

Date: March 6, 2001

ARCO QUARTERLY GROUNDWATER MONITORING REPORT - 1ST QUARTER 2001

01 MAR 26 10:17
RECEIVED

Facility No: 0855

Address: 4603 Ocean Beach Highway
Longview, Washington

ARCO Environmental Engineer: Mr. Chuck Hutchens

Consulting Co./Contact Person: SECOR International Incorporated/Scott Miller

Consultant Project No.: 015.08921.701

Primary Agency: Washington Department of Ecology (Ecology)

Ecology LUST File No: 5421 (Facility ID 300120)
513961 Fac. ID 509011

WORK PERFORMED 1ST QUARTER 2001:

1. Groundwater monitoring and sampling of wells MW-1 through MW-7 on January 18, 2001.

WORK PROPOSED FOR 2ND QUARTER 2001:

1. Quarterly groundwater monitoring and sampling.

Current Phase of Project: Groundwater monitoring

Is Free Product (FP) Present On-Site: No

FP Recovered this Quarter (gallons): Not applicable (NA)

Cumulative FP Recovered to Date (gallons): NA

Current Remediation Techniques: NA

Approximate Depth to Groundwater (feet below top of casing): 3.96 (MW-3) to 6.78 (MW-4).

Groundwater Gradient (direction): East

Groundwater Gradient (magnitude): 0.02 ft/ft

DISCUSSION:

Groundwater monitoring field activities conducted on January 18, 2001 included measuring the water levels and collecting groundwater samples from MW-1 through MW-7. The water samples collected from MW-1 through MW-7 were analyzed for volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method 8026B and total petroleum hydrocarbons in the gasoline range (TPH-G) by NWTPH-Gx.

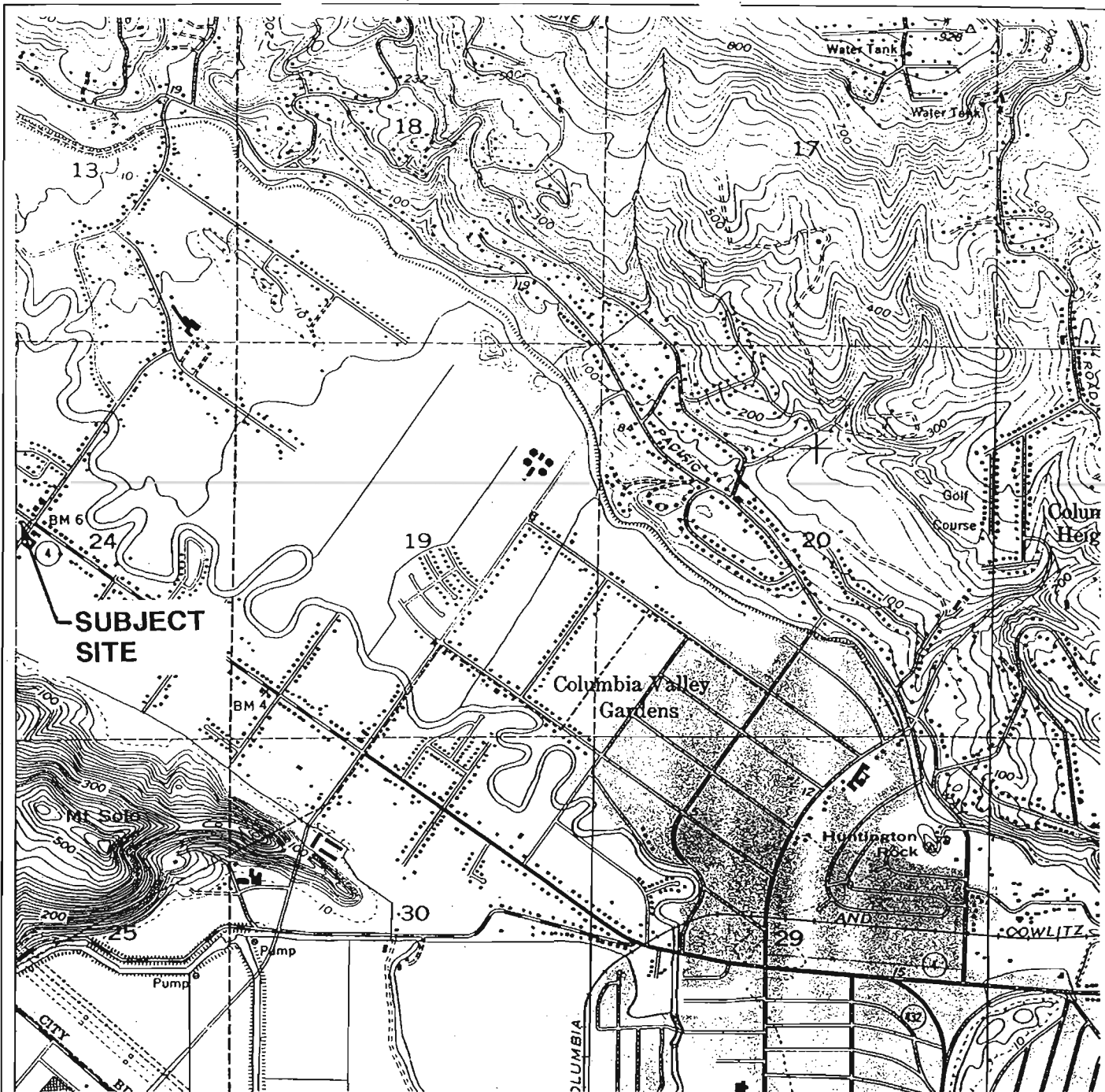
Benzene was detected at concentrations above the laboratory method reporting limit (MRL) in monitoring wells MW-3, and MW-4 at 9,380 micrograms per liter ($\mu\text{g/L}$), and 1,130 $\mu\text{g/L}$, respectively. TPH-G was detected above the laboratory MRL in seven wells at concentrations ranging from 95.6 $\mu\text{g/L}$ to 121,000 $\mu\text{g/L}$.

ATTACHMENTS:

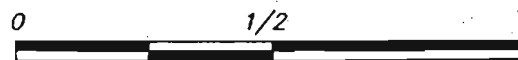
- Figure 1: Site Location Map
- Figure 2: Groundwater Contour and Groundwater Analytical Results Map
- Table 1: Historical Water Sample Analyses
- Table 2: Historical Water Level Elevations
- Laboratory Report and Chain of Custody
- Groundwater Sampling Field Data Sheets

cc: Ms. Patty Martin, Washington Department of Ecology, Olympia, Washington
✓ Mr. David McDowell, Attorney for Wakefield Trust, Vancouver, Washington

FIGURES



QUADRANGLE LOCATION



SCALE (MILES)

