



12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
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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 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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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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January 13, 2014

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Description : D20 Spill Response

ESC Sample # : L676938-01

Sample ID : D20-SPOILS-2

Site ID :

Collected By : Aaron Kelly
Collection Date : 01/03/14 12:00

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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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

* 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	Units	Result	Duplicate Duplicate	RPD	Limit	Ref Samp	Batch
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 Known Val	Sample Result	% Rec	Limit	Batch
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

* 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	Units	Laboratory Control Known Val	Sample Result	% Rec	Limit	Batch
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 Result	Ref	Sample Duplicate %Rec	Limit	RPD	Limit	Batch
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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January 13, 2014

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

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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

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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.

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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.