



12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
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Tax I.D. 62-0814289

Est. 1970

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

Report Summary

Monday October 15, 2012

Report Number: L598202

Samples Received: 09/29/12

Client Project:

Description:

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

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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

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

October 15, 2012

Date Received : September 29, 2012
Description :
Sample ID : F-06 PIT MATERIAL
Collected By : DK Nicholson
Collection Date : 09/24/12 13:10

ESC Sample # : L598202-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	10.	mg/kg	3060A/7196A	10/05/12	5
ORP	250		mV	2580	10/04/12	1
pH	8.2		su	9045D	10/04/12	1
Sodium Adsorption Ratio	2.3			Calc.	10/04/12	1
Specific Conductance	560		umhos/cm	9050AMod	10/05/12	1
Mercury	BDL	0.020	mg/kg	7471	10/02/12	1
Arsenic	8.9	1.0	mg/kg	6010B	10/04/12	1
Barium	320	0.25	mg/kg	6010B	10/04/12	1
Boron	15.	10.	mg/kg	6010B	10/04/12	1
Cadmium	0.31	0.25	mg/kg	6010B	10/04/12	1
Chromium	38.	0.50	mg/kg	6010B	10/04/12	1
Copper	19.	1.0	mg/kg	6010B	10/04/12	1
Iron	20000	5.0	mg/kg	6010B	10/04/12	1
Lead	20.	0.25	mg/kg	6010B	10/04/12	1
Nickel	22.	1.0	mg/kg	6010B	10/04/12	1
Selenium	BDL	1.0	mg/kg	6010B	10/04/12	1
Silver	BDL	0.50	mg/kg	6010B	10/04/12	1
Zinc	54.	1.5	mg/kg	6010B	10/04/12	1
Benzene	BDL	0.0025	mg/kg	8021/8015	09/30/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	09/30/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	09/30/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	09/30/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	09/30/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.0		% Rec.	8021/8015	09/30/12	5
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	09/30/12	5
TPH (GC/FID) High Fraction	120	4.0	mg/kg	3546/DRO	10/08/12	1
Surrogate recovery(%)						
o-Terphenyl	77.0		% Rec.	3546/DRO	10/08/12	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/02/12	1
Acenaphthene	0.0094	0.0060	mg/kg	8270C-SIM	10/02/12	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	10/02/12	1
Benzo(a)anthracene	0.0079	0.0060	mg/kg	8270C-SIM	10/02/12	1
Benzo(a)pyrene	0.012	0.0060	mg/kg	8270C-SIM	10/02/12	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L598202-04 (CR6) - sample color interference
L598202-04 (PH) - 8.2@21.7c



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October 15, 2012

Date Received : September 29, 2012
Description :

Sample ID : F-06 PIT MATERIAL

Collected By : DK Nicholson
Collection Date : 09/24/12 13:10

ESC Sample # : L598202-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	0.028	0.0060	mg/kg	8270C-SIM	10/02/12	1
Benzo(g,h,i)perylene	0.018	0.0060	mg/kg	8270C-SIM	10/02/12	1
Benzo(k)fluoranthene	0.0066	0.0060	mg/kg	8270C-SIM	10/02/12	1
Chrysene	0.016	0.0060	mg/kg	8270C-SIM	10/02/12	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/02/12	1
Fluoranthene	0.0090	0.0060	mg/kg	8270C-SIM	10/02/12	1
Fluorene	0.0086	0.0060	mg/kg	8270C-SIM	10/02/12	1
Indeno(1,2,3-cd)pyrene	0.014	0.0060	mg/kg	8270C-SIM	10/02/12	1
Naphthalene	0.044	0.0060	mg/kg	8270C-SIM	10/02/12	1
Phenanthrene	0.029	0.0060	mg/kg	8270C-SIM	10/02/12	1
Pyrene	0.030	0.0060	mg/kg	8270C-SIM	10/02/12	1
1-Methylnaphthalene	0.034	0.0060	mg/kg	8270C-SIM	10/02/12	1
2-Methylnaphthalene	0.098	0.0060	mg/kg	8270C-SIM	10/02/12	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	10/02/12	1
Surrogate Recovery						
Nitrobenzene-d5	73.6		% Rec.	8270C-SIM	10/02/12	1
2-Fluorobiphenyl	71.2		% Rec.	8270C-SIM	10/02/12	1
p-Terphenyl-d14	75.7		% Rec.	8270C-SIM	10/02/12	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: 10/09/12 14:04 Revised: 10/15/12 12:38

