REPORT ON SUPPLEMENTAL UPLAND REMEDIAL INVESTIGATION ACTIVITIES

VOLUME 2 – APPENDICES

NW Natural – Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

March 11, 2005

Project No. 2708

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ENVIRONMENTAL CONSULTANTS
ASSESSMENT
INVESTIGATION
REMEDIATION

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NW Natural – Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

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Prepared for:

NW Natural
Portland, Oregon

Prepared by:

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Portland, Oregon

HAI Project No. 2708

TABLE OF CONTENTS

VOLUME 1

1.0 INTRODUCTION 1
- 1.1 Purpose and Project Objectives 1
- 1.2 Scope of Work 2
- 1.3 Report Organization 3

2.0 SUPPLEMENTAL INVESTIGATION ACTIVITIES 4
- 2.1 Push Probe Boring Installation 4
  - 2.1.1 Former Effluent Discharge / Low Area 5
  - 2.1.2 Former Tar Pond and River Embankment Area 6
- 2.2 Monitoring Well Installation 8
- 2.3 Monitoring Well Development 9
- 2.4 Monitoring Well Sampling 10
- 2.5 Investigation-Derived Waste Management 10
- 2.6 Elevation Survey 11
- 2.7 Non-Aqueous Phase Liquid Measurements 11
- 2.8 Laboratory Analyses 13
  - 2.8.1 Groundwater 13
  - 2.8.2 Soil 14
    - 2.8.2.1 Chemical Testing 14
    - 2.8.2.2 Physical Soil Core Testing 14
  - 2.8.3 NAPL 16
- 2.9 Sediment Characterization 17
  - 2.9.1 Sediment Collection and Processing 17
  - 2.9.2 Visual Characterization 18
  - 2.9.3 Chemical Testing 19

3.0 RESULTS 20
- 3.1 Former Tar Pond / River Embankment Vicinity 20
  - 3.1.1 Subsurface Conditions 20
  - 3.1.2 Groundwater Analytical Results 21
  - 3.1.3 Soil Analytical Results 24

TABLE OF CONTENTS
(CONTINUED)

3.2 Former Effluent Discharge and Low Area 24
3.2.1 Subsurface Conditions 24
3.2.2 Photo Evaluation and Physical Testing of Soil Core 27
3.2.3 Groundwater Analytical Results 29
3.2.4 Soil Analytical Results 31
3.2.5 NAPL Characterization 32
3.2.6 NAPL Distribution and Mobility Screening 34
3.3 Visible Tar Distribution in Offshore Sediments 37
4.0 CONCLUSIONS 39
5.0 LIMITATIONS AND SIGNATURES 44
6.0 REFERENCES 45
7.0 GLOSSARY OF ABBREVIATIONS 48

TABLE OF CONTENTS
(CONTINUED)

TABLES

1 Summary of Analytical Results for Groundwater Samples: Temporary Well Points – Volatile Organic Compounds by EPA Method 8260

2 Summary of Analytical Results for Groundwater Samples: Temporary Well Points – Polynuclear Aromatic Hydrocarbons by EPA Method 8270 SIM

3 Summary of Analytical Results for Groundwater Samples: Temporary Well Points – Detected Semi-Volatile Organic Compounds by EPA Method 8270C

4 Summary of Analytical Results for Groundwater Samples: Temporary Well Points – Metals and Cyanide

5 Summary of Analytical Results for Groundwater Samples - VOCs, Cyanide, and Metals: August 2004 Sampling Event

6 Summary of Analytical Results for Groundwater Samples - PAHs: August 2004 Sampling Event

7 Summary of Analytical Results for Groundwater Samples – Detected SVOCs: August 2004 Sampling Event

8 Summary Analytical Results for Quality Assurance / Quality Control (QA/QC) Samples: August 2004 Sampling Event

9 Summary of Analytical Results for Soil Samples – TPH, BTEX, Total PAHs, Phenols, and Cyanide

10 Summary of Analytical Results for Soil Samples – PAHs by EPA Method 8270 SIM

11 Summary of Analytical Results for Soil Samples – Phenols by EPA Method 8270

12 Summary of Analytical Results for Soil Samples – Priority Pollutant Metals by EPA Methods 6010 and 7471

13 Summary of Analytical Results for Soil Samples – Physical Parameters

14 Summary of DNAPL Testing Results: Physical and Chemical

15 Summary of DNAPL Testing Results: PAHs by EPA 8270 SIM

16 Summary of DNAPL Testing Results: SVOCs by EPA Method 8270C

17 Summary of DNAPL Recovery Volume: Well MW-16-45

TABLE OF CONTENTS
(CONTINUED)

FIGURES

1 Location Map

2 Soil Borings and Monitoring Well Locations

3 Soil Borings and Monitoring Well Locations with Historical Features

4 Cross-Section Lines

5A Generalized Hydrogeologic Cross-Section A-A' – Benzene Concentrations in Groundwater

5B Generalized Hydrogeologic Cross-Section A-A' – Naphthalene Concentrations in Groundwater

6A Generalized Hydrogeologic Cross-Section B-B' – Benzene Concentrations in Groundwater

6B Generalized Hydrogeologic Cross-Section B-B' – Naphthalene Concentrations in Groundwater

7 Benzene Concentration Contours: Surficial Fill WBZ (0 to 35 feet bgs)

8 Benzene Concentration Contours: Alluvial WBZ (50 to 100 feet bgs)

9 Naphthalene Concentration Contours: Surficial Fill WBZ (0 to 35 feet bgs)

10 Naphthalene Concentration Contours: Alluvial WBZ (50 to 100 feet bgs)

11 Tar and Oil Observations in Soil: Former Effluent Discharge and Tar Pond Area

12 DNAPL Recovery Volume: Well MW-16-45

13 Schematic Cross-Section: Nearshore Area

TABLE OF CONTENTS

(CONTINUED)

VOLUME 2

APPENDICES

A Push Probe Boring Logs

B Monitoring Well Construction Logs

C Well Development Records

D August 2004 Groundwater Monitoring Field Sheets

E Investigation-Derived Waste Management Documentation

F Chain-of-Custody Documentation and Laboratory Analytical Reports – Groundwater Samples from June 2004 Temporary Well Points

G Chain-of-Custody Documentation and Laboratory Analytical Reports – August 2004 Groundwater Monitoring Event

H Chain-of-Custody Documentation and Laboratory Analytical Reports – Soil Samples from June 2004 Push Probe Borings

I Core Photography and Physical Properties Laboratory Analytical Report – MW-16

J Chain-of-Custody Documentation and Laboratory Analytical Reports: NAPL Characterization, Well MW-16-45

APPENDIX A

Push Probe Boring Logs

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-53		
434 NW Sixth Avenue				
Portland, Oregon				
(503) 796-0717	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	Macro Core		
NW Natural	DRILLING METHOD:	Push Probe / Direct Push	Time:	Time:
Gasco Facility	EQUIPMENT TYPE	Geo-Probe 6600	14:30	16:15
Portland, Oregon	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/07/04	06/07/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	31.36
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							1		GP	Grass surface Silty Sandy GRAVEL - brown, dry, plant matter/brick fragments/concrete in upper 2.5' bgs, no tar or staining, no petroleum odor, no sheen (0-2.5' bgs)
							2			
	011	14:45	0.0				3		ML	Gravelly SILT - brown, moist, some small brick fragments, black coal (carbon pitch?) fragments, no petroleum odor, no sheen (2.5-4.5' bgs)
							4			
							5			
							6			Gravelly Sandy SILT - brown, moist, clear broken glass @ 6' bgs, concrete and brick fragments @ 9' bgs, some black flecks (carbon pitch?) in silt from 7-9' bgs (3-4 mm size), no petroleum odor, no sheen (5-9' bgs)
							7			
	BAG	14:55	0.0				8			
							9			
							10			
							11			Silty GRAVEL/debris (brick/concrete) - moist, no petroleum odor, no sheen.
							12			
							13		GM	Silty Sandy GRAVEL (brick/concrete) - no petroleum odor, no sheen, sampler bent at 12-15 ' bgs push. Refusal @ 15' bgs. Hole moved 5 feet south due to debris in soil.
							14			
							15	▽		
							16			Note: Sampling below 15 feet bgs was from new hole located 5 feet south of original hole.
							17			
	BAG	16:10	0.0				18		ML	Gravelly SILT - wet, brown with orange and gray mottling, black carbon pitch flecks, sticky, slightly plastic, carbon pitch odor, no sheen (15-18'
							19			
							20			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-53		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 14:30	Time: 16:15
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/07/04	Date: 06/07/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	31.36
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							21		ML	Gravelly SILT with brick and wood fragments - wet, pieces of concrete, pitch odor, no sheen (20-21' bgs)
							22			Gravelly Sandy SILT - black to gray, moist to wet, very slight carbon pitch odor, no sheen. Larger concrete and brick fragments at base, hard tar fragments, no sheen (21-23' bgs)
							23			
							24			
							25			
							26		GM	Silty Sandy GRAVEL - brick fragments, dark gray with some green/blue/black coloration with crumbled green/gray rock fragments and pitch (black coloration), piece of rock with copper wire embedded at 26.5' bgs, wood fragments at base.
	012	16:45	1.2				27			
							28			
							29			
							30			Refusal on rock @ 29 feet bgs. Boring terminated at 29 feet bgs.
							31			Sample prefix = 2708-040607
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-54**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	9:20	10:10
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/08/04	06/08/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	30.83
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips	013	9:30	2.6		1–5	SM	Grass surface Silty SAND with Gravel - brown, dry, fine-grained sand, pieces of brick and concrete throughout, becomes moist and gray with wood fragments at 3.5-4.0' bgs, no petroleum odor, no sheen (0-4.5' bgs)
					6	SM	Silty SAND with Gravel - concrete and brick fragments, no petroleum odor, no sheen (5-6' bgs)
	014	9:38	0.1		7–8	ML	Sandy gravelly SILT - gray with tan/orange mottling, moist, slightly plastic, angular gravels (up to 40 mm) no petroleum odor, no sheen (6-8' bgs)
					9–10	ML	
					11–13	GM	Silty GRAVEL - olive-gray to brown, very moist, concrete, vesicular basalt or slag, black sandy/silty carbon pitch, no sheen, carbon pitch odor, hydrophobic gray film in water (pitch), no oil, no tar (10-13.5' bgs)
	BAG	9:45	4.9		14–15	GM	
	BAG	9:50	6.2		16	GM	Refusal on concrete at 17' bgs. Relocated boring 20 feet to the southwest for 17-20' sample.
					17–18	GM	Sandy gravelly SILT - brown, moist, angular gravels up to ~ 10 mm, minor plant matter, few black patchy zones (carbon pitch), brick fragments, concrete piece at 19-19.1" bgs, below is black silty sand with gravel, apparent carbon pitch, possible tar fragments, no oil, no sheen (15-20' bgs)
					19	GM	
	BAG	10:05	3.4		20	GM	Refusal on wet concrete or hard rock at 20.5' bgs.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-55**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 9:15	DRILL FINISH Time: 13:15
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/07/04	06/07/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" set at 35' bgs
SURFACE ELEVATION:	32.27
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							1		SM	Grass surface Silty SAND with Gravel - brown, dry, no petroleum odor, no sheen (0-1' bgs)
							2		GP	GRAVEL and CONCRETE - 1-1.5' bgs
	006	9:20	588				3			Sandy silty GRAVEL in TAR matrix - moist, black, ductile (1.5-3.5' bgs)
							4			
							5		GM	
							6			
							7			Sandy silty GRAVEL in TAR matrix - black, moist, angular, large gravels (60 mm), slightly ductile, with patches of viscous, but wet (semi-liquid) tar, brown silt visible towards base of core (5-9' bgs)
							8			
	007	9:30	86				9			
							10			
Bentonite Grout							11			
							12		GM	Sandy silty GRAVEL in TAR matrix - black, moist, angular, large gravels (60 mm), slightly elastic, with patches of viscous, but wet (semi-liquid) tar, patches of black liquid oil observed when break open the semi-ductile tarry matrix (10-13' bgs)
	BAG	9:35	675.0				13			
							14			
							15			
							16			
							17		SM	Silty SAND with gravel - black, moist, not ductile, less tar (black pitch contributing to coloration?), wood fragments at 18' bgs, below which is gray silty sandy gravel, no tar or oil observed below 18' bgs (15-19" bgs)
							18			
	BAG	9:40	8.1				19		GM	
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-55**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 9:15	DRILL FINISH Time: 13:15
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/07/04	06/07/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" set at 35' bgs
SURFACE ELEVATION:	32.27
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout					21		ML	Tarry SILT with few large angular gravels (30-40mm) - black, moist, semi-elastic, dry (no wet tar zones) (20-22' bgs)
					22		GP	GRAVEL with sand - gray, dry, fine grained sand, no sheen, no tar, no oil (22-22.5' bgs)
					23			
					24		PITCH	PITCH? - dark brown to black, brittle, hard, solid, dry, silt-sized particles, hydrophobic, shiny on broken surfaces (like coal), no sheen, no tar, no oil (22.5-25' bgs)
	008	9:50	7.7		25			
					26		ML	Sandy SILT - olive gray with slight brown to orange mottling, <1% mica, fine grained, few very thin rootlets, has sheen, no oil, no tar (25-27.5' bgs)
					27			
					28			
	BAG	10:10	56.2		29			
					30	▽	SP	SAND - gray, moist, fine-grained, grains have light coating of brown oil, silt layers ~10mm thick within sand, silt is olive/gray-brown, sheen (27.5-28.5' bgs)
					31			
	BAG	10:28	60.2		32			SAND - brown to silver (due to sheen on core), wet, fine grained, rainbow sheen with several patches of brown oil coating core at 32' bgs
					33		SM	
					34		SP	
	BAG	10:30	7.5		35		ML	Sandy SILT - brown, moist, non-plastic, fine grained, no sheen, no oil, no tar (32-32.5' bgs) SAND - wet, grey, fine-grained, <1% mica, small (<1mm) shell fragments, no sheen, no oil, no tar (32.5-33.5) SILT - tan with orange mottling, moist, slightly plastic, no sheen, no oil, no tar (33.5-34' bgs)
					36		SP	
					37			SAND - grey, fine to medium grained, subrounded, no sheen, no oil, no tar (34-34.5)
					38			NOTE: Set 3.25 inch OD steel protective casing to 35 feet bgs @ 10:45, 6/7/04.
					39			
	009	11:35	6.4		40		SM	SAND - gray, wet, fine-grained, thin brown silt layer (1/2") at 36' bgs, no sheen, no oil, no tar, no petroleum odor (35-39' bgs)

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER	B-55		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	9:15	13:15
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/07/04	06/07/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" set at 35' bgs
SURFACE ELEVATION:	32.27
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	BAG	11:45	14.8				41-45		SP	SAND - gray, wet, fine-grained, subangular, several sandy silt layers (all less than 1" thick), few white shell fragments, ~4 layers of silt within lower 2' of core, 1 layer in upper 3' of core, no petroleum odor, no sheen (40-44.5' bgs)
							46-47		SM	Silty SAND - gray, wet, muscovite/mica (<1%), shell fragments (<1mm), few fine grained sand layers (<1"), no petroleum odor, no sheen (45-47' bgs)
							48		ML	Sandy SILT - gray, moist, slightly plastic, some mica, no petroleum odor, no sheen (47-47.5' bgs)
	010	11:55					49-50		SP	SAND - gray, subangular, fine-grained, poorly graded, mica (<1%), no petroleum odor, no sheen (47.5-50' bgs)
							51-60			Boring terminated at 50' bgs. Pressure grouted from bottom to approximately 10 feet bgs. Bentonite chips from 0-10' bgs. Sample Prefix = 2708-040607-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time: 8:50 Date: 06/01/04	DRILL FINISH Time: 12:00 Date: 06/02/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
					1	GP	Grass surface Sandy Silty GRAVEL - brown and gray, angular, dry, no petroleum odor, no sheen
					2		
	001	9:00	0.3		3	ML	Sandy Gravelly SILT - brown to orange, dry, non-plastic, 30% gravels, becoming less gravelly and slightly plastic below 3' bgs, no petroleum odor, no sheen (1.5-5' bgs)
					4		
					5		
Bentonite Chips					6		Sandy Silty GRAVEL - brown with orange to red and green mottling in silt, slightly moist, 50% gravels, sands are very fine grained, gravels are angular and up to 20mm diameter, no petroleum odor, no sheen (5-7.5' bgs)
					7		
	002	9:05	0.7		8		
					9		
					10		
					11		Sandy Silty GRAVEL - as above, silts are moist, brown wih gray mottling below 13'. Brick fragment at 14' bgs, gravels are very angular to rounded, no petroleum odor, no sheen (10-14.5' bgs)
	003	9:20	1		12	GM	
					13		
					14		
Bentonite Grout					15		
					16		Sandy Silty GRAVEL - as above to 17' bgs, large (up to 50 mm) rounded and angular gravels below 17', no petroleum odor, no sheen (15-18' bgs)
					17		
					18		
	BAG	9:35	2.4		19	SP	Gravelly SAND - dark gray, wet, fine grained rounded sand, ~ 90% sand, likely solid carbon pitch within the sand, pitch odor, no sheen (18-19' bgs)
					20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER B-56			
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	8:50	12:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/01/04	06/02/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	BAG		35.3		21–25		SP	SAND - gray, wet, very fine grained, poorly graded, rounded, naphthalene odor, becomes tarry (black, ductile) from 22.5 - 23' bgs. no oil identified, slight sheen. Shoe of core (~2 inches below 23' bgs is gray sand, very fine grained, few very fine rootlets, orange oxidation staining, no tar or oil observed below 23' bgs (20-23' bgs)
					26		SM	Silty SAND - gray, wet, fine-grained, less than 1% mica, subangular, no petroleum odor, no sheen (25-26' bgs)
	004	9:55	9.4		27–28		SP	SAND - gray, wet, poorly graded, fine-grained, no petroleum odor, no sheen (26-28.5' bgs)
					29		SM	Silty SAND - gray, wet, fine-grained, less than 1% mica, subangular, no petroleum odor, no sheen (28.5-29' bgs)
					30–32		SP	SAND - gray, wet, poorly graded, fine-grained, < 1% mica, no petroleum odor, no sheen (29-32' bgs)
					33		SM	Note: Set temporary 3.25 inch OD steel protective casing to 30 feet bgs at 10:00, 6/01/04.
	BAG	10:28	4.9		34–35		SP	Silty SAND - gray, very moist to wet, fine-grained, less than 1% mica, subangular, no petroleum odor, no sheen (32-33' bgs)
					36		SM	SAND - gray, wet, poorly graded, very fine-grained, small white shell fragments (<1mm) at 34' bgs, no petroleum odor, no sheen (33-35' bgs)
					37–38		SP	Silty SAND - gray, wet, poorly graded, very fine-grained, small white shell fragments (< 1mm), plant matter (< 1%), no petroleum odor, no sheen (35-36' bgs).
	BAG	10:40	5.3		39–40		SP	SAND - gray, wet, poorly graded, fine-grained, mica (< 1%), no sheen, slight petroleum odor? (36-39' bgs).

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	8:50	12:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/01/04	06/02/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	SAND - gray, wet, very fine-grained, subangular, no petroleum odor, no sheen, SILT layers at: 41' bgs (3" thick), 41.5' bgs (2" thick), and 43.5' bgs (3" thick), the Silt is gray, moist, slightly plastic (40-44.5' bgs)
							42			
							43			
							44			
	BAG	11:00	0.9				45			
							46			SAND - gray, wet, poorly graded, very fine-grained, subangular, no petroleum odor, no sheen (45-48' bgs).
							47			
							48			
	BAG	11:15	0.5				49		ML	Sandy SILT - gray, wet, slightly plastic, no petroleum odor, no sheen (48-49' bgs)
							50		SP	SAND - gray, wet, very fine-grained, poorly graded, subangular, no petroleum odor, no sheen, (49-49.5' bgs)
							51			
							52			
							53			
							54			
							55			
							56			
							57			
							58			
							59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time: 8:50 Date: 06/01/04	DRILL FINISH Time: 12:00 Date: 06/02/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	BAG	11:45	0.7				61 62 63 64 65 66 67 68 69 70		SP	SAND - gray, wet, fine-grained, poorly graded, sub-angular, no petroleum odor, no sheen, Silty SAND layer at: 64.5' bgs (2" thick), the Silty Sand is gray, moist, with few white shell fragments (<1mm) (60-65'bgs)
	BAG	12:20	1.6				71 72 73 74 75 76 77 78 79 80		SP SM ML SP ML	SAND - gray, wet, fine to medium-grained, poorly graded, sub-angular, no petroleum odor, no sheen (70-71' bgs) Silty SAND - gray, moist, very fine grained, shell fragments (<1mm) and rootlets/plant material, no petroleum odor, no sheen (71-72' bgs) SILT - gray, moist, slightly plastic, very small shell fragments (<1mm), no petroleum odor, no sheen (72-73' bgs) SAND - gray, wet, very fine-grained, poorly graded, no petroleum odor, no sheen (73-74' bgs) Sandy SILT - gray to light brown, moist, very fine-grained sand. Silt is non-plastic, no petroleum odor, no sheen (74-75' bgs)

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time: 8:50 Date: 06/01/04	DRILL FINISH Time: 12:00 Date: 06/02/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							81		SP	SAND - gray, wet, fine-grained, poorly graded, no petroleum odor, no sheen (80-83' bgs)
							82			
							83			
	BAG	13:45	6.3				84		SM	Silty SAND - gray, wet, very fine-grained sand, Silt (< 20%) is wet, slight naphthalene odor?, no sheen (83-84'bgs)
							85			
							86			
							87			
							88			
							89			
							90			
							91		SP	SAND - gray, wet, fine to medium-grained, no petroleum odor, no sheen (90-91' bgs)
							92		ML	SILT - gray, moist, slightly plastic, few shell fragments (<1mm) (91-91.5' bgs)
							93		SP	SAND - gray, wet, fine to medium-grained, no petroleum odor, no sheen (91.5-92' bgs)
	BAG	14:55	1.3				94		ML	SILT - gray, moist, slightly plastic, with interbedded sandy SILT and SAND layers (<2" thick) (92-94.5' bgs)
							95			
							96			
							97			
							98			
							99			
							100			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	8:50	12:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/01/04	06/02/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	BAG	15:10	1.2				105		SP	SAND - gray, moist to wet, fine to medium-grained, some mica (<1%), silt layers at 102.5', 103' and 103.5 ' bgs (each approximately 2" to 4" thick). Silt is light gray, slightly plastic, with shell fragments (<1%), unusual odor (organic?) in sand at 104' to 105' bgs, no sheen (100-105' bgs)
							110			
	BAG	15:45	1.8				112		SP	SAND - gray, wet, fine to medium-grained, no petroleum odor, no sheen (110-112.5' bgs)
							115			
							120			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-56		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 8:50	Time: 12:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/01/04	Date: 06/02/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							121			
							122			
							123			
							124			
							125			
							126			
							127			
							128			
							129			
							130			
							131			
							132			
							133			
							134			
							135			
							136		SP	SAND - gray, wet, fine grained, poorly graded, subangular, no petroleum odor, no sheen (135-139' bgs)
							137			
							138			
	BAG	17:45	0.8				139			NOTE: Boring activities stopped at 17:45, 6/01/04. To resume AM 6/02/04.
							140			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	8:50	12:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
PROJECT #: 2708	DRILLER:	Neil Kranz	Date: 06/01/04	Date: 06/02/04
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							141			
							142			
							143			
							144			
							145			
							146			
							147			
							148			
							149			
							150			
							151			
							152			
							153			
							154			
							155			
							156			
							157			
							158			
							159			
							160			

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-56		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	Macro Core	Time:	Time:
NW Natural Gasco Facility Portland, Oregon	DRILLING METHOD:	Push Probe / Direct Push	8:50	12:00
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/01/04	06/02/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.74
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							161		SP	SAND - gray, wet, fine to medium-grained sands, no petroleum odor, no sheen. Silt layers at 162' bgs (6" thick) and 164' bgs (4" thick).
							162			
							163		ML	Silt is gray, moist, slightly plastic with small shell fragments (<1mm), no petroleum odor, no sheen (160-164' bgs)
									SP	
	BAG	10:30	0.7				164			
							165			
							166			
							167			
							168			
							169			
							170			
							171			
							172			
							173			
							174			
							175		GP	Sandy GRAVEL - gray, wet, slightly graded, rounded to sub-angular gravel (2mm to 2in in size) no petroleum odor, no sheen. Sand is gray, wet, fine to coarse-grained, well graded, sub-rounded grains, no petroleum odor, no sheen. Large gravels are angular basalt fragments (174-176.5' bgs).
							176			
	005	11:55	0.7				177			
							178			Refusal at 179' bgs.
							179			Boring terminated at 179' bgs at 11:55 6/2/2004. Pressure grouted from bottom to approximately 10' bgs, bentonite chips from 0-10' bgs on 6/2/2004.
							180			Sample prefix = 2708-040602

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56A**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Andy Rolinger	DRILL START Time: 2:25 Date: 06/02/04	DRILL FINISH Time: 4:00 Date: 06/04/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.47
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							1		GP	NOTE: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe B-56 for soil description.
							2			
							3		ML	
							4			
							5			
							6			
							7			
							8			
							9			
							10			
Bentonite Grout							11		GM	
							12			
							13			
							14	▽		Water levels measured: for 18' to 22' bgs screen = 13.5' bgs for 40' to 44' bgs screen = 14.5' bgs for 80' to 84' bgs screen = 15.0' bgs for 100' to 104' bgs screen = 15.7' bgs
							15	▽		
							16	▽		
							17			
							18			
							19		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 18 to 22 feet bgs. Following the removal of approximately 3 gallons of water, a groundwater sample (#2708-040602-101) was collected with disposable tubing/check valve at 14:45 hours, 6/2/04. Water level was measured at 13.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56A**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Andy Rolinger	DRILL START Time: 2:25	DRILL FINISH Time: 4:00
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/02/04	Date: 06/04/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.47
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		SP	
							22			
							23			
	Water Level measured for 60' to 64' bgs screen						24			
							25			
							26		SM	
							27		SP	
							28			
							29		SM	
							30		SP	
							31			
							32			
							33		SM	
							34		SP	
							35			
							36		SM	
							37		SP	
							38			
							39			
Probe Rod							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56A**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Andy Rolinger	DRILL START Time: 2:25 Date: 06/02/04	DRILL FINISH Time: 4:00 Date: 06/04/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.47
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Heaved Formation							41			**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 40 to 44 feet bgs. Following the removal of approximately 2 gallons of water, a groundwater sample (#2708-040603-102) was collected with disposable tubing/check valve at 11:55 hours, 6/3/04. Water level was measured at 14.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							42		SP	
							43			
							44			
							45			
							46			
							47			
							48			
							49		MI,	
Probe Rod							50		SP	
							51			
							52			
							53			
							54			
							55			
Heaved Formation							56			
							57			
							58			
							59			
							60			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-56A		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	2:25	4:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/02/04	Date: 06/04/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.47
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Probe Rod Heaved Formation							61		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 60 to 64 feet bgs. Following the removal of approximately 3 gallons of water, a groundwater sample (#2708-040603-103) was collected with disposable tubing/check valve at 14:00 hours, 6/3/04. Water level was measured at 23.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							62			
							63			
							64			
							65			
							66			
							67			
							68			
							69			
							70			
							71		SP	
							72		SM	
							73		ML	
							74		SP	
							75		ML	
Heaved Formation							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56A**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	2:25	4:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/02/04	06/04/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.47
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Heaved Formation							81		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 80 to 84 feet bgs. Following the removal of approximately 3 gallons of water, two groundwater samples (#2708-040603-104 & #2708-040603-105) were collected with disposable tubing/check valve at 15:15 hours and 15:30 hours, respectively, on 6/3/04. Water level was measured at 15 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							82			
							83			
							84		SM	
							85			
							86			
							87			
							88			
							89			
							90			
Probe Rod							91		SP	
							92		ML	
							93		SP	
							94		ML	
							95			
Heaved Formation							96			
							97			
							98			
							99			
							100			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56A**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Andy Rolinger	DRILL START Time: 2:25 Date: 06/02/04	DRILL FINISH Time: 4:00 Date: 06/04/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.47
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Heaved Formation							101			**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 100 to 104 feet bgs. Following the removal of approximately 3 gallons of water, a groundwater sample (#2708-040604-106) was collected with disposable tubing/check valve at 8:45 hours, 6/4/04. Water level was measured at 15.7 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							102		SP	
							103			
							104			
							105			
							106			
							107			
							108			
							109			
							110			
Probe Rod							111			
							112		SP	
							113			
							114			
							115			
Heaved Formation							116			
							117			
							118			
							119			
							120			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-56A		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 2:25	Time: 4:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/02/04	Date: 06/04/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.47
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Heaved Formation							121			
							122			
							123			
							124			
							125			
Probe Rod							126			
							127			
							128			
							129			
							130			
Heaved Formation							131			
							132			
							133			
							134			
							135			
							136		SP	**GROUNDWATER SAMPLE (ATTEMPTED)** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 136 to 140 feet bgs. Upon removal of sampling equipment, rods spit at 30' bgs. 110' of rods stuck in hole. Boring terminated at 140' bgs. Advanced 8-inch OD hollow stem auger over sheared end of probe rod to depth of 40 feet bgs. Unable to hook and remove rod. Pressure grouted hole from 40 feet bgs to approximately 10' bgs. Bentonite chips to ground surface.
Water Sampler							137			
							138			
							139			
							140			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-56B		
434 NW Sixth Avenue				
Portland, Oregon				
(503) 796-0717	HAI LOGGER:	Andy Rolinger	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	Macro Core		
NW Natural	DRILLING METHOD:	Push Probe / Direct Push	Time:	Time:
Gasco Facility	EQUIPMENT TYPE	Geo-Probe 6600	12:00	4:30
Portland, Oregon	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/14/04	06/14/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.5
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							1		GP	NOTE: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe B-56 for soil description.
							2			
							3		ML	
							4			
							5			
							6			
							7			
							8			
							9			
							10			
Bentonite Grout							11			
							12		GM	
							13			
							14			
							15			
							16			
							17	▽		Water Level measured for 135-139' bgs screen
							18	▽		Water Level measured for 174-178' bgs screen
							19		SP	
							20			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-56B		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 12:00	Time: 4:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/14/04	Date: 06/14/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.5
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		SP	
							22			
							23			
							24			
							25			
							26		SM	
							27		SP	
							28			
							29		SM	
							30		SP	
							31			
							32			
							33		SM	
							34		SP	
							35			
							36		SM	
							37		SP	
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER	B-56B		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Andy Rolinger	DRILL START Time: 12:00	DRILL FINISH Time: 4:30
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/14/04	Date: 06/14/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.5
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	
							42			
							43			
							44			
							45			
							46			
							47			
							48			
							49		ML	
							50		SP	
							51			
							52			
							53			
							54			
							55			
							56			
							57			
							58			
							59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56B**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Andy Rolinger	DRILL START Time: 12:00 Date: 06/14/04	DRILL FINISH Time: 4:30 Date: 06/14/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.5
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61		SP	
							62			
							63			
							64			
							65			
							66			
							67			
							68			
							69			
							70			
							71		SP	
							72		SM	
							73		ML	
							74		SP	
							75		ML	
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-56B		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 12:00	Time: 4:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/14/04	Date: 06/14/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.5
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							81		SP	
							82			
							83			
							84		SM	
							85			
							86			
							87			
							88			
							89			
							90			
							91		SP	
							92		ML	
							93		SP	
							94		ML	
							95			
							96			
							97			
							98			
							99			
							100			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER	B-56B		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	12:00	4:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/14/04	06/14/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.5
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							101		SP	
							102			
							103			
							104			
							105			
							106			
							107			
							108			
							109			
							110			
							111		SP	
							112			
							113			
							114			
							115			
							116			
							117			
							118			
							119			
							120			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56B**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	12:00	4:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/14/04	06/14/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.5
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							121			
							122			
							123			
							124			
							125			
							126			
							127			
							128			
							129			
							130			
							131			
							132			
							133			
							134			
							135			
							136			
							137		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 136 to 140 feet bgs. Following the removal of approximately 4 gallons of water, a groundwater sample (#2708-040614-115) was collected with disposable tubing/check valve at 13:45 hours, 6/14/04. Water level was measured at 16.9 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							138			
							139			
							140			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56B**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	12:00	4:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/14/04	06/14/04

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							141			BORING DIAMETER: 2-inch
							142			CASING DIAMETER: 3.25" steel temp. from 0-30' bgs
							143			SURFACE ELEVATION: 25.5
							144			TOP OF CASING ELEVATION: Not Applicable
							145			
							146			
							147			
							148			
							149			
Bentonite Grout							150			
							151			
							152			
							153			
							154			
							155			
							156			
							157			
							158			
							159			
							160			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-56B**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	12:00	4:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/14/04	06/14/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-30' bgs
SURFACE ELEVATION:	25.5
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS Total PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							161		SP	
							162			
							163		ML	
							164		SP	
							165			
							166			
							167			
							168			
							169			
							170			
							171			
							172			
							173			
							174			
							175		GP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 174 to 178 feet bgs. Following the removal of approximately 4 gallons of water, a groundwater sample (#2708-040614-116) was collected with disposable tubing/check valve at 16:00 hours, 6/14/04. Water level was measured at 17.5 feet bgs prior to sampling. After sampling, the well point was removed from the borehole.
							176			
							177			
							178			Boring terminated at 16:30 hours, 6/14/04
							179			Pressure grouted from bottom to approximately 10' bgs on 6/15/04. Bentonite chips to top.
							180			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-57**		
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
NW Natural	SAMPLING METHOD:	Macro Core	Time:	Time:
Gasco Facility	DRILLING METHOD:	Push Probe / Direct Push	10:45	16:00
Portland, Oregon	EQUIPMENT TYPE	Geo-Probe 6600	Date:	
PROJECT #: 2708	DRILLER:	Neil Kranz	06/08/04	06/08/04
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temporary set at 45' bgs
SURFACE ELEVATION:	31.46
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					1		SP	Grass surface Silty SAND with Gravel - brown, dry, gravels up to 20 mm, rounded, angular, tarry at 2' bgs, sandy gravel in a tar matrix, tar is solid, but discontinuous with large rock fragments and concrete (0-3' bgs)
					2			
	BAG	11:00	63.5		3			
					4			
					5			
					6			Silty SAND with Gravel - patchy tar, black tar in brown sand matrix (5-7.5' bgs)
					7			
					8			
	BAG	11:05	756		9			Gravelly SILT with TAR - very moist, black to brown, ductile, plastic, tar becomes somewhat liquid (black & viscous) at base of core (7.5-9.5' bgs)
					10			
Bentonite Grout					11		ML	Gravelly SILT with TAR - moist, black to dark gray with minor brown zones, tar is observed to have zones which are more oily when broken open, thick black oil-blebs (~1 to 2 mm diameter), ductile, moderate creosote odor, some gravels have green/gray color (10-14' bgs)
					12			
					13			
	BAG	11:07	249		14			
					15			
					16		GM	Silty GRAVEL - tarry, slightly moist, dark brown to black, tar is less than 30%, non-ductile, slightly plastic, gravel/concrete zone at 17' bgs (3" thick), becoming more tarry and oily below 18' bgs, strong creosote odor (15-18.5' bgs)
					17			
					18			
	BAG	11:15	117		19			
					20			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-57		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	10:45	16:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/08/04	06/08/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temporary set at 45' bgs
SURFACE ELEVATION:	31.46
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
					21	GM	Silty GRAVEL - moist, gray, gravels (~50% gravel) angular to round, up to 20 mm in size, silt is tan to dark brown, small flecks of carbon pitch?, no evidence of tar or oil, no odor, no sheen (20-21.5' bgs)
					22		
	BAG	11:20	2.5		23		Silty gravelly SAND - moist, black, hard very fine grained sand (carbon pitch?) minor tar, brick fragments, and vegetative matter, strong pitch odor (21.5-22.5' bgs), zone of oily tar (22.5-23.0' bgs)
					24		
					25		
					26		Tarry gravelly SILT - moist black tar in tan silt (~75% tar), some brick fragments, woody plant debris, strong creosote odor, tan/orange mottled silt layer (~1" thick) at 26.5' bgs (25-26.5' bgs)
					27		
	BAG	11:50	223		28	SP	SAND - moist, fine to medium grained, poorly graded, few silt layers, sand has strong sheen, minor black oily zone at base of core (26.5-27.5' bgs)
					29		
					30		SAND - black, wet, medium grained, coated with black, semi-viscous oil (30-30.5' bgs)
					31	ML	SILT - olive-gray to dark-gray, moist, thin brown rootlets (<0.5mm), sheen, petroleum odor (30.5-31.5' bgs)
					32		
Bentonite Grout	BAG	13:05	173.0		33	SP	SAND - very moist, fine sand grains, some mica, poorly graded, strong sheen and brown product coating sand grains (31.5-33' bgs)
					34		
					35		
					36		SAND - gray, wet, fine grained, subangular, coated in brown oil, rainbow sheen on core (35-37'8" bgs)
					37		
	BAG		14.2		38	ML	SILT - moist, tan to brown mottled, stained orange at upper and lower margin with sands, no sheen, no oil (37'8"-37'10" bgs)
					39	SP	SAND - moist, gray to brown, wet, fine grained, some mica, poorly graded, no oil, no tar, no sheen, no petroleum odor (37'10"-40' bgs)
	BAG		18.4		40		

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-57		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	10:45	16:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/08/04	06/08/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temporary set at 45' bgs
SURFACE ELEVATION:	31.46
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	SAND - gray, wet, fine-grained, minor white shell fragments interbedded with sandy silt layers from 43-44' bgs, silt is gray, wet, slightly plastic, no petroleum odor, no sheen (40-44' bgs)
							42			
							43			
	BAG	14:55	27				44			
							45			Note: Set 3.25 inch OD steel protective casing to 45 feet bgs at 15:00, 6/8/04.
							46			SAND - gray, wet, fine-grained, minor white shell fragments, silt layer at 49' bgs (~3" thick) silt is gray, slightly plastic, no odor, no sheen (45'-50' bgs)
							47			
							48			
							49			
	BAG	16:00	4.9				50			Boring terminated at 50' bgs. Pressure grouted from bottom to approximately 10' bgs, bentonite chips from 0-10' bgs.
							51			
							52			
							53			
							54			
							55			
							56			
							57			
							58			
							59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-58**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	9:45	12:00
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/09/04	06/09/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					1	SM	Grass surface Silty SAND with GRAVEL - brown, dry, vegetative matter, gravels are rounded to angular, no discoloration, no petroleum odor, no sheen (0-1.5' bgs)
	BAG	9:52	69.7		2		
					3		Silty sandy tarry GRAVEL - brown to black, tar is hard, but a slightly viscous liquid when broken open (liquid is black, thick) (1.5-3.0' bgs)
	BAG	9:52	23.7		4	GM	Silty sandy GRAVEL - gray to green, dry, concrete and brick fragments, no tar (3-3.5' bgs)
					5		
					6		
					7		Silty GRAVEL - gray, dry, large concrete fragments (up to 2" diameter), some pitch and tar (5-6' bgs)
	BAG	9:59	38.7		8		Gravelly SILT - gray/tan/orange, moist, silt is plastic, gravel is round to angular (0.25 to 0.5" diameter) no petroleum odor, no sheen (6-8' bgs)
					9		
					10		
Bentonite Grout					11	ML	Gravelly SILT - gray/tan/orange, moist, silt is plastic, gravel is round to angular (0.25 to 0.5" diameter) no petroleum odor, no sheen (10-11' bgs)
					12		
					13		Gravelly SILT - gray/tan/orange, moist, silt is plastic, gravel is round to angular (0.25 to 0.5" diameter) no petroleum odor, no sheen (11-12.5' bgs)
	BAG	10:05	499		14		Tarry gravelly SILT- black to orange/gray, concrete fragments mixed in, strong creosote odor (12.5-14' bgs)
					15		
					16		Tarry gravelly SILT- black to orange/gray, moist concrete fragments mixed in, strong creosote odor (15-17' bgs)
					17		
					18		Woody material with carbon pitch and GRAVEL at 17' bgs - (4 inches thick)
					19	GM	Sandy silty GRAVEL - gray and black, moist, carbon pitch, no tar or oil observed, strong pitch odor (17.5'-19.5' bgs)
	BAG	10:10	19.7		20		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-58**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Rob Ede	DRILL START Time: 9:45 Date: 06/09/04	DRILL FINISH Time: 12:00 Date: 06/09/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	BAG	10:16	1.4		21–25	ML	Gravelly sandy SILT - olive gray and tan, moist, brick fragments, some gravels have blue/green coloration (<1%), patchy black coloration (carbon pitch?), zone at 22.25' has thick black oil coating gravel, (~1" zone), gravelly silts below with no oil (20-22.5' bgs)
	BAG	10:32	3		26–30		Gravelly SILT - very moist, olive gray to black, brick fragments, black appears to be carbon pitch mixed into silt, no tar observed, strong carbon pitch odor, no sheen (25-27' bgs) CONCRETE - gray, dry, no tar or oil observed (27-27.5' bgs)
					31–33	SM	Sandy SILT - olive gray, moist, slightly plastic, no petroleum odor, no sheen (30-30.5' bgs) Silty SAND - gray to black, very moist, interbedded with thin (<10mm) silt layers, patchy black oil present in sandy zones (30.5-33.5' bgs)
	BAG	10:50	138		34–35	ML	SILT - moist, olive gray and tan layers, no visible oil or tar, creosote odor (33.5-34' bgs)
	BAG	10:54	354		36–37		SILT with interbedded silty sand - grey silt, tan silty sand, moist, slightly plastic, plant matter (rootlets, leaf fragments), small rounded gravels (~5mm), silty sand zones have sheen, some brown oil coating grains (35-37' bgs)
			44.9		38		SILT - dark gray, plastic, no oil, no tar (37'-37'2" bgs)
					39–40	SP	SAND - brown, wet, fine grained, poorly graded, slight sheen on upper few inches, no sheen or oil below upper few inches (37'2"-38.5' bgs)

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-58**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede	DRILL START Time: 9:45	DRILL FINISH Time: 12:00
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/09/04	06/09/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							41			SAND - gray, wet, fine-grained, poorly graded, no petroleum odor, no sheen, several olive-gray silt layers (~0.25" thick at 42.5' bgs, some grassy plant matter in silt zones) (40-44.5' bgs)
							42			
							43			
Bentonite Grout	BAG	11:30	17				44		SP	
							45			
							46			SAND with interbedded silt - gray, wet, fine-grained, interbedded with gray silt layers, no petroleum odor, no sheen (45-47' bgs)
							47			
							48			SAND - gray, wet, fine to medium grained, subangular, minor mica, (47-49' bgs)
							49			
	BAG	11:45	77.2				50		ML	SILT - brown, moist, slightly plastic, small (<1mm) shell fragments, thin (0.5"), brown sandy silt layers, no petroleum odor, no sheen (49-50' bgs)
							51			Boring terminated at 50' bgs. Pressure grouted from bottom to approximately 10 feet bgs. bentonite chips from 0-10' bgs.
							52			
							53			Boring advanced without temporary casing since soils at depth below oil were showing no oil smear from above.
							54			
							55			
							56			
							57			
							58			
							59			
							60			

BORING DIAMETER:	2-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time: 13:00 Date: 06/09/04	DRILL FINISH Time: 13:45 Date: 06/10/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	31.42
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					1	ML	Grass surface Gravelly sandy SILT - tan to brown, dry (0-12" bgs)
					2	TAR	Gravelly SILT and TAR - black, solid hard tar with gravels mixed in (1-2.5' bgs)
	BAG	13:05	285		3		
					4		Gravelly SILT - gray to tan with orange mottling, moist, some dark tarry patches on gravels (2.5-4' bgs)
					5		
					6		Gravelly sandy SILT - moist, gray with gray mottling, some gravels have yellow/green coloration, very moist, tar and black viscous oil surrounding gravels and in sandy zones, strong creosote odor from 6.5-7.5' bgs. (5-8' bgs)
	BAG	13:10	302		7		
	BAG	13:15	67		8	ML	
					9		Gravelly SILT - gray with orange mottling, moist, no evidence of tar or oil (7.5-8.0' bgs)
					10		
Bentonite Grout					11		Gravelly SILT - gray with orange mottling, moist, no evidence of tar or oil (10-11' bgs)
					12		Gravelly SILT with TAR - black, moist, viscous oil within the tar when broken open (11-13' bgs)
	BAG	13:20	734		13		
					14		
					15		
					16		Gravelly SILT with TAR - black viscous oil blebs within the tar when broken open (15-17.5' bgs)
					17		
					18	ML	
	BAG	13:30	83		19		Gravelly SILT - olive gray to brown, very moist, brick fragments, and carbon pitch flecks and odor, no evidence of tar or oil (17.5-19' bgs)
					20		

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-59		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	Macro Core	Time:	Time:
NW Natural Gasco Facility Portland, Oregon	DRILLING METHOD:	Push Probe / Direct Push	13:00	13:45
	EQUIPMENT TYPE	Geo-Probe 6600	Date:	Date:
PROJECT #: 2708	DRILLER:	Neil Kranz	06/09/04	06/10/04
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	31.42
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	BAG	13:35	68.8				21–25		ML	Gravelly SILT - wet, olive gray to brown, brick fragments, woody material and plant matter, strong carbon pitch odor, black flecks and streaks in silt (carbon pitch?), slight sheen, no evidence of tar or oil (20-23' bgs)
							26–27		ML	Gravelly SILT - wet, olive gray to brown, brick fragments, woody material and plant matter, strong carbon pitch odor, black flecks and streaks in silt (carbon pitch?), slight sheen, no evidence of tar or oil (25-27' bgs)
	BAG	13:50	1,394				28–30		ML	Tarry SILT - very moist, black, viscous, strong creosote odor, interbedded silts and fine grained sands (27-28' bgs)
	BAG	14:00	181.0				31–35		SP	SAND - olive gray to brown, wet, fine grained, coated with oil (brown, strong petroleum odor) (30-35' bgs)
	BAG		872				36–38		SP	SAND - olive gray to brown, wet, fine grained, coated with oil (brown, strong petroleum odor) (35-38' bgs)
							38		ML	SILT - gray, moist, slightly plastic, no sheen, 1/2-inch thick with oil above, no oil below.
	BAG		134				39–40		SP	SAND - olive gray, wet, fine grained, no visible oil, strong sheen on outside of core (38-39' bgs)

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time: 13:00	DRILL FINISH Time: 13:45
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/09/04	Date: 06/10/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	31.42
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout	BAG	14:35	0.2		41–44		SP	SAND - wet, olive gray, fine grained, poorly graded, mica (<1%), few very thin (<10mm) tan silt layers, no petroleum odor, no sheen, no oil (40-44' bgs)
								NOTE: 3.25 inch OD steel protective casing set to 45 feet bgs @ 14:45 on 6/09/04
					45–47		SP/ ML	SAND with interbedded SILTS - olive gray, wet, very fine sand grains, minor mica, silts are soft, slightly plastic, no petroleum odor, no sheen (45-47.5' bgs)
	BAG	15:30			47–50		SP	SAND - gray, wet, fine-grained, poorly graded, subangular, no petroleum odor, no sheen, (47.5-50' bgs)
					50–55			
					55–60		SP	SAND - gray, wet, fine-grained, poorly graded, subangular, thin tan silt layer (1") at 58.5' bgs, no petroleum odor, no sheen (55-60' bgs)

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time: 13:00 Date: 06/09/04	DRILL FINISH Time: 13:45 Date: 06/10/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	31.42
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61			
							62			
							63			
							64			
							65			
							66		SP	SAND - gray, wet, fine-grained, poorly graded, subangular, no petroleum odor, no sheen (65-70' bgs)
							67			
							68			
							69			
							70			
							71			NOTE: Boring activities stopped for the day at 17:00. Will resume in AM 6/10/04.
							72			
							73			
							74			
							75			
							76		SP	SAND - gray, wet, fine sand grains, subangular, poorly graded, no petroleum odor, no sheen (75-76.5' bgs)
							77			
							78		ML	SILT - gray, wet, stiff, plastic, reducing/organic odor, no sheen (76.5-80' bgs)
							79			
	BAG	8:40	1.6				80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER	B-59		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	13:00	13:45
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/09/04	06/10/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	31.42
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							81			
							82			
							83			
							84			
							85			
							86		ML	SILT - gray, wet, stiff, plastic, reducing/organic odor, no sheen (85-86' bgs)
							87			
							88		SP	SAND - gray, wet, fine grained, subangular, poorly graded, no petroleum odor, no sheen (86-90' bgs)
							89			
	BAG	9:00	1.1				90			
							91			
							92			
							93			
							94			
							95			
							96		SP	SAND - gray, wet, fine grained, subangular, poorly graded, no petroleum odor, no sheen, silt layers at 96.5' bgs (4" thick), 97.5' bgs (4" thick), 98.0' bgs (3" thick), silt is gray, wet, stiff, plastic, no petroleum, no sheen (95-100' bgs)
							97			
							98			
							99			
	BAG	10:20	1.7				100			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	13:00	13:45
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/09/04	Date: 06/10/04
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							101			
							102			
							103			
							104			
							105			
							106			
							107			
							108			
							109			
							110			
Bentonite Grout							111			
							112			
							113			
							114			
							115			
							116			SAND - gray, wet, fine-grained, subangular, poorly graded, no petroleum odor, no sheen (115-119' bgs)
							117		SP	
							118			
	BAG	11:30	1.9				119			
							120			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER	B-59		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	13:00	13:45
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/09/04	06/10/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	31.42
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							121			
							122			
							123			
							124			
							125			
							126			
							127			
							128			
							129			
							130			
							131			
							132			
							133			
							134			
							135			
							136			
							137			
							138			
							139			
							140			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	13:00	13:45
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/09/04	06/10/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	31.42
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							141			
							142			
							143			
							144			
							145			
							146		SP	SAND - gray, wet, fine sand grains, subangular, poorly graded, silt layer at 145.5' bgs (2" thick) silt is grey, wet, stiff, plastic, no petroleum odor, no sheen (145-148' bgs)
							147			
							148			
							149		ML	SILT - gray, wet, plastic, stiff, with fiberous rootlets (<1%) no petroleum odor, no sheen (148-149.5' bgs)
	BAG	12:45	0.1				150			
							151			
							152			
							153			
							154			
							155			
							156			
							157			
							158			
							159			
							160			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59**		
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Rob Ede / Andy Rolinger	DRILL START Time: 13:00 Date: 06/09/04	DRILL FINISH Time: 13:45 Date: 06/10/04
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							161			
							162			
							163			
							164			
							165			
							166			
							167			
							168			
							169			
							170			
Bentonite Grout							171			
							172			SAND - gray, wet, fine sand grains, subangular, poorly graded, no petroleum odor, no sheen (170-174.5' bgs)
							173		SP	
							174			
	BAG	1:45	0.1				175			
							176			NOTE: Driller concerned about losing tooling down hole if encounter hard substrate below 175' bgs. Decide to terminate boring.
							177			
							178			
							179			Boring terminated at 175' bgs at 13:45 6/10/2004.
							180			Pressure grouted from bottom to approximately 10' bgs, bentonite chips in upper 10' bgs on 6/10/2004.

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	31.42
TOP OF CASING ELEVATION:	Not Applicable

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-59A		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 16:10	Time: 9:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/10/04	Date: 06/14/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							1		ML	NOTE: No soil samples collected. Pushed with well point directly to groundwater sample depths. See boring log for probe B-59 for soil description.
							2		TAR	
							3			
							4			
							5			
							6			
							7		ML	
							8			
							9			
							10			
Bentonite Grout							11			
							12			
							13			
							14			
							15			
							16			
							17		ML	
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER B-59A			
	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 16:10	Time: 9:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/10/04	Date: 06/14/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							21		ML	
	Water Level measured for 46' to 50' bgs screen						22	▽		
							23	▽		
	Water Level measured for 171' to 175' bgs screen									
	Water Level measured for 116' to 120' bgs screen						24	▽		
	Water Level measured for 76' to 80' bgs screen						25	▽		
							26			
	Water Level measured for 144' to 148' bgs screen						27	▽		
	Water Level measured for 96' to 100' bgs screen							▽		
							28		ML	
							29			
							30			
							31		SP	
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39		ML	
							40		SP	

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59A**	
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START Time: 16:10 Date: 06/10/04
	SAMPLING METHOD:	Macro Core	DRILL FINISH Time: 9:30 Date: 06/14/04
	DRILLING METHOD:	Push Probe / Direct Push	
	EQUIPMENT TYPE	Geo-Probe 6600	
	DRILLER:	Neil Kranz	
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							41		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 46 to 50 feet bgs. Following the removal of approximately 4 gallons of water, a groundwater sample (#2708-040611-108) was collected with disposable tubing/check valve at 10:45 hours, 6/11/04. Water level was measured at 21.65 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							42			
							43			
							44			
							45			
							46		SP/ ML	
							47			
							48		SP	
							49			
							50			
							51			
							52			
							53			
							54			
							55			
							56		SP	
							57			
							58			
							59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER	B-59A		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START Time: 16:10 Date: 06/10/04	DRILL FINISH Time: 9:30 Date: 06/14/04
PROJECT #: 2708	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz		
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							61			
							62			
							63			
							64			
							65			
							66		SP	
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76		SP	
							77		ML	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 76 to 80 feet bgs. Following the removal of approximately 3 gallons of water, a groundwater sample (#2708-040611-109) was collected with disposable tubing/check valve at 11:45 hours, 6/11/04. Water level was measured at 24.70 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							78			
							79			
							80			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-59A		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 16:10	Time: 9:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/10/04	Date: 06/14/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							81			
							82			
							83			
							84			
							85			
							86		ML	
							87			
							88		SP	
							89			
							90			
							91			
							92			
							93			
							94			
							95			
							96			
							97		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 96 to 100 feet bgs. Following the removal of approximately 4 gallons of water, a groundwater sample (#2708-040611-110) was collected with disposable tubing/check valve at 12:45 hours, 6/11/04. Water level was measured at 27.25 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							98			
							99			
							100			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	SOIL BORING NUMBER	B-59A		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	16:10	9:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/10/04	06/14/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							101			
							102			
							103			
							104			
							105			
							106			
							107			
							108			
							109			
							110			
							111			
							112			
							113			
							114			
							115			
							116		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 116 to 120 feet bgs. Following the removal of approximately 4 gallons of water, a groundwater sample (#2708-040611-112) was collected with disposable tubing/check valve at 14:00 hours, 6/11/04. Water level was measured at 23.40 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							117			
							118			
							119			
							120			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59A**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START Time:	DRILL FINISH Time:
	SAMPLING METHOD:	Macro Core	16:10	9:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.	06/10/04	06/14/04

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							121			
							122			
							123			
							124			
							125			
							126			
							127			
							128			
							129			
							130			
							131			
							132			
							133			
							134			
							135			
							136			
							137			
							138			
							139			
							140			

HAHN & ASSOCIATES, INC.	SOIL BORING NUMBER	B-59A		
434 NW Sixth Avenue Portland, Oregon (503) 796-0717	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Macro Core	Time: 16:10	Time: 9:30
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/10/04	Date: 06/14/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							141			**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 144 to 148 feet bgs. Following the removal of approximately 3.5 gallons of water, a groundwater sample (#2708-040611-113) was collected with disposable tubing/check valve at 15:40 hours, 6/11/04. Water level was measured at 26.55 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							142			
							143			
							144			
							145			
							146		SP	
							147			
							148			
							149		ML	
							150			
							151			
							152			
							153			
							154			
							155			
							156			
							157			
							158			
							159			
							160			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**B-59A**		
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Matt Graves / Andy Rolinger	DRILL START Time: 16:10	DRILL FINISH Time: 9:30
	SAMPLING METHOD:	Macro Core		
	DRILLING METHOD:	Push Probe / Direct Push		
	EQUIPMENT TYPE	Geo-Probe 6600		
	DRILLER:	Neil Kranz	Date: 06/10/04	Date: 06/14/04
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	2-inch
CASING DIAMETER:	3.25" steel temp. from 0-45' bgs
SURFACE ELEVATION:	Not Surveyed
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS NW-TPH Dx (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							161			
							162			
							163			
							164			
							165			
							166			
							167			
							168			
							169			
							170			
							171		SP	**GROUNDWATER SAMPLE** Installed a temporary 1-inch ID stainless steel well point with a 0.010-inch slotted screen at 171 to 175 feet bgs. Following the removal of approximately 5 gallons of water, a groundwater sample (#2708-040611-114) was collected with disposable tubing/check valve at 9:25 hours, 6/14/04. Water level was measured at 23.2 feet bgs prior to sampling. After sampling, the well point was removed from the borehole and the borehole was advanced.
							172			
							173			
							174			
							175			
							176			Boring terminated at 175' bgs at 9:30 6/14/04. Pressure grouted from bottom to approximately 10' bgs, bentonite chips to top.
							177			
							178			
							179			
							180			

BORING LOGS – ANCHOR ENVIRONMENTAL
WILLAMETTE RIVER BORINGS

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-01
DATE BEGAN: 7/21/04
DATE COMPLETED: 7/21/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring
Mudline: 0.5 feet
Staff Gage: 2.5 feet
Latitude: 45.57977374
Longitude: 122.75818444

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
				1.5		1		**SAND (SP)**; black; fine to medium sand, oil saturated, sticky, sheen.
						2		
						3		
						4		
						5		
						6		0.3 feet: **SAND (SP)**; black; fine to medium sand, oil saturated, sticky, sheen.
				3.5		7		0.2 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; no sheen.
						8		0.3 feet: **SAND (SP)**; grayish brown; fine sand.
						9		0.3 feet: **SILT (ML)**; grayish brown; as above.
						10		0.1 feet: **SAND (SP)**; grayish brown; fine to medium sand.
						11		0.6 feet: **SILT (ML)**; grayish brown; as above.
						12		0.1 feet: **SAND (SP)**; grayish brown; fine to medium sand.
				4.0		13		1.6 feet: **SILT (ML)**; grayish brown; as above.
						14		
						15		**SILT (ML)**; grayish brown; low to medium plasticity fines; trace fine sand.
						16		
						17		0.2 feet: **SAND (SP)**; grayish brown; fine to medium sand. (At base of sample interval)
				4.5		18		
						19		2.5 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; trace fine sand.
						20		2.0 feet: **SILTY SAND (SM)**; grayish brown; fine to medium sand; 10 to 20 percent nonplastic to low plasticity fines.

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site | BORING #: RAA-02
PROJECT NUMBER: 000029-02 | DATE BEGAN: 7/20/04
GEOLOGIST/ENGINEER: J. Renda | DATE COMPLETED: 7/20/04
DRILLING CONTRACTOR: Geotech Explorations, Inc. | TOTAL DEPTH: 20 feet
DRILLING METHOD: Direct Push/Geoprobe | SHEET: 1 OF 1
HOLE DIAMETER: 2-inch

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
								Field location of boring Mudline: 3.2 feet Latitude: 45.57982789 Staff Gage: 2.75 feet Longitude: 122.75792804
								LITHOLOGIC DESCRIPTION
								No recovery 0-10 feet with Geoprobe. Pushed core liner 4 feet into sediment using PVC rods w/ check valve with 0.5 feet recovery.
				0.0		1		
						2		0.5 feet: **Sandy Tar**; black; fine to medium sand in tar matrix.
						3		
						4		
						5		
						6		
				0.0		7		
						8		
						9		
						10		
						11		
						12		**SILT (ML)**; grayish brown; low to medium plasticity fines; light to medium sheen.
				3.0		13		
						14		@ approximately 1 foot from top of sample interval, 0.2 foot-thick oil/tar layer; firm, sticky.
						15		@ approximately 2.5 feet from top of sample interval, 0.2 foot-thick oil/sand layer with wood fragments.
						16		
						17		**SILT (ML)**; grayish brown; low to medium plasticity fines; trace fine sand; lenses of color change to black; spotty sheen.
				3.5		18		
						19		No sheen in bottom 1 foot of sample.
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site | BORING #: RAA-03
PROJECT NUMBER: 000029-02 | DATE BEGAN: 7/21/04
GEOLOGIST/ENGINEER: J. Renda | DATE COMPLETED: 7/21/04
DRILLING CONTRACTOR: Geotech Explorations, Inc. | TOTAL DEPTH: 23 feet
DRILLING METHOD: Direct Push/Geoprobe | SHEET: 1 OF 1
HOLE DIAMETER: 2-inch

Field location of boring
Mudline: 27.4 feet | Latitude: 45.58007390
Staff Gage: 5.25 feet | Longitude: 122.75794293

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
								No recovery 0-8 feet with Geoprobe; rods sink to 8 feet below mudline. Pushed 3-inch outside-diameter piston core 1.5 feet into sediment on 7/22/04.
				0.0		1		
						2		0.0 to 1.5 feet: **SILT (ML)**: grayish brown; medium plasticity fines; sheen.
						3		@ 0.2 to 0.3 feet: Oil/tar layer; black; firm
						4		@ 0.6 to 0.9 feet: Oil/tar layer; black; firm
						5		@ 1.2 to 1.4 feet: Oil/tar layer; black; firm; droplets of free product.
						6		
						7		
						8		
						9		Stratified layers of **Sand (SP)**, **SILT (ML)**, and **SILTY SAND (SM)** in layers of 0.2 to 0.3 feet thick. Trace wood chips; trace oil specks.
						10		
				3.0		11		
						12		
						13		
						14		**SAND (SP)**; grayish brown; fine to medium sand; loose; no sheen or specks.
						15		
				2.0		16		
						17		
						18		
						19		0.5 feet: **SAND (SP)**; grayish brown; fine to medium sand.
						20		0.8 feet: **SILT (ML)**; grayish brown; low to medium plasticity.
				3.0		21		0.3 feet: **SAND (SP)**; grayish brown; fine to medium sand.
						22		0.6 feet: **SILTY SAND (SM)**; grayish brown; fine to medium sand; 20 to 30 percent nonplastic to low plasticity fines.
						23		0.5 feet: **SAND (SP)**; grayish brown; fine sand.
								0.3 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines.

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-04
DATE BEGAN: 7/21/04
DATE COMPLETED: 7/21/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring
0.5 feet
Mudline: above water
Staff Gage: 3.5 feet
Latitude: 45.57971933
Longitude: 122.75805875

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		1.0 foot: **SANDY TAR with SILT**; black; fine to medium sand in tar matrix; nonplastic to low plasticity fines; trace fine to medium gravel; angular to subrounded.
						2		
				2.5				1.5 feet: **SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace fine sand; no sheen.
						3		
						4		
						5		
						6		5.0 to 6.0 feet: **SAND (SP)**; black; fine to medium sand; approximately 30 percent tar; trace fine to medium gravel.
						7		
				5.0		8		6.0 to 20.0 feet: **SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace fine sand; no sheen.
						9		
						10		
						11		
						12		
				3.0		13		
						14		
						15		
						16		
						17		
				4.5		18		
						19		
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-05
DATE BEGAN: 7/22/04
DATE COMPLETED: 7/22/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring
Mudline: 3.1 feet
Staff Gage: 4.9 feet
Latitude: 45.57985022
Longitude: 122.75809311

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
								1.3 feet: **TAR**; black; firm; sticky.
						1		0.3 feet: **SILT (ML)**; black; low plasticity fines; slight sheen.
								0.3 feet: **SAND (SP)**; black; fine sand, trace nonplastic to low plasticity fines.
						2		
				2.3				0.3 feet: **SILTY SAND (SM)**; black; fine to medium sand, 30 to 40 percent nonplastic to low plasticity fines; trace wood fragments.
						3		
						4		0.1 feet: **SAND (SP)**; dark gray to black; fine to medium sand.
						5		
						6		1.5 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; trace wood fibers; slight sheen.
						7		0.5 feet: **SANDY SILT (ML)**; dark gray; low to medium plasticity fines; 15 to 20 percent fine sand; medium sheen.
				3.5				0.2 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; light sheen.
						8		0.1 feet: **SILT (ML)**; dark gray; low to medium plasticity fines; medium sheen.
						9		1.1 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; light sheen in thin lenses.
						10		
						11		**SILT (ML)**; grayish brown; low to medium plasticity fines; no sheen.
						12		
				3.5				Bottom 1 foot of interval contains lenses of fine sand 0.2 to 0.3 feet thick.
						13		
						14		
						15		
						16		2.0 feet: **SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace fine sand; loose; wet.
						17		
				5.0				
						18		2.0 feet: **SANDY SILT (ML)**; grayish brown; nonplastic to low plasticity fines; 30 to 40 percent fine sand.
						19		
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-06
DATE BEGAN: 7/20/04
DATE COMPLETED: 7/20/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring
Mudline: 4.4 feet
Staff Gage: 3.0 feet
Latitude: 45.58001600
Longitude: 122.75808147

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
								0.5 feet: **SILT (ML)**; grayish brown; nonplastic to low plasticity fines; loose.
						1		0.8 feet: **TAR with SILTY SAND**; black; fine to medium sand with low plasticity fines in tar matrix.
						2		0.7 feet: **SANDY SILT (ML)**; grayish brown; nonplastic to low plasticity fines; 30-40 percent fine sand.
				2.2		3		0.2 feet: **SILTY SAND (SM)**; grayish brown; fine to medium sand; 20 to 30 percent nonplastic to low plasticity fines.
						4		
						5		0.5 feet: fine to medium gravel sized tar chunks; hard; brittle.
						6		2.0 feet: **SILTY SAND (SM)**; grayish brown; fine to medium sand; 20 to 30 percent nonplastic to low plasticity fines.
						7		1.5 feet: **SANDY SILT (ML)**; grayish brown; nonplastic to low plasticity fines; 30-40 percent fine sand; specks of oil/sheen.
				5.0		8		1.0 feet: **SILTY SAND (SM)**; dark grayish brown; fine to medium sand; 20 to 30 percent nonplastic to low plasticity fines; specks of oil/sheen.
						9		
						10		0.8 feet: **SILTY SAND (SM)**; dark grayish brown; fine to medium sand; 20 to 30 percent nonplastic to low plasticity fines; specks of oil/sheen.
						11		0.3 feet: **SANDY SILT (ML)**; grayish brown; medium plasticity fines; 30-40 percent fine sand; specks of oil/sheen.
						12		
				1.1		13		
						14		
						15		3.0 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; trace fine sand; lenses of color change to black; spotty sheen.
						16		2.0 feet: **SAND (SP)**; grayish brown; fine to medium sand; no sheen or spotting.
						17		
				5.0		18		
						19		
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site | BORING #: RAA-07
PROJECT NUMBER: 000029-02 | DATE BEGAN: 7/20/04
GEOLOGIST/ENGINEER: J. Renda | DATE COMPLETED: 7/20/04
DRILLING CONTRACTOR: Geotech Explorations, Inc. | TOTAL DEPTH: 20 feet
DRILLING METHOD: Direct Push/Geoprobe | SHEET: 1 OF: 1
HOLE DIAMETER: 2-inch

Field location of boring
Mudline: 16.7 feet | Latitude: 45.58011224
Staff Gage: 5.75 feet | Longitude: 122.75818444

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		No recovery 0-5 feet with Geoprobe; rods sink to 5 feet below mudline in the soft sediment.
						2		
						3		
						4		
						5		
						6		**SAND (SP)**; black; fine to medium sand; stratified with 0.3 to 0.4 foot-thick layers of TAR; firm and sticky.
						7		
				3.5		8		
						9		
						10		
						11		0.5 feet: **TAR**; black; 20 to 30 percent nonplastic to low plasticity fines; firm.
						12		0.5 feet: **SILT (ML)**; gray; medium plasticity fines.
						13		1 foot: **TAR**; black; 20 to 30 percent fine to medium sand.
				3.5		14		0.5 feet: **SAND (SP)**; grayish brown; fine to medium sand; few tar blebs; spotty sheen.
						15		0.5 feet: **SILT (ML)**; grayish brown; medium plasticity fines; slight sheen.
						16		0.5 feet: **SAND (SP)**; grayish brown; fine to medium sand; no sheen.
						17		0.5 feet: **SILT (ML)**; grayish brown; medium plasticity fines; specks of oil/sheen.
				2.5		18		2.0 feet: **SAND (SP)**; grayish brown; fine to medium sand; no sheen or spotting.
						19		
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-08
DATE BEGAN: 7/21/04
DATE COMPLETED: 7/21/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring
0.5 feet
Mudline: above water
Staff Gage: 3.2 feet
Latitude: 45.57982296
Longitude: 122.75845286

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		1 foot: **SANDY GRAVEL (GW)**; lt brown; fine to coarse; angular to subrounded; 20 to 30 percent fine to coarse sand.
						2		1 foot: **SAND (SP)**; black; fine to medium sand; oil/tar saturated.
				2.0		3		
						4		
						5		
						6		1.5 feet: **SAND (SP)**; black; fine to medium sand; saturated with oil/tar; firm and sticky.
						7		1.5 feet: **SILTY SAND (SM)**; grayish brown; fine sand; 20 to 30 percent nonplastic to low plasticity fines; no sheen.
				3.0		8		
						9		
						10		
						11		Note: no recovery; move over 1.5 feet and core 10 to 15 feet with full recovery.
						12		**SILTY SAND (SM)**; grayish brown; fine sand; 20 to 30 percent low to medium plasticity fines; no sheen.
				5.0		13		
						14		
						15		
						16		**SILT (ML)**: grayish brown; nonplastic to low plasticity fines; 5 to 10 percent fine sand; loose, wet, no sheen or spotting.
						17		
				5.0		18		
						19		
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site | BORING #: RAA-09
PROJECT NUMBER: 000029-02 | DATE BEGAN: 7/19/04
GEOLOGIST/ENGINEER: J. Renda | DATE COMPLETED: 7/19/04
DRILLING CONTRACTOR: Geotech Explorations, Inc. | TOTAL DEPTH: 20 feet
DRILLING METHOD: Direct Push/Geoprobe | SHEET: 1 OF 2
HOLE DIAMETER: 2-inch

Field location of boring

Mudline: 0.2 feet | Latitude: 45.57990589
Staff Gage: 3.0 feet | Longitude: 122.75826530

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		1.8 feet: **TAR**; black; firm; sticky.
						2		0.2 feet: **SAND (SP)**; dark gray; fine to medium sand; heavy sheen; oil droplets.
				2.0		3		
						4		
						5		
						6		**SAND (SP)**; dark gray; fine to medium sand; heavy sheen; oil droplets.
						7		
				3.5		8		
						9		
						10		
						11		**SAND (SP)**; dark gray; fine to medium sand; trace tar globs; heavy sheen; trace wood fragments.
						12		@ 12 to 14 feet; same with approximately 30 percent nonplastic fines.
				5.0		13		
						14		
						15		
						16		@ 16 feet: No sheen
						17		
				5.0		18		17.5 to 20 feet: **SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace fine sand; no sheen.
						19		@ 19 feet: 0.1 foot sand lense; fine to medium sand.
						20		@ 19.5 feet: 0.1 foot sand lense; fine to medium sand.

Remarks: A boring was advanced from 0 to 4 feet below mudline with 1.5 feet recovery. 1.5 feet of of tar was observed with sand in drive shoe. In the 4 to 8 foot interval, 2 feet of SAND was observed (2 feet recovery). Borehole was decommissioned with bentonite chips and a second boring was advanced as described above.

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME Northwest Natural "Gasco" Site | BORING # RAA-09
PROJECT NUMBER 000029-02 | DATE BEGAN 7/19/04
GEOLOGIST/ENGINEER J. Renda | DATE COMPLETED 7/19/04
DRILLING CONTRACTOR Geotech Explorations, Inc. | TOTAL DEPTH 20 feet
DRILLING METHOD Direct Push/Geoprobe | SHEET 2 OF 2
HOLE DIAMETER 2-inch

Field location of boring
Mudline: 0.2 feet | Latitude: 45.57990589
Staff Gage: 3.0 feet | Longitude: 122.75826530

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						21		2.5 feet: **SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace fine sand; no sheen.
						22		1.5 feet: **SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace fine sand; loose, soupy; trace wood fibers, no sheen.
				4.5		23		0.5 feet: **SAND (SP)**; grayish brown; fine to medium sand.
						24		
						25		
						26		**SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace fine sand; trace wood fragments; no sheen.
						27		
				5.0		28		@ 27 feet: 0.1 foot-thick sand lens.
						29		
						30		@ 29.5 feet: increase in plasticity and firmness.
						31		
						32		**SAND (SP)**; dark gray; fine to medium sand.
				5.0		33		
						34		
						35		@ 34.5 feet: 0.2 foot-thick silt lense; grayish brown; medium plasticity fines.
						36		
						37		**SAND (SP)**; grayish brown; fine to medium sand.
				5.0		38		
						39		
						40		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-10
DATE BEGAN: 7/19/04
DATE COMPLETED: 7/19/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring

Mudline: 2.3 feet
Staff Gage: 2.0 feet
Latitude: 45.580043205
Longitude: 122.75827003

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		**SAND (SP)**; black; fine to medium sand; 20 to 30 percent oil/tar; loose to firm; wet; heavy sheen.
				3.0		2		
						3		
						4		
						5		
						6		**SAND (SP)**; black; fine to medium sand; 20 to 30 percent oil/tar; loose to firm; wet; heavy sheen.
				2.0		7		
						8		
						9		
						10		
						11		**SILT (ML)**; grayish brown; medium plasticity fines; trace wood fragments.
						12		Oily specks to a depth of approximately 12 feet.
				4.0		13		
						14		
						15		
						16		2.5 feet: **SILT (ML)**: grayish brown; medium plasticity fines; trace wood fragments.
						17		1.0 feet: **SAND (SP)**; grayish brown; fine to medium sand.
				5.0		18		0.5 feet: **SANDY SILT (ML)**; grayish brown; low plasticity fines; 30 to 40 percent fine sand.
						19		0.5 feet: **SILTY SAND (SM)**; grayish brown; fine to medium sand; 20 to 30 percent low plasticity fines.
						20		0.5 feet: **SANDY SILT (ML)**; grayish brown; low plasticity fines; 30 to 40 percent fine sand.

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site | BORING #: RAA-11
PROJECT NUMBER: 000029-02 | DATE BEGAN: 7/22/04
GEOLOGIST/ENGINEER: J. Renda | DATE COMPLETED: 7/22/04
DRILLING CONTRACTOR: Geotech Explorations, Inc. | TOTAL DEPTH: 20 feet
DRILLING METHOD: Direct Push/Geoprobe | SHEET: 1 OF 1
HOLE DIAMETER: 2-inch

Field location of boring

Mudline: 2.9 feet | Latitude: 45.58003730
Staff Gage: 2.9 feet | Longitude: 122.75844474

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
								1.1 feet: **TAR;** black; firm; sticky.
						1		2.2 feet: **SAND (SP);** dark gray grading to grayish brown; fine to medium sand; slight sheen.
						2		
				3.3				@ approximately 2 feet from top of sample interval: 0.1 foot-thick silt lense
						3		@ approximately 3 feet from top of sample interval: 0.1 foot-thick silt lense
						4		
						5		
								SAND (SP); grayish brown; fine to medium sand; few oily specks; slight heavy sheen.
						6		
						7		@ approximately 1.9 feet from top of sample interval: 0.3 foot-thick silt lense; low to medium plasticity; sheen.
				3.3		8		@ approximately 2.9 feet from top of sample interval: 0.2 foot-thick silt lense; low to medium plasticity; sheen.
						9		
						10		
								0.3 feet: **SAND (SP);** grayish brown; fine to medium sand; sheen.
						11		
						12		3.7 feet: **SILT (ML);** grayish brown; low to medium plasticity fines; Oily specks to a depth of approximately 12 feet.
				4.0		13		@ 1 foot from top of sample interval: sand lense; oily, loose, laminated with silt, sand , and wood fibers.
						14		@ 1.5 feet from top of sample interval: tar chunk; hard, brittle, < 0.1 foot.
						15		@ 2.0 feet from top of sample interval: silty sand lense.
								2.8 feet: **SILT (ML):** grayish brown; low to medium plasticity fines; trace wood fragments.
						16		0.2 feet: **SAND (SP);** grayish brown; fine to medium sand, < 10 percent nonplastic fines.
						17		0.5 feet: **SILT (ML):** grayish brown; nonplastic to low plasticity fines.
				5.0		18		0.8 feet: **SAND (SP);** grayish brown; fine to medium sand.
						19		0.7 feet: **SILT (ML):** grayish brown; nonplastic to low plasticity fines.
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-12
DATE BEGAN: 7/20/04
DATE COMPLETED: 7/20/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring

Mudline: 4.3 feet
Staff Gage: 4.5 feet
Latitude: 45.58016669
Longitude: 122.75850000

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLING DATA: SAMPLE NUMBER	SAMPLING DATA: RECOVERY (feet)	SAMPLING DATA: DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		1.0 feet: **SILT (ML);** grayish brown; nonplastic fines; loose; slight sheen. 0.5 feet: **SILT (ML);** dark gray to black; low plasticity fines; heavy sheen.
				1.5		2		Note: An additional sample was collected using a Piston Core sampler. Pushed 3-inch outside-diameter piston core 3.0 feet into sediment on 7/22/04.
						3		
						4		0.0 to 0.2 feet: **SILT (ML)**: grayish brown; nonplastic fines; loose; oily sheen.
						5		0.2 to 3.0 feet: **SILT (ML)**; grayish brown; low plasticity fines; firm; slight sheen. @ 0.4 to 0.5 feet: black oily layer
						6		
						7		
				0.0		8		
						9		
						10		
						11		**SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace oil specks.
						12		@ 12 feet: 0.1 foot-thick oil/tar lense, black; firm. @ 12.1 feet: color change to dark gray/black with oily laminations.
				4.5		13		
						14		
						15		
						16		**SILT (ML)**; grayish brown; nonplastic to low plasticity fines; trace oil specks.
						17		
				5.0		18		@ 17 to 17.5 feet: **SAND (SP)**; grayish brown; fine to medium sand; slight sheen.
						19		@ 18 to 20 feet: no sheen.
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site | BORING #: RAA-13
PROJECT NUMBER: 000029-02 | DATE BEGAN: 7/20/04
GEOLOGIST/ENGINEER: J. Renda | DATE COMPLETED: 7/20/04
DRILLING CONTRACTOR: Geotech Explorations, Inc. | TOTAL DEPTH: 22 feet
DRILLING METHOD: Direct Push/Geoprobe | SHEET: 1 OF 1
HOLE DIAMETER: 2-inch

Field location of boring
Mudline: 19.9 feet | Latitude: 45.58017940
Staff Gage: 4.0 feet | Longitude: 122.75836670

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
				0.0		1		No recovery 0-7 feet with Geoprobe. Pushed core liner 4 feet into sediment using PVC rods w/ check valve with no recovery. Outside of core tube was coated with black oil/tar.
						2		
						3		
						4		
						5		
						6		
						7		
						8		1.0 foot: **SILT (ML);** grayish brown; nonplastic fines; loose; slight sheen.
						9		2.0 feet: **TAR**; black; silty with silt lenses and fibrous wood layers.
				4.0		10		0.4 feet: **SILT (ML);** black; nonplastic to low plasticity fines.
						11		0.3 feet: **SILT (ML);** grayish brown; nonplastic to low plasticity fines.
						12		0.3 feet: **SAND (SP);** grayish brown; fine to medium sand.
						13		2.0 feet: **SAND (SP);** grayish brown; fine to medium sand; loose; slight spotty sheen.
						14		
				3.0		15		1.0 feet: **SILTY SAND (SM);** grayish brown; fine to medium sand; 20 to 30 percent nonplastic to low plasticity fines; no sheen or oil specks.
						16		@ 2.5 feet from top of sample interval: 0.2 foot-thick silt lense.
						17		
						18		3.0 feet: **SAND (SP);** grayish brown; fine to medium sand; 3 specks of oil noted in top 1.5 feet of sample interval.
						19		1.8 feet: **SILTY SAND (SM);** grayish brown; fine sand; 20 to 30 percent nonplastic to low plasticity fines; no sheen or oil specks.
				5.0		20		
						21		0.2 feet: **SILT (ML);** grayish brown; nonplastic to low plasticity fines.
						22		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-14
DATE BEGAN: 7/20/04
DATE COMPLETED: 7/20/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring

Mudline: 31.1 feet
Staff Gage: 3.75 feet
Latitude: 45.58022110
Longitude: 122.75825230

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
								No recovery 0-10 feet with Geoprobe; rods sink to 10 feet below mudline.
				1.1		1		Pushed 3-inch outside-diameter piston core 1.1 feet into sediment on 7/22/04.
						2		
								SILT (ML); grayish brown; low to medium plasticity fines; trace wood fibers;
						3		approximately 6, 0.1 foot-thick lenses of black tar; firm and sticky.
						4		
						5		
						6		
						7		
				0.0		8		
						9		
						10		
						11		10.0 to 11.5 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; loose; blebs of tar/oil.
						12		11.5 to 13.5 feet: **SILT (ML)**: grayish brown to black; low to medium plasticity fines; black dense tar laminations; trace wood fibers and wood chunks.
				5.0		13		@13.5 feet: Fine Gravel.
						14		13.5 to 14.0 feet: **SANDY SILT (ML)**; grayish brown; low to medium plasticity fines; 30 to 40 percent fine sand; no sheen or spotting.
						15		14.0 to 20.0 feet: **SAND (SP)**; grayish brown; fine sand; trace fines; no sheen or spotting.
						16		@ 14.3 to 14.5 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines.
						17		
				4.0		18		@ 18.0 to 18.4 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines.
						19		@ 19.0 to 19.3 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines.
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-15
DATE BEGAN: 7/21/04
DATE COMPLETED: 7/21/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring
3 feet above
Mudline: water
Staff Gage: 4.0 feet
Latitude: 45.57996370
Longitude: 122.75874391

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		0.7 feet: **GRAVELLY SAND (SW)**; rust brown; fine to coarse sand; fine to coarse gravel; angular to rounded; nonplastic fines; moist.
						2		0.3 feet: **GRAVELLY SAND (SW)**; grayish brown; fine to coarse sand; fine to coarse gravel; angular to rounded; nonplastic fines; wet.
				1.0		3		@2.5 feet: standing water in borehole.
						4		
						5		
						6		1.0 feet: **SILT WITH SAND (ML)**; grayish brown; nonplastic fines; 20 to 30 percent fine sand; loose; spotty sheen; sluff?
						7		3.0 feet: **SILT WITH SAND (ML)**; grayish brown; nonplastic fines; 20 to 30 percent fine sand; firm; no sheen.
				4.0		8		@ 3 feet from top of sample interval: 0.1 foot-thick woody layer.
						9		
						10		
						11		**SILT WITH SAND (ML)**; grayish brown; nonplastic fines; 20 to 30 percent fine sand; firm; no sheen.
						12		
				3.0		13		
						14		
						15		
						16		No recovery
						17		
				0.0		18		
						19		
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-16
DATE BEGAN: 7/22/04
DATE COMPLETED: 7/22/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring

Mudline: 2.4 feet
Staff Gage: 3.0 feet

Latitude: 45.58024746
Longitude: 122.75866807

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		0.4 feet: **SILT (ML)**; dark gray to black; low plasticity fines; loose; medium to heavy sheen; 5 to 10 percent wood chips.
						2		0.8 feet: **SAND (SP)**; dark gray to black; fine to medium sand; trace fines; spotty sheen.
				2.8		3		1.2 feet: **SILT (ML)**; black; nonplastic to low plasticity fines; spotty sheen.
						4		@ 1.8 feet from top of sample interval: 0.1 foot-thick heavy sheen layer.
						5		0.4 feet: **SAND (SP)**; dark gray to black; fine to medium sand; trace fines; spotty sheen.
						6		1.4 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; loose, light sheen.
						7		@ 0.2 feet from top of sample interval: 0.1 foot-thick black oily layer.
				3.2		8		0.8 feet: **SAND (SP)**; grayish brown; fine to medium sand; trace fines; light sheen.
						9		1.0 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; dark gray to black banding; light sheen.
						10		
						11		0.3 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; trace fine to medium sand, no sheen or spotting.
						12		0.3 feet: **SAND (SP)**; grayish brown; fine to medium sand; trace fines; no sheen.
				3.7		13		0.7 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; no sheen.
						14		0.6 feet: **SAND (SP)**; grayish brown; fine sand; trace fines; no sheen.
						15		1.8 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; black laminations; no sheen.
						16		**SILT (ML)**; grayish brown; low to medium plasticity fines; < 5 percent fine sand, trace root hairs; no sheen or spotting.
						17		
				5.0		18		
						19		@ 18.5 to 19.2 feet: loose, soupy.
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site | BORING #: RAA-17
PROJECT NUMBER: 000029-02 | DATE BEGAN: 7/22/04
GEOLOGIST/ENGINEER: J. Renda | DATE COMPLETED: 7/22/04
DRILLING CONTRACTOR: Geotech Explorations, Inc. | TOTAL DEPTH: 21 feet
DRILLING METHOD: Direct Push/Geoprobe | SHEET: 1 OF: 1
HOLE DIAMETER: 2-inch

Field location of boring

Mudline: 2.7 feet | Latitude: 45.58014987
Staff Gage: 3.0 feet | Longitude: 122.75872767

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		No recovery 0-1 feet with Geoprobe; rods sink to 1 feet below mudline.
						2		0.5 feet: **SILT (ML)**; dark gray to black; nonplastic to low plasticity fines; loose, trace wood chucks; heavy sheen.
						3		1.0 feet: **SAND (SP)**; dark gray; fine to medium sand; trace fines; light sheen.
				2.5		4		0.5 feet: **SILT (ML)**; dark gray; nonplastic to low plasticity fines; loose, trace wood chucks; light sheen.
						5		0.5 feet: **SAND (SP)**; dark gray; fine to medium sand; trace fines; light sheen.
						6		
						7		**SILT (ML)**; grayish brown; low to medium plasticity fines; trace woody layers; light sheen lenses.
						8		@ 1.5 feet from top of sample interval: 0.1 foot-thick woody layer with heavy sheen.
				3.2		9		
						10		
						11		
						12		0.4 feet: **SAND (SP)**; grayish brown; fine sand; trace fines; no sheen.
						13		0.8 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; trace root hairs; no sheen or spotting.
				3.5		14		0.7 feet: **SAND (SP)**; grayish brown; fine sand; trace fines; trace spotty sheen.
						15		1.5 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; no sheen or spotting.
						16		0.1 feet: **SILT (ML)**; black; nonplastic fines; firm; brittle; no sheen or spotting.
						17		0.5 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; no sheen.
						18		0.2 feet: **SILTY SAND (SM)**; grayish brown; fine sand; nonplastic fines; loose, soupy.
				3.5		19		1.8 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines.
						20		0.6 feet: **SAND (SP)**; grayish brown; fine sand; trace fines.
						21		0.4 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines.

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-18
DATE BEGAN: 7/21/04
DATE COMPLETED: 7/21/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring
4 feet above
Mudline: water
Staff Gage: 2.75 feet
Latitude: 45.57968324
Longitude: 122.75810387

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLING DATA: SAMPLE NUMBER	SAMPLING DATA: RECOVERY (feet)	SAMPLING DATA: DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		**GRAVELLY SAND (SW)**; rust brown; fine to coarse sand; fine to coarse gravel; angular to rounded; nonplastic fines; moist.
				1.2		2		
						3		
						4		
						5		
						6		5.0 to 20.0 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; 5 to 10 percent fine sand.
				1.5		7		
						8		
						9		
						10		
						11		
						12		
				4.0		13		
						14		
						15		
						16		
						17		
				4.0		18		
						19		
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-19
DATE BEGAN: 7/22/04
DATE COMPLETED: 7/22/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring

Latitude: 45.57985626
Longitude: 122.75846549

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		1.4 feet: **GRAVELLY SAND (SW)**; rust brown; fine to coarse sand; fine to coarse gravel; angular to rounded; nonplastic fines.
						2		0.2 feet: **GRAVELLY SAND (SW)**; gray; fine to coarse sand; fine to coarse gravel; angular to rounded; nonplastic fines.
				2.5		3		0.6 feet: **WOOD CHIPS**; dark brown to black; 3 medium sized gravel-like tar chunks; hard.
						4		0.3 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; 5 to 10 percent fine sand; spotty sheen.
						5		
						6		0.3 feet: **SILT (ML)**; grayish brown; nonplastic fines.
						7		2.0 feet: **TAR**; black; with oil/tar saturated lenses of sand and silt.
				2.3		8		
						9		
						10		
						11		10.0 to 20.0 feet: **SILT (ML)**; gray; low to medium plastic fines; 10 to 20 percent fine sand; no sheen.
						12		
				4.0		13		
						14		
						15		
						16		
						17		
				4.5		18		
						19		
						20		

Remarks:

ANCHOR ENVIRONMENTAL, L.L.C.

