BASELINE ASSESSMENT REPORT
Station Number 11051
720 North Central Avenue
Kent, Washington

1. Site Features and History

The facility is an operating service station located on the northeast corner of North Central Avenue and East James Street in Kent, Washington. The service station facility consists of a station building containing a convenience store, a car wash, a canopy area with a concrete drive slab, and four pump islands. Two pump islands are located north of the station building, and two pump islands are located south of the station building. The car wash facility is located north of the pump islands along the northern property boundary. Existing USTs at the station include four 12,000-gallon fiberglass tanks installed in 1987. One tank contains super unleaded gasoline, one contains regular leaded gasoline, and two contain regular unleaded gasoline. The UST complex is located near the southeast corner of the site. During the EMCON site visit on November 9, 1993, the surficial concrete around the pump islands appeared slightly cracked. Patched asphalt was observed around the UST complex. A site plan (Figure A-1) is included with this report as Attachment A. Site photographs are included as Attachment B. Copies of figures and tabulated data from previous site investigations are included as Attachment C. Copies of figures, tabulated data, and laboratory reports from EMCON's supplemental site assessment work are included as Attachment D.

Information documenting when BP purchased the site from Exxon was not provided to EMCON. A former tank complex was located just west of the current UST complex (between the UST complex and the pump islands; Figure A-1). Information documenting the number of tanks in the former complex, their capacities, construction, age, contents, or dates of installation and removal, was not provided to EMCON. No information regarding the locations of former pump islands associated with the former tank complex was provided to EMCON.

The site is surrounded by an auto supply store (T.C.'s Offroad Service) to the north, an apartment complex to the east, East James Street to the south, and North Central Avenue to the west. An ARCO AM/PM retail gasoline station and convenience store occupies the northwest corner of East James Street and North Central Avenue, a Chevron station occupies the southwest corner, and Kent Junior High School occupies the southeast

corner. Ecology lists T C 's Offroad Service as a LUST site (Incident Number 2266), due to soil contamination found on site in May 1991. According to the notification of release form and the UST removal report (reference b), the source of the contamination at the auto supply store site was documented as a 2,000-gallon gasoline UST.

2. Previous Investigations and Remediation Activities

ELI conducted an environmental investigation at the site in May 1990 (reference a). ELI drilled three soil borings (B-1 through B-3) to an approximate depth of 16.5 feet bgs (Figure C-1). The soil types encountered consisted of gray, gravelly sand with varying amounts of silt from just below the asphalt surface to the maximum depth explored (16.5 feet bgs). Groundwater was encountered at approximately 6 feet bgs at the time of drilling. The borings were completed as groundwater monitoring wells (MW-1 through MW-3; Figure A-1). Soil samples were collected from each boring for laboratory analyses. BTEX (17.4 ppm benzene) was detected in the soil sample collected from boring B-3 (Table C-1). TRPH (up to 735 ppm) was detected in samples collected from all three borings.

ELI collected groundwater samples from monitoring wells MW-1 through MW-3 on May 16, 1990. Depth to water measurements taken from the monitoring wells before sample collection ranged from 5.77 feet below the top of casing in MW-2 to 6.05 feet below the top of casing in MW-1. ELI reported (reference a) that, in May 1990, the groundwater flow direction beneath the site was toward the southwest according to measured depth to groundwater data (Figure C-1). BTEX (up to 0.65 ppm benzene) was detected in samples collected from all three monitoring wells (Table C-1). TRPH (up to 9.4 ppm) was also detected in the groundwater sample collected from MW-3.

RZA collected groundwater samples from the on-site monitoring wells in June 1993 and February 1994 (reference c). The only groundwater monitoring report provided to EMCON was dated April 20, 1994, and summarized results of the February 25, 1994, groundwater sampling event (reference c). Depth to water measurements taken in February 1994 ranged from 5.91 feet below the top of casing in MW-2 to 6.32 feet below the top of casing in MW-3 According to RZA, the groundwater flow direction was toward the southwest (Figure C-2), consistent with previously measured data (Figure C-1). The historical groundwater data indicated that BTEX, TPH-G, and total lead have been detected in groundwater samples collected from all three monitoring wells (Table C-2). The highest concentrations of TPH-G (23,000 ppb) and BTEX (up to 4,400 ppb benzene) have been detected in samples collected from monitoring well MW-3, and the benzene and TPH-G concentrations have been increasing from 1990 to 1994 (Tables C-1 and C-2).

3. Regulatory Status and Other Issues

EMCON reviewed available records at Ecology on November 15, 1993. The site has not been assigned an Ecology LUST incident number. The only documentation on file pertained to the new notifiers and notification of dangerous waste activities form. There was no information on file regarding current or former on-site USTs.

ELI performed a site reconnaissance as a part of their environmental investigation (reference a). ELI reported that the Green River was located approximately 1 mile southwest of the site. According to ELI, a stream was located approximately 500 feet east of the site. No basements or public water supply wells were located within 1,000 feet of the site. ELI did not provide any aquifer information in their survey.

4. Supplemental Site Assessment Work

EMCON was on site to collect soil samples in conjunction with Stage II vapor recovery system upgrade activities on March 16, 1994. The soil overlying the four gasoline USTs and the product piping was uncovered during system upgrade activities. The limits of the excavations are shown on Figure D-1. EMCON collected soil samples from the product line trenches and at the UST complex at depths ranging from 0.5 to 1 foot bgs. Hydrocarbon vapors ranging from 0.6 to 31 ppm were detected using a PID in soils exposed in the product line trenches and UST complex. Three of the product line/UST complex samples submitted to the laboratory (NED-1.0, CND-1.0, and NWT-0.5; Figure D-1) were analyzed. Five soil samples (SS-A, SS-B, SS-C, SS-D, and SS-E) collected from the stockpiles generated during Stage II activities were submitted for analyses. TPH-G (up to 61 ppm), TPH-D (up to 541 ppm), and TPH-O (up to 120 ppm) were detected in samples NED-1.0, CND-1.0, and NWT-0.5 (Table D-1). One or more BTEX constituents (0.07 ppm benzene and 0.3 ppm xylenes) were detected in samples CND-1.0 and NWT-0.5. TPH-D (up to 48 ppm) and TPH-O (up to 200 ppm) were detected in all five soil stockpile samples analyzed. TPH-G (2 ppm) was detected in soil stockpile sample SS-B. Xylenes (0.1 ppm) were detected in soil stockpile samples SS-B and SS-D.

EMCON collected a groundwater sample from observation well OW-1, located at the northwest corner of the UST complex, on April 11, 1994 (Figure D-1). Observation well OW-2 was found to be damaged at the time of sampling, and a sample was not collected from the well. The depth to groundwater measured in well OW-1 was 6.5 feet below the top of casing. BTEX (benzene at 59 ppb), TPH-G (16 ppb), TPH-D (310 ppb), and TPH-O (460 ppb) were detected in the groundwater sample collected from OW-1 (Table D-1) Copies of the soil and groundwater laboratory reports are included in Attachment D.