L598202-04 (CR6) - sample color interference

L598202-04 (PH) - 8.2@21.7c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L598202-01	WG615886	SAMP	pH	R2376775	T8
L598202-02	WG615480	SAMP	Benzo(a)pyrene	R2372837	J
	WG615480	SAMP	Dibenz(a,h)anthracene	R2372837	J
	WG615480	SAMP	Nitrobenzene-d5	R2372837	J7
	WG615480	SAMP	2-Fluorobiphenyl	R2372837	J7
	WG615480	SAMP	p-Terphenyl-d14	R2372837	J7
	WG615886	SAMP	pH	R2376775	T8
L598202-03	WG615480	SAMP	Dibenz(a,h)anthracene	R2372837	J
	WG615480	SAMP	Nitrobenzene-d5	R2372837	J7
	WG615480	SAMP	2-Fluorobiphenyl	R2372837	J7
	WG615480	SAMP	p-Terphenyl-d14	R2372837	J7
	WG615886	SAMP	pH	R2376775	T8
L598202-04	WG615886	SAMP	pH	R2376775	T8
	WG616125	SAMP	Chromium, Hexavalent	R2377694	O
L598202-05	WG615480	SAMP	Dibenz(a,h)anthracene	R2372837	J
	WG615480	SAMP	Nitrobenzene-d5	R2372837	J7
	WG615480	SAMP	2-Fluorobiphenyl	R2372837	J7
	WG615480	SAMP	p-Terphenyl-d14	R2372837	J7
	WG615886	SAMP	pH	R2376775	T8
	WG616125	SAMP	Chromium, Hexavalent	R2377694	J6
	WG616768	SAMP	o-Terphenyl	R2380678	J7
L598202-06	WG615886	SAMP	pH	R2376775	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
O	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

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.



YOUR LAB OF CHOICE

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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG615398	09/29/12 23:35
Ethylbenzene	< .0005	mg/kg			WG615398	09/29/12 23:35
Toluene	< .005	mg/kg			WG615398	09/29/12 23:35
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG615398	09/29/12 23:35
Total Xylene	< .0015	mg/kg			WG615398	09/29/12 23:35
a,a,a-Trifluorotoluene(FID)		% Rec.	98.80	59-128	WG615398	09/29/12 23:35
a,a,a-Trifluorotoluene(PID)		% Rec.	103.5	54-144	WG615398	09/29/12 23:35
Benzene	< .0005	mg/kg			WG615594	10/01/12 14:12
Ethylbenzene	< .0005	mg/kg			WG615594	10/01/12 14:12
Toluene	< .005	mg/kg			WG615594	10/01/12 14:12
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG615594	10/01/12 14:12
Total Xylene	< .0015	mg/kg			WG615594	10/01/12 14:12
a,a,a-Trifluorotoluene(FID)		% Rec.	96.20	59-128	WG615594	10/01/12 14:12
a,a,a-Trifluorotoluene(PID)		% Rec.	98.95	54-144	WG615594	10/01/12 14:12
Mercury	< .02	mg/kg			WG615408	10/02/12 08:30
1-Methylnaphthalene	< .006	mg/kg			WG615480	10/02/12 02:08
2-Chloronaphthalene	< .006	mg/kg			WG615480	10/02/12 02:08
2-Methylnaphthalene	< .006	mg/kg			WG615480	10/02/12 02:08
Acenaphthene	< .006	mg/kg			WG615480	10/02/12 02:08
Acenaphthylene	< .006	mg/kg			WG615480	10/02/12 02:08
Anthracene	< .006	mg/kg			WG615480	10/02/12 02:08
Benzo(a)anthracene	< .006	mg/kg			WG615480	10/02/12 02:08
Benzo(a)pyrene	< .006	mg/kg			WG615480	10/02/12 02:08
Benzo(b)fluoranthene	< .006	mg/kg			WG615480	10/02/12 02:08
Benzo(g,h,i)perylene	< .006	mg/kg			WG615480	10/02/12 02:08
Benzo(k)fluoranthene	< .006	mg/kg			WG615480	10/02/12 02:08
Chrysene	< .006	mg/kg			WG615480	10/02/12 02:08
Dibenz(a,h)anthracene	< .006	mg/kg			WG615480	10/02/12 02:08
Fluoranthene	< .006	mg/kg			WG615480	10/02/12 02:08
Fluorene	< .006	mg/kg			WG615480	10/02/12 02:08
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG615480	10/02/12 02:08
Naphthalene	< .006	mg/kg			WG615480	10/02/12 02:08
Phenanthrene	< .006	mg/kg			WG615480	10/02/12 02:08
Pyrene	< .006	mg/kg			WG615480	10/02/12 02:08
2-Fluorobiphenyl		% Rec.	81.13	34-129	WG615480	10/02/12 02:08
Nitrobenzene-d5		% Rec.	79.41	14-141	WG615480	10/02/12 02:08
p-Terphenyl-d14		% Rec.	91.95	25-139	WG615480	10/02/12 02:08
Mercury	< .02	mg/kg			WG615407	10/02/12 11:22
Arsenic	< 1	mg/kg			WG615742	10/03/12 19:52
Barium	< .25	mg/kg			WG615742	10/03/12 19:52
Boron	< 10	mg/kg			WG615742	10/03/12 19:52
Cadmium	< .25	mg/kg			WG615742	10/03/12 19:52
Chromium	< .5	mg/kg			WG615742	10/03/12 19:52
Copper	< 1	mg/kg			WG615742	10/03/12 19:52
Iron	< 5	mg/kg			WG615742	10/03/12 19:52
Lead	< .25	mg/kg			WG615742	10/03/12 19:52
Nickel	< 1	mg/kg			WG615742	10/03/12 19:52
Selenium	< 1	mg/kg			WG615742	10/03/12 19:52
Silver	< .5	mg/kg			WG615742	10/03/12 19:52