REFERENCE: USGS 7.5 MINUTE QUADRANGLE; KELSO, WASHINGTON; 1970

SECOR
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 015

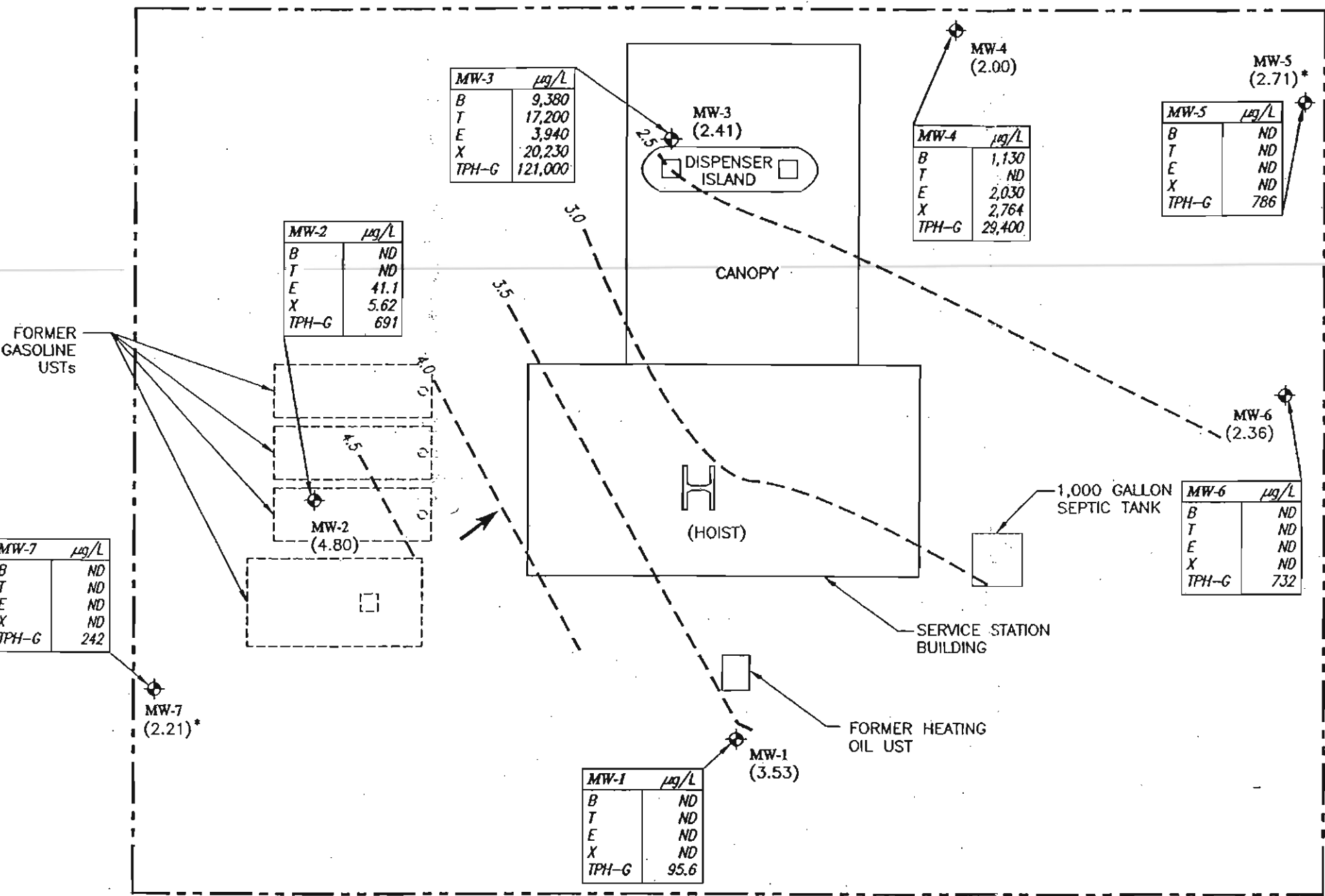
SITE LOCATION MAP
FORMER ARCO SERVICE STATION 0855
4803 OCEAN BEACH HIGHWAY
LONGVIEW, WASHINGTON

FIGURE:

1

JOB#: 015.08898.702 APPR: C.W.G. DWN: KPM DATE: 07/28/00

OCEAN BEACH HWY.



LEGEND

- SUBJECT PROPERTY LINE BOUNDARY
- MW-5 GROUNDWATER MONITORING WELL LOCATION
- INFERRED GROUNDWATER FLOW DIRECTION
- INFERRED GROUNDWATER ELEVATION CONTOUR (FEET)
- (3.70) RELATIVE GROUNDWATER ELEVATION (FEET)
- (NM) NOT MEASURED

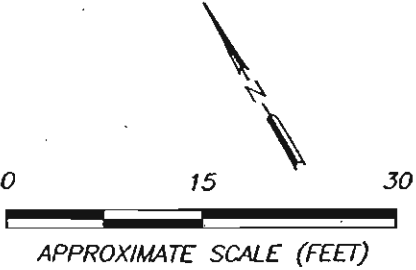
ANALYTE

B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	XYLENES
G	GASOLINE

(ND) NOT DETECTED AT OR ABOVE THE LABORATORY METHOD REPORTING LIMIT

NOTES

- CONTOUR INTERVAL = 0.5 FT
- * GROUNDWATER ELEVATION NOT USED TO GENERATE CONTOURS.
- GROUNDWATER ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL



NOTE: MONITORING WELL LOCATIONS AND CORNERS OF BUILDING SURVEYED APRIL 2000 BY GIBBS & OLSEN, INC. OF LONGVIEW, WASHINGTON.

SOURCE: MAP BASED ON ATLANTIC RICHFIELD "GENERAL ARRANGEMENT" DRAWING, NOVEMBER 30, 1966, 1/8"-1".

SECOR
International Incorporated
015

GROUNDWATER CONTOUR AND GROUNDWATER ANALYTICAL RESULTS MAP (01/18/01)
FORMER ARCO SERVICE STATION 0855
4603 OCEAN BEACH HIGHWAY
LONGVIEW, WASHINGTON

FIGURE:

2

JOB#: 015.08921.701 APPR: DWN: SES DATE: 3/14/01

N:\ARCO\WASHINGTON\08921\701\

DWG: 15-08921-701S-0101

TABLES

Table 1. Historical Water Sample Analyses
Former ARCO Station No. 0855
4603 Ocean Beach Highway, Longview, Washington

Well Number	Sample Date	BTEX (µg/L)				VOCs (µg/L)				TPH-G (µg/L)	TPH-D (µg/L)	TPH-O (µg/L)
		Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	EDB	EDC	MTBE			
MW-1	03/27/00	ND	ND	ND	ND	—	—	—	—	ND	ND	ND
	05/23/00	ND	ND	ND	ND	—	—	—	—	ND	—	—
	07/20/00	ND	ND	ND	ND	—	—	—	—	ND	—	—
	10/18/00	ND	ND	1.61	ND	—	—	—	—	404	—	—
	01/18/01	ND	ND	ND	ND	ND	ND	ND	ND	95.6	—	—
MW-2	03/27/00	6.89	49.5	599	2,490	—	—	—	—	17,100	ND	ND
	05/23/00	26.2	16.2	614	1,770	—	—	—	—	13,200	—	—
	07/20/00	11.9	11.8	304	330	—	—	—	—	7,220	—	—
	10/18/00	3.67	1.23	13.9	7.55	—	—	—	—	743	—	—
	01/18/01	ND	ND	41.1	5.62	ND	ND	ND	ND	691	—	—
MW-3	03/27/00	7,520	12,900	2,780	14,500	—	—	—	—	93,700	ND	ND
	05/23/00	4,710	8,330	2,280	11,200	—	—	—	—	65,200	—	—
	07/20/00	10,700	22,600	3,160	17,400	—	—	—	—	145,000	—	—
	10/18/00	12,900	33,000	4,890	26,700	—	—	—	—	179,000	—	—
	01/18/01	9,380	17,200	3,940	20,230	607	ND	155	ND	121,000	—	—
MW-4	11/15/00 ^a	1,310	53.6	2,430	7,250	—	—	—	—	45,500	—	—
	01/18/01	1,130	ND	2,030	2,764	331	ND	ND	ND	29,400	—	—
MW-5	11/15/00 ^a	ND	ND	ND	ND	—	—	—	—	ND	—	—
	01/18/01	ND	ND	ND	ND	2.44	ND	ND	ND	786	—	—
MW-6	11/15/00 ^a	ND	ND	ND	ND	—	—	—	—	131	—	—
	01/18/01	ND	ND	ND	ND	ND	ND	ND	ND	732	—	—

Table 1. Historical Water Sample Analyses
Former ARCO Station No. 0855
4603 Ocean Beach Highway, Longview, Washington

Well Number	Sample Date	BTEX (µg/L)				VOCs (µg/L)				TPH-G (µg/L)	TPH-D (µg/L)	TPH-O (µg/L)
		Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	EDB	EDC	MTBE			
MW-7	11/15/00 ^a 01/18/01	ND ND	ND ND	ND ND	1.35 ND	— ND	— ND	— ND	— ND	113 242	— —	— —
Current Laboratory MRLs		1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	80	—	—

ND or < = Less than laboratory method reporting limit (MRL).

— = Not sampled or not available.

Benzene, toluene, ethylbenzene, and total xylenes (BTEX) analysis by EPA Method 8021B.

VOCs analyzed by EPA Method 8062B.

EDB = 1,2-dibromoethane and EDC = 1,2-dichloroethane.

Total petroleum hydrocarbons-gasoline range (TPH-G) analysis by Method NWTPH-Gx.

TPH-diesel range (TPH-D) and TPH-oil range (TPH-O) analysis by Method NWTPH-Dx.

^a Monitoring wells MW-4 through MW-7 were installed on October 24 and sampled on November 15, 2000.

Note: Results in micrograms per liter (µg/L), or approximately parts per billion (ppb).

