG S-6/1/0** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/30/01** Prep Date:
Client ID: **5074-010525-075** **0105121** Run ID: **CRICK_010530A** SeqNo: **78086**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	3410	543	0	0	0.0%	0	0	4610	29.9%	20	Q
Trifluorotoluene	431	0	540	0	79.8%	50	150	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Sample Duplicate

Sample ID: 0105121-07B DUP Batch ID: 05 8260 S-6/1 Test Code: EPA 8260B Units: µg/Kg Analysis Date 5/30/01 Prep Date:
Client ID: 5074-010525-049 0105121 Run ID: HORATIO_010530A SeqNo: 78095

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Benzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
m,p-Xylene	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Methyl tert-butyl ether	ND	10	0	0	0.0%	0	0	0	0.0%	20	
n-Propylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Naphthalene	ND	25	0	0	0.0%	0	0	0	0.0%	20	
o-Xylene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
4-Bromofluorobenzene	53.3	0	50	0	106.6%	74	121	0	0.0%	0	
Dibromofluoromethane	48.5	0	50	0	97.0%	80	120	0	0.0%	0	
Toluene-d8	52	0	50	0	104.0%	81	117	0	0.0%	0	

Sample ID: 0105121-07A DUP Batch ID: 2761 Test Code: EPA 8015 Units: mg/Kg-dry Analysis Date 5/30/01 Prep Date: 5/30/01
Client ID: 5074-010525-049 0105121 Run ID: BUTTERCUP_010530B SeqNo: 77982

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	30.3	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	75.8	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	68.18	0	75.8	0	90.0%	50	150	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: 0105121-23A DUP Batch ID: 2761 Test Code: EPA 8015 Units: mg/Kg-dry Analysis Date 5/30/01 Prep Date: 5/30/01

Client ID: 5074-010525-065 0105121 Run ID: BUTTERCUP_010530B SeqNo: 77987

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	21.7	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	54.3	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	53.8	0	54.3	0	99.0%	50	150	0	0.0%	20	

Sample ID: 0105118-08A DUP Batch ID: 2766 Test Code: EPA 6010B Units: mg/Kg Analysis Date 6/1/01 Prep Date: 5/31/01

Client ID: 0105121 Run ID: ICP_010601A SeqNo: 78112

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Chromium	15.1	1	0	0	0.0%	0	0	16.5	8.9%	20	
Lead	5.46	1	0	0	0.0%	0	0	5.89	7.6%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0105121-07B DUP** Batch ID: **2769** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date **6/1/01** Prep Date: **5/31/01**

Client ID: **5074-010525-049** **0105121** Run ID: **HEISENBURG_010601A** SeqNo: **78175**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benz(a)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(a)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(b)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(g,h,i)perylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(k)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Chrysene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Dibenz(a,h)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluorene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Indeno(1,2,3-cd)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Naphthalene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Phenanthrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
2-Fluorobiphenyl	385	0	500	0	77.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	465	0	500	0	93.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	410	0	500	0	82.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0105121-25A MS** Batch ID: **04 BG S-6/1/0** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/30/01** Prep Date:
Client ID: **5074-010525-067** **0105121** Run ID: **CRICK_010530A** SeqNo: **78082**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	3600	617	3700	0	97.3%	80	120	0			
Trifluorotoluene	556	0	617	0	90.0%	50	150	0			

Sample ID: **0105121-36B MS** Batch ID: **05 8260 S-6/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date **5/30/01** Prep Date:
Client ID: **5074-010525-078** **0105121** Run ID: **HORATIO_010530A** SeqNo: **78098**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	238.5	5	250	0	95.4%	0	234	0			
Benzene	233.5	5	250	0	93.4%	37	151	0			
Chlorobenzene	266	5	250	0	106.4%	37	160	0			
Toluene	247	5	250	0	98.8%	47	150	0			
Trichloroethene	246	5	250	0	98.4%	71	157	0			
4-Bromofluorobenzene	276	0	250	0	110.4%	74	121	0			
Dibromofluoromethane	248	0	250	0	99.2%	80	120	0			
Toluene-d8	271	0	250	0	108.4%	81	117	0			

Sample ID: **0105121-06A MS** Batch ID: **2761** Test Code: **EPA 8015** Units: **mg/Kg-dry** Analysis Date **5/30/01** Prep Date: **5/30/01**
Client ID: **5074-010525-048** **0105121** Run ID: **BUTTERCUP_010530B** SeqNo: **78059**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	53.9	26	64.9	0	83.0%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0105118-02B MS** Batch ID: **2766** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date **6/1/01** Prep Date: **5/31/01**
Client ID: **0105121** Run ID: **ICP_010601A** SeqNo: **78109**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	41.9	1	50	0	83.8%	75	125	0			
Chromium	58.6	1	50	10.3	96.6%	75	125	0			
Lead	47.7	1	50	4.4	86.6%	75	125	0			

Sample ID: **0105118-02B MSD** Batch ID: **2766** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date **6/1/01** Prep Date: **5/31/01**
Client ID: **0105121** Run ID: **ICP_010601A** SeqNo: **78110**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	42	1	50	0	84.0%	75	125	41.9	0.2%	20	
Chromium	60.2	1	50	10.3	99.8%	75	125	58.6	2.7%	20	
Lead	48.4	1	50	4.4	88.0%	75	125	47.7	1.5%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0105121-28B MS** Batch ID: **2769** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date **6/1/01** Prep Date: **5/31/01**
Client ID: **5074-010525-070** **0105121** Run ID: **HEISENBURG_010601A** SeqNo: **78177**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	475	50	500	0	95.0%	47	145	0			
Acenaphthylene	470	50	500	0	94.0%	33	145	0			
Anthracene	445	50	500	0	89.0%	27	133	0			
Benz(a)anthracene	490	50	500	0	98.0%	33	143	0			
Benzo(a)pyrene	490	50	500	0	98.0%	17	163	0			
Benzo(b)fluoranthene	370	50	500	0	74.0%	24	159	0			
Benzo(g,h,i)perylene	375	50	500	0	75.0%	1	219	0			
Benzo(k)fluoranthene	570	50	500	0	114.0%	11	162	0			
Chrysene	480	50	500	0	96.0%	17	168	0			
Dibenz(a,h)anthracene	410	50	500	0	82.0%	1	227	0			
Fluoranthene	465	50	500	0	93.0%	26	137	0			
Fluorene	470	50	500	0	94.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	445	50	500	0	89.0%	1	171	0			
Naphthalene	480	50	500	0	96.0%	21	133	0			
Phenanthrene	485	50	500	0	97.0%	54	120	0			
Pyrene	635	50	500	0	127.0%	52	115	0			S
2-Fluorobiphenyl	420	0	500	0	84.0%	30	115	0			
4-Terphenyl-d14	545	0	500	0	109.0%	18	137	0			
Nitrobenzene-d5	400	0	500	0	80.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **04 BG S-6/1/0** Test Code: **8015/8021** Units: **µg/Kg** Analysis Date **5/30/01** Prep Date:
Client ID: **0105121** Run ID: **CRICK_010530A** SeqNo: **78089**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	796	500	800	0	99.5%	80	120	0			
Trifluorotoluene	82.7	0	100	0	82.7%	50	150	0			

Sample ID: **LCS** Batch ID: **05 8260 S-6/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date **5/30/01** Prep Date:
Client ID: **0105121** Run ID: **HORATIO_010530A** SeqNo: **78092**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	225	5	250	0	90.0%	0	234	0			
Benzene	228	5	250	0	91.2%	37	151	0			
Chlorobenzene	236	5	250	0	94.4%	37	160	0			
Toluene	239	5	250	0	95.6%	47	150	0			
Trichloroethene	233	5	250	0	93.2%	71	157	0			
4-Bromofluorobenzene	261.5	0	250	0	104.6%	74	121	0			
Dibromofluoromethane	234.5	0	250	0	93.8%	80	120	0			
Toluene-d8	256.5	0	250	0	102.6%	81	117	0			

Sample ID: **LCS-2761** Batch ID: **2761** Test Code: **EPA 8015** Units: **mg/Kg** Analysis Date **5/30/01** Prep Date: **5/30/01**
Client ID: **0105121** Run ID: **BUTTERCUP_010530B** SeqNo: **77979**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	42.6	20	50	0	85.2%	70	130	0			

Sample ID: **LCSD-2761** Batch ID: **2761** Test Code: **EPA 8015** Units: **mg/Kg** Analysis Date **5/30/01** Prep Date: **5/30/01**
Client ID: **0105121** Run ID: **BUTTERCUP_010530B** SeqNo: **77980**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	41.65	20	50	0	83.3%	70	130	42.6	2.3%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Laboratory Control Spike - generic

Sample ID: LCS-2766 | Batch ID: 2766 | Test Code: EPA 6010B | Units: mg/Kg | Analysis Date 6/1/01 | Prep Date: 5/31/01
Client ID: 0105121 | Run ID: ICP_010601A | SeqNo: 78107

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	47.5	1	50	0	95.0%	80	120	0			
Chromium	47.9	1	50	0	95.8%	80	120	0			
Lead	47.7	1	50	0	95.4%	80	120	0			

Sample ID: LCS-2769 | Batch ID: 2769 | Test Code: 8270-SIM | Units: µg/Kg | Analysis Date 6/1/01 | Prep Date: 5/31/01
Client ID: 0105121 | Run ID: HEISENBURG_010601A | SeqNo: 78172

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	430	50	500	0	86.0%	47	145	0			
Acenaphthylene	410	50	500	0	82.0%	33	145	0			
Anthracene	350	50	500	0	70.0%	27	133	0			
Benz(a)anthracene	400	50	500	0	80.0%	33	143	0			
Benzo(a)pyrene	255	50	500	0	51.0%	17	163	0			
Benzo(b)fluoranthene	420	50	500	0	84.0%	24	159	0			
Benzo(g,h,i)perylene	390	50	500	0	78.0%	1	219	0			
Benzo(k)fluoranthene	440	50	500	0	88.0%	11	162	0			
Chrysene	445	50	500	0	89.0%	17	168	0			
Dibenz(a,h)anthracene	465	50	500	0	93.0%	1	227	0			
Fluoranthene	405	50	500	0	81.0%	26	137	0			
Fluorene	420	50	500	0	84.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	495	50	500	0	99.0%	1	171	0			
Naphthalene	470	50	500	0	94.0%	21	133	0			
Phenanthrene	410	50	500	0	82.0%	54	120	0			
Pyrene	480	50	500	0	96.0%	52	115	0			
2-Fluorobiphenyl	425	0	500	0	85.0%	30	115	0			
4-Terphenyl-d14	470	0	500	0	94.0%	18	137	0			
Nitrobenzene-d5	310	0	500	0	62.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: LCSD-2769 Batch ID: 2769 Test Code: 8270-SIM Units: µg/Kg Analysis Date 6/1/01 Prep Date: 5/31/01
Client ID: 0105121 Run ID: HEISENBURG_010601A SeqNo: 78173