* 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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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Zinc	< 1.5	mg/kg			WG615742	10/03/12 19:52
Specific Conductance	1.14	umhos/cm			WG616082	10/04/12 11:30
Arsenic	< 1	mg/kg			WG615835	10/04/12 01:33
Barium	< .25	mg/kg			WG615835	10/04/12 01:33
Boron	< 10	mg/kg			WG615835	10/04/12 01:33
Cadmium	< .25	mg/kg			WG615835	10/04/12 01:33
Chromium	< .5	mg/kg			WG615835	10/04/12 01:33
Copper	< 1	mg/kg			WG615835	10/04/12 01:33
Iron	< 5	mg/kg			WG615835	10/04/12 01:33
Lead	< .25	mg/kg			WG615835	10/04/12 01:33
Nickel	< 1	mg/kg			WG615835	10/04/12 01:33
Selenium	< 1	mg/kg			WG615835	10/04/12 01:33
Silver	< .5	mg/kg			WG615835	10/04/12 01:33
Zinc	< 1.5	mg/kg			WG615835	10/04/12 01:33
Specific Conductance	1.43	umhos/cm			WG616360	10/05/12 14:30
Chromium, Hexavalent	< 2	mg/kg			WG616125	10/05/12 15:25
TPH (GC/FID) High Fraction	< 4	ppm			WG616768	10/08/12 21:30
o-Terphenyl		% Rec.	65.38	50-150	WG616768	10/08/12 21:30

Analyte	Units	Result	Duplicate		Limit	Ref Samp	Batch
			Duplicate	RPD			
Mercury	mg/kg	0.0180	0.0210	15.4	20	L598235-01	WG615408
Mercury	mg/kg	4.60	9.80	72.0*	20	L598141-06	WG615407
Arsenic	mg/kg	26.0	27.0	2.25	20	L598141-05	WG615742
Barium	mg/kg	550.	560.	2.35	20	L598141-05	WG615742
Boron	mg/kg	14.0	0	NA	20	L598141-05	WG615742
Cadmium	mg/kg	8.20	7.80	4.63	20	L598141-05	WG615742
Chromium	mg/kg	18.0	18.0	2.74	20	L598141-05	WG615742
Copper	mg/kg	310.	0	NA	20	L598141-05	WG615742
Iron	mg/kg	22000	0	NA	20	L598141-05	WG615742
Lead	mg/kg	870.	980.	11.7	20	L598141-05	WG615742
Nickel	mg/kg	19.0	22.0	13.6	20	L598141-05	WG615742
Selenium	mg/kg	0	0	0	20	L598141-05	WG615742
Silver	mg/kg	0	0	0	20	L598141-05	WG615742
Zinc	mg/kg	3500	3400	2.04	20	L598141-05	WG615742
ORP	mV	160.	160.	1.26	20	L597626-01	WG616089
ORP	mV	250.	240.	3.28	20	L598408-08	WG616089
Specific Conductance	umhos/cm	490.	480.	1.65	20	L597626-01	WG616082
Specific Conductance	umhos/cm	1900	1900	0.528	20	L598408-08	WG616082

* Performance of this Analyte is outside of established criteria.

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Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Arsenic	mg/kg	2.50	2.60	2.33	20	L598250-03	WG615835
Barium	mg/kg	140.	160.	15.5	20	L598250-03	WG615835
Boron	mg/kg	13.0	15.3	18.6	20	L598250-03	WG615835
Cadmium	mg/kg	0.290	0.320	8.47	20	L598250-03	WG615835
Chromium	mg/kg	14.0	16.0	11.9	20	L598250-03	WG615835
Copper	mg/kg	14.0	16.7	15.5	20	L598250-03	WG615835
Iron	mg/kg	14000	15900	16.3	20	L598250-03	WG615835
Lead	mg/kg	14.0	17.0	15.9	20	L598250-03	WG615835
Nickel	mg/kg	14.0	15.2	11.8	20	L598250-03	WG615835
Selenium	mg/kg	0	0	0	20	L598250-03	WG615835
Silver	mg/kg	0	0	0	20	L598250-03	WG615835
Zinc	mg/kg	46.0	52.4	14.1	20	L598250-03	WG615835
pH	su	8.60	8.60	0	1	L598313-04	WG615886
pH	su	8.20	8.20	0.244	1	L598313-05	WG615886
ORP	mV	140.	150.	6.19	20	L598202-05	WG616361
ORP	mV	62.0	65.0	4.72	20	L599129-02	WG616361
Specific Conductance	umhos/cm	4600	4400	4.44	20	L598202-05	WG616360
Specific Conductance	umhos/cm	4400	4100	7.06	20	L598785-01	WG616360
Chromium, Hexavalent	mg/kg	0	0	0	20	L598202-06	WG616125

