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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD86

Method: CV
Run Name: 1618803M08
Calibration Date(s): 07/06/2016

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Mercury				0.050	U								

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence	U= Below IDL/MDL B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 4A
ICP-AES INTERFERENCE CHECK SAMPLE
SDG No.: DWD86

Instrument ID: 16417
Run Name: 1618503T72
Concentration Units: ug/L

Analyte	True		Initial Found				Final Found			
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R	Sol. A	%R	Sol. AB	%R
Aluminum	500000	500000	530655	106.1	517436.6	103.5	523326	104.7	513673.3	102.7
Antimony	0	600	-4		607.0	101.2	-5		603.2	100.5
Arsenic	0	100	4		105.6	105.6	3		112.8	112.8
Barium	0	500	4		511.1	102.2	4		509.5	101.9
Beryllium	0	500	-1		490.8	98.2	-1		493.8	98.8
Cadmium	0	1000	3		916.3	91.6	3		915.6	91.6
Calcium	500000	500000	522218	104.4	515003.8	103.0	522753	104.6	518109.8	103.6
Chromium	0	500	8		471.4	94.3	8		464.2	92.8
Cobalt	0	500	1		442.2	88.4	1		439.5	87.9
Copper	0	500	-1		520.3	104.1	-2		525.8	105.2
Iron	200000	200000	211631	105.8	207121.7	103.6	211360	105.7	206986.1	103.5
Lead	0	50	-4		42.7	85.4	2		43.8	87.6
Magnesium	500000	500000	493599	98.7	481762.5	96.4	493324	98.7	483581.8	96.7
Manganese	0	500	2		473.1	94.6	2		471.3	94.3
Nickel	0	1000	-1		871.5	87.2	-2		872.6	87.3
Potassium	0	0	15		41.9		-32		25.8	
Selenium										
Silver	0	200	0		217.5	108.8	2		218.4	109.2
Sodium	0	0	244		243.6		244		240.1	
Vanadium	0	500	1		494.8	99.0	0		497.9	99.6
Zinc	0	1000	5		996.7	99.7	5		999.5	100.0

Control Limits: All Metals 80%-120%

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QUALITY ASSURANCE SUMMARY
FORM 4A
ICP-AES INTERFERENCE CHECK SAMPLE
SDG No.: DWD86

Instrument ID: 11016
Run Name: 1618802T70
Concentration Units: ug/L

Analyte	True		Initial Found				Final Found			
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R	Sol. A	%R	Sol. AB	%R
Aluminum	500000	500000	500410	100.1	495017.5	99.0	515540	103.1	508449.2	101.7
Antimony										
Arsenic										
Barium										
Beryllium										
Cadmium										
Calcium	500000	500000	491198	98.2	486508.4	97.3	510000	102.0	502403.5	100.5
Chromium										
Cobalt										
Copper										
Iron	200000	200000	199967	100.0	197958.6	99.0	208878	104.4	205776.1	102.9
Lead										
Magnesium	500000	500000	487200	97.4	483404.4	96.7	526353	105.3	514993.2	103.0
Manganese										
Nickel										
Potassium										
Selenium	0	50	8		49.4	98.8	1		49.4	98.8
Silver										
Sodium										
Vanadium										
Zinc										

Control Limits: All Metals 80%-120%

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QUALITY ASSURANCE SUMMARY
FORM 4A
ICP-AES INTERFERENCE CHECK SAMPLE
SDG No.: DWD86

Instrument ID: 16417
Run Name: 1618907T72
Concentration Units: ug/L

Analyte	True		Initial Found				Final Found			
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R	Sol. A	%R	Sol. AB	%R
Aluminum	500000	500000	543484	108.7	531141.5	106.2	543796	108.8	536778.6	107.4
Antimony	0	600	-6		632.4	105.4	-4		621.9	103.7
Arsenic	0	100	-6		98.5	98.5	-4		97.2	97.2
Barium	0	500	4		497.8	99.6	4		503.0	100.6
Beryllium	0	500	0		498.2	99.6	0		502.8	100.6
Cadmium	0	1000	-8		912.1	91.2	-8		906.5	90.7
Calcium	500000	500000	542763	108.6	533939.1	106.8	539649	107.9	533226.7	106.6
Chromium	0	500	8		481.6	96.3	8		489.3	97.9
Cobalt	0	500	1		449.2	89.8	1		447.0	89.4
Copper	0	500	1		521.9	104.4	2		523.8	104.8
Iron	200000	200000	219214	109.6	214962.3	107.5	218964	109.5	215077.8	107.5
Lead	0	50	3		52.6	105.2	14		50.4	100.8
Magnesium	500000	500000	524554	104.9	508934.5	101.8	530356	106.1	516083.5	103.2
Manganese	0	500	1		470.6	94.1	1		479.2	95.8
Nickel	0	1000	-2		885.5	88.6	-2		876.0	87.6
Potassium	0	0	128		49.0		26		46.2	
Selenium	0	50	-2		45.4	90.8	4		51.9	103.8
Silver	0	200	0		220.0	110.0	0		220.3	110.2
Sodium	0	0	232		221.5		229		210.4	
Vanadium	0	500	1		503.1	100.6	0		508.1	101.6
Zinc	0	1000	0		1004.7	100.5	0		997.9	99.8

Control Limits: All Metals 80%-120%

QUALITY ASSURANCE SUMMARY
FORM 4B
ICP-MS INTERFERENCE CHECK SAMPLE
SDG No.: DWD86

Instrument ID: 11332
Run Name: 1618703E03
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	97190	97.2	97450.0	97.5
Calcium	44	300000	300000	307700	102.6	308100.0	102.7
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	244200	97.7	242500.0	97.0
Magnesium	24	100000	100000	96290	96.3	96150.0	96.2
Molybdenum	98	2000	2000	1938	96.9	2013.0	100.7
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	96820	96.8	96080.0	96.1
Sodium	23	250000	250000	255200	102.1	253900.0	101.6
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2154	107.7	2112.0	105.6

Control Limits: All Metals 80%-120%

QUALITY ASSURANCE SUMMARY
FORM 4B
ICP-MS INTERFERENCE CHECK SAMPLE
SDG No.: DWD86

Instrument ID: 11332
Run Name: 1618703E03
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	96620	96.6	96560.0	96.6
Calcium	44	300000	300000	311400	103.8	303900.0	101.3
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	239700	95.9	242600.0	97.0
Magnesium	24	100000	100000	95120	95.1	95660.0	95.7
Molybdenum	98	2000	2000	1991	99.6	2001.0	100.1
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	96120	96.1	96400.0	96.4
Sodium	23	250000	250000	253500	101.4	255200.0	102.1
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2111	105.6	2071.0	103.6

Control Limits: All Metals 80%-120%

QUALITY ASSURANCE SUMMARY
FORM 4B
ICP-MS INTERFERENCE CHECK SAMPLE
SDG No.: DWD86

Instrument ID: 11332
Run Name: 1619001E03
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	99720	99.7	100600.0	100.6
Calcium	44	300000	300000	309700	103.2	317200.0	105.7
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	247000	98.8	253900.0	101.6
Magnesium	24	100000	100000	99120	99.1	99670.0	99.7
Molybdenum	98	2000	2000	2025	101.3	2028.0	101.4
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	100100	100.1	102500.0	102.5
Sodium	23	250000	250000	261200	104.5	264300.0	105.7
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2153	107.7	2238.0	111.9

Control Limits: All Metals 80%-120%

QUALITY ASSURANCE SUMMARY
FORM 4B
ICP-MS INTERFERENCE CHECK SAMPLE
SDG No.: DWD86

Instrument ID: 11332
Run Name: 1619001E03
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	101800	101.8	99360.0	99.4
Calcium	44	300000	300000	317800	105.9	310600.0	103.5
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	251000	100.4	243300.0	97.3
Magnesium	24	100000	100000	98480	98.5	96040.0	96.0
Molybdenum	98	2000	2000	1991	99.6	1939.0	97.0
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	102200	102.2	101000.0	101.0
Sodium	23	250000	250000	259200	103.7	257100.0	102.8
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2246	112.3	2161.0	108.1

Control Limits: All Metals 80%-120%

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QUALITY ASSURANCE SUMMARY
FORM 5A(MS/MSD)
MATRIX SPIKE/MATRIX SPIKE DUPLICATE
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438336BKG Matrix Spike Lab Sample ID: 8438337MS Matrix Spike Duplicate Lab Sample ID: 8438338MSD
Batch Number(s): 161820638001

		BKG Sample		MS Sample		MSD Sample		MS Spike	MSD Spike		MS		MSD				Control Limit		
Analyte	Mass	Result	C	Result	C	Result	C	Added	Added	Units	%R	Q	%R	Q	RPD	Q	%R	RPD	M
Mercury		0.0214	B	0.1807		0.1853		0.1538	0.1587	MG/KG	104		103		3		80 - 120	20	CV

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer CV = Cold Vapor
MS = ICP Mass Spectrometry AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL, B= Below LOQ
FLAGS:
N = Matrix Spike OOS, * = Duplicate OOS

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QUALITY ASSURANCE SUMMARY
FORM 5A(MS/MSD)
MATRIX SPIKE/MATRIX SPIKE DUPLICATE
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438343BKG Matrix Spike Lab Sample ID: 8438344MS Matrix Spike Duplicate Lab Sample ID: 8438345MSD
Batch Number(s): 161830637001

		BKG Sample		MS Sample		MSD Sample		MS Spike	MSD Spike		MS		MSD				Control Limit		
Analyte	Mass	Result	C	Result	C	Result	C	Added	Added	Units	%R	Q	%R	Q	RPD	Q	%R	RPD	M
Aluminum		452.6983		837.1845		890.8383		194.1748	186.9159	MG/KG	198	N	234	N	6		75 - 125	20	P
Antimony		0.6087	U	45.3806		45.5234		48.5437	46.7290	MG/KG	93		97		0		75 - 125	20	P
Arsenic		0.8435	U	13.3699		13.5112		14.5631	14.0187	MG/KG	92		96		1		75 - 125	20	P
Barium		3.2217		200.3515		201.8168		194.1748	186.9159	MG/KG	102		106		1		75 - 125	20	P
Beryllium		0.0583	U	4.9146		4.9551		4.8544	4.6729	MG/KG	101		106		1		75 - 125	20	P
Cadmium		0.0470	B	4.9796		4.9897		4.8544	4.6729	MG/KG	102		106		0		75 - 125	20	P
Calcium		935.8904		1663.2126		1787.4907		388.3495	373.8318	MG/KG	187	N	228	N	7		75 - 125	20	P
Chromium		1.5374	B	20.8631		21.2486		19.4175	18.6916	MG/KG	100		105		2		75 - 125	20	P
Cobalt		0.1043	U	49.5204		49.6972		48.5437	46.7290	MG/KG	102		106		0		75 - 125	20	P
Copper		4.3443		31.0961		31.3439		24.2718	23.3645	MG/KG	110		116		1		75 - 125	20	P
Iron		1053.7757		2152.0408		1382.0813		97.0874	93.4579	MG/KG	1131		351		44	*		20	P
Lead		3.9009		16.5641		20.5636		14.5631	14.0187	MG/KG	87		119		22	*	75 - 125	20	P
Magnesium		74.7383		284.7786		300.3935		194.1748	186.9159	MG/KG	108		121		5		75 - 125	20	P
Manganese		10.6200		65.2621		61.6617		48.5437	46.7290	MG/KG	113		109		6		75 - 125	20	P
Nickel		0.5157	B	50.3796		50.7065		48.5437	46.7290	MG/KG	103		107		1		75 - 125	20	P
Potassium		58.4000	B	1065.5126		1079.2336		970.8738	934.5794	MG/KG	104		109		1		75 - 125	20	P
Selenium		0.7826	U	14.9068		13.7944		14.5631	14.0187	MG/KG	102		98		8		75 - 125	20	P
Silver		0.1304	U	4.7184		4.7178		4.8544	4.6729	MG/KG	97		101		0		75 - 125	20	P
Sodium		31.4374	B	1015.9223		1028.8028		970.8738	934.5794	MG/KG	101		107		1		75 - 125	20	P
Thallium	203	0.0252	U	0.3903		0.5865		0.3883	0.3738	MG/KG	101		157	N	40	*	75 - 125	20	MS
Vanadium		1.6539		50.7544		51.0196		48.5437	46.7290	MG/KG	101		106		1		75 - 125	20	P
Zinc		2.8757	B	51.1097		52.4710		48.5437	46.7290	MG/KG	99		106		3		75 - 125	20	P

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer CV = Cold Vapor
MS = ICP Mass Spectrometry AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL, B= Below LOQ
FLAGS:
N = Matrix Spike OOS, * = Duplicate OOS

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QUALITY ASSURANCE SUMMARY
FORM 5A(MS/MSD)
MATRIX SPIKE/MATRIX SPIKE DUPLICATE
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438353BKG Matrix Spike Lab Sample ID: 8438354MS Matrix Spike Duplicate Lab Sample ID: 8438355MSD
Batch Number(s): 161830638001

		BKG Sample		MS Sample		MSD Sample		MS Spike	MSD Spike		MS		MSD				Control Limit		
Analyte	Mass	Result	C	Result	C	Result	C	Added	Added	Units	%R	Q	%R	Q	RPD	Q	%R	RPD	M
Mercury		0.0231	B	0.1799		0.1855		0.1538	0.1667	MG/KG	102		97		3		80 - 120	20	CV

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer CV = Cold Vapor
MS = ICP Mass Spectrometry AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL, B= Below LOQ
FLAGS:
N = Matrix Spike OOS, * = Duplicate OOS

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QUALITY ASSURANCE SUMMARY
FORM 5A(MS/MSD)
MATRIX SPIKE/MATRIX SPIKE DUPLICATE
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438360BKG Matrix Spike Lab Sample ID: 8438361MS Matrix Spike Duplicate Lab Sample ID: 8438362MSD
Batch Number(s): 161870637004

		BKG Sample		MS Sample		MSD Sample		MS Spike	MSD Spike		MS		MSD				Control Limit		
Analyte	Mass	Result	C	Result	C	Result	C	Added	Added	Units	%R	Q	%R	Q	RPD	Q	%R	RPD	M
Aluminum		2980.1940		4377.0343		4494.6634		185.1852	152.6718	MG/KG	754		992		3			20	P
Antimony		0.5263	U	37.9750		31.6504		46.2963	38.1679	MG/KG	82		83		18		75 - 125	20	P
Arsenic		0.7293	U	12.0898		10.3023		13.8889	11.4504	MG/KG	87		90		16		75 - 125	20	P
Barium		9.0368		180.4565		153.3786		185.1852	152.6718	MG/KG	93		95		16		75 - 125	20	P
Beryllium		0.0820	B	4.3185		3.6389		4.6296	3.8168	MG/KG	92		93		17		75 - 125	20	P
Cadmium		0.1421	B	4.3833		3.7542		4.6296	3.8168	MG/KG	92		95		15		75 - 125	20	P
Calcium		745.5218		2213.7565		2755.1260		370.3704	305.3435	MG/KG	396	N	658	N	22	*	75 - 125	20	P
Chromium		4.2955		23.8667		18.3924		18.5185	15.2672	MG/KG	106		92		26	*	75 - 125	20	P
Cobalt		0.2805	B	42.0787		35.1412		46.2963	38.1679	MG/KG	90		91		18		75 - 125	20	P
Copper		5.1842		33.0639		26.2496		23.1481	19.0840	MG/KG	120		110		23	*	75 - 125	20	P
Iron		2268.8053		3033.5120		2226.3237		92.5926	76.3359	MG/KG	826		-56		31	*		20	P
Lead		8.2286		21.4000		18.4443		13.8889	11.4504	MG/KG	95		89		15		75 - 125	20	P
Magnesium		216.5692		520.9139		538.1969		185.1852	152.6718	MG/KG	164	N	211	N	3		75 - 125	20	P
Manganese		49.2421		115.7630		106.4305		46.2963	38.1679	MG/KG	144	N	150	N	8		75 - 125	20	P
Nickel		1.5744		44.5000		36.9733		46.2963	38.1679	MG/KG	93		93		18		75 - 125	20	P
Potassium		84.2459		1041.4926		922.5702		925.9259	763.3588	MG/KG	103		110		12		75 - 125	20	P
Selenium		0.6767	U	12.1935		9.5771		13.8889	11.4504	MG/KG	88		84		24	*	75 - 125	20	P
Silver		0.1128	U	4.0602		3.3977		4.6296	3.8168	MG/KG	88		89		18		75 - 125	20	P
Sodium		17.9699	U	897.3370		769.2450		925.9259	763.3588	MG/KG	97		101		15		75 - 125	20	P
Thallium	203	0.0218	U	0.4254		0.3873		0.3704	0.3053	MG/KG	115		127	N	9		75 - 125	20	MS
Vanadium		3.3045		45.5778		39.0565		46.2963	38.1679	MG/KG	91		94		15		75 - 125	20	P
Zinc		40.5820		103.9954		79.6427		46.2963	38.1679	MG/KG	137	N	102		27	*	75 - 125	20	P

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer CV = Cold Vapor
MS = ICP Mass Spectrometry AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL, B= Below LOQ
FLAGS:
N = Matrix Spike OOS, * = Duplicate OOS

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QUALITY ASSURANCE SUMMARY
FORM 5B
POST DIGEST SPIKE SAMPLE RECOVERY
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438343BKG Post Digest Spike Lab Sample ID: 8438343A
Batch Number(s): 161830637001
Concentration Units: UG/L

Analyte	Mass	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum			6133.3900		5206.0300		1000.0000	93		P
Calcium			11493.9800		10762.7400		1000.0000	73		P
Thallium	203		0.8421	B	0.1450	U	1.0000	84		MS

Comments:

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 5B
POST DIGEST SPIKE SAMPLE RECOVERY
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438360BKG Post Digest Spike Lab Sample ID: 8438360A
Batch Number(s): 161870637004
Concentration Units: UG/L

Analyte	Mass	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Calcium			10674.2700		9915.4400		1000.0000	76		P
Magnesium			3755.4800		2880.3700		1000.0000	88		P
Manganese			695.4900		654.9200		60.0000	68		P
Thallium	203		1.0910		0.1450	U	1.0000	109		MS
Zinc			636.6200		539.7400		120.0000	81		P

Comments:

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 6
DUPLICATES
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438336BKG Duplicate Lab Sample ID: 8438342DUP
Batch Number(s): 161820638001
Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Mercury			0.0214	B	0.0278	B	26		CV

NOTE: An asterisk (*) in column "Q" indicates poor duplicate precision (RPD > 20% OR |(S) - (D)| > LOQ for values < 5x LOQ).
The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample.

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

FLAGS:
* = Duplicate Out of Spec

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QUALITY ASSURANCE SUMMARY
FORM 6
DUPLICATES
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438343BKG Duplicate Lab Sample ID: 8438346DUP
Batch Number(s): 161830637001
Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum			452.6983		430.0400		5		P
Antimony			0.6087	U	1.0550	B	200		P
Arsenic			0.8435	U	0.8083	U			P
Barium		0.9	3.2217		2.8350		13		P
Beryllium			-0.0609	B	-0.0600	B	-1		P
Cadmium			0.0470	B	0.0408	U	200		P
Calcium			935.8904		974.4442		4		P
Chromium			1.5374	B	1.3075	B	16		P
Cobalt			0.1043	U	0.1000	U			P
Copper		1.7	4.3443		4.5850		5		P
Iron			1053.7757		504.9050		70	*	P
Lead		2.6	3.9009		3.1858		20		P
Magnesium		17.4	74.7383		62.5475		18		P
Manganese			10.6200		9.7158		9		P
Nickel			0.5157	B	0.4000	B	25		P
Potassium			58.4000	B	46.0017	B	24		P
Selenium			0.7826	U	0.7500	U			P
Silver			0.1304	U	0.1250	U			P
Sodium			31.4374	B	22.0700	B	35		P
Thallium	203		0.0252	U	0.0242	U			MS
Vanadium		0.9	1.6539		1.7242		4		P
Zinc			2.8757	B	2.2125	B	26		P

NOTE: An asterisk (*) in column "Q" indicates poor duplicate precision (RPD > 20% OR |(S) - (D)| > LOQ for values < 5x LOQ).
The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample.

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

FLAGS:
* = Duplicate Out of Spec

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QUALITY ASSURANCE SUMMARY
FORM 6
DUPLICATES
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438353BKG Duplicate Lab Sample ID: 8438359DUP
Batch Number(s): 161830638001
Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Mercury			0.0231	B	0.0260	B	12		CV

NOTE: An asterisk (*) in column "Q" indicates poor duplicate precision (RPD > 20% OR |(S) - (D)| > LOQ for values < 5x LOQ).
The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample.