Table 2. Historical Water Level Elevations
Former ARCO Service Station No. 0855
4603 Ocean Beach Highway, Longview, Washington

Well Number/ TOC Elevation ^a (feet)	Date Measured	Static Water Level (feet BTOC) ^b	Floating Product Thickness (feet)	Groundwater Elevation (feet) ^c	Change in Water Level Elevation (feet)
MW-1 8.34	03/27/00	4.36	0.00	3.98	— ^d
	05/23/00	5.20	0.00	3.14	-0.84
	07/20/00	5.55	0.00	2.79	-0.35
	10/18/00	5.41	0.00	2.93	0.14
	01/18/01	4.81	0.00	3.53	0.60
MW-2 8.76	03/27/00	3.61	0.00	5.15	—
	05/23/00	4.64	0.00	4.12	-1.03
	07/20/00	5.06	0.00	3.70	-0.42
	10/18/00	5.19	0.00	3.57	-0.13
	01/18/01	3.96	0.00	4.80	1.23
MW-3 8.78	03/27/00	5.61	0.00	3.17	—
	05/23/00	6.46	0.00	2.32	-0.85
	07/20/00	7.05	0.00	1.73	-0.59
	10/18/00	6.84	0.00	1.94	0.21
	01/18/01	6.37	0.00	2.41	0.47
MW-4 8.78	11/15/00 ^e	6.88	0.00	1.90	—
	01/18/01	6.78	0.00	2.00	0.10
MW-5 8.78	11/15/00 ^e	6.54	0.00	2.24	—
	01/18/01	6.07	0.00	2.71	0.47
MW-6 8.21	11/15/00 ^e	6.15	0.00	2.06	—
	01/18/01	5.85	0.00	2.36	0.30
MW-7 8.45	11/15/00 ^e	6.52	0.00	1.93	—
	01/18/01	6.24	0.00	2.21	0.28

a Top of casing (TOC) elevations, NAVD, 1988

b Measurements in feet below top of well casing.

c Elevation relative to mean sea level. Static water level corrected if floating product thickness (FPT) is present; corrected water level elevation = TOC - Static Water Level + (FPT x 0.80).

d — = Data not applicable or not measured.

e Monitoring wells MW-4 through MW-7 were installed on October 24 and measured on November 15, 2000.

**LABORATORY REPORT AND
CHAIN OF CUSTODY**

Cor
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	PIA0548-01	Water	01/18/01 10:15	01/19/01 16:06
MW-2	PIA0548-02	Water	01/18/01 10:47	01/19/01 16:06
MW-3	PIA0548-03	Water	01/18/01 11:01	01/19/01 16:06
MW-4	PIA0548-04	Water	01/18/01 10:53	01/19/01 16:06
MW-5	PIA0548-05	Water	01/18/01 10:33	01/19/01 16:06
MW-6	PIA0548-06	Water	01/18/01 10:24	01/19/01 16:06
MW-7	PIA0548-07	Water	01/18/01 10:39	01/19/01 16:06

North Creek Analytical - Portland



Crystal Burkholder, Project Manager

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.382.9310 fax 541.382.7588

cor
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Gasoline Hydrocarbons per NW TPH-Gx Method
North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-1 (PIA0548-01) Water						Sampled: 01/18/01 Received: 01/19/01			
Gasoline Range Hydrocarbons	95.6	80.0	ug/l	1	NW TPH-Gx	01/22/01	01/22/01	1010598	
Surr: 4-BFB	96.6 %	50-150							
MW-2 (PIA0548-02) Water						Sampled: 01/18/01 Received: 01/19/01			
Gasoline Range Hydrocarbons	691	80.0	ug/l	1	NW TPH-Gx	01/22/01	01/22/01	1010598	
Surr: 4-BFB	78.2 %	50-150							
MW-3 (PIA0548-03RE1) Water -						Sampled: 01/18/01 Received: 01/19/01			
Gasoline Range Hydrocarbons	121000	8000	ug/l	100	NW TPH-Gx	01/23/01	01/23/01	1010636	
Surr: 4-BFB	128 %	50-150							
MW-4 (PIA0548-04) Water						Sampled: 01/18/01 Received: 01/19/01			
Gasoline Range Hydrocarbons	29400	800	ug/l	10	NW TPH-Gx	01/22/01	01/22/01	1010598	
Surr: 4-BFB	NR	50-150							S-02
MW-5 (PIA0548-05) Water						Sampled: 01/18/01 Received: 01/19/01			
Gasoline Range Hydrocarbons	786	80.0	ug/l	1	NW TPH-Gx	01/22/01	01/22/01	1010598	
Surr: 4-BFB	150 %	50-150							
MW-6 (PIA0548-06) Water						Sampled: 01/18/01 Received: 01/19/01			
Gasoline Range Hydrocarbons	732	80.0	ug/l	1	NW TPH-Gx	01/22/01	01/23/01	1010598	
Surr: 4-BFB	137 %	50-150							
MW-7 (PIA0548-07) Water						Sampled: 01/18/01 Received: 01/19/01			
Gasoline Range Hydrocarbons	242	80.0	ug/l	1	NW TPH-Gx	01/22/01	01/23/01	1010598	
Surr: 4-BFB	101 %	50-150							

North Creek Analytical - Portland

Crystal Burkholder, Project Manager

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Environmental Laboratory Network

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503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

For
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B
North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-1 (P1A0548-01) Water						Sampled: 01/18/01 Received: 01/19/01			
Acetone	ND	10.0	ug/l	1	EPA 8260B	01/24/01	01/24/01	1010689	
Benzene	ND	1.00	"	"	"	"	"	"	
Bromobenzene	ND	1.00	"	"	"	"	"	"	
Bromochloromethane	ND	1.00	"	"	"	"	"	"	
Bromodichloromethane	ND	1.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.00	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.00	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.00	"	"	"	"	"	"	
Chlorobenzene	ND	1.00	"	"	"	"	"	"	
Chloroethane	ND	1.00	"	"	"	"	"	"	
Chloroform	ND	1.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Dibromomethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	"	

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

3 of 25

Cor
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-1 (P1A0548-01) Water						Sampled: 01/18/01 Received: 01/19/01			
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	01/24/01	01/24/01	1010689	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Isopropylbenzene	ND	2.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	5.00	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	2.00	"	"	"	"	"	"	
n-Propylbenzene	ND	1.00	"	"	"	"	"	"	
Styrene	ND	1.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	ND	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
3-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.00	"	"	"	"	"	"	
Trichloroethene	ND	1.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	ND	1.00	"	"	"	"	"	"	
m,p-Xylene	ND	2.00	"	"	"	"	"	"	
Surr: 4-BFB	106 %	75-125							
Surr: 1,2-DCA-d4	104 %	75-125							
Surr: Dibromofluoromethane	102 %	75-125							
Surr: Toluene-d8	99.0 %	75-125							

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

 North Creek Analytical, Inc.
 Environmental Laboratory Network

4 of 25

for
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-2 (P1A0548-02RE1) Water						Sampled: 01/18/01 Received: 01/19/01			
Acetone	ND	20.0	ug/l	2	EPA 8260B	01/25/01	01/25/01	1010727	
Benzene	ND	2.00	"	"	"	"	"	"	
Bromobenzene	ND	2.00	"	"	"	"	"	"	
Bromochloromethane	ND	2.00	"	"	"	"	"	"	
Bromodichloromethane	ND	2.00	"	"	"	"	"	"	
Bromoform	ND	2.00	"	"	"	"	"	"	
Bromomethane	ND	10.0	"	"	"	"	"	"	
2-Butanone	ND	20.0	"	"	"	"	"	"	
n-Butylbenzene	ND	10.0	"	"	"	"	"	"	
sec-Butylbenzene	3.70	2.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	2.00	"	"	"	"	"	"	
Carbon disulfide	ND	20.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.00	"	"	"	"	"	"	
Chlorobenzene	ND	2.00	"	"	"	"	"	"	
Chloroethane	ND	2.00	"	"	"	"	"	"	
Chloroform	ND	2.00	"	"	"	"	"	"	
Chloromethane	ND	10.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	2.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	2.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	10.0	"	"	"	"	"	"	
Dibromochloromethane	ND	2.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	2.00	"	"	"	"	"	"	
Dibromomethane	ND	2.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	2.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	2.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	2.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	2.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	2.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	2.00	"	"	"	"	"	"	
Ethylbenzene	41.1	2.00	"	"	"	"	"	"	

North Creek Analytical - Portland

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.