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0510	102.	76-113	WG615398
Ethylbenzene	mg/kg	.05	0.0525	105.	78-115	WG615398
Toluene	mg/kg	.05	0.0511	102.	76-114	WG615398
Total Xylene	mg/kg	.15	0.155	104.	81-118	WG615398
a,a,a-Trifluorotoluene(PID)				102.4	54-144	WG615398
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.52	100.	67-135	WG615398
a,a,a-Trifluorotoluene(FID)				96.81	59-128	WG615398
Benzene	mg/kg	.05	0.0511	102.	76-113	WG615594
Ethylbenzene	mg/kg	.05	0.0506	101.	78-115	WG615594
Toluene	mg/kg	.05	0.0511	102.	76-114	WG615594
Total Xylene	mg/kg	.15	0.152	101.	81-118	WG615594
a,a,a-Trifluorotoluene(PID)				100.5	54-144	WG615594
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.64	103.	67-135	WG615594
a,a,a-Trifluorotoluene(FID)				101.4	59-128	WG615594
Mercury	mg/kg	12.4	13.6	110.	71.6-128	WG615408
1-Methylnaphthalene	mg/kg	.033	0.0251	76.2	48-113	WG615480
2-Chloronaphthalene	mg/kg	.033	0.0257	78.0	51-114	WG615480
2-Methylnaphthalene	mg/kg	.033	0.0255	77.3	44-109	WG615480
Acenaphthene	mg/kg	.033	0.0269	81.6	52-108	WG615480
Acenaphthylene	mg/kg	.033	0.0276	83.6	51-110	WG615480
Anthracene	mg/kg	.033	0.0293	88.8	58-120	WG615480

* Performance of this Analyte is outside of established criteria.

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YOUR LAB OF CHOICE

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Dave Nicholson
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Denver, CO 80202

Quality Assurance Report
Level II

L598202

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

October 15, 2012

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzo(a)anthracene	mg/kg	.033	0.0312	94.5	54-110	WG615480
Benzo(a)pyrene	mg/kg	.033	0.0308	93.3	56-118	WG615480
Benzo(b)fluoranthene	mg/kg	.033	0.0329	99.8	55-114	WG615480
Benzo(g,h,i)perylene	mg/kg	.033	0.0314	95.1	48-130	WG615480
Benzo(k)fluoranthene	mg/kg	.033	0.0284	86.0	55-122	WG615480
Chrysene	mg/kg	.033	0.0304	92.2	57-118	WG615480
Dibenz(a,h)anthracene	mg/kg	.033	0.0322	97.4	53-122	WG615480
Fluoranthene	mg/kg	.033	0.0305	92.6	58-118	WG615480
Fluorene	mg/kg	.033	0.0293	88.7	54-109	WG615480
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0311	94.1	51-125	WG615480
Naphthalene	mg/kg	.033	0.0241	72.9	45-105	WG615480
Phenanthrene	mg/kg	.033	0.0295	89.5	53-114	WG615480
Pyrene	mg/kg	.033	0.0317	96.0	53-121	WG615480
2-Fluorobiphenyl				76.94	34-129	WG615480
Nitrobenzene-d5				70.36	14-141	WG615480
p-Terphenyl-d14				90.58	25-139	WG615480
Mercury	mg/kg	12.4	15.3	123.	71.6-128	WG615407
Arsenic	mg/kg	237	244.	103.	83.1-117	WG615742
Barium	mg/kg	252	260.	103.	84.1-116	WG615742
Boron	mg/kg	118	124.	105.	74-126	WG615742
Cadmium	mg/kg	191	200.	105.	83.2-117	WG615742
Chromium	mg/kg	128	134.	105.	81.3-118	WG615742
Copper	mg/kg	123	132.	107.	83.7-116	WG615742
Iron	mg/kg	13100	12500	95.4	50.8-150	WG615742
Lead	mg/kg	103	108.	105.	83.1-117	WG615742
Nickel	mg/kg	118	128.	108.	82-118	WG615742
Selenium	mg/kg	110	117.	106.	78.7-122	WG615742
Silver	mg/kg	47.3	47.4	100.	66.2-134	WG615742
Zinc	mg/kg	183	188.	103.	82-118	WG615742
ORP	mV	228	230.	101.	95.6-104.	WG616089
Specific Conductance	umhos/cm	1050	1040	99.0	85-115	WG616082
Arsenic	mg/kg	237	242.	102.	83.1-117	WG615835
Barium	mg/kg	252	260.	103.	84.1-116	WG615835
Boron	mg/kg	118	123.	104.	74-126	WG615835
Cadmium	mg/kg	191	193.	101.	83.2-117	WG615835
Chromium	mg/kg	128	132.	103.	81.3-118	WG615835
Copper	mg/kg	123	128.	104.	83.7-116	WG615835
Iron	mg/kg	13100	13400	102.	50.8-150	WG615835
Lead	mg/kg	103	107.	104.	83.1-117	WG615835
Nickel	mg/kg	118	124.	105.	82-118	WG615835
Selenium	mg/kg	110	114.	104.	78.7-122	WG615835
Silver	mg/kg	47.3	45.9	97.0	66.2-134	WG615835
Zinc	mg/kg	183	185.	101.	82-118	WG615835
pH	su	6.03	6.03	100.	98-101	WG615886
ORP	mV	228	228.	100.	95.6-104.	WG616361

