



Nicholson GeoSolutions, LLC

3433 East Lake Drive

Centennial, CO 80121

January 14, 2014

Mr. Derek Johnson
Berry Petroleum Company
235 Callahan Avenue
Parachute, Colorado 81635

Subject: D-20 Soil Investigation

Dear Derek:

Nicholson GeoSolutions LLC was retained by Berry Petroleum Company (Berry) to conduct soil sampling at the site of a produced water and condensate leak on the D-20 well pad in the Garden Gulch area, Garfield County, Colorado. Upon discovery of the leak, an excavation contractor was immediately mobilized to the site to begin excavation of impacted soils and the well was shut in.

Nicholson GeoSolutions inspected the site on December 18, 2013. Impacted soil and rock had been excavated and stored in a bermed area on the well pad prior to the inspection. During the inspection the perimeter of the excavation was mapped using a hand-held GPS unit and five discrete soil samples were collected from the sidewalls and base of the excavation to evaluate compliance with COGCC standards (samples D20-C1 through D20-C5). In addition, a sample of the excavated spoils was also collected (D20-SPOILS).

Figure 1 shows the approximate extent and depth of the excavation and the locations of the five confirmation samples collected. The depth of excavation ranged from about 6 to 13 feet. All samples were analyzed for Total Volatile Petroleum Hydrocarbons (TVPH – gasoline range), Total Extractable Petroleum Hydrocarbons (TEPH – diesel range), BTEX (benzene, toluene, ethylbenzene, and xylenes), sodium adsorption ratio (SAR), pH, and conductivity. The spoils sample was also analyzed for metals and PAHs to evaluate compliance with the Table 910-1 standards and treatment options.

Table 1 provides analytical results for the soil samples collected. The laboratory analytical reports are contained in Appendix A. All parameters for the five confirmation samples were below the Table 910-1 standards, indicating that no further excavation is needed at this site. For the spoils sample collected on December 18th, all results were below the standards, except for arsenic at 6.3 mg/kg. These results suggest that the spill was mostly produced water with minor amounts of condensate. In order to confirm the results from the first sample, a second spoils sample was collected on January 3, 2014. All results for the second spoils sample were also

below the Table 910-1 standards, except for arsenic and pH, and were generally consistent with those from the first sample.

Sincerely,



David K. Nicholson, P.G.
Nicholson GeoSolutions LLC

Table 1 D-20 Sample Results

Parameter	Table 910-1 Standards	D20-C1 (12/18/13)	D20-C2 (12/18/13)	D20-C3 (12/18/13)	D20-C4 (12/18/13)	D20-C5 (12/18/13)	D20-SPOILS (12/18/13)	D20-SPOILS (1/3/14)
sp. conductance (mmhos/cm)	<4	2.1	4.0	2.1	3.6	2.9	2.4	1.6
pH (standard units)	6-9	8.0	8.3	8.2	8.0	8.2	8.3	9.2
SAR (ratio)	<10	2.5	7.6	4.9	6.3	5.6	5.4	5.8
TVPH – gasoline range	500 ¹	<0.5	<0.5	1.2	<0.5	4.2	15	15
TEPH – diesel range	500 ¹	<4.0	<4.0	24	14	350	70	130
benzene	0.17	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	0.016	0.0047
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	0.0036	<0.0025	<0.0025	<0.0025	<0.0025	0.026
xylenes	175	<0.0075	<0.0075	0.011	0.022	0.077	0.020	0.72
PAHs	various	NA	NA	NA	NA	NA	All ok	All ok
arsenic	0.39	NA	NA	NA	NA	NA	6.3	3.8





¹The standard is 500 for the combined total of TVPH and TEPH

Values in bold type exceed standards

All units in mg/kg except where indicated

NA = not analyzed



	Legend  Limits of Excavation  Confirmation Samples 13' Approximate Depth of Excavation 	PROJECT NO. 119808		Berry Petroleum Company	
		DATE: December 2013			
		DRAWN BY: L.Hockert		D-20 Well Pad Confirmation Sample Locations Garfield County, Colorado	FIGURE 1
		CHECKED BY: D.Nicholson			
		FILE NAME: D_20.mxd			

APPENDIX A

Laboratory Reports



12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
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Est. 1970

Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Thursday January 02, 2014

Report Number: L675407

Samples Received: 12/21/13

Client Project:

Description: D20 Spill Response

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

January 02, 2014

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

Date Received : December 21, 2013
Description : D20 Spill Response

Sample ID : D20-C1

Collected By : Dave Nicholson
Collection Date : 12/19/13 08:55

ESC Sample # : L675407-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.0		su	9045D	12/29/13	1
Sodium Adsorption Ratio	2.5			Calc.	12/31/13	1
Specific Conductance	2100		umhos/cm	9050AMod	12/28/13	1
Benzene	BDL	0.0025	mg/kg	8021/8015	12/24/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	12/24/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	12/24/13	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	12/24/13	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	12/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	109.		% Rec.	8021/8015	12/24/13	5
a,a,a-Trifluorotoluene(PID)	111.		% Rec.	8021/8015	12/24/13	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	12/31/13	1
Surrogate recovery(%)						
o-Terphenyl	58.0		% Rec.	3546/DRO	12/31/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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L675407-01 (PH) - 8.0@21.6c



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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

January 02, 2014

Date Received : December 21, 2013
Description : D20 Spill Response
Sample ID : D20-C2
Collected By : Dave Nicholson
Collection Date : 12/19/13 09:00

ESC Sample # : L675407-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.3		su	9045D	12/29/13	1
Sodium Adsorption Ratio	7.6			Calc.	12/31/13	1
Specific Conductance	4000		umhos/cm	9050AMod	12/28/13	1
Benzene	BDL	0.0025	mg/kg	8021/8015	12/24/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	12/24/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	12/24/13	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	12/24/13	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	12/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	112.		% Rec.	8021/8015	12/24/13	5
a,a,a-Trifluorotoluene(PID)	112.		% Rec.	8021/8015	12/24/13	5
TPH (GC/FID) High Fraction	BDL	4.0	mg/kg	3546/DRO	12/30/13	1
Surrogate recovery(%)						
o-Terphenyl	57.3		% Rec.	3546/DRO	12/30/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L675407-02 (PH) - 8.3@20.2c



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REPORT OF ANALYSIS

January 02, 2014

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

ESC Sample # : L675407-03

Date Received : December 21, 2013
Description : D20 Spill Response

Site ID :

Sample ID : D20-C3

Project # :

Collected By : Dave Nicholson
Collection Date : 12/19/13 09:10

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.2		su	9045D	12/29/13	1
Sodium Adsorption Ratio	4.9			Calc.	12/31/13	1
Specific Conductance	2100		umhos/cm	9050AMod	12/28/13	1
Benzene	BDL	0.0025	mg/kg	8021/8015	12/24/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	12/24/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	12/24/13	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	12/24/13	5
TPH (GC/FID) Low Fraction	1.2	0.50	mg/kg	GRO	12/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	112.		% Rec.	8021/8015	12/24/13	5
a,a,a-Trifluorotoluene(PID)	112.		% Rec.	8021/8015	12/24/13	5
TPH (GC/FID) High Fraction	24.	4.0	mg/kg	3546/DRO	12/30/13	1
Surrogate recovery(%)						
o-Terphenyl	55.0		% Rec.	3546/DRO	12/30/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

January 02, 2014

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

ESC Sample # : L675407-04

Date Received : December 21, 2013
Description : D20 Spill Response

Site ID :

Sample ID : D20-C4

Project # :

Collected By : Dave Nicholson
Collection Date : 12/19/13 09:20

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.0		su	9045D	12/29/13	1
Sodium Adsorption Ratio	6.3			Calc.	12/31/13	1
Specific Conductance	3600		umhos/cm	9050AMod	12/28/13	1
Benzene	BDL	0.0025	mg/kg	8021/8015	12/24/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	12/24/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	12/24/13	5
Total Xylene	0.022	0.0075	mg/kg	8021/8015	12/24/13	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	12/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	112.		% Rec.	8021/8015	12/24/13	5
a,a,a-Trifluorotoluene(PID)	113.		% Rec.	8021/8015	12/24/13	5
TPH (GC/FID) High Fraction	14.	4.0	mg/kg	3546/DRO	12/30/13	1
Surrogate recovery(%)						
o-Terphenyl	60.9		% Rec.	3546/DRO	12/30/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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L675407-04 (PH) - 8.0@22.4c



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REPORT OF ANALYSIS

January 02, 2014

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

Date Received : December 21, 2013
Description : D20 Spill Response
Sample ID : D20-C5
Collected By : Dave Nicholson
Collection Date : 12/19/13 09:30

