Delta
Environmental
Consultants, Inc.

1756-114th Avenue S.E.
Suite 110
Bellevue, WA 98004
206/450-7726
FAX: 206/450-8837

February 23, 1996

ARCO Products Company
12520 NE 160th Place
Woodinville, Washington 98072-7960

Attention: Mr. Chuck Hutchens
Environmental Engineer

Subject: Subsurface Investigation Report
ARCO Facility No. 4090
2200 Fourth Avenue South
Seattle, Washington
Delta Project No. M094-510

Dear Mr. Hutchens:

Introduction and Scope of Work

Delta Environmental Consultants (Delta) was authorized by ARCO Products Company (ARCO) to conduct a subsurface investigation at ARCO Facility No. 4090 in Seattle, Washington (Figure 1). Delta subcontracted Boretec, Inc. (Boretec) of Valleyford, Washington to advance two soil borings and install one monitoring well in an area behind the service station building at locations downgradient from Stanley Terminals' former 500-gallon heating oil underground storage tank T-3. Delta collected soil samples during drilling and submitted them to North Creek Analytical, Inc. (North Creek) of Bothell, Washington. This report, in conjunction with the attached boring logs, well construction diagram, and laboratory report summarizes the subsurface investigation activities.

Delta's scope of work for this investigation consisted of:

- Coordinating work between Boretec, North Creek, ARCO, and utility locators;
- Notifying the station manager of the drilling date;
- Observing, monitoring, and documenting the advancement of two soil borings;
- Collecting and field screening soil samples from the borings;
- Observing and documenting the installation of a monitoring well in one of the borings;

- Submitting the soil samples to North Creek for analysis of benzene, toluene, ethylbenzene, xylenes, total lead, and total petroleum hydrocarbons as gasoline, diesel and heavy oil;
- Interpreting the results obtained from the investigation;
- Summarizing the collected data in this letter report.

Site Description

The site is an active ARCO AM-PM facility located on the southeast corner of the intersection of Fourth Avenue South and South Walker Street in Seattle, Washington (Figure 1). The ground elevation of the site is approximately 10 feet above the City of Seattle Vertical Datum. The topography of the area is generally flat, with regional topography sloping gently toward the Duwamish River and Elliott Bay, approximately 0.75 mile to the west and northwest, respectively.

Subsurface Investigation Activities

Delta observed the advancement of two soil borings behind the station building near the site's eastern property boundary on January 25, 1996 (Figure 2). Boretec drilled the borings using a 2.5-inch inside diameter hollow-stem auger advanced by an Acker Soil Mechanic drill rig. The hollow-stem augers, drilling equipment, and sampling tools were steam cleaned before advancing each soil boring. The drilling process was continuously observed and logged, and discrete soil samples were collected at 2.5-foot intervals by a Delta geologist. After collection, each discrete soil sample was field screened for volatile organic compounds with a photoionization detector (PID) to facilitate selecting representative soil samples for laboratory analyses. Soil samples were collected at 2.5, 5, 7.5, 10, and 12.5 feet below ground surface (bgs) from boring MW-8, and were collected at depths of 2.5, 5, 7.5, 10, 12.5, and 15 feet bgs from boring B-9. A one-inch diameter ground water monitoring well (MW-8) was installed in the boring located behind the station building, between the building and a freight container.

Soils encountered during the investigation consisted generally of silty sand with varying amounts of clays, gravels, and cobbles from ground surface to 15 feet bgs. Ground water was encountered in the new borings at approximately 7 feet bgs. Detailed descriptions of the observed soil lithology, sample recovery, and PID screening values are presented on the attached soil boring logs. Well construction details are illustrated on the attached well construction diagram. Laboratory results are summarized in Table 1. The laboratory report is attached.

Results

Laboratory analyses of the soil samples from the soil borings indicate that detectable concentrations of petroleum hydrocarbons in excess of the MTCA Method A cleanup levels for gasoline, diesel, and oil are present in samples collected from the locations of boring MW-8 at depths of 5 and 7.5 feet bgs, and boring B-9 at a depth of 5 feet bgs.