5. Baseline Summary

Based on our review of the most recent relevant data available in existing files, observations made during site visits, and data collected during the environmental investigations performed in accordance with the BP/Tosco purchase agreement, hazardous substance contamination is present in the soil and groundwater at this site. Our review has also determined evidence of contamination and sources of contamination which could result in the presence of hazardous substance contamination which has not yet been detected.

Although the complete extent of contamination is not known at this time, there is sufficient evidence to demonstrate that the site was contaminated before the time of Tosco's purchase. Areas at the site for which evidence of contamination exists include the current and former UST complexes, beneath and to the west of the pump islands, and the product line areas.

Soil samples collected from borings B-1 through B-3, and from product line trenches during Stage II sampling (NED-1.0, CND-1.0, and NWT-0.5), contained one or more of the following constituents at concentrations above the method detection limits: BTEX, TPH-G, TPH-D, TPH-O, and TRPH.

Groundwater samples collected from monitoring wells MW-1 through MW-3 and observation well OW-1 contained one or more of the following constituents at concentrations above the method detection limits: BTEX, TPH-G, TPH-D, TPH-O, and TRPH. Total lead was detected at concentrations above the method detection limit in groundwater samples collected from wells MW-1 through MW-3

The extent of evidence of actual contamination levels present and the evidence of sources of contamination includes:

- Soil and groundwater data as summarized earlier in this report and detailed in existing files
- Field PID readings from soil exposed beneath the dispensers during Stage II work
- High benzene concentrations and increasing TPH values in groundwater samples collected between 1990 and 1994

In conclusion, existing and developed evidence establishes a contamination baseline consisting of the measured presence of hazardous substance contamination in soil and

groundwater and evidence of historic sources of hazardous substances. This report establishes a contamination baseline consisting of:

1 Known areas of contamination from measured or observed direct evidence, and

2. On-site or off-site areas of contamination which have not yet been detected but which are associated with or are consistent with evidence of existing areas of contamination and historic releases of hazardous substances.

References Cited in Report

a ELI. June 8, 1990. *Draft Report, Phase I Environmental Investigation at BP Oil Company Service Station No 11051, 720 North Central Avenue, Kent, Washington, ELI Job No. 90020-1.*

b RZA. July 18, 1991. *Underground Storage Tank Removal Report, 730 Central Avenue North, Kent, Washington.* (Refers to T.C.'s Off-Road site.)

c RZA. April 20, 1994. *Groundwater Monitoring Report, February 1994 Sampling Event, BP Service Station No. 11051, 720 North Central Avenue, Kent, Washington.*

Other Documents Reviewed

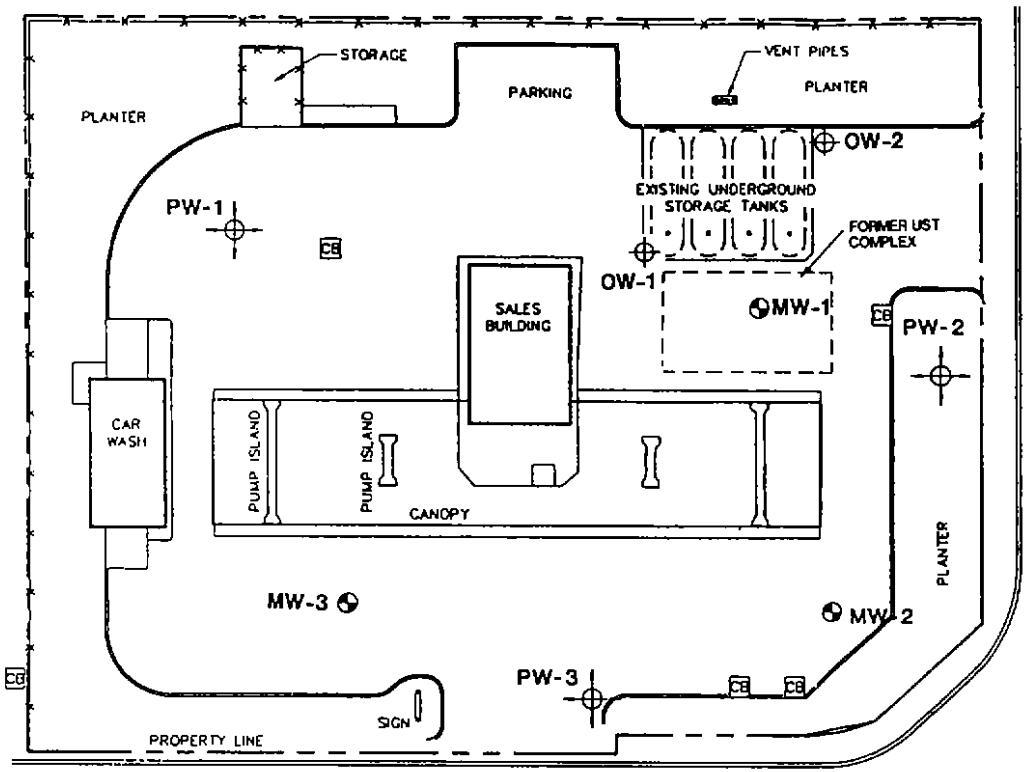
B & C Equipment. January 27, 1989. *Data Chart for Tank System Tightness Test.* (Refers to the 12,000-gallon regular leaded gasoline tank.)

B & C Equipment. January 27, 1989. *Data Chart for Tank System Tightness Test.* (Refers to the two 12,000-gallon regular unleaded gasoline tanks.)

B & C Equipment. January 27, 1989. *Data Chart for Tank System Tightness Test.* (Refers to the 12,000-gallon super unleaded gasoline tank.)

ATTACHMENT A

SITE PLAN



LEGEND

- CB — CATCH BASIN
- MW-3 — EXISTING MONITORING WELL NUMBER AND LOCATION (PREVIOUS STUDY BY ENVIRO-LOGIC INC.)
- PW-3 — PROPOSED MONITORING WELL NUMBER AND APPROXIMATE LOCATION
- OW-1 — EXISTING OBSERVATION WELL

N

0 30 60

SCALE (ft)