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: Northwest Natural "Gasco" Site
PROJECT NUMBER: 000029-02
GEOLOGIST/ENGINEER: J. Renda
DRILLING CONTRACTOR: Geotech Explorations, Inc.
DRILLING METHOD: Direct Push/Geoprobe
HOLE DIAMETER: 2-inch

BORING #: RAA-20
DATE BEGAN: 7/22/04
DATE COMPLETED: 7/22/04
TOTAL DEPTH: 20 feet
SHEET: 1 OF 1

Field location of boring

Latitude: 45.57975098
Longitude: 122.75829940

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	RECOVERY (feet)	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
						1		1.5 feet: **GRAVELLY SAND (SW)**; rust brown; fine to coarse sand; fine to coarse gravel; angular to rounded; nonplastic fines.
						2		0.8 feet: **TAR**; black; with oil/tar saturated lenses of sand and silt.
				2.5		3		0.2 feet: **SAND (SP)**; dark gray; fine to medium; spotty sheen.
						4		0.3 feet: **SILT (ML)**; grayish brown; low to medium plasticity fines; 5 to 10 percent fine sand; spotty sheen.
						5		
						6		5.0 to 5.5 feet: **GRAVELLY SAND (SW)**; gray; fine to coarse sand; fine to medium gravel; angular to subrounded; fine to coarse sand; spotty sheen.
						7		5.5 to 5.6 feet: **SAND (SP)**; dark gray; fine to medium sand; spotty sheen.
				5.0		8		5.6 to 20.0 feet: **SILT (ML);** grayish brown; nonplastic to low plasticity fines; 10 to 20 percent fine sand; trace fine sand lenses; no sheen.
						9		
						10		
						11		10.0 to 20.0 feet: **SILT (ML);** gray; low to medium plastic fines; 10 to 20 percent fine sand; no sheen.
						12		
				4.5		13		
						14		
						15		
						16		
						17		
				5.0		18		
						19		
						20		

Remarks:

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**		**AN-2-1**	
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Kim Magruder/Rob Ede	DRILL START Time: 9:23	DRILL FINISH Time: 9:28
	SAMPLING METHOD:	Stainless Steel Soil Sampler		
	DRILLING METHOD:	Vibracore		
	EQUIPMENT TYPE	Same as above		
	DRILLER:	Bill Jaworski	Date: 04/11/01	Date: 04/11/01
PROJECT #: 2708	DRILLING CONTRACTOR:	Marine Sampling Systems		

BORING DIAMETER: 3-inch OD
CASING DIAMETER: N/A
SURFACE ELEVATION: Estimated to be: N/A
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
				AN2-1A				ML	**AN2-1A (4' 2" core length)** SILT, brown, wet, soft (soupy), small fraction very fine sand (<5%), organic matter (rootlets, wood fiber), no sheen, slight hydrocarbon odor (0 to 10 cm), slight increase in sand content and slight sheen (10 to 20 cm); increased organic matter, decreased moisture content, no sheen, no hydrocarbon odor (30 to 40 cm). SILT, as above to 3', at 3' have a 2" thick tar layer (black and oily with some elastic tar and associated oily tar), slight sheen, hydrocarbon odor, 3-inch thick sandy silt zone from 3'11" to 4'2. **AN2-1B (3' 11" core length)** SILT, olive grey with black mottling, moist, medium soft, with weathered tar layers to 5' 11" bgs, below weathered tar zone silt is olive grey, no sheen, no hydrocarbon odor. **AN2-1C (3' 3" core length)** SILT, olive grey, moist, medium soft, no sheen, no hydrocarbon odor. Total Core Push = Total Recovered Core Length = 11' 4"
			2.0			1			
						2			
						3			
			1.4			4			
				AN2-1B		5			
						6			
						7			
			0.0			8		ML	
				AN2-1C		9			
						10			
						11			
						12			
						13			
						14			
						15			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**AN-2-2**	
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Kim Magruder/Rob Ede	DRILL START Time: 10:06 / DRILL FINISH Time: 10:11
	SAMPLING METHOD:	Stainless Steel Soil Sampler	
	DRILLING METHOD:	Vibracore	
	EQUIPMENT TYPE	Same as above	
	DRILLER:	Bill Jaworski	Date: 04/11/01 / Date: 04/11/01
PROJECT #: 2708	DRILLING CONTRACTOR:	Marine Sampling Systems	

BORING DIAMETER: 3-inch OD
CASING DIAMETER: N/A
SURFACE ELEVATION: Estimated to be: N/A
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
				AN2-2A		1		ML	**AN2-2A (4' 0" core length)** SILT, light brown, wet, medium soft, several hard tar fragments with associated oil blebs (0 to 10 cm). SILT, as above, increased tar fragment content, decreased moisture (10 to 20 cm). SILT, as above, slightly moist, no tar or oil, slight sheen (30 to 40 cm). SILT, as above to 1'8", then encounter a weathered black, stiff tar layer (tar w/out the elasticity), black viscous oil below weathered tarry zone extends to base of core at 4'.
						2			
						3			
						4			
				AN2-2B		5			
						6		ML	**AN2-2B (4' 4" core length)** SILT, olive grey and black, moist, few thin fine grained sand layers, much plant material, black, weathered tar layers with viscous oil to 5' 6" bgs, below which Silt becomes olive grey with no tar or oil to base of core at 8' 4"
						7			
						8			
						9			
				AN2-2C		10			**AN2-2C (3' 8" Core length)** Sandy SILT, light brown and grey mottled, moist, some fines, plant matter, no sheen, slight odor (organic?), fine grained sand across 10'10" to 11'6" interval (moist, grey), no sheen, no odor to base of core at 12 feet bgs.
						11			
						12		S ML	Total Core Push = Total Recovered Core Length = 12' 0"
						13			
						14			
						15			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**		**AN-2-3**	
	HAI LOGGER:	Kim Magruder/Rob Ede	DRILL START	DRILL FINISH
PROJECT: NW Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	Stainless Steel Soil Sampler	Time: 10:40	Time: 10:45
	DRILLING METHOD:	Vibracore		
	EQUIPMENT TYPE	Same as above		
	DRILLER:	Bill Jaworski	Date: 04/11/01	Date: 04/11/01
PROJECT #: 2708	DRILLING CONTRACTOR:	Marine Sampling Systems		

BORING DIAMETER: 3-inch
CASING DIAMETER: N/A
SURFACE ELEVATION: Estimated to be: N/A
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
				AN2-3A		1		ML	**AN2-3A (4' 0" core length)** SILT, olive grey, wet, soft, slight sheen on outside of core, few wood chips, no sheen, no hydrocarbon odor, no product (0 to 10 cm). SILT, as above, 2 small tar fragments (10 to 20 cm) SILT, as above, slightly moist, firm, plant matter - rootlets present, very slight sheen, no hydrocarbon odor, no tar (30 to 40 cm). SILT, as above to 2'9" where layers of black weathered tar (not elastic) are present, patches of viscous oil below weathered tar zone, magnitude of oil (patchy) decreasing to base of core at 4" 0". **AN2-3B (4' 0" core length)** Sandy SILT, light brown, moist, much plant matter, minor black mottling, no sheen, moderate petroleum odor to 5'10", where 4" thick weathered tar is present, tar layer contains several small leaves, tar layer is underlain by light brown sandy SILT with rootlets, no tar, no oil, no sheen (6'2" to 8'). **AN2-3C (4' 2" core length)** Sandy SILT, as above, light brown, soft to medium-stiff, minor rootlets, no odor, no sheen, no oil, no tar, (8' to 11'10"). SAND, grey, moist, very fine grained, no odor, no sheen 11' 10" to 12' 2"). Total Core Push = Total Recovered Core Length = 12' 2"
						2			
						3			
						4			
				AN2-3B		5			
						6			
						7			
						8			
				AN2-3C		9		ML	
						10			
						11			
						12			
			0.0			13		SP	
						14			
						15			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**		**AN-2-4**	
PROJECT: NW Natural Gasco Facility Portland, Oregon	HAI LOGGER:	Kim Magruder/Rob Ede	DRILL START Time: 15:05	DRILL FINISH Time: 15:10
	SAMPLING METHOD:	Stainless Steel Soil Sampler		
	DRILLING METHOD:	Vibracore		
	EQUIPMENT TYPE	Same as above		
	DRILLER:	Bill Jaworski	Date: 04/11/01	Date: 04/11/01
PROJECT #: 2708	DRILLING CONTRACTOR:	Marine Sampling Systems		

BORING DIAMETER: 3-inch
CASING DIAMETER: N/A
SURFACE ELEVATION: Estimated to be: N/A
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
				AN2-4A		1		ML	**AN2-4A (4' 0" core length)** SILT, brown, wet, very soft, brown oily blebs on outside of core, no sheen on interior, moderate petroleum odor (0 to 10 cm). SILT, as above, moist, soft, piece of wood and several blebs of brown oil product within core (10 to 20 cm). SILT, olive grey, moist, medium-soft, no visible oil product on interior of core, slight sheen (30 to 40 cm). SILT, as above to 2'7" where sand content increases and a zone of black, weathered tar (moist, non-elastic, disintegrates with pressure) surrounded by patchy viscous black oil, rootlets, sticks, twigs (2'7" to 4' 0").
						2			
						3			
						4			
				AN2-4B		5			
						6			
						7			
			7.2			8		SP	**AN2-4B (4' 2" core length)** Sandy SILT, brown, moist, much plant material, weathered tar zone at 6'0" to 6'6" SAND, grey, moist, fine grained, hydrocarbon odor, no sheen, no product (6'6" to 8'2").
				AN2-4C		9			
			6.3			10			**AN2-4C (2' 0" core length)** SAND, as above, petroleum odor, no oil, no tar, sheen on outside of core only.
						11			
						12			Total Core Push = Total Recovered Core Length = 10' 2"
						13			
						14			
						15			

APPENDIX B

Monitoring Well Construction Logs

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	MONITORING WELL NUMBER OWRD # 167444	MW-16-45	
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	HAI LOGGER: Matt Graves SAMPLING METHOD: 4-inch Core - Bagged DRILLING METHOD: Sonic EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS DRILLER: Bruce Anderson	DRILL START Time: 10:35 Date: 20-Jul-04	DRILL FINISH Time: 14:40 Date: 20-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	6-inch
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.81' msl
TOP OF CASING ELEVATION:	33.12' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Steel Monument							-3			
							-2			
							-1			Ground surface
Concrete							1			NOTE: No soil sampling from 0 to 24 feet bgs. See log for well MW-16-125 for soil description from 0 to 24 feet bgs.
							2			
							3			
							4			
							5			
							6			
							7			
							8			
							9			
Bentonite Grout 2-inch ID Stainless Steel Casing							10			
							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **OWRD # 167444**	**MW-16-45**	
	HAI LOGGER: Matt Graves	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD: 4-inch Core - Bagged	Time: 10:35	Time: 14:40
	DRILLING METHOD: Sonic		
	EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS		
	DRILLER: Bruce Anderson	Date: 20-Jul-04	Date: 20-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	6-inch
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.81' msl
TOP OF CASING ELEVATION:	33.12' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout / Chips							21			
							22			
							23			
							24			
							25		ML	Sandy Gravely SILT - moist, stiff silt with fine grained sands, some angular to sub angular gravel, no petroleum odor, some sheen (24'-26' bgs)
20/40 Sand	BAG A	12:45	0.2				26			
2-inch ID Stainless Steel Casing							27			
							28			
							29			
							30			
	BAG B	13:10	10.1				31			
							32			Sandy SILT - moist, olive grey, soft to very soft silt with very few fine grained sands, and subangular to angular gravels, petroleum odor, brown oily blebs and sheen present (30.5-32.5' bgs)
							33		ML	
							34			Sandy SILT - moist, olive grey to dark grey, soft silt with very fine grained sands, petroleum odor, brown oily blebs and sheen present (32.5'-35' bgs)
10/20 Sand Pack							35			
0.010- inch Stainless Steel Screen	BAG C	13:15	287.0				36			Silty SAND - wet, light brown, loose/soupy, fine grained with some interbedded silt layers, petroleum odor present, sheen pressent, brown oil present (35'-36' bgs)
							37			
							38		SM	Silty SAND - wet, light brown, loose/soupy, fine grained with some interbedded silt layers, petroleum odor present, sheen present, brown oil present (36'-41' bgs)
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **OWRD # 167444**	**MW-16-45**	
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	HAI LOGGER: Matt Graves SAMPLING METHOD: 4-inch Core - Bagged DRILLING METHOD: Sonic EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS DRILLER: Bruce Anderson	DRILL START Time: 10:35 Date: 20-Jul-04	DRILL FINISH Time: 14:40 Date: 20-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	6-inch
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.81' msl
TOP OF CASING ELEVATION:	33.12' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
10/20 Sand Pack / 0.010-inch Stainless Steel Screen	BAG D	13:50	433.0				41		SM	Silty SAND - wet, light brown, loose/soupy, fine grained with some interbedded silt layers (approximately 1/2" thick), petroleum odor present, sheen pressent, brown oil present (smearing from above?) (42'-46' bgs)
							42			
							43			
							44			
							45			
Bentonite Chips / Sump	BAG E	14:15	127.0				46			Silty SAND - wet, light brown, loose/soupy, fine grained with some interbedded silt layers (approximately 1/2" thick), petroleum odor present, sheen pressent, brown oil (smearing from above?) present - but diminished as compared to 42' to 46' interval (46'-48' bgs)
							47			
	BAG F	14:35					48			
							49			NOTE: Boring terminated @ 49' bgs, 7/20/04 @ 14:40 Due to strong potential of oil smearing in the very wet, loose soils (very disturbed core) below 35 feet bgs, and lack of a protective outer casing at this location, terminate boring at 49 feet bgs and establish screen interval for shallow well on soil description from adjacent 125 foot boring (MW-16-125).
							50			
							51			
							52			
							53			Materials: 15 feet 2-inch ID, 0.010-inch slotted stainless steel screen 30 feet 2-inch diameter stainless steel blank casing 1 50# bag 20/40 sand 7 50# bags 10/20 sand 1 50# bag bentonite pellets 2 50# bags bentonite grout 1 2.5 foot stainless steel sump 1 locking cap above-grade steel monument
							54			
							55			
							56			
							57			
							58			
							59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** OWRD # 167443	**MW-16-65**	
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	HAI LOGGER: Matt Graves SAMPLING METHOD: 6-inch / 4-inch Core - Lexan Tube and Bagged DRILLING METHOD: Sonic EQUIPMENT TYPE: Sonic Rig GP 24 - 300 RS DRILLER: Bruce Anderson	DRILL START Time: 14:00 Date: 16-Jul-04	DRILL FINISH Time: 16:20 Date: 19-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	8-inch to 50' bgs; 6-inch to 68' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.60' msl
TOP OF CASING ELEVATION:	33.11' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Steel Monument							-3			
							-2			
							-1			Ground surface
Concrete							1		GP	NOTE: No soil sampling from 0 to 26 feet bgs. See log for well MW-16-125 for soil description from 0 to 26 feet bgs.
							2		SP	
							3			
							4			
							5			
							6			
							7			
							8			
							9			
							10			
Bentonite Grout							11		ML	
2-inch ID Stainless Steel Casing							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			NOTE: Stop drilling for the day at 20' bgs at 18:00, 7/16/04, resume at 8:00, 7/19/04.
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	MONITORING WELL NUMBER OWRD # 167443	MW-16-65	
	HAI LOGGER: Matt Graves	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD: 6-inch / 4-inch Core - Lexan Tube and Bagged		
	DRILLING METHOD: Sonic	Time: 14:00	Time: 16:20
	EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS		
	DRILLER: Bruce Anderson	Date: 16-Jul-04	Date: 19-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	8-inch to 50' bgs; 6-inch to 68' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.60' msl
TOP OF CASING ELEVATION:	33.11' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout 2-inch ID Stainless Steel Casing	A A B B C C D D E E F F G						21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40		ML GP ML GP ML	NOTE: Lexan Core-Barrel samples collected from 26-46' bgs. Observations across this interval are general and based on observations through the clear Lexan core sampler. Lexan Core Samples were capped, labeled, and frozen for transport to labortatory. SAMPLE A - (Lexan Core Tube) Olive grey, oil observed on inner Lexan surface at or near 28-28.5' bgs (26-28.5' bgs) SAMPLE B - (Lexan Core Tube) Olive grey, oil observed on inner Lexan surface at or near 29-30' bgs (28.5-31' bgs) SAMPLE C - (Lexan Core Tube) Light brown to brown, oil observed on inner Lexan surface from 31.5-33.5' bgs (31-33.5' bgs) SAMPLE D - (Lexan Core Tube) Light brown, oil observed on inner Lexan surface from 33.5-36' bgs (33.5-36' bgs) SAMPLE E - (Lexan Core Tube) Brown, oil observed on inner Lexan surface from 36-37' bgs (36-37' bgs) SAMPLE F - (Lexan Core Tube) Brown, oil observed on inner Lexan surface from 37-39' bgs (37-39' bgs) SAMPLE G - (Lexan Core Tube) Olive grey, oil observed on inner Lexan surface at 38' bgs and at 39' bgs, cleans up at 40' bgs (39-41' bgs)

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **OWRD # 167443**	**MW-16-65**	
	HAI LOGGER:	Matt Graves	DRILL START
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	6-inch / 4-inch Core - Lexan Tube and Bagged	DRILL FINISH
	DRILLING METHOD:	Sonic	Time: 14:00
	EQUIPMENT TYPE	Sonic Rig GP 24 - 300 RS	Time: 16:20
	DRILLER:	Bruce Anderson	Date: 16-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR:	Boart Longyear	Date: 19-Jul-04

BORING DIAMETER:	8-inch to 50' bgs; 6-inch to 68' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.60' msl
TOP OF CASING ELEVATION:	33.11' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout / Bentonite Chips / 2-inch ID Stainless Steel Casing	G						41			SAMPLE H (Lexan Core Tube) - Brown, traces of oil observed on inner Lexan surface throughout core (41-42' bgs)
	H						42			SAMPLE I (Lexan Core Tube) - Brown to olive grey, possible presence of oil on inner Lexan surface at 42' bgs (42-44' bgs)
	H						43			
	I						44			SAMPLE J (Lexan Core Tube) - Olive grey, no visible oil on inner Lexan surface(44-46' bgs)
	I						45			
	J						46			
	J	11:25					47			
							48			NOTE: 8-inch diameter steel drive casing set at 50' bgs, sealed with bentonite chips. Resume drilling through the sealed 8-inch casing with 6-inch drive casing, collecting 4-inch soil core, extruded into plastic bags.
							49			
							50			
20/40 Sand	BAG A	0.5938	14.7				51			SAND with interbedded silts - Very moist, olive grey to dark grey, soft, with fine grained sands petroleum odor and sheen present (50-52.5' bgs)
							52			
10/20 Sand Pack							53			SAND - moist, olive grey, medium dense, with interbedded silt layers (approximately 6" to 1' thick), petroleum odor and sheen present (52.5'-55' bgs)
							54			
	BAG B	14:17	2.3				55		SP	
0.010-inch Stainless Steel Screen							56			SAND with interbedded silts - moist, olive grey to dark grey, loose, with fine grained sands, petroleum odor and sheen present (55.5'-59' bgs)
							57			
							58			
							59			
	BAG C	15:20	0.0				60		SM	Silty SAND - moist, olive grey to dark grey, medium stiff, fine grained, no petroleum odor or sheen present (59'-60' bgs)

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** OWRD # 167443	**MW-16-65**	
	HAI LOGGER: Matt Graves	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD: 6-inch / 4-inch Core - Lexan Tube and Bagged		
	DRILLING METHOD: Sonic	Time: 14:00	Time: 16:20
	EQUIPMENT TYPE: Sonic Rig GP 24 - 300 RS		
	DRILLER: Bruce Anderson	Date: 16-Jul-04	Date: 19-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	8-inch to 50' bgs; 6-inch to 68' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.60' msl
TOP OF CASING ELEVATION:	33.11' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
10/20 Sand Pack; 0.010-inch Stainless Steel Screen	K						61		SM	SAMPLE K (Lexan Core Tube) - Olive grey, no visible oil (60-61' bgs)
	K									
	L						62			SAMPLE L (Lexan Core Tube) - Olive grey, no visible oil (61-63' bgs)
	L						63			
							64			
							65			
Bentonite Chips; Sump							66			Silty SAND - moist, olive grey to dark grey, soft, little to no fines, fine sand grains, no petroleum odor or sheen present (65'-67' bgs)
							67			
	BAG D	16:15	0.0				68		ML	Sandy SILT - very moist, olive grey to dark grey, medium stiff, with fine sand grains, no petroleum odor or sheen present (67'-68' bgs)
							69			NOTE: Boring terminated @ 68' bgs, 7/19/04 @ 16:20
							70			Materials: 10 feet 2-inch ID, 0.010-inch slotted stainless steel screen 58 feet 2-inch diameter stainless steel blank casing 1 50# bag 20/40 sand 5 50# bags 10/20 sand 1 50# bag bentonite pellets 7 50# bags bentonite grout 1 2.5 foot stainless steel sump 1 locking cap above-grade steel monument
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** OWRD # 167442		**MW-16-125**	
	HAI LOGGER:	Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD:	6-inch / 4-inch Core - Bagged		
	DRILLING METHOD:	Sonic	Time:	Time:
	EQUIPMENT TYPE	Sonic Rig GP 24 - 300 RS	11:40	17:25
	DRILLER:	Bruce Anderson	Date:	Date:
PROJECT: 2708	DRILLING CONTRACTOR:	Boart Longyear	14-Jul-04	15-Jul-04

BORING DIAMETER:	8-inch to 57' bgs; 6-inch to 130' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.49' msl
TOP OF CASING ELEVATION:	32.89' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Steel Monument							-3			
							-2			
							-1			Ground surface
Concrete							1		GP	Sandy Silty GRAVEL - dry, tan-brown, no oil, no tar, no sheen, no petroleum odor (0-1' bgs)
							2		SP	Gravelly SAND with cobbles - dry, grey (crushed concrete), no oil, no tar, no sheen, no petroleum odor (1-2.5' bgs)
							3			Gravelly sandy SILT - moist, tan-brown, no oil, no tar, no sheen, no petroleum odor (3-4.5' bgs)
							4			
	BAG	11:50	22.9				5			Gravelly sandy SILT - moist, dark brown-grey, no oil, no tar, no sheen, no petroleum odor (4.5-5' bgs)
							6			Gravelly sandy SILT - moist, olive-grey, slightly plastic, several brick fragments and woody plant matter, no oil, no tar, no sheen, no petroleum odor (5-7.5' bgs)
							7			
							8			Gravelly sandy SILT - moist, brown, plastic, medium stiff, some rock fragments (approximately 2" diameter), no oil, no tar, no sheen, no petroleum odor (7.5-10' bgs)
							9			
	BAG	12:02	27.5				10			
2-inch ID Stainless Steel Casing							11		ML	Gravelly, cobbly, sandy SILT - moist, brown, slightly plastic silts with subrounded to angular gravels and cobbles, no oil, no tar, no sheen, slight naphthalene odor (10-12.5' bgs)
	BAG	12:10	37.9				12			
							13			Gravelly SILT - moist, brown, slightly plastc, minor zones of dark grey staining (with naphthalene odor), some black flecks (carbon pitch, carbon pitch odor), some rootlets and brick fragments. Gravels are sub-rounded to angular. Core becomes very moist and turns olive grey at 14' bgs. No oil, no tar, no sheen (12.5-15' bgs)
							14			
	BAG	12:25	42.6				15			
							16			Gravelly SILT - moist, brown, napthalene and carbon pitch odor, no oil, no tar, no sheen (15-16' bgs)
							17			Gravelly SILT - moist, brown, slightly plastic, naphthalene and carbon pitch odor, no oil, no tar, no sheen (16-18' bgs)
3/8-inch Bentonite Chips							18			
							19			Gravelly SILT - very moist, brown, plastic, carbon pitch odor, no oil, no tar, no sheen (18-20' bgs)
	BAG	12:45	36.6				20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	MONITORING WELL NUMBER OWRD # 167442	MW-16-125	
	HAI LOGGER: Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD: 6-inch / 4-inch Core - Bagged DRILLING METHOD: Sonic EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS DRILLER: Bruce Anderson	Time: 11:40 Date: 14-Jul-04	Time: 17:25 Date: 15-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	8-inch to 57' bgs; 6-inch to 130' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.49' msl
TOP OF CASING ELEVATION:	32.89' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							21		ML	Gravelly SILT - wet, olive grey, few brick fragments, no oil, no tar present, sheen present, strong petroleum odor (20-22.5' bgs)
							22			
							23		GP	Gravelly SILT - wet, olive grey, slight naphthalene odor, no oil, no tar present, sheen present (22.5-23' bgs)
							24		MI	Crushed CONCRETE - grey (23-23.5' bgs) Gravelly SILT - moist, olive-grey, slight naphthalene odor, black tarry oil, slight sheen present (23.5-24' bgs)
	BAG	2:25	326.0				25		GP	Crushed CONCRETE - grey (24-24.5' bgs) Gravelly SILT - moist, black with oil, tarry blebs, sheen present, petroleum odor (24.5-25' bgs)
							26			
							27		ML	Sandy SILT - moist, olive-grey, oily sheen present, no tar, petroleum odor (25-26' bgs)
							28			Sandy native SILT - moist, olive-grey, black staining in silt in rootlet zones (thin brown rootlets approximately 1 mm thick), fine grained sands, sheen present, petroleum odor (26-27.5' bgs)
							29			Sandy SILT - moist, olive grey, coated with oil, sheen present, petroleum odor (27.5-29' bgs)
	BAG	2:30	430.0				30		SP	SAND - moist, olive grey, coated with oil, sheen present, petroleum odor (29-29.5' bgs)
							31		ML	Sandy SILT - moist, black, coated with oil, interbedded sands present, sheen present, petroleum odor (29.5-30' bgs) Sandy SILT - moist, dark brown, oil present, sheen present, petroleum odor (30-31.5' bgs)
							32		SP	SAND - moist, very dark brown, fine sand grains coated with oil, sheen present, strong petroleum odor (31.5-32' bgs)
							33		ML	Sandy SILT - moist, very dark brown, coated with oil, sheen present, petroleum odor (32-34' bgs)
							34			
	BAG	3:00	623.0				35			SAND - moist, brown, fine grained, coated with brown oil, sheen present, petroleum odor (34-35' bgs)
							36			SAND - wet, dark brown, fine grained, coated with brown oil, sheen present, petroleum odor (35-37.5' bgs)
							37		SP	
							38			
							39			SAND - wet, brown, fine grained, oily sheen present, petroleum odor, no oil (37.5-40' bgs)
	BAG	3:08	211.0				40			

Bentonite Grout
2-inch ID Stainless Steel Casing

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	MONITORING WELL NUMBER OWRD # 167442	MW-16-125	
	HAI LOGGER: Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD: 6-inch / 4-inch Core - Bagged DRILLING METHOD: Sonic EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS DRILLER: Bruce Anderson	Time: 11:40	Time: 17:25
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear	Date: 14-Jul-04	Date: 15-Jul-04

BORING DIAMETER:	8-inch to 57' bgs; 6-inch to 130' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.49' msl
TOP OF CASING ELEVATION:	32.89' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
2-inch ID Stainless Steel Casing							41			SAND - wet, brown, fine to medium grained, coated with oil, sheen present, petroleum odor (40-42.5' bgs)
							42		SP	
							43			SAND - wet, brown, fine to medium grained, coated with oil, sheen present, petroleum odor (42.5-44' bgs)
							44		ML?	
	BAG	3:48	20.2				45			SAND - wet, grey, fine to medium grained, napthalene odor, sheen present (44-45' bgs), evidence of silt layer at 44' (disturbed silts in sample core, saturated oil above layer, no visible oil below layer)
Bentonite Grout							46			SAND - wet, greyish brown, fine to medium sand grains, slight petroleum odor, sheen present (45-47.5' bgs)
							47		SP	
							48			SAND - wet, greyish brown, fine to medium-grained sands, slight petroleum odor, sheen present (47.5-49' bgs)
							49			
	BAG	4:17	34.0				50		ML	Sandy SILT - wet, greyish brown, medium stiff, slight petroleum odor, slight sheen present (49-50' bgs)
2-inch ID Blank PVC Casing							51			SAND with interbedded silts - wet, greyish brown, fine grained sands with thin silt layers, slight petroleum odor, slight sheen present (50-52.5' bgs)
							52			
							53			
							54			SAND with interbedded silts - wet, greyish brown, fine grained sands with thin silt layers, slight sheen present, no petroleum odor, no oil, no tar (52.5-55' bgs)
	BAG	5:00	1.8				55			
							56			SAND - wet, grey, fine sand grains, slight sheen, no petroleum odor, no oil, no tar (55-56' bgs)
							57		SP	SAND - wet, grey, fine to medium sand grains, thin interbedded silt layers from 56-57' bgs, no sheen, no petroleum odor, no oil, no tar (56-58.5' bgs)
							58			Note: 8-inch temporary casing set at an initial depth of 59 feet. Bentonite chips were then added to bottom of hole, then casing was pulled up to 57 feet to seal.
							59			SAND - wet, grey, fine to medium sand grains, no sheen, no petroleum odor, no oil, no tar (58.5-60' bgs)
	BAG	5:55	0.0				60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	MONITORING WELL NUMBER OWRD # 167442	MW-16-125	
PROJECT: Northwest Natural Gasco Facility Portland, Oregon PROJECT: 2708	HAI LOGGER: Andy Rolinger SAMPLING METHOD: 6-inch / 4-inch Core - Bagged DRILLING METHOD: Sonic EQUIPMENT TYPE: Sonic Rig GP 24 - 300 RS DRILLER: Bruce Anderson DRILLING CONTRACTOR: Boart Longyear	DRILL START Time: 11:40 Date: 14-Jul-04	DRILL FINISH Time: 17:25 Date: 15-Jul-04

BORING DIAMETER:	8-inch to 57' bgs; 6-inch to 130' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.49' msl
TOP OF CASING ELEVATION:	32.89' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							61		SP	Note: Stop drilling for the day at 60' bgs at 18:00, 7/14/04, resume at 8:00, 7/15/04 with 6-inch drive casing. Protective temp. 8-inch casing dropping by its own weight below target depth of 57' bgs to 60' bgs.
							62			Note: No recovery in 60-62.5' bgs sleeve. Sands are very wet/loose and slipped out of barrel.
							63			
							64			SAND - wet, grey, fine grained, poorly graded, organic/reducing odor, no sheen, no oil, no tar (62.5-65' bgs)
	BAG	9:45	1.3				65			
							66			SAND - wet, grey, fine grained, very fine grained below 66' bgs, poorly graded, organic/reducing odor, no sheen, no oil, no tar (65-67.5' bgs)
							67			
							68			
							69			SAND - wet, grey, fine grained, poorly graded, slight organic/reducing odor, no sheen, no oil, no tar (68.5-69.5' bgs)
2-inch ID Blank PVC Casing Bentonite Grout	BAG	9:45	0.8				70		SM	Silty SAND - wet, grey, fine grained, poorly graded, slight organic/reducing odor, no sheen, no oil, no tar (69.5-70' bgs)
							71			
							72			
							73			
							74			
							75			
							76		SP	
							77			
							78			
							79			SAND - wet, grey, fine grained, poorly graded, slight organic/reducing odor, very slight sheen, no oil, no tar (78-79' bgs)
	BAG	10:30	0.0				80		SM	Silty SAND - wet, grey, fine grained sands, slight organic/reducing odor, no sheen, no oil, no tar (79-80' bgs)

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	MONITORING WELL NUMBER OWRD # 167442	MW-16-125	
	HAI LOGGER: Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD: 6-inch / 4-inch Core - Bagged		
	DRILLING METHOD: Sonic	Time: 11:40	Time: 17:25
	EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS		
	DRILLER: Bruce Anderson	Date: 14-Jul-04	Date: 15-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	8-inch to 57' bgs; 6-inch to 130' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.49' msl
TOP OF CASING ELEVATION:	32.89' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
2-inch ID Blank PVC Casing Bentonite Grout	BAG	11:30	0.0		81–85		ML	Sandy SILT - wet, grey, slightly plastic, minor brown leafy plant matter, onion odor (sulfur?), no sheen, no oil, no tar (80.5-82.5' bgs) SILT - moist, grey, plastic, stiff, onion odor, no sheen, no oil, no tar (83-85' bgs)
	BAG	12:00	0.0		86–90		SM	Silty SAND - moist, light brown, slightly plastic, stiff, onion odor, slight sheen, no oil, no tar (85-90' bgs)
	BAG	1:10	0.0		91–95		SP ML SM ML	SAND - wet, brown, fine grained, slight onion odor, no sheen, no oil, no tar (90.5-91.5' bgs) Sandy SILT - wet, grey, slightly plastic, slightly stiff, fine grained sand, slight onion odor, no sheen, no oil, no tar (91.5-92.5' bgs) Silty SAND - wet, grey, fine sand grains, slight onion odor, no sheen, no oil, no tar (92.5-94' bgs) Sandy SILT - moist, grey, medium stiff, plastic silt, fine grained sand, onion odor, no sheen, no oil, no tar (94-95' bgs)
	BAG	2:00	0.1		96–100		SP	SAND - wet, grey, fine to medium-grained sand, few grey silt clasts, few white shell fragments, no petroleum odor, no sheen, no oil, no tar (95-100' bgs)

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	MONITORING WELL NUMBER OWRD # 167442	MW-16-125	
	HAI LOGGER: Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD: 6-inch / 4-inch Core - Bagged DRILLING METHOD: Sonic EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS DRILLER: Bruce Anderson	Time: 11:40	Time: 17:25
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear	Date: 14-Jul-04	Date: 15-Jul-04

BORING DIAMETER:	8-inch to 57' bgs; 6-inch to 130' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.49' msl
TOP OF CASING ELEVATION:	32.89' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout							101			SAND - wet, grey, fine grained, poorly graded, few silt clasts, few white shell fragments, no petroleum odor, no sheen, no oil, no tar (100.5-105' bgs)
							102			
							103			
							104			
	BAG	3:00	0.0				105			
2-inch ID Blank PVC Casing							106		SP	SAND - wet, grey, fine grained, poorly graded, few silt clasts, few white shell fragments, no petroleum odor, no sheen, no oil, no tar (105-107.5' bgs)
							107			
Bentonite Chips							108			
							109			SAND - moist, grey, fine grained, poorly graded, few white shell fragments, no sheen, no petroleum odor, no oil, no tar (108-110' bgs)
	BAG	4:00	0.0				110			
20/40 Sand Pack							111			SAND - moist, grey, fine grained, poorly graded, few white shell fragments, no sheen, no petroleum odor, no oil, no tar (110.5-115' bgs)
							112			
							113			
							114			
	BAG	4:00	0.1				115		SP	
10/20 Sand Pack							116			SAND - moist, grey, fine grained, poorly graded, few white shell fragments, very few silt clasts, no sheen, no petroleum odor, no oil, no tar (115.5-120' bgs)
0.010-inch Stainless Steel Screen							117			
							118			
							119			
	BAG	5:20	0.0				120			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	MONITORING WELL NUMBER OWRD # 167442	MW-16-125	
	HAI LOGGER: Andy Rolinger	DRILL START	DRILL FINISH
PROJECT: Northwest Natural Gasco Facility Portland, Oregon	SAMPLING METHOD: 6-inch / 4-inch Core - Bagged		
	DRILLING METHOD: Sonic	Time: 11:40	Time: 17:25
	EQUIPMENT TYPE Sonic Rig GP 24 - 300 RS		
	DRILLER: Bruce Anderson	Date: 14-Jul-04	Date: 15-Jul-04
PROJECT: 2708	DRILLING CONTRACTOR: Boart Longyear		

BORING DIAMETER:	8-inch to 57' bgs; 6-inch to 130' bgs
CASING DIAMETER:	2-inch
SURFACE ELEVATION:	30.49' msl
TOP OF CASING ELEVATION:	32.89' msl

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	Core Interval	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
10/20 Sand Pack; 0.010-inch Stainless Steel Screen							121			SAND - moist, grey, fine grained, poorly graded, few white shell fragments, few silt clasts, no sheen, no petroleum odor, no oil, no tar (120.5-124' bgs)
							122			
							123			
							124			
	BAG	5:20	0.0				125		ML	Sandy SILT - moist, grey, plastic, slightly stiff, few rootlets, no petroleum odor, no sheen, no oil, no tar (124-125' bgs)
Stainless Steel Sump; Bentonite Chips							126		SP	SAND - moist, grey, fine grained, poorly graded, few silt clasts, no petroleum odor, no sheen, no oil, no tar (125-127.5' bgs)
							127			
							128			
							129			
							130			
							131			Boring terminated at 130 feet bgs on 7/16/04 Monitoring well installed to 127.5 feet bgs Materials: 10 feet 2-inch ID, 0.010-inch slotted stainless steel screen 70 feet 2-inch diameter Schedule 40 PVC blank casing 45 feet 2-inch diameter stainless steel blank casing 1 50# bag 20/40 sand 4 50# bags 10/20 sand 1 50# bag bentonite pellets 23 50# bags bentonite grout 1 2.5 foot stainless steel sump 1 locking cap above-grade steel monument
							132			
							133			
							134			
							135			
							136			
							137			
							138			
							139			
							140			

APPENDIX C

Well Development Records

Well Development Field Log

Well Number: MW-16i (MW-16-65)

Page 1 of 2

Date: 8-2-04

Project Information
Project Name: NW Natural - Gasco
HAI Project Number: 2708-10
General Information
Field Team: Matt Graves
Purge Method: PURGE PUMP (GEO-SQUIRT)
Pump Intake Depth (ft btc): 55' BTC.
Flow-Through Cell: NO
Decontamination Method: 9 STEP DECON

Well Volume Calculation — (Stick-up) or Flush (circle one)

Well Depth (ft bgs)	Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)
65	68	26.11	41.89	0.17	7.14

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

General Information
Purge Water Disposition: CARBON TREATMENT ON-SITE
Field Conditions: OVERCAST, 70'S

Comments: * STOPPED PUMPING TO LET WELL RECHARGE, AFTER 70 GALLONS PURGED: GRUNDFOS USED @ 125 Hz
SHEEN ON WATER NOT PRESENT UNTIL 77 GALLONS PURGED

Well Purge Data — Total Volume to Purge (gal) =

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Conductivity (uS/cm)	Temp. (°C)	pH	ORP (mV)	D.O. (mg/L)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial							
14:05	0		25.00	253	15.84	6.15	- /	- 2.40	306	CL
14:17	7		48.10	327	16.05	5.80	- /	- 1.43	197	CL
14:35	14		49.96	391	16.66	5.78	- /	- 0.99	153	~~CL~~ MC AC/SC
* 15:10	21		40.85	540	15.55	5.67	- /	- 0.93	135	AC/SC
15:22	28		48.65	589	16.19	5.64	- /	- 1.03	133	AC/SC
* 16:05	35		35.50	659	17.17	5.83	- /	- 3.90	93.1	AC/SC
16:18	42		39.72	698	16.63	5.82	- /	- 3.27	97.4	AC/SC
16:32	49		42.95	783	15.87	5.64	- /	- 1.52	80.2	AC/SC
* 8-3 7:45	56		26.03	710	15.61	6.12	- /	- 1.98	37.3	AC
8:02	63		41.85	717	14.90	5.80	- /	- 1.72	8.77	C
* 8:55	70		44.41	747	14.95	5.96	- /	- 0.98	13.2	C
5 MIN. INTERVAL 15:20	~~71~~ 72		33.85	728	15.95	6.06	- /	- 4.50	8.58	C
15:25	~~73~~ 74		38.71	758	16.83	5.93	- /	- 1.98	9.48	C
15:30	~~75~~ 76		50.11	779	17.17	5.92	- /	- 1.33	17.2	C
15:35	~~77~~ 78		57.75	731	17.30	6.01	- /	- 2.19	13.6	C
15:40	~~79~~ 80		57.80	765	17.81	6.05	- /	- 2.18	79.1	C
15:45	~~81~~ 82		58.20	820	17.82	6.02	- /	- 2.46	338	CL
15:50	~~83~~ 84		58.91	787	17.84	6.01	- /	- 3.43	326	CL
	Pump Off		Final				- /	-		

Note: bgs= below ground surface btc=below top of casing DTW=depth to water gpm=gallons per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Well Development Field Log

Well Number: MW-16S

Date: 8-4-04

HAI Project Number: 2708-10

Well Purge Data (continued from Page 1)

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Conductivity (uS/cm)	Temp. (°C)	pH	ORP (mV)	D.O. (mg/L)	Turbidity (NTUs)	Clarity/Color/ Remarks
13:14	51		28.83	472	18.57	6.06	/	2.33	24.6	AC
13:17	52		28.89	478	18.58	6.06	/	2.26	23.4	AC
14:00	53		28.72	480	18.59	6.07	/	2.22	21.3	AC
14:03	54		28.71	491	18.60	6.07	/	2.00	19.2	AC
14:06	55		28.90	492	18.68	6.07	/	1.98	19.4	AC
14:09	56		28.90	492	18.70	6.09	/	1.95	18.8	AC
14:12	57		28.90	492	18.73	6.08	/	1.63	19.0	AC
14:15	58		28.91	493	18.76	6.07	/	1.60	20.3	AC
14:18	59		28.91	494	18.78	6.09	/	1.54	17.3	AC
14:21	60		28.90	496	18.79	6.09	/	1.39	16.5	AC
14:24	61		28.91	497	18.81	6.08	/	1.30	15.2	AC
14:27	62		28.91	498	18.82	6.09	/	1.29	15.9	AC
14:30	63		28.90	499	18.83	6.09	/	1.30	14.0	AC
14:45	68		28.90	499	18.84	6.10	/	1.29	12.6	AC
14:55	73		28.90 ✓	502	18.93	6.12	/	1.33	11.0	AC
15:05	78		28.90 ✓	503 ✓	18.97 ✓	6.14 ✓	/	1.32 ✓	9.72 ✓	C
15:08	80		28.90 ✓	504 ✓	19.03 ✓	6.16 ✓	/	1.40 ✓	8.76 ✓	C
15:11	82		28.90 ✓	505 ✓	19.04 ✓	6.17 ✓	/	1.39 ✓	9.21 ✓	C
	Pump Off 15:12		Final 28.55							

Comments

8-4-04 PURGED AT 119 Hz.

Note: bgs= below ground surface btc=below top of casing DTW=depth to water gpm=gallons per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Well Development Field Log

Well Number: MW-16S (MW-16-45)

Date: 8-3-04

Project Information
Project Name: NW Natural - Gasco
HAI Project Number: 2708-10
General Information
Field Team: Matt Graves
Purge Method: "GEO-SQUIRT" PURGE PUMP
Pump Intake Depth (ft btc): 35
Flow-Through Cell: NO
Decontamination Method: 9-STEP DECON

Well Volume Calculation — Stick-up or Flush (circle one)

Well Depth (ft bgs)	Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)
45	48	26.0	19	0.17	3.23

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

General Information
Purge Water Disposition: CARBON TREATMENT ON-SITE
Field Conditions: OVERCAST, 70's

Comments: * STOPPED PURGING TO ALLOW WATER TO RECHARGE.

Well Purge Data — Total Volume to Purge (gal) =

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Conductivity (uS/cm)	Temp. (°C)	pH	ORP (mV)	D.O. (mg/L)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial							
10:30	0		26.0	379	15.09	6.71	- /	- 3.83	51.5	CL
10:35	4		35.02	470	14.73	6.40	- /	- 1.05	>1100	VC
* 11:00	8		35.11	511	15.24	6.32	- /	- 3.41	>1100	VC
* 11:25	12		35.20	563	15.05	6.16	- /	- 4.72	>1100	VC
* 11:35	16		35.90	480	15.09	6.15	- /	- 4.62	>1100	VC
* 12:00	20		36.21	461	15.16	6.19	- /	- 4.48	>1100	VC
* 12:15	24		38.16	464	15.26	6.20	- /	- 4.36	>1100	VC
* 12:40	28		38.07	457	15.16	6.18	- /	- 4.92	>1100	VC
* 13:00	32		38.12	456	15.25	6.21	- /	- 5.42	>1100	VC
* 13:25	36		38.20	454	15.33	6.19	- /	- 5.13	1005	VC
* 13:45	40		38.22	450	15.21	6.17	- /	- 4.69	>1100	VC
* 15:05	44		38.04	448	15.33	6.06	- /	- 4.20	763	VC
12:45	45		25.80	463	18.01	6.03	- /	- ~~4.64~~ 2.53 mv	77.7	SC
12:48	46		26.72	464	18.05	6.02	- /	- ~~4.64~~ 2.52 mv	62.7	SC
13:02	47		27.43	464	18.15	6.02	- /	- 2.43	51.6	SC
13:05	48		29.90	465	18.22	6.03	- /	- 2.44	38.0	AC
13:08	49		28.90	467	18.26	6.02	- /	- 2.45	34.5	AC
13:11	50		28.88	468	18.32	6.03	- /	- 2.42	35.8	AC
~~13:14~~	Pump Off		Final				-	-		

Note: bgs= below ground surface btc=below top of casing DTW=depth to water gpm=gallons per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Well Development Field Log

Well Number: MW-16i

Date: 8-4-04

HAI Project Number: 2708-10

Well Purge Data (continued from Page 1)

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Conductivity (uS/cm)	Temp. (°C)	pH	ORP (mV)	D.O. (mg/L)	Turbidity (NTUs)	Clarity/Color/ Remarks
8-4-04										
9:20	85		26.12	356	16.02	5.74	/	3.42	31.7	AC
9:23	86		28.62	359	16.00	5.73	/	3.32	24.0	AC
9:26	87		31.32	360	16.02	5.73	/	3.28	20.9	AC
9:29	88		33.33	363	16.32	5.72	/	2.89	22.0	AC
9:32	89		34.19	637	16.87	5.74	/	3.01	18.4	C
9:35	90		36.35	638	16.88	5.76	/	3.00	12.3	C
9:38	91		37.05	639	16.90	5.77	/	2.97	8.27	C
9:41	92		38.22	641	16.91	5.77	/	2.93	8.55	C
9:44	93		38.65	644	16.92	5.78	/	2.91	9.02	C
9:47	94		38.78	643 ✓	16.93 ✓	5.78 ✓	/	2.89 ✓	8.45 ✓	C
9:50	95		38.79	644 ✓	16.95 ✓	5.79 ✓	/	2.87 ✓	8.48 ✓	C
9:53	96		39.20	645 ✓	16.95 ✓	5.79 ✓	/	2.89 ✓	8.51 ✓	C
	Pump Off 9:55		Final 38.40							

Comments

PURGED WATER FROM 8-4-04 PURGED AT 123 H_2

Note: bgs= below ground surface btc=below top of casing DTW=depth to water gpm=gallons per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Well Development Field Log

Well Number: MW-16D (MW-16-125)

Page 1 of 2

Date: 7-28-04

Project Information

Project Name: GASCO

HAI Project Number: 2708-30

General Information

Field Team: MATT GRAVES

Purge Method: GRUNDFOS @ 150 Hz, 123 Hz

Pump Intake Depth (ft btc): 125', 110', 100', 77', 45'

Flow-Through Cell: NO

Decontamination Method: 9-STEP DECON

Well Volume Calculation — Stick-up or Flush (circle one)

Well Depth (ft bgs)	Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)
125	128	27.05	97.95	0.17	16.65

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

General Information

Purge Water Disposition: ON-SITE CARBON FILTER SYSTEM

Field Conditions: CLEAR, SUNNY, 90's

Comments: SHEEN IN PURGE WATER FROM 0-340, MOST SHEEN @ 119 GALLONS, 0-119 GALLONS @ 125', 119-170' @ 110', 170-221' @ 45', 221-272 @ 77', 272-382 @ 100'

Well Purge Data Total Volume to Purge (gal) =

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Conductivity (uS/cm)	Temp. (°C)	pH	ORP (mV)	D.O. (mg/L)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial							
11:00	0		27.20	1544	14.3	6.64	/	/	42.2	CL
11:10	17		33.51	1743	14.3	6.75	/	/	106.1	AC
11:25	34		33.71	1540	14.6	6.76	/	/	31.8	AC
11:43	51		33.99	1396	14.8	6.76	/	/	26.6	AC
12:02	68		33.99	1275	15.0	6.74	/	/	12.6	AC
13:00	85		34.05	1256	14.7	6.77	/	/	30.2	AC
13:15	102		34.16	1180	15.2	6.77	/	/	11.18	C
13:30	119		34.22	1153	15.2	6.77	/	/	7.46	C
14:30	136		33.60	995	16.2	6.75	/	/	64.5	AC
14:45	153		33.82	1070	15.1	6.74	/	/	9.40	C
15:00	170		33.76	1064	15.5	6.77	/	/	7.26	C
7/29 10:15	0		26.50	314	14.9	6.48	/	/	8.60	C
10:35	187		32.08	500	14.8	6.60	/	/	4.74	C
10:47	204		32.41	1168	14.6	6.61	/	/	49.1	AC
11:02	221		32.68	1013	14.7	6.62	/	/	12.3	C
11:15	238		31.60	965	14.4	6.62	/	/	47.3	AC
11:30	255		31.88	909	14.8	6.63	/	/	14.9	C
11:40	272		32.20	894	14.5	6.63	/	/	6.25	C
	Pump Off		Final							

Note: bgs= below ground surface btc=below top of casing DTW=depth to water gpm=gallons per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Well Development Field Log

Well Number: MW-16D

Date: 8-2-04

HAI Project Number: 2708-3c

Well Purge Data (continued from Page 1)

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Conductivity (uS/cm)	Temp. (°C)	pH	ORP (mV)	D.O. (mg/L)	Turbidity (NTUs)	Clarity/Color/ Remarks
10:45	289		27.28	908	15.85	5.94	✓	3.35	2.64	C
11:15	306		28.49	1379	16.15	5.89	✓	1.55	3.08	C
11:35	323		27.62	1201	16.54	5.91	✓	1.41	2.08	C
12:00	340		27.70	1099	16.62	5.74	✓	1.52	1.89	C
12:25	357		27.83	1089	16.58	5.69	✓	1.48	2.20	C
12:30	362		27.77	1074	16.54	5.65	✓	1.22	1.92	C
12:35	367		27.80	1064	16.60	5.66	✓	1.05	2.21	C
12:40	372		27.76	1066 ✓	16.61 ✓	5.69 ✓	✓	1.03 ✓	2.22 ✓	C
12:45	377		27.81	1068 ✓	16.64 ✓	5.72 ✓	✓	0.99 ✓	2.20 ✓	C
13:00	382		27.80	1067 ✓	16.64 ✓	5.73 ✓	✓	0.96 ✓	2.24 ✓	C
	Pump Off 13:04		Final 26.27							

Comments

ALL WATER PURGED ON 8-2-04 PUMPED AT 123 Hz.

Note: bgs= below ground surface btc=below top of casing DTW=depth to water gpm=gallons per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

APPENDIX D

August 2004 Groundwater Monitoring Field Sheets

Low-Flow Well Sampling Field Log

Well Number: MW-1-22

Page 1 of 1

Date: 8/25/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR/MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	20
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	
Comments:	pump @ 50 psi charge = 30 sec exhaust = 30 sec

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	22.00	24.80	11.00	13.80	11 - 21

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
11:10	Pump On		18.52 Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
11:15			18.57	15.63	2437	8.99	2.66	90.8	4.08	C
11:18	0.5		18.69	15.04	2622	0.87	2.59	98.6	3.34	C
11:21	1		18.67	14.86	2661	0.52	2.58	104.6	6.08	C
11:24	1.5		18.75	14.65	2646	0.25	2.59	111.6	2.21	C
11:27	2		18.85	14.51	2622	0.21	2.61	114.9	1.84	C
11:30	3		18.84	14.37	2602	0.18	2.62	114.6	1.38	C
11:33	3.5		18.97	14.33	2600	0.16	2.61	119.5	1.35	C
11:36	3.75		18.96	14.58	2593	0.15	2.61	121.4	1.34	C
11:30	Start Sampling		18.96							
12:22	End Sampling		18.96 Final	Sample Number:	2708-040825-MW1-22-019					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-2-32

Page 1 of 1

Date: 8/16/04

Project Information

Project Name: NW Natural - Gasco Facility

HAI Project Number: 2708-30

Sampling Information

Field Team: APR/MWG

Purge Method: Low Flow

Pump Intake Depth (ft btc): ~~22'~~ 27'

Flow-Through Cell: Yes

Sampling Method: Bladder Pump

Decontamination Method:
Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized

Purge Water Disposition: AST

Field Conditions: Sunny, 85°

Comments:

Well Information Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	32.50	31.20	21.50	20.20	21.5 - 31.5

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
12:08	Pump On		Initial 25.21	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
12:12	0.5		25.37	-9.99	103	-8.02	6.46	765.2	63.1	AC
12:17	1		25.61	-9.99	104	-5.04	6.46	897.2	99	Cl
12:22	2.5		25.87	-9.99	105	-10.20	6.46	959.4	71.1	CL
12:27	3.5		26.01	-9.99	101	-12.08	6.45	870.0	27.8	Cl
12:32	4		26.19	-9.99	100	-6.60	6.46	988.8	16.8	AC
12:37	4.5		26.26	-9.99	99	-8.22	6.46	974.8	12.9	AC
12:42	5		26.39	-9.99	98	-7.02	6.46	958.5	8.98	C
12:47	5.5		26.40	-9.99	97	-6.85	6.46	971.2	9.05	C
12:50	5.75		resting on pump	-9.99	97	-6.99	6.46	982.1	6.80	C
12:53	6		26.47	-9.99	97	-7.10	6.46	1009.3	6.72	C
12:56	6.5		resting on pump	-9.99	97	-6.36	6.46	1024.3	6.96	C
12:56	Start Sampling									
2:00	End Sampling		27.05 Final	Sample Number:		2708-040816-MW2-32-009				

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-2-61

Page 1 of 1

Date: 8/13/04

Project Information

Project Name: NW Natural - Gasco Facility

HAI Project Number: 2708-30

Sampling Information

Field Team: ARR & MG

Purge Method: Low Flow

Pump Intake Depth (ft btc): 51'

Flow-Through Cell: Yes

Sampling Method: Bladder Pump

Decontamination Method:
Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized

Purge Water Disposition: AST

Field Conditions: Sunny, 85°

Comments: pump set @ 50 psi
30 sec charge
30 sec exhaust

Well Information — Stick-up or (Flush) (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	61.50	61.20	50.00	49.70	50 - 60

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)
	51'			

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
7:57	Pump On		Initial 28.03	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
8:05	2		28.09	19.90	688	1.50	6.13	-9.7	40.5	SC
8:10	3		28.19	19.79	697	0.82	6.14	-17.0	21.9	SC
8:15	4		28.14	19.75	698	0.50	6.14	-20.0	19.9	AC
8:20	5		28.14	19.71	697	0.41	6.15	-20.9	22.6	AC
8:25	7		28.31	20.01	699	0.31	6.15	-21.9	22.1	AC
8:30	8		28.28	19.98	702	0.29	6.21	-22.2	19.6	AC
8:33	9		28.22	20.14	701	0.25	6.22	-22.6	17.3	SC
8:36	9.5		28.28	20.13	703	0.20	6.26	-23.8	17.5	AC
8:39	10 L		28.28	20.18	702	0.16	6.23	-22.1	15.7	SC
8:42	11 L		28.31	20.18	701	0.16	6.25	-21.8	14.1	SC
8:45	12 L		28.29	20.15	702	0.16	6.25	-22.5	12.2	SC
8:46	Start Sampling		28.29							
9:03	End Sampling		28.35 Final	Sample Number:	2708-040813-MW2-61-002					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-3-26

Page 1 of 1

Date: 8/23/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	AER / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	25'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	
Comments:	Pump set @ 45 psi exhaust time - 30 sec charge time - 30 sec

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	26.00	28.90	15.00	17.90	15 - 25

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
10:51	Pump On		Initial 24.23	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
~~10:58~~										
11:05			24.54	17.74	0411	1.62	5.17	7.3	5.75	clear
11:10	0.2		24.68	17.41	399	1.01	5.67	14.8	5.56	clear
11:15	1		24.72	17.14	401	0.81	5.88	2.0	4.63	clear
11:20	1.1		24.80	17.04	389	0.73	5.98	0.1	3.77	clear
11:23	1.5		24.88	16.61	379	0.68	5.97	5.7	2.75	clear
11:26	2		25.00	16.37	377	0.56	5.90	4.4	1.98	clear
11:30	2.1		25.00	16.59	379	0.50	6.01	-5.1	1.67	clear
11:33	2.5		25.03	16.77	384	0.46	6.09	-6.6	1.69	clear
11:36	2.75		25.08	16.81	389	0.44	6.11	-15.3	1.68	clear
11:39	2.9		25.08	16.81	397	0.39	6.14	-18.9	1.65	clear
11:39	Start Sampling		25.08							
12:40	End Sampling		25.47	Sample Number:	2708-040823MW3-26-010					
			Final 25.47							

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-3-56

Page 1 of 1

Date: 8/23/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	AER / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	50'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Rainy 60s°
Comments:	pump set @ 50psi 15 sec exhaust 15 sec charge

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	56.00	58.90	45.00	47.90	45 - 55

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
3	1 L Amber	None	PAHs & SVOCs	N
3	VOAs	HCl	VOCs	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
12:50	Pump On		Initial 28.30	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
12:55	1		28.35	15.77	512	1.98	6.27	-56.4	144	CI
1:00	2		28.29	15.39	528	0.48	6.27	-76.1	129	CI
1:03	3.5		28.66	15.06	538	0.21	6.33	-84.8	58.0	CI
1:06	5		28.45	14.98	544	0.14	6.34	-91.8	39.2	CI
1:09	6.5		28.72	14.96	551	0.12	6.38	-106.9	32.5	CI
1:12	7.5		28.52	14.95	556	0.12	6.42	-128.4	26.4	SC
1:15	9.5		28.60	14.97	560	0.10	6.44	-139.1	23.7	SC
1:18	10.5		28.56	14.98	562	0.10	6.47	-146.1	20.4	SC
1:21	12		28.66	14.98	565	0.10	6.49	-151.5	16.6	SC
1:24	13.5		28.57	14.99	566	0.10	6.50	-154.0	15.0	SC
1:27	15		28.47	14.98	568	0.08	6.51	-156.9	14.4	SC
1:27	Start Sampling		28.47							
1:40	End Sampling		28.56 Final	Sample Number:	2708- 040823-MW3-56-011					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-4-35

Date: 8/23/04

Page 1 of 1

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	APR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	30'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	rainy 60's
Comments:	pump set @ 50 psi 30 sec charge 30 sec exhaust

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	35.00	37.80	24.00	26.80	24 - 34

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
2:09	Pump On		Initial 27.65	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
2:12	0		27.99	16.70	1079	9.25	6.83	-145.2	2.5	C
2:15	0.5			15.66	1172	0.83	6.64	-144.1		
2:30	1		28.05	16.13	1191	0.78	6.83	-150.2	4.83	CG
2:33	0.75		28.27	15.19	1200	0.45	6.75	-149.5	3.02	CG
2:36	2		28.43	14.92	1199	0.27	6.76	-153.1	2.71	C
2:39	3		28.51	14.86	1199	0.20	6.79	-156.1	2.29	C
2:42	3.5		28.61	14.82	1203	0.15	6.82	-160.4	1.91	C
2:45	4		28.65	14.75	1209	0.13	6.83	-160.5	2.43	C
2:48	5		28.71	14.75	1216	0.11	6.84	-163.6	1.72	C
2:48	Start Sampling		28.71							
3:10	End Sampling		28.97 Final	Sample Number:	2708-040823-MW4-35-012					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-4-101

Page 1 of 1

Date: 9/16/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	AR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	94'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	
Comments:	pump set @ 70 psi 15 sec charge 15 sec exhaust

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	120.00	122.60	89.50	92.10	89.5 - 99.5

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
9:06	Pump On		Initial 27.81	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
9:10	1L		27.81	17.29	697	3.13	6.62	-4.5	10.20	C
9:15	2		27.85	15.09	674	2.13	6.48	-14.2	9.51	C
9:20	4.5		27.90	14.78	665	1.17	6.48	-17.6	9.44	C
9:25	7		28.06	14.76	659	0.60	6.48	-18.7	11.0	C
9:28	8.5		27.93	14.71	655	0.50	6.49	-18.9	10.72	C
9:31	9.5		27.96	14.61	653	0.41	6.49	-18.8	11.2	C
9:34	11.0		28.0	14.55	649	0.31	6.49	-18.3	11.2	C
9:37	13.0		27.99	14.66	650	0.23	6.50	-19.2	10.75	C
9:40	14.5		28.02	14.60	646	0.21	6.49	-18.3	11.5	C
9:43	16.0		28.04	14.53	646	0.20	6.50	-18.0	10.76	C
9:44	Start Sampling		28.01							
9:55	End Sampling		28.12 Final	Sample Number:		2708- 040816-MW4-101-007				

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-4-57

Page 1 of 1

Date: 8/24/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	50
Flow-Through Cell:	Yes
Sampling Method:	Grundfos Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Rain - 60°
Comments:	120 Hz

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	57.00	59.80	46.00	48.80	46 - 56

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
3	1 L Amber	None	PAHs & SVOCs	N
3	VOAs	HCl	VOCs	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
3:10	Pump On		Initial 28.50	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
3:20	3.5		30.50	15.53	1265	0.37	6.50	-100.6	5.44	C
3:23	5.5		30.45	16.11	1278	0.19	6.50	-107.1	3.96	C
3:26	9		30.54	16.21	1278	0.14	6.52	-112.2	2.20	C
3:29	12		30.60	16.27	1275	0.11	6.52	-114.6	1.48	C
3:32	15.5		30.61	16.34	1279	0.08	6.52	-116.1	0.91	C
3:35	18		30.60	16.39	1276	0.06	6.52	-117.8	0.71	C
3:38	21.5		30.63	16.32	1280	0.05	6.52	-117.7	1.03	C
3:50	Start Sampling		30.63							
3:52	End Sampling		30.51 Final	Sample Number:	2708- 040824-MW4-57-016					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-5-32

Page 1 of 1

Date: 8/16/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	MWG / APC
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	25
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	
Comments:	pump set @ 30 psi 30 sec charge 30 sec exhaust

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	32.00	34.70	21.00	23.70	21 - 31

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
10:45	Pump On		Initial 21.05	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
10:50	1		22.05	-9.99	148	-5.91	6.46	672.3	38.1	~~AC~~ AC
10:55	2		22.15	-9.99	158	-3.33	6.46	855	13.0	C
11:00	3		22.25	-9.99	165	-3.42	6.46	928.9	13.8	C
11:05	4		22.15	-9.99	168	-3.77	6.46	961.7	8.91	C
11:08	5		22.24	-9.99	169	-3.68	6.46	981.3	8.13	C
11:11	6		22.19	-9.99	170	-3.84	6.46	985	8.59	C
11:12	Start Sampling		22.19							
11:30	End Sampling		22.14 Final	**Sample Number:**		2708- 040816-MW5-32				-008

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-5-100

Page 1 of 1

Date: 8/24/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	ACR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	92'
Flow-Through Cell:	Yes
Sampling Method:	Grundfos Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Rain 65°
Comments:	105 H_2

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	100.00	101.90	88.00	89.90	88 - 98

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
3	1 L Amber	None	PAHs & SVOCs	N
3	VOAs	HCl	VOCs	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
2:20	Pump On		Initial 21.22	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
2:25	3.5		21.60	14.66	888	0.57	6.34	-107.6	14.9	AC
2:30	9		21.58	15.33	874	0.21	6.31	-104.7	10.95	C
2:33	12		21.56	15.49	872	0.18	6.28	-105.0	5.66	C
2:36	15.5		21.52	15.64	876	0.17	6.31	-108.6	3.23	C
2:39	19.5		21.52	15.67	874	0.14	6.32	-111.9	2.30	C
2:39	Start Sampling		21.52							
2:51	End Sampling		21.31 Final	Sample Number:	2708- 040824-MW5-100-015					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Well Number: MW-5-175

Date: 8/24/04

Page 1 of 2

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR / MWG
Purge Method:	Standard
Pump Intake Depth (ft btc):	150'
Flow-Through Cell:	Yes
Sampling Method:	Grundfos Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Rain, 65°
Comments:	139 Hz

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2	175	177	163	165	163 - 173

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
177	22.05	155	0.17	26.34	79

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total & Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data — Total Volume to Purge (gal) =

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
9:10	Pump On		Initial 22.05	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
9:15			27.15	14.35	573	0.09	6.53	-140.1	1.64	C
9:20	9		27.31	14.35	592	0.13	6.67	-150.5	0.91	C
9:25	15		32.90	14.11	590	0.08	6.54	-143.7	3.94	C
9:30	21		33.75	14.02	587	0.07	6.53	-143.5	0.[illegible]	C
9:40	29		26.18	14.52	589	0.17	6.69	-129.6	15.6	C
9:50	40		26.66	15.16	582	0.11	6.59	-125.8	23.7	C
10:00	49		26.42	15.58	572	0.12	6.76	-142.7	17.5	C
10:10	47		26.55	15.88	581	0.22	6.58	-135.3	12.2	C
10:20	52		26.00	16.09	584	0.09	6.58	-135.3	11.5	C
10:30	58		25.75	16.41	584	0.07	6.66	-139.9	10.01	C
10:45	65		25.77	16.79	585	0.06	6.75	-144.6	7.07	C
11:00	70		25.49	16.99	585	0.06	6.62	-138.3	5.78	C
11:00	Start Sampling		25.49							
11:30	End Sampling		24.15 Final	Sample Number:	2708- 040824 - MW-5-175 - 013					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water gpm=gallons per minute
Clarity: VC=very cloudy CI=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Well Number: MW-S-17S

Date: 8/24/04

HAI Project Number: 2708-30

Well Purge Data (continued from Page 1)

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
		Stabilization Criteria =>		-	±3%	±10%	±0.1	±10mv	±10%	
11:15	75		25.21	17.19	585	0.09	6.63	-140.8	4.19	C
11:25	79		25.10	17.31	586	0.06	6.66	-141.2	5.62	C
			②							
	Start Sampling									
11:30	End Sampling		24.15 Final	Sample Number:		2708-				

d surface btc=below top of casing DTW=depth to water gpm=gallons per minute
udy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-8-29

Page 1 of 1

Date: 8/25/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	23
Flow-Through Cell:	Yes
Sampling Method:	Grundfos Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	
Comments:	104 Hz

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	29.00	31.60	18.00	20.60	18 - 28

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
2:57	Pump On		Initial 21.33	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
3:00	3.5		23.30	15.69	978	0.23	6.40	-90.0	17.4	C
3:03	6		23.03	17.19	1126	0.20	6.44	-103.2	12.5	C
3:06	6.5		23.10	17.57	1156	0.12	6.45	-102.7	10.21	C
3:09	7		23.17	18.22	1176	0.17	6.46	-98.3	10.46	C
3:12	7.5		23.22	20.13	1222	0.16	6.49	-100.7	10.69	C
3:15	9		23.40	21.05	1239	0.11	6.64	-110.6	10.38	C
3:19	13		24.28	18.58	1253	0.10	6.52	-104.7	7.37	C
3:22	17		24.54	17.02	1295	0.09	6.52	-114.6	10.53	C
3:25	20		24.50	18.09	1363	0.11	6.54	-116.7	9.63	C
3:25	Start Sampling		24.50							
3:40	End Sampling		25.85 Final	**Sample Number:**	2708-040925-MW8-29-022					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-8-56

Page 1 of 1

Date: 8/25/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	APR - MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	50'
Flow-Through Cell:	Yes
Sampling Method:	Grundfos Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	
Comments:	129 H_2

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	56.00	58.60	45.00	47.60	45 - 55

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
2:17	Pump On		Initial 32.17	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
2:20	3.5		37.10	16.06	1262	0.52	6.70	-159.3	63.7	CI
2:23	5		37.85	17.35	1244	0.20	6.71	-132.3	46.7	CI
2:26	6		38.01	18.04	1231	0.15	6.72	-141.2	35.0	SC
2:29	8		39.22	18.88	1216	0.13	6.73	-157.9	23.0	AC
2:32	9.5		39.35	18.83	1207	0.11	6.72	-149.7	19.5	AC
2:35	10		39.19	18.79	1203	0.10	6.72	-138.4	18.0	AC
2:38	11		39.08	18.98	1191	0.10	6.72	-141.0	16.7	AC
			~~39.35~~							
2:38	Start Sampling		39.08							
2:47	End Sampling		39.38 Final	Sample Number:	2708- 040825-MW-8-56-021					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-9-29

Page 1 of 2

Date: 8/12/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	APR + MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	
Comments:	

Well Information — Stick-up or (Flush) (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	29.00	28.70	18.00	17.70	18 - 28

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
12:15	Pump On		Initial 13.95	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
12:20	1.5		14.89	16.40	156	1.54	6.66	42.4	overrange	VC
12:25	2.5		14.89	16.09	156	1.06	6.60	39.6	overrange	VC
12:30	3.75		15.12	16.13	154	0.92	6.47	39.2	157	C1
12:35	5		15.12	16.09	154	0.94	6.49	39.0	96.2	C1
12:40	6		15.26	16.15	154	0.86	6.35	38.8	71.9	SC
12:45	7		15.28	16.09	154	1.02	6.36	38.6	44.5	SC
12:50	8		15.18	15.96	153	0.69	6.31	38.1	43.4	SC
12:55	9		15.19	15.90	152	0.71	6.06	37.1	38.7	SC
1:00	10		15.09	15.87	153	0.60	6.21	36.9	32.1	SC
1:05	11		15.29	16.8	155	0.51	6.21	37.1	29.2	SC
1:10	12		15.15	15.80	153	0.45	6.11	36.5	29.3	SC
1:15	13		15.23	15.92	153	0.37	5.92	36.3	28.2	SC
	Start Sampling									
	End Sampling			**Sample Number:**	2708-					
			Final 15.10							

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-9-29

Date: 3/12/04

HAI Project Number: 2708-30

Well Purge Data (continued from Page 1)

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
		Stabilization Criteria =>		-	±3%	±10%	±0.1	±10mv	±10%	
1:20	14.5		15.12	15.84	154	0.31	6.18	36.3	26.0	SC
1:25	16		15.14	16.09	155	2.36	6.03	35.7	24.3	SC
1:30	17.2		15.17	15.79	154	0.24	5.96	36.4	23.2	SC
1:35	18.7		15.20	15.80	154	0.03	6.14	35.5	21.5	AC
1:40	19.8		15.36	15.83	153	0.14	6.16	35.6	19.6	AC
1:45	20.5		15.17	15.71	154	0.13	6.09	35.4	19.4	AC
1:50	21.5		15.17	15.95	154	0.12	6.11	35.1	19.1	AC
1:55	23		15.18	15.87	155	0.03	6.10	34.9	18.2	AC
2:00	24		15.11	15.82	154	0.01	6.08	35.1	17.9	AC
2:05	24.5		15.14	15.89	154	0.00	5.98	35.3	17.7	AC
2:10	25.5		15.15	15.98	155	-0.03	6.03	34.6	16.0	AC
2:15	27		15.41	16.10	155	-0.03	6.06	35.1	17.8	AC
2:20	28		15.42	15.98	155	-0.04	5.98	35.1	16.0	AC
2:25	29.2		15.37	16.17	156	-0.05	6.19	35.1	14.6	AC
2:30	30.5		15.46	16.00	154	-0.05	6.17	35.0	13.5	AC
2:35	31.5		15.43	16.05	155	-0.05	6.09	34.9	13.0	AC
2:45	34.0		15.41	16.17	156	-0.07	6.18	34.6	11.8	AC
2:55	36.5		15.39	16.13	155	-0.07	6.25	34.9	10.66	C
3:05	39.5		15.39	15.99	155	-0.09	6.18	34.8	10.17	C
3:15	41.5		15.40	16.02	155	-0.08	6.35	34.5	9.90	C
3:16	Start Sampling									
3:30	End Sampling			Sample Number:		2708- D40312-MW9-29-001				
			Final 15.10							

Comments

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-10-61

Page 1 of 1

Date: 8/13/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	AER / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	54'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Sunny, 85°
Comments:	pump set @ 50psi 30 sec charge 30 sec exhaust

Well Information — Stick-up / or / Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	61.00	63.80	50.00	52.80	50 - 60

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
11:30	Pump On		Initial 21.65	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
11:35	1		22.99	17.69	496	4.03	6.69	33.7	28.3	SC
11:40	2		23.12	16.55	529	1.22	6.58	25.2	28.1	SC
11:45	3.5		23.56	16.33	525	0.50	6.53	23.9	15.2	AC
11:50	4.5		23.51	16.33	529	0.27	6.53	23.2	13.7	AC
11:53	5.5		23.67	16.35	530	0.18	6.56	22.2	13.6	AC
11:56	6.5		23.53	16.21	530	0.18	6.54	22.3	10.61	AC
11:59	7		23.61	16.33	530	0.13	6.53	22.1	10.92	C
12:02	8		23.61	16.26	533	0.11	6.52	21.8	12.3	C
12:05	8.5		23.82	16.23	532	0.06	6.53	21.9	11.2	C
12:08	9.5		23.70	16.22	532	0.07	6.58	21.2	9.86	C
12:11	10		23.70	16.19	533	0.05	6.55	21.2	10.88	C
12:15	Start Sampling		23.70							
12:30	End Sampling			Sample Number: 2708- 040813-MW10-61-005						
			Final 24.03							

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-12-36

Page 1 of 1

Date: 8/25/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	~~30~~ 25'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Overcast, 65°
Comments:	Pump set @ 50 psi exhaust @ 30 sec charge @ 30 sec

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	36.00	38.80	25.00	27.80	25 - 35

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
8:32	Pump On		Initial 16.90	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
8:35	~~X~~		17.63	15.94	447	6.03	6.94	-112.0	5.71	C
8:38	1		17.61	14.77	532	1.97	6.82	-114.8	4.59	C
8:41	1.75		17.65	14.29	572	0.75	6.72	-116.9	2.91	C
8:44	2.5		17.68	14.11	558	0.45	6.64	-117.4	1.89	C
8:47	3.5		18.08	13.86	491	0.44	6.58	-114.7	1.51	C
8:50	4.5		17.90	13.83	460	0.33	6.55	-113.3	1.34	C
8:53	5.5		17.81	13.86	442	0.22	6.54	-112.2	0.97	C
8:56	6		17.79	13.84	432	0.19	6.53	-111.7	1.17	C
8:59	6.5		17.81	13.82	425	0.17	6.54	-112.3	1.06	C
9:02	7.5		17.79	13.83	420	0.15	6.53	-112.6	1.30	C
9:02	Start Sampling		17.79							
9:20	End Sampling		17.94 Final	Sample Number:	2708-040825-MW12-36-017					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-13-30

Page 1 of 1

Date: 8/25/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR/MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	20'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Overcast, calm, 65
Comments:	pump set @ 50 psi; exhaust @ 30 sec; charge @ 30 sec

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	30.00	29.60	19.00	18.60	19 - 29

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
9:49	Pump On		Initial 18.61	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
9:57			18.61	17.60	597	2.37	6.50	-115.2	6.35	C
10:00	0.75		18.61	17.07	648	1.07	6.44	-119.2	4.40	C
10:03	1.25		18.90	16.71	668	0.47	6.44	-126.6	4.95	C
10:06	2		18.61	16.77	674	0.35	6.43	-130.1	4.90	C
10:09	2.75		18.63	16.66	675	0.21	6.43	-132.6	5.35	C
10:12	3.5		18.62	16.55	676	0.18	6.43	-135.3	6.51	C
10:15	4		18.61	16.48	672	0.16	6.43	-131.5	5.04	C
10:18	4.75		18.71	16.53	672	0.14	6.43	-139.7	5.17	C
10:21	5		18.65	16.48	675	0.13	6.43	-141.4	5.77	C
10:21	Start Sampling		18.65							
10:41	End Sampling		18.61 Final	Sample Number:		2708- 040825-MW13-30-018				

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-13-61

Page 1 of 1

Date: 8/13/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	51'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Sunny, 85°
Comments:	pump set @ 50 psi 30 sec charge 30 sec exhaust

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	61.00	60.60	50.00	49.60	50 - 60

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
9:40	Pump On		28.15 Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
9:45	1		29.09	17.44	613	2.39	6.23	2.2	33.9	AC
9:50	2		29.25	16.89	618	0.88	6.23	-10.2	26.8	AC
9:55	3		29.31	16.74	618	0.46	6.22	-13.4	18.3	AC
10:00	4		29.31	16.70	617	0.28	6.24	-14.9	14.8	AC
10:03	5		29.31	16.72	618	0.22	6.24	-15.1	14.6	AC
10:06	6		29.31	16.75	619	0.14	6.25	-15.3	13.4	AC
10:09	7		29.35	16.68	617	0.15	6.23	-15.0	13.7	AC
10:12	8		29.31	16.70	618	0.05	6.21	-14.9	11.5	AC
10:15	Start Sampling		29.31							
10:30	End Sampling		29.35 Final	**Sample Number:**	2708- 040813-MW13-61-D03					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Well Number: MW-14-110

Page 1 of 1

Date: 8/24/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR/MWG
Purge Method:	Standard
Pump Intake Depth (ft btc):	100'
Flow-Through Cell:	Yes
Sampling Method:	Grundfos Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Rain, 65°
Comments:	153 Hz

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2	110	112.1	98	100.1	98 - 108

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
110	26.35	83.65	0.17	14.22	~42.5

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total & Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data — **Total Volume to Purge (gal) =**

Time	Volume Purged (gallons)	Purge Rate (gpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
12:50			26.35							
12:55	7		29.61	14.96	1633	0.22	6.58	-71.5	0.34	C
1:00	11		29.93	15.05	1631	0.10	6.60	-83.6	0.19	C
1:10	19		30.15	15.07	1572	0.07	6.62	-89.6	0.0	C
1:20	30		30.31	15.10	1546	0.03	6.65	-92.2	0.24	C
1:30	92.5		30.47	15.09	1544	0.02	6.65	-91.3	0.21	C
1:30	Start Sampling		30.47							
1:40	End Sampling		30.35	**Sample Number:**	2708- 040824-MW14-110-014					
			Final							

Note: bgs= below ground surface btc=below top of casing DTW=depth to water gpm=gallons per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-15-50

Page 1 of 1

Date: 8/25/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	APR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	42
Flow-Through Cell:	Yes
Sampling Method:	Grundfos Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	
Comments:	103 Hz

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	50.00	49.70	40.00	39.70	40 - 50

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1:10	Pump On		Initial 20.25	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1:13	3.5		21.31	22.19	1507	0.29	6.51	-160.4	2.83	C
1:16	5.5		21.41	23.55	1531	0.25	6.52	-161.0	2.31	C
1:19	8.5		23.05	23.51	1611	0.13	6.56	-175.2	3.85	C
1:22	11		23.43	23.15	1661	0.09	6.55	-176.5	2.93	C
1:25	12.5		23.60	23.06	1737	0.08	6.55	-175.1	2.71	C
1:28	16		23.71	23.08	1750	0.08	6.55	-175.4	2.46	C
1:31	18		23.75	23.16	1760	0.07	6.55	-175.1	2.67	C
1:31	Start Sampling		23.75							
1:36	End Sampling		23.17 Final	**Sample Number:**	2708- 040825-MW15-50-020					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-15-66

Date: 8/17/04

Project Information	
Project Name:	NW Natural - Gasco Facility
HAI Project Number:	2708-30

Sampling Information	
Field Team:	MWG / APR
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	61.5
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Sunny, 85°
Comments:	pump set @ 50psi 30 sec charge 30 sec exhaust

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2"	66.00	65.80	60.50	60.30	60.5 - 65.5

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1 L Amber	None	PAHs	N
3	VOAs	HCl	BTEX	N
1	500 mL	NaOH	Total and Amenable CN	N
1	250 mL	HNO_3	Total Metals	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1:14	Pump On		Initial 18.12	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1:20	1		19.47	25.71	193	1.28	6.97	21.6	9.62	C
1:23	2		19.55	25.14	191	0.77	6.86	23.8	8.87	C
1:26	3		19.60	24.73	192	0.51	6.78	24.4	9.91	C
1:29	3.5		19.65	24.54	193	0.39	6.73	25.1	9.78	C
1:32	4.5		19.71	24.22	194	0.29	6.69	25.1	9.69	C
1:35	5.4		19.73	24.05	193	0.23	6.67	25.2	12.0	C
1:38	6		19.70	23.89	193	0.18	6.66	25.2	12.3	C
1:41	6.5		19.56	23.76	193	0.16	6.65	25.2	13.6	C
1:44	7		19.75	23.63	192	0.12	6.64	25.4	12.6	C
1:47	8		19.78	23.54	191	0.09	6.64	25.4	12.5	C
1:50	9		19.72	23.47	191	0.08	6.63	25.3	13.0	C
1:53	10		19.75	23.38	190	0.07	6.63	25.1	11.9	C
1:55	Start Sampling		19.75							
2:10	End Sampling		19.83 Final	Sample Number:	2708- 040813- MW15-66-006					

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-16-45

Page 1 of 1

Date: 8/26/04

Project Information	
Project Name:	NW Natural - Gasco Site
HAI Project Number:	2708-30
Sampling Information	
Field Team:	APR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	40'
Flow-Through Cell:	Yes
Sampling Method:	~~Bladder Pump~~ Grndfos
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Rainy, 65°
Comments:	126 H_2

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2.00	49.00		35.00		35 - 45

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
3	1 L Amber	None	PAHs & SVOCs	N
1	250 mL	HNO_3	Total Metals	N
1	250 mL	NaOH	Total & Amenable CN	N
3	VOAs	HCl	VOCs	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial 26.88	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
2:21	5		31.33	15.22	931	0.70	8.63	-99.6	over	VC
2:24	7		31.98	16.45	834	0.30	6.93	7.2	65	Cl
2:27	8.5		32.29	17.42	804	0.21	6.74	3.4	40	AC
2:30	10.5		32.19	18.07	762	0.17	6.70	-7.3	29	SC
2:33	12		32.09	18.32	742	0.15	6.70	-8.4	24	SC
2:36	13.5		32.09	18.53	739	0.12	6.69	-6.7	24	SC
			~~31.51~~							
2:30	Start Sampling		32.01							
2:47	End Sampling		31.34 Final	Sample Number: 2708-GW-8261-MW16-45-028						

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Page 1 of 1

Well Number: MW-16-65

Date: 8/26/04

Project Information	
Project Name:	NW Natural - Gasco Site
HAI Project Number:	2708-30

Sampling Information	
Field Team:	ACR / MWG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	60
Flow-Through Cell:	Yes
Sampling Method:	~~Bladder Pump~~ Grundfos
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Rainy, 65
Comments:	120 Hz

Well Information — Stick-up / or / Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2.00	68.00		55.00		55 - 65

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
3	1 L Amber	None	PAHs & SVOCs	N
1	250 mL	HNO_3	Total Metals	N
1	250 mL	NaOH	Total & Amenable CN	N
3	VOAs	HCl	VOCs	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial 26.70	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1:10	2.5		31.46	15.30	1048	0.27	6.60	-59.5	70	C1
1:13	3.5		31.95	15.64	1050	0.22	6.54	-57.8	70	C1
1:16	4		31.87	16.34	1052	0.35	6.55	-56.2	55	C1
1:19	4.5		31.87	17.15	1044	0.42	6.57	-55.6	65	C1
1:22	5		31.84	17.11	1034	0.25	6.57	-55.5	45	C1
1:25	5.5		33.81	18.32	987	0.37	6.53	-50.1	38	C1
1:28	9		35.11	19.13	976	0.20	6.54	-52.1	28	C1
1:31	10		35.47	18.37	959	0.13	6.55	-52.1	28	C1
1:34	11		35.57	18.37	943	0.17	6.54	-53.0	25	C1
1:37	13		37.63	18.57	910	0.16	6.55	-59.9	22	C1
1:37	Start Sampling		37.63							
1:53	End Sampling		37.99 Final	Sample Number: 2708-040826-MW-1665-026						
				2708-040826-MW-16-65-027						

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Page 1 of 2

Well Number: MW-16-125

Date: 8/26/04

Project Information	
Project Name:	NW Natural - Gasco Site
HAI Project Number:	2708-30

Sampling Information	
Field Team:	APR / MwG
Purge Method:	Low Flow
Pump Intake Depth (ft btc):	120'
Flow-Through Cell:	Yes
Sampling Method:	Bladder Pump
Decontamination Method:	Rinse, Alconox, Dilute Hexane, Rinse, Dilute Nitric, Rinse, Spray Isopropanol, Rinse, Spray De-Ionized
Purge Water Disposition:	AST
Field Conditions:	Rain-y, 65
Comments:	pump set @ 50psi 30 sec charge 30 sec exhaust

Well Information — Stick-up or Flush (circle one)

Well Diameter (in)	Drilled Well Depth (ft bgs)	Drilled Well Depth (ft btc)	Top of Screen (ft bgs)	Top of Screen (ft btc)	Screen Interval (ft bgs)
2.00	130.00		115.00		115 - 125

Purge Volume (Only applicable if pump intake is above top of screen)

Top Screen (ft btc)	Pump Intake (ft btc)	Top Screen - Pump Intake (ft)	Convert Factor (L/ft)	Minimum Purge Volume (Liters)

3/4"=0.087 L/ft 2"=0.64 L/ft 4"=2.5 L/ft 6"=5.68 L/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
~~8~~ 7	1 L Amber	None	PAHs & SVOCs	N
3	250 mL	HNO_3	Total Metals	N
3	250 mL	NaOH	Total & Amenable CN	N
~~8~~ 9	VOAs	HCl	VOCs	N

Well Purge Data

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
10:22	Pump On		Initial 27.10	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
10:28	1		27.31	15.18	1304	0.99	6.50	-114.3	340	Cl
10:31	1.75		27.50	15.10	1421	0.68	6.55	-123.7	400	Cl
10:34	3		27.48	15.07	1433	0.45	6.58	-127.4	290	Cl
10:37	3.75		27.52	15.03	1427	0.34	6.59	-128.4	201	Cl
10:40	4		27.52	15.03	1412	0.35	6.59	-129.2	160	Cl
10:43	4.75		27.49	15.00	1406	0.33	6.59	-131.5	110	Cl
10:46	5.5		27.46	14.97	1420	0.32	6.60	-129.1	75	Cl
10:49	6		27.49	14.95	1440	0.31	6.60	-129.4	60	Cl
10:52	6.5		27.51	14.94	1476	0.29	6.61	-131.1	45	Cl
10:55	7.25		27.71	14.99	1506	0.29	6.61	-130.2	38	Cl
10:58	8.5		27.62	14.98	1519	0.26	6.61	-130.5	32	Cl
11:01	9		27.72	14.98	1526	0.27	6.62	-129.3	29	Cl
	Start Sampling									
	End Sampling		Final	Sample Number: 2708-040826-MW16-125-025						

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Low-Flow Well Sampling Field Log

Well Number: MW-16-125

Date: 8/26/04

HAI Project Number: 2708-30

Well Purge Data (continued from Page 1)

Time	Volume Purged (Liters)	Purge Rate (Lpm)	DTW (ft btc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
		Stabilization Criteria =>		-	±3%	±10%	±0.1	±10mv	±10%	
11:04	10		27.57	14.93	1533	0.24	6.62	-124.7	25	SC
11:07	11		27.64	14.94	1537	0.24	6.62	-128.1	23	SC
11:10	11.5		27.76	15.06	1526	0.23	6.62	-127.1	21	SC
11:13	12.0		27.77	15.02	1525	0.23	6.62	-126.2	21	SC
	Start Sampling									
	End Sampling			Sample Number:		2708-				
			Final							

Comments

Note: bgs= below ground surface btc=below top of casing DTW=depth to water Lpm=Liters per minute
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

APPENDIX E

Investigation-Derived Waste Management Documentation

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No. 0 8 2 2 4

2. Page 1 of 1

3. Generator's Name and Mailing Address
NW Natural ATTN: Bob Wyatt
220 NW 2nd Avenue
Portland, OR 97209

4. Generator's Phone (503) 226-4211 ext. 5425

5. Transporter 1 Company Name
WasteWatch, Inc.

6. US EPA ID Number
O R Q 0 0 0 0 0 6 2 2 1

A. State Transporter's ID

B. Transporter 1 Phone (503) 455-3683

7. Transporter 2 Company Name
Savannah Transport. Inc.

8. US EPA ID Number
K 3 0 0 0 0 3 9 5 9 5 1

C. State Transporter's ID

D. Transporter 2 Phone (877) 595-0100

9. Designated Facility Name and Site Address
Pollution Control Industries of
5485 Tay-For Drive
Millington, TN 38053

10. US EPA ID Number
T N D 0 0 0 7 7 2 1 8 5

E. State Facility's ID

F. Facility's Phone (901) 358-5291

11. WASTE DESCRIPTION	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Non Hazardous, Non RCRA Regulated (IDW Soil)	22	D M	012,000	T
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
a) 230465

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Emergency Phone No: (503) 504-1733

Site Address:
7900 NW St. Helens Rd
Portland, OR 97210

NON-HAZARDOUS WASTE

GENERATOR

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: Robert J Wyatt
Signature:
Date: Month 8 Day 26 Year 04

X

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Tim Ferrick
Signature: Tim Ferrick
Date: Month 8 Day 26 Year 04

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: Milton T. Waugh
Signature:
Date: Month 09 Day 02 Year 04

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

Received: 11/ 1/04 3:28PM; 5034651843 -> HAHN * ASSOCIATES; Page 2
11/01/2004 15:41 5034651843 WASTEWATCH PAGE 02

PCI

RECEIVED OCT 21 2004

Certificate

This certificate is to verify that the waste specified will be handled in accordance with all local, state, and federal regulations

Manifest: 08224
Generator: NORTHWEST NATURAL GAS

Page/Line	Waste Stream	PCI H CODE	Final H CODE
1 A	280465	na	na Energy Recovery by Thermal Destruction

Facility Name: Pollution Control Industries
Facility Address: 5485 Tay-For Dr.
Millington, TN 38053
Facility EPA ID: TND000772186

Signature:

Typed: Tita LaGrimas
Title: Executive Vice President of Regulatory Affairs
Date: 9/24/2004

Invoice #: TN0018292

Pollution Control Industries
4343 Kennedy Avenue, East Chicago, IN 46312
(219)397-3951 FAX: (219)397-6411
www.pollutioncontrol.com

RESPONSIBLE℠ RECYCLING
A commitment to our generators, our employees, and our community.

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No. U 8 2 2 4

2. Page 1 of 1

3. Generator's Name and Mailing Address
NW Natural
220 NW 2nd Avenue
Portland, OR 97209
ATTN: Bob Wyatt

4. Generator's Phone (503) 226-4211 ext. 5425

5. Transporter 1 Company Name
WasteWatch, Inc.

6. US EPA ID Number
O R Q 0 0 0 0 0 6 2 2 1

A. State Transporter's ID

B. Transporter 1 Phone (503) 465-8683

7. Transporter 2 Company Name
Savannah Transport, Inc.

8. US EPA ID Number
K 3 0 0 0 0 3 3 6 8 9 1

C. State Transporter's ID

D. Transporter 2 Phone (877) 595-0100

9. Designated Facility Name and Site Address
Pollution Control Industries of
5485 Tay-For Drive
Millington, TN 38053

10. US EPA ID Number
T N D 0 0 0 7 7 2 1 8 6

E. State Facility's ID

F. Facility's Phone (901) 353-5291

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. Non Hazardous, Non RCRA Regulated (IDW Soil)	22	D M	012,000	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
a) 280465

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Emergency Phone No: (503) 504-1733

Site Address:
7900 NW St. Helens Rd
Portland, OR 97210

NON-HAZARDOUS WASTE

GENERATOR

16. **GENERATOR'S CERTIFICATION:** I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

X

Printed/Typed Name: Robert J Wyatt | Signature | Date: Month 8 Day 26 Year 04

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Tim Ferrick | Signature: Tim Ferrick | Date: Month 8 Day 26 Year 04

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name | Signature | Date: Month Day Year

POLLUTION CONTROL INDUSTRIES

PROFILE NUMBER 280465 NE

Please indicate which PCI Facilty(s) are being utilized for this Profile

☐ East Chicago, IN. 46310 1-800-388-7242 ☐ Millington, TN. 38053 1-888-724-8366 ☐ Rancho Cordova, CA. 95670 1-866-724-2272

GENERATORS WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

PLEASE FAX COMPLETED FORM TO THE PCI APPROVALS DEPARTMENT AT 1-219-397-6411

A. GENERATOR INFORMATION:

Generator Name: Northwest Natural Gas
Facility Address 7900 NW St Helens Rd
City Portland State OR Zip 97210
Customer Name: Bob Wyatt
Customer Phone: (503) 226 - 4211 ext 5425
Customer Fax: (____) ____ - ____
Generator USEPA/Federal ID #: CESQG
Generator State ID # (If applicable): ____
Is the Generator a "Conditionally Exempt Small Quantity Generator"? X Yes ____ No
Generator's S.I.C. Code(4 Digit): ____

BILLING INFORMATION:

Billing Name: Waste Watch Inc
Billing Address P. O. Box 430
City Troutdale State OR Zip 97060
Billing Contact Name: Jim Ferrick
Billing Phone: (503) 465 - 8683
Billing Fax: (____) ____ - ____
P.C.I. Sales Rep.: Russ

B. WASTE STREAM INFORMATION:

Name of the Waste: Investigative derived Soil
Original Process Generating Waste: Soil investigation. Material is from gas manufacturing operations

Is a representative sample provided? ____ Yes X No
Is a MSDS attached? ____ Yes X No
Is there any Analytical attached? TCLP X Yes ____ No
Other ____ Yes ____ No

C. GENERAL CHARACTERISTICS:

Color: Light-Brown

Odor: ____ None; ____ Mild; ____ Strong

Physical state @ 70 F: 1-10 % Liquid; ____ % Sludge; 90-100 % Solid; ____ % Powder; ____ % Gas(Aerosol); ____ % Gas(Other); ____ % Other

Phases: ____ Single Layer; X Multi Layer; How Many? 2

Btu/Lb: ____ <3000; ____ 3000-5000; X 5000-10,000; ____ >10,000

PH: ____ <2.0 ____ 2.0 to 4.0 X 4.0 to 10.0 ____ 10.0 to 12.5 ____ >12.5

Liquid Flash Point: ____ <73 F ____ 73 to 99 F ____ 100 to 139 F X 140 to 200 F ____ >200 F ____ None

Specific Gravity 1.15 - 1.2 % Total Halogens -

D. CHEMICAL COMPOSITION: Total of Maximum concentration must be > or = to 100%.

Constituents	Min%	Max%	Constituents	Min%	Max%
Soil	90	99.9			
water	0	10			
petroleum hydrocarbons	0	1.4			
benzene	0.001	0.01			

E. OTHER WASTE STREAM INFORMATION:

Is this waste a "USED OIL" per 40CFR PART 279? ____ Yes X No
If "Yes", does the total halogen content exceed 1,000 ppm? ____ Yes ____ No
If "Yes", can you identify the "Chlorinated Constituent" present in the oil? ____
If "Yes", can you rebut the presumption that this material is a "Hazardous Waste"? ____ Yes ____ No

Does the Waste have any of the following characteristics? (Please check all that apply)

____ Oxidizer ____ Organic Peroxide ____ Water Reactive ____ Air Reactive ____ Pyrophoric ____ Dioxin
____ Radioactive ____ Infectious ____ Pathogen ____ Carcinogen ____ Etiological
____ Explosive ____ Shock Sensitive ____ Undergo Hazardous Polymerization ____ Cylinder ____ Aerosols

Does the Waste contain any of the following?

None	or	LESS THAN	or	ACTUAL	None	or	LESS THAN	or	ACTUAL
X	PCB'S	____ <50ppm		____ ppm	X	Sulfides	____ <50ppm		____ ppm
____	Cyanides	X <50ppm		____ ppm	X	Phenolics	____ <50ppm		____ ppm

Does the waste represented by this profile contain benzene? X Yes ____ No
If "Yes", please list concentration in <300 ppm.
Is the Waste subject to the benzene waste operations NESHAP? (40CFR Part 61, Subpart FF) ____ Yes X No
Answer "Yes" if your waste contains benzene **and** if the SIC code from your facility is one of the following:

2812 2813 2816 2819 2821 2822 2823 2824 2833 2834 2835 2836 2841 2842 2843 2844 2851
2861 2865 2869 2873 2874 2876 2879 2891 2892 2893 2896 2899 2911 3312 4953 4959 9511

E. OTHER WASTE STREAM INFORMATION CONTINUED:

Is the Waste subject to RCRA Subpart CC controls? (40 CFR 265 SUBPART CC) ___Yes _X_No
If "No", does the Waste meet the organic LDR exemption for UHC'S? (40 CFR 268.48, 268.7) _X_Yes ___No
If "No", does the Waste contain <500ppmw volatile organic(VO)? (40 CFR 265 SUBPART CC) ___Yes ___No
Does the Waste contain any Class I or Class II ozone-depleting substances? ___Yes _X_No
If PCB'S are present, is the waste regulated by TSCA per 40 CFR 761? ___Yes _X_No

F. SHIPPING INFORMATION:

Method of Shipment:
___Bulk Liquid(> 500 Gallons) ___Bulk Solids(roll-off box, vacuum box, etc) ___Lab Pack
___Cubic Yard Boxes ___Totes (Please specify size) ___
_X_Drums(Specify size) ___85 _X_55 ___30 ___16 ___5 Other (Please specify)___
Container Type: _X_Metal ___Plastic ___Fiberboard ___Combination(EX: Glass containers in metal drum)
___Other(Please describe)___
Shipping Frequency:
Number of Units 14-17 Per ___Month ___Quarter ___Year Other one Time

G. R.C.R.A. CHARACTERIZATION:

Is this a USEPA "Hazardous Waste" per 40CFR 261.3? ___Yes _X_No
If "No", Please skip to section H.
Is this a "Universal Waste" per 40CFR part 273? ___Yes _X_No
Is this a "Characteristic Waste"? (MGP Exclusion) ___Yes _X_No
If "Yes" Is it: ___D001 Ignitable ___D002 Corrosive ___D003 Reactive
Characteristic for Toxic Metals: ___D004 ___D005 ___D006 ___D007 ___D008 ___D009 ___D010 ___D011
Characteristic for Toxic Organics: D012 thru D043 (please list all that apply)___
Is this an "F" or "K" Listed waste or mixed with one? ___Yes _X_No
If "Yes", Please list all applicable code(s) from 40CFR261.31 and/or 261.32:___
Is this a commercial chemical product or spill cleanup that would carry a "U" or "P" waste code under 40CFR 261.33 (e) or (f)? ___Yes _X_No
If "Yes", Please list all applicable waste code(s).___
Is this a state regulated waste? ___Yes _X_No
If "Yes", Please list all codes.___

H. DOT SHIPPING INFORMATION:

Is this a U.S. Dept. of Transportation(USDOT) Hazardous Material? ___Yes _X_No
Proper Shipping Name per 49CFR 172.101 Hazardous Materials Table: Non Hazardous, Non RCRA regulated material
"Reportable Quantity"(if any) ___lbs
Hazard Class or Division No. ___ UN/NA # ___ Packing Group ___I ___II ___III
Is this a "Poison Inhalation Hazard"? ___Yes _X_No
If "Yes", Please indicate Hazard Zone ___Zone A ___Zone B ___Zone C ___Zone D ___Other
List two primary hazardous constituents:___

I. GENERATOR CERTIFICATION:

I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability. No deliberate or willful omissions of composition or properties exist and that all known or suspected hazards have been disclosed.
I also certify that the obtained sample is representative of the waste material described above and give PCI permission and consent to make amendments and corrections.

X Name(print) Robert J. Wyatt Title Environmental Compliance Specialist
X Signature Date 8-26-04

THIS SPACE FOR PCI APPROVALS DEPARTMENT ONLY

DATE RECEIVED ___/___/___ APPROVER'S INITIALS___ PROFILE NUMBER 280465
PROCESS CODE ___ ___ PRICE___ TRANS___
PROPER WASTE CODES ___
PROPER D.O.T. SHIPPING NAME:___
HAZARD CLASS___ UN___ NA___ PACKING GROUP ___I ___II ___III
N.O.S. DESCRIPTORS___
YARD INSTRUCTIONS:
___ NO LANDFILL CUSTOMER
___ NO SAMPLE APPROVAL
___ RUN SALES ANALYTICAL
___ N/H FOR METALS PER GEN.
___ RUN OX. SCREEN ON INCOMING
___ MSDS ATTACHED
___ SEE ATTACHED ANALYTICAL
___ RUN COMP. ON INCOMING
FORM CODE W___ SYSTEM CODE H___

WasteWatch, Inc.
Environmental Services

INVOICE

RECEIVED SEP 10 2004

		QTY	DESCRIPTION	EACH	TOTAL
Invoice No.	0904-105	22	Disposal: Non Haz Soil Borings, 55-gal drum	$205.00	$4,510.00
Invoice Date	9/8/04	1	Labor to consolidate 9 drums	$190.00	$190.00
WW Job No.	04-08224				
Date Shipped	8/26/04				
Terms	Net 30				
Work Order	**A276-2708-01**				
SOLD TO					
Company	Hahn and Associates				
Contact	Mark Whitson				
Address	434 NW 6th Avenue				
City, State	Portland, OR				
Zip Code	97209-3600				
Phone	(503) 796-0717				
NOTES					
Gasco site, manifest # 08224					
				PLEASE PAY THIS AMOUNT	**$4,700.00**

INTERNAL APPROVAL
Job # 2708-70
Today's Date 9-13-04
Prj Mgr MWW / RGE
GL Number ~~2708-70~~

(TERMS: Net 30 Days)

Please Make Checks Payable To:
WASTEWATCH, INC.
P.O. Box 430
Troutdale, OR 97060

Thank You For Your Business

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

PHONE MEMORANDUM

DATE: September 2, 2004

TO: File
NW Natural – Gasco Site
Portland, Oregon

FROM: Mark Whitson
Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 2708-70

SUBJECT: IDW Soil Cuttings – Non-Hazardous Waste Review
NW Natural Gasco Facility
Portland, Oregon

This memorandum documents the non-hazardous waste determination for the investigation derived waste (IDW) soil cuttings (22 full drums) that were removed from the Gasco site on August 26, 2004.

Listed wastes

The IDW did not meet any listed waste categories.

Characteristic wastes

Based on knowledge of historical waste activities at the Gasco site and previous soil chemical analyses, the soil cuttings are not a corrosive (40 CFR 261.22) or reactive (40 CFR 261.23) waste.

A representative composite sample of the IDW from the drums that contained liquid was collected on August 23, 2004, and analyzed for flashpoint. The flashpoint was non-detect at 150 degrees F (results attached). Therefore, the IDW is not a ignitable waste (40 CFR 261.21).

Based on knowledge of historical waste activities at the Gasco site and previous soil chemical analyses, the soil cuttings are not a Toxicity Characteristic waste (40 CFR 261.24). Benzene concentrations in the soil are elevated and leachate concentrations could be above Toxicity Characteristic regulatory levels; however, Oregon has adopted the Toxicity Characteristic exemption for manufactured gas plant waste (40 CFR 261.24(a)). The IDW contains manufactured gas plant waste. Therefore, the IDW is not a Toxicity Characteristic waste.

434 NW 6th AVENUE, SUITE 203 • PORTLAND, OREGON 97209-3651
503-796-0717 Telephone • 503-227-2209 Facsimile

HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: NORTH CREEK ANALYTICAL
Lab Project No.:

CHAIN OF CUSTODY

Chain of Custody No.: 1

Project Manager: MARK WHITSON
Project No.: 2708
Project Name:
Collected by: MATT GRAVES

Liquid with Sediment Sample
____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample
____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N):
Appropriate Containers Used (Y or N):
Provide Verbal Results (Y or N): No
Provide Preliminary Fax Results: Yes

Comments

Sample Number Prefix: 2708-040823-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: FLASH POINT									RUSH	Remarks
	100	8-23-04	10:00		X				X									X	24 HR.

Relinquished by	Company	Date	Time	Received by	Company
MATT GRAVES	HAI	8-23-04	1320		NCA
Relinquished by	Company	Date	Time	Received by	Company

www.ncalabs.com

Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-9223
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

25 August, 2004

Mark Whitson
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Northwest Natural

Enclosed are the results of analyses for samples received by the laboratory on 08/24/04 14:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Howard Holmes
Project Manager

Work Orders included in this report:
P4H0854

www.ncalabs.com

Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-9223
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

Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Mark Whitson	08/25/04 12:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040823-100	P4H0854-01	Soil	08/23/04 10:00	08/24/04 14:00

North Creek Analytical - Portland

Howard Holmes, Project Manager

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.

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-9223
425.420.9200 fax 425.420.9210
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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Mark Whitson	08/25/04 12:23

Physical Parameters per APHA/ASTM/EPA Methods
North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040823-100 (P4H0854-01) Soil					Sampled: 08/23/04 Received: 08/24/04				
Flashpoint	ND	150	°F	1	EPA 1010	08/25/04	08/25/04	4081039	

North Creek Analytical - Portland

Howard Holmes, Project Manager

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.

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425.420.9200 fax 425.420.9210
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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Mark Whitson	08/25/04 12:23

Physical Parameters per APHA/ASTM/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4081039 - Oil Qual. Extraction										
LCS (4081039-BS1)				Prepared & Analyzed: 08/25/04						
Flashpoint	130		°F				123-131			
Duplicate (4081039-DUP1)		**Source: P4H0456-18**		Prepared & Analyzed: 08/25/04						
Flashpoint	ND	150	°F		ND				50	

North Creek Analytical - Portland

Howard Holmes, Project Manager

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.

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Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-9223
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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

Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Mark Whitson	08/25/04 12:23

Notes and Definitions

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 (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

Howard Holmes, Project Manager

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.

T4HU557

HAHN AND ASSOCIATES, INC.

Environmental Consultants

434 NW Sixth Avenue, Suite 203 • Portland OR 97209

(503) 796-0717 • Fax (503) 227-2209

Laboratory: NORTH CREEK ANALYTICAL

Lab Project No.:

CHAIN OF CUSTODY

Chain of Custody No.: 1

Project Manager: MARK WATSON
Project No.: 2703
Project Name:
Collected by: MATT GRAVES

Liquid with Sediment Sample

____ Test Filtrate ____ Test Sediment ____ Test Both

Multi-Phase Sample

____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N):
Appropriate Containers Used (Y or N):
Provide Verbal Results (Y or N): No
Provide Preliminary Fax Results: Yes

Comments

Sample Number Prefix: 2708-040823-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: FLASH POINT	RUSH	Remarks
	100	8-23-04	10:00		X				X	X	24 HR.

Relinquished by	Company	Date	Time	Received by	Company
Matt Graves	HAI	8-23-04	1320		NCA
	NCA	08-24-04	1400		NCA

8/24/04
1400

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Haley

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other** _____

   By (print) Carrie Fanshaw (sign) Carrie Fanshaw

2. Date samples received 8/24/04 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by [illegible] date 8/24/04.

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice ___gel ice X real ice

   Temperature (degrees C) _____ Raytek thermometer 1.4 Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? X Yes ___No

   Name of project NW Natural (if applicable)

10. **Initial and date for unpacking:** CF **(initials)** **date** 8/24/04

11. Packing material: NA bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___Yes Y No

13. Did all containers indicated on the COC arrive? X Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? Y Yes ___No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? Y Yes ___No

    Do the IDs, times, etc. agree with the COC? Y Yes ___No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? Y Yes ___No

17. Is there adequate volume for the test(s) requested? Y Yes ___No

18. If voa vials were submitted, are they free of bubbles? Y N/A ___Yes ___No

19. **Log-in phase: Date samples were logged in:** 8/24/04 **Elm Project # P** 440854

20. Logged in by (print) Vanessa Evans (sign) Vanessa Evans

21. Was the project manager notified of status? (Use back of form as a record) ___Yes X No

(iii) The potential of the constituent or any toxic degradation product of the constituent to migrate from the waste into the environment under the types of improper management considered in paragraph (a)(3)(vii) of this section.

(iv) The persistence of the constituent or any toxic degradation product of the constituent.

(v) The potential for the constituent or any toxic degradation product of the constituent to degrade into non-harmful constituents and the rate of degradation.

(vi) The degree to which the constituent or any degradation product of the constituent bioaccumulates in ecosystems.

(vii) The plausible types of improper management to which the waste could be subjected.

(viii) The quantities of the waste generated at individual generation sites or on a regional or national basis.

(ix) The nature and severity of the human health and environmental damage that has occurred as a result of the improper management of wastes containing the constituent.

(x) Action taken by other governmental agencies or regulatory programs based on the health or environmental hazard posed by the waste or waste constituent.

(xi) Such other factors as may be appropriate.

Substances will be listed on appendix VIII only if they have been shown in scientific studies to have toxic, carcinogenic, mutagenic or teratogenic effects on humans or other life forms.

(Wastes listed in accordance with these criteria will be designated Toxic wastes.)

(b) The Administrator may list classes or types of solid waste as hazardous waste if he has reason to believe that individual wastes, within the class or type of waste, typically or frequently are hazardous under the definition of hazardous waste found in section 1004(5) of the Act.

(c) The Administrator will use the criteria for listing specified in this section to establish the exclusion limits referred to in § 261.5(c).

[45 FR 33119, May 19, 1980, as amended at 55 FR 18726, May 4, 1990; 57 FR 14, Jan. 2, 1992]

Subpart C—Characteristics of Hazardous Waste

§ 261.20 General.

(a) A solid waste, as defined in § 261.2, which is not excluded from regulation as a hazardous waste under § 261.4(b), is a hazardous waste if it exhibits any of the characteristics identified in this subpart.

[*Comment:* § 262.11 of this chapter sets forth the generator's responsibility to determine whether his waste exhibits one or more of the characteristics identified in this subpart]

(b) A hazardous waste which is identified by a characteristic in this subpart is assigned every EPA Hazardous Waste Number that is applicable as set forth in this subpart. This number must be used in complying with the notification requirements of section 3010 of the Act and all applicable recordkeeping and reporting requirements under parts 262 through 265, 268, and 270 of this chapter.

(c) For purposes of this subpart, the Administrator will consider a sample obtained using any of the applicable sampling methods specified in appendix I to be a representative sample within the meaning of part 260 of this chapter.

[*Comment:* Since the appendix I sampling methods are not being formally adopted by the Administrator, a person who desires to employ an alternative sampling method is not required to demonstrate the equivalency of his method under the procedures set forth in §§ 260.20 and 260.21.]

[45 FR 33119, May 19, 1980, as amended at 51 FR 40636, Nov. 7, 1986; 55 FR 22684, June 1, 1990; 56 FR 3876, Jan. 31, 1991]

§ 261.21 Characteristic of ignitability.

(a) A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

(1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has flash point less than 60 °C (140 °F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D–93–79 or D–93–80 (incorporated by reference, see § 260.11), or a Setaflash Closed Cup Tester, using the test method specified

in ASTM Standard D-3278-78 (incorporated by reference, see § 260.11), or as determined by an equivalent test method approved by the Administrator under procedures set forth in §§ 260.20 and 260.21.

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

(3) It is an ignitable compressed gas as defined in 49 CFR 173.300 and as determined by the test methods described in that regulation or equivalent test methods approved by the Administrator under §§ 260.20 and 260.21.

(4) It is an oxidizer as defined in 49 CFR 173.151.

(b) A solid waste that exhibits the characteristic of ignitability has the EPA Hazardous Waste Number of D001.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990]

§ 261.22 Characteristic of corrosivity.

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

(1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using Method 9040 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter.

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 °C (130 °F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM-01-69 as standardized in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter.

(b) A solid waste that exhibits the characteristic of corrosivity has the EPA Hazardous Waste Number of D002.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990; 58 FR 46049, Aug. 31, 1993]

§ 261.23 Characteristic of reactivity.

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has *any* of the following properties:

(1) It is normally unstable and readily undergoes violent change without detonating.

(2) It reacts violently with water.

(3) It forms potentially explosive mixtures with water.

(4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(b) A solid waste that exhibits the characteristic of reactivity has the EPA Hazardous Waste Number of D003.

[45 FR 33119, May 19, 1980, as amended at 55 FR 22684, June 1, 1990]

§ 261.24 Toxicity characteristic.

(a) A solid waste (except manufactured gas plant waste) exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter, the extract from a representative sample of the waste contains any of the contaminants listed in table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste

itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section.

(b) A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table I which corresponds to the toxic contaminant causing it to be hazardous.