If you have any questions regarding this report or the status of this project, please contact Mr. Andrew Smith or me at (206) 450-7726.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Derek Tonnon for

Paul E. Kalina
Project Engineer

Reviewed by:

Andrew J. Smith

Andrew J. Smith
Project Manager

PEK/AJS/naf

Attachments: Figure 1 - Site Location Map
Figure 2 - Site Map
Table 1 - Summary of Laboratory Results for Soil Samples
Attachment A - Boring Logs
Attachment B - Well Construction Diagram
Attachment C - Laboratory Report

GENERAL NOTES:
BASE MAP FROM U.S.G.S.
SEATTLE SOUTH, WA.
7.5 X 15 MINUTE TOPOGRAPHIC
PRINTED 1983

QUADRANGLE LOCATION

North

0 2000 FT

SCALE 1 : 25,000

FIGURE 1
SITE LOCATION MAP
ARCO PRODUCTS COMPANY
FACILITY NO. 4090
2200 4th AVENUE S
SEATTLE, WA.

PROJECT NO. M094-510	DRAWN BY I.H. 9/7/95
FILE NO. --	PREPARED BY R.B.
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.

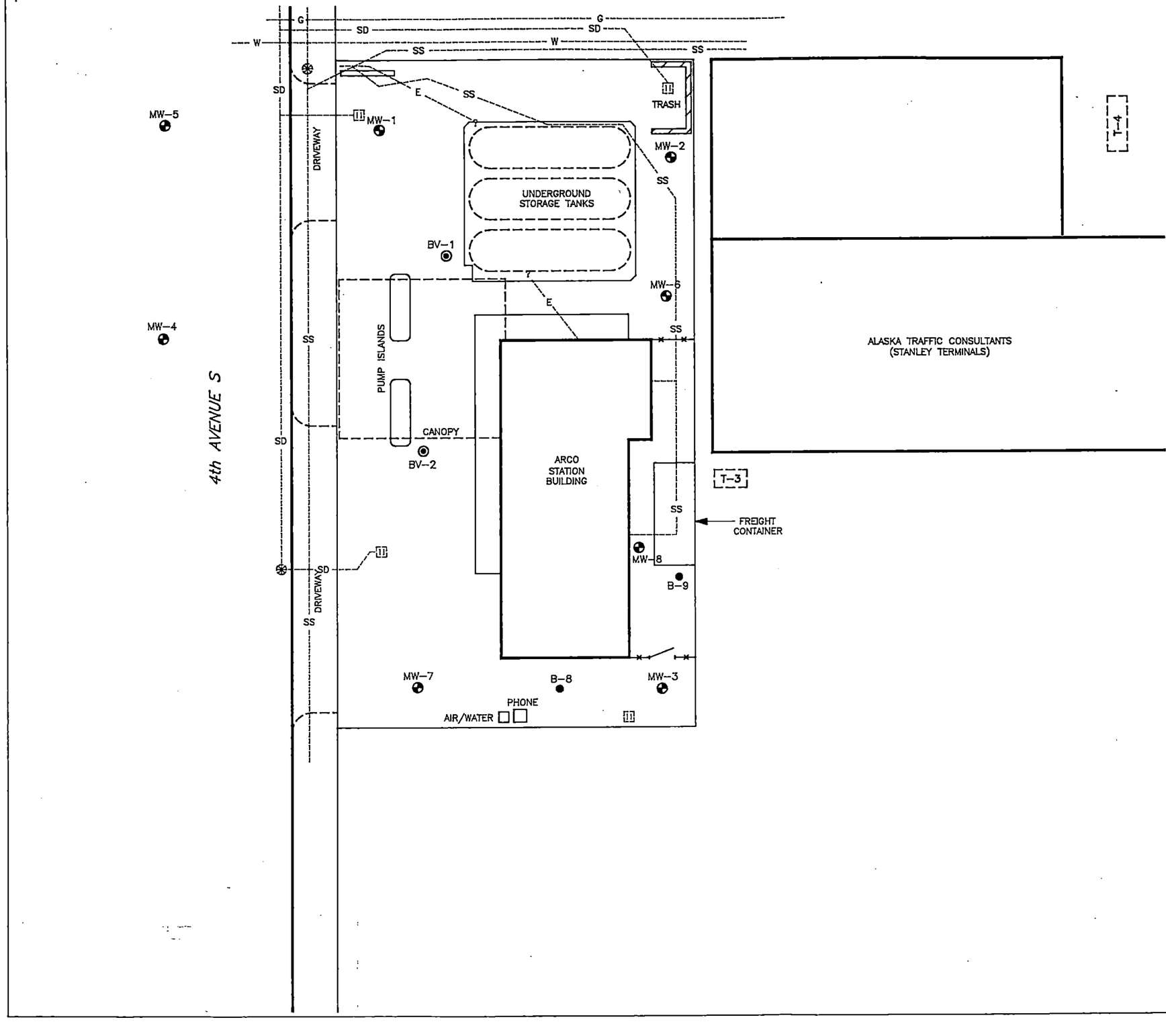


FIGURE 2
SITE MAP

ARCO PRODUCTS COMPANY
FACILITY NO. 4090
2200 4th AVENUE S
SEATTLE, WA.

PROJECT NO. M094-510	DRAWN BY I.H. 2/13/96
FILE NO. M094510A	PREPARED BY P.K.
REVISION NO. 5	REVIEWED BY

Delta Environmental Consultants, Inc.

TABLE 1
SUMMARY OF LABORATORY RESULTS FOR SOIL SAMPLES