SOURCE. RZA AGRA INC AUGUST 19 1993
Engineering & Environmental Services

EMCON Northwest Inc

DATE 4 94
DWN MLP
APPR
REVIS
PROJECT NO 0328 054 03

Figure A 1
TOSCO #11051
720 NORTH CENTRAL AVENUE
KENT WASHINGTON
SITE PLAN

ATTACHMENT B

SITE PHOTOGRAPHS

142322

PUMP ISLANDS AND STATION BUILDING

TANK COMPLEX

EMCON Northwest Inc

DATE 4-94
DWN MLP
APPR
REVIS
PROJECT NO.
0328-054.03

Figure B-1
TOSCO #11051
720 NORTH CENTRAL AVENUE
KENT, WASHINGTON
SITE PHOTOGRAPHS

142322

STAGE II EXCAVATION
SOUTH DISPENSER AND TRENCH
TO TANK COMPLEX

STAGE II EXCAVATION
TANK COMPLEX, EXCAVATION LOOKING NORTHWEST

EMCON
Northwest Inc

DATE 4-94
DWN MLP
APPR
REVIS
PROJECT NO
0328 054 03

Figure B 2
TOSCO #11051
720 NORTH CENTRAL AVENUE
KENT, WASHINGTON
SITE PHOTOGRAPHS

142322

STAGE II EXCAVATION
NORTH - SOUTH TRENCH LOOKING NORTH

STAGE II EXCAVATION
WEST TRENCH LOOKING NORTH

EMCON
Northwest, Inc

DATE 4-94
DWN MLP
APPR
REVIS
PROJECT NO
0328 054 03

Figure B 3
TOSCO #11051
720 NORTH CENTRAL AVENUE
KENT, WASHINGTON
SITE PHOTOGRAPHS

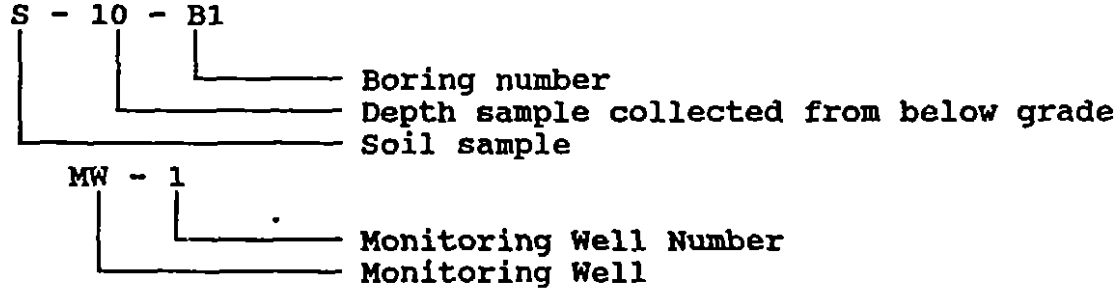
ATTACHMENT C

SUMMARY TABLES AND FIGURES FROM PREVIOUS INVESTIGATIONS

TABLE 3
RESULTS OF CHEMICAL ANALYSES ON SOIL AND WATER SAMPLES
for TPH and BETX
BP Oil Company Service Station No. 11051
Kent, Washington
May 16, 1990

Sample No.	TPH	B	E	T	X
Soil Samples:					
S-5-B1	39	<0.005	<0.005	<0.005	<0.005
S-5-B2	735	<0.005	<0.005	<0.005	<0.005
S-5-B3	84	17.400	7.200	36.200	37.700
Water Samples:					
MW-1	<1.000	0.067	0.007	<0.001	0.064
MW-2	<1.000	0.167	0.005	0.013	0.040
MW-3	9.400	0.650	0.055	0.877	2.060

Results are presented in parts per million (ppm)
TPH: Total petroleum hydrocarbons
B: Benzene; E: Ethylbenzene; T: Toluene; X: Total xylene isomers
<: Results less than detection limit for method used
SAMPLE DESIGNATION:



Source: ELI, June 8, 1990

TABLE C-1

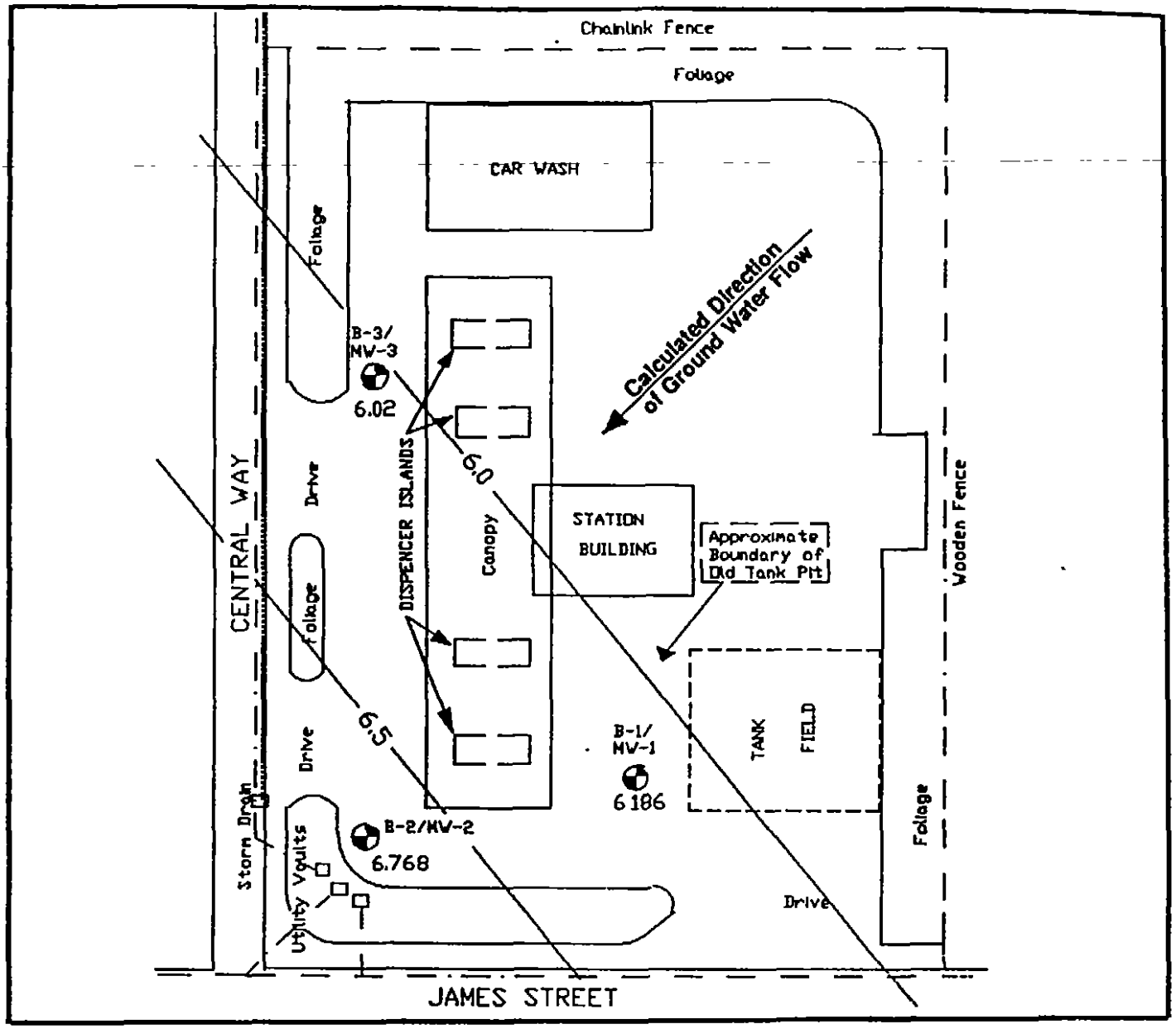
Table 2: Summary of Analytical Results: Groundwater
BP Service Station No. 11051
720 North Central Avenue
Kent, Washington
RZA AGRA, Inc. Project No. 11-09410-03

