PRELIMINARY ENVIRONMENTAL EVALUATION BLOCKS 342 AND 343 SEATTLE TIDE LANDS SEATTLE, WASHINGTON

E-5368-4

October 25, 1994

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

PREPARED FOR
FIRST AND UTAH ASSOCIATES, LP

Joe Nessel, REA, REP
Project Manager

Donald J. Bruno
Manager of Environmental Services

PRELIMINARY ENVIRONMENTAL EVALUATION BLOCKS 342 AND 343 SEATTLE TIDE LANDS SEATTLE, WASHINGTON

E-5368-4

October 25, 1994

Earth Consultants, Inc.
1805 - 136th Place Northeast, Suite 201
Bellevue, Washington 98005
(206) 643-3780

TABLE OF CONTENTS

E-5368-4

EXECUTIVE SUMMARY

A preliminary environmental evaluation was performed by Earth Consultants, Inc. (ECI) to determine if subsurface soils and groundwater may have been impacted by on-site and off-site, current and/or historical activities. Review of a previous underground storage tank (UST) removal on Block 343 (1992/1993) indicated a potential of residual petroleum hydrocarbon contamination.

On July 21, 1994, three soil borings were drilled to eight feet below ground surface at one hydrogeologic upgradient location and two at downgradient locations along the southern edge of the site. Soil samples collected at two to two and one-half foot intervals were visually observed and screened with field instruments for the presence of potential petroleum contamination.

Based upon ECI's review of the previous referenced environmental studies and observations, subsurface samples collected from levels with the greatest potential for contamination were submitted for laboratory analysis. Three hydropunches were driven at the base of the borings with screening at eight to twelve feet below ground surface. Groundwater samples were collected from the hydropunches and submitted for analysis.

Analytical results do not indicate the presence of heavier range petroleum hydrocarbons in the subsurface soils or groundwater at the southeastern or southwestern edge of the subject block. The only potential contaminants of concern detected were related to diesel range petroleum hydrocarbons in the groundwater. The diesel range hydrocarbons were measured in the groundwater at concentrations below MTCA Method A Cleanup Levels.

1.0 INTRODUCTION

Blocks 342 & 343 of the Seattle Tide Lands have a long history of industrial use with the potential to adversely impact subsurface soil. Previous and current adjacent property use have historical documentation of hazardous materials and petroleum products that have been released into the soil and groundwater. These documented releases may have impacted the subject site. The purpose of this project was to perform a preliminary identification and evaluation of potential environmentally impacted subsurface soil and groundwater at the northeast and southwest borders of the subject site.

Preliminary environmental evaluation work and reporting was performed by Earth Consultants, Inc. (ECI), 1805-136th Place Northeast, Suite 201, Bellevue, Washington under a proposal dated July 5, 1994 to First and Utah Associates, LP, 2401 Utah Avenue South, #205, Seattle Washington. Subsurface boring and hydropunching were performed by Cascade Drilling, Inc., P. O. Box 1184, Woodinville, Washington 98072. Pacific Northern Analytical, Inc. (PNA), 15314 Northeast 95th Street, Redmond, Washington 98052, performed the analytical testing on subsurface soil and groundwater samples collected from the subject site.

1.1 Background

The site is located in an area of commercial and light industrial development bordered to the north by South Lander Street, east by First Avenue South, south by South Forrest Street, and west by Colorado Avenue South, Seattle, King County, Washington (see Plates 1 & 2). Prior to development, the area was located with in the tidal flats area of Elliott Bay. During the early 1900's, the site grade was raised with the importation of an unknown quantity of fill material from unknown sources. A review of historical sources indicates that land use and construction on the subject site commenced in approximately 1920.

Historical occupants of Block 342 have included stove companies, metal fabricators, a brass foundry, an electrical transformer manufacturing company, several automotive service stations and petroleum product supply/handling facilities.

A review of references indicates that historical site use of Block 343 was primarily by industrial steel facilities for storage of materials prior to the development of commercial and retail sales facilities by Sears Roebuck and Company. A Sears Automotive Center was located on the south end of Block 343 in approximately 1940. There were eleven underground storage tanks (USTs) reportedly removed from the area of the Auto Center as it was decommissioned in 1992/1993. The former Auto Center site is considered an incomplete cleanup by the Washington State Department of Ecology (Ecology) due to a potential of residual petroleum hydrocarbon contamination.

PLATES 1 AND 2 HERE
(SITE LOCATION PLAN AND SITE PLAN)

1.2 Previous Investigations

Previous studies have included a property transfer investigation by Chemical Processors, Inc.; a property site assessment by Sweet-Edwards/EMCON; a UST decommissioning and site assessment by Alton Geoscience; a geotechnical engineering study by Earth Consultants, Inc.; and a Phase I Environmental Site Assessment (ESA) by SEACOR. In the Phase I ESA, SEACOR recommended assessing the extent of recognized environmental conditions which may impact the site. These reports have been referenced in Section 5.0 of this report.