ESC Sample # : L675407-05

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.2		su	9045D	12/29/13	1
Sodium Adsorption Ratio	5.6			Calc.	12/31/13	1
Specific Conductance	2900		umhos/cm	9050AMod	12/28/13	1
Benzene	BDL	0.0025	mg/kg	8021/8015	12/30/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	12/30/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	12/30/13	5
Total Xylene	0.077	0.0075	mg/kg	8021/8015	12/30/13	5
TPH (GC/FID) Low Fraction	4.2	0.50	mg/kg	GRO	12/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	111.		% Rec.	8021/8015	12/24/13	5
a,a,a-Trifluorotoluene(PID)	98.8		% Rec.	8021/8015	12/30/13	5
TPH (GC/FID) High Fraction	350	4.0	mg/kg	3546/DRO	12/30/13	1
Surrogate recovery(%)						
o-Terphenyl	81.4		% Rec.	3546/DRO	12/30/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L675407-05 (PH) - 8.2@20.9c



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REPORT OF ANALYSIS

January 02, 2014

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

ESC Sample # : L675407-06

Date Received : December 21, 2013
Description : D20 Spill Response

Site ID :

Sample ID : D20 SPOILS

Project # :

Collected By : Dave Nicholson
Collection Date : 12/19/13 09:40

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	12/30/13	1
Chromium, Trivalent	14.	2.0	mg/kg	Calc.	12/31/13	1
ORP	190		mV	2580 B-2011	12/31/13	1
pH	8.3		su	9045D	12/29/13	1
Sodium Adsorption Ratio	5.4			Calc.	12/31/13	1
Specific Conductance	2400		umhos/cm	9050AMod	12/28/13	1
Mercury	0.023	0.020	mg/kg	7471	12/27/13	1
Arsenic	6.3	1.0	mg/kg	6010B	12/26/13	1
Barium	130	0.25	mg/kg	6010B	12/26/13	1
Boron	11.	10.	mg/kg	6010B	12/26/13	1
Cadmium	0.57	0.25	mg/kg	6010B	12/26/13	1
Chromium	14.	0.50	mg/kg	6010B	12/26/13	1
Copper	21.	1.0	mg/kg	6010B	12/26/13	1
Lead	13.	0.25	mg/kg	6010B	12/26/13	1
Nickel	19.	1.0	mg/kg	6010B	12/26/13	1
Selenium	3.1	1.0	mg/kg	6010B	12/26/13	1
Silver	BDL	0.50	mg/kg	6010B	12/26/13	1
Zinc	70.	1.5	mg/kg	6010B	12/26/13	1
Benzene	0.016	0.0025	mg/kg	8021/8015	12/30/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	12/30/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	12/30/13	5
Total Xylene	0.020	0.0075	mg/kg	8021/8015	12/30/13	5
TPH (GC/FID) Low Fraction	15.	0.50	mg/kg	GRO	12/24/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	105.		% Rec.	8021/8015	12/24/13	5
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	12/30/13	5
TPH (GC/FID) High Fraction	70.	4.0	mg/kg	3546/DRO	12/30/13	1
Surrogate recovery(%)						
o-Terphenyl	54.8		% Rec.	3546/DRO	12/30/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L675407-06 (PH) - 8.3@20.9c



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REPORT OF ANALYSIS

January 02, 2014

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

ESC Sample # : L675407-06

Date Received : December 21, 2013
Description : D20 Spill Response

Site ID :

Sample ID : D20 SPOILS

Project # :

Collected By : Dave Nicholson
Collection Date : 12/19/13 09:40

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Fluorene	0.019	0.0060	mg/kg	8270C-SIM	12/26/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
Naphthalene	0.11	0.020	mg/kg	8270C-SIM	12/26/13	1
Phenanthrene	0.020	0.0060	mg/kg	8270C-SIM	12/26/13	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	12/26/13	1
1-Methylnaphthalene	0.11	0.020	mg/kg	8270C-SIM	12/26/13	1
2-Methylnaphthalene	0.32	0.020	mg/kg	8270C-SIM	12/26/13	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	12/26/13	1
Surrogate Recovery						
Nitrobenzene-d5	159.		% Rec.	8270C-SIM	12/26/13	1
2-Fluorobiphenyl	87.5		% Rec.	8270C-SIM	12/26/13	1
p-Terphenyl-d14	85.2		% Rec.	8270C-SIM	12/26/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L675407-06 (PH) - 8.3@20.9c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L675407-06	WG698980	SAMP	Nitrobenzene-d5	R2871896	J1

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
01/02/14 at 10:59:32

TSR Signing Reports: 134
R5 - Desired TAT

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L675407-01 Account: BERPETDCO Received: 12/21/13 11:30 Due Date: 12/30/13 00:00 RPT Date: 01/02/14 10:59

Sample: L675407-02 Account: BERPETDCO Received: 12/21/13 11:30 Due Date: 12/30/13 00:00 RPT Date: 01/02/14 10:59

Sample: L675407-03 Account: BERPETDCO Received: 12/21/13 11:30 Due Date: 12/30/13 00:00 RPT Date: 01/02/14 10:59

Sample: L675407-04 Account: BERPETDCO Received: 12/21/13 11:30 Due Date: 12/30/13 00:00 RPT Date: 01/02/14 10:59

Sample: L675407-05 Account: BERPETDCO Received: 12/21/13 11:30 Due Date: 12/30/13 00:00 RPT Date: 01/02/14 10:59

Sample: L675407-06 Account: BERPETDCO Received: 12/21/13 11:30 Due Date: 12/30/13 00:00 RPT Date: 01/02/14 10:59



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Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L675407

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

January 02, 2014

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
1-Methylnaphthalene	< .02	mg/kg			WG698980	12/26/13 06:03
2-Chloronaphthalene	< .02	mg/kg			WG698980	12/26/13 06:03
2-Methylnaphthalene	< .02	mg/kg			WG698980	12/26/13 06:03
Acenaphthene	< .006	mg/kg			WG698980	12/26/13 06:03
Acenaphthylene	< .006	mg/kg			WG698980	12/26/13 06:03
Anthracene	< .006	mg/kg			WG698980	12/26/13 06:03
Benzo(a)anthracene	< .006	mg/kg			WG698980	12/26/13 06:03
Benzo(a)pyrene	< .006	mg/kg			WG698980	12/26/13 06:03
Benzo(b)fluoranthene	< .006	mg/kg			WG698980	12/26/13 06:03
Benzo(g,h,i)perylene	< .006	mg/kg			WG698980	12/26/13 06:03
Benzo(k)fluoranthene	< .006	mg/kg			WG698980	12/26/13 06:03
Chrysene	< .006	mg/kg			WG698980	12/26/13 06:03
Dibenz(a,h)anthracene	< .006	mg/kg			WG698980	12/26/13 06:03
Fluoranthene	< .006	mg/kg			WG698980	12/26/13 06:03
Fluorene	< .006	mg/kg			WG698980	12/26/13 06:03
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG698980	12/26/13 06:03
Naphthalene	< .02	mg/kg			WG698980	12/26/13 06:03
Phenanthrene	< .006	mg/kg			WG698980	12/26/13 06:03
Pyrene	< .006	mg/kg			WG698980	12/26/13 06:03
2-Fluorobiphenyl	% Rec.		94.00	51.1-131	WG698980	12/26/13 06:03
Nitrobenzene-d5	% Rec.		92.90	40.9-147	WG698980	12/26/13 06:03
p-Terphenyl-d14	% Rec.		92.00	45.3-138	WG698980	12/26/13 06:03
Arsenic	< 1	mg/kg			WG698952	12/26/13 14:07
Barium	< .25	mg/kg			WG698952	12/26/13 14:07
Boron	< 10	mg/kg			WG698952	12/26/13 14:07
Cadmium	< .25	mg/kg			WG698952	12/26/13 14:07
Chromium	< .5	mg/kg			WG698952	12/26/13 14:07
Copper	< 1	mg/kg			WG698952	12/26/13 14:07
Lead	< .25	mg/kg			WG698952	12/26/13 14:07
Nickel	< 1	mg/kg			WG698952	12/26/13 14:07
Selenium	< 1	mg/kg			WG698952	12/26/13 14:07
Silver	< .5	mg/kg			WG698952	12/26/13 14:07
Zinc	< 1.5	mg/kg			WG698952	12/26/13 14:07
Benzene	< .0005	mg/kg			WG698701	12/24/13 17:53
Ethylbenzene	< .0005	mg/kg			WG698701	12/24/13 17:53
Toluene	< .005	mg/kg			WG698701	12/24/13 17:53
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG698701	12/24/13 17:53
Total Xylene	< .0015	mg/kg			WG698701	12/24/13 17:53
a,a,a-Trifluorotoluene(FID)	% Rec.		111.0	59-128	WG698701	12/24/13 17:53
a,a,a-Trifluorotoluene(PID)	% Rec.		113.0	54-144	WG698701	12/24/13 17:53
Mercury	< .02	mg/kg			WG699053	12/27/13 12:16
Specific Conductance	1.40	umhos/cm			WG699244	12/28/13 13:51
Chromium,Hexavalent	< 2	mg/kg			WG699216	12/30/13 10:17
TPH (GC/FID) High Fraction	< 4	mg/kg			WG699416	12/30/13 11:15
o-Terphenyl	% Rec.		94.60	50-150	WG699416	12/30/13 11:15