Well Number	Date Collected	WTPH-G (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	Total Xylenes (ppb)	Total Lead (ppb)	Dissolved Lead (ppb)	Turbidity (NTU)
MW-1	09-Jun-93	110	9.6	0.5	<0.5	2.7	NT	NT	NT
	25-Feb-94	<100	<0.5	0.7	<0.5	1.8	7.8	<3	350
MW-2	09-Jun-93	1,100	220	3.7	24	76	NT	NT	NT
	25-Feb-94	750	780	9.1	63	170	6.8	<3	280
MW-3	09-Jun-93	13,000	1,300	1,000	210	2,000	NT	NT	NT
	25-Feb-94	23,000	4,400	3,200	540	2,700	4.5	<3	110

Notes:

WTPH-G = total petroleum hydrocarbons - gasoline, by Ecology Method WTPH-G.
Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX) were analyzed by EPA Method 8020.
Total and dissolved lead by EPA Method 7421.
NT = Not tested.
All concentrations are expressed in parts per billion (ppb).
Concentrations preceded by a "<" are laboratory method detection limits The method detection limit may vary depending on the laboratory used and sample characteristics.

Source: RZA, April 20, 1994



APPROXIMATE SCALE: 1 inch = 45 feet

SOURCE: Tape and Compass

LEGEND

6.02 — **Boreholes/Monitoring Wells**

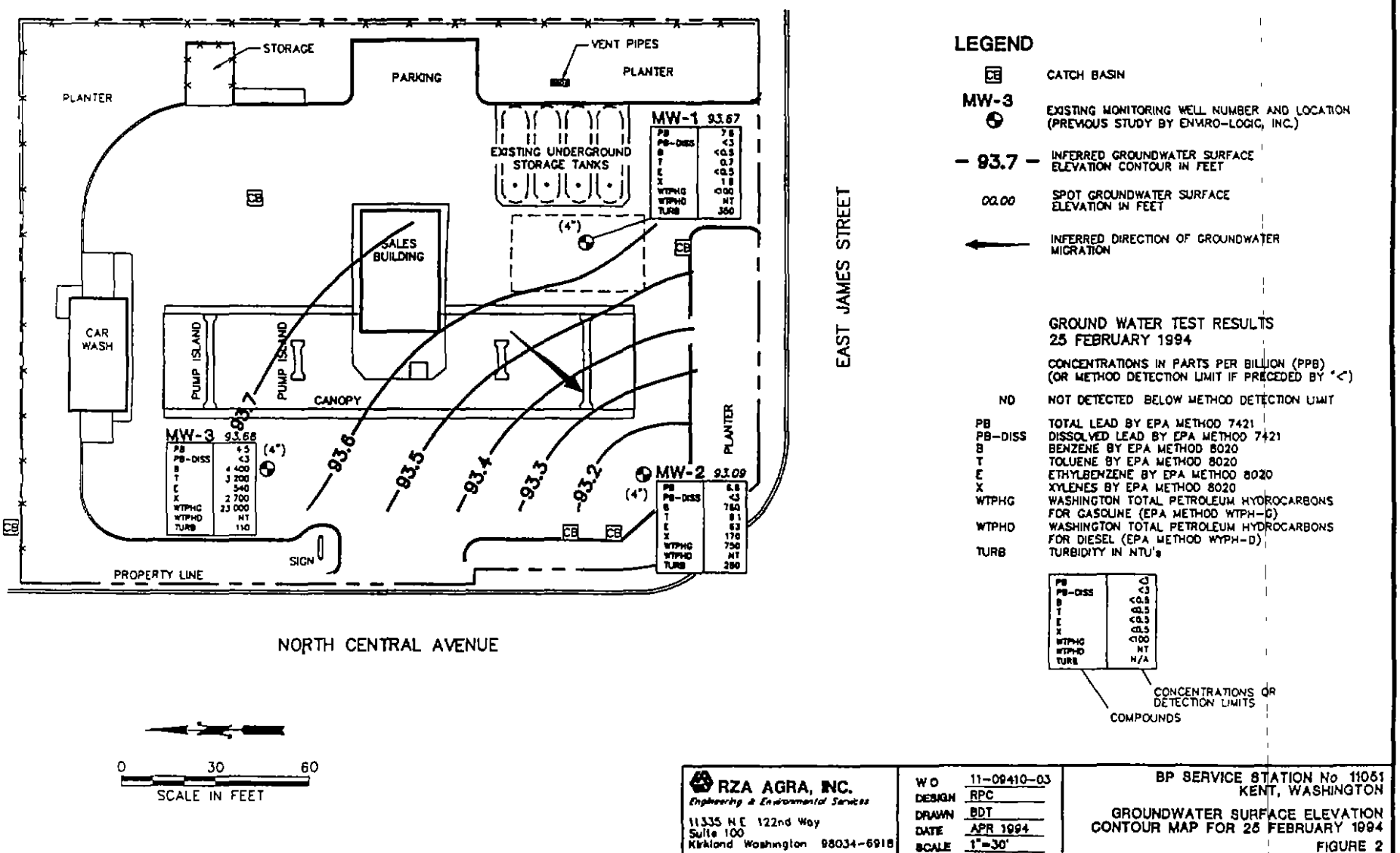
6.0 — **Interpreted line of equal depth to ground water**

N

ENVIRO·LOGIC, Inc. ENVIRONMENTAL AND GEOLOGIC CONSULTANTS	PIEZOMETRIC SURFACE MAP BP Oil Company Service Station No. 11051 720 North Central Avenue Kent, Washington	PLATE P-8
PROJECT NO. 90020-1		

