



BP OIL

BP Oil Company
Environmental Resources Management
Building 13, Suite N
295 SW 41st Street
Renton, Washington 98055-4931
(206) 251-0667
Fax No: (206) 251-0736

August 9, 1996

Mr. Ben Amoah-Forson
Washington Dept. of Ecology
Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008-5452

**RE: BP OIL FACILITY #11096
7601 Ballinger Way
Edmonds, WA**

Attached please find our **GROUNDWATER MONITORING AND SAMPLING REPORT, FIRST QUARTER 1996** for the above referenced facility.

If you should have any questions regarding this site, I may be reached at (206) 251-8209.

Respectfully,

A handwritten signature in blue ink, appearing to read "P.J. DeSantis". To the left of the signature, there is a small handwritten mark that looks like a stylized "f" or "J".

Peter J. DeSantis
Environmental Resources Management

STH:sb msword!ERM11096

cc: Mr. Larry Silva, TOSCO Northwest Co., 601 Union Street, Suite 2500, Seattle, WA 98101

David Cooper, Charles A Gove & Associates, PO Box 3963, Bellevue WA 98009-3963

Site File



Charles A. Gove & Associates, Inc.
Consulting Engineers
11-105th Ave S.E., Suite 8, Bellevue, WA 98004
P.O. Box 3963, Bellevue, WA 98009-3963
PH. (206) 451-1212 FAX. (206) 451-8856

ENTERED
1-7-97
ABF

30 April 1996

BP Oil Company
295 SW 41st Street
Building 13, Suite N
Renton, Washington 98055

Attention: Mr. Scott Hooton

**Subject: Groundwater Monitoring and Sampling Report
1st Quarter 1996**

BP Service Station No. 11096

7601 Ballinger Way
Edmonds, Washington

This report presents the results of groundwater monitoring and sampling activities performed on 6 March 1996 at the above site.

Introduction

The property is an operating service station, located on the northwest corner of the intersection of 244th St. SW and 76th Ave W in Edmonds, Washington (Figure 1).

Presently, the following groundwater wells exist on site:

- Three two-inch ID groundwater monitoring wells.

The wells were completed as vapor extraction points within vaults. Blank PVC lines running from these vaults stub up west of the service station. No system is in operation.

The approximate site boundaries, locations of existing buildings and underground storage tanks, approximate locations of existing monitoring wells, and other pertinent site information are presented on the Site and Exploration Plan, Figure 2.

Groundwater Monitoring

Fluid level measurements in each monitoring well were completed with an interface probe to indicate thickness of liquid petroleum hydrocarbons (LPH), if present, and depth to

**GROUNDWATER MONITORING REPORT
BP SERVICE STATION NO. 11096
30 APR 96
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groundwater relative to the top of the well casings (TOC). Groundwater measurements in the site wells ranged from 46 to 48 feet below ground surface, relative elevations are based on an arbitrary datum of 100.00 feet (Table 1). The inferred groundwater migration direction is to the northwest. This determination is based upon groundwater measurements from the monitoring wells on the site.

Dissolved oxygen levels were measured directly in the well using a cable-mounted polargraphic probe, correcting for temperature and salinity (Table 2).

Sampling Procedures and Analyses

Groundwater samples were collected from the site monitoring wells on 6 March 1996 for analytical laboratory testing. To obtain a sample representative of the surrounding formation, each well was purged of at least three well volumes of groundwater prior to sampling. Samples were retrieved by hand bailer, decontaminated between wells, to obtain discrete and representative groundwater samples. The samples were then decanted into laboratory prepared containers, labeled, and immediately placed into a chilled cooler for transport to Analytical Technologies, Inc. (Renton, WA). Chain-of-custody procedures were followed to track sample possession from the time of collection until receipt by the analytical laboratory.

Each groundwater sample was analyzed for the following:

- Washington Total Petroleum Hydrocarbons-Gasoline range with Benzene, Toluene, Ethylbenzene, and total Xylenes distinction using Washington Department of Ecology (Ecology) test method WTPH-G/BTEX;

Analytical Laboratory Results

In general, petroleum hydrocarbon concentrations were below method detection limits for all samples. A summary of the results of analytical tests performed on groundwater samples collected at the subject site to date are presented in Table 2. The analytical results for this sampling event are also presented on Figure 2.