* Performance of this Analyte is outside of established criteria.
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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG699400	12/30/13 18:39
Ethylbenzene	< .0005	mg/kg			WG699400	12/30/13 18:39
Toluene	< .005	mg/kg			WG699400	12/30/13 18:39
Total Xylene	< .0015	mg/kg			WG699400	12/30/13 18:39
a,a,a-Trifluorotoluene(FID)		% Rec.	95.40	59-128	WG699400	12/30/13 18:39
a,a,a-Trifluorotoluene(PID)		% Rec.	95.70	54-144	WG699400	12/30/13 18:39
TPH (GC/FID) High Fraction	< 4	mg/kg			WG699678	12/31/13 11:30
o-Terphenyl		% Rec.	90.10	50-150	WG699678	12/31/13 11:30

Analyte	Units	Result	Duplicate		Limit	Ref Samp	Batch
			Duplicate	RPD			
Arsenic	mg/kg	8.10	7.21	12.0	20	L675411-01	WG698952
Barium	mg/kg	140.	99.7	35.0*	20	L675411-01	WG698952
Boron	mg/kg	0.0	9.60	13.0	20	L675411-01	WG698952
Cadmium	mg/kg	0.0	0.211	67.0*	20	L675411-01	WG698952
Chromium	mg/kg	16.0	17.8	11.0	20	L675411-01	WG698952
Copper	mg/kg	11.0	9.26	16.0	20	L675411-01	WG698952
Lead	mg/kg	7.20	6.68	7.00	20	L675411-01	WG698952
Nickel	mg/kg	13.0	11.6	13.0	20	L675411-01	WG698952
Selenium	mg/kg	1.60	1.05	42.0*	20	L675411-01	WG698952
Silver	mg/kg	0.0	0.126	21.0*	20	L675411-01	WG698952
Zinc	mg/kg	27.0	26.8	2.00	20	L675411-01	WG698952
Mercury	mg/kg	0.600	0.722	18.0	20	L675397-02	WG699053
Specific Conductance	umhos/cm	2300	2300	0.873	20	L674945-01	WG699244
Specific Conductance	umhos/cm	2200	2100	4.65	20	L675407-03	WG699244
pH	su	7.90	8.00	1.01*	1	L675407-01	WG699412
pH	su	11.0	11.0	0.913	1	L675648-04	WG699412
Chromium,Hexavalent	mg/kg	0.0	0.0	0.0	20	L675362-04	WG699216
Chromium,Hexavalent	mg/kg	0.0	0.0	0.0	20	L675768-01	WG699216
ORP	mV	120.	120.	0.0	20	L675395-28	WG699432
ORP	mV	50.0	50.0	0.0	20	L675648-03	WG699432

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
1-Methylnaphthalene	mg/kg	.08	0.0764	95.5	62.5-121	WG698980
2-Chloronaphthalene	mg/kg	.08	0.0794	99.2	62.1-120	WG698980
2-Methylnaphthalene	mg/kg	.08	0.0760	95.1	62.5-121	WG698980
Acenaphthene	mg/kg	.08	0.0775	96.9	62.4-121	WG698980
Acenaphthylene	mg/kg	.08	0.0739	92.3	62.9-123	WG698980
Anthracene	mg/kg	.08	0.0809	101.	64.9-129	WG698980
Benzo(a)anthracene	mg/kg	.08	0.0713	89.1	61.8-125	WG698980
Benzo(a)pyrene	mg/kg	.08	0.0769	96.2	63.4-119	WG698980
Benzo(b)fluoranthene	mg/kg	.08	0.0770	96.2	62.7-119	WG698980
Benzo(g,h,i)perylene	mg/kg	.08	0.0758	94.8	68.2-129	WG698980
Benzo(k)fluoranthene	mg/kg	.08	0.0770	96.3	64.5-128	WG698980

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Chrysene	mg/kg	.08	0.0821	103.	64.4-128	WG698980
Dibenz(a,h)anthracene	mg/kg	.08	0.0786	98.3	65.3-128	WG698980
Fluoranthene	mg/kg	.08	0.0717	89.6	61.8-129	WG698980
Fluorene	mg/kg	.08	0.0761	95.2	60.8-121	WG698980
Indeno(1,2,3-cd)pyrene	mg/kg	.08	0.0800	99.9	67.6-129	WG698980
Naphthalene	mg/kg	.08	0.0740	92.5	59.5-116	WG698980
Phenanthrene	mg/kg	.08	0.0754	94.3	59.4-121	WG698980
Pyrene	mg/kg	.08	0.0793	99.2	61.2-130	WG698980
2-Fluorobiphenyl				101.0	51.1-131	WG698980
Nitrobenzene-d5				104.0	40.9-147	WG698980
p-Terphenyl-d14				95.00	45.3-138	WG698980
Arsenic	mg/kg	237	222.	94.0	83.1-117	WG698952
Barium	mg/kg	252	243.	97.0	84.1-116	WG698952
Boron	mg/kg	118	115.	97.0	74-126	WG698952
Cadmium	mg/kg	191	175.	92.0	83.2-117	WG698952
Chromium	mg/kg	128	120.	93.0	81.3-118	WG698952
Copper	mg/kg	123	119.	97.0	83.7-116	WG698952
Lead	mg/kg	103	95.4	93.0	83.1-117	WG698952
Nickel	mg/kg	118	105.	89.0	82-118	WG698952
Selenium	mg/kg	110	104.	95.0	78.7-122	WG698952
Silver	mg/kg	47.3	44.3	94.0	66.2-134	WG698952
Zinc	mg/kg	183	172.	94.0	82-118	WG698952
Benzene	mg/kg	.05	0.0590	118.	70-130	WG698701
Ethylbenzene	mg/kg	.05	0.0566	113.	70-130	WG698701
Toluene	mg/kg	.05	0.0558	112.	70-130	WG698701
Total Xylene	mg/kg	.15	0.170	113.	70-130	WG698701
a,a,a-Trifluorotoluene(PID)				111.0	54-144	WG698701
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.86	125.	63.5-137	WG698701
a,a,a-Trifluorotoluene(FID)				113.0	59-128	WG698701
Mercury	mg/kg	12.4	15.5	125.	71.6-128	WG699053
Specific Conductance	umhos/cm	510	510.	100.	85-115	WG699244
pH	su	5.93	5.90	99.5	98.3-101.7	WG699412
Chromium,Hexavalent	mg/kg	146	149.	102.	80-120	WG699216
TPH (GC/FID) High Fraction	mg/kg	60	49.9	83.1	50-150	WG699416
o-Terphenyl				104.0	50-150	WG699416
Benzene	mg/kg	.05	0.0445	89.1	70-130	WG699400
Ethylbenzene	mg/kg	.05	0.0440	88.1	70-130	WG699400
Toluene	mg/kg	.05	0.0429	85.8	70-130	WG699400
Total Xylene	mg/kg	.15	0.132	88.3	70-130	WG699400
a,a,a-Trifluorotoluene(PID)				99.90	54-144	WG699400
TPH (GC/FID) High Fraction	mg/kg	60	48.1	80.2	50-150	WG699678

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
o-Terphenyl				95.60	50-150	
ORP	mV	100	100.	100.	90-110	WG699432

