

*Prepared for:*

*Yard Birds Properties  
Limited Partnership*

*Prepared by:*

*Enviros, Inc.  
210 Marina Park Building  
25 Central Way  
Kirkland, Washington 98033*

***Environmental Site Assessment  
Final Report  
of the Yard Birds Property  
Olympia, Washington***

***June 1, 1994***

***E1/940109.01***

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- Appendix A: Boring Logs and Well Completion Diagrams
- Appendix B: Analytical Lab Reports

## EXECUTIVE SUMMARY

Of the four blocks involved in the environmental assessment and property transfer process, three of the blocks (all except the Farmer's Market block) have achieved substantial closure or resolution of environmental concerns. Remaining environmental concerns on the Farmer's Market have been addressed by thorough site characterization and implementation of preliminary remediation measures directed at source control. Completed remediation measures include decommissioning of the two on-site USTs, removal of approximately 15 tons of diesel-contaminated soil and pump-out of diesel product in a well in the southwest corner of the Farmer's Market.

The results from the soil testing indicated that contamination in the Farmer's Market block was less widespread than initially suspected based on non-detectable contaminant concentrations for soil samples collected by Enviros. It was also discovered that contamination trends may have been obscured by excavation and site grading activities conducted approximately 10 years ago by the City of Olympia in preparation of construction of the Farmer's Market.

Groundwater assessment results indicated that water flows from the west and south toward the northeast and that a very steep groundwater gradient exists at the southwestern end of the Farmer's Market. Groundwater transport may be quite rapid in this area based on the steep gradient and the sandy soil/fill conditions on the site. Changes in groundwater elevations with respect to tides monitored over an 8 hour period appeared minimal even though Puget Sound (Budd Inlet) is located approximately 200 feet west of the Farmer's Market.

Floating petroleum hydrocarbon product was observed in a well within the Farmer's Market and diesel contaminant concentrations were above Ecology cleanup levels. Gasoline contamination above Ecology cleanup levels was also observed in the well adjacent to the gasoline UST of the Treasure Chest and in one down-gradient well.

The results of sampling on the north end of the Farmer's Market block indicated that the gasoline contamination was likely attributable to the former operation of the gasoline UST in the Treasure Chest building. The contamination in this area of the property also appeared to be limited to gasoline contaminants since no heavy oil or diesel contamination was detected in the groundwater. Soil samples collected immediately adjacent to the tank had gasoline contaminant concentrations well above Ecology soil cleanup levels. The total volume of remaining contaminated soil in this area is estimated to be 230 cubic yards and appears to be localized around the groundwater table boundary.

The results of sampling on the south end of the Farmer's Market block indicated that diesel product contamination might be attributable to former operation of the heating fuel (diesel) UST adjacent to the Warehouse building, and/or historical operation of a bulk fuel transfer/storage facility on the south end of the block. Contamination on the west end of the Farmer's Market area appeared to be limited to diesel contaminants since no gasoline constituents were detected in the groundwater. Contamination on the east end of the Farmer's Market area near North Capital Way appeared to be a mixture of diesel and gasoline.

The total volume of remaining contaminated soil in the Farmer's Market area is not accurately known but may range from 405 to 810 cubic yards depending on the actual thickness of the contamination which appears to be localized around the groundwater table boundary. Based on available field data and observations, the thickness of contaminated soil in the Farmer's Market appears to be approximately 2 feet and the lateral extent may cover an area of approximately 11,000 square feet. There also appears to be a substantial overburden of non-contaminated soils resting above the contamination zone which may be related to historical site grading activities.

In addition to tank decommissioning activities, the well in the Farmer's Market that contained floating diesel product was pumped down several times during the course of field activities to remove product. Product and oily water was disposed by vacuum truck. The product was observed to recharge into the well on collection of subsequent groundwater measurements. The estimated volume of product is very approximate and may range from 3100 to 4600 gallons assuming a 2 to 3 -inch product layer, an affected area of 110 by 75 feet and a soil porosity of 0.30 (30%).

## 1.0 INTRODUCTION

Enviros was contracted by the Yard Birds Properties Limited Partnership (Yard Birds) to perform assessment of soil and groundwater at the Yard Birds property. As a result of the assessment, Enviro supervised the decommissioning of a 500-gallon heating oil tank located on the west end of the warehouse on the Farmers Market block, and the in-place closure of a 2,500-gallon gasoline tank underneath the Treasure Chest building. Enviro conducted a site assessment according to guidelines set by the Washington Department of Ecology (Ecology) UST Program. The Yard Bird's property is located at 500 North Capital Way in Olympia, Washington (Figure 1).

## 2.0 PREVIOUS ENVIRONMENTAL WORK

### 2.1 Phase I Environmental Site Assessment (ESA)

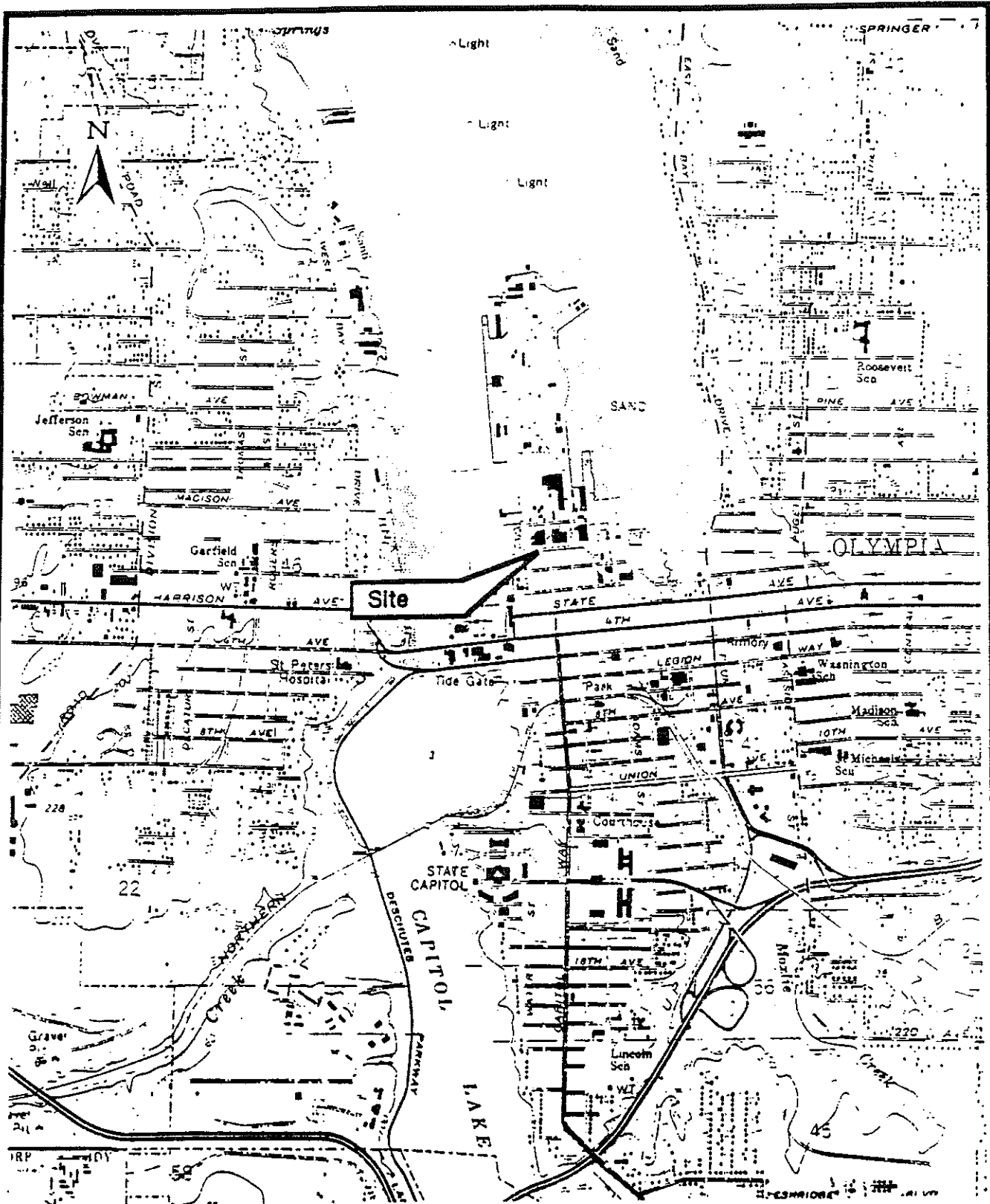
Prior to Enviro's involvement in the project, another environmental consult (ATEC) performed a Phase I Environmental Site Assessment (ESA) of the four block Yard Birds property. The findings from that investigation revealed the presence of two out-of-service underground storage tanks (USTs) and historical operation of a bulk fuel transfer/storage terminal by Associated Oil and/or Tidewater Oil Company on the Farmer Market block of the property. One of the USTs is located underneath the Treasure Chest Building and formerly contained gasoline product. The other UST is located outside and just west of the warehouse building and formerly contained heating fuel.

Another concern identified in the Phase I ESA was the reported presence of asbestos-containing materials in buildings on the block north of the Farmer's Market. A full asbestos survey has been conducted by Prezant Associates of the entire 4-block area and is available under separate cover. Off-site concerns identified in the Phase I ESA included a gasoline and fuel oil distributor (Unocal) with an aboveground storage tank farm 100 feet southwest of the Farmer's Market and a former bulk fuel transfer facility on the block just north of B Avenue.

### 2.2 Phase II ESA

A Phase II ESA was conducted by ATEC following the initial investigation to evaluate soil and groundwater conditions on the Farmer's Market block. The scope of work included installation of four shallow groundwater monitoring wells and groundwater sampling in six locations through a temporary soil vapor probe adapted for shallow groundwater sampling. The depth to groundwater was determined to be approximately 5 to 7 feet below ground surface, but groundwater flow direction was not determined.

Sampling locations were biased to the two on-site USTs and the former bulk fuel transfer/storage operation on the south end of the Farmer's Market block. The results of their investigation revealed groundwater contamination by gasoline, diesel and heavy oil above Ecology groundwater cleanup levels. Soil contamination was also noted in a well boring within the Farmer's Market, but the concentration was not quantified. The gasoline contamination was found primarily in the area of the UST located within the Treasure Chest and the heavy oil/diesel contamination was found in the Farmer's Market. Free oil was discovered in a temporary probe sample collected within the Farmer's Market.



Scale: 1 in. = 2,000 ft.

Source: U.S.G.S. 7.5-Minute Topographic Map of Tumwater, WA, dated 1981.

Figure 2. Vicinity Map of the Yard Birds Property in Olympia, WA.

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### 3.0 GEOLOGY

The near-surface geology of the site, as determined from the shallow borings conducted in this project, is largely that of unconsolidated marine-dredged, shell-rich, sandy fill resting on an uneven pre-existing marginally marine ground surface. On the southeastern quarter of the project area (parking lot) the fill was generally less than eight feet-thick and was often found to rest on an organic-rich soil horizon or non-shell-containing sand or gravelly sediment.

On the southwestern block of the property (Farmers Market), the marine fill appeared similar in thickness to that of the southeastern quarter except that the fill in MW7 existed to a depth of 15 feet. The underlying sediment in most of the area consisted of brown unconsolidated gravelly sand. In MW7, a wood debris layer with plant roots was noted at six feet and gray sandy silt was present below 15 feet. This may indicate that this area was previously under marine influence and was later filled in two separate phases.

Reportedly, the City of Olympia graded a large quantity of soil on the Farmers Market Block. No records are available on this activity. The grading of this area may have obscured soil and groundwater conditions and trends.

On the northwestern block of the property, only one 6.5-foot boring was drilled. The sediment in this boring consisted entirely of shell-rich sand fill material.

### 4.0 FIELD WORK

#### 4.1 Phase III Assessment Work

Enviros was contracted by Yard Birds to perform additional environmental site assessment (Phase III ESA) of areas of concern identified in the previous assessment work and to evaluate potential environmental concerns not addressed by the previous consultant. The Phase III ESA scope of work was designed to address concerns in the Farmers Market block, evaluate potential environmental concerns in the three other blocks of the Yard Birds property and determine the potential impact of off-site concerns. The information derived from the Phase III ESA was intended to be sufficient to proceed directly into site remediation work.

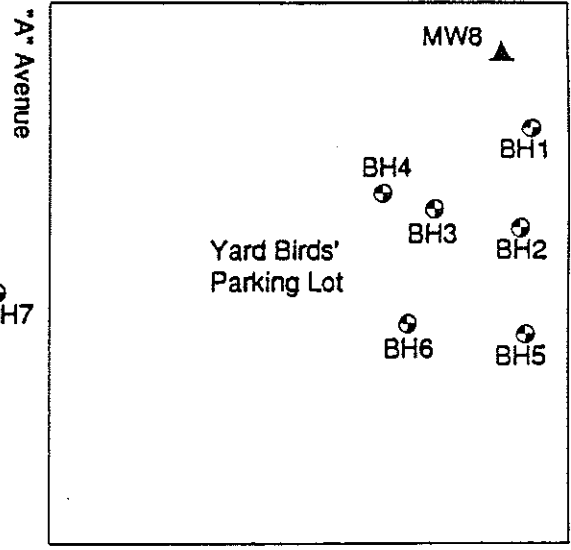
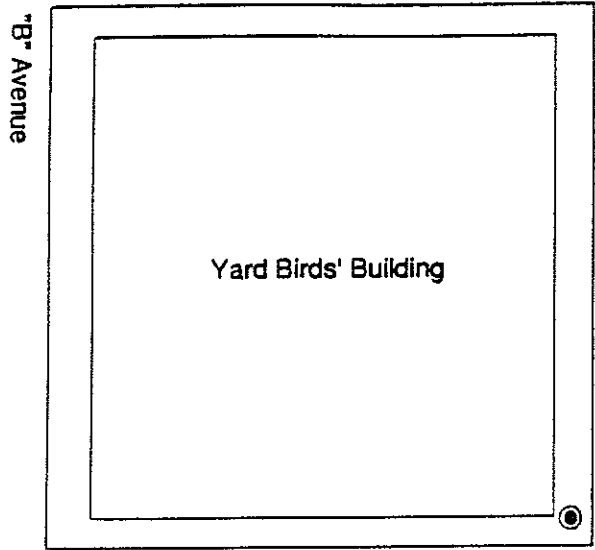
##### *4.1.1 Well Drilling and Soil Sampling*

From January 31, 1994 through February 3, 1994, Lance Robert of Enviros supervised the drilling of 13 soil borings. Four soil borings were completed as groundwater monitoring wells. The boring logs and well completion diagrams from all borings are included in this report as Appendix A. Detailed notes were taken in the field and soil samples were collected from each boring; the field notes were used to construct logs and well completion diagrams.

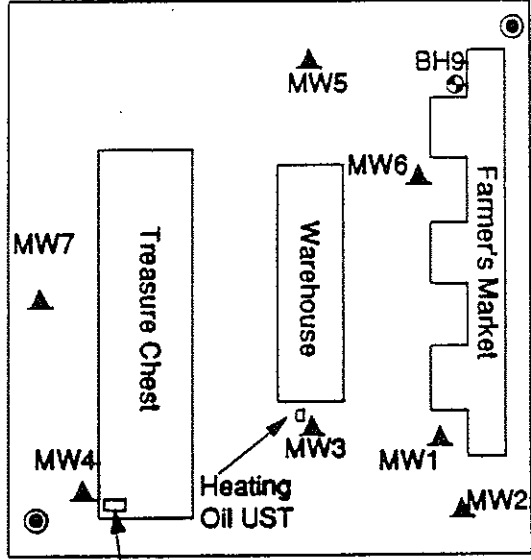
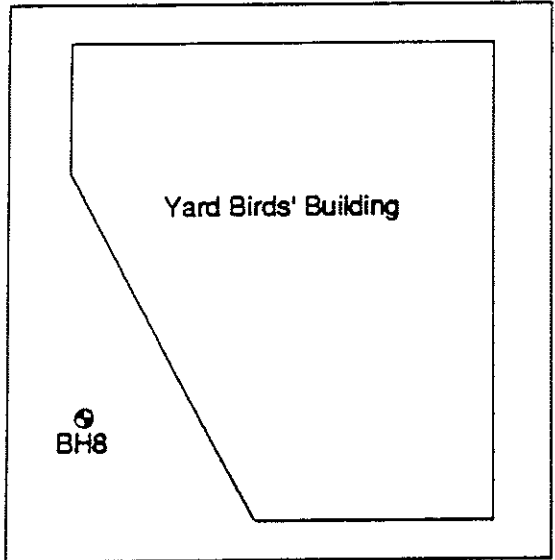
Holt Drilling (Holt) provided a B-61 hollow-stem auger drill rig with a 300-pound hammer for sampling. The sampler used was a four-inch outer diameter Dames & Moore split-spoon. Soil vapors were screened for hydrocarbons using a *Microtip MP100* Photo Ionization Detector (PID).



North Washington Street



North Capital Way



North Columbia Street

**Legend:**

- ⊙ Soil Boring Location
  - ⊙ Fire Hydrant Location
  - ▲ Groundwater Monitoring Well Location
- Approximate Scale: 1" = 100'

Figure 2. Site Sketch with Groundwater Monitoring Well and Soil Boring Locations at the Yard Birds Property in Olympia, WA.

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## Drilling

The nine soil borings were sequentially labeled BH1 through BH9 and monitoring wells were labeled MW5 through MW8. The locations of the borings and wells are presented in Figure 2. Borings BH1 through BH6 were drilled in the parking lot on the southeastern block of the project area; boring BH7 was drilled on the south side of the shopping mall; BH8 on the north side of the hardware store; and BH9 was drilled on the east side of the Farmers Market area. The borings were drilled to a depth of 6.5 feet below the surface, except borings BH3 and BH7 which were drilled to 9 feet (See Figure 2 for boring and well locations).

Four of the 13 soil borings were completed as monitoring wells to assess groundwater quality. Three of the wells (MW5, MW6, and MW7) are located on the Farmer's Market block of the project area. Well MW6 was placed on the eastern extent of the Farmers Market building, MW5 was near the east entrance of the Treasure Chest, and MW7 was placed on the north side of the Treasure Chest. Well MW8 was placed on the eastern extent of the parking lot on the southeastern block of the project area.

## Sampling

While drilling the soil borings, samples were collected at intervals of 2.5 or 5 feet using an 18-inch Dames & Moore split spoon sampler. Samples were logged in detail, photographed when necessary, and collected in 4-ounce glass jars and stored on ice until delivery to the laboratory. In addition to the laboratory samples, sediment was collected in ziplock bags for vapor analysis.

### *4.1.2 Groundwater Sampling*

On February 4, 1994, MaryBeth Gilbrough and Anastasia Speransky of Enviro were present on-site for groundwater sampling of the eight monitoring wells present on-site. Prior to purging, Enviro opened all the wells and conducted a round of water level measurements using an electronic water level probe. The wells were also sounded to verify well construction data, and the probe was decontaminated between measurements to prevent any potential for cross-contamination. Enviro then surveyed the top of casing elevations of the four newly installed groundwater monitoring wells. The original monitoring wells MW-1 through MW-4 were surveyed on January 31, 1994.

Each well was purged by removing 3 to 5 well volumes of groundwater using a disposable teflon bailer. The bailed water was monitored for temperature, pH, turbidity, and conductivity during bailing, as recommended in *Guidance for Site Checks and Site Assessments for Underground Storage Tanks* (Ecology, 1992). Bailing continued until these parameters stabilized. Bailed water was placed in 55-gallon drums present on-site.

