R E P O R T

JDI Realty
150 South Wacker Drive
Suite 2660
Chicago, Illinois 60606

Environmental Sampling and Request for Closure of the Former Gasolene Station Site

Lot 13, Ross Plaza
South 234th Street & Pacific Highway
Federal Way, Washington

STS Project No. 29957-XH

January 8, 1999

STS Consultants, Ltd.
Solutions through Science & Engineering

December 23, 1998

Mr. Norman Peck
State of Washington Department of Ecology
3190 160th Avenue S. E.
Bellevue, Washington 98008-5452

RE: Environmental Sampling and Request for Closure of the Former Gasoline Station Site on Lot 13, Ross Plaza, South 234th Street and Pacific Highway, Federal Way, Washington – STS Project No. 29957-XH

Dear Mr. Peck:

STS Consultants, Ltd. (STS) has prepared the attached report for the above-referenced project. According to Mr. Lillie of your office, the Ross Plaza site is currently enrolled in the Voluntary Cleanup Program (VCP). Previous correspondence from your office indicated that the site could be divided into "sub-sites" to obtain "No Further Action" (NFA) determinations. Based on the results of the recent sampling summarized herein, STS is requesting, on behalf of JDI Realty that a NFR letter be issued for Lot 13 of the subject site under the VCP.

If you have any questions regarding the attached report, please do not hesitate to contact us.

Respectfully,

STS CONSULTANTS, LTD.

Steven T. Newlin
Senior Project Geologist

John N. Elsea for
Richard G. Berggreen
Principal Geologist

Attachment

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750 Corporate Woods Parkway • Vernon Hills, IL 60061-3153 • (847) 279-2500 • (847) 279-2510 Fax

ENVIRONMENTAL SAMPLING AT SEAFIRST BANK SITE
Former Gasoline Station Site
Lot 13 of Ross Plaza
Federal Way, Washington

Background

STS Consultants, Ltd. (STS) conducted a review of several environmental investigation reports prepared for the subject site, prepared by others, and correspondence from the Washington Department of Ecology regarding their review of information submitted for the site. The investigation reports include Phase I Environmental Assessment of the site prepared by H^+GLC and dated October 4, 1993, an Environmental Investigation dated April 30, 1997, and a Soil and Groundwater Investigation Report dated May 13, 1997, both prepared by Clayton Environmental Consultants. In addition to the investigative reports, STS reviewed a letter from the Washington Department of Ecology dated February 5, 1998, regarding their review of the above reports.

The purpose of the review was to assist in obtaining a "No Further Action" designation from the Department of Ecology for the portion of the Ross Plaza site identified as Lot 13. The subject site was formerly occupied by a gasoline service station. The site is currently occupied by a Seafirst National Bank branch.

Seven borings were previously drilled at the former gasoline station site, three of which were completed as monitoring wells. Soil and groundwater samples collected during the initial environmental investigations were analyzed for total petroleum hydrocarbons as gasoline (TPH-G), diesel (TPH-D), heavy oil (TPH-O), and benzene, toluene, ethylbenzene, and xylenes (BTEX). The only soil contamination detected on Lot 13 which exceeded the cleanup standards was in one sample from boring B-4, at a depth of 10 feet.

The three monitoring wells were sampled during the initial environmental investigations, but have since been abandoned. Groundwater samples collected from the three temporary monitoring wells did not contain concentrations of TPH-G, TPH-D, TPH-O, or BTEX in excess of the Washington's Model Toxics Control Act (MTCA) Method A cleanup levels. An exceedance was detected in a groundwater sample collected directly from the borehole of boring B-4. However, it is believed that that sample is not indicative of the true groundwater conditions due to the possibility of suspended solids generated by the drilling operations. This argument is supported by the fact that no exceedances were detected in the groundwater sample collected from monitoring well MW-2 adjacent to boring B-4.

Washington Department of Ecology correspondence dated February 5, 1998 recommended resampling and analysis by an alternate method which might indicate the location of boring B-4 does not exceed an interim cleanup threshold, MTCA Method B interim TPH gasoline guidelines. This letter is intended to transmit the results of that resampling effort which was recently completed.