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	445	50	500	0	89.0%	47	145	430	3.4%	30	
Acenaphthylene	415	50	500	0	83.0%	33	145	410	1.2%	30	
Anthracene	375	50	500	0	75.0%	27	133	350	6.9%	30	
Benz(a)anthracene	390	50	500	0	78.0%	33	143	400	2.5%	30	
Benzo(a)pyrene	320	50	500	0	64.0%	17	163	255	22.6%	30	
Benzo(b)fluoranthene	410	50	500	0	82.0%	24	159	420	2.4%	30	
Benzo(g,h,i)perylene	420	50	500	0	84.0%	1	219	390	7.4%	30	
Benzo(k)fluoranthene	435	50	500	0	87.0%	11	162	440	1.1%	30	
Chrysene	430	50	500	0	86.0%	17	168	445	3.4%	30	
Dibenz(a,h)anthracene	445	50	500	0	89.0%	1	227	465	4.4%	30	
Fluoranthene	400	50	500	0	80.0%	26	137	405	1.2%	30	
Fluorene	405	50	500	0	81.0%	59	121	420	3.6%	30	
Indeno(1,2,3-cd)pyrene	475	50	500	0	95.0%	1	171	495	4.1%	30	
Naphthalene	540	50	500	0	108.0%	21	133	470	13.9%	30	
Phenanthrene	400	50	500	0	80.0%	54	120	410	2.5%	30	
Pyrene	500	50	500	0	100.0%	52	115	480	4.1%	30	
2-Fluorobiphenyl	425	0	500	0	85.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	460	0	500	0	92.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	420	0	500	0	84.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 04 BG S-6/1/0 | Test Code: 8015/8021 | Units: µg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: CRICK_010530A | SeqNo: 78073

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	1030	500	1000	0	103.0%	80	120	0			
Trifluorotoluene	81.1	0	100	0	81.1%	50	150	0			

Sample ID: CCV | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: HORATIO_010530A | SeqNo: 78090

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	104	1	100	0	104.0%	80	120	0			
1,2-Dichloropropane	110	1	100	0	110.0%	80	120	0			
Chloroform	101	1	100	0	101.0%	80	120	0			
Ethylbenzene	113	1	100	0	113.0%	80	120	0			
Toluene	108	1	100	0	108.0%	80	120	0			
Vinyl chloride	113	1.2	100	0	113.0%	80	120	0			
4-Bromofluorobenzene	51.3	0	50	0	102.6%	86	115	0			
Dibromofluoromethane	49.2	0	50	0	98.4%	86	118	0			
Toluene-d8	50.8	0	50	0	101.6%	88	110	0			

Sample ID: CCV | Batch ID: 2761 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: BUTTERCUP_010530A | SeqNo: 77965

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	421	20	400	0	105.3%	85	115	0			
Oil	417	50	400	0	104.3%	85	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2761 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: BUTTERCUP_010530A | SeqNo: 77966

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	375	20	400	0	93.8%	85	115	0			
Oil	361	50	400	0	90.3%	85	115	0			

Sample ID: CCV | Batch ID: 2761 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: BUTTERCUP_010530B | SeqNo: 77976

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	388	20	400	0	97.0%	85	115	0			
Oil	453	50	400	0	113.3%	85	115	0			

Sample ID: CCV | Batch ID: 2761 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: BUTTERCUP_010530B | SeqNo: 77977

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	441	20	400	0	110.3%	85	115	0			
Oil	443	50	400	0	110.8%	85	115	0			

Sample ID: CCV | Batch ID: 2761 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: BUTTERCUP_010530B | SeqNo: 78057

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	390	20	400	0	97.5%	85	115	0			
Oil	452	50	400	0	113.0%	85	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2761 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 5/30/01 | Prep Date:
Client ID: 0105121 | Run ID: BUTTERCUP_010530A | SeqNo: 78068

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	434	20	400	0	108.5%	85	115	0			
Oil	442	50	400	0	110.5%	85	115	0			

Sample ID: CCV | Batch ID: 2761 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/4/01 | Prep Date:
Client ID: 0105121 | Run ID: BUTTERCUP_010604A | SeqNo: 78536

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	388	20	400	0	97.0%	85	115	0			
Oil	357	50	400	0	89.3%	85	115	0			

Sample ID: CCV | Batch ID: 2761 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/4/01 | Prep Date:
Client ID: 0105121 | Run ID: BUTTERCUP_010604A | SeqNo: 78537

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	401	20	400	0	100.3%	85	115	0			
Oil	439	50	400	0	109.8%	85	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2769 | Test Code: 8270-SIM | Units: µg/L | Analysis Date 6/1/01 | Prep Date:

Client ID: 0105121 | Run ID: HEISENBURG_010601A | SeqNo: 78170

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1.79	0.1	2	0	89.5%	80	120	0			
Acenaphthylene	1.72	0.1	2	0	86.0%	80	120	0			
Anthracene	1.72	0.1	2	0	86.0%	80	120	0			
Benz(a)anthracene	1.73	0.1	2	0	86.5%	80	120	0			
Benzo(a)pyrene	1.77	0.1	2	0	88.5%	80	120	0			
Benzo(b)fluoranthene	1.85	0.1	2	0	92.5%	80	120	0			
Benzo(g,h,i)perylene	1.8	0.1	2	0	90.0%	80	120	0			
Benzo(k)fluoranthene	1.82	0.1	2	0	91.0%	80	120	0			
Chrysene	1.78	0.1	2	0	89.0%	80	120	0			
Dibenz(a,h)anthracene	1.89	0.1	2	0	94.5%	80	120	0			
Fluoranthene	1.66	0.1	2	0	83.0%	80	120	0			
Fluorene	1.75	0.1	2	0	87.5%	80	120	0			
Indeno(1,2,3-cd)pyrene	2.02	0.1	2	0	101.0%	80	120	0			
Naphthalene	2.17	0.1	2	0	108.5%	80	120	0			
Phenanthrene	1.75	0.1	2	0	87.5%	80	120	0			
Pyrene	2.02	0.1	2	0	101.0%	80	120	0			
2-Fluorobiphenyl	1.78	0	2	0	89.0%	30	115	0			
4-Terphenyl-d14	2.07	0	2	0	103.5%	18	137	0			
Nitrobenzene-d5	1.77	0	2	0	88.5%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105121
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Initial Calibration Verification Standard

Sample ID: **ICVLOW** Batch ID: **2766** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date **6/1/01** Prep Date: **5/31/01**

Client ID: **0105121** Run ID: **ICP_010601A** SeqNo: **78104**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	.485	0.002	0.5	0	97.0%	90	110	0			
Chromium	.476	0.005	0.5	0	95.2%	90	110	0			
Lead	.491	0.005	0.5	0	98.2%	90	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Hal

HAHN AND ASSOCIATES, INC.
Environmental Management
34 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory ESL
Lab Project No. ~~0105121~~ 0106055

CHAIN OF CUSTODY

Chain of Custody No. 4

Project Manager	Guy Tanz
Project No.	5074
Project Name	Brix Maritime Facility
Collected by	Jay Greifer

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N)
Provide Preliminary Fax Results

Sample Number Prefix: 5074-010525 –

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	HCID by NW TPH Hydrocarbon Identification	NW TPH-G	NW TPH-Dx	BTEX and naphthalene by EPA Method 8021B	BTEX, EDB, EDC, MTBE, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene, iso- and n-propylbenzene by EPA Method 8260B	Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM	Total Lead by EPA Method 6010/200.7	Dissolved Lead (FP) by EPA Method 6010/200.7	HUSII	Remarks
-01	043	5-25-01	816	B24e 3	X			1										
-02	044		826	7														
-03	045		833	11														
-04	046		840	15														
-05	047		849	19														
-06	048		912	23 1/2					*	*								
-07	049		921	27					*	*			*	*	*			
-08	050		1132	B27e 3					X	X			X	X				
-09	051		1607	B26e 2														
-10	052		1610	4														
-11	053		1640	6					*	*								
-12	054		1106	9														
-13	055		1114	10														
-14	056		1136	12														
-15	057		1151	14														
-16	058		1207	16														
-17	059		1227	18					*	*								
-18	060		1248	20														
-19	061		1309	22					*	*								
-20	062		1328	24														
-21	063		1416	B29e 7														
-22	064		1421	12														
-23	065		1428	15					*	*								
-24	066		1433	19														
-25	067		1441	23					*	*								
-26	068		1445	27														

Relinquished by	Company	Date	Time	Received by	Company
[illegible]	HAHN & ASSOC	5/25/01	1600	Guy Tanz	HAI
Relinquished by	Company	Date	Time	Received by	Company
Guy Tanz	HAI	5/29/01	1125	[illegible]	ESL

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

June 20, 2001

Mr. Guy Tanz
Hahn and Associates
434 NW Sixth Avenue
Suite 203
Portland, OR 97209
TEL: (503)796-0717
FAX (503) 227-2209

RE: 5074/Brix Maritme Facility Order No.: 0106055

Dear Mr. Guy Tanz,

Environmental Services Laboratory received 1 sample on 6/12/01 for the analyses presented in the following report.

The Samples were analyzed for the following tests:

GAS/BTEX, Soil (8015/8021)
NWTPH-Dx Soil (EPA 8015)
PAH BY SIM, Soil (8270-SIM)
PERCENT MOISTURE (SM 2540)
Volatiles by GC/MS (EPA 8260B)

There were no analytical problems encountered, and all data met laboratory QC criteria, unless noted in a Case Narrative. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

__Base Sample Report __Method Blank Report __Sample Duplicate Report __Matrix Spike/Matrix Spike Duplicate Report __Laboratory Control Spike/Spike Duplicate Report __Continuing Calibration Verification Report __Initial Calibration Verification Report

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Nichole Karl

Nichole Karl

Keith Hunter

Technical Review

Environmental Services Laboratory

Date: *20-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010525-050
Lab Order:	0106055	**Tag Number:**	
Project:	5074/Brix Maritme Facility	**Collection Date:**	5/25/01
Lab ID:	0106055-01A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	468	225	AC	mg/Kg-dry	10	6/19/01
Oil	6,010	562	AF	mg/Kg-dry	10	6/19/01
Surr: O-Terphenyl	00.0	50-150	X	%REC	10	6/19/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **tmh**
Gasoline	ND	562		µg/Kg-dry	1	6/13/01
Surr: Trifluorotoluene	78.7	70-130		%REC	1	6/13/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	11.0	0		wt%	1	6/14/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *20-Jun-01*

.IENT:	Hahn and Associates	**Client Sample ID:**	5074-010525-050
Lab Order:	0106055	**Tag Number:**	
Project:	5074/Brix Maritme Facility	**Collection Date:**	5/25/01
Lab ID:	0106055-01B	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		EPA 8260B				Analyst: tmh
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	6/13/01
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	6/13/01
Benzene	ND	5.00		µg/Kg	1	6/13/01
Ethylbenzene	ND	5.00		µg/Kg	1	6/13/01
Isopropylbenzene	ND	5.00		µg/Kg	1	6/13/01
m,p-Xylene	ND	10.0		µg/Kg	1	6/13/01
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	6/13/01
n-Propylbenzene	ND	5.00		µg/Kg	1	6/13/01
Naphthalene	ND	25.0		µg/Kg	1	6/13/01
o-Xylene	ND	5.00		µg/Kg	1	6/13/01
Toluene	ND	5.00		µg/Kg	1	6/13/01
Surr: 4-Bromofluorobenzene	122.4	74-121	S	%REC	1	6/13/01
Surr: Dibromofluoromethane	101.2	80-120		%REC	1	6/13/01
Surr: Toluene-d8	103.0	81-117		%REC	1	6/13/01
PAH BY SIM, SOIL		8270-SIM				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	6/14/01
Acenaphthylene	ND	50.0		µg/Kg	1	6/14/01
thracene	ND	50.0		µg/Kg	1	6/14/01
enz(a)anthracene	ND	50.0		µg/Kg	1	6/14/01
Benzo(a)pyrene	ND	50.0		µg/Kg	1	6/14/01
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	6/14/01
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	6/14/01
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	6/14/01
Chrysene	ND	50.0		µg/Kg	1	6/14/01
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	6/14/01
Fluoranthene	ND	50.0		µg/Kg	1	6/14/01
Fluorene	ND	50.0		µg/Kg	1	6/14/01
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	6/14/01
Naphthalene	ND	50.0		µg/Kg	1	6/14/01
Phenanthrene	ND	50.0		µg/Kg	1	6/14/01
Pyrene	ND	50.0		µg/Kg	1	6/14/01
Surr: 2-Fluorobiphenyl	84.0	30-115		%REC	1	6/14/01
Surr: 4-Terphenyl-d14	86.0	18-137		%REC	1	6/14/01
Surr: Nitrobenzene-d5	74.0	23-120		%REC	1	6/14/01

ualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *20-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT