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Specific Conductance	umhos/cm	1050	1060	101.	85-115	WG616360
Chromium, Hexavalent	mg/kg	150	150.	100.	80-120	WG616125
TPH (GC/FID) High Fraction	ppm	60	50.5	84.1	50-150	WG616768
o-Terphenyl				72.76	50-150	WG616768

Analyte	Units	Laboratory Control Sample Duplicate		% Rec	Limit	RPD	Limit	Batch
		Result	Ref					
Benzene	mg/kg	0.0508	0.0510	102.	76-113	0.360	20	WG615398
Ethylbenzene	mg/kg	0.0523	0.0525	104.	78-115	0.380	20	WG615398
Toluene	mg/kg	0.0507	0.0511	101.	76-114	0.710	20	WG615398
Total Xylene	mg/kg	0.155	0.155	103.	81-118	0.370	20	WG615398
a,a,a-Trifluorotoluene(PID)				102.5	54-144			WG615398
TPH (GC/FID) Low Fraction	mg/kg	5.39	5.52	98.0	67-135	2.38	20	WG615398
a,a,a-Trifluorotoluene(FID)				96.81	59-128			WG615398
Benzene	mg/kg	0.0515	0.0511	103.	76-113	0.720	20	WG615594
Ethylbenzene	mg/kg	0.0507	0.0506	101.	78-115	0.250	20	WG615594
Toluene	mg/kg	0.0511	0.0511	102.	76-114	0.0500	20	WG615594
Total Xylene	mg/kg	0.153	0.152	102.	81-118	0.390	20	WG615594
a,a,a-Trifluorotoluene(PID)				100.0	54-144			WG615594
TPH (GC/FID) Low Fraction	mg/kg	5.79	5.64	105.	67-135	2.67	20	WG615594
a,a,a-Trifluorotoluene(FID)				101.2	59-128			WG615594
1-Methylnaphthalene	mg/kg	0.0260	0.0251	79.0	48-113	3.39	24	WG615480
2-Chloronaphthalene	mg/kg	0.0274	0.0257	83.0	51-114	6.05	24	WG615480
2-Methylnaphthalene	mg/kg	0.0268	0.0255	81.0	44-109	5.08	24	WG615480
Acenaphthene	mg/kg	0.0268	0.0269	81.0	52-108	0.513	22	WG615480
Acenaphthylene	mg/kg	0.0271	0.0276	82.0	51-110	1.91	21	WG615480
Anthracene	mg/kg	0.0305	0.0293	92.0	58-120	4.01	20	WG615480
Benzo(a)anthracene	mg/kg	0.0315	0.0312	96.0	54-110	1.11	22	WG615480
Benzo(a)pyrene	mg/kg	0.0309	0.0308	94.0	56-118	0.506	21	WG615480
Benzo(b)fluoranthene	mg/kg	0.0324	0.0329	98.0	55-114	1.78	20	WG615480
Benzo(g,h,i)perylene	mg/kg	0.0320	0.0314	97.0	48-130	1.97	20	WG615480
Benzo(k)fluoranthene	mg/kg	0.0300	0.0284	91.0	55-122	5.59	25	WG615480
Chrysene	mg/kg	0.0311	0.0304	94.0	57-118	2.17	20	WG615480
Dibenz(a,h)anthracene	mg/kg	0.0309	0.0322	94.0	53-122	4.03	20	WG615480
Fluoranthene	mg/kg	0.0313	0.0305	95.0	58-118	2.37	20	WG615480
Fluorene	mg/kg	0.0279	0.0293	85.0	54-109	4.66	20	WG615480
Indeno(1,2,3-cd)pyrene	mg/kg	0.0311	0.0311	94.0	51-125	0.191	21	WG615480
Naphthalene	mg/kg	0.0246	0.0241	74.0	45-105	2.22	24	WG615480
Phenanthrene	mg/kg	0.0297	0.0295	90.0	53-114	0.713	20	WG615480
Pyrene	mg/kg	0.0310	0.0317	94.0	53-121	2.08	20	WG615480
2-Fluorobiphenyl				79.40	34-129			WG615480
Nitrobenzene-d5				77.35	14-141			WG615480
p-Terphenyl-d14				96.65	25-139			WG615480

ORP	mV	230.	230.	101.	95.6-104.	0	20	WG616089
Specific Conductance	umhos/	1050	1040	100.	85-115	0.957	20	WG616082

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
pH	su	6.05	6.03	100.	98-101	0.331	20	WG615886
ORP	mV	228.	228.	100.	95.6-104.	0	20	WG616361
Specific Conductance	umhos/	1060	1060	101.	85-115	0	20	WG616360
Chromium,Hexavalent	mg/kg	147.	150.	98.0	80-120	2.02	20	WG616125
TPH (GC/FID) High Fraction	ppm	51.3	50.5	86.0	50-150	1.72	23	WG616768
o-Terphenyl				72.36	50-150			WG616768