Summary

No LPH has been present at this site since monitoring began in 1993. Dissolved TPH and BTEX concentrations in groundwater samples continue to be below Washington State Action Levels.

**GROUNDWATER MONITORING REPORT
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We appreciate this opportunity to be of service to BP Oil Company. If you have any questions or comments regarding this letter report or other aspects of this project, please do not hesitate to call at your earliest convenience.

Respectfully submitted,
Charles A. Gove & Associates



David G. Cooper, P.G.
Environmental Geologist

Enclosures: **Table 1 - Summary of Fluid Level Measurements**
Table 2 - Summary of Analytical Results: Groundwater
Figure 1 - Location Map
Figure 2 - Site and Exploration Plan
CAG Groundwater Sampling/Monitoring Field Form
ATI Report and Chain of Custody

GROUNDWATER MONITORING REPORT
BP SERVICE STATION NO. 11096
30 APR 96
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Table 1: **Summary of Fluid Level Measurements**
BP Service Station No. 11096
7801 Ballinger Way
Edmonds, Washington

Well Number	Top of Casing Elevation (ft)	Date Collected	Product Thickness (ft)	Depth to Water (ft)	Groundwater Elevation (ft)*
MW-1	97.64	19-Oct-93	0	50.24	47.40
		19-May-93	0	46.78	50.86
		16-Aug-93	0	46.76	50.88
		08-Mar-94	0	47.36	50.28
		22-Jun-94	0	47.44	50.20
		23-Sep-94	0	47.74	49.90
		9-Dec-94	0	47.85	49.79
		1-Mar-95	0	48.40	49.24
		7-Jun-95	0	47.11	50.53
		28-Aug-95	0	47.21	50.43
		29-Nov-95	0	47.22	50.42
MW-2	99.46	19-Oct-93	0	48.43	51.03
		19-May-93	0	49.08	50.38
		16-Aug-93	0	49.07	50.39
		08-Mar-94	0	49.24	50.22
		22-Jun-94	0	47.00	52.46
		23-Sep-94	0	49.60	49.86
		9-Dec-94	0	49.73	49.73
		1-Mar-95	0	49.29	50.17
		7-Jun-95	0	48.98	50.48
		28-Aug-95	0	49.06	50.40
		29-Nov-95	0	49.12	50.34
MW-3	97.26	19-Oct-93	0	48.02	49.24
		19-May-93	0	47.24	50.02
		16-Aug-93	0	47.20	50.06
		8-Mar-94	0	46.92	50.34
		22-Jun-94	0	49.30	47.96
		23-Sep-94	0	47.30	49.96
		9-Dec-94	0	47.41	49.85
		1-Mar-95	0	46.95	50.31
		7-Jun-95	0	46.68	50.58
		28-Aug-95	0	46.74	50.52
		29-Nov-95	0	46.76	50.50
		6-Mar-96	0	46.25	51.01

Notes:

Groundwater elevation established relative to an arbitrary datum of 100.00 feet.

* = Groundwater elevation is corrected for the effects of LPH using the following formula:

TOC - [DTW - (PT)(0.80)] where TOC=Top of Casing, DTW=Depth to Water,

PT=Product Thickness, and 0.80=Typical Specific Gravity for Gasoline.