After well purging, the groundwater samples were collected for analysis of total petroleum hydrocarbons as gasoline, diesel, and heavy oil and benzene, toluene, ethylbenzene, and xylenes (BTEX). For the Gas/BTEX analysis, groundwater was funneled into two volatile organic analysis (VOA) vials. For the diesel and heavy oils analysis, groundwater was funneled into two 1-liter amber bottles. Samples were then delivered to On-Site Environmental in Redmond, Washington.

## 4.2 UST Removal and Closure Activities

MaryBeth Gilbrough of Enviros and Foss Environmental were on-site to remove a heating oil UST from the west end of the warehouse building adjacent and to the north of the Farmer's Market, and to close in-place a gasoline UST that is located in a storage area on the west end of the Treasure Chest building. Enviros was responsible for overseeing Foss Environmental's work, performing site assessment in the area of the two USTs, and collecting water level measurements from each of the eight wells on-site. Foss Environmental was responsible for decommissioning the heating oil UST, closing in-place the gasoline UST, all required permitting, backfilling the excavation from the heating oil tank, and pumping floating product from groundwater monitoring well MW-1 on two consecutive days.

On March 21, 1994, Foss Environmental pumped and rinsed out both USTs. A test pit was excavated near the heating oil UST, in order to get an indication of whether the tank had leaked, and the extent of contamination. A soil sample was collected from this test pit (northeast of the heating oil tank), and was analyzed for gasoline, BTEX, diesel, and heavy oil. In addition, two hand auger borings were advanced adjacent to the east and west sides of the gasoline tank. Samples collected from these two borings were analyzed for gasoline and BTEX. Free product from monitoring well MW-1 was pumped down using Foss Environmental's vacuum truck.

On March 22, 1994, a large hole was cut in the top of the gasoline tank after approval from a marine chemist. The gasoline tank was cleaned and triple rinsed. Hand auger borings were advanced to the north, south, and east of the tank, in order to estimate the extent of the contaminant plume originating from the gasoline tank.

Also on March 22, 1994, the heating oil UST was removed from the west end of the warehouse building adjacent and to the north of the Farmer's Market. Corrosion holes were noticed on the tank. A layer of contaminated soil was observed at approximately 5.5 feet below ground surface. An additional 15 tons of soil was removed from the excavation in an attempt to remove the most severely contaminated soil. Two composite soil samples were collected from the four sidewalls, and a soil sample was collected from the bottom of the excavation. Free product from monitoring well MW-1 was pumped down using Foss Environmental's vacuum truck.

On March 23, 1994, Foss transported 55-gallon drums from the Farmer's Market area to a fenced-off area near the former heating oil UST. Foss filled the gasoline UST with concrete slurry. Foss also paved the surface on top of the gasoline tank.

## 5.0 METHODS

### 5.1 Analytical Methods

Enviros had soil and groundwater analyzed for the following petroleum constituents: BTEX by Environmental Protection Agency (EPA) Method 8020, gasoline by Ecology Method WTPH-G, diesel by Ecology Method WTPH-D, and heavy oil by Ecology Method WTPH-418.1. Soil collected from borings to the north and west of the Farmer's Market block were analyzed for the following metals: arsenic, cadmium, chromium, lead, selenium, silver, copper, nickel, zinc, antimony, thallium, and beryllium by EPA Method 6010, and mercury by EPA Method 7071. All soil and groundwater samples collected for the Phase III Environmental Assessment performed by Enviros were delivered to On-Site Environmental in Redmond, Washington. All soil samples collected for the decommissioning of the heating oil UST and the gasoline UST were delivered to Transglobal Environmental Geosciences Northwest, Inc. in Olympia, Washington.

### 5.2 Field Quality Control/Quality Assurance Procedures

Soil that was collected for analysis was transferred to 4-ounce glass containers that were sealed with plastic, teflon-lined lids. The soil samples were packed into glass containers to minimize the head space volume of each sample. The samples were then delivered to the laboratory to be analyzed in the appropriate holding times.

Collected water samples were poured from the bailer into VOA vials, and 1-liter amber glass bottles. The containers were sealed with plastic, teflon-lined lids. No air bubbles were noted in the VOA vials on inversion. All sample jars were labeled and stored on ice until delivered to the analytical laboratory with a chain-of-custody.

Disposable bailers were used for sampling of all monitoring wells; therefore it was not necessary to decontaminate bailers. Sampling personnel wore latex gloves that were changed after each sample was collected. All soil sampling equipment and the water level probe were decontaminated prior to, and between, periods of sample collection. The decontamination procedure was as follows:

- Initial detergent/distilled water rinse;
- Second detergent/distilled water rinse;
- Distilled water rinse;
- 10 % Methanol Solution Rinse;
- Distilled water rinse; and
- Air Dry.

A chain-of-custody was maintained from the time the containers were obtained from the laboratory, until they were returned and the analyses were performed. Recorded sample information included: time and date of collection, sample identification number, analysis to be performed, preservative used, and special instructions as appropriate. The laboratory used internal precision and accuracy checks that are reported with the analytical results in Appendix A.

## 6.0 RESULTS AND DISCUSSION

This section is organized as follows:

- Hydrogeologic Results
- Sampling Analytical Results from the Southeast Block
- Sampling Analytical Results from the Northeast Block (Former Yard Birds Store)
- Sampling Analytical Results from the Northwest Block (Former Yard Birds Store)
- Sampling Analytical Results from the Farmer's Market Block

### 6.1 Hydrogeologic Results

Previously existing groundwater monitoring wells were surveyed for top of casing elevations on January 31, 1994. The monitoring wells installed by Enviros were surveyed for top of casing elevations on February 4, 1994. Depth to groundwater was measured using a electric water level probe on January 31, 1994, February 4, 1994, March 21, 1994, March 22, 1994, and March 23, 1994.

From the groundwater data obtained during Enviros assessment, it appears that the groundwater flow direction is towards the east and northeast on the Farmers Market block, and towards the northwest on the block to the east of the Farmers Market (parking lot). A steep hydraulic gradient anomaly is present on the southwest corner of the Farmer's Market Block that may be attributed to grading and filling by the City of Olympia a few years ago. All elevations are based on a relative datum of 10 feet at the top of a fire hydrant on the northwest corner of the Farmers Market block. Table 1 summarizes the water level data obtained during Enviros assessment activities. Figures 3 and 4 illustrate groundwater elevation contours (see Figures 3 and 4 for groundwater elevation contours).

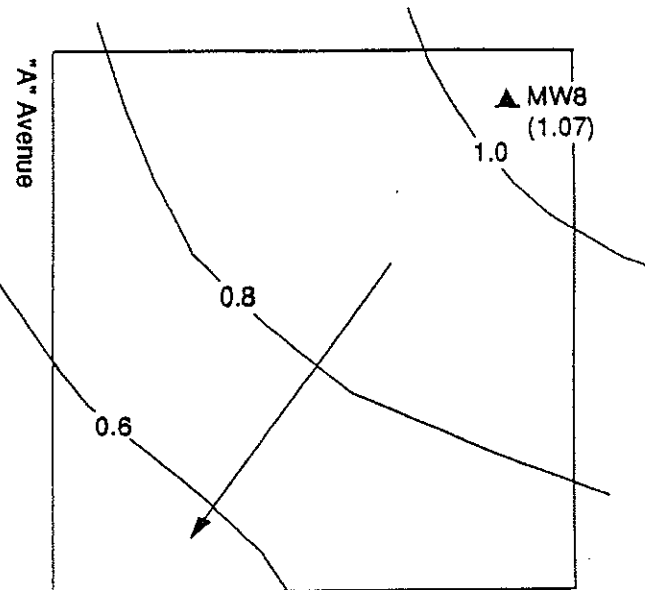
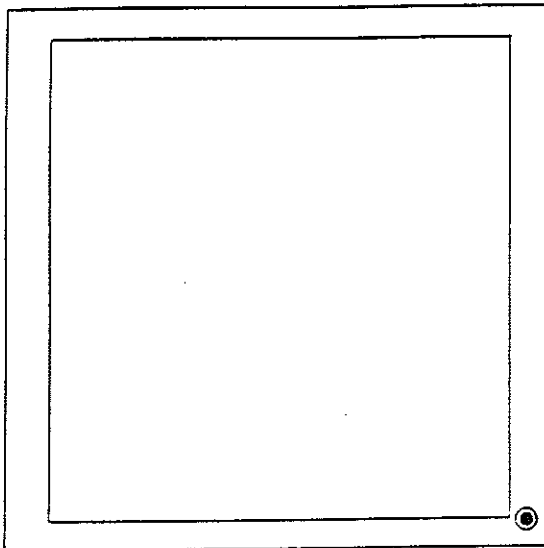
Because the subject property is 200 feet west of Budd Inlet, Enviros suspected that tidal influences may be affecting the water levels in groundwater monitoring wells on-site. In order to evaluate the affect of the tide on water levels on-site, an electric transducer was placed in monitoring well MW-3 with an attached data logger to record water levels every 10 minutes. On February 7, 1994, water levels were recorded from 10:50 am to 2: 20 pm. The greatest variance during this study was 0.08 feet which is negligible. Therefore, Enviros concluded that the tide does not significantly influence water levels on-site.

Table 1. Groundwater Elevation Data.

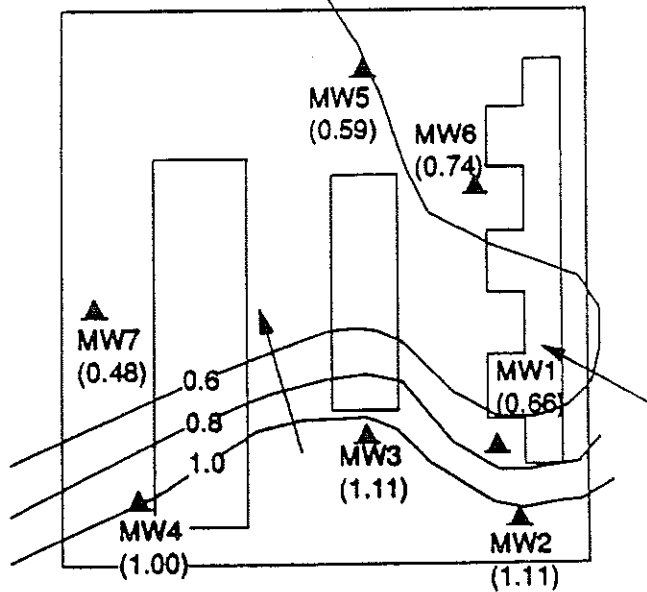
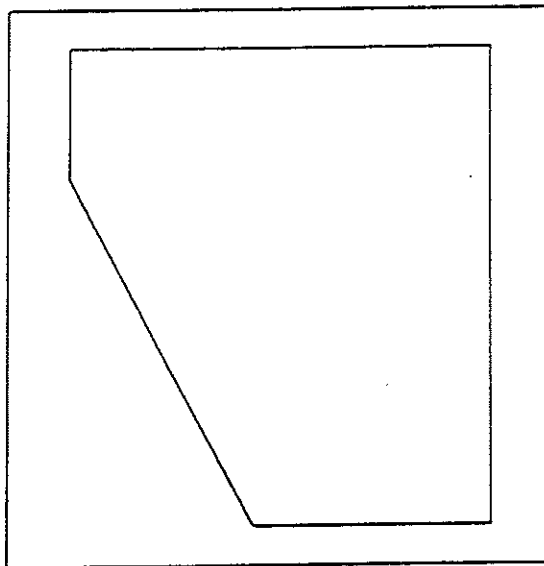
Well Designation	Date of Measurement	Top of Casing Elev. (feet)	Depth to Groundwater (feet)	Groundwater Elevation (feet)
MW-1	1/31/94	7.32	6.75	0.57
	2/4/94		6.66	0.66
	3/21/94		6.35	0.97
	3/22/94		6.16	1.16
	3/23/94		6.21	1.11
MW-2	1/31/94	7.10	5.98	1.12
	2/4/94		5.99	1.11
	3/21/94		5.69	1.41
	3/22/94		5.65	1.45
	3/23/94		5.61	1.49
MW-3	1/31/94	7.19	6.11	1.08
	2/4/94		6.08	1.11
	3/21/94		5.80	1.39
	3/22/94		Covered with stockpiled soil.	
	3/23/94		5.66	1.53
MW-4	1/31/94	6.99	8.06	-1.07
	2/4/94		5.99	1.00
	3/21/94		5.79	1.20
	3/22/94		5.72	1.27
	3/23/94		5.74	1.25
MW-5	2/4/94	7.35	6.76	0.59
	3/21/94		6.49	0.86
	3/22/94		6.45	0.90
	3/23/94		6.49	0.86
MW-6	2/4/94	7.44	6.70	0.74
	3/21/94		6.42	1.02
	3/22/94		6.40	1.04
	3/23/94		6.40	1.04
MW-7	2/4/94	7.48	7.00	0.48
	3/21/94		6.78	0.70
	3/22/94		6.74	0.74
	3/23/94		6.74	0.74
MW-8	2/4/94	6.72	5.65	1.07
	3/21/94		5.21	1.51
	3/22/94		5.18	1.54
	3/23/94		5.16	1.56



North Washington Street



North Capital Way



**Legend:**

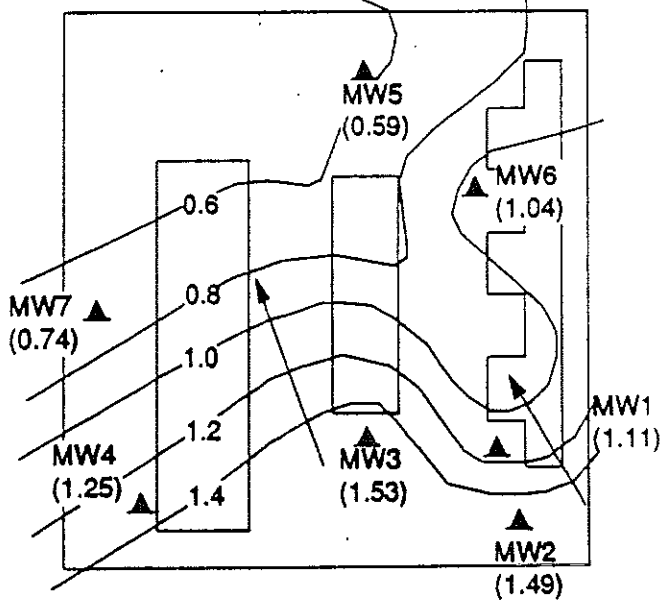
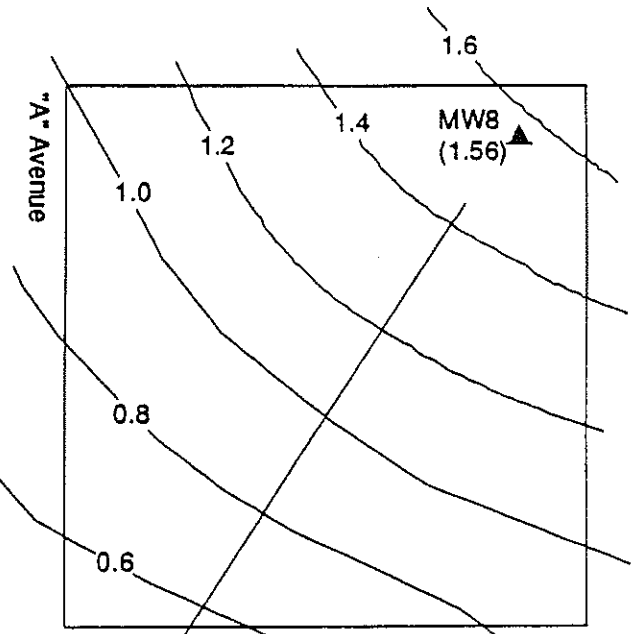
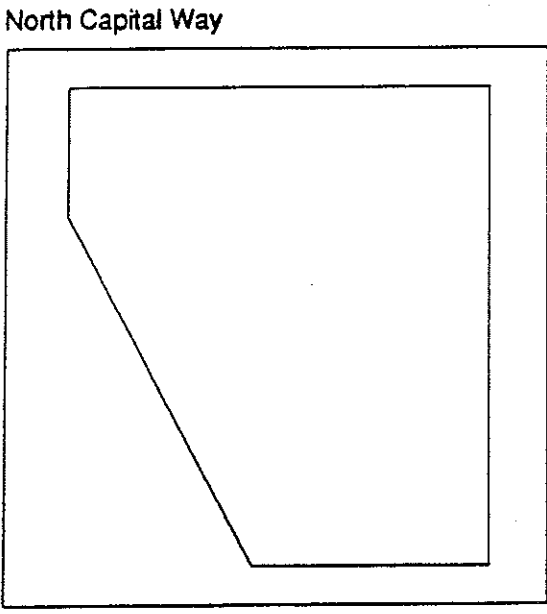
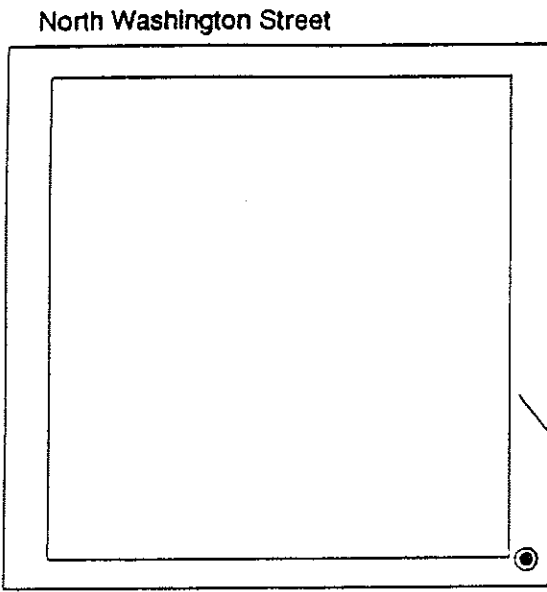
- ▲ Groundwater monitoring well location with elevation in feet.
- Estimated groundwater flow direction.
- 1.0— Groundwater elevation contour in feet.

Approximate Scale: 1" = 100'

Figure 3. Groundwater Elevation Contour Map for Water Level Measurements Taken on February 4, 1994 at the Yard Birds Property in Olympia, WA.

Drawn by: MBG Approved by: MBG Date: 6/1/94

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**Legend:**

- ▲ Monitoring Well with Elevation in Feet.
- Estimated groundwater flow direction.
- 1.0 — Groundwater Elevation Contour in feet

Approximate Scale: 1" = 100'

Figure 4. Groundwater Elevation Contour Map for Water Level Measurements Taken on March 23, 1994 at the Yard Birds Property in Olympia, WA.

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Drawn by: MBG Approved by: MSB Date: 6/1/94

## 6.2 Sample Results for the Southeast Block

Enviros drilled and sampled six, 5-foot soil borings in the southeast block of the Yard Bird's property (parking lot) to assess potential environmental impacts from the former foundry operation at this location. Potential heavy oil petroleum hydrocarbons contaminants and heavy metal concentrations were either not detected or were found to be below Ecology soil cleanup levels. Based on these results, evidence of environmental impact from the former foundry were not found.