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Benzene	mg/kg	0.212	0	.05	84.9	32-137	L598083-01	WG615398
Ethylbenzene	mg/kg	0.202	0	.05	81.0	10-150	L598083-01	WG615398
Toluene	mg/kg	0.210	0	.05	83.9	20-142	L598083-01	WG615398
Total Xylene	mg/kg	0.607	0	.15	80.9	16-141	L598083-01	WG615398
a,a,a-Trifluorotoluene(PID)					101.2	54-144		WG615398
TPH (GC/FID) Low Fraction	mg/kg	23.1	0	5.5	84.0	55-109	L598083-01	WG615398
a,a,a-Trifluorotoluene(FID)					94.50	59-128		WG615398
Benzene	mg/kg	0.225	0	.05	90.0	32-137	L598202-06	WG615594
Ethylbenzene	mg/kg	0.183	0	.05	73.2	10-150	L598202-06	WG615594
Toluene	mg/kg	0.209	0	.05	83.5	20-142	L598202-06	WG615594
Total Xylene	mg/kg	0.561	0	.15	74.8	16-141	L598202-06	WG615594
a,a,a-Trifluorotoluene(PID)					99.37	54-144		WG615594
TPH (GC/FID) Low Fraction	mg/kg	16.9	0	5.5	61.4	55-109	L598202-06	WG615594
a,a,a-Trifluorotoluene(FID)					96.50	59-128		WG615594
Mercury	mg/kg	0.245	0.0210	.25	89.6	80-120	L598235-01	WG615408
Mercury	mg/kg	7.14	9.80	.25	0*	80-120	L598141-06	WG615407
1-Methylnaphthalene	mg/kg	0.0283	0	.033	85.9	25-155	L598260-13	WG615480
2-Chloronaphthalene	mg/kg	0.0290	0	.033	88.0	31-153	L598260-13	WG615480
2-Methylnaphthalene	mg/kg	0.0285	0	.033	86.5	22-172	L598260-13	WG615480
Acenaphthene	mg/kg	0.0289	0	.033	87.7	43-133	L598260-13	WG615480
Acenaphthylene	mg/kg	0.0304	0	.033	92.1	42-146	L598260-13	WG615480
Anthracene	mg/kg	0.0294	0	.033	89.1	38-153	L598260-13	WG615480
Benzo(a)anthracene	mg/kg	0.0332	0	.033	100.	31-142	L598260-13	WG615480
Benzo(a)pyrene	mg/kg	0.0309	0	.033	93.7	26-152	L598260-13	WG615480
Benzo(b)fluoranthene	mg/kg	0.0313	0	.033	94.9	10-188	L598260-13	WG615480
Benzo(g,h,i)perylene	mg/kg	0.0312	0	.033	94.7	10-176	L598260-13	WG615480
Benzo(k)fluoranthene	mg/kg	0.0308	0	.033	93.3	22-163	L598260-13	WG615480
Chrysene	mg/kg	0.0314	0	.033	95.2	26-146	L598260-13	WG615480
Dibenz(a,h)anthracene	mg/kg	0.0324	0	.033	98.0	10-160	L598260-13	WG615480
Fluoranthene	mg/kg	0.0314	0	.033	95.1	23-160	L598260-13	WG615480
Fluorene	mg/kg	0.0302	0	.033	91.6	44-143	L598260-13	WG615480
Indeno(1,2,3-cd)pyrene	mg/kg	0.0319	0	.033	96.6	10-157	L598260-13	WG615480