TABLE 1—MAXIMUM CONCENTRATION OF CONTAMINANTS FOR THE TOXICITY CHARACTERISTIC

EPA HW No.[1]	Contaminant	CAS No.[2]	Regulatory Level (mg/L)
D004	Arsenic	7440–38–2	5.0
D005	Barium	7440–39–3	100.0
D018	Benzene	71–43–2	0.5
D006	Cadmium	7440–43–9	1.0
D019	Carbon tetrachloride	56–23–5	0.5
D020	Chlordane	57–74–9	0.03
D021	Chlorobenzene	108–90–7	100.0
D022	Chloroform	67–66–3	6.0
D007	Chromium	7440–47–3	5.0
D023	o-Cresol	95–48–7	[4]200.0
D024	m-Cresol	108–39–4	[4]200.0
D025	p-Cresol	106–44–5	[4]200.0
D026	Cresol		[4]200.0
D016	2,4-D	94–75–7	10.0
D027	1,4-Dichlorobenzene	106–46–7	7.5
D028	1,2-Dichloroethane	107–06–2	0.5
D029	1,1-Dichloroethylene	75–35–4	0.7
D030	2,4-Dinitrotoluene	121–14–2	[3]0.13
D012	Endrin	72–20–8	0.02
D031	Heptachlor (and its epoxide).	76–44–8	0.008
D032	Hexachlorobenzene	118–74–1	[3]0.13
D033	Hexachlorobutadiene	87–68–3	0.5
D034	Hexachloroethane	67–72–1	3.0
D008	Lead	7439–92–1	5.0
D013	Lindane	58–89–9	0.4
D009	Mercury	7439–97–6	0.2
D014	Methoxychlor	72–43–5	10.0
D035	Methyl ethyl ketone	78–93–3	200.0
D036	Nitrobenzene	98–95–3	2.0
D037	Pentrachlorophenol	87–86–5	100.0
D038	Pyridine	110–86–1	[3]5.0
D010	Selenium	7782–49–2	1.0
D011	Silver	7440–22–4	5.0
D039	Tetrachloroethylene	127–18–4	0.7
D015	Toxaphene	8001–35–2	0.5
D040	Trichloroethylene	79–01–6	0.5
D041	2,4,5-Trichlorophenol	95–95–4	400.0
D042	2,4,6-Trichlorophenol	88–06–2	2.0
D017	2,4,5-TP (Silvex)	93–72–1	1.0
D043	Vinyl chloride	75–01–4	0.2

[1] Hazardous waste number.
[2] Chemical abstracts service number.
[3] Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.
[4] If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

[55 FR 11862, Mar. 29, 1990, as amended at 55 FR 22684, June 1, 1990; 55 FR 26987, June 29, 1990; 58 FR 46049, Aug. 31, 1993; 67 FR 11254, Mar. 13, 2002]

Subpart D—Lists of Hazardous Wastes

§ 261.30 General.

(a) A solid waste is a hazardous waste if it is listed in this subpart, unless it has been excluded from this list under §§ 260.20 and 260.22.

(b) The Administrator will indicate his basis for listing the classes or types of wastes listed in this subpart by employing one or more of the following Hazard Codes:

Ignitable Waste	(I)
Corrosive Waste	(C)
Reactive Waste	(R)
Toxicity Characteristic Waste	(E)
Acute Hazardous Waste	(H)
Toxic Waste	(T)

Appendix VII identifies the constituent which caused the Administrator to list the waste as a Toxicity Characteristic Waste (E) or Toxic Waste (T) in §§ 261.31 and 261.32.

(c) Each hazardous waste listed in this subpart is assigned an EPA Hazardous Waste Number which precedes the name of the waste. This number must be used in complying with the notification requirements of Section 3010 of the Act and certain recordkeeping and reporting requirements under parts 262 through 265, 268, and part 270 of this chapter.

(d) The following hazardous wastes listed in § 261.31 or § 261.32 are subject to the exclusion limits for acutely hazardous wastes established in § 261.5: EPA Hazardous Wastes Nos. FO20, FO21, FO22, FO23, FO26, and FO27.

[45 FR 33119, May 19, 1980, as amended at 48 FR 14294, Apr. 1, 1983; 50 FR 2000, Jan. 14, 1985; 51 FR 40636, Nov. 7, 1986; 55 FR 11863, Mar. 29, 1990]

§ 261.31 Hazardous wastes from non-specific sources.

(a) The following solid wastes are listed hazardous wastes from non-specific sources unless they are excluded under §§ 260.20 and 260.22 and listed in appendix IX.

Formal adoption of rule changes

Attachment A-1

Summary of Proposed Rule Revisions

This proposal adopts by reference 15 recent Environmental Protection Agency (EPA) amendments to federal hazardous waste rules and also amends numerous Oregon Administrative Rules (OARs) related to hazardous waste management.

The Department is proposing 12 amendments that correct or clarify Oregon's hazardous waste regulations. One proposed rule adopts all 15 of the federal rules in Attachment A-2 by reference. Most of the proposed changes are necessary to update administrative rules to reflect recent rule changes in the spills program that are referenced in the hazardous waste regulations. Some of the proposed rules were requested by EPA during our 2002 program reauthorization. Other changes make Oregon's rules consistent with the proposed federal rules. The following table and text in this attachment describe each proposed rule change, the reason for the change, the Oregon impact, and the Department's recommendation to the Environmental Quality Commission.

Rule # as found in this Attachment	OAR Citation	Why is Rule Change Proposed?
1	340-100-0002	Necessary to adopt federal rules by reference
2	340-101-0004	Deletion of state regulation that is less stringent than federal rule as a result of adopting federal rule
3	340-101-0050	Deletion of state rule as a result of adopting federal rule
4	340-102-0011	Requested by EPA for authorization
5	340-104-0340	Federal reference changed
6	340-105-0003	Requested by EPA for authorization
7	340-106-0002	Federal reference changed
8	340-109-0010	New spill response regulations
9	340-100-0020(1); 340-100-0004; 340-100-0010(3); 340-101-0001(1); 340-101-0040(1) & (2); 340-103-0031; 340-104-0001(5); 340-105-0010(2); 340-109-0010; 340-110-0061(2); 340-111-0020(1); 340-111-0050	New spill response regulations
10	340-109-0001; 340-113-0010	Requested by EPA during public comments
11	340-113-0020	Requested by EPA for authorization
12	340-113-0030	Requested by EPA for authorization

Administrative Rule Corrections and Amendments

1. Amendment: Amend OAR 340-100-0002, Adoption of EPA's Hazardous Waste and Used Oil Management Regulations.

a. Background: With each successive adoption of federal hazardous waste regulations, the Department amends OAR 340-100-0002 to record adopted federal rules and exclusions to the federal requirements. With this amendment, all of the proposed federal rules in **Attachment A-2** are adopted.

b. Oregon Impact: Amendment to OAR notes that federal rules are promulgated through July 24, 2002 with the exception of amendments to 40 CFR Parts 264, 265 and 270 as promulgated by 65 FR 30886-30913. Adoption of these rules will update Oregon's regulations making them equivalent to the federal regulations.

c. Recommendation: Amend OAR 340-100-0002 to reflect adoption of federal regulations through July 24, 2002 with the exception of FR 65, 30886-30913.

2. Amendment: Amend OAR 340-101-0004, Exclusions.

a. Background: 40 CFR 261.4(b) (7) exempts solid waste from the extraction, beneficiation and processing of ores and minerals from the definition of hazardous waste. The federal exemption is limited to certain types of processing activities and 20 types of processing ore and mineral wastes.

The current Oregon rule provision at OAR 340-101-0004(1) exempts all mineral processing wastes from being a hazardous waste, making the state provision less stringent than the federal management requirements. Federal law requires state environmental regulations to be at least as stringent as the federal requirements.

To clarify how mineral processing wastes are to be managed, the Department is proposing to delete the state rule, OAR 340-101-0004(1), which refers to mineral processing wastes.

In addition, the Department is proposing to adopt federal Hazardous Remediation Waste Management Requirements for dredged sediments (see item 15 of Federal Hazardous Waste Rule Amendments). Currently, Oregon Administrative Rules do not reflect the federal exclusion of these wastes, leaving Oregon rules more stringent than the federal rules. This exclusion is completed by removing the existing language thereby deleting 40 CFR 261.4(g) (sediment exclusion) from OAR 340-101-0004(3), and accepting the new federal exclusion for these wastes.

b. Oregon Impact: The 20 specific processing wastes exempted from management as hazardous waste include but are not limited to: slag from primary copper lead and zinc processing, gasified ash from coal gasification, iron blast furnace slag, and chloride process waste solids from titanium tetrachloride production. Mineral processing wastes not exempted under 40 CFR 261.7(b) (7) remain subject to management as potential hazardous waste. At this time, there are no known generators of these wastes in Oregon.

Proposed removal of OAR 340-101-0004(3) will recognize adoption of the federal dredged sediment provisions.

c. Recommendation: Delete OAR 340-101-0004(1) and (3). (See Attachment A-3, Proposed Rule #5)

3. Correction: Delete OAR 340-101-0050, Standards for Materials Being Recycled.

a. Background: OAR 340-101-0050(1), regulates metal limits in zinc-containing fertilizers made from K061 hazardous waste (baghouse dust from secondary steel smelting). In 1999, the Department established metal limits for zinc-containing fertilizers made from K061 hazardous waste to be applied to land. Because the Department is recommending the adoption of EPA's new regulations setting metal limits for zinc-containing fertilizers made from any hazardous waste, including K061, the Commission must delete its state-only regulation for metal limits, because those limits are less stringent than new federal limits, including dioxin limits.

b. Oregon Impact: The Oregon Department of Agriculture (ODA) regulates contaminants in waste-derived fertilizers along with the Department. ODA has adopted the federal standard for zinc-micronutrient fertilizers made from hazardous wastes. The adoption of this regulation maintains equivalency with both state programs and the federal program and meets EPA's authorization expectations.

c: Recommendation: Delete and reserve OAR 340-101-0050(1). (See Attachment A-3, Proposed Rule #7)

4. Correction: Amend OAR 340-102-0011(2)(e), Hazardous Waste Determination.

a. Background: Reference to "40 CFR 273," Standards for Universal Waste Management, must be included in the state-only regulation in order to maintain equivalency with the federal program and program authorization. Universal Waste includes only specific post-consumer-use wastes. In Oregon these wastes are recalled and unused pesticides, batteries, mercury-containing thermostats and spent fluorescent lighting tubes.

b. Oregon Impact: Inserting "40 CFR Part 273" into the state-only language at OAR 340-102-0011(2)(e) refers generators to the federal standards for universal waste management rules for possible exclusions or restrictions of their universal wastes.

c: Recommendation: Insert the federal regulation citation 40 CFR Part 273 into the regulatory language at OAR 340-102-0011(2)(e). (See Attachment A-3, Proposed Rule #8)

5. Correction: Amend the federal citation 40 CFR 264.340(d) in the regulatory language at OAR 340-104-0340, Applicability to Incinerators.

a. Background: EPA redesignated "40 CFR 264.340(d)," to "40 CFR 264.340(e)," and the Department must correct the citation to read "40 CFR 264.340(e)" in order to maintain equivalency with the federal program and to meet EPA's authorization expectations.

b. Oregon Impact: Lists a correct citation in the Department's state-only hazardous waste rules.

c: Recommendation: Amend OAR 340-104-0340 to refer to the correct citation 40 CFR 264.340(e). (See Attachment A-3, Proposed Rule #11)

6. Correction: Delete the reference to the federal regulations 40 CFR 270.230(e)(1) in the regulatory language at OAR 340-105-0003, Consideration Under Federal Law.

a. Background: The federal regulation excludes off-site remediation waste management sites that are managed pursuant to Remedial Action Plans (RAPs), a form of a RCRA permit. Making this correction will meet EPA's authorization expectations.

b. Oregon Impact: There will be no impact on Oregon since the Department is already authorized for corrective action under RCRA.

c: Recommendation: Delete reference to 40 CFR 270.230(e)(1) from OAR 340-105-0003. (See Attachment A-3, Proposed Rule #12)

7. Correction: Correct the federal regulation "40 CFR 124.11(e)" to " 40 CFR 124.10(e)" in the regulatory language at OAR 340-106-0002, Requirements Not Applicable. 40 CFR 124.11(e) does not exist in the federal program.

a. Background: The correct citation is 40 CFR 124.10(e). The Department inadvertently listed 40 CFR 124.11(e) rather than 40 CFR 124.10(e).

b. Oregon Impact: This change completes the list of federal hazardous waste permitting rules.

c: Recommendation: Amend OAR 340-106-0002 to correct citation 124.10(e). (See Attachment A-3, Proposed Rule #14)

8. Correction: Delete OAR 340-109-0010(6)(a) and change 340-109-0010(6)(b) to (6)(a). Remove reference to deleted spill response rules, Division 108 and add reference to the new spill response Division 142.

a. Background: This change reflects spill response regulations in the new Division 142 (adopted by the Commission in January, 2003), deletes reference to now deleted Division 108 spill response regulations, and references new Division 142.

b. Oregon Impact: Provide rule consistency.

c. Recommendation: Delete references to Division 108 in OAR 340-109-0010; amend 340-109-0010 to refer to new Division 142. (See Attachment A-3, Proposed Rule #16)

9. Correction: Amend references from Division 108 to the new Division 142 that replaces it in Chapter 340 Divisions 100, 101, 103-105, 110, 111, and 113.

a. Background: Change reflects spill response regulations in new Division 142. Deletes reference to deleted Division 108 spill response regulations and references new Division 142.

b. Oregon Impact: Provide rule consistency.

c. Recommendation: Delete reference to Division 108 and add new reference to Division 142 in OAR 340-100-0020(1), 340-100-0004, 340-100-0010(3), 340-101-0001(1), 340-101-0040(1), 340-101-0040(2), 340-103-0031, 340-104-0001(5), 340-105-0010(2)(d)(B)(iii)(II), 340-109-0010, 340-110-0061(2), 340-111-0020(1), and 340-111-0050. (See Attachment A-3, Proposed Rule #1, 2, 3, 4, 6, 9, 10, 13, 16, 17, 18, and 19)

10. Correction: Correct and clarify OAR 340-100-0010, 340-109-0001, and 340-113-0010 to clarify that state-only pesticide residues are not federal hazardous waste or universal waste.

a. Background: The existing rule may be interpreted to imply that all "Pesticide Residue," which includes all pesticide waste not regulated as federal hazardous wastes is, by definition, federal "universal waste." That is incorrect and was never the intention of the Department when developing OAR 340-113-0010. Pesticide residue is not defined as a "universal waste" even though residues may be managed according to the same universal waste management requirements under State law.

b. Oregon Impact: Generators of pesticide residue will now know for certain that these materials may be managed according to universal waste management standards but are not by definition a "universal waste." Clarifying the Department's intent will meet EPA's authorization expectation.

c: Recommendation: Amend OAR 340-100-0010, 340-109-0001, and 340-113-0010 to clarify that state-only pesticide residues are not included in the definition of universal waste. (See Attachment A-3, Proposed Rule #3, 15, and 20)

11. Correction: Correct OAR 340-113-0020(1) Universal Waste Management, by removing reference to non-existent rule and correct reference from 40 CFR 273.6 to 40 CFR 273.9.

a. Background: This reference contains a non-existent rule, OAR 340-113-0030(5), which must be deleted to meet EPA's authorization expectations. OAR 340-113-0030(5) was deleted with adoption of the federal universal waste lamp provisions in 2000. In addition, 40 CFR 273.6 was changed to 40 CFR 273.9 by EPA.

b. Oregon Impact: Removal of the citation clarifies that no such regulation exists and references correct federal citation of 273.9.

c: Recommendation: Delete OAR reference to OAR 340-113-0030(5) in 340-113-0020(1) and amend citation to 40 CFR 273.6 to 273.9. (See Attachment A-3, Proposed Rule #21)

12. Correction: Amend OAR 340-113-0030(1) & (2), Standards for Small and Large Quantity Handlers of Universal Waste, to reference correct federal universal waste rule provision.

a. Background: EPA changed citation in universal waste regulation, 40 CFR Part 273 from 273.6 to 273.9. State reference currently references a non-existent section 273.6, Definitions.

b. Oregon Impact: Correction to OAR 340-113-0030(1) & (2) will reference correct federal universal waste definition section of 273.9.

c. Recommendation: Correct reference in OAR 340-113-0030 from 40 CFR 273.6 to 273.9. (See Attachment A-3, Proposed Rule #22)

MGP waste exemption See p. 6

Attachment A-2

Federal Hazardous Waste Rule Amendments to be Adopted

This attachment describes the 15 federal amendments the Department is recommending be adopted by reference. All of the federal amendments described in this attachment are adopted by the first state amendment described in Attachment A-1.

1. Proposed Rule: Organobromines Production Wastes; Petroleum Refining Wastes; Identification and Listing of Hazardous Waste; Land Disposal Restrictions; Final Rule and Correcting Amendments. [65 FR 36365, June 8, 2000.]

a. Background: This rule corrects errors made in EPA's August 6, 1998 and March 17, 2000 rule amendments associated with four hazardous wastes that are generated by the petroleum refining industry. The 2000 rule language included a typographical error which made the rule unclear.

The intent of EPA's corrective rule amendment is to clarify that residuals generated from processing or recycling oil-bearing secondary materials that are not returned to a refinery operation are always designated as F037 listed hazardous wastes when disposed of or intended for disposal. The corrective rule creates no new regulatory requirements.

b. Oregon Impact: Adopting this rule will make Oregon administrative rules consistent with the EPA rule. The corrected rule does not create new regulatory requirements. At this time there are no known F037 wastes being generated in Oregon.

c. Recommendation: Adopt the rule correction.

2. Proposed Rule: National Emission Standards for Hazardous Pollutants (NESHAPS): Final Standards for Hazardous Air Pollutants for Hazardous Waste Combustors; Technical Corrections. [65 FR 42292, July 10, 2000; 66 FR 24270, May 14, 2001; 66 FR 35106, July 3, 2001.]

a. Background: On September 30, 1999, the EPA adopted standards to more rigorously control toxic emissions from burning hazardous waste in incinerators, cement kilns, and lightweight aggregate kilns. Several amendments to the original emission standards have subsequently been promulgated. Adopting these standards at this time ensures that Oregon's rules are consistent with federal rules and allows the Department to be the primary implementing agency.

This rule adds gas turbines to the regulatory list of approved burners for hazardous waste comparable/synthetic gas fuel burners. This rule also corrects a typographical error in the 1998 NESHAPS rule and includes an amendment codifying a court vacatur of the Notice of Intent to Comply (NIC) provisions in the hazardous waste regulations relating to the standards for hazardous waste combustors.

b. Oregon Impact: The Commission has already updated the air quality portion of the NESHAPS, and now the hazardous waste program (HW) is proposing to update its portion. By adopting these corrections and clarifications of the NESHAPS standards for hazardous waste combustors, the Commission ensures that the air quality and hazardous waste rules are equivalent while maintaining consistent protectiveness. There is one hazardous waste combustor in Oregon subject to the combustor rules. That facility is the Umatilla Chemical Agent Disposal Facility outside of Hermiston, Oregon. The adoption of these rules will not have an impact on the existing permit for this facility since that permit includes the previously adopted AQ rules.

c. Recommendation: Adopt the rule correction.

3. Proposed Rule: Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Chlorinated Aliphatic Production Wastes; Land Disposal Restrictions for Newly Identified Wastes; and CERCLA Hazardous Substance Designation and Reportable Quantities. [65 FR 67068, November 8, 2000.]

a. Background: In response to a lawsuit, EPA added two new waste streams (K174-wastewater treatment sludge containing dioxin and K175-wastewater treatment sludge containing mercury) generated by some in the chlorinated aliphatic manufacturing industry to the list of hazardous wastes. The listed wastes are those generated by industries manufacturing ethylene dichloride (EDC) and vinyl chloride monomer (VCM).

b. Oregon Impact: At this time, there are no facilities reporting the generation of such wastes in Oregon.

c. Recommendation: Adopt the rule.

4. Proposed Rule: Deferral of Phase IV Standards for Polychlorinated Biphenyls (PCBs) as a Constituent Subject to Treatment in Soil. [65 FR 81373, December 26, 2000.]

a. Background: This rule temporarily defers the requirement that PCBs be treated as a constituent subject to treatment when present in soils that exhibit the toxicity characteristic for metals. PCB's are a group of synthetic organic chemicals that, as wastes, show up as either oily liquids or solids. Once in the environment, PCB's do not readily break down and therefore remain for very long periods of time, increasing the availability of these materials to humans.

Federal PCB treatment standards were promulgated in 1998; however, EPA claims that the regulation discourages generators from cleaning up contaminated, PCB metal-bearing soils. This is the opposite of what EPA wanted to achieve when it promulgated alternative treatment standards for contaminated soils.

b. Oregon Impact: State cleanup rules require that soils contaminated with hazardous waste meet applicable land disposal restriction standards when excavated soils are placed on land. Generally, no cleanup sites were identified in Oregon that have high concentrations of both metals and PCBs. Deferral of the PCB treatment standards for these sites should not have an effect.

c. Recommendation: Adopt the deferral.

5. Proposed Rule: Storage, Treatment, Transportation and Disposal of Mixed Waste. [66 FR 27218, May 16, 2001.]

a. Background: This rule promulgates conditional exemptions for: (1) low-level mixed wastes (LLMW) from most RCRA Subtitle C (hazardous waste) storage and treatment regulations, and (2) LLMW and technologically enhanced naturally occurring and/or accelerator produced radioactive material (NARM) from most hazardous waste manifesting, transportation, and disposal regulations when specified conditions are met.

Mixed low-level radioactive wastes are mixtures that contain hazardous constituents regulated under RCRA. The rule provides that if a facility is licensed by the Nuclear Regulatory Commission (NRC) and the waste is managed according to specified conditions, the waste will be exempted from most hazardous waste management requirements.

b. Oregon Impact: The Commission previously adopted the federal "mixed waste" management regulations. Through these rules, the Department regulates the hazardous waste component of any mixture of a hazardous and a low-level radioactive waste. The NRC, through the Oregon Office of Energy and Oregon Department of Human Services (Oregon Public Health Services), regulates the low-level radioactive component. Adoption of this rule will clarify the proper management of these types of wastes and eliminate jurisdictional confusion. Low-level radioactive and ignitable liquid wastes produced at research laboratories or universities, facilities which are licensed by the NRC, are an example of a low-level mixed waste that could be conditionally exempted from most hazardous waste regulations if this amendment is adopted.

c. Recommendation: Adopt the rule.

6. Proposed Rule: Hazardous Waste Identification Rule (HWIR); Revisions to the Mixture and Derived-From Rules. [66 FR 27266, May 16, 2001.]

a. Background: In response to a federal court case, the revision expands the exclusion for mixtures or derivatives of listed wastes that are listed solely for the ignitability, corrosivity, or reactivity characteristics. Such mixtures and derivatives may be treated to remove the characteristic, and then disposed of as non-hazardous waste in a solid waste landfill, provided land disposal restrictions are met.

b. Oregon Impact: This allows generators of derived-from waste that is ***listed*** solely for ignitability, corrosivity or reactivity, to no longer manage those wastes as hazardous, provided the wastes do not exhibit any of the noted characteristics. The decharacterized wastes must meet land disposal restriction standards before the wastes may be disposed of in a solid waste landfill. Adoption of this rule will clarify management standards for these wastes and make Oregon's regulations equivalent to EPA's.

c. Recommendation: Adopt the rule.

7. Proposed Rule: Correction to the Hazardous Waste Identification Rule (HWIR): Revisions to the Mixture and Derived-From Rules. [66 FR 50332, October 3, 2001.]

a. Background: This rule clarifies 1) the federal exclusion from the definition of solid waste of certain mixtures of wastes, commonly referred to as Bevill wastes (20 "mineral processing" wastes excluded from the definition of hazardous wastes), and 2) the federal exclusion of listed hazardous wastes that are listed solely because they contain a characteristic of ignitability, corrosivity or reactivity (ICR), provided the waste has been decharacterized.

b. Oregon Impact: The Commission adopted the original federal mixture and derived-from rules. Adoption of this rule will clarify management standards for these wastes and make Oregon's regulations equivalent to EPA's.

c. Recommendation: Adopt the correction.

8. Proposed Rule: Change of Official EPA Mailing Address; Additional technical Amendments and Corrections. [66 FR 34374, June 28, 2001.]

a. Background: The rule updates the official mailing address for EPA, due to the relocation of the majority of its Headquarters offices to downtown Washington, D.C.

b. Oregon Impact: None

c. Recommendation: Adopt the rule.

9. Proposed Rule: Hazardous Waste Management System; Identification and Listing of Hazardous Waste: Inorganic Chemical Manufacturing Wastes; Land Disposal

Restrictions for Newly Identified Wastes; and CERCLA Hazardous Substance Designation and Reportable Quantities. [66 FR 58258, November 20, 2001, and 67 FR 17119, April 9, 2002 (Corrections)].

a. Background: As a result of a consent decree, EPA is listing three new inorganic hazardous wastes, (K176, K177, and K178) from chemical manufacturing, and establishing land disposal restrictions standards for these wastes. The listing of these wastes as hazardous will subject the wastes to comprehensive regulation, including the applicable land disposal treatment standards.

b. Oregon Impact: The rule is already in effect in Oregon, but is currently implemented by EPA. There are no known generators of these wastes in Oregon.

c. Recommendation: Adopt the rule.

10. Proposed Rule: Amendments to the Corrective Action Management Unit Rule. [67 FR 2962, January 22, 2002.]

a. Background: A Corrective Action Management Unit (CAMU) is a unit, established at a cleanup site, in which wastes can be treated, stored or disposed of without having to meet land disposal restrictions or trigger minimum technology requirements. The rule amends the 1993 CAMU rule to remove cleanup disincentives that RCRA can create and to facilitate treatment, storage and disposal of hazardous wastes generated during cleanups.

b. Oregon Impact: The Commission adopted the original "CAMU" rule and the Department became authorized to implement the CAMU standards in lieu of EPA in 1995. However, because of a legal challenge, EPA amended the base CAMU rule, and because the Department is authorized for the base CAMU rule, EPA granted the Department interim authorization to implement the CAMU amendments. Therefore, adoption of the amendments is necessary to provide continuity in the CAMU waste management program. In addition, adoption of the rule should facilitate the cleanup of contaminated sites by allowing more options for off-site treatment of wastes, perhaps resulting in lower costs.

c. Recommendation: Adopt the amendments.

11. Proposed Rule: NESHAPS: Interim Standards for Hazardous Air Pollutants for Hazardous Waste Combustors (Interim standards rule). [67 FR 6792, February 13, 2002.]

a. Background: As in # 2 above, the EPA has adopted standards to more rigorously control toxic emissions from burning hazardous waste in incinerators, cement kilns, and lightweight aggregate kilns. Several amendments to the original emission standards have

subsequently been promulgated. Portions of the rule were vacated by the Court, and EPA was granted an extension to develop these interim standards. These interim standards replace the vacated emission standards until final standards are promulgated by June 2005.

b. Oregon Impact: Air Quality (AQ) already adopted their portion of the NESHAP, and with this rule HW is updating its rule to be consistent. There is one hazardous waste combustor in Oregon subject to the combustor rules. That facility is the Umatilla Chemical Agent Disposal Facility outside of Hermiston, Oregon. The adoption of these rules will not have an impact on the existing permit for this facility since that permit includes the previously adopted AQ rules.

c. Recommendation: Adopt the rule.

12. Proposed Rule: NESHAPS: Standards for Hazardous Air Pollutants for Hazardous Waste Combustors. [67 FR 6968, February 14, 2002.]

a. Background: As in # 2 above, the EPA has adopted standards to more rigorously control toxic emissions from burning hazardous waste in incinerators, cement kilns, and lightweight aggregate kilns. Several amendments to the original emission standards have subsequently been promulgated. This rule corrects technical errors that were made in the September 30, 1999 EPA rulemaking establishing standards for hazardous waste burning cement kilns, lightweight aggregate kilns and incinerators (see 64 FR 52828, as amended 64 FR 63209).

b. Oregon Impact: AQ already adopted their portion of the NESHAP, and with this rule HW is updating its rule to be consistent. There is one hazardous waste combustor in Oregon subject to the combustor rules. That facility is the Umatilla Chemical Agent Disposal Facility outside of Hermiston, Oregon. The adoption of these rules will not have an impact on the existing permit for this facility since that permit includes the previously adopted AQ rules.

c. Recommendation: Adopt the rule.

13. Proposed Rule: Vacatur of Mineral Processing Spent Materials Being Reclaimed as Solid Wastes and TCLP Use with Manufacturing Gas Plant Wastes (MGP). 67 FR 11251, March 13, 2002.

a. Background: Because of a court challenge, EPA was required to vacate a previous rule that excluded certain mineral processing waste "secondary materials" from the definition of solid waste. EPA's original rule was promulgated to avoid the practice of placing mineral processing wastes on the ground, unprotected. However, the Court for the District of Columbia ruled that the additional processing of by-products and sludge generated from mineral processing is a continuation of the manufacturing process.

The court also determined that the Toxicity Characteristic Leaching Procedure (TCLP) was not appropriate for evaluating manufacturing gas plant (MGP) waste because the TCLP test was developed to evaluate only those wastes destined for disposal in solid waste disposal facilities, and there is no evidence that these wastes have been managed in such facilities.

b. Oregon Impact: The Commission previously adopted EPA's rule classifying mineral processing by-products and sludge as "solid wastes" when being reclaimed. However, these secondary materials were exempted from the definition of solid wastes if the materials were physically contained prior to and during reclamation (recycling). The effect of this rule vacatur is that certain mineral processing wastes that are by-products or sludge and destined for reclamation are not classified as "solid waste" and, therefore, have no requirement to be physically contained.

There are no known operations generating mineral processing characteristic by-products or sludge that are affected by the vacatur in Oregon.

There are seven MGP cleanup sites in Oregon. Two of these have already been cleaned up. The remaining five sites could be affected by this rule change. Adoption of the vacatur should increase flexibility and decrease costs for cleanups at these sites.

c. Recommendation: Adopt the rule deletions.

14. Proposed Rule: Zinc Fertilizers Made From Recycled Hazardous Secondary Materials. [67 FR 48393, July 24, 2002.]

a. Background: This rule establishes exclusions from the definition of solid waste and limits for metals and dioxin in zinc-containing fertilizers made from hazardous wastes.

b. Oregon Impact: In 1999, the Commission adopted metal limits for zinc-containing fertilizers made from K061 hazardous wastes. Prior to that, K061 (baghouse dust from steel manufacturing) could be processed and placed on the ground as fertilizer without having to meet dioxin and metal limits.

EPA's fertilizer rule establishes standards for all zinc-containing fertilizers made from hazardous waste, including K061. These new EPA standards supersede the Department's because they are more stringent than Oregon rules.

In addition, the Oregon Department of Agriculture (ODA) is also adopting by reference EPA's new rules, and the Department's adoption will be consistent with the ODA.

c. Recommendation: Adopt the rule.

15. Proposed Rule: Hazardous Remediation Waste Management Requirements (HWIR-Media); [63 FR 65874, November 30, 1998.]

a. Background: This proposed rule excludes from the definition of hazardous waste, dredged sediments managed pursuant to certain federal Clean Water Act requirements. This exclusion is limited to sediments destined for upland disposal areas with return flow discharge or otherwise regulated by the Clean Water Act. Sediments destined for upland disposal with no return flow will not be eligible for this exclusion.

b. Oregon Impact: On July 14, 2000, the Commission elected not to adopt the federal dredged materials exclusion in this rule from the definition of hazardous wastes. At that time, the Department was evaluating the best way to manage contaminated dredged sediments and stated that it was premature to eliminate the hazardous waste regulations as a management option.

Since then, the Department has evaluated best management methods for dredged materials throughout their life cycle, and believes that adoption of the exclusion will promote cleanup of contaminated sediments. Sediments meeting the exclusion will be managed according to Clean Water Act requirements. Sediments not meeting the conditions of the exclusion will be subject to applicable solid waste and hazardous waste management requirements. Hazardous waste regulations may be in effect after the dewatering of the dredged materials and before their final upland disposal if these materials are determined to be a solid waste.

c. Recommendation: Adopt the rule.

APPENDIX F

Chain-of-Custody Documentation and Laboratory Analytical Reports:
Groundwater Samples from June 2004 Temporary Well Points

HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: North Creek Analytical Portland OR
Lab Project No.:

CHAIN OF CUSTODY
Chain of Custody No. P4F0164

Project Manager: Rob Ede
Project No.: 2708
Project Name: GASCO
Collected by: APR

Liquid with Sediment Sample
____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample
____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N):
Appropriate Containers Used (Y or N):
Provide Verbal Results (Y or N): No
Provide Preliminary Fax Results: Yes

Comments

Sample Number Prefix: 2708-040602-

metals = As, Cr, Cu, Ni, Pb, Zn
Pricing/reporting levels As per Necenby to Ede, 12/12/03.

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	PAHs (EPA 8270 SIM)	SVOCs (EPA 8270)	VOCs (EPA 8260)	TOTAL CN (EPA 9010)	Amenb CN (EPA 9010)	Total metals (EPA 6010 #)	Diss. metals (EPA 6010) #	RUSH	Remarks
	100	6/2/04	14:05	E.B./F.B.		X		4			X						~~Hold~~ 15d
	101	↓	14:45	356A 18-22'		X		10	X	X	X	X	X	X	X		
	99		1545	TRIP		X		1			~~X~~ bk						Hold

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAI	6/3/04	13:20	[signature]	NCA
[signature]	NCA	6/3/04	16:45	[signature]	NCA

5.0°C

B-56 18-22' BGS GROUNDWATER

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hart & Assoc.

1. **Please sign for receipt and opening of** 1 **cooler or** ____ **other** ____

   By (print) Erica Dakan (sign) Erica Dakan

2. Date samples received 6/3/04 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other ____

   Airbill # if applicable ____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by BOB date 6/3/04

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice X gel ice ___real ice

   Temperature (degrees C) 5.0°C Raytek thermometer ____ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? X Yes ___No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: ____

9. Was project identifiable from custody papers? X Yes ___No

   Name of project FASCO (if applicable)

10. **Initial and date for unpacking:** VE **(initials)** **date** 6/4/04

11. Packing material: X bubble wrap/bag ___styrofoam ___cardboard ____other

12. Were samples in bags? ___Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___No

    If "no" please indicate which containers were absent ____

14. Were all containers unbroken and labels in good condition? X Yes ___No

    If "no" please indicate which containers ____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___No

    Do the IDs, times, etc. agree with the COC? X Yes ___No

    If "no" please indicate which containers ____

16. Are containers properly preserved for indicated analysis? X Yes ___No

17. Is there adequate volume for the test(s) requested? X Yes ___No

18. If voa vials were submitted, are they free of bubbles? X N/A ___Yes ___No

19. **Log-in phase: Date samples were logged in:** 6/4/04 **Elm Project # P** 4F0116

20. Logged in by (print) Vanessa Evans (sign) Vanessa Evans

21. Was the project manager notified of status? (Use back of form as a record) ___Yes X No

www.ncalabs.com

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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

22 June, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 06/03/04 16:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

Work Orders included in this report:
P4F0166

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040602-100	P4F0166-01	Water	06/02/04 14:05	06/03/04 16:45
2708-040602-101	P4F0166-02	Water	06/02/04 14:45	06/03/04 16:45

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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.

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Total Metals per EPA 6000/7000 Series Methods

B-56 18-22'

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-101 (P4F0166-02) Water					Sampled: 06/02/04 Received: 06/03/04				
Arsenic	**0.00177**	0.00100	mg/l	1	EPA 6020	06/08/04	06/10/04	4060323	
Chromium	**0.00803**	0.00100	"	"	"	"	"	"	
Copper	**0.00856**	0.00200	"	"	"	"	"	"	
Lead	**0.00446**	0.00100	"	"	"	"	"	"	
Nickel	**0.0121**	0.00200	"	"	"	"	"	"	
Zinc	**0.0288**	0.00500	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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.

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Dissolved Metals per EPA 6000/7000 Series Methods

B-56 18-22'

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-101 (P4F0166-02) Water						Sampled: 06/02/04	Received: 06/03/04		
Arsenic	**0.00134**	0.00100	mg/l	1	EPA 6020	06/10/04	06/12/04	4060454	
Chromium	**0.00100**	0.00100	"	"	"	"	"	"	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Nickel	**0.0238**	0.00200	"	"	"	"	"	"	
Zinc	**0.0199**	0.00500	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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.

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

FIELD BLANK B-5R (8-22)

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-100 (P4F0166-01) Water					Sampled: 06/02/04 Received: 06/03/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/09/04	06/09/04	4060374	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-100 (P4F0166-01) Water					Sampled: 06/02/04 Received: 06/03/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/09/04	06/09/04	4060374	
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	"	"	"	"	"	"	
1,1,1,2-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	*92.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*102 %*	*77-129*							
Surr: Dibromofluoromethane	*100 %*	*80-121*							
Surr: Toluene-d8	*98.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Volatile Organic Compounds per EPA Method 8260B

B-56 18-22'

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-101 (P4F0166-02RE1) Water						Sampled: 06/02/04	Received: 06/03/04		
Acetone	ND	125	ug/l	5	EPA 8260B	06/10/04	06/10/04	4060429	
Benzene	**8.00**	5.00	"	"	"	"	"	"	
Bromobenzene	ND	5.00	"	"	"	"	"	"	
Bromochloromethane	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	25.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
n-Butylbenzene	ND	25.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	50.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	25.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	25.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	5.00	"	"	"	"	"	"	
Dibromomethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	25.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-101 (P4F0166-02RE1) Water					Sampled: 06/02/04 Received: 06/03/04				
trans-1,3-Dichloropropene	ND	5.00	ug/l	5	EPA 8260B	06/10/04	06/10/04	4060429	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Isopropylbenzene	ND	10.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	25.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	25.0	"	"	"	"	"	"	
Naphthalene	**328**	10.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.00	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	10.0	"	"	"	"	"	"	
Surr: 4-BFB	*91.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*94.5 %*	*77-129*							
Surr: Dibromofluoromethane	*96.5 %*	*80-121*							
Surr: Toluene-d8	*92.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte B-56 18-22	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-101 (P4F0166-02) Water					Sampled: 06/02/04 Received: 06/03/04				**R-05**
Carbazole	ND	25.0	ug/l	5	EPA 8270C	06/07/04	06/09/04	4060257	
Acenaphthene	**71.3**	25.0	"	"	"	"	"	"	
Acenaphthylene	ND	25.0	"	"	"	"	"	"	
Anthracene	**45.9**	25.0	"	"	"	"	"	"	
Benzo (a) anthracene	**50.4**	25.0	"	"	"	"	"	"	
Benzo (a) pyrene	**66.7**	25.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	**39.4**	25.0	"	"	"	"	"	"	
Benzo (ghi) perylene	**50.9**	25.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	**40.6**	25.0	"	"	"	"	"	"	
Benzoic Acid	ND	250	"	"	"	"	"	"	
Benzyl alcohol	ND	50.0	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	25.0	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	25.0	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	25.0	"	"	"	"	"	"	
4-Chloroaniline	ND	100	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	50.0	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	25.0	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	50.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	25.0	"	"	"	"	"	"	
2-Chlorophenol	ND	25.0	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	25.0	"	"	"	"	"	"	
Chrysene	**69.2**	25.0	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	25.0	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	25.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	25.0	"	"	"	"	"	"	
Dibenzofuran	ND	25.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	25.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	25.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	25.0	"	"	"	"	"	"	
3,3'-Dichlorobenzidine	ND	25.0	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	25.0	"	"	"	"	"	"	
Diethyl phthalate	ND	25.0	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	50.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	25.0	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	50.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	125	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	25.0	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-101 (P4F0166-02) Water					Sampled: 06/02/04 Received: 06/03/04				**R-05**
2,6-Dinitrotoluene	ND	25.0	ug/l	5	EPA 8270C	06/07/04	06/09/04	4060257	
Bis(2-ethylhexyl)phthalate	ND	50.0	"	"	"	"	"	"	
Fluoranthene	**161**	25.0	"	"	"	"	"	"	
Fluorene	**34.5**	25.0	"	"	"	"	"	"	
Hexachlorobenzene	ND	25.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	50.0	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	50.0	"	"	"	"	"	"	
Hexachloroethane	ND	50.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**36.9**	25.0	"	"	"	"	"	"	
Isophorone	ND	25.0	"	"	"	"	"	"	
2-Methylnaphthalene	ND	25.0	"	"	"	"	"	"	
2-Methylphenol	ND	50.0	"	"	"	"	"	"	
3-,4-Methylphenol	ND	25.0	"	"	"	"	"	"	
Naphthalene	ND	25.0	"	"	"	"	"	"	
2-Nitroaniline	ND	25.0	"	"	"	"	"	"	
3-Nitroaniline	ND	50.0	"	"	"	"	"	"	
4-Nitroaniline	ND	50.0	"	"	"	"	"	"	
Nitrobenzene	ND	25.0	"	"	"	"	"	"	
2-Nitrophenol	ND	25.0	"	"	"	"	"	"	
4-Nitrophenol	ND	125	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	50.0	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	25.0	"	"	"	"	"	"	
Pentachlorophenol	ND	50.0	"	"	"	"	"	"	
Phenanthrene	**136**	25.0	"	"	"	"	"	"	
Phenol	ND	25.0	"	"	"	"	"	"	
Pyrene	**199**	25.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	25.0	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	25.0	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	25.0	"	"	"	"	"	"	
Surr: 2-Fluorobiphenyl	*77.3 %*	*26-135*							
Surr: 2-Fluorophenol	*38.9 %*	*6-124*							
Surr: Nitrobenzene-d5	*77.5 %*	*23-147*							
Surr: Phenol-d6	*27.7 %*	*11-130*							
Surr: p-Terphenyl-d14	*116 %*	*38-149*							
Surr: 2,4,6-Tribromophenol	*97.2 %*	*19-126*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte B-56 18-22	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-101 (P4F0166-02) Water					Sampled: 06/02/04 Received: 06/03/04				**R-05**
Acenaphthene	**54.1**	2.00	ug/l	20	EPA 8270m	06/07/04	06/09/04	4060262	
Acenaphthylene	**4.08**	2.00	"	"	"	"	"	"	
Anthracene	**14.1**	2.00	"	"	"	"	"	"	
Benzo (a) anthracene	**7.99**	2.00	"	"	"	"	"	"	
Benzo (a) pyrene	**9.45**	2.00	"	"	"	"	"	"	
Benzo (b) fluoranthene	**7.03**	2.00	"	"	"	"	"	"	
Benzo (ghi) perylene	**6.89**	2.00	"	"	"	"	"	"	
Benzo (k) fluoranthene	**6.04**	2.00	"	"	"	"	"	"	
Chrysene	**10.2**	2.00	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	4.00	"	"	"	"	"	"	
Fluoranthene	**44.2**	2.00	"	"	"	"	"	"	
Fluorene	**23.3**	2.00	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**4.81**	2.00	"	"	"	"	"	"	
Naphthalene	**21.0**	2.00	"	"	"	"	"	"	
Phenanthrene	**53.7**	2.00	"	"	"	"	"	"	
Pyrene	**50.7**	2.00	"	"	"	"	"	"	
Surr: Fluorene-d10	*85.6 %*	*25-125*							
Surr: Pyrene-d10	*73.7 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*39.3 %*	*10-125*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte B-56-18-22	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040602-101 (P4F0166-02) Water					Sampled: 06/02/04 Received: 06/03/04				
Cyanide (amenable)	**0.0343**	0.00500	mg/l	1	EPA 9010A	06/14/04	06/15/04	4060555	
Cyanide (total)	**0.0800**	0.00500	"	"	EPA 9012A	06/11/04	06/11/04	4060476	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060323 - EPA 200/3005										
Blank (4060323-BLK1)				Prepared: 06/08/04 Analyzed: 06/09/04						
Arsenic	ND	0.00100	mg/l							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Zinc	ND	0.00500	"							
LCS (4060323-BS1)				Prepared: 06/08/04 Analyzed: 06/10/04						
Arsenic	0.0960	0.00100	mg/l	0.100		96.0	80-120			
Chromium	0.102	0.00100	"	0.100		102	80-120			
Copper	0.0979	0.00200	"	0.100		97.9	80-120			
Lead	0.101	0.00100	"	0.100		101	80-120			
Nickel	0.0974	0.00200	"	0.100		97.4	80-120			
Zinc	0.0940	0.00500	"	0.100		94.0	80-120			
LCS Dup (4060323-BSD1)				Prepared: 06/08/04 Analyzed: 06/10/04						
Arsenic	0.0973	0.00100	mg/l	0.100		97.3	80-120	1.35	20	
Chromium	0.105	0.00100	"	0.100		105	80-120	2.90	20	
Copper	0.0995	0.00200	"	0.100		99.5	80-120	1.62	20	
Lead	0.103	0.00100	"	0.100		103	80-120	1.96	20	
Nickel	0.100	0.00200	"	0.100		100	80-120	2.63	20	
Zinc	0.0954	0.00500	"	0.100		95.4	80-120	1.48	20	
Duplicate (4060323-DUP1)		**Source: P4F0072-01**		Prepared: 06/08/04 Analyzed: 06/10/04						
Arsenic	0.000830	0.00100	mg/l		0.000850			2.38	20	
Chromium	0.00348	0.00100	"		0.00391			11.6	20	
Copper	0.0598	0.00200	"		0.0574			4.10	20	
Lead	0.00572	0.00100	"		0.00546			4.65	20	
Nickel	0.00485	0.00200	"		0.00488			0.617	20	
Zinc	0.159	0.00500	"		0.154			3.19	20	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060323 - EPA 200/3005										
Matrix Spike (4060323-MS1)	**Source: P4F0072-01**			Prepared: 06/08/04		Analyzed: 06/10/04				
Arsenic	0.0974	0.00100	mg/l	0.100	0.000850	96.6	75-125			
Chromium	0.107	0.00100	"	0.100	0.00391	103	75-125			
Copper	0.158	0.00200	"	0.100	0.0574	101	75-125			
Lead	0.108	0.00100	"	0.100	0.00546	103	75-125			
Nickel	0.104	0.00200	"	0.100	0.00488	99.1	75-125			
Zinc	0.250	0.00500	"	0.100	0.154	96.0	75-125			
Matrix Spike (4060323-MS2)	**Source: P4F0072-02**			Prepared: 06/08/04		Analyzed: 06/10/04				
Arsenic	0.102	0.00100	mg/l	0.100	0.000420	102	75-125			
Chromium	0.107	0.00100	"	0.100	0.00106	106	75-125			
Copper	0.109	0.00200	"	0.100	0.00854	100	75-125			
Lead	0.102	0.00100	"	0.100	ND	102	75-125			
Nickel	0.104	0.00200	"	0.100	0.00213	102	75-125			
Zinc	0.126	0.00500	"	0.100	0.0291	96.9	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060454 - EPA 200/3005 Diss										
Blank (4060454-BLK1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	ND	0.00100	mg/l							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Zinc	ND	0.00500	"							
LCS (4060454-BS1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.0961	0.00100	mg/l	0.100		96.1	80-120			
Chromium	0.101	0.00100	"	0.100		101	80-120			
Copper	0.101	0.00200	"	0.100		101	80-120			
Lead	0.100	0.00100	"	0.100		100	80-120			
Nickel	0.105	0.00200	"	0.100		105	80-120			
Zinc	0.0942	0.00500	"	0.100		94.2	80-120			
LCS Dup (4060454-BSD1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.100	0.00100	mg/l	0.100		100	80-120	3.98	20	
Chromium	0.103	0.00100	"	0.100		103	80-120	1.96	20	
Copper	0.105	0.00200	"	0.100		105	80-120	3.88	20	
Lead	0.0991	0.00100	"	0.100		99.1	80-120	0.904	20	
Nickel	0.106	0.00200	"	0.100		106	80-120	0.948	20	
Zinc	0.0977	0.00500	"	0.100		97.7	80-120	3.65	20	
Duplicate (4060454-DUP1)		**Source: P4F0212-01**		Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.00151	0.00100	mg/l		0.00119			23.7	20	Q-06
Chromium	0.000840	0.00100	"		0.00498			142	20	Q-06
Copper	0.00231	0.00200	"		0.00218			5.79	20	
Lead	0.000760	0.00100	"		0.000640			17.1	20	
Nickel	0.0326	0.00200	"		0.0320			1.86	20	
Zinc	0.0687	0.00500	"		0.0647			6.00	20	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060454 - EPA 200/3005 Diss										
Matrix Spike (4060454-MS1)		**Source: P4F0212-01**		Prepared: 06/10/04		Analyzed: 06/12/04				
Arsenic	0.109	0.00100	mg/l	0.100	0.00119	108	75-125			
Chromium	0.107	0.00100	"	0.100	0.00498	102	75-125			
Copper	0.101	0.00200	"	0.100	0.00218	98.8	75-125			
Lead	0.0913	0.00100	"	0.100	0.000640	90.7	75-125			
Nickel	0.134	0.00200	"	0.100	0.0320	102	75-125			
Zinc	0.169	0.00500	"	0.100	0.0647	104	75-125			
Matrix Spike (4060454-MS2)		**Source: P4F0212-02**		Prepared: 06/10/04		Analyzed: 06/12/04				
Arsenic	0.112	0.00100	mg/l	0.100	0.00796	104	75-125			
Chromium	0.103	0.00100	"	0.100	0.00538	97.6	75-125			
Copper	0.0958	0.00200	"	0.100	0.00177	94.0	75-125			
Lead	0.0913	0.00100	"	0.100	0.000600	90.7	75-125			
Nickel	0.138	0.00200	"	0.100	0.0338	104	75-125			
Zinc	0.106	0.00500	"	0.100	0.0103	95.7	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

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 4060374 - EPA 5030B										
Blank (4060374-BLK1)				Prepared & Analyzed: 06/09/04						
Acetone	ND	25.0	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	"							

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

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 4060374 - EPA 5030B										
Blank (4060374-BLK1)				Prepared & Analyzed: 06/09/04						
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	"							
1,1,1,2-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	*19.3*		"	*20.0*		*96.5*	*75-120*			
Surr: 1,2-DCA-d4	*19.4*		"	*20.0*		*97.0*	*77-129*			
Surr: Dibromofluoromethane	*19.6*		"	*20.0*		*98.0*	*80-121*			
Surr: Toluene-d8	*19.4*		"	*20.0*		*97.0*	*80-120*			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

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 4060374 - EPA 5030B										
LCS (4060374-BS1)				Prepared & Analyzed: 06/09/04						
Benzene	20.3	1.00	ug/l	20.0		102	80-120			
Chlorobenzene	20.1	1.00	"	20.0		100	80-124			
1,1-Dichloroethene	18.8	1.00	"	20.0		94.0	78-120			
Toluene	20.5	1.00	"	20.0		102	80-124			
Trichloroethene	19.2	1.00	"	20.0		96.0	80-132			
Surr: 4-BFB	*20.2*		"	*20.0*		*101*	*75-120*			
Surr: 1,2-DCA-d4	*19.4*		"	*20.0*		*97.0*	*77-129*			
Surr: Dibromofluoromethane	*20.7*		"	*20.0*		*104*	*80-121*			
Surr: Toluene-d8	*20.4*		"	*20.0*		*102*	*80-120*			
Matrix Spike (4060374-MS1)		**Source: P4F0166-01**		Prepared & Analyzed: 06/09/04						
Benzene	20.9	1.00	ug/l	20.0	ND	104	80-124			
Chlorobenzene	20.2	1.00	"	20.0	ND	101	72.9-134			
1,1-Dichloroethene	20.9	1.00	"	20.0	ND	104	79.3-127			
Toluene	21.0	1.00	"	20.0	0.390	103	79.7-131			
Trichloroethene	18.9	1.00	"	20.0	ND	94.5	68.4-130			
Surr: 4-BFB	*19.8*		"	*20.0*		*99.0*	*75-120*			
Surr: 1,2-DCA-d4	*20.3*		"	*20.0*		*102*	*77-129*			
Surr: Dibromofluoromethane	*21.2*		"	*20.0*		*106*	*80-121*			
Surr: Toluene-d8	*20.1*		"	*20.0*		*100*	*80-120*			
Matrix Spike Dup (4060374-MSD1)		**Source: P4F0166-01**		Prepared & Analyzed: 06/09/04						
Benzene	21.0	1.00	ug/l	20.0	ND	105	80-124	0.477	25	
Chlorobenzene	20.5	1.00	"	20.0	ND	102	72.9-134	1.47	25	
1,1-Dichloroethene	21.0	1.00	"	20.0	ND	105	79.3-127	0.477	25	
Toluene	21.2	1.00	"	20.0	0.390	104	79.7-131	0.948	25	
Trichloroethene	18.8	1.00	"	20.0	ND	94.0	68.4-130	0.531	25	
Surr: 4-BFB	*19.4*		"	*20.0*		*97.0*	*75-120*			
Surr: 1,2-DCA-d4	*19.2*		"	*20.0*		*96.0*	*77-129*			
Surr: Dibromofluoromethane	*19.8*		"	*20.0*		*99.0*	*80-121*			
Surr: Toluene-d8	*19.1*		"	*20.0*		*95.5*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project:	Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number:	2708	**Reported:**
Portland, OR 97209	Project Manager:	Rob Ede	06/22/04 11:55

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 4060429 - EPA 5030B										
Blank (4060429-BLK1)				Prepared & Analyzed: 06/10/04						
Acetone	ND	25.0	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

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

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 4060429 - EPA 5030B										
Blank (4060429-BLK1)				Prepared & Analyzed: 06/10/04						
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	"							
1,1,1,2-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	*17.9*		"	*20.0*		*89.5*	*75-120*			
Surr: 1,2-DCA-d4	*18.2*		"	*20.0*		*91.0*	*77-129*			
Surr: Dibromofluoromethane	*18.7*		"	*20.0*		*93.5*	*80-121*			
Surr: Toluene-d8	*18.3*		"	*20.0*		*91.5*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

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 4060429 - EPA 5030B										
LCS (4060429-BS1)				Prepared & Analyzed: 06/10/04						
Benzene	20.5	1.00	ug/l	20.0		102	80-120			
Chlorobenzene	20.6	1.00	"	20.0		103	80-124			
1,1-Dichloroethene	19.1	1.00	"	20.0		95.5	78-120			
Toluene	20.7	1.00	"	20.0		104	80-124			
Trichloroethene	19.6	1.00	"	20.0		98.0	80-132			
Surr: 4-BFB	*19.0*		"	*20.0*		*95.0*	*75-120*			
Surr: 1,2-DCA-d4	*18.1*		"	*20.0*		*90.5*	*77-129*			
Surr: Dibromofluoromethane	*18.6*		"	*20.0*		*93.0*	*80-121*			
Surr: Toluene-d8	*18.6*		"	*20.0*		*93.0*	*80-120*			
Matrix Spike (4060429-MS1)	**Source: P4F0225-01**			Prepared & Analyzed: 06/10/04						
Benzene	20.8	1.00	ug/l	20.0	ND	104	80-124			
Chlorobenzene	20.6	1.00	"	20.0	ND	103	72.9-134			
1,1-Dichloroethene	20.4	1.00	"	20.0	ND	102	79.3-127			
Toluene	20.9	1.00	"	20.0	ND	104	79.7-131			
Trichloroethene	18.0	1.00	"	20.0	ND	90.0	68.4-130			
Surr: 4-BFB	*19.5*		"	*20.0*		*97.5*	*75-120*			
Surr: 1,2-DCA-d4	*18.6*		"	*20.0*		*93.0*	*77-129*			
Surr: Dibromofluoromethane	*20.5*		"	*20.0*		*102*	*80-121*			
Surr: Toluene-d8	*19.4*		"	*20.0*		*97.0*	*80-120*			
Matrix Spike Dup (4060429-MSD1)	**Source: P4F0225-01**			Prepared & Analyzed: 06/10/04						
Benzene	21.1	1.00	ug/l	20.0	ND	106	80-124	1.43	25	
Chlorobenzene	20.6	1.00	"	20.0	ND	103	72.9-134	0.00	25	
1,1-Dichloroethene	20.7	1.00	"	20.0	ND	104	79.3-127	1.46	25	
Toluene	21.0	1.00	"	20.0	ND	105	79.7-131	0.477	25	
Trichloroethene	18.0	1.00	"	20.0	ND	90.0	68.4-130	0.00	25	
Surr: 4-BFB	*19.0*		"	*20.0*		*95.0*	*75-120*			
Surr: 1,2-DCA-d4	*19.2*		"	*20.0*		*96.0*	*77-129*			
Surr: Dibromofluoromethane	*20.6*		"	*20.0*		*103*	*80-121*			
Surr: Toluene-d8	*19.0*		"	*20.0*		*95.0*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060257 - EPA 3510/600 Series										
Blank (4060257-BLK1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Carbazole	ND	5.00	ug/l							
Acenaphthene	ND	5.00	"							
Acenaphthylene	ND	5.00	"							
Anthracene	ND	5.00	"							
Benzo (a) anthracene	ND	5.00	"							
Benzo (a) pyrene	ND	5.00	"							
Benzo (b) fluoranthene	ND	5.00	"							
Benzo (ghi) perylene	ND	5.00	"							
Benzo (k) fluoranthene	ND	5.00	"							
Benzoic Acid	ND	50.0	"							
Benzyl alcohol	ND	10.0	"							
4-Bromophenyl phenyl ether	ND	5.00	"							
Butyl benzyl phthalate	ND	5.00	"							
4-Chloro-3-methylphenol	ND	5.00	"							
4-Chloroaniline	ND	20.0	"							
Bis(2-chloroethoxy)methane	ND	10.0	"							
Bis(2-chloroethyl)ether	ND	5.00	"							
Bis(2-chloroisopropyl)ether	ND	10.0	"							
2-Chloronaphthalene	ND	5.00	"							
2-Chlorophenol	ND	5.00	"							
4-Chlorophenyl phenyl ether	ND	5.00	"							
Chrysene	ND	5.00	"							
Di-n-butyl phthalate	ND	5.00	"							
Di-n-octyl phthalate	ND	5.00	"							
Dibenzo (a,h) anthracene	ND	5.00	"							
Dibenzofuran	ND	5.00	"							
1,2-Dichlorobenzene	ND	5.00	"							
1,3-Dichlorobenzene	ND	5.00	"							
1,4-Dichlorobenzene	ND	5.00	"							
3,3'-Dichlorobenzidine	ND	5.00	"							
2,4-Dichlorophenol	ND	5.00	"							
Diethyl phthalate	ND	5.00	"							
2,4-Dimethylphenol	ND	10.0	"							
Dimethyl phthalate	ND	5.00	"							
4,6-Dinitro-2-methylphenol	ND	10.0	"							
2,4-Dinitrophenol	ND	25.0	"							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060257 - EPA 3510/600 Series										
Blank (4060257-BLK1)				Prepared: 06/07/04 Analyzed: 06/09/04						
2,4-Dinitrotoluene	ND	5.00	ug/l							
2,6-Dinitrotoluene	ND	5.00	"							
Bis(2-ethylhexyl)phthalate	ND	10.0	"							
Fluoranthene	ND	5.00	"							
Fluorene	ND	5.00	"							
Hexachlorobenzene	ND	5.00	"							
Hexachlorobutadiene	ND	10.0	"							
Hexachlorocyclopentadiene	ND	10.0	"							
Hexachloroethane	ND	10.0	"							
Indeno (1,2,3-cd) pyrene	ND	5.00	"							
Isophorone	ND	5.00	"							
2-Methylnaphthalene	ND	5.00	"							
2-Methylphenol	ND	10.0	"							
3-,4-Methylphenol	ND	5.00	"							
Naphthalene	ND	5.00	"							
2-Nitroaniline	ND	5.00	"							
3-Nitroaniline	ND	10.0	"							
4-Nitroaniline	ND	10.0	"							
Nitrobenzene	ND	5.00	"							
2-Nitrophenol	ND	5.00	"							
4-Nitrophenol	ND	25.0	"							
N-Nitrosodi-n-propylamine	ND	10.0	"							
N-Nitrosodiphenylamine	ND	5.00	"							
Pentachlorophenol	ND	10.0	"							
Phenanthrene	ND	5.00	"							
Phenol	ND	5.00	"							
Pyrene	ND	5.00	"							
1,2,4-Trichlorobenzene	ND	5.00	"							
2,4,5-Trichlorophenol	ND	5.00	"							
2,4,6-Trichlorophenol	ND	5.00	"							
Surr: 2-Fluorobiphenyl	*53.6*		"	*75.0*		*71.5*	*26-135*			
Surr: 2-Fluorophenol	*71.6*		"	*150*		*47.7*	*6-124*			
Surr: Nitrobenzene-d5	*67.4*		"	*75.0*		*89.9*	*23-147*			
Surr: Phenol-d6	*48.8*		"	*150*		*32.5*	*11-130*			
Surr: p-Terphenyl-d14	*76.5*		"	*75.0*		*102*	*38-149*			
Surr: 2,4,6-Tribromophenol	*112*		"	*150*		*74.7*	*19-126*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060257 - EPA 3510/600 Series										
LCS (4060257-BS1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Acenaphthene	65.3	5.00	ug/l	75.0		87.1	40-110			
4-Chloro-3-methylphenol	121	5.00	"	150		80.7	40-110			
2-Chlorophenol	109	5.00	"	150		72.7	40-110			
1,4-Dichlorobenzene	49.4	5.00	"	75.0		65.9	20-90			
2,4-Dinitrotoluene	69.7	5.00	"	75.0		92.9	50-110			
4-Nitrophenol	50.6	25.0	"	150		33.7	15-100			
N-Nitrosodi-n-propylamine	72.4	10.0	"	75.0		96.5	40-110			
Pentachlorophenol	99.4	10.0	"	150		66.3	30-120			
Phenol	49.3	5.00	"	150		32.9	15-110			
Pyrene	71.7	5.00	"	75.0		95.6	40-110			
1,2,4-Trichlorobenzene	50.0	5.00	"	75.0		66.7	25-100			
Surr: 2-Fluorobiphenyl	*58.9*		"	*75.0*		*78.5*	*26-135*			
Surr: 2-Fluorophenol	*79.8*		"	*150*		*53.2*	*6-124*			
Surr: Nitrobenzene-d5	*72.1*		"	*75.0*		*96.1*	*23-147*			
Surr: Phenol-d6	*55.2*		"	*150*		*36.8*	*11-130*			
Surr: p-Terphenyl-d14	*73.5*		"	*75.0*		*98.0*	*38-149*			
Surr: 2,4,6-Tribromophenol	*135*		"	*150*		*90.0*	*19-126*			
LCS Dup (4060257-BSD1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Acenaphthene	65.8	5.00	ug/l	75.0		87.7	40-110	0.763	36	
4-Chloro-3-methylphenol	123	5.00	"	150		82.0	40-110	1.64	43	
2-Chlorophenol	108	5.00	"	150		72.0	40-110	0.922	38	
1,4-Dichlorobenzene	47.1	5.00	"	75.0		62.8	20-90	4.77	43	
2,4-Dinitrotoluene	71.1	5.00	"	75.0		94.8	50-110	1.99	31	
4-Nitrophenol	55.7	25.0	"	150		37.1	15-100	9.60	36	
N-Nitrosodi-n-propylamine	71.4	10.0	"	75.0		95.2	40-110	1.39	37	
Pentachlorophenol	100	10.0	"	150		66.7	30-120	0.602	40	
Phenol	52.5	5.00	"	150		35.0	15-110	6.29	36	
Pyrene	72.0	5.00	"	75.0		96.0	40-110	0.418	31	
1,2,4-Trichlorobenzene	49.9	5.00	"	75.0		66.5	25-100	0.200	42	
Surr: 2-Fluorobiphenyl	*62.3*		"	*75.0*		*83.1*	*26-135*			
Surr: 2-Fluorophenol	*83.4*		"	*150*		*55.6*	*6-124*			
Surr: Nitrobenzene-d5	*71.7*		"	*75.0*		*95.6*	*23-147*			
Surr: Phenol-d6	*57.2*		"	*150*		*38.1*	*11-130*			
Surr: p-Terphenyl-d14	*72.2*		"	*75.0*		*96.3*	*38-149*			
Surr: 2,4,6-Tribromophenol	*138*		"	*150*		*92.0*	*19-126*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

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

Batch 4060257 - EPA 3510/600 Series

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060262 - EPA 3520/600 Series										
Blank (4060262-BLK1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Acenaphthene	ND	0.100	ug/l							
Acenaphthylene	ND	0.100	"							
Anthracene	ND	0.100	"							
Benzo (a) anthracene	ND	0.100	"							
Benzo (a) pyrene	ND	0.100	"							
Benzo (b) fluoranthene	ND	0.100	"							
Benzo (ghi) perylene	ND	0.100	"							
Benzo (k) fluoranthene	ND	0.100	"							
Chrysene	ND	0.100	"							
Dibenzo (a,h) anthracene	ND	0.200	"							
Fluoranthene	ND	0.100	"							
Fluorene	ND	0.100	"							
Indeno (1,2,3-cd) pyrene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Phenanthrene	ND	0.100	"							
Pyrene	ND	0.100	"							
Surr: Fluorene-d10	*2.12*		"	*2.50*		*84.8*	*25-125*			
Surr: Pyrene-d10	*2.32*		"	*2.50*		*92.8*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.20*		"	*2.50*		*88.0*	*10-125*			
LCS (4060262-BS1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Acenaphthene	2.44	0.100	ug/l	2.50		97.6	26-135			
Benzo (a) pyrene	2.43	0.100	"	2.50		97.2	38-137			
Pyrene	2.56	0.100	"	2.50		102	33-133			
Surr: Fluorene-d10	*2.62*		"	*2.50*		*105*	*25-125*			
Surr: Pyrene-d10	*2.72*		"	*2.50*		*109*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.57*		"	*2.50*		*103*	*10-125*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060262 - EPA 3520/600 Series										
LCS Dup (4060262-BSD1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Acenaphthene	2.07	0.100	ug/l	2.50		82.8	26-135	16.4	60	
Benzo (a) pyrene	2.19	0.100	"	2.50		87.6	38-137	10.4	60	
Pyrene	2.33	0.100	"	2.50		93.2	33-133	9.41	60	
Surr: Fluorene-d10	*2.21*		"	*2.50*		*88.4*	*25-125*			
Surr: Pyrene-d10	*2.43*		"	*2.50*		*97.2*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.26*		"	*2.50*		*90.4*	*10-125*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060476 - General Preparation										
Blank (4060476-BLK1)				Prepared & Analyzed: 06/11/04						
Cyanide (total)	ND	0.00500	mg/l							
LCS (4060476-BS1)				Prepared & Analyzed: 06/11/04						
Cyanide (total)	0.0462	0.00500	mg/l	0.0500		92.4	75-125			
Duplicate (4060476-DUP1)		Source: P4F0258-01		Prepared & Analyzed: 06/11/04						
Cyanide (total)	0.00208	0.00500	mg/l		0.00198			4.93	20	
Matrix Spike (4060476-MS1)		Source: P4F0258-01		Prepared & Analyzed: 06/11/04						
Cyanide (total)	0.0456	0.00500	mg/l	0.0500	0.00198	87.2	75-125			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:55

Notes and Definitions

Q-06	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
R-05	Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
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 (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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P4F0212

HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: North Creek Analytical Portland OR
Lab Project No.:

CHAIN OF CUSTODY

Chain of Custody No.:

Project Manager: Rob Ede
Project No.: 2708
Project Name: Gasco
Collected by: Andy Rolinger

Liquid with Sediment Sample
___ Test Filtrate ___ Test Sediment ___ Test-Both
Multi-Phase Sample
___ Test One (which) ___ Test Separately ___ Shake

Samples Received at 4C (Y or N):
Appropriate Containers Used (Y or N):
Provide Verbal Results (Y or N): No
Provide Preliminary Fax Results: Yes

Comments

Sample Number Prefix: 2708-040603-

*metals = As, Cr, Cu, Ni, Pb, Zn
pricing / reporting levels as per Nerenberg to Ede, 12/12/03

Lab ID	Sample #	Date	Time	Sample Description	Soil	Water	Other	Number of Containers	PAHs (EPA 8270 SIM)	SVOCs (EPA 8270)	VOCs (EPA 8260)	TOTAL CN (EPA 9010)	Amenable CN (EPA 9010)	TOTAL METALS* (EPA 6010)	Dissolved metals* field filtered (EPA 6010)			RUSH	Remarks
	-102	6/3/04	11:55	B-56A (40-44)		X		10	X	X	X	X	X	X	X				
	-103	6/3/04	2:00	B-56A (60-64)		X		10	X	X	X	X	X	X	X				
	-104	6/3/04	3:15	B-56A (80-84)		X		10	X	X	X	X	X	X	X				
	-105	6/3/04	3:30	B-56A		X		5	X		X			~~X~~					
	-TB57	6/3/04	4:00	TRIP		X		1			X								

Relinquished by	Company	Date	Time	Received by	Company
Andrew Rolinger	HAI	6/3/04	6/4/04 @ 14:00	[signature]	NCA
[signature]	NCA	6/4/04	14:20	[signature]	NCA

5.1 $ 1.1

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hahn

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other** _____

   By (print) Vanessa Evans (sign) Vanessa Evans

2. Date samples received 6/4/04 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by BOB date 6/4/04

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice X gel ice ___real ice

   Temperature (degrees C) 5.1 Raytek thermometer _____ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___ Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? X Yes ___No

   Name of project Casco (if applicable)

10. **Initial and date for unpacking:** ED **(initials) date** 6/4/04

11. Packing material: NA bubble wrap/bag ___styrofoam X cardboard _____other

12. Were samples in bags? ___ Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? X Yes ___No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___No

    Do the IDs, times, etc. agree with the COC? X Yes ___No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? X Yes ___No

17. Is there adequate volume for the test(s) requested? X Yes ___No

18. If voa vials were submitted, are they free of bubbles? ___N/A X Yes ___No

19. **Log-in phase: Date samples were logged in:** 6/4/04 **Elm Project #** P4F0212

20. Logged in by (print) Erica Dolan (sign) Erica Dolan

21. Was the project manager notified of status? (Use back of form as a record) ___ Yes ___No

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6 July, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 06/04/04 14:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

Work Orders included in this report:
P4F0212

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Hahn and Associates. Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040603-102	P4F0212-01	Water	06/03/04 11:55	06/04/04 14:20
2708-040603-103	P4F0212-02	Water	06/03/04 14:00	06/04/04 14:20
2708-040603-104	P4F0212-03	Water	06/03/04 15:15	06/04/04 14:20
2708-040603-105	P4F0212-04	Water	06/03/04 15:30	06/04/04 14:20
TB57	P4F0212-05	Water	06/03/04 16:40	06/04/04 14:20

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-102 (P4F0212-01) Water					Sampled: 06/03/04 Received: 06/04/04				
Arsenic	**0.00401**	0.00100	mg/l	1	EPA 6020	06/09/04	06/11/04	4060378	
Chromium	**0.0595**	0.00100	"	"	"	"	"	"	
Copper	**0.0202**	0.00200	"	"	"	"	"	"	
Lead	**0.00232**	0.00100	"	"	"	"	"	"	
Nickel	**0.0256**	0.00200	"	"	"	"	"	"	
Zinc	**0.270**	0.00500	"	"	"	"	"	"	
2708-040603-103 (P4F0212-02) Water					Sampled: 06/03/04 Received: 06/04/04				
Arsenic	**0.0143**	0.00100	mg/l	1	EPA 6020	06/09/04	06/11/04	4060378	
Chromium	**0.0460**	0.00100	"	"	"	"	"	"	
Copper	**0.0336**	0.00200	"	"	"	"	"	"	
Lead	ND	0.00446	"	4.46	"	"	06/11/04	"	R-03
Nickel	**0.117**	0.00200	"	1	"	"	06/11/04	"	
Zinc	**0.224**	0.00500	"	"	"	"	"	"	
2708-040603-104 (P4F0212-03) Water					Sampled: 06/03/04 Received: 06/04/04				
Arsenic	**0.0179**	0.00200	mg/l	1	EPA 6020	06/09/04	06/11/04	4060378	
Chromium	**0.316**	0.00200	"	"	"	"	"	"	
Copper	**0.194**	0.00400	"	"	"	"	"	"	
Lead	**0.0256**	0.00200	"	"	"	"	"	"	
Nickel	**0.145**	0.00400	"	"	"	"	"	"	
Zinc	**0.702**	0.0100	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Dissolved Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-102 (P4F0212-01) Water					Sampled: 06/03/04 Received: 06/04/04				
Arsenic	**0.00119**	0.00100	mg/l	1	EPA 6020	06/10/04	06/12/04	4060454	
Chromium	**0.00498**	0.00100	"	"	"	"	"	"	
Copper	**0.00218**	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Nickel	**0.0320**	0.00200	"	"	"	"	"	"	
Zinc	**0.0647**	0.00500	"	"	"	"	"	"	
2708-040603-103 (P4F0212-02) Water					Sampled: 06/03/04 Received: 06/04/04				
Arsenic	**0.00796**	0.00100	mg/l	1	EPA 6020	06/10/04	06/12/04	4060454	
Chromium	**0.00538**	0.00100	"	"	"	"	"	"	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Nickel	**0.0338**	0.00200	"	"	"	"	"	"	
Zinc	**0.0103**	0.00500	"	"	"	"	"	"	
2708-040603-104 (P4F0212-03) Water					Sampled: 06/03/04 Received: 06/04/04				
Arsenic	**0.00724**	0.00100	mg/l	1	EPA 6020	06/10/04	06/12/04	4060454	
Chromium	**0.00653**	0.00100	"	"	"	"	"	"	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Nickel	**0.0325**	0.00200	"	"	"	"	"	"	
Zinc	**0.0755**	0.00500	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Edc	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-102 (P4F0212-01) Water					Sampled: 06/03/04 Received: 06/04/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/09/04	06/10/04	4060374	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-102 (P4F0212-01) Water					Sampled: 06/03/04 Received: 06/04/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/09/04	06/10/04	4060374	
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	**2.57**	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	"	"	"	"	"	"	
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	*102 %*	*75-120*							
Surr: 1,2-DCA-d4	*108 %*	*77-129*							
Surr: Dibromofluoromethane	*110 %*	*80-121*							
Surr: Toluene-d8	*106 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-103 (P4F0212-02) Water					Sampled: 06/03/04 Received: 06/04/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/09/04	06/10/04	4060374	
Benzene	**3.62**	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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-103 (P4F0212-02) Water					Sampled: 06/03/04 Received: 06/04/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/09/04	06/10/04	4060374	
Ethylbenzene	**70.0**	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	**140**	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	"	"	"	"	"	"	
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	**2.06**	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	**10.5**	1.00	"	"	"	"	"	"	
m,p-Xylene	**8.14**	2.00	"	"	"	"	"	"	
Surr: 4-BFB	*108 %*	*75-120*							
Surr: 1,2-DCA-d4	*106 %*	*77-129*							
Surr: Dibromofluoromethane	*113 %*	*80-121*							
Surr: Toluene-d8	*101 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-104 (P4F0212-03) Water					Sampled: 06/03/04 Received: 06/04/04				
Acetone	ND	125	ug/l	5	EPA 8260B	06/09/04	06/10/04	4060374	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromobenzene	ND	5.00	"	"	"	"	"	"	
Bromochloromethane	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	25.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
n-Butylbenzene	ND	25.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	50.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	25.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	25.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	5.00	"	"	"	"	"	"	
Dibromomethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	25.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-104 (P4F0212-03) Water					Sampled: 06/03/04 Received: 06/04/04				
trans-1,3-Dichloropropene	ND	5.00	ug/l	5	EPA 8260B	06/09/04	06/10/04	4060374	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Isopropylbenzene	ND	10.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	25.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	25.0	"	"	"	"	"	"	
Naphthalene	**441**	10.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.00	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	**10.6**	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	10.0	"	"	"	"	"	"	
Surr: 4-BFB	*96.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*98.0 %*	*77-129*							
Surr: Dibromofluoromethane	*106 %*	*80-121*							
Surr: Toluene-d8	*94.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-105 (P4F0212-04) Water					Sampled: 06/03/04 Received: 06/04/04				
Acetone	ND	50.0	ug/l	2	EPA 8260B	06/09/04	06/10/04	4060374	
Benzene	**3.10**	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	ND	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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-105 (P4F0212-04) Water					Sampled: 06/03/04 Received: 06/04/04				
trans-1,3-Dichloropropene	ND	2.00	ug/l	2	EPA 8260B	06/09/04	06/10/04	4060374	
Ethylbenzene	**2.02**	2.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	4.00	"	"	"	"	"	"	
2-Hexanone	ND	20.0	"	"	"	"	"	"	
Isopropylbenzene	ND	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	**273**	4.00	"	"	"	"	"	"	
n-Propylbenzene	ND	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	ND	2.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	2.00	"	"	"	"	"	"	
Vinyl chloride	ND	2.00	"	"	"	"	"	"	
o-Xylene	**6.96**	2.00	"	"	"	"	"	"	
m,p-Xylene	ND	4.00	"	"	"	"	"	"	
Surr: 4-BFB	*105 %*	*75-120*							
Surr: 1,2-DCA-d4	*106 %*	*77-129*							
Surr: Dibromofluoromethane	*112 %*	*80-121*							
Surr: Toluene-d8	*102 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
TB57 (P4F0212-05) Water					Sampled: 06/03/04 Received: 06/04/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/09/04	06/10/04	4060374	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
TB57 (P4F0212-05) Water					Sampled: 06/03/04 Received: 06/04/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/09/04	06/10/04	4060374	
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	"	"	"	"	"	"	
1,1,1,2-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	*94.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*99.0 %*	*77-129*							
Surr: Dibromofluoromethane	*101 %*	*80-121*							
Surr: Toluene-d8	*98.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-102 (P4F0212-01) Water					Sampled: 06/03/04	Received: 06/04/04			
Carbazole	ND	5.00	ug/l	1	EPA 8270C	06/07/04	06/09/04	4060257	
Acenaphthene	ND	5.00	"	"	"	"	"	"	
Acenaphthylene	ND	5.00	"	"	"	"	"	"	
Anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) pyrene	ND	5.00	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	5.00	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzoic Acid	ND	50.0	"	"	"	"	"	"	
Benzyl alcohol	ND	10.0	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	5.00	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	5.00	"	"	"	"	"	"	
4-Chloroaniline	ND	20.0	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	10.0	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	5.00	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	10.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	5.00	"	"	"	"	"	"	
2-Chlorophenol	ND	5.00	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Chrysene	ND	5.00	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	5.00	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	5.00	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	5.00	"	"	"	"	"	"	
Dibenzofuran	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
3,3'-Dichlorobenzidine	ND	5.00	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	5.00	"	"	"	"	"	"	
Diethyl phthalate	ND	5.00	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	10.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	5.00	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	10.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	25.0	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-102 (P4F0212-01) Water					Sampled: 06/03/04 Received: 06/04/04				
2,6-Dinitrotoluene	ND	5.00	ug/l	1	EPA 8270C	06/07/04	06/09/04	4060257	
Bis(2-ethylhexyl)phthalate	**17.4**	10.0	"	"	"	"	"	"	
Fluoranthene	ND	5.00	"	"	"	"	"	"	
Fluorene	ND	5.00	"	"	"	"	"	"	
Hexachlorobenzene	ND	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	10.0	"	"	"	"	"	"	
Hexachloroethane	ND	10.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	5.00	"	"	"	"	"	"	
Isophorone	ND	5.00	"	"	"	"	"	"	
2-Methylnaphthalene	ND	5.00	"	"	"	"	"	"	
2-Methylphenol	ND	10.0	"	"	"	"	"	"	
3-,4-Methylphenol	ND	5.00	"	"	"	"	"	"	
Naphthalene	**5.19**	5.00	"	"	"	"	"	"	
2-Nitroaniline	ND	5.00	"	"	"	"	"	"	
3-Nitroaniline	ND	10.0	"	"	"	"	"	"	
4-Nitroaniline	ND	10.0	"	"	"	"	"	"	
Nitrobenzene	ND	5.00	"	"	"	"	"	"	
2-Nitrophenol	ND	5.00	"	"	"	"	"	"	
4-Nitrophenol	ND	25.0	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	10.0	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	5.00	"	"	"	"	"	"	
Pentachlorophenol	ND	10.0	"	"	"	"	"	"	
Phenanthrene	ND	5.00	"	"	"	"	"	"	
Phenol	ND	5.00	"	"	"	"	"	"	
Pyrene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	5.00	"	"	"	"	"	"	

Surr: 2-Fluorobiphenyl	*71.8 %*	*26-135*
Surr: 2-Fluorophenol	*44.5 %*	*6-124*
Surr: Nitrobenzene-d5	*83.1 %*	*23-147*
Surr: Phenol-d6	*30.4 %*	*11-130*
Surr: p-Terphenyl-d14	*104 %*	*38-149*
Surr: 2,4,6-Tribromophenol	*98.6 %*	*19-126*

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-103 (P4F0212-02) Water					Sampled: 06/03/04 Received: 06/04/04				
Carbazole	ND	5.00	ug/l	1	EPA 8270C	06/07/04	06/09/04	4060257	
Acenaphthene	ND	5.00	"	"	"	"	"	"	
Acenaphthylene	ND	5.00	"	"	"	"	"	"	
Anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) pyrene	ND	5.00	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	5.00	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzoic Acid	ND	50.0	"	"	"	"	"	"	
Benzyl alcohol	ND	10.0	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	5.00	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	5.00	"	"	"	"	"	"	
4-Chloroaniline	ND	20.0	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	10.0	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	5.00	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	10.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	5.00	"	"	"	"	"	"	
2-Chlorophenol	ND	5.00	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Chrysene	ND	5.00	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	5.00	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	5.00	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	5.00	"	"	"	"	"	"	
Dibenzofuran	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
3,3'-Dichlorobenzidine	ND	5.00	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	5.00	"	"	"	"	"	"	
Diethyl phthalate	ND	5.00	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	10.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	5.00	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	10.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	25.0	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-103 (P4F0212-02) Water					Sampled: 06/03/04 Received: 06/04/04				
2,6-Dinitrotoluene	ND	5.00	ug/l	1	EPA 8270C	06/07/04	06/09/04	4060257	
Bis(2-ethylhexyl)phthalate	ND	10.0	"	"	"	"	"	"	
Fluoranthene	ND	5.00	"	"	"	"	"	"	
Fluorene	ND	5.00	"	"	"	"	"	"	
Hexachlorobenzene	ND	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	10.0	"	"	"	"	"	"	
Hexachloroethane	ND	10.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	5.00	"	"	"	"	"	"	
Isophorone	ND	5.00	"	"	"	"	"	"	
2-Methylnaphthalene	ND	5.00	"	"	"	"	"	"	
2-Methylphenol	ND	10.0	"	"	"	"	"	"	
3-,4-Methylphenol	ND	5.00	"	"	"	"	"	"	
Naphthalene	**41.5**	5.00	"	"	"	"	"	"	
2-Nitroaniline	ND	5.00	"	"	"	"	"	"	
3-Nitroaniline	ND	10.0	"	"	"	"	"	"	
4-Nitroaniline	ND	10.0	"	"	"	"	"	"	
Nitrobenzene	ND	5.00	"	"	"	"	"	"	
2-Nitrophenol	ND	5.00	"	"	"	"	"	"	
4-Nitrophenol	ND	25.0	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	10.0	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	5.00	"	"	"	"	"	"	
Pentachlorophenol	ND	10.0	"	"	"	"	"	"	
Phenanthrene	ND	5.00	"	"	"	"	"	"	
Phenol	ND	5.00	"	"	"	"	"	"	
Pyrene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
Surr: 2-Fluorobiphenyl	*63.6 %*	*26-135*							
Surr: 2-Fluorophenol	*41.9 %*	*6-124*							
Surr: Nitrobenzene-d5	*73.9 %*	*23-147*							
Surr: Phenol-d6	*28.3 %*	*11-130*							
Surr: p-Terphenyl-d14	*101 %*	*38-149*							
Surr: 2,4,6-Tribromophenol	*94.2 %*	*19-126*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-104 (P4F0212-03) Water					Sampled: 06/03/04 Received: 06/04/04				
Carbazole	ND	5.00	ug/l	1	EPA 8270C	06/07/04	06/09/04	4060257	
Acenaphthene	ND	5.00	"	"	"	"	"	"	
Acenaphthylene	ND	5.00	"	"	"	"	"	"	
Anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) pyrene	ND	5.00	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	5.00	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzoic Acid	ND	50.0	"	"	"	"	"	"	
Benzyl alcohol	ND	10.0	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	5.00	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	5.00	"	"	"	"	"	"	
4-Chloroaniline	ND	20.0	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	10.0	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	5.00	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	10.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	5.00	"	"	"	"	"	"	
2-Chlorophenol	ND	5.00	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Chrysene	ND	5.00	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	5.00	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	5.00	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	5.00	"	"	"	"	"	"	
Dibenzofuran	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
3,3'-Dichlorobenzidine	ND	5.00	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	5.00	"	"	"	"	"	"	
Diethyl phthalate	ND	5.00	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	10.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	5.00	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	10.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	25.0	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-104 (P4F0212-03) Water					Sampled: 06/03/04 Received: 06/04/04				
2,6-Dinitrotoluene	ND	5.00	ug/l	1	EPA 8270C	06/07/04	06/09/04	4060257	
Bis(2-ethylhexyl)phthalate	ND	10.0	"	"	"	"	"	"	
Fluoranthene	ND	5.00	"	"	"	"	"	"	
Fluorene	ND	5.00	"	"	"	"	"	"	
Hexachlorobenzene	ND	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	10.0	"	"	"	"	"	"	
Hexachloroethane	ND	10.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	5.00	"	"	"	"	"	"	
Isophorone	ND	5.00	"	"	"	"	"	"	
2-Methylnaphthalene	ND	5.00	"	"	"	"	"	"	
2-Methylphenol	ND	10.0	"	"	"	"	"	"	
3-,4-Methylphenol	ND	5.00	"	"	"	"	"	"	
Naphthalene	**317**	50.0	"	10	"	"	06/10/04	"	
2-Nitroaniline	ND	5.00	"	1	"	"	06/09/04	"	
3-Nitroaniline	ND	10.0	"	"	"	"	"	"	
4-Nitroaniline	ND	10.0	"	"	"	"	"	"	
Nitrobenzene	ND	5.00	"	"	"	"	"	"	
2-Nitrophenol	ND	5.00	"	"	"	"	"	"	
4-Nitrophenol	ND	25.0	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	10.0	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	5.00	"	"	"	"	"	"	
Pentachlorophenol	ND	10.0	"	"	"	"	"	"	
Phenanthrene	ND	5.00	"	"	"	"	"	"	
Phenol	ND	5.00	"	"	"	"	"	"	
Pyrene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
Surr: 2-Fluorobiphenyl	*77.2 %*	*26-135*							
Surr: 2-Fluorophenol	*44.7 %*	*6-124*							
Surr: Nitrobenzene-d5	*87.3 %*	*23-147*							
Surr: Phenol-d6	*31.5 %*	*11-130*							
Surr: p-Terphenyl-d14	*95.9 %*	*38-149*							
Surr: 2,4,6-Tribromophenol	*97.2 %*	*19-126*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-102 (P4F0212-01) Water					Sampled: 06/03/04 Received: 06/04/04				
Acenaphthene	**0.342**	0.100	ug/l	1	EPA 8270m	06/07/04	06/10/04	4060262	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	**0.168**	0.100	"	"	"	"	"	"	
Fluorene	**0.132**	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**3.61**	0.100	"	"	"	"	"	"	
Phenanthrene	**0.330**	0.100	"	"	"	"	"	"	
Pyrene	**0.223**	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*68.9 %*	*25-125*							
Surr: Pyrene-d10	*81.5 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*39.4 %*	*10-125*							
2708-040603-102 (P4F0212-01RE1) Water					Sampled: 06/03/04 Received: 06/04/04				
Benzo (a) anthracene	**0.0239**	0.0100	ug/l	1	EPA 8270m	06/07/04	06/25/04	4060262	
Benzo (a) pyrene	**0.0196**	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	**0.0234**	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	**0.0188**	0.0100	"	"	"	"	"	"	
Chrysene	**0.0345**	0.0100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**0.0167**	0.0100	"	"	"	"	"	"	
Surr: Benzo (a) pyrene-d12	*31.0 %*	*10-125*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-103 (P4F0212-02) Water					Sampled: 06/03/04 Received: 06/04/04				
Acenaphthene	**0.103**	0.100	ug/l	1	EPA 8270m	06/07/04	06/09/04	4060262	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**63.8**	2.50	"	25	"	"	06/10/04	"	
Phenanthrene	ND	0.100	"	1	"	"	06/09/04	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*70.4 %*	*25-125*							
Surr: Pyrene-d10	*101 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*63.3 %*	*10-125*							
2708-040603-103 (P4F0212-02RE1) Water					Sampled: 06/03/04 Received: 06/04/04				
Benzo (a) anthracene	ND	0.0100	ug/l	1	EPA 8270m	06/07/04	06/25/04	4060262	
Benzo (a) pyrene	ND	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Chrysene	ND	0.0100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.0100	"	"	"	"	"	"	
Surr: Benzo (a) pyrene-d12	*49.2 %*	*10-125*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-104 (P4F0212-03) Water					Sampled: 06/03/04 Received: 06/04/04				
Acenaphthene	**0.126**	0.100	ug/l	1	EPA 8270m	06/07/04	06/10/04	4060262	
Acenaphthylene	ND	0.150	"	"	"	"	"	"	R-03
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	**0.165**	0.100	"	"	"	"	"	"	
Fluorene	ND	0.150	"	"	"	"	"	"	R-03
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**358**	25.0	"	250	"	"	06/11/04	"	
Phenanthrene	**0.280**	0.100	"	1	"	"	06/10/04	"	
Pyrene	**0.230**	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*74.8 %*	*25-125*							
Surr: Pyrene-d10	*107 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*60.1 %*	*10-125*							
2708-040603-104 (P4F0212-03RE1) Water					Sampled: 06/03/04 Received: 06/04/04				
Benzo (a) anthracene	**0.0315**	0.0100	ug/l	1	EPA 8270m	06/07/04	06/25/04	4060262	
Benzo (a) pyrene	**0.0313**	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	**0.0236**	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	**0.0166**	0.0100	"	"	"	"	"	"	
Chrysene	**0.0416**	0.0100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**0.0154**	0.0100	"	"	"	"	"	"	
Surr: Benzo (a) pyrene-d12	*50.0 %*	*10-125*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-105 (P4F0212-04) Water					Sampled: 06/03/04 Received: 06/04/04				
Acenaphthene	ND	0.150	ug/l	1	EPA 8270m	06/07/04	06/11/04	4060262	R-03
Acenaphthylene	ND	0.150	"	"	"	"	"	"	R-03
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	**0.132**	0.100	"	"	"	"	"	"	
Fluorene	ND	0.150	"	"	"	"	"	"	R-03
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**405**	25.0	"	250	"	"	06/11/04	"	
Phenanthrene	**0.214**	0.100	"	1	"	"	06/11/04	"	
Pyrene	**0.184**	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*93.7 %*	*25-125*							
Surr: Pyrene-d10	*99.6 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*74.8 %*	*10-125*							
2708-040603-105 (P4F0212-04RE1) Water					Sampled: 06/03/04 Received: 06/04/04				J
Benzo (a) anthracene	ND	0.0300	ug/l	3	EPA 8270m	06/07/04	06/29/04	4060262	
Benzo (a) pyrene	ND	0.0300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.0300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.0300	"	"	"	"	"	"	
Chrysene	ND	0.0300	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.0300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.0300	"	"	"	"	"	"	
Surr: Benzo (a) pyrene-d12	*18.1 %*	*10-125*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040603-102 (P4F0212-01) Water					Sampled: 06/03/04 Received: 06/04/04				
Cyanide (amenable)	**0.105**	0.00500	mg/l	1	EPA 9010A	06/14/04	06/15/04	4060555	
Cyanide (total)	**0.517**	0.00500	"	"	EPA 9012A	06/11/04	06/11/04	4060476	
2708-040603-103 (P4F0212-02) Water					Sampled: 06/03/04 Received: 06/04/04				
Cyanide (amenable)	**0.0842**	0.00500	mg/l	1	EPA 9010A	06/14/04	06/15/04	4060555	
Cyanide (total)	**0.406**	0.00500	"	"	EPA 9012A	06/11/04	06/11/04	4060476	
2708-040603-104 (P4F0212-03) Water					Sampled: 06/03/04 Received: 06/04/04				
Cyanide (amenable)	**0.107**	0.00500	mg/l	1	EPA 9010A	06/14/04	06/15/04	4060555	
Cyanide (total)	**0.506**	0.00500	"	"	EPA 9012A	06/11/04	06/11/04	4060476	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060378 - EPA 200/3005										
Blank (4060378-BLK1)				Prepared: 06/09/04 Analyzed: 06/10/04						
Arsenic	ND	0.00100	mg/l							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Zinc	ND	0.00500	"							
LCS (4060378-BS1)				Prepared: 06/09/04 Analyzed: 06/10/04						
Arsenic	0.0926	0.00100	mg/l	0.100		92.6	80-120			
Chromium	0.100	0.00100	"	0.100		100	80-120			
Copper	0.0945	0.00200	"	0.100		94.5	80-120			
Lead	0.104	0.00100	"	0.100		104	80-120			
Nickel	0.0958	0.00200	"	0.100		95.8	80-120			
Zinc	0.0901	0.00500	"	0.100		90.1	80-120			
LCS Dup (4060378-BSD1)				Prepared: 06/09/04 Analyzed: 06/10/04						
Arsenic	0.0959	0.00100	mg/l	0.100		95.9	80-120	3.50	20	
Chromium	0.103	0.00100	"	0.100		103	80-120	2.96	20	
Copper	0.0964	0.00200	"	0.100		96.4	80-120	1.99	20	
Lead	0.103	0.00100	"	0.100		103	80-120	0.966	20	
Nickel	0.0966	0.00200	"	0.100		96.6	80-120	0.832	20	
Zinc	0.0932	0.00500	"	0.100		93.2	80-120	3.38	20	
Duplicate (4060378-DUP1)		**Source: P4F0201-02**		Prepared: 06/09/04 Analyzed: 06/10/04						
Arsenic	0.00178	0.00100	mg/l		0.00196			9.63	20	
Chromium	0.00266	0.00100	"		0.00270			1.49	20	
Copper	0.00386	0.00200	"		0.00390			1.03	20	
Lead	0.000610	0.00100	"		0.000610			0.00	20	
Nickel	0.00511	0.00200	"		0.00468			8.78	20	
Zinc	0.00493	0.00500	"		0.00518			4.95	20	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060378 - EPA 200/3005										
Matrix Spike (4060378-MS1)	**Source: P4F0201-02**			Prepared: 06/09/04 Analyzed: 06/11/04						
Arsenic	0.108	0.00100	mg/l	0.100	0.00196	106	75-125			
Chromium	0.112	0.00100	"	0.100	0.00270	109	75-125			
Copper	0.108	0.00200	"	0.100	0.00390	104	75-125			
Lead	0.102	0.00100	"	0.100	0.000610	101	75-125			
Nickel	0.111	0.00200	"	0.100	0.00468	106	75-125			
Zinc	0.106	0.00500	"	0.100	0.00518	101	75-125			
Matrix Spike (4060378-MS2)	**Source: P4F0201-03**			Prepared: 06/09/04 Analyzed: 06/11/04						
Arsenic	0.106	0.00100	mg/l	0.100	0.000630	105	75-125			
Chromium	0.111	0.00100	"	0.100	0.00970	101	75-125			
Copper	0.106	0.00200	"	0.100	0.00166	104	75-125			
Lead	0.104	0.00100	"	0.100	0.000350	104	75-125			
Nickel	0.108	0.00200	"	0.100	0.00863	99.4	75-125			
Zinc	0.102	0.00500	"	0.100	0.00151	100	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060454 - EPA 200/3005 Diss										
Blank (4060454-BLK1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	ND	0.00100	mg/l							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Zinc	ND	0.00500	"							
LCS (4060454-BS1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.0961	0.00100	mg/l	0.100		96.1	80-120			
Chromium	0.101	0.00100	"	0.100		101	80-120			
Copper	0.101	0.00200	"	0.100		101	80-120			
Lead	0.100	0.00100	"	0.100		100	80-120			
Nickel	0.105	0.00200	"	0.100		105	80-120			
Zinc	0.0942	0.00500	"	0.100		94.2	80-120			
LCS Dup (4060454-BSD1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.100	0.00100	mg/l	0.100		100	80-120	3.98	20	
Chromium	0.103	0.00100	"	0.100		103	80-120	1.96	20	
Copper	0.105	0.00200	"	0.100		105	80-120	3.88	20	
Lead	0.0991	0.00100	"	0.100		99.1	80-120	0.904	20	
Nickel	0.106	0.00200	"	0.100		106	80-120	0.948	20	
Zinc	0.0977	0.00500	"	0.100		97.7	80-120	3.65	20	
Duplicate (4060454-DUP1)		**Source: P4F0212-01**		Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.00151	0.00100	mg/l		0.00119			23.7	20	Q-06
Chromium	0.000840	0.00100	"		0.00498			142	20	Q-06
Copper	0.00231	0.00200	"		0.00218			5.79	20	
Lead	0.000760	0.00100	"		0.000640			17.1	20	
Nickel	0.0326	0.00200	"		0.0320			1.86	20	
Zinc	0.0687	0.00500	"		0.0647			6.00	20	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060454 - EPA 200/3005 Diss										
Matrix Spike (4060454-MS1)	**Source: P4F0212-01**			Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.109	0.00100	mg/l	0.100	0.00119	108	75-125			
Chromium	0.107	0.00100	"	0.100	0.00498	102	75-125			
Copper	0.101	0.00200	"	0.100	0.00218	98.8	75-125			
Lead	0.0913	0.00100	"	0.100	0.000640	90.7	75-125			
Nickel	0.134	0.00200	"	0.100	0.0320	102	75-125			
Zinc	0.169	0.00500	"	0.100	0.0647	104	75-125			
Matrix Spike (4060454-MS2)	**Source: P4F0212-02**			Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.112	0.00100	mg/l	0.100	0.00796	104	75-125			
Chromium	0.103	0.00100	"	0.100	0.00538	97.6	75-125			
Copper	0.0958	0.00200	"	0.100	0.00177	94.0	75-125			
Lead	0.0913	0.00100	"	0.100	0.000600	90.7	75-125			
Nickel	0.138	0.00200	"	0.100	0.0338	104	75-125			
Zinc	0.106	0.00500	"	0.100	0.0103	95.7	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

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 4060374 - EPA 5030B										
Blank (4060374-BLK1)				Prepared & Analyzed: 06/09/04						
Acetone	ND	25.0	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	"							

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

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 4060374 - EPA 5030B										
Blank (4060374-BLK1)				Prepared & Analyzed: 06/09/04						
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	"							
1,1,1,2-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	*19.3*		"	*20.0*		*96.5*	*75-120*			
Surr: 1,2-DCA-d4	*19.4*		"	*20.0*		*97.0*	*77-129*			
Surr: Dibromofluoromethane	*19.6*		"	*20.0*		*98.0*	*80-121*			
Surr: Toluene-d8	*19.4*		"	*20.0*		*97.0*	*80-120*			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

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 4060374 - EPA 5030B										
LCS (4060374-BS1)				Prepared & Analyzed: 06/09/04						
Benzene	20.3	1.00	ug/l	20.0		102	80-120			
Chlorobenzene	20.1	1.00	"	20.0		100	80-124			
1,1-Dichloroethene	18.8	1.00	"	20.0		94.0	78-120			
Toluene	20.5	1.00	"	20.0		102	80-124			
Trichloroethene	19.2	1.00	"	20.0		96.0	80-132			
Surr: 4-BFB	*20.2*		"	*20.0*		*101*	*75-120*			
Surr: 1,2-DCA-d4	*19.4*		"	*20.0*		*97.0*	*77-129*			
Surr: Dibromofluoromethane	*20.7*		"	*20.0*		*104*	*80-121*			
Surr: Toluene-d8	*20.4*		"	*20.0*		*102*	*80-120*			
Matrix Spike (4060374-MS1)	**Source: P4F0166-01**			Prepared & Analyzed: 06/09/04						
Benzene	20.9	1.00	ug/l	20.0	ND	104	80-124			
Chlorobenzene	20.2	1.00	"	20.0	ND	101	72.9-134			
1,1-Dichloroethene	20.9	1.00	"	20.0	ND	104	79.3-127			
Toluene	21.0	1.00	"	20.0	0.390	103	79.7-131			
Trichloroethene	18.9	1.00	"	20.0	ND	94.5	68.4-130			
Surr: 4-BFB	*19.8*		"	*20.0*		*99.0*	*75-120*			
Surr: 1,2-DCA-d4	*20.3*		"	*20.0*		*102*	*77-129*			
Surr: Dibromofluoromethane	*21.2*		"	*20.0*		*106*	*80-121*			
Surr: Toluene-d8	*20.1*		"	*20.0*		*100*	*80-120*			
Matrix Spike Dup (4060374-MSD1)	**Source: P4F0166-01**			Prepared & Analyzed: 06/09/04						
Benzene	21.0	1.00	ug/l	20.0	ND	105	80-124	0.477	25	
Chlorobenzene	20.5	1.00	"	20.0	ND	102	72.9-134	1.47	25	
1,1-Dichloroethene	21.0	1.00	"	20.0	ND	105	79.3-127	0.477	25	
Toluene	21.2	1.00	"	20.0	0.390	104	79.7-131	0.948	25	
Trichloroethene	18.8	1.00	"	20.0	ND	94.0	68.4-130	0.531	25	
Surr: 4-BFB	*19.4*		"	*20.0*		*97.0*	*75-120*			
Surr: 1,2-DCA-d4	*19.2*		"	*20.0*		*96.0*	*77-129*			
Surr: Dibromofluoromethane	*19.8*		"	*20.0*		*99.0*	*80-121*			
Surr: Toluene-d8	*19.1*		"	*20.0*		*95.5*	*80-120*			