Source: ELI, June 8, 1990

FIGURE C-1



Source: RZA, April 20, 1994

FIGURE C-2

ATTACHMENT D

EMCON SUPPLEMENTAL ASSESSMENT INFORMATION

Table D-1

Tosco Station #11051
720 North Central Avenue, Kent, Washington

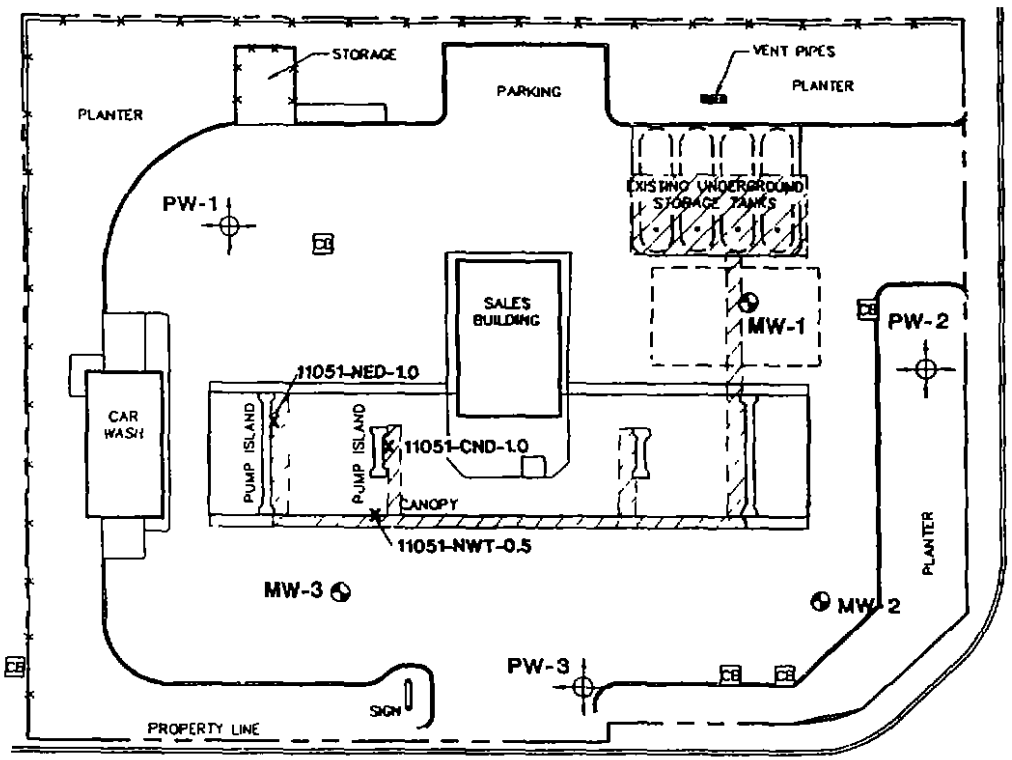
Soil Sample Results of Analyses (ppm)

Sample Number	Depth (feet)	Date Collected	Ecology Method WTPH-G	Ecology Method WTPH-D (extended)		EPA Method 5030/8020			
			TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes
11051-CND-1 0	1	03/16/94	11	85	120	*nd*	*nd*	*nd*	0 3
11051-NED-1 0	1	03/16/94	61	541	98	*nd*	*nd*	*nd*	*nd*
11051-NWT-0.5	0 5	03/16/94	9	21	54	0.07	*nd*	*nd*	0.3
11051-SSA	—	03/16/94	*nd*	23	66	*nd*	*nd*	*nd*	*nd*
11051-SSB	—	03/16/94	2	21	98	*nd*	*nd*	*nd*	0 1
11051-SSC	—	03/16/94	*nd*	48	200	*nd*	*nd*	*nd*	*nd*
11051-SSD	—	03/16/94	*nd*	19	90	*nd*	*nd*	*nd*	0 1
11051-SSE	—	03/16/94	*nd*	9	30	*nd*	*nd*	*nd*	*nd*

Groundwater Sample Results of Analyses (ppb)

Sample Number	Depth to Water (feet)	Date Sampled	Ecology Method WTPH-G	Ecology Method WTPH-D (extended)		EPA Method 5030/8020			
			TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes
11051-OBW-WS	6 5	04/11/94	16	310	460	59	2 3	*nd*	3 3

NOTE TPH-G = Total petroleum hydrocarbons as gasoline
TPH-D = Total petroleum hydrocarbons as diesel
TPH-O = Total petroleum hydrocarbons as oil
nd = Not detected at or above method reporting limit



NORTH CENTRAL AVENUE

EAST JAMES STREET

LEGEND

- CB — CATCH BASIN
- MW-3 — EXISTING MONITORING WELL NUMBER AND LOCATION (PREVIOUS STUDY BY ENVIRO-LOGIC, INC.)
- PW-3 — PROPOSED MONITORING WELL NUMBER AND APPROXIMATE LOCATION
- 11051-NED-1.0 — TOSCO SOIL SAMPLE LOCATION
- APPROXIMATE LIMIT OF EXCAVATION

N

0 30 60

SCALE (ft)

SOURCE RZA AGRA INC AUGUST 19 1993
Engineering & Environmental Services

emcon Northwest Inc

DATE 4-94
DWN MLP
APPR
REVIS
PROJECT NO 0328 054 03

Figure D-1
TOSCO #11051
720 NORTH CENTRAL AVENUE
KENT WASHINGTON
SITE PLAN SHOWING STAGE II LIMIT OF EXCAVATION

Columbia Analytical Services inc

March 28, 1994 Service Request No B940172

Mike Noll
EMCON Northwest
18912 N Creek Parkway
Suite 210
Bothell, WA 98011

Re: **TOSCO #11051/Project #0328-054.02**

Dear Mike:

Attached are the results of the sample(s) submitted to our laboratory on March 17, 1994. For your reference, these analyses have been assigned our service request number B940172.

All analyses were performed consistent with our laboratory's quality assurance program All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results only apply to samples analyzed.

Please call if you have any questions

Respectfully submitted,

Columbia Analytical Services, Inc.

Colin B. Elliott
Laboratory Manager

CBE/bdr

18912 North Creek Parkway, Suite 110 • Bothell, WA 98011 • 206/ 36 [illegible]

COLUMBIA ANALYTICAL SERVICES, INC

Analytical Report

Client	EMCON Northwest	Date Collected	03/16/94
Project	TOSCO #11051	Date Received	03/17/94
Sample Matrix.	Soil	Date Extracted	03/18/94
		Work Order No	B940172

BTEX and TPH as Gasoline
EPA Methods 5030/8020
Washington DOE Method WTPH-G Modified
mg/Kg (ppm)
Dry Weight Basis

Sample Name		11051-NED-1 0	11051-CND-1.0	11051-NWT-0.5
Lab Code		B0172-2	B0172-3	B0172-7
Date Analyzed.		03/21/94	03/21/94	03/22/94
Analyte	**MRL**			
Benzene	0 05	ND	ND	0 07
Toluene	0 1	ND	ND	ND
Ethylbenzene	0 1	ND	ND	ND
Total Xylenes	0 1	ND	0 3	0 3
TPH as Gasoline	1	61	11	9

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Chris Elliott Date 3/28/94

COLUMBIA ANALYTICAL SERVICES, INC

Analytical Report

Client	EMCON Northwest	**Date Collected**	03/16/94
Project.	TOSCO #11051	**Date Received**	03/17/94
Sample Matrix.	Soil	**Date Extracted**	03/18/94
		Work Order No	B940172

BTEX and TPH as Gasoline
EPA Methods 5030/8020
Washington DOE Method WTPH-G Modified
mg/Kg (ppm)
Dry Weight Basis

Sample Name		11051-SSA	11051-SSC	11051-SSB
Lab Code		B0172-8	B0172-9	B0172-10
Date Analyzed		03/21/94	03/21/94	03/26/94
Analyte	**MRL**			
Benzene	0 05	ND	ND	ND
Toluene	0 1	ND	ND	ND
Ethylbenzene	0 1	ND	ND	ND
Total Xylenes	0 1	ND	ND	0 1
TPH as Gasoline	1	ND	ND	2

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Ann. Ellis Date 3/28/94

COLUMBIA ANALYTICAL SERVICES INC

Analytical Report

Client	EMCON Northwest	Date Collected	03/16/94
Project:	TOSCO #11051	Date Received	03/17/94
Sample Matrix:	Soil	Date Extracted	03/21/94
		Work Order No	B940172