Method Blank

Sample ID: **MBlank** Batch ID: **04 BG S-6/14/** Test Code: **8015/8021** Units: **µg/L** Analysis Date **6/13/01** Prep Date:

Client ID: **0106055** Run ID: **CRICK_010613A** SeqNo: **79124**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.5									
Ethylbenzene	ND	0.5									
Gasoline	ND	100									
Methyl tert-Butyl Ether	ND	5									
Naphthalene	ND	2									
Toluene	ND	0.5									
Xylenes, Total	ND	1.5									
Trifluorotoluene	118	0	100	0	118.0%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT
Method Blank

Sample ID: MBlank | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/L | Analysis Date 6/13/01 | Prep Date:
Client ID: | 0106055 | Run ID: HORATIO_010613A | SeqNo: 79081

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT
Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	1
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	10
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	48.4	0	50	0	96.8%	86	115	0
Dibromofluoromethane	46.8	0	50	0	93.6%	86	118	0
Toluene-d8	50.4	0	50	0	100.8%	88	110	0

Sample ID: **MB-2805** Batch ID: **2805** Test Code: **EPA 8015** Units: **mg/Kg** Analysis Date **6/14/01** Prep Date: **6/13/01**

Client ID: **0106055** Run ID: **BUTTERCUP_010614C** SeqNo: **79543**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	20									
Oil	ND	50									
O-Terphenyl	48	0	50	0	96.0%	50	150	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT
Method Blank

Sample ID: MB-2806 | Batch ID: 2806 | Test Code: 8270-SIM | Units: µg/Kg | Analysis Date 6/14/01 | Prep Date: 6/13/01
Client ID: 0106055 | Run ID: HEISENBURG_010614A | SeqNo: 79341

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									
2-Fluorobiphenyl	425	0	500	0	85.0%	30	115	0			
4-Terphenyl-d14	400	0	500	0	80.0%	18	137	0			
Nitrobenzene-d5	385	0	500	0	77.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *20-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0106061-03B DUP** Batch ID: **04 BG S-6/14/** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **6/13/01** Prep Date:
Client ID: **0106055** Run ID: **CRICK_010613A** SeqNo: **79129**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	15.4	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	808.6	15.4	0	0	0.0%	0	0	1105	31.0%	20	Q
Gasoline	108000	3090	0	0	0.0%	0	0	129000	17.7%	20	
Naphthalene	475.3	61.7	0	0	0.0%	0	0	2090	125.9%	20	Q
Toluene	15.4	15.4	0	0	0.0%	0	0	37.04	82.5%	20	T
Xylenes, Total	1009	46.3	0	0	0.0%	0	0	1188	16.3%	20	
Trifluorotoluene	2657	0	3090	0	86.0%	50	150	0	0.0%	20	

Sample ID: **0106055-01B DUP** Batch ID: **05 8260 S-6/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date **6/13/01** Prep Date:
Client ID: **5074-010525-050** **0106055** Run ID: **HORATIO_010613A** SeqNo: **79084**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Benzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Isopropylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
m,p-Xylene	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Methyl tert-butyl ether	ND	10	0	0	0.0%	0	0	0	0.0%	20	
n-Propylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Naphthalene	ND	25	0	0	0.0%	0	0	0	0.0%	20	
o-Xylene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
4-Bromofluorobenzene	61.6	0	50	0	123.2%	74	121	0	0.0%	0	S
Dibromofluoromethane	48.4	0	50	0	96.8%	80	120	0	0.0%	0	
Toluene-d8	53.2	0	50	0	106.4%	81	117	0	0.0%	0	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT
Sample Duplicate

Sample ID: 0106005-20A DUP Batch ID: 2805 Test Code: EPA 8015 Units: mg/Kg-dry Analysis Date 6/13/01 Prep Date: 6/13/01
Client ID: 0106055 Run ID: BUTTERCUP_010613A SeqNo: 79164

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	23	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	57.5	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	55.17	0	57.5	0	96.0%	50	150	0	0.0%	20	

Sample ID: 0106009-14B DUP Batch ID: 2806 Test Code: 8270-SIM Units: µg/Kg Analysis Date 6/14/01 Prep Date: 6/13/01
Client ID: 0106055 Run ID: HEISENBURG_010614A SeqNo: 79345

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benz(a)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(a)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(b)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(g,h,i)perylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(k)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Chrysene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Dibenz(a,h)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluorene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Indeno(1,2,3-cd)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Naphthalene	18200	50	0	0	0.0%	0	0	13000	33.3%	30	Q
Phenanthrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
2-Fluorobiphenyl	420	0	500	0	84.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	395	0	500	0	79.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	ND	0	500	0	0.0%	23	120	0	0.0%	30	MI

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *20-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0106055-01A MS** Batch ID: **04 BG S-6/14/** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **6/13/01** Prep Date:
Client ID: **5074-010525-050** **0106055** Run ID: **CRICK_010613A** SeqNo: **79127**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	3365	562	3370	0	99.9%	80	120	0			
Trifluorotoluene	485.4	0	562	0	86.4%	70	130	0			

Sample ID: **0106063-01A MS** Batch ID: **04 BG S-6/14/** Test Code: **8015/8021** Units: **µg/Kg** Analysis Date **6/13/01** Prep Date:
Client ID: **0106055** Run ID: **CRICK_010613A** SeqNo: **79137**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	208.5	2.5	200	0	104.3%	85	115	0			
Ethylbenzene	199	2.5	200	0	99.5%	85	115	0			
Toluene	205.5	2.5	200	0	102.8%	85	115	0			
Xylenes, Total	600	7.5	600	0	100.0%	85	115	0			
Trifluorotoluene	555	0	500	0	111.0%	70	130	0			

Sample ID: **0106062-06B MS** Batch ID: **05 8260 S-6/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date **6/13/01** Prep Date:
Client ID: **0106055** Run ID: **HORATIO_010613A** SeqNo: **79093**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	206.5	5	250	0	82.6%	0	234	0			
Benzene	227	5	250	0	90.8%	37	151	0			
Chlorobenzene	261.5	5	250	0	104.6%	37	160	0			
Toluene	226	5	250	0	90.4%	47	150	0			
Trichloroethene	281.5	5	250	0	112.6%	71	157	0			
4-Bromofluorobenzene	289.5	0	250	0	115.8%	74	121	0			
Dibromofluoromethane	236.5	0	250	0	94.6%	80	120	0			
Toluene-d8	265.5	0	250	0	106.2%	81	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 0106055-01A MS | Batch ID: 2805 | Test Code: EPA 8015 | Units: mg/Kg-dry | Analysis Date 6/19/01 | Prep Date: 6/13/01
Client ID: 5074-010525-050 | 0106055 | Run ID: BUTTERCUP_010619A | SeqNo: 79776

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	526.4	225	56.2	468	104.0%	70	130	0			

Sample ID: 0106009-16B MS | Batch ID: 2806 | Test Code: 8270-SIM | Units: µg/Kg | Analysis Date 6/14/01 | Prep Date: 6/13/01
Client ID: | 0106055 | Run ID: HEISENBURG_010614A | SeqNo: 79347

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	395	50	500	0	79.0%	47	145	0			
Acenaphthylene	380	50	500	0	76.0%	33	145	0			
Anthracene	335	50	500	0	67.0%	27	133	0			
Benz(a)anthracene	375	50	500	0	75.0%	33	143	0			
Benzo(a)pyrene	335	50	500	0	67.0%	17	163	0			
Benzo(b)fluoranthene	320	50	500	0	64.0%	24	159	0			
Benzo(g,h,i)perylene	285	50	500	0	57.0%	1	219	0			
Benzo(k)fluoranthene	405	50	500	0	81.0%	11	162	0			
Chrysene	400	50	500	0	80.0%	17	168	0			
Dibenz(a,h)anthracene	320	50	500	0	64.0%	1	227	0			
Fluoranthene	430	50	500	0	86.0%	26	137	0			
Fluorene	355	50	500	0	71.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	310	50	500	0	62.0%	1	171	0			
Naphthalene	395	50	500	0	79.0%	21	133	0			
Phenanthrene	325	50	500	0	65.0%	54	120	0			
Pyrene	355	50	500	0	71.0%	52	115	0			
2-Fluorobiphenyl	370	0	500	0	74.0%	30	115	0			
4-Terphenyl-d14	345	0	500	0	69.0%	18	137	0			
Nitrobenzene-d5	290	0	500	0	58.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *20-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS | Batch ID: 04 BG S-6/14/ | Test Code: 8015/8021 | Units: µg/Kg | Analysis Date 6/13/01 | Prep Date:
Client ID: 0106055 | Run ID: CRICK_010613A | SeqNo: 79125

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	41.4	2.5	40	0	103.5%	85	115	0			
Ethylbenzene	42.3	2.5	40	0	105.8%	85	115	0			
Gasoline	974	500	1000	0	97.4%	80	120	0			
Naphthalene	39.7	10	40	0	99.3%	85	115	0			
Toluene	42	2.5	40	0	105.0%	85	115	0			
Xylenes, Total	129	7.5	120	0	107.5%	85	115	0			
Trifluorotoluene	112	0	100	0	112.0%	50	150	0			

Sample ID: LCS | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/Kg | Analysis Date 6/13/01 | Prep Date:
Client ID: 0106055 | Run ID: HORATIO_010613A | SeqNo: 79082

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	213.5	5	250	0	85.4%	0	234	0			
Benzene	206	5	250	0	82.4%	37	151	0			
Chlorobenzene	215.5	5	250	0	86.2%	37	160	0			
Toluene	227.5	5	250	0	91.0%	47	150	0			
Trichloroethene	215.5	5	250	0	86.2%	71	157	0			
4-Bromofluorobenzene	254	0	250	0	101.6%	74	121	0			
Dibromofluoromethane	239.5	0	250	0	95.8%	80	120	0			
Toluene-d8	256.5	0	250	0	102.6%	81	117	0			

Sample ID: LCS-2805 | Batch ID: 2805 | Test Code: EPA 8015 | Units: mg/Kg | Analysis Date 6/13/01 | Prep Date: 6/13/01
Client ID: 0106055 | Run ID: BUTTERCUP_010613A | SeqNo: 79154

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	51	20	50	0	102.0%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: LCSD-2805 | Batch ID: 2805 | Test Code: EPA 8015 | Units: mg/Kg | Analysis Date 6/13/01 | Prep Date: 6/13/01
Client ID: 0106055 | Run ID: BUTTERCUP_010613A | SeqNo: 79155

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	49.55	20	50	0	99.1%	70	130	51	2.9%	20	

Sample ID: LCS-2806 | Batch ID: 2806 | Test Code: 8270-SIM | Units: µg/Kg | Analysis Date 6/14/01 | Prep Date: 6/13/01
Client ID: 0106055 | Run ID: HEISENBURG_010614A | SeqNo: 79342