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Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060257 - EPA 3510/600 Series										
Blank (4060257-BLK1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Carbazole	ND	5.00	ug/l							
Acenaphthene	ND	5.00	"							
Acenaphthylene	ND	5.00	"							
Anthracene	ND	5.00	"							
Benzo (a) anthracene	ND	5.00	"							
Benzo (a) pyrene	ND	5.00	"							
Benzo (b) fluoranthene	ND	5.00	"							
Benzo (ghi) perylene	ND	5.00	"							
Benzo (k) fluoranthene	ND	5.00	"							
Benzoic Acid	ND	50.0	"							
Benzyl alcohol	ND	10.0	"							
4-Bromophenyl phenyl ether	ND	5.00	"							
Butyl benzyl phthalate	ND	5.00	"							
4-Chloro-3-methylphenol	ND	5.00	"							
4-Chloroaniline	ND	20.0	"							
Bis(2-chloroethoxy)methane	ND	10.0	"							
Bis(2-chloroethyl)ether	ND	5.00	"							
Bis(2-chloroisopropyl)ether	ND	10.0	"							
2-Chloronaphthalene	ND	5.00	"							
2-Chlorophenol	ND	5.00	"							
4-Chlorophenyl phenyl ether	ND	5.00	"							
Chrysene	ND	5.00	"							
Di-n-butyl phthalate	ND	5.00	"							
Di-n-octyl phthalate	ND	5.00	"							
Dibenzo (a,h) anthracene	ND	5.00	"							
Dibenzofuran	ND	5.00	"							
1,2-Dichlorobenzene	ND	5.00	"							
1,3-Dichlorobenzene	ND	5.00	"							
1,4-Dichlorobenzene	ND	5.00	"							
3,3'-Dichlorobenzidine	ND	5.00	"							
2,4-Dichlorophenol	ND	5.00	"							
Diethyl phthalate	ND	5.00	"							
2,4-Dimethylphenol	ND	10.0	"							
Dimethyl phthalate	ND	5.00	"							
4,6-Dinitro-2-methylphenol	ND	10.0	"							
2,4-Dinitrophenol	ND	25.0	"							

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060257 - EPA 3510/600 Series										
Blank (4060257-BLK1)				Prepared: 06/07/04 Analyzed: 06/09/04						
2,4-Dinitrotoluene	ND	5.00	ug/l							
2,6-Dinitrotoluene	ND	5.00	"							
Bis(2-ethylhexyl)phthalate	ND	10.0	"							
Fluoranthene	ND	5.00	"							
Fluorene	ND	5.00	"							
Hexachlorobenzene	ND	5.00	"							
Hexachlorobutadiene	ND	10.0	"							
Hexachlorocyclopentadiene	ND	10.0	"							
Hexachloroethane	ND	10.0	"							
Indeno (1,2,3-cd) pyrene	ND	5.00	"							
Isophorone	ND	5.00	"							
2-Methylnaphthalene	ND	5.00	"							
2-Methylphenol	ND	10.0	"							
3-,4-Methylphenol	ND	5.00	"							
Naphthalene	ND	5.00	"							
2-Nitroaniline	ND	5.00	"							
3-Nitroaniline	ND	10.0	"							
4-Nitroaniline	ND	10.0	"							
Nitrobenzene	ND	5.00	"							
2-Nitrophenol	ND	5.00	"							
4-Nitrophenol	ND	25.0	"							
N-Nitrosodi-n-propylamine	ND	10.0	"							
N-Nitrosodiphenylamine	ND	5.00	"							
Pentachlorophenol	ND	10.0	"							
Phenanthrene	ND	5.00	"							
Phenol	ND	5.00	"							
Pyrene	ND	5.00	"							
1,2,4-Trichlorobenzene	ND	5.00	"							
2,4,5-Trichlorophenol	ND	5.00	"							
2,4,6-Trichlorophenol	ND	5.00	"							
Surr: 2-Fluorobiphenyl	*53.6*		"	*75.0*		*71.5*	*26-135*			
Surr: 2-Fluorophenol	*71.6*		"	*150*		*47.7*	*6-124*			
Surr: Nitrobenzene-d5	*67.4*		"	*75.0*		*89.9*	*23-147*			
Surr: Phenol-d6	*48.8*		"	*150*		*32.5*	*11-130*			
Surr: p-Terphenyl-d14	*76.5*		"	*75.0*		*102*	*38-149*			
Surr: 2,4,6-Tribromophenol	*112*		"	*150*		*74.7*	*19-126*			

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Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060257 - EPA 3510/600 Series										
LCS (4060257-BS1)				Prepared: 06/07/04		Analyzed: 06/09/04				
Acenaphthene	65.3	5.00	ug/l	75.0		87.1	40-110			
4-Chloro-3-methylphenol	121	5.00	"	150		80.7	40-110			
2-Chlorophenol	109	5.00	"	150		72.7	40-110			
1,4-Dichlorobenzene	49.4	5.00	"	75.0		65.9	20-90			
2,4-Dinitrotoluene	69.7	5.00	"	75.0		92.9	50-110			
4-Nitrophenol	50.6	25.0	"	150		33.7	15-100			
N-Nitrosodi-n-propylamine	72.4	10.0	"	75.0		96.5	40-110			
Pentachlorophenol	99.4	10.0	"	150		66.3	30-120			
Phenol	49.3	5.00	"	150		32.9	15-110			
Pyrene	71.7	5.00	"	75.0		95.6	40-110			
1,2,4-Trichlorobenzene	50.0	5.00	"	75.0		66.7	25-100			
Surr: 2-Fluorobiphenyl	*58.9*		"	*75.0*		*78.5*	*26-135*			
Surr: 2-Fluorophenol	*79.8*		"	*150*		*53.2*	*6-124*			
Surr: Nitrobenzene-d5	*72.1*		"	*75.0*		*96.1*	*23-147*			
Surr: Phenol-d6	*55.2*		"	*150*		*36.8*	*11-130*			
Surr: p-Terphenyl-d14	*73.5*		"	*75.0*		*98.0*	*38-149*			
Surr: 2,4,6-Tribromophenol	*135*		"	*150*		*90.0*	*19-126*			
LCS Dup (4060257-BSD1)				Prepared: 06/07/04		Analyzed: 06/09/04				
Acenaphthene	65.8	5.00	ug/l	75.0		87.7	40-110	0.763	36	
4-Chloro-3-methylphenol	123	5.00	"	150		82.0	40-110	1.64	43	
2-Chlorophenol	108	5.00	"	150		72.0	40-110	0.922	38	
1,4-Dichlorobenzene	47.1	5.00	"	75.0		62.8	20-90	4.77	43	
2,4-Dinitrotoluene	71.1	5.00	"	75.0		94.8	50-110	1.99	31	
4-Nitrophenol	55.7	25.0	"	150		37.1	15-100	9.60	36	
N-Nitrosodi-n-propylamine	71.4	10.0	"	75.0		95.2	40-110	1.39	37	
Pentachlorophenol	100	10.0	"	150		66.7	30-120	0.602	40	
Phenol	52.5	5.00	"	150		35.0	15-110	6.29	36	
Pyrene	72.0	5.00	"	75.0		96.0	40-110	0.418	31	
1,2,4-Trichlorobenzene	49.9	5.00	"	75.0		66.5	25-100	0.200	42	
Surr: 2-Fluorobiphenyl	*62.3*		"	*75.0*		*83.1*	*26-135*			
Surr: 2-Fluorophenol	*83.4*		"	*150*		*55.6*	*6-124*			
Surr: Nitrobenzene-d5	*71.7*		"	*75.0*		*95.6*	*23-147*			
Surr: Phenol-d6	*57.2*		"	*150*		*38.1*	*11-130*			
Surr: p-Terphenyl-d14	*72.2*		"	*75.0*		*96.3*	*38-149*			
Surr: 2,4,6-Tribromophenol	*138*		"	*150*		*92.0*	*19-126*			

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Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates. Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

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

Batch 4060257 - EPA 3510/600 Series

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060262 - EPA 3520/600 Series										
Blank (4060262-BLK1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Acenaphthene	ND	0.100	ug/l							
Acenaphthylene	ND	0.100	"							
Anthracene	ND	0.100	"							
Benzo (a) anthracene	ND	0.100	"							
Benzo (a) pyrene	ND	0.100	"							
Benzo (b) fluoranthene	ND	0.100	"							
Benzo (ghi) perylene	ND	0.100	"							
Benzo (k) fluoranthene	ND	0.100	"							
Chrysene	ND	0.100	"							
Dibenzo (a,h) anthracene	ND	0.200	"							
Fluoranthene	ND	0.100	"							
Fluorene	ND	0.100	"							
Indeno (1,2,3-cd) pyrene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Phenanthrene	ND	0.100	"							
Pyrene	ND	0.100	"							
Surr: Fluorene-d10	*2.12*		"	*2.50*		*84.8*	*25-125*			
Surr: Pyrene-d10	*2.32*		"	*2.50*		*92.8*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.20*		"	*2.50*		*88.0*	*10-125*			
Blank (4060262-BLK2)				Prepared: 06/07/04 Analyzed: 06/25/04						
Benzo (a) anthracene	ND	0.0100	ug/l							
Benzo (a) pyrene	ND	0.0100	"							
Benzo (b) fluoranthene	ND	0.0100	"							
Benzo (k) fluoranthene	ND	0.0100	"							
Chrysene	ND	0.0100	"							
Dibenzo (a,h) anthracene	ND	0.0100	"							
Indeno (1,2,3-cd) pyrene	ND	0.0100	"							
Surr: Benzo (a) pyrene-d12	*1.75*		"	*2.50*		*70.0*	*10-125*			

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060262 - EPA 3520/600 Series										
LCS (4060262-BS1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Acenaphthene	2.44	0.100	ug/l	2.50		97.6	26-135			
Benzo (a) pyrene	2.43	0.100	"	2.50		97.2	38-137			
Pyrene	2.56	0.100	"	2.50		102	33-133			
Surr: Fluorene-d10	*2.62*		"	*2.50*		*105*	*25-125*			
Surr: Pyrene-d10	*2.72*		"	*2.50*		*109*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.57*		"	*2.50*		*103*	*10-125*			
LCS Dup (4060262-BSD1)				Prepared: 06/07/04 Analyzed: 06/09/04						
Acenaphthene	2.07	0.100	ug/l	2.50		82.8	26-135	16.4	60	
Benzo (a) pyrene	2.19	0.100	"	2.50		87.6	38-137	10.4	60	
Pyrene	2.33	0.100	"	2.50		93.2	33-133	9.41	60	
Surr: Fluorene-d10	*2.21*		"	*2.50*		*88.4*	*25-125*			
Surr: Pyrene-d10	*2.43*		"	*2.50*		*97.2*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.26*		"	*2.50*		*90.4*	*10-125*			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060476 - General Preparation										
Blank (4060476-BLK1)				Prepared & Analyzed: 06/11/04						
Cyanide (total)	ND	0.00500	mg/l							
LCS (4060476-BS1)				Prepared & Analyzed: 06/11/04						
Cyanide (total)	0.0462	0.00500	mg/l	0.0500		92.4	75-125			
Duplicate (4060476-DUP1)		Source: P4F0258-01		Prepared & Analyzed: 06/11/04						
Cyanide (total)	0.00208	0.00500	mg/l		0.00198			4.93	20	
Matrix Spike (4060476-MS1)		Source: P4F0258-01		Prepared & Analyzed: 06/11/04						
Cyanide (total)	0.0456	0.00500	mg/l	0.0500	0.00198	87.2	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 13:01

Notes and Definitions

J	Estimated value.
Q-06	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
R-03	The reporting limit for this analyte was raised due to matrix interference.
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 (as received)
RPD	Relative Percent Difference

HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: NORTH CREEK ANALYTICAC PORTLAND OR

CHAIN OF CUSTODY

Lab Project No.:

Chain of Custody No.:

Project Manager	ROB EDE
Project No.	2708
Project Name	GASCO
Collected by	APR/RBE

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)	
Appropriate Containers Used (Y or N)	
Provide Verbal Results (Y or N)	No
Provide Preliminary Fax Results	Yes

Comments

Sample Number Prefix: 2708-040604

* Metals = As, Cr, Cu, Ni, Pb, Zn
pricing/reporting levels as per Nerenberg to Ede 12/12/03

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Water	Other	Number of Containers	PAHs (EPA 8270 SIM)	SVOCs (EPA 8270)	VOCs (EPA 8260)	TOTAL CN (SPA 9010)	Amenable CN (SPA 9012)	TOTAL METALS* (EPA 6010)	Dissolved Metals* Field Filtered (EPA 6010)			RUSH	Remarks
	098	6/4/04	800	TRIP B.		X		1			X								
	106		845	B-56 (A) (100-104')		X		10	X	X	X	X	X	X	X				
	107	↓	900	E.B.		X		9	X		X				X				

Relinquished by	Company	Date	Time	Received by	Company
	HAI	6/7/04	12:22		NCA
Relinquished by	Company	Date	Time	Received by	Company

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541.383.9310 fax 541.382.7588

6 July, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 06/07/04 13:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

Work Orders included in this report:
P4F0245

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040604-098	P4F0245-01	Water	06/04/04 08:00	06/07/04 13:45
2708-040604-106	P4F0245-02	Water	06/04/04 08:45	06/07/04 13:45
2708-040604-107	P4F0245-03	Water	06/04/04 09:00	06/07/04 13:45

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-106 (P4F0245-02) Water					Sampled: 06/04/04 Received: 06/07/04				
Arsenic	**0.00869**	0.00100	mg/l	1	EPA 6020	06/09/04	06/12/04	4060379	
Chromium	**0.0375**	0.00100	"	"	"	"	"	"	
Copper	**0.0415**	0.00200	"	"	"	"	"	"	
Lead	**0.00457**	0.00100	"	"	"	"	"	"	
Nickel	**0.0505**	0.00200	"	"	"	"	"	"	
Zinc	**0.100**	0.00500	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Dissolved Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-106 (P4F0245-02) Water					Sampled: 06/04/04 Received: 06/07/04				
Arsenic	**0.00515**	0.00100	mg/l	1	EPA 6020	06/10/04	06/12/04	4060454	
Chromium	**0.00123**	0.00100	"	"	"	"	"	"	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Nickel	**0.0173**	0.00200	"	"	"	"	"	"	
Zinc	**0.0103**	0.00500	"	"	"	"	"	"	
2708-040604-107 (P4F0245-03) Water					Sampled: 06/04/04 Received: 06/07/04				
Arsenic	ND	0.00100	mg/l	1	EPA 6020	06/10/04	06/12/04	4060454	
Chromium	ND	0.00100	"	"	"	"	"	"	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Nickel	ND	0.00200	"	"	"	"	"	"	
Zinc	ND	0.00500	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-098 (P4F0245-01) Water					Sampled: 06/04/04 Received: 06/07/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/10/04	06/10/04	4060426	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-098 (P4F0245-01) Water					Sampled: 06/04/04 Received: 06/07/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/10/04	06/10/04	4060426	
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	"	"	"	"	"	"	
1,1,1,2-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	*98.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*109 %*	*77-129*							
Surr: Dibromofluoromethane	*104 %*	*80-121*							
Surr: Toluene-d8	*105 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-106 (P4F0245-02) Water					Sampled: 06/04/04 Received: 06/07/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/10/04	06/10/04	4060426	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-106 (P4F0245-02) Water					Sampled: 06/04/04 Received: 06/07/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/10/04	06/10/04	4060426	
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	"	"	"	"	"	"	
1,1,1,2-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	*97.5 %*	*75-120*							
Surr: 1,2-DCA-d4	*104 %*	*77-129*							
Surr: Dibromofluoromethane	*101 %*	*80-121*							
Surr: Toluene-d8	*100 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-107 (P4F0245-03) Water					Sampled: 06/04/04 Received: 06/07/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/10/04	06/10/04	4060426	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-107 (P4F0245-03) Water					Sampled: 06/04/04 Received: 06/07/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/10/04	06/10/04	4060426	
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	"	"	"	"	"	"	
1,1,1,2-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	*103 %*	*75-120*							
Surr: 1,2-DCA-d4	*114 %*	*77-129*							
Surr: Dibromofluoromethane	*108 %*	*80-121*							
Surr: Toluene-d8	*108 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-106 (P4F0245-02) Water					Sampled: 06/04/04 Received: 06/07/04				
Carbazole	ND	5.00	ug/l	1	EPA 8270C	06/10/04	06/15/04	4060423	
Acenaphthene	ND	5.00	"	"	"	"	"	"	
Acenaphthylene	ND	5.00	"	"	"	"	"	"	
Anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) pyrene	ND	5.00	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	5.00	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzoic Acid	ND	50.0	"	"	"	"	"	"	
Benzyl alcohol	ND	10.0	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	5.00	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	5.00	"	"	"	"	"	"	
4-Chloroaniline	ND	20.0	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	10.0	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	5.00	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	10.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	5.00	"	"	"	"	"	"	
2-Chlorophenol	ND	5.00	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Chrysene	ND	5.00	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	5.00	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	5.00	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	5.00	"	"	"	"	"	"	
Dibenzofuran	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
3,3'-Dichlorobenzidine	ND	5.00	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	5.00	"	"	"	"	"	"	
Diethyl phthalate	ND	5.00	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	10.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	5.00	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	10.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	25.0	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-106 (P4F0245-02) Water					Sampled: 06/04/04 Received: 06/07/04				
2,6-Dinitrotoluene	ND	5.00	ug/l	1	EPA 8270C	06/10/04	06/15/04	4060423	
Bis(2-ethylhexyl)phthalate	ND	10.0	"	"	"	"	"	"	
Fluoranthene	ND	5.00	"	"	"	"	"	"	
Fluorene	ND	5.00	"	"	"	"	"	"	
Hexachlorobenzene	ND	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	10.0	"	"	"	"	"	"	
Hexachloroethane	ND	10.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	5.00	"	"	"	"	"	"	
Isophorone	ND	5.00	"	"	"	"	"	"	
2-Methylnaphthalene	ND	5.00	"	"	"	"	"	"	
2-Methylphenol	ND	10.0	"	"	"	"	"	"	
3-,4-Methylphenol	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	5.00	"	"	"	"	"	"	
2-Nitroaniline	ND	5.00	"	"	"	"	"	"	
3-Nitroaniline	ND	10.0	"	"	"	"	"	"	
4-Nitroaniline	ND	10.0	"	"	"	"	"	"	
Nitrobenzene	ND	5.00	"	"	"	"	"	"	
2-Nitrophenol	ND	5.00	"	"	"	"	"	"	
4-Nitrophenol	ND	25.0	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	10.0	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	5.00	"	"	"	"	"	"	
Pentachlorophenol	ND	10.0	"	"	"	"	"	"	
Phenanthrene	ND	5.00	"	"	"	"	"	"	
Phenol	ND	5.00	"	"	"	"	"	"	
Pyrene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
Surr: 2-Fluorobiphenyl	*80.9 %*	*26-135*							
Surr: 2-Fluorophenol	*51.2 %*	*6-124*							
Surr: Nitrobenzene-d5	*96.5 %*	*23-147*							
Surr: Phenol-d6	*36.5 %*	*11-130*							
Surr: p-Terphenyl-d14	*103 %*	*38-149*							
Surr: 2,4,6-Tribromophenol	*79.2 %*	*19-126*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-106 (P4F0245-02) Water					Sampled: 06/04/04 Received: 06/07/04				
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	06/10/04	06/17/04	4060424	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**0.850**	0.100	"	"	"	"	"	"	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*68.9 %*	*25-125*							
Surr: Pyrene-d10	*95.0 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*67.6 %*	*10-125*							
2708-040604-106 (P4F0245-02RE1) Water					Sampled: 06/04/04 Received: 06/07/04				J
Benzo (a) anthracene	**0.0167**	0.0100	ug/l	1	EPA 8270m	06/10/04	06/29/04	4060424	
Benzo (a) pyrene	**0.0170**	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	**0.0121**	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	**0.0113**	0.0100	"	"	"	"	"	"	
Chrysene	**0.0216**	0.0100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**0.0108**	0.0100	"	"	"	"	"	"	
Surr: Benzo (a) pyrene-d12	*52.5 %*	*10-125*							

North Creek Analytical - Portland

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Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-107 (P4F0245-03) Water					Sampled: 06/04/04 Received: 06/07/04				
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	06/10/04	06/17/04	4060424	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*96.6 %*	*25-125*							
Surr: Pyrene-d10	*112 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*93.7 %*	*10-125*							
2708-040604-107 (P4F0245-03RE1) Water					Sampled: 06/04/04 Received: 06/07/04				J
Benzo (a) anthracene	ND	0.0100	ug/l	1	EPA 8270m	06/10/04	06/29/04	4060424	
Benzo (a) pyrene	ND	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Chrysene	ND	0.0100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.0100	"	"	"	"	"	"	
Surr: Benzo (a) pyrene-d12	*71.0 %*	*10-125*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040604-106 (P4F0245-02) Water					Sampled: 06/04/04 Received: 06/07/04				
Cyanide (amenable)	**0.156**	0.00500	mg/l	1	EPA 9010A	06/14/04	06/15/04	4060555	
Cyanide (total)	**0.533**	0.00500	"	"	EPA 9012A	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060379 - EPA 200/3005										
Blank (4060379-BLK1)				Prepared: 06/09/04 Analyzed: 06/11/04						
Arsenic	ND	0.00100	mg/l							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Zinc	ND	0.00500	"							
LCS (4060379-BS1)				Prepared: 06/09/04 Analyzed: 06/11/04						
Arsenic	0.0989	0.00100	mg/l	0.100		98.9	80-120			
Chromium	0.102	0.00100	"	0.100		102	80-120			
Copper	0.102	0.00200	"	0.100		102	80-120			
Lead	0.105	0.00100	"	0.100		105	80-120			
Nickel	0.106	0.00200	"	0.100		106	80-120			
Zinc	0.0970	0.00500	"	0.100		97.0	80-120			
LCS Dup (4060379-BSD1)				Prepared: 06/09/04 Analyzed: 06/11/04						
Arsenic	0.0978	0.00100	mg/l	0.100		97.8	80-120	1.12	20	
Chromium	0.100	0.00100	"	0.100		100	80-120	1.98	20	
Copper	0.0994	0.00200	"	0.100		99.4	80-120	2.58	20	
Lead	0.101	0.00100	"	0.100		101	80-120	3.88	20	
Nickel	0.105	0.00200	"	0.100		105	80-120	0.948	20	
Zinc	0.0979	0.00500	"	0.100		97.9	80-120	0.924	20	
Duplicate (4060379-DUP1)		**Source: P4F0261-02**		Prepared: 06/09/04 Analyzed: 06/12/04						
Arsenic	0.00357	0.00100	mg/l		0.00426			17.6	20	
Chromium	0.0171	0.00100	"		0.0176			2.88	20	
Copper	0.0408	0.00200	"		0.0416			1.94	20	
Lead	0.125	0.00100	"		0.134			6.95	20	
Nickel	0.0626	0.00200	"		0.0620			0.963	20	
Zinc	1.82	0.0248	"		1.73			5.07	20	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060379 - EPA 200/3005										
Matrix Spike (4060379-MS1)	**Source: P4F0261-02**			Prepared: 06/09/04	Analyzed: 06/12/04					
Arsenic	0.113	0.00100	mg/l	0.100	0.00426	109	75-125			
Chromium	0.122	0.00100	"	0.100	0.0176	104	75-125			
Copper	0.135	0.00200	"	0.100	0.0416	93.4	75-125			
Lead	0.220	0.00100	"	0.100	0.134	86.0	75-125			
Nickel	0.168	0.00200	"	0.100	0.0620	106	75-125			
Zinc	1.79	0.0224	"	0.100	1.73	60.0	75-125			Q-03
Matrix Spike (4060379-MS2)	**Source: P4F0261-04**			Prepared: 06/09/04	Analyzed: 06/12/04					
Arsenic	0.113	0.00100	mg/l	0.100	0.00103	112	75-125			
Chromium	0.111	0.00100	"	0.100	0.00973	101	75-125			
Copper	0.119	0.00200	"	0.100	0.0244	94.6	75-125			
Lead	0.164	0.00100	"	0.100	0.0726	91.4	75-125			
Nickel	0.166	0.00200	"	0.100	0.0620	104	75-125			
Zinc	1.29	0.0244	"	0.100	1.06	230	75-125			Q-03

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060454 - EPA 200/3005 Diss										
Blank (4060454-BLK1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	ND	0.00100	mg/l							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Zinc	ND	0.00500	"							
LCS (4060454-BS1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.0961	0.00100	mg/l	0.100		96.1	80-120			
Chromium	0.101	0.00100	"	0.100		101	80-120			
Copper	0.101	0.00200	"	0.100		101	80-120			
Lead	0.100	0.00100	"	0.100		100	80-120			
Nickel	0.105	0.00200	"	0.100		105	80-120			
Zinc	0.0942	0.00500	"	0.100		94.2	80-120			
LCS Dup (4060454-BSD1)				Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.100	0.00100	mg/l	0.100		100	80-120	3.98	20	
Chromium	0.103	0.00100	"	0.100		103	80-120	1.96	20	
Copper	0.105	0.00200	"	0.100		105	80-120	3.88	20	
Lead	0.0991	0.00100	"	0.100		99.1	80-120	0.904	20	
Nickel	0.106	0.00200	"	0.100		106	80-120	0.948	20	
Zinc	0.0977	0.00500	"	0.100		97.7	80-120	3.65	20	
Duplicate (4060454-DUP1)		**Source: P4F0212-01**		Prepared: 06/10/04 Analyzed: 06/12/04						
Arsenic	0.00151	0.00100	mg/l		0.00119			23.7	20	Q-06
Chromium	0.000840	0.00100	"		0.00498			142	20	Q-06
Copper	0.00231	0.00200	"		0.00218			5.79	20	
Lead	0.000760	0.00100	"		0.000640			17.1	20	
Nickel	0.0326	0.00200	"		0.0320			1.86	20	
Zinc	0.0687	0.00500	"		0.0647			6.00	20	

North Creek Analytical - Portland

Philip Nerenberg

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060454 - EPA 200/3005 Diss										
Matrix Spike (4060454-MS1)	**Source: P4F0212-01**			Prepared: 06/10/04	Analyzed: 06/12/04					
Arsenic	0.109	0.00100	mg/l	0.100	0.00119	108	75-125			
Chromium	0.107	0.00100	"	0.100	0.00498	102	75-125			
Copper	0.101	0.00200	"	0.100	0.00218	98.8	75-125			
Lead	0.0913	0.00100	"	0.100	0.000640	90.7	75-125			
Nickel	0.134	0.00200	"	0.100	0.0320	102	75-125			
Zinc	0.169	0.00500	"	0.100	0.0647	104	75-125			
Matrix Spike (4060454-MS2)	**Source: P4F0212-02**			Prepared: 06/10/04	Analyzed: 06/12/04					
Arsenic	0.112	0.00100	mg/l	0.100	0.00796	104	75-125			
Chromium	0.103	0.00100	"	0.100	0.00538	97.6	75-125			
Copper	0.0958	0.00200	"	0.100	0.00177	94.0	75-125			
Lead	0.0913	0.00100	"	0.100	0.000600	90.7	75-125			
Nickel	0.138	0.00200	"	0.100	0.0338	104	75-125			
Zinc	0.106	0.00500	"	0.100	0.0103	95.7	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

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 4060426 - EPA 5030B										
Blank (4060426-BLK1)				Prepared & Analyzed: 06/10/04						
Acetone	ND	25.0	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	"							

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Philip Nerenberg

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

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 4060426 - EPA 5030B										
Blank (4060426-BLK1)				Prepared & Analyzed: 06/10/04						
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	"							
1,1,1,2-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	*19.6*		"	*20.0*		*98.0*	*75-120*			
Surr: 1,2-DCA-d4	*20.7*		"	*20.0*		*104*	*77-129*			
Surr: Dibromofluoromethane	*19.8*		"	*20.0*		*99.0*	*80-121*			
Surr: Toluene-d8	*19.9*		"	*20.0*		*99.5*	*80-120*			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

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 4060426 - EPA 5030B										
LCS (4060426-BS1)				Prepared & Analyzed: 06/10/04						
Benzene	19.4	1.00	ug/l	20.0		97.0	80-120			
Chlorobenzene	19.0	1.00	"	20.0		95.0	80-124			
1,1-Dichloroethene	18.4	1.00	"	20.0		92.0	78-120			
Toluene	19.1	1.00	"	20.0		95.5	80-124			
Trichloroethene	18.5	1.00	"	20.0		92.5	80-132			
Surr: 4-BFB	*19.2*		"	*20.0*		*96.0*	*75-120*			
Surr: 1,2-DCA-d4	*20.7*		"	*20.0*		*104*	*77-129*			
Surr: Dibromofluoromethane	*20.2*		"	*20.0*		*101*	*80-121*			
Surr: Toluene-d8	*20.3*		"	*20.0*		*102*	*80-120*			
Matrix Spike (4060426-MS1)	**Source: P4F0245-02**			Prepared & Analyzed: 06/10/04						
Benzene	20.3	1.00	ug/l	20.0	0.160	101	80-124			
Chlorobenzene	19.1	1.00	"	20.0	ND	95.5	72.9-134			
1,1-Dichloroethene	18.6	1.00	"	20.0	ND	93.0	79.3-127			
Toluene	18.0	1.00	"	20.0	0.280	88.6	79.7-131			
Trichloroethene	18.6	1.00	"	20.0	ND	93.0	68.4-130			
Surr: 4-BFB	*19.4*		"	*20.0*		*97.0*	*75-120*			
Surr: 1,2-DCA-d4	*20.8*		"	*20.0*		*104*	*77-129*			
Surr: Dibromofluoromethane	*21.0*		"	*20.0*		*105*	*80-121*			
Surr: Toluene-d8	*19.9*		"	*20.0*		*99.5*	*80-120*			
Matrix Spike Dup (4060426-MSD1)	**Source: P4F0245-02**			Prepared & Analyzed: 06/10/04						
Benzene	20.1	1.00	ug/l	20.0	0.160	99.7	80-124	0.990	25	
Chlorobenzene	19.3	1.00	"	20.0	ND	96.5	72.9-134	1.04	25	
1,1-Dichloroethene	18.1	1.00	"	20.0	ND	90.5	79.3-127	2.72	25	
Toluene	17.9	1.00	"	20.0	0.280	88.1	79.7-131	0.557	25	
Trichloroethene	19.1	1.00	"	20.0	ND	95.5	68.4-130	2.65	25	
Surr: 4-BFB	*19.8*		"	*20.0*		*99.0*	*75-120*			
Surr: 1,2-DCA-d4	*20.8*		"	*20.0*		*104*	*77-129*			
Surr: Dibromofluoromethane	*20.8*		"	*20.0*		*104*	*80-121*			
Surr: Toluene-d8	*19.4*		"	*20.0*		*97.0*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060423 - EPA 3510/600 Series										
Blank (4060423-BLK1)				Prepared: 06/10/04 Analyzed: 06/14/04						
Carbazole	ND	5.00	ug/l							
Acenaphthene	ND	5.00	"							
Acenaphthylene	ND	5.00	"							
Anthracene	ND	5.00	"							
Benzo (a) anthracene	ND	5.00	"							
Benzo (a) pyrene	ND	5.00	"							
Benzo (b) fluoranthene	ND	5.00	"							
Benzo (ghi) perylene	ND	5.00	"							
Benzo (k) fluoranthene	ND	5.00	"							
Benzoic Acid	ND	50.0	"							
Benzyl alcohol	ND	10.0	"							
4-Bromophenyl phenyl ether	ND	5.00	"							
Butyl benzyl phthalate	ND	5.00	"							
4-Chloro-3-methylphenol	ND	5.00	"							
4-Chloroaniline	ND	20.0	"							
Bis(2-chloroethoxy)methane	ND	10.0	"							
Bis(2-chloroethyl)ether	ND	5.00	"							
Bis(2-chloroisopropyl)ether	ND	10.0	"							
2-Chloronaphthalene	ND	5.00	"							
2-Chlorophenol	ND	5.00	"							
4-Chlorophenyl phenyl ether	ND	5.00	"							
Chrysene	ND	5.00	"							
Di-n-butyl phthalate	ND	5.00	"							
Di-n-octyl phthalate	ND	5.00	"							
Dibenzo (a,h) anthracene	ND	5.00	"							
Dibenzofuran	ND	5.00	"							
1,2-Dichlorobenzene	ND	5.00	"							
1,3-Dichlorobenzene	ND	5.00	"							
1,4-Dichlorobenzene	ND	5.00	"							
3,3'-Dichlorobenzidine	ND	5.00	"							
2,4-Dichlorophenol	ND	5.00	"							
Diethyl phthalate	ND	5.00	"							
2,4-Dimethylphenol	ND	10.0	"							
Dimethyl phthalate	ND	5.00	"							
4,6-Dinitro-2-methylphenol	ND	10.0	"							
2,4-Dinitrophenol	ND	25.0	"							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060423 - EPA 3510/600 Series										
Blank (4060423-BLK1)				Prepared: 06/10/04 Analyzed: 06/14/04						
2,4-Dinitrotoluene	ND	5.00	ug/l							
2,6-Dinitrotoluene	ND	5.00	"							
Bis(2-ethylhexyl)phthalate	ND	10.0	"							
Fluoranthene	ND	5.00	"							
Fluorene	ND	5.00	"							
Hexachlorobenzene	ND	5.00	"							
Hexachlorobutadiene	ND	10.0	"							
Hexachlorocyclopentadiene	ND	10.0	"							
Hexachloroethane	ND	10.0	"							
Indeno (1,2,3-cd) pyrene	ND	5.00	"							
Isophorone	ND	5.00	"							
2-Methylnaphthalene	ND	5.00	"							
2-Methylphenol	ND	10.0	"							
3-,4-Methylphenol	ND	5.00	"							
Naphthalene	ND	5.00	"							
2-Nitroaniline	ND	5.00	"							
3-Nitroaniline	ND	10.0	"							
4-Nitroaniline	ND	10.0	"							
Nitrobenzene	ND	5.00	"							
2-Nitrophenol	ND	5.00	"							
4-Nitrophenol	ND	25.0	"							
N-Nitrosodi-n-propylamine	ND	10.0	"							
N-Nitrosodiphenylamine	ND	5.00	"							
Pentachlorophenol	ND	10.0	"							
Phenanthrene	ND	5.00	"							
Phenol	ND	5.00	"							
Pyrene	ND	5.00	"							
1,2,4-Trichlorobenzene	ND	5.00	"							
2,4,5-Trichlorophenol	ND	5.00	"							
2,4,6-Trichlorophenol	ND	5.00	"							
Surr: 2-Fluorobiphenyl	*60.0*		"	*75.0*		*80.0*	*26-135*			
Surr: 2-Fluorophenol	*74.6*		"	*150*		*49.7*	*6-124*			
Surr: Nitrobenzene-d5	*62.9*		"	*75.0*		*83.9*	*23-147*			
Surr: Phenol-d6	*51.9*		"	*150*		*34.6*	*11-130*			
Surr: p-Terphenyl-d14	*68.6*		"	*75.0*		*91.5*	*38-149*			
Surr: 2,4,6-Tribromophenol	*123*		"	*150*		*82.0*	*19-126*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060423 - EPA 3510/600 Series										
LCS (4060423-BS1)				Prepared: 06/10/04 Analyzed: 06/14/04						
Acenaphthene	60.6	5.00	ug/l	75.0		80.8	40-110			
4-Chloro-3-methylphenol	113	5.00	"	150		75.3	40-110			
2-Chlorophenol	95.7	5.00	"	150		63.8	40-110			
1,4-Dichlorobenzene	34.8	5.00	"	75.0		46.4	20-90			
2,4-Dinitrotoluene	68.4	5.00	"	75.0		91.2	50-110			
4-Nitrophenol	55.4	25.0	"	150		36.9	15-100			
N-Nitrosodi-n-propylamine	65.6	10.0	"	75.0		87.5	40-110			
Pentachlorophenol	99.6	10.0	"	150		66.4	30-120			
Phenol	47.5	5.00	"	150		31.7	15-110			
Pyrene	72.5	5.00	"	75.0		96.7	40-110			
1,2,4-Trichlorobenzene	37.6	5.00	"	75.0		50.1	25-100			
Surr: 2-Fluorobiphenyl	*56.1*		"	*75.0*		*74.8*	*26-135*			
Surr: 2-Fluorophenol	*77.0*		"	*150*		*51.3*	*6-124*			
Surr: Nitrobenzene-d5	*64.7*		"	*75.0*		*86.3*	*23-147*			
Surr: Phenol-d6	*53.2*		"	*150*		*35.5*	*11-130*			
Surr: p-Terphenyl-d14	*75.1*		"	*75.0*		*100*	*38-149*			
Surr: 2,4,6-Tribromophenol	*135*		"	*150*		*90.0*	*19-126*			
LCS Dup (4060423-BSD1)				Prepared: 06/10/04 Analyzed: 06/14/04						
Acenaphthene	71.0	5.00	ug/l	75.0		94.7	40-110	15.8	36	
4-Chloro-3-methylphenol	128	5.00	"	150		85.3	40-110	12.4	43	
2-Chlorophenol	109	5.00	"	150		72.7	40-110	13.0	38	
1,4-Dichlorobenzene	45.7	5.00	"	75.0		60.9	20-90	27.1	43	
2,4-Dinitrotoluene	75.8	5.00	"	75.0		101	50-110	10.3	31	
4-Nitrophenol	59.9	25.0	"	150		39.9	15-100	7.81	36	
N-Nitrosodi-n-propylamine	75.5	10.0	"	75.0		101	40-110	14.0	37	
Pentachlorophenol	109	10.0	"	150		72.7	30-120	9.01	40	
Phenol	52.2	5.00	"	150		34.8	15-110	9.43	36	
Pyrene	75.4	5.00	"	75.0		101	40-110	3.92	31	
1,2,4-Trichlorobenzene	50.8	5.00	"	75.0		67.7	25-100	29.9	42	
Surr: 2-Fluorobiphenyl	*65.4*		"	*75.0*		*87.2*	*26-135*			
Surr: 2-Fluorophenol	*82.6*		"	*150*		*55.1*	*6-124*			
Surr: Nitrobenzene-d5	*73.1*		"	*75.0*		*97.5*	*23-147*			
Surr: Phenol-d6	*57.7*		"	*150*		*38.5*	*11-130*			
Surr: p-Terphenyl-d14	*79.4*		"	*75.0*		*106*	*38-149*			
Surr: 2,4,6-Tribromophenol	*148*		"	*150*		*98.7*	*19-126*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

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

Batch 4060423 - EPA 3510/600 Series

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060424 - EPA 3510/600 Series										
Blank (4060424-BLK1)				Prepared: 06/10/04 Analyzed: 06/14/04						
Acenaphthene	ND	0.100	ug/l							
Acenaphthylene	ND	0.100	"							
Anthracene	ND	0.100	"							
Benzo (a) anthracene	ND	0.100	"							
Benzo (a) pyrene	ND	0.100	"							
Benzo (b) fluoranthene	ND	0.100	"							
Benzo (ghi) perylene	ND	0.100	"							
Benzo (k) fluoranthene	ND	0.100	"							
Chrysene	ND	0.100	"							
Dibenzo (a,h) anthracene	ND	0.200	"							
Fluoranthene	ND	0.100	"							
Fluorene	ND	0.100	"							
Indeno (1,2,3-cd) pyrene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Phenanthrene	ND	0.100	"							
Pyrene	ND	0.100	"							
Surr: Fluorene-d10	*2.37*		"	*2.50*		*94.8*	*25-125*			
Surr: Pyrene-d10	*2.50*		"	*2.50*		*100*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.10*		"	*2.50*		*84.0*	*10-125*			
Blank (4060424-BLK2)				Prepared: 06/10/04 Analyzed: 06/29/04						J
Benzo (a) anthracene	ND	0.0100	ug/l							
Benzo (a) pyrene	ND	0.0100	"							
Benzo (b) fluoranthene	ND	0.0100	"							
Benzo (k) fluoranthene	ND	0.0100	"							
Chrysene	ND	0.0100	"							
Dibenzo (a,h) anthracene	ND	0.0100	"							
Indeno (1,2,3-cd) pyrene	ND	0.0100	"							
Surr: Benzo (a) pyrene-d12	*1.47*		"	*2.50*		*58.8*	*10-125*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060424 - EPA 3510/600 Series										
LCS (4060424-BS1)				Prepared: 06/10/04 Analyzed: 06/14/04						
Acenaphthene	2.40	0.100	ug/l	2.50		96.0	26-135			
Benzo (a) pyrene	2.19	0.100	"	2.50		87.6	38-137			
Pyrene	2.46	0.100	"	2.50		98.4	33-133			
Surr: Fluorene-d10	*2.62*		"	*2.50*		*105*	*25-125*			
Surr: Pyrene-d10	*2.72*		"	*2.50*		*109*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.47*		"	*2.50*		*98.8*	*10-125*			
LCS Dup (4060424-BSD1)				Prepared: 06/10/04 Analyzed: 06/14/04						
Acenaphthene	2.30	0.100	ug/l	2.50		92.0	26-135	4.26	60	
Benzo (a) pyrene	2.12	0.100	"	2.50		84.8	38-137	3.25	60	
Pyrene	2.38	0.100	"	2.50		95.2	33-133	3.31	60	
Surr: Fluorene-d10	*2.49*		"	*2.50*		*99.6*	*25-125*			
Surr: Pyrene-d10	*2.55*		"	*2.50*		*102*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.29*		"	*2.50*		*91.6*	*10-125*			

North Creek Analytical - Portland

Philip Nerenberg

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060555 - General Preparation										
Blank (4060555-BLK1)				Prepared: 06/14/04 Analyzed: 06/15/04						
Cyanide (total)	ND	0.00500	mg/l							
LCS (4060555-BS1)				Prepared: 06/14/04 Analyzed: 06/15/04						
Cyanide (total)	0.194	0.00500	mg/l	0.200		97.0	75-125			
Duplicate (4060555-DUP1)		Source: P4F0245-02		Prepared: 06/14/04 Analyzed: 06/15/04						
Cyanide (total)	0.529	0.00500	mg/l		0.533			0.753	20	
Matrix Spike (4060555-MS1)		Source: P4F0245-02		Prepared: 06/14/04 Analyzed: 06/15/04						
Cyanide (total)	0.716	0.0100	mg/l	0.200	0.533	91.5	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/06/04 12:50

Notes and Definitions

J	Estimated value.
Q-03	The matrix spike recovery, and/or RPD, for this QC sample cannot be accurately calculated due to the high concentration of analyte already present in the source sample.
Q-06	Analyses are not controlled on RPD values from sample concentrations less than 5 times the reporting limit.
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 (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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P4FC037

HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: NORTH CREEK ANALYTICAL PORTLAND OR
Lab Project No.:

CHAIN OF CUSTODY

Chain of Custody No.:

Project Manager: ROB CODE
Project No.: 2708-10
Project Name: CASCO
Collected by: MWG

Liquid with Sediment Sample
____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample
____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N):
Appropriate Containers Used (Y or N):
Provide Verbal Results (Y or N): No
Provide Preliminary Fax Results: Yes

Comments
Sample Number Prefix: 2708-040611-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: VOCs (EPA 8260)	RUSH	Remarks
	-097	6-13-04	1000	TB		X		1	X		
	-108		1045	B59A; 46-50'		X		4	X		
	-109		1145	B59A; 76-80'		X		4	X		
	-110		1245	B59A; 96-100'		X		4	X		
	-111		1335	B59A; EB		X		4	X		
	-112		1400	B59A; 116-120		X		4	X		
	-113		1540	B59A; 144-148'		X		4	X		

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAI	06-14-04	1620	[signature]	NCA
[signature]	NCA	06-14-04	1700	[signature]	NCA

2.3

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hahn & Associates

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other** _____

   By (print) Vanessa Evans (sign) Vanessa Evans

2. Date samples received 6/14/04 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier (Larry) ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by Larry date 6/14/04

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice ___gel ice ___real ice

   Temperature (degrees C) 2.3 Raytek thermometer _____ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? ___Yes X No

   Name of project Gasco (if applicable)

10. **Initial and date for unpacking:** _____ **(initials)** **date** ___/___/___

11. Packing material: NA bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? X Yes (X) No

    If "no" please indicate which containers one Voa. of 109 was broken upon receipt

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___No

    Do the IDs, times, etc. agree with the COC? X Yes ___No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? X Yes ___No

17. Is there adequate volume for the test(s) requested? X Yes ___No

18. If voa vials were submitted, are they free of bubbles? ___N/A X Yes ___No

19. **Log-in phase: Date samples were logged in:** 6/15/04 **Elm Project # P** 4F0537

20. Logged in by (print) Callie Fahsholz (sign) Callie Fahsholz

21. Was the project manager notified of status? (Use back of form as a record) ___Yes X No

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541.383.9310 fax 541.382.7588

29 June, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 06/14/04 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

Work Orders included in this report:
P4F0537

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040611-097	P4F0537-01	Water	06/11/04 10:00	06/14/04 17:00
2708-040611-108	P4F0537-02	Water	06/11/04 10:45	06/14/04 17:00
2708-040611-109	P4F0537-03	Water	06/11/04 11:45	06/14/04 17:00
2708-040611-110	P4F0537-04	Water	06/11/04 12:45	06/14/04 17:00
2708-040611-111	P4F0537-05	Water	06/11/04 13:35	06/14/04 17:00
2708-040611-112	P4F0537-06	Water	06/11/04 14:00	06/14/04 17:00
2708-040611-113	P4F0537-07	Water	06/11/04 15:40	06/14/04 17:00

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-097 (P4F0537-01RE1) Water					Sampled: 06/11/04 Received: 06/14/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/25/04	06/25/04	4061093	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-097 (P4F0537-01RE1) Water					Sampled: 06/11/04 Received: 06/14/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/25/04	06/25/04	4061093	
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	"	"	"	"	"	"	
1,1,1,2-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	*89.5 %*	*75-120*							
Surr: 1,2-DCA-d4	*95.0 %*	*77-129*							
Surr: Dibromofluoromethane	*102 %*	*80-121*							
Surr: Toluene-d8	*98.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-108 (P4F0537-02) Water					Sampled: 06/11/04 Received: 06/14/04				
Acetone	ND	1250	ug/l	50	EPA 8260B	06/24/04	06/24/04	4061040	
Benzene	**5570**	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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-108 (P4F0537-02) Water					Sampled: 06/11/04 Received: 06/14/04				
trans-1,3-Dichloropropene	ND	50.0	ug/l	50	EPA 8260B	06/24/04	06/24/04	4061040	
Ethylbenzene	**317**	50.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	100	"	"	"	"	"	"	
2-Hexanone	ND	500	"	"	"	"	"	"	
Isopropylbenzene	ND	100	"	"	"	"	"	"	
p-Isopropyltoluene	ND	100	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	250	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	250	"	"	"	"	"	"	
Naphthalene	**4460**	100	"	"	"	"	"	"	
n-Propylbenzene	ND	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	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	50.0	"	"	"	"	"	"	
1,2,4-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	**63.0**	50.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	50.0	"	"	"	"	"	"	
o-Xylene	**85.5**	50.0	"	"	"	"	"	"	
m,p-Xylene	ND	100	"	"	"	"	"	"	
Surr: 4-BFB	*89.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*93.5 %*	*77-129*							
Surr: Dibromofluoromethane	*102 %*	*80-121*							
Surr: Toluene-d8	*96.5 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-109 (P4F0537-03) Water					Sampled: 06/11/04 Received: 06/14/04				
Acetone	ND	125	ug/l	5	EPA 8260B	06/24/04	06/24/04	4061040	
Benzene	**230**	5.00	"	"	"	"	"	"	
Bromobenzene	ND	5.00	"	"	"	"	"	"	
Bromochloromethane	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	25.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
n-Butylbenzene	ND	25.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.00	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	50.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	25.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.00	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.00	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	25.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	5.00	"	"	"	"	"	"	
Dibromomethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	25.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.00	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-109 (P4F0537-03) Water					Sampled: 06/11/04 Received: 06/14/04				
trans-1,3-Dichloropropene	ND	5.00	ug/l	5	EPA 8260B	06/24/04	06/24/04	4061040	
Ethylbenzene	**25.8**	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	100	"	10	"	"	06/24/04	"	
Isopropylbenzene	ND	10.0	"	5	"	"	06/24/04	"	
p-Isopropyltoluene	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	25.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	25.0	"	"	"	"	"	"	
Naphthalene	**582**	10.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.00	"	"	"	"	"	"	
Styrene	ND	10.0	"	10	"	"	06/24/04	"	
1,1,1,2-Tetrachloroethane	ND	5.00	"	5	"	"	06/24/04	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	**12.4**	5.00	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.00	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.00	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	**6.65**	5.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	**12.2**	5.00	"	"	"	"	"	"	
m,p-Xylene	**13.8**	10.0	"	"	"	"	"	"	
Surr: 4-BFB	*95.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*95.0 %*	*77-129*							
Surr: Dibromofluoromethane	*99.0 %*	*80-121*							
Surr: Toluene-d8	*96.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-110 (P4F0537-04) Water					Sampled: 06/11/04 Received: 06/14/04				
Acetone	ND	50.0	ug/l	2	EPA 8260B	06/24/04	06/24/04	4061040	
Benzene	**113**	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	ND	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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-110 (P4F0537-04) Water					Sampled: 06/11/04 Received: 06/14/04				
trans-1,3-Dichloropropene	ND	2.00	ug/l	2	EPA 8260B	06/24/04	06/24/04	4061040	
Ethylbenzene	**9.78**	2.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	4.00	"	"	"	"	"	"	
2-Hexanone	ND	20.0	"	"	"	"	"	"	
Isopropylbenzene	ND	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	**272**	4.00	"	"	"	"	"	"	
n-Propylbenzene	ND	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	**6.16**	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	**2.58**	2.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	2.00	"	"	"	"	"	"	
Vinyl chloride	ND	2.00	"	"	"	"	"	"	
o-Xylene	**5.24**	2.00	"	"	"	"	"	"	
m,p-Xylene	**6.04**	4.00	"	"	"	"	"	"	
Surr: 4-BFB	*91.5 %*	*75-120*							
Surr: 1,2-DCA-d4	*95.0 %*	*77-129*							
Surr: Dibromofluoromethane	*102 %*	*80-121*							
Surr: Toluene-d8	*95.5 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-111 (P4F0537-05) Water					Sampled: 06/11/04 Received: 06/14/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061040	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-111 (P4F0537-05) Water					Sampled: 06/11/04 Received: 06/14/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061040	
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	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	"	"	"	
Tetrachloroethene	ND	1.00	"	"	"	"	"	"	
Toluene	**1.13**	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	*89.5 %*	*75-120*							
Surr: 1,2-DCA-d4	*97.5 %*	*77-129*							
Surr: Dibromofluoromethane	*102 %*	*80-121*							
Surr: Toluene-d8	*96.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-112 (P4F0537-06) Water					Sampled: 06/11/04 Received: 06/14/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061040	
Benzene	**166**	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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-112 (P4F0537-06) Water					Sampled: 06/11/04 Received: 06/14/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061040	
Ethylbenzene	**3.02**	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	**116**	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	**2.16**	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	**1.51**	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	**1.63**	1.00	"	"	"	"	"	"	
m,p-Xylene	**5.42**	2.00	"	"	"	"	"	"	
Surr: 4-BFB	*95.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*97.5 %*	*77-129*							
Surr: Dibromofluoromethane	*104 %*	*80-121*							
Surr: Toluene-d8	*97.5 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-113 (P4F0537-07) Water					Sampled: 06/11/04 Received: 06/14/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061040	
Benzene	**19.3**	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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040611-113 (P4F0537-07) Water					Sampled: 06/11/04 Received: 06/14/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061040	
Ethylbenzene	**2.58**	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	**119**	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	**1.43**	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	**1.17**	1.00	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	"	"	"	
Vinyl chloride	ND	1.00	"	"	"	"	"	"	
o-Xylene	**1.31**	1.00	"	"	"	"	"	"	
m,p-Xylene	**2.27**	2.00	"	"	"	"	"	"	
Surr: 4-BFB	*94.5 %*	*75-120*							
Surr: 1,2-DCA-d4	*96.5 %*	*77-129*							
Surr: Dibromofluoromethane	*107 %*	*80-121*							
Surr: Toluene-d8	*99.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

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 4061040 - EPA 5030B										
Blank (4061040-BLK1)				Prepared & Analyzed: 06/24/04						
Acetone	ND	25.0	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

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

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 4061040 - EPA 5030B										
Blank (4061040-BLK1)				Prepared & Analyzed: 06/24/04						
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	"							
1,1,1,2-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	*18.7*		"	*20.0*		*93.5*	*75-120*			
Surr: 1,2-DCA-d4	*19.2*		"	*20.0*		*96.0*	*77-129*			
Surr: Dibromofluoromethane	*20.4*		"	*20.0*		*102*	*80-121*			
Surr: Toluene-d8	*19.8*		"	*20.0*		*99.0*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

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 4061040 - EPA 5030B										
LCS (4061040-BS1)				Prepared & Analyzed: 06/24/04						
Benzene	22.7	1.00	ug/l	20.0		114	80-120			
Chlorobenzene	24.1	1.00	"	20.0		120	80-124			
1,1-Dichloroethene	21.6	1.00	"	20.0		108	78-120			
Toluene	23.8	1.00	"	20.0		119	80-124			
Trichloroethene	20.3	1.00	"	20.0		102	80-132			
Surr: 4-BFB	*19.3*		"	*20.0*		*96.5*	*75-120*			
Surr: 1,2-DCA-d4	*19.5*		"	*20.0*		*97.5*	*77-129*			
Surr: Dibromofluoromethane	*22.1*		"	*20.0*		*110*	*80-121*			
Surr: Toluene-d8	*20.6*		"	*20.0*		*103*	*80-120*			
Matrix Spike (4061040-MS1)	**Source: P4F0878-01**			Prepared & Analyzed: 06/24/04						
Benzene	21.8	1.00	ug/l	20.0	ND	109	80-124			
Chlorobenzene	21.8	1.00	"	20.0	ND	109	72.9-134			
1,1-Dichloroethene	21.1	1.00	"	20.0	ND	106	79.3-127			
Toluene	21.6	1.00	"	20.0	ND	108	79.7-131			
Trichloroethene	18.0	1.00	"	20.0	ND	90.0	68.4-130			
Surr: 4-BFB	*19.1*		"	*20.0*		*95.5*	*75-120*			
Surr: 1,2-DCA-d4	*19.7*		"	*20.0*		*98.5*	*77-129*			
Surr: Dibromofluoromethane	*22.5*		"	*20.0*		*112*	*80-121*			
Surr: Toluene-d8	*20.2*		"	*20.0*		*101*	*80-120*			
Matrix Spike Dup (4061040-MSD1)	**Source: P4F0878-01**			Prepared & Analyzed: 06/24/04						
Benzene	21.8	1.00	ug/l	20.0	ND	109	80-124	0.00	25	
Chlorobenzene	21.8	1.00	"	20.0	ND	109	72.9-134	0.00	25	
1,1-Dichloroethene	21.0	1.00	"	20.0	ND	105	79.3-127	0.475	25	
Toluene	21.7	1.00	"	20.0	ND	108	79.7-131	0.462	25	
Trichloroethene	18.1	1.00	"	20.0	ND	90.5	68.4-130	0.554	25	
Surr: 4-BFB	*19.0*		"	*20.0*		*95.0*	*75-120*			
Surr: 1,2-DCA-d4	*19.3*		"	*20.0*		*96.5*	*77-129*			
Surr: Dibromofluoromethane	*22.1*		"	*20.0*		*110*	*80-121*			
Surr: Toluene-d8	*20.3*		"	*20.0*		*102*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Edc	06/29/04 14:00

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 4061093 - EPA 5030B										
Blank (4061093-BLK1)				Prepared & Analyzed: 06/25/04						
Acetone	ND	25.0	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

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

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 4061093 - EPA 5030B										
Blank (4061093-BLK1)				Prepared & Analyzed: 06/25/04						
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	"							
1,1,1,2-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	*17.7*		"	*20.0*		*88.5*	*75-120*			
Surr: 1,2-DCA-d4	*18.1*		"	*20.0*		*90.5*	*77-129*			
Surr: Dibromofluoromethane	*19.9*		"	*20.0*		*99.5*	*80-121*			
Surr: Toluene-d8	*19.6*		"	*20.0*		*98.0*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Edc	06/29/04 14:00

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 4061093 - EPA 5030B										
LCS (4061093-BS1)				Prepared & Analyzed: 06/25/04						
Benzene	22.0	1.00	ug/l	20.0		110	80-120			
Chlorobenzene	22.2	1.00	"	20.0		111	80-124			
1,1-Dichloroethene	20.6	1.00	"	20.0		103	78-120			
Toluene	22.4	1.00	"	20.0		112	80-124			
Trichloroethene	19.1	1.00	"	20.0		95.5	80-132			
Surr: 4-BFB	*19.2*		"	*20.0*		*96.0*	*75-120*			
Surr: 1,2-DCA-d4	*19.0*		"	*20.0*		*95.0*	*77-129*			
Surr: Dibromofluoromethane	*21.0*		"	*20.0*		*105*	*80-121*			
Surr: Toluene-d8	*20.2*		"	*20.0*		*101*	*80-120*			
Matrix Spike (4061093-MS1)	**Source: P4F0763-01**			Prepared & Analyzed: 06/25/04						
Benzene	26.9	1.00	ug/l	20.0	4.76	111	80-124			
Chlorobenzene	22.4	1.00	"	20.0	ND	112	72.9-134			
1,1-Dichloroethene	21.4	1.00	"	20.0	ND	107	79.3-127			
Toluene	22.0	1.00	"	20.0	0.210	109	79.7-131			
Trichloroethene	18.8	1.00	"	20.0	ND	94.0	68.4-130			
Surr: 4-BFB	*20.0*		"	*20.0*		*100*	*75-120*			
Surr: 1,2-DCA-d4	*19.8*		"	*20.0*		*99.0*	*77-129*			
Surr: Dibromofluoromethane	*21.3*		"	*20.0*		*106*	*80-121*			
Surr: Toluene-d8	*19.9*		"	*20.0*		*99.5*	*80-120*			
Matrix Spike Dup (4061093-MSD1)	**Source: P4F0763-01**			Prepared & Analyzed: 06/25/04						
Benzene	26.5	1.00	ug/l	20.0	4.76	109	80-124	1.50	25	
Chlorobenzene	21.7	1.00	"	20.0	ND	108	72.9-134	3.17	25	
1,1-Dichloroethene	20.3	1.00	"	20.0	ND	102	79.3-127	5.28	25	
Toluene	21.7	1.00	"	20.0	0.210	107	79.7-131	1.37	25	
Trichloroethene	17.8	1.00	"	20.0	ND	89.0	68.4-130	5.46	25	
Surr: 4-BFB	*19.8*		"	*20.0*		*99.0*	*75-120*			
Surr: 1,2-DCA-d4	*19.0*		"	*20.0*		*95.0*	*77-129*			
Surr: Dibromofluoromethane	*21.8*		"	*20.0*		*109*	*80-121*			
Surr: Toluene-d8	*20.2*		"	*20.0*		*101*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 14:00

Notes and Definitions

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 (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: NORTH CREEK ANALYTICAL PORTLAND OR
Lab Project No.:

CHAIN OF CUSTODY
Chain of Custody No.: 04F0614

Project Manager: Rob LDE
Project No.: 2705.10
Project Name: GASCO
Collected by: AFR

Liquid with Sediment Sample
___ Test Filtrate ___ Test Sediment ___ Test Both
Multi-Phase Sample
___ Test One (which) ___ Test Separately ___ Shake

Samples Received at 4C (Y or N):
Appropriate Containers Used (Y or N):
Provide Verbal Results (Y or N): No
Provide Preliminary Fax Results: Yes

Comments

Sample Number Prefix: 2705-c406/4-

* Metals = As, Cr, Cu, Ni, Pb, Zn

Pricing/Reporting Levels as per Nelson & Kelly 12/12/03

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	PAHs (EPA 8270 SIM)	SVOCs (EPA 8270)	VOCs (EPA 8260)	TOTAL CN (EPA 9010)	Amenable CN (EPA 9010)	TOTAL metals* (EPA 6020)	DISS. metals* -filtered (EPA 6020)	RUSH	Remarks
	-096	6/14/04	800AM	TB		X		1			X						
	-114		925AM	BS9A (171-175)		X		4			X						
	-115		145PM	BS6B (136-140)		X		10	X	X	X	X	X	X	X		
	-116	↓	400PM	BS6B (174-178)		X		10	X	X	X	X	X	X	X		

Relinquished by	Company	Date	Time	Received by	Company
[signature]	NCA	6-15-04	14:24	[signature]	NCA
[signature]	NCA	6/15/04	17:20	[signature]	NCA

2.5

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hahn & Associates

1. **Please sign for receipt and opening of** 1 **cooler or** ____ **other** ____

   By (print) Vanessa Evans (sign) Vanessa Evans

2. Date samples received 6/15/04 Date opened: Same X or ___/___/___

3. Delivered by: X Bob NCA courier ___ FedEx ___ UPS ___ Courier ___ Client ___ Other ____

   Airbill # if applicable ____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by Bob date 6/15/04

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___ No

6. Was ice used? X yes ___ no Type of ice: ___ blue ice X gel ice ___ real ice

   Temperature (degrees C) 2.5 Raytek thermometer ____ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___ Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___ No

   If "no" please specify: ____

9. Was project identifiable from custody papers? X Yes ___ No

   Name of project Gasco (if applicable)

10. **Initial and date for unpacking:** ED **(initials)** **date** 6/16/04

11. Packing material: ___ bubble wrap/bag X styrofoam X cardboard ____ other

12. Were samples in bags? ___ Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___ No

    If "no" please indicate which containers were absent ____

14. Were all containers unbroken and labels in good condition? X Yes ___ No

    If "no" please indicate which containers ____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___ No

    Do the IDs, times, etc. agree with the COC? X Yes ___ No

    If "no" please indicate which containers ____

16. Are containers properly preserved for indicated analysis? X Yes ___ No

17. Is there adequate volume for the test(s) requested? X Yes ___ No

18. If voa vials were submitted, are they free of bubbles? ___ N/A X Yes ___ No

19. **Log-in phase: Date samples were logged in:** 6/16/04 **Elm Project # P** 4F0616

20. Logged in by (print) Vanessa Evans (sign) Vanessa Evans

21. Was the project manager notified of status? (Use back of form as a record) ___ Yes X No

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2 July, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 06/15/04 17:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

Work Orders included in this report:
P4F0616

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040614-096	P4F0616-01	Water	06/14/04 08:00	06/15/04 17:20
2708-040614-114	P4F0616-02	Water	06/14/04 09:25	06/15/04 17:20
2708-040614-115	P4F0616-03	Water	06/14/04 13:45	06/15/04 17:20
2708-040614-116	P4F0616-04	Water	06/14/04 16:00	06/15/04 17:20

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-115 (P4F0616-03) Water					Sampled: 06/14/04 Received: 06/15/04				
Arsenic	**0.0290**	0.00200	mg/l	1	EPA 6020	06/17/04	06/19/04	4060762	
Chromium	**0.827**	0.00200	"	"	"	"	06/18/04	"	
Copper	**0.457**	0.00400	"	"	"	"	"	"	
Lead	**0.0306**	0.00200	"	"	"	"	"	"	
Nickel	**0.291**	0.00400	"	"	"	"	"	"	
Zinc	**6.51**	0.0566	"	5.66	"	"	06/18/04	"	
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
Arsenic	**0.00369**	0.00100	mg/l	1	EPA 6020	06/17/04	06/19/04	4060762	
Chromium	**0.0351**	0.00100	"	"	"	"	06/18/04	"	
Copper	**0.0218**	0.00200	"	"	"	"	"	"	
Lead	**0.00204**	0.00100	"	"	"	"	"	"	
Nickel	**0.0246**	0.00200	"	"	"	"	"	"	
Zinc	**0.177**	0.00500	"	"	"	"	"	"	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Dissolved Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-115 (P4F0616-03) Water					Sampled: 06/14/04 Received: 06/15/04				
Arsenic	**0.00582**	0.00100	mg/l	1	EPA 6020	06/18/04	06/22/04	4060840	
Chromium	ND	0.00100	"	"	"	"	"	"	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Nickel	**0.0162**	0.00200	"	"	"	"	"	"	
Zinc	**0.191**	0.00500	"	"	"	"	"	"	
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
Arsenic	ND	0.00100	mg/l	1	EPA 6020	06/18/04	06/22/04	4060840	
Chromium	ND	0.00100	"	"	"	"	"	"	
Copper	ND	0.00200	"	"	"	"	"	"	
Lead	ND	0.00100	"	"	"	"	"	"	
Nickel	**0.00445**	0.00200	"	"	"	"	"	"	
Zinc	**0.0383**	0.00500	"	"	"	"	"	"	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-096 (P4F0616-01) Water					Sampled: 06/14/04 Received: 06/15/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061039	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-096 (P4F0616-01) Water					Sampled: 06/14/04 Received: 06/15/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061039	
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	"	"	"	"	"	"	
1,1,1,2-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	*77.5 %*	*75-120*							
Surr: 1,2-DCA-d4	*97.5 %*	*77-129*							
Surr: Dibromofluoromethane	*97.5 %*	*80-121*							
Surr: Toluene-d8	*94.0 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-114 (P4F0616-02) Water					Sampled: 06/14/04 Received: 06/15/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061039	
Benzene	**2.29**	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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-114 (P4F0616-02) Water					Sampled: 06/14/04 Received: 06/15/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061039	
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	**3.46**	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	"	"	"	"	"	"	
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	*82.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*102 %*	*77-129*							
Surr: Dibromofluoromethane	*101 %*	*80-121*							
Surr: Toluene-d8	*89.5 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-115 (P4F0616-03) Water					Sampled: 06/14/04 Received: 06/15/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061039	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-115 (P4F0616-03) Water					Sampled: 06/14/04 Received: 06/15/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061039	
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	**3.26**	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	"	"	"	"	"	"	
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	*77.0 %*	*75-120*							
Surr: 1,2-DCA-d4	*101 %*	*77-129*							
Surr: Dibromofluoromethane	*99.5 %*	*80-121*							
Surr: Toluene-d8	*95.5 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
Acetone	ND	25.0	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061039	
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	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
trans-1,3-Dichloropropene	ND	1.00	ug/l	1	EPA 8260B	06/24/04	06/24/04	4061039	
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	**4.20**	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	"	"	"	"	"	"	
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	*85.5 %*	*75-120*							
Surr: 1,2-DCA-d4	*106 %*	*77-129*							
Surr: Dibromofluoromethane	*102 %*	*80-121*							
Surr: Toluene-d8	*98.5 %*	*80-120*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-115 (P4F0616-03) Water					Sampled: 06/14/04 Received: 06/15/04				
Carbazole	ND	5.00	ug/l	1	EPA 8270C	06/18/04	06/22/04	4060792	
Acenaphthene	ND	5.00	"	"	"	"	"	"	
Acenaphthylene	ND	5.00	"	"	"	"	"	"	
Anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) pyrene	ND	5.00	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	5.00	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzoic Acid	ND	50.0	"	"	"	"	"	"	
Benzyl alcohol	ND	10.0	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	5.00	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	5.00	"	"	"	"	"	"	
4-Chloroaniline	ND	20.0	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	10.0	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	5.00	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	10.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	5.00	"	"	"	"	"	"	
2-Chlorophenol	ND	5.00	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Chrysene	ND	5.00	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	5.00	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	5.00	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	5.00	"	"	"	"	"	"	
Dibenzofuran	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
3,3'-Dichlorobenzidine	ND	5.00	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	5.00	"	"	"	"	"	"	
Diethyl phthalate	ND	5.00	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	10.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	5.00	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	10.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	25.0	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates. Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-115 (P4F0616-03) Water					Sampled: 06/14/04 Received: 06/15/04				
2,6-Dinitrotoluene	ND	5.00	ug/l	1	EPA 8270C	06/18/04	06/22/04	4060792	
Bis(2-ethylhexyl)phthalate	ND	10.0	"	"	"	"	"	"	
Fluoranthene	ND	5.00	"	"	"	"	"	"	
Fluorene	ND	5.00	"	"	"	"	"	"	
Hexachlorobenzene	ND	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	10.0	"	"	"	"	"	"	
Hexachloroethane	ND	10.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	5.00	"	"	"	"	"	"	
Isophorone	ND	5.00	"	"	"	"	"	"	
2-Methylnaphthalene	ND	5.00	"	"	"	"	"	"	
2-Methylphenol	ND	10.0	"	"	"	"	"	"	
3-,4-Methylphenol	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	5.00	"	"	"	"	"	"	
2-Nitroaniline	ND	5.00	"	"	"	"	"	"	
3-Nitroaniline	ND	10.0	"	"	"	"	"	"	
4-Nitroaniline	ND	10.0	"	"	"	"	"	"	
Nitrobenzene	ND	5.00	"	"	"	"	"	"	
2-Nitrophenol	ND	5.00	"	"	"	"	"	"	
4-Nitrophenol	ND	25.0	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	10.0	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	5.00	"	"	"	"	"	"	
Pentachlorophenol	ND	10.0	"	"	"	"	"	"	
Phenanthrene	**5.16**	5.00	"	"	"	"	"	"	
Phenol	ND	5.00	"	"	"	"	"	"	
Pyrene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
Surr: 2-Fluorobiphenyl	*84.6 %*	*26-135*							
Surr: 2-Fluorophenol	*47.6 %*	*6-124*							
Surr: Nitrobenzene-d5	*95.1 %*	*23-147*							
Surr: Phenol-d6	*32.7 %*	*11-130*							
Surr: p-Terphenyl-d14	*109 %*	*38-149*							
Surr: 2,4,6-Tribromophenol	*106 %*	*19-126*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
Carbazole	ND	5.00	ug/l	1	EPA 8270C	06/18/04	06/22/04	4060792	
Acenaphthene	ND	5.00	"	"	"	"	"	"	
Acenaphthylene	ND	5.00	"	"	"	"	"	"	
Anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) anthracene	ND	5.00	"	"	"	"	"	"	
Benzo (a) pyrene	ND	5.00	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	5.00	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	5.00	"	"	"	"	"	"	
Benzoic Acid	ND	50.0	"	"	"	"	"	"	
Benzyl alcohol	ND	10.0	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	5.00	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	5.00	"	"	"	"	"	"	
4-Chloroaniline	ND	20.0	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	10.0	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	5.00	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	10.0	"	"	"	"	"	"	
2-Chloronaphthalene	ND	5.00	"	"	"	"	"	"	
2-Chlorophenol	ND	5.00	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	5.00	"	"	"	"	"	"	
Chrysene	ND	5.00	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	5.00	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	5.00	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	5.00	"	"	"	"	"	"	
Dibenzofuran	ND	5.00	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.00	"	"	"	"	"	"	
3,3'-Dichlorobenzidine	ND	5.00	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	5.00	"	"	"	"	"	"	
Diethyl phthalate	ND	5.00	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	10.0	"	"	"	"	"	"	
Dimethyl phthalate	ND	5.00	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	10.0	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	25.0	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	5.00	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
2,6-Dinitrotoluene	ND	5.00	ug/l	1	EPA 8270C	06/18/04	06/22/04	4060792	
Bis(2-ethylhexyl)phthalate	ND	10.0	"	"	"	"	"	"	
Fluoranthene	ND	5.00	"	"	"	"	"	"	
Fluorene	ND	5.00	"	"	"	"	"	"	
Hexachlorobenzene	ND	5.00	"	"	"	"	"	"	
Hexachlorobutadiene	ND	10.0	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	10.0	"	"	"	"	"	"	
Hexachloroethane	ND	10.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	5.00	"	"	"	"	"	"	
Isophorone	ND	5.00	"	"	"	"	"	"	
2-Methylnaphthalene	ND	5.00	"	"	"	"	"	"	
2-Methylphenol	ND	10.0	"	"	"	"	"	"	
3-,4-Methylphenol	ND	5.00	"	"	"	"	"	"	
Naphthalene	ND	5.00	"	"	"	"	"	"	
2-Nitroaniline	ND	5.00	"	"	"	"	"	"	
3-Nitroaniline	ND	10.0	"	"	"	"	"	"	
4-Nitroaniline	ND	10.0	"	"	"	"	"	"	
Nitrobenzene	ND	5.00	"	"	"	"	"	"	
2-Nitrophenol	ND	5.00	"	"	"	"	"	"	
4-Nitrophenol	ND	25.0	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	10.0	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	5.00	"	"	"	"	"	"	
Pentachlorophenol	ND	10.0	"	"	"	"	"	"	
Phenanthrene	ND	5.00	"	"	"	"	"	"	
Phenol	ND	5.00	"	"	"	"	"	"	
Pyrene	ND	5.00	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	5.00	"	"	"	"	"	"	
Surr: 2-Fluorobiphenyl	*65.5 %*	*26-135*							
Surr: 2-Fluorophenol	*30.1 %*	*6-124*							
Surr: Nitrobenzene-d5	*67.9 %*	*23-147*							
Surr: Phenol-d6	*20.1 %*	*11-130*							
Surr: p-Terphenyl-d14	*104 %*	*38-149*							
Surr: 2,4,6-Tribromophenol	*64.5 %*	*19-126*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-115 (P4F0616-03) Water					Sampled: 06/14/04 Received: 06/15/04				
Acenaphthene	**0.646**	0.100	ug/l	1	EPA 8270m	06/18/04	06/21/04	4060793	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	**0.392**	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	**0.170**	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	**0.137**	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	**0.214**	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	**1.10**	0.100	"	"	"	"	"	"	
Fluorene	**0.449**	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**2.58**	0.100	"	"	"	"	"	"	
Phenanthrene	**2.99**	0.100	"	"	"	"	"	"	
Pyrene	**1.31**	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*110 %*	*25-125*							
Surr: Pyrene-d10	*114 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*64.6 %*	*10-125*							
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	06/18/04	06/21/04	4060793	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**0.920**	0.100	"	"	"	"	"	"	
Phenanthrene	**0.144**	0.100	"	"	"	"	"	"	
Pyrene	**0.106**	0.100	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
Surr: Fluorene-d10	*91.7 %*	*25-125*							
Surr: Pyrene-d10	*117 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*97.1 %*	*10-125*							
2708-040614-116 (P4F0616-04RE1) Water					Sampled: 06/14/04 Received: 06/15/04				J
Benzo (a) anthracene	ND	0.100	ug/l	1	EPA 8270m	06/18/04	06/29/04	4060793	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Benzo (a) pyrene-d12	*85.0 %*	*10-125*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040614-115 (P4F0616-03) Water					Sampled: 06/14/04 Received: 06/15/04				
Cyanide (amenable)	ND	0.00500	mg/l	1	EPA 9010A	06/24/04	06/24/04	4061043	
Cyanide (total)	**0.00600**	0.00500	"	"	EPA 9012A	06/23/04	06/24/04	4060978	
2708-040614-116 (P4F0616-04) Water					Sampled: 06/14/04 Received: 06/15/04				
Cyanide (amenable)	**0.0319**	0.00500	mg/l	1	EPA 9010A	06/24/04	06/24/04	4061043	
Cyanide (total)	**0.0557**	0.00500	"	"	EPA 9012A	06/23/04	06/24/04	4060978	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060762 - EPA 200/3005										
Blank (4060762-BLK1)				Prepared: 06/17/04 Analyzed: 06/19/04						
Arsenic	ND	0.00100	mg/l							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Zinc	ND	0.00500	"							
LCS (4060762-BS1)				Prepared: 06/17/04 Analyzed: 06/19/04						
Arsenic	0.0958	0.00100	mg/l	0.100		95.8	80-120			
Chromium	0.104	0.00100	"	0.100		104	80-120			
Copper	0.106	0.00200	"	0.100		106	80-120			
Lead	0.100	0.00100	"	0.100		100	80-120			
Nickel	0.106	0.00200	"	0.100		106	80-120			
Zinc	0.101	0.00500	"	0.100		101	80-120			
LCS Dup (4060762-BSD1)				Prepared: 06/17/04 Analyzed: 06/19/04						
Arsenic	0.0998	0.00100	mg/l	0.100		99.8	80-120	4.09	20	
Chromium	0.103	0.00100	"	0.100		103	80-120	0.966	20	
Copper	0.103	0.00200	"	0.100		103	80-120	2.87	20	
Lead	0.0996	0.00100	"	0.100		99.6	80-120	0.401	20	
Nickel	0.106	0.00200	"	0.100		106	80-120	0.00	20	
Zinc	0.100	0.00500	"	0.100		100	80-120	0.995	20	
Duplicate (4060762-DUP1)		**Source: P4F0610-01**		Prepared: 06/17/04 Analyzed: 06/19/04						
Arsenic	0.00521	0.00100	mg/l		0.00518			0.577	20	
Chromium	0.00267	0.00100	"		0.00318			17.4	20	
Copper	0.0796	0.00200	"		0.0831			4.30	20	
Lead	0.00592	0.00100	"		0.00608			2.67	20	
Nickel	0.0182	0.00200	"		0.0194			6.38	20	
Zinc	0.0182	0.00500	"		0.0194			6.38	20	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060762 - EPA 200/3005										
Matrix Spike (4060762-MS1)		**Source: P4F0610-01**		Prepared: 06/17/04		Analyzed: 06/19/04				
Arsenic	0.105	0.00100	mg/l	0.100	0.00518	99.8	75-125			
Chromium	0.104	0.00100	"	0.100	0.00318	101	75-125			
Copper	0.182	0.00200	"	0.100	0.0831	98.9	75-125			
Lead	0.102	0.00100	"	0.100	0.00608	95.9	75-125			
Nickel	0.121	0.00200	"	0.100	0.0194	102	75-125			
Zinc	0.118	0.00500	"	0.100	0.0194	98.6	75-125			
Matrix Spike (4060762-MS2)		**Source: P4F0632-01**		Prepared: 06/17/04		Analyzed: 06/20/04				
Arsenic	0.116	0.00100	mg/l	0.100	0.0151	101	75-125			
Chromium	0.199	0.00100	"	0.100	0.0980	101	75-125			
Copper	0.561	0.00200	"	0.100	0.468	93.0	75-125			
Lead	0.0940	0.00100	"	0.100	0.00395	90.0	75-125			
Nickel	0.234	0.00200	"	0.100	0.133	101	75-125			
Zinc	4.53	0.0286	"	0.100	4.39	140	75-125			Q-03

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Hahn and Associates, Inc.	Project: Gasco Upland	
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Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060840 - EPA 200/3005 Diss										
Blank (4060840-BLK1)				Prepared: 06/18/04 Analyzed: 06/22/04						
Arsenic	ND	0.00100	mg/l							
Chromium	ND	0.00100	"							
Copper	ND	0.00200	"							
Lead	ND	0.00100	"							
Nickel	ND	0.00200	"							
Zinc	ND	0.00500	"							
LCS (4060840-BS1)				Prepared: 06/18/04 Analyzed: 06/22/04						
Arsenic	0.102	0.00100	mg/l	0.100		102	80-120			
Chromium	0.104	0.00100	"	0.100		104	80-120			
Copper	0.0991	0.00200	"	0.100		99.1	80-120			
Lead	0.102	0.00100	"	0.100		102	80-120			
Nickel	0.100	0.00200	"	0.100		100	80-120			
Zinc	0.0970	0.00500	"	0.100		97.0	80-120			
LCS Dup (4060840-BSD1)				Prepared: 06/18/04 Analyzed: 06/22/04						
Arsenic	0.101	0.00100	mg/l	0.100		101	80-120	0.985	20	
Chromium	0.102	0.00100	"	0.100		102	80-120	1.94	20	
Copper	0.0986	0.00200	"	0.100		98.6	80-120	0.506	20	
Lead	0.103	0.00100	"	0.100		103	80-120	0.976	20	
Nickel	0.0982	0.00200	"	0.100		98.2	80-120	1.82	20	
Zinc	0.0980	0.00500	"	0.100		98.0	80-120	1.03	20	
Duplicate (4060840-DUP1)		**Source: P4F0616-03**		Prepared: 06/18/04 Analyzed: 06/22/04						
Arsenic	0.00564	0.00100	mg/l		0.00582			3.14	20	
Chromium	0.000810	0.00100	"		ND				20	
Copper	ND	0.00200	"		ND			NA	20	
Lead	0.000260	0.00100	"		0.000240			8.00	20	
Nickel	0.0163	0.00200	"		0.0162			0.615	20	
Zinc	0.187	0.00500	"		0.191			2.12	20	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Dissolved Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060840 - EPA 200/3005 Diss										
Matrix Spike (4060840-MS1)	**Source: P4F0616-03**			Prepared: 06/18/04	Analyzed: 06/22/04					
Arsenic	0.112	0.00100	mg/l	0.100	0.00582	106	75-125			
Chromium	0.106	0.00100	"	0.100	ND	106	75-125			
Copper	0.102	0.00200	"	0.100	ND	102	75-125			
Lead	0.104	0.00100	"	0.100	0.000240	104	75-125			
Nickel	0.116	0.00200	"	0.100	0.0162	99.8	75-125			
Zinc	0.281	0.00500	"	0.100	0.191	90.0	75-125			
Matrix Spike (4060840-MS2)	**Source: P4F0616-04**			Prepared: 06/18/04	Analyzed: 06/22/04					
Arsenic	0.107	0.00100	mg/l	0.100	0.000660	106	75-125			
Chromium	0.106	0.00100	"	0.100	ND	106	75-125			
Copper	0.102	0.00200	"	0.100	ND	102	75-125			
Lead	0.104	0.00100	"	0.100	0.000310	104	75-125			
Nickel	0.104	0.00200	"	0.100	0.00445	99.6	75-125			
Zinc	0.139	0.00500	"	0.100	0.0383	101	75-125			

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434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

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 4061039 - EPA 5030B										
Blank (4061039-BLK1)				Prepared & Analyzed: 06/24/04						
Acetone	ND	25.0	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	"							

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

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 4061039 - EPA 5030B										
Blank (4061039-BLK1)				Prepared & Analyzed: 06/24/04						
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	"							
1,1,1,2-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	*17.5*		"	*20.0*		*87.5*	*75-120*			
Surr: 1,2-DCA-d4	*22.0*		"	*20.0*		*110*	*77-129*			
Surr: Dibromofluoromethane	*21.6*		"	*20.0*		*108*	*80-121*			
Surr: Toluene-d8	*20.9*		"	*20.0*		*104*	*80-120*			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

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 4061039 - EPA 5030B										
LCS (4061039-BS1)				Prepared & Analyzed: 06/24/04						
Benzene	20.4	1.00	ug/l	20.0		102	80-120			
Chlorobenzene	21.3	1.00	"	20.0		106	80-124			
1,1-Dichloroethene	19.2	1.00	"	20.0		96.0	78-120			
Toluene	21.1	1.00	"	20.0		106	80-124			
Trichloroethene	22.6	1.00	"	20.0		113	80-132			
Surr: 4-BFB	*21.1*		"	*20.0*		*106*	*75-120*			
Surr: 1,2-DCA-d4	*20.6*		"	*20.0*		*103*	*77-129*			
Surr: Dibromofluoromethane	*20.6*		"	*20.0*		*103*	*80-121*			
Surr: Toluene-d8	*21.0*		"	*20.0*		*105*	*80-120*			
Matrix Spike (4061039-MS1)	**Source: P4F0616-02**			Prepared & Analyzed: 06/24/04						
Benzene	21.5	1.00	ug/l	20.0	2.29	96.0	80-124			
Chlorobenzene	20.8	1.00	"	20.0	ND	104	72.9-134			
1,1-Dichloroethene	17.9	1.00	"	20.0	ND	89.5	79.3-127			
Toluene	18.1	1.00	"	20.0	ND	90.5	79.7-131			
Trichloroethene	20.3	1.00	"	20.0	ND	102	68.4-130			
Surr: 4-BFB	*19.7*		"	*20.0*		*98.5*	*75-120*			
Surr: 1,2-DCA-d4	*20.0*		"	*20.0*		*100*	*77-129*			
Surr: Dibromofluoromethane	*19.9*		"	*20.0*		*99.5*	*80-121*			
Surr: Toluene-d8	*18.7*		"	*20.0*		*93.5*	*80-120*			
Matrix Spike Dup (4061039-MSD1)	**Source: P4F0616-02**			Prepared & Analyzed: 06/24/04						
Benzene	21.8	1.00	ug/l	20.0	2.29	97.6	80-124	1.39	25	
Chlorobenzene	19.9	1.00	"	20.0	ND	99.5	72.9-134	4.42	25	
1,1-Dichloroethene	18.3	1.00	"	20.0	ND	91.5	79.3-127	2.21	25	
Toluene	18.6	1.00	"	20.0	ND	93.0	79.7-131	2.72	25	
Trichloroethene	19.4	1.00	"	20.0	ND	97.0	68.4-130	4.53	25	
Surr: 4-BFB	*19.8*		"	*20.0*		*99.0*	*75-120*			
Surr: 1,2-DCA-d4	*19.3*		"	*20.0*		*96.5*	*77-129*			
Surr: Dibromofluoromethane	*19.7*		"	*20.0*		*98.5*	*80-121*			
Surr: Toluene-d8	*19.6*		"	*20.0*		*98.0*	*80-120*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060792 - EPA 3510/600 Series										
Blank (4060792-BLK1)				Prepared: 06/18/04 Analyzed: 06/22/04						
Carbazole	ND	5.00	ug/l							
Acenaphthene	ND	5.00	"							
Acenaphthylene	ND	5.00	"							
Anthracene	ND	5.00	"							
Benzo (a) anthracene	ND	5.00	"							
Benzo (a) pyrene	ND	5.00	"							
Benzo (b) fluoranthene	ND	5.00	"							
Benzo (ghi) perylene	ND	5.00	"							
Benzo (k) fluoranthene	ND	5.00	"							
Benzoic Acid	ND	50.0	"							
Benzyl alcohol	ND	10.0	"							
4-Bromophenyl phenyl ether	ND	5.00	"							
Butyl benzyl phthalate	ND	5.00	"							
4-Chloro-3-methylphenol	ND	5.00	"							
4-Chloroaniline	ND	20.0	"							
Bis(2-chloroethoxy)methane	ND	10.0	"							
Bis(2-chloroethyl)ether	ND	5.00	"							
Bis(2-chloroisopropyl)ether	ND	10.0	"							
2-Chloronaphthalene	ND	5.00	"							
2-Chlorophenol	ND	5.00	"							
4-Chlorophenyl phenyl ether	ND	5.00	"							
Chrysene	ND	5.00	"							
Di-n-butyl phthalate	ND	5.00	"							
Di-n-octyl phthalate	ND	5.00	"							
Dibenzo (a,h) anthracene	ND	5.00	"							
Dibenzofuran	ND	5.00	"							
1,2-Dichlorobenzene	ND	5.00	"							
1,3-Dichlorobenzene	ND	5.00	"							
1,4-Dichlorobenzene	ND	5.00	"							
3,3'-Dichlorobenzidine	ND	5.00	"							
2,4-Dichlorophenol	ND	5.00	"							
Diethyl phthalate	ND	5.00	"							
2,4-Dimethylphenol	ND	10.0	"							
Dimethyl phthalate	ND	5.00	"							
4,6-Dinitro-2-methylphenol	ND	10.0	"							
2,4-Dinitrophenol	ND	25.0	"							

North Creek Analytical - Portland

Philip Nerenberg

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060792 - EPA 3510/600 Series										
Blank (4060792-BLK1)				Prepared: 06/18/04 Analyzed: 06/22/04						
2,4-Dinitrotoluene	ND	5.00	ug/l							
2,6-Dinitrotoluene	ND	5.00	"							
Bis(2-ethylhexyl)phthalate	ND	10.0	"							
Fluoranthene	ND	5.00	"							
Fluorene	ND	5.00	"							
Hexachlorobenzene	ND	5.00	"							
Hexachlorobutadiene	ND	10.0	"							
Hexachlorocyclopentadiene	ND	10.0	"							
Hexachloroethane	ND	10.0	"							
Indeno (1,2,3-cd) pyrene	ND	5.00	"							
Isophorone	ND	5.00	"							
2-Methylnaphthalene	ND	5.00	"							
2-Methylphenol	ND	10.0	"							
3-,4-Methylphenol	ND	5.00	"							
Naphthalene	ND	5.00	"							
2-Nitroaniline	ND	5.00	"							
3-Nitroaniline	ND	10.0	"							
4-Nitroaniline	ND	10.0	"							
Nitrobenzene	ND	5.00	"							
2-Nitrophenol	ND	5.00	"							
4-Nitrophenol	ND	25.0	"							
N-Nitrosodi-n-propylamine	ND	10.0	"							
N-Nitrosodiphenylamine	ND	5.00	"							
Pentachlorophenol	ND	10.0	"							
Phenanthrene	ND	5.00	"							
Phenol	ND	5.00	"							
Pyrene	ND	5.00	"							
1,2,4-Trichlorobenzene	ND	5.00	"							
2,4,5-Trichlorophenol	ND	5.00	"							
2,4,6-Trichlorophenol	ND	5.00	"							
Surr: 2-Fluorobiphenyl	*61.8*		"	*75.0*		*82.4*	*26-135*			
Surr: 2-Fluorophenol	*70.5*		"	*150*		*47.0*	*6-124*			
Surr: Nitrobenzene-d5	*71.8*		"	*75.0*		*95.7*	*23-147*			
Surr: Phenol-d6	*48.3*		"	*150*		*32.2*	*11-130*			
Surr: p-Terphenyl-d14	*87.4*		"	*75.0*		*117*	*38-149*			
Surr: 2,4,6-Tribromophenol	*155*		"	*150*		*103*	*19-126*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060792 - EPA 3510/600 Series										
LCS (4060792-BS1)				Prepared: 06/18/04 Analyzed: 06/22/04						
Acenaphthene	63.9	5.00	ug/l	75.0		85.2	40-110			
4-Chloro-3-methylphenol	134	5.00	"	150		89.3	40-110			
2-Chlorophenol	96.0	5.00	"	150		64.0	40-110			
1,4-Dichlorobenzene	35.8	5.00	"	75.0		47.7	20-90			
2,4-Dinitrotoluene	78.2	5.00	"	75.0		104	50-110			
4-Nitrophenol	69.0	25.0	"	150		46.0	15-100			
N-Nitrosodi-n-propylamine	65.4	10.0	"	75.0		87.2	40-110			
Pentachlorophenol	122	10.0	"	150		81.3	30-120			
Phenol	42.2	5.00	"	150		28.1	15-110			
Pyrene	84.0	5.00	"	75.0		112	40-110			Q-29
1,2,4-Trichlorobenzene	44.9	5.00	"	75.0		59.9	25-100			
Surr: 2-Fluorobiphenyl	*59.8*		"	*75.0*		*79.7*	*26-135*			
Surr: 2-Fluorophenol	*69.2*		"	*150*		*46.1*	*6-124*			
Surr: Nitrobenzene-d5	*68.8*		"	*75.0*		*91.7*	*23-147*			
Surr: Phenol-d6	*47.4*		"	*150*		*31.6*	*11-130*			
Surr: p-Terphenyl-d14	*92.4*		"	*75.0*		*123*	*38-149*			
Surr: 2,4,6-Tribromophenol	*165*		"	*150*		*110*	*19-126*			
LCS Dup (4060792-BSD1)				Prepared: 06/18/04 Analyzed: 06/22/04						
Acenaphthene	73.4	5.00	ug/l	75.0		97.9	40-110	13.8	36	
4-Chloro-3-methylphenol	146	5.00	"	150		97.3	40-110	8.57	43	
2-Chlorophenol	106	5.00	"	150		70.7	40-110	9.90	38	
1,4-Dichlorobenzene	43.1	5.00	"	75.0		57.5	20-90	18.5	43	
2,4-Dinitrotoluene	84.3	5.00	"	75.0		112	50-110	7.51	31	Q-29
4-Nitrophenol	76.0	25.0	"	150		50.7	15-100	9.66	36	
N-Nitrosodi-n-propylamine	73.2	10.0	"	75.0		97.6	40-110	11.3	37	
Pentachlorophenol	132	10.0	"	150		88.0	30-120	7.87	40	
Phenol	46.7	5.00	"	150		31.1	15-110	10.1	36	
Pyrene	82.4	5.00	"	75.0		110	40-110	1.92	31	
1,2,4-Trichlorobenzene	53.8	5.00	"	75.0		71.7	25-100	18.0	42	
Surr: 2-Fluorobiphenyl	*69.4*		"	*75.0*		*92.5*	*26-135*			
Surr: 2-Fluorophenol	*75.7*		"	*150*		*50.5*	*6-124*			
Surr: Nitrobenzene-d5	*77.4*		"	*75.0*		*103*	*23-147*			
Surr: Phenol-d6	*52.6*		"	*150*		*35.1*	*11-130*			
Surr: p-Terphenyl-d14	*90.3*		"	*75.0*		*120*	*38-149*			
Surr: 2,4,6-Tribromophenol	*180*		"	*150*		*120*	*19-126*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Edc	07/02/04 13:22

Semivolatile Organic Compounds per EPA Method 8270C - Quality Control

North Creek Analytical - Portland

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

Batch 4060792 - EPA 3510/600 Series

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060793 - EPA 3510/600 Series										
Blank (4060793-BLK1)				Prepared & Analyzed: 06/18/04						
Acenaphthene	ND	0.100	ug/l							
Acenaphthylene	ND	0.100	"							
Anthracene	ND	0.100	"							
Benzo (a) anthracene	ND	0.100	"							
Benzo (a) pyrene	ND	0.100	"							
Benzo (b) fluoranthene	ND	0.100	"							
Benzo (ghi) perylene	ND	0.100	"							
Benzo (k) fluoranthene	ND	0.100	"							
Chrysene	ND	0.100	"							
Dibenzo (a,h) anthracene	ND	0.200	"							
Fluoranthene	ND	0.100	"							
Fluorene	ND	0.100	"							
Indeno (1,2,3-cd) pyrene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Phenanthrene	ND	0.100	"							
Pyrene	ND	0.100	"							
Surr: Fluorene-d10	*2.59*		"	*2.50*		*104*	*25-125*			
Surr: Pyrene-d10	*3.02*		"	*2.50*		*121*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.75*		"	*2.50*		*110*	*10-125*			
Blank (4060793-BLK2)				Prepared: 06/18/04 Analyzed: 06/29/04						J
Benzo (a) anthracene	ND	0.0100	ug/l							
Benzo (a) pyrene	ND	0.0100	"							
Benzo (b) fluoranthene	ND	0.0100	"							
Benzo (k) fluoranthene	ND	0.0100	"							
Chrysene	ND	0.0100	"							
Dibenzo (a,h) anthracene	ND	0.0100	"							
Indeno (1,2,3-cd) pyrene	ND	0.0100	"							
Surr: Benzo (a) pyrene-d12	*2.26*		"	*2.50*		*90.4*	*10-125*			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060793 - EPA 3510/600 Series										
LCS (4060793-BS1)				Prepared & Analyzed: 06/18/04						
Acenaphthene	2.13	0.100	ug/l	2.50		85.2	26-135			
Benzo (a) pyrene	1.96	0.100	"	2.50		78.4	38-137			
Pyrene	2.49	0.100	"	2.50		99.6	33-133			
Surr: Fluorene-d10	*2.56*		"	*2.50*		*102*	*25-125*			
Surr: Pyrene-d10	*3.17*		"	*2.50*		*127*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.61*		"	*2.50*		*104*	*10-125*			
LCS Dup (4060793-BSD1)				Prepared & Analyzed: 06/18/04						
Acenaphthene	2.36	0.100	ug/l	2.50		94.4	26-135	10.2	60	
Benzo (a) pyrene	2.08	0.100	"	2.50		83.2	38-137	5.94	60	
Pyrene	2.58	0.100	"	2.50		103	33-133	3.55	60	
Surr: Fluorene-d10	*2.83*		"	*2.50*		*113*	*25-125*			
Surr: Pyrene-d10	*3.22*		"	*2.50*		*129*	*23-150*			
Surr: Benzo (a) pyrene-d12	*2.72*		"	*2.50*		*109*	*10-125*			

North Creek Analytical - Portland

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Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060978 - General Preparation										
Blank (4060978-BLK1)				Prepared: 06/23/04 Analyzed: 06/24/04						
Cyanide (total)	ND	0.00500	mg/l							
LCS (4060978-BS1)				Prepared: 06/23/04 Analyzed: 06/24/04						
Cyanide (total)	0.185	0.00500	mg/l	0.200		92.5	75-125			
Duplicate (4060978-DUP1)		Source: P4F0569-03		Prepared: 06/23/04 Analyzed: 06/24/04						
Cyanide (total)	0.113	0.00500	mg/l		0.110			2.69	20	
Matrix Spike (4060978-MS1)		Source: P4F0569-03		Prepared: 06/23/04 Analyzed: 06/24/04						
Cyanide (total)	0.280	0.00500	mg/l	0.200	0.110	85.0	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	07/02/04 13:22

Notes and Definitions

J	Estimated value.
Q-03	The matrix spike recovery, and/or RPD, for this QC sample cannot be accurately calculated due to the high concentration of analyte already present in the source sample.
Q-29	The recovery for the Laboratory Control Sample, and/or LCS Duplicate, for this analyte was above method specified criteria. All samples were Non Detect for this analyte, therefore Data Quality is not affected.
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 (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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APPENDIX G

Chain-of-Custody Documentation and Laboratory Analytical Reports:
August 2004 Groundwater Monitoring Event

nca

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20332 Empire Ave Suite F-1, Bend, OR 99701-5711 541-383-9310 FAX 382-7588
3209 Denali St, Anchorage, AK 99503-4030 907-334-9200 FAX 334-9210

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: Hahn and Associates, Inc.

REPORT TO: Rob Ede
ADDRESS: HAI
PHONE: 509-796-0717 FAX:

INVOICE TO: HAI
- pricing & reporting as per Philip Nomberg.

P.O. NUMBER: 2708-30

PROJECT NAME: 2708-30
PROJECT NUMBER: 2708-30
SAMPLED BY: MWG/APR

TURNAROUND REQUEST
in Business Days *

Organic & Inorganic Analyses: ~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: ~~5~~ STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PAH's EPA 8270 SIM (None)	EPA BTEX 8021 (HCL)	EPA Tot. Cyn. 9010 (NaOH)	EPA Amen. Cyn. 9010 (NaOH)	EPA Tot. Metals 6010 (HNO3)								MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1 2708-040812-MW7-29-001	8-12-04/1516	X	X	X	X	X								W	6	*As, Cr, Cu, Ni, Pb, Zn	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

RELEASED BY: Matt Graves DATE: 8-12-04
PRINT NAME: MATT GRAVES FIRM: HAI TIME:

RECEIVED BY: [signature] DATE: 8/13/04
PRINT NAME: Rafi F. FIRM: NCA TIME: 10:05 am

RELEASED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

TEMP:

COC REV 1/03

PAGE OF

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November 03, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: NWNG Gasco Site

Enclosed are the results of analyses for samples received by the laboratory on 08/13/04 10:40.
The following list is a summary of the NCA Work Orders contained in this report.
If you have any questions concerning this report, please feel free to contact me.