Field Exploration

Based on the Department of Ecology's recommendation in their February 5, 1998 letter, STS conducted resampling of the soils in the area of boring B-4. The soil in the immediate vicinity of B-4 was resampled to investigate whether the site exceeds the cleanup standard. Two borings, B-2 and B-4a, were advanced using a truck mounted drill rig. Samples were collected from 10 feet deep, the depth at which the prior exceedance was measured.

Hollow stem augers were used to advance the borings to 10 feet where a split spoon sampler was utilized to collect a sample from 10 to 11.5 feet below grade. Boring logs for the two borings are attached. The locations of the two borings are illustrated on Figure 1.

The sample from boring B-4a (resampled) was retained for submittal to a subcontract laboratory, OnSite Environmental Inc. The laboratory tested the parameters for which the previous sample exceeded the cleanup level, TPH-gasoline and benzene, ethylbenzene, toluene and xylene (BETX). The sample was also analyzed for volatile petroleum hydrocarbon (VPH), extractable petroleum hydrocarbons (EPH), and petroleum aromatic hydrocarbons (PAHs), in order to calculate risk levels under the interim Method B guidance. The chemical laboratory report is attached.

Summary of Findings

Low levels of TPH-G (47 ppm) and xylenes (0.06 ppm) were detected by the laboratory analyses, concentrations within MTCA Method A cleanup criteria. This samples was obtained within three feet of the sample which had originally shown elevated concentrations in the prior study of the site.

STS also conducted an interim Method B calculation to evaluate the human risk and environmental fate and transport of the detected petroleum fractions and carcinogenic PAHs. The interim Method B risk analysis utilizes the aromatic and aliphatic fractions of the detected petroleum and assigned surrogates to evaluate human health (direct contact) risk. The method also estimates the potential for contaminates to impact groundwater through a fate and transport analysis.

Tables 1 through 3 summarize the detected concentrations of the various petroleum fractions and the values derived from the interim Method B calculations. From these summaries, the hazard index for non-carcinogenic soil contact is less than 1 for any exposure scenario; residential, commercial, or industrial (Table 1).

The soil sample slightly exceeds the Method B cleanup levels for total carcinogenic PAHs in a residential scenario, due to the presence of 0.21 ppm chrysene which was detected (Table 2).