 Crystal Burkholder, Project Manager

 North Creek Analytical, Inc.
 Environmental Laboratory Network

5 of 25

for
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-2 (P1A0548-02RE1) Water						Sampled: 01/18/01 Received: 01/19/01			
Hexachlorobutadiene	ND	4.00	ug/l	2	EPA 8260B	01/25/01	01/25/01	1010727	
2-Hexanone	ND	20.0	"	"	"	"	"	"	
Isopropylbenzene	5.88	4.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	4.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.00	"	"	"	"	"	"	
Methylene chloride	ND	10.0	"	"	"	"	"	"	
Naphthalene	ND	4.00	"	"	"	"	"	"	
n-Propylbenzene	13.5	2.00	"	"	"	"	"	"	
Styrene	ND	2.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	2.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.00	"	"	"	"	"	"	
Tetrachloroethene	ND	2.00	"	"	"	"	"	"	
Toluene	ND	2.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	2.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	2.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.00	"	"	"	"	"	"	
Trichloroethene	ND	2.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	2.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	23.0	2.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	2.02	2.00	"	"	"	"	"	"	
Vinyl chloride	ND	2.00	"	"	"	"	"	"	
o-Xylene	ND	2.00	"	"	"	"	"	"	
m,p-Xylene	5.62	4.00	"	"	"	"	"	"	
Surr: 4-BFB	109 %	75-125							
Surr: 1,2-DCA-d4	100 %	75-125							
Surr: Dibromofluoromethane	99.0 %	75-125							
Surr: Toluene-d8	98.0 %	75-125							

North Creek Analytical - Portland

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.


 Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
 Environmental Laboratory Network

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for
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-3 (P1A0548-03) Water						Sampled: 01/18/01 Received: 01/19/01			
Acetone	ND	1000	ug/l	100	EPA 8260B	01/24/01	01/24/01	1010689	
Benzene	9380	100	"	"	"	"	"	"	
Bromobenzene	ND	100	"	"	"	"	"	"	
Bromochloromethane	ND	100	"	"	"	"	"	"	
Bromodichloromethane	ND	100	"	"	"	"	"	"	
Bromoform	ND	100	"	"	"	"	"	"	
Bromomethane	ND	500	"	"	"	"	"	"	
2-Butanone	ND	1000	"	"	"	"	"	"	
n-Butylbenzene	ND	500	"	"	"	"	"	"	
sec-Butylbenzene	ND	100	"	"	"	"	"	"	
tert-Butylbenzene	ND	100	"	"	"	"	"	"	
Carbon disulfide	ND	1000	"	"	"	"	"	"	
Carbon tetrachloride	ND	100	"	"	"	"	"	"	
Chlorobenzene	ND	100	"	"	"	"	"	"	
Chloroethane	ND	100	"	"	"	"	"	"	
Chloroform	ND	100	"	"	"	"	"	"	
Chloromethane	ND	500	"	"	"	"	"	"	
2-Chlorotoluene	ND	100	"	"	"	"	"	"	
4-Chlorotoluene	ND	100	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	500	"	"	"	"	"	"	
Dibromochloromethane	ND	100	"	"	"	"	"	"	
1,2-Dibromoethane	ND	100	"	"	"	"	"	"	
Dibromomethane	ND	100	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	100	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	100	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	100	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	500	"	"	"	"	"	"	
1,1-Dichloroethane	ND	100	"	"	"	"	"	"	
1,2-Dichloroethane	155	100	"	"	"	"	"	"	
1,1-Dichloroethene	ND	100	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	100	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	100	"	"	"	"	"	"	
1,2-Dichloropropane	ND	100	"	"	"	"	"	"	
1,3-Dichloropropane	ND	100	"	"	"	"	"	"	
2,2-Dichloropropane	ND	100	"	"	"	"	"	"	
1,1-Dichloropropene	ND	100	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	100	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	100	"	"	"	"	"	"	
Ethylbenzene	3940	100	"	"	"	"	"	"	

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

 North Creek Analytical, Inc.
 Environmental Laboratory Network

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cor
 P.O. Box 1508
 Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-3 (PIA0548-03) Water						Sampled: 01/18/01 Received: 01/19/01			
Hexachlorobutadiene	ND	200	ug/l	100	EPA 8260B	01/24/01	01/24/01	1010689	
2-Hexanone	ND	1000	"	"	"	"	"	"	
Isopropylbenzene	203	200	"	"	"	"	"	"	
p-Isopropyltoluene	ND	200	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	500	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	100	"	"	"	"	"	"	
Methylene chloride	ND	500	"	"	"	"	"	"	
Naphthalene	607	200	"	"	"	"	"	"	
n-Propylbenzene	625	100	"	"	"	"	"	"	
Styrene	ND	100	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	100	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	100	"	"	"	"	"	"	
Tetrachloroethene	ND	100	"	"	"	"	"	"	
Toluene	17200	100	"	"	"	"	"	"	
1,3-Trichlorobenzene	ND	100	"	"	"	"	"	"	
1,2-Trichlorobenzene	ND	100	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	100	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	100	"	"	"	"	"	"	
Trichloroethene	ND	100	"	"	"	"	"	"	
Trichlorofluoromethane	ND	100	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	100	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	4550	100	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	1140	100	"	"	"	"	"	"	
Vinyl chloride	ND	100	"	"	"	"	"	"	
o-Xylene	5930	100	"	"	"	"	"	"	
m,p-Xylene	14300	200	"	"	"	"	"	"	
Surr: 4-BFB	105 %	75-125							
Surr: 1,2-DCA-d4	104 %	75-125							
Surr: Dibromofluoromethane	103 %	75-125							
Surr: Toluene-d8	101 %	75-125							

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
 Environmental Laboratory Network

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Seattle 117 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8223
425.486.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

for
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B
North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-4 (P1A0548-04) Water						Sampled: 01/18/01 Received: 01/19/01			
Acetone	ND	500	ug/l	50	EPA 8260B	01/24/01	01/24/01	1010689	
Benzene	1130	50.0	"	"	"	"	"	"	
Bromobenzene	ND	50.0	"	"	"	"	"	"	
Bromochloromethane	ND	50.0	"	"	"	"	"	"	
Bromodichloromethane	ND	50.0	"	"	"	"	"	"	
Bromoform	ND	50.0	"	"	"	"	"	"	
Bromomethane	ND	250	"	"	"	"	"	"	
2-Butanone	ND	500	"	"	"	"	"	"	
n-Butylbenzene	ND	250	"	"	"	"	"	"	
sec-Butylbenzene	ND	50.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	50.0	"	"	"	"	"	"	
Carbon disulfide	ND	500	"	"	"	"	"	"	
Carbon tetrachloride	ND	50.0	"	"	"	"	"	"	
Chlorobenzene	ND	50.0	"	"	"	"	"	"	
Chloroethane	ND	50.0	"	"	"	"	"	"	
Chloroform	ND	50.0	"	"	"	"	"	"	
Chloromethane	ND	250	"	"	"	"	"	"	
2-Chlorotoluene	ND	50.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	50.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	250	"	"	"	"	"	"	
Dibromochloromethane	ND	50.0	"	"	"	"	"	"	
1,2-Dibromoethane	ND	50.0	"	"	"	"	"	"	
Dibromomethane	ND	50.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	50.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	50.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	50.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	250	"	"	"	"	"	"	
1,1-Dichloroethane	ND	50.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	50.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	50.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	50.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	50.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	50.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	50.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	50.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	50.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	50.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	50.0	"	"	"	"	"	"	
Ethylbenzene	2030	50.0	"	"	"	"	"	"	

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

9 of 25



Seattle 11 11th Creek Pkwy N, Suite 400, Bothell, WA 98011-8223
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
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503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F 1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

for
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B
North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-4 (P1A0548-04) Water						Sampled: 01/18/01 Received: 01/19/01			
Hexachlorobutadiene	ND	100	ug/l	50	EPA 8260B	01/24/01	01/24/01	1010689	
2-Hexanone	ND	500	"	"	"	"	"	"	
Isopropylbenzene	213	100	"	"	"	"	"	"	
p-Isopropyltoluene	ND	100	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	250	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	250	"	"	"	"	"	"	
Naphthalene	331	100	"	"	"	"	"	"	
n-Propylbenzene	576	50.0	"	"	"	"	"	"	
Styrene	ND	50.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	50.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	50.0	"	"	"	"	"	"	
Tetrachloroethene	ND	50.0	"	"	"	"	"	"	
Toluene	ND	50.0	"	"	"	"	"	"	
1,3-Trichlorobenzene	ND	50.0	"	"	"	"	"	"	
1-Trichlorobenzene	ND	50.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	50.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	50.0	"	"	"	"	"	"	
Trichloroethene	ND	50.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	50.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	50.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	2170	50.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	414	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	50.0	"	"	"	"	"	"	
o-Xylene	184	50.0	"	"	"	"	"	"	
m,p-Xylene	2580	100	"	"	"	"	"	"	
Surr: 4-BFB	105 %	75-125							
Surr: 1,2-DCA-d4	104 %	75-125							
Surr: Dibromofluoromethane	99.5 %	75-125							
Surr: Toluene-d8	103 %	75-125							

North Creek Analytical - Portland

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.


Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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for
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

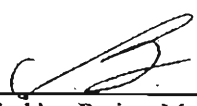
Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-5 (PIA0548-05) Water						Sampled: 01/18/01 Received: 01/19/01			
Acetone	ND	10.0	ug/l	1	EPA 8260B	01/24/01	01/24/01	1010689	
Benzene	ND	1.00	"	"	"	"	"	"	
Bromobenzene	ND	1.00	"	"	"	"	"	"	
Bromochloromethane	ND	1.00	"	"	"	"	"	"	
Bromodichloromethane	ND	1.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.00	"	"	"	"	"	"	
sec-Butylbenzene	1.48	1.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.00	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.00	"	"	"	"	"	"	
Chlorobenzene	ND	1.00	"	"	"	"	"	"	
Chloroethane	ND	1.00	"	"	"	"	"	"	
Chloroform	ND	1.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Dibromomethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	"	

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

 North Creek Analytical, Inc.
 Environmental Laboratory Network

11 of 25

for
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-5 (P1A0548-05) Water						Sampled: 01/18/01 Received: 01/19/01			
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	01/24/01	01/24/01	1010689	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Isopropylbenzene	9.63	2.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	5.00	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
Naphthalene	2.44	2.00	"	"	"	"	"	"	
n-Propylbenzene	14.3	1.00	"	"	"	"	"	"	
Styrene	ND	1.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	ND	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.00	"	"	"	"	"	"	
Trichloroethene	ND	1.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	ND	1.00	"	"	"	"	"	"	
m,p-Xylene	ND	2.00	"	"	"	"	"	"	
Surr: 4-BFB	104 %	75-125							
Surr: 1,2-DCA-d4	106 %	75-125							
Surr: Dibromofluoromethane	104 %	75-125							
Surr: Toluene-d8	104 %	75-125							

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

12 of 25

For
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-6 (PIA0548-06) Water						Sampled: 01/18/01 Received: 01/19/01			
Acetone	ND	10.0	ug/l	1	EPA 8260B	01/24/01	01/24/01	1010689	
Benzene	ND	1.00	"	"	"	"	"	"	
Bromobenzene	ND	1.00	"	"	"	"	"	"	
Bromochloromethane	ND	1.00	"	"	"	"	"	"	
Bromodichloromethane	ND	1.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.00	"	"	"	"	"	"	
sec-Butylbenzene	3.81	1.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.00	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.00	"	"	"	"	"	"	
Chlorobenzene	ND	1.00	"	"	"	"	"	"	
Chloroethane	ND	1.00	"	"	"	"	"	"	
Chloroform	ND	1.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Dibromomethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	"	

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

 North Creek Analytical, Inc.
 Environmental Laboratory Network

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Cor
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-6 (PIA0548-06) Water						Sampled: 01/18/01 Received: 01/19/01			
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	01/24/01	01/24/01	1010689	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Isopropylbenzene	4.72	2.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	5.00	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	2.00	"	"	"	"	"	"	
n-Propylbenzene	2.37	1.00	"	"	"	"	"	"	
Styrene	ND	1.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	ND	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
3-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.00	"	"	"	"	"	"	
Trichloroethene	ND	1.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	ND	1.00	"	"	"	"	"	"	
m,p-Xylene	ND	2.00	"	"	"	"	"	"	
Surr: 4-BFB	106 %	75-125							
Surr: 1,2-DCA-d4	104 %	75-125							
Surr: Dibromofluoromethane	101 %	75-125							
Surr: Toluene-d8	102 %	75-125							

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

 North Creek Analytical, Inc.
 Environmental Laboratory Network

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for
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

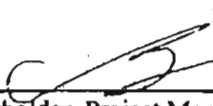
Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-7 (PIA0548-07) Water						Sampled: 01/18/01 Received: 01/19/01			
Acetone	ND	10.0	ug/l	1	EPA 8260B	01/24/01	01/24/01	1010689	
Benzene	ND	1.00	"	"	"	"	"	"	
Bromobenzene	ND	1.00	"	"	"	"	"	"	
Bromochloromethane	ND	1.00	"	"	"	"	"	"	
Bromodichloromethane	ND	1.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.00	"	"	"	"	"	"	
sec-Butylbenzene	1.48	1.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.00	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.00	"	"	"	"	"	"	
Chlorobenzene	ND	1.00	"	"	"	"	"	"	
Chloroethane	ND	1.00	"	"	"	"	"	"	
Chloroform	ND	1.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Dibromomethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	ND	1.00	"	"	"	"	"	"	

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

 North Creek Analytical, Inc.
 Environmental Laboratory Network

15 of 25

for
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
MW-7 (PIA0548-07) Water						Sampled: 01/18/01 Received: 01/19/01			
Hexachlorobutadiene	ND	2.00	ug/l	1	EPA 8260B	01/24/01	01/24/01	1010689	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Isopropylbenzene	2.78	2.00	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	5.00	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	2.00	"	"	"	"	"	"	
n-Propylbenzene	3.36	1.00	"	"	"	"	"	"	
Styrene	ND	1.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	ND	1.00	"	"	"	"	"	"	
Toluene	ND	1.00	"	"	"	"	"	"	
1,3-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,2-Trichlorobenzene	ND	1.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.00	"	"	"	"	"	"	
Trichloroethene	ND	1.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	ND	1.00	"	"	"	"	"	"	
m,p-Xylene	ND	2.00	"	"	"	"	"	"	
Surr: 4-BFB	105 %	75-125							
Surr: 1,2-DCA-d4	104 %	75-125							
Surr: Dibromofluoromethane	101 %	75-125							
Surr: Toluene-d8	102 %	75-125							

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

 North Creek Analytical, Inc.
 Environmental Laboratory Network

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Seattle 111 North Creek Pkwy N, Suite 400, Bellingham, WA 98011-8223
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

For
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Gasoline Hydrocarbons per NW TPH-Gx Method - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1010598 - EPA 5030B

Blank (1010598-BLK1)

Prepared & Analyzed: 01/22/01

Gasoline Range Hydrocarbons	ND	80.0	ug/l							
Surr: 4-BFB	52.5		"	50.0		105	50-150			

LCS (1010598-BS1)

Prepared & Analyzed: 01/22/01

Gasoline Range Hydrocarbons	1320	80.0	ug/l	1250		106	70-120			
Surr: 4-BFB	60.3		"	50.0		121	50-150			

Duplicate (1010598-DUP1)

Source: P1A0548-01

Prepared & Analyzed: 01/22/01

Gasoline Range Hydrocarbons	110	80.0	ug/l		95.6			14.0	50	
Surr: 4-BFB	46.7		"	50.0		93.4	50-150			

Duplicate (1010598-DUP2)

Source: P1A0548-02

Prepared & Analyzed: 01/22/01

Gasoline Range Hydrocarbons	1180	80.0	ug/l		691			52.3	50	Q-01
Surr: 4-BFB	64.1		"	50.0		128	50-150			

Batch 1010636 - EPA 5030B

Blank (1010636-BLK1)

Prepared & Analyzed: 01/23/01

Gasoline Range Hydrocarbons	ND	80.0	ug/l							
Surr: 4-BFB	49.0		"	50.0		98.0	50-150			

LCS (1010636-BS1)

Prepared & Analyzed: 01/23/01

Gasoline Range Hydrocarbons	1270	80.0	ug/l	1250		102	70-120			
Surr: 4-BFB	57.8		"	50.0		116	50-150			

LCS (1010636-BS2)

Prepared & Analyzed: 01/23/01

Gasoline Range Hydrocarbons	323	80.0	ug/l				70-120			
Surr: 4-BFB	50.5		"	50.0		101	50-150			

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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Seattle 111 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8223
425-420-9200 fax 425-420-9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

for
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Gasoline Hydrocarbons per NW-TPH-Gx Method - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1010636 - EPA 5030B

Duplicate (1010636-DUP1)