1.3 Potential Contaminants of Concern

The many different and varied historical uses on the subject site provided a range of potential contaminants. Also confirmed releases in areas around and upgradient to the subject site may potentially contribute contaminants to the subject site. The uses most common on the site appear to have been related to petroleum products and metals handling. As previously mentioned, cleanup of petroleum on a portion of Block 343 has been considered by Ecology not to be complete. The primary contaminants of concern related to the historical uses are: gasoline, diesel, heavier range petroleum hydrocarbons, and heavy metals. Other contaminants of concern associated with the above and other site uses include volatile organic compounds (VOCs), semivolatile organic compounds including polyaromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).

During the 1992/1993 UST decommissioning by Alton Geoscience, TPHs heavier than diesel were the only potential contaminant of concern discovered to be present. PCBs and VOCs were not detected. Priority pollutant metals were detected below MTCA Method A cleanup levels.

2.0 SUBSURFACE INVESTIGATION AND SAMPLING

On July 21, 1994, Earth Consultants and Cascade Drilling performed subsurface soil borings at three locations (Plate 3). One location (SB-1) was at the north border of the site in Block 342 and west of First Avenue South. Referenced studies infer that the groundwater flow is from the north/northeast toward the south/southwest. This selected location is at the position upgradient for the site and analytical information obtained reflects potential contaminants migrating down gradient onto the subject site. The other two boring locations were at the southern border; one at the west edge of Utah Street (SB-2), and one (SB-3) at the southwest corner of the subject site (Block 343). Analytical information obtained from this evaluation supplements that from previous referenced studies to provide an indication of current site conditions and if there is a potential for off-site migration of contaminants.

The three borings were advanced to just above groundwater level using a hollow stem auger drill rig. Samples were collected every two to two and one-half feet by driving a conventional split spoon sampler into the undisturbed soil beneath the hollow stem auger. Samples were observed visually for impact from petroleum hydrocarbons and monitored with a photoionization detector (PID) for the presence of organic vapors. When no petroleum contamination was observed in the samples collected from a boring, the sample just above groundwater was submitted for analysis.

The same drill rig was then utilized to drive hydropunches into the groundwater. One groundwater sample was collected from each hydropunch by bailing and was submitted to the laboratory for analysis.

PNA provided all sample containers utilized for the project. Chain-of-Custody forms were completed and accompanied all samples to the laboratory to provide for sample documentation and laboratory tracking.

2.1 Subsurface Conditions

2.1.1 Soil

Fill consisting of silty sand and silt with sand was encountered to 5.5 feet below ground surface (BGS) in boring SB-1. Fill material consisting of medium dense sand and fine gravel (pea gravel) was encountered to 6.5 feet BGS in SB-2. Native medium dense black sand was encountered at boring SB-3 and beneath the fill material in SB-1 and SB-2 to the maximum exploration depth of eight feet BGS.

PLATE 3 HERE
(SOIL BORINGS/SAMPLE LOCATIONS PLAN)

2.1.2 Groundwater

Groundwater conditions were explored by installing a temporary well screen in the base of each boring using Hydropunch Techniques. The screened interval extended from 8 to 12 feet BGS. Groundwater levels in the wells screens were measured from 8.3 to 8.6 feet BGS.

2.2 Field Observations

2.2.1 Soil

During the drilling of borings SB-1, SB-2, and SB-3, there were no indications of petroleum impacted soils. No petroleum odors or visible sheens were detected. Low PID readings of organic vapor levels were recorded for subsurface soil samples collected (see boring logs, Appendix A).

Based upon the field geologist observations and field screening with the PID, soil samples collected from the bottom of the borings at approximately seven feet bgs were submitted for laboratory analyses.

2.2.2 Groundwater

Groundwater temperature measurements ranged from 20° to 23° C, pH measurements ranged from 6.5 to 7.0. Groundwater levels, temperature, and pH measurements are included on the boring logs (Appendix A). No visible sheens were observed on the groundwater. However, the groundwater samples collected for laboratory analyses were slightly turbid.

3.0 ANALYSES AND RESULTS

Based upon review of referenced documents, and potential contaminants of concern, subsurface soil samples were analyzed by the laboratory for total petroleum hydrocarbons (TPHs), volatile organic compounds (VOCs), semivolatile organic compounds, polychlorinated biphenyls (PCBs), and selected total metals chromium (Cr), copper (Cu), lead (Pb), and zinc (Zn). A duplicate sample was collected at SB-2 for quality control purposes. Groundwater samples were analyzed for the same potential contaminants as the subsurface soils with the addition of dissolved metals and turbidity measurements. Turbidity and dissolved metals were measured due to anticipated elevation of total metal results from particulate disturbances with the installation of the hydropunches. Test methods utilized are presented in Table 1 and sample locations are shown on Plate 3.

A review of quality control documentation indicates that there was one semivolatile organic compound, di-n-butyl phthalate, detected in the method blank. All samples analyzed measured less than the blank concentration and are considered to be not detected for this compound. Acetone detected in the rinsate blank was not detected in analytical samples. A review of all remaining blanks and controls indicates no other interferences, and acceptable limits for precision and accuracy.

All subsurface soil results are presented on a dry weight basis. Complete laboratory analyses and quality control data are presented in Appendix B.