BTEX and TPH as Gasoline
EPA Methods 5030/8020
Washington DOE Method WTPH-G Modified
mg/Kg (ppm)
Dry Weight Basis

Sample Name		11051-SSD	11051-SSE	Method Blank
Lab Code.		B0172-11	B0172-12	B0172-MB
Date Analyzed		03/21/94	03/22/94	03/22/94
Analyte	**MRL**			
Benzene	0 05	ND	ND	ND
Toluene	0 1	ND	ND	ND
Ethylbenzene	0 1	ND	ND	ND
Total Xylenes	0 1	0 1	ND	ND
TPH as Gasoline	1	ND	ND	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Colin Elliott Date 3/28/94

COLUMBIA ANALYTICAL SERVICES, INC

Analytical Report

Client	EMCON Northwest	Date Collected	03/16/94
Project	TOSCO #11051	Date Received	03/17/94
Sample Matrix	Soil	Date Extracted	03/22/94
		Date Analyzed	03/24,25/94
		Work Order No ·	B940172

Total Petroleum Hydrocarbons as Diesel and Oil
Washington DOE Method WTPH-D
mg/Kg (ppm)
Dry Weight Basis

		Diesel		Oil*	
Sample Name	Lab Code	MRL	Result	MRL	Result
11051-NED-1 0	B0172-2	25	[a]541	100	[b]98
11051-CND-1 0	B0172-3	25	[a]85	100	120
11051-NWT-0 5	B0172-7	25	[a b]21	100	[b]54
11051-SSA	B0172-8	25	[a b]23	100	[b]66
11051-SSC	B0172-9	25	[a,b]48	100	200
11051-SSB	B0172-10	25	[a b]21	100	[b]98
11051-SSD	B0172-11	25	[a b]19	100	[b]90
11051-SSE	B0172-12	25	[a b]9	100	[b]30
Method Blank	B0172-MB	25	ND	100	ND

* Quantified using 30-weight motor oil as a standard
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
[a] Quantified as diesel The sample contained components that eluted in the diesel range, but the chromatogram did not match the typical diesel fingerprint
[b] Estimated concentration The value is less than the method reporting limit, but greater than the method detection limit

Approved by C. Elliott Date 3/28/94

COLUMBIA ANALYTICAL SERVICES, INC

QA/QC Report

Client	EMCON Northwest	Date Collected	03/16/94
Project	TOSCO #11051	Date Received	03/17/94
Sample Matrix	Soil	Date Extracted	03/18/94
		Date Analyzed.	03/21,22/94
		Work Order No	B940172

Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020
Washington DOE Method WTPH-G Modified

Sample Name	Lab Code	Spike Level (mg/Kg)	Percent Recovery 4-Bromofluorobenzene
11051-NED-1 0	B0172-2	8 8	73
11051-CND-1.0	B0172-3	8.8	76
11051-NWT-0 5	B0172-7	8 8	78
11051-SSA	B0172-8	8 8	102
11051-SSC	B0172-9	8 8	79
11051-SSB	B0172-10	8 8	*90
11051-SSD	B0172-11	8 8	75
11051-SSE	B0172-12	8 8	91
Method Blank	B0172-MB	8 8	91
	CAS Acceptance Criteria		73-116

TPH Total Petroleum Hydrocarbons
* Result is from an analysis performed on March 26, 1994

Approved by Chris Elliot Date 3/28/94

COLUMBIA ANALYTICAL SERVICES, INC

QA/QC Report

Client	EMCON Northwest	**Date Extracted**	03/18/94
Project	TOSCO #11051	**Date Analyzed**	03/22/94
LCS Matrix	Soil	**Work Order No**	B940172

Laboratory Control Sample Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/Washington DOE Method WTPH-G
mg/Kg (ppm)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	1.00	0.88	88	23-170
Toluene	1.00	0 92	92	31-166
Ethylbenzene	1 00	0.86	86	30-164
TPH as Gasoline	50	52	104	70-140

TPH Total Petroleum Hydrocarbons

Approved by Ken. Elliott Date 3/28/94

COLUMBIA ANALYTICAL SERVICES, INC

QA/QC Report

Client	EMCON Northwest	Date Collected	03/16/94
Project	TOSCO #11051	Date Received	03/17/94
Sample Matrix.	Soil	Date Extracted	03/22/94
		Date Analyzed.	03/24,25/94
		Work Order No.	B940172

Surrogate Recovery Summary
Total Petroleum Hydrocarbons as Diesel and Oil
Washington DOE Method WTPH-D

Sample Name	Lab Code	Percent Recovery *p*-Terphenyl
11051-NED-1 0	B0172-2	100
11051-NED-1.0	B0172-2Dup	94
11051-CND-1 0	B0172-3	103
11051-NWT-0.5	B0172-7	95
11051-SSA	B0172-8	101
11051-SSC	B0172-9	95
11051-SSB	B0172-10	99
11051-SSD	B0172-11	94
11051-SSD	B0172-11MS	96
11051-SSE	B0172-12	94
Method Blank	B0172-MB	97
Laboratory Control Sample	B0172-LCS	101
	CAS Acceptance Criteria	50-114

Approved by Ann Elliott Date 3/28/94

EMCON Northwest, Inc.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REPORT FORM

DATE 3/16/94 PAGE 1 OF 2

PROJECT NAME TOSCO 11051 # 0328 054.02

PROJECT Attn Mike Noll

COMPANY/ADDRESS

PHONE 485-5000

SAMPLERS SIGNATURE

SAMPLE ID	DATE	TIME	LAB ID	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSIS REQUEST: PETROLEUM HCS — TPH - HCID State	TPH - G BTEX State	TPH - Oil State	TPH - 418.1 State	TPH - Other	Halogenated or Aromatic Volatiles 601/8010 602/8020	Volatile Organics GC/MS 624-8240	Base/Neu/Acid Organics GC/MS 625/8270	Pesticides/PCBS 8080 PCB ONLY	PAH 8100 GC 8310 HPCL	TCLP Metals	Semi VOA VOA	Metals Total List Below	DISS	Cyanide	ORGANIC METALS/INORGANICS — pH, Cond Cl, SO_4, PO_4 F, Br NO_2 NO_3 (Circle)	NH_3 N COD, Total-P TKN, TOC TOX (Circle)	HOLD	REMARKS
11051-NWO-1.0	3/16/94	1020	172-1	Soil	1																		+	
11051-NEO-1.0		1025	-2				X	X																
11051-CNO-1.0		1030	-3				X	X																
11051-SWO-2.0		1040	-4																				+	
11051-SEO-2.0		1045	-5																				+	
11051-CSO-1.0		1035	-6																				+	
11051-NWT-0.5		1130	-7				X	X																
11051-SSA		1155	-8				X	X																
11051-SSC		1200	-9				X	X																
11051-SSB		1115	-10		2		X	X																