ARCO FACILITY NO. 4090
2200 FOURTH AVENUE SOUTH
SEATTLE, WASHINGTON
DELTA PROJECT NO. MO94-510

Sample Name	Sample Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	WTPH-Gasoline (mg/kg)	WTPH-Diesel (mg/kg)	WTPH-Oil (mg/kg)	Total Lead (mg/kg)
MW-8-5	5.0	<0.050	<0.050	<0.050	0.11	390	370	<25	20
MW-8-7	7.5	<0.050	<0.050	<0.050	0.25	860	2,300	250	NA
B-9-5	5.0	0.064	0.098	<0.050	0.12	410	240	43	62
B-9-10	10.0	<0.050	<0.050	<0.050	<0.10	1.8	34	49	NA
Analytical Method	--	EPA 8020	EPA 8020	EPA 8020	EPA 8020	WTPH-G	WTPH-D ext	WTPH-D ext	EPA 7420
MTCA Method A Cleanup Level	--	0.5	40.0	20.0	20.0	100.0	200.0	200.0	250.0

mg/kg = Milligrams per kilogram
NA = Not Analyzed
WTPH-G = Total petroleum hydrocarbons as gasoline, Washington State method
WTPH-D ext = Total petroleum hydrocarbons as diesel and oil, Washington State method
MTCA = Model Toxics Control Act, Washington State

ATTACHMENT A

Boring Logs

PROJECT NAME/LOCATION:	Project Number	M094-510	Boring Number	MW-8
ARCO Facility No. 4090 2200 4th Avenue South Seattle, Washington	Contractor	Boretec, Inc.	Drilling Method	2½" ID HSA
	Driller	Jim	Drilling Rig	Acker Soil Mechanic
	Start	12:00 p.m. 01/25/96	Completed	4:45 p.m. 01/25/96
Landowner: ARCO Products Company	Surface Elev.	---	Logged By	Ron Bruce