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
1-Methylnaphthalene	mg/kg	0.0712	0.0764	89.0	62.5-121	7.03	20	WG698980
2-Chloronaphthalene	mg/kg	0.0723	0.0794	90.0	62.1-120	9.32	20	WG698980
2-Methylnaphthalene	mg/kg	0.0699	0.0760	87.0	62.5-121	8.40	20	WG698980
Acenaphthene	mg/kg	0.0705	0.0775	88.0	62.4-121	9.45	20	WG698980
Acenaphthylene	mg/kg	0.0672	0.0739	84.0	62.9-123	9.45	20	WG698980
Anthracene	mg/kg	0.0749	0.0809	94.0	64.9-129	7.74	20	WG698980
Benzo(a)anthracene	mg/kg	0.0650	0.0713	81.0	61.8-125	9.20	20	WG698980
Benzo(a)pyrene	mg/kg	0.0696	0.0769	87.0	63.4-119	10.1	20	WG698980
Benzo(b)fluoranthene	mg/kg	0.0724	0.0770	90.0	62.7-119	6.11	20	WG698980
Benzo(g,h,i)perylene	mg/kg	0.0708	0.0758	88.0	68.2-129	6.92	20	WG698980
Benzo(k)fluoranthene	mg/kg	0.0695	0.0770	87.0	64.5-128	10.2	20	WG698980
Chrysene	mg/kg	0.0743	0.0821	93.0	64.4-128	9.98	20	WG698980
Dibenz(a,h)anthracene	mg/kg	0.0729	0.0786	91.0	65.3-128	7.53	20	WG698980
Fluoranthene	mg/kg	0.0652	0.0717	81.0	61.8-129	9.50	20	WG698980
Fluorene	mg/kg	0.0695	0.0761	87.0	60.8-121	9.03	20	WG698980
Indeno(1,2,3-cd)pyrene	mg/kg	0.0744	0.0800	93.0	67.6-129	7.19	20	WG698980
Naphthalene	mg/kg	0.0682	0.0740	85.0	59.5-116	8.15	20	WG698980
Phenanthrene	mg/kg	0.0687	0.0754	86.0	59.4-121	9.31	20	WG698980
Pyrene	mg/kg	0.0740	0.0793	92.0	61.2-130	7.03	20	WG698980
2-Fluorobiphenyl				91.40	51.1-131			WG698980
Nitrobenzene-d5				92.80	40.9-147			WG698980
p-Terphenyl-d14				85.90	45.3-138			WG698980
Benzene	mg/kg	0.0612	0.0590	122.	70-130	3.65	20	WG698701
Ethylbenzene	mg/kg	0.0586	0.0566	117.	70-130	3.41	20	WG698701
Toluene	mg/kg	0.0577	0.0558	115.	70-130	3.35	20	WG698701
Total Xylene	mg/kg	0.176	0.170	117.	70-130	3.53	20	WG698701
a,a,a-Trifluorotoluene(PID)				111.0	54-144			WG698701
TPH (GC/FID) Low Fraction	mg/kg	6.70	6.86	122.	63.5-137	2.47	20	WG698701
a,a,a-Trifluorotoluene(FID)				113.0	59-128			WG698701
Specific Conductance	umhos/	510.	510.	100.	85-115	0.0	20	WG699244
pH	su	5.90	5.90	99.0	98.3-101.7	0.0	20	WG699412
Chromium,Hexavalent	mg/kg	145.	149.	99.0	80-120	2.72	20	WG699216
TPH (GC/FID) High Fraction	mg/kg	52.6	49.9	88.0	50-150	5.42	20	WG699416
o-Terphenyl				109.0	50-150			WG699416
Benzene	mg/kg	0.0451	0.0445	90.0	70-130	1.26	20	WG699400
Ethylbenzene	mg/kg	0.0451	0.0440	90.0	70-130	2.37	20	WG699400
Toluene	mg/kg	0.0439	0.0429	88.0	70-130	2.21	20	WG699400
Total Xylene	mg/kg	0.136	0.132	91.0	70-130	2.69	20	WG699400
a,a,a-Trifluorotoluene(PID)				99.10	54-144			WG699400

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
TPH (GC/FID) High Fraction	mg/kg	45.2	48.1	75.0	50-150	6.29	20	WG699678
o-Terphenyl				94.00	50-150			WG699678
ORP	mV	100.	100.	100.	90-110	0.0	20	WG699432

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
1-Methylnaphthalene	mg/kg	0.0621	0.	.08	77.6	58.9-123	L675362-01	WG698980
2-Chloronaphthalene	mg/kg	0.0654	0.	.08	81.7	61.6-120	L675362-01	WG698980
2-Methylnaphthalene	mg/kg	0.0612	0.	.08	76.5	50.7-129	L675362-01	WG698980
Acenaphthene	mg/kg	0.0610	0.	.08	76.2	51.6-124	L675362-01	WG698980
Acenaphthylene	mg/kg	0.0606	0.	.08	75.7	58.3-126	L675362-01	WG698980
Anthracene	mg/kg	0.0636	0.	.08	79.6	47.9-137	L675362-01	WG698980
Benzo(a)anthracene	mg/kg	0.0541	0.	.08	67.6	34.2-138	L675362-01	WG698980
Benzo(a)pyrene	mg/kg	0.0597	0.	.08	74.6	34.6-133	L675362-01	WG698980
Benzo(b)fluoranthene	mg/kg	0.0511	0.	.08	63.9	19.8-142	L675362-01	WG698980
Benzo(g,h,i)perylene	mg/kg	0.0562	0.	.08	70.2	20-149	L675362-01	WG698980
Benzo(k)fluoranthene	mg/kg	0.0626	0.	.08	78.2	32.1-137	L675362-01	WG698980
Chrysene	mg/kg	0.0639	0.	.08	79.8	36.6-137	L675362-01	WG698980
Dibenz(a,h)anthracene	mg/kg	0.0611	0.	.08	76.3	27.1-145	L675362-01	WG698980
Fluoranthene	mg/kg	0.0527	0.	.08	65.9	39.8-141	L675362-01	WG698980
Fluorene	mg/kg	0.0604	0.	.08	75.5	42.5-130	L675362-01	WG698980
Indeno(1,2,3-cd)pyrene	mg/kg	0.0589	0.	.08	73.6	19-151	L675362-01	WG698980
Naphthalene	mg/kg	0.0613	0.00128	.08	75.0	40.6-135	L675362-01	WG698980
Phenanthrene	mg/kg	0.0579	0.	.08	72.4	39.7-129	L675362-01	WG698980
Pyrene	mg/kg	0.0578	0.	.08	72.2	31.5-141	L675362-01	WG698980
2-Fluorobiphenyl					89.30	51.1-131		WG698980
Nitrobenzene-d5					88.80	40.9-147		WG698980
p-Terphenyl-d14					80.60	45.3-138		WG698980

Arsenic	mg/kg	55.6	7.21	50	97.0	75-125	L675411-01	WG698952
Barium	mg/kg	140.	99.7	50	81.0	75-125	L675411-01	WG698952
Boron	mg/kg	56.5	9.60	50	94.0	75-125	L675411-01	WG698952
Cadmium	mg/kg	47.9	0.211	50	95.0	75-125	L675411-01	WG698952
Chromium	mg/kg	65.6	17.8	50	96.0	75-125	L675411-01	WG698952
Copper	mg/kg	57.9	9.26	50	97.0	75-125	L675411-01	WG698952
Lead	mg/kg	53.6	6.68	50	94.0	75-125	L675411-01	WG698952
Nickel	mg/kg	56.1	11.6	50	89.0	75-125	L675411-01	WG698952
Selenium	mg/kg	47.1	1.05	50	92.0	75-125	L675411-01	WG698952
Silver	mg/kg	49.5	0.126	50	99.0	75-125	L675411-01	WG698952
Zinc	mg/kg	74.6	26.8	50	96.0	75-125	L675411-01	WG698952

Benzene	mg/kg	0.233	0.0	.05	93.0	49.7-127	L675407-01	WG698701
Ethylbenzene	mg/kg	0.226	0.0	.05	91.0	40.8-141	L675407-01	WG698701
Toluene	mg/kg	0.225	0.000998	.05	89.0	49.8-132	L675407-01	WG698701
Total Xylene	mg/kg	0.679	0.00148	.15	90.0	41.2-140	L675407-01	WG698701
a,a,a-Trifluorotoluene(PID)					110.0	54-144		WG698701
TPH (GC/FID) Low Fraction	mg/kg	25.9	0.0123	5.5	94.0	28.5-138	L675407-01	WG698701
a,a,a-Trifluorotoluene(FID)					111.0	59-128		WG698701

Mercury	mg/kg	0.888	0.722	.025	66.0*	80-120	L675397-02	WG699053
Chromium,Hexavalent	mg/kg	15.2	0.0	20	76.0	75-125	L675648-05	WG699216