3.1 Subsurface Soils

No gasoline, diesel, or extended range motor oil petroleum hydrocarbons were detected in the subsurface soils at any of the three boring locations. Also, no VOCs or PCBS were detected. The only semivolatile organic compounds detected and not also in the method blank, were in soil boring SB-2: 1) the polycyclic aromatic hydrocarbon (PAH) Benzo(b)fluoranthene at 0.25 mg/kg, and 2) a common environmental contaminant, Bis(2-ethylhexyl)phthalate at 0.5 mg/kg. Both of these semivolatile compounds are at concentrations below soil cleanup levels (MTCA Methods A or B). The concentrations of metals detected in the subsurface soils agree with previous studies which found the metals concentrations to be below MTCA cleanup levels. Metals results for the subsurface soils are presented in Table 2.

3.2 Groundwater

No gasoline or extended range hydrocarbons were detected in the groundwater samples collected by hydropunches at the three boring locations. Diesel range hydrocarbons were detected in the groundwater at the three boring/hydropunch locations. Sample HPGW-1 from SB-1 contained 230 ug/L, SB-2 sample HPGW-2 contained 640 ug/L, and SB-3 sample HPGW-3 contained 280 ug/L of diesel range petroleum hydrocarbons. These concentrations were all below the MTCA Method A Cleanup standard of 1000 ug/L. PAHs consistent with the petroleum hydrocarbons detected were present in the groundwater only at SB-3 and were below MTCA Method A Cleanup Levels (PQLs). The semivolatile compound Bis(2-ethylhexyl)phthalate was present in all three groundwater locations (HPGW-1 = 7.0 ug/L, HPGW-2 = 6.3 ug/L, HPGW-3 = 6.1 ug/L), but below the Method A cleanup level of 10 ug/L.

TABLE 1

ANALYSIS AND METHODS PERFORMED

E-5368-4

Analyte	Method for Soil	Method for Groundwater
TPH-Gasoline	WTPH-G	WTPH-G
TPH-Diesel	WTPH-D	WTPH-D
Heavy Oils	WTPH-D Extended	WTPH-D Extended
Volatile Organic Compound	EPA 8260	EPA 8260
Semivolatile Organic Compounds	EPA 8270	EPA 8270
Polychlorinated Biphenyls (PCBs)	EPA 8080	—
Turbidity	—	EPA 180.1
Total Metals	EPA 6020	EPA 6010/7421
Dissolved Metals	—	EPA 6010/7421

TABLE 2

METALS RESULTS IN SUBSURFACE SOILS

TOTAL METALS (mg/Kg)

E-5368-4

Sample Number	Depth (ft bgs)	Chromium	Copper	Lead	Zinc
SB-1-7	7	5.0	6.5	ND	13.9
SB-2-7	7	5.6	8.1	ND	25.0
SB-2-7D	7	17.3	8.5	ND	23.0
SB-3-7	7	4.7	5.8	ND	14.5
MTCA Method A Cleanup Level		100	NA	250	NA
MTCA Method B Cleanup Level		400	2,960	NA	24,000

ND = Not Detected above Reporting Limits.

NA = Not Applicable.

Metals analytical results obtained from the hydropunches in the three borings are presented in Table 3. As noted from the turbidity measurements, a significant amount of suspended materials was present in the groundwater samples collected. This could be expected from the installation of the hydropunch disturbing the subsurface materials into which it was driven. The turbidity results from soils particles suspended in the water. When the total metals are measured, the analytical results include those from metals in soil particles as well as the metals in the groundwater. When the turbidity is taken into consideration and the samples observed for metals which would be dissolved in the groundwater, only one sample, HPGW-3, indicated that a small amount of zinc was present. Taking turbidity into consideration, all the dissolved metals results are below Method A cleanup levels and meet the Groundwater Quality Criteria of WAC 173-200.

TABLE 3

METALS RESULTS IN GROUNDWATER

(µg/L)

E-5368-4

Sample Number	Sample Location	Turbidity (NTUs)	Chromium		Copper		Lead		Zinc	
			Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
HPGW-1	SB-1	6,500	176	ND	537	ND	106	ND	1,020	ND
HPGW-2	SB-2	1,100	413	ND	163	ND	162	ND	752	ND
HPGW-3	SB-3	2,600	653	ND	390	ND	251	ND	1,300	ND
Groundwater Quality Criteria WAC 173-200			50	-	1,000	-	50	-	5,000	-

ND = Not Detected at Reporting Limit

4.0 CONCLUSIONS

Analytical results from the two down gradient borings (SB-2, SB-3) and hydropunch groundwater samples (HPGW-2, HPGW-3) were compared with the results from the upgradient location (SB-1) and with results from referenced studies. The subject site is located in an area which is zoned with an industrial classification. Since the cleanup action report was submitted in January 1993, a warehouse building has been constructed on the subject site which covers approximately one-half of the block, and the remainder of the block is covered by a asphalt paved parking lot.

Subsurface soil results of this study confirm results from the referenced Cleanup Action Report indicating that no PCBs or volatile organic compounds appear to be present in the area of Block 343. Metals levels in the subsurface soils also agree with the previous report in existing below MTCA cleanup levels. TPHs do not appear to exist in the soils at the southeastern or southwestern edge of the subject block.

Groundwater samples collected with the hydropunches and submitted for laboratory analysis do not indicate that there has been a significant impact to the site. No heavier range petroleum hydrocarbons, volatile organic compounds, or PCBs were detected in these groundwater samples.