Sample Type	Sample No.	Blow Count	Sample Interval (ft)	Sample Recovery (in.)	Depth Scale 1" = 4'	Descriptions of Materials and Conditions	Observations Instrument: Units: OVM ppm	Comments
					0	Asphalt 4"		
					1	SILTY SAND WITH GRAVEL AND COBBLES (SM); tan, moist.		
	MW-8-2	--	2.5	--	2 3	SANDY SILT WITH GRAVEL AND COBBLES (ML); grey, moist.	0	
SB	MW-8-5	8	5.0-6.0	12	4 5	SANDY SILT WITH CLAY (ML); gray, wet to saturated, medium stiff.	137	
SB	MW-8-7	11	7.5-8.0	6	6 7 8		75	
SB	MW-8-10	11	10.0-10.1	1.5	9 10	ORGANIC SILT (OL); black, wet to saturated, stiff.	--	
SB	MW-8-12	9	12.5-14.0	18	11 12 13	POORLY GRADED SAND (SP); black, saturated, loose.	0	
					14	Boring terminated at 12½ feet.		
					15 16 17 18 19 20 21 22 23			

BOREHOLE WATER LEVEL DATA			
Date			
Time			
GWL			
Casing Depth			

Delta Environmental Consultants, Inc.

Sheet 1 of 1

Rev. February 14, 1996

PROJECT NAME/LOCATION:	Project Number	M094-510	Boring Number	B-9
ARCO Facility No. 4090 2200 4th Avenue South Seattle, Washington	Contractor	Boretec, Inc.	Drilling Method	2½" ID HSA
	Driller	Jim	Drilling Rig	Acker Soil Mechanic
	Start	2:40 p.m. 01/25/96	Completed	4:30 p.m. 01/25/96
Landowner: ARCO Products Company	Surface Elev.	---	Logged By	Ron Bruce

Sample Type	Sample No.	Blow Count	Sample Interval (ft)	Sample Recovery (in.)	Depth Scale 1" = 4'	Descriptions of Materials and Conditions	Observations Instrument: Units: OVM ppm	Comments
					0	Asphalt 4"		
					1	SILTY SAND WITH GRAVEL AND COBBLES (SM); tan, moist.		
	B-9-2	--	2.5	--	2 3	SILT WITH CLAY AND GRAVEL (ML); grey, moist.	0	
SB	B-9-5	13 2 7	5.0-6.0 7.0-9.0 5.0-9.0	0 2 6	4 5 6		117	
SB	B-9-7	12	7.5-8.0	6	7 8	Becomes saturated.	48	
SB	B-9-10	15	10.0-10.7	8	9 10	POORLY GRADED SAND (SP); black, saturated, medium dense.	0	
					11 12	Boring terminated at 10 feet.		
					13 14 15 16 17 18 19 20 21 22 23			

BOREHOLE WATER LEVEL DATA			
Date			
Time			
GWL			
Casing Depth			

Delta Environmental Consultants, Inc.