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	425	50	500	0	85.0%	47	145	0			
Acenaphthylene	410	50	500	0	82.0%	33	145	0			
Anthracene	365	50	500	0	73.0%	27	133	0			
Benz(a)anthracene	400	50	500	0	80.0%	33	143	0			
Benzo(a)pyrene	240	50	500	0	48.0%	17	163	0			
Benzo(b)fluoranthene	370	50	500	0	74.0%	24	159	0			
Benzo(g,h,i)perylene	340	50	500	0	68.0%	1	219	0			
Benzo(k)fluoranthene	430	50	500	0	86.0%	11	162	0			
Chrysene	415	50	500	0	83.0%	17	168	0			
Dibenz(a,h)anthracene	380	50	500	0	76.0%	1	227	0			
Fluoranthene	465	50	500	0	93.0%	26	137	0			
Fluorene	400	50	500	0	80.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	380	50	500	0	76.0%	1	171	0			
Naphthalene	425	50	500	0	85.0%	21	133	0			
Phenanthrene	365	50	500	0	73.0%	54	120	0			
Pyrene	375	50	500	0	75.0%	52	115	0			
2-Fluorobiphenyl	390	0	500	0	78.0%	30	115	0			
4-Terphenyl-d14	355	0	500	0	71.0%	18	137	0			
Nitrobenzene-d5	340	0	500	0	68.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-2806** Batch ID: **2806** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date **6/14/01** Prep Date: **6/13/01**
Client ID: **0106055** Run ID: **HEISENBURG_010614A** SeqNo: **79343**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	405	50	500	0	81.0%	47	145	425	4.8%	30	
Acenaphthylene	390	50	500	0	78.0%	33	145	410	5.0%	30	
Anthracene	330	50	500	0	66.0%	27	133	365	10.1%	30	
Benz(a)anthracene	385	50	500	0	77.0%	33	143	400	3.8%	30	
Benzo(a)pyrene	205	50	500	0	41.0%	17	163	240	15.7%	30	
Benzo(b)fluoranthene	340	50	500	0	68.0%	24	159	370	8.5%	30	
Benzo(g,h,i)perylene	305	50	500	0	61.0%	1	219	340	10.9%	30	
Benzo(k)fluoranthene	420	50	500	0	84.0%	11	162	430	2.4%	30	
Chrysene	405	50	500	0	81.0%	17	168	415	2.4%	30	
Dibenz(a,h)anthracene	365	50	500	0	73.0%	1	227	380	4.0%	30	
Fluoranthene	450	50	500	0	90.0%	26	137	465	3.3%	30	
Fluorene	385	50	500	0	77.0%	59	121	400	3.8%	30	
Indeno(1,2,3-cd)pyrene	355	50	500	0	71.0%	1	171	380	6.8%	30	
Naphthalene	400	50	500	0	80.0%	21	133	425	6.1%	30	
Phenanthrene	350	50	500	0	70.0%	54	120	365	4.2%	30	
Pyrene	360	50	500	0	72.0%	52	115	375	4.1%	30	
2-Fluorobiphenyl	380	0	500	0	76.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	350	0	500	0	70.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	330	0	500	0	66.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *20-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 04 BG S-6/14/ | Test Code: 8015/8021 | Units: µg/L | Analysis Date 6/13/01 | Prep Date:
Client ID: 0106055 | Run ID: CRICK_010613A | SeqNo: 79123

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	31.8	2.5	30	0	106.0%	85	115	0			
Ethylbenzene	32.3	2.5	30	0	107.7%	85	115	0			
Gasoline	633	500	600	0	105.5%	80	120	0			
Naphthalene	31.7	10	30	0	105.7%	85	115	0			
Toluene	32.4	2.5	30	0	108.0%	85	115	0			
Xylenes, Total	98.5	7.5	90	0	109.4%	85	115	0			
Trifluorotoluene	116	0	100	0	116.0%	70	130	0			

Sample ID: CCV | Batch ID: 05 8260 S-6/1 | Test Code: EPA 8260B | Units: µg/L | Analysis Date 6/13/01 | Prep Date:
Client ID: 0106055 | Run ID: HORATIO_010613A | SeqNo: 79080

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	97.7	1	100	0	97.7%	80	120	0			
1,2-Dichloropropane	104	1	100	0	104.0%	80	120	0			
Chloroform	92.7	1	100	0	92.7%	80	120	0			
Ethylbenzene	110	1	100	0	110.0%	80	120	0			
Toluene	103	1	100	0	103.0%	80	120	0			
Vinyl chloride	94.4	1.2	100	0	94.4%	80	120	0			
4-Bromofluorobenzene	53.5	0	50	0	107.0%	86	115	0			
Dibromofluoromethane	47	0	50	0	94.0%	86	118	0			
Toluene-d8	50.6	0	50	0	101.2%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2805 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/19/01 | Prep Date:
Client ID: 0106055 | Run ID: BUTTERCUP_010619A | SeqNo: 79770

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	350	20	400	0	87.5%	85	115	0			
Oil	359	50	400	0	89.8%	85	115	0			

Sample ID: CCV | Batch ID: 2805 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/19/01 | Prep Date:
Client ID: 0106055 | Run ID: BUTTERCUP_010619A | SeqNo: 79771

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	414	20	400	0	103.5%	85	115	0			
Oil	435	50	400	0	108.8%	85	115	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0106055
Project: 5074/Brix Maritme Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2806 | Test Code: 8270-SIM | Units: µg/L | Analysis Date 6/14/01 | Prep Date:

Client ID: 0106055 | Run ID: HEISENBURG_010614A | SeqNo: 79340

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1.83	0.1	2	0	91.5%	80	120	0			
Acenaphthylene	1.83	0.1	2	0	91.5%	80	120	0			
Anthracene	1.75	0.1	2	0	87.5%	80	120	0			
Benz(a)anthracene	1.86	0.1	2	0	93.0%	80	120	0			
Benzo(a)pyrene	1.86	0.1	2	0	93.0%	80	120	0			
Benzo(b)fluoranthene	1.67	0.1	2	0	83.5%	80	120	0			
Benzo(g,h,i)perylene	1.61	0.1	2	0	80.5%	80	120	0			
Benzo(k)fluoranthene	1.78	0.1	2	0	89.0%	80	120	0			
Chrysene	1.74	0.1	2	0	87.0%	80	120	0			
Dibenz(a,h)anthracene	1.78	0.1	2	0	89.0%	80	120	0			
Fluoranthene	1.93	0.1	2	0	96.5%	80	120	0			
Fluorene	1.86	0.1	2	0	93.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	1.75	0.1	2	0	87.5%	80	120	0			
Naphthalene	1.81	0.1	2	0	90.5%	80	120	0			
Phenanthrene	1.68	0.1	2	0	84.0%	80	120	0			
Pyrene	1.65	0.1	2	0	82.5%	80	120	0			
2-Fluorobiphenyl	1.74	0	2	0	87.0%	30	115	0			
4-Terphenyl-d14	1.67	0	2	0	83.5%	18	137	0			
Nitrobenzene-d5	1.71	0	2	0	85.5%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

ENVIRONMENTAL SERVICES LABORATORY -- GLOSSARY OF FLAGS

Qualifier	Description
AA	This sample was analyzed after the holding time had expired.
AB	The hydrocarbon pattern in this sample is not typical of gasoline.
AC	The hydrocarbon pattern in this sample is not typical of diesel.
AD	The hydrocarbon pattern in this sample is not typical of oil.
AE	The hydrocarbon pattern in this sample extends into the gasoline range.
AF	The hydrocarbon pattern in this sample extends into the diesel range.
AG	The hydrocarbon pattern in this sample extends into the oil range.
A	This analysis was performed on a VOA sample containing headspace.
B	Analyte detected in the Method Blank above the reporting level.
C	The Relative Percent Difference (RPD) for the primary result and confirmation result was greater than 40%. The higher result was reported.
D	The sample was supplied in an inappropriate container, according to method criteria.
E	This value is above the quantitation limit. It is considered an estimate.
H	The Matrix Spike/Matrix Spike Duplicate (MS/MSD) result was outside control limits. The Laboratory Control Standard/Duplicate (LCS/LCSD) result was in control validating the batch.
J	The result is above the Method Detection Limit (MDL) and below the Reporting Level (RL). It is considered an estimate.
M	The MS/MSD recoveries are not calculable due to a high amount of analyte in sample.
MI	This indicates a high level of matrix interference affecting the spike or surrogate recovery.
N	See case narrative.
O	Detection Limits are elevated due to sample dilution. See case narrative.
Q	Further inspection of the sample confirms a non-homogenous sample matrix affecting RPD result.
R	The RPD result is outside method control limits. See other qualifiers or case narrative.
S	The spike recovery is outside method control limits. See other qualifiers or case narrative.
T	The RPD between the sample result and duplicate result was greater than 20%. The original result was less than three times the reporting level, therefore the RPD is not applicable.
X	Unable to quantitate surrogate recovery due to sample dilution.

HAHN AND ASSOCIATES, INC.
Environmental Management
4 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: ESL
Lab Project No.: 010513

CHAIN OF CUSTODY

Chain of Custody No. 2

Project Manager	Guy Tanz
Project No.	5074
Project Name	Brix Maritime Facility
Collected by	Jay Greifer

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N) ____
Appropriate Containers Used (Y or N) ____
Provide Verbal Results (Y or N) ____
Provide Preliminary Fax Results ____

Sample Number Prefix: 5074-010529-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	HCID by NW TPH Hydrocarbon Identification	NW TPH-G	NW TPH-Dx	BTEX and naphthalene by EPA Method 8021B	BTEX, EDB, EDC, MTBE, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene, iso- and n-propylbenzene by EPA Method 8260B	Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM	Total Lead by EPA Method 6010/200.7	Dissolved Lead (FP) by EPA Method 6010/200.7	RUSH	Remarks
-01	084	5/29/01	747	B14e 4	X			1										
-02	085		756	8														
-03	086		804	12														
-04	087		814	16														
-05	088		823	20														
-06	089		838	23														
-07	090		850	28														
-08	091		930	B15e 4														
-09	092		937	8														
-10	093		944	12														
-11	094		1000	16														
-12	095		1011	20														
-13	096		1023	24														
-14	097		1036	25														
-15	098		1037	28														
-16	099		1135	B16e 4														
-17	201		1137	8														
-18	202		1140	12						X								
-19	203		1144	16														
-20	204		1152	20														
-21	205		1201	23½														
-22	206		1210	24½					X	X								
-23	207		1211	27														
-24	208		1351	B18e 4														
-25	209		1356	8														
-26	210		1400	12														

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAHN & ASSOC	5/30/01	9:30	[signature]	ESL
Relinquished by	Company	Date	Time	Received by	Company

HAHN AND ASSOCIATES, INC.
Environmental Management
NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: ESL

Lab Project No.: 0105131

CHAIN OF CUSTODY

Chain of Custody No.: 9

Project Manager	Guy Tanz
Project No.	5074
Project Name	Brix Maritime Facility
Collected by	Jay Greifer

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both

Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N) ____
Appropriate Containers Used (Y or N) ____
Provide Verbal Results (Y or N) ____
Provide Preliminary Fax Results ____

Sample Number Prefix: 5074-010529-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	HCID by NW TPH Hydrocarbon Identification	NW TPH-G	NW TPH-Dx	BTEX and naphthalene by EPA Method 8021B	BTEX, EDB, EDC, MTBE, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene, iso- and n-propylbenzene by EPA Method 8260B	Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM	Total Lead by EPA Method 6010/200.7	Dissolved Lead (PP) by EPA Method 6010/200.7	RUSH	Remarks
-27	211	5-29-01	1411	B15@15½	X			1		X	X							
-28	212		1419	20														
-29	213		1428	24						X	X							
-30	214		1440	28														
-31	215		1547	B17@4														
-32	216		1550	8														
-33	217		1553	12							X							
-34	218		1601	16														
-35	219		1612	20														
-36	220		1621	23						X	X							
-37	221	??																