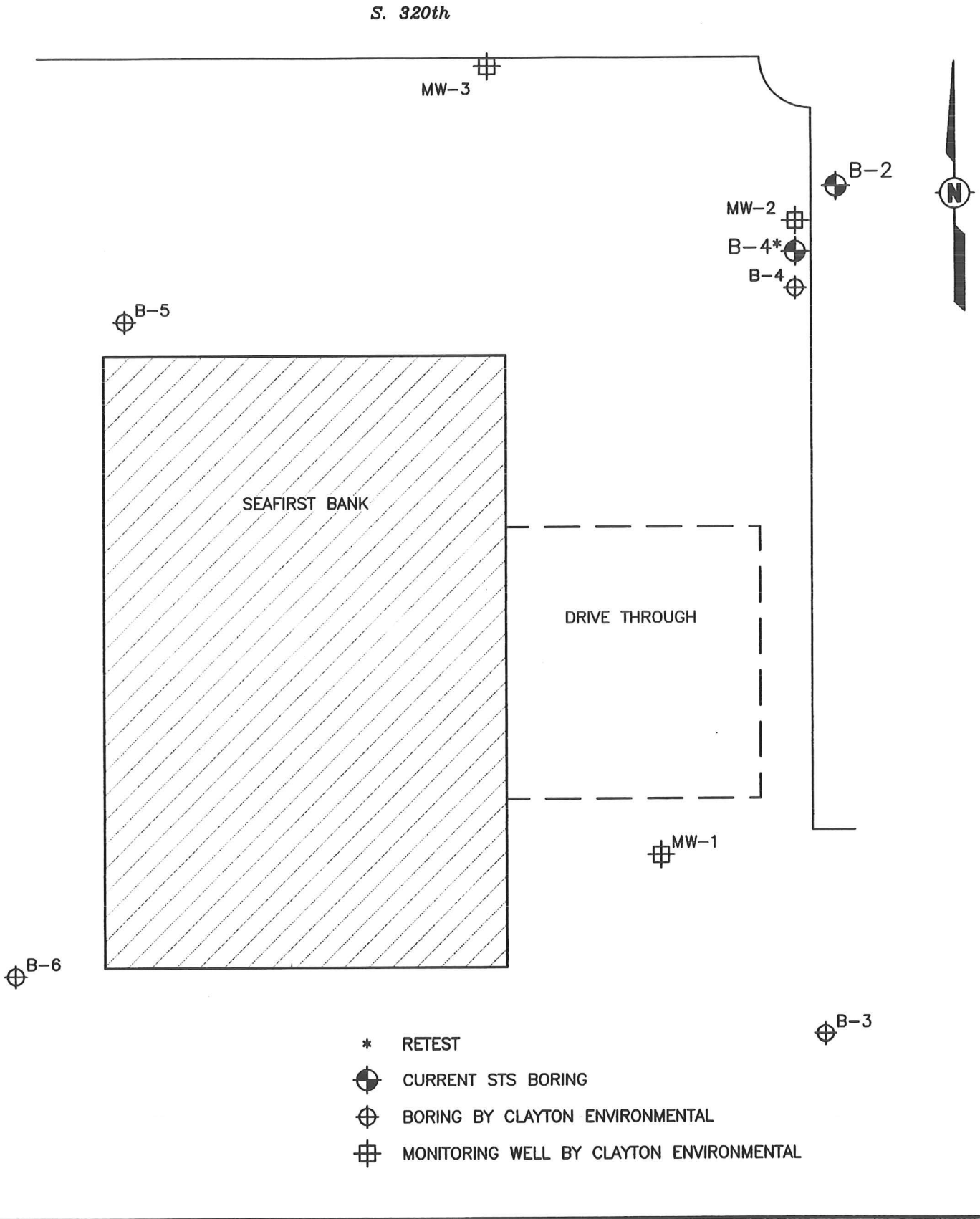
The fate and transport model in Table 3 indicates that the detected soil concentrations are protective of groundwater.

The detected exceedances are only slightly above the Method B allowable hazard indices as calculated on Table 2 for carcinogenic PAHs. No groundwater is evident in the soil borings. The depth of the contaminated is on the order of 10 feet or more. The soils are tight silty clay till, with minimal potential for contaminant migration. The site and vicinity are paved and covered with either parking lots, buildings or street pavement. The potential for contact and risk of exposure to these materials is unlikely given the current and proposed future use of the site.

Based on the previous groundwater sampling, there does not appear to be groundwater impacts resulting from the former gasoline station. The fate and transport model suggests that the current soil conditions do not present a threat of future groundwater impacts.

Conclusion

STS requests Department of Ecology concurrence with the findings presented above regarding the low risk represented by the residual contamination. We request a No Further Action determination for lot 13 of the Ross Plaza property, Federal Way, Washington.



STS Consultants Ltd.
Consulting Engineers

SOIL BORING LOCATION DIAGRAM
SEAFIRST
LOT 13, ROSS PLAZA
FEDERAL WAY, WASHINGTON

DRAWN BY	KKB	12-21-98
CHECKED BY	STN	12-21-98
APPROVED BY	RGB	12-21-98
CADFILE g1XH3.dwg	SCALE 1"=20'±	
STS PROJECT NO. 29957-XH	FIGURE NO. 1	

X:\PROJECTS\29957\XH\g1XH3.dwg 01/05/1999 13:

STS Consultants Ltd.