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

FLAGS:
* = Duplicate Out of Spec

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QUALITY ASSURANCE SUMMARY
FORM 6
DUPLICATES
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438360BKG Duplicate Lab Sample ID: 8438363DUP
Batch Number(s): 161870637004
Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum			2980.1940		3101.2981		4		P
Antimony			0.5263	U	2.1925	B	200		P
Arsenic			0.7293	U	0.9151	U			P
Barium			9.0368		11.2925		22	*	P
Beryllium			0.0820	B	0.0811	B	1		P
Cadmium			0.1421	B	0.1208	B	16		P
Calcium			745.5218		875.0377		16		P
Chromium		2.3	4.2955		4.8472		12		P
Cobalt			0.2805	B	0.3425	B	20		P
Copper		1.5	5.1842		7.2349		33	*	P
Iron			2268.8053		2878.3274		24	*	P
Lead		2.3	8.2286		9.7321		17		P
Magnesium			216.5692		232.5877		7		P
Manganese			49.2421		54.5434		10		P
Nickel		1.5	1.5744		2.0698		27		P
Potassium		75.2	84.2459		87.2000	B	3		P
Selenium			0.6767	U	0.8491	U			P
Silver			0.1128	U	0.1415	U			P
Sodium			17.9699	U	22.5472	U			P
Thallium	203		0.0218	U	0.0274	U			MS
Vanadium		0.8	3.3045		3.4915		6		P
Zinc			40.5820		50.9274		23	*	P

NOTE: An asterisk (*) in column "Q" indicates poor duplicate precision (RPD > 20% OR |(S) - (D)| > LOQ for values < 5x LOQ).
The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample.

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ
FLAGS:
* = Duplicate Out of Spec

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QUALITY ASSURANCE SUMMARY
FORM 7
LABORATORY CONTROL SAMPLE
SDG No.: DWD86
Matrix: SOIL

Analyte	Mass	Batch Number	Units	True	Found	C	Control Limits (%)	%R	M	In Spec
Aluminum		161830637001	MG/KG	200.000	198.770		80 - 120	99	P	Yes
Antimony		161830637001	MG/KG	50.000	48.474		80 - 120	97	P	Yes
Arsenic		161830637001	MG/KG	15.000	14.256		80 - 120	95	P	Yes
Barium		161830637001	MG/KG	200.000	199.950		80 - 120	100	P	Yes
Beryllium		161830637001	MG/KG	5.000	4.931		80 - 120	99	P	Yes
Cadmium		161830637001	MG/KG	5.000	5.028		80 - 120	101	P	Yes
Calcium		161830637001	MG/KG	400.000	408.628		80 - 120	102	P	Yes
Chromium		161830637001	MG/KG	20.000	19.731		80 - 120	99	P	Yes
Cobalt		161830637001	MG/KG	50.000	50.633		80 - 120	101	P	Yes
Copper		161830637001	MG/KG	25.000	26.537		80 - 120	106	P	Yes
Iron		161830637001	MG/KG	100.000	96.881		80 - 120	97	P	Yes
Lead		161830637001	MG/KG	15.000	15.373		80 - 120	102	P	Yes
Magnesium		161830637001	MG/KG	200.000	200.047		80 - 120	100	P	Yes
Manganese		161830637001	MG/KG	50.000	50.498		80 - 120	101	P	Yes
Mercury		161820638001	MG/KG	0.100	0.092		80 - 120	92	CV	Yes
Nickel		161830637001	MG/KG	50.000	50.932		80 - 120	102	P	Yes
Potassium		161830637001	MG/KG	1000.000	989.641		80 - 120	99	P	Yes
Selenium		161830637001	MG/KG	15.000	14.339		80 - 120	96	P	Yes
Silver		161830637001	MG/KG	5.000	4.855		80 - 120	97	P	Yes
Sodium		161830637001	MG/KG	1000.000	999.331		80 - 120	100	P	Yes
Thallium	203	161830637001	MG/KG	0.200	0.200		80 - 120	100	MS	Yes
Vanadium		161830637001	MG/KG	50.000	49.597		80 - 120	99	P	Yes
Zinc		161830637001	MG/KG	50.000	49.521		80 - 120	99	P	Yes

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 7
LABORATORY CONTROL SAMPLE
SDG No.: DWD86
Matrix: SOIL

Analyte	Mass	Batch Number	Units	True	Found	C	Control Limits (%)	%R	M	In Spec
Aluminum		161870637004	MG/KG	200.000	183.048		80 - 120	92	P	Yes
Antimony		161870637004	MG/KG	50.000	46.283		80 - 120	93	P	Yes
Arsenic		161870637004	MG/KG	15.000	14.051		80 - 120	94	P	Yes
Barium		161870637004	MG/KG	200.000	187.961		80 - 120	94	P	Yes
Beryllium		161870637004	MG/KG	5.000	4.659		80 - 120	93	P	Yes
Cadmium		161870637004	MG/KG	5.000	4.626		80 - 120	93	P	Yes
Calcium		161870637004	MG/KG	400.000	380.524		80 - 120	95	P	Yes
Chromium		161870637004	MG/KG	20.000	18.610		80 - 120	93	P	Yes
Cobalt		161870637004	MG/KG	50.000	46.576		80 - 120	93	P	Yes
Copper		161870637004	MG/KG	25.000	24.919		80 - 120	100	P	Yes
Iron		161870637004	MG/KG	100.000	93.172		80 - 120	93	P	Yes
Lead		161870637004	MG/KG	15.000	13.642		80 - 120	91	P	Yes
Magnesium		161870637004	MG/KG	200.000	184.908		80 - 120	92	P	Yes
Manganese		161870637004	MG/KG	50.000	46.505		80 - 120	93	P	Yes
Mercury		161830638001	MG/KG	0.100	0.093		80 - 120	93	CV	Yes
Nickel		161870637004	MG/KG	50.000	47.290		80 - 120	95	P	Yes
Potassium		161870637004	MG/KG	1000.000	953.695		80 - 120	95	P	Yes
Selenium		161870637004	MG/KG	15.000	13.724		80 - 120	91	P	Yes
Silver		161870637004	MG/KG	5.000	4.542		80 - 120	91	P	Yes
Sodium		161870637004	MG/KG	1000.000	959.550		80 - 120	96	P	Yes
Thallium	203	161870637004	MG/KG	0.200	0.195	B	80 - 120	98	MS	Yes
Vanadium		161870637004	MG/KG	50.000	46.521		80 - 120	93	P	Yes
Zinc		161870637004	MG/KG	50.000	45.798		80 - 120	92	P	Yes

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 9
SERIAL DILUTIONS
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438343BKG Serial Dilution Lab Sample ID: 8438343L
Batch Number(s): 161830637001
Concentration Units: UG/L

Analyte	Mass	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Diff.	Q	M
Aluminum		5206.0300		5120.5500		2		P
Antimony		7.0000	U	35.0000	U			P
Arsenic		9.7000	U	48.5000	U			P
Barium		37.0500		37.7500	B	2		P
Beryllium		0.6700	U	3.3500	U			P
Cadmium		0.5400	B	2.4500	U	100		P
Calcium		10762.7400		10629.7500		1		P
Chromium		17.6800	B	22.3500	B	26		P
Cobalt		1.2000	U	6.0000	U			P
Copper		49.9600		44.9000	B	10		P
Iron		12118.4200		11929.1000		2		P
Lead		44.8600		56.0000	B	25		P
Magnesium		859.4900		843.8500	B	2		P
Manganese		122.1300		121.4500		1		P
Nickel		5.9300	B	15.0000	U	100		P
Potassium		671.6000	B	1195.0000	U	100		P
Selenium		9.0000	U	45.0000	U			P
Silver		1.5000	U	7.5000	U			P
Sodium		361.5300	B	1195.0000	U	100		P
Thallium	203	0.1450	U	0.7250	U			MS
Vanadium		19.0200		24.9500	B	31		P
Zinc		33.0700	B	34.0000	U	100		P

NOTE: An E in column Q indicates the presence of a chemical or physical interference in the matrix when the % difference is greater than 10%. This applies only when (I) is greater than or equal to 50x MDL for ICP, 100x MDL for ICP-MS (6020), 50x MDL for ICP-MS (200.8), or 25x MDL for GFAA.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ
FLAGS:
E = Matrix Effects exist as proven by Serial Dilution or Spiked Dilution

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QUALITY ASSURANCE SUMMARY
FORM 9
SERIAL DILUTIONS
SDG No.: DWD86
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8438360BKG Serial Dilution Lab Sample ID: 8438360L
Batch Number(s): 161870637004
Concentration Units: UG/L

Analyte	Mass	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Diff.	Q	M
Aluminum		39636.5800		39557.0500		0		P
Antimony		7.0000	U	35.0000	U			P
Arsenic		9.7000	U	48.5000	U			P
Barium		120.1900		120.5500		0		P
Beryllium		1.0900	B	3.3500	U	100		P
Cadmium		1.8900	B	2.4500	U	100		P
Calcium		9915.4400		9831.0500		1		P
Chromium		57.1300		59.7000	B	4		P
Cobalt		3.7300	B	6.0000	U	100		P
Copper		68.9500		64.9500	B	6		P
Iron		30175.1100		29746.1500		1		P
Lead		109.4400		95.0000	B	13		P
Magnesium		2880.3700		2803.6000		3		P
Manganese		654.9200		660.7500		1		P
Nickel		20.9400		19.8000	B	5		P
Potassium		1120.4700		1214.2000	B	8		P
Selenium		9.0000	U	45.0000	U			P
Silver		1.5000	U	7.5000	U			P
Sodium		239.0000	U	1195.0000	U			P
Thallium	203	0.1450	U	0.7250	U			MS
Vanadium		43.9500		47.6500	B	8		P
Zinc		539.7400		524.1000		3		P

NOTE: An E in column Q indicates the presence of a chemical or physical interference in the matrix when the % difference is greater than 10%. This applies only when (I) is greater than or equal to 50x MDL for ICP, 100x MDL for ICP-MS (6020), 50x MDL for ICP-MS (200.8), or 25x MDL for GFAA.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ
FLAGS:
E = Matrix Effects exist as proven by Serial Dilution or Spiked Dilution

QUALITY ASSURANCE SUMMARY
FORM 10
INSTRUMENT DETECTION LIMITS (QUARTERLY)
SDG No.: DWD86

Method: P
Instrument ID: 11016
Date: 04/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Magnesium			
Manganese			
Nickel			
Potassium			
Selenium	196.09		7.5
Silver			
Sodium			
Vanadium			
Zinc			

Comments:
_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: P
Instrument ID: 16417
Date: 04/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Aluminum	308.21		45.0
Antimony	206.83		3.3
Arsenic	189.04		3.6
Barium	455.40		0.33
Beryllium	313.04		0.67
Cadmium	226.50		0.33
Calcium	317.93		33.4
Chromium	267.72		0.75
Cobalt	228.62		0.50
Copper	327.40		1.7
Iron	261.19		33.4
Lead	220.35		1.7
Magnesium	285.21		16.7
Manganese	257.61		0.83
Nickel	231.60		0.80
Potassium	766.49		83.4
Selenium	196.09		6.5
Silver	328.06		0.83
Sodium	589.59		167
Vanadium	292.40		0.75
Zinc	213.86		2.0

Comments:
_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: MS
Instrument ID: 11332
Date: 04/2016

Analyte	MASS (amu)	Background	IDL (UG/L)
Thallium	203		0.15

Comments:

_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: CV
Instrument ID: 19302
Date: 04/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Mercury			0.050

Comments:

_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD86
Matrix: SOIL

Method: P
Date: 06/2016

Analyte	Wavelength (nm)	Background	LOQ (UG/L)	MDL (UG/L)
Aluminum	308.21		400	86.8
Antimony	206.83		40.0	7.0
Arsenic	189.04		40.0	9.7
Barium	455.40		10.0	0.33
Beryllium	313.04		10.0	0.67
Cadmium	226.50		10.0	0.49
Calcium	317.93		400	56.6
Chromium	267.72		30.0	1.4
Cobalt	228.62		10.0	1.2
Copper	327.40		20.0	2.3
Iron	261.19		400	41.2
Lead	220.35		30.0	5.5
Magnesium	285.21		200	19.0
Manganese	257.61		10.0	0.83
Nickel	231.60		20.0	3.0
Potassium	766.49		1000	239
Selenium	196.09		40.0	9.0
Silver	328.06		10.0	1.5
Sodium	589.59		2000	239
Vanadium	292.40		10.0	1.4
Zinc	213.86		40.0	6.8

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD86
Matrix: SOIL

Method: MS
Date: 06/2016

Analyte	Mass	Background	LOQ (UG/L)	MDL (UG/L)
Thallium	203		1.0	0.15

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD86
Matrix: SOIL

Method: CV
Date: 07/2015

Analyte	Wavelength (nm)	Background	LOQ (UG/L)	MDL (UG/L)
Mercury			0.60	0.060

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD86

Instrument ID: 11016
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: AL	CA	FE	MG	W
Selenium	196.09	0.0000000	0.0000000	0.0000580	0.0000000	0.0077900

Comments:
_____
_____
_____
_____

QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD86

Instrument ID: 16417
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: AL	CA	FE	MG	CO
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.83	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	-0.0001600	0.0000000	0.0000000
Barium	455.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0001170	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	327.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0002550
Iron	261.19	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0002270	0.0000000	0.0000000	0.0000000	-0.0003780
Magnesium	285.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.09	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.06	0.0000000	0.0000000	-0.0004180	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000190	0.0000000	0.0000000
Zinc	213.86	0.0000000	0.0000000	0.0001080	0.0000000	0.0000000

Comments:
_____
_____
_____
_____

QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD86

Instrument ID: 16417
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: CR	MO	NI	SI	TI
Aluminum	308.21	0.0000000	0.0197250	0.0000000	0.0000000	0.0000000
Antimony	206.83	0.0203250	-0.0071940	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0010380	0.0017140	0.0000000	0.0000000	0.0000000
Barium	455.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0022370
Copper	327.40	0.0000000	-0.0009140	0.0000000	0.0000000	0.0000000
Iron	261.19	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	-0.0026860	0.0000000	0.0000910	0.0000000
Magnesium	285.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.09	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.06	0.0000000	0.0000000	0.0000000	0.0000000	-0.0004780
Vanadium	292.40	0.0000000	-0.0127040	0.0000000	0.0000000	0.0007100
Zinc	213.86	0.0000000	0.0000000	0.0047920	0.0000000	0.0000000

Comments:
_____
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QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD86

Instrument ID: 16417
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: V	ZR	--	--	--
Aluminum	308.21	0.0244560	0.0000000			
Antimony	206.83	0.0000000	-0.0009840			
Arsenic	189.04	0.0000000	0.0000000			
Barium	455.40	0.0000000	0.0005290			
Beryllium	313.04	0.0000000	0.0000000			
Cadmium	226.50	0.0000000	0.0000000			
Calcium	317.93	0.0000000	0.0000000			
Chromium	267.72	0.0000000	0.0000000			
Cobalt	228.62	0.0000000	0.0000000			
Copper	327.40	0.0000000	-0.0005790			
Iron	261.19	0.0000000	0.0000000			
Lead	220.35	0.0000000	0.0000000			
Magnesium	285.21	0.0000000	0.0000000			
Nickel	231.60	0.0000000	0.0000000			
Selenium	196.09	0.0000000	0.0000000			
Silver	328.06	0.0000000	0.0054810			
Vanadium	292.40	0.0000000	0.0000000			
Zinc	213.86	0.0000000	0.0000000			

Comments:
_____
_____
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_____

QUALITY ASSURANCE SUMMARY
FORM 12
LINEAR RANGES
SDG No.: DWD86

Method: P
Instrument ID: 11016
Date: 04/2016

Analyte	Wavelength (nm)	Integration Time (Sec.)	Concentration (ug/L)
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Magnesium			
Manganese			
Nickel			
Potassium			
Selenium	196.09	10.00	20000.0
Silver			
Sodium			
Vanadium			
Zinc			

Comments:
_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 12
LINEAR RANGES
SDG No.: DWD86

Method: P
Instrument ID: 16417
Date: 04/2016

Analyte	Wavelength (nm)	Integration Time (Sec.)	Concentration (ug/L)
Aluminum	308.21	10.00	600000.0
Antimony	206.83	10.00	20000.0
Arsenic	189.04	10.00	20000.0
Barium	455.4	10.00	10000.0
Beryllium	313.04	10.00	10000.0
Cadmium	226.5	10.00	20000.0
Calcium	317.93	10.00	600000.0
Chromium	267.72	10.00	20000.0
Cobalt	228.62	10.00	20000.0
Copper	327.4	10.00	20000.0
Iron	261.19	10.00	300000.0
Lead	220.35	10.00	20000.0
Magnesium	285.21	10.00	600000.0
Manganese	257.61	10.00	20000.0
Nickel	231.6	10.00	20000.0
Potassium	766.49	10.00	500000.0
Selenium	196.09	10.00	20000.0
Silver	328.06	10.00	10000.0
Sodium	589.59	10.00	500000.0
Vanadium	292.4	10.00	20000.0
Zinc	213.86	10.00	20000.0

Comments:
_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 15
ICP-MS TUNE
SDG No.: DWD86
Matrix: SOIL

Instrument ID: 11332
Date: 07/05/2016

Analyte	Mass	Avg. Measured Mass (amu)	Avg. Peak Width at 5% Peak Height (amu)	%RSD
Lithium	6.000	6.00	0.70	3.8
Magnesium	24.000	23.95	0.70	0.7
Rhodium	103.000	102.95	0.65	0.6
Indium	115.000	115.00	0.65	3.8
Cerium	140.000	140.00	0.65	2.1
Lead	208.000	208.00	0.65	1.5
Uranium	238.000	237.95	0.60	1.6

Comments:

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QUALITY ASSURANCE SUMMARY
FORM 15
ICP-MS TUNE
SDG No.: DWD86
Matrix: SOIL

Instrument ID: 11332
Date: 07/08/2016

Analyte	Mass	Avg. Measured Mass (amu)	Avg. Peak Width at 5% Peak Height (amu)	%RSD
Lithium	6.000	5.95	0.70	1.6
Magnesium	24.000	24.05	0.70	1.8
Rhodium	103.000	103.05	0.65	1.6
Indium	115.000	115.05	0.65	1.7
Cerium	140.000	140.05	0.65	1.5
Lead	208.000	208.00	0.65	1.2
Uranium	238.000	238.00	0.60	1.5

Comments:

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QUALITY ASSURANCE SUMMARY
FORM 16
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
SDG No.: DWD86

Instrument ID: 11332
Run Name: 1618703E03

Start Date: 07/05/2016
End Date: 07/05/2016

Standard	Elements Applies to	Standard	Elements Applies to
BI-1-209	TL		

Lab Sample ID	Time	Internal Standards %RI For: Element BI-1-209	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q
S0	09:09	100													
S	09:11	96													
CCS	09:12	98													
CCS	09:14	99													
ICV	09:16	97													
ICB	09:17	100													
LLC	09:19	100													
ICSA	09:21	89													
ICSAB	09:22	89													
ZZZZZZ	09:24														
CCV	09:26	99													
CCB	09:28	98													
P18337AB	09:29	98													
P18337AQ	09:31	98													
8438343BKG	09:33	99													
8438343A	09:35	98													
8438346DUP	09:37	99													
8438344MS	09:38	97													
8438345MSD	09:40	94													
8438343L	09:42	100													
8438322	09:43	97													
8438326	09:45	96													
CCV	09:47	98													
CCB	09:49	97													
8438330	09:51	96													
8438334	09:52	95													
8438351	09:54	96													
8455216	09:56	97													
LLC	09:58	98													
ICSA	09:59	86													
ICSAB	10:01	86													
ZZZZZZ	10:03														
CCV	10:04	95													

LEGEND:
BKG = Background
DUP = Duplicate
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike

FLAG:
R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:
BE = Beryllium
BI = Bismuth
GE = Germanium
HO = Holmium
IN = Indium
LI = Lithium
SC = Scandium
TB = Terbium
Y = Yttrium

QUALITY ASSURANCE SUMMARY
FORM 16
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
SDG No.: DWD86

Instrument ID: 11332
Run Name: 1618703E03

Start Date: 07/05/2016
End Date: 07/05/2016

Standard	Elements Applies to	Standard	Elements Applies to
BI-1-209	TL		

Lab Sample ID	Time	Internal Standards %RI For: Element BI-1-209	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q
CCB	10:06	94													

LEGEND:
BKG = Background
DUP = Duplicate
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike
FLAG:
R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:
BE = Beryllium
BI = Bismuth
GE = Germanium
HO = Holmium
IN = Indium
LI = Lithium
SC = Scandium
TB = Terbium
Y = Yttrium

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QUALITY ASSURANCE SUMMARY
FORM 16
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
SDG No.: DWD86

Instrument ID: 11332
Run Name: 1619001E03

Start Date: 07/08/2016
End Date: 07/08/2016

Standard	Elements Applies to	Standard	Elements Applies to
BI-1-209	TL		

Lab Sample ID	Time	Internal Standards %RI For: Element BI-1-209	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q
S0	00:22	100													
S	00:24	97													
CCS	00:25	99													
CCS	00:26	98													
ICV	00:28	98													
ICB	00:29	97													
LLC	00:30	98													
ICSA	00:32	92													
ICSAB	00:33	90													
ZZZZZZ	00:35														
CCV	00:36	96													
CCB	00:37	98													
P18737DB	00:39	100													
P18737DQ	00:40	101													
8438360BKG	00:41	101													
8438360A	00:43	102													
8438363DUP	00:44	103													
8438361MS	00:45	100													
8438362MSD	00:47	103													
8438360L	00:48	104													
8438371	00:50	102													
8438375	00:51	102													
CCV	00:52	98													
CCB	00:54	99													
ZZZZZZ	00:55														
ZZZZZZ	00:56														
ZZZZZZ	00:58														
ZZZZZZ	00:59														
LLC	01:01	100													
ICSA	01:02	94													
ICSAB	01:03	91													
ZZZZZZ	01:05														
CCV	01:06	101													