EXTRA SAMPLE NOT LISTED (SW)

Relinquished by	Company	Date	Time	Received by	Company
[illegible]	HAHN & ASSOC	5/30/01	4:30	[illegible]	ESL
Relinquished by	Company	Date	Time	Received by	Company

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

June 07, 2001

Mr. Guy Tanz
Hahn and Associates
434 NW Sixth Avenue
Suite 203
Portland, OR 97209
TEL: (503)796-0717
FAX (503) 227-2209

RE: 5074/Brix Maritime Facility Order No.: 0105131

Dear Mr. Guy Tanz,

Environmental Services Laboratory received 37 samples on 5/30/01 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
GAS/BTEX, Soil (8015/8021)
NWTPH-Dx Soil (EPA 8015)
PERCENT MOISTURE (SM 2540)

There were no analytical problems encountered, and all data met laboratory QC criteria, unless noted in a Case Narrative. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

✓Base Sample Report ✓Method Blank Report ✓Sample Duplicate Report
✓Matrix Spike/Matrix Spike Duplicate Report ✓Laboratory Control Spike/Spike Duplicate Report ✓Continuing Calibration Verification Report __Initial Calibration Verification Report

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Nichole Karl

Nichole Karl
Project Manager

Keith Hunter

Technical Review

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010529-202
Lab Order:	0105131	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/29/01
Lab ID:	0105131-18A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	21.7		mg/Kg-dry	1	6/4/01
Oil	ND	54.3		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	56.0	50-150		%REC	1	6/4/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	8.00	0		wt%	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010529-206
Lab Order:	0105131	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/29/01
Lab ID:	0105131-22A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	28.2		mg/Kg-dry	1	6/4/01
Oil	121	70.4		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	99.0	50-150		%REC	1	6/4/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	704		µg/Kg-dry	1	5/31/01
Surr: Trifluorotoluene	75.6	70-130		%REC	1	5/31/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	29.0	0		wt%	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

ENT:	Hahn and Associates	**Client Sample ID:**	5074-010529-211
Lab Order:	0105131	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/29/01
Lab ID:	0105131-27A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	21.3		mg/Kg-dry	1	6/4/01
Oil	ND	53.2		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	102.0	50-150		%REC	1	6/4/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	ND	532		µg/Kg-dry	1	5/31/01
Surr: Trifluorotoluene	87.1	70-130		%REC	1	5/31/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	6.00	0		wt%	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

.IENT:	Hahn and Associates	**Client Sample ID:**	5074-010529-213
Lab Order:	0105131	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/29/01
Lab ID:	0105131-29A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	24.7		mg/Kg-dry	1	6/4/01
Oil	ND	61.7		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	83.0	50-150		%REC	1	6/4/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	1,140	617		µg/Kg-dry	1	5/31/01
Surr: Trifluorotoluene	91.4	70-130		%REC	1	5/31/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	19.0	0		wt%	1	6/4/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

ENT:	Hahn and Associates	**Client Sample ID:**	5074-010529-217
Lab Order:	0105131	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/29/01
Lab ID:	0105131-33A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	21.5		mg/Kg-dry	1	6/4/01
Oil	ND	53.8		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	89.0	50-150		%REC	1	6/4/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	7.00	0		wt%	1	6/1/01

lifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010529-220
Lab Order:	0105131	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/29/01
Lab ID:	0105131-36A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX SOIL		**EPA 8015**				Analyst: **smc**
Diesel	ND	22.0		mg/Kg-dry	1	6/4/01
Oil	ND	54.9		mg/Kg-dry	1	6/4/01
Surr: O-Terphenyl	88.0	50-150		%REC	1	6/4/01
GAS/BTEX, SOIL		**8015/8021**				Analyst: **jlw**
Gasoline	10,900	2,750		µg/Kg-dry	5	5/31/01
Surr: Trifluorotoluene	88.3	70-130		%REC	5	5/31/01
PERCENT MOISTURE		**SM 2540**				Analyst: **etw**
% Moisture	9.00	0		wt%	1	6/1/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105131
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

Sample ID: **MBlank** Batch ID: **04 BG S-6/4/0** Test Code: **8015/8021** Units: **µg/Kg** Analysis Date **5/31/01** Prep Date:
Client ID: **0105131** Run ID: **CRICK_010531A** SeqNo: **78281**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.5									
Ethylbenzene	ND	0.5									
Gasoline	ND	100									
Toluene	ND	0.5									
Xylenes, Total	ND	1.5									
Trifluorotoluene	112	0	100	0	112.0%	70	130	0			

Sample ID: **MB-2773** Batch ID: **2773** Test Code: **EPA 8015** Units: **mg/Kg** Analysis Date **6/4/01** Prep Date: **6/1/01**
Client ID: **0105131** Run ID: **BUTTERCUP_010604A** SeqNo: **78538**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	20									
Oil	ND	50									
O-Terphenyl	46	0	50	0	92.0%	50	150	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105131
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0105118-27A DUP** Batch ID: **04 BG S-6/4/0** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/31/01** Prep Date:
Client ID: **0105131** Run ID: **CRICK_010531A** SeqNo: **78285**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	3.09	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	3.09	0	0	0.0%	0	0	0	0.0%	20	
Gasoline	ND	617	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	3.09	0	0	0.0%	0	0	0	0.0%	20	
Xylenes, Total	ND	9.26	0	0	0.0%	0	0	0	0.0%	20	
Trifluorotoluene	140.7	0	123	0	114.4%	50	150	0	0.0%	20	

Sample ID: **0105131-29A DUP** Batch ID: **04 BG S-6/4/0** Test Code: **8015/8021** Units: **µg/Kg-dry** Analysis Date **5/31/01** Prep Date:
Client ID: **5074-010529-213** **0105131** Run ID: **CRICK_010531A** SeqNo: **78292**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	712.6	617	0	0	0.0%	0	0	1142	46.3%	20	T
Trifluorotoluene	712.6	0	593	0	120.2%	50	150	0	0.0%	20	

Sample ID: **0105118-41A DUP** Batch ID: **2773** Test Code: **EPA 8015** Units: **mg/Kg-dry** Analysis Date **6/4/01** Prep Date: **6/1/01**
Client ID: **0105131** Run ID: **BUTTERCUP_010604A** SeqNo: **78544**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	24.7	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	61.7	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	56.79	0	61.7	0	92.0%	50	150	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105131
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0105131-18A DUP** Batch ID: **2773** Test Code: **EPA 8015** Units: **mg/Kg-dry** Analysis Date **6/4/01** Prep Date: **6/1/01**

Client ID: **5074-010529-202** **0105131** Run ID: **BUTTERCUP_010604A** SeqNo: **78548**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	21.7	0	0	0.0%	0	0	0	0.0%	20	
Oil	ND	54.3	0	0	0.0%	0	0	0	0.0%	20	
O-Terphenyl	50.54	0	54.3	0	93.0%	50	150	0	0.0%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105131
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0105118-05A MS** Batch ID: **04 BG S-6/4/0** Test Code: **8015/8021** Units: **µg/Kg** Analysis Date **5/31/01** Prep Date:

Client ID: **0105131** Run ID: **CRICK_010531A** SeqNo: **78287**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	169	2.72	163	0	103.7%	85	115	0			
Ethylbenzene	169	2.72	163	0	103.7%	85	115	0			
Gasoline	3500	543	3260	0	107.4%	80	120	0			
Toluene	169	2.72	163	0	103.7%	85	115	0			
Xylenes, Total	512.5	8.15	489	0	104.8%	85	115	0			
Trifluorotoluene	587	0	543	0	108.1%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105131
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS | Batch ID: 04 BG S-6/4/0 | Test Code: 8015/8021 | Units: µg/Kg | Analysis Date 5/31/01 | Prep Date:
Client ID: 0105131 | Run ID: CRICK_010531A | SeqNo: 78282

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	156.5	2.5	150	0	104.3%	85	115	0			
Ethylbenzene	157	2.5	150	0	104.7%	85	115	0			
Gasoline	4060	500	4000	0	101.5%	80	120	0			
Toluene	157	2.5	150	0	104.7%	85	115	0			
Xylenes, Total	478	7.5	450	0	106.2%	85	115	0			
Trifluorotoluene	550	0	500	0	110.0%	50	150	0			

Sample ID: LCS-2773 | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/Kg | Analysis Date 6/4/01 | Prep Date: 6/1/01
Client ID: 0105131 | Run ID: BUTTERCUP_010604A | SeqNo: 78539

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	42.5	20	50	0	85.0%	70	130	0			

Sample ID: LCSD-2773 | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/Kg | Analysis Date 6/4/01 | Prep Date: 6/1/01
Client ID: 0105131 | Run ID: BUTTERCUP_010604A | SeqNo: 78540

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	49.15	20	50	0	98.3%	70	130	42.5	14.5%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105131
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 04 BG S-6/4/0 | Test Code: 8015/8021 | Units: µg/L | Analysis Date 5/31/01 | Prep Date:
Client ID: 0105131 | Run ID: CRICK_010531A | SeqNo: 78280

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	41.6	0.5	40	0	104.0%	85	115	0			
Ethylbenzene	41.9	0.5	40	0	104.8%	85	115	0			
Gasoline	1010	100	1000	0	101.0%	80	120	0			
Toluene	41.7	0.5	40	0	104.3%	85	115	0			
Xylenes, Total	127	1.5	120	0	105.8%	85	115	0			
Trifluorotoluene	107	0	100	0	107.0%	70	130	0			

Sample ID: CCV | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/4/01 | Prep Date:
Client ID: 0105131 | Run ID: BUTTERCUP_010604A | SeqNo: 78536

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	388	20	400	0	97.0%	85	115	0			
Oil	357	50	400	0	89.3%	85	115	0			

Sample ID: CCV | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/4/01 | Prep Date:
Client ID: 0105131 | Run ID: BUTTERCUP_010604A | SeqNo: 78537

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	401	20	400	0	100.3%	85	115	0			
Oil	439	50	400	0	109.8%	85	115	0			

Sample ID: CCV | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/4/01 | Prep Date:
Client ID: 0105131 | Run ID: BUTTERCUP_010604B | SeqNo: 78628

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	401	20	400	0	100.3%	85	115	0			
Oil	427	50	400	0	106.8%	85	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105131
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2773 | Test Code: EPA 8015 | Units: mg/L | Analysis Date 6/4/01 | Prep Date:

Client ID: 0105131 | Run ID: BUTTERCUP_010604B | SeqNo: 78629

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	413	20	400	0	103.3%	85	115	0			
Oil	388	50	400	0	97.0%	85	115	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

APPENDIX C

LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION: MAY 2001 GROUNDWATER SAMPLES

HAHN AND ASSOCIATES, INC.
Environmental Management
,34 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory ESL

Lab Project No. 0105130

CHAIN OF CUSTODY

Chain of Custody No. 8

Project Manager	Guy Tanz
Project No.	5074
Project Name	Brix Maritime Facility
Collected by	Jay Greifer

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both

Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N) ____
Appropriate Containers Used (Y or N) ____
Provide Verbal Results (Y or N) ____
Provide Preliminary Fax Results ____

Sample Number Prefix: 5074-010529-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	HCID by NW TPH Hydrocarbon Identification	NW TPH-G	NW TPH-Dx	BTEX and naphthalene by EPA Method 8021B	BTEX, EDB, EDC, MTBE, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene, iso- and n-propylbenzene by EPA Method 8260B	Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM	Total Lead by EPA Method 6010/200.7	Dissolved Lead (FP) by EPA Method 6010/200.7	RUSH	Remarks
-01	104	5-26-01	1114	TWP-B15		X		6					X	X		X		
-02	105		1115	TWP-B15 DUP		X		4					X					4 VOA
-03	106		1336	EB-106		X		5										" + 1L A Hcl
-04	107		1518	TWP-B18		X		6					X	X		X		
-05	108		1539	TWP-B-14		X		1					X					1-40 ml V
-06	109		1735	TWP-B-17		X		6					X	X		X		