** = Groundwater elevation was not measured on this date.

GROUNDWATER MONITORING REPORT
BP SERVICE STATION NO. 11096

30 APR 96

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Table 2. Summary of Analytical Results: Groundwater

BP Service Station No. 11096
 7601 Ballinger Way
 Edmonds, Washington

Well Number	Date Collected	WTPH-D (ug/l)	WTPH-G (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Benzene (ug/l)	Xylenes (ug/l)	Ethyl Lead (ug/l)	Total Lead (ug/l)	Dissolved Lead (ug/l)	Dissolved Turbidity (NTU)	Dissolved Oxygen (%)
MW-1	19-Oct-93	<250	<50	<0.5	<0.5	<0.5	<1	<1	43	<2	3,600	
	19-May-93	1,500	<50	<0.5	<0.5	<0.5	<1	4	<3	230		
	16-Aug-93	<50	<50	<0.5	<0.5	<0.5	<0.5	16	<3	50		
	08-Mar-94	NT	<100	<0.5	<0.5	<0.5	<0.5	6.1	<3	520		
	22-Jun-94	<250	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	56	
	23-Sep-94	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	5	
	9-Dec-94	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	79	
	1-Mar-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	62	
	7-Jun-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	58	
	28-Aug-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	50	
	29-Nov-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	55	
	6-Mar-96	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	51	
MW-2	19-Oct-93	<250	<50	<0.5	<0.5	<0.5	<1	54	<2	8,300		
	19-May-93	4,200	<50	<0.5	<0.5	<0.5	<1	4	<3	70		
	16-Aug-93	<50	<50	<0.5	<0.5	<0.5	<0.5	14	<3	270		
	08-Mar-94	NT	<100	<0.5	<0.5	<0.5	<0.5	6.8	<3	410		
	22-Jun-94	<250	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	53	
	23-Sep-94	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	4	
	9-Dec-94	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	73	
	1-Mar-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	47	
	7-Jun-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	53	
	28-Aug-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	48	
	29-Nov-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	52	
	6-Mar-96	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	63	
MW-3	19-Oct-93	<250	<50	<0.5	<0.5	<0.5	<1	111	4.9	3,400		
	19-May-93	1,700	<50	<0.5	<0.5	<0.5	<1	9	5	78		
	16-Aug-93	<50	<50	<0.5	<0.5	<0.5	<0.5	18	<3	650		
	08-Mar-94	NT	<100	<0.5	<0.5	<0.5	<0.5	6.2	<3	410		
	22-Jun-94	<250	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	70	
	23-Sep-94	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	5	
	9-Dec-94	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	82	
	1-Mar-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	63	
	7-Jun-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	62	
	28-Aug-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	57	
	29-Nov-95	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	70	
	6-Mar-96	NT	<100	<0.5	<0.5	<0.5	<0.5	NT	NT	NT	65	

Notes:
 WTPH-G = total petroleum hydrocarbons - gasoline, by Ecology Method WTPH-G.

WTPH-D = total petroleum hydrocarbons - diesel, by Ecology Method WTPH-D.