LEGEND:
BKG = Background
DUP = Duplicate
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike

FLAG:
R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:
BE = Beryllium
BI = Bismuth
GE = Germanium
HO = Holmium
IN = Indium
LI = Lithium
SC = Scandium
TB = Terbium
Y = Yttrium

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QUALITY ASSURANCE SUMMARY
FORM 16
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
SDG No.: DWD86

Instrument ID: 11332
Run Name: 1619001E03

Start Date: 07/08/2016
End Date: 07/08/2016

Standard	Elements Applies to	Standard	Elements Applies to
BI-1-209	TL		

Lab Sample ID	Time	Internal Standards %RI For: Element BI-1-209	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q
CCB	01:07	101													

LEGEND:
BKG = Background
DUP = Duplicate
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike
FLAG:
R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:
BE = Beryllium
BI = Bismuth
GE = Germanium
HO = Holmium
IN = Indium
LI = Lithium
SC = Scandium
TB = Terbium
Y = Yttrium

Preparation and Run Logs

Metals in Solid

LLENS Worksheet for 0637 SW846 (IV) ICP/ICP MS Digest

Batch# 16 183 0637 001

Balance ID#: 10685 **Start Time:** 7/3/16 7:30 **End Time:** 7/3/16 12:40 **Hot Block:** 4

Pipette ID: 23041058 /2000 I43551C /1000

Spike/Reagent	Lot#	Volume Added(mL)
1:1 HNO3	P16-180B	10.00
30% H2O2	161509	4.00
HCL	123882	10.00
HNO3	119637	5.00
ICP Spike 1A	1616510#2	2.00
ICP Spike 1B	1616511#2	2.00
ICP/MS Spike	1614727#1	2.00
LCS	1614727#1	1.00
LCS A1	1616510#2	2.00
LCS B1	1616511#2	2.00

Method Ref: SW-846 3050B

	SampleID	Date Due	C	ST	P	H	PH<2	BC	Vessel Lot#	Comments
1)	PBS	.							1512329	Chemware boiling chips R335-6D006 1.03
2)	LCSW	.							1512329	Chemware boiling chips R335-6D006 1.08
3)	LCSW2	.							1512329	Chemware boiling chips R335-6D006 1.05
4)	8452797	07/12/16 18:20		SW	S8			077a	1512329	SQAR
5)	8443152	07/06/16 19:30		SW	N8			062a	1512329	SQAR T2 All Metals
6)	8446538	07/06/16 19:30		SW	Q8			062a	1512329	SQAR Limited Volume
7)	8449021	07/08/16 17:35		SW	Q8			062a	1512329	SQAR
8)	8449403	07/11/16 17:35		SW	N8			620a	1512329	
9)	8449405	07/11/16 17:35		SW	N8			620a	1512329	
10)	8438322	07/14/16 09:30		SW	N15			620a	1512329	
11)	8438326	07/14/16 09:30		SW	N15			620a	1512329	
12)	8438330	07/14/16 09:30		SW	N15			620a	1512329	
13)	8438334	07/14/16 09:30		SW	N15			620a	1512329	
14)	**8438343U**	07/14/16 09:30		SW	N15			620a	1512329	
15)	**8438344R**	07/14/16 09:30		SW	N15			620a	1512329	
16)	**8438344R**	07/14/16 09:30		SW	N15			034a	1512329	
17)	**8438345M**	07/14/16 09:30		SW	N15			620a	1512329	
18)	**8438345M**	07/14/16 09:30		SW	N15			034a	1512329	
19)	**8438346D**	07/14/16 09:30		SW	N15			620a	1512329	
20)	8438351	07/14/16 09:30		SW	N15			620a	1512329	
21)	8455216BL	07/22/16 09:50		SW	N15			620a	1512329	

Prep Employee: 943

7/3/2016

v 1.0.1

Batch# 16 183 0637 001

LLENS Batch Chronology and Change Log - SW846 (IV) ICP/ICP MS Digest

	Operation	Instrument	Operation Date	ANALYST
1)	Batch Creation		7/1/16 16:48	943
2)	Sample Wt		7/1/16 16:49	851
3)	Sample Wt		7/3/16 6:17	943
4)	Final Vol	10685	7/3/16 6:17	943
5)	Trial		7/3/16 6:17	943
6)	Sample Wt		7/3/16 6:35	943
7)	Sample Wt		7/3/16 6:35	943
8)	Upload Prep	US19PCC06698	7/3/16 12:45	943

					Original Entry				Data Changed		
Sample ID	Analysis	D	Operation	Measurement	Date/Time	Data	Units	Analyst	Date/Time	Analyst	Reason
8443152	10637	1	Sample Wt	Sample Wt	7/3/16 6:26	1.04	(g)	943	7/3/16 6:35	943	Wrong entry
8443152	10637	1	Final Vol	Final Volume	7/3/16 6:27	1.36	(g)	943	7/3/16 6:35	943	Wrong entry
8446538	10637	1	Sample Wt	Sample Wt	7/3/16 6:24	1.38	(g)	943	7/3/16 6:35	943	Wrong entry

Analysis: 0637 SW846 (IV) ICP/ICP MS Digest Batch# 16 183 0637 001

Sample ID	Due Date	P	EPA#	SDG#	Sample Wt	Final Volume	Trial
PBS					1.0000	100.0000	1
LCSW					1.0000	100.0000	1
LCSW2					1.0000	100.0000	1
8452797	07/12/16	S8	55626		3.7800	100.0000	1
8443152	07/06/16	N8			1.3500	100.0000	2
8446538	07/06/16	Q8			34.5000	100.0000	1
8449021	07/08/16	Q8			5.3800	100.0000	1
8449403	07/11/16	N8			1.0500	100.0000	1
8449405	07/11/16	N8			1.2900	100.0000	1
8438322	07/14/16	N15	D8602	DWD86-02	1.1000	100.0000	1
8438326	07/14/16	N15	D8606	DWD86-06	1.3300	100.0000	1
8438330	07/14/16	N15	D8610	DWD86-10	1.2200	100.0000	1
8438334	07/14/16	N15	D8614	DWD86-14	1.0900	100.0000	1
8438343U	07/14/16	N15	D8617	DWD86-17BKG	1.1500	100.0000	1
8438344R	07/14/16	N15	D8617	DWD86-17MS	1.0300	100.0000	1
8438344R	07/14/16	N15	D8617	DWD86-17MS	1.0300	100.0000	1
8438345M	07/14/16	N15	D8617	DWD86-17MSD	1.0700	100.0000	1
8438345M	07/14/16	N15	D8617	DWD86-17MSD	1.0700	100.0000	1
8438346D	07/14/16	N15	D8617	DWD86-17DUP	1.2000	100.0000	1
8438351	07/14/16	N15	D8620	DWD86-20	1.4000	100.0000	1
8455216BL	07/22/16	N15	D86B1	DWD86-37BL	1.2400	100.0000	1

LLENS Worksheet for 0637 SW846 (IV) ICP/ICP MS Digest

Batch# 16 187 0637 004

Balance ID#: 10685 **Start Time:** 7/6/16 8:45 **End Time:** 7/6/16 13:50 **Hot Block:** 6

Pipette ID: 24111202 /2000 I43551C /1000

Spike/Reagent	Lot#	Volume Added(mL)
1:1 HNO3	P16-180B	10.00
30% H2O2	160241	4.00
HCL	123882	10.00
HNO3	119637	5.00
ICP Spike 1A	1616510#4	2.00
ICP Spike 1B	1616511#4	2.00
ICP/MS Spike	1614727#1	2.00
LCS	1614727#1	1.00
LCS A1	1616510#4	2.00
LCS B1	1616511#4	2.00

Method Ref: SW-846 3050B

	SampleID	Date Due	C	ST	P	H	PH<2	BC	Vessel Lot#	Comments
1)	PBS	.							1512329	Chemware boiling chips R335-6D006 1.02
2)	LCSW	.							1512329	Chemware boiling chips R335-6D006 1.04
3)	LCSW2	.							1512329	Chemware boiling chips R335-6D006 1.01
4)	**8438360U**	07/14/16 09:30		SW	N15			620a	1512329	
5)	**8438361R**	07/14/16 09:30		SW	N15			620a	1512329	
6)	**8438361R**	07/14/16 09:30		SW	N15			034a	1512329	
7)	**8438362M**	07/14/16 09:30		SW	N15			620a	1512329	
8)	**8438362M**	07/14/16 09:30		SW	N15			034a	1512329	
9)	**8438363D**	07/14/16 09:30		SW	N15			620a	1512329	
10)	8438371	07/14/16 09:30		SW	N15			620a	1512329	
11)	8438375	07/14/16 09:30		SW	N15			620a	1512329	
12)	8455242BL	07/18/16 09:30		SW	N15			620a	1512329	
13)	8442817	07/18/16 18:10		SW	N15			034a	1512329	
14)	8442821	07/18/16 18:10		SW	N15			034a	1512329	
15)	8442825	07/18/16 18:10		SW	N15			034a	1512329	

Prep Employee: 1184

7/6/2016

v 1.0.1

Batch# 16 187 0637 004

LLENS Batch Chronology and Change Log - SW846 (IV) ICP/ICP MS Digest

	Operation	Instrument	Operation Date	ANALYST
1)	Batch Creation		7/5/16 14:54	1184
2)	Sample Wt		7/5/16 14:55	851
3)	Final Vol	10685	7/6/16 5:51	10287
4)	Trial		7/6/16 5:51	10287
5)	Sample Wt		7/6/16 6:56	10287
6)	Sample Wt		7/6/16 8:00	10287
7)	Sample Wt		7/6/16 8:16	10287
8)	Upload Prep	US19PCC06691	7/6/16 14:03	1184

					Original Entry				Data Changed		
Sample ID	Analysis	D	Operation	Measurement	Date/Time	Data	Units	Analyst	Date/Time	Analyst	Reason
8442817	10637	1	Sample Wt	Sample Wt	7/6/16 8:11	0.9800	(g)	10287	7/6/16 8:16	10287	Wrong entry

Analysis: 0637 SW846 (IV) ICP/ICP MS Digest Batch# 16 187 0637 004

Sample ID	Due Date	P	EPA#	SDG#	Sample Wt	Final Volume	Trial
PBS					1.0000	100.0000	1
LCSW					1.0000	100.0000	1
LCSW2					1.0000	100.0000	1
8438360U	07/14/16		N15D8623	DWD86-23BKG	1.3300	100.0000	1
8438361R	07/14/16		N15D8623	DWD86-23MS	1.0800	100.0000	1
8438361R	07/14/16		N15D8623	DWD86-23MS	1.0800	100.0000	1
8438362M	07/14/16		N15D8623	DWD86-23MSD	1.3100	100.0000	1
8438362M	07/14/16		N15D8623	DWD86-23MSD	1.3100	100.0000	1
8438363D	07/14/16		N15D8623	DWD86-23DUP	1.0600	100.0000	1
8438371	07/14/16		N15D8627	DWD86-27	1.4300	100.0000	1
8438375	07/14/16		N15D8631	DWD86-31	1.0100	100.0000	1
8455242BL	07/18/16		N15D87B1	DWD87-29BL	1.0900	100.0000	1
8442817	07/18/16		N15D16A2	DWD87-14	1.0100	100.0000	1
8442821	07/18/16		N15D16B2	DWD87-18	1.0100	100.0000	1
8442825	07/18/16		N15D16C2	DWD87-22	1.0200	100.0000	1

LLENS Worksheet for 0637 SW846 (IV) ICP/ICP MS Digest

Batch# 16 183 0637 001

Balance ID#: 10685 **Start Time:** 7/3/16 7:30 **End Time:** 7/3/16 12:40 **Hot Block:** 4

Pipette ID: 23041058 /2000 I43551C /1000

Spike/Reagent	Lot#	Volume Added(mL)
1:1 HNO3	P16-180B	10.00
30% H2O2	161509	4.00
HCL	123882	10.00
HNO3	119637	5.00
ICP Spike 1A	1616510#2	2.00
ICP Spike 1B	1616511#2	2.00
ICP/MS Spike	1614727#1	2.00
LCS	1614727#1	1.00
LCS A1	1616510#2	2.00
LCS B1	1616511#2	2.00

Method Ref: SW-846 3050B

	SampleID	Date Due	C	ST	P	H	PH<2	BC	Vessel Lot#	Comments
1)	PBS	.							1512329	Chemware boiling chips R335-6D006 1.03
2)	LCSW	.							1512329	Chemware boiling chips R335-6D006 1.08
3)	LCSW2	.							1512329	Chemware boiling chips R335-6D006 1.05
4)	8452797	07/12/16 18:20		SW	S8			077a	1512329	SQAR
5)	8443152	07/06/16 19:30		SW	N8			062a	1512329	SQAR T2 All Metals
6)	8446538	07/06/16 19:30		SW	Q8			062a	1512329	SQAR Limited Volume
7)	8449021	07/08/16 17:35		SW	Q8			062a	1512329	SQAR
8)	8449403	07/11/16 17:35		SW	N8			620a	1512329	
9)	8449405	07/11/16 17:35		SW	N8			620a	1512329	
10)	8438322	07/14/16 09:30		SW	N15			620a	1512329	
11)	8438326	07/14/16 09:30		SW	N15			620a	1512329	
12)	8438330	07/14/16 09:30		SW	N15			620a	1512329	
13)	8438334	07/14/16 09:30		SW	N15			620a	1512329	
14)	**8438343U**	07/14/16 09:30		SW	N15			620a	1512329	
15)	**8438344R**	07/14/16 09:30		SW	N15			620a	1512329	
16)	**8438344R**	07/14/16 09:30		SW	N15			034a	1512329	
17)	**8438345M**	07/14/16 09:30		SW	N15			620a	1512329	
18)	**8438345M**	07/14/16 09:30		SW	N15			034a	1512329	
19)	**8438346D**	07/14/16 09:30		SW	N15			620a	1512329	
20)	8438351	07/14/16 09:30		SW	N15			620a	1512329	
21)	8455216BL	07/22/16 09:50		SW	N15			620a	1512329	

Prep Employee: 943

7/3/2016

v 1.0.1

Batch# 16 183 0637 001

LLENS Batch Chronology and Change Log - SW846 (IV) ICP/ICP MS Digest

	Operation	Instrument	Operation Date	ANALYST
1)	Batch Creation		7/1/16 16:48	943
2)	Sample Wt		7/1/16 16:49	851
3)	Sample Wt		7/3/16 6:17	943
4)	Final Vol	10685	7/3/16 6:17	943
5)	Trial		7/3/16 6:17	943
6)	Sample Wt		7/3/16 6:35	943
7)	Sample Wt		7/3/16 6:35	943
8)	Upload Prep	US19PCC06698	7/3/16 12:45	943

					Original Entry				Data Changed		
Sample ID	Analysis	D	Operation	Measurement	Date/Time	Data	Units	Analyst	Date/Time	Analyst	Reason
8443152	10637	1	Sample Wt	Sample Wt	7/3/16 6:26	1.04	(g)	943	7/3/16 6:35	943	Wrong entry
8443152	10637	1	Final Vol	Final Volume	7/3/16 6:27	1.36	(g)	943	7/3/16 6:35	943	Wrong entry
8446538	10637	1	Sample Wt	Sample Wt	7/3/16 6:24	1.38	(g)	943	7/3/16 6:35	943	Wrong entry

Analysis: 0637 SW846 (IV) ICP/ICP MS Digest Batch# 16 183 0637 001

Sample ID	Due Date	P	EPA#	SDG#	Sample Wt	Final Volume	Trial
PBS					1.0000	100.0000	1
LCSW					1.0000	100.0000	1
LCSW2					1.0000	100.0000	1
8452797	07/12/16	S8	55626		3.7800	100.0000	1
8443152	07/06/16	N8			1.3500	100.0000	2
8446538	07/06/16	Q8			34.5000	100.0000	1
8449021	07/08/16	Q8			5.3800	100.0000	1
8449403	07/11/16	N8			1.0500	100.0000	1
8449405	07/11/16	N8			1.2900	100.0000	1
8438322	07/14/16	N15	D8602	DWD86-02	1.1000	100.0000	1
8438326	07/14/16	N15	D8606	DWD86-06	1.3300	100.0000	1
8438330	07/14/16	N15	D8610	DWD86-10	1.2200	100.0000	1
8438334	07/14/16	N15	D8614	DWD86-14	1.0900	100.0000	1
8438343U	07/14/16	N15	D8617	DWD86-17BKG	1.1500	100.0000	1
8438344R	07/14/16	N15	D8617	DWD86-17MS	1.0300	100.0000	1
8438344R	07/14/16	N15	D8617	DWD86-17MS	1.0300	100.0000	1
8438345M	07/14/16	N15	D8617	DWD86-17MSD	1.0700	100.0000	1
8438345M	07/14/16	N15	D8617	DWD86-17MSD	1.0700	100.0000	1
8438346D	07/14/16	N15	D8617	DWD86-17DUP	1.2000	100.0000	1
8438351	07/14/16	N15	D8620	DWD86-20	1.4000	100.0000	1
8455216BL	07/22/16	N15	D86B1	DWD86-37BL	1.2400	100.0000	1

LLENS Worksheet for 0637 SW846 (IV) ICP/ICP MS Digest

Batch# 16 187 0637 004

Balance ID#: 10685 **Start Time:** 7/6/16 8:45 **End Time:** 7/6/16 13:50 **Hot Block:** 6

Pipette ID: 24111202 /2000 I43551C /1000

Spike/Reagent	Lot#	Volume Added(mL)
1:1 HNO3	P16-180B	10.00
30% H2O2	160241	4.00
HCL	123882	10.00
HNO3	119637	5.00
ICP Spike 1A	1616510#4	2.00
ICP Spike 1B	1616511#4	2.00
ICP/MS Spike	1614727#1	2.00
LCS	1614727#1	1.00
LCS A1	1616510#4	2.00
LCS B1	1616511#4	2.00

Method Ref: SW-846 3050B

	SampleID	Date Due	C	ST	P	H	PH<2	BC	Vessel Lot#	Comments
1)	PBS	.							1512329	Chemware boiling chips R335-6D006 1.02
2)	LCSW	.							1512329	Chemware boiling chips R335-6D006 1.04
3)	LCSW2	.							1512329	Chemware boiling chips R335-6D006 1.01
4)	**8438360U**	07/14/16 09:30		SW	N15			620a	1512329	
5)	**8438361R**	07/14/16 09:30		SW	N15			620a	1512329	
6)	**8438361R**	07/14/16 09:30		SW	N15			034a	1512329	
7)	**8438362M**	07/14/16 09:30		SW	N15			620a	1512329	
8)	**8438362M**	07/14/16 09:30		SW	N15			034a	1512329	
9)	**8438363D**	07/14/16 09:30		SW	N15			620a	1512329	
10)	8438371	07/14/16 09:30		SW	N15			620a	1512329	
11)	8438375	07/14/16 09:30		SW	N15			620a	1512329	
12)	8455242BL	07/18/16 09:30		SW	N15			620a	1512329	
13)	8442817	07/18/16 18:10		SW	N15			034a	1512329	
14)	8442821	07/18/16 18:10		SW	N15			034a	1512329	
15)	8442825	07/18/16 18:10		SW	N15			034a	1512329	

Prep Employee: 1184

7/6/2016

v 1.0.1

Batch# 16 187 0637 004

LLENS Batch Chronology and Change Log - SW846 (IV) ICP/ICP MS Digest

	Operation	Instrument	Operation Date	ANALYST
1)	Batch Creation		7/5/16 14:54	1184
2)	Sample Wt		7/5/16 14:55	851
3)	Final Vol	10685	7/6/16 5:51	10287
4)	Trial		7/6/16 5:51	10287
5)	Sample Wt		7/6/16 6:56	10287
6)	Sample Wt		7/6/16 8:00	10287
7)	Sample Wt		7/6/16 8:16	10287
8)	Upload Prep	US19PCC06691	7/6/16 14:03	1184

					Original Entry				Data Changed		
Sample ID	Analysis	D	Operation	Measurement	Date/Time	Data	Units	Analyst	Date/Time	Analyst	Reason
8442817	10637	1	Sample Wt	Sample Wt	7/6/16 8:11	0.9800	(g)	10287	7/6/16 8:16	10287	Wrong entry

Analysis: 0637 SW846 (IV) ICP/ICP MS Digest Batch# 16 187 0637 004

Sample ID	Due Date	P	EPA#	SDG#	Sample Wt	Final Volume	Trial
PBS					1.0000	100.0000	1
LCSW					1.0000	100.0000	1
LCSW2					1.0000	100.0000	1
8438360U	07/14/16		N15D8623	DWD86-23BKG	1.3300	100.0000	1
8438361R	07/14/16		N15D8623	DWD86-23MS	1.0800	100.0000	1
8438361R	07/14/16		N15D8623	DWD86-23MS	1.0800	100.0000	1
8438362M	07/14/16		N15D8623	DWD86-23MSD	1.3100	100.0000	1
8438362M	07/14/16		N15D8623	DWD86-23MSD	1.3100	100.0000	1
8438363D	07/14/16		N15D8623	DWD86-23DUP	1.0600	100.0000	1
8438371	07/14/16		N15D8627	DWD86-27	1.4300	100.0000	1
8438375	07/14/16		N15D8631	DWD86-31	1.0100	100.0000	1
8455242BL	07/18/16		N15D87B1	DWD87-29BL	1.0900	100.0000	1
8442817	07/18/16		N15D16A2	DWD87-14	1.0100	100.0000	1
8442821	07/18/16		N15D16B2	DWD87-18	1.0100	100.0000	1
8442825	07/18/16		N15D16C2	DWD87-22	1.0200	100.0000	1