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L675407

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

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Est. 1970

January 02, 2014

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Benzene	mg/kg	0.274	0.0	.05	110.	49.7-127	L675671-01	WG699400
Ethylbenzene	mg/kg	0.254	0.0	.05	100.	40.8-141	L675671-01	WG699400
Toluene	mg/kg	0.260	0.000808	.05	100.	49.8-132	L675671-01	WG699400
Total Xylene	mg/kg	0.762	0.000800	.15	100.	41.2-140	L675671-01	WG699400
a,a,a-Trifluorotoluene(PID)					99.80	54-144		WG699400
TPH (GC/FID) High Fraction	mg/kg	54.2	0.156	60	90.0	50-150	L675406-42	WG699416
o-Terphenyl					108.0	50-150		WG699416

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
1-Methylnaphthalene	mg/kg	0.0640	0.0621	80.0	58.9-123	3.04	20	L675362-01	WG698980
2-Chloronaphthalene	mg/kg	0.0665	0.0654	83.1	61.6-120	1.64	20	L675362-01	WG698980
2-Methylnaphthalene	mg/kg	0.0627	0.0612	78.4	50.7-129	2.44	20	L675362-01	WG698980
Acenaphthene	mg/kg	0.0627	0.0610	78.3	51.6-124	2.73	20	L675362-01	WG698980
Acenaphthylene	mg/kg	0.0629	0.0606	78.6	58.3-126	3.67	20	L675362-01	WG698980
Anthracene	mg/kg	0.0652	0.0636	81.4	47.9-137	2.33	20	L675362-01	WG698980
Benzo(a)anthracene	mg/kg	0.0534	0.0541	66.7	34.2-138	1.38	22.8	L675362-01	WG698980
Benzo(a)pyrene	mg/kg	0.0594	0.0597	74.2	34.6-133	0.470	26.3	L675362-01	WG698980
Benzo(b)fluoranthene	mg/kg	0.0455	0.0511	56.9	19.8-142	11.6	30.3	L675362-01	WG698980
Benzo(g,h,i)perylene	mg/kg	0.0553	0.0562	69.1	20-149	1.58	27.1	L675362-01	WG698980
Benzo(k)fluoranthene	mg/kg	0.0658	0.0626	82.2	32.1-137	5.03	24.6	L675362-01	WG698980
Chrysene	mg/kg	0.0666	0.0639	83.2	36.6-137	4.18	22.7	L675362-01	WG698980
Dibenz(a,h)anthracene	mg/kg	0.0613	0.0611	76.6	27.1-145	0.360	21.9	L675362-01	WG698980
Fluoranthene	mg/kg	0.0504	0.0527	63.0	39.8-141	4.50	22.2	L675362-01	WG698980
Fluorene	mg/kg	0.0608	0.0604	76.0	42.5-130	0.580	20	L675362-01	WG698980
Indeno(1,2,3-cd)pyrene	mg/kg	0.0582	0.0589	72.8	19-151	1.09	25	L675362-01	WG698980
Naphthalene	mg/kg	0.0636	0.0613	77.9	40.6-135	3.74	20	L675362-01	WG698980
Phenanthrene	mg/kg	0.0578	0.0579	72.3	39.7-129	0.0700	20	L675362-01	WG698980
Pyrene	mg/kg	0.0560	0.0578	70.0	31.5-141	3.13	23.5	L675362-01	WG698980
2-Fluorobiphenyl				94.10	51.1-131				WG698980
Nitrobenzene-d5				101.0	40.9-147				WG698980
p-Terphenyl-d14				85.40	45.3-138				WG698980

Arsenic	mg/kg	53.5	55.6	92.6	75-125	4.00	20	L675411-01	WG698952
Barium	mg/kg	125.	140.	49.8*	75-125	12.0	20	L675411-01	WG698952
Boron	mg/kg	55.3	56.5	91.4	75-125	2.00	20	L675411-01	WG698952
Cadmium	mg/kg	47.2	47.9	93.9	75-125	1.00	20	L675411-01	WG698952
Chromium	mg/kg	63.9	65.6	92.3	75-125	3.00	20	L675411-01	WG698952
Copper	mg/kg	57.6	57.9	96.6	75-125	1.00	20	L675411-01	WG698952
Lead	mg/kg	53.2	53.6	93.1	75-125	1.00	20	L675411-01	WG698952
Nickel	mg/kg	53.7	56.1	84.2	75-125	5.00	20	L675411-01	WG698952
Selenium	mg/kg	46.4	47.1	90.8	75-125	1.00	20	L675411-01	WG698952
Silver	mg/kg	48.6	49.5	97.0	75-125	2.00	20	L675411-01	WG698952
Zinc	mg/kg	72.8	74.6	92.1	75-125	2.00	20	L675411-01	WG698952

Benzene	mg/kg	0.235	0.233	94.0	49.7-127	0.650	23.5	L675407-01	WG698701
Ethylbenzene	mg/kg	0.225	0.226	89.8	40.8-141	0.800	23.8	L675407-01	WG698701
Toluene	mg/kg	0.222	0.225	88.4	49.8-132	1.12	23.5	L675407-01	WG698701
Total Xylene	mg/kg	0.672	0.679	89.4	41.2-140	1.02	23.7	L675407-01	WG698701
a,a,a-Trifluorotoluene(PID)				111.0	54-144				WG698701
TPH (GC/FID) Low Fraction	mg/kg	25.1	25.9	91.1	28.5-138	3.33	23.6	L675407-01	WG698701
a,a,a-Trifluorotoluene(FID)				110.0	59-128				WG698701

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Denver, CO 80202

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Level II

L675407

12065 Lebanon Rd.
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January 02, 2014

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
Mercury	mg/kg	1.07	0.888	141.*	80-120	19.0	20	L675397-02		WG699053
Chromium,Hexavalent	mg/kg	17.0	15.2	85.0	75-125	11.2	20	L675648-05		WG699216
Benzene	mg/kg	0.288	0.274	115.	49.7-127	5.04	23.5	L675671-01		WG699400
Ethylbenzene	mg/kg	0.255	0.254	102.	40.8-141	0.0500	23.8	L675671-01		WG699400
Toluene	mg/kg	0.263	0.260	105.	49.8-132	1.18	23.5	L675671-01		WG699400
Total Xylene	mg/kg	0.762	0.762	101.	41.2-140	0.0	23.7	L675671-01		WG699400
a,a,a-Trifluorotoluene(PID)				100.0	54-144					WG699400
TPH (GC/FID) High Fraction	mg/kg	53.5	54.2	88.9	50-150	1.41	20	L675406-42		WG699416
o-Terphenyl				108.0	50-150					WG699416

Post Spike

Serial Dilution

Batch number /Run number / Sample number cross reference

WG698980: R2871896: L675407-06

WG698952: R2871911: L675407-06

WG698701: R2871935: L675407-01 02 03 04 05 06

WG699053: R2872216: L675407-06

* Performance of this Analyte is outside of established criteria.

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January 02, 2014

WG699287: R2872396: L675407-01 02 03 04 05 06
WG699244: R2872456: L675407-01 02 03 04 05 06
WG699412: R2872459: L675407-01 02 03 04 05 06
WG699216: R2872481: L675407-06
WG699416: R2872557 R2872968: L675407-02 03 04 05 06
WG699400: R2872720: L675407-05 06
WG699678: R2872970: L675407-01
WG699432: R2873155: L675407-06

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.



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Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Monday January 13, 2014

Report Number: L676938

Samples Received: 01/08/14

Client Project:

Description: D20 Spill Response

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

January 13, 2014

Date Received : January 08, 2014
Description : D20 Spill Response
Sample ID : D20-SPOILS-2
Collected By : Aaron Kelly
Collection Date : 01/03/14 12:00

ESC Sample # : L676938-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	01/09/14	1
ORP	160		mV	2580 B-2011	01/10/14	1
pH	9.2		su	9045D	01/13/14	1
Sodium Adsorption Ratio	5.8			Calc.	01/10/14	1
Specific Conductance	1600		umhos/cm	9050AMod	01/12/14	1
Mercury	0.030	0.020	mg/kg	7471	01/09/14	1
Arsenic	3.8	1.0	mg/kg	6010B	01/09/14	1
Barium	160	0.25	mg/kg	6010B	01/09/14	1
Boron	14.	10.	mg/kg	6010B	01/09/14	1
Cadmium	0.98	0.25	mg/kg	6010B	01/09/14	1
Chromium	14.	0.50	mg/kg	6010B	01/09/14	1
Copper	20.	1.0	mg/kg	6010B	01/09/14	1
Lead	11.	0.25	mg/kg	6010B	01/09/14	1
Nickel	16.	1.0	mg/kg	6010B	01/09/14	1
Selenium	1.4	1.0	mg/kg	6010B	01/09/14	1
Silver	BDL	0.50	mg/kg	6010B	01/09/14	1
Zinc	69.	1.5	mg/kg	6010B	01/09/14	1
Benzene	0.0047	0.0025	mg/kg	8021/8015	01/09/14	5
Toluene	BDL	0.025	mg/kg	8021/8015	01/09/14	5
Ethylbenzene	0.026	0.0025	mg/kg	8021/8015	01/09/14	5
Total Xylene	0.72	0.0075	mg/kg	8021/8015	01/09/14	5
TPH (GC/FID) Low Fraction	15.	0.50	mg/kg	GRO	01/09/14	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8021/8015	01/09/14	5
a,a,a-Trifluorotoluene(PID)	107.		% Rec.	8021/8015	01/09/14	5
TPH (GC/FID) High Fraction	130	4.0	mg/kg	3546/DRO	01/09/14	1
Surrogate recovery(%)						
o-Terphenyl	78.4		% Rec.	3546/DRO	01/09/14	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Acenaphthene	0.0070	0.0060	mg/kg	8270C-SIM	01/10/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L676938-01 (PH) - 9.2@22.1c