CLIENT: JDI Realty	LOG OF BORING NUMBER: B-4
PROJECT NAME: Seafirst	ARCHITECT-ENGINEER:

SITE LOCATION: Lot 13, Ross Plaza; Federal Way, Washington

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL	FIELD PHOTO-IONIZATION DETECTOR READING (PPM)	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)
				SURFACE ELEVATION		
				Blank drill		
2.5						
5.0		HSA				
7.5						
10.0						
	1	SS		Silty sand - brownish gray	35	⊗ 13
11.5				End of Boring Boring backfilled with bentonite. Casing used: 4-1/4" HSA		

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL: Dry	BORING STARTED: 11/13/98	STS OFFICE: Chicago Area-01	
WL	BORING COMPLETED: 11/13/98	ENTERED BY: KKB	SHEET NO.: 1 OF 1
WL	RIG/FOREMAN: CME-75/Cascade	APP'D BY: STN	STS JOB NO.: 29957-XH

STS Consultants Ltd.

CLIENT: JDI Realty

LOG OF BORING NUMBER: B-2

PROJECT NAME: Seafirst

ARCHITECT-ENGINEER:

SITE LOCATION: Lot 13, Ross Plaza; Federal Way, Washington

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	FIELD PHOTO-IONIZATION DETECTOR READING (PPM)	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)
					SURFACE ELEVATION		
					Blank drill		
2.5							
5.0							
7.5							
10.0							
	1	SS			Silty sand, little gravel	47	50/6"
11.5					End of Boring Boring backfilled with bentonite.		

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL: Dry	BORING STARTED: 11/13/98	STS OFFICE: Chicago Area-01	
WL	BORING COMPLETED: 11/13/98	ENTERED BY: KKB	SHEET NO.: 1 OF: 1
WL	RIG/FOREMAN: CME-75/Cascade	APP'D BY: STN	STS JOB NO.: 29957-XH

Risk Calculation Table 1
Model Toxics Control Act Method B
Non Carcinogen - Human Health Soils Contact Worksheet

SAMPLE: SEAFIRST S-1 (B-4 Resample @ 10' BGS)

Compound	***Soil Conc. (ppm)***	***ORfD***	***Residential Factor = 1.25(10^{-5})***		***Commercial Factor = 3.125(10^{-6})***		***Industrial Factor = 2.86(10^{-7})***	
			Multiplier	***HQ***	***Multiplier***	***HQ***	***Multiplier***	***HQ***
Total Aliphatic (C_5 - C_{21})	59	0.06	2.08e-04	0.01	5.21e-05	0.00	4.77e-06	0.00
Total Aromatic (C_8 - C_{34})*	367	0.03		--		--		--
Benzene	0			--		--		--
Ethylbenzene	0	0.10	1.25e-04	0.00	3.13e-05	0.00	2.86e-06	0.00
Toluene	0	0.20	6.25e-05	0.00	1.56e-06	0.00	1.43e-06	0.00
Xylenes	0.06	2.00	6.25e-06	0.00	1.56e-07	0.00	1.43e-07	0.00
Total Aromatic +B-E-X	370	0.03	4.17e-04	0.15	1.04e-04	0.04	9.53e-06	0.00
Hazard Index			***0.16***		***0.04***		***0.00***	

Notes:
Multiplier =MTCA calculation "factor"/Oral Reference Dose (ORfD)

HQ = Hazard quotient of individual components = (concentration in ppm)(factor)/ORfD

Hazard Index = Sum of hazard quotients. Hazard Index may not exceed 1 under MTCA regulation.

* Using the VPH analytical method,"total aromatics" includes the hydrocarbon range of C_8 to C_{34} which includes ethylbenzene and xylenes, but not benzene. As used in this calculation, ethylbenzene and xylenes each have a separate hazard quotient, so their contribution to "total aromatics" must be subtracted. Benzene is not included, so its quantity must be added.