The six soil samples from the block east of the Farmer's Market Block were analyzed for priority pollutant metals: arsenic (As), cadmium (Cd), chromium (Cr), lead (Pb), selenium (Se), silver (Ag), copper (Cu), nickel (Ni), zinc (Zn), antimony (Sb), thallium (Tl), and beryllium (Be). In general, these soil samples had concentrations that were below MTCA Method A or B cleanup levels; although, low background concentrations of cadmium, chromium, lead, copper, nickel, and zinc were detected. A sample collected from boring BH-5 at 3 feet below the ground surface had a concentration of cadmium (2.2 ppm) slightly above the MTCA Method A cleanup level of 2.0 ppm. By utilizing Land's upper confidence level statistical analysis for all six samples, the average cadmium concentration was found to be statistically below the MTCA Method A Cleanup level. Tables 2 and 3 summarize these soil analytical results, and Appendix B contains all analytical reports from Enviro assessment and remediation activities.

Enviros drilled and sampled a 15-foot well boring (MW8) in the southeast corner of the parking lot block to assess potential environmental impacts from a former service station that was located to the east of the subject property. No petroleum hydrocarbons were detected in the soil samples collected. The groundwater flow direction in this area appears to place the former service station upgradient of the parking lot. Groundwater sampling results indicated low levels of gasoline contaminants that were well below Ecology groundwater cleanup levels. Based on these results, there appears to be little or no environmental impact from the former service station to the southeast Yard Birds block.

Table 2. Soil Sampling Results for City Blocks North and East of Farmers Market

Sample Number	Depth (feet)	Date Analyzed	Diesel	Heavy Oil
BH1	3	2/8/94	NA	<25
BH1	6	2/4/94	NA	NA
BH3	3	2/8/94	NA	<25
BH3	6	2/4/94	NA	<25
BH3	8	2/8/94	NA	NA
BH4	3	2/8/94	NA	<25
BH5	3	2/8/94	NA	<25
BH6	3	2/8/94	NA	<25
BH7	6	2/4/94	<25	NA
BH8	6	2/4/94	<25	NA
MW8	7	2/4/94	<25	NA
Method Blank		2/8/94	<25	NA

Soil sample results are expressed in ppm.  
 "NA" - Not Analyzed

Table 3. Priority Pollutant Metals Soil Sampling Results for City Blocks North and East of the Farmers Market

Sample No.	Depth (feet)	Date Analyzed	As	Cd	Cr	Pb	Se	Ag	Cu	Ni	Zn	Sb	Tl	Be	Hg
BH1	3	2/8/94	4.6	1.5	11	6.7	<5.8	<0.39	20	13	25	<2.3	<5.8	<0.2	<0.07
BH3	3	2/8/94	<4.9	1.2	16	4.4	<7.4	<0.49	9.0	16	25	<2.9	<7.4	<0.24	<0.08
BH3	8	2/8/94	5.6	1.3	15	4.7	<7.0	<0.47	12	20	21	<2.8	<7.0	<0.23	<0.09
BH4	3	2/8/94	<4.0	1.2	10	3.2	<6.1	<0.40	8.1	13	20	<2.4	<6.1	<0.2	<0.08
BH5	3	2/8/94	8	2.2	22	6.5	<8	0.7	19	20	34	<3.2	<8	<0.27	<0.08
BH6	3	2/8/94	<6.6	1.9	13	4	<6.6	<1.1	10	17	25	<2.7	<6.6	<0.22	<0.08
Method Blank		2/8/94	<5	<0.25	<5	<2.5	<7.5	<0.5	<1.2	<2	<1	<3.0	<7.5	<0.25	<1.0
Cleanup Level A or B			20	2	100	250	400**	240**	2,960**	1,600**	24,000**	32**	7.2**	400**	1

All sample results are given in ppm.

\*\* Method B Cleanup Levels were used for compounds for which there are no established Method A levels

### 6.3 Sample Results for the Northeast Block - Former Yard Bird's Store

An asbestos-wrapped steam line pipe is suspected to be present on the northeast block of the property. Asbestos materials were not encountered in any of the borings drilled by Enviro, although the purpose of the assessment did not include a specific search for the pipe insulation.

Enviros drilled and sampled a ten foot soil boring (BH7) in the estimated location of a former UST just south of the Yard Birds store (edge of A Avenue) to assess potential environmental impacts from the suspected former UST. No petroleum hydrocarbons were detected in the soil samples collected. Based on these results, evidence of environmental impact from the suspected UST was not found.

### 6.4 Sample Results for the Northwest Block - Former Yard Bird's Store

Enviros drilled and sampled a ten foot soil boring (BH8) in the Yard Birds block just south of B Avenue to assess potential environmental impacts from the former Chevron bulk fuel transfer operation located across the street to the north. No petroleum hydrocarbons were detected in the soil samples collected. Based on these results, the Chevron operation does not appear to have impacted the Yard Birds Block.

### 6.5 Sample Results for the Farmers Market Block

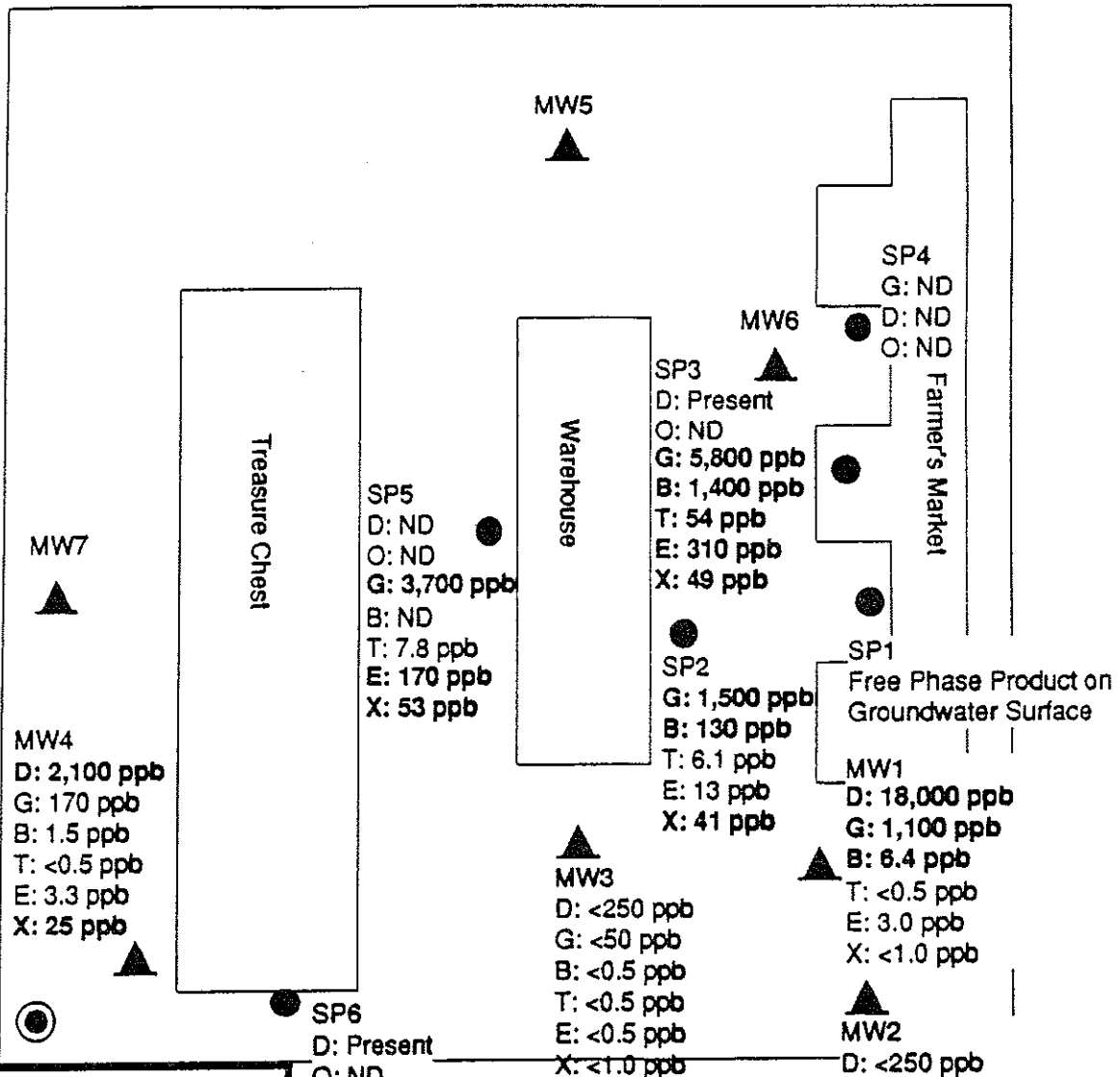
#### 6.5.1 Soil and Groundwater Assessment Results

##### ATEC Results

Analytical results from the previous assessment performed by ATEC Associates indicate that monitoring wells MW-1 and MW-4 have been affected by both diesel and gasoline. Monitoring wells MW-2 and MW-3 had no detectable levels of gasoline, BTEX, diesel, or heavy oil. ATEC also performed some groundwater sampling using a modified soil vapor probe. From these groundwater samples, gasoline-affected groundwater is evident to the northeast of MW-1, which is consistent with the groundwater elevation data (See Figure 5 for an illustration of groundwater sample results from the modified soil vapor probe and monitoring wells MW-1 through MW-4). Table 4 summarizes previous analytical results of monitoring wells MW-1, MW-2, MW-3, and MW-4, and the modified soil vapor probe groundwater sample results.

##### Enviros Results

Soil samples were collected from four soil borings designated BH9, MW5, MW6, and MW7 on the Farmer's Market block as part of Enviro's assessment. Soil samples from these borings were analyzed for gasoline, BTEX, diesel, and heavy oil. The soil samples collected from this area had no detectable levels of the suspected contaminants. Table 5 summarizes the analytical results.



**Legend:**

- Fire Hydrant Location
  - ▲ Monitoring Well Location
  - Groundwater Sampling Probe
- D: Diesel      T: Toluene  
 O: Heavy Oil    E: Ethylbenzene  
 G: Gasoline    X: Total Xylenes  
 B: Benzene
- Concentrations in bold are above  
 MTCA Method A Cleanup Levels.
- Scale: 1" = 50'

Figure 5. Map of Previous Sampling Locations and Analytical Results at Yard Birds Property in Olympia, WA.

Drawn by: MBG Approved by: ms Date: 6/1/94

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 E1/940109.01

**Table 4. Previous Environmental Assessment Results**

Sample Number	Date Sampled	Matrix	Diesel	Heavy Oil	Gasoline	B	E	T	X
MW-1	11/4/93	water	18,000	NA	1,100	6.4	3.0	<0.5	<1.0
MW-2	11/4/93	water	<250	NA	<50	<0.5	<0.5	<0.5	<1.0
MW-3	11/4/93	water	<250	NA	<50	<0.5	<0.5	<0.5	<1.0
MW-4	11/4/93	water	2,100	NA	170	1.5	3.3	<0.5	25
MW-1	10/20/93	soil	Present	Present	Present	1.83	1.39	1.03	6.5
MW-2	10/20/93	soil	<50	<100	<20	<0.3	<0.3	<0.3	<0.3
MW-3	10/20/93	soil	<50	<100	<20	<0.3	<0.3	<0.3	<0.3
MW-4	10/20/93	soil	<50	<100	<20	<0.3	<0.3	<0.3	<0.3
SP-1	12/1/93	water	NS	Free Phase	NS	NS	NS	NS	NS
SP-2	12/1/93	water	NA	NA	1,500	130(E)	13	6.1	40.6
SP-3	12/1/93	water	Present	<1,000	5,800	1,400	310	54	49
SP-4	12/6/93	water	<500	<1,000	<200	NA	NA	NA	NA
SP-5	12/6/93	water	<500	<1,000	3,700	<1.0	170	7.8	53
SP-6	12/6/93	water	Present	<1,000	9,300	1,300	1,200	21	1,512

All groundwater sample results are given in ppb and all soil sample results are given in ppm.

NA - Not Analyzed

NS - Not Sampled

(E) - Value reported is an estimate

B - Benzene

T - Toluene

E - Ethylbenzene

X - Total Xylenes

**Table 5. Soil Sample Results for the Farmers Market Block**

Sample No.	Depth (feet)	Date Analyzed	Heavy Oil	Diesel	Gasoline	B	T	E	X
MW5	5	2/4/94	NA	<25	<0.1	<0.1	<0.1	<0.001	<0.002
MW6	3	2/4/94	<25	<25	<0.1	<0.1	<0.1	<0.001	<0.002
MW6	6	2/4/94	NA	<25	<0.1	<0.1	<0.1	<0.001	<0.002
MW6	8	2/6/94	<25	NA	NA	NA	NA	NA	NA
MW7	6	2/4/94	NA	<25	<0.1	<0.1	<0.1	<0.001	<0.002
BH-9	3	2/3/94	<25	<25	<0.1	<0.1	<0.1	<0.001	<0.002
BH-9	6	2/3/94	<25	NA	NA	NA	NA	NA	NA
MTC Method A Cleanup			200	200	100	0.5	40	20	20

B - Benzene

T - Toluene

E - Ethylbenzene

X - Total Xylenes

All soil sample results are given in ppm.

\*NA\*-Not Analyzed

Groundwater samples were collected from the seven wells on the Farmer's Market block and were analyzed for gasoline, BTEX, diesel, and heavy oil. Floating product was observed in monitoring well MW1. The analysis of the groundwater sample collected from MW1 indicated the floating product is either diesel or heavy oil. Gasoline and BTEX were detected in a sample from monitoring well MW4 above MTCA Method A cleanup levels. Elevated levels of benzene (11 and 51 ppb) were detected in samples from monitoring wells MW5 and MW6. Levels of heavy oil (1,200 ppb) slightly above the MTCA Method A cleanup level were detected in monitoring well MW6. See Figure 6 for an illustration of the analytical results. Table 6 summarizes the analytical data.

**Table 6. Enviro Groundwater Sampling Results (In ppb)**

Sample No.	Date Analyzed	Diesel	Heavy Oil	Gasoline	B	T	E	X
MW1	2/7/94	280,000	2,600,000	<300	<1.0	<1.0	<1.0	<2.0
MW2	2/7/94	900	NA	<300	<1.0	<1.0	<1.0	2.2
MW3	2/7/94	<500	<500	<300	<1.0	<1.0	<1.0	2.2
MW4	2/7/94	<500	NA	6,200	140	210	530	1,440
MW5	2/7/94	890	<500	<300	11	1.3	1.6	3.0
MW6	2/7/94	860	1,200	720	51	3.2	3.1	9.3
MW7	2/7/94	<500	<500	<300	<1.0	1.5	2.3	14.8
MW8	2/7/94	<500	NA	<300	<1.0	<1.0	1.0	3.5
Method Blank	2/7/94	<500	<500	<300	<1.0	<1.0	<1.0	2.3
MTCA Method A Cleanup Levels		1,000	1,000	1,000	5	40	30	20

Groundwater sample results are provided in ppb.

\*NA\* - Not Analyzed

B - Benzene

T - Toluene

E - Ethylbenzene

X - Total Xylenes

### 6.5.2 Ecology File Review of Former Fuel Bulk Storage Facilities

Historically, Shell Oil and Unocal operated a bulk storage facility to the southwest of the Farmers Market block. This site is present on Ecology's Confirmed and Suspected Contaminated Sites list. The City of Olympia has been interested in purchasing this property for construction of a park; therefore, the City of Olympia had an environmental site assessment performed on the property. According to a report written by Rittenhouse-Zeman and Associates, Inc. (RZA) dated October 20, 1989, petroleum hydrocarbon affected soils were encountered in vadose zone soils that appear to have been the result of isolated surface spills. Groundwater contamination was not encountered during this assessment. The groundwater flow direction at this property was determined to be towards the west during low tide and towards southwest during high tide.

Two USTs were removed from this site on July 11, 1989. Applied Geotechnology, Inc. (AGI) was on-site to assess the environmental impact of these tanks. AGI concluded that much of the property appeared to be underlain by soil and groundwater contaminated by petroleum hydrocarbons. The source of contamination may have been surface spills or leaks associated with one or more underground or above-ground storage tanks on or off-site. The TPH analysis indicated the contamination was gasoline and similar hydrocarbons with little or no diesel or heavy oil constituents.

From the two reports reviewed regarding this property, it appears that the groundwater flow is not in the direction of the Farmers Market. In addition, the groundwater on this site is contaminated by gasoline, and not diesel as was detected in monitoring well MW-1 on the southwest corner of the Farmers Market (closest to the former bulk plant). In conclusion, it does not appear that this site has affected the Yard Birds property.

### 6.5.3 Tank Removal Results

Soil samples collected in the vicinity of the heating oil UST were analyzed for diesel, except for the first sample collected from a test pit southwest of the tank which was analyzed for diesel, heavy oil, and gasoline. This sample indicated diesel-contaminated soil. After the tank was removed from the excavation three samples were collected: a composite sample from the north and west sidewalls (N&W Sidewall), a composite sample from the south and east sidewalls (S&E Sidewall), and a sample from the bottom of the excavation (Bottom). The analytical results of these samples indicated that diesel-affected soils above the MTCA Method A Cleanup level exist to the southeast of the former heating oil UST. The sample collected from the bottom of the excavation had detectable levels of diesel below MTCA Method A cleanup levels. The samples collected from the stockpile indicated that the stockpile has significant levels of diesel. Figure 7 illustrates the sample locations and the associated analytical results.

Soil samples collected in the vicinity of the gasoline UST were analyzed for gasoline and BTEX. Hand auger samples were collected around the gasoline UST that was closed in place in order to determine the extent of the gasoline-affected soil and groundwater. From the analytical results, it appears that gasoline has migrated via groundwater to the north and east. Figure 8 illustrates the sample locations and the associated analytical results. Table 7 summarizes all analytical results related to the heating oil tank and the gasoline tank.

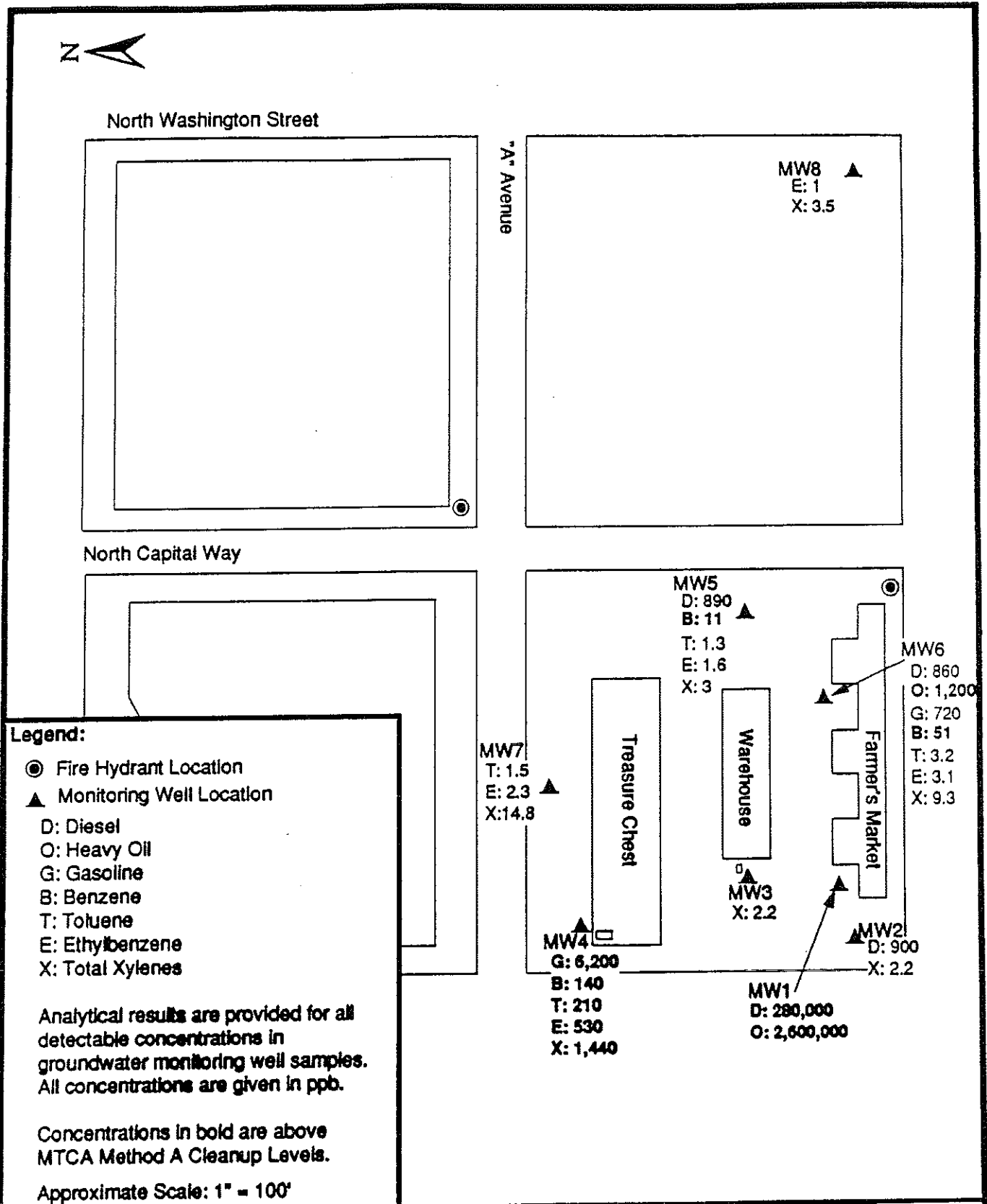


Figure 6. Groundwater Analytical Results  
Yard Birds Property in Olympia, WA.