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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

January 13, 2014

Date Received : January 08, 2014
Description : D20 Spill Response
Sample ID : D20-SPOILS-2
Collected By : Aaron Kelly
Collection Date : 01/03/14 12:00

ESC Sample # : L676938-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Fluorene	0.022	0.0060	mg/kg	8270C-SIM	01/10/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
Naphthalene	0.076	0.020	mg/kg	8270C-SIM	01/10/14	1
Phenanthrene	0.025	0.0060	mg/kg	8270C-SIM	01/10/14	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/10/14	1
1-Methylnaphthalene	0.12	0.020	mg/kg	8270C-SIM	01/10/14	1
2-Methylnaphthalene	0.28	0.020	mg/kg	8270C-SIM	01/10/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	01/10/14	1
Surrogate Recovery						
Nitrobenzene-d5	64.3		% Rec.	8270C-SIM	01/10/14	1
2-Fluorobiphenyl	96.8		% Rec.	8270C-SIM	01/10/14	1
p-Terphenyl-d14	90.1		% Rec.	8270C-SIM	01/10/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 01/13/14 17:30 Printed: 01/13/14 17:30
L676938-01 (PH) - 9.2@22.1c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L676938-01	WG700674	SAMP	Chromium, Hexavalent	R2875100	J6

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
01/13/14 at 17:30:59

TSR Signing Reports: 134
R4 - Rush: Three Day

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L676938-01 Account: BERPETDCO Received: 01/08/14 11:00 Due Date: 01/13/14 00:00 RPT Date: 01/13/14 17:30



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Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

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L676938

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Est. 1970

January 13, 2014

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG700622	01/08/14 16:29
Ethylbenzene	< .0005	mg/kg			WG700622	01/08/14 16:29
Toluene	< .005	mg/kg			WG700622	01/08/14 16:29
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG700622	01/08/14 16:29
Total Xylene	< .0015	mg/kg			WG700622	01/08/14 16:29
a,a,a-Trifluorotoluene(FID)		% Rec.	106.0	59-128	WG700622	01/08/14 16:29
a,a,a-Trifluorotoluene(PID)		% Rec.	106.0	54-144	WG700622	01/08/14 16:29
TPH (GC/FID) High Fraction	< 4	mg/kg			WG700644	01/09/14 08:58
o-Terphenyl		% Rec.	82.80	50-150	WG700644	01/09/14 08:58
Mercury	< .02	mg/kg			WG700586	01/09/14 08:57
Arsenic	< 1	mg/kg			WG700625	01/09/14 04:46
Barium	< .25	mg/kg			WG700625	01/09/14 04:46
Boron	< 10	mg/kg			WG700625	01/09/14 04:46
Cadmium	< .25	mg/kg			WG700625	01/09/14 04:46
Chromium	< .5	mg/kg			WG700625	01/09/14 04:46
Copper	< 1	mg/kg			WG700625	01/09/14 04:46
Lead	< .25	mg/kg			WG700625	01/09/14 04:46
Nickel	< 1	mg/kg			WG700625	01/09/14 04:46
Selenium	< 1	mg/kg			WG700625	01/09/14 04:46
Silver	< .5	mg/kg			WG700625	01/09/14 04:46
Zinc	< 1.5	mg/kg			WG700625	01/09/14 04:46
Chromium, Hexavalent	< 2	mg/kg			WG700674	01/09/14 14:21
1-Methylnaphthalene	< .02	mg/kg			WG700702	01/10/14 02:00
2-Chloronaphthalene	< .02	mg/kg			WG700702	01/10/14 02:00
2-Methylnaphthalene	< .02	mg/kg			WG700702	01/10/14 02:00
Acenaphthene	< .006	mg/kg			WG700702	01/10/14 02:00
Acenaphthylene	< .006	mg/kg			WG700702	01/10/14 02:00
Anthracene	< .006	mg/kg			WG700702	01/10/14 02:00
Benzo(a)anthracene	< .006	mg/kg			WG700702	01/10/14 02:00
Benzo(a)pyrene	< .006	mg/kg			WG700702	01/10/14 02:00
Benzo(b)fluoranthene	< .006	mg/kg			WG700702	01/10/14 02:00
Benzo(g,h,i)perylene	< .006	mg/kg			WG700702	01/10/14 02:00
Benzo(k)fluoranthene	< .006	mg/kg			WG700702	01/10/14 02:00
Chrysene	< .006	mg/kg			WG700702	01/10/14 02:00
Dibenz(a,h)anthracene	< .006	mg/kg			WG700702	01/10/14 02:00
Fluoranthene	< .006	mg/kg			WG700702	01/10/14 02:00
Fluorene	< .006	mg/kg			WG700702	01/10/14 02:00
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG700702	01/10/14 02:00
Naphthalene	< .02	mg/kg			WG700702	01/10/14 02:00
Phenanthrene	< .006	mg/kg			WG700702	01/10/14 02:00
Pyrene	< .006	mg/kg			WG700702	01/10/14 02:00
2-Fluorobiphenyl		% Rec.	107.0	51.1-131	WG700702	01/10/14 02:00
Nitrobenzene-d5		% Rec.	71.60	40.9-147	WG700702	01/10/14 02:00
p-Terphenyl-d14		% Rec.	87.80	45.3-138	WG700702	01/10/14 02:00
Specific Conductance	1.80	umhos/cm			WG700819	01/12/14 23:32

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Tax I.D. 62-0814289

Est. 1970

January 13, 2014

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Mercury	mg/kg	0.0	0.0200	3.00	20	L676844-01	WG700586
Copper	mg/kg	480.	582.	20.0	20	L676958-06	WG700625
Nickel	mg/kg	70.0	128.	58.0*	20	L676958-06	WG700625
Arsenic	mg/kg	0.0	-11.8	10.0	20	L676958-06	WG700625
Barium	mg/kg	240.	221.	7.00	20	L676958-06	WG700625
Boron	mg/kg	130.	155.	15.0	20	L676958-06	WG700625
Cadmium	mg/kg	18.0	24.4	28.0*	20	L676958-06	WG700625
Chromium	mg/kg	2300	2740	16.0	20	L676958-06	WG700625
Lead	mg/kg	360.	479.	29.0*	20	L676958-06	WG700625
Selenium	mg/kg	19.0	22.4	16.0	20	L676958-06	WG700625
Silver	mg/kg	10.0	11.2	10.0	20	L676958-06	WG700625
Zinc	mg/kg	9100	11900	26.0*	20	L676958-06	WG700625
Chromium,Hexavalent	mg/kg	0.0	0.0	0.0	20	L676844-01	WG700674
ORP	mV	240.	230.	3.00	20	L677207-25	WG700811
Specific Conductance	umhos/cm	1600	1600	1.73	20	L676938-01	WG700819
pH	su	5.40	5.50	1.83*	1	L676773-15	WG700829