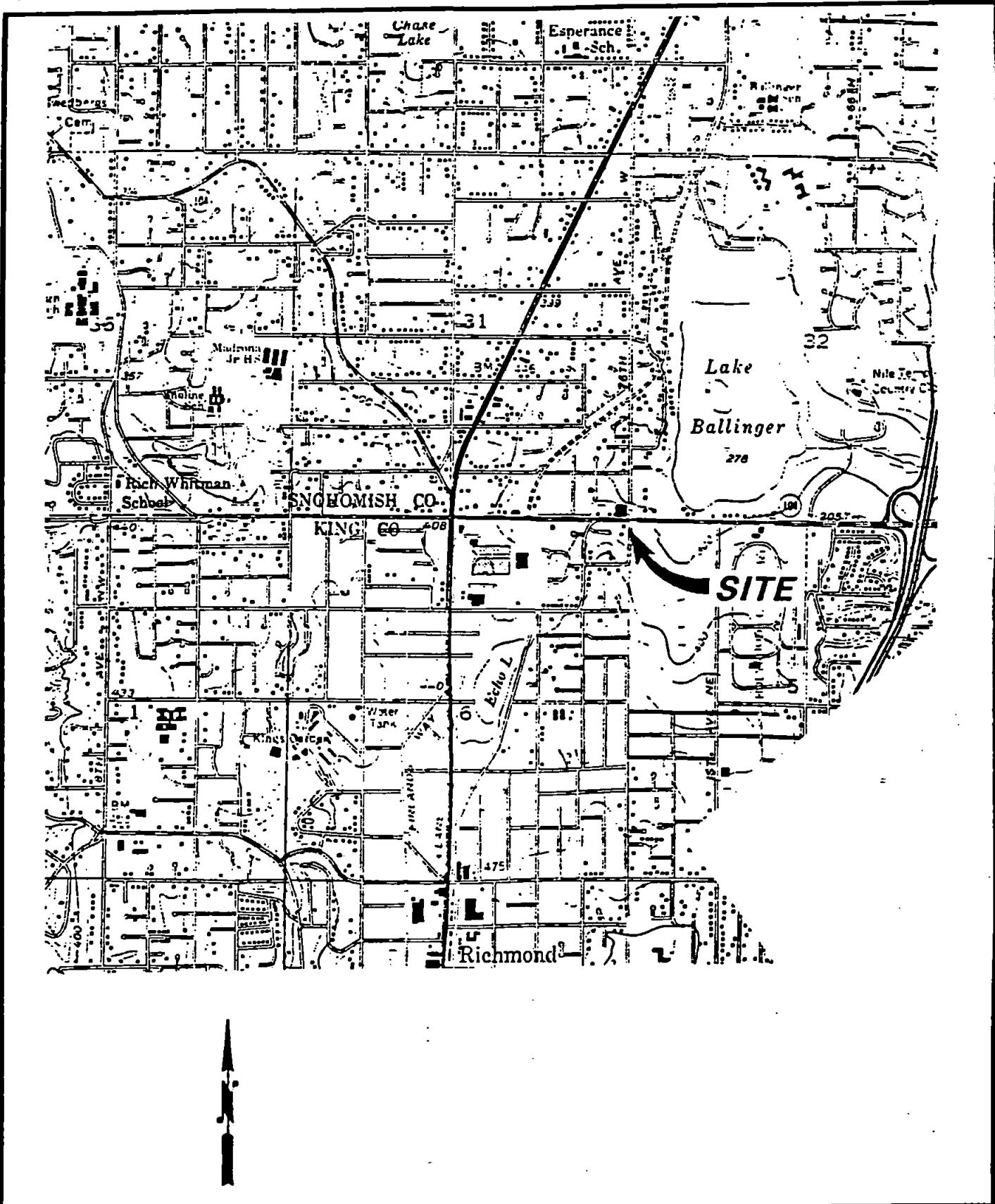
Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX) were analyzed by EPA Method 8020.

Total and dissolved lead by EPA Method 7421.

NT = Not tested.

All concentrations are expressed in micrograms per liter (ug/l).

Concentrations preceded by a "<" are below method detection limits. The method detection limit may vary depending on the laboratory used and sample characteristics.