Risk Calculation Table 2
Model Toxics Control Act Method B
Carcinogen Formula for Human Health Contact

$$\text{Residential Soil Cleanup Level (ug/l)} = \frac{\text{RISK x ABW x LIFE x UCF1}}{\text{CPF x SIR x AB1 x DUR x FOC}}$$

Where:	Risk = Acceptable cancer risk level		(Residential 1 in 1,000,000)
	ABW = Average Body Weight	-	Assigned by Washington State = 16 Kg.
	Life = Assumed Lifetime	-	Assigned by Washington State = 75 Years
	UCF1 = Unit Conversion Factor	-	1,000,000 mg/Kg.
	CPF = Carcinogenic Potency Factor	-	From published EPA Database
	SIR = Soil Ingestion Rate	-	Assigned by Washington State = 200 mg/day
	AB1 = Gastrointestinal Absorption Rate	-	Assigned by Washington State = 1.0
	DUR = Duration of Exposure	-	Assigned by Washington State = 6 Years
	FOC = Frequency of Contact	-	Assigned by Washington State = 1.0

Calculate separately for benzene and total carcinogenic PAHs, if necessary, based on range of hydrocarbons in petroleum product present. Excess Risk is assumed to be additive.

$$\text{Benzene Soil Cleanup Level} = \frac{(0.000001) \times (16) \times (75) \times (1{,}000{,}000)}{(0.029) \times (200) \times (1.0) \times (6) \times (1.0)} = 34.5 \text{ ppm}$$

$$\text{Carcinogenic PAH Cleanup Level} = \frac{(0.000001) \times (16) \times (75) \times (1{,}000{,}000)}{(7.30) \times (200) \times (1.0) \times (6) \times (1.0)} = 0.137 \text{ ppm}$$

By the standard MTCA assumptions, Sample SEAFIRST S-1 (B-4 Resample @ 10' BGS) does NOT meet Method B Residential Cleanup Levels for carcinogenic PAHs. However, based on the depth to the zone of contaminants and site characteristics, the potential for exposure at the MTCA standard Frequency of Contact is unlikely under any current or future site. Lower Frequency of Contact raises the possible soil concentration that is protective of human health. Alternatively, Commercial site risk assumptions could be used (MethodC).

Risk Calculation Table 2
Model Toxics Control Act Method B
Summary of Carcinogen Risk Levels for Human Health

Sample SEAFIRST S-1 (B-4 Resample @ 10' BGS)

Compound	***Soil Conc. (ppm)***	***OCPF***	***Residential Risk***		***Commercial Risk***		***Industrial Risk***	
			Multiplier		***Multiplier***		***Multiplier***	
Benzene	0.025	0.029	1.00e-06	7.25e-10	2.50e-07	1.81e-10	7.62e-08	5.52e-11
Total cPAHs	0.21	7.30	1.00e-06	1.53e-06	2.50e-07	3.83e-07	7.62e-08	1.17e-07

Benzene not detected in laboratory testing. A soil concentration of ½ the laboratory PQL is used for calculation.

Table 3
Model Toxics Control Act Method B
Fate and Transport Model - Raoult's Law Soil to Groundwater Calculation

Sample SEAFIRST S-1 (B-4 Resample @ 10' BGS)

Compound	*Soil Conc. (ppm)*	*Mole Weight (g/mol)*	*Moles (mmol/kg)*	*Mole Fraction*	*Solubility (mg/L)*	*Effective Solubility (Mol. Fract. x Sol.) (mg/L)*	*Dilution Factor*	*Calculated Conc. in Well (mg/L)*
Aliphatics								
EC 5-6	0	81	0.00	0.00	28	0.00	20	0.00
EC >6-8	0	100	0.00	0.00	4.2	0.00	20	0.00
EC >8-10	0	130	0.00	0.00	0.33	0.000	20	0.00
EC >10-12	36	160	0.23	0.11	0.026	0.0029	20	0.00
EC >12-16	11	200	0.06	0.03	0.00059	0.00002	20	0.000
EC >16-21	12	270	0.04	0.02	0.000001	0.0000000	20	0.0000
Aromatics								
Benzene	0	78	0.00	0.00	1780	0.0	20	0.00
Toluene	0	92	0.00	0.00	520	0.0	20	0.00
EC >8-10	11	120	0.09	0.05	65	3.0	20	0.15
EC >10-12	18	130	0.14	0.07	25	1.7	20	0.09
EC >12-16	10	150	0.07	0.03	5.8	0.19	20	0.01
EC >16-21	9.4	190	0.05	0.02	0.51	0.013	20	0.001
EC >21-35	319	240	1.33	0.66	0.0066	0.00439	20	0.0002
Totals	--	--	2.00	1.00	--	--	--	0.3