Source: P1A0572-01

Prepared & Analyzed: 01/23/01

Gasoline Range Hydrocarbons	ND	80.0	ug/l		ND				50	
Surr: 4-BFB	48.0		"	50.0		96.0	50-150			

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
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Seattle 117 North Creek Pkwy N, Suite 400, Bothell, WA 98011-3223
425.425.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite 8, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

for
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 1010689 - EPA 5030B

Blank (1010689-BLK1)

Prepared & Analyzed: 01/24/01

Acetone	ND	10.0	ug/l
Benzene	ND	1.00	"
Bromobenzene	ND	1.00	"
Bromochloromethane	ND	1.00	"
Bromodichloromethane	ND	1.00	"
Bromoform	ND	1.00	"
Bromomethane	ND	5.00	"
2-Butanone	ND	10.0	"
n-Butylbenzene	ND	5.00	"
sec-Butylbenzene	ND	1.00	"
tert-Butylbenzene	ND	1.00	"
Carbon disulfide	ND	10.0	"
Carbon tetrachloride	ND	1.00	"
Chlorobenzene	ND	1.00	"
Chloroethane	ND	1.00	"
Chloroform	ND	1.00	"
Chloromethane	ND	5.00	"
2-Chlorotoluene	ND	1.00	"
4-Chlorotoluene	ND	1.00	"
1,2-Dibromo-3-chloropropane	ND	5.00	"
Dibromochloromethane	ND	1.00	"
1,2-Dibromoethane	ND	1.00	"
Dibromomethane	ND	1.00	"
1,2-Dichlorobenzene	ND	1.00	"
1,3-Dichlorobenzene	ND	1.00	"
1,4-Dichlorobenzene	ND	1.00	"
Dichlorodifluoromethane	ND	5.00	"
1,1-Dichloroethane	ND	1.00	"
1,2-Dichloroethane	ND	1.00	"
1,1-Dichloroethene	ND	1.00	"
cis-1,2-Dichloroethene	ND	1.00	"
trans-1,2-Dichloroethene	ND	1.00	"
1,2-Dichloropropane	ND	1.00	"
1,3-Dichloropropane	ND	1.00	"
2,2-Dichloropropane	ND	1.00	"
1,1-Dichloropropene	ND	1.00	"

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

for
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch 1010689 - EPA 5030B

Blank (1010689-BLK1)

Prepared & Analyzed: 01/24/01

cis-1,3-Dichloropropene	ND	1.00	ug/l
trans-1,3-Dichloropropene	ND	1.00	"
Ethylbenzene	ND	1.00	"
Hexachlorobutadiene	ND	2.00	"
2-Hexanone	ND	10.0	"
Isopropylbenzene	ND	2.00	"
p-Isopropyltoluene	ND	2.00	"
4-Methyl-2-pentanone	ND	5.00	"
Methyl tert-butyl ether	ND	1.00	"
Methylene chloride	ND	5.00	"
Naphthalene	ND	2.00	"
n-Propylbenzene	ND	1.00	"
Styrene	ND	1.00	"
1,2-Dichloroethane	ND	1.00	"
1,1,2,2-Tetrachloroethane	ND	1.00	"
Tetrachloroethene	ND	1.00	"
Toluene	ND	1.00	"
1,2,3-Trichlorobenzene	ND	1.00	"
1,2,4-Trichlorobenzene	ND	1.00	"
1,1,1-Trichloroethane	ND	1.00	"
1,1,2-Trichloroethane	ND	1.00	"
Trichloroethene	ND	1.00	"
Trichlorofluoromethane	ND	1.00	"
1,2,3-Trichloropropane	ND	1.00	"
1,2,4-Trimethylbenzene	ND	1.00	"
1,3,5-Trimethylbenzene	ND	1.00	"
Vinyl chloride	ND	1.00	"
o-Xylene	ND	1.00	"
m,p-Xylene	ND	2.00	"

Surr: 4-BFB	20.5	"	20.0	103	75-125
Surr: 1,2-DCA-d4	20.5	"	20.0	103	75-125
Surr: Dibromofluoromethane	20.1	"	20.0	101	75-125
Surr: Toluene-d8	20.4	"	20.0	102	75-125

North Creek Analytical - Portland

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Environmental Laboratory Network

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541.383.9310 fax 541.382.7588

For
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1010689 - EPA 5030B

LCS (1010689-BS1)

Prepared & Analyzed: 01/24/01

Benzene	20.6	1.00	ug/l	20.0		103	80-125			
Chlorobenzene	20.2	1.00	"	20.0		101	80-125			
1,1-Dichloroethene	21.5	1.00	"	20.0		108	70-135			
Toluene	19.6	1.00	"	20.0		98.0	80-125			
Trichloroethene	19.1	1.00	"	20.0		95.5	70-130			
Surr: 4-BFB	21.5		"	20.0		108	75-125			
Surr: 1,2-DCA-d4	20.7		"	20.0		104	75-125			
Surr: Dibromofluoromethane	20.0		"	20.0		100	75-125			
Surr: Toluene-d8	19.7		"	20.0		98.5	75-125			

LCS Dup (1010689-BSD1)

Prepared & Analyzed: 01/24/01

Benzene	20.8	1.00	ug/l	20.0		104	80-125	0.966	25	
Chlorobenzene	21.1	1.00	"	20.0		106	80-125	4.36	25	
1,1-Dichloroethene	21.3	1.00	"	20.0		106	70-135	0.935	25	
Toluene	20.9	1.00	"	20.0		104	80-125	6.42	25	
Trichloroethene	19.1	1.00	"	20.0		95.5	70-130	0	25	
Surr: 4-BFB	21.0		"	20.0		105	75-125			
Surr: 1,2-DCA-d4	20.7		"	20.0		104	75-125			
Surr: Dibromofluoromethane	19.9		"	20.0		99.5	75-125			
Surr: Toluene-d8	20.3		"	20.0		101	75-125			

Batch 1010727 - EPA 5030B

Blank (1010727-BLK1)

Prepared & Analyzed: 01/25/01

Acetone	ND	10.0	ug/l							
Benzene	ND	1.00	"							
Bromobenzene	ND	1.00	"							
Bromochloromethane	ND	1.00	"							
Bromodichloromethane	ND	1.00	"							
Bromoform	ND	1.00	"							
Bromomethane	ND	5.00	"							
2-Butanone	ND	10.0	"							
n-Butylbenzene	ND	5.00	"							
sec-Butylbenzene	ND	1.00	"							
tert-Butylbenzene	ND	1.00	"							
Carbon disulfide	ND	10.0	"							

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

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Environmental Laboratory Network

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cor
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1010727 - EPA 5030B

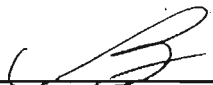
Blank (1010727-BLK1)

Prepared & Analyzed: 01/25/01

Carbon tetrachloride	ND	1.00	ug/l
Chlorobenzene	ND	1.00	"
Chloroethane	ND	1.00	"
Chloroform	ND	1.00	"
Chloromethane	ND	5.00	"
2-Chlorotoluene	ND	1.00	"
4-Chlorotoluene	ND	1.00	"
1,2-Dibromo-3-chloropropane	ND	5.00	"
Dibromochloromethane	ND	1.00	"
1,2-Dibromoethane	ND	1.00	"
Dibromomethane	ND	1.00	"
1,2-Dichlorobenzene	ND	1.00	"
1,3-Dichlorobenzene	ND	1.00	"
1,4-Dichlorobenzene	ND	1.00	"
1,1,1-Trichloroethane	ND	5.00	"
1,1-Dichloroethane	ND	1.00	"
1,2-Dichloroethane	ND	1.00	"
1,1-Dichloroethene	ND	1.00	"
cis-1,2-Dichloroethene	ND	1.00	"
trans-1,2-Dichloroethene	ND	1.00	"
1,2-Dichloropropane	ND	1.00	"
1,3-Dichloropropane	ND	1.00	"
2,2-Dichloropropane	ND	1.00	"
1,1-Dichloropropene	ND	1.00	"
cis-1,3-Dichloropropene	ND	1.00	"
trans-1,3-Dichloropropene	ND	1.00	"
Ethylbenzene	ND	1.00	"
Hexachlorobutadiene	ND	2.00	"
2-Hexanone	ND	10.0	"
Isopropylbenzene	ND	2.00	"
p-Isopropyltoluene	ND	2.00	"
4-Methyl-2-pentanone	ND	5.00	"
Methyl tert-butyl ether	ND	1.00	"
Methylene chloride	ND	5.00	"
Naphthalene	ND	2.00	"
n-Propylbenzene	ND	1.00	"