Diesel range petroleum hydrocarbons that were detected in groundwater are well below MTCA Method A Cleanup Levels. Since no diesel range TPHs have been detected in several previous studies of subsurface soils at the subject site, it appears that any diesel range TPHs detected during this study are originating from an off-site source. Semi-volatile organic compounds detected were consistent with the petroleum hydrocarbons detected and are also below MTCA Method A Cleanup Levels. At this time, the groundwater appears to comply with MTCA Method A Cleanup Level guidance.

5.0 REFERENCES

Washington State Department of Ecology; "Guidance for Remediation of Petroleum Contaminated Soils"; 91-30 (Revised April 1994).

Earth Consultants, Inc., Bellevue, Washington; "Geotechnical Engineering Study, Home Depot, SODO Center, Seattle, Washington"; Project No. E-5368, October 23, 1991.

Science & Engineering Analysis Corporation (SEACOR), Bellevue, Washington; "Phase I Environmental Assessment, SODO Center, 2401 Utah Avenue South, Seattle, Washington"; SEACOR Job No. 00507-001-01; December 7, 1993.

Washington Administrative Code; Chapter 173-340; "Model Toxics Control Act, Cleanup Regulation"; Publication No. 94-06; December 1993.

Washington State Department of Ecology, "Guidance for Site Checks and Site Assessments for Underground Storage Tanks"; Department of Ecology Underground Storage Tank Program (90-52); February 1991, (Revised October 1992).

Washington Administrative Code, Chapter 173-360 ; Underground Storage Tank Regulations; 10/29/91.

Washington State Department of Ecology; "Guidance for Remediation of Releases from Underground Storage Tanks"; 91-30 (July 1991).

Chemical Processors, Inc., 2203 Airport Way South, Suite 400, Seattle, Washington, 98134; Property Transfer Investigation, Sears Roebuck and Company Property, 76 South Lander Street, Seattle, Washington; December 9, 1988.

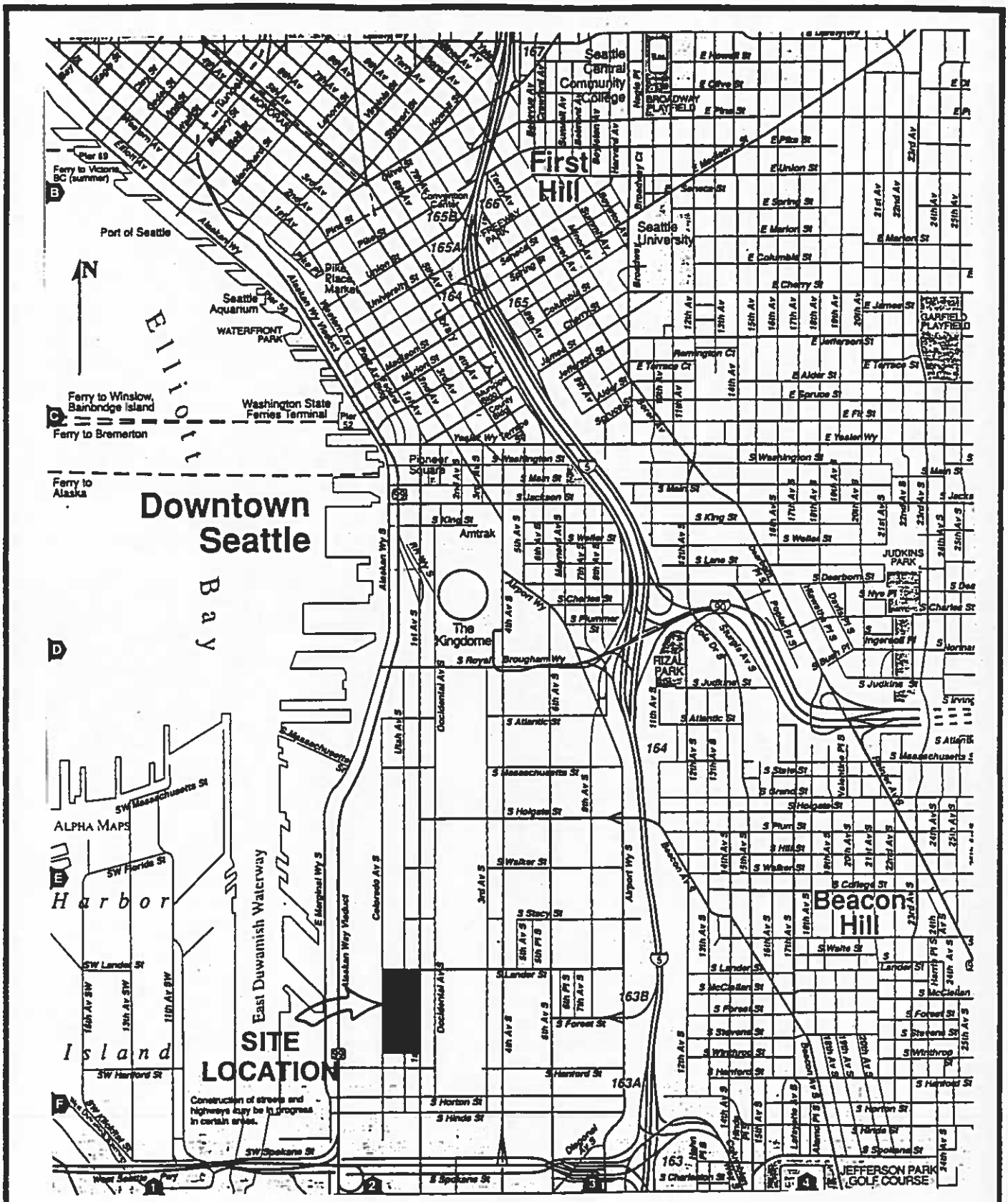
Sweet-Edwards/EMCON, Bothell, Washington; Sears Retail Property Site Assessment, First Avenue and South Lander, Seattle, Washington; December 16, 1988; Project No. S94-11.01.