Notes: (Mole fraction for each EC range)x(solubility)x(dilution factor) = calculated expected concentration in a well.

Resulting Well Concentration is BELOW 1.0 mg/L, so soil concentration is acceptable, protective of groundwater.

Date of Report: November 24, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

NWTPH-G/BTEX

Date Extracted: 11-13-98
Date Analyzed: 11-13-98

Matrix: Soil
Units: mg/Kg (ppm)

Client ID: **CFIRST, S-1**
Lab ID: 11-074-10

	Result	Flags	PQL
Benzene	**ND**		0.057
Toluene	**ND**		0.057
Ethyl Benzene	**ND**		0.057
m,p-Xylene	**0.060**		0.057
o-Xylene	**ND**		0.057
TPH-Gas	**46**	T	5.7

Surrogate Recovery:
Fluorobenzene 99%

Date of Report: November 24, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

NWTPH-G/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-13-98
Date Analyzed: 11-16-98

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1113S1

	Result	Flags	PQL
Benzene	**ND**		0.050
Toluene	**ND**		0.050
Ethyl Benzene	**ND**		0.050
m,p-Xylene	**ND**		0.050
o-Xylene	**ND**		0.050
TPH-Gas	**ND**		5.0

Surrogate Recovery:
Fluorobenzene 98%

Date of Report: November 24, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

NWTPH-G/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 11-13-98
Date Analyzed: 11-15-98

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID:	11-060-05 **Original**	11-060-05 **Duplicate**	**RPD**	**Flags**
Benzene	**ND**	**ND**	NA	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**ND**	**ND**	NA	
m,p-Xylene	**ND**	**ND**	NA	
o-Xylene	**ND**	**ND**	NA	
TPH-Gas	**ND**	**ND**	NA	
Surrogate Recovery:				
Fluorobenzene	100%	104%		

Date of Report: November 24, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

NWTPH-G/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 11-13-98
Date Analyzed: 11-13-98

Matrix: Soil
Units: mg/Kg (ppm)

Spike Level: 1.00 ppm

Lab ID:	11-077-02 **MS**	Percent Recovery	11-077-02 **MSD**	Percent Recovery	RPD
Benzene	**0.846**	**85**	**0.885**	**89**	4.5
Toluene	**0.879**	**78**	**0.949**	**85**	8.6
Ethyl Benzene	**0.847**	**85**	**0.900**	**90**	6.1
m,p-Xylene	**0.886**	**77**	**0.984**	**87**	12
o-Xylene	**0.851**	**78**	**0.919**	**85**	8.3

Surrogate Recovery:

Fluorobenzene	85%	89%

Date of Report: December 3, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

PAH's by EPA 8270C

Date Extracted:	11-25-98
Date Analyzed:	12-01-98
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	11-074-10
Client ID:	CFIRST, S-1

Compound:	Results	Flags	PQL
Naphthalene	ND		0.19
2-Methylnaphthalene	ND		0.19
Acenaphthylene	ND		0.19
Acenaphthene	ND		0.19
Fluorene	ND		0.19
Phenanthrene	ND		0.19
Anthracene	ND		0.19
Fluoranthene	ND		0.19
Pyrene	ND		0.19
Benzo[a]anthracene	ND		0.19
Chrysene	0.21		0.19
Benzo[b]fluoranthene	ND		0.19
Benzo[k]fluoranthene	ND		0.19
Benzo[a]pyrene	ND		0.19
Indeno[1,2,3-cd]pyrene	ND		0.19
Dibenz[a,h]anthracene	ND		0.19
Benzo[g,h,i]perylene	ND		0.19