LLENS Worksheet for 0638 SW SW846 Hg Digest

Batch# 16 182 0638 001

Balance ID#: 19119 **Start Time:** 7/1/16 11:45 **End Time:** 7/1/16 12:15 **Hot Block:** 2

Pipette ID: I43551C /1000

Spike/Reagent	Lot#	Volume Added(mL)
5%KMnO4	P16-179C	15.00
Aqua Regia	P16-183C	5.00
LCS 100 ppb Hg	P16-181B	1.00
Spike 100 ppb Hg	P16-181B	1.00

Method Ref: SW-846 7471B

	SampleID	Date Due	C	ST	P	H	PH<2	BC	Vessel Lot#	Comments
1)	PBS	.							1512329	Chemware boiling chips R335-6D006 0.6243
2)	LCSW	.							1512329	Chemware boiling chips R335-6D006 0.6372
3)	8446538	07/06/16 19:30		SW	S8			062a	1512329	SQAR
4)	8452797	07/12/16 18:20		SW	S8			077a	1512329	SQAR
5)	8442663	07/06/16 12:20		SW	N8			034a	1512329	SQAR
6)	8442664	07/06/16 12:20		SW	N8			034a	1512329	SQAR Limited Sample
7)	8446793	07/06/16 17:50		SW	N7			034a	1512329	SQAR
8)	8443152	07/06/16 19:30		SW	N8			062a	1512329	SQAR
9)	8442730	07/07/16 10:12		SW	N8			034a	1512329	SQAR
10)	8445316	07/07/16 12:05		SW	N8			062a	1512329	SQAR
11)	8446822	07/07/16 17:50		SW	N8			034a	1512329	SQAR
12)	8446939	07/07/16 17:50		SW	N8			034a	1512329	SQAR
13)	8449021	07/08/16 17:35		SW	Q8			062a	1512329	SQAR
14)	8438321	07/14/16 09:30		SW	N15				1512329	
15)	8438325	07/14/16 09:30		SW	N15				1512329	
16)	8438329	07/14/16 09:30		SW	N15				1512329	
17)	8438333	07/14/16 09:30		SW	N15				1512329	
18)	**8438336U**	07/14/16 09:30		SW	N15				1512329	
19)	**8438337R**	07/14/16 09:30		SW	N15				1512329	
20)	**8438338M**	07/14/16 09:30		SW	N15				1512329	
21)	**8438342D**	07/14/16 09:30		SW	N15				1512329	
22)	8438350	07/14/16 09:30		SW	N15				1512329	
23)	8449395	07/11/16 17:35		SW	N8				1512329	
24)	8449397	07/11/16 17:35		SW	N8				1512329	

Prep Employee: 10287

7/1/2016

v 1.0.1

Batch# 16 182 0638 001

LLENS Batch Chronology and Change Log - SW SW846 Hg Digest

	Operation	Instrument	Operation Date	ANALYST
1)	Batch Creation		6/30/16 17:10	10287
2)	Sample Wt		6/30/16 17:11	851
3)	Final Vol	19119	7/1/16 8:34	10287
4)	Trial		7/1/16 8:34	10287
5)	Sample Wt	19119	7/1/16 8:38	10287
6)	Sample Wt	19119	7/1/16 8:40	10287
7)	Sample Wt	19119	7/1/16 9:32	10287
8)	Sample Wt	19119	7/1/16 9:33	10287
9)	Sample Wt	19119	7/1/16 10:46	10287
10)	Upload Prep	US19LAB000017	1/16 12:18	10287

					Original Entry				Data Changed		
Sample ID	Analysis	D	Operation	Measurement	Date/Time	Data	Units	Analyst	Date/Time	Analyst	Reason
8442663	10638	1	Sample Wt	Sample Wt	7/1/16 9:03	.65	(g)	10287	7/1/16 9:32	10287	Wrong entry
8442663	10638	1	Final Vol	Final Volume	7/1/16 9:08	.61	(g)	10287	7/1/16 9:32	10287	Wrong entry
8443152	10638	1	Sample Wt	Sample Wt	7/1/16 9:14	.64	(g)	10287	7/1/16 9:32	10287	Wrong entry
8445316	10638	1	Sample Wt	Sample Wt	7/1/16 9:19	.62	(g)	10287	7/1/16 9:32	10287	Wrong entry
8446538	10638	1	Sample Wt	Sample Wt	7/1/16 9:01	.64	(g)	10287	7/1/16 9:32	10287	Wrong entry
8446793	10638	1	Sample Wt	Sample Wt	7/1/16 9:12	.63	(g)	10287	7/1/16 9:32	10287	Wrong entry
8446822	10638	1	Sample Wt	Sample Wt	7/1/16 9:21	.64	(g)	10287	7/1/16 9:32	10287	Wrong entry
8446939	10638	1	Sample Wt	Sample Wt	7/1/16 9:23	.63	(g)	10287	7/1/16 9:32	10287	Wrong entry
8446939	10638	1	Final Vol	Final Volume	7/1/16 9:26	.6	(g)	10287	7/1/16 9:32	10287	Wrong entry
LCSW		1	Sample Wt	Sample Wt	7/1/16 8:37	d006	(g)	10287	7/1/16 8:38	10287	Wrong entry

Analysis: 0638 SW SW846 Hg Digest

Batch# 16 182 0638 001

Sample ID	Due Date	P	EPA#	SDG#	Sample Wt	Final Volume	Trial
PBS					.6000	100.0000	1
LCSW					1.0000	100.0000	1
8446538	07/06/16	S8			75.0960	100.0000	1
8452797	07/12/16	S8	55626		2.2406	100.0000	1
8442663	07/06/16	N8			33.4468	100.0000	1
8442664	07/06/16	N8			28.2890	100.0000	1
8446793	07/06/16	N7			6.2168	100.0000	1
8443152	07/06/16	N8			.8071	100.0000	1
8442730	07/07/16	N8			66.7108	100.0000	1
8445316	07/07/16	N8			13.9667	100.0000	1
8446822	07/07/16	N8			6.9996	100.0000	1
8446939	07/07/16	N8			7.4284	100.0000	1
8449021	07/08/16	Q8			5.3574	100.0000	1
8438321	07/14/16	N15	D8601	DWD86-01	.6000	100.0000	1
8438325	07/14/16	N15	D8605	DWD86-05	.6300	100.0000	1
8438329	07/14/16	N15	D8609	DWD86-09	.6300	100.0000	1
8438333	07/14/16	N15	D8613	DWD86-13	.6000	100.0000	1
8438336U	07/14/16	N15	D8616	DWD86-16BKG	.6200	100.0000	1
8438337R	07/14/16	N15	D8616	DWD86-16MS	.6500	100.0000	1
8438338M	07/14/16	N15	D8616	DWD86-16MSD	.6300	100.0000	1
8438342D	07/14/16	N15	D8616	DWD86-16DUP	.6500	100.0000	1
8438350	07/14/16	N15	D8619	DWD86-19	.6400	100.0000	1
8449395	07/11/16	N8			.6300	100.0000	1
8449397	07/11/16	N8			.6000	100.0000	1

LLENS Worksheet for 0638 SW SW846 Hg Digest

Batch# 16 183 0638 001

Balance ID#: 10685 **Start Time:** 7/5/16 10:20 **End Time:** 7/5/16 10:50 **Hot Block:** 1

Pipette ID: I43551C /1000

Spike/Reagent	Lot#	Volume Added(mL)
5%KMnO4	P16-179C	15.00
Aqua Regia	P16-187B	5.00
LCS 100 ppb Hg	P16-181B	1.00
Spike 100 ppb Hg	P16-181B	1.00

Method Ref: SW-846 7471B

	SampleID	Date Due	C	ST	P	H	PH<2	BC	Vessel Lot#	Comments
1)	PBS	.							1512329	Chemware boiling chips R335-6D006 0.6126
2)	LCSW	.							1512329	Chemware boiling chips R335-6D006 0.6017
3)	8445802	07/08/16 00:00		SW	N8			621a	1512329	
4)	8449399	07/11/16 17:35		SW	N8			621a	1512329	
5)	8449401	07/11/16 17:35		SW	N8			621a	1512329	
6)	8449403	07/11/16 17:35		SW	N8			621a	1512329	
7)	8455611	07/12/16 20:33		SW	P7			621a	1512329	
8)	8456453	07/13/16 18:00		SW	N8			621a	1512329	
9)	**8438353U**	07/14/16 09:30		SW	N15			621a	1512329	
10)	**8438354R**	07/14/16 09:30		SW	N15			621a	1512329	
11)	**8438355M**	07/14/16 09:30		SW	N15			621a	1512329	
12)	**8438359D**	07/14/16 09:30		SW	N15			621a	1512329	
13)	8438370	07/14/16 09:30		SW	N15			621a	1512329	
14)	8438374	07/14/16 09:30		SW	N15			621a	1512329	

Prep Employee: 10287

7/5/2016

v 1.0.1

Batch# 16 183 0638 001

LLENS Batch Chronology and Change Log - SW SW846 Hg Digest

	Operation	Instrument	Operation Date	ANALYST
1)	Batch Creation		7/1/16 17:15	10287
2)	Sample Wt		7/1/16 17:17	851
3)	Final Vol	10685	7/5/16 8:07	10287
4)	Trial		7/5/16 8:07	10287
5)	Sample Wt	19119	7/5/16 9:09	10287
6)	Sample Wt	19119	7/5/16 9:09	10287
7)	Upload Prep	US19PCC18516	7/5/16 10:54	10287

Sample ID	Analysis	D	Operation	Measurement	Original Entry Date/Time	Data	Units	Analyst	Data Changed Date/Time	Analyst	Reason

Analysis: 0638 SW SW846 Hg Digest

Batch# 16 183 0638 001

Sample ID	Due Date	P	EPA#	SDG#	Sample Wt	Final Volume	Trial
PBS					.6000	100.0000	1
LCSW					1.0000	100.0000	1
8445802	07/08/16	N8	FC310	FCP03-10	.6000	100.0000	1
8449399	07/11/16	N8			.6200	100.0000	1
8449401	07/11/16	N8			.6300	100.0000	1
8449403	07/11/16	N8			.6100	100.0000	1
8455611	07/12/16	P7	5731A		.6500	100.0000	1
8456453	07/13/16	N8			.6500	100.0000	1
8438353U	07/14/16	N15	D8622	DWD86-22BKG	.6300	100.0000	1
8438354R	07/14/16	N15	D8622	DWD86-22MS	.6500	100.0000	1
8438355M	07/14/16	N15	D8622	DWD86-22MSD	.6000	100.0000	1
8438359D	07/14/16	N15	D8622	DWD86-22DUP	.6400	100.0000	1
8438370	07/14/16	N15	D8626	DWD86-26	.6200	100.0000	1
8438374	07/14/16	N15	D8630	DWD86-30	.6300	100.0000	1

Instrumental Wet Chemistry Data

Case Narrative/Conformance Summary

Instrumental Wet Chemistry

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8438321	DU-1-15-A		X	1	
8438325	DU-1-15-B		X	1	
8438329	DU-1-15-C		X	1	
8438333	DU-3-1-A		X	1	
8438336	DU-3-1-B		X	1	Background/Unspiked
8438337	DU-3-1-B MS		X	1	Matrix Spike
8438342	DU-3-1-B DUP		X	1	Duplicate
8438350	DU-3-1-C		X	1	
8438353	DU-1-12-A		X	1	Background/
8438354	DU-1-12-A MS		X	1	Matrix Spike
8438359	DU-1-12-A DUP		X	1	Duplicate
8438370	DU-1-12-B		X	1	
8438374	DU-1-12-C		X	1	
8438378	DU-1-12-EB	X		1	Equipment Blank
8438379	DU-3-1-EB	X		1	Equipment Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

Sample Duplicate

Method defined actions are taken for any failed matrix QC.

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

Batch#: 16183102201A (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336-8438337, 8438342, 8438350, 8438370, 8438374, UNSPK: 8438336, BKG: 8438336)
The duplicate RPD for the following analyte(s) is outside the acceptance window: Total Cyanide (solid)

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

U = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
R = Matrix Spike (MS)	MDL = Method Detection Limit
M = Matrix Spike Duplicate (MSD)	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	NA = Not Applicable
HS = High Spike	ME = Method
LS = Low Spike	CO = Colorimetric
SS = Soluble Spike	G = Gravimetric
IS = Insoluble Spike	IR = Infrared Spectrophotometry
ISD = Insoluble Spike Duplicate	MTR = Meter
PDS = Post Digestion Spike	OD = Oven Dried
* = Out of Specification	TI = Titration
V = Visual	TOC = Total Organic Carbon
AK = Alpkem	IC = Ion Chromatography
TC = Total Carbon	RA = Rapid Analyzer

Quality Control and Calibration Summary Forms

Instrumental Wet Chemistry

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Quality Control Reference List
Instrumental Water Quality

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Fraction: Instrumental Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
Total Cyanide (solid)	16183102201A	P18302AB	07/02/2016 13:06:00
		P18302AQ	07/02/2016 13:02:00
		8438321	07/02/2016 13:07:00
		8438325	07/02/2016 13:37:00
		8438329	07/02/2016 13:09:00
		8438333	07/02/2016 13:11:00
		8438336 UNSPK/BKG	07/02/2016 13:12:00
		8438337 MS	07/02/2016 13:13:00
		8438342 DUP	07/02/2016 13:14:00
		8438350	07/02/2016 13:15:00
		8438370	07/02/2016 13:16:00
		8438374	07/02/2016 13:20:00
Total Cyanide (solid)	16183102201B	8438353 UNSPK/BKG	07/02/2016 13:23:00
		8438354 MS	07/02/2016 13:25:00
		8438359 DUP	07/02/2016 13:26:00
Total Cyanide (water)	16180117101A	P18017AB	06/28/2016 13:51:00
		P18017AQ	06/28/2016 13:50:00
		8438378	06/28/2016 13:53:00
		8438379	06/28/2016 13:55:00
		P445371 UNSPK/BKG	06/28/2016 14:05:00
		P445371 DUP	06/28/2016 14:06:00
		P445371 MS	06/28/2016 14:07:00

Quality Control Summary
Method Blank
Instrumental Water Quality
SDG: DWD86
Matrix: SOLID

Fraction: Instrumental Wet Chemistry

16183102201A / P18302AB Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Total Cyanide (solid)	AK	07/02/16	N.D.	mg/kg	0.18	0.50

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Quality Control Summary
Method Blank
Instrumental Water Quality
SDG: DWD86
Matrix: LIQUID

Fraction: Instrumental Wet Chemistry

16180117101A / P18017AB Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Total Cyanide (water)	AK	06/28/16	N.D.	mg/l	0.0050	0.010

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

UNSPK: 8438336 MS: 8438337	Batch: **16183102201A** (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336-8438337, 8438342, 8438350, 8438370, 8438374)									
Parameter	**ME**	**Spike Added mg/kg**	**Unspiked Conc mg/kg**	**MS Conc mg/kg**	**MSD Conc mg/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (solid)	AK	5.00	0.216 J	5.06	NA	97	NA	41-145	NA	NA

UNSPK: 8438353 MS: 8438354	Batch: **16183102201B** (Sample number(s): 8438353-8438354, 8438359)									
Parameter	**ME**	**Spike Added mg/kg**	**Unspiked Conc mg/kg**	**MS Conc mg/kg**	**MSD Conc mg/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (solid)	AK	4.83	N.D.	4.35	NA	90	NA	41-145	NA	NA

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

BKG: 8438336 DUP: 8438342	Batch: **16183102201A** (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336-8438337, 8438342, 8438350, 8438370, 8438374)				
Parameter	**ME**	**Unspiked Conc mg/kg**	**DUP Conc mg/kg**	**%RPD**	**%RPD Limits**
Total Cyanide (solid)	AK	0.22 J	N.D.	200* (1)	20

BKG: 8438353 DUP: 8438359	Batch: **16183102201B** (Sample number(s): 8438353-8438354, 8438359)				
Parameter	**ME**	**Unspiked Conc mg/kg**	**DUP Conc mg/kg**	**%RPD**	**%RPD Limits**
Total Cyanide (solid)	AK	N.D.	N.D.	0 (1)	20

Comments:
(1) The sample and/or duplicate result is less than five times the LOQ.
* = Out of Specification

Results are being reported on an as received basis.

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

UNSPK: P445371 MS: P445371	Batch: **16180117101A** (Sample number(s): 8438378-8438379)									
Parameter	**ME**	**Spike Added mg/l**	**Unspiked Conc mg/l**	**MS Conc mg/l**	**MSD Conc mg/l**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (water)	AK	0.200	N.D.	0.199	NA	100	NA	72-114	NA	NA

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

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Quality Control Summary
Duplicate

SDG: DWD86
Matrix: LIQUID

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

BKG: P445371 DUP: P445371 **Parameter**	Batch: **16180117101A** (Sample number(s): 8438378-8438379) **ME**	**Unspiked Conc mg/l**	**DUP Conc mg/l**	**%RPD**	**%RPD Limits**
Total Cyanide (water)	AK	N.D.	N.D.	0 (1)	20

Comments:
(1) The sample and/or duplicate result is less than five times the LOQ.
* = Out of Specification

Results are being reported on an as received basis.

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Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD86
Matrix: SOLID

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

LCS: P18302AQ	Batch: **16183102201A** (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336-8438337, 8438342, 8438350, 8438370, 8438374) Batch: **16183102201B** (Sample number(s): 8438353-8438354, 8438359)								
Parameter	**ME**	**Spike Added mg/kg**	**LCS Conc mg/kg**	**LCSD Conc mg/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (solid)	AK	10	10.13	NA	101	NA	90-110	NA	NA

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD86
Matrix: LIQUID

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

LCS: P18017AQ	Batch: **16180117101A** (Sample number(s): 8438378-8438379)								
Parameter	**ME**	**Spike Added mg/l**	**LCS Conc mg/l**	**LCSD Conc mg/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (water)	AK	0.200	0.194	NA	97	NA	90-110	NA	NA

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Quality Control Summary
Initial And Continuing Calibration
Instrumental Analysis/SCN

SDG: DWD86

Instrument ID: 09037
Calibration Date: 06/28/2016

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	AUTO CAL6	CC
Total Cyanide	0.3904	0.4597	0.6452	0.9539	1.5721	2.5459	0.9999

Acceptance Range:
ICV/CCV: +/- 10%
ICB/CCB: < MDL

Concentration units: mg/L

Batch Numbers: 16180117101A
Run Start Dates: 06/28/2016
Run Names: 1618001C01

	Total Cyanide		
Sample	True	Result	%Rec
ICV	0.15	0.15110	101
ICB	0	ND	NA
CCV2	0.15	0.15090	101
CCB 3	0	ND	NA
CCV2	0.15	0.15430	103
CCB 4	0	ND	NA

* = Out of Specifications

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Quality Control Summary
Initial And Continuing Calibration
Instrumental Analysis/TCN

SDG: DWD86

Instrument ID: 09037
Calibration Date: 07/02/2016

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	AUTO CAL6	CC
Total Cyanide	0.3809	0.4420	0.6136	0.8997	1.4799	2.3576	1.0000

Acceptance Range:
ICV/CCV: +/- 10%
ICB/CCB: < MDL

Concentration units: mg/L

Batch Numbers: 16183102201A, 16183102201B
Run Start Dates: 07/02/2016
Run Names: 1618401C01

	Total Cyanide		
Sample	True	Result	%Rec
ICV	0.15	0.14370	96
ICB	0	ND	NA
CCV2	0.15	0.14100	94
CCB 1	0	ND	NA
CCV2	0.15	0.14500	97
CCB 2	0	ND	NA
CCV2	0.15	0.14160	94
CCB 3	0	ND	NA
CCV2	0.15	0.14580	97
CCB 4	0	ND	NA

* = Out of Specifications

Fraction: Instrumental Wet Chemistry

05895: Total Cyanide (solid) Analyte Name	Default MDL	Default LOQ	Units
Total Cyanide (solid)	0.18	0.50	mg/kg

08255: Total Cyanide (water) Analyte Name	Default MDL	Default LOQ	Units
Total Cyanide (water)	0.0050	0.010	mg/l

Extraction/Distillation/Digestion Logs

Instrumental Wet Chemistry

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Raw Data Logbook
Total Cyanide/Distillations
Analysis #492, 5896, 8256