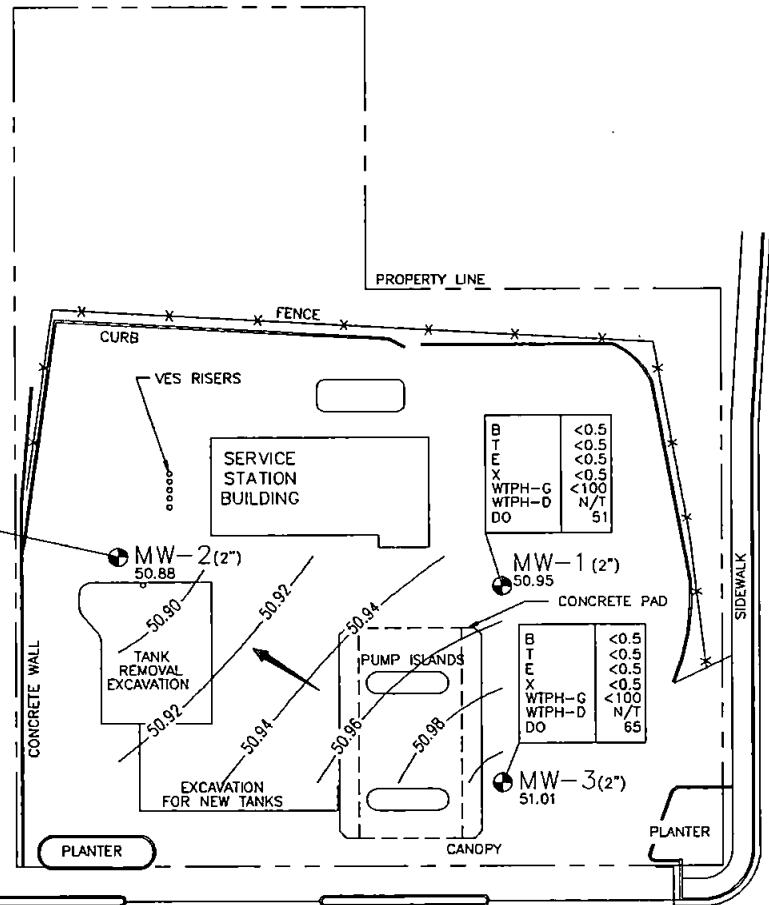


Charles A. Gove & Associates, Inc.
Consulting Engineers

11-105th Ave S.E., Suite 8, Bellevue, WA 98004
P.O. Box 3963, Bellevue, WA 98009-3963
PH. (206) 451-1212 FAX. (206) 451-8856

LOCATION MAP - FIGURE 1
BP SITE #11096
EDMONDS, WASHINGTON

Date	8/22/94	Scale	NTS	FILE:	JOB#:	94095
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244TH STREET S.W. (BALLINGER ROAD)

C

LEGEND

MW-3

MONITORING WELL NUMBER AND LOCATION

20.10

SPOT GROUNDWATER SURFACE ELEVATION IN FEET

—18.56—

INFERRED GROUNDWATER SURFACE ELEVATION CONTOUR IN FEET

←

INFERRED DIRECTION OF GROUNDWATER FLOW

GROUND WATER TEST RESULTS 6-MAR-96

CONCENTRATIONS IN PARTS PER BILLION (PPB)
(OR METHOD DETECTION LIMIT IF PRECEDED BY "<")

B

BENZENE BY EPA METHOD 8020

T

TOLUENE BY EPA METHOD 8020

E

ETHYLBENZENE BY EPA METHOD 8020

X

XYLEMES BY EPA METHOD 8020

WTPH-G

WASHINGTON TOTAL PETROLEUM HYDROCARBONS FOR GASOLINE (EPA METHOD WTPH-G)

WTPH-D

WASHINGTON TOTAL PETROLEUM HYDROCARBONS FOR DIESEL (EPA METHOD WTPH-D)

DO

DISSOLVED OXYGEN (%)

N/T

NOT TESTED

B

BENZENE <0.5

T

TOLUENE <0.5

E

ETHYLBENZENE <0.5

X

XYLEMES <0.5

WTPH-G

WASHINGTON TOTAL PETROLEUM HYDROCARBONS <100

WTPH-D

WASHINGTON TOTAL PETROLEUM HYDROCARBONS <100

DO

DISSOLVED OXYGEN (%) <100

N/T

NOT TESTED

B

BENZENE <0.5

T

TOLUENE <0.5

E

ETHYLBENZENE <0.5

X

XYLEMES <0.5

WTPH-G

WASHINGTON TOTAL PETROLEUM HYDROCARBONS <100

WTPH-D

WASHINGTON TOTAL PETROLEUM HYDROCARBONS <100

DO

DISSOLVED OXYGEN (%) <100

N/T

NOT TESTED

0 30 60

SCALE IN FEET

SOURCE OF BASE MAP:- AGRA INC.