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Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Naphthalene	mg/kg	0.0267	0	.033	80.9	22-156	L598260-13	WG615480
Phenanthrene	mg/kg	0.0296	0	.033	89.8	23-164	L598260-13	WG615480
Pyrene	mg/kg	0.0317	0	.033	96.2	12-170	L598260-13	WG615480
2-Fluorobiphenyl					89.00	34-129		WG615480
Nitrobenzene-d5					84.15	14-141		WG615480
p-Terphenyl-d14					97.53	25-139		WG615480
Arsenic	mg/kg	75.8	27.0	50	97.6	75-125	L598141-05	WG615742
Barium	mg/kg	641.	560.	50	162.*	75-125	L598141-05	WG615742
Boron	mg/kg	57.5	16.7	50	81.6	75-125	L598141-05	WG615742
Cadmium	mg/kg	56.0	7.80	50	96.4	75-125	L598141-05	WG615742
Chromium	mg/kg	65.1	18.0	50	94.2	75-125	L598141-05	WG615742
Copper	mg/kg	161.	128.	50	66.0*	75-125	L598141-05	WG615742
Iron	mg/kg	21500	27100	50	0*	75-125	L598141-05	WG615742
Lead	mg/kg	932.	980.	50	0*	75-125	L598141-05	WG615742
Nickel	mg/kg	67.3	22.0	50	90.6	75-125	L598141-05	WG615742
Selenium	mg/kg	46.4	0	50	92.8	75-125	L598141-05	WG615742
Silver	mg/kg	48.0	0	50	96.0	75-125	L598141-05	WG615742
Zinc	mg/kg	3700	3400	25	600.*	75-125	L598141-05	WG615742
Arsenic	mg/kg	52.5	2.60	50	99.8	75-125	L598250-03	WG615835
Barium	mg/kg	215.	160.	50	110.	75-125	L598250-03	WG615835
Boron	mg/kg	60.6	15.3	50	90.6	75-125	L598250-03	WG615835
Cadmium	mg/kg	50.3	0.320	50	100.	75-125	L598250-03	WG615835
Chromium	mg/kg	65.0	16.0	50	98.0	75-125	L598250-03	WG615835
Copper	mg/kg	71.3	16.7	50	109.	75-125	L598250-03	WG615835
Iron	mg/kg	16000	15900	50	200.*	75-125	L598250-03	WG615835
Lead	mg/kg	65.4	17.0	50	96.8	75-125	L598250-03	WG615835
Nickel	mg/kg	67.1	15.2	50	104.	75-125	L598250-03	WG615835
Selenium	mg/kg	47.8	0	50	95.6	75-125	L598250-03	WG615835
Silver	mg/kg	50.3	0	50	101.	75-125	L598250-03	WG615835
Zinc	mg/kg	109.	52.4	50	113.	75-125	L598250-03	WG615835
Chromium, Hexavalent	mg/kg	0.560	0	20	2.80*	75-125	L598202-05	WG616125
TPH (GC/FID) High Fraction	ppm	46.9	0	60	78.2	50-150	L598352-04	WG616768
o-Terphenyl					71.81	50-150		WG616768

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.228	0.212	91.4	32-137	7.37	39	L598083-01	WG615398
Ethylbenzene	mg/kg	0.211	0.202	84.4	10-150	4.09	44	L598083-01	WG615398
Toluene	mg/kg	0.218	0.210	87.2	20-142	3.91	42	L598083-01	WG615398
Total Xylene	mg/kg	0.628	0.607	83.8	16-141	3.50	46	L598083-01	WG615398
a,a,a-Trifluorotoluene(PID)				101.9	54-144				WG615398
TPH (GC/FID) Low Fraction	mg/kg	15.0	23.1	54.5*	55-109	42.6*	20	L598083-01	WG615398
a,a,a-Trifluorotoluene(FID)				86.32	59-128				WG615398
Benzene	mg/kg	0.223	0.225	89.2	32-137	0.860	39	L598202-06	WG615594
Ethylbenzene	mg/kg	0.178	0.183	71.1	10-150	2.80	44	L598202-06	WG615594
Toluene	mg/kg	0.202	0.209	80.8	20-142	3.22	42	L598202-06	WG615594
Total Xylene	mg/kg	0.545	0.561	72.7	16-141	2.82	46	L598202-06	WG615594
a,a,a-Trifluorotoluene(PID)				98.74	54-144				WG615594