Start Time: 0930
Cool Time: 1115
Finish: 1130

Batch No. 16180 | 117 | 101 |

Enter 102 for Analysis 492, 5896
Enter 117 for Analysis 8256

Analysis: 8256 Date: 6-28-16 Analyst: MJS 1203

Std. Ref. (Book/Page/Line): 220405 p. 63 l. 1-2

Bottle Code	Sample Number	Initial Volume (mL)	Initial Weight (g)	Comments/True Values	SDG
	LCSW	50		+.5 ml 20 mg/L KCN	
	PBW	50			
02A	8437224	50			ABQ73
02A	8438378	50			DWD86
02A	8438379	50			+
02A	8442829	50			DWD87
02A	8442830	50			↓
02A	8442831	50			↓
02A	8444113	50			DWD
02A	8444115	50			↓
02A	8444116	50			↓
02A	8445371 (L)	50			GPA02
+	8445371 (D)	50			↓
	8445371 (A)	50		+.5 ml 20 mg/L KCN	
02A	8445372 (L)	50			
	8445372 (D)	50			
+	8445372 (A)	50		+.5 ml 20 mg/L KCN	
02A	8445373	50			↓
02A	8445666	50			DWD89
02A	8445667	50			+

Please Note: Final extraction volume is 50 mL

Verified: SM/347 Date: 6/29/16

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Raw Data Logbook
Total Cyanide/Distillations
Analysis #492, 5896, 8256

Start Time: 0925
Cool Time: 1110
Finish: 1125

Batch No. 16183 | 102 | 201 |

Enter 102 for Analysis 492, 5896
Enter 117 for Analysis 8256

Analysis: 5896 Date: 7-1-16 Analyst: MYS1213

Std. Ref. (Book/Page/Line): 220405 p65 l. 1-2

Bottle Code	Sample Number	Initial Volume (mL)	Initial Weight (g)	Comments/True Values	SDG
	LCSS		1.00	+.5ml 20 mg/L KCN	
	PBS		2.00		
20A	8438321		2.04	A	DWD86
20A	8438325		2.05		
20A	8438329		2.07		
20A	8438333		2.00		
20A	8438336 (4)		2.08		
20A	8438337 (A)		2.00	+.5ml 20 mg/L KCN	
20A	8438342 (D)		2.07		
20A	8438350		2.10		
20A	8438370		2.06		
20A	8438374		2.00		
20A	8444051		2.03		DWD88
20A	8444055	MYS 1-25 7-1-16	2.02		+
(4) 8438353	~~8438336~~ (4)		2.05		DWD86
(A) 8438354	~~8438337~~ (A)		2.07	+.5ml 20 mg/L KCN	+
(D) 8438359	~~8438342~~ (D)		2.00		+
36A	8450402		2.09		
36A	8450405		2.10		
34A	8452050		2.07		

Please Note: Final extraction volume is 50 mL

Verified: SM/347 Date: 7/5/16

Wet Chemistry Data

Case Narrative/Conformance Summary

Wet Chemistry

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Water Quality

Fraction: Wet Chemistry

Sample #	Client ID	Matrix Liquid	Matrix Solid	Comments
8438321	DU-1-15-A		X	
8438325	DU-1-15-B		X	
8438329	DU-1-15-C		X	
8438333	DU-3-1-A		X	
8438336	DU-3-1-B		X	Background/Unspiked
8438339	DU-3-1-B SS		X	Soluble Spike
8438340	DU-3-1-B IS		X	Insoluble Spike
8438341	DU-3-1-B PDS		X	Post Digestion Spike
8438342	DU-3-1-B DUP		X	Duplicate
8438350	DU-3-1-C		X	
8438353	DU-1-12-A		X	Background/
8438356	DU-1-12-A SS		X	Soluble Spike
8438357	DU-1-12-A IS		X	Insoluble Spike
8438358	DU-1-12-A PDS		X	Post Digestion Spike
8438359	DU-1-12-A DUP		X	Duplicate
8438370	DU-1-12-B		X	
8438374	DU-1-12-C		X	
8438378	DU-1-12-EB	X		Equipment Blank
8438379	DU-3-1-EB	X		Equipment Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Water Quality

Fraction: Wet Chemistry

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Method defined actions are taken for any failed matrix QC.

Batch#: 16187042502A (Sample number(s): 8438353, 8438356-8438359, UNSPK: 8438356-8438353, BKG: 8438353)
The recovery(ies) for the following analyte(s) in the MS is outside the acceptance window: Hexavalent Chromium (SOLIDS)

Batch#: 16187042501A (Sample number(s): 8438321, 8438325, 8438329, 8438336, 8438339-8438342, 8438350, 8438370, 8438374, UNSPK: 8438339-8438336, BKG: 8438336)
The recovery(ies) for the following analyte(s) in the MS is outside the acceptance window: Hexavalent Chromium (SOLIDS)

Sample Duplicate

Method defined actions are taken for any failed matrix QC.

Batch#: 16188182101B (Sample number(s): 8438353, 8438359, 8438370, 8438374, BKG: 8438353)
The duplicate RPD for the following analyte(s) is outside the acceptance window: Oxidation Reduction Potential

Batch#: 16188039401A (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336, 8438342, 8438350, BKG: 8438336)
The duplicate RPD for the following analyte(s) is outside the acceptance window: pH

SAMPLE ANALYSIS:

Samples	Hexavalent Chromium	Hexavalent Chromium (SOLIDS)	Oxidation Reduction Potential	pH
8438321		DF25	DF1	DF1
8438325		DF20	DF1	DF1
8438329		DF20	DF1	DF1
8438333		DF10	DF1	DF1
8438336		UNSPK/ DF20	UNSPK/ DF1	UNSPK/ DF1
8438339		SS/ DF20		
8438340		IS/ DF20		
8438341		PDS/ DF20		
8438342		D/ DF20	D/ DF1	D/ DF1
8438350		DF20	DF1	DF1
8438353		UNSPK/ DF5	UNSPK/ DF1	UNSPK/ DF1

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Water Quality

Fraction: Wet Chemistry

Samples	Hexavalent Chromium	Hexavalent Chromium (SOLIDS)	Oxidation Reduction Potential	pH
8438356		SS/ DF5		
8438357		IS/ DF25		
8438358		PDS/ DF5		
8438359		D/ DF5	D/ DF1	D/ DF1
8438370		DF5	DF1	DF1
8438374		DF10	DF1	DF1
8438378	DF1			
8438379	UNSPK,D/ DF1			

No problems were encountered with the analysis of the samples.

(Sample number(s): 8438342: Analysis: 00394)
The pH was measured in water at 20.2 C.

(Sample number(s): 8438333, 8438370: Analysis: 00394)
The pH was measured in water at 19.9 C.

(Sample number(s): 8438350, 8438359, 8438374: Analysis: 00394)
The pH was measured in water at 19.8 C.

(Sample number(s): 8438329, 8438336: Analysis: 00394)
The pH was measured in water at 19.7 C.

(Sample number(s): 8438321: Analysis: 00394)
The pH was measured in water at 19.6 C.

(Sample number(s): 8438325: Analysis: 00394)
The pH was measured in water at 19.5 C.

(Sample number(s): 8438353: Analysis: 00394)
The pH was measured in water at 19.2 C.

(Sample number(s): 8438333: Analysis: 00425)
Reporting limits were raised due to interference from the sample matrix.

(Sample number(s): 8438321, 8438325, 8438329, 8438336, 8438350, 8438353, 8438370, 8438374: Analysis: 00425)
Reporting limits were raised due to interference from the sample matrix.

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Water Quality

Fraction: Wet Chemistry

Abbreviation Key

U = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
R = Matrix Spike (MS)	MDL = Method Detection Limit
M = Matrix Spike Duplicate (MSD)	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	NA = Not Applicable
HS = High Spike	ME = Method
LS = Low Spike	CO = Colorimetric
SS = Soluble Spike	G = Gravimetric
IS = Insoluble Spike	IR = Infrared Spectrophotometry
ISD = Insoluble Spike Duplicate	MTR = Meter
PDS = Post Digestion Spike	OD = Oven Dried
* = Out of Specification	TI = Titration
V = Visual	TOC = Total Organic Carbon
AK = Alpkem	IC = Ion Chromatography
TC = Total Carbon	RA = Rapid Analyzer

QC Summary

Wet Chemistry

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Quality Control Reference List
Water Quality

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Fraction: Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
Hexavalent Chromium	16174027601A	P174027B	06/22/2016 13:50:00
		P174027Q	06/22/2016 13:50:00
		P174027Y	06/22/2016 13:50:00
		8438378	06/22/2016 13:50:00
		8438379 BKG,DUP	06/22/2016 13:50:00
Hexavalent Chromium (SOLIDS)	16187042501A	P187042B	07/05/2016 20:45:00
		P187042Q	07/05/2016 20:45:00
		8438339 SS	07/05/2016 20:45:00
		8438341 PDS	07/05/2016 20:45:00
		8438321	07/05/2016 20:45:00
		8438325	07/05/2016 20:45:00
		8438329	07/05/2016 20:45:00
		8438336 UNSPK/BKG	07/05/2016 20:45:00
		8438340 IS	07/05/2016 20:45:00
		8438342 DUP	07/05/2016 20:45:00
		8438350	07/05/2016 20:45:00
		8438370	07/05/2016 20:45:00
		8438374	07/05/2016 20:45:00
Hexavalent Chromium (SOLIDS)	16187042502A	P187042B	07/05/2016 20:45:00
		P187042Q	07/05/2016 20:45:00
		8438356 SS	07/05/2016 20:45:00
		8438358 PDS	07/05/2016 20:45:00
		8438353 UNSPK/BKG	07/05/2016 20:45:00
		8438357 IS	07/05/2016 20:45:00
		8438359 DUP	07/05/2016 20:45:00
Hexavalent Chromium (SOLIDS)	16189042501A	P189042B	07/11/2016 19:30:00
		P189042Q	07/11/2016 19:30:00
		8438333	07/11/2016 19:30:00
Oxidation Reduction Potential	16188182101A	P188182Q	07/06/2016 20:00:00
		8438321	07/06/2016 20:00:00
		8438325	07/06/2016 20:00:00
		8438329	07/06/2016 20:00:00
		8438333	07/06/2016 20:00:00
		8438336 BKG	07/06/2016 20:00:00
		8438342 DUP	07/06/2016 20:00:00
		8438350	07/06/2016 20:00:00
Oxidation Reduction Potential	16188182101B	8438353 BKG	07/06/2016 20:00:00
		8438359 DUP	07/06/2016 20:00:00
		8438370	07/06/2016 20:00:00
		8438374	07/06/2016 20:00:00

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Quality Control Reference List
Water Quality

CLIENT: CH2M Hill, Inc.
SDG: DWD86

Fraction: Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
pH	16188039401A	P188039Q	07/06/2016 20:00:00
		8438321	07/06/2016 20:00:00
		8438325	07/06/2016 20:00:00
		8438329	07/06/2016 20:00:00
		8438333	07/06/2016 20:00:00
		8438336 BKG	07/06/2016 20:00:00
		8438342 DUP	07/06/2016 20:00:00
		8438350	07/06/2016 20:00:00
pH	16188039401B	8438353 BKG	07/06/2016 20:00:00
		8438359 DUP	07/06/2016 20:00:00
		8438370	07/06/2016 20:00:00
		8438374	07/06/2016 20:00:00

Quality Control Summary
Method Blank
Water Quality
SDG: DWD86
Matrix: LIQUID

Fraction: Wet Chemistry

16174027601A / P174027B Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Hexavalent Chromium	CO	06/22/16	N.D.	mg/l	0.0070	0.020

Quality Control Summary
Method Blank
Water Quality
SDG: DWD86
Matrix: SOLID

Fraction: Wet Chemistry

16187042501A / P187042B Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Hexavalent Chromium (SOLIDS)	CO	07/05/16	N.D.	mg/kg	0.50	1.5

16187042502A / P187042B Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Hexavalent Chromium (SOLIDS)	CO	07/05/16	N.D.	mg/kg	0.50	1.5

16189042501A / P189042B Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Hexavalent Chromium (SOLIDS)	CO	07/11/16	N.D.	mg/kg	0.50	1.5

Water Quality
Fraction: Wet Chemistry

UNSPK: 8438336 MS: 8438336	Batch: **16187042501A** (Sample number(s): 8438321, 8438325, 8438329, 8438336, 8438339-8438342, 8438350, 8438370, 8438374)									
Parameter	**ME**	**Spike Added mg/kg**	**Unspiked Conc mg/kg**	**MS Conc mg/kg**	**MSD Conc mg/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Hexavalent Chromium (SOLIDS)	CO	40.7	N.D.	N.D.	NA	0 *	NA	75-125	NA	NA

UNSPK: 8438353 MS: 8438353	Batch: **16187042502A** (Sample number(s): 8438353, 8438356-8438359)									
Parameter	**ME**	**Spike Added mg/kg**	**Unspiked Conc mg/kg**	**MS Conc mg/kg**	**MSD Conc mg/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Hexavalent Chromium (SOLIDS)	CO	40.3	N.D.	9.19	NA	23 *	NA	75-125	NA	NA

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

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Quality Control Summary
Duplicate

SDG: DWD86
Matrix: LIQUID

Water Quality
Fraction: Wet Chemistry

BKG: 8438379 DUP: 8438379 **Parameter**	Batch: **16174027601A** (Sample number(s): 8438378-8438379) **ME**	**Unspiked Conc mg/l**	**DUP Conc mg/l**	**%RPD**	**%RPD Limits**
Hexavalent Chromium	CO	N.D.	N.D.	0 (1)	5

Comments:
(1) The sample and/or duplicate result is less than five times the LOQ.
* = Out of Specification

Results are being reported on an as received basis.

Water Quality
Fraction: Wet Chemistry

BKG: 8438336 DUP: 8438342	Batch: **16187042501A** (Sample number(s): 8438321, 8438325, 8438329, 8438336, 8438339-8438342, 8438350, 8438370, 8438374)				
Parameter	**ME**	**Unspiked Conc mg/kg**	**DUP Conc mg/kg**	**%RPD**	**%RPD Limits**
Hexavalent Chromium (SOLIDS)	CO	N.D.	N.D.	0 (1)	20

BKG: 8438353 DUP: 8438359	Batch: **16187042502A** (Sample number(s): 8438353, 8438356-8438359)				
Parameter	**ME**	**Unspiked Conc mg/kg**	**DUP Conc mg/kg**	**%RPD**	**%RPD Limits**
Hexavalent Chromium (SOLIDS)	CO	N.D.	N.D.	0 (1)	20

BKG: 8438336 DUP: 8438342	Batch: **16188039401A** (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336, 8438342, 8438350)				
Parameter	**ME**	**Unspiked Conc Std. Units**	**DUP Conc Std. Units**	**%RPD**	**%RPD Limits**
pH	MTR	3.99	4.28	7*	3

BKG: 8438353 DUP: 8438359	Batch: **16188039401B** (Sample number(s): 8438353, 8438359, 8438370, 8438374)				
Parameter	**ME**	**Unspiked Conc Std. Units**	**DUP Conc Std. Units**	**%RPD**	**%RPD Limits**
pH	MTR	6.03	6.12	1	3

BKG: 8438336 DUP: 8438342	Batch: **16188182101A** (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336, 8438342, 8438350)				
Parameter	**ME**	**Unspiked Conc mV**	**DUP Conc mV**	**%RPD**	**%RPD Limits**
Oxidation Reduction Potential	TI	571.	573.	0	5

BKG: 8438353 DUP: 8438359	Batch: **16188182101B** (Sample number(s): 8438353, 8438359, 8438370, 8438374)				
Parameter	**ME**	**Unspiked Conc mV**	**DUP Conc mV**	**%RPD**	**%RPD Limits**
Oxidation Reduction Potential	TI	420.5	464.5	10*	5

Comments:
(1) The sample and/or duplicate result is less than five times the LOQ.
* = Out of Specification

Results are being reported on an as received basis.

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Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD86
Matrix: LIQUID

Water Quality
Fraction: Wet Chemistry

LCS: P174027Q LCSD: P174027Y	Batch: **16174027601A** (Sample number(s): 8438378-8438379)								
Parameter	**ME**	**Spike Added mg/l**	**LCS Conc mg/l**	**LCSD Conc mg/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Hexavalent Chromium	CO	0.200	0.205	0.204	103	102	90-110	1	4

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD86
Matrix: SOLID

Water Quality
Fraction: Wet Chemistry

LCS: P187042Q	Batch: **16187042501A** (Sample number(s): 8438321, 8438325, 8438329, 8438336, 8438339-8438342, 8438350, 8438370, 8438374)								
Parameter	**ME**	**Spike Added mg/kg**	**LCS Conc mg/kg**	**LCSD Conc mg/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Hexavalent Chromium (SOLIDS)	CO	5.00	4.29	NA	86	NA	80-120	NA	NA

LCS: P187042Q	Batch: **16187042502A** (Sample number(s): 8438353, 8438356-8438359)								
Parameter	**ME**	**Spike Added mg/kg**	**LCS Conc mg/kg**	**LCSD Conc mg/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Hexavalent Chromium (SOLIDS)	CO	5.00	4.29	NA	86	NA	80-120	NA	NA

LCS: P188039Q	Batch: **16188039401A** (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336, 8438342, 8438350) Batch: **16188039401B** (Sample number(s): 8438353, 8438359, 8438370, 8438374)								
Parameter	**ME**	**Spike Added Std. Units**	**LCS Conc Std. Units**	**LCSD Conc Std. Units**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
pH	MTR	7.00	7.01	NA	100	NA	95-105	NA	NA

LCS: P188182Q	Batch: **16188182101A** (Sample number(s): 8438321, 8438325, 8438329, 8438333, 8438336, 8438342, 8438350) Batch: **16188182101B** (Sample number(s): 8438353, 8438359, 8438370, 8438374)								
Parameter	**ME**	**Spike Added mV**	**LCS Conc mV**	**LCSD Conc mV**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Oxidation Reduction Potential	TI	427	428.5	NA	100	NA	98-102	NA	NA

LCS: P189042Q	Batch: **16189042501A** (Sample number(s): 8438333)								
Parameter	**ME**	**Spike Added mg/kg**	**LCS Conc mg/kg**	**LCSD Conc mg/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Hexavalent Chromium (SOLIDS)	CO	5.00	4.74	NA	95	NA	80-120	NA	NA

Fraction: Wet Chemistry

00276: Hexavalent Chromium Analyte Name	Default MDL	Default LOQ	Units
Hexavalent Chromium	0.0070	0.020	mg/l

00425: Hexavalent Chromium (SOLIDS) Analyte Name	Default MDL	Default LOQ	Units
Hexavalent Chromium (SOLIDS)	0.50	1.5	mg/kg

01821: Oxidation Reduction Potential Analyte Name	Default MDL	Default LOQ	Units
Oxidation Reduction Potential	10.0	10.0	mV

00394: pH Analyte Name	Default MDL	Default LOQ	Units
pH	0.0100	0.0100	Std. Units

Moisture Data

MOISTURE

SAMPLE NUMBERS:

Sample #	Sample Code
8438321	D8601
8438322	D8602
8438323	D8603
8438324	D8604
8438325	D8605
8438326	D8606
8438327	D8607
8438328	D8608
8438329	D8609
8438330	D8610
8438331	D8611
8438332	D8612
8438333	D8613
8438334	D8614
8438335	D8615
8438336	D8616BKG
8438337	D8616MS
8438338	D8616MSD
8438339	D8616SS
8438340	D8616IS
8438341	D8616PDS
8438342	D8616DUP
8438343	D8617BKG
8438344	D8617MS
8438345	D8617MSD
8438346	D8617DUP
8438347	D8618BKG
8438348	D8618MS
8438349	D8618MSD
8438350	D8619
8438351	D8620
8438352	D8621
8438353	D8622BKG
8438354	D8622MS
8438355	D8622MSD
8438356	D8622SS
8438357	D8622IS
8438358	D8622PDS
8438359	D8622DUP
8438360	D8623BKG
8438361	D8623MS
8438362	D8623MSD
8438363	D8623DUP
8438364	D8624BKG
8438365	D8624MS
8438366	D8624MSD
8438367	D8625BKG
8438368	D8625MS
8438369	D8625MSD
8438370	D8626
8438371	D8627

MOISTURE

8438372	D8628
8438373	D8629

COMMENTS:

Method defined actions are taken for any failed matrix QC.

Laboratory Compliance Quality Control

Analysis Name	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16231820012A	Sample number(s): 8438321-8438352, 8438321-8438352				
Moisture	100		99-101		
Moisture	100		99-101		
Moisture Duplicate	100		99-101		
Batch number: 16231820012B	Sample number(s): 8438370-8438373, 8438370-8438373				
Moisture	100		99-101		
Moisture	100		99-101		
Batch number: 16235820001A	Sample number(s): 8438353-8438369, 8438353-8438369				
Moisture	100		99-101		
Moisture	100		99-101		
Moisture Duplicate	100		99-101		

Sample Matrix Quality Control

Analysis Name	BKG Conc	DUP Conc	RPD	RPD Max
Batch number: 16231820012A	Sample number(s): 8438321-8438352, 8438321-8438352			
Moisture	14.8	15.2	3	5
Moisture	14.8	15.2	3	5
Moisture Duplicate	14.8	15.2	3	5
Batch number: 16231820012B	Sample number(s): 8438370-8438373, 8438370-8438373			
Moisture	3.2	2.1	40* (1)	5
Moisture	3.2	2.2	40* (1)	5
Batch number: 16235820001A	Sample number(s): 8438353-8438369, 8438353-8438369			
Moisture	2.5	2.4	3 (1)	5
Moisture	2.5	2.4	3 (1)	5
Moisture Duplicate	2.5	2.4	3 (1)	5

* - Outside of specification

(1) - The result for one or both determinations was less than five times the LOQ.