Relinquished by	Company	Date	Time	Received by	Company
[illegible]	HAHN & ASSOC	5/30/01	9:30	[illegible]	ESL

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

June 07, 2001

Mr. Guy Tanz
Hahn and Associates
434 NW Sixth Avenue
Suite 203
Portland, OR 97209
TEL: (503)796-0717
FAX (503) 227-2209

RE: 5074/Brix Maritime Facility Order No.: 0105130

Dear Mr. Guy Tanz,

Environmental Services Laboratory received 6 samples on 5/30/01 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
ICP Metals (EPA 6010B)
PAH BY SIM, Aqueous (8270-SIM)
Volatiles by GC/MS (EPA 8260B)

There were no analytical problems encountered, and all data met laboratory QC criteria, unless noted in a Case Narrative. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

✓Base Sample Report ✓Method Blank Report ✓Sample Duplicate Report
✓Matrix Spike/Matrix Spike Duplicate Report ✓Laboratory Control Spike/Spike Duplicate Report ✓Continuing Calibration Verification Report ✓Initial Calibration Verification Report

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Nichole Karl

Nichole Karl
Project Manager

Keith Hunter

Technical Review

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	**Client Sample ID:**	5074-010529-104
Lab Order:	0105130	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/29/01
Lab ID:	0105130-01A	**Matrix:**	AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 6010B**				Analyst: lmc
Lead, Diss	ND	0.00500		mg/L	1	6/5/01
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: tmh
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	5/31/01
1,2-Dibromoethane	ND	1.00		µg/L	1	5/31/01
1,2-Dichloroethane	ND	1.00		µg/L	1	5/31/01
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	5/31/01
Benzene	ND	1.00		µg/L	1	5/31/01
Ethylbenzene	ND	1.00		µg/L	1	5/31/01
Isopropylbenzene	ND	1.00		µg/L	1	5/31/01
m,p-Xylene	ND	2.00		µg/L	1	5/31/01
Methyl tert-butyl ether	ND	2.00		µg/L	1	5/31/01
n-Propylbenzene	ND	1.00		µg/L	1	5/31/01
Naphthalene	ND	2.00		µg/L	1	5/31/01
o-Xylene	ND	1.00		µg/L	1	5/31/01
Toluene	ND	1.00		µg/L	1	5/31/01
Surr: 4-Bromofluorobenzene	100.6	86-115		%REC	1	5/31/01
Surr: Dibromofluoromethane	96.8	86-118		%REC	1	5/31/01
Surr: Toluene-d8	102.0	88-110		%REC	1	5/31/01
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: ams
Acenaphthene	ND	0.100		µg/L	1	5/31/01
Acenaphthylene	ND	0.100		µg/L	1	5/31/01
Anthracene	ND	0.100		µg/L	1	5/31/01
Benz(a)anthracene	ND	0.100		µg/L	1	5/31/01
Benzo(a)pyrene	ND	0.100		µg/L	1	5/31/01
Benzo(b)fluoranthene	ND	0.100		µg/L	1	5/31/01
Benzo(g,h,i)perylene	0.130	0.100		µg/L	1	5/31/01
Benzo(k)fluoranthene	ND	0.100		µg/L	1	5/31/01
Chrysene	ND	0.100		µg/L	1	5/31/01
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	5/31/01
Fluoranthene	0.140	0.100		µg/L	1	5/31/01
Fluorene	ND	0.100		µg/L	1	5/31/01
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	5/31/01
Naphthalene	ND	0.100		µg/L	1	5/31/01
Phenanthrene	0.110	0.100		µg/L	1	5/31/01
Pyrene	0.260	0.100		µg/L	1	5/31/01
Surr: 2-Fluorobiphenyl	77.0	43-116		%REC	1	5/31/01
Surr: 4-Terphenyl-d14	82.0	33-141		%REC	1	5/31/01
Surr: Nitrobenzene-d5	67.0	35-114		%REC	1	5/31/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

LIENT:	Hahn and Associates	**Client Sample ID:**	5074-010529-105
Lab Order:	0105130	**Tag Number:**	
Project:	5074/Brix Maritime Facility	**Collection Date:**	5/29/01
Lab ID:	0105130-02A	**Matrix:**	AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		EPA 8260B				Analyst: tmh
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	5/31/01
1,2-Dibromoethane	ND	1.00		µg/L	1	5/31/01
1,2-Dichloroethane	ND	1.00		µg/L	1	5/31/01
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	5/31/01
Benzene	ND	1.00		µg/L	1	5/31/01
Ethylbenzene	ND	1.00		µg/L	1	5/31/01
Isopropylbenzene	ND	1.00		µg/L	1	5/31/01
m,p-Xylene	ND	2.00		µg/L	1	5/31/01
Methyl tert-butyl ether	ND	2.00		µg/L	1	5/31/01
n-Propylbenzene	ND	1.00		µg/L	1	5/31/01
Naphthalene	ND	2.00		µg/L	1	5/31/01
o-Xylene	ND	1.00		µg/L	1	5/31/01
Toluene	ND	1.00		µg/L	1	5/31/01
Surr: 4-Bromofluorobenzene	96.8	86-115		%REC	1	5/31/01
Surr: Dibromofluoromethane	101.0	86-118		%REC	1	5/31/01
Surr: Toluene-d8	101.0	88-110		%REC	1	5/31/01

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010529-107
Lab Order:	0105130	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/29/01
Lab ID:	0105130-04A	Matrix:	AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 6010B**				Analyst: lmc
Lead, Diss	ND	0.00500		mg/L	1	6/5/01
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: tmh
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	5/31/01
1,2-Dibromoethane	ND	1.00		µg/L	1	5/31/01
1,2-Dichloroethane	ND	1.00		µg/L	1	5/31/01
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	5/31/01
Benzene	ND	1.00		µg/L	1	5/31/01
Ethylbenzene	ND	1.00		µg/L	1	5/31/01
Isopropylbenzene	ND	1.00		µg/L	1	5/31/01
m,p-Xylene	ND	2.00		µg/L	1	5/31/01
Methyl tert-butyl ether	ND	2.00		µg/L	1	5/31/01
n-Propylbenzene	ND	1.00		µg/L	1	5/31/01
Naphthalene	ND	2.00		µg/L	1	5/31/01
o-Xylene	ND	1.00		µg/L	1	5/31/01
Toluene	ND	1.00		µg/L	1	5/31/01
Surr: 4-Bromofluorobenzene	99.6	86-115		%REC	1	5/31/01
Surr: Dibromofluoromethane	99.0	86-118		%REC	1	5/31/01
Surr: Toluene-d8	100.8	88-110		%REC	1	5/31/01
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: ams
Acenaphthene	0.189	0.111		µg/L	1	5/31/01
Acenaphthylene	ND	0.111		µg/L	1	5/31/01
Anthracene	ND	0.111		µg/L	1	5/31/01
Benz(a)anthracene	0.189	0.111		µg/L	1	5/31/01
Benzo(a)pyrene	0.467	0.111		µg/L	1	5/31/01
Benzo(b)fluoranthene	0.311	0.111		µg/L	1	5/31/01
Benzo(g,h,i)perylene	0.778	0.111		µg/L	1	5/31/01
Benzo(k)fluoranthene	0.300	0.111		µg/L	1	5/31/01
Chrysene	0.300	0.111		µg/L	1	5/31/01
Dibenz(a,h)anthracene	ND	0.111		µg/L	1	5/31/01
Fluoranthene	0.400	0.111		µg/L	1	5/31/01
Fluorene	ND	0.111		µg/L	1	5/31/01
Indeno(1,2,3-cd)pyrene	0.578	0.111		µg/L	1	5/31/01
Naphthalene	ND	0.111		µg/L	1	5/31/01
Phenanthrene	0.278	0.111		µg/L	1	5/31/01
Pyrene	0.611	0.111		µg/L	1	5/31/01
Surr: 2-Fluorobiphenyl	80.0	43-116		%REC	1	5/31/01
Surr: 4-Terphenyl-d14	81.0	33-141		%REC	1	5/31/01
Surr: Nitrobenzene-d5	72.0	35-114		%REC	1	5/31/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010529-108
Lab Order:	0105130	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/29/01
Lab ID:	0105130-05A	Matrix:	AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		EPA 8260B				Analyst: tmh
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	5/31/01
1,2-Dibromoethane	ND	1.00		µg/L	1	5/31/01
1,2-Dichloroethane	ND	1.00		µg/L	1	5/31/01
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	5/31/01
Benzene	ND	1.00		µg/L	1	5/31/01
Ethylbenzene	ND	1.00		µg/L	1	5/31/01
Isopropylbenzene	ND	1.00		µg/L	1	5/31/01
m,p-Xylene	ND	2.00		µg/L	1	5/31/01
Methyl tert-butyl ether	2.39	2.00		µg/L	1	5/31/01
n-Propylbenzene	ND	1.00		µg/L	1	5/31/01
Naphthalene	ND	2.00		µg/L	1	5/31/01
o-Xylene	ND	1.00		µg/L	1	5/31/01
Toluene	2.06	1.00		µg/L	1	5/31/01
Surr: 4-Bromofluorobenzene	100.2	86-115		%REC	1	5/31/01
Surr: Dibromofluoromethane	97.0	86-118		%REC	1	5/31/01
Surr: Toluene-d8	101.0	88-110		%REC	1	5/31/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT:	Hahn and Associates	Client Sample ID:	5074-010529-109
Lab Order:	0105130	Tag Number:	
Project:	5074/Brix Maritime Facility	Collection Date:	5/29/01
Lab ID:	0105130-06A	Matrix:	AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 6010B**				Analyst: lmc
Lead, Diss	ND	0.00500		mg/L	1	6/5/01
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: tmh
1,2,4-Trimethylbenzene	627	10.0		µg/L	1	5/31/01
1,2-Dibromoethane	ND	1.00		µg/L	1	5/31/01
1,2-Dichloroethane	ND	1.00		µg/L	1	5/31/01
1,3,5-Trimethylbenzene	190	10.0		µg/L	1	5/31/01
Benzene	125	1.00		µg/L	1	5/31/01
Ethylbenzene	723	10.0		µg/L	1	5/31/01
Isopropylbenzene	115	1.00		µg/L	1	5/31/01
m,p-Xylene	395	20.0		µg/L	1	5/31/01
Methyl tert-butyl ether	ND	2.00		µg/L	1	5/31/01
n-Propylbenzene	420	10.0		µg/L	1	5/31/01
Naphthalene	65.1	2.00		µg/L	1	5/31/01
o-Xylene	25.4	1.00		µg/L	1	5/31/01
Toluene	6.20	1.00		µg/L	1	5/31/01
Surr: 4-Bromofluorobenzene	108.0	86-115		%REC	1	5/31/01
Surr: Dibromofluoromethane	99.8	86-118		%REC	1	5/31/01
Surr: Toluene-d8	102.6	88-110		%REC	1	5/31/01
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: ams
Acenaphthene	0.947	0.105		µg/L	1	5/31/01
Acenaphthylene	0.232	0.105		µg/L	1	5/31/01
Anthracene	0.326	0.105		µg/L	1	5/31/01
Benz(a)anthracene	0.295	0.105		µg/L	1	5/31/01
Benzo(a)pyrene	0.316	0.105		µg/L	1	5/31/01
Benzo(b)fluoranthene	0.200	0.105		µg/L	1	5/31/01
Benzo(g,h,i)perylene	0.284	0.105		µg/L	1	5/31/01
Benzo(k)fluoranthene	0.221	0.105		µg/L	1	5/31/01
Chrysene	0.347	0.105		µg/L	1	5/31/01
Dibenz(a,h)anthracene	ND	0.105		µg/L	1	5/31/01
Fluoranthene	0.811	0.105		µg/L	1	5/31/01
Fluorene	0.674	0.105		µg/L	1	5/31/01
Indeno(1,2,3-cd)pyrene	0.242	0.105		µg/L	1	5/31/01
Naphthalene	34.7	0.105		µg/L	1	5/31/01
Phenanthrene	1.51	0.105		µg/L	1	5/31/01
Pyrene	1.04	0.105		µg/L	1	5/31/01
Surr: 2-Fluorobiphenyl	72.0	43-116		%REC	1	5/31/01
Surr: 4-Terphenyl-d14	67.0	33-141		%REC	1	5/31/01
Surr: Nitrobenzene-d5	60.0	35-114		%REC	1	5/31/01