Drawn by: MBG Approved by: mas Date: 6/1/94

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E1/940109.01

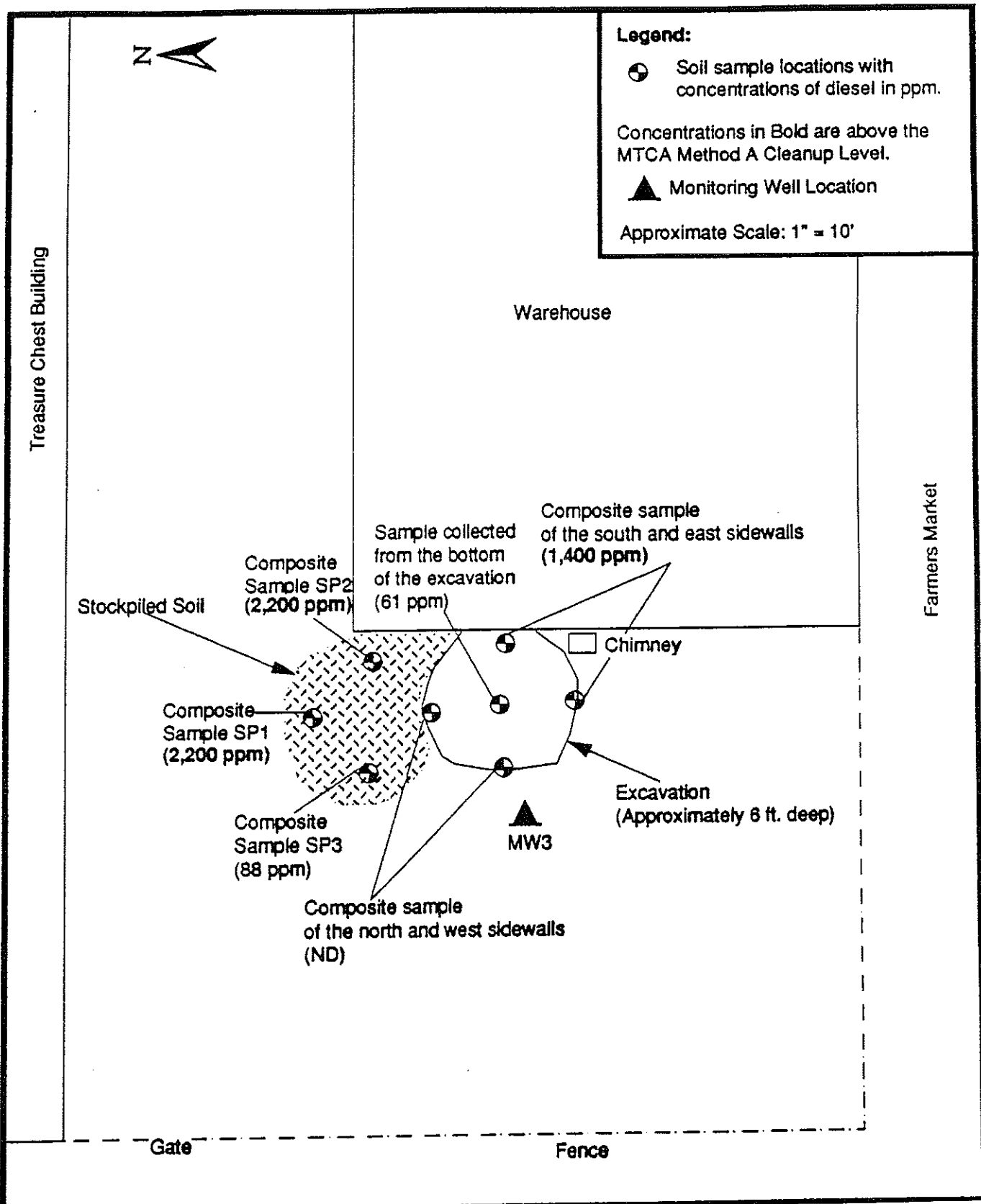


Figure 7. Sampling Locations and Analytical Results from the Heating Oil UST Excavation at the Yardbirds Property in Olympia, WA.

Drawn by: MBG Approved by: N.S.S. Date: 6/1/44

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**Legend:**

⊕ Boring Location

G: Gasoline Concentration

B: Benzene

T: Toluene

E: Ethylbenzene

X: Total Xylenes

All concentrations are given in ppm.

Concentrations in bold are above MTCA Method A Cleanup Levels.

Approximate Scale: 1" = 10'

Covered Treasure Chest Area



⊕ Eastside 3  
Abandoned because encountered additional slab at approximately 1 foot below ground surface.

Treasure Chest Building

Estimated extent of soil contaminant plume.

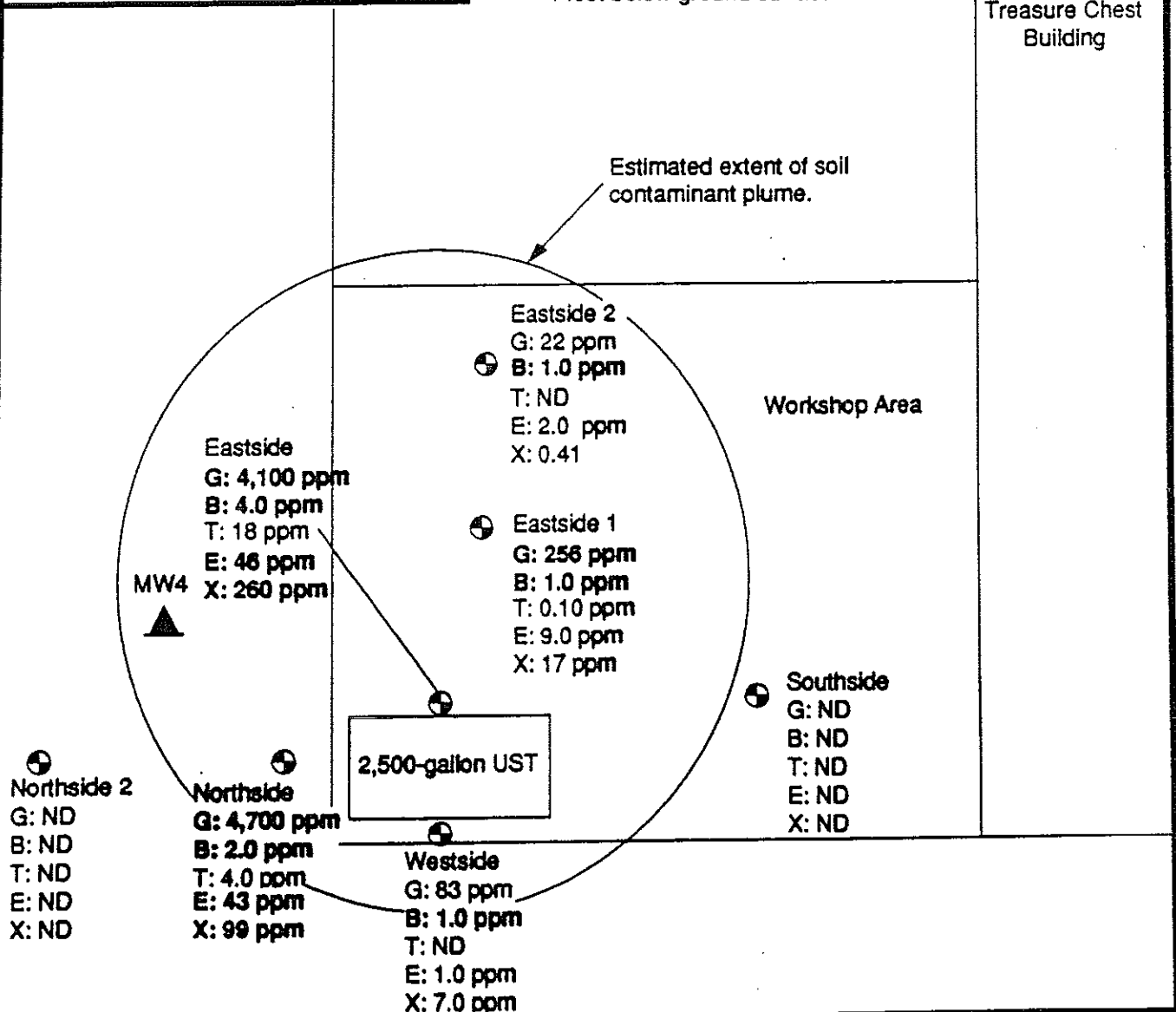


Figure 8. Sample Locations and Analytical Results in the Vicinity of the Gasoline Tank at the Yard Birds Property in Olympia, WA

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E1/940109.01

Drawn by: MBG Approved by: WSE Date: 6/1/94

**Table 7. Soil Analytical Results for Samples Collected in the Vicinity of the Gasoline and Heating Oil USTs**

Sample Name	Date	Depth (feet)	Diesel	Heavy Oil	Gasoline	B	T	E	X
Test Pit	3/21/94	5	270	207	<10	<0.05	<0.05	<0.05	<0.05
N&W Sidewall	3/22/94	4	<20	NA	<10	<0.05	<0.05	<0.05	<0.05
S&E Sidewall	3/22/94	4	1,373	NA	<10	<0.05	<0.05	<0.05	<0.05
Bottom	3/22/94	6	61	NA	<10	<0.05	<0.05	<0.05	<0.05
SP-1	3/22/94	-	2,157	NA	<10	<0.05	<0.05	<0.05	<0.05
SP-2	3/22/94	-	2,188	NA	<10	<0.05	<0.05	<0.05	<0.05
SP-3	3/22/94	-	80	NA	<10	<0.05	<0.05	<0.05	<0.05
Northside	3/22/94	5.5	NA	NA	4,690	1.58	4.45	43.04	98.84
Northside 2	3/22/94	6	NA	NA	<10	<0.05	<0.05	<0.05	<0.05
Southside	3/22/94	6	NA	NA	<10	<0.05	<0.05	<0.05	<0.05
Westside	3/21/94	5	NA	NA	83	0.05	<0.05	1.48	6.87
Eastside	3/21/94	5	NA	NA	4,136	4.03	17.92	45.64	259.20
Eastside 1	3/23/94	6	NA	NA	256	1.14	0.08	8.99	17.04
Eastside 2	3/23/94	6	NA	NA	<10	<0.05	<0.05	<0.05	<0.05
Method Blank	2/7/94	-	<20	<20	<10	<0.05	<0.05	<0.05	<0.05
MTCA Method A Cleanup Levels			200	200	100	0.5	40.0	20.0	20.0

All soil sample results are provided in ppm.

\*NA\* - Not Analyzed

B - The analyte indicated was also found in the blank sample

## 7.0. SUMMARY AND CONCLUSIONS

### 7.1 Summary

Of the four blocks involved in the environmental assessment and property transfer process, three of the blocks (all except the Farmer's Market block) have achieved substantial closure or resolution of environmental concerns. Remaining environmental concerns on the Farmer's Market have been addressed by thorough site characterization and implementation of preliminary remediation measures directed at source control. Completed remediation measures include decommissioning of the two on-site USTs, removal of approximately 15 tons of diesel-contaminated soil and pump-out of diesel product in a well in the southwest corner of the Farmer's Market.

### 7.2 Conclusions

The results from the soil testing indicated that contamination in the Farmer's Market block was less widespread than initially suspected based on non-detectable contaminant concentrations for soil samples collected by Enviros. It was also discovered that contamination trends may have been obscured by excavation and site grading activities conducted approximately 10 years ago by the City of Olympia in preparation of construction of the Farmer's Market.

Groundwater assessment results indicated that water flows from the west and south toward the northeast and that a very steep groundwater gradient exists at the southwestern end of the Farmer's Market. Groundwater transport may be quite rapid in this area based on the steep gradient and the sandy soil/fill conditions on the site. Changes in groundwater elevations with respect to tides monitored over an 8 hour period appeared minimal even though Puget Sound (Budd Inlet) is located approximately 200 feet west of the Farmer's Market.

Floating petroleum hydrocarbon product was observed in a well within the Farmer's Market and diesel contaminant concentrations were above Ecology cleanup levels. Gasoline contamination above Ecology cleanup levels was also observed in the well adjacent to the gasoline UST of the Treasure Chest and in one down-gradient well.

The results of sampling on the north end of the Farmer's Market block indicated that the gasoline contamination was likely attributable to the former operation of the gasoline UST in the Treasure Chest building. The contamination in this area of the property also appeared to be limited to gasoline contaminants since no heavy oil or diesel contamination was detected in the groundwater. Soil samples collected immediately adjacent to the tank had gasoline contaminant concentrations well above Ecology soil cleanup levels. The total volume of remaining contaminated soil in this area is estimated to be 230 cubic yards and appears to be localized around the groundwater table boundary.

The results of sampling on the south end of the Farmer's Market block indicated that diesel product contamination might be attributable to former operation of the heating fuel (diesel) UST adjacent to the Warehouse building, and/or historical operation of a bulk fuel transfer/storage facility on the south end of the block. Contamination on the west end of the Farmer's Market area appeared to be limited to diesel contaminants since no gasoline constituents were detected in the groundwater. Contamination on the east end of the Farmer's Market area near North Capital Way appeared to be a mixture of diesel and gasoline.

The total volume of remaining contaminated soil in the Farmer's Market area is not accurately known but may range from 405 to 810 cubic yards depending on the actual thickness of the contamination which appears to be localized around the groundwater table boundary. Based on available field data and observations, the thickness of contaminated soil in the Farmer's Market appears to be approximately 2 feet and the lateral extent may cover an area of approximately 11,000 square feet. There also appears to be a substantial overburden of non-contaminated soils resting above the contamination zone which may be related to historical site grading activities.

In addition to tank decommissioning activities, the well in the Farmer's Market that contained floating diesel product was pumped down several times during the course of field activities to remove product. Product and oily water was disposed by vacuum truck. The product was observed to recharge into the well on collection of subsequent groundwater measurements. The estimated volume of product is very approximate and may range from 3100 to 4600 gallons assuming a 2 to 3 -inch product layer, an affected area of 110 by 75 feet and a soil porosity of 0.30 (30%).

### 7.3 Recommendations

The overall strategy for final cleanup of the Yard Birds Property is to perform source control by removal and/or treatment of contaminated soils and long-term monitoring of groundwater which is currently contaminated above Ecology cleanup levels. Soil removal/treatment of diesel-contaminated soils in the Farmer's Market area has been deferred until 1996 by arrangement with the City of Olympia in consideration of their desire to maintain operation of the Farmer's Market in its current location. Soil removal/treatment of gasoline-contaminated soil in the Treasure Chest area is also proposed to be deferred until 1996 to coordinate with cleanup activities in the Farmer's Market and thereby provide a cost savings on mobilization and field activities. Remediation of contaminated soil in the Treasure Chest building area by soil removal is not currently feasible without destroying the west end of the building and potentially damaging the building foundation.

Active treatment of groundwater contamination is not proposed at this time for the following reasons: contaminated on-site groundwater should not pose a threat to human health since it is not likely to be used for drinking water purposes due to proximity to brackish water of Budd Inlet; the water table is within 5 to 7 feet of the ground surface such that subsurface construction activities which would cause exposure of contaminated groundwater is unlikely; and aggressive treatment and cleanup of groundwater does not appear practical or consistent with the current industrial land use practices in the immediate area.

Accordingly, groundwater compliance monitoring is proposed for both the interim period when the Farmer's Market will be operating and after source control measures have been completed. This monitoring will serve the purpose of verifying groundwater conditions so that corrective actions can be taken if groundwater sampling indicates rapid spread of contaminants or increasing levels of contaminants.

Proposed corrective actions for floating product will either consist of: episodic pump-out of a proposed recovery well, soil excavation area or the existing wells; or installation and operation of a well pump and oil/water separator system.

## 8.0 ASSESSMENT LIMITATIONS

No warranty is expressly stated or implied in this report with regard to the condition of the substrate and groundwater at and/or below the surface of the property with the exception of the samples collected and parameters analyzed in this assessment. Due to natural variability of the soil matrix and subsurface geologic and hydrogeologic conditions, the limited sampling performed at the site may not be indicative of general site conditions and potential soil contamination in other areas of the property. Therefore, EnviroS cannot guarantee the general conditions of subsurface soils on the property or specify an absence of contamination in potential soil sampling locations not addressed in this assessment.

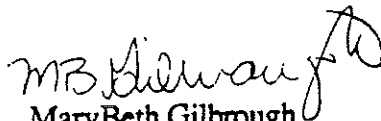
This report reflects our professional opinions, interpretations, recommendations and observations of property conditions on the days of the assessment only, and does not cover any other conditions subsequently found on the property that were not visible during the assessment.

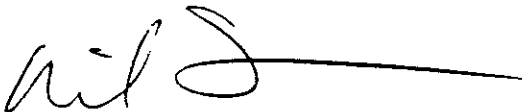
The findings and conclusions documented in this report have been prepared in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area, and in accordance with the Exhibit and General Services Agreement executed between EnviroS and Client.

It has been a pleasure to work with you on this project, and if you have any questions regarding this report, please call. EnviroS will be happy to discuss site future regulatory requirements or remediation alternatives.

Sincerely,

EnviroS, Inc.