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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for
 P.O. Box 1508
 Tualatin, OR 97062

 Project: ARCO #0855, Longview, WA
 Project Number: 015.08921
 Project Manager: Scott Miller

 Reported:
 01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B - Quality Control
North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1010727 - EPA 5030B
Blank (1010727-BLK1)

Prepared & Analyzed: 01/25/01

Styrene	ND	1.00	ug/l							
1,1,1,2-Tetrachloroethane	ND	1.00	"							
1,1,2,2-Tetrachloroethane	ND	1.00	"							
Tetrachloroethene	ND	1.00	"							
Toluene	ND	1.00	"							
1,2,3-Trichlorobenzene	ND	1.00	"							
1,2,4-Trichlorobenzene	ND	1.00	"							
1,1,1-Trichloroethane	ND	1.00	"							
1,1,2-Trichloroethane	ND	1.00	"							
Trichloroethene	ND	1.00	"							
Trichlorofluoromethane	ND	1.00	"							
1,2,3-Trichloropropane	ND	1.00	"							
1,3,5-Trimethylbenzene	ND	1.00	"							
1,3,5-Trimethylbenzene	ND	1.00	"							
Vinyl chloride	ND	1.00	"							
o-Xylene	ND	1.00	"							
m,p-Xylene	ND	2.00	"							
Surr: 4-BFB	21.8		"	20.0		109	75-125			
Surr: 1,2-DCA-d4	19.9		"	20.0		99.5	75-125			
Surr: Dibromofluoromethane	19.3		"	20.0		96.5	75-125			
Surr: Toluene-d8	19.2		"	20.0		96.0	75-125			

LCS (1010727-BS1)

Prepared & Analyzed: 01/25/01

Benzene	20.4	1.00	ug/l	20.0		102	80-125			
Chlorobenzene	20.7	1.00	"	20.0		104	80-125			
1,1-Dichloroethene	20.9	1.00	"	20.0		104	70-135			
Toluene	20.4	1.00	"	20.0		102	80-125			
Trichloroethene	18.7	1.00	"	20.0		93.5	70-130			
Surr: 4-BFB	21.3		"	20.0		106	75-125			
Surr: 1,2-DCA-d4	20.3		"	20.0		101	75-125			
Surr: Dibromofluoromethane	19.6		"	20.0		98.0	75-125			
Surr: Toluene-d8	19.9		"	20.0		99.5	75-125			

North Creek Analytical - Portland

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 Crystal Burkholder, Project Manager

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 Environmental Laboratory Network

23 of 25



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for
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Volatile Organic Compounds per EPA Method 8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	----------------	-----	--------------	-------

Batch 1010727 - EPA 5030B

LCS Dup (1010727-BSDI)

Prepared & Analyzed: 01/25/01

Benzene	20.2	1.00	ug/l	20.0	101	80-125	0.985	25	
Chlorobenzene	20.7	1.00	"	20.0	104	80-125	0	25	
1,1-Dichloroethene	20.9	1.00	"	20.0	104	70-135	0	25	
Toluene	20.2	1.00	"	20.0	101	80-125	0.985	25	
Trichloroethene	18.6	1.00	"	20.0	93.0	70-130	0.536	25	
Surr: 4-BFB	21.4		"	20.0	107	75-125			
Surr: 1,2-DCA-d4	20.0		"	20.0	100	75-125			
Surr: Dibromofluoromethane	19.2		"	20.0	96.0	75-125			
Surr: Toluene-d8	19.7		"	20.0	98.5	75-125			

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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for
P.O. Box 1508
Tualatin, OR 97062

Project: ARCO #0855, Longview, WA
Project Number: 015.08921
Project Manager: Scott Miller

Reported:
01/29/01 17:16

Notes and Definitions

- Q-01 The spike recovery, and/or RPD, for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
- S-02 The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
- wet Sample results reported on a wet weight basis
- RPD Relative Percent Difference

North Creek Analytical - Portland

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Crystal Burkholder, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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ARCO Proj		Company		Work Authorizer		Chain of Custody		Page of	
ARCO Facility no.		00855-QGWM		City, State (Facility)		Project Manager (Consultant)		Laboratory	
ARCO Engineer		Chuck Hutchens		Longview, Washington		Scott Miller		Northcreek Analytical	
Consultant Company		SECOR International, Inc		ARCO Telephone No.		Telephone No. (Consultant)		Method of Shipment	
				(425) 485-8792		(503) 691-2030		Laboratory Courier	
				Consultant Address		Fax No. (Consultant)		Special Detection Limit/Reporting	
				7730 SW Mohawk St, Portland, Oregon 97062		(503) 692-7074			
Sample I.D.	Lab Sample No.	No. of Containers	Matrix	Prsv.	Sampling Date	Sampling Time	EPA 8260	HOLD (see remarks)	Turn Around Time (business days)
MW-1		3	Soil		1/18/01	1015	X		10
MW-2		3	Water	Yes		1047	X		10
MW-3		3	Air			1101	X		10
MW-4		3	Other			1053	X		10
MW-5		3	Water	Yes		1033	X		10
MW-6		3	Air			1024	X		10
MW-7		3	Other			1039	X		10
TD		1	Soil	Yes			X		10
REMARKS									
Special QA/QC									
Sub'd COC Attached:									
Temperature received: Ice No Ice									
Sample Received Intact: Yes No									
Relinquished by: <i>Joseph A. C. Shaw</i>									
Relinquished by: <i>Mr. A. P. Shaw</i>									
Relinquished by: <i>Mr. A. P. Shaw</i>									
Received by (Sign & Print Name)									
Received by: <i>Barclay Chandler</i>									
Received by: <i>Rachel Arriola</i>									
Received by laboratory: <i>N/A</i>									
Lab Work No. <i>P1A2348</i>									
Rev. 11/20/00									

**GROUNDWATER SAMPLING
FIELD DATA SHEETS**

FCOR

7730 MOHAWK ST

TUALATIN, OREGON 97062

GROUNDWATER LEVEL DATA

PROJECT: QGWM

SITE: ARCO Facility 0855

PROJECT #: ~~015-08698-050~~

05012680-310

CLIENT: ARCO

RECORDED BY:

MEASURING DEVICE:

DTW End.

SITE LOCATION: 4603 Ocean Beach Hwy, Longview, Washington

[illegible]

* All measurements from top of PVC casing unless noted.

SECOR GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015-08921.050 ~~015-08608.050~~ DATE: 1/18/01 WELL NO. MW/
 FACILITY NAME: Arco 0855, Longview, Washington TEMPERATURE: 40 °F or °C
 FIELD PERSONNEL: JE WEATHER: overcast

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 4.81 FT.
 B. Thickness of Free Product, if present: _____ Inches _____ FT.
 C. Total Depth of well (TD) from top of casing/piezometer: _____ FT.
 D. Height of Water Column in casing ($h = TD - SWL$): _____ FT.
 E. Casing Size (in.): _____
 F. Calculated Purge Volume (3 Well Volumes): _____ gal

PURGING METHOD: MP DURATION: —

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:	_____	_____	_____	_____	_____	_____	_____	_____
2nd Volume:	_____	_____	_____	_____	_____	_____	_____	_____
3rd Volume:	<u>No purge sampling</u>							
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____

PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

AMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>MW1-0855</u>	<u>10:15</u>	<u>3x 40ml NDA</u>	<u>HCL</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

COMMENTS:

Casing Capacities:

2-inch hole.....0.16 gal/lin ft.
 4-inch hole.....0.65 gal/lin ft.
 6.5-inch hole.....1.70 gal/lin ft.
 8-inch hole.....2.60 gal/lin ft.
 10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____
 Original Water Column: _____ x 0.80 = -- ()
 Collect sample when Depth to Water measures
Less than or equal to: _____

Signature: _____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015-08921-050 DATE: 1/18/01 WELL NO. MW2
FACILITY NAME: Arco 0855 TEMPERATURE: 40 °F or °C
FIELD PERSONNEL: JK WEATHER: overcast

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 3.96 FT. or IN.
B. Thickness of Free Product, if present: _____ Inches
C. Total Depth of well (TD) from top of casing/piezometer: _____ FT. or IN.
D. Height of Water Column in casing ($h = TD - SWL$): _____ FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water	=	_____ PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water	=	_____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water	=	_____ PV (gallons)