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 A-6/1** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date **5/31/01** Prep Date:

Client ID: **0105130** Run ID: **HORATIO_010531A** SeqNo: **78125**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

4-Methyl-2-pentanone	ND	1
Acetone	ND	20
Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	1
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	10
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Method Blank

Tetrachloroethene	ND	1						
Toluene	ND	1						
trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	49.5	0	50	0	99.0%	86	115	0
Dibromofluoromethane	48.5	0	50	0	97.0%	86	118	0
Toluene-d8	50.1	0	50	0	100.2%	88	110	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

Sample ID: **MB-2770** Batch ID: **2770** Test Code: **8270-SIM** Units: **µg/L** Analysis Date **5/31/01** Prep Date: **5/31/01**

Client ID: **0105130** Run ID: **HEISENBURG_010531A** SeqNo: **78156**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.1									
Acenaphthylene	ND	0.1									
Anthracene	ND	0.1									
Benz(a)anthracene	ND	0.1									
Benzo(a)pyrene	ND	0.1									
Benzo(b)fluoranthene	ND	0.1									
Benzo(g,h,i)perylene	ND	0.1									
Benzo(k)fluoranthene	ND	0.1									
Chrysene	ND	0.1									
Dibenz(a,h)anthracene	ND	0.1									
Fluoranthene	ND	0.1									
Fluorene	ND	0.1									
Indeno(1,2,3-cd)pyrene	ND	0.1									
Naphthalene	ND	0.1									
Phenanthrene	ND	0.1									
Pyrene	ND	0.1									
2-Fluoroblphenyl	.86	0	1	0	86.0%	43	116	0			
4-Terphenyl-d14	.92	0	1	0	92.0%	33	141	0			
Nitrobenzene-d5	.77	0	1	0	77.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Method Blank

Sample ID: MB-2775 | Batch ID: 2775 | Test Code: EPA 6010B | Units: mg/L | Analysis Date 6/5/01 | Prep Date: 6/4/01

Client ID: 0105130 | Run ID: ICP_010605A | SeqNo: 78422

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.005									
Barium	ND	0.005									
Cadmium	ND	0.002									
Chromium	ND	0.005									
Lead	ND	0.005									
Selenium	ND	0.005									
Silver	ND	0.005									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0105119-04A DUP** Batch ID: **05 8260 A-6/1** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date **5/31/01** Prep Date:

Client ID: **0105130** Run ID: **HORATIO_010531A** SeqNo: **78131**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	1.5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	1.8	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	2	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	1.9	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

4-Methyl-2-pentanone	ND	1	0	0	0.0%	0	0	0	0.0%	20
Acetone	ND	20	0	0	0.0%	0	0	0	0.0%	20
Benzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromodichloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromoform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Carbon disulfide	ND	1	0	0	0.0%	0	0	0	0.0%	20
Carbon tetrachloride	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Chloroform	7.19	1	0	0	0.0%	0	0	7.19	0.0%	20
Chloromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
cis-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
cis-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dichlorodifluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Ethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Iodomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Isopropylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
m,p-Xylene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methyl tert-butyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methylene chloride	ND	10	0	0	0.0%	0	0	0	0.0%	20
n-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
n-Propylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	20
o-Xylene	ND	1	0	0	0.0%	0	0	0	0.0%	20
sec-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Styrene	ND	1	0	0	0.0%	0	0	0	0.0%	20
tert-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Duplicate

Tetrachloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Toluene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichlorofluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Vinyl acetate	ND	1	0	0	0.0%	0	0	0	0.0%	20
Vinyl chloride	ND	1.2	0	0	0.0%	0	0	0	0.0%	20
4-Bromofluorobenzene	48.6	0	50	0	97.2%	86	115	0	0.0%	0
Dibromofluoromethane	47.9	0	50	0	95.8%	86	118	0	0.0%	0
Toluene-d8	50.3	0	50	0	100.6%	88	110	0	0.0%	0

Sample ID: **0105119-04A DUP** Batch ID: **2775** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date **6/5/01** Prep Date: **6/4/01**

Client ID: **0105130** Run ID: **ICP_010605A** SeqNo: **78428**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Barium	.536	0.005	0	0	0.0%	0	0	0.538	0.4%	20	
Cadmium	ND	0.002	0	0	0.0%	0	0	0	0.0%	20	
Chromium	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Lead	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Selenium	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Silver	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0105135-02A MS** Batch ID: **05 8260 A-6/1** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date **5/31/01** Prep Date:
Client ID: **0105130** Run ID: **HORATIO_010531A** SeqNo: **78139**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	46.1	1	50	0	92.2%	0	234	0			
Benzene	43.2	1	50	0	86.4%	37	151	0			
Chlorobenzene	45.6	1	50	0	91.2%	37	160	0			
Toluene	46.7	1	50	0	93.4%	47	150	0			
Trichloroethene	45.3	1	50	0	90.6%	71	157	0			
4-Bromofluorobenzene	49.5	0	50	0	99.0%	86	115	0			
Dibromofluoromethane	48.1	0	50	0	96.2%	86	118	0			
Toluene-d8	50.7	0	50	0	101.4%	88	110	0			

Sample ID: **0105129-01A MS** Batch ID: **2775** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date **6/5/01** Prep Date: **6/4/01**
Client ID: **0105130** Run ID: **ICP_010605A** SeqNo: **78425**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	.513	0.005	0.5	0	102.6%	75	125	0			
Barium	.489	0.005	0.5	0	97.8%	75	125	0			
Cadmium	.484	0.002	0.5	0	96.8%	75	125	0			
Chromium	.499	0.005	0.5	0	99.8%	75	125	0			
Lead	.484	0.005	0.5	0	96.8%	75	125	0			
Selenium	.489	0.005	0.5	0	97.8%	75	125	0			
Silver	.496	0.005	0.5	0	99.2%	75	125	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID: 0105129-01A MSD Batch ID: 2775 Test Code: EPA 6010B Units: mg/L Analysis Date 6/5/01 Prep Date: 6/4/01

Client ID: 0105130 Run ID: ICP_010605A SeqNo: 78426

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	.514	0.005	0.5	0	102.8%	75	125	0.513	0.2%	20	
Barium	.487	0.005	0.5	0	97.4%	75	125	0.489	0.4%	20	
Cadmium	.483	0.002	0.5	0	96.6%	75	125	0.484	0.2%	20	
Chromium	.498	0.005	0.5	0	99.6%	75	125	0.499	0.2%	20	
Lead	.484	0.005	0.5	0	96.8%	75	125	0.484	0.0%	20	
Selenium	.49	0.005	0.5	0	98.0%	75	125	0.489	0.2%	20	
Silver	.496	0.005	0.5	0	99.2%	75	125	0.496	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **05 8260 A-6/1** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date **5/31/01** Prep Date:

Client ID: **0105130** Run ID: **HORATIO_010531A** SeqNo: **78126**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	46.3	1	50	0	92.6%	0	234	0			
Benzene	43.6	1	50	0	87.2%	37	151	0			
Chlorobenzene	46.8	1	50	0	93.6%	37	160	0			
Toluene	53.4	1	50	0	106.8%	47	150	0			
Trichloroethene	45.9	1	50	0	91.8%	71	157	0			
4-Bromofluorobenzene	51.1	0	50	0	102.2%	86	115	0			
Dibromofluoromethane	59.1	0	50	0	118.2%	86	118	0			S
Toluene-d8	51.2	0	50	0	102.4%	88	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS-2770 | Batch ID: 2770 | Test Code: 8270-SIM | Units: µg/L | Analysis Date 5/31/01 | Prep Date: 5/31/01

Client ID: 0105130 | Run ID: HEISENBURG_010531A | SeqNo: 78157

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.79	0.1	1	0	79.0%	47	145	0			
Acenaphthylene	.76	0.1	1	0	76.0%	33	145	0			
Anthracene	.77	0.1	1	0	77.0%	27	133	0			
Benz(a)anthracene	.76	0.1	1	0	76.0%	33	143	0			
Benzo(a)pyrene	.74	0.1	1	0	74.0%	17	163	0			
Benzo(b)fluoranthene	.74	0.1	1	0	74.0%	24	159	0			
Benzo(g,h,i)perylene	.87	0.1	1	0	87.0%	1	219	0			
Benzo(k)fluoranthene	.74	0.1	1	0	74.0%	11	162	0			
Chrysene	.79	0.1	1	0	79.0%	17	168	0			
Dibenz(a,h)anthracene	.86	0.1	1	0	86.0%	1	227	0			
Fluoranthene	.77	0.1	1	0	77.0%	26	137	0			
Fluorene	.78	0.1	1	0	78.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	.97	0.1	1	0	97.0%	1	171	0			
Naphthalene	.79	0.1	1	0	79.0%	21	133	0			
Phenanthrene	.78	0.1	1	0	78.0%	54	120	0			
Pyrene	.82	0.1	1	0	82.0%	52	115	0			
2-Fluorobiphenyl	.87	0	1	0	87.0%	43	116	0			
4-Terphenyl-d14	.9	0	1	0	90.0%	33	141	0			
Nitrobenzene-d5	.8	0	1	0	80.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: LCSD-2770 Batch ID: 2770 Test Code: 8270-SIM Units: µg/L Analysis Date 5/31/01 Prep Date: 5/31/01
Client ID: 0105130 Run ID: HEISENBURG_010531A SeqNo: 78158

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.76	0.1	1	0	76.0%	47	145	0.79	3.9%	30	
Acenaphthylene	.73	0.1	1	0	73.0%	33	145	0.76	4.0%	30	
Anthracene	.78	0.1	1	0	78.0%	27	133	0.77	1.3%	30	
Benz(a)anthracene	.77	0.1	1	0	77.0%	33	143	0.76	1.3%	30	
Benzo(a)pyrene	.77	0.1	1	0	77.0%	17	163	0.74	4.0%	30	
Benzo(b)fluoranthene	.77	0.1	1	0	77.0%	24	159	0.74	4.0%	30	
Benzo(g,h,i)perylene	.89	0.1	1	0	89.0%	1	219	0.87	2.3%	30	
Benzo(k)fluoranthene	.76	0.1	1	0	76.0%	11	162	0.74	2.7%	30	
Chrysene	.8	0.1	1	0	80.0%	17	168	0.79	1.3%	30	
Dibenz(a,h)anthracene	.88	0.1	1	0	88.0%	1	227	0.86	2.3%	30	
Fluoranthene	.79	0.1	1	0	79.0%	26	137	0.77	2.6%	30	
Fluorene	.74	0.1	1	0	74.0%	59	121	0.78	5.3%	30	
Indeno(1,2,3-cd)pyrene	.98	0.1	1	0	98.0%	1	171	0.97	1.0%	30	
Naphthalene	.75	0.1	1	0	75.0%	21	133	0.79	5.2%	30	
Phenanthrene	.77	0.1	1	0	77.0%	54	120	0.78	1.3%	30	
Pyrene	.85	0.1	1	0	85.0%	52	115	0.82	3.6%	30	
2-Fluorobiphenyl	.84	0	1	0	84.0%	43	116	0	0.0%	30	
4-Terphenyl-d14	.93	0	1	0	93.0%	33	141	0	0.0%	30	
Nitrobenzene-d5	.84	0	1	0	84.0%	35	114	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS-2775 | Batch ID: 2775 | Test Code: EPA 6010B | Units: mg/L | Analysis Date 6/5/01 | Prep Date: 6/4/01