Sheet 1 of 1

Rev. February 14, 1996

ATTACHMENT B

Well Construction Diagram

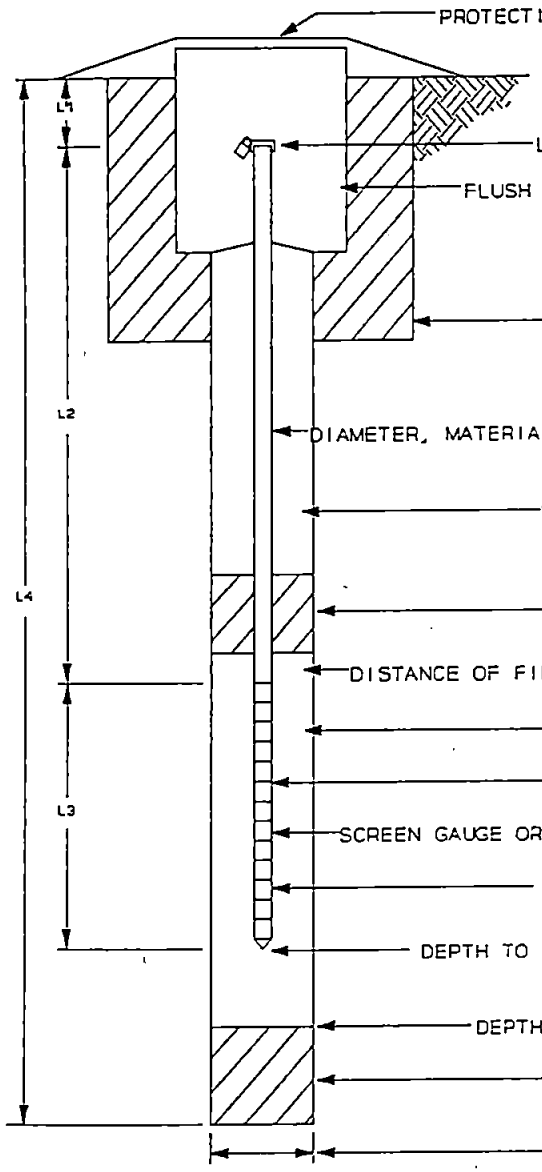
INSTALLATION OF FLUSH GRADE MONITORING WELL

Project: ARCO Facility No. 4090
2200 4th Avenue South
Seattle, Washington

Delta No. M094-510

Monitoring Well No. MW-8

Elevations:
Top of Riser:
Ground Level:



DIAMETER AND MATERIAL	8" Steel
TOTAL LENGTH	15"
THICKNESS & TYPE OF SEAL	1 foot cement
DIAMETER, MATERIAL, & JOINT TYPE OF RISER PIPE	1-inch PVC SCH 40 threaded
TYPE OF BACKFILL AROUND RISER	
THICKNESS & TYPE OF SEAL	1 foot bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	6"
TYPE OF FILTER AROUND SCREEN	#10/20 Colorado Silica Sand
MONITORING WELL MATERIAL	Schedule 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.020 inch
DIAMETER AND LENGTH OF SCREEN	1" x 10 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	12½ feet
DEPTH TO THE BOTTOM OF FILTER SAND	12½ feet
THICKNESS & TYPE OF SEAL	
DIAMETER OF BOREHOLE	

L1 = .25 FT
L2 = 2.25 FT
L3 = 10 FT
L4 = 12.5 FT

Installation Completed
Date: 1/25/96
Time: 4:45 p.m.

Delta Environmental Consultants, Inc.

Monitoring Well Water Level Measurements		
Date	Time	Water Level*

* Measure Point

ATTACHMENT C

Laboratory Report

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 99206-4776 (509) 924-9200 • FAX 924-9290
9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

FEB - 9 1996

Delta Environmental	Project Name:	ARCO Seattle, #4090	
1756 114th Avenue SE, #110	Client Project :	Not Provided	
Bellevue, WA 98004			Received: Jan 26, 1996
Attention: Andy Smith	NCA Project #:	B601406	Reported: Feb 8, 1996

PROJECT SUMMARY PAGE

Laboratory Sample Number	Sample Description	Sample Matrix	Date Sampled
B601406-01	MW-8-2	Soil	1/25/96
B601406-02	MW-8-5	Soil	1/25/96
B601406-03	MW-8-7	Soil	1/25/96
B601406-04	MW-8-10	Soil	1/25/96
B601406-05	MW-8-12	Soil	1/25/96
B601406-06	B-9-2	Soil	1/25/96
B601406-07	B-9-5	Soil	1/25/96
B601406-08	B-9-7	Soil	1/25/96
B601406-09	B-9-10	Soil	1/25/96

The results in this report apply to the samples analyzed in accordance with the chain of custody document.
This analytical report must be reproduced in its entirety.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton
for Project Manager

NORTH CREEK ANALYTICAL

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East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290
9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Delta Environmental
1756 114th Avenue SE, #110
Bellevue, WA 98004
Attention: Andy Smith