Moisture Data Report

Batch #: 16231820012

Sample ID	Batch ID	Analysis#	Tare Wt	Sample Wt	Dry Wt	%Moisture	Analysis Date (Emp#)	Verified Date (Emp#)
8438321	A	00111	1.0507	5.9453	6.3836	10.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438322	A	00118				10.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438323	A	00118				10.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438324	A	00118				10.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438325	A	00111	1.0956	5.8275	6.3252	10.26	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438326	A	00118				10.26	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438327	A	00118				10.26	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438328	A	00118				10.26	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438329	A	00111	1.0837	6.2147	6.7757	8.41	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438330	A	00118				8.41	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438331	A	00118				8.41	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438332	A	00118				8.41	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438333	A	00111	1.0893	6.4372	6.6967	12.89	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438334	A	00118				12.89	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438335	A	00118				12.89	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438336BKG	A	00111	1.0373	5.3255	5.5743	14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438337MS	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438338MSD	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438339SS	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438340IS	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438341PDS	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438342DUP	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438342DUP	A	00121	1.0330	5.2046	5.4455	15.22	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438343BKG	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438344MS	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438345MSD	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438346DUP	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438347BKG	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438348MS	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438349MSD	A	00118				14.81	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438350	A	00111	1.0734	8.2121	8.3038	11.95	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438351	A	00118				11.95	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438352	A	00118				11.95	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438370	B	00111	1.0340	7.9118	8.5526	4.97	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438371	B	00118				4.97	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438372	B	00118				4.97	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8438373	B	00118				4.97	8/18/16 (1201/SWF)	8/22/16 (236/CW)
LCS 89.5% Std.		00111	1.0396	5.0025	1.5666	89.47	8/18/16 (1201/SWF)	8/22/16 (236/CW)

Batch #: 16235820001

Sample ID	Batch ID	Analysis#	Tare Wt	Sample Wt	Dry Wt	%Moisture	Analysis Date (Emp#)	Verified Date (Emp#)
8438353BKG	A	00111	1.0796	5.8138	6.7504	2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438354MS	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438355MSD	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438356SS	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438357IS	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438358PDS	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438359DUP	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438359DUP	A	00121	1.0845	5.8542	6.7984	2.40	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438360BKG	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438361MS	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438362MSD	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438363DUP	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)

MOISTURE

8438364BKG	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438365MS	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438366MSD	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438367BKG	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438368MS	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
8438369MSD	A	00118				2.46	8/23/16 (835/LEB)	8/24/16 (236/CW)
LCS 89.5% Std.		00111	1.0914	5.0402	1.6220	89.47	8/23/16 (835/LEB)	8/24/16 (236/CW)

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Type I (No Raw Data) Data Package

Prepared for:

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Project: Woodbine Phase III MEC RFI
Sand, Soil and Water Samples
Collected on 06/22/16

SDG# DWD87

GROUP	SAMPLE NUMBERS
16-5-29	8442-987,8442831
16--901	8455242,8455243

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by: Dana M Kauffman

Dana M. Kauffman
Manager

Date: **09/09/2016**

Any questions or concerns you might have regarding this data package should be directed to your client representative, Natalie Luciano at (-1-) 5567-258.

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Sample Reference List for SDG Number DWD87 with a Data Package Type of I-NODATA

11372 - CH2M Hill, Inc.

Project: Woodbine Phase III MEC RFI

Lab Sample Number	Client Sample ID	Collection Date	Date Received
8442798	RTPA-1	06/22/2016 08:16	06/24/2016 09:30
8442799	RTPA-1	06/22/2016 08:16	06/24/2016 09:30
8442800	RTPA-1	06/22/2016 08:16	06/24/2016 09:30
8442801	RTPA-2	06/22/2016 09:01	06/24/2016 09:30
8442802	RTPA-2	06/22/2016 09:01	06/24/2016 09:30
8442803	RTPA-2	06/22/2016 09:01	06/24/2016 09:30
8442804	RTPA-3	06/22/2016 08:51	06/24/2016 09:30
8442805	RTPA-3	06/22/2016 08:51	06/24/2016 09:30
8442806	RTPA-3	06/22/2016 08:51	06/24/2016 09:30
8442807	RTPA-4	06/22/2016 08:37	06/24/2016 09:30
8442808	RTPA-4MS	06/22/2016 08:37	06/24/2016 09:30
8442809	RTPA-4MSD	06/22/2016 08:37	06/24/2016 09:30
8442810	RTPA-4	06/22/2016 08:37	06/24/2016 09:30
8442811	RTPA-4MS	06/22/2016 08:37	06/24/2016 09:30
8442812	RTPA-4MSD	06/22/2016 08:37	06/24/2016 09:30
8442813	RTPA-4	06/22/2016 08:37	06/24/2016 09:30
8442814	RTPA-4MS	06/22/2016 08:37	06/24/2016 09:30
8442815	RTPA-4MSD	06/22/2016 08:37	06/24/2016 09:30
8442816	DU-1-6-A	06/22/2016 11:00	06/24/2016 09:30
8442817	DU-1-6-A	06/22/2016 11:00	06/24/2016 09:30
8442818	DU-1-6-A	06/22/2016 11:00	06/24/2016 09:30
8442819	DU-1-6-A	06/22/2016 11:00	06/24/2016 09:30
8442820	DU-1-6-B	06/22/2016 13:45	06/24/2016 09:30
8442821	DU-1-6-B	06/22/2016 13:45	06/24/2016 09:30
8442822	DU-1-6-B	06/22/2016 13:45	06/24/2016 09:30
8442823	DU-1-6-B	06/22/2016 13:45	06/24/2016 09:30
8442824	DU-1-6-C	06/22/2016 15:30	06/24/2016 09:30
8442825	DU-1-6-C	06/22/2016 15:30	06/24/2016 09:30
8442826	DU-1-6-C	06/22/2016 15:30	06/24/2016 09:30
8442827	DU-1-6-C	06/22/2016 15:30	06/24/2016 09:30
8442828	TB-2	06/22/2016 08:00	06/24/2016 09:30
8442829	RTPA-EB	06/22/2016 09:00	06/24/2016 09:30
8442830	RTPA-FB	06/22/2016 09:30	06/24/2016 09:30
8442831	DU-1-6-FB	06/22/2016 12:00	06/24/2016 09:30
8455242	Metals Blank		06/24/2016 09:30
8455243	Explosives/Perchlorate Blank		06/24/2016 09:30

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Sample pH Log

SDG: DWD86

LLI Sample Number	Bottle Code	Actual pH	Exp. pH	pH Check Code	Adj. pH	Adjusted Date	Adjusted Time	Preservative Added	Preservative Lot #	LLI Supplied Bottle?	Sulfide Present?	Corrective Substance	CS Lot #	Res. Cl. Present?	Corrective Substance	CS Lot #	Record Date	Employee
8442828	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:38:32AM	1731
8442829	002A	>12	>12	PK	NA	NA	NA	NA	NA	Y	N	NA	NA	N	NA	NA	6/24/2016 1:26:17PM	0
8442829	008A	<2	<2	PK	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	6/24/2016 1:32:55PM	0
8442829	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731
8442830	002A	>12	>12	PK	NA	NA	NA	NA	NA	Y	N	NA	NA	N	NA	NA	6/24/2016 1:37:53PM	0
8442830	008A	<2	<2	PK	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	6/24/2016 1:33:15PM	0
8442830	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731
8442831	002A	>12	>12	PK	NA	NA	NA	NA	NA	Y	N	NA	NA	N	NA	NA	6/24/2016 1:29:57PM	0
8442831	008A	<2	<2	PK	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	6/24/2016 1:38:23PM	0
8442831	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731

Check Code Key
PK = Original container checked - pH is within the correct range. (No preservative was added)
PA = Original container checked - pH adjusted to correct range. (Preservative was added)
PV = Volatile container checked
PC = pH checked (unpreserved container)
SPK = Subsampled from an original container. Original container checked - pH is within correct range
SPA = Subsampled from an original container. Subsample container checked - pH adjusted to correct range.
SPC = Subsampled from an original container. pH checked (unpreserved container).
SUP = Subsampled from original container. Unable to be preserved due to the matrix of the sample.
UP = Unable to preserve due to matrix of the sample.
NA = Not applicable

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 · 717-656-2300 Fax: 717-656-2681 · www.lancasterlabs.com

01163 GC/MS VOA Water Prep

An undiluted aliquot of the water sample or a dilution of the sample is purged with an inert gas and the volatiles are collected on an adsorbent trap that is subsequently desorbed onto a gas chromatographic column.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 5030B, December 1996.

11997 VOCs- 5ml Water by 8260C

The water sample is purged and the volatile compounds are collected on a sorbent trap that is subsequently desorbed onto the GC/MS system for chromatographic and mass spectral analysis.

Reference: Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS), SW-846 Method 8260C, August 2006.

11995 VOCs- Solid by 8260C

The soil sample is purged and the volatile compounds are collected on a sorbent trap that is subsequently desorbed onto the GC/MS system for chromatographic and mass spectral analysis.

Reference: Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS), SW-846 Method 8260C, August 2006.

00259 Mercury

The solution resulting from the mercury digestion is analyzed by Cold Vapor AA.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7470A, September 1994

10638 Hg - SW, 7471B - U4
00159 Mercury

The solution resulting from the mercury digestion is analyzed by Cold Vapor AA.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7471B, February 2007

10635 ICP-WW, 3005A (tot rec) - U4

The sample is digested with nitric acid and hydrochloric acid.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3005A, July 1992

10639 ICPMS - Water, 3020A - U4

The sample is digested with nitric and hydrochloric acid.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3020A, July 1992

05713 WW SW846 Hg Digest

The sample is heated at 95 c with nitric acid, sulfuric acid, potassium persulfate, and potassium permanganate. Excess potassium permanganate is reduced with sodium chloride/hydroxylamine hydrochloride. Mercuric ions are reduced to mercury metal using stannous chloride.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7470A, September 1994

01643 Aluminum
01743 Aluminum
06944 Antimony
07044 Antimony
07035 Arsenic
06935 Arsenic
07046 Barium
06946 Barium
07047 Beryllium
06947 Beryllium
06949 Cadmium
07049 Cadmium
01650 Calcium
01750 Calcium
07051 Chromium
06951 Chromium
06952 Cobalt
07052 Cobalt
07053 Copper
06953 Copper
01754 Iron
01654 Iron
07055 Lead
06955 Lead
01657 Magnesium
01757 Magnesium
07058 Manganese
06958 Manganese
06961 Nickel
07061 Nickel
01762 Potassium
01662 Potassium
07036 Selenium
06936 Selenium
06966 Silver
07066 Silver
01767 Sodium
01667 Sodium
06971 Vanadium
07071 Vanadium
06972 Zinc
07072 Zinc

The solution resulting from the metals digestion is analyzed by Trace ICP.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 6010C, February 2007.

06145 Thallium
06045 Thallium

The solution resulting from the metals digestion is analyzed by ICP/MS.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 6020A, February 2007.

10637 ICP/ICPMS-SW, 3050B - U4

The sample is digested with nitric acid, hydrochloric acid and hydrogen peroxide.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3050B, December 1996

13432 Nitroaromatic/Amine Ext 8330B

The sample is passed through a Porapak RDX cartridge. The cartridge is then eluted with acetonitrile and the extract is brought to 5 mL. The extract is diluted to 10 mL using a calcium chloride solution.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8330B, Revision 2, October 2006.

13395 Nitroaromatics/Amines 8330B(w)

The sample is extracted into acetonitrile using SPE on a Porapak RDX cartridge. The extract is analyzed using High Performance Liquid Chromatography with UV detection at two wavelengths for optimum sensitivity for all target compounds 214 and 254 nm. Confirmation of presumptive peaks is performed on a second column at the same two wavelengths.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8330B, Revision 2, October 2006.

13433 Nitroaromatic/Amine Ext 8330B

The sample is extracted with acetonitrile in a vial using a chilled ultrasonic bath. The vial is centrifuged and the acetonitrile removed. The extract is brought to volume with calcium chloride solution and filtered prior to analysis.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8330B, Revision 2, October 2006.

13413 Nitroaromatics/Amines 8330B(s)

The sample is extracted into acetonitrile using an ultrasonic bath. The extract is analyzed using High Performance Liquid Chromatography (HPLC) with UV detection at two wavelengths for optimum sensitivity for all target compounds 214 and 254 nm. Confirmation of presumptive peaks is performed on a second column at the same two wavelengths.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8330B, Revision 2, October 2006.

06386 Perchlorate in Water LC/MS/MS
06568 Perchlorate Soil Prep

Water samples are filtered through a 0.45-um syringe filter, followed by direct injection into a LC/MS/MS system followed by multiple reaction monitoring. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

06557 Perchlorate in Soil LC/MS/MS

Soil samples are extracted with water, then filtered through a 0.45-um syringe filter and analyzed by LC/MS/MS. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

11010 8270D BNA Extraction

10475 BNA Water Extraction CS BZ

The sample aliquot is extracted with methylene chloride by either separatory funnel or liquid/liquid apparatus. Extraction is performed at both a pH of 11 and 2. The extract is concentrated prior to analysis.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3510C, Rev 3, December 1996

02395 Specials in water by GC/MS
10726 SVOA 8270D (microwave)
10461 SVOAs by 8270D in Water

The sample extract is analyzed by capillary column Gas Chromatography/Mass Spectrometry.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8270D, February 2007.

10813 BNA Soil Microwave APP IX

The sample aliquot is extracted using microwave extraction with 1:1 methylene chloride and acetone. The extract is concentrated prior to analysis.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3546, Revision 0, February 2007.

05895 Total Cyanide (solid)
08255 Total Cyanide (water)

During the distillation step, complex cyanides are converted to hydrogen cyanide which readily reacts with chloramine T. Simple cyanides are converted to cyanogen chloride by reaction with chloramine T. This reacts with pyridine and barbituric acid to give a red colored complex determined colorimetrically.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9012B Rev. 2, November 2004.

05896 Cyanide Solid Distillation
08256 Cyanide Water Distillation

The sample is acidified and distilled. Cyanide is released as hydrogen cyanide and is absorbed in a sodium hydroxide solution.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9012B Rev. 2, November 2004.

00276 Hexavalent Chromium

Hexavalent chromium is determined colorimetrically using diphenylcarbazide to produce a red-violet color. The absorbance is read at 540 nm and compared to a standard curve.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7196A, July 1992.

00394 pH

A 1:1 slurry is prepared. The activity of hydrogen ions in the supernatant is measured using a glass electrode and a reference electrode.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9045D Modified, November 2004.

00425 Hexavalent Chromium (SOLIDS)

The filtrate from method #7825 is analyzed colorimetrically using diphenylcarbazide to produce a red-violet color. The absorbance is read at 540 nm and compared to a standard curve.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7196A, July 1992.

01821 Oxidation Reduction Potential

The oxidation-reduction potential is measured using a platinum electrode and a reference electrode. The potential reported is the electromotive force between the platinum electrode and the reference electrode, referred to the standard hydrogen scale.

Reference: Annual Book of ASTM Standards, Method D 1498

07825 Hexavalent Cr (Extraction)

The sample is digested using a 3% sodium carbonate - 2% sodium hydroxide solution and then filtered through a 0.45 micron filter.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3060A, December 1996

00111 Moisture
00118 Moisture
00121 Moisture Duplicate

A well-mixed sample is placed in a tared container and dried to a constant weight in an oven at 103-105C. The increase in weight is the total solids.

Reference: Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998, Method 2540 G-1997

07320 GC/MS - LL DIH2O Encore Prep

Two EnCore samples are collected per sample. The vials used for preparation are pre-preserved and pre-weighed. Two aliquots are extruded into DI water. The vials are re-weighed and the weight of the sample should be 5-g +/- .5 g. The prepared samples are then delivered to the lab for analysis. DI vials are frozen after they are weighed to complete preservation step.

Reference: Test Methods for Evaluating Solid Wastes, SW-846, Method 5035A, Revision 1, July 2002.

07578 GC/MS-HL Encore Prep-NC

The sample is collected in an EnCore sampler and is submitted to the laboratory. A vial containing 5-ml methanol is prepared for each sample and weighed prior to adding the sample. After the sample is added to the vial, the vial is reweighed and the weight of sample is determined by difference. The weight of the sample should be 5-g +/- .5 g. The sample vial is then delivered to the lab for analysis.

Reference: Test Methods for Evaluating Solid Wastes, SW-846, Method 5035A, Revision 1, July 2002.

Analysis Reports / Field Chain of Custody

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Report Date: September 08, 2016

Project: Woodbine Phase III MEC RFI

Submittal Date: 06/24/2016
Group Number: 1675729
SDG: DWD87
PO Number: 10381-7-113967
Release Number: DWD87
State of Sample Origin: GA

Client Sample Description	Lancaster Labs (LL) #
RTPA-1 Composite Soil	8442798
RTPA-1 Composite Soil	8442799
RTPA-1 Composite Soil	8442800
RTPA-2 Composite Soil	8442801
RTPA-2 Composite Soil	8442802
RTPA-2 Composite Soil	8442803
RTPA-3 Composite Soil	8442804
RTPA-3 Composite Soil	8442805
RTPA-3 Composite Soil	8442806
RTPA-4 Composite Soil	8442807
RTPA-4MS Composite Soil	8442808
RTPA-4MSD Composite Soil	8442809
RTPA-4 Composite Soil	8442810
RTPA-4MS Composite Soil	8442811
RTPA-4MSD Composite Soil	8442812
RTPA-4 Composite Soil	8442813
RTPA-4MS Composite Soil	8442814
RTPA-4MSD Composite Soil	8442815
DU-1-6-A Composite Soil	8442816
DU-1-6-A Composite Soil	8442817
DU-1-6-A Composite Soil	8442818
DU-1-6-A Composite Soil	8442819
DU-1-6-B Composite Soil	8442820
DU-1-6-B Composite Soil	8442821
DU-1-6-B Composite Soil	8442822
DU-1-6-B Composite Soil	8442823
DU-1-6-C Composite Soil	8442824
DU-1-6-C Composite Soil	8442825
DU-1-6-C Composite Soil	8442826
DU-1-6-C Composite Soil	8442827

TB-2 Water	8442828
RTPA-EB Grab Water	8442829
RTPA-FB Grab Water	8442830
DU-1-6-FB Grab Water	8442831

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	CH2M Hill, Inc.	Attn: Mark Sherrill
Electronic Copy To	CH2M Hill, Inc.	Attn: Chemistry Mailbox
Electronic Copy To	CH2M Hill, Inc.	Attn: Mark Stinnett

Respectfully Submitted,

Natalie R. Luciano
Senior Specialist

(717) 556-7258

Sample Description: RTPA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442798
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:16 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP11 SDG#: DWD87-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	170	U	170	850	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	850	U	850	2,500	5
10726	Quinoline	91-22-5	170	U	170	850	5

The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.

Reporting limits were raised due to interference from the sample matrix.

Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	2.3		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 13:47	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442799
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:16 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RTP12 SDG#: DWD87-02

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	42	U	42	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	42	U	42	120	1
13413	1,3-Dinitrobenzene	99-65-0	41	U	41	120	1
13413	2,4-Dinitrotoluene	121-14-2	41	U	41	120	1
13413	2,6-Dinitrotoluene	606-20-2	120	U	120	120	1
13413	HM	2691-41-0	220	U	220	300	1
13413	Nitrobenzene	98-95-3	100	U	100	300	1
13413	Nitroglycerin	55-63-0	810	U	810	2,400	1
13413	2-Nitrotoluene	88-72-2	76	U	76	120	1
13413	3-Nitrotoluene	99-08-1	110	U	110	120	1
13413	4-Nitrotoluene	99-99-0	110	U	110	120	1
13413	PETN	78-11-5	810	U	810	2,400	1
13413	RD	121-82-4	41	U	41	120	1
13413	Tetryl	479-45-8	100	U	100	300	1
13413	1,3,5-Trinitrobenzene	99-35-4	41	U	41	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	45	U	45	120	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	2.3		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 05:32	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: RTPA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442800
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:16 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP13 SDG#: DWD87-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	5	U	5	15	1.5
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	2.3		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161792AA	06/27/2016 14:55	Jennifer Howe	1.5
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:23	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:24	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 12:15	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442801
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:01 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP21 SDG#: DWD87-04

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	170	U	170	830	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	830	U	830	2,500	5
10726	Quinoline	91-22-5	170	U	170	830	5

The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.

Reporting limits were raised due to interference from the sample matrix.

Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	0.50	U	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 14:13	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442802
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:01 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RTP22 SDG#: DWD87-05

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	40	U	40	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	40	U	40	120	1
13413	1,3-Dinitrobenzene	99-65-0	39	U	39	120	1
13413	2,4-Dinitrotoluene	121-14-2	39	U	39	120	1
13413	2,6-Dinitrotoluene	606-20-2	110	U	110	120	1
13413	HM	2691-41-0	210	U	210	290	1
13413	Nitrobenzene	98-95-3	98	U	98	290	1
13413	Nitroglycerin	55-63-0	780	U	780	2,400	1
13413	2-Nitrotoluene	88-72-2	73	U	73	120	1
13413	3-Nitrotoluene	99-08-1	110	U	110	120	1
13413	4-Nitrotoluene	99-99-0	110	U	110	120	1
13413	PETN	78-11-5	780	U	780	2,400	1
13413	RD	121-82-4	39	U	39	120	1
13413	Tetryl	479-45-8	98	U	98	290	1
13413	1,3,5-Trinitrobenzene	99-35-4	39	U	39	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	43	U	43	120	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	0.50	U	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 06:15	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: RTPA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442803
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:01 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP23 SDG#: DWD87-06

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	5	U	5	15	1.52
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	0.50	U	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161792AA	06/27/2016 15:18	Jennifer Howe	1.52
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:23	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:23	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 12:14	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442804
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:51 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP31 SDG#: DWD87-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	830	U	830	4,100	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	4,100	U	4,100	12,000	5
10726	Quinoline	91-22-5	830	U	830	4,100	5

The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.

Reporting limits were raised due to interference from the sample matrix.

Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	0.50	U	0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 14:38	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442805
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:51 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RTP32 SDG#: DWD87-08

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	40	U	40	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	40	U	40	120	1
13413	1,3-Dinitrobenzene	99-65-0	39	U	39	120	1
13413	2,4-Dinitrotoluene	121-14-2	39	U	39	120	1
13413	2,6-Dinitrotoluene	606-20-2	110	U	110	120	1
13413	HM	2691-41-0	210	U	210	290	1
13413	Nitrobenzene	98-95-3	98	U	98	290	1
13413	Nitroglycerin	55-63-0	780	U	780	2,300	1
13413	2-Nitrotoluene	88-72-2	73	U	73	120	1
13413	3-Nitrotoluene	99-08-1	110	U	110	120	1
13413	4-Nitrotoluene	99-99-0	110	U	110	120	1
13413	PETN	78-11-5	780	U	780	2,300	1
13413	RD	121-82-4	39	U	39	120	1
13413	Tetryl	479-45-8	98	U	98	290	1
13413	1,3,5-Trinitrobenzene	99-35-4	39	U	39	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	43	U	43	120	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	0.50	U	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 06:57	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: RTPA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442806
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:51 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RTP33 SDG#: DWD87-09

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	4	U	4	14	1.36
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	0.50	U	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161792AA	06/27/2016 15:41	Jennifer Howe	1.36
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:23	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:23	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 12:13	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820012B	08/18/2016 22:32	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-4 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442807
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP41 SDG#: DWD87-10B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	170	U	170	830	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	830	U	830	2,500	5
10726	Quinoline	91-22-5	170	U	170	830	5

The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.

Reporting limits were raised due to interference from the sample matrix.

Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	0.67		0.50	0.50	1

Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 12:30	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-4MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442808
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP41 SDG#: DWD87-10MS

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	170	U	170	830	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	830	U	830	2,500	5
10726	Quinoline	91-22-5	1,200		170	830	5
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	0.67		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 12:55	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-4MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442809
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RTP41 SDG#: DWD87-10MSD

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	170	U	170	830	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	830	U	830	2,500	5
10726	Quinoline	91-22-5	1,200		170	830	5
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	0.67		0.50	0.50	1
00121	Moisture Duplicate	n.a.	0.68		0.50	0.50	1

The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 13:21	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1
00121	Moisture Duplicate	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-4 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442810
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RTP42 SDG#: DWD87-11B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	41	U	41	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	41	U	41	120	1
13413	1,3-Dinitrobenzene	99-65-0	40	U	40	120	1
13413	2,4-Dinitrotoluene	121-14-2	40	U	40	120	1
13413	2,6-Dinitrotoluene	606-20-2	110	U	110	120	1
13413	HM	2691-41-0	210	U	210	300	1
13413	Nitrobenzene	98-95-3	100	U	100	300	1
13413	Nitroglycerin	55-63-0	810	U	810	2,400	1
13413	2-Nitrotoluene	88-72-2	76	U	76	120	1
13413	3-Nitrotoluene	99-08-1	110	U	110	120	1
13413	4-Nitrotoluene	99-99-0	110	U	110	120	1
13413	PETN	78-11-5	810	U	810	2,400	1
13413	RD	121-82-4	40	U	40	120	1
13413	Tetryl	479-45-8	100	U	100	300	1
13413	1,3,5-Trinitrobenzene	99-35-4	40	U	40	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	44	U	44	120	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	0.67		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 07:40	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: RTPA-4MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442811
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP42 SDG#: DWD87-11MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg	ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	1,800	41	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	1,800	41	120	1
13413	1,3-Dinitrobenzene	99-65-0	2,300	40	120	1
13413	2,4-Dinitrotoluene	121-14-2	1,700	40	120	1
13413	2,6-Dinitrotoluene	606-20-2	2,000	110	120	1
13413	HM	2691-41-0	1,700	210	300	1
13413	Nitrobenzene	98-95-3	2,100	100	300	1
13413	Nitroglycerin	55-63-0	17,000	800	2,400	1
13413	2-Nitrotoluene	88-72-2	1,800	75	120	1
13413	3-Nitrotoluene	99-08-1	1,900	110	120	1
13413	4-Nitrotoluene	99-99-0	1,700	110	120	1
13413	PETN	78-11-5	20,000	800	2,400	1
13413	RD	121-82-4	1,900	40	120	1
13413	Tetryl	479-45-8	1,700	100	300	1
13413	1,3,5-Trinitrobenzene	99-35-4	310	40	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	1,900	44	120	1
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	0.67	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 08:22	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-4MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442812
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RTP42 SDG#: DWD87-11MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg	ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	1,800	40	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	1,800	40	120	1
13413	1,3-Dinitrobenzene	99-65-0	2,300	39	120	1
13413	2,4-Dinitrotoluene	121-14-2	1,700	39	120	1
13413	2,6-Dinitrotoluene	606-20-2	1,900	110	120	1
13413	HM	2691-41-0	1,800	210	290	1
13413	Nitrobenzene	98-95-3	2,100	98	290	1
13413	Nitroglycerin	55-63-0	16,000	780	2,300	1
13413	2-Nitrotoluene	88-72-2	1,800	73	120	1
13413	3-Nitrotoluene	99-08-1	1,900	110	120	1
13413	4-Nitrotoluene	99-99-0	1,700	110	120	1
13413	PETN	78-11-5	18,000	780	2,300	1
13413	RD	121-82-4	1,900	39	120	1
13413	Tetryl	479-45-8	1,700	98	290	1
13413	1,3,5-Trinitrobenzene	99-35-4	330	39	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	1,800	43	120	1
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	0.67	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 09:05	Jessica L Miller	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: RTPA-4 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442813
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP43 SDG#: DWD87-12B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	4	U	4	13	1.25
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	0.67		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161792AA	06/27/2016 13:48	Jennifer Howe	1.25
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:23	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:23	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 12:13	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: RTPA-4MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442814
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RTP43 SDG#: DWD87-12MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg	ug/kg	ug/kg	
Trial ID: RE						
11995	4-Methyl-2-pentanone	108-10-1	250	8	26	2.55
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	0.67	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1-RE	A161792AB	07/06/2016 14:04	Jennifer Howe	2.55
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:24	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:24	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 12:21	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: RTPA-4MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442815
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:37 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

RTP43 SDG#: DWD87-12MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg	ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	190	5	18	1.8
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	0.67	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161792AA	06/27/2016 14:33	Jennifer Howe	1.8
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:24	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:24	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 12:22	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442816
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 11:00 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16A1 SDG#: DWD87-13

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	880	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	880	U	880	2,600	5
10726	Quinoline	91-22-5	180	U	180	880	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0250	J	0.0100	0.100	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.18	U	0.18	0.51	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	532		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	5.3	U	5.3	15.8	10
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	4.58		0.0100	0.0100	1
	The pH was measured in water at 19.7 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	5.1		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 15:04	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442816
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 11:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16A1 SDG#: DWD87-13

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:50	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16182102201A	07/02/2016 12:59	Brianna A White	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16182102201A	06/30/2016 09:00	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16188182101B	07/06/2016 20:00	Michelle L Lalli	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16187042501A	07/05/2016 20:45	Daniel S Smith	10
00394	pH	SW-846 9045D modified	1	16188039401B	07/06/2016 20:00	Michelle L Lalli	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16187042501A	07/05/2016 12:40	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442817
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 11:00 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16A2 SDG#: DWD87-14

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	1,160		9.06	41.7	1
06944	Antimony	7440-36-0	0.730	U	0.730	4.17	1
06935	Arsenic	7440-38-2	1.01	U	1.01	4.17	1
06946	Barium	7440-39-3	4.20		0.0344	1.04	1
06947	Beryllium	7440-41-7	0.0699	U	0.0699	1.04	1
06949	Cadmium	7440-43-9	0.0511	U	0.0511	1.04	1
01650	Calcium	7440-70-2	274		5.91	41.7	1
06951	Chromium	7440-47-3	1.66	J	0.146	3.13	1
06952	Cobalt	7440-48-4	0.125	U	0.125	1.04	1
06953	Copper	7440-50-8	3.39		0.240	2.09	1
01654	Iron	7439-89-6	589		4.30	41.7	1
06955	Lead	7439-92-1	3.99		0.574	3.13	1
01657	Magnesium	7439-95-4	88.4		1.98	20.9	1
06958	Manganese	7439-96-5	19.4		0.0866	1.04	1
06961	Nickel	7440-02-0	0.390	J	0.313	2.09	1
01662	Potassium	7440-09-7	59.1	J	24.9	104	1
06936	Selenium	7782-49-2	0.939	U	0.939	4.17	1
06966	Silver	7440-22-4	0.156	U	0.156	1.04	1
01667	Sodium	7440-23-5	24.9	U	24.9	209	1
06971	Vanadium	7440-62-2	2.58		0.146	1.04	1
06972	Zinc	7440-66-6	1.94	J	0.709	4.17	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0303	U	0.0303	0.209	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	5.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06944	Antimony	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06935	Arsenic	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06946	Barium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06947	Beryllium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442817
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 11:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16A2 SDG#: DWD87-14

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
01650	Calcium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06951	Chromium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06952	Cobalt	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06953	Copper	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
01654	Iron	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06955	Lead	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
01657	Magnesium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06958	Manganese	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06961	Nickel	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
01662	Potassium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06936	Selenium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06966	Silver	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
01667	Sodium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06971	Vanadium	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06972	Zinc	SW-846 6010C	1	161870637004	07/07/2016 23:31	Elaine F Stoltzfus	1
06145	Thallium	SW-846 6020A	1	161870637004A	07/08/2016 00:56	Tara L Snyder	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161870637004	07/06/2016 08:45	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442818
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 11:00 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16A3 SDG#: DWD87-15

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	42	U	42	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	42	U	42	120	1
13413	1,3-Dinitrobenzene	99-65-0	41	U	41	120	1
13413	2,4-Dinitrotoluene	121-14-2	41	U	41	120	1
13413	2,6-Dinitrotoluene	606-20-2	120	U	120	120	1
13413	HM	2691-41-0	220	U	220	310	1
13413	Nitrobenzene	98-95-3	100	U	100	310	1
13413	Nitroglycerin	55-63-0	820	U	820	2,400	1
13413	2-Nitrotoluene	88-72-2	76	U	76	120	1
13413	3-Nitrotoluene	99-08-1	110	U	110	120	1
13413	4-Nitrotoluene	99-99-0	110	U	110	120	1
13413	PETN	78-11-5	820	U	820	2,400	1
13413	RD	121-82-4	41	U	41	120	1
13413	Tetryl	479-45-8	100	U	100	310	1
13413	1,3,5-Trinitrobenzene	99-35-4	140	U	140	140	1
13413	2,4,6-Trinitrotoluene	118-96-7	45	U	45	120	1
	Reporting limits were raised due to interference from the sample matrix.						
Perchlorate	**SW-846 6850 1/2007**		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.2	U	2.2	5.3	1
Wet Chemistry	**SM 2540 G-1997**		%		%	%	
00118	Moisture	n.a.	5.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 09:47	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 02:19	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-1-6-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442819
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 11:00 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16A4 SDG#: DWD87-16

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	6	U	6	20	1.94
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	5.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161792AA	06/27/2016 16:03	Jennifer Howe	1.94
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:06	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:06	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 12:04	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-1-6-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442820
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 13:45 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16B1 SDG#: DWD87-17

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	920	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	920	U	920	2,800	5
10726	Quinoline	91-22-5	180	U	180	920	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0395	J	0.0105	0.105	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.19	U	0.19	0.54	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	563		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	11.0	U	11.0	33.0	20
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	4.37		0.0100	0.0100	1
	The pH was measured in water at 20.1 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	9.1		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 15:30	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442820
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 13:45 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16B1 SDG#: DWD87-17

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:52	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16182102201A	07/02/2016 13:00	Brianna A White	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16182102201A	06/30/2016 09:00	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16188182101B	07/06/2016 20:00	Michelle L Lalli	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16187042501A	07/05/2016 20:45	Daniel S Smith	20
00394	pH	SW-846 9045D modified	1	16188039401B	07/06/2016 20:00	Michelle L Lalli	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16187042501A	07/05/2016 12:40	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-1-6-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442821
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 13:45 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16B2 SDG#: DWD87-18

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	1,210		9.45	43.6	1
06944	Antimony	7440-36-0	0.762	U	0.762	4.36	1
06935	Arsenic	7440-38-2	1.06	U	1.06	4.36	1
06946	Barium	7440-39-3	5.20		0.0359	1.09	1
06947	Beryllium	7440-41-7	0.0730	U	0.0730	1.09	1
06949	Cadmium	7440-43-9	0.0534	U	0.0534	1.09	1
01650	Calcium	7440-70-2	438		6.16	43.6	1
06951	Chromium	7440-47-3	1.67	J	0.152	3.27	1
06952	Cobalt	7440-48-4	0.131	U	0.131	1.09	1
06953	Copper	7440-50-8	2.78		0.251	2.18	1
01654	Iron	7439-89-6	646		4.49	43.6	1
06955	Lead	7439-92-1	3.82		0.599	3.27	1
01657	Magnesium	7439-95-4	117		2.07	21.8	1
06958	Manganese	7439-96-5	25.1		0.0904	1.09	1
06961	Nickel	7440-02-0	0.584	J	0.327	2.18	1
01662	Potassium	7440-09-7	83.2	J	26.0	109	1
06936	Selenium	7782-49-2	0.980	U	0.980	4.36	1
06966	Silver	7440-22-4	0.163	U	0.163	1.09	1
01667	Sodium	7440-23-5	26.0	U	26.0	218	1
06971	Vanadium	7440-62-2	2.56		0.152	1.09	1
06972	Zinc	7440-66-6	2.75	J	0.741	4.36	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0316	U	0.0316	0.218	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	9.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06944	Antimony	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06935	Arsenic	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06946	Barium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06947	Beryllium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442821
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 13:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16B2 SDG#: DWD87-18

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
01650	Calcium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06951	Chromium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06952	Cobalt	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06953	Copper	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
01654	Iron	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06955	Lead	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
01657	Magnesium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06958	Manganese	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06961	Nickel	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
01662	Potassium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06936	Selenium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06966	Silver	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
01667	Sodium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06971	Vanadium	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06972	Zinc	SW-846 6010C	1	161870637004	07/07/2016 23:34	Elaine F Stoltzfus	1
06145	Thallium	SW-846 6020A	1	161870637004A	07/08/2016 00:58	Tara L Snyder	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161870637004	07/06/2016 08:45	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442822
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 13:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16B3 SDG#: DWD87-19

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives		SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene		19406-51-0	45	U	45	130	1
13413	2-Amino-4,6-Dinitrotoluene		35572-78-2	45	U	45	130	1
13413	1,3-Dinitrobenzene		99-65-0	44	U	44	130	1
13413	2,4-Dinitrotoluene		121-14-2	44	U	44	130	1
13413	2,6-Dinitrotoluene		606-20-2	130	U	130	130	1
13413	HM		2691-41-0	230	U	230	330	1
13413	Nitrobenzene		98-95-3	110	U	110	330	1
13413	Nitroglycerin		55-63-0	880	U	880	2,600	1
13413	2-Nitrotoluene		88-72-2	82	U	82	130	1
13413	3-Nitrotoluene		99-08-1	120	U	120	130	1
13413	4-Nitrotoluene		99-99-0	120	U	120	130	1
13413	PETN		78-11-5	2,700		880	2,600	1
13413	RD		121-82-4	44	U	44	130	1
13413	Tetryl		479-45-8	110	U	110	330	1
13413	1,3,5-Trinitrobenzene		99-35-4	44	U	44	130	1
13413	2,4,6-Trinitrotoluene		118-96-7	48	U	48	130	1
Perchlorate		SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil	LC/MS/MS	14797-73-0	2.3	U	2.3	5.5	1
Wet Chemistry		SM 2540 G-1997		%		%	%	
00118	Moisture		n.a.	9.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 10:29	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 02:31	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-1-6-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442823
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 13:45 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16B4 SDG#: DWD87-20

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	5	U	5	17	1.51
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	9.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161792AA	06/27/2016 16:26	Jennifer Howe	1.51
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:06	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:06	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 11:59	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442824
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 15:30 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16C1 SDG#: DWD87-21

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	890	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	890	U	890	2,700	5
10726	Quinoline	91-22-5	180	U	180	890	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0338	J	0.0108	0.108	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.19	U	0.19	0.52	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	582		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	10.8	U	10.8	32.4	20
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	4.40		0.0100	0.0100	1
	The pH was measured in water at 20 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	7.4		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLB026	07/06/2016 15:55	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLB026	07/05/2016 08:30	ayla A Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442824
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 15:30 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16C1 SDG#: DWD87-21

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:54	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16182102201A	07/02/2016 13:01	Brianna A White	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16182102201A	06/30/2016 09:00	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16188182101B	07/06/2016 20:00	Michelle L Lalli	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16187042501A	07/05/2016 20:45	Daniel S Smith	20
00394	pH	SW-846 9045D modified	1	16188039401B	07/06/2016 20:00	Michelle L Lalli	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16187042501A	07/05/2016 12:40	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442825
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 15:30 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16C2 SDG#: DWD87-22

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	871		9.19	42.3	1
06944	Antimony	7440-36-0	0.741	U	0.741	4.23	1
06935	Arsenic	7440-38-2	1.03	U	1.03	4.23	1
06946	Barium	7440-39-3	3.86		0.0349	1.06	1
06947	Beryllium	7440-41-7	0.0709	U	0.0709	1.06	1
06949	Cadmium	7440-43-9	0.0519	U	0.0519	1.06	1
01650	Calcium	7440-70-2	281		5.99	42.3	1
06951	Chromium	7440-47-3	1.26	J	0.148	3.18	1
06952	Cobalt	7440-48-4	0.127	U	0.127	1.06	1
06953	Copper	7440-50-8	2.54		0.244	2.12	1
01654	Iron	7439-89-6	587		4.36	42.3	1
06955	Lead	7439-92-1	3.48		0.582	3.18	1
01657	Magnesium	7439-95-4	81.6		2.01	21.2	1
06958	Manganese	7439-96-5	18.8		0.0879	1.06	1
06961	Nickel	7440-02-0	0.347	J	0.318	2.12	1
01662	Potassium	7440-09-7	57.8	J	25.3	106	1
06936	Selenium	7782-49-2	0.953	U	0.953	4.23	1
06966	Silver	7440-22-4	0.159	U	0.159	1.06	1
01667	Sodium	7440-23-5	25.3	U	25.3	212	1
06971	Vanadium	7440-62-2	2.33		0.148	1.06	1
06972	Zinc	7440-66-6	5.78		0.720	4.23	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0307	U	0.0307	0.212	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	7.4		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06944	Antimony	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06935	Arsenic	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06946	Barium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06947	Beryllium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442825
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 15:30 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16C2 SDG#: DWD87-22

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
01650	Calcium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06951	Chromium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06952	Cobalt	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06953	Copper	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
01654	Iron	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06955	Lead	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
01657	Magnesium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06958	Manganese	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06961	Nickel	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
01662	Potassium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06936	Selenium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06966	Silver	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
01667	Sodium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06971	Vanadium	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06972	Zinc	SW-846 6010C	1	161870637004	07/07/2016 23:37	Elaine F Stoltzfus	1
06145	Thallium	SW-846 6020A	1	161870637004A	07/08/2016 00:59	Tara L Snyder	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161870637004	07/06/2016 08:45	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-1-6-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442826
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 15:30 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16C3 SDG#: DWD87-23