REV.	DATE	BY	DESCRIPTION	SITE & EXPLORATION PLAN FIGURE - 2	
				BP SITE #11096	
				EDMONDS, WASHINGTON	
Drawn	Scale	1"=30'-0"			
Approved	Date	3/3/95	SHEETS	SHEET	
CAG					
Charles A. Gove & Associates, Inc. Consulting Engineers 11-105th Ave S.E., Suite 8, Bellevue, WA 98004 P.O. Box 3953, Bellevue, WA 98009-3953 Ph. (206) 451-1212 FAX. (206) 451-8856 CAG FILE: 11096.DWG JOB# 94055					



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11-105th Ave S.E., Suite 8, Bellevue, WA 98004
P.O. Box 3853, Bellevue, WA 98006-3853
PH. (206) 451-1212 FAX. (206) 451-0856

GROUNDWATER SAMPLING / MONITORING

Location 11096, Ballinger + 76th, Edmonds JOB # 94095
Method of Collection Disp. Weather Cloudy, 50° Page 1 of 1
Sampled By: Bill Dougherty Date 3/6/96

**TOTAL
PURGED**

22

COMMENTS:

No bbl/s
No treatment system



Analytical**Technologies**, Inc.

17400 S.W. Upper Boones Ferry Road, Suite 270

Durham, OR. 97224

(503) 684-0447 (503) 620-0393 (FAX)

ATI I.D. 603543

March 15, 1996

Dave Cooper
Charles A. Gove & Assoc.
P.O. Box 3963
Bellevue, WA 98004

Project Name/Number: BP - 11096 / 94095

Attention: Dave Cooper

On March 8, 1996, American Environmental Network (OR), Inc. received four water samples for analysis for the above listed project. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed. The results from these samples relate only to the items tested. This report shall not be reproduced, except in full, without the written approval of the laboratory.

If you have any questions or comments, please do not hesitate to contact us at (503)684-0447.

Brian Hennes
Project Manager

Steven E. Stanley
Laboratory Manager

SES:alm
Enclosure



SAMPLE CROSS REFERENCE SHEET

CLIENT: Charles A. Gove & Assoc. **AEN I.D.:** 603543
PROJECT #: 94095
PROJECT NAME: BP-11096 **MATRIX:** WATER

AEN #	CLIENT DESCRIPTION	DATE SAMPLED
603543-1	MW1	3/06/96
603543-2	MW3	3/06/96
603543-3	MW2	3/06/96
603543-4	Trip Blank	3/06/96

-----TOTALS-----

<u>MATRIX</u>	<u># SAMPLES</u>
WATER	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



ANALYTICAL SCHEDULE

CLIENT: Charles A. Gove & Assoc. **AEN I.D.:** 603543
PROJECT #: 94095
PROJECT NAME: BP-11096

ANALYSIS	TECHNIQUE	REFERENCE	LAB
BETX	GC/PID	EPA 8020M	PLD
Petroleum Hydrocarbon	GC/FID	WA TPH-G	PLD

PLD = AEN - Portland
R = ATI - Renton
PHX = AEN - Phoenix
PNR = AEN - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract



GAS CHROMATOGRAPHY RESULTS

TEST: BETX (EPA 8020M)
CLIENT: Charles A. Gove & Assoc.
PROJECT #: 94095
PROJECT NAME: BP-11096
SAMPLE MATRIX: WATER

ATI I.D.: 603543
DATE SAMPLED: 03/06/96
DATE RECEIVED: 03/08/96
UNITS: ug/L

ATI I.D.	CLIENT I.D.	DATE ANALYZED	DF	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLEMES	SURROGATE (81% - 116%)
603543-0	Method Blank	03/11/96	1	< 0.5	< 0.5	< 0.5	< 0.5	93%
603543-1	MW1	03/11/96	1	< 0.5	< 0.5	< 0.5	< 0.5	96%
603543-2	MW3	03/11/96	1	< 0.5	< 0.5	< 0.5	< 0.5	99%
603543-3	MW2	03/11/96	1	< 0.5	< 0.5	< 0.5	< 0.5	97%
603543-4	Trip Blank	03/11/96	1	< 0.5	< 0.5	< 0.5	< 0.5	93%

Analyst: CS 3/13/96
Reviewer: JMK 3/14/96



GAS CHROMATOGRAPHY SPIKE RESULTS

METHOD: BETX (EPA 8020M) ATI ID: 603543
CLIENT: Charles A. Gove & Assoc. QC SAMPLE: 603543-1
PROJECT #: 94095 DATE ANALYZED: 03/12/96
PROJECT NAME: BP-11096 DILUTION FACTOR: 1
SAMPLE MATRIX: WATER UNITS: ug/L