Client Project ID: ARCO Seattle, #4090
Sample Matrix: Soil

First Sample #: B601406-02

Received: Jan 26, 1996
Reported: Feb 8, 1996

TOTAL SOLIDS & MOISTURE CONTENT REPORT

Sample Number	Sample Description	Total Solids %	Moisture Content %
B601406-02	MW-8-5	87	13
B601406-03	MW-8-7	85	15
B601406-07	B-9-5	81	19
B601406-09	B-9-10	74	26

The enclosed analytical results for soils, sediments and sludges have been converted to a DRY WEIGHT reporting basis.
To attain the wet weight "as received" equivalent, multiply the dry weight result by the decimal fraction of percent Total Solids.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton
Project Manager

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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Delta Environmental	Client Project ID:	ARCO Seattle, #4090	Sampled:	Jan 25, 1996
1756 114th Avenue SE, #110	Sample Matrix:	Soil	Received:	Jan 26, 1996
Bellevue, WA 98004	Analysis Method:	WTPH-G	Analyzed:	Jan 30, 1996
Attention: Andy Smith	First Sample #:	B601406-02	Reported:	Feb 8, 1996

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
B601406-02	MW-8-5	390 G-1	87
B601406-03	MW-8-7	860 G-1	S-2
B601406-07	B-9-5	410 G-1	75
B601406-09	B-9-10	1.8	89
BLK013096	Method Blank	N.D.	116

Reporting Limits	1.0

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. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton
Project Manager

Please Note:
S-2 = The Surrogate Recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.

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Delta Environmental
1756 114th Avenue SE, #110
Bellevue, WA 98004
Attention: Andy Smith

Client Project ID: ARCO Seattle, #4090
Sample Matrix: Soil
Analysis Method: WTPH-G
Units: mg/kg (ppm)

Analyzed: Jan 30, 1996
Reported: Feb 8, 1996

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline

Spike Conc. Added:	5.0
Spike Result:	3.7
% Recovery:	74
Upper Control Limit %:	115
Lower Control Limit %:	33

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Hydrocarbons

Sample Number:	B601407-02
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:	67

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Laura Dutton
Project Manager

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

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

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Delta Environmental	Client Project ID:	ARCO Seattle, #4090	Sampled: Jan 25, 1996
1756 114th Avenue SE, #110	Sample Matrix:	Soil	Received: Jan 26, 1996
Bellevue, WA 98004	Analysis Method:	EPA 8020	Analyzed: Jan 30, 1996
Attention: Andy Smith	First Sample #:	B601406-02	Reported: Feb 8, 1996

BTEX DISTINCTION

Sample Number	Sample Description	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
B601406-02	MW-8-5	N.D.	N.D.	N.D.	0.11	144
B601406-03	MW-8-7	N.D.	N.D.	N.D.	0.25	156
B601406-07	B-9-5	0.064	0.098	N.D.	0.12	134
B601406-09	B-9-10	N.D.	N.D.	N.D.	N.D.	108
BLK013096	Method Blank	N.D.	N.D.	N.D.	N.D.	135
Reporting Limits:		**0.050**	**0.050**	**0.050**	**0.10**	

4-Bromofluorobenzene surrogate recovery control limits are 34 - 166 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.
The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

Laura Dutton
Project Manager

NORTH CREEK ANALYTICAL

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Delta Environmental
1756 114th Avenue SE, #110
Bellevue, WA 98004
Attention: Andy Smith

Client Project ID: ARCO Seattle, #4090
Sample Matrix: Soil
Analysis Method: EPA 8020
Units: mg/kg (ppm)
QC Sample #: B601419-03

Analyzed: Jan 30, 1996
Reported: Feb 8, 1996

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:	0.62	0.62	0.62	1.85
Spike Result:	0.49	0.47	0.48	1.61
Spike % Recovery:	79%	76%	77%	87%
Spike Dup. Result:	0.48	0.47	0.48	1.63
Spike Duplicate % Recovery:	77%	76%	77%	88%
Upper Control Limit %:	111	118	120	128
Lower Control Limit %:	59	55	61	55
Relative % Difference:	2.1%	0.0%	0.0%	1.2%
Maximum RPD:	17	16	17	17