Work	Project	ProjectNumber
P4H0513	NWNG Gasco Site	HAI 2708-30

Thank You,

Crystal Jones For Philip Nerenberg, Laboratory Manager

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North Creek Analytical, Inc.
Environmental Laboratory Network

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Hahn and Associates, Inc.	Project Name:	**NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	08/27/04 12:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040812-MW9-29-001	P4H0513-01	Water	08/12/04 15:16	08/13/04 10:40

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Crystal Jones For Philip Nercnberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	08/27/04 12:12

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	08/27/04 12:12

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080647 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4080647-BLK1)							**Extracted: 08/17/04 08:59**							
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/17/04 09:53	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 104%*		*Limits: 70-130%*		"							*08/17/04 09:53*	
LCS (4080647-BS1)							**Extracted: 08/17/04 08:59**							
Benzene	EPA 8021B	20.0	---	0.500	ug/l	1x	--	20.0	100%	(70-130)	--	--	08/17/04 10:22	
Toluene	"	20.6	---	0.500	"	"	--	"	103%	(76-129)	--	--	"	
Ethylbenzene	"	21.0	---	0.500	"	"	--	"	105%	(82-130)	--	--	"	
Xylenes (total)	"	61.7	---	1.00	"	"	--	60.0	103%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 106%*		*Limits: 70-130%*		"							*08/17/04 10:22*	
Matrix Spike (4080647-MS1)							**QC Source: P4H0513-01**						**Extracted: 08/17/04 08:59**	
Benzene	EPA 8021B	18.8	---	0.500	ug/l	1x	ND	20.0	94.0%	(65-144)	--	--	08/17/04 11:59	
Toluene	"	19.1	---	0.500	"	"	ND	"	95.5%	(68-139)	--	--	"	
Ethylbenzene	"	19.4	---	0.500	"	"	ND	"	97.0%	(69-144)	--	--	"	
Xylenes (total)	"	56.6	---	1.00	"	"	ND	60.0	94.3%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 96.0%*		*Limits: 70-130%*		"							*08/17/04 11:59*	
Matrix Spike Dup (4080647-MSD1)							**QC Source: P4H0513-01**						**Extracted: 08/17/04 08:59**	
Benzene	EPA 8021B	19.0	---	0.500	ug/l	1x	ND	20.0	95.0%	(65-144)	1.06%	(20)	08/17/04 12:29	
Toluene	"	19.4	---	0.500	"	"	ND	"	97.0%	(68-139)	1.56%	"	"	
Ethylbenzene	"	19.7	---	0.500	"	"	ND	"	98.5%	(69-144)	1.53%	"	"	
Xylenes (total)	"	57.5	---	1.00	"	"	ND	60.0	95.8%	(60-144)	1.58%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 96.8%*		*Limits: 70-130%*		"							*08/17/04 12:29*	

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	08/27/04 12:12

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080802 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4080802-BLK1)								Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	ND	---	0.00100	mg/l	1x	--	--	--	--	--	--	08/21/04 19:41	
Chromium	"	ND	---	0.00100	"	"	--	--	--	--	--	--	08/22/04 18:47	
Copper	"	ND	---	0.00200	"	"	--	--	--	--	--	--	08/21/04 19:41	
Lead	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Nickel	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Zinc	"	ND	---	0.00500	"	"	--	--	--	--	--	--	"	
LCS (4080802-BS1)								Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	0.0944	---	0.00100	mg/l	1x	--	0.100	94.4%	(80-120)	--	--	08/21/04 19:48	
Chromium	"	0.105	---	0.00100	"	"	--	"	105%	"	--	--	"	
Copper	"	0.0987	---	0.00200	"	"	--	"	98.7%	"	--	--	"	
Lead	"	0.0920	---	0.00100	"	"	--	"	92.0%	"	--	--	"	
Nickel	"	0.104	---	0.00200	"	"	--	"	104%	"	--	--	"	
Zinc	"	0.0936	---	0.00500	"	"	--	"	93.6%	"	--	--	"	
LCS Dup (4080802-BSD1)								Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	0.0958	---	0.00100	mg/l	1x	--	0.100	95.8%	(80-120)	1.47%	(20)	08/21/04 19:54	
Chromium	"	0.102	---	0.00100	"	"	--	"	102%	"	2.90%	"	"	
Copper	"	0.0993	---	0.00200	"	"	--	"	99.3%	"	0.606%	"	"	
Lead	"	0.0914	---	0.00100	"	"	--	"	91.4%	"	0.654%	"	"	
Nickel	"	0.102	---	0.00200	"	"	--	"	102%	"	1.94%	"	"	
Zinc	"	0.0939	---	0.00500	"	"	--	"	93.9%	"	0.320%	"	"	
Duplicate (4080802-DUP1)				QC Source: P4H0552-01				Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	0.00144	---	0.00100	mg/l	1x	0.00161	--	--	--	11.1%	(20)	08/21/04 21:04	
Chromium	"	0.00145	---	0.00100	"	"	0.00169	--	--	--	15.3%	"	"	
Copper	"	0.00165	---	0.00200	"	"	ND	--	--	--	NR	"	"	
Lead	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Nickel	"	0.0104	---	0.00200	"	"	0.0105	--	--	--	0.957%	"	"	
Zinc	"	0.00402	---	0.00500	"	"	ND	--	--	--	NR	"	"	
Matrix Spike (4080802-MS1)				QC Source: P4H0552-01				Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	0.101	---	0.00100	mg/l	1x	0.00161	0.100	99.4%	(75-125)	--	--	08/21/04 20:01	
Chromium	"	0.104	---	0.00100	"	"	0.00169	"	102%	"	--	--	"	
Copper	"	0.0960	---	0.00200	"	"	ND	"	94.4%	"	--	--	"	
Lead	"	0.0865	---	0.00100	"	"	ND	"	86.5%	"	--	--	"	
Nickel	"	0.110	---	0.00200	"	"	0.0105	"	99.5%	"	--	--	"	
Zinc	"	0.0970	---	0.00500	"	"	ND	"	93.3%	"	--	--	"	

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Crystal Jones For Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name:	**NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	08/27/04 12:12

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080802 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (4080802-MS2)				QC Source: P4H0552-02				Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	0.105	---	0.00100	mg/l	1x	0.00772	0.100	97.3%	(75-125)	--	--	08/21/04 20:13	
Chromium	"	0.104	---	0.00100	"	"	0.00180	"	102%	"	--	--	"	
Copper	"	0.0976	---	0.00200	"	"	0.00237	"	95.2%	"	--	--	"	
Lead	"	0.0867	---	0.00100	"	"	ND	"	86.7%	"	--	--	"	
Nickel	"	0.111	---	0.00200	"	"	0.0138	"	97.2%	"	--	--	"	
Zinc	"	0.100	---	0.00500	"	"	0.00613	"	93.9%	"	--	--	"	

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434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	08/27/04 12:12

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080770 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4080770-BLK1)							**Extracted: 08/19/04 08:03**							
Acenaphthene	EPA 8270m	ND	---	0.100	ug/l	1x	--	--	--	--	--	--	08/23/04 19:42	
Acenaphthylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 84.4%*			*Limits: 25-125%*	"							*08/23/04 19:42*	
Pyrene-d10		*63.6%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*62.0%*			*10-125%*	"							"	
LCS (4080770-BS1)							**Extracted: 08/19/04 08:03**							
Acenaphthene	EPA 8270m	1.64	---	0.100	ug/l	1x	--	2.50	65.6%	(26-135)	--	--	08/23/04 18:43	
Benzo (a) pyrene	"	1.32	---	0.100	"	"	--	"	52.8%	(38-137)	--	--	"	
Pyrene	"	1.33	---	0.100	"	"	--	"	53.2%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 79.6%*			*Limits: 25-125%*	"							*08/23/04 18:43*	
Pyrene-d10		*58.8%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*57.6%*			*10-125%*	"							"	
LCS Dup (4080770-BSD1)							**Extracted: 08/19/04 08:03**							
Acenaphthene	EPA 8270m	1.77	---	0.100	ug/l	1x	--	2.50	70.8%	(26-135)	7.62%	(60)	08/23/04 19:13	
Benzo (a) pyrene	"	1.35	---	0.100	"	"	--	"	54.0%	(38-137)	2.25%	"	"	
Pyrene	"	1.36	---	0.100	"	"	--	"	54.4%	(33-133)	2.23%	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 83.2%*			*Limits: 25-125%*	"							*08/23/04 19:13*	
Pyrene-d10		*58.0%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*56.4%*			*10-125%*	"							"	

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Crystal Jones For Philip Nercnberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name:	NWNG Gasco Site	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	08/27/04 12:12

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080967 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4080967-BLK1)								Extracted: 08/24/04 09:59						
Cyanide (total)	EPA 9012A	ND	---	0.00500	mg/l	1x	--	--	--	--	--	--	08/25/04 15:48	
LCS (4080967-BS1)								Extracted: 08/24/04 09:59						
Cyanide (total)	EPA 9012A	0.189	---	0.00500	mg/l	1x	--	0.200	94.5%	(75-125)	--	--	08/25/04 15:48	
Duplicate (4080967-DUP1)				QC Source: P4H0513-01				Extracted: 08/24/04 09:59						
Cyanide (total)	EPA 9012A	0.0146	---	0.00500	mg/l	1x	0.0125	--	--	--	15.5%	(20)	08/25/04 15:48	
Matrix Spike (4080967-MS1)				QC Source: P4H0513-01				Extracted: 08/24/04 09:59						
Cyanide (total)	EPA 9012A	0.194	---	0.00500	mg/l	1x	0.0125	0.200	90.8%	(75-125)	--	--	08/25/04 15:48	

North Creek Analytical - Portland

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Crystal Jones For Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name:	**NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	08/27/04 12:12

Notes and Definitions

Report Specific Notes:

None

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR / NA - Not Reported / Not Available

dry - Sample results reported on a dry weight basis. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

RPD - Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

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3209 Denali St, Anchorage, AK 99503-4030 907-334-9200 FAX 334-9210

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: Hahnan Associates, Inc.

REPORT TO: Rob Ede
ADDRESS: HAI

PHONE: 503-726-0917 FAX:

INVOICE TO:
HAI
pricing & reporting as per Philip Nordberg.

P.O. NUMBER: 2708-30

PROJECT NAME:

PROJECT NUMBER: 2708-30

SAMPLED BY: MWG/APR

TURNAROUND REQUEST
in Business Days *
Organic & Inorganic Analyses
~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses
~~5~~ STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE: None | HCL | HNO3 | NaOH | H2SO4

REQUESTED ANALYSES: PAH's EPA 8270 | BTEX EPA 8021 | Tot. Cyn. EPA 9010 | Amen. Cyn. EPA 9013 | Tot. Metals EPA 6010 (8)

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PAH's	BTEX	Tot. Cyn.	Amen. Cyn.	Tot. Metals	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
12708-040813-MW2-61-002	8-13-04 / 8:55	X	X	X	X	X	W	6	(8) As, Cr, Cd, Ni, Pb, Zn	
22708-040813-MW13-61-003	8-13-04 / 10:20	X	X	X	X	X	W	6	"	
32708-040813-MW7-004	8-13-04 / 11:00	X	X				W	5	"	
42708-040813-MW10-61-005	8-13-04 / 12:15	X	X	X	X	X	W	6	"	
52708-040813-MW13-61-006	8-13-04 13:57	X	X	X	X	X	W	6	"	
6										
7										
8										
9										
10										

RELEASED BY: Matt Graves
PRINT NAME: Matt Graves FIRM: HAI DATE: 8-13-04 TIME:

RECEIVED BY:
PRINT NAME: FIRM: NCA DATE: 8/16/04 TIME: 15:27

RELEASED BY:
PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS:

TEMP:

COC REV 1/03

PAGE OF

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November 03, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: NWNG Gasco Site

Enclosed are the results of analyses for samples received by the laboratory on 08/16/04 17:03.
The following list is a summary of the NCA Work Orders contained in this report.
If you have any questions concerning this report, please feel free to contact me.

Work	Project	ProjectNumber
P4H0552	NWNG Gasco Site	HAI 2708-30

Thank You,

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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North Creek Analytical, Inc.
Environmental Laboratory Network

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Hahn and Associates, Inc.	Project Name:	**NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/03/04 13:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040813-MW2-61-002	P4H0552-01	Water	08/13/04 08:55	08/16/04 17:03
2708-040813-MW13-61-003	P4H0552-02	Water	08/13/04 10:20	08/16/04 17:03
2708-040813-MW7-004	P4H0552-03	Water	08/13/04 11:00	08/16/04 17:03
2708-040813-MW10-61-005	P4H0552-04	Water	08/13/04 12:15	08/16/04 17:03
2708-040813-MW15-66-006	P4H0552-05	Water	08/13/04 13:57	08/16/04 17:03

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-01 Water	**2708-040813-MW2-61-002**			**Sampled: 08/13/04 08:55**						
Benzene	EPA 8021B	ND	-----	0.500	ug/l	1x	4080834	08/20/04	08/20/04 11:39	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 110%*		*Limits: 70 - 130 %*		"			"	
P4H0552-02 Water	**2708-040813-MW13-61-003**			**Sampled: 08/13/04 10:20**						
Benzene	EPA 8021B	**2.19**	-----	0.500	ug/l	1x	4080834	08/20/04	08/20/04 12:07	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 108%*		*Limits: 70 - 130 %*		"			"	
P4H0552-03 Water	**2708-040813-MW7-004**			**Sampled: 08/13/04 11:00**						
Benzene	EPA 8021B	ND	-----	0.500	ug/l	1x	4080834	08/20/04	08/20/04 12:35	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 111%*		*Limits: 70 - 130 %*		"			"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-04 Water	**2708-040813-MW10-61-005**			**Sampled: 08/13/04 12:15**						
Benzene	EPA 8021B	ND	-----	0.500	ug/l	1x	4080834	08/20/04	08/20/04 13:03	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 110%*		*Limits: 70 - 130 %*	"				"	
P4H0552-05 Water	**2708-040813-MW15-66-006**			**Sampled: 08/13/04 13:57**						
Benzene	EPA 8021B	ND	-----	0.500	ug/l	1x	4080834	08/20/04	08/20/04 13:32	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 111%*		*Limits: 70 - 130 %*	"				"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/03/04 13:02

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-01	**Water**	**2708-040813-MW2-61-002**			**Sampled: 08/13/04 08:55**						
Arsenic		EPA 6020	**0.00161**	-----	0.00100	mg/l	1x	4080802	08/19/04	08/21/04 20:52	
Chromium		"	**0.00169**	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.0105**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	
P4H0552-02	**Water**	**2708-040813-MW13-61-003**			**Sampled: 08/13/04 10:20**						
Arsenic		EPA 6020	**0.00772**	-----	0.00100	mg/l	1x	4080802	08/19/04	08/21/04 21:11	
Chromium		"	**0.00180**	-----	0.00100	"	"	"	"	"	
Copper		"	**0.00237**	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.0138**	-----	0.00200	"	"	"	"	"	
Zinc		"	**0.00613**	-----	0.00500	"	"	"	"	"	
P4H0552-04	**Water**	**2708-040813-MW10-61-005**			**Sampled: 08/13/04 12:15**						
Arsenic		EPA 6020	**0.00227**	-----	0.00100	mg/l	1x	4080802	08/19/04	08/21/04 21:24	
Chromium		"	**0.00355**	-----	0.00100	"	"	"	"	"	
Copper		"	**0.00414**	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.0130**	-----	0.00200	"	"	"	"	"	
Zinc		"	**0.0183**	-----	0.00500	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name:	**NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/03/04 13:02

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-05	**Water**	**2708-040813-MW15-66-006**			**Sampled: 08/13/04 13:57**						
Arsenic		EPA 6020	**0.00477**	-----	0.00100	mg/l	1x	4080802	08/19/04	08/21/04 21:36	
Chromium		"	**0.00270**	-----	0.00100	"	"	"	"	"	
Copper		"	**0.00295**	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00553**	-----	0.00200	"	"	"	"	"	
Zinc		"	**0.00895**	-----	0.00500	"	"	"	"	"	

North Creek Analytical - Portland

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434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-01 Water	**2708-040813-MW2-61-002**			**Sampled: 08/13/04 08:55**						
Acenaphthene	EPA 8270m	ND	-----	0.100	ug/l	1x	4080770	08/19/04	08/24/04 16:58	
Acenaphthylene	"	ND	-----	0.100	"	"	"	"	"	
Anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Chrysene	"	ND	-----	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.200	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Fluorene	"	ND	-----	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Naphthalene	"	ND	-----	0.100	"	"	"	"	"	
Phenanthrene	"	ND	-----	0.100	"	"	"	"	"	
Pyrene	"	ND	-----	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 71.4%*		*Limits: 25 - 125 %*	"				"	
Pyrene-d10		*62.6%*		*23 - 150 %*	"				"	
Benzo (a) pyrene-d12		*36.4%*		*10 - 125 %*	"				"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/03/04 13:02

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-02 Water	**2708-040813-MW13-61-003**			**Sampled: 08/13/04 10:20**						
Acenaphthene	EPA 8270m	**0.115**	-----	0.100	ug/l	1x	4080770	08/19/04	08/24/04 17:24	
Acenaphthylene	"	ND	-----	0.100	"	"	"	"	"	
Anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Chrysene	"	ND	-----	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.200	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Fluorene	"	ND	-----	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Naphthalene	"	**0.168**	-----	0.100	"	"	"	"	"	
Phenanthrene	"	ND	-----	0.100	"	"	"	"	"	
Pyrene	"	ND	-----	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 84.5%*		*Limits: 25 - 125 %*		"			"	
Pyrene-d10		*68.5%*		*23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*47.1%*		*10 - 125 %*		"			"	

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-03 Water	**2708-040813-MW7-004**			**Sampled: 08/13/04 11:00**						
Acenaphthene	EPA 8270m	ND	-----	0.100	ug/l	1x	4080770	08/19/04	08/24/04 17:50	
Acenaphthylene	"	ND	-----	0.100	"	"	"	"	"	
Anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Chrysene	"	ND	-----	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.200	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Fluorene	"	ND	-----	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Naphthalene	"	ND	-----	0.100	"	"	"	"	"	
Phenanthrene	"	ND	-----	0.100	"	"	"	"	"	
Pyrene	"	ND	-----	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 60.9%*		*Limits: 25 - 125 %*		"			"	
Pyrene-d10		*68.9%*		*23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*52.1%*		*10 - 125 %*		"			"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-04 Water	**2708-040813-MW10-61-005**			**Sampled: 08/13/04 12:15**						
Acenaphthene	EPA 8270m	ND	-----	0.100	ug/l	1x	4080770	08/19/04	08/24/04 18:43	
Acenaphthylene	"	ND	-----	0.100	"	"	"	"	"	
Anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	**0.104**	-----	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	**0.111**	-----	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Chrysene	"	ND	-----	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.200	"	"	"	"	"	
Fluoranthene	"	**0.135**	-----	0.100	"	"	"	"	"	
Fluorene	"	ND	-----	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Naphthalene	"	ND	-----	0.100	"	"	"	"	"	
Phenanthrene	"	ND	-----	0.100	"	"	"	"	"	
Pyrene	"	**0.177**	-----	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 76.9%*		*Limits: 25 - 125 %*		"			"	
Pyrene-d10		*73.9%*		*23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*62.6%*		*10 - 125 %*		"			"	

North Creek Analytical - Portland

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434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-05 Water	**2708-040813-MW15-66-006**			**Sampled: 08/13/04 13:57**						
Acenaphthene	EPA 8270m	ND	-----	0.100	ug/l	1x	4080770	08/19/04	08/24/04 18:17	
Acenaphthylene	"	ND	-----	0.100	"	"	"	"	"	
Anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Chrysene	"	ND	-----	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	0.200	"	"	"	"	"	
Fluoranthene	"	ND	-----	0.100	"	"	"	"	"	
Fluorene	"	ND	-----	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	0.100	"	"	"	"	"	
Naphthalene	"	ND	-----	0.100	"	"	"	"	"	
Phenanthrene	"	ND	-----	0.100	"	"	"	"	"	
Pyrene	"	ND	-----	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 69.3%*		*Limits: 25 - 125 %*	"				"	
Pyrene-d10		*76.1%*		*23 - 150 %*	"				"	
Benzo (a) pyrene-d12		*66.4%*		*10 - 125 %*	"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0552-01	**Water**	**2708-040813-MW2-61-002**			**Sampled: 08/13/04 08:55**						
Cyanide (amenable)		EPA 9010A	**0.0850**	-----	0.0500	mg/l	10x	4080967	08/24/04	08/25/04 15:48	
Cyanide (total)		EPA 9012A	**0.819**	-----	0.0500	"	"	"	"	"	
P4H0552-02	**Water**	**2708-040813-MW13-61-003**			**Sampled: 08/13/04 10:20**						
Cyanide (amenable)		EPA 9010A	**0.0423**	-----	0.00500	mg/l	1x	4080967	08/24/04	08/25/04 15:48	
Cyanide (total)		EPA 9012A	**0.125**	-----	0.00500	"	"	"	"	"	
P4H0552-04	**Water**	**2708-040813-MW10-61-005**			**Sampled: 08/13/04 12:15**						
Cyanide (amenable)		EPA 9010A	**0.0321**	-----	0.00500	mg/l	1x	4080967	08/24/04	08/25/04 15:48	
Cyanide (total)		EPA 9012A	**0.0614**	-----	0.00500	"	"	"	"	"	
P4H0552-05	**Water**	**2708-040813-MW15-66-006**			**Sampled: 08/13/04 13:57**						
Cyanide (amenable)		EPA 9010A	ND	-----	0.00500	mg/l	1x	4080967	08/24/04	08/25/04 15:48	
Cyanide (total)		EPA 9012A	ND	-----	0.00500	"	"	"	"	"	

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080834 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4080834-BLK1)									Extracted: 08/20/04 08:51					
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/20/04 09:43	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 117%*		*Limits: 70-130%*		"							*08/20/04 09:43*	
LCS (4080834-BS1)									Extracted: 08/20/04 08:51					
Benzene	EPA 8021B	22.8	---	0.500	ug/l	1x	--	20.0	114%	(70-130)	--	--	08/20/04 10:10	
Toluene	"	21.6	---	0.500	"	"	--	"	108%	(76-129)	--	--	"	
Ethylbenzene	"	21.9	---	0.500	"	"	--	"	110%	(82-130)	--	--	"	
Xylenes (total)	"	65.2	---	1.00	"	"	--	60.0	109%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 110%*		*Limits: 70-130%*		"							*08/20/04 10:10*	
Matrix Spike (4080834-MS1)							QC Source: P4H0552-01		Extracted: 08/20/04 08:51					
Benzene	EPA 8021B	21.7	---	0.500	ug/l	1x	ND	20.0	108%	(65-144)	--	--	08/20/04 10:39	
Toluene	"	20.6	---	0.500	"	"	ND	"	103%	(68-139)	--	--	"	
Ethylbenzene	"	20.7	---	0.500	"	"	ND	"	104%	(69-144)	--	--	"	
Xylenes (total)	"	61.8	---	1.00	"	"	ND	60.0	103%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 113%*		*Limits: 70-130%*		"							*08/20/04 10:39*	
Matrix Spike Dup (4080834-MSD1)							QC Source: P4H0552-01		Extracted: 08/20/04 08:51					
Benzene	EPA 8021B	19.2	---	0.500	ug/l	1x	ND	20.0	96.0%	(65-144)	12.2%	(20)	08/20/04 11:07	
Toluene	"	18.4	---	0.500	"	"	ND	"	92.0%	(68-139)	11.3%	"	"	
Ethylbenzene	"	18.5	---	0.500	"	"	ND	"	92.5%	(69-144)	11.2%	"	"	
Xylenes (total)	"	54.8	---	1.00	"	"	ND	60.0	91.3%	(60-144)	12.0%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 112%*		*Limits: 70-130%*		"							*08/20/04 11:07*	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/03/04 13:02

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080802 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4080802-BLK1)								Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	ND	---	0.00100	mg/l	1x	--	--	--	--	--	--	08/21/04 19:41	
Chromium	"	ND	---	0.00100	"	"	--	--	--	--	--	--	08/22/04 18:47	
Copper	"	ND	---	0.00200	"	"	--	--	--	--	--	--	08/21/04 19:41	
Lead	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Nickel	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Zinc	"	ND	---	0.00500	"	"	--	--	--	--	--	--	"	
LCS (4080802-BS1)								Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	0.0944	---	0.00100	mg/l	1x	--	0.100	94.4%	(80-120)	--	--	08/21/04 19:48	
Chromium	"	0.105	---	0.00100	"	"	--	"	105%	"	--	--	"	
Copper	"	0.0987	---	0.00200	"	"	--	"	98.7%	"	--	--	"	
Lead	"	0.0920	---	0.00100	"	"	--	"	92.0%	"	--	--	"	
Nickel	"	0.104	---	0.00200	"	"	--	"	104%	"	--	--	"	
Zinc	"	0.0936	---	0.00500	"	"	--	"	93.6%	"	--	--	"	
LCS Dup (4080802-BSD1)								Extracted: 08/19/04 13:11						
Arsenic	EPA 6020	0.0958	---	0.00100	mg/l	1x	--	0.100	95.8%	(80-120)	1.47%	(20)	08/21/04 19:54	
Chromium	"	0.102	---	0.00100	"	"	--	"	102%	"	2.90%	"	"	
Copper	"	0.0993	---	0.00200	"	"	--	"	99.3%	"	0.606%	"	"	
Lead	"	0.0914	---	0.00100	"	"	--	"	91.4%	"	0.654%	"	"	
Nickel	"	0.102	---	0.00200	"	"	--	"	102%	"	1.94%	"	"	
Zinc	"	0.0939	---	0.00500	"	"	--	"	93.9%	"	0.320%	"	"	
Duplicate (4080802-DUP1)					QC Source: P4H0552-01				Extracted: 08/19/04 13:11					
Arsenic	EPA 6020	0.00144	---	0.00100	mg/l	1x	0.00161	--	--	--	11.1%	(20)	08/21/04 21:04	
Chromium	"	0.00145	---	0.00100	"	"	0.00169	--	--	--	15.3%	"	"	
Copper	"	0.00165	---	0.00200	"	"	ND	--	--	--	NR	"	"	
Lead	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Nickel	"	0.0104	---	0.00200	"	"	0.0105	--	--	--	0.957%	"	"	
Zinc	"	0.00402	---	0.00500	"	"	ND	--	--	--	NR	"	"	
Matrix Spike (4080802-MS1)					QC Source: P4H0552-01				Extracted: 08/19/04 13:11					
Arsenic	EPA 6020	0.101	---	0.00100	mg/l	1x	0.00161	0.100	99.4%	(75-125)	--	--	08/21/04 20:01	
Chromium	"	0.104	---	0.00100	"	"	0.00169	"	102%	"	--	--	"	
Copper	"	0.0960	---	0.00200	"	"	ND	"	94.4%	"	--	--	"	
Lead	"	0.0865	---	0.00100	"	"	ND	"	86.5%	"	--	--	"	
Nickel	"	0.110	---	0.00200	"	"	0.0105	"	99.5%	"	--	--	"	
Zinc	"	0.0970	---	0.00500	"	"	ND	"	93.3%	"	--	--	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080802 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (4080802-MS2)				**QC Source: P4H0552-02**				**Extracted: 08/19/04 13:11**						
Arsenic	EPA 6020	0.105	---	0.00100	mg/l	Ix	0.00772	0.100	97.3%	(75-125)	--	--	08/21/04 20:13	
Chromium	"	0.104	---	0.00100	"	"	0.00180	"	102%	"	--	--	"	
Copper	"	0.0976	---	0.00200	"	"	0.00237	"	95.2%	"	--	--	"	
Lead	"	0.0867	---	0.00100	"	"	ND	"	86.7%	"	--	--	"	
Nickel	"	0.111	---	0.00200	"	"	0.0138	"	97.2%	"	--	--	"	
Zinc	"	0.100	---	0.00500	"	"	0.00613	"	93.9%	"	--	--	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name:	**NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/03/04 13:02

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080770 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4080770-BLK1)							**Extracted: 08/19/04 08:03**							
Total Aqueous Hydrocarbons (TAqH)	EPA 8270m	ND	---	1.00	ug/l	1x	--	--	--	--	--	--	08/23/04 19:42	
Total PAHs (TPAH)	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
Acenaphthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Acenaphthylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 84.4%*			*Limits: 25-125%*	"							*08/23/04 19:42*	
Pyrene-d10		*63.6%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*62.0%*			*10-125%*	"							"	
LCS (4080770-BS1)							**Extracted: 08/19/04 08:03**							
Acenaphthene	EPA 8270m	1.64	---	0.100	ug/l	1x	--	2.50	65.6%	(26-135)	--	--	08/23/04 18:43	
Benzo (a) pyrene	"	1.32	---	0.100	"	"	--	"	52.8%	(38-137)	--	--	"	
Pyrene	"	1.33	---	0.100	"	"	--	"	53.2%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 79.6%*			*Limits: 25-125%*	"							*08/23/04 18:43*	
Pyrene-d10		*58.8%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*57.6%*			*10-125%*	"							"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name: **NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number: HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/03/04 13:02

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080770 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS Dup (4080770-BSD1)							**Extracted: 08/19/04 08:03**							
Acenaphthene	EPA 8270m	1.77	---	0.100	ug/l	1x	--	2.50	70.8%	(26-135)	7.62%	(60)	08/23/04 19:13	
Benzo (a) pyrene	"	1.35	---	0.100	"	"	--	"	54.0%	(38-137)	2.25%	"	"	
Pyrene	"	1.36	---	0.100	"	"	--	"	54.4%	(33-133)	2.23%	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 83.2%*			*Limits: 25-125%*	"							*08/23/04 19:13*	
Pyrene-d10		*58.0%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*56.4%*			*10-125%*	"							"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	NWNG Gasco Site	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/03/04 13:02

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4080967 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4080967-BLK1)							Extracted: 08/24/04 09:59							
Cyanide (total)	EPA 9012A	ND	---	0.00500	mg/l	1x	--	--	--	--	--	--	08/25/04 15:48	
LCS (4080967-BS1)							Extracted: 08/24/04 09:59							
Cyanide (total)	EPA 9012A	0.189	---	0.00500	mg/l	1x	--	0.200	94.5%	(75-125)	--	--	08/25/04 15:48	
Duplicate (4080967-DUP1)				QC Source: P4H0513-01			Extracted: 08/24/04 09:59							
Cyanide (total)	EPA 9012A	0.0146	---	0.00500	mg/l	1x	0.0125	--	--	--	15.5%	(20)	08/25/04 15:48	
Matrix Spike (4080967-MS1)				QC Source: P4H0513-01			Extracted: 08/24/04 09:59							
Cyanide (total)	EPA 9012A	0.194	---	0.00500	mg/l	1x	0.0125	0.200	90.8%	(75-125)	--	--	08/25/04 15:48	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**NWNG Gasco Site**	
434 NW Sixth Ave., Suite 203	Project Number:	HAI 2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/03/04 13:02

Notes and Definitions

Report Specific Notes:

None

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR / NA - Not Reported / Not Available

dry - Sample results reported on a dry weight basis. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

RPD - Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

nca

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3209 Denali St, Anchorage, AK 99503-4030 907-334-9200 FAX 334-921

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: HAI

REPORT TO: Rob Eck
ADDRESS: HAI

PHONE: 5-3-76-0717 FAX:

INVOICE TO: HAI
pricing and reporting as per Philip N.
&AS, Cr, Cu, Ni, Pb, Zn

P.O. NUMBER: 2708-30

PROJECT NAME: NW NATURAL

PROJECT NUMBER: 2708-30

SAMPLED BY: MWG/APR

TURNAROUND REQUEST
in Business Days *

Organic & Inorganic Analyses: ~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: ~~5~~ STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* *Turnaround Requests less than standard may incur Rush Charges.*

PRESERVATIVE

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NONE: PAH EPA 8270	HCL: BTEX EPA 8021	NaOH: TOT. CYN. EPA 9010	NaOH: AMEN. CYN. EPA 9010	H_2NO_3: TOT. METAL EPA 601	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1 2708-040816-MW4-104-007	8-16-04 9:50	X	X	X	X	X	W	6		
2 2708-040816-MW5-32-008	8-16-04 11:20	X	X	X	X	X	W	6		
3 2708-040816-MW2-32-009	8-16-04 13:05	X	X	X	X	X	W	6		
4										
5										
6										
7										
8										
9										
10										

RELEASED BY: MATT GRAVES DATE: 8-17-04
PRINT NAME: Matt Graves FIRM: HAI TIME:

RECEIVED BY: [signature] DATE: 8/17/04
PRINT NAME: Bob F FIRM: NCA TIME: 17:35

RELEASED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

TEMP:

PAGE OF

COC REV 1/03

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1 September, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Northwest Natural

Enclosed are the results of analyses for samples received by the laboratory on 08/17/04 18:06. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Howard Holmes
Project Manager

Work Orders included in this report:
P4H0592

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040816-MW4-101-007	P4H0592-01	Water	08/16/04 09:50	08/17/04 18:06
2708-040816-MW5-32-008	P4H0592-02	Water	08/16/04 11:20	08/17/04 18:06
2708-040816-MW2-32-009	P4H0592-03	Water	08/16/04 13:05	08/17/04 18:06

North Creek Analytical - Portland

Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040816-MW4-101-007 (P4H0592-01) Water					Sampled: 08/16/04 Received: 08/17/04				
Benzene	**513**	2.50	ug/l	5	EPA 8021B	08/20/04	08/20/04	4080834	
Toluene	ND	2.50	"	"	"	"	"	"	
Ethylbenzene	**3.14**	2.50	"	"	"	"	"	"	
Xylenes (total)	ND	5.00	"	"	"	"	"	"	
Surr: 4-BFB (PID)	*112 %*	*70-130*							
2708-040816-MW5-32-008 (P4H0592-02) Water					Sampled: 08/16/04 Received: 08/17/04				
Benzene	ND	0.500	ug/l	1	EPA 8021B	08/20/04	08/20/04	4080834	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surr: 4-BFB (PID)	*113 %*	*70-130*							
2708-040816-MW2-32-009 (P4H0592-03) Water					Sampled: 08/16/04 Received: 08/17/04				
Benzene	ND	0.500	ug/l	1	EPA 8021B	08/20/04	08/20/04	4080834	
Toluene	ND	0.500	"	"	"	"	"	"	
Ethylbenzene	ND	0.500	"	"	"	"	"	"	
Xylenes (total)	ND	1.00	"	"	"	"	"	"	
Surr: 4-BFB (PID)	*115 %*	*70-130*							

North Creek Analytical - Portland

Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040816-MW4-101-007 (P4H0592-01) Water					Sampled: 08/16/04 Received: 08/17/04				
Arsenic	**0.0142**	0.00100	mg/l	1	EPA 6010B	08/18/04	09/01/04	4080719	M-01
Chromium	ND	0.00100	"	"	"	"	"	"	M-01
Copper	ND	0.00200	"	"	"	"	"	"	M-01
Lead	ND	0.00100	"	"	"	"	"	"	M-01
Nickel	ND	0.00200	"	"	"	"	"	"	M-01
Zinc	ND	0.00500	"	"	"	"	"	"	M-01
2708-040816-MW5-32-008 (P4H0592-02) Water					Sampled: 08/16/04 Received: 08/17/04				
Arsenic	ND	0.00100	mg/l	1	EPA 6010B	08/18/04	09/01/04	4080719	M-01
Chromium	ND	0.00100	"	"	"	"	"	"	M-01
Copper	ND	0.00200	"	"	"	"	"	"	M-01
Lead	ND	0.00100	"	"	"	"	"	"	M-01
Nickel	**0.00359**	0.00200	"	"	"	"	"	"	M-01
Zinc	ND	0.00500	"	"	"	"	"	"	M-01
2708-040816-MW2-32-009 (P4H0592-03) Water					Sampled: 08/16/04 Received: 08/17/04				
Arsenic	**0.00108**	0.00100	mg/l	1	EPA 6010B	08/18/04	09/01/04	4080719	M-01
Chromium	ND	0.00100	"	"	"	"	"	"	M-01
Copper	ND	0.00200	"	"	"	"	"	"	M-01
Lead	ND	0.00100	"	"	"	"	"	"	M-01
Nickel	**0.00621**	0.00200	"	"	"	"	"	"	M-01
Zinc	ND	0.00500	"	"	"	"	"	"	M-01

North Creek Analytical - Portland

Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040816-MW4-101-007 (P4H0592-01) Water					Sampled: 08/16/04 Received: 08/17/04				
Acenaphthene	**0.541**	0.100	ug/l	1	EPA 8270m	08/19/04	08/24/04	4080770	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	**26.2**	1.00	"	10	"	"	08/25/04	"	
Phenanthrene	ND	0.100	"	1	"	"	08/24/04	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*76.9 %*	*25-125*							
Surr: Pyrene-d10	*70.6 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*45.0 %*	*10-125*							
2708-040816-MW5-32-008 (P4H0592-02) Water					Sampled: 08/16/04 Received: 08/17/04				
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	08/19/04	08/24/04	4080770	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	**0.269**	0.100	"	"	"	"	"	"	

North Creek Analytical - Portland

Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040816-MW5-32-008 (P4H0592-02) Water						Sampled: 08/16/04	Received: 08/17/04		
Surr: Fluorene-d10	*85.0 %*	*25-125*							
Surr: Pyrene-d10	*64.6 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*60.4 %*	*10-125*							
2708-040816-MW2-32-009 (P4H0592-03) Water						Sampled: 08/16/04	Received: 08/17/04		
Acenaphthene	ND	0.100	ug/l	1	EPA 8270m	08/19/04	08/24/04	4080770	
Acenaphthylene	ND	0.100	"	"	"	"	"	"	
Anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.100	"	"	"	"	"	"	
Chrysene	ND	0.100	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	0.200	"	"	"	"	"	"	
Fluoranthene	ND	0.100	"	"	"	"	"	"	
Fluorene	ND	0.100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Phenanthrene	ND	0.100	"	"	"	"	"	"	
Pyrene	ND	0.100	"	"	"	"	"	"	
Surr: Fluorene-d10	*79.7 %*	*25-125*							
Surr: Pyrene-d10	*62.7 %*	*23-150*							
Surr: Benzo (a) pyrene-d12	*58.9 %*	*10-125*							

North Creek Analytical - Portland

Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040816-MW4-101-007 (P4H0592-01) Water					Sampled: 08/16/04 Received: 08/17/04				
Cyanide (amenable)	ND	0.00500	mg/l	1	EPA 9010A	08/24/04	08/25/04	4080967	
Cyanide (total)	ND	0.00500	"	"	EPA 9012A	"	"	"	
2708-040816-MW5-32-008 (P4H0592-02) Water					Sampled: 08/16/04 Received: 08/17/04				
Cyanide (amenable)	**0.175**	0.00500	mg/l	1	EPA 9010A	08/24/04	08/25/04	4080967	
Cyanide (total)	**0.521**	0.00500	"	"	EPA 9012A	"	"	"	
2708-040816-MW2-32-009 (P4H0592-03) Water					Sampled: 08/16/04 Received: 08/17/04				
Cyanide (amenable)	**0.0285**	0.00500	mg/l	1	EPA 9010A	08/24/04	08/25/04	4080967	
Cyanide (total)	**0.0835**	0.00500	"	"	EPA 9012A	"	"	"	

North Creek Analytical - Portland

Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

BTEX per EPA Method 8021B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4080834 - EPA 5030B										
Blank (4080834-BLK1)				Prepared & Analyzed: 08/20/04						
Benzene	ND	0.500	ug/l							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	1.00	"							
Surr: 4-BFB (PID)	*58.5*		"	*50.0*		*117*	*70-130*			
LCS (4080834-BS1)				Prepared & Analyzed: 08/20/04						
Benzene	22.8	0.500	ug/l	20.0		114	70-130			
Toluene	21.6	0.500	"	20.0		108	76-129			
Ethylbenzene	21.9	0.500	"	20.0		110	82-130			
Xylenes (total)	65.2	1.00	"	60.0		109	76-130			
Surr: 4-BFB (PID)	*55.2*		"	*50.0*		*110*	*70-130*			
Matrix Spike (4080834-MS1)	**Source: P4H0552-01**			Prepared & Analyzed: 08/20/04						
Benzene	21.7	0.500	ug/l	20.0	ND	108	65-144			
Toluene	20.6	0.500	"	20.0	ND	103	68-139			
Ethylbenzene	20.7	0.500	"	20.0	ND	104	69-144			
Xylenes (total)	61.8	1.00	"	60.0	ND	103	60-144			
Surr: 4-BFB (PID)	*56.5*		"	*50.0*		*113*	*70-130*			
Matrix Spike Dup (4080834-MSD1)	**Source: P4H0552-01**			Prepared & Analyzed: 08/20/04						
Benzene	19.2	0.500	ug/l	20.0	ND	96.0	65-144	12.2	20	
Toluene	18.4	0.500	"	20.0	ND	92.0	68-139	11.3	20	
Ethylbenzene	18.5	0.500	"	20.0	ND	92.5	69-144	11.2	20	
Xylenes (total)	54.8	1.00	"	60.0	ND	91.3	60-144	12.0	20	
Surr: 4-BFB (PID)	*56.1*		"	*50.0*		*112*	*70-130*			

North Creek Analytical - Portland

Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4080719 - EPA 200/3005										
Blank (4080719-BLK1)				Prepared: 08/18/04 Analyzed: 09/01/04						
Arsenic	ND	0.00100	mg/l							M-01
Chromium	ND	0.00100	"							M-01
Copper	ND	0.00200	"							M-01
Lead	ND	0.00100	"							M-01
Nickel	ND	0.00200	"							M-01
Zinc	ND	0.00500	"							M-01
LCS (4080719-BS1)				Prepared: 08/18/04 Analyzed: 08/19/04						
Arsenic	0.969	0.0100	mg/l	1.00		96.9	80-120			M-01
Chromium	0.478	0.0100	"	0.500		95.6	80-120			M-01
Copper	0.484	0.0200	"	0.500		96.8	80-120			M-01
Lead	0.962	0.0100	"	1.00		96.2	80-120			M-01
Nickel	0.477	0.0200	"	0.500		95.4	80-120			M-01
Zinc	0.494	0.0500	"	0.500		98.8	80-120			M-01
LCS Dup (4080719-BSD1)				Prepared: 08/18/04 Analyzed: 08/19/04						
Arsenic	0.940	0.0100	mg/l	1.00		94.0	80-120	3.04	20	M-01
Chromium	0.475	0.0100	"	0.500		95.0	80-120	0.630	20	M-01
Copper	0.462	0.0200	"	0.500		92.4	80-120	4.65	20	M-01
Lead	0.968	0.0100	"	1.00		96.8	80-120	0.622	20	M-01
Nickel	0.469	0.0200	"	0.500		93.8	80-120	1.69	20	M-01
Zinc	0.495	0.0500	"	0.500		99.0	80-120	0.202	20	M-01
Duplicate (4080719-DUP1)	**Source: P4H0586-01**			Prepared: 08/18/04 Analyzed: 08/19/04						
Arsenic	ND	0.0100	mg/l		0.00460				20	M-01
Chromium	ND	0.0100	"		ND			NA	20	M-01
Copper	ND	0.0200	"		ND			NA	20	M-01
Lead	ND	0.0100	"		ND			NA	20	M-01
Nickel	ND	0.0200	"		ND			NA	20	M-01
Zinc	ND	0.0500	"		ND			NA	20	M-01

North Creek Analytical - Portland

Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Total Metals per EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4080719 - EPA 200/3005										
Matrix Spike (4080719-MS1)	**Source: P4H0586-01**			Prepared: 08/18/04		Analyzed: 08/19/04				
Arsenic	0.990	0.0100	mg/l	1.00	0.00460	98.5	75-125			M-01
Chromium	0.491	0.0100	"	0.500	ND	98.2	75-125			M-01
Copper	0.484	0.0200	"	0.500	ND	96.8	75-125			M-01
Lead	0.970	0.0100	"	1.00	ND	97.0	75-125			M-01
Nickel	0.484	0.0200	"	0.500	ND	96.8	75-125			M-01
Zinc	0.509	0.0500	"	0.500	ND	102	75-125			M-01
Matrix Spike (4080719-MS2)	**Source: P4H0586-04**			Prepared: 08/18/04		Analyzed: 08/19/04				
Arsenic	1.02	0.0100	mg/l	1.00	ND	102	75-125			M-01
Chromium	0.498	0.0100	"	0.500	ND	99.6	75-125			M-01
Copper	0.504	0.0200	"	0.500	ND	101	75-125			M-01
Lead	1.00	0.0100	"	1.00	ND	100	75-125			M-01
Nickel	0.500	0.0200	"	0.500	ND	100	75-125			M-01
Zinc	0.610	0.0500	"	0.500	0.103	101	75-125			M-01

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4080770 - EPA 3520/600 Series										
Blank (4080770-BLK1)				Prepared: 08/19/04 Analyzed: 08/23/04						
Acenaphthene	ND	0.100	ug/l							
Acenaphthylene	ND	0.100	"							
Anthracene	ND	0.100	"							
Benzo (a) anthracene	ND	0.100	"							
Benzo (a) pyrene	ND	0.100	"							
Benzo (b) fluoranthene	ND	0.100	"							
Benzo (ghi) perylene	ND	0.100	"							
Benzo (k) fluoranthene	ND	0.100	"							
Chrysene	ND	0.100	"							
Dibenzo (a,h) anthracene	ND	0.200	"							
Fluoranthene	ND	0.100	"							
Fluorene	ND	0.100	"							
Indeno (1,2,3-cd) pyrene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Phenanthrene	ND	0.100	"							
Pyrene	ND	0.100	"							
Surr: Fluorene-d10	*2.11*		"	*2.50*		*84.4*	*25-125*			
Surr: Pyrene-d10	*1.59*		"	*2.50*		*63.6*	*23-150*			
Surr: Benzo (a) pyrene-d12	*1.55*		"	*2.50*		*62.0*	*10-125*			
LCS (4080770-BS1)				Prepared: 08/19/04 Analyzed: 08/23/04						
Acenaphthene	1.64	0.100	ug/l	2.50		65.6	26-135			
Benzo (a) pyrene	1.32	0.100	"	2.50		52.8	38-137			
Pyrene	1.33	0.100	"	2.50		53.2	33-133			
Surr: Fluorene-d10	*1.99*		"	*2.50*		*79.6*	*25-125*			
Surr: Pyrene-d10	*1.47*		"	*2.50*		*58.8*	*23-150*			
Surr: Benzo (a) pyrene-d12	*1.44*		"	*2.50*		*57.6*	*10-125*			

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4080770 - EPA 3520/600 Series										
LCS Dup (4080770-BSD1)				Prepared: 08/19/04 Analyzed: 08/23/04						
Acenaphthene	1.77	0.100	ug/l	2.50		70.8	26-135	7.62	60	
Benzo (a) pyrene	1.35	0.100	"	2.50		54.0	38-137	2.25	60	
Pyrene	1.36	0.100	"	2.50		54.4	33-133	2.23	60	
Surr: Fluorene-d10	*2.08*		"	*2.50*		*83.2*	*25-125*			
Surr: Pyrene-d10	*1.45*		"	*2.50*		*58.0*	*23-150*			
Surr: Benzo (a) pyrene-d12	*1.41*		"	*2.50*		*56.4*	*10-125*			

North Creek Analytical - Portland

Howard Holmes, Project Manager

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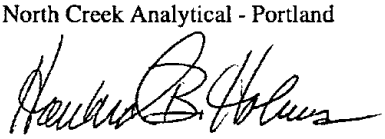
Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4080967 - General Preparation										
Blank (4080967-BLK1)				Prepared: 08/24/04 Analyzed: 08/25/04						
Cyanide (total)	ND	0.00500	mg/l							
LCS (4080967-BS1)				Prepared: 08/24/04 Analyzed: 08/25/04						
Cyanide (total)	0.189	0.00500	mg/l	0.200		94.5	75-125			
Duplicate (4080967-DUP1)		**Source: P4H0513-01**		Prepared: 08/24/04 Analyzed: 08/25/04						
Cyanide (total)	0.0146	0.00500	mg/l		0.0125			15.5	20	
Matrix Spike (4080967-MS1)		**Source: P4H0513-01**		Prepared: 08/24/04 Analyzed: 08/25/04						
Cyanide (total)	0.194	0.00500	mg/l	0.200	0.0125	90.8	75-125			

North Creek Analytical - Portland



Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	09/01/04 20:54

Notes and Definitions

M-01	Analysis performed by EPA 200.8/6020 due to matrix interference or to meet lower reporting limit.
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 (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

Howard Holmes, Project Manager

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20332 Empire Ave Suite F-1, Bend, OR 99701-5711 541-383-9310 FAX 382-7588
3209 Denali St, Anchorage, AK 99503-4030 907-334-9200 FAX 334-9210

CHAIN OF CUSTODY REPORT

Work Order #: P4H0913

CLIENT: HAI

REPORT TO: Rob Code // HAI
ADDRESS:

PHONE: 503-796-0217 FAX:

INVOICE TO: HAI
Pricing & reporting as per Phil for N. metals = As, Cr, Cu, Ni, Pb, Zn

P.O. NUMBER: 2708-30

PROJECT NAME: NW NATURAL

PROJECT NUMBER: 2708-30

SAMPLED BY: MWG/APR

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: [10] [7] [5] [4] [3] [2] [1] [<1] STD.

Petroleum Hydrocarbon Analyses: [5] [4] [3] [2] [1] [<1] STD.

[OTHER] Specify:

* Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE: MeOH	HCl	NaOH	MeOH	HNO3	HCl	None	REQUESTED ANALYSES: PAH EPA 8270	BTEX EPA 8021	Tot. CN EPA 9010	Amen. CN EPA 9010	Tot. Metals EPA 6020	VOC's EPA 8260	SVOC's EPA 8270	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
2708-040823-MW3 26-1010	8-23-04 11:50								X	X	X	X	X			W	7		
2708-040823-MW3-26-2 011	8-23-04 13:35								X	·	X	X	X	X	X	W	8		
2708-040823-MW4-36-3 012	8-23-04 15:00								X	X	X	X	X			W	7		
4																			
5																			
6																			
7																			
8																			
9																			
10																			

RELEASED BY: Matt Graves — DATE: 08-24-04 — TIME: 1320
PRINT NAME: MATT GRAVES — FIRM: HAI
RECEIVED BY: [signature] — DATE: 08-24-04 — TIME: 1320
PRINT NAME: Gary Spangler — FIRM: NCA

RELEASED BY: [signature] — DATE: 08-24-04 — TIME: 1400
PRINT NAME: Gary Spangler — FIRM: NCA
RECEIVED BY: [signature] — DATE: 8/24/04 — TIME: 1400
PRINT NAME: Cuille Fausnot — FIRM: NCA

ADDITIONAL REMARKS:

TEMP: 1.4

COC REV 1/03

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hahn

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other** _____

   By (print) Carrie Fahlsholz (sign) Carrie Fahlsholz

2. Date samples received 8/24/04 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other _____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by Lamy date 8/24/04.

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice ___gel ice X real ice

   Temperature (degrees C) _____ Raytek thermometer 1.4 Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? (X) Yes ___No

   Name of project NW Natural (if applicable)

10. **Initial and date for unpacking:** CF **(initials)** **date** 8/25/04

11. Packing material: NA bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___Yes Y No

13. Did all containers indicated on the COC arrive? X Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? X Yes ___No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___No

    Do the IDs, times, etc. agree with the COC? X Yes ___No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? X Yes ___No

17. Is there adequate volume for the test(s) requested? X Yes ___No

18. If voa vials were submitted, are they free of bubbles? ___ N/A X Yes ___No

19. **Log-in phase: Date samples were logged in:** 8/25/04 **Elm Project # P** 4H0913

20. Logged in by (print) Carrie Fahlsholz (sign) Carrie Fahlsholz

21. Was the project manager notified of status? (Use back of form as a record) ✓ Yes ___No

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October 22, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Northwest Natural

Enclosed are the results of analyses for samples received by the laboratory on 08/24/04 14:00.
The following list is a summary of the NCA Work Orders contained in this report.
If you have any questions concerning this report, please feel free to contact me.

Work	Project	ProjectNumber
P4H0913	Northwest Natural	2708-30

Thank You,

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040823-MW3-26-010	P4H0913-01	Water	08/23/04 11:50	08/24/04 14:00
2708-040823-MW3-56-011	P4H0913-02	Water	08/23/04 13:35	08/24/04 14:00
2708-040823-MW4-35-012	P4H0913-03	Water	08/23/04 13:05	08/24/04 14:00

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-01 Water	**2708-040823-MW3-26-010**			**Sampled: 08/23/04 11:50**						
Benzene	EPA 8021B	ND	-----	0.500	ug/l	1x	4081203	08/27/04	08/27/04 20:40	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 110%*		*Limits: 70 - 130 %*	"				"	
P4H0913-03 Water	**2708-040823-MW4-35-012**			**Sampled: 08/23/04 13:05**						
Benzene	EPA 8021B	**1.61**	-----	0.500	ug/l	1x	4081203	08/27/04	08/27/04 21:12	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	**1.65**	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 109%*		*Limits: 70 - 130 %*	"				"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-01	**Water**	**2708-040823-MW3-26-010**			**Sampled: 08/23/04 11:50**						
Arsenic		EPA 6020	ND	-----	0.00100	mg/l	1x	4081098	08/26/04	09/06/04 22:35	
Chromium		"	ND	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.0983**	-----	0.00200	"	"	"	"	"	
Zinc		"	**0.00692**	-----	0.00500	"	"	"	"	"	
P4H0913-02	**Water**	**2708-040823-MW3-56-011**			**Sampled: 08/23/04 13:35**						
Arsenic		EPA 6020	**0.00345**	-----	0.00100	mg/l	1x	4081098	08/26/04	09/06/04 23:01	
Chromium		"	**0.00177**	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00420**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	
P4H0913-03	**Water**	**2708-040823-MW4-35-012**			**Sampled: 08/23/04 13:05**						
Arsenic		EPA 6020	**0.00672**	-----	0.00100	mg/l	1x	4081098	08/26/04	09/06/04 23:14	
Chromium		"	ND	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00730**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-02 Water	**2708-040823-MW3-56-011**			**Sampled: 08/23/04 13:35**						
Acetone	EPA 8260B	ND	-----	25.0	ug/l	1x	4090180	09/04/04	09/04/04 13:32	
Benzene	"	**10.6**	-----	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	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	2.00	"	"	"	"	"	
2-Hexanone	"	ND	-----	10.0	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	2.00	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-02 Water	**2708-040823-MW3-56-011**			**Sampled: 08/23/04 13:35**						
p-Isopropyltoluene	EPA 8260B	ND	-----	2.00	ug/l	1x	4090180	09/04/04	09/04/04 13:32	
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	"	"	"	"	"	
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	"	"	"	"	"	
Surrogate(s): 4-BFB		*Recovery: 94.0%*		*Limits: 75 - 120 %*	"				"	
1,2-DCA-d4		*100%*		*77 - 129 %*	"				"	
Dibromofluoromethane		*95.5%*		*80 - 121 %*	"				"	
Toluene-d8		*93.5%*		*80 - 120 %*	"				"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-02 Water	**2708-040823-MW3-56-011**			**Sampled: 08/23/04 13:35**						
Carbazole	EPA 8270C	**18.6**	-----	5.00	ug/l	1x	4081091	08/26/04	08/30/04 21:33	
Acenaphthene	"	**34.2**	-----	5.00	"	"	"	"	"	
Acenaphthylene	"	ND	-----	5.00	"	"	"	"	"	
Anthracene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	5.00	"	"	"	"	"	
Benzoic Acid	"	ND	-----	50.0	"	"	"	"	"	
Benzyl alcohol	"	ND	-----	10.0	"	"	"	"	"	
4-Bromophenyl phenyl ether	"	ND	-----	5.00	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
4-Chloro-3-methylphenol	"	ND	-----	5.00	"	"	"	"	"	
4-Chloroaniline	"	ND	-----	20.0	"	"	"	"	"	
Bis(2-chloroethoxy)methane	"	ND	-----	10.0	"	"	"	"	"	
Bis(2-chloroethyl)ether	"	ND	-----	5.00	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	"	ND	-----	10.0	"	"	"	"	"	
2-Chloronaphthalene	"	ND	-----	5.00	"	"	"	"	"	
2-Chlorophenol	"	ND	-----	5.00	"	"	"	"	"	
4-Chlorophenyl phenyl ether	"	ND	-----	5.00	"	"	"	"	"	
Chrysene	"	ND	-----	5.00	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	5.00	"	"	"	"	"	
Dibenzofuran	"	**9.27**	-----	5.00	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	5.00	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	5.00	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	5.00	"	"	"	"	"	
3,3'-Dichlorobenzidine	"	ND	-----	5.00	"	"	"	"	"	
2,4-Dichlorophenol	"	ND	-----	5.00	"	"	"	"	"	
Diethyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
2,4-Dimethylphenol	"	ND	-----	10.0	"	"	"	"	"	
Dimethyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	"	ND	-----	10.0	"	"	"	"	"	
2,4-Dinitrophenol	"	ND	-----	25.0	"	"	"	"	"	
2,4-Dinitrotoluene	"	ND	-----	5.00	"	"	"	"	"	
2,6-Dinitrotoluene	"	ND	-----	5.00	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	ND	-----	10.0	"	"	"	"	"	
Fluoranthene	"	**7.18**	-----	5.00	"	"	"	"	"	
Fluorene	"	**13.9**	-----	5.00	"	"	"	"	"	
Hexachlorobenzene	"	ND	-----	5.00	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-02 Water	**2708-040823-MW3-56-011**			**Sampled: 08/23/04 13:35**						
Hexachlorobutadiene	EPA 8270C	ND	-----	10.0	ug/l	1x	4081091	08/26/04	08/30/04 21:33	
Hexachlorocyclopentadiene	"	ND	-----	10.0	"	"	"	"	"	
Hexachloroethane	"	ND	-----	10.0	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	5.00	"	"	"	"	"	
Isophorone	"	ND	-----	5.00	"	"	"	"	"	
2-Methylnaphthalene	"	ND	-----	5.00	"	"	"	"	"	
2-Methylphenol	"	ND	-----	10.0	"	"	"	"	"	
3-,4-Methylphenol	"	ND	-----	5.00	"	"	"	"	"	
Naphthalene	"	ND	-----	5.00	"	"	"	"	"	
2-Nitroaniline	"	ND	-----	5.00	"	"	"	"	"	
3-Nitroaniline	"	ND	-----	10.0	"	"	"	"	"	
4-Nitroaniline	"	ND	-----	10.0	"	"	"	"	"	
Nitrobenzene	"	ND	-----	5.00	"	"	"	"	"	
2-Nitrophenol	"	ND	-----	5.00	"	"	"	"	"	
4-Nitrophenol	"	ND	-----	25.0	"	"	"	"	"	
N-Nitrosodi-n-propylamine	"	ND	-----	10.0	"	"	"	"	"	
N-Nitrosodiphenylamine	"	ND	-----	5.00	"	"	"	"	"	
Pentachlorophenol	"	ND	-----	10.0	"	"	"	"	"	
Phenanthrene	"	**5.63**	-----	5.00	"	"	"	"	"	
Phenol	"	ND	-----	5.00	"	"	"	"	"	
Pyrene	"	**7.23**	-----	5.00	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	5.00	"	"	"	"	"	
2,4,5-Trichlorophenol	"	ND	-----	5.00	"	"	"	"	"	
2,4,6-Trichlorophenol	"	ND	-----	5.00	"	"	"	"	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 71.8%*		*Limits: 26 - 135 %*	"				"	
2-Fluorophenol		*45.9%*		*6 - 124 %*	"				"	
Nitrobenzene-d5		*86.4%*		*23 - 147 %*	"				"	
Phenol-d6		*29.0%*		*11 - 130 %*	"				"	
p-Terphenyl-d14		*88.0%*		*38 - 149 %*	"				"	
2,4,6-Tribromophenol		*97.2%*		*19 - 126 %*	"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-01 Water	**2708-040823-MW3-26-010**			**Sampled: 08/23/04 11:50**						
Acenaphthene	EPA 8270m	ND	*0.0500*	0.100	ug/l	1x	4081163	08/27/04	09/02/04 12:37	
Acenaphthylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Chrysene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*0.100*	0.200	"	"	"	"	"	
Fluoranthene	"	**0.0632**	*0.0500*	0.100	"	"	"	"	"	**J**
Fluorene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Naphthalene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Phenanthrene	"	**0.0681**	*0.0500*	0.100	"	"	"	"	"	**J**
Pyrene	"	**0.0808**	*0.0500*	0.100	"	"	"	"	"	**J**
Surrogate(s): Fluorene-d10		*Recovery: 95.3%*		*Limits: 25 - 125 %*		"			"	
Pyrene-d10		*93.6%*		*23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*75.0%*		*10 - 125 %*		"			"	

North Creek Analytical - Portland

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-02 Water	**2708-040823-MW3-56-011**			**Sampled: 08/23/04 13:35**						**R-05**
Acenaphthene	EPA 8270m	**25.8**	*0.500*	1.00	ug/l	10x	4081163	08/27/04	09/01/04 23:33	
Acenaphthylene	"	ND	*0.500*	1.00	"	"	"	"	"	
Anthracene	"	**2.29**	*0.500*	1.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Chrysene	"	ND	*0.500*	1.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*1.00*	2.00	"	"	"	"	"	
Fluoranthene	"	**6.76**	*0.500*	1.00	"	"	"	"	"	
Fluorene	"	**10.2**	*0.500*	1.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Naphthalene	"	**0.554**	*0.500*	1.00	"	"	"	"	"	J
Phenanthrene	"	**3.94**	*0.500*	1.00	"	"	"	"	"	
Pyrene	"	**6.62**	*0.500*	1.00	"	"	"	"	"	
Surrogate(s): Fluorene-d10	*Recovery: 94.5%*			*Limits: 25 - 125 %*	"				"	
Pyrene-d10	*103%*			*23 - 150 %*	"				"	
Benzo (a) pyrene-d12	*76.1%*			*10 - 125 %*	"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-03 Water	**2708-040823-MW4-35-012**			**Sampled: 08/23/04 13:05**						**R-05**
Acenaphthene	EPA 8270m	**32.8**	*0.500*	1.00	ug/l	10x	4081163	08/27/04	09/01/04 23:58	
Acenaphthylene	"	**1.39**	*0.500*	1.00	"	"	"	"	"	
Anthracene	"	**1.02**	*0.500*	1.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Chrysene	"	ND	*0.500*	1.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*1.00*	2.00	"	"	"	"	"	
Fluoranthene	"	**7.46**	*0.500*	1.00	"	"	"	"	"	
Fluorene	"	**11.4**	*0.500*	1.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Naphthalene	"	**1.44**	*0.500*	1.00	"	"	"	"	"	
Phenanthrene	"	**2.46**	*0.500*	1.00	"	"	"	"	"	
Pyrene	"	**7.36**	*0.500*	1.00	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 104%*		*Limits: 25 - 125 %*		"			"	
Pyrene-d10		*115%*		*23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*60.6%*		*10 - 125 %*		"			"	

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0913-01	**Water**	**2708-040823-MW3-26-010**			**Sampled: 08/23/04 11:50**						
Cyanide (amenable)		EPA 9010A	**0.184**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.184**	-----	0.00500	"	"	"	"	"	
P4H0913-02	**Water**	**2708-040823-MW3-56-011**			**Sampled: 08/23/04 13:35**						
Cyanide (amenable)		EPA 9010A	**0.0324**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.0324**	-----	0.00500	"	"	"	"	"	
P4H0913-03	**Water**	**2708-040823-MW4-35-012**			**Sampled: 08/23/04 13:05**						
Cyanide (amenable)		EPA 9010A	**0.0980**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.178**	-----	0.00500	"	"	"	"	"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081203 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081203-BLK1)								**Extracted: 08/27/04 16:24**						
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/27/04 17:02	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 107%*		*Limits: 70-130%*		"							*08/27/04 17:02*	
LCS (4081203-BS1)								**Extracted: 08/27/04 16:24**						
Benzene	EPA 8021B	18.6	---	0.500	ug/l	1x	--	20.0	93.0%	(70-130)	--	--	08/27/04 18:00	
Toluene	"	18.6	---	0.500	"	"	--	"	93.0%	(76-129)	--	--	"	
Ethylbenzene	"	17.7	---	0.500	"	"	--	"	88.5%	(82-130)	--	--	"	
Xylenes (total)	"	58.2	---	1.00	"	"	--	60.0	97.0%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 98.6%*		*Limits: 70-130%*		"							*08/27/04 18:00*	
Matrix Spike (4081203-MS1)						**QC Source: P4H0913-01**		**Extracted: 08/27/04 16:24**						
Benzene	EPA 8021B	18.8	---	0.500	ug/l	1x	ND	20.0	94.0%	(65-144)	--	--	08/27/04 18:32	
Toluene	"	18.7	---	0.500	"	"	ND	"	92.3%	(68-139)	--	--	"	
Ethylbenzene	"	17.8	---	0.500	"	"	ND	"	89.0%	(69-144)	--	--	"	
Xylenes (total)	"	58.7	---	1.00	"	"	ND	60.0	97.1%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 96.0%*		*Limits: 70-130%*		"							*08/27/04 18:32*	
Matrix Spike Dup (4081203-MSD1)						**QC Source: P4H0913-01**		**Extracted: 08/27/04 16:24**						
Benzene	EPA 8021B	18.8	---	0.500	ug/l	1x	ND	20.0	94.0%	(65-144)	0.00%	(20)	08/27/04 19:04	
Toluene	"	18.6	---	0.500	"	"	ND	"	91.8%	(68-139)	0.536%	"	"	
Ethylbenzene	"	17.7	---	0.500	"	"	ND	"	88.5%	(69-144)	0.563%	"	"	
Xylenes (total)	"	58.3	---	1.00	"	"	ND	60.0	96.4%	(60-144)	0.684%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 95.4%*		*Limits: 70-130%*		"							*08/27/04 19:04*	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081098 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081098-BLK1)							Extracted: 08/26/04 08:53							
Arsenic	EPA 6020	ND	---	0.00100	mg/l	1x	--	--	--	--	--	--	09/08/04 21:34	
Chromium	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Copper	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Lead	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Nickel	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Zinc	"	ND	---	0.00500	"	"	--	--	--	--	--	--	"	
LCS (4081098-BS1)							Extracted: 08/26/04 08:53							
Arsenic	EPA 6020	0.0981	---	0.00100	mg/l	1x	--	0.100	98.1%	(80-120)	--	--	09/08/04 21:42	
Chromium	"	0.104	---	0.00100	"	"	--	"	104%	"	--	--	"	
Copper	"	0.106	---	0.00200	"	"	--	"	106%	"	--	--	"	
Lead	"	0.104	---	0.00100	"	"	--	"	104%	"	--	--	"	
Nickel	"	0.106	---	0.00200	"	"	--	"	106%	"	--	--	"	
Zinc	"	0.0973	---	0.00500	"	"	--	"	97.3%	"	--	--	"	
LCS Dup (4081098-BSD1)							Extracted: 08/26/04 08:53							
Arsenic	EPA 6020	0.0958	---	0.00100	mg/l	1x	--	0.100	95.8%	(80-120)	2.37%	(20)	09/08/04 21:50	
Chromium	"	0.102	---	0.00100	"	"	--	"	102%	"	1.94%	"	"	
Copper	"	0.104	---	0.00200	"	"	--	"	104%	"	1.90%	"	"	
Lead	"	0.104	---	0.00100	"	"	--	"	104%	"	0.00%	"	"	
Nickel	"	0.104	---	0.00200	"	"	--	"	104%	"	1.90%	"	"	
Zinc	"	0.0975	---	0.00500	"	"	--	"	97.5%	"	0.205%	"	"	
Duplicate (4081098-DUP1)							QC Source: P4H0913-01						Extracted: 08/26/04 08:53	
Arsenic	EPA 6020	ND	---	0.00100	mg/l	1x	ND	--	--	--	NR	(20)	09/06/04 22:48	
Chromium	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Copper	"	0.00117	---	0.00200	"	"	ND	--	--	--	NR	"	"	
Lead	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Nickel	"	0.0931	---	0.00200	"	"	0.0983	--	--	--	5.43%	"	"	
Zinc	"	0.00719	---	0.00500	"	"	0.00692	--	--	--	3.83%	"	"	
Matrix Spike (4081098-MS1)							QC Source: P4H0913-02						Extracted: 08/26/04 08:53	
Arsenic	EPA 6020	0.114	---	0.00100	mg/l	1x	0.00345	0.100	111%	(75-125)	--	--	09/06/04 23:08	
Chromium	"	0.116	---	0.00100	"	"	0.00177	"	114%	"	--	--	"	
Copper	"	0.108	---	0.00200	"	"	ND	"	107%	"	--	--	"	
Lead	"	0.103	---	0.00100	"	"	ND	"	103%	"	--	--	"	
Nickel	"	0.113	---	0.00200	"	"	0.00420	"	109%	"	--	--	"	
Zinc	"	0.106	---	0.00500	"	"	ND	"	103%	"	--	--	"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081098 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (4081098-MS2)				QC Source: P4H0913-03				Extracted: 08/26/04 08:53						
Arsenic	EPA 6020	0.122	---	0.00100	mg/l	1x	0.00672	0.100	115%	(75-125)	--	--	09/06/04 23:27	
Chromium	"	0.117	---	0.00100	"	"	ND	"	117%	"	--	--	"	
Copper	"	0.104	---	0.00200	"	"	ND	"	103%	"	--	--	"	
Lead	"	0.100	---	0.00100	"	"	ND	"	100%	"	--	--	"	
Nickel	"	0.117	---	0.00200	"	"	0.00730	"	110%	"	--	--	"	
Zinc	"	0.0996	---	0.00500	"	"	ND	"	99.6%	"	--	--	"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090180 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4090180-BLK1)							**Extracted: 09/04/04 09:00**							
Acetone	EPA 8260B	ND	---	25.0	ug/l	1x	--	--	--	--	--	--	09/04/04 13:05	
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	"	"	--	--	--	--	--	--	"	
Hexachlorobutadiene	"	ND	---	2.00	"	"	--	--	--	--	--	--	"	
2-Hexanone	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090180 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4090180-BLK1)								Extracted: 09/04/04 09:00						
Isopropylbenzene	EPA 8260B	ND	---	2.00	ug/l	1x	--	--	--	--	--	--	09/04/04 13:05	
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-Tetrachlorocthane	"	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	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB	*Recovery:*	*94.0%*		*Limits:*	*75-120%*	"							*09/04/04 13:05*	
1,2-DCA-d4		*102%*			*77-129%*	"							"	
Dibromofluoromethane		*95.5%*			*80-121%*	"							"	
Toluene-d8		*100%*			*80-120%*	"							"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090180 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4090180-BS1)													**Extracted: 09/04/04 09:00**	
Benzene	EPA 8260B	20.6	---	1.00	ug/l	1x	--	20.0	103%	(80-120)	--	--	09/04/04 11:15	
Chlorobenzene	"	20.2	---	1.00	"	"	--	"	101%	(80-124)	--	--	"	
1,1-Dichloroethene	"	17.0	---	1.00	"	"	--	"	85.0%	(78-120)	--	--	"	
Toluene	"	20.9	---	1.00	"	"	--	"	104%	(80-124)	--	--	"	
Trichloroethene	"	20.3	---	1.00	"	"	--	"	102%	(80-132)	--	--	"	
Surrogate(s): 4-BFB		*Recovery: 96.5%*			*Limits: 75-120%*	"							*09/04/04 11:15*	
1,2-DCA-d4		*100%*			*77-129%*	"							"	
Dibromofluoromethane		*100%*			*80-121%*	"							"	
Toluene-d8		*102%*			*80-120%*	"							"	
Matrix Spike (4090180-MS1)							**QC Source: P4H0913-02**						**Extracted: 09/04/04 09:00**	
Benzene	EPA 8260B	29.7	---	1.00	ug/l	1x	10.6	20.0	95.5%	(80-124)	--	--	09/04/04 11:42	
Chlorobenzene	"	20.1	---	1.00	"	"	ND	"	100%	(72.9-134)	--	--	"	
1,1-Dichloroethene	"	19.4	---	1.00	"	"	ND	"	97.0%	(79.3-127)	--	--	"	
Toluene	"	18.7	---	1.00	"	"	ND	"	93.5%	(79.7-131)	--	--	"	
Trichloroethene	"	20.1	---	1.00	"	"	ND	"	100%	(68.4-130)	--	--	"	
Surrogate(s): 4-BFB		*Recovery: 98.5%*			*Limits: 75-120%*	"							*09/04/04 11:42*	
1,2-DCA-d4		*104%*			*77-129%*	"							"	
Dibromofluoromethane		*102%*			*80-121%*	"							"	
Toluene-d8		*96.0%*			*80-120%*	"							"	
Matrix Spike Dup (4090180-MSD1)							**QC Source: P4H0913-02**						**Extracted: 09/04/04 09:00**	
Benzene	EPA 8260B	30.3	---	1.00	ug/l	1x	10.6	20.0	98.5%	(80-124)	2.00%	(25)	09/04/04 12:10	
Chlorobenzene	"	20.7	---	1.00	"	"	ND	"	104%	(72.9-134)	2.94%	"	"	
1,1-Dichloroethene	"	20.1	---	1.00	"	"	ND	"	100%	(79.3-127)	3.54%	"	"	
Toluene	"	19.6	---	1.00	"	"	ND	"	98.0%	(79.7-131)	4.70%	"	"	
Trichloroethene	"	20.4	---	1.00	"	"	ND	"	102%	(68.4-130)	1.48%	"	"	
Surrogate(s): 4-BFB		*Recovery: 103%*			*Limits: 75-120%*	"							*09/04/04 12:10*	
1,2-DCA-d4		*106%*			*77-129%*	"							"	
Dibromofluoromethane		*106%*			*80-121%*	"							"	
Toluene-d8		*102%*			*80-120%*	"							"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081091 **Water Preparation Method: EPA 3510/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081091-BLK1)							**Extracted: 08/26/04 08:13**							
Carbazole	EPA 8270C	ND	---	5.00	ug/l	1x	--	--	--	--	--	--	08/30/04 20:04	
Acenaphthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Acenaphthylene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzoic Acid	"	ND	---	50.0	"	"	--	--	--	--	--	--	"	
Benzyl alcohol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
4-Bromophenyl phenyl ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Butyl benzyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chloro-3-methylphenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chloroaniline	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
Bis(2-chloroethoxy)methane	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Bis(2-chloroethyl)ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Bis(2-chloroisopropyl)ether	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
2-Chloronaphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Chlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chlorophenyl phenyl ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Di-n-butyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Di-n-octyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Dibenzofuran	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,2-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,3-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,4-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
3,3'-Dichlorobenzidine	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4-Dichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Diethyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4-Dimethylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Dimethyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4,6-Dinitro-2-methylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
2,4-Dinitrophenol	"	ND	---	25.0	"	"	--	--	--	--	--	--	"	
2,4-Dinitrotoluene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,6-Dinitrotoluene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Bis(2-ethylhexyl)phthalate	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081091 **Water Preparation Method: EPA 3510/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081091-BLK1)							**Extracted: 08/26/04 08:13**							
Hexachlorobenzene	EPA 8270C	ND	---	5.00	ug/l	1x	--	--	--	--	--	--	08/30/04 20:04	
Hexachlorobutadiene	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Hexachlorocyclopentadiene	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Hexachloroethane	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Isophorone	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Methylnaphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Methylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
3-,4-Methylphenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Nitroaniline	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
3-Nitroaniline	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
4-Nitroaniline	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Nitrobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Nitrophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Nitrophenol	"	ND	---	25.0	"	"	--	--	--	--	--	--	"	
N-Nitrosodi-n-propylamine	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
N-Nitrosodiphenylamine	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Pentachlorophenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Phenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,2,4-Trichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4,5-Trichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4,6-Trichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2-Fluorobiphenyl	*Recovery:*	*69.7%*		*Limits:*	*26-135%*	"							*08/30/04 20:04*	
2-Fluorophenol		*44.2%*			*6-124%*	"							"	
Nitrobenzene-d5		*80.0%*			*23-147%*	"							"	
Phenol-d6		*30.6%*			*11-130%*	"							"	
p-Terphenyl-d14		*80.5%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*85.3%*			*19-126%*	"							"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081091 **Water Preparation Method: EPA 3510/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4081091-BS1)								**Extracted: 08/26/04 08:13**						
Acenaphthene	EPA 8270C	54.5	---	5.00	ug/l	1x	--	75.0	72.7%	(40-110)	--	--	08/30/04 18:35	
4-Chloro-3-methylphenol	"	107	---	5.00	"	"	--	150	71.3%	"	--	--	"	
2-Chlorophenol	"	97.4	---	5.00	"	"	--	"	64.9%	"	--	--	"	
1,4-Dichlorobenzene	"	33.0	---	5.00	"	"	--	75.0	44.0%	(20-90)	--	--	"	
2,4-Dinitrotoluene	"	57.8	---	5.00	"	"	--	"	77.1%	(50-110)	--	--	"	
4-Nitrophenol	"	49.5	---	25.0	"	"	--	150	33.0%	(15-100)	--	--	"	
N-Nitrosodi-n-propylamine	"	55.3	---	10.0	"	"	--	75.0	73.7%	(40-110)	--	--	"	
Pentachlorophenol	"	108	---	10.0	"	"	--	150	72.0%	(30-120)	--	--	"	
Phenol	"	46.2	---	5.00	"	"	--	"	30.8%	(15-110)	--	--	"	
Pyrene	"	55.6	---	5.00	"	"	--	75.0	74.1%	(40-110)	--	--	"	
1,2,4-Trichlorobenzene	"	37.0	---	5.00	"	"	--	"	49.3%	(25-100)	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 63.2%*			*Limits: 26-135%*	"							*08/30/04 18:35*	
2-Fluorophenol		*44.8%*			*6-124%*	"							"	
Nitrobenzene-d5		*76.0%*			*23-147%*	"							"	
Phenol-d6		*30.4%*			*11-130%*	"							"	
p-Terphenyl-d14		*76.4%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*84.7%*			*19-126%*	"							"	
LCS Dup (4081091-BSD1)								**Extracted: 08/26/04 08:13**						
Acenaphthene	EPA 8270C	62.1	---	5.00	ug/l	1x	--	75.0	82.8%	(40-110)	13.0% (36)		08/30/04 19:20	
4-Chloro-3-methylphenol	"	118	---	5.00	"	"	--	150	78.7%	"	9.78% (43)		"	
2-Chlorophenol	"	105	---	5.00	"	"	--	"	70.0%	"	7.51% (38)		"	
1,4-Dichlorobenzene	"	39.9	---	5.00	"	"	--	75.0	53.2%	(20-90)	18.9% (43)		"	
2,4-Dinitrotoluene	"	66.1	---	5.00	"	"	--	"	88.1%	(50-110)	13.4% (31)		"	
4-Nitrophenol	"	56.4	---	25.0	"	"	--	150	37.6%	(15-100)	13.0% (36)		"	
N-Nitrosodi-n-propylamine	"	59.9	---	10.0	"	"	--	75.0	79.9%	(40-110)	7.99% (37)		"	
Pentachlorophenol	"	122	---	10.0	"	"	--	150	81.3%	(30-120)	12.2% (40)		"	
Phenol	"	49.5	---	5.00	"	"	--	"	33.0%	(15-110)	6.90% (36)		"	
Pyrene	"	61.5	---	5.00	"	"	--	75.0	82.0%	(40-110)	10.1% (31)		"	
1,2,4-Trichlorobenzene	"	45.4	---	5.00	"	"	--	"	60.5%	(25-100)	20.4% (42)		"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 68.0%*			*Limits: 26-135%*	"							*08/30/04 19:20*	
2-Fluorophenol		*47.5%*			*6-124%*	"							"	
Nitrobenzene-d5		*87.5%*			*23-147%*	"							"	
Phenol-d6		*32.5%*			*11-130%*	"							"	
p-Terphenyl-d14		*84.5%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*96.0%*			*19-126%*	"							"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:05

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081163 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081163-BLK1)								Extracted: 08/27/04 08:06						
Acenaphthene	EPA 8270m	ND	0.0500	0.100	ug/l	1x	--	--	--	--	--	--	09/07/04 17:36	
Acenaphthylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	0.100	0.200	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 71.6%*			*Limits: 25-125%*	"							*09/07/04 17:36*	
Pyrene-d10		*93.2%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*71.6%*			*10-125%*	"							"	
LCS (4081163-BS1)								Extracted: 08/27/04 08:06						
Acenaphthene	EPA 8270m	1.97	0.0500	0.100	ug/l	1x	--	2.50	78.8%	(26-135)	--	--	09/03/04 14:35	
Benzo (a) pyrene	"	2.16	0.0500	0.100	"	"	--	"	86.4%	(38-137)	--	--	"	
Pyrene	"	2.47	0.0500	0.100	"	"	--	"	98.8%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 85.6%*			*Limits: 25-125%*	"							*09/03/04 14:35*	
Pyrene-d10		*104%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*95.2%*			*10-125%*	"							"	
LCS Dup (4081163-BSD1)								Extracted: 08/27/04 08:06						
Acenaphthene	EPA 8270m	2.17	0.0500	0.100	ug/l	1x	--	2.50	86.8%	(26-135)	9.66%	(60)	09/03/04 15:01	
Benzo (a) pyrene	"	2.22	0.0500	0.100	"	"	--	"	88.8%	(38-137)	2.74%	"	"	
Pyrene	"	2.59	0.0500	0.100	"	"	--	"	104%	(33-133)	4.74%	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 89.6%*			*Limits: 25-125%*	"							*09/03/04 15:01*	
Pyrene-d10		*105%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*92.4%*			*10-125%*	"							"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081272 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081272-BLK1)								**Extracted: 08/31/04 08:20**						
Cyanide (total)	EPA 9012A	ND	---	0.00500	mg/l	1x	--	--	--	--	--	--	09/03/04 12:53	
LCS (4081272-BS1)								**Extracted: 08/31/04 08:20**						
Cyanide (total)	EPA 9012A	0.190	---	0.00500	mg/l	1x	--	0.200	95.0%	(75-125)	--	--	09/03/04 12:53	
Matrix Spike (4081272-MS1)				**QC Source: P4H1069-03**				**Extracted: 08/31/04 08:20**						
Cyanide (total)	EPA 9012A	0.281	---	0.00500	mg/l	1x	0.0943	0.200	93.3%	(75-125)	--	--	09/03/04 12:53	
Matrix Spike Dup (4081272-MSD1)				**QC Source: P4H1069-03**				**Extracted: 08/31/04 08:20**						
Cyanide (total)	EPA 9012A	0.280	---	0.00500	mg/l	1x	0.0943	0.200	92.8%	(75-125)	0.357%	(20)	09/03/04 12:53	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
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Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:05

Notes and Definitions

Report Specific Notes:

J - Estimated value.

R-05 - Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR / NA - Not Reported / Not Available

dry - Sample results reported on a dry weight basis. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

RPD - Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

nca

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11115 E Montgomery Suite B, Spokane, WA 99206-4776 509-924-9200 FAX 924-9290
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20332 Empire Ave Suite F-1, Bend, OR 99701-5711 541-383-9310 FAX 382-7588
3209 Denali St, Anchorage, AK 99503-4030 907-334-9200 FAX 334-9210

CHAIN OF CUSTODY REPORT

Work Order #: P4H0982

CLIENT: HAI

REPORT TO: Bob Ede HAI
ADDRESS:

PHONE: 503-796-0717 FAX:

INVOICE TO: HAI pricing as per Philip N.
*METALS: As, Cr, Cu, Ni, Pb, Zn

P.O. NUMBER: 2708-30

PROJECT NAME: NW NATURAL

PROJECT NUMBER: 2708-30

SAMPLED BY: MWG/APR

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: ~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: ~~5~~ STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE / REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NONE: PAH EPA 8270	HCL: BTEX EPA 8021	NaOH: TOT. CYN. EPA 9010	NaOH: AMEN CYN. EPA 9010	HNO_3: TOT. METALS EPA 6020	NONE: SVOC's EPA 8270	HCL: VOC's EPA 8260	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1 2708-040824-MW5 175-013	8-24-04 11:30	X	X	X	X	X			W	7		
2 2708-040824-MW4-100-014	8-24-04 13:40	X	X	X	X	X			W	7		
3 2708-040824-MW5-100-015	8-24-04 14:45	X		X	X	X	X	X	W	8		
4 2708-040824-MW4-57-016	8-24-04 15:45	X		X	X	X	X	X	W	8		
5												
6												
7												
8												
9												
10												

RELEASED BY: Matt Brand DATE: 8-25-04
PRINT NAME: Matt Graves FIRM: HAI TIME:

RECEIVED BY: [signature] DATE: 8/25/04
PRINT NAME: Bob F FIRM: NCA TIME: 14:10

RELEASED BY: [signature] DATE: 8/25/04
PRINT NAME: Bob F FIRM: NCA TIME: 14:55

RECEIVED BY: [signature] DATE: 8/25/04
PRINT NAME: Callie Fanshaw FIRM: NCA TIME: 1455

ADDITIONAL REMARKS:

TEMP: 3.5 4.6

PAGE OF

COC REV 1/03

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Haley

1. **Please sign for receipt and opening of** 2 **cooler or** _____ **other** _____

   By (print) Callie Fairshold (sign) Callie Fairshold

2. Date samples received 8/25/04 Date opened: Same X or ___/___/___

3. Delivered by: Bob NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by Bob date 8/25/04.

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? Y yes ___no Type of ice: ___ blue ice Y gel ice ___ real ice

   Temperature (degrees C) 4.1 3.9 Raytek thermometer _____ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? Y Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? Y Yes ___No

   Name of project _____ (if applicable)

10. **Initial and date for unpacking:** VE **(initials)** **date** 8/26/04

11. Packing material: N/A bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? 1 Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? X Yes ___No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___No

    Do the IDs, times, etc. agree with the COC? X Yes ___No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? Y Yes ___No

17. Is there adequate volume for the test(s) requested? X Yes ___No

18. If voa vials were submitted, are they free of bubbles? X N/A ___Yes ___No

19. **Log-in phase: Date samples were logged in:** 8/25/04 **Elm Project # P** 410982

20. Logged in by (print) Vanessa Evans (sign) Vanessa Evans

21. Was the project manager notified of status? (Use back of form as a record) ___Yes X No

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October 22, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Northwest Natural

Enclosed are the results of analyses for samples received by the laboratory on 08/25/04 14:55.
The following list is a summary of the NCA Work Orders contained in this report.
If you have any questions concerning this report, please feel free to contact me.

Work	Project	ProjectNumber
P4H0982	Northwest Natural	2708-30

Thank You,

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040824-MW5-175-013	P4H0982-01	Water	08/24/04 11:30	08/25/04 14:55
2708-040824-MW14-110-014	P4H0982-02	Water	08/24/04 13:40	08/25/04 14:55
2708-040824-MW5-100-015	P4H0982-03	Water	08/24/04 14:45	08/25/04 14:55
2708-040824-MW4-57-016	P4H0982-04	Water	08/24/04 15:45	08/25/04 14:55

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-01 Water	**2708-040824-MW5-175-013**			**Sampled: 08/24/04 11:30**						
Benzene	EPA 8021B	ND	-----	0.500	ug/l	1x	4081203	08/27/04	08/27/04 21:43	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 109%*		*Limits: 70 - 130 %*	"				"	
P4H0982-02 Water	**2708-040824-MW14-110-014**			**Sampled: 08/24/04 13:40**						
Benzene	EPA 8021B	ND	-----	0.500	ug/l	1x	4081203	08/27/04	08/27/04 22:15	
Toluene	"	ND	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 105%*		*Limits: 70 - 130 %*	"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-01	**Water**	**2708-040824-MW5-175-013**			**Sampled: 08/24/04 11:30**						
Arsenic		EPA 6020	**0.00620**	-----	0.00100	mg/l	1x	4081204	08/30/04	08/31/04 21:13	
Chromium		"	**0.00123**	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00307**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	
P4H0982-02	**Water**	**2708-040824-MW14-110-014**			**Sampled: 08/24/04 13:40**						
Arsenic		EPA 6020	**0.0114**	-----	0.00100	mg/l	1x	4081204	08/30/04	08/31/04 21:52	
Chromium		"	ND	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00279**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	
P4H0982-03	**Water**	**2708-040824-MW5-100-015**			**Sampled: 08/24/04 14:45**						
Arsenic		EPA 6020	**0.00865**	-----	0.00100	mg/l	1x	4081204	08/30/04	08/31/04 22:34	
Chromium		"	ND	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00200**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-04	**Water**	**2708-040824-MW4-57-016**			**Sampled: 08/24/04 15:45**						
Arsenic		EPA 6020	**0.0126**	-----	0.00100	mg/l	1x	4081204	08/30/04	08/31/04 22:47	
Chromium		"	**0.00108**	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00788**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-03 Water	**2708-040824-MW5-100-015**			**Sampled: 08/24/04 14:45**						
Acetone	EPA 8260B	ND	-----	2500	ug/l	100x	4081207	08/28/04	08/28/04 21:31	
Benzene	"	**11500**	-----	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	"	ND	-----	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	"	**683**	-----	100	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	200	"	"	"	"	"	
2-Hexanone	"	ND	-----	1000	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	200	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-03 Water	**2708-040824-MW5-100-015**			**Sampled: 08/24/04 14:45**						
p-Isopropyltoluene	EPA 8260B	ND	-----	200	ug/l	100x	4081207	08/28/04	08/28/04 21:31	
4-Methyl-2-pentanone	"	ND	-----	500	"	"	"	"	"	
Methyl tert-butyl ether	"	ND	-----	100	"	"	"	"	"	
Methylene chloride	"	ND	-----	500	"	"	"	"	"	
Naphthalene	"	**12100**	-----	200	"	"	"	"	"	
n-Propylbenzene	"	ND	-----	100	"	"	"	"	"	
Styrene	"	ND	-----	100	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	"	ND	-----	100	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	"	ND	-----	100	"	"	"	"	"	
Tetrachloroethene	"	ND	-----	100	"	"	"	"	"	
Toluene	"	ND	-----	100	"	"	"	"	"	
1,2,3-Trichlorobenzene	"	ND	-----	100	"	"	"	"	"	
1,2,4-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	"	ND	-----	100	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	ND	-----	100	"	"	"	"	"	
Vinyl chloride	"	ND	-----	100	"	"	"	"	"	
o-Xylene	"	**253**	-----	100	"	"	"	"	"	
m,p-Xylene	"	ND	-----	200	"	"	"	"	"	

Surrogate(s):	*Recovery:*	*Limits:*		
4-BFB	*97.0%*	*75 - 120 %*	*1X*	"
1,2-DCA-d4	*102%*	*77 - 129 %*	"	"
Dibromofluoromethane	*101%*	*80 - 121 %*	"	"
Toluene-d8	*97.0%*	*80 - 120 %*	"	"

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-04RE1 Water	**2708-040824-MW4-57-016**			**Sampled: 08/24/04 15:45**						
Acetone	EPA 8260B	ND	-----	2500	ug/l	100x	4081244	08/30/04	08/30/04 14:31	
Benzene	"	**15000**	-----	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	"	ND	-----	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	"	**748**	-----	100	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	200	"	"	"	"	"	
2-Hexanone	"	ND	-----	1000	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	200	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-04RE1 Water	**2708-040824-MW4-57-016**			**Sampled: 08/24/04 15:45**						
p-Isopropyltoluene	EPA 8260B	ND	-----	200	ug/l	100x	4081244	08/30/04	08/30/04 14:31	
4-Methyl-2-pentanone	"	ND	-----	500	"	"	"	"	"	
Methyl tert-butyl ether	"	ND	-----	100	"	"	"	"	"	
Methylene chloride	"	ND	-----	500	"	"	"	"	"	
Naphthalene	"	**3640**	-----	200	"	"	"	"	"	
n-Propylbenzene	"	ND	-----	100	"	"	"	"	"	
Styrene	"	ND	-----	100	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	"	ND	-----	100	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	"	ND	-----	100	"	"	"	"	"	
Tetrachloroethene	"	ND	-----	100	"	"	"	"	"	
Toluene	"	ND	-----	100	"	"	"	"	"	
1,2,3-Trichlorobenzene	"	ND	-----	100	"	"	"	"	"	
1,2,4-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	"	ND	-----	100	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	ND	-----	100	"	"	"	"	"	
Vinyl chloride	"	ND	-----	100	"	"	"	"	"	
o-Xylene	"	**122**	-----	100	"	"	"	"	"	
m,p-Xylene	"	ND	-----	200	"	"	"	"	"	

Surrogate(s):		*Recovery:*	*Limits:*		
	4-BFB	*99.0%*	*75 - 120 %*	*1X*	"
	1,2-DCA-d4	*100%*	*77 - 129 %*	"	"
	Dibromofluoromethane	*98.5%*	*80 - 121 %*	"	"
	Toluene-d8	*99.0%*	*80 - 120 %*	"	"

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-03 Water	**2708-040824-MW5-100-015**			**Sampled: 08/24/04 14:45**						**R-05**
Carbazole	EPA 8270C	ND	-----	500	ug/l	100x	4081273	08/31/04	09/02/04 23:47	
Acenaphthene	"	ND	-----	500	"	"	"	"	"	
Acenaphthylene	"	ND	-----	500	"	"	"	"	"	
Anthracene	"	ND	-----	500	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	500	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	500	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	500	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	500	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	500	"	"	"	"	"	
Benzoic Acid	"	ND	-----	5000	"	"	"	"	"	
Benzyl alcohol	"	ND	-----	1000	"	"	"	"	"	
4-Bromophenyl phenyl ether	"	ND	-----	500	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	500	"	"	"	"	"	
4-Chloro-3-methylphenol	"	ND	-----	500	"	"	"	"	"	
4-Chloroaniline	"	ND	-----	2000	"	"	"	"	"	
Bis(2-chloroethoxy)methane	"	ND	-----	1000	"	"	"	"	"	
Bis(2-chloroethyl)ether	"	ND	-----	500	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	"	ND	-----	1000	"	"	"	"	"	
2-Chloronaphthalene	"	ND	-----	500	"	"	"	"	"	
2-Chlorophenol	"	ND	-----	500	"	"	"	"	"	
4-Chlorophenyl phenyl ether	"	ND	-----	500	"	"	"	"	"	
Chrysene	"	ND	-----	500	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	500	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	-----	500	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	500	"	"	"	"	"	
Dibenzofuran	"	ND	-----	500	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	500	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	500	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	500	"	"	"	"	"	
3,3'-Dichlorobenzidine	"	ND	-----	500	"	"	"	"	"	
2,4-Dichlorophenol	"	ND	-----	500	"	"	"	"	"	
Diethyl phthalate	"	ND	-----	500	"	"	"	"	"	
2,4-Dimethylphenol	"	ND	-----	1000	"	"	"	"	"	
Dimethyl phthalate	"	ND	-----	500	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	"	ND	-----	1000	"	"	"	"	"	
2,4-Dinitrophenol	"	ND	-----	2500	"	"	"	"	"	
2,4-Dinitrotoluene	"	ND	-----	500	"	"	"	"	"	
2,6-Dinitrotoluene	"	ND	-----	500	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	ND	-----	1000	"	"	"	"	"	
Fluoranthene	"	ND	-----	500	"	"	"	"	"	
Fluorene	"	ND	-----	500	"	"	"	"	"	
Hexachlorobenzene	"	ND	-----	500	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-03 Water	**2708-040824-MW5-100-015**			**Sampled: 08/24/04 14:45**						**R-05**
Hexachlorobutadiene	EPA 8270C	ND	-----	1000	ug/l	100x	4081273	08/31/04	09/02/04 23:47	
Hexachlorocyclopentadiene	"	ND	-----	1000	"	"	"	"	"	
Hexachloroethane	"	ND	-----	1000	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	500	"	"	"	"	"	
Isophorone	"	ND	-----	500	"	"	"	"	"	
2-Methylnaphthalene	"	ND	-----	500	"	"	"	"	"	
2-Methylphenol	"	ND	-----	1000	"	"	"	"	"	
3-,4-Methylphenol	"	ND	-----	500	"	"	"	"	"	
Naphthalene	"	**9820**	-----	500	"	"	"	"	"	
2-Nitroaniline	"	ND	-----	500	"	"	"	"	"	
3-Nitroaniline	"	ND	-----	1000	"	"	"	"	"	
4-Nitroaniline	"	ND	-----	1000	"	"	"	"	"	
Nitrobenzene	"	ND	-----	500	"	"	"	"	"	
2-Nitrophenol	"	ND	-----	500	"	"	"	"	"	
4-Nitrophenol	"	ND	-----	2500	"	"	"	"	"	
N-Nitrosodi-n-propylamine	"	ND	-----	1000	"	"	"	"	"	
N-Nitrosodiphenylamine	"	ND	-----	500	"	"	"	"	"	
Pentachlorophenol	"	ND	-----	1000	"	"	"	"	"	
Phenanthrene	"	ND	-----	500	"	"	"	"	"	
Phenol	"	ND	-----	500	"	"	"	"	"	
Pyrene	"	ND	-----	500	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	500	"	"	"	"	"	
2,4,5-Trichlorophenol	"	ND	-----	500	"	"	"	"	"	
2,4,6-Trichlorophenol	"	ND	-----	500	"	"	"	"	"	
Surrogate(s): 2-Fluorobiphenyl	*Recovery: NR*			*Limits: 26 - 135 %*	"				"	***S-01***
2-Fluorophenol	*NR*			*6 - 124 %*	"				"	***S-01***
Nitrobenzene-d5	*NR*			*23 - 147 %*	"				"	***S-01***
Phenol-d6	*NR*			*11 - 130 %*	"				"	***S-01***
p-Terphenyl-d14	*NR*			*38 - 149 %*	"				"	***S-01***
2,4,6-Tribromophenol	*NR*			*19 - 126 %*	"				"	***S-01***

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-04 Water	**2708-040824-MW4-57-016**			**Sampled: 08/24/04 15:45**						**R-05**
Carbazole	EPA 8270C	ND	-----	500	ug/l	100x	4081273	08/31/04	09/03/04 00:29	
Acenaphthene	"	ND	-----	500	"	"	"	"	"	
Acenaphthylene	"	ND	-----	500	"	"	"	"	"	
Anthracene	"	ND	-----	500	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	500	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	500	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	500	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	500	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	500	"	"	"	"	"	
Benzoic Acid	"	ND	-----	5000	"	"	"	"	"	
Benzyl alcohol	"	ND	-----	1000	"	"	"	"	"	
4-Bromophenyl phenyl ether	"	ND	-----	500	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	500	"	"	"	"	"	
4-Chloro-3-methylphenol	"	ND	-----	500	"	"	"	"	"	
4-Chloroaniline	"	ND	-----	2000	"	"	"	"	"	
Bis(2-chloroethoxy)methane	"	ND	-----	1000	"	"	"	"	"	
Bis(2-chloroethyl)ether	"	ND	-----	500	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	"	ND	-----	1000	"	"	"	"	"	
2-Chloronaphthalene	"	ND	-----	500	"	"	"	"	"	
2-Chlorophenol	"	ND	-----	500	"	"	"	"	"	
4-Chlorophenyl phenyl ether	"	ND	-----	500	"	"	"	"	"	
Chrysene	"	ND	-----	500	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	500	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	-----	500	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	500	"	"	"	"	"	
Dibenzofuran	"	ND	-----	500	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	500	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	500	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	500	"	"	"	"	"	
3,3'-Dichlorobenzidine	"	ND	-----	500	"	"	"	"	"	
2,4-Dichlorophenol	"	ND	-----	500	"	"	"	"	"	
Diethyl phthalate	"	ND	-----	500	"	"	"	"	"	
2,4-Dimethylphenol	"	ND	-----	1000	"	"	"	"	"	
Dimethyl phthalate	"	ND	-----	500	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	"	ND	-----	1000	"	"	"	"	"	
2,4-Dinitrophenol	"	ND	-----	2500	"	"	"	"	"	
2,4-Dinitrotoluene	"	ND	-----	500	"	"	"	"	"	
2,6-Dinitrotoluene	"	ND	-----	500	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	ND	-----	1000	"	"	"	"	"	
Fluoranthene	"	ND	-----	500	"	"	"	"	"	
Fluorene	"	ND	-----	500	"	"	"	"	"	
Hexachlorobenzene	"	ND	-----	500	"	"	"	"	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-04 Water	**2708-040824-MW4-57-016**			**Sampled: 08/24/04 15:45**						**R-05**
Hexachlorobutadiene	EPA 8270C	ND	-----	1000	ug/l	100x	4081273	08/31/04	09/03/04 00:29	
Hexachlorocyclopentadiene	"	ND	-----	1000	"	"	"	"	"	
Hexachloroethane	"	ND	-----	1000	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	500	"	"	"	"	"	
Isophorone	"	ND	-----	500	"	"	"	"	"	
2-Methylnaphthalene	"	ND	-----	500	"	"	"	"	"	
2-Methylphenol	"	ND	-----	1000	"	"	"	"	"	
3-,4-Methylphenol	"	ND	-----	500	"	"	"	"	"	
Naphthalene	"	**3640**	-----	500	"	"	"	"	"	
2-Nitroaniline	"	ND	-----	500	"	"	"	"	"	
3-Nitroaniline	"	ND	-----	1000	"	"	"	"	"	
4-Nitroaniline	"	ND	-----	1000	"	"	"	"	"	
Nitrobenzene	"	ND	-----	500	"	"	"	"	"	
2-Nitrophenol	"	ND	-----	500	"	"	"	"	"	
4-Nitrophenol	"	ND	-----	2500	"	"	"	"	"	
N-Nitrosodi-n-propylamine	"	ND	-----	1000	"	"	"	"	"	
N-Nitrosodiphenylamine	"	ND	-----	500	"	"	"	"	"	
Pentachlorophenol	"	ND	-----	1000	"	"	"	"	"	
Phenanthrene	"	ND	-----	500	"	"	"	"	"	
Phenol	"	ND	-----	500	"	"	"	"	"	
Pyrene	"	ND	-----	500	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	500	"	"	"	"	"	
2,4,5-Trichlorophenol	"	ND	-----	500	"	"	"	"	"	
2,4,6-Trichlorophenol	"	ND	-----	500	"	"	"	"	"	
Surrogate(s): 2-Fluorobiphenyl	*Recovery: NR*			*Limits: 26 - 135 %*	"				"	***S-01***
2-Fluorophenol	*NR*			*6 - 124 %*	"				"	***S-01***
Nitrobenzene-d5	*NR*			*23 - 147 %*	"				"	***S-01***
Phenol-d6	*NR*			*11 - 130 %*	"				"	***S-01***
p-Terphenyl-d14	*NR*			*38 - 149 %*	"				"	***S-01***
2,4,6-Tribromophenol	*NR*			*19 - 126 %*	"				"	***S-01***