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0552	110.	70-130	WG700622
Ethylbenzene	mg/kg	.05	0.0532	106.	70-130	WG700622
Toluene	mg/kg	.05	0.0529	106.	70-130	WG700622
Total Xylene	mg/kg	.15	0.162	108.	70-130	WG700622
a,a,a-Trifluorotoluene(PID)				106.0	54-144	WG700622
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.13	111.	63.5-137	WG700622
a,a,a-Trifluorotoluene(FID)				106.0	59-128	WG700622
TPH (GC/FID) High Fraction	mg/kg	60	47.0	78.3	50-150	WG700644
o-Terphenyl				83.60	50-150	WG700644
Mercury	mg/kg	12.4	13.9	112.	71.6-128	WG700586
Arsenic	mg/kg	237	219.	92.0	83.1-117	WG700625
Barium	mg/kg	252	244.	97.0	84.1-116	WG700625
Boron	mg/kg	118	114.	97.0	74-126	WG700625
Cadmium	mg/kg	191	182.	95.0	83.2-117	WG700625
Chromium	mg/kg	128	121.	94.0	81.3-118	WG700625
Copper	mg/kg	123	118.	96.0	83.7-116	WG700625
Lead	mg/kg	103	93.8	91.0	83.1-117	WG700625
Nickel	mg/kg	118	105.	89.0	82-118	WG700625
Selenium	mg/kg	110	106.	96.0	78.7-122	WG700625
Silver	mg/kg	47.3	43.3	92.0	66.2-134	WG700625
Zinc	mg/kg	183	173.	95.0	82-118	WG700625
Chromium,Hexavalent	mg/kg	125	118.	94.4	80-120	WG700674

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
1-Methylnaphthalene	mg/kg	.08	0.0807	101.	62.5-121	WG700702
2-Chloronaphthalene	mg/kg	.08	0.0848	106.	62.1-120	WG700702
2-Methylnaphthalene	mg/kg	.08	0.0808	101.	62.5-121	WG700702
Acenaphthene	mg/kg	.08	0.0767	95.9	62.4-121	WG700702
Acenaphthylene	mg/kg	.08	0.0726	90.8	62.9-123	WG700702
Anthracene	mg/kg	.08	0.0920	115.	64.9-129	WG700702
Benzo(a)anthracene	mg/kg	.08	0.0765	95.6	61.8-125	WG700702
Benzo(a)pyrene	mg/kg	.08	0.0725	90.6	63.4-119	WG700702
Benzo(b)fluoranthene	mg/kg	.08	0.0811	101.	62.7-119	WG700702
Benzo(g,h,i)perylene	mg/kg	.08	0.0773	96.7	68.2-129	WG700702
Benzo(k)fluoranthene	mg/kg	.08	0.0880	110.	64.5-128	WG700702
Chrysene	mg/kg	.08	0.0873	109.	64.4-128	WG700702
Dibenz(a,h)anthracene	mg/kg	.08	0.0797	99.6	65.3-128	WG700702
Fluoranthene	mg/kg	.08	0.100	125.	61.8-129	WG700702
Fluorene	mg/kg	.08	0.0791	98.9	60.8-121	WG700702
Indeno(1,2,3-cd)pyrene	mg/kg	.08	0.0789	98.6	67.6-129	WG700702
Naphthalene	mg/kg	.08	0.0706	88.2	59.5-116	WG700702
Phenanthrene	mg/kg	.08	0.0775	96.8	59.4-121	WG700702
Pyrene	mg/kg	.08	0.0765	95.7	61.2-130	WG700702
2-Fluorobiphenyl				106.0	51.1-131	WG700702
Nitrobenzene-d5				102.0	40.9-147	WG700702
p-Terphenyl-d14				88.40	45.3-138	WG700702
ORP	mV	100	93.0	93.0	90-110	WG700811
Specific Conductance	umhos/cm	510	510.	100.	85-115	WG700819
pH	su	5.93	5.90	99.5	98.3-101.7	WG700829

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzene	mg/kg	0.0515	0.0552	103.	70-130	7.00	20	WG700622
Ethylbenzene	mg/kg	0.0507	0.0532	101.	70-130	4.81	20	WG700622
Toluene	mg/kg	0.0499	0.0529	100.	70-130	5.79	20	WG700622
Total Xylene	mg/kg	0.153	0.162	102.	70-130	5.29	20	WG700622
a,a,a-Trifluorotoluene(PID)				104.0	54-144			WG700622
TPH (GC/FID) Low Fraction	mg/kg	6.28	6.13	114.	63.5-137	2.40	20	WG700622
a,a,a-Trifluorotoluene(FID)				106.0	59-128			WG700622
TPH (GC/FID) High Fraction	mg/kg	48.9	47.0	81.0	50-150	3.97	20	WG700644
o-Terphenyl				87.50	50-150			WG700644
Chromium,Hexavalent	mg/kg	119.	118.	95.0	80-120	0.844	20	WG700674
1-Methylnaphthalene	mg/kg	0.0775	0.0807	97.0	62.5-121	4.12	20	WG700702
2-Chloronaphthalene	mg/kg	0.0819	0.0848	102.	62.1-120	3.44	20	WG700702
2-Methylnaphthalene	mg/kg	0.0774	0.0808	97.0	62.5-121	4.24	20	WG700702
Acenaphthene	mg/kg	0.0737	0.0767	92.0	62.4-121	3.96	20	WG700702
Acenaphthylene	mg/kg	0.0687	0.0726	86.0	62.9-123	5.52	20	WG700702
Anthracene	mg/kg	0.0855	0.0920	107.	64.9-129	7.25	20	WG700702
Benzo(a)anthracene	mg/kg	0.0712	0.0765	89.0	61.8-125	7.14	20	WG700702
Benzo(a)pyrene	mg/kg	0.0694	0.0725	87.0	63.4-119	4.36	20	WG700702

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzo(b)fluoranthene	mg/kg	0.0739	0.0811	92.0	62.7-119	9.27	20	WG700702
Benzo(g,h,i)perylene	mg/kg	0.0757	0.0773	94.0	68.2-129	2.17	20	WG700702
Benzo(k)fluoranthene	mg/kg	0.0910	0.0880	114.	64.5-128	3.30	20	WG700702
Chrysene	mg/kg	0.0832	0.0873	104.	64.4-128	4.76	20	WG700702
Dibenz(a,h)anthracene	mg/kg	0.0759	0.0797	95.0	65.3-128	4.80	20	WG700702
Fluoranthene	mg/kg	0.0961	0.100	120.	61.8-129	4.10	20	WG700702
Fluorene	mg/kg	0.0744	0.0791	93.0	60.8-121	6.04	20	WG700702
Indeno(1,2,3-cd)pyrene	mg/kg	0.0760	0.0789	95.0	67.6-129	3.76	20	WG700702
Naphthalene	mg/kg	0.0669	0.0706	84.0	59.5-116	5.38	20	WG700702
Phenanthrene	mg/kg	0.0755	0.0775	94.0	59.4-121	2.59	20	WG700702
Pyrene	mg/kg	0.0732	0.0765	92.0	61.2-130	4.46	20	WG700702
2-Fluorobiphenyl				99.00	51.1-131			WG700702
Nitrobenzene-d5				68.40	40.9-147			WG700702
p-Terphenyl-d14				81.90	45.3-138			WG700702
ORP	mV	94.0	93.0	94.0	90-110	1.07	20	WG700811
Specific Conductance	umhos/	510.	510.	100.	85-115	0.0	20	WG700819
pH	su	5.90	5.90	99.0	98.3-101.7	0.0	20	WG700829

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Benzene	mg/kg	0.300	0.0	.05	120.	49.7-127	L676935-03	WG700622
Ethylbenzene	mg/kg	0.285	0.0	.05	110.	40.8-141	L676935-03	WG700622
Toluene	mg/kg	0.287	0.00111	.05	110.	49.8-132	L676935-03	WG700622
Total Xylene	mg/kg	0.864	0.000914	.15	120.	41.2-140	L676935-03	WG700622
a,a,a-Trifluorotoluene(PID)					100.0	54-144		WG700622
TPH (GC/FID) Low Fraction	mg/kg	27.0	0.0	5.5	98.0	28.5-138	L676935-03	WG700622
a,a,a-Trifluorotoluene(FID)					104.0	59-128		WG700622
TPH (GC/FID) High Fraction	mg/kg	41.8	0.00952	60	70.0	50-150	L676969-03	WG700644
o-Terphenyl					75.60	50-150		WG700644
Mercury	mg/kg	0.252	0.0200	.25	93.0	80-120	L676844-01	WG700586
Copper	mg/kg	602.	582.	50	39.0*	75-125	L676958-06	WG700625
Nickel	mg/kg	137.	128.	50	17.0*	75-125	L676958-06	WG700625
Arsenic	mg/kg	42.5	-11.8	10	85.0	75-125	L676958-06	WG700625
Barium	mg/kg	269.	221.	10	96.0	75-125	L676958-06	WG700625
Boron	mg/kg	190.	155.	10	71.0*	75-125	L676958-06	WG700625
Cadmium	mg/kg	73.4	24.4	10	98.0	75-125	L676958-06	WG700625
Chromium	mg/kg	2540	2740	10	0.0*	75-125	L676958-06	WG700625
Lead	mg/kg	477.	479.	10	0.0*	75-125	L676958-06	WG700625
Selenium	mg/kg	67.5	22.4	10	90.0	75-125	L676958-06	WG700625
Silver	mg/kg	65.1	11.2	10	110.	75-125	L676958-06	WG700625
Zinc	mg/kg	11200	11900	10	0.0*	75-125	L676958-06	WG700625
Chromium,Hexavalent	mg/kg	10.2	0.0	20	51.0*	75-125	L676938-01	WG700674