  
MaryBeth Gilbrough  
Civil Engineer  
(206) 828-2511

  
Mike Surowiec, P.E., P.G.  
Senior Geoenvironmental Engineer  
(206) 828-2506

cc: Files

**APPENDIX A: BORING LOGS AND WELL COMPLETION DIAGRAMS**

# Log of MW5 - Yard Birds Shopping Center

Analytical Results	Sample Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks			
<b>YB-MW5-5'</b> G = ND BTEX = ND D = ND	3/4/10	100	2							
			4							
			6							
<b>YB-MW5-10</b> Not Analyzed	4/4/4	100	6.76' 2/4/94		SP	Moist, brown, pebbly, medium-to-coarse-grained SAND with purple and white shell fragments. Soft white material of unknown origin present.				
			8							
			10							
<b>YB-MW5-15'</b> Not Analyzed	4/10/12	100	14		GP	Saturated gray, medium-to-coarse-grained SAND. Lower 3" has abundant gravel - up to 1" in diameter.				
			16							
			18							
<b>LEGEND</b> G = Gasoline B = Benzene T = Toluene E = Ethyl Benzene X = Xylene ND = Not detected Log depths are below ground surface. Water depths are below top of casing. - Interval sampled with split- spoon.			20							
			22							
			24							
			26							
			28							
			30							
			32							
			34							
			Bottom of Boring - 15.5'							

**enviros** .

5808 Lake Washington Blvd. NE  
 Kirkland, WA 98033-7350  
 (206)828-2520

Yard Birds Shopping Center, Olympia, Washington  
 Date Drilled: February 2, 1994  
 Geologist: Lance Robert  
 Equipment: 4-inch I.D. HSA  
 Project Name: Yard Birds Shopping Center

**MW5**

Job No.: E1/940109.02      Date: 02/15/94

# Log of MW6 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
<b>YB-MW6-3</b> G = ND BTEX = ND D = ND 418.1 = ND	4/5/5	100	2	SP		Slightly moist, brown, shell-rich, medium-grained SAND. Occasional whole bi-valves (white and purple) present. Excepting shell material, sand is siliclastic. (Appears to be dredged fill material).	1.5 ppmv
			4				
<b>YB-MW6-6</b> G = ND BTEX = ND D = ND 418.1 = ND	3/2/3	80	6	SP		Moist, dark-brown, shell-rich, silty, gravelly, medium-grained SAND. Shell fragments are white and purple. Lower 3" of sample is stained black. Outside of sampler also had a black stain. Slight hydrocarbon odor. (Fill as above)	1.6 ppmv
		6.70' 2/4/94	8				
	4/4/4	100	10				
			12				
<b>YB-MW6-8</b> 418.1 = ND			14	GP		Saturated, brown, gravelly, medium-to-coarse-grained SAND. No shell fragments present. Gravel to 1" in diameter.	6.0 ppmv
			16				
	3/10/11	100	18				
			20				
			22				
			24				
			26			Saturated olive-gray, gravelly, medium-to-coarse-grained SAND. Gravel appears to be stratified; upper 9" has sparse pebbles and lower 3" has >50% gravel (to 2" in diameter).	0.0 ppmv
			28				
			30				
			32				
			34				

**LEGEND**

G = Gasoline  
 B = Benzene  
 T = Toluene  
 E = Ethyl Benzene  
 X = Xylene  
 ND = Not detected  
 Log depths are below ground surface.  
 Water depths are below top of casing.  
 - Interval sampled with split-spoon.

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Yard Birds Shopping Center, Olympia, Washington  
 Date Drilled: February 3, 1994  
 Geologist: Lance Robert  
 Equipment: 4-Inch I.D. HSA  
 Project Name: Yard Birds Shopping Center

**MW6**

Job No.: E1/940109.02      Date: 02/15/94

# Log of MW7 -Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
YB-MW7-3 Not Analyzed	9/10/7	100	2			Slightly moist, stratified, shell-rich, gravelly, medium-to-coarse-grained SAND. Rust-stained in places. Shells are white and purple. (Appears to be dredged fill material)	0.0 ppmv
YB-MW7-6 'G = ND BTEX = ND D = ND	2/2/2	100	4				
YB-MW7-8 Not Analyzed	4/3/2	100	7.00'			Upper 6" - Moist, brown, shell-rich, medium-to-coarse-grained SAND. (Fill as above) Lower 6" - Moist gray, medium-grained SAND with small shell fragments. Wood debris and roots present. (Former ground surface?)	0.0 ppmv
			8		SP	Saturated, gray, shell-bearing, laminated, medium-grained SAND. Laminations are thin (<1") silt. (Appears to be dredge fill material).	1.1 ppmv
			10				
			12				
			14				
	1 (16") 1 (12")	100	16		ML	Upper 9" - Saturated, gray, shell-rich, medium-grained SAND. Shells <25% and <.5" diameter. Lower 3" - Saturated, gray, sandy, pebbly, SILT. No shells present. Pebbles are matrix supported. (Fill Material?)	0.0 ppmv
			18			Bottom of Boring - 16.5'	
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

G = Gasoline  
 B = Benzene  
 T = Toluene  
 E = Ethyl Benzene  
 X = Xylene  
 ND = Not detected



Log depths are below ground surface.  
 Water depths are below top of casing.

- Interval sampled with split-spoon.


- Roots and plant material.

<p><b>enviros</b> <small>®</small></p> <p>5808 Lake Washington Blvd. NE          Kirkland, WA 98033-7350          (206)828-2520</p>	<p>Yard Birds Shopping Center, Olympia, Washington</p> <p>Date Drilled: February 3, 1994</p> <p>Geologist: Lance Robert</p> <p>Equipment: 4-inch I.D. HSA</p> <p>Project Name: Yard Birds Shopping Center</p>	MW7
<p>Job No.: E1/940109.02      Date: 02/15/94</p>		

# Log of MW8 -Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
<b>YB-MW8-7</b> G = ND BTEX = ND D = ND	4/5/4	100	2 4 5.65' 2/4/94 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34		SP	Saturated, gray, shell-rich, pebbly, medium-to-coarse-grained SAND. Shell fragments are white and purple.	0.0 ppmv
	4/8/12)	100	16 18 20 22 24 26 28 30 32 34			Saturated, gray, gravelly, medium-to-coarse-grained SAND.  Bottom of Boring - 16.5'	0.5 ppmv

**LEGEND**

G = Gasoline  
 B = Benzene  
 T = Toluene  
 E = Ethyl Benzene  
 X = Xylene  
 ND = Not detected  
 Log depths are below ground surface.  
 Water depths are below top of casing.  
 - Interval sampled with split-spoon.

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Yard Birds Shopping Center, Olympia, Washington

Date Drilled: February 3, 1994  
 Geologist: Lance Robert  
 Equipment: 4-inch I.D. HSA  
 Project Name: Yard Birds Shopping Center

**MW8**

Job No.: E1/940109.02      Date: 02/15/94

# Log of BH1 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
YB-MW1-3' 418.1 - ND Metals -	3/2/6	100	2		SP	Moist, brown, pebbly, fine-to-medium-grained, SAND with specs of soft white material of unknown origin. Sand is composed of siliciclastic material; of which, approximately 25% is quartz. (Appears to be imported fill material)	0.0 ppmv
YB-MW1-6' HCID - ND	1/1/1	100	4		PT		Wet, dark-brown, organic-rich, peaty, clayey, silty, sandy SOIL HORIZON. Abundant roots and straw blades. (Unit appears to be in-situ material) Bottom of Boring - 6.5'
			6				
			8				
			10				
			12				
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

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- B = Benzene
- T = Toluene
- E = Ethyl Benzene
- X = Xylene
- ND = Not detected
- Log depths are below ground surface.
- Water depths are below top of casing.
- Interval sampled with split-spoon.
- Roots and plant material.

<p style="text-align: center;"><b>enviros</b> </p> <p style="text-align: center;">5808 Lake Washington Blvd. NE Kirkland, WA 98033-7350 (206)827-5525</p>	<p style="text-align: center;">Yard Bird Shopping Center, Olympia, Washington</p> <p>Date Drilled: February 2, 1994 Geologist: Lance Robert Equipment: 4-inch I.D. HSA Project Name: Yard Bird Shopping Center -</p>	BH1
<p>Job No.: E1/940109      Date: 02/09/94</p>		

# Log of BH2 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
YB-BH2-3' 418.1 - ND Metals	5/6/7	100	2		SP	Moist, brown, gravelly, medium-grained SAND with white and purple shell fragments. Sand is largely composed of siliciclastic material. Occasional soft white material of unknown origin. (Appears to be imported fill material)	2.0 ppmv
YB-BH2-6' HCID - ND	1/1/1	100	4		SP		
			6			Upper 12" - Wet, mottled, gray CLAYEY SILT with abundant roots and other organic material.	2.5 ppmv
			8		PT	Lower 6" - Moist, black, grading down to dark-brown gravelly, silty, sandy SOIL HORIZON. Abundant roots and other organic material.	
			10			Bottom of boring 6.5 feet.	
			12				
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

- G = Gasoline
- B = Benzene
- T = Toluene
- E = Ethyl Benzene
- X = Xylene
- ND = Not detected
- Log depths are below ground surface.
- Water depths are below top of casing.
- Interval sampled with split-spoon.
- Roots and plant material.

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Yard Bird Shopping Center, Olympia, Washington

Date Drilled: February 2, 1994

Geologist: Lance Robert

Equipment: 4-inch I.D. HSA

Project Name: Yard Bird Shopping Center -

**BH2**

Job No.: E1/940109.02      Date: 02/09/94

# Log of BH3 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
YB-BH3-3' 418.1 - ND Metals	5/6/6	100	2		SP	Moist, brown, medium-grained SAND with white and purple shell fragments. Excepting shell fragments, sand is largely composed of siliciclastic material. Occasional soft white material of unknown origin. (Unit appears to be imported fill material)	0.0 ppmv
YB-BH3-6' HCID - ND	6/3/2	20	4				
	4/7/6	100	6			Saturated, gray silty fine-to coarse-grained SAND with sporadic shell fragments. Same unit as above with different color.	0.5 ppmv
			8				
			10		GM	Saturated, gray sandy, silty, fine GRAVEL. Gravel to 50mm (50%), sand/silt (50%).	
			12			Bottom of Boring - 9.0'	
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

- G = Gasoline
- B = Benzene
- T = Toluene
- E = Ethyl Benzene
- X = Xylene
- ND = Not detected
- Log depths are below ground surface.
- Water depths are below top of casing.
- Interval sampled with split-spoon.
- Roots and plant material.

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Yard Bird Shopping Center, Olympia, Washington

Date Drilled: February 2, 1994  
Geologist: Lance Robert  
Equipment: 4-inch I.D. HSA  
Project Name: Yard Bird Shopping Center -

**BH3**

Job No.: E1/940109      Date: 02/10/94

# Log of BH4 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
YB-BH4-3' 418.1 - ND Metals	3/5/6	100	2		SP	Moist, brown, medium-grained, silty, pebbly SAND with white and purple shell fragments. Excepting shell fragments, sand is largely composed of siliciclastic material. Occasional soft white material of unknown origin. (Unit appears to be imported fill material)	1.6 ppmv
YB-BH4-6' Not Analyzed	4/3/2	20	6				
			8			Bottom of Boring - 6.5'	2.1 ppmv
			10				
			12				
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

- G = Gasoline
  - B = Benzene
  - T = Toluene
  - E = Ethyl Benzene
  - X = Xylene
  - ND = Not detected
- Log depths are below ground surface.  
Water depths are below top of casing.
- Interval sampled with split-spoon.

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**Yard Bird Shopping Center, Olympia, Washington**

Date Drilled: February 2, 1994  
Geologist: Lance Robert  
Equipment: 4-inch I.D. HSA

Project Name: Yard Bird Shopping Center -

**BH4**

Job No.: E1/940109.02      Date: 02/10/94

# Log of BH5 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
YB-BH3-3' 418.1 - ND Metals	5/6/6	100	2				
			4		SP	Moist, brown, medium-grained SAND with white and purple shell fragments. Excepting shell fragments, sand is largely composed of siliciclastic material. Occasional soft white material of unknown origin. (Unit appears to be imported fill material)	0.0 ppmv
YB-BH3-6' HCID - ND	6/3/2	20	6				
	4/7/6	100	8		GM	Saturated, gray silty fine-to coarse-grained SAND with sporadic shell fragments. Same unit as above with different color.	
			10			Saturated, gray, sandy, silty, fine GRAVEL. Gravel to 50mm (50%), sand/silt (50%).	0.5 ppmv
			12			Bottom of Boring - 9.0'	
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

- G = Gasoline
- B = Benzene
- T = Toluene
- E = Ethyl Benzene
- X = Xylene
- ND = Not detected
- Log depths are below ground surface.
- Water depths are below top of casing.
- Interval sampled with split-spoon.
- Roots and plant material.

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**Yard Bird Shopping Center, Olympia, Washington**

Date Drilled: February 2, 1994  
Geologist: Lance Robert  
Equipment: 4-inch I.D. HSA  
Project Name: Yard Birds Shopping Center

**BH5**

Job No.: E1/940109.01      Date: 02/10/94

# Log of BH6 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
<b>YB-BH6-3'</b> 418.1 - ND Metals	4/6/6	100	2	SP	SP	Moist, gray, pebbly, medium-to-coarse-grained SAND with white and purple shell fragments. Excepting shell fragments, sand is largely composed of siliciclastic material. Sporadic specks of soft white material of unknown origin. (Unit appears to be imported fill material)	0.0 ppmv
<b>YB-BH6-6'</b> Not Analyzed	2/1/1	50	4	ML	ML		Upper 4" - Saturated, gray, shell-rich, pebbly, medium-grained SAND. Lower 2" - Gray, clayey, thinly laminated SILT.
			6			Bottom of Boring - 6.5'	
			8				
			10				
			12				
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

- G - Gasoline
- B - Benzene
- T - Toluene
- E - Ethyl Benzene
- X - Xylene
- ND - Not detected
- Log depths are below ground surface.
- Water depths are below top of casing.
- Interval sampled with split-spoon.
- Roots and plant material.

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**Yard Bird Shopping Center, Olympia, Washington**

Date Drilled: February 2, 1994  
 Geologist: Lance Robert  
 Equipment: 4-inch I.D. HSA  
 Project Name: Yard Bird Shopping Center

**BH6**

Job No.: E1/940109.02      Date: 02/10/94

# Log of BH7 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
YB-BH7-3' Not Analyzed	3/6/8	100	2		SP	Slightly moist, gray, micaceous, medium-grained SAND with white and purple shell fragments. Excepting shell fragments, sand is largely composed of siliciclastic material. Sporadic specks of soft white material of unknown origin. (Unit appears to be imported fill material)	
YB-BH7-6' G - ND, BTEX - ND Diesel - ND	3/4/4	100	4				
YB-BH7-9' Not Analyzed	1/1/4	100	6			Medium-grained SAND as above. Rust stained in center of sample. Brown above the stain and gray below; probable water indicator.	
			8		PT		
			10			Upper 2" - Gray to black, silty, clayey, sandy, organic-rich, SOIL HORIZON. Lower 10" - Wet, dark-brown, pebbly, organic-rich, medium-to-coarse-grained SAND.  Bottom of Boring - 6.5'	
			12				
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

- G = Gasoline
- B = Benzene
- T = Toluene
- E = Ethyl Benzene
- X = Xylene
- ND = Not detected
- Log depths are below ground surface.
- Water depths are below top of casing.
- Interval sampled with split-spoon.
- Roots and plant material.

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Yard Bird Shopping Center, Olympia, Washington

Date Drilled: February 2, 1994

Geologist: Lance Robert

Equipment: 4-inch I.D. HSA

Project Name: Yard Bird Shopping Center -  
Olympia, Washington

**BH7**

Job No.: E1/940109      Date: 02/10/94

# Log of BH8 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
<p><b>YB-BH8-3'</b> Not Analyzed</p>	6/8/8	100	2		SP	Slightly moist, brown, gravelly, medium-coarse-grained SAND with white and purple shells and shell fragments. Excepting shells, sand is largely composed of siliciclastic material. (Unit appears to be imported fill material)	0.2 ppmv
<p><b>YB-BH8-6'</b> G - ND, BTEX - ND Diesel - ND</p>	3/2/3	100	4				Medium-to-coarse-grained SAND as above. Lesser amount of gravel components.
			6			Bottom of Boring - 6.5'	
			8				
			10				
			12				
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				

**LEGEND**

G = Gasoline  
 B = Benzene  
 T = Toluene  
 E = Ethyl Benzene  
 X = Xylene  
 ND = Not detected

Log depths are below ground surface.  
 Water depths are below top of casing.

- Interval sampled with split-spoon.

- Roots and plant material.

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<p>Job No.: E1/940109.02    Date: 02/10/94</p>		

# Log of BH9 - Yard Birds Shopping Center

Analytical Results	Blow Count	Sample Recovery (%)	Depth (ft)	Lithologic Symbol	USCS Symbol	Lithologic Description	PID/Remarks
YB-BH9-3' Not analyzed.	4/6/6	100	2	█	SP	Slightly moist, brown, pebbly, medium to coarse-grained SAND with white and purple shell fragments. Excepting shells, sand is largely composed of siliciclastic material. (Unit appears to be imported fill material)	0.9 ppmv
YB-BH9-6' G - ND, BTEX - ND Diesel - ND	2/1/1	50	4	█			
			6	█		Medium to coarse-grained SAND as above. Lesser amounts of pebbles than above. Black hydrocarbon stains at 6".	0.40 ppmv
			8				
			10				
			12				
			14				
			16				
			18				
			20				
			22				
			24				
			26				
			28				
			30				
			32				
			34				
<b>LEGEND</b>							
G = Gasoline							
B = Benzene							
T = Toluene							
E = Ethyl Benzene							
X = Xylene							
ND = Not detected							
Log depths are below ground surface.							
Water depths are below top of casing.							
█ - Interval sampled with split-spoon.							
√ - Roots and plant material.							
Bottom of Boring - 6.5'							

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Job No.: E1/940109.02      Date: 02/10/94		

**APPENDIX B: ANALYTICAL LAB REPORTS**



February 7, 1992  
Lab Traveler #:02-018

Lance Robert  
Enviros, Inc.  
5808 Lake Washington Blvd NE  
Kirkland, WA 98033

Dear Lance:

Enclosed are the results of the analyses of samples submitted on February 4, 1994 from Project 940109.01.

Please note that metals data will follow at a later date.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this report, please feel free to call me.

Sincerely,

A handwritten signature in cursive script that reads "Andy Bay". The signature is written in dark ink and is positioned above the typed name and title.