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Laura Dutton
Project Manager

$$\%\ \text{Recovery:} \quad \frac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} \quad \frac{\text{Spike Result - Spike Dup. Result}}{(\text{Spike Result + Spike Dup. Result}) / 2} \times 100$$

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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Delta Environmental	Client Project ID:	ARCO Seattle, #4090	Sampled: Jan 25, 1996
1756 114th Avenue SE, #110	Sample Matrix:	Soil	Received: Jan 26, 1996
Bellevue, WA 98004	Analysis Method:	WTPH-D Extended	Extracted: Jan 29, 1996
Attention: Andy Smith	First Sample #:	B601406-02	Analyzed: 1/29-2/8/1996
			Reported: Feb 8, 1996

TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE EXTENDED

Sample Number	Sample Description	Diesel Result mg/kg (ppm)	Heavy Oil Result mg/kg (ppm)	Surrogate Recovery %
B601406-02	MW-8-5	370	N.D.	119
B601406-03	MW-8-7	2,300 D-1	250	131
B601406-07	B-9-5	240	43	92
B601406-09	B-9-10	34	49	82
BLK012996	Method Blank	N.D.	N.D.	82

Reporting Limit:	10	25

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. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

for Laura Dutton
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9508 (206) 481-9200 • FAX 485-2992
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HYDROCARBON ANALYSIS FOOTNOTES

2/94, Rev. 3

VOLATILE HYDROCARBONS - GASOLINE RANGE ORGANICS

G 1 This sample appears to contain extractable diesel range organics.

G 2 The chromatogram for this sample does not resemble a typical gasoline pattern. Please refer to the sample chromatogram.

G 3 The total hydrocarbon result in this sample is primarily due to an individual compound(s) eluting in the volatile hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.

G 4 This sample contains compound(s) not identified as Benzene, Toluene, Ethyl benzene or Xylene.

G 5 This sample appears to contain or be saturated with gasoline product.

EXTRACTABLE HYDROCARBONS - DIESEL RANGE ORGANICS

D 1 This sample appears to contain volatile gasoline range organics.

D 2 The hydrocarbons present in this sample resemble heavy, non-resolvable oil range organics. Quantitation by TPH-Diesel Extended or TPH 418.1 is recommended.

D 3 The hydrocarbon concentration result in this sample is partially due to an individual peak(s) eluting in the diesel / motor oil carbon range.

D 4 The hydrocarbons present in this sample are a complex mixture of diesel range and heavy oil range organics.

D 5 The hydrocarbon result shown is an estimated (greater than) value due to the high concentration. Reanalysis is being performed to yield a quantitative result. An amended report will follow.

D 6 The sample chromatographic pattern does not resemble the fuel standard used for quantitation. A fuel fingerprint is advised.

D 7 This sample appears to contain or be saturated with diesel product.

Oils and Lubricants
[----------]
TRPH 418.1

Diesel & Fuel Oils
[----------]
Extractable Hydrocarbons (TPH-D)

Gasoline
[----------]
Volatile Hydrocarbons (TPH-G)

HYDROCARBON BOILING POINT RANGE

LOW LOW TO MEDIUM MEDIUM MEDIUM TO HIGH VERY HIGH

CARBON RANGE:

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31+

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Delta Environmental
1756 114th Avenue SE, #110
Bellevue, WA 98004
Attention: Andy Smith

Client Project ID: ARCO Seattle, #4090
Sample Matrix: Soil
Analysis Method: WTPH-D
Units: mg/kg (ppm)

Extracted: Jan 29, 1996
Analyzed: Jan 29, 1996
Reported: Feb 8, 1996

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Diesel

Spike Conc. Added:	68
Spike Result:	63
% Recovery:	93
Upper Control Limit %:	110
Lower Control Limit %:	72