Kroll Map Company, Inc., Seattle, Washington, No. 50E, Atlas of Seattle.

Alton Geoscience, 3425 South 116th Street, Suite 101, Seattle, Washington; "Interim Independent Cleanup Action Report, Former Sears Automotive Center, 2753 Utah Avenue South, Seattle, Washington"; January 14, 1993.

Washington Administrative Code, Chapter 173-200; Water Quality Standards for Ground Waters of the State of Washington' 10/31/90.

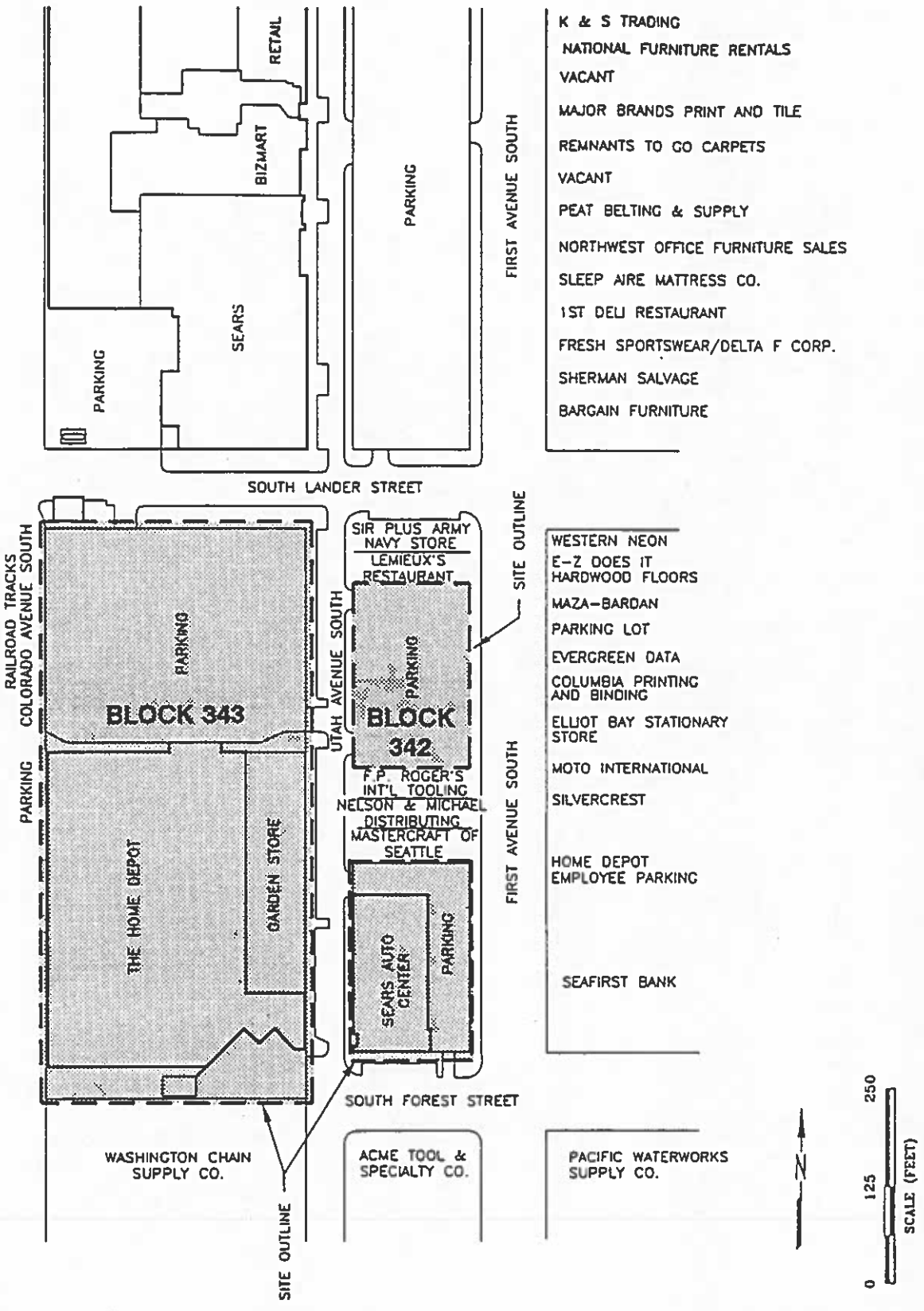
Washington State Department of Ecology; "Model Toxics Control Act Cleanup Levels and Risk Calculation (C/ARCII), Updated March 1994.



Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

Site Location
Blocks 342 & 343 - Seattle Tidelands
Seattle, Washington

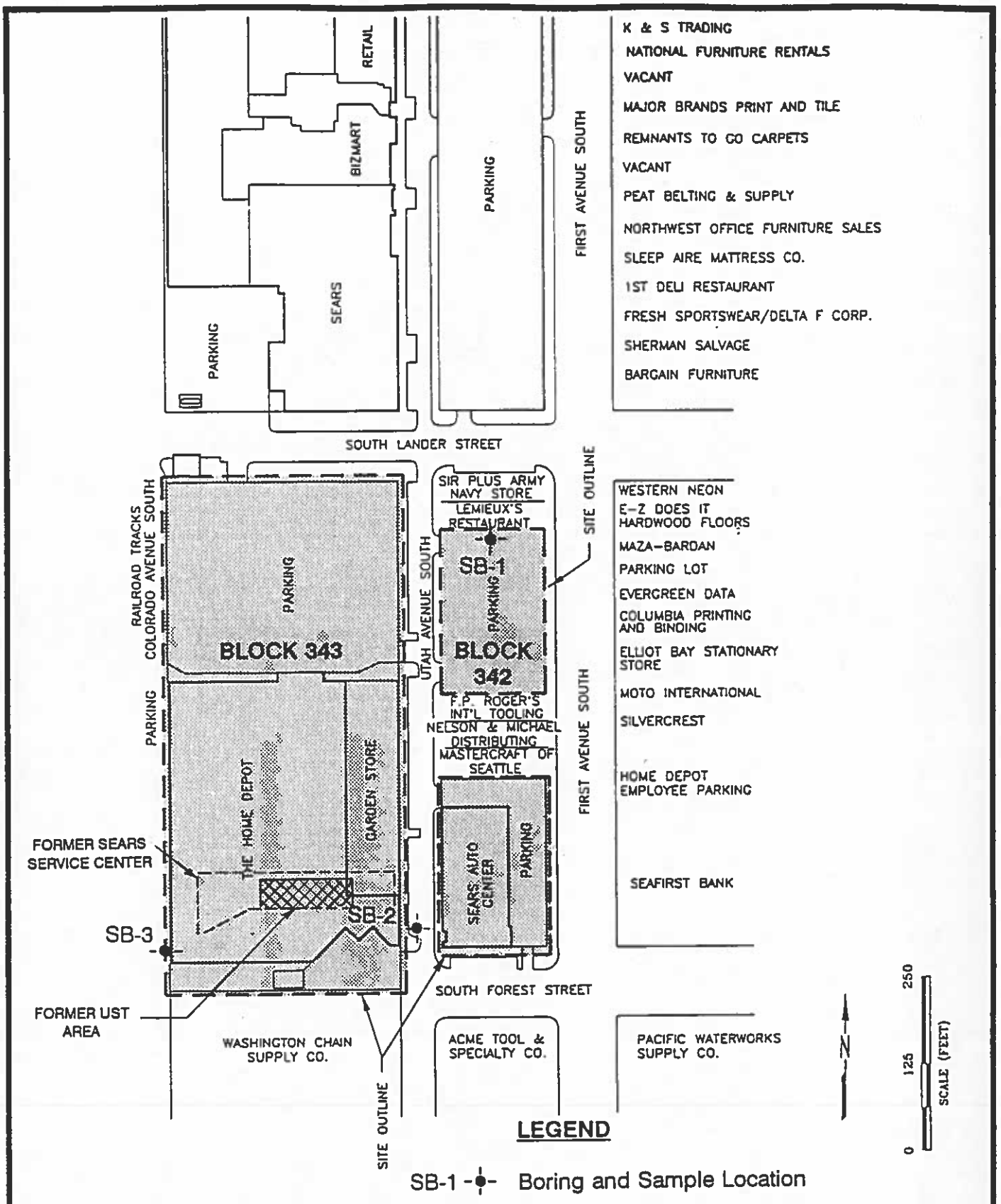
Proj. No. 5368-4	Drwn. GLS	Date Sept. '94	Checked JN	Date 9/7/94	Plate 1



Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

Site Plan
Blocks 342 & 343 - Seattle Tidelands
Seattle, Washington

Proj. No. 5368-4	Drwn. GLS	Date Sept. '94	Checked JN	Date 9/7/94	Plate 2



Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

Soil Borings and Sample Locations
Blocks 342 & 343 - Seattle Tidelands
Seattle, Washington

Proj. No. 5368-4	Drwn. GLS	Date Sept. '94	Checked JN	Date 9/7/94	Plate 3

APPENDIX A

APPENDIX A

EXPLORATION PROCEDURES AND BORING LOGS

E-5368-4

Soil Sampling

Three soil borings were drilled using 4-1/4 inch I.D., hollow-stem auger, truck-mounted drilling equipment. Lithologic samples were collected at approximately 2.5 foot intervals for soil logging and analytical purposes. Borehole lithology was logged by an ECI field geologist in accordance with the Unified Soil Classification System (USCS). The environmental boring logs are included in this Appendix.