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
1-Methylnaphthalene	mg/kg	0.0767	0.	.08	95.9	58.9-123	L677009-03	WG700702
2-Chloronaphthalene	mg/kg	0.0821	0.	.08	103.	61.6-120	L677009-03	WG700702
2-Methylnaphthalene	mg/kg	0.0773	0.	.08	96.6	50.7-129	L677009-03	WG700702
Acenaphthene	mg/kg	0.0733	0.	.08	91.6	51.6-124	L677009-03	WG700702
Acenaphthylene	mg/kg	0.0730	0.	.08	91.2	58.3-126	L677009-03	WG700702
Anthracene	mg/kg	0.0905	0.	.08	113.	47.9-137	L677009-03	WG700702
Benzo(a)anthracene	mg/kg	0.0677	0.	.08	84.7	34.2-138	L677009-03	WG700702
Benzo(a)pyrene	mg/kg	0.0752	0.	.08	94.1	34.6-133	L677009-03	WG700702
Benzo(b)fluoranthene	mg/kg	0.0641	0.	.08	80.1	19.8-142	L677009-03	WG700702
Benzo(g,h,i)perylene	mg/kg	0.0676	0.	.08	84.4	20-149	L677009-03	WG700702
Benzo(k)fluoranthene	mg/kg	0.0796	0.	.08	99.5	32.1-137	L677009-03	WG700702
Chrysene	mg/kg	0.0817	0.	.08	102.	36.6-137	L677009-03	WG700702
Dibenz(a,h)anthracene	mg/kg	0.0725	0.	.08	90.6	27.1-145	L677009-03	WG700702
Fluoranthene	mg/kg	0.0890	0.	.08	111.	39.8-141	L677009-03	WG700702
Fluorene	mg/kg	0.0726	0.	.08	90.7	42.5-130	L677009-03	WG700702
Indeno(1,2,3-cd)pyrene	mg/kg	0.0683	0.	.08	85.4	19-151	L677009-03	WG700702
Naphthalene	mg/kg	0.0696	0.000984	.08	85.8	40.6-135	L677009-03	WG700702
Phenanthrene	mg/kg	0.0700	0.	.08	87.5	39.7-129	L677009-03	WG700702
Pyrene	mg/kg	0.0694	0.	.08	86.8	31.5-141	L677009-03	WG700702
2-Fluorobiphenyl					104.0	51.1-131		WG700702
Nitrobenzene-d5					77.50	40.9-147		WG700702
p-Terphenyl-d14					87.90	45.3-138		WG700702

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.253	0.300	101.	49.7-127	17.0	23.5	L676935-03	WG700622
Ethylbenzene	mg/kg	0.243	0.285	97.2	40.8-141	16.0	23.8	L676935-03	WG700622
Toluene	mg/kg	0.239	0.287	95.3	49.8-132	18.2	23.5	L676935-03	WG700622
Total Xylene	mg/kg	0.729	0.864	97.0	41.2-140	17.0	23.7	L676935-03	WG700622
a,a,a-Trifluorotoluene(PID)				102.0	54-144				WG700622
TPH (GC/FID) Low Fraction	mg/kg	29.1	27.0	106.	28.5-138	7.53	23.6	L676935-03	WG700622
a,a,a-Trifluorotoluene(FID)				105.0	59-128				WG700622
TPH (GC/FID) High Fraction	mg/kg	43.4	41.8	72.4	50-150	3.90	20	L676969-03	WG700644
o-Terphenyl				76.50	50-150				WG700644
Mercury	mg/kg	0.249	0.252	91.7	80-120	1.00	20	L676844-01	WG700586
Copper	mg/kg	647.	602.	129.*	75-125	7.00	20	L676958-06	WG700625
Nickel	mg/kg	134.	137.	10.8*	75-125	2.00	20	L676958-06	WG700625
Arsenic	mg/kg	45.2	42.5	114.	75-125	6.00	20	L676958-06	WG700625
Barium	mg/kg	273.	269.	103.	75-125	1.00	20	L676958-06	WG700625
Boron	mg/kg	186.	190.	62.4*	75-125	2.00	20	L676958-06	WG700625
Cadmium	mg/kg	87.0	73.4	125.	75-125	17.0	20	L676958-06	WG700625
Chromium	mg/kg	2450	2540	0*	75-125	4.00	20	L676958-06	WG700625
Lead	mg/kg	582.	477.	205.*	75-125	20.0	20	L676958-06	WG700625
Selenium	mg/kg	70.3	67.5	95.9	75-125	4.00	20	L676958-06	WG700625
Silver	mg/kg	67.9	65.1	113.	75-125	4.00	20	L676958-06	WG700625
Zinc	mg/kg	14200	11200	4770*	75-125	24.0*	20	L676958-06	WG700625
Chromium, Hexavalent	mg/kg	10.4	10.2	52.0*	75-125	1.94	20	L676938-01	WG700674
1-Methylnaphthalene	mg/kg	0.0797	0.0767	99.6	58.9-123	3.82	20	L677009-03	WG700702

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L676938

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

January 13, 2014

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
2-Chloronaphthalene	mg/kg	0.0842	0.0821	105.	61.6-120	2.56	20	L677009-03	WG700702	
2-Methylnaphthalene	mg/kg	0.0798	0.0773	99.8	50.7-129	3.27	20	L677009-03	WG700702	
Acenaphthene	mg/kg	0.0749	0.0733	93.6	51.6-124	2.21	20	L677009-03	WG700702	
Acenaphthylene	mg/kg	0.0753	0.0730	94.1	58.3-126	3.13	20	L677009-03	WG700702	
Anthracene	mg/kg	0.0898	0.0905	112.	47.9-137	0.720	20	L677009-03	WG700702	
Benzo(a)anthracene	mg/kg	0.0693	0.0677	86.6	34.2-138	2.24	22.8	L677009-03	WG700702	
Benzo(a)pyrene	mg/kg	0.0759	0.0752	94.9	34.6-133	0.870	26.3	L677009-03	WG700702	
Benzo(b)fluoranthene	mg/kg	0.0646	0.0641	80.7	19.8-142	0.770	30.3	L677009-03	WG700702	
Benzo(g,h,i)perylene	mg/kg	0.0677	0.0676	84.6	20-149	0.180	27.1	L677009-03	WG700702	
Benzo(k)fluoranthene	mg/kg	0.0794	0.0796	99.3	32.1-137	0.250	24.6	L677009-03	WG700702	
Chrysene	mg/kg	0.0811	0.0817	101.	36.6-137	0.710	22.7	L677009-03	WG700702	
Dibenz(a,h)anthracene	mg/kg	0.0738	0.0725	92.2	27.1-145	1.76	21.9	L677009-03	WG700702	
Fluoranthene	mg/kg	0.0887	0.0890	111.	39.8-141	0.330	22.2	L677009-03	WG700702	
Fluorene	mg/kg	0.0744	0.0726	93.0	42.5-130	2.53	20	L677009-03	WG700702	
Indeno(1,2,3-cd)pyrene	mg/kg	0.0685	0.0683	85.6	19-151	0.210	25	L677009-03	WG700702	
Naphthalene	mg/kg	0.0729	0.0696	89.9	40.6-135	4.63	20	L677009-03	WG700702	
Phenanthrene	mg/kg	0.0714	0.0700	89.2	39.7-129	1.88	20	L677009-03	WG700702	
Pyrene	mg/kg	0.0694	0.0694	86.8	31.5-141	0.0200	23.5	L677009-03	WG700702	
2-Fluorobiphenyl				106.0	51.1-131				WG700702	
Nitrobenzene-d5				82.40	40.9-147				WG700702	
p-Terphenyl-d14				89.70	45.3-138				WG700702	

Post Spike

Serial Dilution

Batch number /Run number / Sample number cross reference

WG700622: R2874970: L676938-01

* Performance of this Analyte is outside of established criteria.

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WG700644: R2875022: L676938-01
WG700586: R2875040: L676938-01
WG700625: R2875060: L676938-01
WG700674: R2875100: L676938-01
WG700660: R2875230: L676938-01
WG700702: R2875302: L676938-01
WG700811: R2875354: L676938-01
WG700819: R2875683: L676938-01
WG700829: R2875810: L676938-01

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.