RELINQUISHED BY

Signature

Printed Name TANYA P. TREAT

Firm EMCON NW Inc

Date/Time 3/17/94 1220

RECEIVED BY

Signature

Printed Name Colin Elliott

Firm CAS

Date/Time 3/17/94 1220

TURNAROUND REQUIREMENTS

___ 24 hr ___ 48 hr X 5 day

~~Standard (10-15 working days)~~

___ Provide Verbal Preliminary Results

X Provide FAX preliminary Results

Requested Report Date

REPORT REQUIREMENTS

___ I Routine Report

___ II Report (includes DUP.MAS MSD, as required, may be charged as samples)

___ III Data Validation Report (includes All Raw Data)

___ IV CLP Deliverable Report

INVOICE INFORMATION

P.O.#

Bill To

SAMPLE RECEIPT

Shipping VIA

Shipping to

Condition

Lab No B04-172

RELINQUISHED BY:

Signature

Printed Name

Firm

Date/Time

RECEIVED BY:

Signature

Printed Name

Firm

Date/Time

SPECIAL INSTRUCTIONS/COMMENTS

EMCON Northwest, Inc

CHAIN OF CUSTODY/LABORATORY ANALYSIS REPORT FORM

DATE 3/16/94 PAGE 2 OF 2

PROJECT NAME TOSCO 11051 # 0328.054.02

PROJECT Attn Mike Noll

COMPANY/ADDRESS

PHONE 285-5000

SAMPLERS SIGNATURE

SAMPLE ID	DATE	TIME	LAB ID	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSIS REQUEST: PETROLEUM HCS: TPH - HCID State	TPH - G State	TPH - D State	TPH - 418.1 State	TPH - Other	ORGANIC: Halogenated or Aromatic Volatiles 601/8010 / 602/8020	Volatile Organics GC/MS 624-8240	Base/Neu/Acid Organics GC/MS 625/8270	Pesticides/PCBS 8080 PCB ONLY	PAH 8310 HPCL	TCLP Metals	Semi VOA	VOA	Pest/Herb	Metals Total / DISS List Below	Cyanide	ORGANIC METALS/INORGANICS: pH Cond Cl SO_4 PO_4 F Br NO_2 NO_3 (Circle)	NH_3 N COD Total-P TKN, TOC TOX (Circle)	REMARKS
							BTEX X	Oil Extended																
11051-SSD	3/16/94	1120	172-11	Soil	2		X	X																
11051-SSE	1	1125	-12-1		2		X	X																

RELINQUISHED BY

Signature

Printed Name TANYA D. TRGAT

Firm EMCON NW

Date/Time 3/17/94 1220

RECEIVED BY

Signature

Printed Name Colin Elliott

Firm CAS

Date/Time 3/17/94 12:20

TURNAROUND REQUIREMENTS

___ 24 hr ___ 48 hr ___ 5 day

X Standard (10-15 working days)

___ Provide Verbal Preliminary Results

X Provide FAX preliminary Results

Requested Report Date

REPORT REQUIREMENTS

___ I Routine Report

___ II Report (includes DUP MAS MSD, as required, may be charged as samples)

___ III. Data Validation Report (includes All Raw Data)

___ IV CLP Deliverable Report

INVOICE INFORMATION

P.O.#

Bill To

SAMPLE RECEIPT

Shipping VIA

Shipping to

Condition

Lab No 9404-172

RELINQUISHED BY

Signature

Printed Name

Firm

Date/Time

RECEIVED BY.

Signature

Printed Name

Firm

Date/Time

SPECIAL INSTRUCTIONS/COMMENTS

NORTH CREEK ANALYTICAL

18939 120th Avenue N E Suite 101 • Bo ..il WA 98011 9508 (206) 481 9200 • FAX 485 2992
East 11115 Montgomery Suite B • Spokane WA 99206-4779 (509) 924 9200 • FAX 924 9290
15055 S W Sequoia Parkway Suite 110 • Portland OR 97224 7155 (503) 624 9800 • FAX 684-3782

EMCON Northwest	Client Project ID:	TOSCO #11051, #0328-054 02	Sampled	Apr 11, 1994
18912 N Creek Parkway, #100	Sample Matrix	Water	Received	Apr 11, 1994
Bothell, WA 98011	Analysis Method:	WTPH-G	Analyzed:	Apr 13, 1994
Attention: Mike Noll	First Sample #:	404-0477	Reported:	Apr 15, 1994

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result µg/L (ppb)	Surrogate Recovery %
404-0477	#11051-OBW-WS	16	83
BLK041394	Method Blank	N.D.	74

Reporting Limit:	10

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton for
Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N E Suite 101 • Bothell WA 98011 9508 (206) 481-9200 • FAX 485 2992
East 11115 Montgomery Suite B • Spokane WA 99206 4779 (509) 924 9200 • FAX 924-9290
15055 S W Sequoia Parkway Suite 110 • Portland OR 97224 7155 (503) 624-9800 • FAX 684 3782

EMCON Northwest	Client Project ID: TOSCO #11051, #0328-054 02	Analyst	R. Lister
18912 N. Creek Parkway, #100	Sample Matrix: Water		F Shino
Bothell, WA 98011	Analysis Method: WTPH-G		
Attention Mike Noll	Units. µg/L (ppb)	Analyzed:	Apr 13, 1994
		Reported:	Apr 15, 1994

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline

Spike Conc. Added:	100
Spike Result:	101
% Recovery:	101
Upper Control Limit %:	123
Lower Control Limit %:	77

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Organics

Sample Number:	404-0477
Original Result:	16
Duplicate Result:	16
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit
Maximum RPD:	25

NORTH CREEK ANALYTICAL Inc.

Matthew T Essig
Project Manager

% Recovery:	Spike Result / Spike Concentration Added	x 100
Relative % Difference	Original Result - Duplicate Result / (Original Result + Duplicate Result) / 2	x 100

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E. Suite 101 • Bothell WA 98011-9508 (206) 481 9200 • FAX 485 2992
East 11115 Montgomery Suite B • Spokane WA 99206 4779 (509) 924 9200 • FAX 924 9290
15055 S.W. Sequoia Parkway Suite 110 • Portland OR 97224 7155 (503) 624 9800 • FAX 684-3782

EMCON Northwest	Client Project ID	TOSCO #11051, #0328-054.02	Sampled:	Apr 11, 1994
18912 N. Creek Parkway, #100	Sample Matrix:	Water	Received	Apr 11, 1994
Bothell, WA 98011	Analysis Method:	EPA 8020	Analyzed:	Apr 13, 1994
Attention: Mike Noll	First Sample #:	404-0477	Reported:	Apr 15, 1994

BTEX DISTINCTION

Sample Number	Sample Description	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
404-0477	#11051-OBW-WS	59	2.3	N.D.	3.3	77
BLK041394	Method Blank	N.D.	N.D.	N.D.	N.D.	74, S-3

Reporting Limits:	0.20	0.20	0.20	0.40	

4-Bromofluorobenzene surrogate recovery control limits are 75 - 124 %
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton for
Matthew T. Essig
Project Manager

Please Note:
S-3 = The Surrogate Recovery for the Method Blank is outside of NCA established control limits.