PRECISION ASSESSMENT
Sample Duplicate

Diesel Range Hydrocarbons

Sample Number:	B601409-03
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 Reporting Limit.
Maximum RPD:	49

NORTH CREEK ANALYTICAL Inc

Laura Dutton
Project Manager

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

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

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9508 (206) 481-9200 • FAX 485-2992
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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

Delta Environmental	Client Project ID:	ARCO Seattle, #4090	Sampled: Jan 25, 1996
1756 114th Avenue SE, #110	Sample Matrix:	Soil	Received: Jan 26, 1996
Bellevue, WA 98004	Analysis Method:	EPA 7420	Digested: Feb 1, 1996
Attention: Andy Smith	First Sample #:	B601406-02	Analyzed: Feb 2, 1996
			Reported: Feb 8, 1996

METALS ANALYSIS FOR: TOTAL LEAD

Sample Number	Sample Description	Reporting Limit mg/kg (ppm)	Sample Result mg/kg (ppm)
B601406-02	MW-8-5	10	20
B601406-07	B-9-5	10	62
BLK020196	Method Blank	10	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.
The results reported above are on a dry weight basis.

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Delta Environmental
1756 114th Avenue SE, #110
Bellevue, WA 98004
Attention: Andy Smith

Client Project ID: ARCO Seattle, #4090
Sample Matrix: Soil
Units: mg/kg (ppm)

Digested: Feb 1, 1996
Reported: Feb 8, 1996

METALS QUALITY CONTROL DATA REPORT

ANALYTE	Lead
EPA Method:	7420
Date Analyzed:	Feb 2, 1996

ACCURACY ASSESSMENT

LCS Spike Conc. Added:	50
LCS Spike Result:	50
LCS Spike % Recovery:	100
Upper Control Limit:	121
Lower Control Limit:	71
Matrix Spike Sample #:	B601457-01
MS/MSD % Recovery:	92/107

PRECISION ASSESSMENT

Sample #:	B601457-01
Original:	N.D.
Duplicate:	12
Relative % Difference:	RPD values are not reported at sample concentration levels <10 X the Reporting Limit.

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Project Manager

Lab Control Sample % Recovery: $\frac{\text{Conc. of L.C.S.}}{\text{L.C.S. Spike Conc. Added}} \times 100$

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 19377 00

Chain of Custody

ARCO Facility no. 4090	City (Facility) Seattle	Project manager (Consultant) Andy Smith	Laboratory name North Creek
ARCO engineer Chuck Hutchens	Telephone no. (ARCO)	Telephone no. (Consultant) (206) 450-7726	Fax no. (Consultant) -8837
Consultant name Delta Environmental Consultants Inc	Address (Consultant) 1756 114th AVE SE #110 Bellevue		Contract number

Method of shipment: Courier

	Sample I.D.	Lab no.	Container no.	Matrix: Soil	Water	Other	Preservation: Ice	Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☒ Extended	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☒		
01	MW-8-2		1	X			Y		1/25/96	1235					B601406				-01				
02	MW-8-5		1	X			X			110		X	X						-02		X		
03	MW-8-7		1	X			X			130		X	X						-03				
04	MW-8-10		1	X			X			155									-04				
05	MW-8-12		1	X			Y			200									-05				
06	B-9-2		1	X			Y			330									-06				
07	B-9-5		1	X			Y			350		X	X						-07		X		
08	B-9-7		1	X			X			415		X	X	CONT ANALYZE - PK 2/6/96					-08				
09	B-9-10		1	X			X			420		X	X						-09				

Special detection Limit/reporting

Special QA/QC

Remarks: TPH-D Extended

Lab number

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler: Ron Bull	1-26-96	945	Received by: Paul Kalina - DELTA
Relinquished by	Date	Time	Received by: Mara G. NCA 1-26-96 12:48
Relinquished by	Date	Time	Received by laboratory / Date / Time

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APC-3292 (2-91)

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