Soil samples were collected with a split spoon sampler. Sampling protocol consisted of driving a clean soil sampler into undisturbed soil. Soil samples collected for laboratory analysis were extracted from the split spoon sampler using a clean, stainless steel spoon. All soil samples were immediately packed in laboratory grade glass jars, sealed, labelled, and packed in a cooler with ice for delivery under chain-of-custody to Pacific Northern Analytical in Redmond, Washington for analyses.

A cursory field screening using a Photovac Microtip photoionization detector (PID) was performed on a portion of all the soil samples collected during drilling. The PID measures organic vapors, which provides an indication of the presence of hydrocarbons. The portion of the sample to be field screened was placed in a clean plastic bag, sealed, and gently shaken to release organic vapors into the bag's headspace. The PID probe was inserted into the plastic bag, withdrawing vapors from the bag's headspace. Headspace readings are included on the boring logs.

Headspace vapor field screening results are site specific and vary according to contaminant type, atmospheric conditions, and soil moisture content.

Ground Water Sampling

A temporary well was installed below the base of each boring at the completion of drilling. The clean well was driven into undisturbed soil using Hydropunch techniques and intersected the water table interface. The well screen was removed from each boring at the completion of groundwater sample collection. The Hydropunch drive point remained in the ground and was abandoned in place.

The depth to groundwater was measured in each temporary well using a clean electric water level indicator prior to collection of groundwater samples. Groundwater temperature and pH were measured during sample collection using a Corning Checkmate Deluxe field system meter.

Groundwater samples were collected from the wells using a clean/decontaminated teflon bailer. The groundwater samples collected for laboratory analysis were immediately transferred to containers provided by the analytical laboratory, sealed, labelled and packed in a cooler with ice for delivery under chain-of-custody to Pacific Northern Analytical in Redmond, Washington for analyses.

Equipment Decontamination Procedures

All groundwater sampling, soil sampling, and drilling equipment was thoroughly decontaminated with a pressurized steam cleaner prior to drilling each boring. The split spoon sampler and stainless steel sampling spoons were cleaned in a solution of Alconox and water, then rinsed with distilled water between each sample collection attempt. The electric water level indicator was cleaned in a solution of Alconox and distilled water, then rinsed with distilled water prior to use at each temporary well. The temperature and pH meter was thoroughly rinsed with distilled water prior to use at each well.

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION
Coarse Grained Soils	Gravel And Gravelly Soils	Clean Gravels (little or no fines)		GW gw	Well-Graded Gravels, Gravel-Sand Mixtures, Little Or No Fines
				GP gp	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little Or No Fines
	More Than 50% Coarse Fraction Retained On No. 4 Sieve	Gravels With Fines (appreciable amount of fines)		GM gm	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC gc	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand And Sandy Soils	Clean Sand (little or no fines)		SW sw	Well-Graded Sands, Gravelly Sands, Little Or No Fines
				SP sp	Poorly-Graded Sands, Gravelly Sands, Little Or No Fines
More Than 50% Material Larger Than No. 200 Sieve Size	More Than 50% Coarse Fraction Passing No. 4 Sieve	Sands With Fines (appreciable amount of fines)		SM sm	Silty Sands, Sand-Silt Mixtures
				SC sc	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils	Silts And Clays	Liquid Limit Less Than 50		ML ml	Inorganic Silts & Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands; Clayey Silts w/ Slight Plasticity
				CL cl	Inorganic Clays Of Low To Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
				OL ol	Organic Silts And Organic Silty Clays Of Low Plasticity
More Than 50% Material Smaller Than No. 200 Sieve Size	Silts And Clays	Liquid Limit Greater Than 50		MH mh	Inorganic Silts, Micaceous Or Diatomaceous Fine Sand Or Silty Soils
				CH ch	Inorganic Clays Of High Plasticity, Fat Clays.
				OH oh	Organic Clays Of Medium To High Plasticity, Organic Silts
Highly Organic Soils				PT pt	Peat, Humus, Swamp Soils With High Organic Contents

Topsoil		Humus And Duff Layer
Fill		Highly Variable Constituents

The discussion in the text of this report is necessary for a proper understanding of the nature of the material presented in the attached logs.

DUAL SYMBOLS are used to indicate borderline soil classification. UPPER CASE LETTER SYMBOLS designate sample classifications based upon laboratory testing; LOWER CASE LETTER SYMBOLS designate classifications not verified by laboratory testing.

C	TORVANE READING, tsf
qu	PENETROMETER READING, tsf
W	MOISTURE, % dry weight
P	SAMPLER PUSHED
*	SAMPLE NOT RECOVERED
pcf	DRY DENSITY, lbs. per cubic ft.
LL	LIQUID LIMIT, %
PI	PLASTIC INDEX

- I 2" O.D. SPLIT SPOON SAMPLER
- II 24" I.D. RING OR SHELBY TUBE SAMPLER
- WATER OBSERVATION WELL
- ▽ DEPTH OF ENCOUNTERED GROUNDWATER DURING EXCAVATION
- ▼ SUBSEQUENT GROUNDWATER LEVEL W/ DATE