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-01 Water	**2708-040824-MW5-175-013**			**Sampled: 08/24/04 11:30**						
Acenaphthene	EPA 8270m	ND	*0.0500*	0.100	ug/l	1x	4081163	08/27/04	09/02/04 00:23	
Acenaphthylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Chrysene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*0.100*	0.200	"	"	"	"	"	
Fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Fluorene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Naphthalene	"	**0.0883**	*0.0500*	0.100	"	"	"	"	"	**J**
Phenanthrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 102%*		*Limits: 25 - 125 %*	"				"	
Pyrene-d10		*116%*		*23 - 150 %*	"				"	
Benzo (a) pyrene-d12		*68.5%*		*10 - 125 %*	"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-02 Water	**2708-040824-MW14-110-014**			**Sampled: 08/24/04 13:40**						
Acenaphthene	EPA 8270m	**0.0828**	*0.0500*	0.100	ug/l	1x	4081163	08/27/04	09/02/04 00:48	**J**
Acenaphthylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Chrysene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*0.100*	0.200	"	"	"	"	"	
Fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Fluorene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Naphthalene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Phenanthrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10	*Recovery: 75.2%*			*Limits: 25 - 125 %*		"			"	
Pyrene-d10	*113%*			*23 - 150 %*		"			"	
Benzo (a) pyrene-d12	*95.8%*			*10 - 125 %*		"			"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: Northwest Natural	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-03 Water	**2708-040824-MW5-100-015**			**Sampled: 08/24/04 14:45**						**R-05**
Acenaphthene	EPA 8270m	**21.9**	*2.50*	5.00	ug/l	50x	4081163	08/27/04	09/02/04 14:32	
Acenaphthylene	"	ND	*2.50*	5.00	"	"	"	"	"	
Anthracene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*2.50*	5.00	"	"	"	"	"	
Chrysene	"	ND	*2.50*	5.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*5.00*	10.0	"	"	"	"	"	
Fluoranthene	"	ND	*2.50*	5.00	"	"	"	"	"	
Fluorene	"	ND	*2.50*	5.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*2.50*	5.00	"	"	"	"	"	
Naphthalene	"	**11900**	*250*	500	"	5000x	"	"	09/02/04 16:29	
Phenanthrene	"	ND	*2.50*	5.00	"	50x	"	"	09/02/04 14:32	
Pyrene	"	ND	*2.50*	5.00	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 87.4%*		*Limits: 25 - 125 %*		"			"	*J*
Pyrene-d10		*104%*		*23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*71.8%*		*10 - 125 %*		"			"	*J*

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-03RE1 Water	**2708-040824-MW5-100-015**			**Sampled: 08/24/04 14:45**						**O-04, R-05**
Benzo (a) anthracene	EPA 8270m	ND	*0.100*	0.200	ug/l	2x	4081163	08/27/04	10/15/04 15:19	
Benzo (a) pyrene	"	ND	*0.100*	0.200	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.100*	0.200	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.100*	0.200	"	"	"	"	"	
Chrysene	"	ND	*0.100*	0.200	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*0.200*	0.400	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.100*	0.200	"	"	"	"	"	
Surrogate(s): Pyrene-d10		*Recovery: 99.6%*		*Limits: 23 - 150 %*	"				"	
Benzo (a) pyrene-d12		*69.3%*		*10 - 125 %*	"				"	
P4H0982-04 Water	**2708-040824-MW4-57-016**			**Sampled: 08/24/04 15:45**						**R-05**
Acenaphthene	EPA 8270m	**42.1**	*5.00*	10.0	ug/l	100x	4081163	08/27/04	09/02/04 15:03	
Acenaphthylene	"	ND	*5.00*	10.0	"	"	"	"	"	
Anthracene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*5.00*	10.0	"	"	"	"	"	
Chrysene	"	ND	*5.00*	10.0	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*10.0*	20.0	"	"	"	"	"	
Fluoranthene	"	ND	*5.00*	10.0	"	"	"	"	"	
Fluorene	"	ND	*5.00*	10.0	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*5.00*	10.0	"	"	"	"	"	
Naphthalene	"	**3780**	*50.0*	100	"	1000x	"	"	09/02/04 16:00	
Phenanthrene	"	ND	*5.00*	10.0	"	100x	"	"	09/02/04 15:03	
Pyrene	"	ND	*5.00*	10.0	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: NR*		*Limits: 25 - 125 %*	"				"	***S-01***
Pyrene-d10		*NR*		*23 - 150 %*	"				"	***S-01***
Benzo (a) pyrene-d12		*NR*		*10 - 125 %*	"				"	***S-01***

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-04RE1 Water	**2708-040824-MW4-57-016**			**Sampled: 08/24/04 15:45**						**O-04, R-05**
Benzo (a) anthracene	EPA 8270m	**0.275**	*0.100*	0.200	ug/l	2x	4081163	08/27/04	10/15/04 15:19	
Benzo (a) pyrene	"	**0.207**	*0.100*	0.200	"	"	"	"	"	
Benzo (b) fluoranthene	"	**0.168**	*0.100*	0.200	"	"	"	"	"	**J**
Benzo (k) fluoranthene	"	**0.167**	*0.100*	0.200	"	"	"	"	"	**J**
Chrysene	"	**0.275**	*0.100*	0.200	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*0.200*	0.400	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	**0.113**	*0.100*	0.200	"	"	"	"	"	**J**
Surrogate(s): Pyrene-d10		*Recovery: 92.8%*		*Limits: 23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*67.4%*		*10 - 125 %*		"			"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H0982-01	**Water**	**2708-040824-MW5-175-013**			**Sampled: 08/24/04 11:30**						
Cyanide (amenable)		EPA 9010A	**0.00690**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.00690**	-----	0.00500	"	"	"	"	"	
P4H0982-02	**Water**	**2708-040824-MW14-110-014**			**Sampled: 08/24/04 13:40**						
Cyanide (amenable)		EPA 9010A	**0.0154**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.0154**	-----	0.00500	"	"	"	"	"	
P4H0982-03	**Water**	**2708-040824-MW5-100-015**			**Sampled: 08/24/04 14:45**						
Cyanide (amenable)		EPA 9010A	**0.298**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.816**	-----	0.0100	"	2x	"	"	"	
P4H0982-04	**Water**	**2708-040824-MW4-57-016**			**Sampled: 08/24/04 15:45**						
Cyanide (amenable)		EPA 9010A	**0.261**	-----	0.0500	mg/l	10x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**1.76**	-----	0.0500	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081203 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081203-BLK1)							**Extracted: 08/27/04 16:24**							
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/27/04 17:02	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 107%*		*Limits: 70-130%*		"							*08/27/04 17:02*	
LCS (4081203-BS1)							**Extracted: 08/27/04 16:24**							
Benzene	EPA 8021B	18.6	---	0.500	ug/l	1x	--	20.0	93.0%	(70-130)	--	--	08/27/04 18:00	
Toluene	"	18.6	---	0.500	"	"	--	"	93.0%	(76-129)	--	--	"	
Ethylbenzene	"	17.7	---	0.500	"	"	--	"	88.5%	(82-130)	--	--	"	
Xylenes (total)	"	58.2	---	1.00	"	"	--	60.0	97.0%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 98.6%*		*Limits: 70-130%*		"							*08/27/04 18:00*	
Matrix Spike (4081203-MS1)							**QC Source: P4H0913-01**						**Extracted: 08/27/04 16:24**	
Benzene	EPA 8021B	18.8	---	0.500	ug/l	1x	ND	20.0	94.0%	(65-144)	--	--	08/27/04 18:32	
Toluene	"	18.7	---	0.500	"	"	ND	"	92.3%	(68-139)	--	--	"	
Ethylbenzene	"	17.8	---	0.500	"	"	ND	"	89.0%	(69-144)	--	--	"	
Xylenes (total)	"	58.7	---	1.00	"	"	ND	60.0	97.1%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 96.0%*		*Limits: 70-130%*		"							*08/27/04 18:32*	
Matrix Spike Dup (4081203-MSD1)							**QC Source: P4H0913-01**						**Extracted: 08/27/04 16:24**	
Benzene	EPA 8021B	18.8	---	0.500	ug/l	1x	ND	20.0	94.0%	(65-144)	0.00%	(20)	08/27/04 19:04	
Toluene	"	18.6	---	0.500	"	"	ND	"	91.8%	(68-139)	0.536%	"	"	
Ethylbenzene	"	17.7	---	0.500	"	"	ND	"	88.5%	(69-144)	0.563%	"	"	
Xylenes (total)	"	58.3	---	1.00	"	"	ND	60.0	96.4%	(60-144)	0.684%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 95.4%*		*Limits: 70-130%*		"							*08/27/04 19:04*	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081204 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081204-BLK1)								Extracted: 08/27/04 17:32						
Arsenic	EPA 6020	ND	---	0.00100	mg/l	1x	--	--	--	--	--	--	08/31/04 20:10	
Chromium	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Copper	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Lead	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Nickel	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Zinc	"	ND	---	0.00500	"	"	--	--	--	--	--	--	"	
LCS (4081204-BS1)								Extracted: 08/27/04 17:32						
Arsenic	EPA 6020	0.0984	---	0.00100	mg/l	1x	--	0.100	98.4%	(80-120)	--	--	08/31/04 20:16	
Chromium	"	0.0942	---	0.00100	"	"	--	"	94.2%	"	--	--	"	
Copper	"	0.0948	---	0.00200	"	"	--	"	94.8%	"	--	--	"	
Lead	"	0.101	---	0.00100	"	"	--	"	101%	"	--	--	"	
Nickel	"	0.0954	---	0.00200	"	"	--	"	95.4%	"	--	--	"	
Zinc	"	0.0910	---	0.00500	"	"	--	"	91.0%	"	--	--	"	
LCS Dup (4081204-BSD1)								Extracted: 08/27/04 17:32						
Arsenic	EPA 6020	0.0956	---	0.00100	mg/l	1x	--	0.100	95.6%	(80-120)	2.89%	(20)	08/31/04 20:23	
Chromium	"	0.0914	---	0.00100	"	"	--	"	91.4%	"	3.02%	"	"	
Copper	"	0.0925	---	0.00200	"	"	--	"	92.5%	"	2.46%	"	"	
Lead	"	0.0994	---	0.00100	"	"	--	"	99.4%	"	1.60%	"	"	
Nickel	"	0.0939	---	0.00200	"	"	--	"	93.9%	"	1.58%	"	"	
Zinc	"	0.0876	---	0.00500	"	"	--	"	87.6%	"	3.81%	"	"	
Duplicate (4081204-DUP1)					QC Source: P4H0982-01			Extracted: 08/27/04 17:32						
Arsenic	EPA 6020	0.00610	---	0.00100	mg/l	1x	0.00620	--	--	--	1.63%	(20)	08/31/04 21:26	
Chromium	"	0.00119	---	0.00100	"	"	0.00123	--	--	--	3.31%	"	"	
Copper	"	ND	---	0.00200	"	"	ND	--	--	--	NR	"	"	
Lead	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Nickel	"	0.00285	---	0.00200	"	"	0.00307	--	--	--	7.43%	"	"	
Zinc	"	ND	---	0.00500	"	"	ND	--	--	--	NR	"	"	
Matrix Spike (4081204-MS1)					QC Source: P4H0982-01			Extracted: 08/27/04 17:32						
Arsenic	EPA 6020	0.105	---	0.00100	mg/l	1x	0.00620	0.100	98.8%	(75-125)	--	--	08/31/04 21:39	
Chromium	"	0.0945	---	0.00100	"	"	0.00123	"	93.3%	"	--	--	"	
Copper	"	0.0930	---	0.00200	"	"	ND	"	93.0%	"	--	--	"	
Lead	"	0.101	---	0.00100	"	"	ND	"	101%	"	--	--	"	
Nickel	"	0.0963	---	0.00200	"	"	0.00307	"	93.2%	"	--	--	"	
Zinc	"	0.0903	---	0.00500	"	"	ND	"	90.3%	"	--	--	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081204 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (4081204-MS2)				QC Source: P4H0982-02					Extracted: 08/27/04 17:32					
Arsenic	EPA 6020	0.112	---	0.00100	mg/l	1x	0.0114	0.100	101%	(75-125)	--	--	08/31/04 22:20	
Chromium	"	0.0940	---	0.00100	"	"	ND	"	94.0%	"	--	--	"	
Copper	"	0.0925	---	0.00200	"	"	ND	"	91.3%	"	--	--	"	
Lead	"	0.0998	---	0.00100	"	"	ND	"	99.8%	"	--	--	"	
Nickel	"	0.0948	---	0.00200	"	"	0.00279	"	92.0%	"	--	--	"	
Zinc	"	0.0881	---	0.00500	"	"	ND	"	86.3%	"	--	--	"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081207 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081207-BLK1)								Extracted: 08/28/04 09:41						
Acetone	EPA 8260B	ND	---	25.0	ug/l	1x	--	--	--	--	--	--	08/28/04 12:48	
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	"	"	--	--	--	--	--	--	"	
Hexachlorobutadiene	"	ND	---	2.00	"	"	--	--	--	--	--	--	"	
2-Hexanone	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	

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434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081207 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081207-BLK1)							**Extracted: 08/28/04 09:41**							
Isopropylbenzene	EPA 8260B	ND	---	2.00	ug/l	1x	--	--	--	--	--	--	08/28/04 12:48	
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	"	"	--	--	--	--	--	--	"	
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	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB	*Recovery:*	*92.0%*		*Limits:*	*75-120%*	"							*08/28/04 12:48*	
1,2-DCA-d4		*100%*			*77-129%*	"							"	
Dibromofluoromethane		*99.0%*			*80-121%*	"							"	
Toluene-d8		*97.5%*			*80-120%*	"							"	

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081207 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4081207-BS1)							**Extracted: 08/28/04 09:41**							
Benzene	EPA 8260B	20.4	---	1.00	ug/l	1x	--	20.0	102%	(80-120)	--	--	08/28/04 10:56	
Chlorobenzene	"	20.0	---	1.00	"	"	--	"	100%	(80-124)	--	--	"	
1,1-Dichloroethene	"	17.3	---	1.00	"	"	--	"	86.5%	(78-120)	--	--	"	
Toluene	"	20.4	---	1.00	"	"	--	"	102%	(80-124)	--	--	"	
Trichloroethene	"	19.5	---	1.00	"	"	--	"	97.5%	(80-132)	--	--	"	
Surrogate(s): 4-BFB		*Recovery: 100%*			*Limits: 75-120%*	"							*08/28/04 10:56*	
1,2-DCA-d4		*96.5%*			*77-129%*	"							"	
Dibromofluoromethane		*99.0%*			*80-121%*	"							"	
Toluene-d8		*98.5%*			*80-120%*	"							"	
Matrix Spike (4081207-MS1)					**QC Source: P4H0929-01**				**Extracted: 08/28/04 09:41**					
Benzene	EPA 8260B	20.0	---	1.00	ug/l	1x	ND	20.0	100%	(80-124)	--	--	08/28/04 11:25	
Chlorobenzene	"	19.2	---	1.00	"	"	ND	"	96.0%	(72.9-134)	--	--	"	
1,1-Dichloroethene	"	17.6	---	1.00	"	"	ND	"	88.0%	(79.3-127)	--	--	"	
Toluene	"	15.4	---	1.00	"	"	ND	"	77.0%	(79.7-131)	--	--	"	Q-01
Trichloroethene	"	18.8	---	1.00	"	"	ND	"	94.0%	(68.4-130)	--	--	"	
Surrogate(s): 4-BFB		*Recovery: 96.5%*			*Limits: 75-120%*	"							*08/28/04 11:25*	
1,2-DCA-d4		*100%*			*77-129%*	"							"	
Dibromofluoromethane		*100%*			*80-121%*	"							"	
Toluene-d8		*86.0%*			*80-120%*	"							"	
Matrix Spike Dup (4081207-MSD1)					**QC Source: P4H0929-01**				**Extracted: 08/28/04 09:41**					
Benzene	EPA 8260B	20.6	---	1.00	ug/l	1x	ND	20.0	103%	(80-124)	2.96%	(25)	08/28/04 11:53	
Chlorobenzene	"	20.2	---	1.00	"	"	ND	"	101%	(72.9-134)	5.08%	"	"	
1,1-Dichloroethene	"	18.5	---	1.00	"	"	ND	"	92.5%	(79.3-127)	4.99%	"	"	
Toluene	"	15.6	---	1.00	"	"	ND	"	78.0%	(79.7-131)	1.29%	"	"	Q-01
Trichloroethene	"	19.1	---	1.00	"	"	ND	"	95.5%	(68.4-130)	1.58%	"	"	
Surrogate(s): 4-BFB		*Recovery: 94.0%*			*Limits: 75-120%*	"							*08/28/04 11:53*	
1,2-DCA-d4		*98.0%*			*77-129%*	"							"	
Dibromofluoromethane		*100%*			*80-121%*	"							"	
Toluene-d8		*85.0%*			*80-120%*	"							"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081244 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081244-BLK1)							**Extracted: 08/30/04 09:26**							
Acetone	EPA 8260B	ND	---	25.0	ug/l	1x	--	--	--	--	--	--	08/30/04 11:18	
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	"	"	--	--	--	--	--	--	"	
Hexachlorobutadiene	"	ND	---	2.00	"	"	--	--	--	--	--	--	"	
2-Hexanone	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081244 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081244-BLK1)							**Extracted: 08/30/04 09:26**							
Isopropylbenzene	EPA 8260B	ND	---	2.00	ug/l	1x	--	--	--	--	--	--	08/30/04 11:18	
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	"	"	--	--	--	--	--	--	"	
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	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB	*Recovery: 96.5%*			*Limits: 75-120%*	"								*08/30/04 11:18*	
1,2-DCA-d4	*106%*			*77-129%*	"								"	
Dibromofluoromethane	*106%*			*80-121%*	"								"	
Toluene-d8	*103%*			*80-120%*	"								"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081244 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4081244-BS1)														
Benzene	EPA 8260B	20.7	---	1.00	ug/l	1x	--	20.0	104%	(80-120)	--	--	08/30/04 09:27	
Chlorobenzene	"	20.6	---	1.00	"	"	--	"	103%	(80-124)	--	--	"	
1,1-Dichloroethene	"	17.0	---	1.00	"	"	--	"	85.0%	(78-120)	--	--	"	
Toluene	"	20.8	---	1.00	"	"	--	"	104%	(80-124)	--	--	"	
Trichloroethene	"	20.1	---	1.00	"	"	--	"	100%	(80-132)	--	--	"	
Surrogate(s): 4-BFB		*Recovery: 100%*			*Limits: 75-120%*	"							*08/30/04 09:27*	
1,2-DCA-d4		*96.0%*			*77-129%*	"							"	
Dibromofluoromethane		*99.0%*			*80-121%*	"							"	
Toluene-d8		*96.0%*			*80-120%*	"							"	
Matrix Spike (4081244-MS1)					**QC Source: P4H0856-01**								**Extracted: 08/30/04 09:26**	
Benzene	EPA 8260B	20.3	---	1.00	ug/l	1x	ND	20.0	102%	(80-124)	--	--	08/30/04 09:55	
Chlorobenzene	"	20.1	---	1.00	"	"	ND	"	100%	(72.9-134)	--	--	"	
1,1-Dichloroethene	"	21.3	---	1.00	"	"	ND	"	104%	(79.3-127)	--	--	"	
Toluene	"	20.4	---	1.00	"	"	ND	"	102%	(79.7-131)	--	--	"	
Trichloroethene	"	31.3	---	1.00	"	"	11.7	"	98.0%	(68.4-130)	--	--	"	
Surrogate(s): 4-BFB		*Recovery: 96.5%*			*Limits: 75-120%*	"							*08/30/04 09:55*	
1,2-DCA-d4		*97.5%*			*77-129%*	"							"	
Dibromofluoromethane		*100%*			*80-121%*	"							"	
Toluene-d8		*97.0%*			*80-120%*	"							"	
Matrix Spike Dup (4081244-MSD1)					**QC Source: P4H0856-01**								**Extracted: 08/30/04 09:26**	
Benzene	EPA 8260B	20.6	---	1.00	ug/l	1x	ND	20.0	103%	(80-124)	1.47%	(25)	08/30/04 10:23	
Chlorobenzene	"	19.9	---	1.00	"	"	ND	"	99.5%	(72.9-134)	1.00%	"	"	
1,1-Dichloroethene	"	21.2	---	1.00	"	"	ND	"	104%	(79.3-127)	0.471%	"	"	
Toluene	"	20.3	---	1.00	"	"	ND	"	102%	(79.7-131)	0.491%	"	"	
Trichloroethene	"	31.1	---	1.00	"	"	11.7	"	97.0%	(68.4-130)	0.641%	"	"	
Surrogate(s): 4-BFB		*Recovery: 93.5%*			*Limits: 75-120%*	"							*08/30/04 10:23*	
1,2-DCA-d4		*93.5%*			*77-129%*	"							"	
Dibromofluoromethane		*96.0%*			*80-121%*	"							"	
Toluene-d8		*94.0%*			*80-120%*	"							"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081273 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081273-BLK1)							**Extracted: 08/31/04 08:22**							
Carbazole	EPA 8270C	ND	---	5.00	ug/l	1x	--	--	--	--	--	--	09/03/04 15:41	
Acenaphthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Acenaphthylene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzoic Acid	"	ND	---	50.0	"	"	--	--	--	--	--	--	"	
Benzyl alcohol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
4-Bromophenyl phenyl ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Butyl benzyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chloro-3-methylphenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chloroaniline	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
Bis(2-chloroethoxy)methane	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Bis(2-chloroethyl)ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Bis(2-chloroisopropyl)ether	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
2-Chloronaphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Chlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chlorophenyl phenyl ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Di-n-butyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Di-n-octyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Dibenzofuran	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,2-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,3-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,4-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
3,3'-Dichlorobenzidine	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4-Dichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Diethyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4-Dimethylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Dimethyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4,6-Dinitro-2-methylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
2,4-Dinitrophenol	"	ND	---	25.0	"	"	--	--	--	--	--	--	"	
2,4-Dinitrotoluene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,6-Dinitrotoluene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Bis(2-ethylhexyl)phthalate	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081273 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081273-BLK1)							**Extracted: 08/31/04 08:22**							
Hexachlorobenzene	EPA 8270C	ND	---	5.00	ug/l	1x	--	--	--	--	--	--	09/03/04 15:41	
Hexachlorobutadiene	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Hexachlorocyclopentadiene	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Hexachloroethane	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Isophorone	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Methylnaphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Methylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
3-,4-Methylphenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Nitroaniline	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
3-Nitroaniline	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
4-Nitroaniline	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Nitrobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Nitrophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Nitrophenol	"	ND	---	25.0	"	"	--	--	--	--	--	--	"	
N-Nitrosodi-n-propylamine	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
N-Nitrosodiphenylamine	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Pentachlorophenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Phenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,2,4-Trichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4,5-Trichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4,6-Trichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2-Fluorobiphenyl	*Recovery: 70.0%*				*Limits: 26-135%*	"							*09/03/04 15:41*	
2-Fluorophenol		*71.3%*			*6-124%*	"							"	
Nitrobenzene-d5		*85.5%*			*23-147%*	"							"	
Phenol-d6		*75.3%*			*11-130%*	"							"	
p-Terphenyl-d14		*86.3%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*99.3%*			*19-126%*	"							"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 12:27

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081273 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4081273-BS1)								**Extracted: 08/31/04 08:22**						
Acenaphthene	EPA 8270C	58.5	---	5.00	ug/l	1x	--	75.0	78.0%	(40-110)	--	--	09/02/04 22:23	
4-Chloro-3-methylphenol	"	117	---	5.00	"	"	--	150	78.0%	"	--	--	"	
2-Chlorophenol	"	109	---	5.00	"	"	--	"	72.7%	"	--	--	"	
1,4-Dichlorobenzene	"	42.3	---	5.00	"	"	--	75.0	56.4%	(20-90)	--	--	"	
2,4-Dinitrotoluene	"	60.1	---	5.00	"	"	--	"	80.1%	(50-110)	--	--	"	
4-Nitrophenol	"	121	---	25.0	"	"	--	150	80.7%	(15-100)	--	--	"	
N-Nitrosodi-n-propylamine	"	57.9	---	10.0	"	"	--	75.0	77.2%	(40-110)	--	--	"	
Pentachlorophenol	"	117	---	10.0	"	"	--	150	78.0%	(30-120)	--	--	"	
Phenol	"	103	---	5.00	"	"	--	"	68.7%	(15-110)	--	--	"	
Pyrene	"	59.2	---	5.00	"	"	--	75.0	78.9%	(40-110)	--	--	"	
1,2,4-Trichlorobenzene	"	47.5	---	5.00	"	"	--	"	63.3%	(25-100)	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 70.0%*			*Limits: 26-135%*	"							*09/02/04 22:23*	
2-Fluorophenol		*70.0%*			*6-124%*	"							"	
Nitrobenzene-d5		*84.3%*			*23-147%*	"							"	
Phenol-d6		*72.0%*			*11-130%*	"							"	
p-Terphenyl-d14		*83.7%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*90.7%*			*19-126%*	"							"	
LCS Dup (4081273-BSD1)								**Extracted: 08/31/04 08:22**						
Acenaphthene	EPA 8270C	60.6	---	5.00	ug/l	1x	--	75.0	80.8%	(40-110)	3.53%	(36)	09/02/04 23:05	
4-Chloro-3-methylphenol	"	122	---	5.00	"	"	--	150	81.3%	"	4.18%	(43)	"	
2-Chlorophenol	"	112	---	5.00	"	"	--	"	74.7%	"	2.71%	(38)	"	
1,4-Dichlorobenzene	"	44.6	---	5.00	"	"	--	75.0	59.5%	(20-90)	5.29%	(43)	"	
2,4-Dinitrotoluene	"	62.8	---	5.00	"	"	--	"	83.7%	(50-110)	4.39%	(31)	"	
4-Nitrophenol	"	128	---	25.0	"	"	--	150	85.3%	(15-100)	5.62%	(36)	"	
N-Nitrosodi-n-propylamine	"	59.9	---	10.0	"	"	--	75.0	79.9%	(40-110)	3.40%	(37)	"	
Pentachlorophenol	"	119	---	10.0	"	"	--	150	79.3%	(30-120)	1.69%	(40)	"	
Phenol	"	108	---	5.00	"	"	--	"	72.0%	(15-110)	4.74%	(36)	"	
Pyrene	"	61.9	---	5.00	"	"	--	75.0	82.5%	(40-110)	4.46%	(31)	"	
1,2,4-Trichlorobenzene	"	49.5	---	5.00	"	"	--	"	66.0%	(25-100)	4.12%	(42)	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 71.2%*			*Limits: 26-135%*	"							*09/02/04 23:05*	
2-Fluorophenol		*72.0%*			*6-124%*	"							"	
Nitrobenzene-d5		*86.7%*			*23-147%*	"							"	
Phenol-d6		*74.7%*			*11-130%*	"							"	
p-Terphenyl-d14		*86.5%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*92.0%*			*19-126%*	"							"	

North Creek Analytical - Portland

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081163 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081163-BLK1)								**Extracted: 08/27/04 08:06**						
Acenaphthene	EPA 8270m	ND	0.0500	0.100	ug/l	1x	--	--	--	--	--	--	09/07/04 17:36	
Acenaphthylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	0.100	0.200	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*71.6%*		*Limits:*	*25-125%*	"						*09/07/04 17:36*	
Pyrene-d10			*93.2%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*71.6%*			*10-125%*	"						"	
LCS (4081163-BS1)								**Extracted: 08/27/04 08:06**						
Acenaphthene	EPA 8270m	1.97	0.0500	0.100	ug/l	1x	--	2.50	78.8%	(26-135)	--	--	09/03/04 14:35	
Benzo (a) pyrene	"	2.16	0.0500	0.100	"	"	--	"	86.4%	(38-137)	--	--	"	
Pyrene	"	2.47	0.0500	0.100	"	"	--	"	98.8%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*85.6%*		*Limits:*	*25-125%*	"						*09/03/04 14:35*	
Pyrene-d10			*104%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*95.2%*			*10-125%*	"						"	
LCS Dup (4081163-BSD1)								**Extracted: 08/27/04 08:06**						
Acenaphthene	EPA 8270m	2.17	0.0500	0.100	ug/l	1x	--	2.50	86.8%	(26-135)	9.66%	(60)	09/03/04 15:01	
Benzo (a) pyrene	"	2.22	0.0500	0.100	"	"	--	"	88.8%	(38-137)	2.74%	"	"	
Pyrene	"	2.59	0.0500	0.100	"	"	--	"	104%	(33-133)	4.74%	"	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*89.6%*		*Limits:*	*25-125%*	"						*09/03/04 15:01*	
Pyrene-d10			*105%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*92.4%*			*10-125%*	"						"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081272 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081272-BLK1)								**Extracted: 08/31/04 08:20**						
Cyanide (total)	EPA 9012A	ND	---	0.00500	mg/l	1x	--	--	--	--	--	--	09/03/04 12:53	
LCS (4081272-BS1)								**Extracted: 08/31/04 08:20**						
Cyanide (total)	EPA 9012A	0.190	---	0.00500	mg/l	1x	--	0.200	95.0%	(75-125)	--	--	09/03/04 12:53	
Matrix Spike (4081272-MS1)				**QC Source: P4H1069-03**				**Extracted: 08/31/04 08:20**						
Cyanide (total)	EPA 9012A	0.281	---	0.00500	mg/l	1x	0.0943	0.200	93.3%	(75-125)	--	--	09/03/04 12:53	
Matrix Spike Dup (4081272-MSD1)				**QC Source: P4H1069-03**				**Extracted: 08/31/04 08:20**						
Cyanide (total)	EPA 9012A	0.280	---	0.00500	mg/l	1x	0.0943	0.200	92.8%	(75-125)	0.357%	(20)	09/03/04 12:53	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 12:27

Notes and Definitions

Report Specific Notes:

J - Estimated value.

O-04 - This sample was analyzed outside the EPA recommended holding time.

Q-01 - The matrix spike recovery, and/or RPD, for this QC sample is outside of established control limits. Failure of a matrix spike QC sample does not represent an out-of-control condition for the batch.

R-05 - Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.

S-01 - The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR / NA - Not Reported / Not Available

dry - Sample results reported on a dry weight basis. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

RPD - Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

nca

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3209 Denali St, Anchorage, AK 99503-4030 907-334-9200 FAX 334-9210

CHAIN OF CUSTODY REPORT

Work Order #: 24H1019

CLIENT: HAI

REPORT TO: Rob Ede / HAI
ADDRESS:
PHONE: 503-746-0717 FAX:

INVOICE TO: HAI pricing as per Philip N.
Metals = As, Cr, Cu, Ni, Pb, Zn

P.O. NUMBER: 2708-30

PROJECT NAME: NW NATURAL
PROJECT NUMBER: 2708-30
SAMPLED BY: MWG/APR

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: ~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: ~~5~~ STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE: NONE | HCL | NaOH | NaOH | HNO3

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PAH EPA 8270	BTEX EPA 8021	TOT. CYN EPA 9010	AMEN, LIN, EPA 9010	TOT. METALS EPA 6020	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1 2708-040825-MW12-36-017	8-25-04 9:10	X	X	X	X	X	W	7		
2 2708-040825-MW13-36-018	8-25-04 10:30	X	X	X	X	X	W	7		
3 2708-040825-MW1-22-019	8-25-04 11:45	X	X	X	X	X	W	7		
4 2708-040825-MW15-56-020	8-25-04 13:40	X	X	X	X	X	W	7		
5 2708-040825-MW8 56-021	8-25-04 14:45	X	X	X	X	X	W	7		
6 2708-040825-MW8-29-022	8-25-04	X	X	X	X	X	W	7		
7										
8										
9										
10										

RELEASED BY: Matt Graves DATE: 8-26-04
PRINT NAME: MATT GRAVES FIRM: HAI TIME:

RECEIVED BY: [signature] DATE: 8/26/04
PRINT NAME: Bob K FIRM: NCA TIME: 15:05

RELEASED BY: [signature] DATE: 8/26/04
PRINT NAME: Bob K FIRM: NCA TIME: 16:17

RECEIVED BY: [signature] DATE: 8/26/04
PRINT NAME: Carrie Fairshield FIRM: NCA TIME: 16:17

ADDITIONAL REMARKS:

TEMP: 1.2, 6.7

PAGE OF

COC REV 1/03

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Haley

1. **Please sign for receipt and opening of** 2 **cooler or** _____ **other** _____

   By (print) Callie Fahlsholz (sign) Callie Fahlsholz

2. Date samples received 8/26/04 Date opened: Same X or ___/___/___

3. Delivered by: BCD X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by Bob date 8/26/04.

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice X gel ice ___real ice

   Temperature (degrees C) 4.7 Raytek thermometer _____ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___ Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___ No

   If "no" please specify: _____

9. Was project identifiable from custody papers? X Yes ___ No

   Name of project Northwest Natural (if applicable)

10. **Initial and date for unpacking:** CF **(initials)** **date** 8/27/04

11. Packing material: NA bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___ Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___ No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? X Yes ___ No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___ No

    Do the IDs, times, etc. agree with the COC? X Yes ___ No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? X Yes ___ No

17. Is there adequate volume for the test(s) requested? X Yes ___ No

18. If voa vials were submitted, are they free of bubbles? ___ N/A X Yes ___ No

19. **Log-in phase: Date samples were logged in:** 8/27/04 **Elm Project #** PA#1019

20. Logged in by (print) Callie Fahlsholz (sign) Callie Fahlsholz

21. Was the project manager notified of status? (Use back of form as a record) ___ Yes X No

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October 22, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Northwest Natural

Enclosed are the results of analyses for samples received by the laboratory on 08/26/04 16:17.
The following list is a summary of the NCA Work Orders contained in this report.
If you have any questions concerning this report, please feel free to contact me.

Work	Project	ProjectNumber
P4H1019	Northwest Natural	2708-30

Thank You,

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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.

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 17:18

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040825-MW12-36-017	P4H1019-01	Water	08/25/04 09:10	08/26/04 16:17
2708-040825-MW13-30-018	P4H1019-02	Water	08/25/04 10:30	08/26/04 16:17
2708-040825-MW1-22-019	P4H1019-03	Water	08/25/04 11:45	08/26/04 16:17
2708-040825-MW15-50-020	P4H1019-04	Water	08/25/04 13:40	08/26/04 16:17
2708-040825-MW8-56-021	P4H1019-05	Water	08/25/04 14:45	08/26/04 16:17
2708-040825-MW8-29-022	P4H1019-06	Water	08/25/04 12:00	08/26/04 16:17

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-01RE1 Water	**2708-040825-MW12-36-017**			**Sampled: 08/25/04 09:10**						
Benzene	EPA 8021B	**235**	-----	25.0	ug/l	50x	4081213	08/28/04	08/28/04 18:34	
Toluene	"	**584**	-----	25.0	"	"	"	"	"	
Ethylbenzene	"	**488**	-----	25.0	"	"	"	"	"	
Xylenes (total)	"	**991**	-----	50.0	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 94.8%*		*Limits: 70 - 130 %*		*1X*			"	
P4H1019-02RE1 Water	**2708-040825-MW13-30-018**			**Sampled: 08/25/04 10:30**						
Benzene	EPA 8021B	**1150**	-----	5.00	ug/l	10x	4081213	08/28/04	08/28/04 21:13	
Toluene	"	**8.25**	-----	5.00	"	"	"	"	"	
Ethylbenzene	"	**120**	-----	5.00	"	"	"	"	"	
Xylenes (total)	"	**75.6**	-----	10.0	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 89.4%*		*Limits: 70 - 130 %*		*1X*			"	
P4H1019-03 Water	**2708-040825-MW1-22-019**			**Sampled: 08/25/04 11:45**						
Benzene	EPA 8021B	**4.66**	-----	0.500	ug/l	1x	4081203	08/27/04	08/28/04 03:05	
Toluene	"	**5.87**	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	**6.59**	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	**46.3**	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 107%*		*Limits: 70 - 130 %*		"			"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-04RE3 Water	**2708-040825-MW15-50-020**			**Sampled: 08/25/04 13:40**						
Benzene	EPA 8021B	**40500**	-----	250	ug/l	500x	4081314	08/31/04	09/01/04 00:47	
Toluene	"	ND	-----	250	"	"	"	"	"	
Ethylbenzene	"	**288**	-----	250	"	"	"	"	"	
Xylenes (total)	"	**764**	-----	500	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 113%*		*Limits: 70 - 130 %*		*1X*			"	
P4H1019-05RE2 Water	**2708-040825-MW8-56-021**			**Sampled: 08/25/04 14:45**						
Benzene	EPA 8021B	**20300**	-----	100	ug/l	200x	4081258	08/30/04	08/31/04 00:30	
Toluene	"	**248**	-----	100	"	"	"	"	"	
Ethylbenzene	"	**795**	-----	100	"	"	"	"	"	
Xylenes (total)	"	**831**	-----	200	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 94.2%*		*Limits: 70 - 130 %*		*1X*			"	
P4H1019-06 Water	**2708-040825-MW8-29-022**			**Sampled: 08/25/04 12:00**						
Benzene	EPA 8021B	**85.9**	-----	0.500	ug/l	1x	4081203	08/27/04	08/28/04 04:42	
Toluene	"	**13.4**	-----	0.500	"	"	"	"	"	
Ethylbenzene	"	**14.3**	-----	0.500	"	"	"	"	"	
Xylenes (total)	"	**29.1**	-----	1.00	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 110%*		*Limits: 70 - 130 %*		"			"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-01	**Water**	**2708-040825-MW12-36-017**			**Sampled: 08/25/04 09:10**						
Arsenic		EPA 6020	**0.00297**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/09/04 21:48	
Chromium		"	ND	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	ND	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	
P4H1019-02	**Water**	**2708-040825-MW13-30-018**			**Sampled: 08/25/04 10:30**						
Arsenic		EPA 6020	**0.0144**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/09/04 22:39	
Chromium		"	ND	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	ND	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	
P4H1019-03	**Water**	**2708-040825-MW1-22-019**			**Sampled: 08/25/04 11:45**						
Arsenic		EPA 6020	**0.00302**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/09/04 22:52	
Chromium		"	**0.0315**	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	**0.0182**	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.168**	-----	0.00200	"	"	"	"	"	
Zinc		"	**0.230**	-----	0.00500	"	"	"	"	"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-04	**Water**	**2708-040825-MW15-50-020**			**Sampled: 08/25/04 13:40**						
Arsenic		EPA 6020	**0.0172**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/09/04 23:05	
Chromium		"	**0.00141**	-----	0.00100	"	"	"	"	"	
Copper		"	**0.00265**	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00529**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	
P4H1019-05	**Water**	**2708-040825-MW8-56-021**			**Sampled: 08/25/04 14:45**						
Arsenic		EPA 6020	**0.00766**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/09/04 23:18	
Chromium		"	**0.00720**	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00760**	-----	0.00200	"	"	"	"	"	
Zinc		"	**0.00535**	-----	0.00500	"	"	"	"	"	
P4H1019-06	**Water**	**2708-040825-MW8-29-022**			**Sampled: 08/25/04 12:00**						
Arsenic		EPA 6020	**0.00243**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/09/04 23:43	
Chromium		"	**0.00660**	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.0113**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-01 Water	**2708-040825-MW12-36-017**			**Sampled: 08/25/04 09:10**						**R-05**
Acenaphthene	EPA 8270m	**62.0**	*0.500*	1.00	ug/l	10x	4081231	08/30/04	09/03/04 20:18	
Acenaphthylene	"	ND	*1.00*	1.00	"	"	"	"	"	
Anthracene	"	**2.66**	*0.500*	1.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Chrysene	"	ND	*0.500*	1.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*1.00*	2.00	"	"	"	"	"	
Fluoranthene	"	**6.34**	*0.500*	1.00	"	"	"	"	"	
Fluorene	"	**29.6**	*0.500*	1.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Naphthalene	"	**554**	*5.00*	10.0	"	100x	"	"	09/07/04 16:31	
Phenanthrene	"	**36.2**	*0.500*	1.00	"	10x	"	"	09/03/04 20:18	
Pyrene	"	**5.51**	*0.500*	1.00	"	"	"	"	"	
Surrogate(s): Fluorene-d10	*Recovery: 97.9%*			*Limits: 25 - 125 %*	"				"	
Pyrene-d10	*126%*			*23 - 150 %*	"				"	
Benzo (a) pyrene-d12	*103%*			*10 - 125 %*	"				"	

North Creek Analytical - Portland

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 17:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-02 Water	**2708-040825-MW13-30-018**			**Sampled: 08/25/04 10:30**						**R-05**
Acenaphthene	EPA 8270m	**171**	*5.00*	10.0	ug/l	100x	4081231	08/30/04	09/10/04 06:12	
Acenaphthylene	"	ND	*1.50*	1.50	"	10x	"	"	09/03/04 20:51	**R-03**
Anthracene	"	**6.46**	*0.500*	1.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Chrysene	"	ND	*0.500*	1.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*1.00*	2.00	"	"	"	"	"	
Fluoranthene	"	**2.94**	*0.500*	1.00	"	"	"	"	"	
Fluorene	"	**35.9**	*0.500*	1.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Naphthalene	"	**78.6**	*0.500*	1.00	"	"	"	"	"	
Phenanthrene	"	**57.1**	*0.500*	1.00	"	"	"	"	"	
Pyrene	"	**2.41**	*0.500*	1.00	"	"	"	"	"	
Surrogate(s): Fluorene-d10	*Recovery: 89.8%*		*Limits: 25 - 125 %*		"				"	
Pyrene-d10	*120%*		*23 - 150 %*		"				"	
Benzo (a) pyrene-d12	*93.1%*		*10 - 125 %*		"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-03 Water	**2708-040825-MW1-22-019**			**Sampled: 08/25/04 11:45**						**R-05**
Acenaphthene	EPA 8270m	**50.0**	*0.500*	1.00	ug/l	10x	4081231	08/30/04	09/03/04 21:23	
Acenaphthylene	"	ND	*0.500*	1.00	"	"	"	"	"	
Anthracene	"	**7.00**	*0.500*	1.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.500*	1.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.500*	1.00	"	"	"	"	"	
Chrysene	"	ND	*0.500*	1.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*1.00*	2.00	"	"	"	"	"	
Fluoranthene	"	**2.61**	*0.500*	1.00	"	"	"	"	"	
Fluorene	"	**46.9**	*0.500*	1.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.500*	1.00	"	"	"	"	"	
Naphthalene	"	**403**	*5.00*	10.0	"	100x	"	"	09/07/04 17:05	
Phenanthrene	"	**77.4**	*0.500*	1.00	"	10x	"	"	09/03/04 21:23	
Pyrene	"	**2.34**	*0.500*	1.00	"	"	"	"	"	
Surrogate(s): Fluorene-d10	*Recovery: 90.3%*			*Limits: 25 - 125 %*	"				"	
Pyrene-d10	*124%*			*23 - 150 %*	"				"	
Benzo (a) pyrene-d12	*103%*			*10 - 125 %*	"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-03RE1 Water	**2708-040825-MW1-22-019**			**Sampled: 08/25/04 11:45**						**O-04, R-05, X**
Benzo (a) anthracene	EPA 8270m	**0.130**	*0.100*	0.200	ug/l	2x	4081231	08/30/04	10/15/04 11:31	**J**
Benzo (a) pyrene	"	ND	*0.100*	0.200	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.100*	0.200	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.100*	0.200	"	"	"	"	"	
Chrysene	"	**0.131**	*0.100*	0.200	"	"	"	"	"	**J**
Dibenzo (a,h) anthracene	"	ND	*0.200*	0.400	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.100*	0.200	"	"	"	"	"	
Surrogate(s): Pyrene-d10		*Recovery: 98.3%*		*Limits: 23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*85.2%*		*10 - 125 %*		"			"	
P4H1019-04 Water	**2708-040825-MW15-50-020**			**Sampled: 08/25/04 13:40**						**R-05**
Acenaphthene	EPA 8270m	**35.3**	*2.50*	5.00	ug/l	50x	4081231	08/30/04	09/03/04 21:55	
Acenaphthylene	"	**50.9**	*2.50*	5.00	"	"	"	"	"	
Anthracene	"	**4.23**	*2.50*	5.00	"	"	"	"	"	**J**
Benzo (a) anthracene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*2.50*	5.00	"	"	"	"	"	
Chrysene	"	ND	*2.50*	5.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*5.00*	10.0	"	"	"	"	"	
Fluoranthene	"	**4.44**	*2.50*	5.00	"	"	"	"	"	**J**
Fluorene	"	**51.9**	*2.50*	5.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*2.50*	5.00	"	"	"	"	"	
Naphthalene	"	**6130**	*50.0*	100	"	1000x	"	"	09/07/04 17:39	
Phenanthrene	"	**78.8**	*2.50*	5.00	"	50x	"	"	09/03/04 21:55	
Pyrene	"	**3.93**	*2.50*	5.00	"	"	"	"	"	**J**
Surrogate(s): Fluorene-d10		*Recovery: 97.9%*		*Limits: 25 - 125 %*		"			"	*J*
Pyrene-d10		*114%*		*23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*83.2%*		*10 - 125 %*		"			"	*J*

North Creek Analytical - Portland

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-05 Water	**2708-040825-MW8-56-021**			**Sampled: 08/25/04 14:45**						**R-05**
Acenaphthene	EPA 8270m	**165**	*2.50*	5.00	ug/l	50x	4081231	08/30/04	09/03/04 22:28	
Acenaphthylene	"	**57.2**	*2.50*	5.00	"	"	"	"	"	
Anthracene	"	**11.7**	*2.50*	5.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*2.50*	5.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*2.50*	5.00	"	"	"	"	"	
Chrysene	"	ND	*2.50*	5.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*5.00*	10.0	"	"	"	"	"	
Fluoranthene	"	**14.7**	*2.50*	5.00	"	"	"	"	"	
Fluorene	"	**59.8**	*2.50*	5.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*2.50*	5.00	"	"	"	"	"	
Naphthalene	"	**10400**	*250*	500	"	5000x	"	"	09/08/04 17:14	
Phenanthrene	"	**108**	*2.50*	5.00	"	50x	"	"	09/03/04 22:28	
Pyrene	"	**16.3**	*2.50*	5.00	"	"	"	"	"	
Surrogate(s): Fluorene-d10	*Recovery: 127%*		*Limits: 25 - 125 %*		"				"	*S-09*
Pyrene-d10	*114%*		*23 - 150 %*		"				"	
Benzo (a) pyrene-d12	*77.1%*		*10 - 125 %*		"				"	*J*

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Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-06 Water	**2708-040825-MW8-29-022**			**Sampled: 08/25/04 12:00**						**R-05**
Acenaphthene	EPA 8270m	**234**	*5.00*	10.0	ug/l	100x	4081231	08/30/04	09/07/04 18:47	
Acenaphthylene	"	**2.82**	*0.500*	1.00	"	10x	"	"	09/03/04 23:00	
Anthracene	"	**16.1**	*0.500*	1.00	"	"	"	"	"	
Benzo (a) anthracene	"	**7.49**	*0.500*	1.00	"	"	"	"	"	
Benzo (a) pyrene	"	**8.19**	*0.500*	1.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	**4.95**	*0.500*	1.00	"	"	"	"	"	
Benzo (ghi) perylene	"	**6.01**	*0.500*	1.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	**4.24**	*0.500*	1.00	"	"	"	"	"	
Chrysene	"	**9.56**	*0.500*	1.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*1.00*	2.00	"	"	"	"	"	
Fluoranthene	"	**27.8**	*0.500*	1.00	"	"	"	"	"	
Fluorene	"	**56.6**	*0.500*	1.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	**4.09**	*0.500*	1.00	"	"	"	"	"	
Naphthalene	"	**2520**	*50.0*	100	"	1000x	"	"	09/08/04 17:47	
Phenanthrene	"	**136**	*5.00*	10.0	"	100x	"	"	09/07/04 18:47	
Pyrene	"	**34.6**	*0.500*	1.00	"	10x	"	"	09/03/04 23:00	
Surrogate(s): Fluorene-d10	*Recovery: 115%*		*Limits: 25 - 125 %*		"				"	
Pyrene-d10	*115%*		*23 - 150 %*		"				"	
Benzo (a) pyrene-d12	*107%*		*10 - 125 %*		"				"	

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1019-01	**Water**	**2708-040825-MW12-36-017**			**Sampled: 08/25/04 09:10**						
Cyanide (amenable)		EPA 9010A	ND	-----	0.00500	mg/l	1x	4090227	09/07/04	09/08/04 15:01	
Cyanide (total)		EPA 9012A	ND	-----	0.00500	"	"	"	"	"	
P4H1019-02	**Water**	**2708-040825-MW13-30-018**			**Sampled: 08/25/04 10:30**						
Cyanide (amenable)		EPA 9010A	**0.0552**	-----	0.00500	mg/l	1x	4090227	09/07/04	09/08/04 15:01	
Cyanide (total)		EPA 9012A	**0.100**	-----	0.00500	"	"	"	"	"	
P4H1019-03	**Water**	**2708-040825-MW1-22-019**			**Sampled: 08/25/04 11:45**						
Cyanide (amenable)		EPA 9010A	**1.89**	-----	0.0500	mg/l	10x	4090227	09/07/04	09/08/04 15:01	
Cyanide (total)		EPA 9012A	**4.31**	-----	0.0500	"	"	"	"	"	
P4H1019-04	**Water**	**2708-040825-MW15-50-020**			**Sampled: 08/25/04 13:40**						
Cyanide (amenable)		EPA 9010A	**0.418**	-----	0.00500	mg/l	1x	4090227	09/07/04	09/08/04 15:01	
Cyanide (total)		EPA 9012A	**0.460**	-----	0.00500	"	"	"	"	"	
P4H1019-05	**Water**	**2708-040825-MW8-56-021**			**Sampled: 08/25/04 14:45**						
Cyanide (amenable)		EPA 9010A	**0.153**	-----	0.00500	mg/l	1x	4090227	09/07/04	09/08/04 15:01	
Cyanide (total)		EPA 9012A	**0.474**	-----	0.00500	"	"	"	"	"	
P4H1019-06	**Water**	**2708-040825-MW8-29-022**			**Sampled: 08/25/04 12:00**						
Cyanide (amenable)		EPA 9010A	**0.138**	-----	0.0500	mg/l	10x	4090227	09/07/04	09/08/04 15:01	
Cyanide (total)		EPA 9012A	**2.69**	-----	0.0500	"	"	"	"	"	

North Creek Analytical - Portland

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081203 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081203-BLK1)									Extracted: 08/27/04 16:24					
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/27/04 17:02	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 107%*			*Limits: 70-130%*	"							*08/27/04 17:02*	
LCS (4081203-BS1)									Extracted: 08/27/04 16:24					
Benzene	EPA 8021B	18.6	---	0.500	ug/l	1x	--	20.0	93.0%	(70-130)	--	--	08/27/04 18:00	
Toluene	"	18.6	---	0.500	"	"	--	"	93.0%	(76-129)	--	--	"	
Ethylbenzene	"	17.7	---	0.500	"	"	--	"	88.5%	(82-130)	--	--	"	
Xylenes (total)	"	58.2	---	1.00	"	"	--	60.0	97.0%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 98.6%*			*Limits: 70-130%*	"							*08/27/04 18:00*	
Matrix Spike (4081203-MS1)							QC Source: P4H0913-01		Extracted: 08/27/04 16:24					
Benzene	EPA 8021B	18.8	---	0.500	ug/l	1x	ND	20.0	94.0%	(65-144)	--	--	08/27/04 18:32	
Toluene	"	18.7	---	0.500	"	"	ND	"	92.3%	(68-139)	--	--	"	
Ethylbenzene	"	17.8	---	0.500	"	"	ND	"	89.0%	(69-144)	--	--	"	
Xylenes (total)	"	58.7	---	1.00	"	"	ND	60.0	97.1%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 96.0%*			*Limits: 70-130%*	"							*08/27/04 18:32*	
Matrix Spike Dup (4081203-MSD1)							QC Source: P4H0913-01		Extracted: 08/27/04 16:24					
Benzene	EPA 8021B	18.8	---	0.500	ug/l	1x	ND	20.0	94.0%	(65-144)	0.00%	(20)	08/27/04 19:04	
Toluene	"	18.6	---	0.500	"	"	ND	"	91.8%	(68-139)	0.536%	"	"	
Ethylbenzene	"	17.7	---	0.500	"	"	ND	"	88.5%	(69-144)	0.563%	"	"	
Xylenes (total)	"	58.3	---	1.00	"	"	ND	60.0	96.4%	(60-144)	0.684%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 95.4%*			*Limits: 70-130%*	"							*08/27/04 19:04*	

North Creek Analytical - Portland

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 17:18

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081213 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081213-BLK1)									Extracted: 08/28/04 12:20					
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/28/04 16:50	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 104%*		*Limits: 70-130%*		"							*08/28/04 16:50*	
LCS (4081213-BS1)									Extracted: 08/28/04 12:20					
Benzene	EPA 8021B	19.3	---	0.500	ug/l	1x	--	20.0	96.5%	(70-130)	--	--	08/28/04 14:02	
Toluene	"	18.9	---	0.500	"	"	--	"	94.5%	(76-129)	--	--	"	
Ethylbenzene	"	18.3	---	0.500	"	"	--	"	91.5%	(82-130)	--	--	"	
Xylenes (total)	"	59.8	---	1.00	"	"	--	60.0	99.7%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 108%*		*Limits: 70-130%*		"							*08/28/04 14:02*	
Duplicate (4081213-DUP1)						QC Source: P4H1041-01			Extracted: 08/28/04 12:20					
Benzene	EPA 8021B	9.38	---	0.500	ug/l	1x	10.1	--	--	--	7.39%	(20)	08/28/04 23:21	
Toluene	"	8.14	---	0.500	"	"	8.11	--	--	--	0.369%	"	"	
Ethylbenzene	"	2.03	---	0.500	"	"	2.07	--	--	--	1.95%	"	"	
Xylenes (total)	"	88.4	---	1.00	"	"	88.9	--	--	--	0.564%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 108%*		*Limits: 70-130%*		"							*08/28/04 23:21*	
Matrix Spike (4081213-MS1)						QC Source: P4H1019-01RE1			Extracted: 08/28/04 12:20					
Benzene	EPA 8021B	958	---	25.0	ug/l	50x	235	1000	72.3%	(65-144)	--	--	08/28/04 19:05	
Toluene	"	1330	---	25.0	"	"	584	"	74.6%	(68-139)	--	--	"	
Ethylbenzene	"	1200	---	25.0	"	"	488	"	71.2%	(69-144)	--	--	"	
Xylenes (total)	"	3390	---	50.0	"	"	991	3000	80.0%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 94.8%*		*Limits: 70-130%*		*1x*							*08/28/04 19:05*	
Matrix Spike Dup (4081213-MSD1)						QC Source: P4H1019-01RE1			Extracted: 08/28/04 12:20					
Benzene	EPA 8021B	1120	---	25.0	ug/l	50x	235	1000	88.5%	(65-144)	15.6%	(20)	08/28/04 20:42	
Toluene	"	1500	---	25.0	"	"	584	"	91.6%	(68-139)	12.0%	"	"	
Ethylbenzene	"	1350	---	25.0	"	"	488	"	86.2%	(69-144)	11.8%	"	"	
Xylenes (total)	"	3880	---	50.0	"	"	991	3000	96.3%	(60-144)	13.5%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 104%*		*Limits: 70-130%*		*1x*							*08/28/04 20:42*	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081258 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081258-BLK1)								**Extracted: 08/30/04 16:57**						
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/30/04 19:34	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 96.2%*			*Limits: 70-130%*	"							*08/30/04 19:34*	
LCS (4081258-BS1)								**Extracted: 08/30/04 16:57**						
Benzene	EPA 8021B	20.5	---	0.500	ug/l	1x	--	20.0	102%	(70-130)	--	--	08/30/04 21:16	
Toluene	"	19.6	---	0.500	"	"	--	"	98.0%	(76-129)	--	--	"	
Ethylbenzene	"	19.1	---	0.500	"	"	--	"	95.5%	(82-130)	--	--	"	
Xylenes (total)	"	57.4	---	1.00	"	"	--	60.0	95.7%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 99.0%*			*Limits: 70-130%*	"							*08/30/04 21:16*	
Matrix Spike (4081258-MS1)					**QC Source: P4H1069-06**			**Extracted: 08/30/04 16:57**						
Benzene	EPA 8021B	2210	---	25.0	ug/l	50x	1250	1000	96.0%	(65-144)	--	--	08/31/04 02:49	
Toluene	"	1220	---	25.0	"	"	339	"	88.1%	(68-139)	--	--	"	
Ethylbenzene	"	1130	---	25.0	"	"	223	"	90.7%	(69-144)	--	--	"	
Xylenes (total)	"	3120	---	50.0	"	"	486	3000	87.8%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 97.8%*			*Limits: 70-130%*	*1x*							*08/31/04 02:49*	
Matrix Spike Dup (4081258-MSD1)					**QC Source: P4H1069-06**			**Extracted: 08/30/04 16:57**						
Benzene	EPA 8021B	2270	---	25.0	ug/l	50x	1250	1000	102%	(65-144)	2.68%	(20)	08/31/04 03:17	
Toluene	"	1300	---	25.0	"	"	339	"	96.1%	(68-139)	6.35%	"	"	
Ethylbenzene	"	1190	---	25.0	"	"	223	"	96.7%	(69-144)	5.17%	"	"	
Xylenes (total)	"	3360	---	50.0	"	"	486	3000	95.8%	(60-144)	7.41%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 98.0%*			*Limits: 70-130%*	*1x*							*08/31/04 03:17*	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081314 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081314-BLK1)									**Extracted: 08/31/04 15:14**					
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/31/04 16:41	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 113%*			*Limits: 70-130%*	"							*08/31/04 16:41*	
LCS (4081314-BS1)									**Extracted: 08/31/04 15:14**					
Benzene	EPA 8021B	19.2	---	0.500	ug/l	1x	--	20.0	96.0%	(70-130)	--	--	08/31/04 17:10	
Toluene	"	19.9	---	0.500	"	"	--	"	99.5%	(76-129)	--	--	"	
Ethylbenzene	"	20.1	---	0.500	"	"	--	"	100%	(82-130)	--	--	"	
Xylenes (total)	"	58.4	---	1.00	"	"	--	60.0	97.3%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 111%*			*Limits: 70-130%*	"							*08/31/04 17:10*	
Matrix Spike (4081314-MS1)					**QC Source: P4H1116-01**				**Extracted: 08/31/04 15:14**					
Benzene	EPA 8021B	30.9	---	0.500	ug/l	1x	13.8	20.0	85.5%	(65-144)	--	--	08/31/04 20:57	
Toluene	"	18.8	---	0.500	"	"	ND	"	94.0%	(68-139)	--	--	"	
Ethylbenzene	"	18.9	---	0.500	"	"	ND	"	93.2%	(69-144)	--	--	"	
Xylenes (total)	"	48.1	---	1.00	"	"	ND	60.0	80.2%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 116%*			*Limits: 70-130%*	"							*08/31/04 20:57*	
Matrix Spike Dup (4081314-MSD1)					**QC Source: P4H1116-01**				**Extracted: 08/31/04 15:14**					
Benzene	EPA 8021B	30.8	---	0.500	ug/l	1x	13.8	20.0	85.0%	(65-144)	0.324%	(20)	08/31/04 21:26	
Toluene	"	18.7	---	0.500	"	"	ND	"	93.5%	(68-139)	0.533%	"	"	
Ethylbenzene	"	18.3	---	0.500	"	"	ND	"	90.2%	(69-144)	3.23%	"	"	
Xylenes (total)	"	47.1	---	1.00	"	"	ND	60.0	78.5%	(60-144)	2.10%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 121%*			*Limits: 70-130%*	"							*08/31/04 21:26*	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081235 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081235-BLK1)								Extracted: 08/30/04 09:48						
Arsenic	EPA 6020	ND	---	0.00100	mg/l	1x	--	--	--	--	--	--	09/09/04 21:29	
Chromium	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Copper	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Lead	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Nickel	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Zinc	"	ND	---	0.00500	"	"	--	--	--	--	--	--	"	
LCS (4081235-BS1)								Extracted: 08/30/04 09:48						
Arsenic	EPA 6020	0.108	---	0.00100	mg/l	1x	--	0.100	108%	(80-120)	--	--	09/09/04 21:35	
Chromium	"	0.107	---	0.00100	"	"	--	"	107%	"	--	--	"	
Copper	"	0.107	---	0.00200	"	"	--	"	107%	"	--	--	"	
Lead	"	0.102	---	0.00100	"	"	--	"	102%	"	--	--	"	
Nickel	"	0.107	---	0.00200	"	"	--	"	107%	"	--	--	"	
Zinc	"	0.105	---	0.00500	"	"	--	"	105%	"	--	--	"	
LCS Dup (4081235-BSD1)								Extracted: 08/30/04 09:48						
Arsenic	EPA 6020	0.107	---	0.00100	mg/l	1x	--	0.100	107%	(80-120)	0.930%	(20)	09/09/04 21:42	
Chromium	"	0.106	---	0.00100	"	"	--	"	106%	"	0.939%	"	"	
Copper	"	0.106	---	0.00200	"	"	--	"	106%	"	0.939%	"	"	
Lead	"	0.102	---	0.00100	"	"	--	"	102%	"	0.00%	"	"	
Nickel	"	0.105	---	0.00200	"	"	--	"	105%	"	1.89%	"	"	
Zinc	"	0.106	---	0.00500	"	"	--	"	106%	"	0.948%	"	"	
Duplicate (4081235-DUP1)					QC Source: P4H1019-01				Extracted: 08/30/04 09:48					
Arsenic	EPA 6020	0.00307	---	0.00100	mg/l	1x	0.00297	--	--	--	3.31%	(20)	09/09/04 22:01	
Chromium	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Copper	"	ND	---	0.00200	"	"	ND	--	--	--	NR	"	"	
Lead	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Nickel	"	0.00159	---	0.00200	"	"	ND	--	--	--	NR	"	"	
Zinc	"	ND	---	0.00500	"	"	ND	--	--	--	NR	"	"	
Matrix Spike (4081235-MS1)					QC Source: P4H1069-03				Extracted: 08/30/04 09:48					
Arsenic	EPA 6020	0.118	---	0.00100	mg/l	1x	0.00461	0.100	113%	(75-125)	--	--	09/10/04 02:05	
Chromium	"	0.112	---	0.00100	"	"	0.00134	"	111%	"	--	--	"	
Copper	"	0.111	---	0.00200	"	"	ND	"	109%	"	--	--	"	
Lead	"	0.0980	---	0.00100	"	"	ND	"	98.0%	"	--	--	"	
Nickel	"	0.113	---	0.00200	"	"	0.00542	"	108%	"	--	--	"	
Zinc	"	0.108	---	0.00500	"	"	ND	"	105%	"	--	--	"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081235 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (4081235-MS2)				QC Source: P4H1019-01				Extracted: 08/30/04 09:48						
Arsenic	EPA 6020	0.114	---	0.00100	mg/l	1x	0.00297	0.100	111%	(75-125)	--	--	09/09/04 22:26	
Chromium	"	0.109	---	0.00100	"	"	ND	"	109%	"	--	--	"	
Copper	"	0.108	---	0.00200	"	"	ND	"	108%	"	--	--	"	
Lead	"	0.0996	---	0.00100	"	"	ND	"	99.6%	"	--	--	"	
Nickel	"	0.109	---	0.00200	"	"	ND	"	107%	"	--	--	"	
Zinc	"	0.110	---	0.00500	"	"	ND	"	108%	"	--	--	"	
Matrix Spike Dup (4081235-MSD1)				QC Source: P4H1069-03				Extracted: 08/30/04 09:48						
Arsenic	EPA 6020	0.121	---	0.00100	mg/l	1x	0.00461	0.100	116%	(75-125)	2.51%	(20)	09/10/04 02:30	
Chromium	"	0.117	---	0.00100	"	"	0.00134	"	116%	"	4.37%	"	"	
Copper	"	0.114	---	0.00200	"	"	ND	"	112%	"	2.67%	"	"	
Lead	"	0.0967	---	0.00100	"	"	ND	"	96.7%	"	1.34%	"	"	
Nickel	"	0.118	---	0.00200	"	"	0.00542	"	113%	"	4.33%	"	"	
Zinc	"	0.114	---	0.00500	"	"	ND	"	111%	"	5.41%	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081231 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081231-BLK1)							**Extracted: 08/30/04 08:20**							
Acenaphthene	EPA 8270m	ND	0.0500	0.100	ug/l	1x	--	--	--	--	--	--	09/08/04 17:08	
Acenaphthylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	0.100	0.200	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 115%*			*Limits: 25-125%*	"							*09/08/04 17:08*	
Pyrene-d10		*146%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*95.6%*			*10-125%*	"							"	
LCS (4081231-BS1)							**Extracted: 08/30/04 08:20**							
Acenaphthene	EPA 8270m	2.72	0.0500	0.100	ug/l	1x	--	2.50	109%	(26-135)	--	--	09/09/04 13:59	
Benzo (a) pyrene	"	2.79	0.0500	0.100	"	"	--	"	112%	(38-137)	--	--	"	
Pyrene	"	3.09	0.0500	0.100	"	"	--	"	124%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery: 120%*			*Limits: 25-125%*	"							*09/09/04 13:59*	
Pyrene-d10		*132%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*123%*			*10-125%*	"							"	
LCS Dup (4081231-BSD1)							**Extracted: 08/30/04 08:20**							
Acenaphthene	EPA 8270m	2.71	0.0500	0.100	ug/l	1x	--	2.50	108%	(26-135)	0.368%	(60)	09/09/04 14:25	
Benzo (a) pyrene	"	2.70	0.0500	0.100	"	"	--	"	108%	(38-137)	3.28%	"	"	
Pyrene	"	3.09	0.0500	0.100	"	"	--	"	124%	(33-133)	0.00%	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 123%*			*Limits: 25-125%*	"							*09/09/04 14:25*	
Pyrene-d10		*135%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*121%*			*10-125%*	"							"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 17:18

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090227 **Water Preparation Method: Wet Chem**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4090227-BLK1)								**Extracted: 09/07/04 10:30**						
Cyanide (total)	EPA 9012A	ND	---	0.00500	mg/l	1x	--	--	--	--	--	--	09/08/04 15:01	
LCS (4090227-BS1)								**Extracted: 09/07/04 10:30**						
Cyanide (total)	EPA 9012A	0.185	---	0.00500	mg/l	1x	--	0.200	92.5%	(75-125)	--	--	09/08/04 15:01	
Duplicate (4090227-DUP1)				**QC Source: P4H1019-01**				**Extracted: 09/07/04 10:30**						
Cyanide (total)	EPA 9012A	0.00330	---	0.00500	mg/l	1x	ND	--	--	--	NR	(20)	09/08/04 15:01	Q-05
Matrix Spike (4090227-MS1)				**QC Source: P4H1019-01**				**Extracted: 09/07/04 10:30**						
Cyanide (total)	EPA 9012A	0.188	---	0.00500	mg/l	1x	ND	0.200	92.7%	(75-125)	--	--	09/08/04 15:01	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 17:18

Notes and Definitions

Report Specific Notes:

J - Estimated value.

O-04 - This sample was analyzed outside the EPA recommended holding time.

Q-05 - Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.

R-03 - The reporting limit for this analyte was raised due to matrix interference.

R-05 - Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.

S-09 - Surrogate recovery is outside control limits due to matrix interference.

X - See case narrative.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR / NA - Not Reported / Not Available

dry - Sample results reported on a dry weight basis. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

RPD - Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

nca

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CHAIN OF CUSTODY REPORT

Work Order #: P4H1069

CLIENT: HAI

REPORT TO: Rob Ede / HAI
ADDRESS:

PHONE: 503-796-0717 FAX:

INVOICE TO: HAI pricing as per Philip N.
∝ metals = As, Cr, Cu, Ni, Pb, Zn

P.O. NUMBER: 2708-3[illegible]

PROJECT NAME: NW NATURAL

PROJECT NUMBER: [illegible]

SAMPLED BY: [illegible]

TURNAROUND REQUEST
in Business Days *

Organic & Inorganic Analyses: ~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: ~~5~~ STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE / REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PAH EPA 8270 (NONE)	VOCs EPA 8260 (HCL)	SVOCs 8270 (NONE)	TOT. CYN EPA 9010 (NaOH)	AMER. CYN EPA 9010 (NaOH)	TOT. METALS EPA 6020 (HNO3)	BTEX 8021	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1 2708-040826-MW7-023	8-26-04 9:10	X	X						W	5		
2 2708-040826-MW7-024	8-26-04 9:35	X	X						W	5		
3 2708-040826-MW[illegible]-025	8-26-04 11:30	X	X	X	X	X	X	~~X~~	W	~~[illegible]~~ 22	MS/MSD: PAH, BTEX, TOT. CYN, AMER. CYN.	
4 2708-040826-MW[illegible]-026	8-26-04 13:35	X	X	X	X	X	X		W	~~[illegible]~~ 9	~~[illegible]~~ PAHs, ~~[illegible]~~ VOCs	
5 2708-040826-MW[illegible]-028	8-26-04 15:10	X	X	X	X	X	X		W	8		
6 2708-040826-MW[illegible]-027	8-26-04 13:38	X						X	W	4	DUP.	
7												
8												
9												
10												

RELEASED BY: Matt Dunn DATE: 8/27/04
PRINT NAME: MATT DUNN FIRM: HAI TIME:
RECEIVED BY: [signature] DATE: 8/27/04
PRINT NAME: Bob F FIRM: NA TIME: 14:10

RELEASED BY: [signature] DATE: 8/27/04
PRINT NAME: Bob F FIRM: NA TIME: 14:40
RECEIVED BY: Vanssueras DATE: 8.27.04
PRINT NAME: Vanssueras FIRM: NCA TIME: 14:40

ADDITIONAL REMARKS:

TEMP: 5°F

COC REV 1/03

PAGE OF

52

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Haun

1. **Please sign for receipt and opening of** 2 **cooler or** _____ **other** _____

   By (print) Vanessa Evan (sign) Vanessa Evan

2. Date samples received 8/27/04 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by Bob date 8/27/04 per cooler

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: X blue ice ___gel ice ___real ice

   Temperature (degrees C) _____ Raytek thermometer 5.9,5.2 Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag ~~and taped inside~~ to lid? X Yes (X) No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? X Yes ___No

   Name of project NW Natural (if applicable)

10. **Initial and date for unpacking:** CF **(initials)** **date** 8/30/04

11. Packing material: NA bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___Yes X No

13. Did all containers indicated on the COC arrive? ✓ Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? ✓ Yes ___No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? ✓ Yes ___No

    Do the IDs, times, etc. agree with the COC? ___Yes ✓ No

    If "no" please indicate which containers TB not on COC

16. Are containers properly preserved for indicated analysis? ✓ Yes ___No

17. Is there adequate volume for the test(s) requested? ✓ Yes ___No

18. If voa vials were submitted, are they free of bubbles? ___N/A ✓ Yes ___No

19. **Log-in phase: Date samples were logged in:** 8/30/04 **Elm Project # P** 4H1069

20. Logged in by (print) Carrie Fairsnolz (sign) Carrie Fairsnolz

21. Was the project manager notified of status? (Use back of form as a record) ___Yes ✓ No

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October 22, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Northwest Natural

Enclosed are the results of analyses for samples received by the laboratory on 08/27/04 14:40.
The following list is a summary of the NCA Work Orders contained in this report.
If you have any questions concerning this report, please feel free to contact me.

Work	Project	ProjectNumber
P4H1069	Northwest Natural	2708-30

Thank You,

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Environmental Laboratory Network

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040826-MW7-023	P4H1069-01	Water	08/26/04 09:10	08/27/04 14:40
2708-040826-MW7-024	P4H1069-02	Water	08/26/04 09:35	08/27/04 14:40
2708-040826-MW16-125-025	P4H1069-03	Water	08/26/04 11:30	08/27/04 14:40
2708-040826-MW16-65-026	P4H1069-04	Water	08/26/04 13:35	08/27/04 14:40
2708-040826-MW16-45-028	P4H1069-05	Water	08/26/04 15:10	08/27/04 14:40
2708-040826-MW16-65-027	P4H1069-06	Water	08/26/04 13:38	08/27/04 14:40

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:49

Analytical Case Narrative

North Creek Analytical - Portland

P4H1069

Sample P4H1069-03 for 8270C Semi-volatiles may have low level contamination from the spike mix. This may have come from an improperly rinsed syringe. There was insufficient sample to re-extract. The data was reported and the affected analytes were flagged.

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BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-06	**Water**	**2708-040826-MW16-65-027**			**Sampled: 08/26/04 13:38**						
Benzene		EPA 8021B	**1250**	-----	25.0	ug/l	50x	4081258	08/30/04	08/31/04 02:21	
Toluene		"	**339**	-----	25.0	"	"	"	"	"	
Ethylbenzene		"	**223**	-----	25.0	"	"	"	"	"	
Xylenes (total)		"	**486**	-----	50.0	"	"	"	"	"	
Surrogate(s): 4-BFB (PID)			*Recovery: 94.2%*		*Limits: 70 - 130 %*		*1X*			"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-03	**Water**	**2708-040826-MW16-125-025**			**Sampled: 08/26/04 11:30**						
Arsenic		EPA 6020	**0.00461**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/10/04 01:52	
Chromium		"	**0.00134**	-----	0.00100	"	"	"	"	"	
Copper		"	ND	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.00542**	-----	0.00200	"	"	"	"	"	
Zinc		"	ND	-----	0.00500	"	"	"	"	"	
P4H1069-04	**Water**	**2708-040826-MW16-65-026**			**Sampled: 08/26/04 13:35**						
Arsenic		EPA 6020	**0.00173**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/10/04 02:43	
Chromium		"	**0.00137**	-----	0.00100	"	"	"	"	"	
Copper		"	**0.00201**	-----	0.00200	"	"	"	"	"	
Lead		"	ND	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.0197**	-----	0.00200	"	"	"	"	"	
Zinc		"	**0.00762**	-----	0.00500	"	"	"	"	"	
P4H1069-05	**Water**	**2708-040826-MW16-45-028**			**Sampled: 08/26/04 15:10**						
Arsenic		EPA 6020	**0.00917**	-----	0.00100	mg/l	1x	4081235	08/30/04	09/10/04 02:56	
Chromium		"	**0.0138**	-----	0.00100	"	"	"	"	"	
Copper		"	**0.00473**	-----	0.00200	"	"	"	"	"	
Lead		"	**0.00138**	-----	0.00100	"	"	"	"	"	
Nickel		"	**0.131**	-----	0.00200	"	"	"	"	"	
Zinc		"	**0.0110**	-----	0.00500	"	"	"	"	"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-01 Water	**2708-040826-MW7-023**			**Sampled: 08/26/04 09:10**						
Acetone	EPA 8260B	**140**	-----	25.0	ug/l	1x	4090189	09/06/04	09/06/04 21:16	
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	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	2.00	"	"	"	"	"	
2-Hexanone	"	ND	-----	10.0	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	2.00	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-01 Water	**2708-040826-MW7-023**			**Sampled: 08/26/04 09:10**						
p-Isopropyltoluene	EPA 8260B	ND	-----	2.00	ug/l	1x	4090189	09/06/04	09/06/04 21:16	
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	"	"	"	"	"	
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	"	**1.67**	-----	1.00	"	"	"	"	"	
m,p-Xylene	"	ND	-----	2.00	"	"	"	"	"	
Surrogate(s): 4-BFB	*Recovery: 87.0%*			*Limits: 75 - 120 %*	"				"	
1,2-DCA-d4	*101%*			*77 - 129 %*	"				"	
Dibromofluoromethane	*96.5%*			*80 - 121 %*	"				"	
Toluene-d8	*97.0%*			*80 - 120 %*	"				"	

North Creek Analytical - Portland

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-02 Water	**2708-040826-MW7-024**			**Sampled: 08/26/04 09:35**						
Acetone	EPA 8260B	**153**	-----	25.0	ug/l	1x	4090189	09/06/04	09/06/04 21:43	
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	-----	50.0	"	"	"	"	"	**R-03**
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	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	2.00	"	"	"	"	"	
2-Hexanone	"	ND	-----	10.0	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	2.00	"	"	"	"	"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-02 Water	**2708-040826-MW7-024**			**Sampled: 08/26/04 09:35**						
p-Isopropyltoluene	EPA 8260B	ND	-----	2.00	ug/l	1x	4090189	09/06/04	09/06/04 21:43	
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	"	"	"	"	"	
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	"	**1.71**	-----	1.00	"	"	"	"	"	
m,p-Xylene	"	ND	-----	2.00	"	"	"	"	"	

Surrogate(s):	*4-BFB*	*Recovery: 90.5%*	*Limits: 75 - 120 %*	"
	1,2-DCA-d4	*103%*	*77 - 129 %*	"
	Dibromofluoromethane	*98.0%*	*80 - 121 %*	"
	Toluene-d8	*100%*	*80 - 120 %*	"

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-03 Water	**2708-040826-MW16-125-025**			**Sampled: 08/26/04 11:30**						
Acetone	EPA 8260B	ND	-----	25.0	ug/l	1x	4090189	09/06/04	09/06/04 15:45	
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	"	**1.17**	-----	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	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	2.00	"	"	"	"	"	
2-Hexanone	"	ND	-----	10.0	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	2.00	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-03 Water	**2708-040826-MW16-125-025**			**Sampled: 08/26/04 11:30**						
p-Isopropyltoluene	EPA 8260B	ND	-----	2.00	ug/l	1x	4090189	09/06/04	09/06/04 15:45	
4-Methyl-2-pentanone	"	ND	-----	5.00	"	"	"	"	"	
Methyl tert-butyl ether	"	ND	-----	1.00	"	"	"	"	"	
Methylene chloride	"	ND	-----	5.00	"	"	"	"	"	
Naphthalene	"	**22.2**	-----	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	"	"	"	"	"	
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	"	"	"	"	"	
Surrogate(s): 4-BFB		*Recovery: 90.0%*		*Limits: 75 - 120 %*	"				"	
1,2-DCA-d4		*104%*		*77 - 129 %*	"				"	
Dibromofluoromethane		*97.0%*		*80 - 121 %*	"				"	
Toluene-d8		*98.0%*		*80 - 120 %*	"				"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-04 Water	**2708-040826-MW16-65-026**			**Sampled: 08/26/04 13:35**						
Acetone	EPA 8260B	ND	-----	1250	ug/l	50x	4090189	09/06/04	09/06/04 22:11	
Benzene	"	**1370**	-----	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	"	**236**	-----	50.0	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	100	"	"	"	"	"	
2-Hexanone	"	ND	-----	500	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	100	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-04 Water	**2708-040826-MW16-65-026**			**Sampled: 08/26/04 13:35**						
p-Isopropyltoluene	EPA 8260B	ND	-----	100	ug/l	50x	4090189	09/06/04	09/06/04 22:11	
4-Methyl-2-pentanone	"	ND	-----	250	"	"	"	"	"	
Methyl tert-butyl ether	"	ND	-----	50.0	"	"	"	"	"	
Methylene chloride	"	ND	-----	250	"	"	"	"	"	
Naphthalene	"	**4890**	-----	100	"	"	"	"	"	
n-Propylbenzene	"	ND	-----	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	"	**388**	-----	50.0	"	"	"	"	"	
1,2,3-Trichlorobenzene	"	ND	-----	50.0	"	"	"	"	"	
1,2,4-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	"	ND	-----	50.0	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	ND	-----	50.0	"	"	"	"	"	
Vinyl chloride	"	ND	-----	50.0	"	"	"	"	"	
o-Xylene	"	**181**	-----	50.0	"	"	"	"	"	
m,p-Xylene	"	**371**	-----	100	"	"	"	"	"	
Surrogate(s): 4-BFB		*Recovery: 96.5%*		*Limits: 75 - 120 %*		*1X*			"	
1,2-DCA-d4		*104%*		*77 - 129 %*		"			"	
Dibromofluoromethane		*101%*		*80 - 121 %*		"			"	
Toluene-d8		*101%*		*80 - 120 %*		"			"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-05 Water	**2708-040826-MW16-45-028**			**Sampled: 08/26/04 15:10**						
Acetone	EPA 8260B	ND	-----	1250	ug/l	50x	4090189	09/06/04	09/06/04 22:38	
Benzene	"	**2880**	-----	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	"	**460**	-----	50.0	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	100	"	"	"	"	"	
2-Hexanone	"	ND	-----	500	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	100	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-05 Water	**2708-040826-MW16-45-028**			**Sampled: 08/26/04 15:10**						
p-Isopropyltoluene	EPA 8260B	ND	-----	100	ug/l	50x	4090189	09/06/04	09/06/04 22:38	
4-Methyl-2-pentanone	"	ND	-----	250	"	"	"	"	"	
Methyl tert-butyl ether	"	ND	-----	50.0	"	"	"	"	"	
Methylene chloride	"	ND	-----	250	"	"	"	"	"	
Naphthalene	"	**7590**	-----	100	"	"	"	"	"	
n-Propylbenzene	"	ND	-----	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	"	**959**	-----	50.0	"	"	"	"	"	
1,2,3-Trichlorobenzene	"	ND	-----	50.0	"	"	"	"	"	
1,2,4-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	"	**66.0**	-----	50.0	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	ND	-----	50.0	"	"	"	"	"	
Vinyl chloride	"	ND	-----	50.0	"	"	"	"	"	
o-Xylene	"	**321**	-----	50.0	"	"	"	"	"	
m,p-Xylene	"	**546**	-----	100	"	"	"	"	"	
Surrogate(s): 4-BFB		*Recovery: 102%*		*Limits: 75 - 120 %*		*1X*			"	
1,2-DCA-d4		*108%*		*77 - 129 %*		"			"	
Dibromofluoromethane		*102%*		*80 - 121 %*		"			"	
Toluene-d8		*104%*		*80 - 120 %*		"			"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-03 Water	**2708-040826-MW16-125-025**			**Sampled: 08/26/04 11:30**						
Carbazole	EPA 8270C	ND	-----	5.00	ug/l	1x	4090065	09/02/04	09/07/04 18:10	
Acenaphthene	"	**7.23**	-----	5.00	"	"	"	"	"	X
Acenaphthylene	"	ND	-----	5.00	"	"	"	"	"	
Anthracene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	5.00	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	5.00	"	"	"	"	"	
Benzoic Acid	"	ND	-----	50.0	"	"	"	"	"	
Benzyl alcohol	"	ND	-----	10.0	"	"	"	"	"	
4-Bromophenyl phenyl ether	"	ND	-----	5.00	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
4-Chloro-3-methylphenol	"	**6.27**	-----	5.00	"	"	"	"	"	X
4-Chloroaniline	"	ND	-----	20.0	"	"	"	"	"	
Bis(2-chloroethoxy)methane	"	ND	-----	10.0	"	"	"	"	"	
Bis(2-chloroethyl)ether	"	ND	-----	5.00	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	"	ND	-----	10.0	"	"	"	"	"	
2-Chloronaphthalene	"	ND	-----	5.00	"	"	"	"	"	
2-Chlorophenol	"	ND	-----	5.00	"	"	"	"	"	X
4-Chlorophenyl phenyl ether	"	ND	-----	5.00	"	"	"	"	"	
Chrysene	"	ND	-----	5.00	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	5.00	"	"	"	"	"	
Dibenzofuran	"	ND	-----	5.00	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	5.00	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	5.00	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	5.00	"	"	"	"	"	X
3,3'-Dichlorobenzidine	"	ND	-----	5.00	"	"	"	"	"	
2,4-Dichlorophenol	"	ND	-----	5.00	"	"	"	"	"	
Diethyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
2,4-Dimethylphenol	"	ND	-----	10.0	"	"	"	"	"	
Dimethyl phthalate	"	ND	-----	5.00	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	"	ND	-----	10.0	"	"	"	"	"	
2,4-Dinitrophenol	"	ND	-----	25.0	"	"	"	"	"	
2,4-Dinitrotoluene	"	ND	-----	5.00	"	"	"	"	"	
2,6-Dinitrotoluene	"	ND	-----	5.00	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	ND	-----	10.0	"	"	"	"	"	
Fluoranthene	"	ND	-----	5.00	"	"	"	"	"	
Fluorene	"	ND	-----	5.00	"	"	"	"	"	
Hexachlorobenzene	"	ND	-----	5.00	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-03 Water	**2708-040826-MW16-125-025**			**Sampled: 08/26/04 11:30**						
Hexachlorobutadiene	EPA 8270C	ND	-----	10.0	ug/l	1x	4090065	09/02/04	09/07/04 18:10	
Hexachlorocyclopentadiene	"	ND	-----	10.0	"	"	"	"	"	
Hexachloroethane	"	ND	-----	10.0	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	5.00	"	"	"	"	"	
Isophorone	"	ND	-----	5.00	"	"	"	"	"	
2-Methylnaphthalene	"	**6.23**	-----	5.00	"	"	"	"	"	
2-Methylphenol	"	ND	-----	10.0	"	"	"	"	"	
3-,4-Methylphenol	"	ND	-----	5.00	"	"	"	"	"	
Naphthalene	"	**23.3**	-----	5.00	"	"	"	"	"	
2-Nitroaniline	"	ND	-----	5.00	"	"	"	"	"	
3-Nitroaniline	"	ND	-----	10.0	"	"	"	"	"	
4-Nitroaniline	"	ND	-----	10.0	"	"	"	"	"	
Nitrobenzene	"	ND	-----	5.00	"	"	"	"	"	
2-Nitrophenol	"	ND	-----	5.00	"	"	"	"	"	
4-Nitrophenol	"	ND	-----	25.0	"	"	"	"	"	
N-Nitrosodi-n-propylamine	"	ND	-----	10.0	"	"	"	"	"	X
N-Nitrosodiphenylamine	"	ND	-----	5.00	"	"	"	"	"	
Pentachlorophenol	"	ND	-----	10.0	"	"	"	"	"	
Phenanthrene	"	**5.94**	-----	5.00	"	"	"	"	"	
Phenol	"	ND	-----	5.00	"	"	"	"	"	X
Pyrene	"	ND	-----	5.00	"	"	"	"	"	X
1,2,4-Trichlorobenzene	"	ND	-----	5.00	"	"	"	"	"	X
2,4,5-Trichlorophenol	"	ND	-----	5.00	"	"	"	"	"	
2,4,6-Trichlorophenol	"	ND	-----	5.00	"	"	"	"	"	

Surrogate(s):	*2-Fluorobiphenyl*	*Recovery: 76.9%*	*Limits: 26 - 135 %*	"	"
	2-Fluorophenol	*74.1%*	*6 - 124 %*	"	"
	Nitrobenzene-d5	*89.6%*	*23 - 147 %*	"	"
	Phenol-d6	*78.3%*	*11 - 130 %*	"	"
	p-Terphenyl-d14	*91.3%*	*38 - 149 %*	"	"
	2,4,6-Tribromophenol	*101%*	*19 - 126 %*	"	"

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-04 Water	**2708-040826-MW16-65-026**			**Sampled: 08/26/04 13:35**						**R-05**
Carbazole	EPA 8270C	ND	-----	100	ug/l	20x	4090065	09/02/04	09/07/04 21:42	
Acenaphthene	"	ND	-----	100	"	"	"	"	"	
Acenaphthylene	"	ND	-----	100	"	"	"	"	"	
Anthracene	"	ND	-----	100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	100	"	"	"	"	"	
Benzoic Acid	"	ND	-----	1000	"	"	"	"	"	
Benzyl alcohol	"	ND	-----	200	"	"	"	"	"	
4-Bromophenyl phenyl ether	"	ND	-----	100	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	100	"	"	"	"	"	
4-Chloro-3-methylphenol	"	ND	-----	100	"	"	"	"	"	
4-Chloroaniline	"	ND	-----	400	"	"	"	"	"	
Bis(2-chloroethoxy)methane	"	ND	-----	200	"	"	"	"	"	
Bis(2-chloroethyl)ether	"	ND	-----	100	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	"	ND	-----	200	"	"	"	"	"	
2-Chloronaphthalene	"	ND	-----	100	"	"	"	"	"	
2-Chlorophenol	"	ND	-----	100	"	"	"	"	"	
4-Chlorophenyl phenyl ether	"	ND	-----	100	"	"	"	"	"	
Chrysene	"	ND	-----	100	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	100	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	-----	100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	100	"	"	"	"	"	
Dibenzofuran	"	ND	-----	100	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	100	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	100	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	100	"	"	"	"	"	
3,3'-Dichlorobenzidine	"	ND	-----	100	"	"	"	"	"	
2,4-Dichlorophenol	"	ND	-----	100	"	"	"	"	"	
Diethyl phthalate	"	ND	-----	100	"	"	"	"	"	
2,4-Dimethylphenol	"	ND	-----	200	"	"	"	"	"	
Dimethyl phthalate	"	ND	-----	100	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	"	ND	-----	200	"	"	"	"	"	
2,4-Dinitrophenol	"	ND	-----	500	"	"	"	"	"	
2,4-Dinitrotoluene	"	ND	-----	100	"	"	"	"	"	
2,6-Dinitrotoluene	"	ND	-----	100	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	ND	-----	200	"	"	"	"	"	
Fluoranthene	"	ND	-----	100	"	"	"	"	"	
Fluorene	"	ND	-----	100	"	"	"	"	"	
Hexachlorobenzene	"	ND	-----	100	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-04 Water	**2708-040826-MW16-65-026**			**Sampled: 08/26/04 13:35**						**R-05**
Hexachlorobutadiene	EPA 8270C	ND	-----	200	ug/l	20x	4090065	09/02/04	09/07/04 21:42	
Hexachlorocyclopentadiene	"	ND	-----	200	"	"	"	"	"	
Hexachloroethane	"	ND	-----	200	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	100	"	"	"	"	"	
Isophorone	"	ND	-----	100	"	"	"	"	"	
2-Methylnaphthalene	"	**460**	-----	100	"	"	"	"	"	
2-Methylphenol	"	ND	-----	200	"	"	"	"	"	
3-,4-Methylphenol	"	ND	-----	100	"	"	"	"	"	
Naphthalene	"	**3130**	-----	100	"	"	"	"	"	
2-Nitroaniline	"	ND	-----	100	"	"	"	"	"	
3-Nitroaniline	"	ND	-----	200	"	"	"	"	"	
4-Nitroaniline	"	ND	-----	200	"	"	"	"	"	
Nitrobenzene	"	ND	-----	100	"	"	"	"	"	
2-Nitrophenol	"	ND	-----	100	"	"	"	"	"	
4-Nitrophenol	"	ND	-----	500	"	"	"	"	"	
N-Nitrosodi-n-propylamine	"	ND	-----	200	"	"	"	"	"	
N-Nitrosodiphenylamine	"	ND	-----	100	"	"	"	"	"	
Pentachlorophenol	"	ND	-----	200	"	"	"	"	"	
Phenanthrene	"	ND	-----	100	"	"	"	"	"	
Phenol	"	ND	-----	100	"	"	"	"	"	
Pyrene	"	ND	-----	100	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	100	"	"	"	"	"	
2,4,5-Trichlorophenol	"	ND	-----	100	"	"	"	"	"	
2,4,6-Trichlorophenol	"	ND	-----	100	"	"	"	"	"	
Surrogate(s): 2-Fluorobiphenyl	*Recovery: 76.9%*			*Limits: 26 - 135 %*	"				"	*J*
2-Fluorophenol	*76.9%*			*6 - 124 %*	"				"	
Nitrobenzene-d5	*87.0%*			*23 - 147 %*	"				"	*J*
Phenol-d6	*79.7%*			*11 - 130 %*	"				"	
p-Terphenyl-d14	*81.1%*			*38 - 149 %*	"				"	*J*
2,4,6-Tribromophenol	*87.4%*			*19 - 126 %*	"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-05 Water	**2708-040826-MW16-45-028**			**Sampled: 08/26/04 15:10**						**R-05**
Carbazole	EPA 8270C	**137**	-----	100	ug/l	20x	4090065	09/02/04	09/07/04 22:25	
Acenaphthene	"	**130**	-----	100	"	"	"	"	"	
Acenaphthylene	"	ND	-----	100	"	"	"	"	"	
Anthracene	"	ND	-----	100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	100	"	"	"	"	"	
Benzoic Acid	"	ND	-----	1000	"	"	"	"	"	
Benzyl alcohol	"	ND	-----	200	"	"	"	"	"	
4-Bromophenyl phenyl ether	"	ND	-----	100	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	100	"	"	"	"	"	
4-Chloro-3-methylphenol	"	ND	-----	100	"	"	"	"	"	
4-Chloroaniline	"	ND	-----	400	"	"	"	"	"	
Bis(2-chloroethoxy)methane	"	ND	-----	200	"	"	"	"	"	
Bis(2-chloroethyl)ether	"	ND	-----	100	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	"	ND	-----	200	"	"	"	"	"	
2-Chloronaphthalene	"	ND	-----	100	"	"	"	"	"	
2-Chlorophenol	"	ND	-----	100	"	"	"	"	"	
4-Chlorophenyl phenyl ether	"	ND	-----	100	"	"	"	"	"	
Chrysene	"	ND	-----	100	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	100	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	-----	100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	100	"	"	"	"	"	
Dibenzofuran	"	ND	-----	100	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	100	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	100	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	100	"	"	"	"	"	
3,3'-Dichlorobenzidine	"	ND	-----	100	"	"	"	"	"	
2,4-Dichlorophenol	"	ND	-----	100	"	"	"	"	"	
Diethyl phthalate	"	ND	-----	100	"	"	"	"	"	
2,4-Dimethylphenol	"	ND	-----	200	"	"	"	"	"	
Dimethyl phthalate	"	ND	-----	100	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	"	ND	-----	200	"	"	"	"	"	
2,4-Dinitrophenol	"	ND	-----	500	"	"	"	"	"	
2,4-Dinitrotoluene	"	ND	-----	100	"	"	"	"	"	
2,6-Dinitrotoluene	"	ND	-----	100	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	ND	-----	200	"	"	"	"	"	
Fluoranthene	"	ND	-----	100	"	"	"	"	"	
Fluorene	"	ND	-----	100	"	"	"	"	"	
Hexachlorobenzene	"	ND	-----	100	"	"	"	"	"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-05 Water	**2708-040826-MW16-45-028**			**Sampled: 08/26/04 15:10**						**R-05**
Hexachlorobutadiene	EPA 8270C	ND	-----	200	ug/l	20x	4090065	09/02/04	09/07/04 22:25	
Hexachlorocyclopentadiene	"	ND	-----	200	"	"	"	"	"	
Hexachloroethane	"	ND	-----	200	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	100	"	"	"	"	"	
Isophorone	"	ND	-----	100	"	"	"	"	"	
2-Methylnaphthalene	"	**544**	-----	100	"	"	"	"	"	
2-Methylphenol	"	ND	-----	200	"	"	"	"	"	
3-,4-Methylphenol	"	ND	-----	100	"	"	"	"	"	
Naphthalene	"	**7200**	-----	1000	"	200x	"	"	09/08/04 19:12	
2-Nitroaniline	"	ND	-----	100	"	20x	"	"	09/07/04 22:25	
3-Nitroaniline	"	ND	-----	200	"	"	"	"	"	
4-Nitroaniline	"	ND	-----	200	"	"	"	"	"	
Nitrobenzene	"	ND	-----	100	"	"	"	"	"	
2-Nitrophenol	"	ND	-----	100	"	"	"	"	"	
4-Nitrophenol	"	ND	-----	500	"	"	"	"	"	
N-Nitrosodi-n-propylamine	"	ND	-----	200	"	"	"	"	"	
N-Nitrosodiphenylamine	"	ND	-----	100	"	"	"	"	"	
Pentachlorophenol	"	ND	-----	200	"	"	"	"	"	
Phenanthrene	"	**136**	-----	100	"	"	"	"	"	
Phenol	"	ND	-----	100	"	"	"	"	"	
Pyrene	"	ND	-----	100	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	100	"	"	"	"	"	
2,4,5-Trichlorophenol	"	ND	-----	100	"	"	"	"	"	
2,4,6-Trichlorophenol	"	ND	-----	100	"	"	"	"	"	

Surrogate(s):	*2-Fluorobiphenyl*	*Recovery: 70.2%*	*Limits: 26 - 135 %*	"	"	*J*
	2-Fluorophenol	*69.3%*	*6 - 124 %*	"	"	
	Nitrobenzene-d5	*84.6%*	*23 - 147 %*	"	"	*J*
	Phenol-d6	*75.0%*	*11 - 130 %*	"	"	
	p-Terphenyl-d14	*74.9%*	*38 - 149 %*	"	"	*J*
	2,4,6-Tribromophenol	*86.8%*	*19 - 126 %*	"	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-01 Water	**2708-040826-MW7-023**			**Sampled: 08/26/04 09:10**						
Acenaphthene	EPA 8270m	ND	*0.0500*	0.100	ug/l	1x	4081279	08/31/04	09/08/04 20:01	
Acenaphthylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Chrysene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*0.100*	0.200	"	"	"	"	"	
Fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Fluorene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Naphthalene	"	**0.322**	*0.0500*	0.100	"	"	"	"	"	
Phenanthrene	"	**0.140**	*0.0500*	0.100	"	"	"	"	"	
Pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 94.5%*		*Limits: 25 - 125 %*		"			"	
Pyrene-d10		*122%*		*23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*62.2%*		*10 - 125 %*		"			"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-02 Water	**2708-040826-MW7-024**			**Sampled: 08/26/04 09:35**						
Acenaphthene	EPA 8270m	ND	*0.0500*	0.100	ug/l	1x	4081279	08/31/04	09/08/04 20:34	
Acenaphthylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Chrysene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*0.100*	0.200	"	"	"	"	"	
Fluoranthene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Fluorene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Naphthalene	"	**0.188**	*0.0500*	0.100	"	"	"	"	"	
Phenanthrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Pyrene	"	ND	*0.0500*	0.100	"	"	"	"	"	
Surrogate(s): Fluorene-d10	*Recovery: 96.2%*			*Limits: 25 - 125 %*	"				"	
Pyrene-d10	*122%*			*23 - 150 %*	"				"	
Benzo (a) pyrene-d12	*69.5%*			*10 - 125 %*	"				"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-03 Water	**2708-040826-MW16-125-025**			**Sampled: 08/26/04 11:30**						**R-05**
Acenaphthene	EPA 8270m	**1.74**	*0.500*	1.00	ug/l	10x	4090066	09/02/04	09/09/04 21:27	
Acenaphthylene	"	ND	*0.500*	1.00	"	"	"	"	"	
Anthracene	"	**0.676**	*0.500*	1.00	"	"	"	"	"	J
Benzo (a) anthracene	"	ND	*0.100*	0.200	"	2x	"	"	10/06/04 13:39	
Benzo (a) pyrene	"	ND	*0.100*	0.200	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.100*	0.200	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*0.500*	1.00	"	10x	"	"	09/09/04 21:27	
Benzo (k) fluoranthene	"	ND	*0.100*	0.200	"	2x	"	"	10/06/04 13:39	
Chrysene	"	ND	*0.100*	0.200	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*0.200*	0.400	"	"	"	"	"	
Fluoranthene	"	**0.621**	*0.500*	1.00	"	10x	"	"	09/09/04 21:27	J
Fluorene	"	**1.14**	*0.500*	1.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.100*	0.200	"	2x	"	"	10/06/04 13:39	
Naphthalene	"	**26.5**	*0.500*	1.00	"	10x	"	"	09/09/04 21:27	
Phenanthrene	"	**5.39**	*0.500*	1.00	"	"	"	"	"	
Pyrene	"	**0.816**	*0.500*	1.00	"	"	"	"	"	J
Surrogate(s): Fluorene-d10	*Recovery: 81.4%*			*Limits: 25 - 125 %*		"			"	
Pyrene-d10	*98.7%*			*23 - 150 %*		*2X*			*10/06/04 13:39*	
Benzo (a) pyrene-d12	*94.1%*			*10 - 125 %*		"			"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-04 Water	**2708-040826-MW16-65-026**			**Sampled: 08/26/04 13:35**						**R-05**
Acenaphthene	EPA 8270m	**91.0**	*5.00*	10.0	ug/l	100x	4090066	09/02/04	09/08/04 21:08	
Acenaphthylene	"	ND	*10.0*	10.0	"	"	"	"	"	
Anthracene	"	**10.3**	*5.00*	10.0	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*5.00*	10.0	"	"	"	"	"	
Chrysene	"	ND	*5.00*	10.0	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*10.0*	20.0	"	"	"	"	"	
Fluoranthene	"	**5.54**	*5.00*	10.0	"	"	"	"	"	**J**
Fluorene	"	**42.8**	*5.00*	10.0	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*5.00*	10.0	"	"	"	"	"	
Naphthalene	"	**3600**	*50.0*	100	"	1000x	"	"	09/09/04 22:37	
Phenanthrene	"	**81.1**	*5.00*	10.0	"	100x	"	"	09/08/04 21:08	
Pyrene	"	**6.84**	*5.00*	10.0	"	"	"	"	"	**J**
Surrogate(s): Fluorene-d10	*Recovery: NR*		*Limits: 25 - 125 %*		"				"	***S-01***
Pyrene-d10	*NR*		*23 - 150 %*		"				"	***S-01***
Benzo (a) pyrene-d12	*NR*		*10 - 125 %*		"				"	***S-01***