PARAMETER	SAMPLE RESULT	SPIKE CONC.	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	<	0.5	20.0	100	19.1	96	5
TOLUENE	<	0.5	20.0	98	18.8	94	4
ETHYLBENZENE	<	0.5	20.0	100	19.0	95	5
TOTAL XYLEMES	<	0.5	40.0	99	37.8	95	4
SURROGATE:							
TRIFLUOROTOLUENE (81% - 116%)				101%		98%	

CONTROL LIMITS

	% REC	RPD
BENZENE	77-131	20
TOLUENE	79-125	20
ETHYLBENZENE	76-124	20
TOTAL XYLEMES	74-127	20

Analyst: CS 3/13/96

Reviewer: JJK 3/14/96



GAS CHROMATOGRAPHY RESULTS

TEST: TPH-GASOLINE (WASHINGTON) ATI I.D.: 603543
CLIENT: Charles A. Gove & Assoc. DATE SAMPLED: 03/06/96
PROJECT #: 94095 DATE RECEIVED: 03/08/96
PROJECT NAME: BP-11096 UNITS: mg/L
SAMPLE MATRIX: WATER

ATI ID	CLIENT ID	DATE ANALYZED	DF	GASOLINE (C7 - C12)	TFT (75%-118%)
603543-0	Method Blank	03/11/96	1	< 0.1	109%
603543-1	MW1	03/11/96	1	< 0.1	110%
603543-2	MW3	03/11/96	1	< 0.1	118%
603543-3	MW2	03/11/96	1	< 0.1	105%
603543-4	Trip Blank	03/11/96	1	< 0.1	111%

Analyst: CS 3/13/96
Reviewer: JLG 3/14/96



Analytical Technologies, Inc.

GAS CHROMATOGRAPHY DUPLICATE RESULTS

TEST:	TPH-GASOLINE (WASHINGTON)	ATI ACCESSION:	603543
CLIENT:	Charles A. Gove & Assoc.	QC SAMPLE:	603543-1
PROJECT #:	94095	DATE ANALYZED:	03/11/96
PROJECT NAME:	BP-11096	DILUTION FACTOR:	1
SAMPLE MATRIX:	WATER	UNITS:	mg/L

PARAMETER	SAMPLE RESULT	SAMPLE		RPD
		DUP	RESULT	
GASOLINE	< 0.1	<	0.1	N/A
SURROGATE: TRIFLUOROTOLUENE (75% - 118%)	110%		114%	

CONTROL LIMITS

GASOLINE	RPD
	20

Analyst: CS 3/13/C6Reviewer: JLC 3/14/96



Analytical Technologies, Inc.

GAS CHROMATOGRAPHY SPIKE RESULTS

TEST:	TPH-GASOLINE (Washington)	ATI ACCESSION:	603543
CLIENT:	Charles A. Gove & Assoc.	QC SAMPLE:	603543-2
PROJECT #:	94095	DATE ANALYZED:	03/12/96
PROJECT NAME:	BP-11096	DILUTION FACTOR:	1
SAMPLE MATRIX:	WATER	UNITS:	mg/L

	SAMPLE RESULT	SPIKE CONC.	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
GASOLINE	< 0.1	1.00	0.99	99	1.00	100	1
TRIFLUOROTOLUENE (75% - 118%)				109%		111%	

CONTROL LIMITS

Gasoline	% REC 66 - 132	RPD 20
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Analyst: CS 3/13/96Reviewer: JMK 3/14/96



CHAIN OF CUSTODY

No.056274 Page 1 of 1

RELINQUISHED BY / AFFILIATION

DATE TIME

ACCEPTED BY / AFFILIATION

DATE _____ TIME _____

ADDITIONAL COMMENTS

Bill Dougherty

34/41 9

10 Jemal & Khan / AEN

3/8/910 113

5.5%