NORTH CREEK ANALYTICAL

18939 120th Avenue N E Suite 101 • Bothell WA 98011 9508 (206) 481 9200 • FAX 485 2992
East 11115 Montgomery Suite B • Spokane WA 99206-4779 (509) 924 9200 • FAX 924 9290
15055 S W Sequoia Parkway Suite 110 • Portland OR 97224 7155 (503) 624 9800 • FAX 684-3782

EMCON Northwest	Client Project ID: TOSCO #11051, #0328-054.02	Analyst	R Lister
18912 N Creek Parkway, #100	Sample Matrix: Water		F. Shino
Bothell, WA 98011	Analysis Method: EPA 8020		
Attention. Mike Noll	Units: µg/L (ppb)	Analyzed:	Apr 13, 1994
	QC Sample #. 404-0497	Reported:	Apr 15, 1994

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	N D.	N.D.	N.D	N.D.
Spike Conc. Added:	10.0	10.0	10.0	30.0
Spike Result:	10.0	9 1	9 4	27.5
Spike % Recovery:	100%	91%	94%	92%
Spike Dup. Result:	10 0	9 2	9.4	27 8
Spike Duplicate % Recovery:	100%	92%	94%	93%
Upper Control Limit %:	125	112	116	116
Lower Control Limit %:	92	87	87	83
Relative % Difference:	0.0%	1.1%	0.0%	1 1%
Maximum RPD:	10	10	11	12

RTH CREEK ANALYTICAL Inc.

Laura Dutton for

Matthew T. Essig
Project Manager

% Recovery	Spike Result - Sample Result / Spike Conc Added	x 100
Relative % Difference	Spike Result - Spike Dup Result / (Spike Result + Spike Dup Result) / 2	x 100

NORTH CREEK ANALYTICAL

18939 120th Avenue N E Suite 101 • Bothell WA 98011 9508 (206) 481-9200 • FAX 485 2992
East 11115 Montgomery Suite B • Spokane WA 99206 4779 (509) 924 9200 • FAX 924-9290
15055 S W Sequoia Parkway Suite 110 • Portland OR 97224-7155 (503) 624 9800 • FAX 684-378

EMCON Northwest	Client Project ID	TOSCO #11051, #0328-054 02	Sampled:	Apr 11, 1994
18912 N. Creek Parkway, #100	Sample Matrix	Water	Received.	Apr 11, 1994
Bothell, WA 98011	Analysis Method	WTPH-D Extended	Extracted:	Apr 13, 1994
Attention: Mike Noll	First Sample #.	404-0477	Analyzed:	Apr 14-15, 1994
			Reported	Apr 15, 1994

TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE EXTENDED

Sample Number	Sample Description	Diesel Result µg/L (ppb)	Heavy Oil Result µg/L (ppb)	Surrogate Recovery %
404-0477	#11051-OBW-WS	310	460	93
BLK041394	Method Blank	N.D.	N.D.	82

Reporting Limit:	0.050	0.50

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150%.
Extractable Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24) and Heavy Oil Range Organics (>C24)
Analytes reported as N D were not detected above the stated Reporting Limit

NORTH CREEK ANALYTICAL Inc.

Matthew T Essig
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N E Suite 101 • Bothell WA 98011-9508 (206) 481 9200 • FAX 485 2992
East 11115 Montgomery Suite B • Spokane WA 99206 4779 (509) 924-9200 • FAX 924 9290
15055 S W Sequoia Parkway Suite 110 • Portland OR 97224-7155 (503) 624 9800 • FAX 684 3782

EMCON Northwest	Client Project ID. TOSCO #11051, #0328-054.02	Analyst D Anderson
18912 N Creek Parkway, #100	Sample Matrix: Water	
Bothell, WA 98011	Analysis Method. WTPH-D	Extracted: Apr 13, 1994
Attention: Mike Noll	Units. µg/L (ppb)	Analyzed: Apr 14-15, 1994
		Reported: Apr 15, 1994

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Diesel

Spike Conc. Added:	2.1
Spike Result:	2.2
% Recovery:	105
Upper Control Limit %:	112
Lower Control Limit %:	84

PRECISION ASSESSMENT
Sample Duplicate

Diesel Range Organics

Sample Number:	404-0456
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	31

NORTH CREEK ANALYTICAL Inc.

Laura Dutton for

Matthew T Essig
Project Manager

$$\% \text{ Recovery} = \frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$$

$$\text{Relative \% Difference} = \frac{\text{Original Result} - \text{Duplicate Result}}{(\text{Original Result} + \text{Duplicate Result}) / 2} \times 100$$

EMCON Northwest, Inc.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REPORT FORM

DATE 4/11/94 PAGE 1 OF 1

PROJECT NAME Tosco 11051 #0328-054.02

PROJECT

COMPANY/ADDRESS EMCON Northwest

ATTN. Mike Noll

PHONE 485-5000

SAMPLERS SIGNATURE Daniel Galvez

NUMBER OF CONTAINERS

ANALYSIS REQUEST

						PETROLEUM HCS						ORGANIC						ORGANIC METALS/INORGANICS							
SAMPLE ID	DATE	TIME	LAB ID	SAMPLE MATRIX	NUMBER OF CONTAINERS	TPH - HCID State	TPH - G State WA BTEX ✓	TPH - D State WA OIL ✓ Extended	TPH - 418.1 State	TPH - Other	Halogenated or Aromatic Volatiles 601/8010 ___ 602/8020	Volatile Organics GC/MS 624-8240	Base/Neu/Acid Organics GC/MS 625/8270	Pesticides/PCBS 8080 PCB ONLY	PAH 8310 8100 GC ___ HPCL ___	TCLP Metals ___ Semi VOA ___ VOA ___ Pest/Herb	Metals Total ___ DISS ___ List Below	Cyanide	pH Cond Cl, SO_4 PO_4 F, Br NO_2 NO_3 (Circle)	NH_3 N COD Total P TKN, TOC TOX (Circle)				REMARKS
11051-OBW-WB	4/11/94	1500	4040477	Water	4		X	X																	

RELINQUISHED BY

Signature: Daniel Galvez

Printed Name: Daniel Galvez

Firm: EMCON Northwest

Date/Time: 4/11/94 6:30pm

RECEIVED BY

Signature: Russell Lister

Printed Name: Russell Lister

Firm: NCA

Date/Time: 4/11/94 18:30

TURNAROUND REQUIREMENTS

___ 24 hr ___ 48 hr ✓ 5 day

✓ Standard (10-15 working days)

___ Provide Verbal Preliminary Results

___ Provide FAX preliminary Results

Requested Report Date ___

REPORT REQUIREMENTS

___ I Routine Report

___ II Report (includes DUP MAS MSD, as required, may be charged as samples)

___ III Data Validation Report (includes All Raw Data)

___ IV CLP Deliverable Report

INVOICE INFORMATION

P.O.# ___

Bill To ___

SAMPLE RECEIPT

Shipping VIA ___

Shipping Id ___

Condition ___

Lab No ___

RELINQUISHED BY

Signature

Printed Name

Firm

Date/Time

RECEIVED BY

Signature

Printed Name

Firm

Date/Time

SPECIAL INSTRUCTIONS/COMMENTS