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-04RE1 Water	**2708-040826-MW16-65-026**			**Sampled: 08/26/04 13:35**						**O-04, R-05**
Benzo (a) anthracene	EPA 8270m	**0.241**	*0.200*	0.400	ug/l	4x	4090066	09/02/04	10/15/04 14:47	**J**
Benzo (a) pyrene	"	ND	*0.200*	0.400	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.200*	0.400	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.200*	0.400	"	"	"	"	"	
Chrysene	"	**0.300**	*0.200*	0.400	"	"	"	"	"	**J**
Dibenzo (a,h) anthracene	"	ND	*0.400*	0.800	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.200*	0.400	"	"	"	"	"	
Surrogate(s): Pyrene-d10	*Recovery: 99.2%*		*Limits: 23 - 150 %*		"				"	
Benzo (a) pyrene-d12	*89.9%*		*10 - 125 %*		"				"	
P4H1069-05 Water	**2708-040826-MW16-45-028**			**Sampled: 08/26/04 15:10**						**R-05**
Acenaphthene	EPA 8270m	**137**	*10.0*	20.0	ug/l	200x	4090066	09/02/04	09/09/04 23:10	
Acenaphthylene	"	**17.8**	*10.0*	20.0	"	"	"	"	"	**J**
Anthracene	"	**22.4**	*10.0*	20.0	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*10.0*	20.0	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*10.0*	20.0	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*10.0*	20.0	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*10.0*	20.0	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*10.0*	20.0	"	"	"	"	"	
Chrysene	"	ND	*10.0*	20.0	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*20.0*	40.0	"	"	"	"	"	
Fluoranthene	"	**19.6**	*10.0*	20.0	"	"	"	"	"	**J**
Fluorene	"	**60.7**	*10.0*	20.0	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*10.0*	20.0	"	"	"	"	"	
Naphthalene	"	**7500**	*100*	200	"	2000x	"	"	09/09/04 23:42	
Phenanthrene	"	**154**	*10.0*	20.0	"	200x	"	"	09/09/04 23:10	
Pyrene	"	**23.9**	*10.0*	20.0	"	"	"	"	"	
Surrogate(s): Fluorene-d10	*Recovery: NR*		*Limits: 25 - 125 %*		"				"	***S-01***
Pyrene-d10	*NR*		*23 - 150 %*		"				"	***S-01***
Benzo (a) pyrene-d12	*NR*		*10 - 125 %*		"				"	***S-01***

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-05RE1 Water	**2708-040826-MW16-45-028**			**Sampled: 08/26/04 15:10**						**O-04, R-05**
Benzo (a) anthracene	EPA 8270m	**2.64**	*1.25*	2.50	ug/l	25x	4090066	09/02/04	10/15/04 13:09	
Benzo (a) pyrene	"	**2.23**	*1.25*	2.50	"	"	"	"	"	**J**
Benzo (b) fluoranthene	"	**2.57**	*1.25*	2.50	"	"	"	"	"	**R-08**
Benzo (k) fluoranthene	"	ND	*1.25*	2.50	"	"	"	"	"	**R-08**
Chrysene	"	**3.33**	*1.25*	2.50	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*2.50*	5.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*1.25*	2.50	"	"	"	"	"	
Surrogate(s): Pyrene-d10		*Recovery: 118%*		*Limits: 23 - 150 %*		"			"	
Benzo (a) pyrene-d12		*118%*		*10 - 125 %*		"			"	
P4H1069-06 Water	**2708-040826-MW16-65-027**			**Sampled: 08/26/04 13:38**						**R-05**
Acenaphthene	EPA 8270m	**85.6**	*5.00*	10.0	ug/l	100x	4090066	09/02/04	09/08/04 22:14	
Acenaphthylene	"	ND	*10.0*	10.0	"	"	"	"	"	
Anthracene	"	**10.3**	*5.00*	10.0	"	"	"	"	"	
Benzo (a) anthracene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (a) pyrene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	*5.00*	10.0	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*5.00*	10.0	"	"	"	"	"	
Chrysene	"	ND	*5.00*	10.0	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	*10.0*	20.0	"	"	"	"	"	
Fluoranthene	"	**5.62**	*5.00*	10.0	"	"	"	"	"	**J**
Fluorene	"	**39.5**	*5.00*	10.0	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*5.00*	10.0	"	"	"	"	"	
Naphthalene	"	**3870**	*50.0*	100	"	1000x	"	"	09/10/04 00:15	
Phenanthrene	"	**80.2**	*5.00*	10.0	"	100x	"	"	09/08/04 22:14	
Pyrene	"	**6.70**	*5.00*	10.0	"	"	"	"	"	**J**
Surrogate(s): Fluorene-d10		*Recovery: NR*		*Limits: 25 - 125 %*		"			"	***S-01***
Pyrene-d10		*NR*		*23 - 150 %*		"			"	***S-01***
Benzo (a) pyrene-d12		*NR*		*10 - 125 %*		"			"	***S-01***

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-06RE1 Water	**2708-040826-MW16-65-027**			**Sampled: 08/26/04 13:38**						**O-04, R-05**
Benzo (a) anthracene	EPA 8270m	**0.343**	*0.250*	0.500	ug/l	5x	4090066	09/02/04	10/15/04 14:14	**J**
Benzo (a) pyrene	"	ND	*0.250*	0.500	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	*0.250*	0.500	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	*0.250*	0.500	"	"	"	"	"	
Chrysene	"	**0.413**	*0.250*	0.500	"	"	"	"	"	**J**
Dibenzo (a,h) anthracene	"	ND	*0.500*	1.00	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	*0.250*	0.500	"	"	"	"	"	
Surrogate(s): Pyrene-d10		*Recovery: 114%*		*Limits: 23 - 150 %*	"				"	
Benzo (a) pyrene-d12		*100%*		*10 - 125 %*	"				"	

North Creek Analytical - Portland

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Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4H1069-03	**Water**	**2708-040826-MW16-125-025**			**Sampled: 08/26/04 11:30**						
Cyanide (amenable)		EPA 9010A	**0.0747**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.0943**	-----	0.00500	"	"	"	"	"	
P4H1069-04	**Water**	**2708-040826-MW16-65-026**			**Sampled: 08/26/04 13:35**						
Cyanide (amenable)		EPA 9010A	**0.186**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.402**	-----	0.00500	"	"	"	"	"	
P4H1069-05	**Water**	**2708-040826-MW16-45-028**			**Sampled: 08/26/04 15:10**						
Cyanide (amenable)		EPA 9010A	**0.0725**	-----	0.00500	mg/l	1x	4081272	08/31/04	09/03/04 12:53	
Cyanide (total)		EPA 9012A	**0.138**	-----	0.00500	"	"	"	"	"	

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

BTEX per EPA Method 8021B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081258 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081258-BLK1)									**Extracted: 08/30/04 16:57**					
Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/30/04 19:34	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 96.2%*			*Limits: 70-130%*	"							*08/30/04 19:34*	
LCS (4081258-BS1)									**Extracted: 08/30/04 16:57**					
Benzene	EPA 8021B	20.5	---	0.500	ug/l	1x	--	20.0	102%	(70-130)	--	--	08/30/04 21:16	
Toluene	"	19.6	---	0.500	"	"	--	"	98.0%	(76-129)	--	--	"	
Ethylbenzene	"	19.1	---	0.500	"	"	--	"	95.5%	(82-130)	--	--	"	
Xylenes (total)	"	57.4	---	1.00	"	"	--	60.0	95.7%	(76-130)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 99.0%*			*Limits: 70-130%*	"							*08/30/04 21:16*	
Matrix Spike (4081258-MS1)					**QC Source: P4H1069-06**				**Extracted: 08/30/04 16:57**					
Benzene	EPA 8021B	2210	---	25.0	ug/l	50x	1250	1000	96.0%	(65-144)	--	--	08/31/04 02:49	
Toluene	"	1220	---	25.0	"	"	339	"	88.1%	(68-139)	--	--	"	
Ethylbenzene	"	1130	---	25.0	"	"	223	"	90.7%	(69-144)	--	--	"	
Xylenes (total)	"	3120	---	50.0	"	"	486	3000	87.8%	(60-144)	--	--	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 97.8%*			*Limits: 70-130%*	*1x*							*08/31/04 02:49*	
Matrix Spike Dup (4081258-MSD1)					**QC Source: P4H1069-06**				**Extracted: 08/30/04 16:57**					
Benzene	EPA 8021B	2270	---	25.0	ug/l	50x	1250	1000	102%	(65-144)	2.68%	(20)	08/31/04 03:17	
Toluene	"	1300	---	25.0	"	"	339	"	96.1%	(68-139)	6.35%	"	"	
Ethylbenzene	"	1190	---	25.0	"	"	223	"	96.7%	(69-144)	5.17%	"	"	
Xylenes (total)	"	3360	---	50.0	"	"	486	3000	95.8%	(60-144)	7.41%	"	"	
Surrogate(s): 4-BFB (PID)		*Recovery: 98.0%*			*Limits: 70-130%*	*1x*							*08/31/04 03:17*	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081235 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081235-BLK1)							**Extracted: 08/30/04 09:48**							
Arsenic	EPA 6020	ND	---	0.00100	mg/l	1x	--	--	--	--	--	--	09/09/04 21:29	
Chromium	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Copper	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Lead	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Nickel	"	ND	---	0.00200	"	"	--	--	--	--	--	--	"	
Zinc	"	ND	---	0.00500	"	"	--	--	--	--	--	--	"	
LCS (4081235-BS1)							**Extracted: 08/30/04 09:48**							
Arsenic	EPA 6020	0.108	---	0.00100	mg/l	1x	--	0.100	108%	(80-120)	--	--	09/09/04 21:35	
Chromium	"	0.107	---	0.00100	"	"	--	"	107%	"	--	--	"	
Copper	"	0.107	---	0.00200	"	"	--	"	107%	"	--	--	"	
Lead	"	0.102	---	0.00100	"	"	--	"	102%	"	--	--	"	
Nickel	"	0.107	---	0.00200	"	"	--	"	107%	"	--	--	"	
Zinc	"	0.105	---	0.00500	"	"	--	"	105%	"	--	--	"	
LCS Dup (4081235-BSD1)							**Extracted: 08/30/04 09:48**							
Arsenic	EPA 6020	0.107	---	0.00100	mg/l	1x	--	0.100	107%	(80-120)	0.930%	(20)	09/09/04 21:42	
Chromium	"	0.106	---	0.00100	"	"	--	"	106%	"	0.939%	"	"	
Copper	"	0.106	---	0.00200	"	"	--	"	106%	"	0.939%	"	"	
Lead	"	0.102	---	0.00100	"	"	--	"	102%	"	0.00%	"	"	
Nickel	"	0.105	---	0.00200	"	"	--	"	105%	"	1.89%	"	"	
Zinc	"	0.106	---	0.00500	"	"	--	"	106%	"	0.948%	"	"	
Duplicate (4081235-DUP1)					**QC Source: P4H1019-01**				**Extracted: 08/30/04 09:48**					
Arsenic	EPA 6020	0.00307	---	0.00100	mg/l	1x	0.00297	--	--	--	3.31%	(20)	09/09/04 22:01	
Chromium	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Copper	"	ND	---	0.00200	"	"	ND	--	--	--	NR	"	"	
Lead	"	ND	---	0.00100	"	"	ND	--	--	--	NR	"	"	
Nickel	"	0.00159	---	0.00200	"	"	ND	--	--	--	NR	"	"	
Zinc	"	ND	---	0.00500	"	"	ND	--	--	--	NR	"	"	
Matrix Spike (4081235-MS1)					**QC Source: P4H1069-03**				**Extracted: 08/30/04 09:48**					
Arsenic	EPA 6020	0.118	---	0.00100	mg/l	1x	0.00461	0.100	113%	(75-125)	--	--	09/10/04 02:05	
Chromium	"	0.112	---	0.00100	"	"	0.00134	"	111%	"	--	--	"	
Copper	"	0.111	---	0.00200	"	"	ND	"	109%	"	--	--	"	
Lead	"	0.0980	---	0.00100	"	"	ND	"	98.0%	"	--	--	"	
Nickel	"	0.113	---	0.00200	"	"	0.00542	"	108%	"	--	--	"	
Zinc	"	0.108	---	0.00500	"	"	ND	"	105%	"	--	--	"	

North Creek Analytical - Portland

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Total Metals per EPA 6000/7000 Series Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081235 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (4081235-MS2)				QC Source: P4H1019-01					Extracted: 08/30/04 09:48					
Arsenic	EPA 6020	0.114	---	0.00100	mg/l	1x	0.00297	0.100	111%	(75-125)	--	--	09/09/04 22:26	
Chromium	"	0.109	---	0.00100	"	"	ND	"	109%	"	--	--	"	
Copper	"	0.108	---	0.00200	"	"	ND	"	108%	"	--	--	"	
Lead	"	0.0996	---	0.00100	"	"	ND	"	99.6%	"	--	--	"	
Nickel	"	0.109	---	0.00200	"	"	ND	"	107%	"	--	--	"	
Zinc	"	0.110	---	0.00500	"	"	ND	"	108%	"	--	--	"	
Matrix Spike Dup (4081235-MSD1)				QC Source: P4H1069-03					Extracted: 08/30/04 09:48					
Arsenic	EPA 6020	0.121	---	0.00100	mg/l	1x	0.00461	0.100	116%	(75-125)	2.51%	(20)	09/10/04 02:30	
Chromium	"	0.117	---	0.00100	"	"	0.00134	"	116%	"	4.37%	"	"	
Copper	"	0.114	---	0.00200	"	"	ND	"	112%	"	2.67%	"	"	
Lead	"	0.0967	---	0.00100	"	"	ND	"	96.7%	"	1.34%	"	"	
Nickel	"	0.118	---	0.00200	"	"	0.00542	"	113%	"	4.33%	"	"	
Zinc	"	0.114	---	0.00500	"	"	ND	"	111%	"	5.41%	"	"	

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434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090189 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4090189-BLK1)								Extracted: 09/06/04 09:31						
Acetone	EPA 8260B	ND	---	25.0	ug/l	1x	--	--	--	--	--	--	09/06/04 15:18	
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	"	"	--	--	--	--	--	--	"	
Hexachlorobutadiene	"	ND	---	2.00	"	"	--	--	--	--	--	--	"	
2-Hexanone	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	

North Creek Analytical - Portland

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090189 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4090189-BLK1)							**Extracted: 09/06/04 09:31**							
Isopropylbenzene	EPA 8260B	ND	---	2.00	ug/l	1x	--	--	--	--	--	--	09/06/04 15:18	
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	"	"	--	--	--	--	--	--	"	
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	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB	*Recovery: 96.0%*			*Limits: 75-120%*	"								*09/06/04 15:18*	
1,2-DCA-d4	*106%*			*77-129%*	"								"	
Dibromofluoromethane	*100%*			*80-121%*	"								"	
Toluene-d8	*104%*			*80-120%*	"								"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090189 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4090189-BS1)													**Extracted: 09/06/04 09:31**	
Benzene	EPA 8260B	21.4	---	1.00	ug/l	1x	--	20.0	107%	(80-120)	--	--	09/06/04 13:00	
Chlorobenzene	"	20.8	---	1.00	"	"	--	"	104%	(80-124)	--	--	"	
1,1-Dichloroethene	"	18.2	---	1.00	"	"	--	"	91.0%	(78-120)	--	--	"	
Toluene	"	21.4	---	1.00	"	"	--	"	107%	(80-124)	--	--	"	
Trichloroethene	"	20.2	---	1.00	"	"	--	"	101%	(80-132)	--	--	"	
Surrogate(s): 4-BFB		*Recovery: 95.0%*			*Limits: 75-120%*	"							*09/06/04 13:00*	
1,2-DCA-d4		*97.0%*			*77-129%*	"							"	
Dibromofluoromethane		*94.5%*			*80-121%*	"							"	
Toluene-d8		*97.5%*			*80-120%*	"							"	
LCS Dup (4090189-BSD1)													**Extracted: 09/06/04 09:31**	
Benzene	EPA 8260B	20.8	---	1.00	ug/l	1x	--	20.0	104%	(80-120)	2.84%	(25)	09/06/04 13:28	
Chlorobenzene	"	20.5	---	1.00	"	"	--	"	102%	(80-124)	1.45%	"	"	
1,1-Dichloroethene	"	17.5	---	1.00	"	"	--	"	87.5%	(78-120)	3.92%	"	"	
Toluene	"	21.3	---	1.00	"	"	--	"	106%	(80-124)	0.468%	"	"	
Trichloroethene	"	20.2	---	1.00	"	"	--	"	101%	(80-132)	0.00%	"	"	
Surrogate(s): 4-BFB		*Recovery: 98.5%*			*Limits: 75-120%*	"							*09/06/04 13:28*	
1,2-DCA-d4		*98.5%*			*77-129%*	"							"	
Dibromofluoromethane		*96.0%*			*80-121%*	"							"	
Toluene-d8		*100%*			*80-120%*	"							"	
Matrix Spike (4090189-MS1)					**QC Source: P4H1069-03**								**Extracted: 09/06/04 09:31**	
Benzene	EPA 8260B	22.1	---	1.00	ug/l	1x	ND	20.0	107%	(80-124)	--	--	09/06/04 13:55	
Chlorobenzene	"	20.6	---	1.00	"	"	ND	"	103%	(72.9-134)	--	--	"	
1,1-Dichloroethene	"	20.1	---	1.00	"	"	ND	"	100%	(79.3-127)	--	--	"	
Toluene	"	20.5	---	1.00	"	"	ND	"	100%	(79.7-131)	--	--	"	
Trichloroethene	"	20.4	---	1.00	"	"	ND	"	102%	(68.4-130)	--	--	"	
Surrogate(s): 4-BFB		*Recovery: 98.0%*			*Limits: 75-120%*	"							*09/06/04 13:55*	
1,2-DCA-d4		*102%*			*77-129%*	"							"	
Dibromofluoromethane		*99.0%*			*80-121%*	"							"	
Toluene-d8		*99.5%*			*80-120%*	"							"	

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090189 **Water Preparation Method: EPA 5030B**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (4090189-MSD1)					**QC Source: P4H1069-03**				**Extracted: 09/06/04 09:31**					
Benzene	EPA 8260B	21.5	---	1.00	ug/l	1x	ND	20.0	104%	(80-124)	2.75%	(25)	09/06/04 14:23	
Chlorobenzene	"	20.5	---	1.00	"	"	ND	"	102%	(72.9-134)	0.487%	"	"	
1,1-Dichloroethene	"	19.5	---	1.00	"	"	ND	"	97.5%	(79.3-127)	3.03%	"	"	
Toluene	"	20.0	---	1.00	"	"	ND	"	97.6%	(79.7-131)	2.47%	"	"	
Trichloroethene	"	19.8	---	1.00	"	"	ND	"	99.0%	(68.4-130)	2.99%	"	"	
Surrogate(s): 4-BFB		*Recovery: 98.5%*			*Limits: 75-120%*	"							*09/06/04 14:23*	
1,2-DCA-d4		*101%*			*77-129%*	"							"	
Dibromofluoromethane		*98.0%*			*80-121%*	"							"	
Toluene-d8		*98.5%*			*80-120%*	"							"	

North Creek Analytical - Portland

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434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090065 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4090065-BLK1)								Extracted: 09/02/04 07:08						
Carbazole	EPA 8270C	ND	---	5.00	ug/l	1x	--	--	--	--	--	--	09/07/04 19:35	
Acenaphthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Acenaphthylene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Benzoic Acid	"	ND	---	50.0	"	"	--	--	--	--	--	--	"	
Benzyl alcohol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
4-Bromophenyl phenyl ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Butyl benzyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chloro-3-methylphenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chloroaniline	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
Bis(2-chloroethoxy)methane	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Bis(2-chloroethyl)ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Bis(2-chloroisopropyl)ether	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
2-Chloronaphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Chlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Chlorophenyl phenyl ether	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Di-n-butyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Di-n-octyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Dibenzofuran	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,2-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,3-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,4-Dichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
3,3'-Dichlorobenzidine	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4-Dichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Diethyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4-Dimethylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Dimethyl phthalate	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4,6-Dinitro-2-methylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
2,4-Dinitrophenol	"	ND	---	25.0	"	"	--	--	--	--	--	--	"	
2,4-Dinitrotoluene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,6-Dinitrotoluene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Bis(2-ethylhexyl)phthalate	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	

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Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090065 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4090065-BLK1)							**Extracted: 09/02/04 07:08**							
Hexachlorobenzene	EPA 8270C	ND	---	5.00	ug/l	1x	--	--	--	--	--	--	09/07/04 19:35	
Hexachlorobutadiene	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Hexachlorocyclopentadiene	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Hexachloroethane	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Isophorone	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Methylnaphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Methylphenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
3-,4-Methylphenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Nitroaniline	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
3-Nitroaniline	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
4-Nitroaniline	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Nitrobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2-Nitrophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
4-Nitrophenol	"	ND	---	25.0	"	"	--	--	--	--	--	--	"	
N-Nitrosodi-n-propylamine	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
N-Nitrosodiphenylamine	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Pentachlorophenol	"	ND	---	10.0	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Phenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
1,2,4-Trichlorobenzene	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4,5-Trichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
2,4,6-Trichlorophenol	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 74.8%*			*Limits: 26-135%*	"							*09/07/04 19:35*	
2-Fluorophenol		*76.7%*			*6-124%*	"							"	
Nitrobenzene-d5		*88.3%*			*23-147%*	"							"	
Phenol-d6		*78.0%*			*11-130%*	"							"	
p-Terphenyl-d14		*88.3%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*96.0%*			*19-126%*	"							"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090065 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4090065-BS1)									**Extracted: 09/02/04 07:08**					
Acenaphthene	EPA 8270C	61.6	---	5.00	ug/l	1x	--	75.0	82.1%	(40-110)	--	--	09/07/04 18:52	
4-Chloro-3-methylphenol	"	122	---	5.00	"	"	--	150	81.3%	"	--	--	"	
2-Chlorophenol	"	116	---	5.00	"	"	--	"	77.3%	"	--	--	"	
1,4-Dichlorobenzene	"	51.1	---	5.00	"	"	--	75.0	68.1%	(20-90)	--	--	"	
2,4-Dinitrotoluene	"	64.3	---	5.00	"	"	--	"	85.7%	(50-110)	--	--	"	
4-Nitrophenol	"	142	---	25.0	"	"	--	150	94.7%	(15-100)	--	--	"	
N-Nitrosodi-n-propylamine	"	60.6	---	10.0	"	"	--	75.0	80.8%	(40-110)	--	--	"	
Pentachlorophenol	"	121	---	10.0	"	"	--	150	80.7%	(30-120)	--	--	"	
Phenol	"	110	---	5.00	"	"	--	"	73.3%	(15-110)	--	--	"	
Pyrene	"	61.0	---	5.00	"	"	--	75.0	81.3%	(40-110)	--	--	"	
1,2,4-Trichlorobenzene	"	54.7	---	5.00	"	"	--	"	72.9%	(25-100)	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 68.1%*			*Limits: 26-135%*	"							*09/07/04 18:52*	
2-Fluorophenol		*74.7%*			*6-124%*	"							"	
Nitrobenzene-d5		*88.0%*			*23-147%*	"							"	
Phenol-d6		*76.7%*			*11-130%*	"							"	
p-Terphenyl-d14		*86.5%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*99.3%*			*19-126%*	"							"	
Matrix Spike (4090065-MS1)						**QC Source: P4H1069-03**			**Extracted: 09/02/04 07:08**					
Acenaphthene	EPA 8270C	59.7	---	5.00	ug/l	1x	7.23	71.4	73.5%	(40-110)	--	--	09/07/04 20:18	
4-Chloro-3-methylphenol	"	125	---	5.00	"	"	6.27	143	83.0%	"	--	--	"	
2-Chlorophenol	"	99.6	---	5.00	"	"	ND	"	67.4%	"	--	--	"	
1,4-Dichlorobenzene	"	45.2	---	5.00	"	"	ND	71.4	57.1%	(20-90)	--	--	"	
2,4-Dinitrotoluene	"	61.2	---	5.00	"	"	ND	"	85.7%	(50-110)	--	--	"	
4-Nitrophenol	"	127	---	25.0	"	"	ND	143	88.8%	(15-100)	--	--	"	
N-Nitrosodi-n-propylamine	"	52.8	---	10.0	"	"	ND	71.4	63.9%	(40-110)	--	--	"	
Pentachlorophenol	"	119	---	10.0	"	"	ND	143	83.2%	(30-120)	--	--	"	
Phenol	"	96.4	---	5.00	"	"	ND	"	64.5%	(15-110)	--	--	"	
Pyrene	"	58.8	---	5.00	"	"	ND	71.4	78.1%	(40-110)	--	--	"	
1,2,4-Trichlorobenzene	"	48.1	---	5.00	"	"	ND	"	61.0%	(25-100)	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 66.7%*			*Limits: 26-135%*	"							*09/07/04 20:18*	
2-Fluorophenol		*66.7%*			*6-124%*	"							"	
Nitrobenzene-d5		*76.3%*			*23-147%*	"							"	
Phenol-d6		*69.7%*			*11-130%*	"							"	
p-Terphenyl-d14		*81.5%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*97.2%*			*19-126%*	"							"	

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090065 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (4090065-MSD1)					**QC Source: P4H1069-03**				**Extracted: 09/02/04 07:08**					
Acenaphthene	EPA 8270C	58.3	---	5.00	ug/l	1x	7.23	70.8	72.1%	(40-110)	2.37%	(36)	09/07/04 21:00	
4-Chloro-3-methylphenol	"	120	---	5.00	"	"	6.27	142	80.1%	"	4.08%	(43)	"	
2-Chlorophenol	"	102	---	5.00	"	"	ND	"	69.5%	"	2.38%	(38)	"	
1,4-Dichlorobenzene	"	42.0	---	5.00	"	"	ND	70.8	53.0%	(20-90)	7.34%	(43)	"	
2,4-Dinitrotoluene	"	60.8	---	5.00	"	"	ND	"	85.9%	(50-110)	0.656%	(31)	"	
4-Nitrophenol	"	131	---	25.0	"	"	ND	142	92.3%	(15-100)	3.10%	(36)	"	
N-Nitrosodi-n-propylamine	"	51.5	---	10.0	"	"	ND	70.8	62.6%	(40-110)	2.49%	(37)	"	
Pentachlorophenol	"	122	---	10.0	"	"	ND	142	85.9%	(30-120)	2.49%	(40)	"	
Phenol	"	94.5	---	5.00	"	"	ND	"	63.6%	(15-110)	1.99%	(36)	"	
Pyrene	"	57.0	---	5.00	"	"	ND	70.8	76.2%	(40-110)	3.11%	(31)	"	
1,2,4-Trichlorobenzene	"	45.9	---	5.00	"	"	ND	"	58.4%	(25-100)	4.68%	(42)	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 70.6%*			*Limits: 26-135%*	"							*09/07/04 21:00*	
2-Fluorophenol		*67.9%*			*6-124%*	"							"	
Nitrobenzene-d5		*80.4%*			*23-147%*	"							"	
Phenol-d6		*67.8%*			*11-130%*	"							"	
p-Terphenyl-d14		*83.2%*			*38-149%*	"							"	
2,4,6-Tribromophenol		*95.8%*			*19-126%*	"							"	

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Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081279 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081279-BLK1)													**Extracted: 08/31/04 09:15**	
Acenaphthene	EPA 8270m	ND	0.0500	0.100	ug/l	1x	--	--	--	--	--	--	09/07/04 21:01	
Acenaphthylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	0.100	0.200	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*92.0%*		*Limits:*	*25-125%*	"						*09/07/04 21:01*	
Pyrene-d10			*118%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*111%*			*10-125%*	"						"	
LCS (4081279-BS1)													**Extracted: 08/31/04 09:15**	
Acenaphthene	EPA 8270m	2.11	0.0500	0.100	ug/l	1x	--	2.50	84.4%	(26-135)	--	--	09/07/04 19:54	
Benzo (a) pyrene	"	2.50	0.0500	0.100	"	"	--	"	100%	(38-137)	--	--	"	
Pyrene	"	2.43	0.0500	0.100	"	"	--	"	97.2%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*97.2%*		*Limits:*	*25-125%*	"						*09/07/04 19:54*	
Pyrene-d10			*114%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*119%*			*10-125%*	"						"	
LCS Dup (4081279-BSD1)													**Extracted: 08/31/04 09:15**	
Acenaphthene	EPA 8270m	2.06	0.0500	0.100	ug/l	1x	--	2.50	82.4%	(26-135)	2.40%	(60)	09/07/04 20:27	
Benzo (a) pyrene	"	2.44	0.0500	0.100	"	"	--	"	97.6%	(38-137)	2.43%	"	"	
Pyrene	"	2.38	0.0500	0.100	"	"	--	"	95.2%	(33-133)	2.08%	"	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*94.0%*		*Limits:*	*25-125%*	"						*09/07/04 20:27*	
Pyrene-d10			*110%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*114%*			*10-125%*	"						"	

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Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090066 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4090066-BLK1)							**Extracted: 09/02/04 07:27**							
Acenaphthene	EPA 8270m	ND	0.0500	0.100	ug/l	1x	--	--	--	--	--	--	09/08/04 23:46	
Acenaphthylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	0.100	0.200	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	0.0500	0.100	"	"	--	--	--	--	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*80.4%*		*Limits:*	*25-125%*	"						*09/08/04 23:46*	
Pyrene-d10			*118%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*96.4%*			*10-125%*	"						"	
LCS (4090066-BS1)							**Extracted: 09/02/04 07:27**							
Acenaphthene	EPA 8270m	1.90	0.0500	0.100	ug/l	1x	--	2.50	76.0%	(26-135)	--	--	09/09/04 16:33	
Benzo (a) pyrene	"	2.07	0.0500	0.100	"	"	--	"	82.8%	(38-137)	--	--	"	
Pyrene	"	2.19	0.0500	0.100	"	"	--	"	87.6%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*85.2%*		*Limits:*	*25-125%*	"						*09/09/04 16:33*	
Pyrene-d10			*93.6%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*95.2%*			*10-125%*	"						"	
Matrix Spike (4090066-MS1)					**QC Source: P4H1069-03**		**Extracted: 09/02/04 07:27**							R-05
Acenaphthene	EPA 8270m	3.85	0.500	1.00	ug/l	10x	1.74	2.38	88.7%	(26-135)	--	--	09/09/04 21:54	
Benzo (a) pyrene	"	1.07	0.500	1.00	"	"	ND	"	45.0%	(38-137)	--	--	"	
Pyrene	"	3.43	0.500	1.00	"	"	0.816	"	110%	(33-133)	--	--	"	
Surrogate(s): Fluorene-d10		*Recovery:*	*83.6%*		*Limits:*	*25-125%*	"						*09/09/04 21:54*	
Pyrene-d10			*127%*			*23-150%*	"						"	
Benzo (a) pyrene-d12			*97.5%*			*10-125%*	"						"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4090066 **Water Preparation Method: EPA 3520/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (4090066-MSD1)					QC Source: P4H1069-03				Extracted: 09/02/04 07:27					R-05
Acenaphthene	EPA 8270m	3.82	0.500	1.00	ug/l	10x	1.74	2.38	87.4%	(26-135)	0.782%	(60)	09/09/04 22:20	
Benzo (a) pyrene	"	0.838	0.500	1.00	"	"	ND	"	35.2%	(38-137)	24.3%	"	"	Q-01, J
Pyrene	"	3.50	0.500	1.00	"	"	0.816	"	113%	(33-133)	2.02%	"	"	
Surrogate(s): Fluorene-d10		*Recovery: 84.5%*			*Limits: 25-125%*	"							*09/09/04 22:20*	
Pyrene-d10		*129%*			*23-150%*	"							"	
Benzo (a) pyrene-d12		*103%*			*10-125%*	"							"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name: **Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-30	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	10/22/04 16:49

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4081272 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4081272-BLK1)							**Extracted: 08/31/04 08:20**							
Cyanide (total)	EPA 9012A	ND	---	0.00500	mg/l	1x	--	--	--	--	--	--	09/03/04 12:53	
LCS (4081272-BS1)							**Extracted: 08/31/04 08:20**							
Cyanide (total)	EPA 9012A	0.190	---	0.00500	mg/l	1x	--	0.200	95.0%	(75-125)	--	--	09/03/04 12:53	
Matrix Spike (4081272-MS1)				**QC Source: P4H1069-03**			**Extracted: 08/31/04 08:20**							
Cyanide (total)	EPA 9012A	0.281	---	0.00500	mg/l	1x	0.0943	0.200	93.3%	(75-125)	--	--	09/03/04 12:53	
Matrix Spike Dup (4081272-MSD1)				**QC Source: P4H1069-03**			**Extracted: 08/31/04 08:20**							
Cyanide (total)	EPA 9012A	0.280	---	0.00500	mg/l	1x	0.0943	0.200	92.8%	(75-125)	0.357%	(20)	09/03/04 12:53	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg For Howard Holmes, Project Manager

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Hahn and Associates, Inc.	Project Name:	**Northwest Natural**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-30	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	10/22/04 16:49

Notes and Definitions

Report Specific Notes:

J - Estimated value.

O-04 - This sample was analyzed outside the EPA recommended holding time.

Q-01 - The matrix spike recovery, and/or RPD, for this QC sample is outside of established control limits. Failure of a matrix spike QC sample does not represent an out-of-control condition for the batch.

R-03 - The reporting limit for this analyte was raised due to matrix interference.

R-05 - Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.

R-08 - Due to matrix unable to resolve Benzofluoranthene isomers. Value reported only in Benzo(b) category represents Total Benzo(b+k)fluoranthene.

S-01 - The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.

X - See case narrative.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR / NA - Not Reported / Not Available

dry - Sample results reported on a dry weight basis. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

RPD - Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

APPENDIX H

Chain-of-Custody Documentation and Laboratory Analytical Reports:
Soil Samples form June 2004 Push Probe Borings

HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: NORTH CREEK ANALYTICAL PORTLAND OR

Lab Project No:

CHAIN OF CUSTODY

Chain of Custody No: P4F0426

Project Manager: ROB EDE
Project No.: 2708
Project Name: GASCO UPLAND
Collected by: RBE

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N) No
Provide Preliminary Fax Results Yes

Comments
Sample Number Prefix: 2708-040608-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: BTEX (EPA 8021)	Analyses to be Performed: PAHs (EPA 8270 SIM)	RUSH	Remarks
	13	6/8/04	930	B54 2-2.5	X			2	X	X		
	14	6/8/04	938	B54 7.5-8.0	X			2	X	X		

Relinquished by	Company	Date	Time	Received by	Company
RS Ede	HAI	6/11/04	9:30	[signature]	NCA
[signature]	NCA	6/11/04	9:52	[signature]	NCA

3.2°C

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hahn

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other** _____

   By (print) Sarah Passarge (sign) [signature]

2. Date samples received 6/11/04 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other _____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by BOB date 6/11/04.

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice X gel ice ___real ice

   Temperature (degrees C) 3.7 Raytek thermometer _____ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___ Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___ No

   If "no" please specify: _____

9. Was project identifiable from custody papers? X Yes ___ No

   Name of project Gasco Upland (if applicable)

10. **Initial and date for unpacking:** BF **(initials)** **date** 6/11/04

11. Packing material: NA bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___ Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___ No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? X Yes ___ No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___ No

    Do the IDs, times, etc. agree with the COC? X Yes ___ No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? X Yes ___ No

17. Is there adequate volume for the test(s) requested? X Yes ___ No

18. If voa vials were submitted, are they free of bubbles? X N/A ___ Yes ___ No

19. **Log-in phase: Date samples were logged in:** 6/11/04 **Elm Project #** P4F0426

20. Logged in by (print) Sarah Passarge (sign) [signature]

21. Was the project manager notified of status? (Use back of form as a record) ___ Yes X No

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29 June, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 06/11/04 09:52. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

Work Orders included in this report:
P4F0426

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Hahn and Associates, Inc.	Project:	Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number:	2708	**Reported:**
Portland, OR 97209	Project Manager:	Rob Ede	06/29/04 13:44

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040608-13	P4F0426-01	Soil	06/08/04 09:30	06/11/04 09:52
2708-040608-14	P4F0426-02	Soil	06/08/04 09:38	06/11/04 09:52

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040608-13 (P4F0426-01) Soil					Sampled: 06/08/04 Received: 06/11/04				
Benzene	ND	0.0500	mg/kg dry	1	EPA 8021B	06/14/04	06/16/04	4060531	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.0500	"	"	"	"	"	"	
Surr: a,a,a-TFT (PID)	*91.4 %*	*60-130*							
2708-040608-14 (P4F0426-02) Soil					Sampled: 06/08/04 Received: 06/11/04				
Benzene	ND	0.0500	mg/kg dry	1	EPA 8021B	06/14/04	06/16/04	4060531	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.0500	"	"	"	"	"	"	
Surr: a,a,a-TFT (PID)	*89.6 %*	*60-130*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040608-13 (P4F0426-01) Soil					Sampled: 06/08/04 Received: 06/11/04				**R-05**
Acenaphthene	ND	168	ug/kg dry	5	EPA 8270m	06/16/04	06/22/04	4060661	
Acenaphthylene	ND	168	"	"	"	"	"	"	
Anthracene	ND	168	"	"	"	"	"	"	
Benzo (a) anthracene	**240**	168	"	"	"	"	"	"	
Benzo (a) pyrene	**323**	168	"	"	"	"	"	"	
Benzo (b) fluoranthene	**303**	168	"	"	"	"	"	"	
Benzo (ghi) perylene	**306**	168	"	"	"	"	"	"	
Benzo (k) fluoranthene	**211**	168	"	"	"	"	"	"	
Chrysene	**330**	168	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	168	"	"	"	"	"	"	
Fluoranthene	**370**	168	"	"	"	"	"	"	
Fluorene	ND	168	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**233**	168	"	"	"	"	"	"	
Naphthalene	ND	168	"	"	"	"	"	"	
Phenanthrene	**290**	168	"	"	"	"	"	"	
Pyrene	**454**	168	"	"	"	"	"	"	
Surr: Fluorene-d10	*120 %*	*40-150*							
Surr: Pyrene-d10	*121 %*	*40-150*							
Surr: Benzo (a) pyrene-d12	*115 %*	*40-150*							
2708-040608-14 (P4F0426-02) Soil					Sampled: 06/08/04 Received: 06/11/04				**R-05**
Acenaphthene	ND	3350	ug/kg dry	100	EPA 8270m	06/16/04	06/22/04	4060661	
Acenaphthylene	ND	3350	"	"	"	"	"	"	
Anthracene	ND	3350	"	"	"	"	"	"	
Benzo (a) anthracene	**15700**	3350	"	"	"	"	"	"	
Benzo (a) pyrene	**22100**	3350	"	"	"	"	"	"	
Benzo (b) fluoranthene	**20900**	3350	"	"	"	"	"	"	
Benzo (ghi) perylene	**24200**	3350	"	"	"	"	"	"	
Benzo (k) fluoranthene	**11800**	3350	"	"	"	"	"	"	
Chrysene	**20400**	3350	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	3350	"	"	"	"	"	"	
Fluoranthene	**56800**	3350	"	"	"	"	"	"	
Fluorene	ND	3350	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**16400**	3350	"	"	"	"	"	"	
Naphthalene	ND	3350	"	"	"	"	"	"	
Phenanthrene	**18200**	3350	"	"	"	"	"	"	
Pyrene	**62100**	3350	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040608-14 (P4F0426-02) Soil						Sampled: 06/08/04	Received: 06/11/04		**R-05**
Surr: Fluorene-d10	*NR*	*40-150*							*S-01*
Surr: Pyrene-d10	*NR*	*40-150*							*S-01*
Surr: Benzo (a) pyrene-d12	*NR*	*40-150*							*S-01*

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

Percent Dry Weight (Solids) per Standard Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040608-13 (P4F0426-01) Soil					Sampled: 06/08/04 Received: 06/11/04				
% Solids	**89.5**	1.00	% by Weight	1	NCA SOP	06/17/04	06/18/04	4060748	
2708-040608-14 (P4F0426-02) Soil					Sampled: 06/08/04 Received: 06/11/04				
% Solids	**81.1**	1.00	% by Weight	1	NCA SOP	06/17/04	06/18/04	4060748	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

BTEX per EPA Method 8021B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060531 - EPA 5035										
Blank (4060531-BLK1)				Prepared: 06/14/04 Analyzed: 06/16/04						
Benzene	ND	0.0500	mg/kg							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.0500	"							
Surr: a,a,a-TFT (PID)	*1.41*		"	*1.25*		*113*	*60-130*			
LCS (4060531-BS1)				Prepared: 06/14/04 Analyzed: 06/16/04						
Benzene	1.43	0.0500	mg/kg	1.25		114	70-130			
Toluene	1.44	0.0500	"	1.25		115	70-130			
Ethylbenzene	1.36	0.0500	"	1.25		109	70-130			
Xylenes (total)	4.26	0.0500	"	3.75		114	70-130			
Surr: a,a,a-TFT (PID)	*1.39*		"	*1.25*		*111*	*60-130*			
Matrix Spike (4060531-MS1)	**Source: P4F0423-06**			Prepared: 06/14/04 Analyzed: 06/16/04						
Benzene	1.31	0.0500	mg/kg dry	1.52	0.0151	85.2	65-130			
Toluene	1.35	0.0500	"	1.52	0.0134	87.9	65-130			
Ethylbenzene	1.27	0.0500	"	1.52	ND	83.6	65-130			
Xylenes (total)	3.97	0.0500	"	4.55	ND	87.3	65-130			
Surr: a,a,a-TFT (PID)	*0.999*		"	*1.52*		*65.7*	*60-130*			
Matrix Spike Dup (4060531-MSD1)	**Source: P4F0423-06**			Prepared: 06/14/04 Analyzed: 06/16/04						
Benzene	1.32	0.0500	mg/kg dry	1.52	0.0151	85.8	65-130	0.760	20	
Toluene	1.38	0.0500	"	1.52	0.0134	89.9	65-130	2.20	20	
Ethylbenzene	1.29	0.0500	"	1.52	ND	84.9	65-130	1.56	20	
Xylenes (total)	3.99	0.0500	"	4.55	ND	87.7	65-130	0.503	20	
Surr: a,a,a-TFT (PID)	*1.03*		"	*1.52*		*67.8*	*60-130*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060661 - EPA 3550										
Blank (4060661-BLK1)				Prepared & Analyzed: 06/16/04						
Acenaphthene	ND	13.4	ug/kg							
Acenaphthylene	ND	13.4	"							
Anthracene	ND	13.4	"							
Benzo (a) anthracene	ND	13.4	"							
Benzo (a) pyrene	ND	13.4	"							
Benzo (b) fluoranthene	ND	13.4	"							
Benzo (ghi) perylene	ND	13.4	"							
Benzo (k) fluoranthene	ND	13.4	"							
Chrysene	ND	13.4	"							
Dibenzo (a,h) anthracene	ND	13.4	"							
Fluoranthene	ND	13.4	"							
Fluorene	ND	13.4	"							
Indeno (1,2,3-cd) pyrene	ND	13.4	"							
Naphthalene	ND	13.4	"							
Phenanthrene	ND	13.4	"							
Pyrene	ND	13.4	"							
Surr: Fluorene-d10	*93.3*		"	*83.3*		*112*	*40-150*			
Surr: Pyrene-d10	*103*		"	*83.3*		*124*	*40-150*			
Surr: Benzo (a) pyrene-d12	*97.3*		"	*83.3*		*117*	*40-150*			
LCS (4060661-BS1)				Prepared: 06/16/04 Analyzed: 06/17/04						
Acenaphthene	172	13.4	ug/kg	167		103	33-139			
Benzo (a) pyrene	180	13.4	"	167		108	45-149			
Pyrene	197	13.4	"	167		118	39-138			
Surr: Fluorene-d10	*97.3*		"	*83.3*		*117*	*40-150*			
Surr: Pyrene-d10	*114*		"	*83.3*		*137*	*40-150*			
Surr: Benzo (a) pyrene-d12	*103*		"	*83.3*		*124*	*40-150*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060661 - EPA 3550										
Matrix Spike (4060661-MS1)	**Source: P4F0275-01**			Prepared: 06/16/04		Analyzed: 06/21/04				**R-05**
Acenaphthene	7690	670	ug/kg dry	194	7950	-134	33-139			Q-01
Benzo (a) pyrene	654	670	"	194	417	122	45-149			
Pyrene	7910	670	"	194	6950	>300%	39-138			Q-01
Surr: Fluorene-d10	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Surr: Pyrene-d10	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Surr: Benzo (a) pyrene-d12	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Matrix Spike Dup (4060661-MSD1)	**Source: P4F0275-01**			Prepared: 06/16/04		Analyzed: 06/21/04				**R-05**
Acenaphthene	8680	670	ug/kg dry	194	7950	>300%	33-139	12.1	60	Q-01
Benzo (a) pyrene	639	670	"	194	417	114	45-149	2.32	60	
Pyrene	7580	670	"	194	6950	>300%	39-138	4.26	60	Q-01
Surr: Fluorene-d10	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Surr: Pyrene-d10	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Surr: Benzo (a) pyrene-d12	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060748 - Dry Weight										
Duplicate (4060748-DUP1)		**Source: P4F0470-02**		Prepared: 06/17/04 Analyzed: 06/18/04						
% Solids	94.0	1.00% by Weight			93.9			0.106	20	
Duplicate (4060748-DUP2)		**Source: P4F0470-03**		Prepared: 06/17/04 Analyzed: 06/18/04						
% Solids	95.1	1.00% by Weight			94.9			0.211	20	
Duplicate (4060748-DUP3)		**Source: P4F0619-01**		Prepared: 06/17/04 Analyzed: 06/18/04						
% Solids	73.9	1.00% by Weight			74.1			0.270	20	
Duplicate (4060748-DUP4)		**Source: P4F0619-02**		Prepared: 06/17/04 Analyzed: 06/18/04						
% Solids	71.8	1.00% by Weight			72.2			0.556	20	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:44

Notes and Definitions

Q-01	The matrix spike recovery, and/or RPD, for this QC sample is outside of established control limits. Failure of a matrix spike QC sample does not represent an out-of-control condition for the batch.
R-05	Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
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 (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Jun-10-04 5:15PM; 5032272209; Sent By: HAHN * ASSOCIATES;

HAHN AND ASSOCIATES, INC.

Environmental Consultants

434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory NORTH CREEK ANALYTICAL PORTLAND OR

Lab Project No

CHAIN OF CUSTODY

Chain of Custody No P4F0425

Project Manager ROB EDE
Project No 2208
Project Name GASCO UPLAND
Collected by RBE

Liquid with Sediment Sample — Test Filtrate / Test Sediment / Test Both:
Multi-Phase Sample — Test One (which) / Test Separately / Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N) No
Provide Preliminary Fax Results Yes

Comments

Sample Number Prefix: 2208-040607 -

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Water	Other	Number of Containers	BTEX (EPA 8021)	PAHs (EPA 8270 SIM)	TCLP-Benzene	RUSH	Remarks
	06	6/7/04	920	B55 2-3	Y			2	X	X	X		
	07	6/7/04	930	B-55 8-8.5	Y			2					HOLD
	08	6/7/04	950	B-55 24-24.5	X			2					HOLD
	09	6/7/04	1135	B-55 32-32.5	Y			2					HOLD
	10	6/7/04	1155	B-55 49.5-50	X			2					HOLD
	11	6/7/04	1440	B-53 2.5-3.0	X			2	X	X			—
	12	6/7/04	645	B-53 26.5-27	X			2					

Relinquished by	Company	Date	Time	Received by	Company
	HAI	6/11/04	9:30		NCA
	NCA	6/11/04	9:52		NCA

3.2°C

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hahn

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other** _____

   By (print) Sarah Passarge (sign) [signature]

2. Date samples received 6/11/04 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier (BOB) ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by BOB date 6/11/04.

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice X gel ice ___real ice

   Temperature (degrees C) 3.2 Raytek thermometer _____ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? X Yes ___No

   Name of project Casco Upland (if applicable)

10. **Initial and date for unpacking:** SP **(initials)** **date** 6/11/04

11. Packing material: N/A bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? X Yes ___No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___No

    Do the IDs, times, etc. agree with the COC? X Yes ___No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? X Yes ___No

17. Is there adequate volume for the test(s) requested? X Yes ___No

18. If voa vials were submitted, are they free of bubbles? X N/A ___Yes ___No

19. **Log-in phase: Date samples were logged in:** 6/11/04 **Elm Project # P** 4F0423

20. Logged in by (print) Sarah Passarge (sign) [signature]

21. Was the project manager notified of status? (Use back of form as a record) ___Yes X No

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29 June, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 06/11/04 09:52. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

Work Orders included in this report:
P4F0423

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Hahn and Associates, Inc.	Project:	Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number:	2708	**Reported:**
Portland, OR 97209	Project Manager:	Rob Ede	06/29/04 13:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2108-040607-06	P4F0423-01	Soil	06/07/04 09:20	06/11/04 09:52
2108-040607-11	P4F0423-06	Soil	06/07/04 14:40	06/11/04 09:52

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2108-040607-06 (P4F0423-01) Soil					Sampled: 06/07/04 Received: 06/11/04				
Benzene	**137**	2.00	mg/kg dry	40	EPA 8021B	06/14/04	06/16/04	4060531	
Toluene	**95.6**	2.00	"	"	"	"	"	"	
Ethylbenzene	**77.3**	2.00	"	"	"	"	"	"	
Xylenes (total)	**92.6**	2.00	"	"	"	"	"	"	
Surr: a,a,a-TFT (PID)	*NR*	*60-130*							*S-01*
2108-040607-11 (P4F0423-06) Soil					Sampled: 06/07/04 Received: 06/11/04				
Benzene	ND	0.0500	mg/kg dry	1	EPA 8021B	06/14/04	06/16/04	4060531	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.0500	"	"	"	"	"	"	
Surr: a,a,a-TFT (PID)	*75.7 %*	*60-130*							

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2108-040607-06 (P4F0423-01) Soil					Sampled: 06/07/04 Received: 06/11/04				**R-05**
Acenaphthene	**977000**	335000	ug/kg dry	5000	EPA 8270m	06/16/04	06/22/04	4060661	
Acenaphthylene	**2400000**	335000	"	"	"	"	"	"	
Anthracene	**1760000**	335000	"	"	"	"	"	"	
Benzo (a) anthracene	**1240000**	335000	"	"	"	"	"	"	
Benzo (a) pyrene	**1170000**	335000	"	"	"	"	"	"	
Benzo (b) fluoranthene	**688000**	335000	"	"	"	"	"	"	
Benzo (ghi) perylene	**700000**	335000	"	"	"	"	"	"	
Benzo (k) fluoranthene	**731000**	335000	"	"	"	"	"	"	
Chrysene	**1480000**	335000	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	335000	"	"	"	"	"	"	
Fluoranthene	**4890000**	335000	"	"	"	"	"	"	
Fluorene	**1740000**	335000	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**522000**	335000	"	"	"	"	"	"	
Naphthalene	**27600000**	3350000	"	50000	"	"	06/22/04	"	
Phenanthrene	**9750000**	335000	"	5000	"	"	06/22/04	"	
Pyrene	**5360000**	335000	"	"	"	"	"	"	
Surr: Fluorene-d10	*NR*	*40-150*							*S-01*
Surr: Pyrene-d10	*NR*	*40-150*							*S-01*
Surr: Benzo (a) pyrene-d12	*NR*	*40-150*							*S-01*
2108-040607-11 (P4F0423-06) Soil					Sampled: 06/07/04 Received: 06/11/04				**R-05**
Acenaphthene	ND	670	ug/kg dry	20	EPA 8270m	06/16/04	06/22/04	4060661	
Acenaphthylene	**745**	670	"	"	"	"	"	"	
Anthracene	**996**	670	"	"	"	"	"	"	
Benzo (a) anthracene	**4210**	670	"	"	"	"	"	"	
Benzo (a) pyrene	**6820**	670	"	"	"	"	"	"	
Benzo (b) fluoranthene	**4970**	670	"	"	"	"	"	"	
Benzo (ghi) perylene	**5480**	670	"	"	"	"	"	"	
Benzo (k) fluoranthene	**4210**	670	"	"	"	"	"	"	
Chrysene	**5320**	670	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	**1040**	670	"	"	"	"	"	"	
Fluoranthene	**6430**	670	"	"	"	"	"	"	
Fluorene	ND	670	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**4010**	670	"	"	"	"	"	"	
Naphthalene	ND	670	"	"	"	"	"	"	
Phenanthrene	**2690**	670	"	"	"	"	"	"	
Pyrene	**9700**	670	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2108-040607-11 (P4F0423-06) Soil						Sampled: 06/07/04	Received: 06/11/04		**R-05**
Surr: Fluorene-d10	*NR*	*40-150*							*S-01*
Surr: Pyrene-d10	*NR*	*40-150*							*S-01*
Surr: Benzo (a) pyrene-d12	*NR*	*40-150*							*S-01*

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

TCLP Volatile Organic Compounds per EPA Method 1311/8260B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2108-040607-06 (P4F0423-01) Soil						Sampled: 06/07/04	Received: 06/11/04		
Benzene	**4.10**	0.0500	mg/l	5	1311/8260B	06/23/04	06/25/04	4061033	
Surr: 4-BFB	*96.0 %*	*75-130*							
Surr: Dibromofluoromethane	*110 %*	*75-130*							
Surr: Toluene-d8	*105 %*	*75-130*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

Percent Dry Weight (Solids) per Standard Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2108-040607-06 (P4F0423-01) Soil					Sampled: 06/07/04 Received: 06/11/04				
% Solids	**78.0**	1.00	% by Weight	1	NCA SOP	06/17/04	06/18/04	4060748	
2108-040607-11 (P4F0423-06) Soil					Sampled: 06/07/04 Received: 06/11/04				
% Solids	**82.4**	1.00	% by Weight	1	NCA SOP	06/17/04	06/18/04	4060748	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

BTEX per EPA Method 8021B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060531 - EPA 5035										
Blank (4060531-BLK1)				Prepared: 06/14/04 Analyzed: 06/16/04						
Benzene	ND	0.0500	mg/kg							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.0500	"							
Surr: a,a,a-TFT (PID)	*1.41*		"	*1.25*		*113*	*60-130*			
LCS (4060531-BS1)				Prepared: 06/14/04 Analyzed: 06/16/04						
Benzene	1.43	0.0500	mg/kg	1.25		114	70-130			
Toluene	1.44	0.0500	"	1.25		115	70-130			
Ethylbenzene	1.36	0.0500	"	1.25		109	70-130			
Xylenes (total)	4.26	0.0500	"	3.75		114	70-130			
Surr: a,a,a-TFT (PID)	*1.39*		"	*1.25*		*111*	*60-130*			
Matrix Spike (4060531-MS1)	**Source: P4F0423-06**			Prepared: 06/14/04 Analyzed: 06/16/04						
Benzene	1.31	0.0500	mg/kg dry	1.52	0.0151	85.2	65-130			
Toluene	1.35	0.0500	"	1.52	0.0134	87.9	65-130			
Ethylbenzene	1.27	0.0500	"	1.52	ND	83.6	65-130			
Xylenes (total)	3.97	0.0500	"	4.55	ND	87.3	65-130			
Surr: a,a,a-TFT (PID)	*0.999*		"	*1.52*		*65.7*	*60-130*			
Matrix Spike Dup (4060531-MSD1)	**Source: P4F0423-06**			Prepared: 06/14/04 Analyzed: 06/16/04						
Benzene	1.32	0.0500	mg/kg dry	1.52	0.0151	85.8	65-130	0.760	20	
Toluene	1.38	0.0500	"	1.52	0.0134	89.9	65-130	2.20	20	
Ethylbenzene	1.29	0.0500	"	1.52	ND	84.9	65-130	1.56	20	
Xylenes (total)	3.99	0.0500	"	4.55	ND	87.7	65-130	0.503	20	
Surr: a,a,a-TFT (PID)	*1.03*		"	*1.52*		*67.8*	*60-130*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060661 - EPA 3550										
Blank (4060661-BLK1)				Prepared & Analyzed: 06/16/04						
Acenaphthene	ND	13.4	ug/kg							
Acenaphthylene	ND	13.4	"							
Anthracene	ND	13.4	"							
Benzo (a) anthracene	ND	13.4	"							
Benzo (a) pyrene	ND	13.4	"							
Benzo (b) fluoranthene	ND	13.4	"							
Benzo (ghi) perylene	ND	13.4	"							
Benzo (k) fluoranthene	ND	13.4	"							
Chrysene	ND	13.4	"							
Dibenzo (a,h) anthracene	ND	13.4	"							
Fluoranthene	ND	13.4	"							
Fluorene	ND	13.4	"							
Indeno (1,2,3-cd) pyrene	ND	13.4	"							
Naphthalene	ND	13.4	"							
Phenanthrene	ND	13.4	"							
Pyrene	ND	13.4	"							
Surr: Fluorene-d10	*93.3*		"	*83.3*		*112*	*40-150*			
Surr: Pyrene-d10	*103*		"	*83.3*		*124*	*40-150*			
Surr: Benzo (a) pyrene-d12	*97.3*		"	*83.3*		*117*	*40-150*			
LCS (4060661-BS1)				Prepared: 06/16/04 Analyzed: 06/17/04						
Acenaphthene	172	13.4	ug/kg	167		103	33-139			
Benzo (a) pyrene	180	13.4	"	167		108	45-149			
Pyrene	197	13.4	"	167		118	39-138			
Surr: Fluorene-d10	*97.3*		"	*83.3*		*117*	*40-150*			
Surr: Pyrene-d10	*114*		"	*83.3*		*137*	*40-150*			
Surr: Benzo (a) pyrene-d12	*103*		"	*83.3*		*124*	*40-150*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060661 - EPA 3550										
Matrix Spike (4060661-MS1)	**Source: P4F0275-01**			Prepared: 06/16/04		Analyzed: 06/21/04				**R-05**
Acenaphthene	7690	670	ug/kg dry	194	7950	-134	33-139			Q-01
Benzo (a) pyrene	654	670	"	194	417	122	45-149			
Pyrene	7910	670	"	194	6950	>300%	39-138			Q-01
Surr: Fluorene-d10	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Surr: Pyrene-d10	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Surr: Benzo (a) pyrene-d12	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Matrix Spike Dup (4060661-MSD1)	**Source: P4F0275-01**			Prepared: 06/16/04		Analyzed: 06/21/04				**R-05**
Acenaphthene	8680	670	ug/kg dry	194	7950	>300%	33-139	12.1	60	Q-01
Benzo (a) pyrene	639	670	"	194	417	114	45-149	2.32	60	
Pyrene	7580	670	"	194	6950	>300%	39-138	4.26	60	Q-01
Surr: Fluorene-d10	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Surr: Pyrene-d10	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*
Surr: Benzo (a) pyrene-d12	*ND*		"	*96.9*		*NR*	*40-150*			*S-01*

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

TCLP Volatile Organic Compounds per EPA Method 1311/8260B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4061033 - EPA 5030B										
Blank (4061033-BLK1)				Prepared: 06/23/04 Analyzed: 06/25/04						
Benzene	ND	0.0100	mg/l							
Surr: 4-BFB	*0.0182*		"	*0.0200*		*91.0*	*75-130*			
Surr: Dibromofluoromethane	*0.0212*		"	*0.0200*		*106*	*75-130*			
Surr: Toluene-d8	*0.0203*		"	*0.0200*		*102*	*75-130*			
LCS (4061033-BS1)				Prepared: 06/23/04 Analyzed: 06/24/04						
Benzene	0.224	0.0100	mg/l	0.200		112	66-142			
Surr: 4-BFB	*0.0185*		"	*0.0200*		*92.5*	*75-130*			
Surr: Dibromofluoromethane	*0.0204*		"	*0.0200*		*102*	*75-130*			
Surr: Toluene-d8	*0.0198*		"	*0.0200*		*99.0*	*75-130*			
LCS Dup (4061033-BSD1)				Prepared: 06/23/04 Analyzed: 06/24/04						
Benzene	0.233	0.0100	mg/l	0.200		116	66-142	3.94	21	
Surr: 4-BFB	*0.0195*		"	*0.0200*		*97.5*	*75-130*			
Surr: Dibromofluoromethane	*0.0213*		"	*0.0200*		*106*	*75-130*			
Surr: Toluene-d8	*0.0203*		"	*0.0200*		*102*	*75-130*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060748 - Dry Weight										
Duplicate (4060748-DUP1)		**Source: P4F0470-02**		Prepared: 06/17/04 Analyzed: 06/18/04						
% Solids	94.0	1.00% by Weight			93.9			0.106	20	
Duplicate (4060748-DUP2)		**Source: P4F0470-03**		Prepared: 06/17/04 Analyzed: 06/18/04						
% Solids	95.1	1.00% by Weight			94.9			0.211	20	
Duplicate (4060748-DUP3)		**Source: P4F0619-01**		Prepared: 06/17/04 Analyzed: 06/18/04						
% Solids	73.9	1.00% by Weight			74.1			0.270	20	
Duplicate (4060748-DUP4)		**Source: P4F0619-02**		Prepared: 06/17/04 Analyzed: 06/18/04						
% Solids	71.8	1.00% by Weight			72.2			0.556	20	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/29/04 13:52

Notes and Definitions

Q-01	The matrix spike recovery, and/or RPD, for this QC sample is outside of established control limits. Failure of a matrix spike QC sample does not represent an out-of-control condition for the batch.
R-05	Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
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 (as received)
RPD	Relative Percent Difference

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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PHFO 113

HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: North Creek Analytical Portland, OR
Lab Project No.:

CHAIN OF CUSTODY

Chain of Custody No.:

Project Manager: Rob EDE
Project No.: 2708
Project Name: Gasco Upland
Collected by: RBE/APR

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N):
Appropriate Containers Used (Y or N):
Provide Verbal Results (Y or N): No
Provide Preliminary Fax Results: Yes

Comments
Sample Number Prefix: 2708-040601-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	PAHs (EPA 8270 SIM)	BTEX (EPA 8021)	Total CN (EPA 9010)	RUSH	Remarks
	-01	6/1/04	900	B-56 2.5-3.5	X			2	X	X	X		
	-02		905	B-56 7.0-8.0	X			2					
	-03		920	B-56 11-12	X			2	X	X	X		
	-04		955	B-56 26-27	X			2	X	X			

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAI	6/2/04	12:20	[signature]	NCA
[signature]	NCA	6/2/04	15:00	[signature]	NCA

1.2

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hahn & Associates

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other**_____

   By (print) Vanessa Evans (sign) Vanessa Evans

2. Date samples received 6/2/09 Date opened: Same X or ___/___/___

3. Delivered by: X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by Bob date 6/2/09.

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___blue ice ___gel ice X real ice

   Temperature (degrees C) X Raytek thermometer 1.2 Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? X Yes ___No

   Name of project Mascoupland (if applicable)

10. **Initial and date for unpacking:** VE **(initials)** **date** 6/2/09

11. Packing material: NA bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___Yes X No

13. Did all containers indicated on the COC arrive? X Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? X Yes ___No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___No

    Do the IDs, times, etc. agree with the COC? X Yes ___No

    If "no" please indicate which containers _____

16. Are containers properly preserved for indicated analysis? X Yes ___No

17. Is there adequate volume for the test(s) requested? X Yes ___No

18. If voa vials were submitted, are they free of bubbles? X N/A ___Yes ___No

19. **Log-in phase: Date samples were logged in:** 6/2/09 **Elm Project # P** 9F0013

20. Logged in by (print) Vanessa Evans (sign) Vanessa Evans

21. Was the project manager notified of status? (Use back of form as a record) ___Yes X No

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22 June, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 06/02/04 15:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Philip Nerenberg
Laboratory Manager

Work Orders included in this report:
P4F0113

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-040601-01	P4F0113-01	Soil	06/01/04 09:00	06/02/04 15:00
2708-040601-03	P4F0113-03	Soil	06/01/04 09:20	06/02/04 15:00
2708-040601-04	P4F0113-04	Soil	06/01/04 09:55	06/02/04 15:00

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

BTEX per EPA Method 8021B

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040601-01 (P4F0113-01) Soil					Sampled: 06/01/04 Received: 06/02/04				
Benzene	ND	0.0500	mg/kg dry	1	EPA 8021B	06/07/04	06/09/04	4060277	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.0500	"	"	"	"	"	"	
Surr: a,a,a-TFT (PID)	*91.4 %*	*60-130*							
2708-040601-03 (P4F0113-03) Soil					Sampled: 06/01/04 Received: 06/02/04				
Benzene	ND	0.0500	mg/kg dry	1	EPA 8021B	06/07/04	06/09/04	4060277	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.0500	"	"	"	"	"	"	
Surr: a,a,a-TFT (PID)	*87.3 %*	*60-130*							
2708-040601-04 (P4F0113-04) Soil					Sampled: 06/01/04 Received: 06/02/04				
Benzene	ND	0.0500	mg/kg dry	1	EPA 8021B	06/07/04	06/09/04	4060277	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.0500	"	"	"	"	"	"	
Surr: a,a,a-TFT (PID)	*63.8 %*	*60-130*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040601-01 (P4F0113-01) Soil					Sampled: 06/01/04 Received: 06/02/04				
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	06/03/04	06/09/04	4060142	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	**14.0**	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	*93.6 %*	*40-150*							
Surr: Pyrene-d10	*110 %*	*40-150*							
Surr: Benzo (a) pyrene-d12	*90.5 %*	*40-150*							
2708-040601-03 (P4F0113-03) Soil					Sampled: 06/01/04 Received: 06/02/04				
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	06/03/04	06/09/04	4060142	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	**23.1**	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	**35.1**	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	**31.4**	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	**37.0**	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	**24.7**	13.4	"	"	"	"	"	"	
Chrysene	**30.7**	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	**41.7**	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**25.5**	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	**38.7**	13.4	"	"	"	"	"	"	
Pyrene	**69.0**	13.4	"	"	"	"	"	"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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

Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040601-03 (P4F0113-03) Soil					Sampled: 06/01/04 Received: 06/02/04				
Surr: Fluorene-d10	*79.2 %*	*40-150*							
Surr: Pyrene-d10	*96.4 %*	*40-150*							
Surr: Benzo (a) pyrene-d12	*78.6 %*	*40-150*							
2708-040601-04 (P4F0113-04) Soil					Sampled: 06/01/04 Received: 06/02/04				
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	06/03/04	06/09/04	4060142	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	**14.0**	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	**32.7**	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	**41.9**	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	**33.6**	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	**32.2**	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	**25.0**	13.4	"	"	"	"	"	"	
Chrysene	**37.7**	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	**95.3**	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**22.2**	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	**47.6**	13.4	"	"	"	"	"	"	
Pyrene	**143**	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	*100 %*	*40-150*							
Surr: Pyrene-d10	*119 %*	*40-150*							
Surr: Benzo (a) pyrene-d12	*94.1 %*	*40-150*							

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040601-01 (P4F0113-01) Soil					Sampled: 06/01/04 Received: 06/02/04				
Cyanide (total)	ND	0.435	mg/kg dry	1	EPA 9010B	06/11/04	06/11/04	4060488	
2708-040601-03 (P4F0113-03) Soil					Sampled: 06/01/04 Received: 06/02/04				
Cyanide (total)	ND	0.379	mg/kg dry	1	EPA 9010B	06/11/04	06/11/04	4060488	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Percent Dry Weight (Solids) per Standard Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
2708-040601-01 (P4F0113-01) Soil					Sampled: 06/01/04 Received: 06/02/04				
% Solids	**82.3**	1.00	% by Weight	1	NCA SOP	06/07/04	06/08/04	4060285	
2708-040601-03 (P4F0113-03) Soil					Sampled: 06/01/04 Received: 06/02/04				
% Solids	**75.6**	1.00	% by Weight	1	NCA SOP	06/07/04	06/08/04	4060285	
2708-040601-04 (P4F0113-04) Soil					Sampled: 06/01/04 Received: 06/02/04				
% Solids	**70.5**	1.00	% by Weight	1	NCA SOP	06/07/04	06/08/04	4060285	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

BTEX per EPA Method 8021B - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060277 - EPA 5035										
Blank (4060277-BLK1)				Prepared: 06/07/04 Analyzed: 06/08/04						
Benzene	ND	0.0500	mg/kg							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.0500	"							
Surr: a,a,a-TFT (PID)	*1.35*		"	*1.25*		*108*	*60-130*			
LCS (4060277-BS1)				Prepared: 06/07/04 Analyzed: 06/08/04						
Benzene	1.36	0.0500	mg/kg	1.25		109	70-130			
Toluene	1.42	0.0500	"	1.25		114	70-130			
Ethylbenzene	1.32	0.0500	"	1.25		106	70-130			
Xylenes (total)	4.44	0.0500	"	3.75		118	70-130			
Surr: a,a,a-TFT (PID)	*1.42*		"	*1.25*		*114*	*60-130*			
Matrix Spike (4060277-MS1)	**Source: P4F0113-01**			Prepared: 06/07/04 Analyzed: 06/09/04						
Benzene	1.29	0.0500	mg/kg dry	1.52	ND	84.9	65-130			
Toluene	1.36	0.0500	"	1.52	ND	89.5	65-130			
Ethylbenzene	1.34	0.0500	"	1.52	ND	88.2	65-130			
Xylenes (total)	4.33	0.0500	"	4.55	ND	95.2	65-130			
Surr: a,a,a-TFT (PID)	*0.809*		"	*1.52*		*53.2*	*60-130*			*S-09*
Matrix Spike Dup (4060277-MSD1)	**Source: P4F0113-01**			Prepared: 06/07/04 Analyzed: 06/09/04						
Benzene	1.36	0.0500	mg/kg dry	1.52	ND	89.5	65-130	5.28	20	
Toluene	1.45	0.0500	"	1.52	ND	95.4	65-130	6.41	20	
Ethylbenzene	1.40	0.0500	"	1.52	ND	92.1	65-130	4.38	20	
Xylenes (total)	4.49	0.0500	"	4.55	ND	98.7	65-130	3.63	20	
Surr: a,a,a-TFT (PID)	*0.981*		"	*1.52*		*64.5*	*60-130*			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060142 - EPA 3550										
Blank (4060142-BLK1)				Prepared: 06/03/04 Analyzed: 06/09/04						
Benzo (e) pyrene	ND	13.4	ug/kg							
Acenaphthene	ND	13.4	"							
Acenaphthylene	ND	13.4	"							
Anthracene	ND	13.4	"							
Benzo (a) anthracene	ND	13.4	"							
Benzo (a) pyrene	ND	13.4	"							
Benzo (b) fluoranthene	ND	13.4	"							
Benzo (ghi) perylene	ND	13.4	"							
Benzo (k) fluoranthene	ND	13.4	"							
Chrysene	ND	13.4	"							
Dibenzo (a,h) anthracene	ND	13.4	"							
Fluoranthene	ND	13.4	"							
Fluorene	ND	13.4	"							
Indeno (1,2,3-cd) pyrene	ND	13.4	"							
Naphthalene	ND	13.4	"							
Phenanthrene	ND	13.4	"							
Pyrene	ND	13.4	"							
Surr: Fluorene-d10	*80.8*		"	*83.3*		*97.0*	*40-150*			
Surr: Pyrene-d10	*101*		"	*83.3*		*121*	*40-150*			
Surr: Benzo (a) pyrene-d12	*45.0*		"	*83.3*		*54.0*	*40-150*			
LCS (4060142-BS1)				Prepared: 06/03/04 Analyzed: 06/08/04						
Acenaphthene	160	13.4	ug/kg	167		95.8	33-139			
Benzo (a) pyrene	158	13.4	"	167		94.6	45-149			
Pyrene	165	13.4	"	167		98.8	39-138			
Surr: Fluorene-d10	*84.7*		"	*83.3*		*102*	*40-150*			
Surr: Pyrene-d10	*87.0*		"	*83.3*		*104*	*40-150*			
Surr: Benzo (a) pyrene-d12	*82.5*		"	*83.3*		*99.0*	*40-150*			

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060142 - EPA 3550										
Matrix Spike (4060142-MS1)	**Source: P4F0077-01**			Prepared: 06/03/04		Analyzed: 06/09/04				
Acenaphthene	175	13.4	ug/kg dry	185	ND	94.6	33-139			
Benzo (a) pyrene	153	13.4	"	185	ND	82.7	45-149			
Pyrene	178	13.4	"	185	ND	96.2	39-138			
Surr: Fluorene-d10	*94.8*		"	*92.5*		*102*	*40-150*			
Surr: Pyrene-d10	*94.3*		"	*92.5*		*102*	*40-150*			
Surr: Benzo (a) pyrene-d12	*78.7*		"	*92.5*		*85.1*	*40-150*			
Matrix Spike Dup (4060142-MSD1)	**Source: P4F0077-01**			Prepared: 06/03/04		Analyzed: 06/08/04				
Acenaphthene	168	13.4	ug/kg dry	185	ND	90.8	33-139	4.08	60	
Benzo (a) pyrene	200	13.4	"	185	ND	108	45-149	26.6	60	
Pyrene	173	13.4	"	185	ND	93.5	39-138	2.85	60	
Surr: Fluorene-d10	*89.2*		"	*92.5*		*96.4*	*40-150*			
Surr: Pyrene-d10	*90.4*		"	*92.5*		*97.7*	*40-150*			
Surr: Benzo (a) pyrene-d12	*97.6*		"	*92.5*		*106*	*40-150*			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Conventional Chemistry Parameters per APHA/EPA Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060488 - General Preparation										
Blank (4060488-BLK1)				Prepared & Analyzed: 06/11/04						
Cyanide (total)	ND	0.500	mg/kg							
LCS (4060488-BS1)				Prepared & Analyzed: 06/11/04						
Cyanide (total)	9.38	0.500	mg/kg	10.0		93.8	75-125			
Duplicate (4060488-DUP1)		**Source: P4F0113-01**		Prepared & Analyzed: 06/11/04						
Cyanide (total)	0.318	0.336	mg/kg dry		0.259			20.5	40	
Matrix Spike (4060488-MS1)		**Source: P4F0113-01**		Prepared & Analyzed: 06/11/04						
Cyanide (total)	9.23	0.410	mg/kg dry	9.96	0.259	90.1	75-125			

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4060285 - Dry Weight										
Duplicate (4060285-DUP1)		**Source: P4F0169-05**		Prepared: 06/07/04 Analyzed: 06/08/04						
% Solids	80.0	1.00% by Weight			80.3			0.374	20	
Duplicate (4060285-DUP2)		**Source: P4F0169-06**		Prepared: 06/07/04 Analyzed: 06/08/04						
% Solids	77.4	1.00% by Weight			77.5			0.129	20	

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Hahn and Associates, Inc.	Project: Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number: 2708	**Reported:**
Portland, OR 97209	Project Manager: Rob Ede	06/22/04 11:43

Notes and Definitions

S-09	Surrogate recovery is outside control limits due to matrix interference.
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 (as received)
RPD	Relative Percent Difference

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Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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APPENDIX I

Core Photography and Physical Properties Data Report: Well MW-16

PTS Laboratories
ENVIRONMENTAL SERVICES

January 26, 2005

Mr. Rob Ede
Hahn and Associates, Inc.
434 NW 6th Avenue, Suite 203
Portland, OR 97209

Re: NW Natural-Gasco
PTS File 34452

Dear Mr. Ede:

Enclosed are final data and PhotoLog™ of samples submitted from your NW Natural-Gasco Project 2708-10. Electronic versions of the data have been previously sent to your attention and are on the enclosed CD along with digital images. All analyses were performed by applicable ASTM, EPA or API methodology. The samples are currently preserved in frozen storage pending further analyses. Core storage charges of $65.00/mo will start January 2005.

We appreciate the opportunity to be of service and trust these data will prove beneficial in the development of this project. Please call me at (562) 907-3607 with any questions or if you require additional information.

Sincerely,
PTS Laboratories, Inc.

Larry Kunkel
District Manager

LAK:re

Encl.

8100 Secura Way – Santa Fe Springs, CA 90670
Phone 562.907.3607 Fax 562.907.3610
www.ptsgeolabs.com

PHYSICAL PROPERTIES DATA

(METHODOLOGY: ASTM D2216 / API RP40, API RP40)

PROJECT NAME: NW Natural Gasco
PROJECT NO: 2708-10

	METHODS:	API RP 40 / ASTM D2216	API RP 40		API RP 40		API RP 40	
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	MOISTURE CONTENT (% wt)	DENSITY BULK (g/cc)	DENSITY GRAIN (g/cc)	POROSITY, %Vb (2) TOTAL	POROSITY, %Vb (2) AIR FILLED	PORE FLUID SATURATIONS, % Pv (3) WATER	PORE FLUID SATURATIONS, % Pv (3) NAPL
MW-16-65	27.5	V	34.6	1.30	2.64	50.6	5.8	77.4	11.2
MW-16-65	29.2	V	39.3	1.24	2.65	53.0	4.9	67.6	23.1
MW-16-65	31.5	V	33.7	1.27	2.65	52.1	10.5	43.7	36.1
MW-16-65	33.5	V	32.1	1.34	2.71	50.6	8.2	63.1	20.7
MW-16-65	35.7	V	37.9	1.25	2.64	52.7	7.1	36.2	50.3
MW-16-65	38.5	V	35.8	1.31	2.67	51.0	5.3	55.8	33.8
MW-16-65	40.4	V	28.4	1.39	2.65	47.5	8.8	50.6	30.8
MW-16-65	42.5	V	27.4	1.45	2.68	45.9	6.1	85.4	1.4
MW-16-65	44.8	V	29.0	1.40	2.69	48.0	7.3	83.8	0.9
MW-16-65	45.3	V	29.8	1.39	2.69	48.1	6.6	83.2	3.2
MW-16-65	60.7	V	23.9	1.54	2.66	42.2	5.2	87.6	ND <0.1

(1) Sample Orientation: H = horizontal; V = vertical (2) Total Porosity = no pore fluids in place; all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids (3) Water = 0.9989 g/cc, Hydrocarbon = 1.0700 g/cc; Vb = Bulk Volume, cc; Pv = Pore Volume, cc; ND = Not Detected

FREE PRODUCT MOBILITY: INITIAL AND RESIDUAL SATURATIONS

PROJECT NAME: NW Natural Gasco
PROJECT NO: 2708-10

METHODS:			API RP40	API RP40	API RP40	ASTM D425M, DEAN-STARK			
						PORE FLUID SATURATIONS, % Pv			
						Initial Fluid Saturations		After Centrifuge at 1000xG (2)	
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	BULK DENSITY, (g/cc)	GRAIN DENSITY, (g/cc)	TOTAL POROSITY, %Vb	WATER (Swi) SATURATION	NAPL (Soi) SATURATION	WATER (Srw) SATURATION	NAPL (Sor) SATURATION
MW-16-65	35.55	H	1.27	2.65	52.0	31.8	51.9	31.8	34.4
MW-16-65	40.10	H	1.53	2.66	42.4	64.0	23.0	42.3	17.3
MW-16-65	42.35	H	1.45	2.69	46.0	84.6	1.2	65.3	1.2

N/A = Not Analyzed. Vb = Bulk Volume, Pv = Pore Volume. (1) H = horizontal, V = vertical; (2) Samples centrifuged under water
Soi = Initial NAPL Saturation as received prior to centrifuging at 1000xG, Swi = Initial Water Saturation as received prior to centrifuging at 1000xG
Sor = Residual NAPL Saturation after centrifuging at 1000xG, Srw = Residual Water Saturation after centrifuging at 1000xG
Fluid Densities for pore fluid saturation calculations: Water =0.9989 g/cc, NAPL = 1.0700 g/cc.

PTS Laboratories

Hahn + Associates
PTS File No: 34452

AMOTT WETTABILITY DATA

PROJECT NAME: NW Natural Gasco
PROJECT NO: 2708-10

Sample ID	Depth, feet	Porosity, Total % Pore Volume	NAPL Displacing Water, ml		NAPL Wetting Index (1)	Water Displacing NAPL, ml		Water Wetting Index (2)	Wettability Index (3)
			Spontaneous Water Production	Total Water Production		Spontaneous NAPL Production	Total NAPL Production		
MW-16-65	35.55	46.9	0.01	2.50	0.00	0.01	2.10	0.00	0.00

(1) Amott Oil-Wetting Index = Spontaneous Water Displaced, ml / Total Water Displaced, ml
(2) Amott Water-Wetting Index = Spontaneous Oil Displaced, ml / Total Oil Displaced, ml
(3) Wettability Index, WI = Oil-Wetting Index - Water-Wetting Index
WI = 1 = Strongly Water Wet
WI = 0 = Netural
WI = -1 = Strongly Oil Wet

VISCOSITY, SPECIFIC GRAVITY and DENSITY DATA

(METHODOLOGY: - ASTM D445, API RP40)

PROJECT NAME: NW Natural Gasco
PROJECT NO: 2708-10

SAMPLE ID	MATRIX	TEMP., (°F)	SPECIFIC GRAVITY	DENSITY (g/cc)	VISCOSITY (centistokes)	VISCOSITY (centipoise)
MW-16-45-OIL	Water	70	1.001	0.9987	1.015	1.013
		100	1.002	0.9953	0.704	0.701
		130	1.007	0.9924	0.530	0.526
MW-16-45-OIL	DNAPL	70	1.084	1.081	105	114
		100	1.079	1.072	40.1	43.0
		130	1.080	1.065	18.7	20.0

INTERFACIAL / SURFACE TENSION DATA

(METHODOLOGY: DuNuoy Method - ASTM D971)

PROJECT NAME: NW Natural Gasco
PROJECT NO: 2708-10

PHASE PAIR		TEMP.,	INTERFACIAL TENSION,
SAMPLE ID / PHASE	SAMPLE ID / PHASE	(°F)	(Dynes/centimeter)
MW-16-45-OIL (Water)	Air	70	66.7
MW-16-45-OIL (DNAPL)	Air	70	34.9
MW-16-45-OIL (DNAPL)	MW-16-45-OIL (Water)	70	14.2

QUALITY CONTROL DATA

PHASE PAIR:	DIWATER / AIR
TEMPERATURE, °F:	70
IFT, MEASURED:	73.2
IFT, PUBLISHED:	72.6
RPD:	0.89

PTS Laboratories, Inc.

Hahn and Associates, Inc.
PTS File No: 34452

PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422/D4464M)

PROJECT NAME: NW Natural-Gasco
PROJECT NO: 2708-10

Sample ID	Depth, ft.	Mean Grain Size Description (1)	Median Grain Size mm	Particle Size Distribution, wt. percent						Silt & Clay
				Gravel	Sand Size			Silt	Clay	
					Coarse	Medium	Fine			
MW-16-65	27.50	Silt	0.027	0.00	0.00	0.00	27.81	49.70	22.49	72.19
MW-16-65	29.20	Silt	0.040	0.00	0.00	0.00	34.98	48.63	16.39	65.02
MW-16-65	31.50	Fine sand	0.198	0.00	0.00	1.66	74.97	16.97	6.41	23.37
MW-16-65	33.50	Fine sand	0.134	0.00	0.00	0.60	60.77	27.97	10.66	38.63
MW-16-65	35.70	Fine sand	0.199	0.00	0.00	1.63	73.22	17.85	7.30	25.15
MW-16-65	38.50	Fine sand	0.187	0.00	0.00	0.85	72.40	17.73	9.02	26.75
MW-16-65	40.40	Fine sand	0.145	0.00	0.00	0.18	63.46	24.31	12.05	36.36
MW-16-65	42.50	Fine sand	0.235	0.00	0.00	8.04	71.96	13.68	6.33	20.00
MW-16-65	44.80	Fine sand	0.175	0.00	0.00	0.08	78.02	14.99	6.90	21.90
MW-16-65	45.30	Fine sand	0.257	0.00	0.00	11.95	62.41	17.77	7.87	25.64
MW-16-65	60.70	Fine sand	0.183	0.00	0.00	2.64	72.80	17.30	7.26	24.56

(1) Based on Mean from Trask

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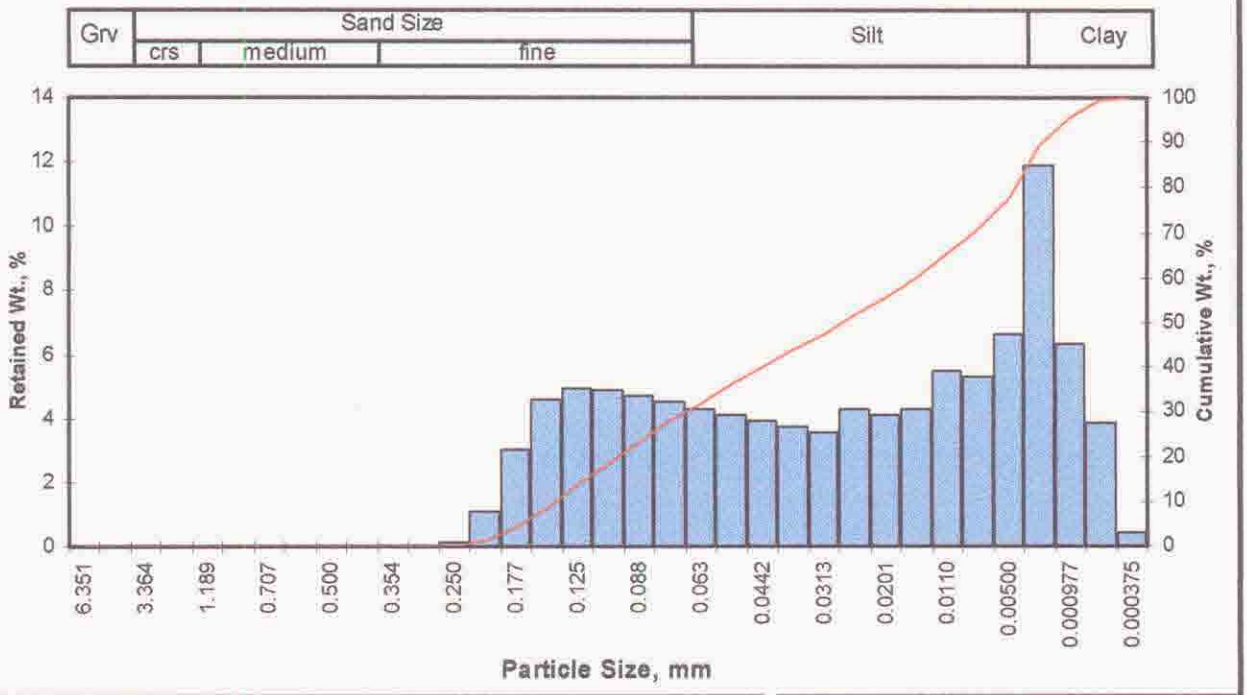
Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	27.50



Particle Size, mm

Opening		Phi of	U.S.	Sample	Increment	Cumulative
Inches	Millimeters	Screen	No.	Weight, grams	Weight, percent	Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.00	0.00	0.00
0.0098	0.250	2.00	60	0.13	0.13	0.13
0.0083	0.210	2.25	70	1.10	1.10	1.23
0.0070	0.177	2.50	80	3.00	3.00	4.23
0.0059	0.149	2.75	100	4.58	4.58	8.81
0.0049	0.125	3.00	120	4.95	4.95	13.75
0.0041	0.105	3.25	140	4.87	4.87	18.62
0.0035	0.088	3.50	170	4.69	4.69	23.31
0.0029	0.074	3.75	200	4.51	4.51	27.81
0.0025	0.063	4.00	230	4.29	4.29	32.10
0.0021	0.053	4.25	270	4.09	4.09	36.19
0.00174	0.0442	4.50	325	3.93	3.93	40.12
0.00146	0.0372	4.75	400	3.75	3.75	43.86
0.00123	0.0313	5.00	450	3.54	3.54	47.40
0.000986	0.0250	5.32	500	4.27	4.27	51.67
0.000790	0.0201	5.64	635	4.10	4.10	55.77
0.000615	0.0156	6.00		4.31	4.31	60.07
0.000435	0.0110	6.50		5.51	5.51	65.58
0.000308	0.00781	7.00		5.29	5.29	70.87
0.000197	0.00500	7.65		6.65	6.65	77.51
0.000077	0.00195	9.00		11.90	11.89	89.41
0.000038	0.000977	10.00		6.31	6.31	95.71
0.000019	0.000488	11.00		3.87	3.87	99.58
0.000015	0.000375	11.38		0.42	0.42	100.00
TOTALS				**100.10**	**100.00**	**100.00**

Cumulative Weight Percent greater than

Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	2.54	0.0068	0.172
10	2.81	0.0056	0.143
16	3.12	0.0045	0.115
25	3.59	0.0033	0.083
40	4.49	0.0017	0.044
50	5.19	0.0011	0.027
60	5.99	0.0006	0.016
75	7.40	0.0002	0.006
84	8.38	0.0001	0.003
90	9.09	0.0001	0.002
95	9.89	0.0000	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	5.19	5.19	5.19
Median, in.	0.0011	0.0011	0.0011
Median, mm	0.027	0.027	0.027
Mean, phi	4.49	5.75	5.56
Mean, in.	0.0017	0.0007	0.0008
Mean, mm	0.044	0.019	0.021
Sorting	3.741	2.634	2.430
Skewness	0.811	0.211	0.244
Kurtosis	0.273	0.394	0.791

Grain Size Description (ASTM-USCS Scale)	Silt (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	27.81
Silt	>0.005 mm	49.70
Clay	<0.005 mm	22.49
	Total	**100**

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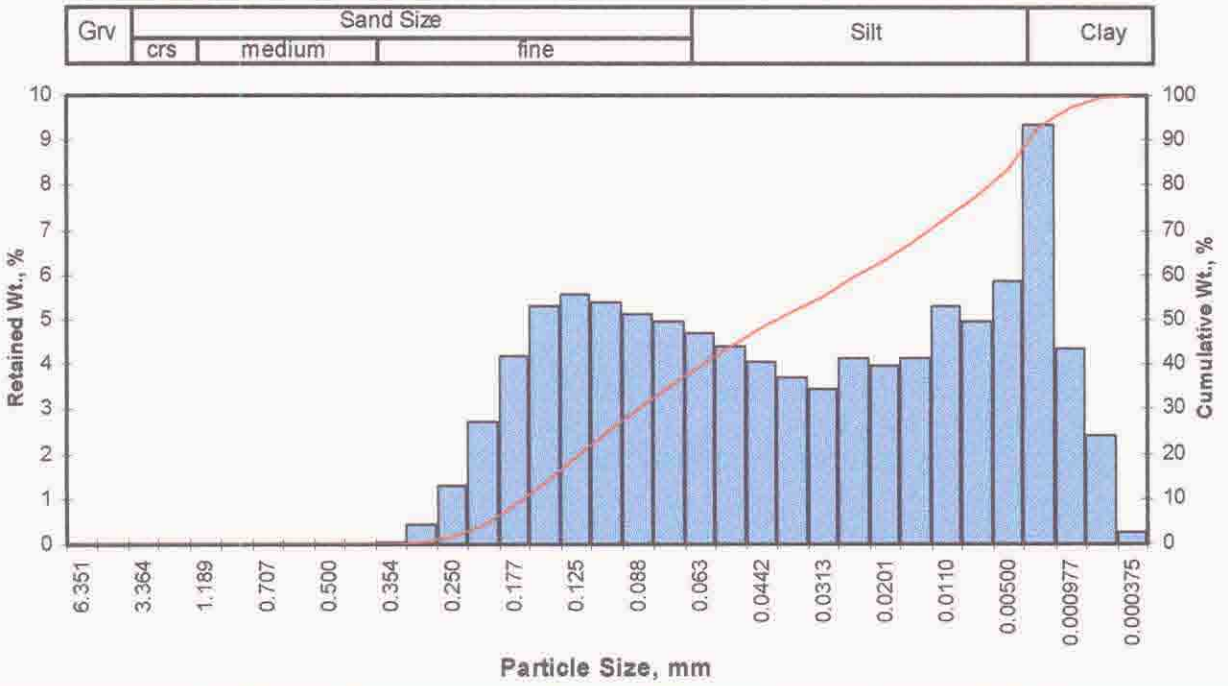
Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	29.20



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.03	0.03	0.03
0.0117	0.297	1.75	50	0.42	0.42	0.45
0.0098	0.250	2.00	60	1.31	1.31	1.76
0.0083	0.210	2.25	70	2.72	2.72	4.48
0.0070	0.177	2.50	80	4.18	4.18	8.66
0.0059	0.149	2.75	100	5.28	5.28	13.94
0.0049	0.125	3.00	120	5.54	5.54	19.48
0.0041	0.105	3.25	140	5.40	5.40	24.88
0.0035	0.088	3.50	170	5.15	5.15	30.03
0.0029	0.074	3.75	200	4.95	4.95	34.98
0.0025	0.063	4.00	230	4.70	4.70	39.68
0.0021	0.053	4.25	270	4.38	4.38	44.06
0.00174	0.0442	4.50	325	4.03	4.03	48.09
0.00146	0.0372	4.75	400	3.71	3.71	51.80
0.00123	0.0313	5.00	450	3.43	3.43	55.24
0.000986	0.0250	5.32	500	4.13	4.13	59.37
0.000790	0.0201	5.64	635	3.96	3.96	63.33
0.000615	0.0156	6.00		4.15	4.15	67.48
0.000435	0.0110	6.50		5.32	5.32	72.80
0.000308	0.00781	7.00		4.96	4.96	77.76
0.000197	0.00500	7.65		5.85	5.85	83.61
0.000077	0.00195	9.00		9.37	9.37	92.98
0.000038	0.000977	10.00		4.35	4.35	97.33
0.000019	0.000488	11.00		2.42	2.42	99.75
0.000015	0.000375	11.38		0.25	0.25	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	2.28	0.0081	0.206
10	2.56	0.0067	0.169
16	2.84	0.0055	0.139
25	3.26	0.0041	0.105
40	4.02	0.0024	0.062
50	4.63	0.0016	0.040
60	5.37	0.0010	0.024
75	6.72	0.0004	0.009
84	7.70	0.0002	0.005
90	8.57	0.0001	0.003
95	9.46	0.0001	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	4.63	4.63	4.63
Median, in.	0.0016	0.0016	0.0016
Median, mm	0.040	0.040	0.040
Mean, phi	4.13	5.27	5.06
Mean, in.	0.0022	0.0010	0.0012
Mean, mm	0.057	0.026	0.030
Sorting	3.325	2.429	2.303
Skewness	0.779	0.265	0.306
Kurtosis	0.286	0.478	0.849
Grain Size Description (ASTM-USCS Scale)		(based on Mean from Trask)	Silt

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	34.98
Silt	>0.005 mm	48.63
Clay	<0.005 mm	16.39
	Total	**100**

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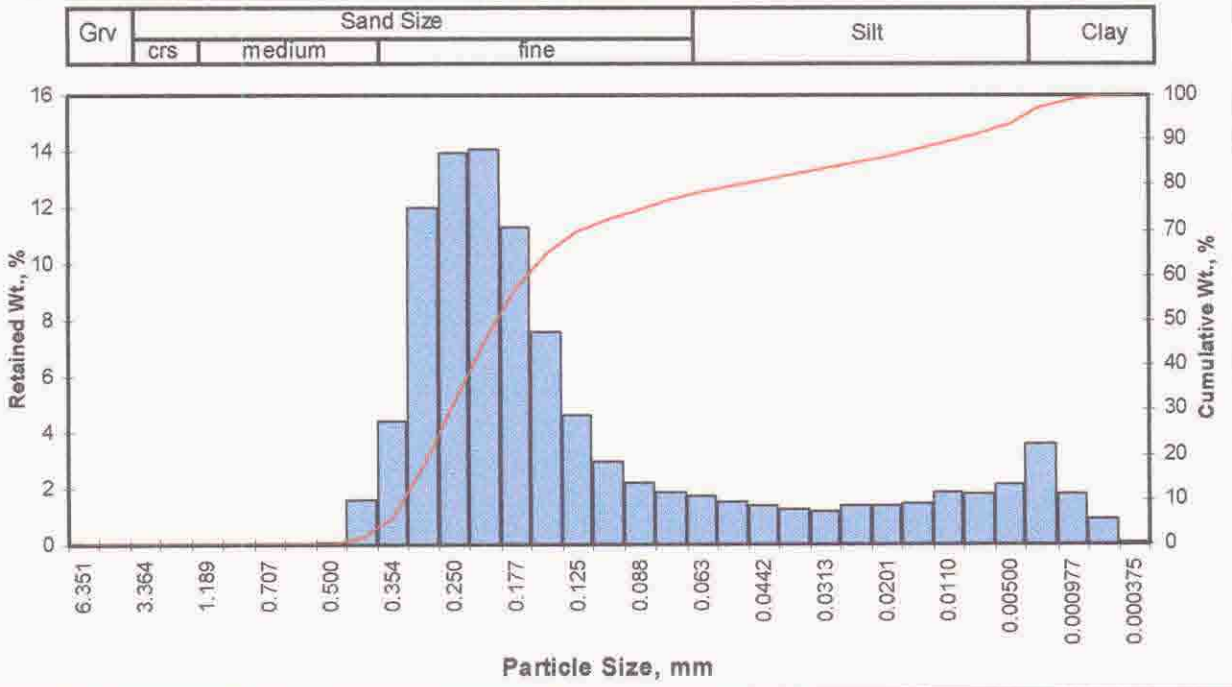
Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	31.50



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.09	0.09	0.09
0.0166	0.420	1.25	40	1.57	1.57	1.66
0.0139	0.354	1.50	45	4.43	4.43	6.09
0.0117	0.297	1.75	50	12.00	12.00	18.09
0.0098	0.250	2.00	60	13.90	13.90	31.98
0.0083	0.210	2.25	70	14.10	14.10	46.08
0.0070	0.177	2.50	80	11.30	11.30	57.38
0.0059	0.149	2.75	100	7.61	7.61	64.99
0.0049	0.125	3.00	120	4.63	4.63	69.62
0.0041	0.105	3.25	140	2.95	2.95	72.57
0.0035	0.088	3.50	170	2.18	2.18	74.75
0.0029	0.074	3.75	200	1.88	1.88	76.63
0.0025	0.063	4.00	230	1.70	1.70	78.33
0.0021	0.053	4.25	270	1.52	1.52	79.85
0.00174	0.0442	4.50	325	1.36	1.36	81.21
0.00146	0.0372	4.75	400	1.25	1.25	82.45
0.00123	0.0313	5.00	450	1.16	1.16	83.61
0.000986	0.0250	5.32	500	1.41	1.41	85.02
0.000790	0.0201	5.64	635	1.35	1.35	86.37
0.000615	0.0156	6.00		1.44	1.44	87.81
0.000435	0.0110	6.50		1.89	1.89	89.70
0.000308	0.00781	7.00		1.78	1.78	91.48
0.000197	0.00500	7.65		2.11	2.11	93.59
0.000077	0.00195	9.00		3.62	3.62	97.21
0.000038	0.000977	10.00		1.80	1.80	99.01
0.000019	0.000488	11.00		0.90	0.90	99.91
0.000015	0.000375	11.38		0.09	0.09	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	1.44	0.0145	0.369
10	1.58	0.0132	0.334
16	1.71	0.0121	0.306
25	1.87	0.0107	0.273
40	2.14	0.0089	0.227
50	2.34	0.0078	0.198
60	2.59	0.0066	0.167
75	3.53	0.0034	0.086
84	5.09	0.0012	0.029
90	6.58	0.0004	0.010
95	8.17	0.0001	0.003

Measure	Trask	Inman	Folk-Ward
Median, phi	2.34	2.34	2.34
Median, in.	0.0078	0.0078	0.0078
Median, mm	0.198	0.198	0.198
Mean, phi	2.48	3.40	3.04
Mean, in.	0.0071	0.0037	0.0048
Mean, mm	0.180	0.095	0.121
Sorting	1.777	1.690	1.865
Skewness	0.775	0.627	0.680
Kurtosis	0.288	0.991	1.663

Grain Size Description (ASTM-USCS Scale)	Fine sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	1.66
Fine Sand	200	74.97
Silt	>0.005 mm	16.97
Clay	<0.005 mm	6.41
	Total	**100**

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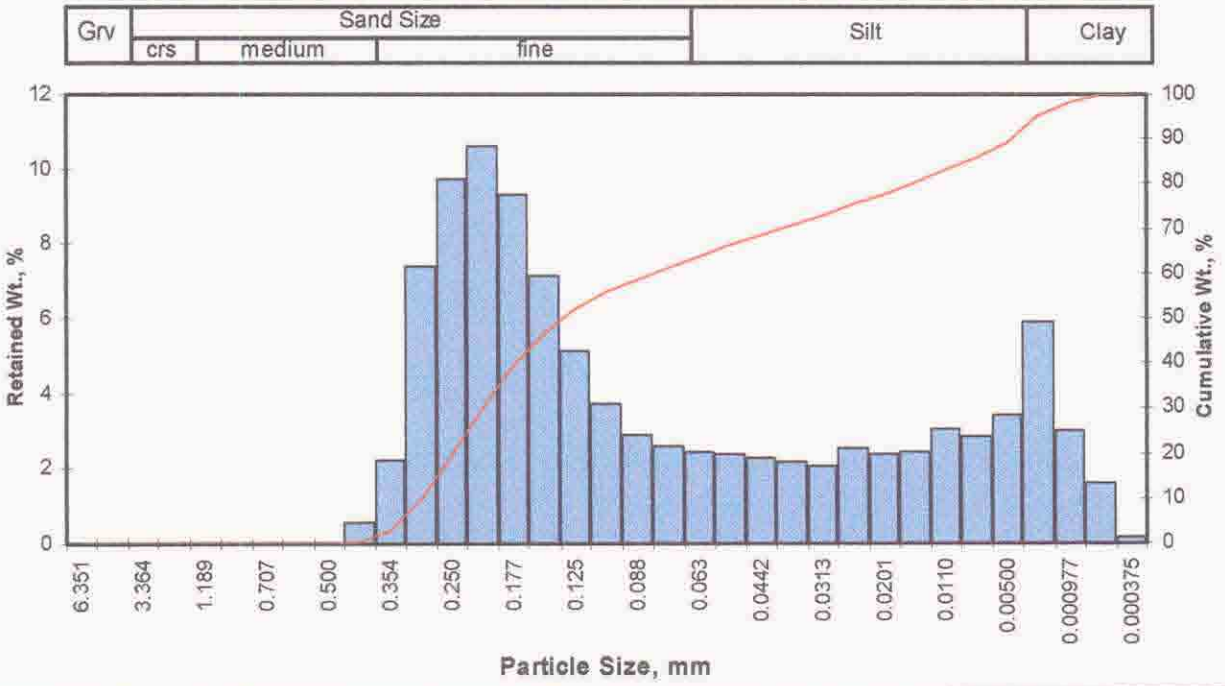
Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	33.50