PURGING METHOD: _____ DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:	_____	_____	_____	_____	_____	_____	_____	_____
2nd Volume:	_____	<u>No</u>	<u>purge sampling</u>	_____	_____	_____	_____	_____
3rd Volume:	_____	_____	_____	_____	_____	_____	_____	_____
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____
PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>MW2-0855</u>	<u>1647</u>	<u>3x40ml VOA</u>	<u>H₂O</u>

COMMENTS:

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____
Original Water Column: _____ x 0.80 = ---(---)
Collect sample when Depth to Water measures
Less than or equal to: _____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.08921.050 DATE: 1/10/01 WELL NO. MW 3
 FACILITY NAME: AVID 0655 TEMPERATURE: 40 °F or °C
 FIELD PERSONNEL: JK WEATHER: overcast

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 6137 FT. or IN.
 B. Thickness of Free Product, if present: _____ Inches
 C. Total Depth of well (TD) from top of casing/piezometer: _____ FT. or IN.
 D. Height of Water Column in casing ($h = TD - SWL$): _____ FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.				
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water	=	_____	PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water	=	_____	PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water	=	_____	PV (gallons)

PURGING METHOD: _____ DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:	_____	_____	_____	_____	_____	_____	_____	_____
2nd Volume:	_____	<u>No purge sampling</u>				_____	_____	_____
3rd Volume:	_____	_____	_____	_____	_____	_____	_____	_____
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____
 PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>MW3-0555</u>	<u>1101</u>	<u>3x40-ml VOA</u>	<u>HCl</u>

COMMENTS: Strong odor, light sheen

Casing Capacities:
 2-inch hole.....0.16 gal/in ft.
 4-inch hole.....0.65 gal/in ft.
 6.5-inch hole.....1.70 gal/in ft.
 8-inch hole.....2.60 gal/in ft.
 10-inch hole.....4.10 gal/in ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____
 Original Water Column: _____ x 0.80 = ---
 Collect sample when Depth to Water measures
 Less than or equal to: _____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015-08921 DATE: 1/18/01 WELL NO. MW4
 FACILITY NAME: Arco 0855 TEMPERATURE: 40 (°F) or °C
 FIELD PERSONNEL: JE WEATHER: overcast

FIELD MEASUREMENTS:

- A. Static Water Level (SWL) below top of casing/piezometer: 6.78 FT. or IN.
 B. Thickness of Free Product, if present: _____ Inches
 C. Total Depth of well (TD) from top of casing/piezometer: _____ FT. or IN.
 D. Height of Water Column in casing ($h = TD - SWL$): _____ FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water	=	_____ PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water	=	_____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water	=	_____ PV (gallons)

PURGING METHOD: _____ DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:								
2nd Volume:		<u>No purge sampling</u>						
3rd Volume:								
4th Volume:								
Addl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: _____
 PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>MW4-0855</u>	<u>1053</u>	<u>3x40ml VEA</u>	<u>HCO</u>

COMMENTS:

data

Casing Capacities:

2-inch hole.....0.16 gal/lin ft.
 4-inch hole.....0.65 gal/lin ft.
 6.5-inch hole.....1.70 gal/lin ft.
 8-inch hole.....2.60 gal/lin ft.
 10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____
 Original Water Column: _____ x 0.80 = ---
 Collect sample when Depth to Water measures
 Less than or equal to: _____

SECOR GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015-08921.050 DATE: 1/19/01 WELL NO. MW5
 FACILITY NAME: Aveo 0655 TEMPERATURE: 40 °F or °C
 FIELD PERSONNEL: AE WEATHER: overcast

FIELD MEASUREMENTS:

- A. Static Water Level (SWL) below top of casing/piezometer: 6.07 FT. or IN.
 B. Thickness of Free Product, if present: _____ Inches
 C. Total Depth of well (TD) from top of casing/piezometer: _____ FT. or IN.
 D. Height of Water Column in casing ($h = TD - SWL$): _____ FT. or IN.
 E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:
- | | 3 Well Vols. | 5 Well Vols. | | | |
|---------------|--------------|--------------|-----------------|---|--------------------|
| 2" diameter = | 0.5 gals/ft | 0.82 gals/ft | X feet of water | = | _____ PV (gallons) |
| 4" diameter = | 2.0 gals/ft | 3.25 gals/ft | X feet of water | = | _____ PV (gallons) |
| 6" diameter = | 4.4 gals/ft | 7.35 gals/ft | X feet of water | = | _____ PV (gallons) |

PURGING METHOD: _____ DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:								
2nd Volume:		<u>No</u>	<u>purge sampling</u>					
3rd Volume:								
4th Volume:								
Addl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: _____
 PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>MW5-0655</u>	<u>1133</u>	<u>3x40ml N/A</u>	<u>ACD</u>

COMMENTS:

color

Casing Capacities:

2-inch hole.....0.16 gal/lin ft.
 4-inch hole.....0.65 gal/lin ft.
 6.5-inch hole.....1.70 gal/lin ft.
 8-inch hole.....2.60 gal/lin ft.
 10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____
 Original Water Column: _____ x 0.80 = -- ()
 Collect sample when Depth to Water measures
 Less than or equal to: _____

SECOR GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015.08921 DATE: 1/18/01 WELL NO. MW6
 FACILITY NAME: Aric 0855 TEMPERATURE: 41 °F or °C
 FIELD PERSONNEL: J WEATHER: overcast

FIELD MEASUREMENTS:

- A. Static Water Level (SWL) below top of casing/piezometer: 585 FT. or IN.
 B. Thickness of Free Product, if present: _____ Inches
 C. Total Depth of well (TD) from top of casing/piezometer: _____ FT. or IN.
 D. Height of Water Column in casing ($h = TD - SWL$): _____ FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water	=	_____ PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water	=	_____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water	=	_____ PV (gallons)

PURGING METHOD: WP DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:								
2nd Volume:		<u>No</u>	<u>purge</u>	<u>sampling</u>				
3rd Volume:								
4th Volume:								
Addl. Volumes:								

TOTAL VOLUME OF WATER PURGED FROM WELL: _____
 PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>MW6-0855</u>	<u>1024</u>	<u>3x 40ml VOM</u>	<u>HCl</u>

COMMENTS:

Casing Capacities:

2-inch hole.....0.16 gal/lin ft.
 4-inch hole.....0.65 gal/lin ft.
 6.5-inch hole.....1.70 gal/lin ft.
 8-inch hole.....2.60 gal/lin ft.
 10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____
 Original Water Column: _____ x 0.80 = _____
 Collect sample when Depth to Water measures
 Less than or equal to: _____

SECOR
GROUNDWATER SAMPLING FIELD DATA SHEET

SECOR PN: 015-08921-050 DATE: 1/18/01 WELL NO. mw7
 FACILITY NAME: Avco 0855 TEMPERATURE: 40 °F or °C
 FIELD PERSONNEL: FE WEATHER: overcast

FIELD MEASUREMENTS:

- A. Static Water Level (SWL) below top of casing/piezometer: 6.24 FT. or IN.
 B. Thickness of Free Product, if present: _____ Inches
 C. Total Depth of well (TD) from top of casing/piezometer: _____ FT. or IN.
 D. Height of Water Column in casing (h = TD - SWL): _____ FT. or IN.

E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" diameter =	0.5 gals/ft	0.82 gals/ft	X feet of water	=	_____ PV (gallons)
4" diameter =	2.0 gals/ft	3.25 gals/ft	X feet of water	=	_____ PV (gallons)
6" diameter =	4.4 gals/ft	7.35 gals/ft	X feet of water	=	_____ PV (gallons)

PURGING METHOD: _____ DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	pH	Temp.	Conduct.	SWL
1st Volume:	_____	_____	_____	_____	_____	_____	_____	_____
2nd Volume:	_____	<u>No</u>	<u>purge</u>	<u>sampling</u>	_____	_____	_____	_____
3rd Volume:	_____	_____	_____	_____	_____	_____	_____	_____
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____
 PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>mw7-0855</u>	<u>1039</u>	<u>3x40-ml VOA</u>	<u>HCO</u>

COMMENTS:

Casing Capacities:
 2-inch hole.....0.16 gal/in ft.
 4-inch hole.....0.65 gal/in ft.
 6.5-inch hole.....1.70 gal/in ft.
 8-inch hole.....2.60 gal/in ft.
 10-inch hole.....4.10 gal/in ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____
 Original Water Column: _____ x 0.80 = 1
 Collect sample when Depth to Water measures
 Less than or equal to: _____