Client ID: 0105130 | Run ID: ICP_010605A | SeqNo: 78423

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	.509	0.005	0.5	0	101.8%	80	120	0			
Barium	.484	0.005	0.5	0	96.8%	80	120	0			
Cadmium	.482	0.002	0.5	0	96.4%	80	120	0			
Chromium	.498	0.005	0.5	0	99.6%	80	120	0			
Lead	.486	0.005	0.5	0	97.2%	80	120	0			
Selenium	.487	0.005	0.5	0	97.4%	80	120	0			
Silver	.494	0.005	0.5	0	98.8%	80	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 05 8260 A-6/1 | Test Code: EPA 8260B | Units: µg/L | Analysis Date 5/31/01 | Prep Date:

Client ID: 0105130 | Run ID: HORATIO_010531A | SeqNo: 78124

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	21	1	20	0	105.0%	80	120	0			
1,2-Dichloropropane	22.2	1	20	0	111.0%	80	120	0			
Chloroform	20.1	1	20	0	100.5%	80	120	0			
Ethylbenzene	22	1	20	0	110.0%	80	120	0			
Toluene	21.6	1	20	0	108.0%	80	120	0			
Vinyl chloride	22.1	1.2	20	0	110.5%	80	120	0			
4-Bromofluorobenzene	50.4	0	50	0	100.8%	86	115	0			
Dibromofluoromethane	48.5	0	50	0	97.0%	86	118	0			
Toluene-d8	50.5	0	50	0	101.0%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank

J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV | Batch ID: 2770 | Test Code: 8270-SIM | Units: µg/L | Analysis Date 5/31/01 | Prep Date:

Client ID: 0105130 | Run ID: HEISENBURG_010531A | SeqNo: 78155

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.91	0.1	1	0	91.0%	80	120	0			
Acenaphthylene	.87	0.1	1	0	87.0%	80	120	0			
Anthracene	.86	0.1	1	0	86.0%	80	120	0			
Benz(a)anthracene	.88	0.1	1	0	88.0%	80	120	0			
Benzo(a)pyrene	.86	0.1	1	0	86.0%	80	120	0			
Benzo(b)fluoranthene	.93	0.1	1	0	93.0%	80	120	0			
Benzo(g,h,i)perylene	.91	0.1	1	0	91.0%	80	120	0			
Benzo(k)fluoranthene	.9	0.1	1	0	90.0%	80	120	0			
Chrysene	.89	0.1	1	0	89.0%	80	120	0			
Dibenz(a,h)anthracene	.94	0.1	1	0	94.0%	80	120	0			
Fluoranthene	.83	0.1	1	0	83.0%	80	120	0			
Fluorene	.88	0.1	1	0	88.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	1	0.1	1	0	100.0%	80	120	0			
Naphthalene	.87	0.1	1	0	87.0%	80	120	0			
Phenanthrene	.89	0.1	1	0	89.0%	80	120	0			
Pyrene	1.04	0.1	1	0	104.0%	80	120	0			
2-Fluorobiphenyl	.91	0	1	0	91.0%	43	116	0			
4-Terphenyl-d14	1.09	0	1	0	109.0%	33	141	0			
Nitrobenzene-d5	.89	0	1	0	89.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

Environmental Services Laboratory

Date: *07-Jun-01*

CLIENT: Hahn and Associates
Work Order: 0105130
Project: 5074/Brix Maritime Facility

QC SUMMARY REPORT

Initial Calibration Verification Standard

Sample ID: ICVLOW | Batch ID: 2775 | Test Code: EPA 6010B | Units: mg/L | Analysis Date 6/5/01 | Prep Date: 6/4/01

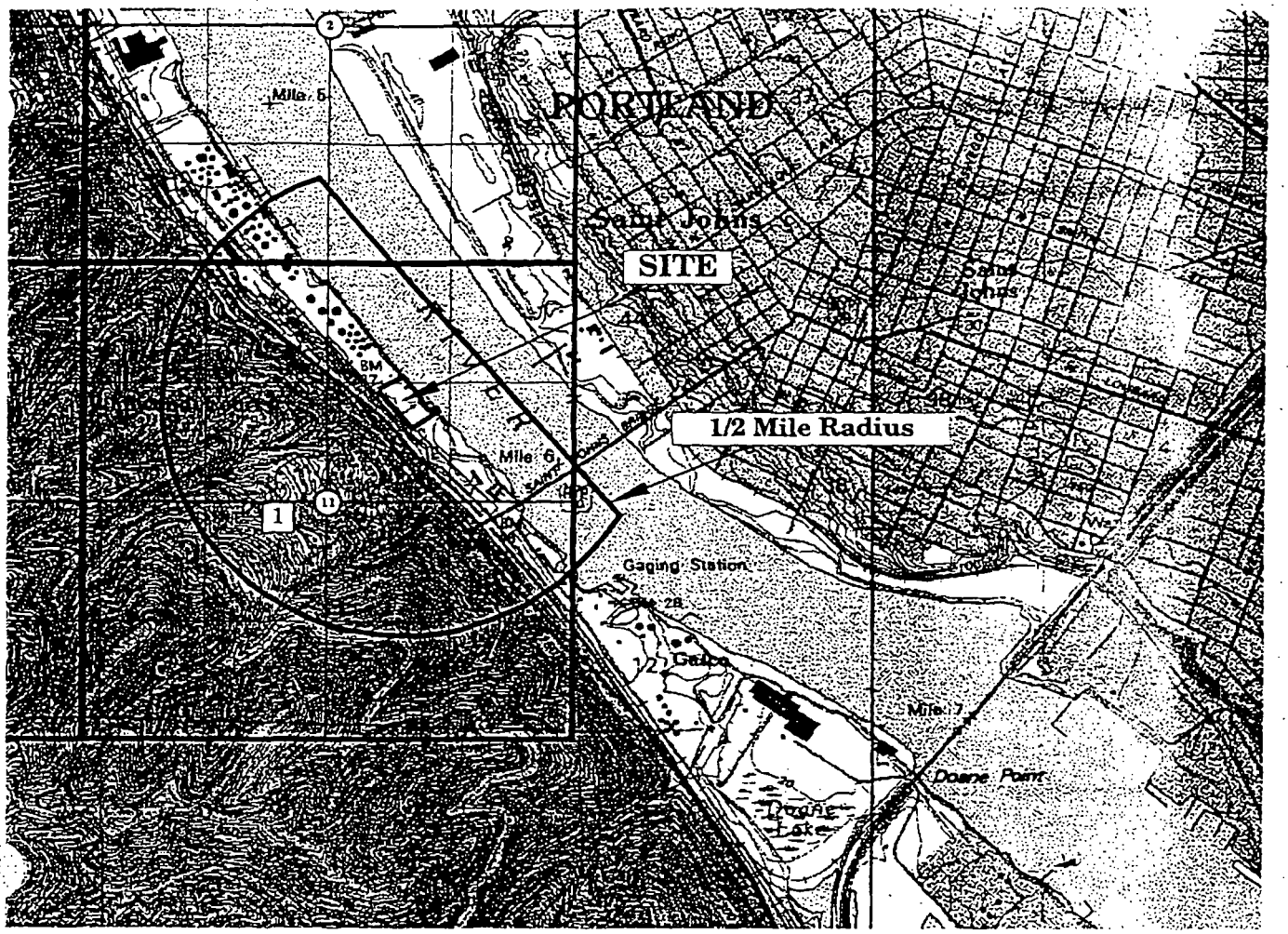
Client ID: 0105130 | Run ID: ICP_010605A | SeqNo: 78420

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	.51	0.005	0.5	0	102.0%	90	110	0			
Barium	.494	0.005	0.5	0	98.8%	90	110	0			
Cadmium	.487	0.002	0.5	0	97.4%	90	110	0			
Chromium	.495	0.005	0.5	0	99.0%	90	110	0			
Lead	.493	0.005	0.5	0	98.6%	90	110	0			
Selenium	.492	0.005	0.5	0	98.4%	90	110	0			
Silver	.492	0.005	0.5	0	98.4%	90	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

APPENDIX D

WATER WELL SURVEY DOCUMENTATION



N

0 2000 4000

Scale in Feet

Source: Linton, Oregon U.S.G.S. 7.5-Minute Quadrangle, 1990
Contour Interval: 10 feet

LEGEND

- 6 Domestic Well
- 11 Section Number
- Section Line

Note: Well locations are approximate and have not been field checked.

HAI Project No. 5074	**HAHN and ASSOCIATES** INCORPORATED	**Water Well Location Map**	**FIGURE**
ust 2001	ENVIRONMENTAL MANAGEMENT 434 NW SIXTH AVENUE, SUITE 203 PORTLAND, OREGON 97209 503/796-0717	Risk Based Assessment Brix Maritime Company Facility 9030 NW St. Helens Road Portland, Oregon	**D1**

Mult 047

1N/1W/11 ca

STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)

SEP 18 1990
WATER RESOURCES DEPT. SALEM, OREGON

(START CARD) # 16068

(1) OWNER:
Name George A. Buford / Lysdale Wilson Well Number
Address 8451 N.W. Whitney
City Portland State OR Zip 97231

(2) TYPE OF WORK:
☑ New Well ☐ Deepen ☐ Recondition ☐ Abandon

(3) DRILL METHOD
☑ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Other

(4) PROPOSED USE:
☑ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval Yes ☐ No ☑ Depth of Completed Well 530 ft.
Explosives used Yes ☐ No ☑ Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
10	0	112	Cement +	0	112	31
			Bentonite			
6	112	530				

How was seal placed: Method ☐ A ☐ B ☑ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6	+1	224	250	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	None				☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) 224

(7) PERFORATIONS/SCREENS: None
☐ Perforations Method
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☑ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
17		510	1 hr.

Temperature of water Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County Multnomah Latitude Longitude
Township 1N N.or S. Range 1W E or W. WM.
Section 11 NE ¼ SW ¼
Tax Lot R-90720-6460 Lot Block Subdivision
Street Address of Well (or nearest address) 8650 N.W. Mansfield, Portland

(10) STATIC WATER LEVEL:
450 ft. below land surface. Date 9-12-90
Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:
Depth at which water was first found 520

From	To	Estimated Flow Rate	SWL
520	530	17	450

(12) WELL LOG: Ground elevation

Material	From	To	SWL
Top Soil	0	2	
Dark Brn Clay	2	6	
Brn Clay	6	42	
Red Clay	42	72	
Weathered Rock	72	80	
Grey Broken Rock	80	205	
Soft Black Rock	205	252	
Grey Rock	252	265	
Brn Rock	265	273	
Soft Grey Rock	273	305	
Brn Rock	305	322	
Grey Rock	322	330	
Brn Rock	330	370	
Grey Rock	370	520	
Soft Seam + Grey Rock	520	530	450

RECEIVED
OCT - 8 1990
WATER RESOURCES DEPT
SALEM, OREGON

Date started 9-6-90 Completed 9-12-90

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.
WWC Number
Signed Date

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. all work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 715
Signed Don Feaker Date 9-13-90

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER 3809C 3/88