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

LEGEND

Proj. No 5368-4 | Date Aug. '94 | Plate A1

Environmental Boring Log

Project Name: Blocks 342 and 343 - Seattle Tidelands				Sheet 1 of 1
Job No.: 5368-4	Logged by: DJK	Start Date: 7/21/94	Completion Date: 7/21/94	Boring No: **SB-1**
Drilling Contractor: Cascade		Drilling Method: HSA		Sampling Method: Split Spoon 140# Hanner
Ground Surface Elevation:		Hole Completion: ☐ Monitoring Well ☐ Piezometer ☒ Abandoned, sealed with bentonite		

Microtip Reading (ppm)	Sample ID	Blow Count	Litho-graphy	Depth in Feet	USCS Symbol	Surface Conditions: Asphalt Concrete
					AC	6" Asphalt Concrete
				1		
				2		
		5		3	SM	Fill: Brown silty fine to medium SAND with occasional gravel, medium dense, moist
		6				
16	SB-1-3	7		4		
				5	ML	Grades to gray SILT with sand
		7				
32	SB-1-5.5	7		6		
		8				
		7		7		
9	SB-1-7	7			SP	Native black fine to medium SAND, medium dense, moist
		8		8 ▽		
				9		Boring completed at 8 feet on 7/21/94. Hydropunch screen temporarily installed from 8 to 12 feet BGS.
				10		Groundwater level measured at 8.3 feet BGS. pH: 6.6 Temperature: 20°C
				11		
				12		
				13		
				14		
				15		
				16		
				17		
				18		
				19		

Notes/Location

Earth Consultants Inc.

Proj. No. 5368-4	Date Aug.'94	Plate A2

Environmental Boring Log

Project Name: Blocks 342 and 343 - Seattle Tidelands				Sheet 1 of 1
Job No.: 5368-4	Logged by: DJK	Start Date: 7/21/94	Completion Date: 7/21/94	Boring No: **SB-2**
Drilling Contractor: Cascade		Drilling Method: HSA		Sampling Method: Split Spoon 140# Hanner
Ground Surface Elevation:		Hole Completion: ☐ Monitoring Well ☐ Piezometer ☒ Abandoned, sealed with bentonite		

Microtip Reading (ppm)	Sample ID	Blow Count	Litho-graphy	Depth in Feet	USCS Symbol	Surface Conditions: Asphalt Concrete
				1	AC	1' Asphalt concrete
				2		
21	SB-2-3	5		3	SP	Fill: Black fine to medium SAND, medium dense, moist
		7				
		9		4		
				5		
14		5			GP	Fill: Fine GRAVEL with sand, trace of SILT, medium dense, moist
		6		6		
		7				
		1		7	SP	Black fine to medium SAND, loose, moist to wet
1		2				
		3		8		Boring completed at 8 feet on 7/21/94. Hydropunch screen temporarily installed from 8 to 12 feet BGS. Groundwater level measured at 8.6 feet BGS. pH: 6.5 Temperature: 23°C
				9		
				10		
				11		
				12		
				13		
				14		
				15		
				16		
				17		
				18		
				19		

Notes/Location

Earth Consultants Inc.

Proj. No. 5368-4	Date Aug. '94	Plate A3

Environmental Boring Log

Project Name: Blocks 342 and 343 - Seattle Tidelands				Sheet 1 of 1
Job No.: 5368-4	Logged by: LAC	Start Date: 7/21/94	Completion Date: 7/21/94	Boring No: **SB-3**
Drilling Contractor: Cascade		Drilling Method:		Sampling Method: Split Spoon
Ground Surface Elevation:		Hole Completion: ☐ Monitoring Well ☐ Piezometer ☒ Abandoned, sealed with bentonite		

Microtip Reading (ppm)	Sample ID	Blow Count	Litho-graphy	Depth in Feet	USCS Symbol	Surface Conditions: Asphalt Concrete
				1	AC	4" Asphalt concrete 6" Coarse gravel base
				2		
		17				
49	SB-3-3	17		3	SP	Fill: Black fine to medium SAND with silt, medium dense, moist
		17		4		
				5		
		12				
9	SB-3-5.5	15		6		
		15		7		
		10				
12	SB-3-7	12		8		
		13				
				9	▽	Boring completed at 8 feet on 7/21/94. Hydropunch screen temporarily installed from 8 to 12 feet BGS. Groundwater level measured at 8.6 feet BGS. pH: 7.0 Temperature: 21°C
				10		
				11		
				12		
				13		
				14		
				15		
				16		
				17		
				18		
				19		

Notes/Location

Earth Consultants Inc.

Proj. No. 5368-4 | Date Aug. '94 | Plate A4

APPENDIX B

APPENDIX B

E-5368-4

ANALYTICAL RESULTS

Pacific
Northern
Analytical, Inc.

August 2, 1994

Joe Nessel
Earth Consultants Inc.
1805 136th Place NE
Bellevue, WA 98005

Dear Joe:

Enclosed are the analytical results of samples submitted on July 22, 1994 from project Block 342 & 343, E 5368-4.

If you have any questions regarding this report or if you need any other assistance, please do not hesitate to call me.

Sincerely,

Cynthia Rezania
Project Chemist

CLR/lh

15314 N.E. 95th Street
Redmond, WA 98052-2517
(206) 881-7538 • Fax 881-8215