Surrogate :	Percent Recovery	Flags	Control Limits
Nitrobenzene-d5	55		23 - 120
2-Fluorobiphenyl	63		30 - 115
Terphenyl-d14	81		18 - 137

Date of Report: December 3, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

PAH's by EPA 8270C
METHOD BLANK QUALITY CONTROL

Date Extracted:	11-25-98
Date Analyzed:	11-25-98
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB1125S1

Compound:	Results	Flags	PQL
Naphthalene	ND		0.033
2-Methylnaphthalene	ND		0.033
Acenaphthylene	ND		0.033
Acenaphthene	ND		0.033
Fluorene	ND		0.033
Phenanthrene	ND		0.033
Anthracene	ND		0.033
Fluoranthene	ND		0.033
Pyrene	ND		0.033
Benzo[a]anthracene	ND		0.033
Chrysene	ND		0.033
Benzo[b]fluoranthene	ND		0.033
Benzo[k]fluoranthene	ND		0.033
Benzo[a]pyrene	ND		0.033
Indeno[1,2,3-cd]pyrene	ND		0.033
Dibenz[a,h]anthracene	ND		0.033
Benzo[g,h,i]perylene	ND		0.033

Surrogate :	Percent Recovery	Flags	Control Limits
Nitrobenzene-d5	54		23 - 120
2-Fluorobiphenyl	66		30 - 115
Terphenyl-d14	83		18 - 137

Date of Report: December 3, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

PAH's by EPA 8270C
MS/MSD QUALITY CONTROL

Date Extracted: 11-19-98
Date Analyzed: 11-20-98

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-030-15MS

Compound:	Spike Amount	MS	Percent Recovery		MSD	Percent Recovery		RPD
Phenol	3.30	2.13	64		2.14	65		0.37
2-Chlorophenol	3.30	2.39	72		2.37	72		0.8
1,4-Dichlorobenzene	1.65	1.19	72		1.12	68		5.8
N-Nitroso-di-n-propylamine	1.65	1.23	74		1.19	72		2.9
1,2,4-Trichlorobenzene	1.65	1.35	82		1.38	83		1.8
4-Chloro-3-methylphenol	3.30	3.25	98		3.53	107		8.4
Acenaphthene	1.65	1.51	92		1.62	98		6.6
2,4-Dinitrotoluene	1.65	0.23	14	**	0.19	12	**	18
4-Nitrophenol	3.30	1.15	35		1.44	43		22
Pentachlorophenol	3.30	2.76	83		3.02	92		9.2
Pyrene	1.65	1.50	91		1.63	98		7.8

** Compound recovery outside control limits.

Date of Report: December 3, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

EXTRACTABLE PETROLEUM HYDROCARBONS

Date Extracted: 11-24-98
Date Analyzed: 11-25-98

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-074-10
Client ID: CFIRST, S-1

		PQL
Aliphatic C10-C12:	8.8	5.7
Aliphatic C12-C16:	11	5.7
Aliphatic C16-C18:	ND	5.7
Aliphatic C18-C21:	12	5.7
Aliphatic C21-C28:	140	5.7
Aliphatic C28-C36:	270	5.7
Total Aliphatic:	440	
Aromatic C10-C12:	ND	5.7
Aromatic C12-C16:	ND	5.7
Aromatic C16-C18:	ND	5.7
Aromatic C18-C21:	9.4	5.7
Aromatic C21-C28:	99	5.7
Aromatic C28-C36:	220	5.7
Total Aromatic:	330	

Surrogate Recovery:		Control Limits
o-Terphenyl	84%	50%-150%

Flags:

Date of Report: December 3, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

EXTRACTABLE PETROLEUM HYDROCARBONS
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-24-98
Date Analyzed: 11-25-98