Andy Bay  
Project Chemist

Enclosures

Date of Report: February 7, 1992  
 Samples Submitted: February 4, 1994  
 Lab Traveler: 02-018  
 Project: 940109.01

EPA 8020 & WTPH-G

Date Extracted: 02-04-94  
 Date Analyzed: 02-04-94

Matrix: Soil  
 Units: mg/Kg (ppm)

Client ID	YB-MW5-5	YB-MW6-3	YB-MW6-6	YB-MW7-6	Method PQL
Dilution Factor	50	50	50	50	
Benzene	ND	ND	ND	ND	.001
Toluene	ND	ND	ND	ND	.001
Ethyl Benzene	ND	ND	ND	ND	.001
m,p-Xylene	ND	ND	ND	ND	.001
o-Xylene	ND	ND	ND	ND	.001
TPH-Gas	ND	ND	ND	ND	.100
4-BFB					
Surrogate Recovery	89%	87%	77%	78%	

*Note: Sample PQL(practical quantitation limit)= Method PQL x dilution factor*

Date of Report: February 7, 1992  
 Samples Submitted: February 4, 1994  
 Lab Traveler: 02-018  
 Project: 940109.01

**EPA 8020 & WTPH-G**

Date Extracted: 02-04-94  
 Date Analyzed: 02-04-94

Matrix: Soil  
 Units: mg/Kg (ppm)

Client ID	YB-MW8-7	YB-BH7-6	YB-BH8-6	YB-BH9-3	Method PQL
Dilution Factor	50	50	50	50	
Benzene	ND	ND	ND	ND	.001
Toluene	ND	ND	ND	ND	.001
Ethyl Benzene	ND	ND	ND	ND	.001
m,p-Xylene	ND	ND	ND	ND	.001
o-Xylene	ND	ND	ND	ND	.001
TPH-Gas	ND	ND	ND	ND	.100
4-BFB					
Surrogate Recovery	80%	83%	80%	89%	

*Note: Sample PQL(practical quantitation limit)= Method PQL x dilution factor*

Date of Report: February 7, 1992  
 Samples Submitted: February 4, 1994  
 Lab Traveler: 02-018  
 Project: 940109.01

**EPA 8020 & WTPH-G  
 QUALITY CONTROL**

Date Extracted: 2-4-94  
 Date Analyzed: 2-4-94

Matrix: Soil  
 Units: mg/Kg (ppm)

Sample Number	Blank	02-018-10 Original	02-018-10 Duplicate	RPD
Dilution Factor	50	50	50	
Benzene	ND	ND	ND	NA
Toluene	ND	ND	ND	NA
Ethyl Benzene	ND	ND	ND	NA
m,p-Xylene	ND	ND	ND	NA
o-Xylene	ND	ND	ND	NA
TPH-Gas	ND	ND	ND	NA
4-BFB Surrogate Recovery	94%	80%	84%	

Date of Report: February 7, 1992  
 Samples Submitted: February 4, 1994  
 Lab Traveler: 02-018  
 Project: 940109.01

**EPA 8020 & WTPH-G  
 QUALITY CONTROL**

Date Extracted: 2-4-94  
 Date Analyzed: 2-4-94

Matrix: Soil  
 Units: mg/Kg (ppm)

Sample Number spiked @ 1 ppm Dilution Factor	02-018-10		02-018-10		RPD
	MS	Percent Recovery	MSD	Percent Recovery	
Benzene	0.799	80%	0.857	86%	6.9
Toluene	0.771	77%	0.845	84%	9.2
Ethyl Benzene	0.782	78%	0.847	85%	8
m,p-Xylene	0.792	79%	0.86	86%	8.2
o-Xylene	0.783	78%	0.843	84%	7.4
4-BFB Surrogate Recovery		78%		83%	

Date of Report: February 7, 1992  
Samples Submitted: February 4, 1994  
Lab Traveler: 02-018  
Project: 940109.01

**WTPH-HCID**

Date Extracted: 2-4-94  
Date Analyzed: 2-4-94

Matrix: Soil

Client ID	GC Characterization	o-terphenyl Surrogate Recovery
YB-BH1-6	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	98%

**Quality Assurance**

Method Blank	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	96%
--------------	---	-----

Date of Report: February 7, 1992  
Samples Submitted: February 4, 1994  
Lab Traveler: 02-018  
Project: 940109.01

**WTPH-D**

Date Extracted: 2-6-94  
Date Analyzed: 2-6-94

Matrix: Soil  
Units: mg/Kg (ppm)

Client ID	Dilution Factor	TPH	o-terphenyl Surrogate Recovery
YB-MW5-5	1	<25	82%
YB-MW6-3	1	<25	80%
YB-MW6-6	1	<25	78%
YB-MW7-6	1	<25	66%
YB-MW8-7	1	<25	79%
YB-BH7-6	1	<25	62%
YB-BH8-6	1	<25	78%
YB-BH9-3	1	<25	67%

Date of Report: February 7, 1992  
 Samples Submitted: February 4, 1994  
 Lab Traveler: 02-018  
 Project: 940109.01

**WTPH-D  
 QUALITY ASSURANCE**

Date Extracted: 2-6-94  
 Date Analyzed: 2-6-94

Matrix: Soil  
 Units: mg/Kg (ppm)

	Dilution Factor	TPH	o-terphenyl Surrogate Recovery
Method Blank	1	<25	86%
Sample: 02-018-8	1	<25	66%
Duplicate	1	<25	61%
RPD		0	

	Dilution Factor	TPH	o-terphenyl Surrogate Recovery
Spiked @ 100ppm			
Spike Blank	1	87.0	100%
Percent Recovery		87%	
Spike Blank Duplicate	1	83.8	93%
Percent Recovery		84%	
RPD		3.7	

Date of Report: February 7, 1992  
Samples Submitted: February 4, 1994  
Lab Traveler: 02-018  
Project: 940109.01

**WTPH 418.1**

Date Extracted: 2-6-94  
Date Analyzed: 2-6-94

Matrix: Soil  
Units: mg/Kg (ppm)

Client ID	Dilution Factor	Total Petroleum Hydrocarbons
YB-MW6-3	5	<25
YB-MW6-6	5	<25
YB-MW6-8	5	<25
YB-BH1-3	5	<25
YB-BH3-3	5	<25
YB-BH3-6	5	<25
YB-BH4-3	5	<25
YB-BH5-3	5	<25
YB-BH6-3	5	<25
YB-BH9-3	5	<25
YB-BH9-6	5	<25

Date of Report: February 7, 1992  
Samples Submitted: February 4, 1994  
Lab Traveler: 02-018  
Project: 940109.01

**WTPH 418.1**  
**QUALITY ASSURANCE**

Date Extracted: 2-6-94  
Date Analyzed: 2-6-94

Matrix: Soil  
Units: mg/Kg (ppm)

	Dilution Factor	Total Petroleum Hydrocarbons
Method Blank	5	<25
Sample: 02-018-4	5	<25
Duplicate	5	<25
RPD		0

Date of Report: February 7, 1992  
Samples Submitted: February 4, 1994  
Lab Traveler: 02-018  
Project: 940109.01

Date Analyzed: 2-4-94

### RESULTS OF DRY WEIGHT

Client ID	% Moisture
YB-MW5-5	8.0
YB-MW6-3	8.0
YB-MW6-6	18
YB-MW6-8	11
YB-MW7-6	28
YB-MW8-7	19

Date of Report: February 7, 1992  
Samples Submitted: February 4, 1994  
Lab Traveler: 02-018  
Project: 940109.01

Date Analyzed: 2-4-94

### RESULTS OF DRY WEIGHT

Client ID	% Moisture
YB-BH1-3	11
YB-BH3-3	6.0
YB-BH3-6	19
YB-BH4-3	8.0
YB-BH5-3	10
YB-BH6-3	9.0
YB-BH7-6	14
YB-BH8-6	19
YB-BH9-3	6.0
YB-BH9-6	28

Company Name: ENVIRO'S

PROJECT # 940104.01

PROJECT NAME Yard Birds

MANAGER Lance Robert

PM AS



**OnSite**  
**ENVIRONMENTAL INC.**

1474 MC 31st CIRCLE, REDMOND, WA 98072  
PHONE (206) 883.3881 FAX (206) 883.6802

WTPH-HCID
WTPH-G/BTEX
WTPH-G
WTPH-D
WTPH-410.1
DRY WEIGHT

REQUESTED  
TURNAROUND?

TRAVELER #  
02-078

46  
80  
12 417  
No wait

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required	Chromatograms, Residue?	Comments	
-1	YB-MW5-5	2/2/94	14:46	S	2	✓	✓	X	extended diesel please
2	-10	"	14:50	S	2				
3	-15	"	15:05	S	1				
4	YB-MW6-3	2/3/94	08:40	S	2	✓	✓	X	
5	-6	"	09:00	S	2	✓	✓	X	extended diesel please
6	-8	"	09:10	S	2				
7	YB-MW7-3	"	12:55	S	1			X	
8	-6	"	13:05	S	1	✓	✓	X	extended diesel please
9	-8	"	13:15	S	1				
10	YB-MW8-7	"	14:50	S	1	✓	✓	X	extended diesel please

Submitted Lance Robert

Firm Enviro's

Submitted

Firm

Date 2/4/94

Time 13:30

Received by B. Smith

Firm OSE

Received by

Firm

Date 2/4/94

Time 1:30 p

Date

Time


Environ

PROJECT # 940109.01

PROJECT NAME Yard Bldgs

MANAGER Laurie Roberts

PM AB



**MVA OnSite**  
Environmental Inc.  
14574 NE 31st CIRCL E REDMOND, WA 98072  
PHONE (206) 883.3881 FAX (206) 883.4603

WTPH-HCID
WTPH-G/BTEX
WTPH-G
WTPH-D
WTPH-410.1
Priority Metals
DRY WEIGHT

REQUESTED TURNAROUND?

TRAVELER # 02-018

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required	Comments
	VB-BH1-3	2/2/94	0800	S	1	✓ ✓	X
	-6	11	0810	S	1	✓	
	VB-BH2-3	11	0900	S	1	✓	
	-6	11	0915	S	1	✓	
	VB-BH3-3	11	0950	S	1	✓ ✓	X
	-6	11	10:00	S	1	✓	X
	-B	11	10:10	S	1	✓	X
	VB-BH4-3	11	11:20	S	1	✓ ✓	X
	-6	11	11:30	S	1	✓	
	VB-BH5-3	11	11:55	S	1	✓ ✓	X
	-6	11	12:10	S	1	✓	

Submitted Laurie Roberts

Firm Environ

Submitted

Date 2/4/94

Time 1330

Date

Time

Received by Brian DL

Firm OSE

Received by

Firm

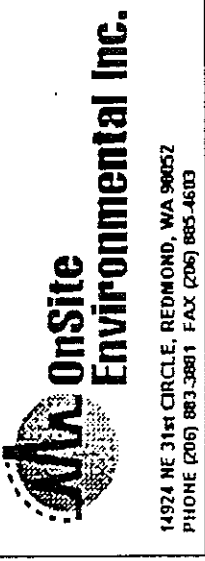
Date 2/4/94

Time 1309

Date

Time

COMPANY Enviros  
 PROJECT # 940109.01  
 PROJECT NAME Yard Birds  
 MANAGER Lance Pobert  
 PM Ab



WTPH-HCID  
 WTPH-G/BTEX  
 WTPH-G  
 WTPH-D  
 WTPH-418.1  
 Prior Metals  
 DRY WEIGHT

REQUESTED  
 TURNAROUND?

TRAVELER #  
02-018

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required	Comments
<del>98</del>	YB-BH6-3	2/2/94	12:30	S	1	✓	X
<del>98</del>	-6	u	12:40	S	1	✓	
<del>98</del>	YB-BH7-3	2/2/94	13:25	S	1	✓	
<del>98</del>	-6	u	13:40	S	1	✓	extended brown please
<del>98</del>	-9	u	13:50	S	1		
<del>98</del>	YB-BH8-3	2/2/94	07:50	S	1	✓	
<del>98</del>	-6	u	08:00	S	1	✓	attended range
<del>98</del>	YB-BH9-3	u	11:45	S	1	✓	X
<del>98</del>	-6	u	11:55	S	2	✓	X

Submitted Lance Pobert Date 2/4/94 Received by Bob Walker Date 2/4/94  
 Firm Enviros Time 1330 Firm OSR Time 1:30  
 Submitted \_\_\_\_\_ Date \_\_\_\_\_ Received by \_\_\_\_\_ Date \_\_\_\_\_  
 Firm \_\_\_\_\_ Time \_\_\_\_\_ Firm \_\_\_\_\_ Time \_\_\_\_\_



February 9, 1994  
Lab Traveler #:02-022

Lance Robert  
Enviros, Inc.  
5808 Lake Washington Blvd NE  
Kirkland, WA 98033

Dear Lance:

Enclosed are the results of the analyses of samples submitted on February 7, 1994 from Project E1/940109.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this report, please feel free to call me.

Sincerely,

Andy Bay  
Project Chemist

Enclosures

Date of Report: February 9, 1994  
 Samples Submitted: February 7, 1994  
 Lab Traveler: 02-022  
 Project: E1/940109

## EPA 602 &amp; WTPH-G

Date Extracted: 2-7-94  
 Date Analyzed: 2-7-94  
 Matrix: Water  
 Units: ug/L (ppb)

Client ID	YB-MW1	YB-MW2	YB-MW3	YB-MW4	Method PQL
Dilution Factor	1000	1	1	10	
Benzene	ND	ND	ND	140	1.00
Toluene	ND	ND	ND	210	1.00
Ethyl Benzene	ND	ND	ND	530	1.00
m,p-Xylene	NDB1,B	2.2 <sup>B</sup>	2.2 <sup>B</sup>	1100 <sup>B</sup>	1.00
o-Xylene	ND	ND	ND	340	1.00
TPH-Gas	NDR	ND	ND	6200	300
4-BFB					
Surrogate Recovery	74%	68%	65%	72%	

*Note: Sample PQL(practical quantitation limit)= Method PQL x dilution factor*

B1-Sample blank subtracted due to high dilution factor.

B-The analyte indicated was also found in the blank sample.

R-Sample run at 1:1000 dilution due to high level of diesel present in sample.

Date of Report: February 9, 1994  
 Samples Submitted: February 7, 1994  
 Lab Traveler: 02-022  
 Project: E1/940109

EPA 602 & WTPH-G

Date Extracted: 2-7-94  
 Date Analyzed: 2-7-94  
 Matrix: Water  
 Units: ug/L (ppb)

Client ID	YB-MW5	YB-MW6	YB-MW7	YB-MW8	Method PQL
Dilution Factor	1	1	1	1	
Benzene	11	51	ND	ND	1.00
Toluene	1.3	3.2	1.5	ND	1.00
Ethyl Benzene	1.6	3.1	2.3	1.0	1.00
m,p-Xylene	3.0 <sup>B</sup>	7.8 <sup>B</sup>	11 <sup>B</sup>	2.4 <sup>B</sup>	1.00
o-Xylene	ND	1.5	3.8	1.1	1.00
TPH-Gas	ND	720	ND	ND	300
4-BFB					
Surrogate Recovery	69%	79%	70%	66%	

*Note: Sample PQL(practical quantitation limit)= Method PQL x dilution factor*

B-The analyte indicated was also found in the blank sample.

Date of Report: February 9, 1994  
 Samples Submitted: February 7, 1994  
 Lab Traveler: 02-022  
 Project: E1/940109

**EPA 602 & WTPH-G  
 QUALITY CONTROL**

Date Extracted: 2-7-94  
 Date Analyzed: 2-7-94  
 Matrix: Water  
 Units: ug/L (ppb)

Sample Number	02-023-2	02-023-2		
	Blank	Original	Duplicate	
			RPD	
Dilution Factor	1	1	1	
Benzene	ND	940	950	1.6
Toluene	ND	1100	1100	1.8
Ethyl Benzene	ND	630	650	2.3
m,p-Xylene	2.3	950	970	2.2
o-Xylene	ND	800	810	1.7
TPH-Gas	ND	45000	48000	5.3
4-BFB				
Surrogate Recovery	76%	F	F	

F-Surrogate recovery data not available due to the high concentration in the sample.

Amount spiked insufficient for meaningful MS/MSD data recovery.

Date of Report: February 9, 1994  
 Samples Submitted: February 7, 1994  
 Lab Traveler: 02-022  
 Project: E1/940109

### WTPH-D

Date Extracted: 2-8-94  
 Date Analyzed: 2-8-94  
 Matrix: Water  
 Units: mg/L (ppm)

Client ID	Dilution Factor	TPH	o-terphenyl Surrogate Recovery
YB-MW1	.2	280 <sup>L</sup>	S
YB-MW2	.02	.90 <sup>L</sup>	84%
YB-MW3	.02	<.5	73%
YB-MW4	.02	<.5 <sup>C</sup>	86%
YB-MW5	.02	.89 <sup>L</sup>	79%
YB-MW6	.02	.86 <sup>C,L</sup>	80%
YB-MW7	.02	<.5	80%
YB-MW8	.02	<.5	83%

**L-Quantitated from C12-C30 as diesel fuel #2.**

**S-Surrogate recovery data not available due to the necessary dilution of the sample.**

**C-Hydrocarbons in the gasoline region(C7-toluene) present in the sample.**

Date of Report: February 9, 1994  
Samples Submitted: February 7, 1994  
Lab Traveler: 02-022  
Project: E1/940109

WTPH-D  
QUALITY ASSURANCE

Date Extracted: 2-8-94  
Date Analyzed: 2-8-94  
Matrix: Water  
Units: mg/L (ppm)

	Dilution Factor	TPH	o-terphenyl Surrogate Recovery
Method Blank	.02	<.5	82%
Sample: 02-022-2	.02	.901	84%
Duplicate	.02	.628	86%
RPD		35%	

Date of Report: February 9, 1994  
Samples Submitted: February 7, 1994  
Lab Traveler: 02-022  
Project: E1/940109

## WTPH 418.1

Date Extracted: 2-7-94  
Date Analyzed: 2-7-94  
Matrix: Water  
Units: mg/L (ppm)

Client ID	Dilution Factor	Total Petroleum Hydrocarbons
YB-MW1	40	2600G ← diesel
YB-MW3	.1	<.5
YB-MW5	.1	<.5
YB-MW6	.1	1.2
YB-MW7	.1	<.5

G-Free product present in sample.