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
TPH (GC/FID) Low Fraction	mg/kg	19.1	16.9	69.5	55-109	12.4	20	L598202-06	WG615594
a,a,a-Trifluorotoluene(FID)				96.60	59-128				WG615594
Mercury	mg/kg	0.269	0.245	99.2	80-120	9.34	20	L598235-01	WG615408
Mercury	mg/kg	7.95	7.14	0*	80-120	10.7	20	L598141-06	WG615407
1-Methylnaphthalene	mg/kg	0.0296	0.0283	89.7	25-155	4.38	27	L598260-13	WG615480
2-Chloronaphthalene	mg/kg	0.0290	0.0290	88.0	31-153	0.00782	22	L598260-13	WG615480
2-Methylnaphthalene	mg/kg	0.0306	0.0285	92.7	22-172	6.91	29	L598260-13	WG615480
Acenaphthene	mg/kg	0.0284	0.0289	86.1	43-133	1.89	26	L598260-13	WG615480
Acenaphthylene	mg/kg	0.0297	0.0304	90.0	42-146	2.31	22	L598260-13	WG615480
Anthracene	mg/kg	0.0325	0.0294	98.4	38-153	9.90	27	L598260-13	WG615480
Benzo(a)anthracene	mg/kg	0.0328	0.0332	99.2	31-142	1.23	31	L598260-13	WG615480
Benzo(a)pyrene	mg/kg	0.0311	0.0309	94.4	26-152	0.685	32	L598260-13	WG615480
Benzo(b)fluoranthene	mg/kg	0.0313	0.0313	94.8	10-188	0.0390	33	L598260-13	WG615480
Benzo(g,h,i)perylene	mg/kg	0.0317	0.0312	96.2	10-176	1.58	30	L598260-13	WG615480
Benzo(k)fluoranthene	mg/kg	0.0315	0.0308	95.4	22-163	2.25	29	L598260-13	WG615480
Chrysene	mg/kg	0.0312	0.0314	94.5	26-146	0.717	30	L598260-13	WG615480
Dibenz(a,h)anthracene	mg/kg	0.0318	0.0324	96.4	10-160	1.66	39	L598260-13	WG615480
Fluoranthene	mg/kg	0.0322	0.0314	97.7	23-160	2.68	22	L598260-13	WG615480
Fluorene	mg/kg	0.0296	0.0302	89.6	44-143	2.27	23	L598260-13	WG615480
Indeno(1,2,3-cd)pyrene	mg/kg	0.0316	0.0319	95.6	10-157	0.958	40	L598260-13	WG615480
Naphthalene	mg/kg	0.0284	0.0267	86.1	22-156	6.19	27	L598260-13	WG615480
Phenanthrene	mg/kg	0.0311	0.0296	94.3	23-164	4.88	25	L598260-13	WG615480
Pyrene	mg/kg	0.0317	0.0317	96.0	12-170	0.203	24	L598260-13	WG615480
2-Fluorobiphenyl				88.87	34-129				WG615480
Nitrobenzene-d5				88.66	14-141				WG615480
p-Terphenyl-d14				99.95	25-139				WG615480
Arsenic	mg/kg	72.9	75.8	91.8	75-125	3.90	20	L598141-05	WG615742
Barium	mg/kg	893.	641.	666.*	75-125	32.9*	20	L598141-05	WG615742
Boron	mg/kg	56.6	57.5	79.8	75-125	1.58	20	L598141-05	WG615742
Cadmium	mg/kg	54.1	56.0	92.6	75-125	3.45	20	L598141-05	WG615742
Chromium	mg/kg	65.8	65.1	95.6	75-125	1.07	20	L598141-05	WG615742
Copper	mg/kg	157.	161.	58.0*	75-125	2.52	20	L598141-05	WG615742
Iron	mg/kg	22400	21500	0*	75-125	4.10	20	L598141-05	WG615742
Lead	mg/kg	871.	932.	0*	75-125	6.77	20	L598141-05	WG615742
Nickel	mg/kg	69.0	67.3	94.0	75-125	2.49	20	L598141-05	WG615742
Selenium	mg/kg	45.8	46.4	91.6	75-125	1.30	20	L598141-05	WG615742
Silver	mg/kg	47.2	48.0	94.4	75-125	1.68	20	L598141-05	WG615742
Zinc	mg/kg	3470	3700	140.*	75-125	6.42	20	L598141-05	WG615742
Arsenic	mg/kg	44.7	52.5	84.2	75-125	16.0	20	L598250-03	WG615835
Barium	mg/kg	184.	215.	48.0*	75-125	15.5	20	L598250-03	WG615835
Boron	mg/kg	52.4	60.6	74.2*	75-125	14.5	20	L598250-03	WG615835
Cadmium	mg/kg	43.1	50.3	85.6	75-125	15.4	20	L598250-03	WG615835
Chromium	mg/kg	55.1	65.0	78.2	75-125	16.5	20	L598250-03	WG615835
Copper	mg/kg	59.2	71.3	85.0	75-125	18.5	20	L598250-03	WG615835
Iron	mg/kg	13100	16000	0*	75-125	19.9	20	L598250-03	WG615835
Lead	mg/kg	55.5	65.4	77.0	75-125	16.4	20	L598250-03	WG615835
Nickel	mg/kg	55.8	67.1	81.2	75-125	18.4	20	L598250-03	WG615835
Selenium	mg/kg	39.9	47.8	79.8	75-125	18.0	20	L598250-03	WG615835
Silver	mg/kg	43.3	50.3	86.6	75-125	15.0	20	L598250-03	WG615835

* 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
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Denver, CO 80202

Quality Assurance Report
Level II

L598202

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

October 15, 2012

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Zinc	mg/kg	92.0	109.	79.2	75-125	16.9	20	L598250-03	WG615835
Chromium, Hexavalent	mg/kg	0.680	0.560	3.40*	75-125	19.4	20	L598202-05	WG616125
TPH (GC/FID) High Fraction	ppm	39.8	46.9	66.3	50-150	16.4	40	L598352-04	WG616768
o-Terphenyl				63.66	50-150				WG616768

Batch number / Run number / Sample number cross reference

WG615398: R2370799: L598202-01 03 04 05
WG615594: R2371914: L598202-02 06
WG615408: R2372315: L598202-02 03 04 05 06
WG615480: R2372837: L598202-01 02 03 04 05 06
WG615407: R2373254: L598202-01
WG615742: R2375796: L598202-01 02 03
WG616089: R2375993: L598202-01 02 03 04
WG616082: R2376155: L598202-01
WG615835: R2376196: L598202-04 05 06
WG615936: R2376755: L598202-01 02 03 04 05 06
WG615886: R2376775: L598202-01 02 03 04 05 06
WG616361: R2377215: L598202-05 06
WG616360: R2377435: L598202-02 03 04 05 06
WG616125: R2377694: L598202-01 02 03 04 05 06
WG616768: R2380678: L598202-01 02 03 04 05 06

* * 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.