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1124S2

		PQL
Aliphatic C10-C12:	ND	5.0
Aliphatic C12-C16:	ND	5.0
Aliphatic C16-C18:	ND	5.0
Aliphatic C18-C21:	ND	5.0
Aliphatic C21-C28:	ND	5.0
Aliphatic C28-C36:	ND	5.0
Total Aliphatic:	NA	
Aromatic C10-C12:	ND	5.0
Aromatic C12-C16:	ND	5.0
Aromatic C16-C18:	ND	5.0
Aromatic C18-C21:	ND	5.0
Aromatic C21-C28:	ND	5.0
Aromatic C28-C36:	ND	5.0
Total Aromatic:	NA	

Surrogate Recovery:		Control Limits
o-Terphenyl	79%	50%-150%

Flags:

Date of Report: December 3, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

EXTRACTABLE PETROLEUM HYDROCARBONS
DUPLICATE QUALITY CONTROL

Date Extracted: 11-23-98
Date Analyzed: 11-25-98

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID:	11-030-09	11-030-09 DUP		
			PQL	RPD
Aliphatic C10-C12:	ND	ND	5.0	NA
Aliphatic C12-C16:	5.48	7.22	5.0	27
Aliphatic C16-C18:	6.41	8.47	5.0	28
Aliphatic C18-C21:	9.25	12.1	5.0	27
Aliphatic C21-C28:	153	195	5.0	24
Aliphatic C28-C36:	260	335	5.0	25
Aromatic C10-C12:	ND	ND	5.0	NA
Aromatic C12-C16:	ND	ND	5.0	NA
Aromatic C16-C18:	ND	ND	5.0	NA
Aromatic C18-C21:	ND	ND	5.0	NA
Aromatic C21-C28:	40.7	48.4	5.0	17
Aromatic C28-C36:	94.9	113	5.0	17
Surrogate Recovery:			Control Limits	
o-Terphenyl	73%	74%	50-150%	

Flags:

Date of Report: December 3, 1998
Samples Submitted: November 13, 1998
Lab Traveler: 11-074
Project: Ross Plaza

EXTRACTABLE PETROLEUM HYDROCARBONS
SPIKE BLANK QUALITY CONTROL

Date Extracted: 11-12-98
Date Analyzed: 11-23-98

Matrix: Soil
Units: mg/Kg (ppm)

Spike Level: 100 ppm

Lab ID: SB1112S1

		PQL
Aliphatic C10-C12:	ND	5.0
Aliphatic C12-C16:	19.4	5.0
Aliphatic C16-C18:	12.9	5.0
Aliphatic C18-C21:	9.59	5.0
Aliphatic C21-C28:	ND	5.0
Aliphatic C28-C36:	ND	5.0
Aromatic C10-C12:	ND	5.0
Aromatic C12-C16:	11.4	5.0
Aromatic C16-C18:	8.96	5.0
Aromatic C18-C21:	8.78	5.0
Aromatic C21-C28:	ND	5.0
Aromatic C28-C36:	ND	5.0
Percent Recovery:	71	
Surrogate Recovery:		Control Limits
o-Terphenyl	77%	50%-150%

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

A - Due to high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

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

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

D - Data from 1:____ dilution.

E - The value reported exceeds the quantitation range, and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeniety. The sample was re-extracted and re-analyzed with similar results.

M - Predominantly _____ range hydrocarbons present in the sample.

N - Hydrocarbons in the gasoline range (C7-toluene) are present in the sample.

O - Hydrocarbons in the heavy oil range (>C24) are present in the sample.

P - Hydrocarbons in the diesel range (C12-C24) are present in the sample which are elevating the oil result.

Q - The RPD of the results between the two columns is greater than 25.

R - Hydrocarbons outside the defined gasoline range are present in the sample; NWTPH-Dx recommended.

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

T - The sample chromatogram is not similar to a typical _____.

U - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

X - Sample underwent silica gel cleanup procedures.

Y - Sample underwent acid cleanup procedures.

Z - Interferences were present which prevented the quantitation of the analyte below the detection limit reported.

ND - Not Detected
MRL - Method Reporting Limit
PQL - Practical Quantitation