Particle Size, mm

Opening		Phi of	U.S.	Sample	Increment	Cumulative
Inches	Millimeters	Screen	No.	Weight, grams	Weight, percent	Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.02	0.02	0.02
0.0166	0.420	1.25	40	0.58	0.58	0.60
0.0139	0.354	1.50	45	2.22	2.22	2.82
0.0117	0.297	1.75	50	7.42	7.42	10.24
0.0098	0.250	2.00	60	9.70	9.70	19.94
0.0083	0.210	2.25	70	10.60	10.60	30.54
0.0070	0.177	2.50	80	9.31	9.31	39.85
0.0059	0.149	2.75	100	7.16	7.16	47.01
0.0049	0.125	3.00	120	5.14	5.14	52.14
0.0041	0.105	3.25	140	3.74	3.74	55.88
0.0035	0.088	3.50	170	2.92	2.92	58.80
0.0029	0.074	3.75	200	2.57	2.57	61.37
0.0025	0.063	4.00	230	2.44	2.44	63.81
0.0021	0.053	4.25	270	2.37	2.37	66.18
0.00174	0.0442	4.50	325	2.28	2.28	68.46
0.00146	0.0372	4.75	400	2.17	2.17	70.63
0.00123	0.0313	5.00	450	2.07	2.07	72.70
0.000986	0.0250	5.32	500	2.52	2.52	75.22
0.000790	0.0201	5.64	635	2.38	2.38	77.60
0.000615	0.0156	6.00		2.43	2.43	80.03
0.000435	0.0110	6.50		3.07	3.07	83.10
0.000308	0.00781	7.00		2.84	2.84	85.94
0.000197	0.00500	7.65		3.40	3.40	89.34
0.000077	0.00195	9.00		5.88	5.88	95.22
0.000038	0.000977	10.00		3.02	3.02	98.24
0.000019	0.000488	11.00		1.60	1.60	99.84
0.000015	0.000375	11.38		0.16	0.16	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	1.57	0.0132	0.336
10	1.74	0.0118	0.299
16	1.90	0.0106	0.268
25	2.12	0.0091	0.230
40	2.51	0.0069	0.176
50	2.90	0.0053	0.134
60	3.62	0.0032	0.082
75	5.29	0.0010	0.026
84	6.66	0.0004	0.010
90	7.80	0.0002	0.004
95	8.95	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	2.90	2.90	2.90
Median, in.	0.0053	0.0053	0.0053
Median, mm	0.134	0.134	0.134
Mean, phi	2.97	4.28	3.82
Mean, in.	0.0050	0.0020	0.0028
Mean, mm	0.128	0.052	0.071
Sorting	3.003	2.380	2.307
Skewness	0.570	0.581	0.611
Kurtosis	0.347	0.550	0.953

Grain Size Description (ASTM-USCS Scale)	Fine sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.60
Fine Sand	200	60.77
Silt	>0.005 mm	27.97
Clay	<0.005 mm	10.66
	Total	**100**

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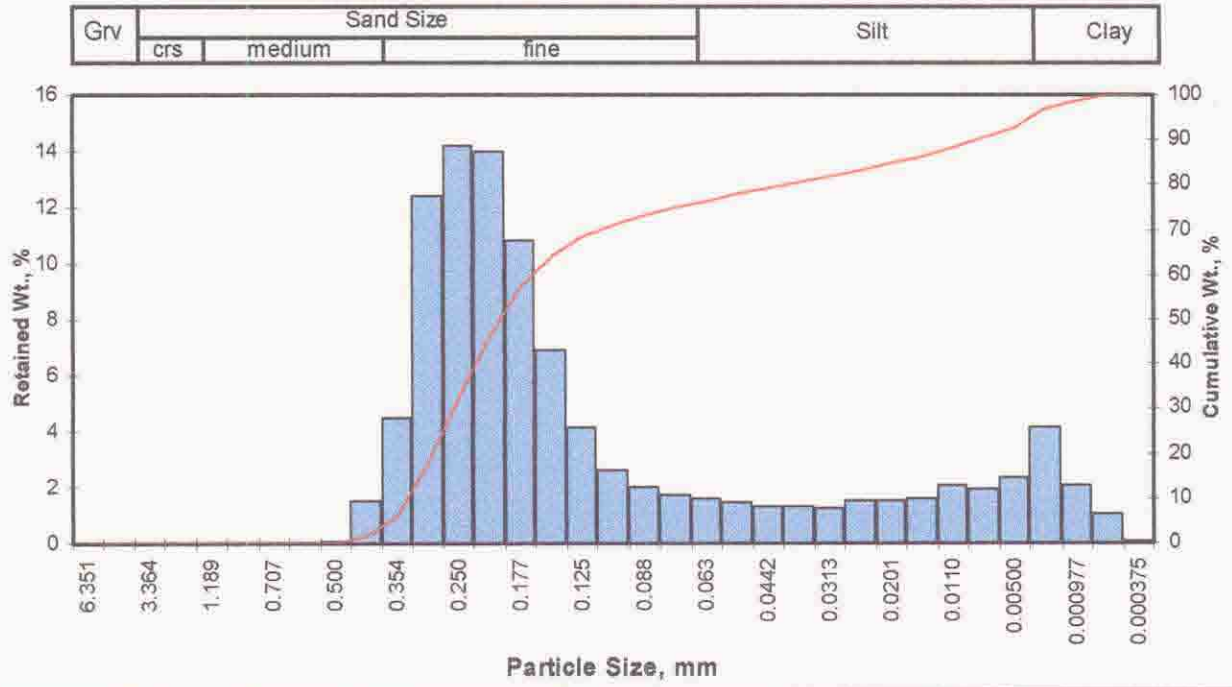
Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	35.70



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.08	0.08	0.08
0.0166	0.420	1.25	40	1.55	1.55	1.63
0.0139	0.354	1.50	45	4.50	4.50	6.13
0.0117	0.297	1.75	50	12.40	12.39	18.52
0.0098	0.250	2.00	60	14.20	14.19	32.72
0.0083	0.210	2.25	70	14.00	13.99	46.71
0.0070	0.177	2.50	80	10.80	10.79	57.50
0.0059	0.149	2.75	100	6.91	6.91	64.41
0.0049	0.125	3.00	120	4.11	4.11	68.52
0.0041	0.105	3.25	140	2.63	2.63	71.15
0.0035	0.088	3.50	170	1.98	1.98	73.12
0.0029	0.074	3.75	200	1.73	1.73	74.85
0.0025	0.063	4.00	230	1.58	1.58	76.43
0.0021	0.053	4.25	270	1.45	1.45	77.88
0.00174	0.0442	4.50	325	1.34	1.34	79.22
0.00146	0.0372	4.75	400	1.28	1.28	80.50
0.00123	0.0313	5.00	450	1.24	1.24	81.74
0.000986	0.0250	5.32	500	1.53	1.53	83.27
0.000790	0.0201	5.64	635	1.49	1.49	84.76
0.000615	0.0156	6.00		1.58	1.58	86.34
0.000435	0.0110	6.50		2.07	2.07	88.41
0.000308	0.00781	7.00		1.95	1.95	90.36
0.000197	0.00500	7.65		2.35	2.35	92.70
0.000077	0.00195	9.00		4.11	4.11	96.81
0.000038	0.000977	10.00		2.06	2.06	98.87
0.000019	0.000488	11.00		1.03	1.03	99.90
0.000015	0.000375	11.38		0.10	0.10	100.00
TOTALS				**100.10**	**100.00**	**100.00**

Cumulative Weight Percent greater than

Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	1.44	0.0145	0.369
10	1.58	0.0132	0.335
16	1.70	0.0121	0.308
25	1.86	0.0108	0.275
40	2.13	0.0090	0.228
50	2.33	0.0079	0.199
60	2.59	0.0065	0.166
75	3.77	0.0029	0.073
84	5.48	0.0009	0.022
90	6.91	0.0003	0.008
95	8.40	0.0001	0.003

Measure	Trask	Inman	Folk-Ward
Median, phi	2.33	2.33	2.33
Median, in.	0.0079	0.0079	0.0079
Median, mm	0.199	0.199	0.199
Mean, phi	2.52	3.59	3.17
Mean, in.	0.0068	0.0033	0.0044
Mean, mm	0.174	0.083	0.111
Sorting	1.938	1.889	2.000
Skewness	0.711	0.668	0.706
Kurtosis	0.309	0.844	1.495

Grain Size Description (ASTM-USCS Scale)	Fine sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	1.63
Fine Sand	200	73.22
Silt	>0.005 mm	17.85
Clay	<0.005 mm	7.30
	Total	**100**

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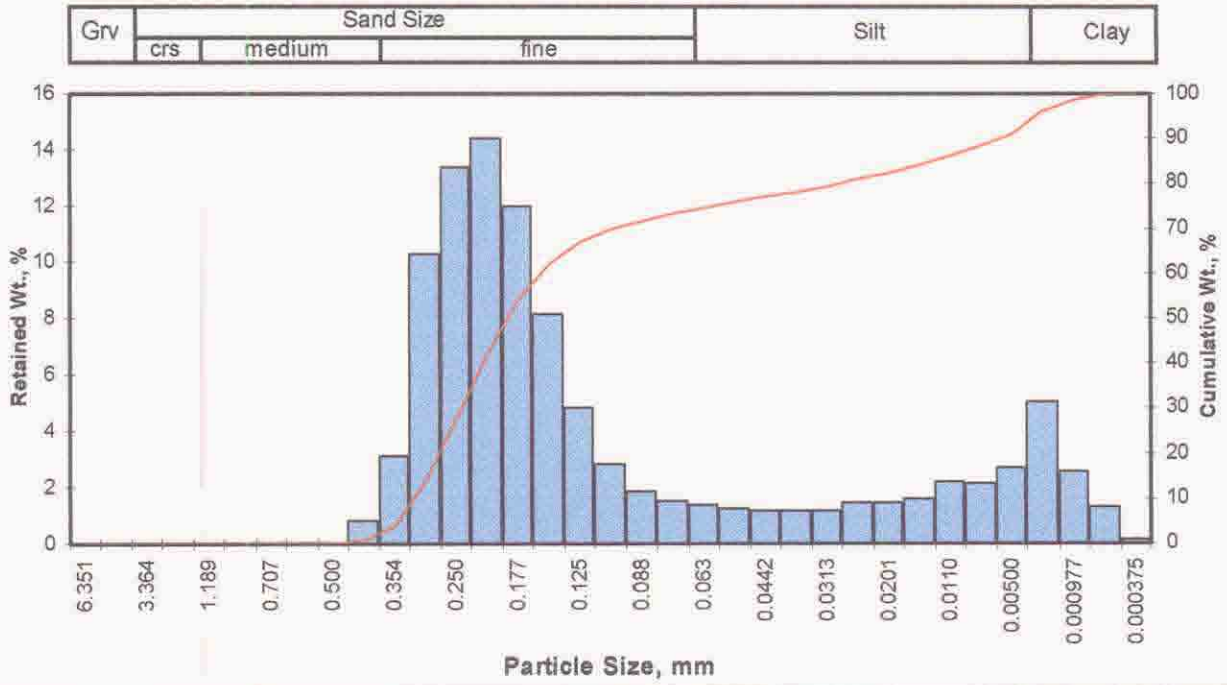
Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	38.50



Opening		Phi of	U.S.	Sample Weight,	Increment Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.03	0.03	0.03
0.0166	0.420	1.25	40	0.82	0.82	0.85
0.0139	0.354	1.50	45	3.10	3.10	3.95
0.0117	0.297	1.75	50	10.30	10.30	14.25
0.0098	0.250	2.00	60	13.40	13.40	27.66
0.0083	0.210	2.25	70	14.40	14.40	42.06
0.0070	0.177	2.50	80	12.00	12.00	54.07
0.0059	0.149	2.75	100	8.15	8.15	62.22
0.0049	0.125	3.00	120	4.80	4.80	67.02
0.0041	0.105	3.25	140	2.81	2.81	69.83
0.0035	0.088	3.50	170	1.88	1.88	71.71
0.0029	0.074	3.75	200	1.54	1.54	73.25
0.0025	0.063	4.00	230	1.37	1.37	74.62
0.0021	0.053	4.25	270	1.24	1.24	75.86
0.00174	0.0442	4.50	325	1.17	1.17	77.03
0.00146	0.0372	4.75	400	1.16	1.16	78.19
0.00123	0.0313	5.00	450	1.16	1.16	79.35
0.000986	0.0250	5.32	500	1.47	1.47	80.82
0.000790	0.0201	5.64	635	1.47	1.47	82.29
0.000615	0.0156	6.00		1.62	1.62	83.91
0.000435	0.0110	6.50		2.19	2.19	86.11
0.000308	0.00781	7.00		2.15	2.15	88.26
0.000197	0.00500	7.65		2.72	2.72	90.98
0.000077	0.00195	9.00		5.04	5.04	96.02
0.000038	0.000977	10.00		2.58	2.58	98.60
0.000019	0.000488	11.00		1.28	1.28	99.88
0.000015	0.000375	11.38		0.12	0.12	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	1.53	0.0137	0.347
10	1.65	0.0126	0.319
16	1.78	0.0114	0.291
25	1.95	0.0102	0.259
40	2.21	0.0085	0.216
50	2.42	0.0074	0.187
60	2.68	0.0061	0.156
75	4.08	0.0023	0.059
84	6.02	0.0006	0.015
90	7.41	0.0002	0.006
95	8.73	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	2.42	2.42	2.42
Median, in.	0.0074	0.0074	0.0074
Median, mm	0.187	0.187	0.187
Mean, phi	2.65	3.90	3.41
Mean, in.	0.0063	0.0026	0.0037
Mean, mm	0.159	0.067	0.094
Sorting	2.089	2.118	2.150
Skewness	0.661	0.701	0.727
Kurtosis	0.318	0.700	1.388
Grain Size Description (ASTM-USCS Scale)		(based on Mean from Trask)	Fine sand

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.85
Fine Sand	200	72.40
Silt	>0.005 mm	17.73
Clay	<0.005 mm	9.02
	Total	**100**

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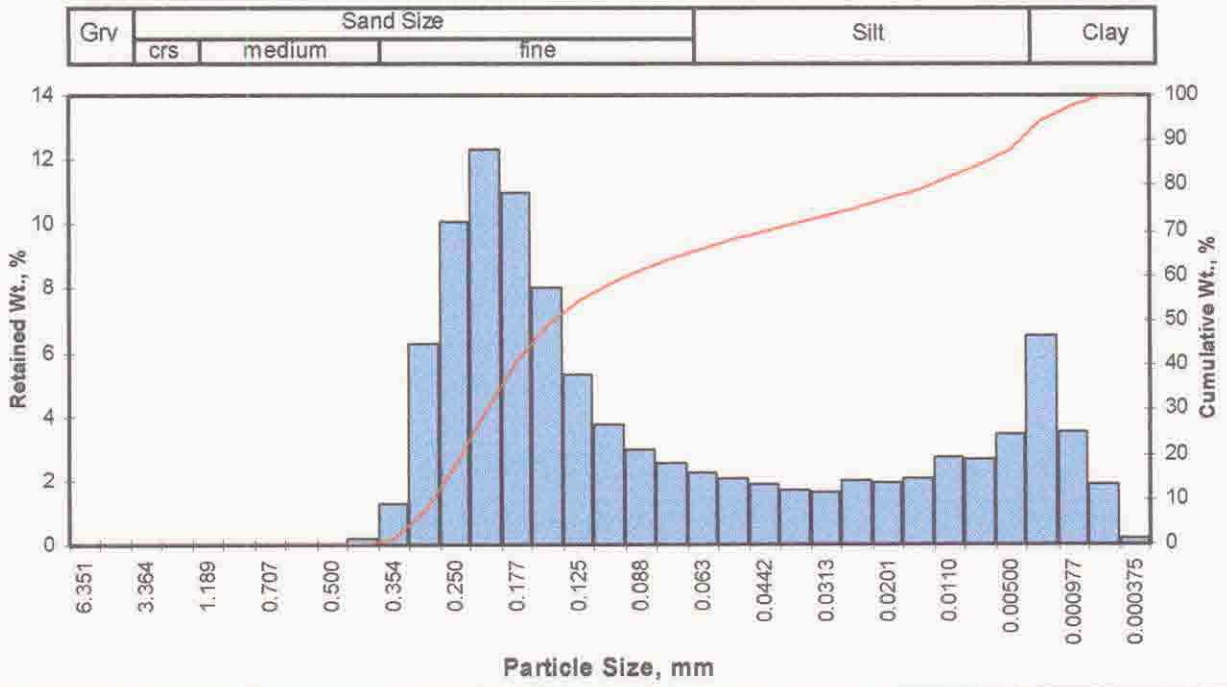
Particle Size Analysis - ASTM D4464M

Client: Hahn and Associates, Inc.
Project: NW Natural-Gasco
Project No: 2708-10

PTS File No: 34452
Sample ID: MW-16-65
Depth, ft: 40.40



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.18	0.18	0.18
0.0139	0.354	1.50	45	1.29	1.29	1.47
0.0117	0.297	1.75	50	6.26	6.26	7.73
0.0098	0.250	2.00	60	10.10	10.10	17.83
0.0083	0.210	2.25	70	12.30	12.30	30.13
0.0070	0.177	2.50	80	11.00	11.00	41.13
0.0059	0.149	2.75	100	8.01	8.01	49.14
0.0049	0.125	3.00	120	5.31	5.31	54.45
0.0041	0.105	3.25	140	3.73	3.73	58.17
0.0035	0.088	3.50	170	2.93	2.93	61.10
0.0029	0.074	3.75	200	2.54	2.54	63.64
0.0025	0.063	4.00	230	2.26	2.26	65.90
0.0021	0.053	4.25	270	2.03	2.03	67.93
0.00174	0.0442	4.50	325	1.85	1.85	69.78
0.00146	0.0372	4.75	400	1.72	1.72	71.50
0.00123	0.0313	5.00	450	1.61	1.61	73.11
0.000986	0.0250	5.32	500	1.97	1.97	75.08
0.000790	0.0201	5.64	635	1.94	1.94	77.02
0.000615	0.0156	6.00		2.07	2.07	79.09
0.000435	0.0110	6.50		2.71	2.71	81.80
0.000308	0.00781	7.00		2.68	2.68	84.48
0.000197	0.00500	7.65		3.47	3.47	87.95
0.000077	0.00195	9.00		6.54	6.54	94.49
0.000038	0.000977	10.00		3.48	3.48	97.97
0.000019	0.000488	11.00		1.85	1.85	99.82
0.000015	0.000375	11.38		0.18	0.18	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than

Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	1.64	0.0126	0.321
10	1.81	0.0113	0.286
16	1.95	0.0102	0.258
25	2.15	0.0089	0.226
40	2.47	0.0071	0.180
50	2.79	0.0057	0.145
60	3.41	0.0037	0.094
75	5.31	0.0010	0.025
84	6.91	0.0003	0.008
90	8.07	0.0001	0.004
95	9.15	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	2.79	2.79	2.79
Median, in.	0.0057	0.0057	0.0057
Median, mm	0.145	0.145	0.145
Mean, phi	2.99	4.43	3.89
Mean, in.	0.0049	0.0018	0.0027
Mean, mm	0.126	0.046	0.068
Sorting	2.991	2.478	2.376
Skewness	0.523	0.663	0.678
Kurtosis	0.356	0.515	0.973

Grain Size Description (ASTM-USCS Scale): Fine sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.18
Fine Sand	200	63.46
Silt	>0.005 mm	24.31
Clay	<0.005 mm	12.05
	Total	**100**

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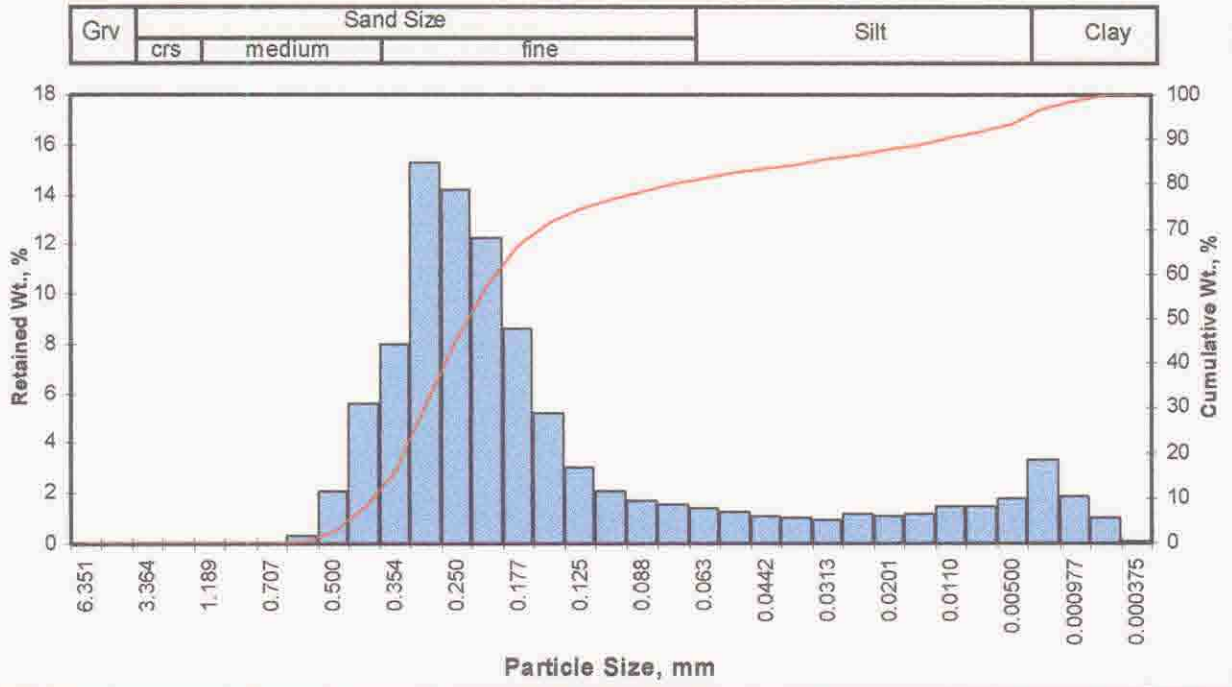
Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	42.50



Opening		Phi of	U.S.	Sample	Increment	Cumulative
Inches	Millimeters	Screen	No.	Weight, grams	Weight, percent	Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.02	0.02	0.02
0.0234	0.595	0.75	30	0.34	0.34	0.36
0.0197	0.500	1.00	35	2.07	2.07	2.43
0.0166	0.420	1.25	40	5.61	5.61	8.04
0.0139	0.354	1.50	45	8.02	8.02	16.05
0.0117	0.297	1.75	50	15.30	15.30	31.35
0.0098	0.250	2.00	60	14.20	14.20	45.55
0.0083	0.210	2.25	70	12.30	12.30	57.84
0.0070	0.177	2.50	80	8.64	8.64	66.48
0.0059	0.149	2.75	100	5.20	5.20	71.68
0.0049	0.125	3.00	120	3.06	3.06	74.74
0.0041	0.105	3.25	140	2.06	2.06	76.80
0.0035	0.088	3.50	170	1.68	1.68	78.48
0.0029	0.074	3.75	200	1.52	1.52	80.00
0.0025	0.063	4.00	230	1.37	1.37	81.37
0.0021	0.053	4.25	270	1.21	1.21	82.58
0.00174	0.0442	4.50	325	1.07	1.07	83.65
0.00146	0.0372	4.75	400	0.99	0.99	84.64
0.00123	0.0313	5.00	450	0.93	0.93	85.57
0.000986	0.0250	5.32	500	1.13	1.13	86.70
0.000790	0.0201	5.64	635	1.08	1.08	87.78
0.000615	0.0156	6.00		1.14	1.14	88.92
0.000435	0.0110	6.50		1.51	1.51	90.43
0.000308	0.00781	7.00		1.45	1.45	91.88
0.000197	0.00500	7.65		1.80	1.80	93.67
0.000077	0.00195	9.00		3.37	3.37	97.04
0.000038	0.000977	10.00		1.87	1.87	98.91
0.000019	0.000488	11.00		0.99	0.99	99.90
0.000015	0.000375	11.38		0.10	0.10	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Millimeters
5	1.11	0.0182	0.462
10	1.31	0.0159	0.403
16	1.50	0.0139	0.354
25	1.65	0.0126	0.319
40	1.90	0.0105	0.268
50	2.09	0.0092	0.235
60	2.31	0.0079	0.201
75	3.03	0.0048	0.122
84	4.59	0.0016	0.042
90	6.36	0.0005	0.012
95	8.18	0.0001	0.003

Measure	Trask	Inman	Folk-Ward
Median, phi	2.09	2.09	2.09
Median, in.	0.0092	0.0092	0.0092
Median, mm	0.235	0.235	0.235
Mean, phi	2.18	3.04	2.73
Mean, in.	0.0087	0.0048	0.0060
Mean, mm	0.221	0.121	0.151
Sorting	1.616	1.545	1.843
Skewness	0.842	0.617	0.670
Kurtosis	0.252	1.285	2.089
Grain Size Description (ASTM-USCS Scale)			Fine sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	8.04
Fine Sand	200	71.96
Silt	>0.005 mm	13.68
Clay	<0.005 mm	6.33
	Total	**100**

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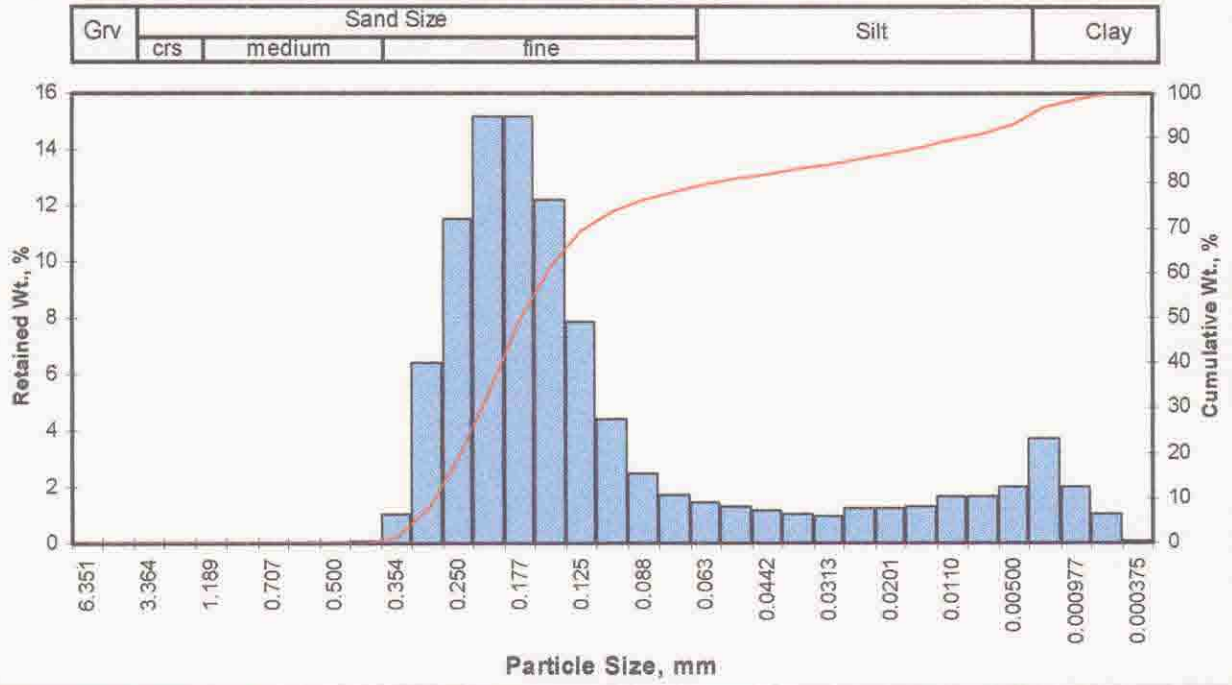
Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	44.80



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.08	0.08	0.08
0.0139	0.354	1.50	45	1.05	1.05	1.13
0.0117	0.297	1.75	50	6.45	6.44	7.57
0.0098	0.250	2.00	60	11.50	11.49	19.06
0.0083	0.210	2.25	70	15.20	15.18	34.24
0.0070	0.177	2.50	80	15.20	15.18	49.43
0.0059	0.149	2.75	100	12.20	12.19	61.61
0.0049	0.125	3.00	120	7.88	7.87	69.48
0.0041	0.105	3.25	140	4.43	4.43	73.91
0.0035	0.088	3.50	170	2.48	2.48	76.39
0.0029	0.074	3.75	200	1.72	1.72	78.10
0.0025	0.063	4.00	230	1.47	1.47	79.57
0.0021	0.053	4.25	270	1.31	1.31	80.88
0.00174	0.0442	4.50	325	1.14	1.14	82.02
0.00146	0.0372	4.75	400	1.03	1.03	83.05
0.00123	0.0313	5.00	450	0.99	0.99	84.04
0.000986	0.0250	5.32	500	1.24	1.24	85.28
0.000790	0.0201	5.64	635	1.21	1.21	86.49
0.000615	0.0156	6.00		1.28	1.28	87.76
0.000435	0.0110	6.50		1.69	1.69	89.45
0.000308	0.00781	7.00		1.63	1.63	91.08
0.000197	0.00500	7.65		2.02	2.02	93.10
0.000077	0.00195	9.00		3.74	3.74	96.83
0.000038	0.000977	10.00		2.02	2.02	98.85
0.000019	0.000488	11.00		1.05	1.05	99.90
0.000015	0.000375	11.38		0.10	0.10	100.00
TOTALS				**100.10**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	1.65	0.0125	0.319
10	1.80	0.0113	0.287
16	1.93	0.0103	0.262
25	2.10	0.0092	0.234
40	2.34	0.0078	0.197
50	2.51	0.0069	0.175
60	2.72	0.0060	0.152
75	3.36	0.0038	0.097
84	4.99	0.0012	0.031
90	6.67	0.0004	0.010
95	8.33	0.0001	0.003

Measure	Trask	Inman	Folk-Ward
Median, phi	2.51	2.51	2.51
Median, in.	0.0069	0.0069	0.0069
Median, mm	0.175	0.175	0.175
Mean, phi	2.60	3.46	3.15
Mean, in.	0.0065	0.0036	0.0045
Mean, mm	0.166	0.091	0.113
Sorting	1.549	1.529	1.777
Skewness	0.860	0.622	0.682
Kurtosis	0.246	1.187	2.170
Grain Size Description (ASTM-USCS Scale)			Fine sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.08
Fine Sand	200	78.02
Silt	>0.005 mm	14.99
Clay	<0.005 mm	6.90
	Total	**100**

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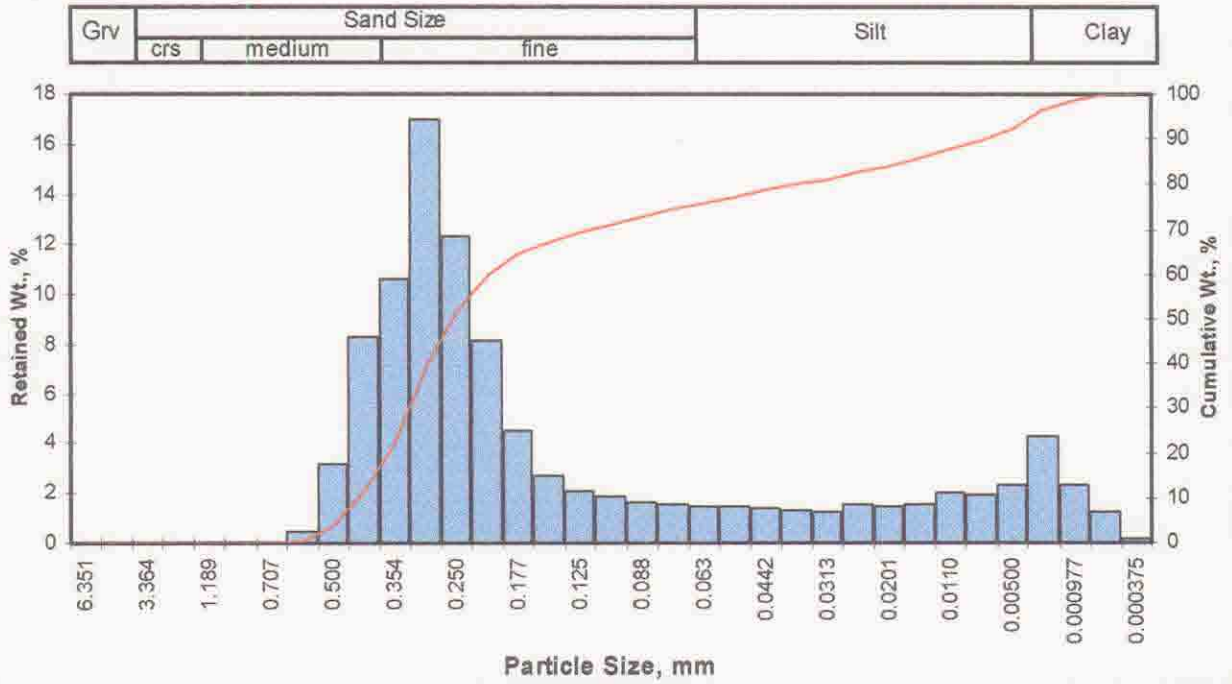
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	45.30



Opening (Inches)	Opening (Millimeters)	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.02	0.01	0.01
0.0234	0.595	0.75	30	0.45	0.45	0.46
0.0197	0.500	1.00	35	3.22	3.22	3.68
0.0166	0.420	1.25	40	8.27	8.27	11.95
0.0139	0.354	1.50	45	10.60	10.60	22.55
0.0117	0.297	1.75	50	17.00	17.00	39.55
0.0098	0.250	2.00	60	12.30	12.30	51.85
0.0083	0.210	2.25	70	8.13	8.13	59.98
0.0070	0.177	2.50	80	4.51	4.51	64.49
0.0059	0.149	2.75	100	2.72	2.72	67.20
0.0049	0.125	3.00	120	2.10	2.10	69.30
0.0041	0.105	3.25	140	1.84	1.84	71.14
0.0035	0.088	3.50	170	1.66	1.66	72.80
0.0029	0.074	3.75	200	1.56	1.56	74.36
0.0025	0.063	4.00	230	1.50	1.50	75.86
0.0021	0.053	4.25	270	1.45	1.45	77.31
0.00174	0.0442	4.50	325	1.37	1.37	78.68
0.00146	0.0372	4.75	400	1.29	1.29	79.97
0.00123	0.0313	5.00	450	1.24	1.24	81.21
0.000986	0.0250	5.32	500	1.54	1.54	82.75
0.000790	0.0201	5.64	635	1.49	1.49	84.24
0.000615	0.0156	6.00		1.57	1.57	85.81
0.000435	0.0110	6.50		2.04	2.04	87.85
0.000308	0.00781	7.00		1.93	1.93	89.78
0.000197	0.00500	7.65		2.35	2.35	92.13
0.000077	0.00195	9.00		4.23	4.23	96.36
0.000038	0.000977	10.00		2.30	2.30	98.66
0.000019	0.000488	11.00		1.22	1.22	99.88
0.000015	0.000375	11.38		0.12	0.12	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	1.04	0.0191	0.486
10	1.19	0.0172	0.438
16	1.35	0.0155	0.394
25	1.54	0.0136	0.345
40	1.76	0.0116	0.295
50	1.96	0.0101	0.257
60	2.25	0.0083	0.210
75	3.86	0.0027	0.069
84	5.59	0.0008	0.021
90	7.06	0.0003	0.007
95	8.56	0.0001	0.003

Measure	Trask	Inman	Folk-Ward
Median, phi	1.96	1.96	1.96
Median, in.	0.0101	0.0101	0.0101
Median, mm	0.257	0.257	0.257
Mean, phi	2.27	3.47	2.97
Mean, in.	0.0081	0.0036	0.0050
Mean, mm	0.207	0.090	0.128
Sorting	2.235	2.121	2.201
Skewness	0.601	0.709	0.732
Kurtosis	0.320	0.774	1.329
Grain Size Description (ASTM-USCS Scale)		(based on Mean from Trask)	Fine sand

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	11.95
Fine Sand	200	62.41
Silt	>0.005 mm	17.77
Clay	<0.005 mm	7.87
	Total	**100**

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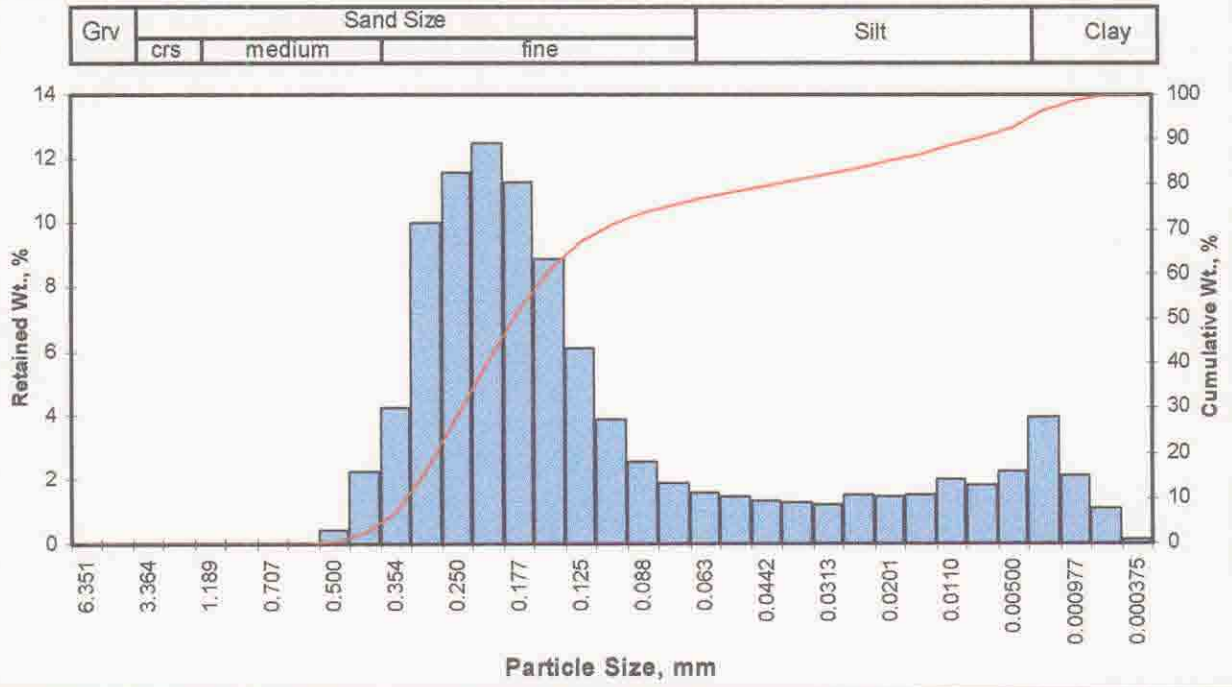
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Hahn and Associates, Inc.	**PTS File No:**	34452
Project:	NW Natural-Gasco	**Sample ID:**	MW-16-65
Project No:	2708-10	**Depth, ft:**	60.70



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.01	0.01	0.01
0.0197	0.500	1.00	35	0.42	0.42	0.43
0.0166	0.420	1.25	40	2.21	2.21	2.64
0.0139	0.354	1.50	45	4.21	4.21	6.85
0.0117	0.297	1.75	50	10.00	10.00	16.85
0.0098	0.250	2.00	60	11.60	11.60	28.45
0.0083	0.210	2.25	70	12.50	12.50	40.95
0.0070	0.177	2.50	80	11.30	11.30	52.25
0.0059	0.149	2.75	100	8.86	8.86	61.11
0.0049	0.125	3.00	120	6.07	6.07	67.17
0.0041	0.105	3.25	140	3.89	3.89	71.06
0.0035	0.088	3.50	170	2.52	2.52	73.58
0.0029	0.074	3.75	200	1.86	1.86	75.44
0.0025	0.063	4.00	230	1.58	1.58	77.02
0.0021	0.053	4.25	270	1.44	1.44	78.46
0.00174	0.0442	4.50	325	1.33	1.33	79.79
0.00146	0.0372	4.75	400	1.25	1.25	81.04
0.00123	0.0313	5.00	450	1.21	1.21	82.25
0.000986	0.0250	5.32	500	1.50	1.50	83.75
0.000790	0.0201	5.64	635	1.45	1.45	85.20
0.000615	0.0156	6.00		1.52	1.52	86.72
0.000435	0.0110	6.50		1.97	1.97	88.69
0.000308	0.00781	7.00		1.84	1.84	90.53
0.000197	0.00500	7.65		2.21	2.21	92.74
0.000077	0.00195	9.00		3.93	3.93	96.67
0.000038	0.000977	10.00		2.11	2.11	98.78
0.000019	0.000488	11.00		1.11	1.11	99.89
0.000015	0.000375	11.38		0.11	0.11	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	1.39	0.0150	0.382
10	1.58	0.0132	0.335
16	1.73	0.0119	0.302
25	1.93	0.0104	0.263
40	2.23	0.0084	0.213
50	2.45	0.0072	0.183
60	2.72	0.0060	0.152
75	3.69	0.0030	0.077
84	5.37	0.0009	0.024
90	6.86	0.0003	0.009
95	8.42	0.0001	0.003

Measure	Trask	Inman	Folk-Ward
Median, phi	2.45	2.45	2.45
Median, in.	0.0072	0.0072	0.0072
Median, mm	0.183	0.183	0.183
Mean, phi	2.55	3.55	3.18
Mean, in.	0.0067	0.0034	0.0043
Mean, mm	0.170	0.085	0.110
Sorting	1.843	1.823	1.977
Skewness	0.780	0.604	0.651
Kurtosis	0.285	0.929	1.634
Grain Size Description (ASTM-USCS Scale)			Fine sand (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	2.64
Fine Sand	200	72.80
Silt	>0.005 mm	17.30
Clay	<0.005 mm	7.26
	Total	**100**

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DATE **PTS FILE#** 34452 **CHAIN OF CUSTODY RECORD** **PAGE** 1 **OF** 3

COMPANY: HAN AND ASSOCIATES, INC.

ADDRESS: 111 NW 6th Avenue #203 CITY: Portland ZIP CODE: 97209

PROJECT MANAGER: Rob Ede

PROJECT NAME: Natural-Gasco PHONE NUMBER: 503-796-0717

PROJECT NUMBER: 2708-10 FAX NUMBER:

SITE LOCATION: Gasco Facility 7900 NW St. Helens Rd

SAMPLER SIGNATURE:

PO# 2708-10

SPECIAL HANDLING
24 HOURS 5 DAYS
72 HOURS NORMAL
OTHER

SAMPLE CONDITIONS
RECEIVED ON ICE YES/NO
SEALED YES/NO
OTHER YES/NO

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT
A/L 16-65	7/19/04	955	26-27
		955	27-28
		955	28-28.5
		955	28.5-29.5
		955	29.5-30.5
	✓	955	30.5-31
	✓	1020	31-32
	✓	1020	32-32.3
	✓	1020	32.3-33.3
	✓	1020	33.3-33.5
	✓	1020	33.5-34.5

PHYSICAL PROPERTIES PACKAGE, API RP40
MOISTURE CONTENT, ASTM D2216
POROSITY: TOTAL, API RP40
GRAIN DENSITY, API RP40
BULK DENSITY (DRY), API RP40
AIR PERMEABILITY, API RP40
SPECIFIC RETENTION/YIELD ASTM D425
CAPILLARY PRESSURE, ASTM D425M
SOIL pH, EPA 9045
POROSITY: EFFECTIVE, ASTM D425M
TCEQ/TNRCC PROPERTIES PACKAGE
GRAIN SIZE DISTRIBUTION, ASTM D422/4464M
HYDRAULIC CONDUCTIVITY, EPA 9100, API RP40
TOC: WALKLEY-BLACK
HYDRAULIC CONDUCTIVITY PACKAGE
ATTERBERG LIMITS, ASTM D4318
DIGITAL CORE PHOTO w/ UV
NUMBER OF SAMPLES

COMMENTS
*6" DIAM. CORE IN LEXAN, cut into 5x1.5.
*continuously frozen with dry ice.

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
	T. Allison		
COMPANY	COMPANY PTS	COMPANY	COMPANY
DATE TIME	DATE 7/23/04 TIME 10:00 AM	DATE TIME	DATE TIME

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DATE **PTS FILE#** 34452 **CHAIN OF CUSTODY RECORD** **PAGE** 2 OF 3

COMPANY: [illegible] AND ASSOCIATES, INC

ADDRESS | CITY | ZIP CODE

PROJECT MANAGER

PROJECT NAME | PHONE NUMBER

PROJECT NUMBER | FAX NUMBER

SITE LOCATION

SAMPLER SIGNATURE

PO# 2708-10

SPECIAL HANDLING

24 HOURS 5 DAYS
72 HOURS NORMAL
OTHER

SAMPLE CONDITIONS

RECEIVED ON ICE YES/NO
SEALED YES/NO
OTHER YES/NO

COMMENTS

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT
[illegible]-16-65	7/19/01	1020	34.5-35.5
		1020	35.5-36
		1055	36-37
		1055	37-38
		1055	38-39
		1055	39-40
		1055	40-41
		1125	41-42
		1125	42-43
		1125	43-44
		1125	44-45

PHYSICAL PROPERTIES PACKAGE, API RP40
MOISTURE CONTENT, ASTM D2216
POROSITY: TOTAL, API RP40
GRAIN DENSITY, API RP40
BULK DENSITY (DRY), API RP40
AIR PERMEABILITY, API RP40
SPECIFIC RETENTION/YIELD ASTM D425
CAPILLARY PRESSURE, ASTM D425M
SOIL pH, EPA 9045
POROSITY: EFFECTIVE, ASTM D425M
TCEQ/TNRCC PROPERTIES PACKAGE
GRAIN SIZE DISTRIBUTION, ASTM D422/4464M
HYDRAULIC CONDUCTIVITY, EPA 9100, API RP40
TOC: WALKLEY-BLACK
HYDRAULIC CONDUCTIVITY PACKAGE
ATTERBERG LIMITS, ASTM D4318
DIGITAL COLOR PHOTO wet/UV
NUMBER OF SAMPLES

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
[illegible] B. [illegible]	[illegible]		
COMPANY	COMPANY PTS [illegible]	COMPANY	COMPANY
DATE TIME	DATE 7/25/01 TIME 10 [illegible]	DATE TIME	DATE TIME

DATE **PTS FILE# 34452 CHAIN OF CUSTODY RECORD** PAGE 3 OF 3

COMPANY: HAHN AND ASSOCIATES, INC.

ADDRESS | CITY | ZIP CODE

PROJECT MANAGER

PROJECT NAME | PHONE NUMBER

PROJECT NUMBER | FAX NUMBER

SITE LOCATION

SAMPLER SIGNATURE

ANALYSIS REQUEST

PO# 2708-16

SPECIAL HANDLING

24 HOURS 5 DAYS
72 HOURS NORMAL
OTHER

SAMPLE CONDITIONS

RECEIVED ON ICE YES/NO
SEALED YES/NO
OTHER YES/NO

COMMENTS

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT
MW-16-65	7/19/04	1125	45-46
↓	↓	1500	60-61

PHYSICAL PROPERTIES PACKAGE, API RP40 | MOISTURE CONTENT, ASTM D2216 | POROSITY: TOTAL, API RP40 | GRAIN DENSITY, API RP40 | BULK DENSITY (DRY), API RP40 | AIR PERMEABILITY, API RP40 | SPECIFIC RETENTION/YIELD ASTM D425 | CAPILLARY PRESSURE, ASTM D425M | SOIL pH, EPA 9045 | POROSITY: EFFECTIVE, ASTM D425M | TCEQ/TNRCC PROPERTIES PACKAGE | GRAIN SIZE DISTRIBUTION, ASTM D422/4464M | HYDRAULIC CONDUCTIVITY, EPA 9100, API RP40 | TOC: WALKLEY-BLACK | HYDRAULIC CONDUCTIVITY PACKAGE | ATTERBERG LIMITS, ASTM D4318 | DIGITAL CAP PHOTO WHITE / CW | NUMBER OF SAMPLES

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
COMPANY	COMPANY	COMPANY	COMPANY
DATE TIME	DATE 7/20/04 TIME 1020AM	DATE TIME	DATE TIME

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APPENDIX J

Chain-of-Custody Documentation and Laboratory Analytical Reports:
NAPL Characterization, Well MW-16-45

HAHN AND ASSOCIATES, INC.
Environmental Consultants
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: North Creek Analytical Beaverton Oregon
Lab Project No.:

CHAIN OF CUSTODY
Chain of Custody No.: PHD524

Project Manager: ROB EDE
Project No.: 2708-10
Project Name: Gasco RI
Collected by: Matt Graves

Liquid with Sediment Sample
___ Test Filtrate ___ Test Sediment ___ Test Both
Multi-Phase Sample
X Test One (which) OIL PHASE ___ Test Separately ___ Shake

Samples Received at 4C (Y or N):
Appropriate Containers Used (Y or N):
Provide Verbal Results (Y or N): No
Provide Preliminary Fax Results: Yes

Comments

Sample Number Prefix: 2708-041011-

NCA PM: Philip Ni

PLEASE ANALYZE OIL PHASE ONLY.

* include carbazole on SVOC list

** May Need Follow-up for PAHs by 8270SIM, depending on detections/reporting limits

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Water	Other	Number of Containers	VOCs (EPA 8260B)	SVOCs (EPA 8270)* **	Flashpoint	Hydrocarbon Fuel Fingerprint (EPA 8015M)	pH	RUSH	Remarks
	MW16-45-Oil	10/4/04	1625	NAPL-MW16-45			X		X	X	X	X	X		

Relinquished by	Company	Date	Time	Received by	Company
[illegible]	HAI	10/13/04	15:55	[illegible]	NCA
[illegible]	NCA	10/13/04	16:42	[illegible]	NCA

10.0

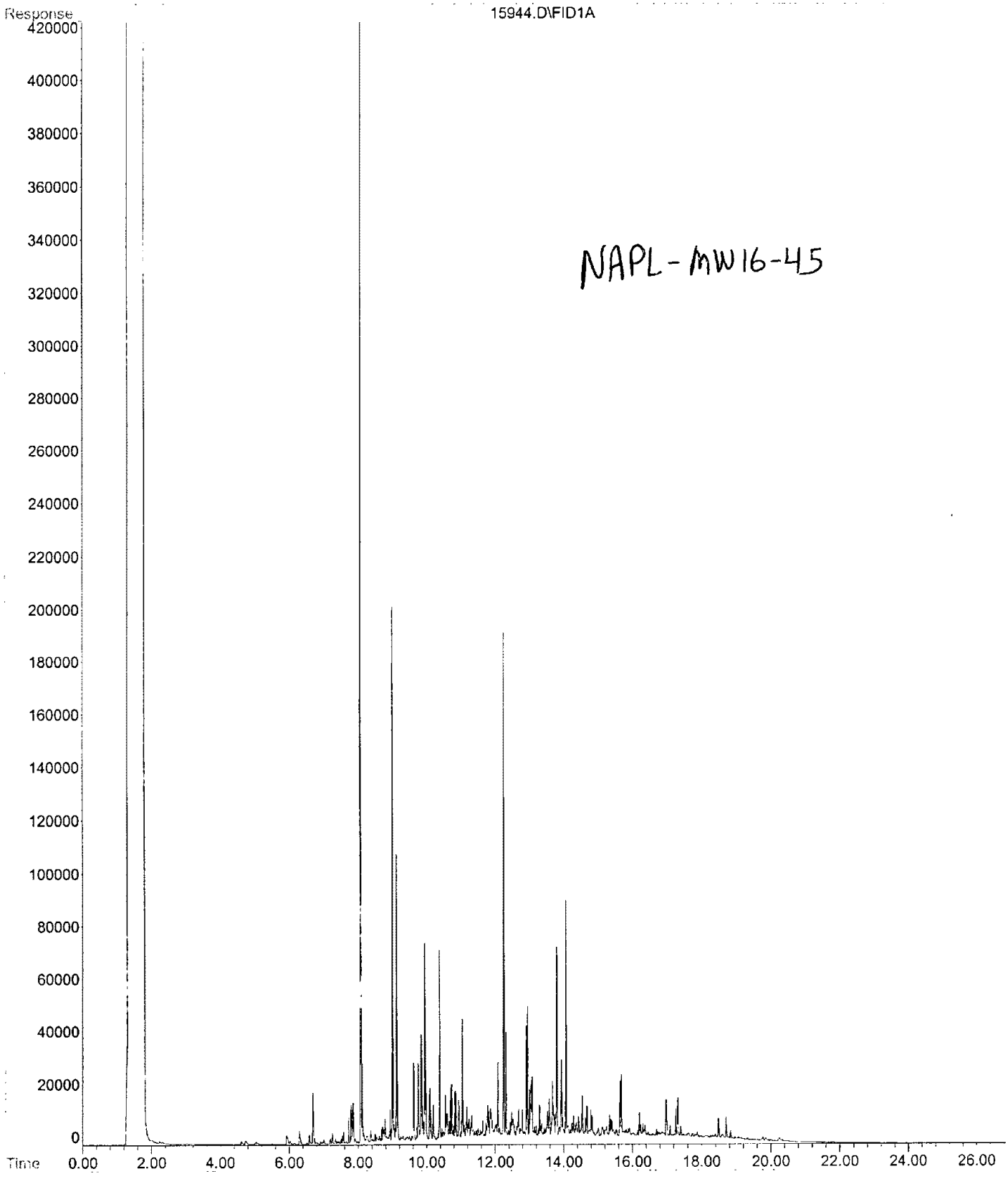
NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

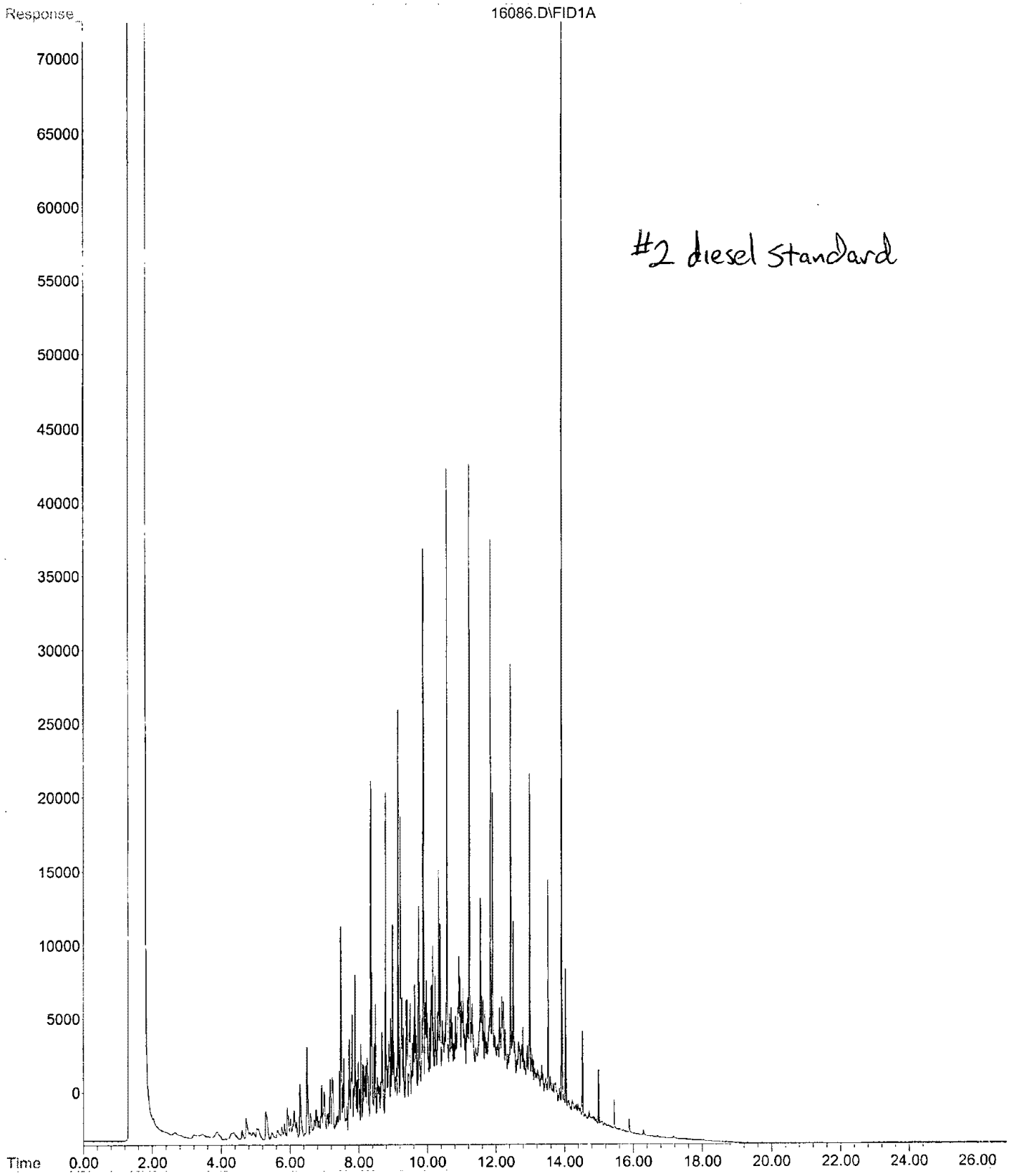
Client: Hahn & Associates

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other** _____
   By (print) Vanessa Brown (sign) Vanessa Brown
2. Date samples received 10/13/04 Date opened: Same X or ___/___/___
3. Delivered by: X NCA courier ___ FedEx ___UPS ___Courier ___Client ___Other_____
   Airbill # if applicable _____ (Put copy of shipping papers in file)
4. There were 1 custody seals present, signed by Bob date 10/13/04
5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No
6. Was ice used? X yes ___no Type of ice: ___ blue ice X gel ice ___real ice
   Temperature (degrees C) 10.0 Raytek thermometer _____ Digi-Therm (probe temperature blank)
7. Are custody papers sealed in a plastic bag and taped inside to lid? ___Yes X No
8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No
   If "no" please specify: _____
9. Was project identifiable from custody papers? X Yes ___No
   Name of project Chasco R1 (if applicable)
10. **Initial and date for unpacking:** VE **(initials)** **date** 10/13/04
11. Packing material: X bubble wrap/bag ___styrofoam X cardboard _____other
12. Were samples in bags? ___Yes X No
13. Did all containers indicated on the COC arrive? X Yes ___No
    If "no" please indicate which containers were absent _____
14. Were all containers unbroken and labels in good condition? X Yes ___No
    If "no" please indicate which containers _____
15. Were all bottle labels complete (ID, date, time, signature, etc.)? X Yes ___No
    Do the IDs, times, etc. agree with the COC? X Yes ___No
    If "no" please indicate which containers _____
16. Are containers properly preserved for indicated analysis? X Yes ___No
17. Is there adequate volume for the test(s) requested? X Yes ___No
18. If voa vials were submitted, are they free of bubbles? X N/A ___Yes ___No
19. **Log-in phase: Date samples were logged in:** 10/13/04 **Elm Project # P** 4J0524
20. Logged in by (print) Vanessa Brown (sign) Vanessa Brown
21. Was the project manager notified of status? (Use back of form as a record) ___Yes ___No

File : D:\HPCHEM\041022\15944.D
Operator : BWJ
Acquired : 22 Oct 2004 15:00 using AcqMethod NW3HF.M
Instrument : DualFID3
Sample Name: P4J0524-01
Misc Info : 1X
Vial Number: 27

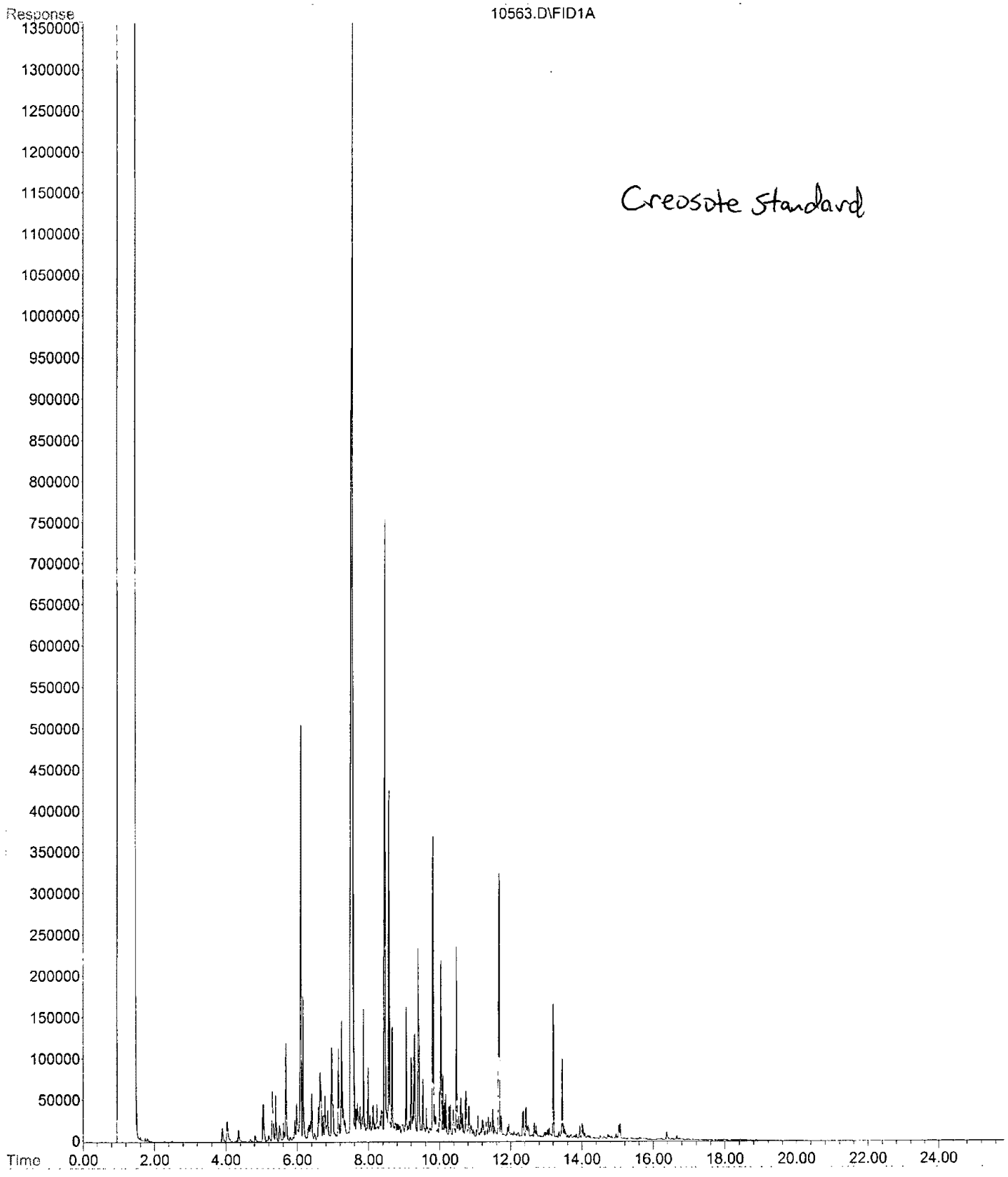


File : D:\HPCHEM\3\DATA\041028\16086.D
Operator : BWJ
Acquired : 29 Oct 2004 9:43 using AcqMethod AK3F704.M
Instrument : DualFID3
Sample Name: D 500/14.9 4050274
Misc Info : 1X
Vial Number: 50



#2 diesel standard

File : D:\HPCHEM\LIBRARY\DUALFID3F\10563.D
Operator : BWJ
Acquired : 29 Dec 2003 15:58 using AcqMethod ND3FO122.M
Instrument : DualFID3
Sample Name: creosote 2500 ppm
Misc Info : 1X
Vial Number: 40



Creosote Standard

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Anchorage 2000 W International Airport Road, Suite A-10, Anchorage, AK 99502-1119
907.563.9200 fax 907.563.9210

November 15, 2004

Rob Ede
Hahn and Associates, Inc.
434 NW Sixth Ave., Suite 203
Portland, OR 97209

RE: Gasco Upland

Enclosed are the results of analyses for samples received by the laboratory on 10/13/04 16:42.
The following list is a summary of the NCA Work Orders contained in this report.
If you have any questions concerning this report, please feel free to contact me.

Work	Project	ProjectNumber
P4J0524	Gasco Upland	2708-10

Thank You,

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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North Creek Analytical, Inc.
Environmental Laboratory Network

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2708-041011MW-16-45-oil	P4J0524-01	Oil	10/11/04 16:25	10/13/04 16:42

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Analytical Case Narrative

North Creek Analytical - Portland

P4J0524

Product Identification

The sample exhibited a pattern consistent with a medium distillate non-fuel gas-oil (e.g. Creosote or coal oil) by the HCID method. Further investigation by GC-MS confirmed the majority of the sample was made up of polycyclic aromatic hydrocarbons (PAHs) although the majority were naphthalene and its alky homologues. From this we conclude the sample may have been derived from only a few likely sources, those being: coal oil based creosote or the cracking and coking operations in many refineries (e.g. light cycle oil residue or coke oil).

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Hydrocarbon Identification per NW-TPH Methodology

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4J0524-01 Oil	**2708-041011MW-16-45-oil**			**Sampled: 10/11/04 16:25**						
Gasoline Range Hydrocarbons	NWTPH HCID	ND	-----	1050	mg/kg wet	1x	4101021	10/21/04	10/22/04 15:00	
Diesel Range Hydrocarbons	"	**DET**	-----	2630	"	"	"	"	"	X
Heavy Oil Range Hydrocarbons	"	**DET**	-----	5260	"	"	"	"	"	X
Surrogate(s): 1-Chlorooctadecane		*Recovery: 32.5%*		*Limits: 50 - 150 %*	"				"	***S-09***

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4J0524-01 Oil	**2708-041011MW-16-45-oil**			**Sampled: 10/11/04 16:25**						
Acetone	EPA 8260B	ND	-----	250	mg/kg wet	10x	4100719	10/14/04	10/20/04 20:03	
Benzene	"	ND	-----	10.0	"	"	"	"	"	
Bromobenzene	"	ND	-----	10.0	"	"	"	"	"	
Bromochloromethane	"	ND	-----	10.0	"	"	"	"	"	
Bromodichloromethane	"	ND	-----	10.0	"	"	"	"	"	
Bromoform	"	ND	-----	10.0	"	"	"	"	"	
Bromomethane	"	ND	-----	50.0	"	"	"	"	"	
2-Butanone	"	ND	-----	100	"	"	"	"	"	
n-Butylbenzene	"	ND	-----	50.0	"	"	"	"	"	
sec-Butylbenzene	"	ND	-----	10.0	"	"	"	"	"	
tert-Butylbenzene	"	ND	-----	10.0	"	"	"	"	"	
Carbon disulfide	"	ND	-----	100	"	"	"	"	"	
Carbon tetrachloride	"	ND	-----	10.0	"	"	"	"	"	
Chlorobenzene	"	ND	-----	10.0	"	"	"	"	"	
Chloroethane	"	ND	-----	10.0	"	"	"	"	"	
Chloroform	"	ND	-----	10.0	"	"	"	"	"	
Chloromethane	"	ND	-----	50.0	"	"	"	"	"	
2-Chlorotoluene	"	ND	-----	10.0	"	"	"	"	"	
4-Chlorotoluene	"	ND	-----	10.0	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	"	ND	-----	50.0	"	"	"	"	"	
Dibromochloromethane	"	ND	-----	10.0	"	"	"	"	"	
1,2-Dibromoethane	"	ND	-----	10.0	"	"	"	"	"	
Dibromomethane	"	ND	-----	10.0	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	10.0	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	10.0	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	10.0	"	"	"	"	"	
Dichlorodifluoromethane	"	ND	-----	50.0	"	"	"	"	"	
1,1-Dichloroethane	"	ND	-----	10.0	"	"	"	"	"	
1,2-Dichloroethane	"	ND	-----	10.0	"	"	"	"	"	
1,1-Dichloroethene	"	ND	-----	10.0	"	"	"	"	"	
cis-1,2-Dichloroethene	"	ND	-----	10.0	"	"	"	"	"	
trans-1,2-Dichloroethene	"	ND	-----	10.0	"	"	"	"	"	
1,2-Dichloropropane	"	ND	-----	10.0	"	"	"	"	"	
1,3-Dichloropropane	"	ND	-----	10.0	"	"	"	"	"	
2,2-Dichloropropane	"	ND	-----	10.0	"	"	"	"	"	
1,1-Dichloropropene	"	ND	-----	10.0	"	"	"	"	"	
cis-1,3-Dichloropropene	"	ND	-----	10.0	"	"	"	"	"	
trans-1,3-Dichloropropene	"	ND	-----	10.0	"	"	"	"	"	
Ethylbenzene	"	**34.4**	-----	10.0	"	"	"	"	"	
Hexachlorobutadiene	"	ND	-----	40.0	"	"	"	"	"	
2-Hexanone	"	ND	-----	100	"	"	"	"	"	
Isopropylbenzene	"	ND	-----	20.0	"	"	"	"	"	

North Creek Analytical - Portland

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Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Volatile Organic Compounds per EPA Method 8260B

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4J0524-01 Oil	**2708-041011MW-16-45-oil**			**Sampled: 10/11/04 16:25**						
p-Isopropyltoluene	EPA 8260B	ND	-----	20.0	mg/kg wet	10x	4100719	10/14/04	10/20/04 20:03	
4-Methyl-2-pentanone	"	ND	-----	50.0	"	"	"	"	"	
Methyl tert-butyl ether	"	ND	-----	10.0	"	"	"	"	"	
Methylene chloride	"	ND	-----	50.0	"	"	"	"	"	
Naphthalene	"	**1720**	-----	20.0	"	"	"	"	"	
n-Propylbenzene	"	ND	-----	10.0	"	"	"	"	"	
Styrene	"	ND	-----	10.0	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	"	ND	-----	10.0	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	"	ND	-----	10.0	"	"	"	"	"	
Tetrachloroethene	"	ND	-----	10.0	"	"	"	"	"	
Toluene	"	**17.8**	-----	10.0	"	"	"	"	"	
1,2,3-Trichlorobenzene	"	ND	-----	10.0	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	10.0	"	"	"	"	"	
1,1,1-Trichloroethane	"	ND	-----	10.0	"	"	"	"	"	
1,1,2-Trichloroethane	"	ND	-----	10.0	"	"	"	"	"	
Trichloroethene	"	ND	-----	10.0	"	"	"	"	"	
Trichlorofluoromethane	"	ND	-----	10.0	"	"	"	"	"	
1,2,3-Trichloropropane	"	ND	-----	10.0	"	"	"	"	"	
1,2,4-Trimethylbenzene	"	**54.9**	-----	10.0	"	"	"	"	"	
1,3,5-Trimethylbenzene	"	**16.2**	-----	10.0	"	"	"	"	"	
Vinyl chloride	"	ND	-----	10.0	"	"	"	"	"	
o-Xylene	"	**22.3**	-----	10.0	"	"	"	"	"	
m,p-Xylene	"	**43.8**	-----	20.0	"	"	"	"	"	
Surrogate(s): 4-BFB	*Recovery: 94.5%*		*Limits: 42.6 - 130 %*		"				"	
1,2-DCA-d4	*112%*		*57.3 - 144 %*		"				"	
Dibromofluoromethane	*91.0%*		*45.5 - 130 %*		"				"	
Toluene-d8	*103%*		*42.1 - 144 %*		"				"	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4J0524-01 Oil	**2708-041011MW-16-45-oil**			**Sampled: 10/11/04 16:25**						**R-05**
Carbazole	EPA 8270C	ND	-----	980	mg/kg	10x	4100753	10/15/04	10/22/04 09:01	
Acenaphthene	"	**1570**	-----	980	"	"	"	"	"	
Acenaphthylene	"	ND	-----	980	"	"	"	"	"	
Anthracene	"	**1020**	-----	980	"	"	"	"	"	
Benzo (a) anthracene	"	ND	-----	980	"	"	"	"	"	
Benzo (a) pyrene	"	ND	-----	980	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	-----	980	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	-----	980	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	-----	980	"	"	"	"	"	
Benzoic Acid	"	ND	-----	2970	"	"	"	"	"	
Benzyl alcohol	"	ND	-----	980	"	"	"	"	"	
4-Bromophenyl phenyl ether	"	ND	-----	980	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	-----	980	"	"	"	"	"	
4-Chloro-3-methylphenol	"	ND	-----	980	"	"	"	"	"	
4-Chloroaniline	"	ND	-----	5940	"	"	"	"	"	
Bis(2-chloroethoxy)methane	"	ND	-----	980	"	"	"	"	"	
Bis(2-chloroethyl)ether	"	ND	-----	980	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	"	ND	-----	980	"	"	"	"	"	
2-Chloronaphthalene	"	ND	-----	980	"	"	"	"	"	
2-Chlorophenol	"	ND	-----	980	"	"	"	"	"	
4-Chlorophenyl phenyl ether	"	ND	-----	980	"	"	"	"	"	
Chrysene	"	ND	-----	980	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	-----	2970	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	-----	980	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	-----	980	"	"	"	"	"	
Dibenzofuran	"	ND	-----	980	"	"	"	"	"	
1,2-Dichlorobenzene	"	ND	-----	2970	"	"	"	"	"	
1,3-Dichlorobenzene	"	ND	-----	2970	"	"	"	"	"	
1,4-Dichlorobenzene	"	ND	-----	2970	"	"	"	"	"	
3,3'-Dichlorobenzidine	"	ND	-----	2970	"	"	"	"	"	
2,4-Dichlorophenol	"	ND	-----	980	"	"	"	"	"	
Diethyl phthalate	"	ND	-----	980	"	"	"	"	"	
2,4-Dimethylphenol	"	ND	-----	2970	"	"	"	"	"	
Dimethyl phthalate	"	ND	-----	980	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	"	ND	-----	2970	"	"	"	"	"	
2,4-Dinitrophenol	"	ND	-----	5940	"	"	"	"	"	
2,4-Dinitrotoluene	"	ND	-----	1490	"	"	"	"	"	
2,6-Dinitrotoluene	"	ND	-----	1490	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	ND	-----	5940	"	"	"	"	"	
Fluoranthene	"	**1780**	-----	980	"	"	"	"	"	
Fluorene	"	**995**	-----	980	"	"	"	"	"	
Hexachlorobenzene	"	ND	-----	980	"	"	"	"	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	Gasco Upland	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Semivolatile Organic Compounds per EPA Method 8270C

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4J0524-01 Oil	**2708-041011MW-16-45-oil**			**Sampled: 10/11/04 16:25**						**R-05**
Hexachlorobutadiene	EPA 8270C	ND	-----	2970	mg/kg	10x	4100753	10/15/04	10/22/04 09:01	
Hexachlorocyclopentadiene	"	ND	-----	2970	"	"	"	"	"	
Hexachloroethane	"	ND	-----	2970	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	-----	980	"	"	"	"	"	
Isophorone	"	ND	-----	980	"	"	"	"	"	
2-Methylnaphthalene	"	**5500**	-----	980	"	"	"	"	"	
2-Methylphenol	"	ND	-----	980	"	"	"	"	"	
3-,4-Methylphenol	"	ND	-----	980	"	"	"	"	"	
Naphthalene	"	**15400**	-----	980	"	"	"	"	"	
2-Nitroaniline	"	ND	-----	980	"	"	"	"	"	
3-Nitroaniline	"	ND	-----	2970	"	"	"	"	"	
4-Nitroaniline	"	ND	-----	980	"	"	"	"	"	
Nitrobenzene	"	ND	-----	980	"	"	"	"	"	
2-Nitrophenol	"	ND	-----	980	"	"	"	"	"	
4-Nitrophenol	"	ND	-----	2970	"	"	"	"	"	
N-Nitrosodi-n-propylamine	"	ND	-----	980	"	"	"	"	"	
N-Nitrosodiphenylamine	"	ND	-----	980	"	"	"	"	"	
Pentachlorophenol	"	ND	-----	2970	"	"	"	"	"	
Phenanthrene	"	**6020**	-----	980	"	"	"	"	"	
Phenol	"	ND	-----	980	"	"	"	"	"	
Pyrene	"	**2210**	-----	980	"	"	"	"	"	
1,2,4-Trichlorobenzene	"	ND	-----	980	"	"	"	"	"	
2,4,5-Trichlorophenol	"	ND	-----	980	"	"	"	"	"	
2,4,6-Trichlorophenol	"	ND	-----	980	"	"	"	"	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 112%*		*Limits: 20 - 150 %*		"			"	
2-Fluorophenol		*106%*		*10 - 150 %*		"			"	
Nitrobenzene-d5		*104%*		*20 - 150 %*		"			"	
Phenol-d6		*98.6%*		*10 - 150 %*		"			"	
p-Terphenyl-d14		*109%*		*20 - 150 %*		"			"	
2,4,6-Tribromophenol		*85.1%*		*10 - 150 %*		"			"	

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Polynuclear Aromatic Compounds per EPA 8270M-SIM

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4J0524-01 Oil	**2708-041011MW-16-45-oil**		**Sampled: 10/11/04 16:25**							**A-02**
Acenaphthene	EPA 8270m	**1500**	-----	39.8	mg/kg	20x	4100753	10/15/04	11/03/04 00:41	
Acenaphthylene	"	**165**	-----	39.8	"	"	"	"	"	
Anthracene	"	**1110**	-----	39.8	"	"	"	"	"	
Benzo (a) anthracene	"	**565**	-----	39.8	"	"	"	"	"	
Benzo (a) pyrene	"	**508**	-----	39.8	"	"	"	"	"	
Benzo (b) fluoranthene	"	**289**	-----	39.8	"	"	"	"	"	
Benzo (ghi) perylene	"	**385**	-----	39.8	"	"	"	"	"	
Benzo (k) fluoranthene	"	**277**	-----	39.8	"	"	"	"	"	
Chrysene	"	**666**	-----	39.8	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	**68.2**	-----	39.8	"	"	"	"	"	
Fluoranthene	"	**1800**	-----	39.8	"	"	"	"	"	
Fluorene	"	**1100**	-----	39.8	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	**274**	-----	39.8	"	"	"	"	"	
Naphthalene	"	**15600**	-----	398	"	200x	"	"	11/03/04 14:09	
Phenanthrene	"	**6200**	-----	398	"	"	"	"	"	
Pyrene	"	**2280**	-----	398	"	"	"	"	"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Conventional Chemistry Parameters per APHA/EPA Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4J0524-01	**Oil**	**2708-041011MW-16-45-oil**			**Sampled: 10/11/04 16:25**						
pH		150.1/9040A	**8.28**	-----		pH Units	1x	4100737	10/14/04	10/14/04 18:00	

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Physical Parameters per APHA/ASTM/EPA Methods

North Creek Analytical - Portland

Analyte		Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P4J0524-01	**Oil**	**2708-041011MW-16-45-oil**			**Sampled: 10/11/04 16:25**						
Flashpoint		EPA 1010	ND	-----	150	°F	1x	4100866	10/18/04	10/18/04 12:46	

North Creek Analytical - Portland

Philip Nerenberg

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Hydrocarbon Identification per NW-TPH Methodology - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4101021 **Soil Preparation Method: EPA 3550 Fuels**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4101021-BLK1)							Extracted: 10/21/04 06:41							
Gasoline Range Hydrocarbons	NWTPH HCID	ND	---	20.0	mg/kg	1x	--	--	--	--	--	--	10/22/04 11:58	
Diesel Range Hydrocarbons	"	ND	---	50.0	"	"	--	--	--	--	--	--	"	
Heavy Oil Range Hydrocarbons	"	ND	---	100	"	"	--	--	--	--	--	--	"	
Surrogate(s): 1-Chlorooctadecane		*Recovery: 131%*			*Limits: 50-150%*	"							*10/22/04 11:58*	
Duplicate (4101021-DUP1)							QC Source: P4J0524-01					Extracted: 10/21/04 06:41		
Gasoline Range Hydrocarbons	NWTPH HCID	DET	---	1000	mg/kg wet	1x	ND	--	--	--		(50)	10/22/04 14:19	Q-14
Diesel Range Hydrocarbons	"	DET	---	2500	"	"	53400	--	--	--	59.5%	"	"	Q-14
Heavy Oil Range Hydrocarbons	"	DET	---	5000	"	"	30700	--	--	--	64.7%	"	"	Q-14
Surrogate(s): 1-Chlorooctadecane		*Recovery: 34.8%*			*Limits: 50-150%*	"							*10/22/04 14:19*	*S-09*

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100719 **Soil Preparation Method: EPA 5035 Modified**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4100719-BLK1)								Extracted: 10/14/04 12:13						
Acetone	EPA 8260B	ND	---	2.50	mg/kg	1x	--	--	--	--	--	--	10/14/04 23:36	
Benzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Bromobenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Bromochloromethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Bromodichloromethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Bromoform	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Bromomethane	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
2-Butanone	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
n-Butylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
sec-Butylbenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
tert-Butylbenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Carbon disulfide	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Carbon tetrachloride	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Chlorobenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Chloroethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Chloroform	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Chloromethane	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
2-Chlorotoluene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
4-Chlorotoluene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2-Dibromo-3-chloropropane	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Dibromochloromethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2-Dibromoethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Dibromomethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2-Dichlorobenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,3-Dichlorobenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,4-Dichlorobenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Dichlorodifluoromethane	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
1,1-Dichloroethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2-Dichloroethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,1-Dichloroethene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
cis-1,2-Dichloroethene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
trans-1,2-Dichloroethene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2-Dichloropropane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,3-Dichloropropane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
2,2-Dichloropropane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,1-Dichloropropene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
cis-1,3-Dichloropropene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
trans-1,3-Dichloropropene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Hexachlorobutadiene	"	ND	---	0.400	"	"	--	--	--	--	--	--	"	
2-Hexanone	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100719 **Soil Preparation Method: EPA 5035 Modified**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4100719-BLK1)							**Extracted: 10/14/04 12:13**							
Isopropylbenzene	EPA 8260B	ND	---	0.200	mg/kg	1x	--	--	--	--	--	--	10/14/04 23:36	
p-Isopropyltoluene	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
4-Methyl-2-pentanone	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Methyl tert-butyl ether	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Methylene chloride	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
n-Propylbenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Styrene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,1,1,2-Tetrachloroethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,1,2,2-Tetrachloroethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Tetrachloroethene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Toluene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2,3-Trichlorobenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2,4-Trichlorobenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,1,1-Trichloroethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,1,2-Trichloroethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Trichloroethene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Trichlorofluoromethane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2,3-Trichloropropane	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,2,4-Trimethylbenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
1,3,5-Trimethylbenzene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
Vinyl chloride	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
o-Xylene	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
m,p-Xylene	"	ND	---	0.200	"	"	--	--	--	--	--	--	"	
Surrogate(s): 4-BFB	*Recovery: 98.0%*			*Limits: 42.6-130%*	"								*10/14/04 23:36*	
1,2-DCA-d4	*116%*			*57.3-144%*	"								"	
Dibromofluoromethane	*102%*			*45.5-130%*	"								"	
Toluene-d8	*112%*			*42.1-144%*	"								"	

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Volatile Organic Compounds per EPA Method 8260B - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100719 **Soil Preparation Method: EPA 5035 Modified**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC (Limits)	% RPD (Limits)	Analyzed	Notes
LCS (4100719-BS1)									**Extracted: 10/14/04 12:13**			
Benzene	EPA 8260B	1.98	---	0.100	mg/kg	1x	--	2.00	99.0% (81.9-125)	-- --	10/14/04 19:58	
Chlorobenzene	"	2.03	---	0.100	"	"	--	"	102% (79.2-125)	-- --	"	
1,1-Dichloroethene	"	1.62	---	0.100	"	"	--	"	81.0% (66.1-125)	-- --	"	
Toluene	"	2.04	---	0.100	"	"	--	"	102% (80-125)	-- --	"	
Trichloroethene	"	1.98	---	0.100	"	"	--	"	99.0% (76-125)	-- --	"	
Surrogate(s): 4-BFB		*Recovery: 104%*			*Limits: 42.6-130%*	"					*10/14/04 19:58*	
1,2-DCA-d4		*116%*			*57.3-144%*	"					"	
Dibromofluoromethane		*115%*			*45.5-130%*	"					"	
Toluene-d8		*113%*			*42.1-144%*	"					"	
Matrix Spike (4100719-MS1)					**QC Source: P4J0234-02**				**Extracted: 10/14/04 12:13**			
Benzene	EPA 8260B	2.86	---	0.100	mg/kg dry	1x	ND	2.89	99.0% (68.5-125)	-- --	10/14/04 21:20	
Chlorobenzene	"	2.95	---	0.100	"	"	ND	"	102% (65.9-125)	-- --	"	
1,1-Dichloroethene	"	2.35	---	0.100	"	"	ND	"	81.3% (55.8-125)	-- --	"	
Toluene	"	2.93	---	0.100	"	"	ND	"	101% (70.3-125)	-- --	"	
Trichloroethene	"	2.89	---	0.100	"	"	ND	"	100% (65.5-125)	-- --	"	
Surrogate(s): 4-BFB		*Recovery: 86.2%*			*Limits: 42.6-130%*	"					*10/14/04 21:20*	
1,2-DCA-d4		*96.5%*			*57.3-144%*	"					"	
Dibromofluoromethane		*98.6%*			*45.5-130%*	"					"	
Toluene-d8		*95.5%*			*42.1-144%*	"					"	
Matrix Spike Dup (4100719-MSD1)					**QC Source: P4J0234-02**				**Extracted: 10/14/04 12:13**			
Benzene	EPA 8260B	2.88	---	0.100	mg/kg dry	1x	ND	2.89	99.7% (68.5-125)	0.697% (25)	10/14/04 21:47	
Chlorobenzene	"	2.97	---	0.100	"	"	ND	"	103% (65.9-125)	0.676% "	"	
1,1-Dichloroethene	"	2.31	---	0.100	"	"	ND	"	79.9% (55.8-125)	1.72% "	"	
Toluene	"	3.00	---	0.100	"	"	ND	"	104% (70.3-125)	2.36% "	"	
Trichloroethene	"	2.89	---	0.100	"	"	ND	"	100% (65.5-125)	0.00% "	"	
Surrogate(s): 4-BFB		*Recovery: 85.8%*			*Limits: 42.6-130%*	"					*10/14/04 21:47*	
1,2-DCA-d4		*97.9%*			*57.3-144%*	"					"	
Dibromofluoromethane		*97.6%*			*45.5-130%*	"					"	
Toluene-d8		*96.9%*			*42.1-144%*	"					"	

North Creek Analytical - Portland

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100753 **Other wet Preparation Method: EPA 3580**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4100753-BLK1)								Extracted: 10/15/04 07:23						
Carbazole	EPA 8270C	ND	---	99.0	mg/kg	1x	--	--	--	--	--	--	10/22/04 09:44	
Acenaphthene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Acenaphthylene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Benzoic Acid	"	ND	---	300	"	"	--	--	--	--	--	--	"	
Benzyl alcohol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
4-Bromophenyl phenyl ether	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Butyl benzyl phthalate	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
4-Chloro-3-methylphenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
4-Chloroaniline	"	ND	---	600	"	"	--	--	--	--	--	--	"	
Bis(2-chloroethoxy)methane	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Bis(2-chloroethyl)ether	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Bis(2-chloroisopropyl)ether	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2-Chloronaphthalene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2-Chlorophenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
4-Chlorophenyl phenyl ether	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Di-n-butyl phthalate	"	ND	---	300	"	"	--	--	--	--	--	--	"	
Di-n-octyl phthalate	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Dibenzofuran	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
1,2-Dichlorobenzene	"	ND	---	300	"	"	--	--	--	--	--	--	"	
1,3-Dichlorobenzene	"	ND	---	300	"	"	--	--	--	--	--	--	"	
1,4-Dichlorobenzene	"	ND	---	300	"	"	--	--	--	--	--	--	"	
3,3'-Dichlorobenzidine	"	ND	---	300	"	"	--	--	--	--	--	--	"	
2,4-Dichlorophenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Diethyl phthalate	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2,4-Dimethylphenol	"	ND	---	300	"	"	--	--	--	--	--	--	"	
Dimethyl phthalate	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
4,6-Dinitro-2-methylphenol	"	ND	---	300	"	"	--	--	--	--	--	--	"	
2,4-Dinitrophenol	"	ND	---	600	"	"	--	--	--	--	--	--	"	
2,4-Dinitrotoluene	"	ND	---	150	"	"	--	--	--	--	--	--	"	
2,6-Dinitrotoluene	"	ND	---	150	"	"	--	--	--	--	--	--	"	
Bis(2-ethylhexyl)phthalate	"	ND	---	600	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100753 **Other wet Preparation Method: EPA 3580**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4100753-BLK1)							**Extracted: 10/15/04 07:23**							
Hexachlorobenzene	EPA 8270C	ND	---	99.0	mg/kg	1x	--	--	--	--	--	--	10/22/04 09:44	
Hexachlorobutadiene	"	ND	---	300	"	"	--	--	--	--	--	--	"	
Hexachlorocyclopentadiene	"	ND	---	300	"	"	--	--	--	--	--	--	"	
Hexachloroethane	"	ND	---	300	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Isophorone	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2-Methylnaphthalene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2-Methylphenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
3-,4-Methylphenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2-Nitroaniline	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
3-Nitroaniline	"	ND	---	300	"	"	--	--	--	--	--	--	"	
4-Nitroaniline	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Nitrobenzene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2-Nitrophenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
4-Nitrophenol	"	ND	---	300	"	"	--	--	--	--	--	--	"	
N-Nitrosodi-n-propylamine	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
N-Nitrosodiphenylamine	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Pentachlorophenol	"	ND	---	300	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Phenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
1,2,4-Trichlorobenzene	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2,4,5-Trichlorophenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
2,4,6-Trichlorophenol	"	ND	---	99.0	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2-Fluorobiphenyl	*Recovery:*	*105%*		*Limits:*	*20-150%*	"							*10/22/04 09:44*	
2-Fluorophenol		*104%*			*10-150%*	"							"	
Nitrobenzene-d5		*106%*			*20-150%*	"							"	
Phenol-d6		*103%*			*10-150%*	"							"	
p-Terphenyl-d14		*107%*			*20-150%*	"							"	
2,4,6-Tribromophenol		*104%*			*10-150%*	"							"	

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100753 **Other wet Preparation Method: EPA 3580**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4100753-BS1)								**Extracted: 10/15/04 07:23**						
Acenaphthene	EPA 8270C	492	---	99.0	mg/kg	1x	--	500	98.4%	(20-150)	--	--	10/22/04 03:16	
4-Chloro-3-methylphenol	"	898	---	99.0	"	"	--	1000	89.8%	"	--	--	"	
2-Chlorophenol	"	914	---	99.0	"	"	--	"	91.4%	"	--	--	"	
1,4-Dichlorobenzene	"	474	---	300	"	"	--	500	94.8%	"	--	--	"	
2,4-Dinitrotoluene	"	462	---	150	"	"	--	"	92.4%	"	--	--	"	
4-Nitrophenol	"	947	---	300	"	"	--	1000	94.7%	"	--	--	"	
N-Nitrosodi-n-propylamine	"	474	---	99.0	"	"	--	500	94.8%	"	--	--	"	
Pentachlorophenol	"	836	---	300	"	"	--	1000	83.6%	"	--	--	"	
Phenol	"	831	---	99.0	"	"	--	"	83.1%	"	--	--	"	
Pyrene	"	492	---	99.0	"	"	--	500	98.4%	"	--	--	"	
1,2,4-Trichlorobenzene	"	477	---	99.0	"	"	--	"	95.4%	"	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 108%*			*Limits: 20-150%*	"							*10/22/04 03:16*	
2-Fluorophenol		*102%*			*10-150%*	"							"	
Nitrobenzene-d5		*105%*			*20-150%*	"							"	
Phenol-d6		*101%*			*10-150%*	"							"	
p-Terphenyl-d14		*107%*			*20-150%*	"							"	
2,4,6-Tribromophenol		*110%*			*10-150%*	"							"	
Duplicate (4100753-DUP1)					**QC Source: P4J0475-01**					**Extracted: 10/15/04 07:23**				
Carbazole	EPA 8270C	ND	---	97.1	mg/kg	1x	ND	--	--	--	NR	(50)	10/22/04 04:42	
Acenaphthene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Acenaphthylene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Anthracene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Benzo (a) anthracene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Benzo (a) pyrene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Benzo (b) fluoranthene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Benzo (ghi) perylene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Benzo (k) fluoranthene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Benzoic Acid	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
Benzyl alcohol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
4-Bromophenyl phenyl ether	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Butyl benzyl phthalate	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
4-Chloro-3-methylphenol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
4-Chloroaniline	"	ND	---	588	"	"	ND	--	--	--	NR	"	"	
Bis(2-chloroethoxy)methane	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Bis(2-chloroethyl)ether	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Bis(2-chloroisopropyl)ether	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
2-Chloronaphthalene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
2-Chlorophenol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
4-Chlorophenyl phenyl ether	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Chrysene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Di-n-butyl phthalate	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100753 **Other wet Preparation Method: EPA 3580**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (4100753-DUP1)				QC Source: P4J0475-01				Extracted: 10/15/04 07:23						
Di-n-octyl phthalate	EPA 8270C	ND	---	97.1	mg/kg	1x	ND	--	--	--	NR	(50)	10/22/04 04:42	
Dibenzo (a,h) anthracene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Dibenzofuran	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
1,2-Dichlorobenzene	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
1,3-Dichlorobenzene	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
1,4-Dichlorobenzene	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
3,3'-Dichlorobenzidine	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
2,4-Dichlorophenol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Diethyl phthalate	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
2,4-Dimethylphenol	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
Dimethyl phthalate	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
4,6-Dinitro-2-methylphenol	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
2,4-Dinitrophenol	"	ND	---	588	"	"	ND	--	--	--	NR	"	"	
2,4-Dinitrotoluene	"	ND	---	147	"	"	ND	--	--	--	NR	"	"	
2,6-Dinitrotoluene	"	ND	---	147	"	"	ND	--	--	--	NR	"	"	
Bis(2-ethylhexyl)phthalate	"	ND	---	588	"	"	ND	--	--	--	NR	"	"	
Fluoranthene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Fluorene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Hexachlorobenzene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Hexachlorobutadiene	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
Hexachlorocyclopentadiene	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
Hexachloroethane	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Isophorone	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
2-Methylnaphthalene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
2-Methylphenol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
3-,4-Methylphenol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Naphthalene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
2-Nitroaniline	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
3-Nitroaniline	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
4-Nitroaniline	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Nitrobenzene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
2-Nitrophenol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
4-Nitrophenol	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
N-Nitrosodi-n-propylamine	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
N-Nitrosodiphenylamine	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Pentachlorophenol	"	ND	---	294	"	"	ND	--	--	--	NR	"	"	
Phenanthrene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Phenol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Pyrene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
1,2,4-Trichlorobenzene	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	

North Creek Analytical - Portland

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Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Semivolatile Organic Compounds per EPA Method 8270C - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100753 **Other wet Preparation Method: EPA 3580**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (4100753-DUP1)					**QC Source: P4J0475-01**				**Extracted: 10/15/04 07:23**					
2,4,5-Trichlorophenol	EPA 8270C	ND	---	97.1	mg/kg	1x	ND	--	--	--	NR	(50)	10/22/04 04:42	
2,4,6-Trichlorophenol	"	ND	---	97.1	"	"	ND	--	--	--	NR	"	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 124%*			*Limits: 20-150%*	"							*10/22/04 04:42*	
2-Fluorophenol		*122%*			*10-150%*	"							"	
Nitrobenzene-d5		*123%*			*20-150%*	"							"	
Phenol-d6		*120%*			*10-150%*	"							"	
p-Terphenyl-d14		*125%*			*20-150%*	"							"	
2,4,6-Tribromophenol		*108%*			*10-150%*	"							"	
Matrix Spike (4100753-MS1)					**QC Source: P4J0475-01**				**Extracted: 10/15/04 07:23**					
Acenaphthene	EPA 8270C	619	---	98.0	mg/kg	1x	ND	495	125%	(20-150)	--	--	10/22/04 03:59	
4-Chloro-3-methylphenol	"	1120	---	98.0	"	"	ND	990	113%	(10-150)	--	--	"	
2-Chlorophenol	"	1120	---	98.0	"	"	ND	"	113%	"	--	--	"	
1,4-Dichlorobenzene	"	574	---	297	"	"	ND	495	116%	(20-150)	--	--	"	
2,4-Dinitrotoluene	"	568	---	149	"	"	ND	"	115%	"	--	--	"	
4-Nitrophenol	"	1070	---	297	"	"	ND	990	108%	(10-150)	--	--	"	
N-Nitrosodi-n-propylamine	"	589	---	98.0	"	"	ND	495	119%	(20-150)	--	--	"	
Pentachlorophenol	"	584	---	297	"	"	ND	990	59.0%	(10-150)	--	--	"	
Phenol	"	988	---	98.0	"	"	ND	"	99.8%	"	--	--	"	
Pyrene	"	602	---	98.0	"	"	ND	495	122%	(20-150)	--	--	"	
1,2,4-Trichlorobenzene	"	587	---	98.0	"	"	ND	"	119%	"	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		*Recovery: 131%*			*Limits: 20-150%*	"							*10/22/04 03:59*	
2-Fluorophenol		*120%*			*10-150%*	"							"	
Nitrobenzene-d5		*130%*			*20-150%*	"							"	
Phenol-d6		*118%*			*10-150%*	"							"	
p-Terphenyl-d14		*131%*			*20-150%*	"							"	
2,4,6-Tribromophenol		*132%*			*10-150%*	"							"	

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100753 **Other wet Preparation Method: EPA 3580**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (4100753-BLK1)							**Extracted: 10/15/04 07:23**							
Acenaphthene	EPA 8270m	ND	---	2.01	mg/kg	1x	--	--	--	--	--	--	11/03/04 00:10	
Acenaphthylene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	2.01	"	"	--	--	--	--	--	--	"	

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100737 **Other wet Preparation Method: General**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (4100737-DUP1)					**QC Source: P4J0533-01**				**Extracted: 10/14/04 14:59**					
pH	150.1/9040A	6.54	---		pH Units	1x	6.58	--	--	--	0.610%	(25)	10/14/04 18:00	

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Hahn and Associates, Inc.	Project Name: **Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number: 2708-10	Report Created:
Portland, OR 97209	Project Manager: Rob Ede	11/15/04 16:25

Physical Parameters per APHA/ASTM/EPA Methods - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 4100866 **Other wet Preparation Method: Oil Qual.**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (4100866-BS1)								**Extracted: 10/18/04 12:46**						
Flashpoint	EPA 1010	125	---		°F	1x	--	127	98.4%	(96.5-103)	--	--	10/18/04 12:46	
Duplicate (4100866-DUP1)							**QC Source: P4J0524-01**							
Flashpoint	EPA 1010	ND	---	150	°F	1x	ND	--	--	--	NR	(50)	10/18/04 12:46	

North Creek Analytical - Portland

Philip Nerenberg

Philip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project Name:	**Gasco Upland**	
434 NW Sixth Ave., Suite 203	Project Number:	2708-10	Report Created:
Portland, OR 97209	Project Manager:	Rob Ede	11/15/04 16:25

Notes and Definitions

Report Specific Notes:

A-02 - This analysis was performed on the 8270 SVOC extract, therefore no surrogate recoveries are available, and the blank is the only batch QC.

Q-14 - The matrix spike recovery, and/or RPD, for this QC sample is outside of control limits due to a non-homogeneous sample matrix.

R-05 - Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.

S-09 - Surrogate recovery is outside control limits due to matrix interference.

X - See case narrative.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR / NA - Not Reported / Not Available

dry - Sample results reported on a dry weight basis. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

RPD - Relative Percent Difference. (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.