Date of Report: February 9, 1994  
Samples Submitted: February 7, 1994  
Lab Traveler: 02-022  
Project: E1/940109

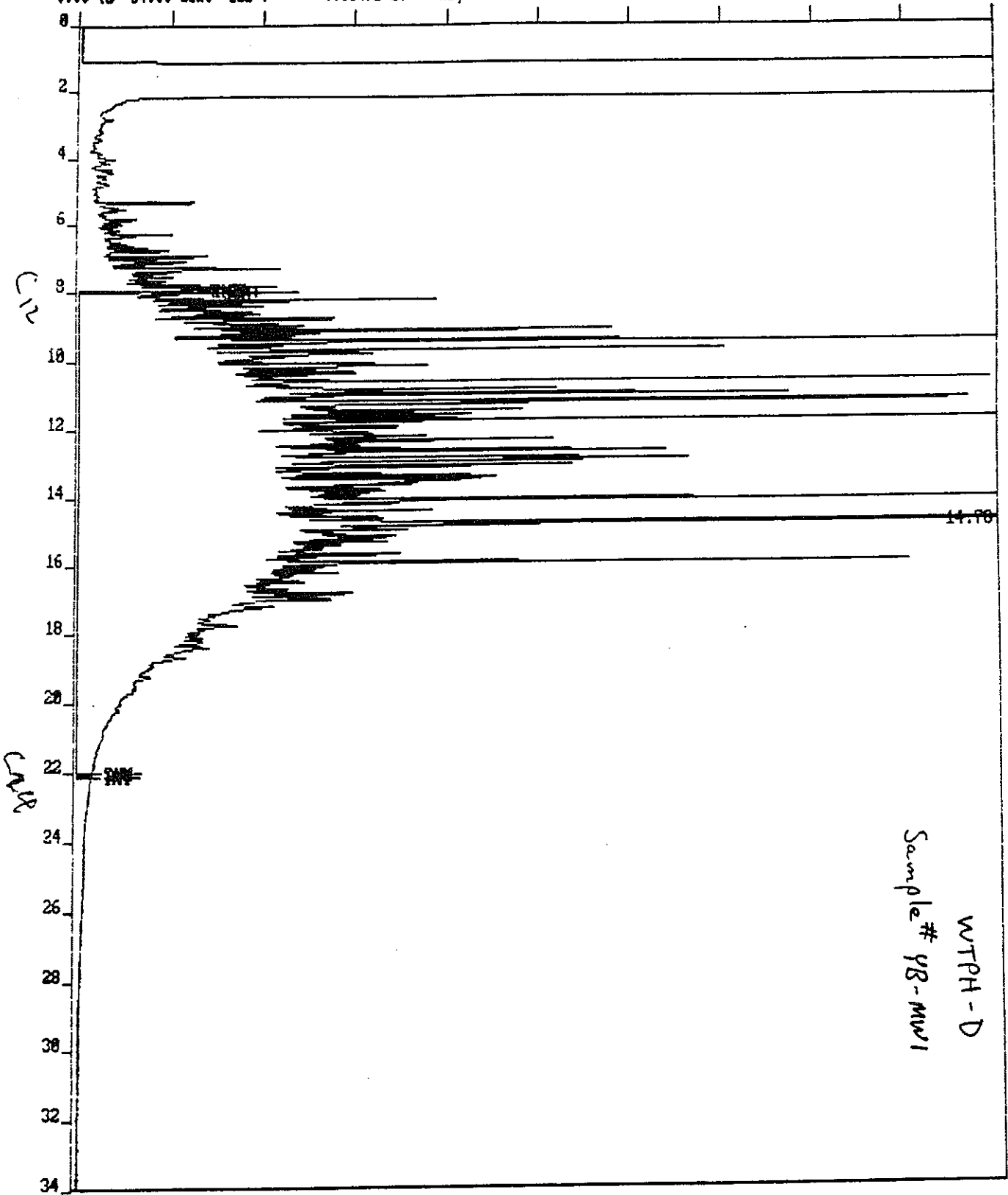
**WTPH 418.1  
QUALITY ASSURANCE**

Date Extracted: 2-7-94  
Date Analyzed: 2-7-94  
Matrix: Water  
Units: mg/L (ppm)

	Dilution Factor	Total Petroleum Hydrocarbons
Method Blank	.1	<.5

**Insufficient sample for duplicate analysis.**

0.00 to 34.00 min. Low Y = 0.33471 mv High Y = 10.33471 mv Span = 10.00000 mv



COMPANY Environos, Inc.  
 PROJECT # E1940109.  
 PROJECT NAME Yard Birds  
 MANAGER MaryBeth Gilbray  
 PM Mike Surawiec

**Onsite Environmental Inc.**  
 14924 NE 31st Circle, Redmond, WA 98052  
 Phone (206) 883-3881 Fax (206) 885-4803

WTPH-HCID
WTPH-G/BTEX
WTPH-G
WTPH-D - Extended Range
WTPH-418.1
DRY WEIGHT

REQUESTED  
 TURNAROUND?  
 By Thursday  
 2/10/94  
 TRAVELER #  
 02 - 022

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required						Comments
						WTPH-HCID	WTPH-G/BTEX	WTPH-G	WTPH-D - Extended Range	WTPH-418.1	DRY WEIGHT	
-1	YB-MU01	2/4/94	15:35	Water	4	X	X	X	X			* For the report phase
-2	YB-MU02		15:45			X		X				put a YB in front of each sample.
-3	YB-MU03		14:35			X		X	X			
-4	YB-MU04		14:10			X		X				
-5	YB-MU05		13:45			X		X	X			
-6	YB-MU06		14:50			X		X	X			
-7	YB-MU07		12:45			X		X	X			
-8	YB-MU08		12:40			X		X				

Submitted MaryBeth Gilbray Date 2/7/94 Received by Antony Date 2/7/94  
 Firm Environos, Inc. Time 12:15 Firm On-Site Environmental/Time Time 12:15

Submitted \_\_\_\_\_ Date \_\_\_\_\_ Received by \_\_\_\_\_ Date \_\_\_\_\_  
 Firm \_\_\_\_\_ Time \_\_\_\_\_ Firm \_\_\_\_\_ Time \_\_\_\_\_



**OnSite  
Environmental Inc.**

February 18, 1994  
Lab Traveler #:02-018

Lance Robert  
Enviros, Inc.  
5808 Lake Washington Blvd NE  
Kirkland, WA 98033

Dear Lance:

Enclosed are the results of the analyses of samples submitted on February 4, 1994 from Project 940109.01.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this report, please feel free to call me.

Sincerely,

*Judith G. Colera*  
for Andy Bay  
Project Chemist

**Enclosures**

# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

---

## TRANSMITTAL MEMORANDUM

DATE: February 14, 1994  
TO: Lance Robert  
OnSite Environmental  
PROJECT NUMBER: 940109.01  
LABORATORY NUMBER: 37934

Enclosed are one original and one copy of the Tier I data deliverables package for Laboratory Work Order Number 37934. Six samples were received for analysis at Sound Analytical Services, Inc., on February 7, 1994.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Stan P. Palmquist  
Project Manager

SPP:tm

# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: OnSite Environmental

Date: February 14, 1994

Report On: Analysis of Soil

Lab No.: 37934

IDENTIFICATION:

Samples received on 02-07-94

Project: 940109.01

-----  
ANALYSIS:

Lab Sample No. 37934-1

Client ID: YB-BH1-3

ICP Metals Per EPA Method 6010  
Date Analyzed: 2-8-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Arsenic	4.6	3.9
Cadmium	1.5	0.20
Chromium	11	0.39
Lead	6.7	2.0
Selenium	ND	5.8
Silver	ND	0.39
Copper	20	0.98
Nickel	13	1.6
Zinc	25	0.78
Antimony	ND	2.3
Thallium	ND	5.8
Beryllium	ND	0.20

Mercury By Cold Vapor AA Per EPA Method 7471  
Date Analyzed: 2-10-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Mercury	ND	0.07

ND - Not Detected

PQL - Practical Quantitation Limit

# SOUND ANALYTICAL SERVICES, INC.

OnSite Environmental  
Project: 940109.01  
Lab No. 37934  
February 14, 1994

Lab Sample No. 37934-2

Client ID: YB-BH3-3

ICP Metals Per EPA Method 6010  
Date Analyzed: 2-8-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Arsenic	ND	4.9
Cadmium	1.2	0.24
Chromium	16	0.49
Lead	4.4	2.4
Selenium	ND	7.4
Silver	ND	0.49
Copper	9.0	1.2
Nickel	16	2.0
Zinc	25	0.98
Antimony	ND	2.9
Thallium	ND	7.4
Beryllium	ND	0.24

Mercury By Cold Vapor AA Per EPA Method 7471  
Date Analyzed: 2-10-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Mercury	ND	0.08

ND - Not Detected  
PQL - Practical Quantitation Limit

# SOUND ANALYTICAL SERVICES, INC.

OnSite Environmental  
Project: 940109.01  
Lab No. 37934  
February 14, 1994

Lab Sample No. 37934-3

Client ID: YB-BH3-8

ICP Metals Per EPA Method 6010  
Date Analyzed: 2-8-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Arsenic	5.6	4.7
Cadmium	1.3	0.23
Chromium	15	0.47
Lead	4.7	2.3
Selenium	ND	7.0
Silver	ND	0.47
Copper	12	1.2
Nickel	20	1.9
Zinc	21	0.93
Antimony	ND	2.8
Thallium	ND	7.0
Beryllium	ND	0.23

Mercury By Cold Vapor AA Per EPA Method 7471  
Date Analyzed: 2-10-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Mercury	ND	0.09

ND - Not Detected

PQL - Practical Quantitation Limit

# SOUND ANALYTICAL SERVICES, INC.

OnSite Environmental  
Project: 940109.01  
Lab No. 37934  
February 14, 1994

Lab Sample No. 37934-4

Client ID: YB-BH4-3

ICP Metals Per EPA Method 6010  
Date Analyzed: 2-8-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Arsenic	ND	4.0
Cadmium	1.2	0.20
Chromium	10	0.40
Lead	3.2	2.0
Selenium	ND	6.1
Silver	ND	0.40
Copper	8.1	1.0
Nickel	13	1.6
Zinc	20	0.81
Antimony	ND	2.4
Thallium	ND	6.1
Beryllium	ND	0.20

Mercury By Cold Vapor AA Per EPA Method 7471  
Date Analyzed: 2-10-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Mercury	ND	0.08

ND - Not Detected  
PQL - Practical Quantitation Limit

# SOUND ANALYTICAL SERVICES, INC.

OnSite Environmental  
Project: 940109.01  
Lab No. 37934  
February 14, 1994

Lab Sample No. 37934-5

Client ID: YB-BH5-3

ICP Metals Per EPA Method 6010  
Date Analyzed: 2-8-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Arsenic	8.0	5.3
Cadmium	2.2	0.27
Chromium	22	0.53
Lead	6.5	2.7
Selenium	ND	8.0
Silver	0.77	0.53
Copper	19	1.3
Nickel	20	2.1
Zinc	34	1.1
Antimony	ND	3.2
Thallium	ND	8.0
Beryllium	ND	0.27

Mercury By Cold Vapor AA Per EPA Method 7471  
Date Analyzed: 2-10-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Mercury	ND	0.08

ND - Not Detected  
PQL - Practical Quantitation Limit

# SOUND ANALYTICAL SERVICES, INC.

OnSite Environmental  
Project: 940109.01  
Lab No. 37934  
February 14, 1994

Lab Sample No. 37934-6

Client ID: YB-BH6-3

ICP Metals Per EPA Method 6010  
Date Analyzed: 2-8-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Arsenic	ND	6.6
Cadmium	1.9	0.22
Chromium	13	0.44
Lead	4.0	2.2
Selenium	ND	6.6
Silver	ND	0.44
Copper	10	1.1
Nickel	17	1.8
Zinc	25	0.89
Antimony	ND	2.7
Thallium	ND	6.6
Beryllium	ND	0.22

Mercury By Cold Vapor AA Per EPA Method 7471  
Date Analyzed: 2-10-94

<u>Parameter</u>	<u>Result, mg/kg</u>	<u>PQL</u>
Mercury	ND	0.08

ND - Not Detected  
PQL - Practical Quantitation Limit

# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

## QUALITY CONTROL REPORT

### Total Metals

Client: OnSite Environmental  
Lab No: 37934qc  
Units: mg/kg

### METHOD BLANKS

Date Analyzed: 2-8-94

Parameter	Result	PQL
Arsenic	ND	5.0
Cadmium	ND	0.25
Chromium	ND	0.50
Lead	ND	2.5
Selenium	ND	7.5
Silver	ND	0.50
Copper	ND	1.2
Nickel	ND	2.0
Zinc	ND	1.0
Antimony	ND	3.0
Thallium	ND	7.5
Beryllium	ND	0.25

Date Analyzed: 2-8-94

Parameter	Result	PQL
Mercury	ND	0.10

ND - Not Detected

PQL - Practical Quantitation Limit


Company: Enviros

PROJECT # 940109.01

PROJECT NAME Yard Birds

MANAGER Lance Robart

PM AS



**OnSite**  
Environmental Inc.

1474 NE 31st Circle Redmond, WA 98072  
PHONE (206) 823-3881 FAX (206) 865-6833

WTPH-HCID
WTPH-G/BTEX
WTPH-G
WTPH-D
WTPH-410.1
DRY WEIGHT

REQUESTED  
TURNAROUND?

TRAVELER  
02-078

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required							Chromatograms Present?	Comments	
-1	YB-MW5-5	2/2/94	14:46	S	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
2	-10	"	14:50	S	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
3	-15	"	15:05	S	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
4	YB-MW6-3	2/3/94	08:40	S	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
5	-6	"	09:00	S	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
6	-8	"	09:10	S	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
7	YB-MW7-3	"	12:55	S	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
8	-6	"	13:05	S	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
9	-8	"	13:15	S	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please
10	YB-MW8-7	"	14:50	S	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended diesel please

Submitted Lance Robart

Firm Enviros

Submitted \_\_\_\_\_

Date 2/4/94

Time 13:30

Date \_\_\_\_\_

Time \_\_\_\_\_

Received by Brinell

Firm OSE

Received by \_\_\_\_\_

Firm \_\_\_\_\_

Date 2/4/94

Time 1:30 p

Date \_\_\_\_\_

Time \_\_\_\_\_

46  
30  
124  
No wet


Environ 5

PROJECT # 940109.01

PROJECT NAME Yard Birds

MANAGER Lane Roberts

PM AB



**OnSite Environmental Inc.**  
 14571 NE 31st Circle, Redmond, WA 98073  
 PHONE (509) 883-3881 FAX (509) 885-4803

WTPH-HCID
WTPH-G/BTEX
WTPH-G
WTPH-D
WTPH-418.1
Priority Metals
DRY WEIGHT

REQUESTED TURNAROUND?

TRAVELER # 02-018

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required	Comments
	VB-BH1-3	2/2/94	0800	S	1	V	X
	-6	11	0810	S	1	V	
	VB-BH2-3	11	0900	S	1	Trace	
	-6	11	0915	S	1		
	VB-BH3-3	11	0950	S	1	V	X
	-6	11	10:00	S	1	V	X
	-6	11	10:10	S	1	V	X
	VB-BH4-3	11	11:20	S	1	V	X
	-6	11	11:30	S	1	V	X
	VB-BH5-3	11	11:55	S	1	V	X
	-6	11	12:10	S	1	V	X

Submitted Lane Roberts

Firm Environ 5

Submitted

Firm

Date 2/4/94

Time 1330

Date

Time

Received by Brian D

Firm OSE

Received by

Firm

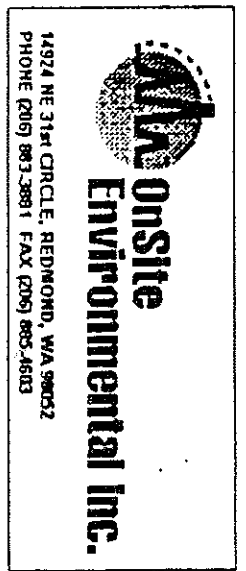
Date 2/4/94 10:00

Time 1300

Date

Time

COMPANY EnviroS  
 PROJECT # 940109.01  
 PROJECT NAME Yard Birds  
 MANAGER Lance Roberts  
 PM AG



WTPH-HCID
WTPH-G/BTEX
WTPH-G
WTPH-D
WTPH-418.1
Prim Metals
DRY WEIGHT

REQUESTED  
TURNAROUND?

TRAVELER #  
**02 - 018**

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required	Comments
<del>2</del>	YB-BH6-3	2/2/94	12:30	S	1	<input checked="" type="checkbox"/>	X
<del>3</del>	-6	u	12:40	S	1	<input checked="" type="checkbox"/>	
<del>4</del>	YB-BH7-3	2/2/94	13:25	S	1	<input checked="" type="checkbox"/>	extended draw
<del>5</del>	-6	u	13:40	S	1	<input checked="" type="checkbox"/>	place
<del>6</del>	-9	u	13:50	S	1	<input checked="" type="checkbox"/>	
<del>7</del>	YB-BH8-3	2/2/94	07:50	S	1	<input checked="" type="checkbox"/>	extended range
<del>8</del>	-6	u	08:00	S	1	<input checked="" type="checkbox"/>	
<del>9</del>	YB-BH9-3	u	11:45	S	1	<input checked="" type="checkbox"/>	X
<del>10</del>	-6	u	11:55	S	2	<input checked="" type="checkbox"/>	X

Submitted Jan Bohm Date 2/4/94 Received by Ben Waller Date 2/4/94  
 Firm EnviroS Time 13:30 Firm OSR Time 1:30  
 Submitted \_\_\_\_\_ Date \_\_\_\_\_ Received by \_\_\_\_\_ Date \_\_\_\_\_  
 \_\_\_\_\_ Time \_\_\_\_\_



February 24, 1994  
Lab Traveler #:02-018

Lance Robert  
Enviros, Inc.  
5808 Lake Washington Blvd NE  
Kirkland, WA 98033

Dear Lance:

Enclosed are the results of the analyses of samples submitted on February 4, 1994 from Project 940109.01.

We appreciate this opportunity to be of service to you on this project. If you have any questions regarding this report, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "K. Hornyik", written over a horizontal line.

Karl P. Hornyik  
Project Chemist

Enclosures

# SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

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## TRANSMITTAL MEMORANDUM

DATE: February 17, 1994

TO: Andy Bay  
OnSite Environmental

LABORATORY NUMBER: 37998

Enclosed are one original and one copy of the Tier I data deliverables package for Laboratory Work Order Number 37998. One sample was received for analysis at Sound Analytical Services, Inc., on February 9, 1994.

Semivolatile organic results are presented in spreadsheet format.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Stan P. Palmquist  
Project Manager

# SOUND ANALYTICAL SERVICES, INC.

Client Name	OnSite Environmental
Client ID:	YB-MW6-6
Lab ID:	37998-1
Date Received:	2/9/94
Date Extracted:	2/11/94
Date Analyzed:	2/17/94

## Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	77		23	120
2 - Fluorobiphenyl	64		30	115
p - Terphenyl - d14	60		18	137
Phenol - d5	29		24	113
2 - Fluorophenol	42		25	121
2,4,6 - Tribromophenol	40		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	840	
bis(2-Chloroethyl)ether	ND	840	
2-Chlorophenol	ND	840	
1,3-Dichlorobenzene	ND	840	
1,4-Dichlorobenzene	ND	840	
Benzyl Alcohol	ND	1700	
1,2-Dichlorobenzene	ND	840	
2-Methylphenol	ND	840	
bis(2-Chloroisopropyl)ether	ND	840	
4-Methylphenol	ND	840	
N-nitroso-di-N-propylamine	ND	840	
Hexachloroethane	ND	840	
Nitrobenzene	ND	840	
Isophorone	ND	840	
2-Nitrophenol	ND	840	
2,4-Dimethylphenol	ND	840	
Benzoic Acid	ND	4200	
bis(2-Chloroethoxy)methane	ND	840	
2,4-Dichlorophenol	ND	840	
1,2,4-Trichlorobenzene	ND	840	
Naphthalene	ND	840	
4-Chloroaniline	ND	1700	
Hexachlorobutadiene	ND	840	
4-Chloro-3-methylphenol	ND	1700	
2-Methylnaphthalene	ND	840	
Hexachlorocyclopentadiene	ND	840	
2,4,6-Trichlorophenol	ND	840	

# SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 37998-1 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,5-Trichlorophenol	ND	840	
2-Chloronaphthalene	ND	840	
2-Nitroaniline	ND	4200	
Dimethylphthalate	ND	840	
Acenaphthylene	ND	840	
2,6-Dinitrotoluene	ND	840	
3-Nitroaniline	ND	4200	
Acenaphthene	ND	840	
2,4-Dinitrophenol	ND	4200	
4-Nitrophenol	ND	4200	
Dibenzofuran	ND	840	
2,4-Dinitrotoluene	ND	840	
Diethylphthalate	ND	840	
4-Chlorophenyl phenyl ether	ND	840	
Fluorene	ND	840	
4-Nitroaniline	ND	4200	
4,6-Dinitro-2-methylphenol	ND	4200	
N-Nitrosodiphenylamine	ND	840	
4-Bromophenyl phenyl ether	ND	840	
Hexachlorobenzene	ND	840	
Pentachlorophenol	ND	4200	
Phenanthrene	ND	840	
Anthracene	ND	840	
Di-n-butylphthalate	210	840	J
Fluoranthene	ND	840	
Pyrene	ND	840	
Butylbenzylphthalate	ND	840	
3,3'-Dichlorobenzidine	ND	840	
Benzo(a)anthracene	ND	840	
Chrysene	ND	840	
bis(2-Ethylhexyl)phthalate	ND	840	
Di-n-octylphthalate	ND	840	
Benzo(b)fluoranthene	ND	840	
Benzo(k)fluoranthene	ND	840	
Benzo(a)pyrene	ND	840	
Indeno(1,2,3-cd)pyrene	ND	840	
Dibenz(a,h)anthracene	ND	840	
Benzo(g,h,i)perylene	ND	840	

# SOUND ANALYTICAL SERVICES, INC.

Client Name	OnSite Environmental
Client ID:	-
Lab ID:	Method Blank - s11134
Date Received:	-
Date Extracted:	2/11/94
Date Analyzed:	2/15/94

## Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Nitrobenzene - d5	77		23	120
2 - Fluorobiphenyl	74		30	115
p - Terphenyl - d14	118		18	137
Phenol - d5	48		24	113
2 - Fluorophenol	75		25	121
2,4,6 - Tribromophenol	65		19	122

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	Flags
Phenol	ND	670	
bis(2-Chloroethyl)ether	ND	670	
2-Chlorophenol	ND	670	
1,3-Dichlorobenzene	ND	670	
1,4-Dichlorobenzene	ND	670	
Benzyl Alcohol	ND	1300	
1,2-Dichlorobenzene	ND	670	
2-Methylphenol	ND	670	
bis(2-Chloroisopropyl)ether	ND	670	
4-Methylphenol	ND	670	
N-nitroso-di-N-propylamine	ND	670	
Hexachloroethane	ND	670	
Nitrobenzene	ND	670	
Isophorone	ND	670	
2-Nitrophenol	ND	670	
2,4-Dimethylphenol	ND	670	
Benzoic Acid	ND	3300	
bis(2-Chloroethoxy)methane	ND	670	
2,4-Dichlorophenol	ND	670	
1,2,4-Trichlorobenzene	ND	670	
Naphthalene	ND	670	
4-Chloroaniline	ND	1300	
Hexachlorobutadiene	ND	670	
4-Chloro-3-methylphenol	ND	1300	
2-Methylnaphthalene	ND	670	
Hexachlorocyclopentadiene	ND	670	
2,4,6-Trichlorophenol	ND	670	

# SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for s11134 continued...

Analyte	Result (ug/kg)	PQL	Flags
2,4,5-Trichlorophenol	ND	670	
2-Chloronaphthalene	ND	670	
2-Nitroaniline	ND	3300	
Dimethylphthalate	ND	670	
Acenaphthylene	ND	670	
2,6-Dinitrotoluene	ND	670	
3-Nitroaniline	ND	3300	
Acenaphthene	ND	670	
2,4-Dinitrophenol	ND	3300	
4-Nitrophenol	ND	3300	
Dibenzofuran	ND	670	
2,4-Dinitrotoluene	ND	670	
Diethylphthalate	ND	670	
4-Chlorophenyl phenyl ether	ND	670	
Fluorene	ND	670	
4-Nitroaniline	ND	3300	
4,6-Dinitro-2-methylphenol	ND	3300	
N-Nitrosodiphenylamine	ND	670	
4-Bromophenyl phenyl ether	ND	670	
Hexachlorobenzene	ND	670	
Pentachlorophenol	ND	3300	
Phenanthrene	ND	670	
Anthracene	ND	670	
Di-n-butylphthalate	ND	670	
Fluoranthene	ND	670	
Pyrene	ND	670	
Butylbenzylphthalate	ND	670	
3,3'-Dichlorobenzidine	ND	670	
Benzo(a)anthracene	ND	670	
Chrysene	ND	670	
bis(2-Ethylhexyl)phthalate	ND	670	
Di-n-octylphthalate	ND	670	
Benzo(b)fluoranthene	ND	670	
Benzo(k)fluoranthene	ND	670	
Benzo(a)pyrene	ND	670	
Indeno(1,2,3-cd)pyrene	ND	670	
Dibenz(a,h)anthracene	ND	670	
Benzo(g,h,i)perylene	ND	670	

# SOUND ANALYTICAL SERVICES, INC.

4813 PACIFIC HIGHWAY EAST. TACOMA, WASHINGTON 98424 • TELEPHONE 206-922-2310 • FAX 206-922-5047

---

## DATA QUALIFIER FLAGS

- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- E: The concentration of this analyte exceeded the instrument calibration range.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be  
\_\_\_\_\_.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results.
- X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside QC limits due to matrix composition.




COMPANY EnviroS

PROJECT # 940109.01

PROJECT NAME Yard Birds

MANAGER Louise Polera

PM AB



**Alpha Onsite Environmental Inc.**  
 14924 NE 31st Circle, Redmond, WA 98052  
 PHONE (206) 883-3881 FAX (206) 885-4603

WTPH-HCID
WTPH-G/BTEX
WTPH-G
WTPH-D
WTPH-418.1
Trace Metals
DRY WEIGHT

TRAVELER #  
**02-018**

REQUESTED  
TURNAROUND?

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required						Comments				
<del>YB-13</del>	<del>BH6-3</del>	<del>2/2/94</del>	<del>12:30</del>	<del>S</del>	<del>1</del>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<del>YB-14</del>	<del>BH7-3</del>	<del>2/2/94</del>	<del>13:25</del>	<del>S</del>	<del>1</del>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	extended draw please
<del>YB-15</del>	<del>BH8-3</del>	<del>2/2/94</del>	<del>07:50</del>	<del>S</del>	<del>1</del>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	extended ramp
<del>YB-16</del>	<del>BH9-3</del>	<del>2/2/94</del>	<del>11:45</del>	<del>S</del>	<del>1</del>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<del>YB-17</del>	<del>BH10-3</del>	<del>2/2/94</del>	<del>11:55</del>	<del>S</del>	<del>2</del>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Submitted Jan Bohm

Firm EnviroS

Date 2/4/94

Time 13:30

Received by Bar Waller

Firm OSR

Date 2/4/94

Time 1:30

Submitted \_\_\_\_\_

Firm \_\_\_\_\_

Date \_\_\_\_\_

Time \_\_\_\_\_

Received by \_\_\_\_\_

Firm \_\_\_\_\_

Date \_\_\_\_\_

Time \_\_\_\_\_

PROJECT # 940109, D1  
 PROJECT NAME Yard Bldg  
 MANAGER Lance Roberts  
 PM AB

**M/A OnSite**  
**Environmental Inc.**  
 1474 NE 31st Circle, Redmond, WA 98072  
 PHONE (206) 883-3881 FAX (206) 883-4603

WTPH-HCID
WTPH-G/BTEX
WTPH-G
WTPH-D
WTPH-418.1
Priority Metals
DRY WEIGHT

TRAVELER #  
**02-018**

REQUESTED  
 TURNAROUND?

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required	Comments
<del>11</del>	<del>VB-BH1-3</del>	<del>2/2/94</del>	<del>0800</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>2</del>	<del>-6</del>	<del>11</del>	<del>0810</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>3</del>	<del>VB-BH2-3</del>	<del>11</del>	<del>0900</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>4</del>	<del>-6</del>	<del>11</del>	<del>0915</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>5</del>	<del>VB-BH3-3</del>	<del>11</del>	<del>0950</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>6</del>	<del>-6</del>	<del>11</del>	<del>10:00</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>7</del>	<del>-B</del>	<del>11</del>	<del>10:10</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>8</del>	<del>VB-BH4-3</del>	<del>11</del>	<del>11:20</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>9</del>	<del>-6</del>	<del>11</del>	<del>11:30</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>10</del>	<del>VB-BH5-3</del>	<del>11</del>	<del>11:55</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>
<del>11</del>	<del>-6</del>	<del>11</del>	<del>12:10</del>	<del>S</del>	<del>1</del>	<del>V</del>	<del>X</del>

Submitted Lance Roberts  
 Firm Sumios  
 Submitted \_\_\_\_\_  
 Firm \_\_\_\_\_

Date 2/4/94  
 Time 1330  
 Date \_\_\_\_\_  
 Time \_\_\_\_\_

Received by Brian DL  
 Firm OSE  
 Received by \_\_\_\_\_  
 Firm \_\_\_\_\_


Date 2/4/94 0900  
 Time 1300  
 Date \_\_\_\_\_  
 Time \_\_\_\_\_

BOS

PROJECT # 990109.01  
 PROJECT NAME Yard Birds

MANAGER Lance Robert

PM AS



**MVA OnSite**  
 Environmental Inc.  
 1532 NE 31st CIRCL E, REDMOND, WA 98072  
 PHONE (800) 881-3881 FAX (800) 881-1203

WTPH-HCID
WTPH-G/DTEX
WTPH-G
WTPH-D
WTPH-418.1
DRY WEIGHT

REQUESTED  
 TURNAROUND?

TRAVELER #  
02-018

Dash	Sample Number	Date Sampled	Time Sampled	Type	# Jars	Analysis Required				Chromatograms, Peak Comments	
-1	YB-MW5-5	2/2/94	14:46	S	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended dial plate
2	-10	"	14:50	S	2						
3	-15	"	15:05	S	1						
4	YB-MW6-3	2/2/94	08:40	S	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended dial plate
5	-6	"	05:00	S	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended dial plate
6	-8	"	09:10	S	2						
7	YB-MW7-3	"	12:55	S	1						
8	-6	"	13:05	S	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended dial plate
9	-8	"	13:15	S	1						
10	YB-MW8-7	"	14:50	S	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	extended dial plate

Submitted Lance Robert  
 Firm Enviros

Date 2/4/94  
 Time 13:30  
 Received by B. Will  
 Firm OSE  
 Date 2/4/94  
 Time 1:30 P

Submitted \_\_\_\_\_  
 Firm \_\_\_\_\_  
 Date \_\_\_\_\_  
 Time \_\_\_\_\_  
 Received by \_\_\_\_\_  
 Firm \_\_\_\_\_  
 Date \_\_\_\_\_  
 Time \_\_\_\_\_

**TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.**

**7110 38th Drive SE  
Lacey, Washington 98503**

**Mobile Environmental Laboratories**

**Telephone: 206-459-4670  
Fax: 206-459-3432**

Mike Surowiec  
Enviros Inc.  
210 Marina Park Building  
25 Central Way  
Kirkland, WA 98033

March 24, 1994

Dear Mr. Surowiec:

Please find enclosed the data report for the analyses conducted off-site March 21st through 23rd for samples from the Farmers' Market Project, Olympia, Washington. There were 8 soil samples analyzed for Gasoline by WTPH-G and BTEX by EPA Method 8020, 7 for Diesel by WTPH-D, 1 for TPH by WTPH-418.1, and 1 for Total Lead by EPA 7420.

The results of the analyses are summarized in the attached table. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

TEG Northwest appreciates the opportunity to have provided analytical services to Enviros for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,



Michael A. Korosec  
(President)

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

FARMERS' MARKET PROJECT  
 Olympia, Washington  
 Enviros Inc., Project No. E1/940109.02

Diesel Range Hydrocarbons in Soil by WTPH-D

Sample Number	Date	Recovery (%)	Diesel mg/kg
Blank	03/21/94		nd
Meth. Blank	03/21/94	98	nd
Test Pit 1	03/21/94	93	270
Meth. Blank	03/22/94	93	nd
N & W Sidewall	03/22/94	109	nd
S & E Sidewall	03/22/94	95	1373
Bottom	03/22/94	106	61
SP-1	03/22/94	88	2157
SP-1 Dup.	03/22/94	101	2722
SP-2	03/22/94	83	2188
SP-3	03/22/94	88	80
Method Detection Limit			20

"nd" indicates Not Detected at the listed detection limit.

"int" Indicates that Interfering peaks prevent determination.

FARMERS' MARKET PROJECT  
 Olympia, Washington  
 Enviros Inc., Project No. E1/940109.02

Hydrocarbon Identification by WTPH-HCID for Soils

Sample	Date	Percent Recovery	Gasoline mg/kg	Diesel mg/kg	Heavy Oil mg/kg
Meth. Blank	03/21/94	98	nd	nd	nd
Test Pit 1	03/21/94	88	nd	D	nd
MDL			20	50	100

"nd" Indicates Not Detected at the listed Detection Limit.

"D" Indicates Detected above the listed Detection Limit

TPH is Soil by WTPH-418.1

Sample	Date	TPH mg/kg
Meth. Blank	03/21/94	nd
Test Pit 1	03/21/94	207
Test Pit 1 Dup.	03/21/94	217
MDL		20

"nd" Indicates Not Detected at the listed Detection Limit.

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

FARMERS' MARKET PROJECT  
 Olympia, Washington  
 Enviros Inc., Project No. E1/940109.02

Gasoline by WTPH-G and Volatile Aromatic Hydrocarbons by EPA Method 8020

SAMPLE Number	DATE Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Eth Benz (mg/kg)	Xylene (mg/kg)	Gasoline (mg/kg)	Recov. (%)
Meth. Blank	03/21/94	nd	nd	nd	nd	nd	103
Test Pit 1	03/21/94	nd	nd	nd	nd	nd	93
Test Pit 1 Dup	03/21/94	nd	nd	nd	nd	nd	91
Meth. Blank	03/22/94	nd	nd	nd	nd	nd	89
North Side	03/22/94	1.58	4.45	43.04	98.84	4690	int
North Side 2	03/22/94	nd	nd	nd	nd	nd	103
South Side	03/22/94	nd	nd	nd	nd	nd	102
South Side Dup	03/22/94	nd	nd	nd	nd	nd	89
West Side	03/22/94	0.05	nd	1.48	6.87	83	105
East Side	03/22/94	4.03	17.92	45.64	259.20	4136	int
Meth. Blank	03/23/94	nd	nd	nd	nd	nd	96
East Side 1	03/09/94	1.14	0.08	8.99	17.04	256	101
East Side 2	03/09/94	0.66	nd	1.78	0.41	22	104
DETECTION LIMITS		0.05	0.05	0.05	0.05	10	

"nd" Indicates NOT DETECTED at the Listed Detection Limits

"int" Indicates that INTERFERENCES prevent determination

FARMERS' MARKET PROJECT  
Olympia, Washington  
Enviros, Inc., Project No. E1/940109.02

Total Lead Analyses (EPA 7420) for Soils

SAMPLE Number	Date Analyzed	Lead (mg/kg)
Meth. Blank	03/23/94	nd
Test Pit #1	03/23/94	nd

Method Detection Limit = 1.0 mg/kg  
"nd" Indicates Not Detected at the listed MDL

FARMERS' MARKET PROJECT  
 Olympia, Washington  
 Enviros Inc., Project No. E1/940109.02

Diesel Range Hydrocarbons in Soil by WTPH-D

Sample Number	Date	Recovery (%)	Diesel mg/kg
Blank	03/21/94		nd
Meth. Blank	03/21/94	98	nd
Test Pit 1	03/21/94	93	270
Meth. Blank	03/22/94	93	nd
N & W Sidewall	03/22/94	109	nd
S & E Sidewall	03/22/94	95	1373
Bottom	03/22/94	106	61
SP-1	03/22/94	88	2157
SP-1 Dup.	03/22/94	101	2722
SP-2	03/22/94	83	2188
SP-3	03/22/94	88	80
Method Detection Limit			20

"nd" indicates Not Detected at the listed detection limit.

"int" Indicates that Interfering peaks prevent determination.

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

FARMERS' MARKET PROJECT  
 Olympia, Washington  
 Enviros Inc., Project No. E1/940109.02

Hydrocarbon Identification by WTPH-HCID for Soils

Sample	Date	Percent Recovery	Gasoline mg/kg	Diesel mg/kg	Heavy Oil mg/kg
Meth. Blank	03/21/94	98	nd	nd	nd
Test Pit 1	03/21/94	88	nd	D	nd
MDL			20	50	100

"nd" Indicates Not Detected at the listed Detection Limit.  
 "D" Indicates Detected above the listed Detection Limit

TPH is Soil by WTPH-418.1

Sample	Date	TPH mg/kg
Meth. Blank	03/21/94	nd
Test Pit 1	03/21/94	207
Test Pit 1 Dup.	03/21/94	217
MDL		20

"nd" Indicates Not Detected at the listed Detection Limit.

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

FARMERS' MARKET PROJECT  
 Olympia, Washington  
 Enviros Inc., Project No. E1/940109.02

Gasoline by WTPH-G and Volatile Aromatic Hydrocarbons by EPA Method 8020

SAMPLE Number	DATE Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Eth Benz (mg/kg)	Xylene (mg/kg)	Gasoline (mg/kg)	Recov. (%)
Meth. Blank	03/21/94	nd	nd	nd	nd	nd	103
Test Pit 1	03/21/94	nd	nd	nd	nd	nd	93
Test Pit 1 Dup	03/21/94	nd	nd	nd	nd	nd	91
Meth. Blank	03/22/94	nd	nd	nd	nd	nd	89
North Side	03/22/94	1.58	4.45	43.04	98.84	4690	int
North Side 2	03/22/94	nd	nd	nd	nd	nd	103
South Side	03/22/94	nd	nd	nd	nd	nd	102
South Side Dup	03/22/94	nd	nd	nd	nd	nd	89
West Side	03/22/94	0.05	nd	1.48	6.87	83	105
East Side	03/22/94	4.03	17.92	45.64	259.20	4136	int
Meth. Blank	03/23/94	nd	nd	nd	nd	nd	96
East Side 1	03/09/94	1.14	0.08	8.99	17.04	256	101
East Side 2	03/09/94	0.66	nd	1.78	0.41	22	104
DETECTION LIMITS		0.05	0.05	0.05	0.05	10	

"nd" Indicates NOT DETECTED at the Listed Detection Limits

"int" Indicates that INTERFERENCES prevent determination

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC

FARMERS' MARKET PROJECT  
Olympia, Washington  
Enviros, Inc., Project No. E1/940109.02

Total Lead Analyses (EPA 7420) for Soils

SAMPLE Number	Date Analyzed	Lead (mg/kg)
Meth. Blank	03/23/94	nd
Test Pit #1	03/23/94	nd

Method Detection Limit = 1.0 mg/kg  
"nd" Indicates Not Detected at the listed MDL.

## QA/QC FOR ANALYTICAL METHODS

### GENERAL

The TEG Northwest Mobile Laboratory quality assurance and quality control (QA/QC) procedures are conducted following the guidelines and objectives which meet or exceed certification/accreditation requirements of California DOHS, Washington DOE, and Oregon DEQ. The Quality Control Program is a consistent set of procedures which assures data quality through the use of appropriate blanks, replicate analyses, surrogate spikes, and matrix spikes, and with the use of reference standards that meet or exceed EPA standards.

When analyses are taking place on-site with the mobile lab, the need for Field Blanks or Travel/Trip Blanks is eliminated. If there is going to be a delay before sample preparation for analysis, the sample is stored at 4° C.

### ANALYTICAL METHODS

TEG Northwest Mobile Labs use analytical methodologies which are in conformity with U. S. Environmental Protection Agency (EPA), Washington DOE, and Oregon DEQ methodologies. When necessary and appropriate due to the nature or composition of the sample, TEG may use variations of the methods which are consistent with recognized standards or variations used by the industry and government laboratories.

#### **TPH-Gasoline, TPH-Diesel**

**(Gasoline and/or Diesel, Modified EPA 8015, WTPH-G and WTPH-D)**

A blank and a calibration standard are run at the beginning of the day. The standard must be within 15% of the continuing calibration curve value. The standard is rerun at the end of the day. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135%. A duplicate sample is run at a rate of 1 per 10 samples (or a matrix spike sample is prepared and analyzed). At least 1 method blank is run per 10 samples analyzed.

**Purgeable Volatile Aromatics**  
(BTEX, EPA 602/8020)

A blank and a calibration standard are run at the beginning of the day. The standard must be within 15% of the continuing calibration curve value. The standard is rerun at the end of the day if more than 10 samples have been run. All samples are prepared with a surrogate spike, and the recovery must be between 65% and 135%. At least 1 method blank is run per day.

**TPH-Heavy Fuel Hydrocarbons**  
(EPA 418.1, WTPH-418.1)

Calibration plot values must produce a best fit line, with known values deviating from the plot by less than 10%. Prior to sample run, a blank, a calibration standard, and a method blank are run. One method blank per 10 samples is prepared. A sample duplicate is prepared for each 10 samples to be run per day.