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	44	U	44	130	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	44	U	44	130	1
13413	1,3-Dinitrobenzene	99-65-0	43	U	43	130	1
13413	2,4-Dinitrotoluene	121-14-2	43	U	43	130	1
13413	2,6-Dinitrotoluene	606-20-2	120	U	120	130	1
13413	HM	2691-41-0	230	U	230	320	1
13413	Nitrobenzene	98-95-3	110	U	110	320	1
13413	Nitroglycerin	55-63-0	860	U	860	2,600	1
13413	2-Nitrotoluene	88-72-2	81	U	81	130	1
13413	3-Nitrotoluene	99-08-1	120	U	120	130	1
13413	4-Nitrotoluene	99-99-0	120	U	120	130	1
13413	PETN	78-11-5	860	U	860	2,600	1
13413	RD	121-82-4	43	U	43	130	1
13413	Tetryl	479-45-8	110	U	110	320	1
13413	1,3,5-Trinitrobenzene	99-35-4	43	U	43	130	1
13413	2,4,6-Trinitrotoluene	118-96-7	48	U	48	130	1
	This sample was used for the ISM triplicate. The individual RSD is included in the data package for review.						
Perchlorate	**SW-846 6850 1/2007**		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.3	U	2.3	5.4	1
Wet Chemistry	**SM 2540 G-1997**		%		%	%	
00118	Moisture	n.a.	7.4		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 11:54	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 02:57	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-1-6-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8442827
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 15:30 by JC

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D16C4 SDG#: DWD87-24

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	5	U	5	16	1.52
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	7.4		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161792AA	06/27/2016 16:49	Jennifer Howe	1.52
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641607	06/24/2016 12:06	Mitchell R Washel	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641607	06/24/2016 12:06	Mitchell R Washel	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641607	06/24/2016 12:01	Mitchell R Washel	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-2 Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442828
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 08:00

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

WBTB2 SDG#: DWD87-25TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/l		ug/l	ug/l	
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	L161872AA	07/05/2016 18:41	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 18:41	Matthew S rause	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442829
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RT-EB SDG#: DWD87-26EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/l		ug/l	ug/l	
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
GC/MS Semivolatiles	SW-846 8270D		ug/l		ug/l	ug/l	
10461	2-Chlorobenzaldehyde	89-98-5	1	U	1	5	1
02395	2-Chlorobenzalmalononitrile	2698-41-1	5	U	5	15	1
10461	Quinoline	91-22-5	1	U	1	5	1
	The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/l		ug/l	ug/l	
13395	4-Amino-2,6-Dinitrotoluene	19406-51-0	0.23	U	0.23	0.60	1
13395	2-Amino-4,6-Dinitrotoluene	35572-78-2	0.23	U	0.23	0.60	1
13395	1,3-Dinitrobenzene	99-65-0	0.25	U	0.25	0.60	1
13395	2,4-Dinitrotoluene	121-14-2	0.20	U	0.20	0.60	1
13395	2,6-Dinitrotoluene	606-20-2	0.40	U	0.40	0.60	1
13395	HM	2691-41-0	0.20	U	0.20	0.60	1
13395	Nitrobenzene	98-95-3	0.44	U	0.44	0.60	1
13395	Nitroglycerin	55-63-0	3.0	U	3.0	10	1
13395	2-Nitrotoluene	88-72-2	0.40	U	0.40	0.60	1
13395	3-Nitrotoluene	99-08-1	0.32	U	0.32	0.60	1
13395	4-Nitrotoluene	99-99-0	0.32	U	0.32	0.60	1
13395	PETN	78-11-5	3.0	U	3.0	10	1
13395	RD	121-82-4	0.40	U	0.40	0.60	1
13395	Tetryl	479-45-8	0.44	U	0.44	0.60	1
13395	1,3,5-Trinitrobenzene	99-35-4	0.22	U	0.22	0.60	1
13395	2,4,6-Trinitrotoluene	118-96-7	0.40	U	0.40	0.60	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Perchlorate	SW-846 6850 1/2007		ug/l		ug/l	ug/l	
06386	Perchlorate in Water LC/MS/MS	14797-73-0	0.20	U	0.20	1.0	1
Metals	SW-846 6010C		mg/l		mg/l	mg/l	
01743	Aluminum	7429-90-5	0.0868	U	0.0868	0.400	1
07044	Antimony	7440-36-0	0.0077	U	0.0077	0.0400	1
07035	Arsenic	7440-38-2	0.0131	J	0.0097	0.0400	1
07046	Barium	7440-39-3	0.0011	U	0.0011	0.0100	1
07047	Beryllium	7440-41-7	0.00067	U	0.00067	0.0100	1
07049	Cadmium	7440-43-9	0.00049	U	0.00049	0.0100	1
01750	Calcium	7440-70-2	0.0464	J	0.0382	0.400	1
07051	Chromium	7440-47-3	0.0018	U	0.0018	0.0300	1
07052	Cobalt	7440-48-4	0.0019	U	0.0019	0.0100	1
07053	Copper	7440-50-8	0.0051	J	0.0041	0.0200	1
01754	Iron	7439-89-6	0.0747	U	0.0747	0.400	1
07055	Lead	7439-92-1	0.0062	U	0.0062	0.0300	1
01757	Magnesium	7439-95-4	0.0190	U	0.0190	0.200	1
07058	Manganese	7439-96-5	0.0018	U	0.0018	0.0100	1
07061	Nickel	7440-02-0	0.0028	U	0.0028	0.0200	1
01762	Potassium	7440-09-7	0.160	U	0.160	1.00	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442829
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RT-EB SDG#: DWD87-26EB

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals		SW-846 6010C		mg/l	mg/l	mg/l	
07036	Selenium		7782-49-2	0.0097 U	0.0097	0.0400	1
07066	Silver		7440-22-4	0.0019 U	0.0019	0.0100	1
01767	Sodium		7440-23-5	0.173 U	0.173	2.00	1
07071	Vanadium		7440-62-2	0.0016 U	0.0016	0.0100	1
07072	Zinc		7440-66-6	0.0054 U	0.0054	0.0400	1
		SW-846 6020A		mg/l	mg/l	mg/l	
06045	Thallium		7440-28-0	0.00016 U	0.00016	0.0010	1
		SW-846 7470A		mg/l	mg/l	mg/l	
00259	Mercury		7439-97-6	0.000050 U	0.000050	0.00020	1
Wet Chemistry		SW-846 9012B		mg/l	mg/l	mg/l	
08255	Total Cyanide water		57-12-5	0.0050 U	0.0050	0.010	1
		SW-846 7196A		mg/l	mg/l	mg/l	
00276	Hexavalent Chromium		18540-29-9	0.0070 U	0.0070	0.020	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	L161872AA	07/05/2016 19:03	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 19:03	Matthew S rause	1
02395	CS Compound	SW-846 8270D	1	16178WAA026	06/28/2016 13:03	Joseph M Gambler	1
10461	SVOA 8270D water	SW-846 8270D	1	16178WAD026	07/09/2016 00:25	Catherine E Bachman	1
10475	BNA Water Extraction CS BZ	SW-846 3510C	1	16178WAA026	06/27/2016 21:00	aren L Beyer	1
11010	8270D BNA Extraction	SW-846 3510C	1	16178WAD026	06/28/2016 09:00	Andrea J ramer	1
13395	Nitroaromatics/Amines 8330B w	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	07/31/2016 23:50	James H Place	1
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	161800005A	06/28/2016 16:09	Richard A Shober	1
13432	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	06/28/2016 11:15	Edwin Ortiz	1
01743	Aluminum	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07044	Antimony	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07035	Arsenic	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07046	Barium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442829
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RT-EB SDG#: DWD87-26EB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07047	Beryllium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07049	Cadmium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
01750	Calcium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07051	Chromium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07052	Cobalt	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07053	Copper	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
01754	Iron	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07055	Lead	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07058	Manganese	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07061	Nickel	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07036	Selenium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07066	Silver	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07071	Vanadium	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
07072	Zinc	SW-846 6010C	1	161790635001	06/28/2016 21:45	Suzanne M Will	1
06045	Thallium	SW-846 6020A	1	1617906390001A	06/28/2016 23:59	Tara L Snyder	1
00259	Mercury	SW-846 7470A	1	161795713002	06/29/2016 09:15	Damary Valentin	1
10635	ICP-WW, 3005A tot rec - U4	SW-846 3005A	1	161790635001	06/28/2016 07:40	James L Mertz	1
10639	ICPMS - Water, 3020A - U4	SW-846 3020A	1	161790639001	06/28/2016 07:40	James L Mertz	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	161795713002	06/28/2016 09:50	JoElla L Rice	1
08255	Total Cyanide water	SW-846 9012B	1	16180117101A	06/28/2016 13:56	Dein Bernot	1
08256	Cyanide Water Distillation	SW-846 9012B	1	16180117101A	06/28/2016 09:30	Nancy J Shoop	1
00276	Hexavalent Chromium	SW-846 7196A	1	16176027601A	06/24/2016 11:50	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442830
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:30 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RT-FB SDG#: DWD87-27FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/l		ug/l	ug/l	
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
GC/MS Semivolatiles	SW-846 8270D		ug/l		ug/l	ug/l	
10461	2-Chlorobenzaldehyde	89-98-5	1	U	1	5	1
02395	2-Chlorobenzalmalononitrile	2698-41-1	5	U	5	15	1
10461	Quinoline	91-22-5	1	U	1	5	1
	The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/l		ug/l	ug/l	
13395	4-Amino-2,6-Dinitrotoluene	19406-51-0	0.23	U	0.23	0.60	1
13395	2-Amino-4,6-Dinitrotoluene	35572-78-2	0.23	U	0.23	0.60	1
13395	1,3-Dinitrobenzene	99-65-0	0.25	U	0.25	0.60	1
13395	2,4-Dinitrotoluene	121-14-2	0.20	U	0.20	0.60	1
13395	2,6-Dinitrotoluene	606-20-2	0.40	U	0.40	0.60	1
13395	HM	2691-41-0	0.20	U	0.20	0.60	1
13395	Nitrobenzene	98-95-3	0.44	U	0.44	0.90	1
13395	Nitroglycerin	55-63-0	3.0	U	3.0	10	1
13395	2-Nitrotoluene	88-72-2	0.40	U	0.40	0.80	1
13395	3-Nitrotoluene	99-08-1	0.32	U	0.32	0.70	1
13395	4-Nitrotoluene	99-99-0	0.32	U	0.32	0.70	1
13395	PETN	78-11-5	3.0	U	3.0	10	1
13395	RD	121-82-4	0.40	U	0.40	0.80	1
13395	Tetryl	479-45-8	0.44	U	0.44	0.90	1
13395	1,3,5-Trinitrobenzene	99-35-4	0.22	U	0.22	0.60	1
13395	2,4,6-Trinitrotoluene	118-96-7	0.40	U	0.40	0.80	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Perchlorate	SW-846 6850 1/2007		ug/l		ug/l	ug/l	
06386	Perchlorate in Water LC/MS/MS	14797-73-0	0.20	U	0.20	1.0	1
Metals	SW-846 6010C		mg/l		mg/l	mg/l	
01743	Aluminum	7429-90-5	0.0868	U	0.0868	0.400	1
07044	Antimony	7440-36-0	0.0077	U	0.0077	0.0400	1
07035	Arsenic	7440-38-2	0.0097	U	0.0097	0.0400	1
07046	Barium	7440-39-3	0.0011	U	0.0011	0.0100	1
07047	Beryllium	7440-41-7	0.00067	U	0.00067	0.0100	1
07049	Cadmium	7440-43-9	0.00049	U	0.00049	0.0100	1
01750	Calcium	7440-70-2	0.0618	J	0.0382	0.400	1
07051	Chromium	7440-47-3	0.0018	U	0.0018	0.0300	1
07052	Cobalt	7440-48-4	0.0019	U	0.0019	0.0100	1
07053	Copper	7440-50-8	0.0054	J	0.0041	0.0200	1
01754	Iron	7439-89-6	0.0747	U	0.0747	0.400	1
07055	Lead	7439-92-1	0.0062	U	0.0062	0.0300	1
01757	Magnesium	7439-95-4	0.0190	U	0.0190	0.200	1
07058	Manganese	7439-96-5	0.0059	J	0.0018	0.0100	1
07061	Nickel	7440-02-0	0.0028	U	0.0028	0.0200	1
01762	Potassium	7440-09-7	0.160	U	0.160	1.00	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442830
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:30 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RT-FB SDG#: DWD87-27FB

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals		SW-846 6010C		mg/l	mg/l	mg/l	
07036	Selenium		7782-49-2	0.0097 U	0.0097	0.0400	1
07066	Silver		7440-22-4	0.0019 U	0.0019	0.0100	1
01767	Sodium		7440-23-5	0.173 U	0.173	2.00	1
07071	Vanadium		7440-62-2	0.0016 U	0.0016	0.0100	1
07072	Zinc		7440-66-6	0.0054 U	0.0054	0.0400	1
		SW-846 6020A		mg/l	mg/l	mg/l	
06045	Thallium		7440-28-0	0.00016 U	0.00016	0.0010	1
		SW-846 7470A		mg/l	mg/l	mg/l	
00259	Mercury		7439-97-6	0.000050 U	0.000050	0.00020	1
Wet Chemistry		SW-846 9012B		mg/l	mg/l	mg/l	
08255	Total Cyanide water		57-12-5	0.0050 U	0.0050	0.010	1
		SW-846 7196A		mg/l	mg/l	mg/l	
00276	Hexavalent Chromium		18540-29-9	0.0070 U	0.0070	0.020	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	L161872AA	07/05/2016 19:25	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 19:25	Matthew S rause	1
02395	CS Compound	SW-846 8270D	1	16178WAA026	06/28/2016 13:29	Joseph M Gambler	1
10461	SVOA 8270D water	SW-846 8270D	1	16178WAD026	07/09/2016 00:54	Catherine E Bachman	1
10475	BNA Water Extraction CS BZ	SW-846 3510C	1	16178WAA026	06/27/2016 21:00	aren L Beyer	1
11010	8270D BNA Extraction	SW-846 3510C	1	16178WAD026	06/28/2016 09:00	Andrea J ramer	1
13395	Nitroaromatics/Amines 8330B w	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	08/01/2016 00:33	James H Place	1
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	161800005A	06/28/2016 16:22	Richard A Shober	1
13432	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	06/28/2016 11:15	Edwin Ortiz	1
01743	Aluminum	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07044	Antimony	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07035	Arsenic	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07046	Barium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1

*=This limit was used in the evaluation of the final result

Sample Description: RTPA-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442830
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 09:30 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

RT-FB SDG#: DWD87-27FB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07047	Beryllium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07049	Cadmium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
01750	Calcium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07051	Chromium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07052	Cobalt	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07053	Copper	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
01754	Iron	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07055	Lead	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07058	Manganese	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07061	Nickel	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07036	Selenium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07066	Silver	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07071	Vanadium	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
07072	Zinc	SW-846 6010C	1	161790635001	06/28/2016 21:48	Suzanne M Will	1
06045	Thallium	SW-846 6020A	1	1617906390O1A	06/29/2016 00:00	Tara L Snyder	1
00259	Mercury	SW-846 7470A	1	161795713002	06/29/2016 09:17	Damary Valentin	1
10635	ICP-WW, 3005A tot rec - U4	SW-846 3005A	1	161790635001	06/28/2016 07:40	James L Mertz	1
10639	ICPMS - Water, 3020A - U4	SW-846 3020A	1	161790639001	06/28/2016 07:40	James L Mertz	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	161795713002	06/28/2016 09:50	JoElla L Rice	1
08255	Total Cyanide water	SW-846 9012B	1	16180117101A	06/28/2016 13:57	Dein Bernot	1
08256	Cyanide Water Distillation	SW-846 9012B	1	16180117101A	06/28/2016 09:30	Nancy J Shoop	1
00276	Hexavalent Chromium	SW-846 7196A	1	16176027601A	06/24/2016 11:50	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442831
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 12:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16C1 SDG#: DWD87-28FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/l		ug/l	ug/l	
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
GC/MS Semivolatiles	SW-846 8270D		ug/l		ug/l	ug/l	
10461	2-Chlorobenzaldehyde	89-98-5	1	U	1	5	1
02395	2-Chlorobenzalmalononitrile	2698-41-1	5	U	5	14	1
10461	Quinoline	91-22-5	1	U	1	5	1
	The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/l		ug/l	ug/l	
13395	4-Amino-2,6-Dinitrotoluene	19406-51-0	0.23	U	0.23	0.60	1
13395	2-Amino-4,6-Dinitrotoluene	35572-78-2	0.23	U	0.23	0.60	1
13395	1,3-Dinitrobenzene	99-65-0	0.25	U	0.25	0.60	1
13395	2,4-Dinitrotoluene	121-14-2	0.20	U	0.20	0.60	1
13395	2,6-Dinitrotoluene	606-20-2	0.40	U	0.40	0.60	1
13395	HM	2691-41-0	0.20	U	0.20	0.60	1
13395	Nitrobenzene	98-95-3	0.44	U	0.44	0.90	1
13395	Nitroglycerin	55-63-0	3.0	U	3.0	10	1
13395	2-Nitrotoluene	88-72-2	0.40	U	0.40	0.80	1
13395	3-Nitrotoluene	99-08-1	0.32	U	0.32	0.70	1
13395	4-Nitrotoluene	99-99-0	0.32	U	0.32	0.70	1
13395	PETN	78-11-5	3.0	U	3.0	10	1
13395	RD	121-82-4	0.40	U	0.40	0.80	1
13395	Tetryl	479-45-8	0.44	U	0.44	0.90	1
13395	1,3,5-Trinitrobenzene	99-35-4	0.22	U	0.22	0.60	1
13395	2,4,6-Trinitrotoluene	118-96-7	0.40	U	0.40	0.80	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Perchlorate	SW-846 6850 1/2007		ug/l		ug/l	ug/l	
06386	Perchlorate in Water LC/MS/MS	14797-73-0	0.20	U	0.20	1.0	1
Metals	SW-846 6010C		mg/l		mg/l	mg/l	
01743	Aluminum	7429-90-5	0.0868	U	0.0868	0.400	1
07044	Antimony	7440-36-0	0.0077	U	0.0077	0.0400	1
07035	Arsenic	7440-38-2	0.0097	U	0.0097	0.0400	1
07046	Barium	7440-39-3	0.0011	U	0.0011	0.0100	1
07047	Beryllium	7440-41-7	0.00067	U	0.00067	0.0100	1
07049	Cadmium	7440-43-9	0.00049	U	0.00049	0.0100	1
01750	Calcium	7440-70-2	0.0382	U	0.0382	0.400	1
07051	Chromium	7440-47-3	0.0018	U	0.0018	0.0300	1
07052	Cobalt	7440-48-4	0.0019	U	0.0019	0.0100	1
07053	Copper	7440-50-8	0.0052	J	0.0041	0.0200	1
01754	Iron	7439-89-6	0.0747	U	0.0747	0.400	1
07055	Lead	7439-92-1	0.0062	U	0.0062	0.0300	1
01757	Magnesium	7439-95-4	0.0190	U	0.0190	0.200	1
07058	Manganese	7439-96-5	0.0018	U	0.0018	0.0100	1
07061	Nickel	7440-02-0	0.0028	U	0.0028	0.0200	1
01762	Potassium	7440-09-7	0.160	U	0.160	1.00	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442831
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 12:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16C1 SDG#: DWD87-28FB

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals		SW-846 6010C		mg/l	mg/l	mg/l	
07036	Selenium		7782-49-2	0.0097 U	0.0097	0.0400	1
07066	Silver		7440-22-4	0.0019 U	0.0019	0.0100	1
01767	Sodium		7440-23-5	0.173 U	0.173	2.00	1
07071	Vanadium		7440-62-2	0.0016 U	0.0016	0.0100	1
07072	Zinc		7440-66-6	0.0054 U	0.0054	0.0400	1
		SW-846 6020A		mg/l	mg/l	mg/l	
06045	Thallium		7440-28-0	0.00016 U	0.00016	0.0010	1
		SW-846 7470A		mg/l	mg/l	mg/l	
00259	Mercury		7439-97-6	0.000050 U	0.000050	0.00020	1
Wet Chemistry		SW-846 9012B		mg/l	mg/l	mg/l	
08255	Total Cyanide water		57-12-5	0.0050 U	0.0050	0.010	1
		SW-846 7196A		mg/l	mg/l	mg/l	
00276	Hexavalent Chromium		18540-29-9	0.0070 U	0.0070	0.020	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	L161872AA	07/05/2016 19:47	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 19:47	Matthew S rause	1
02395	CS Compound	SW-846 8270D	1	16178WAA026	06/28/2016 13:56	Joseph M Gambler	1
10461	SVOA 8270D water	SW-846 8270D	1	16178WAD026	07/09/2016 01:22	Catherine E Bachman	1
10475	BNA Water Extraction CS BZ	SW-846 3510C	1	16178WAA026	06/27/2016 21:00	aren L Beyer	1
11010	8270D BNA Extraction	SW-846 3510C	1	16178WAD026	06/28/2016 09:00	Andrea J ramer	1
13395	Nitroaromatics/Amines 8330B w	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	08/01/2016 01:15	James H Place	1
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	161800005A	06/28/2016 16:34	Richard A Shober	1
13432	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	06/28/2016 11:15	Edwin Ortiz	1
01743	Aluminum	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07044	Antimony	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07035	Arsenic	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07046	Barium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-1-6-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8442831
LL Group # 1675729
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/22/2016 12:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:05

D16C1 SDG#: DWD87-28FB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07047	Beryllium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07049	Cadmium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
01750	Calcium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07051	Chromium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07052	Cobalt	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07053	Copper	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
01754	Iron	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07055	Lead	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07058	Manganese	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07061	Nickel	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07036	Selenium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07066	Silver	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07071	Vanadium	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
07072	Zinc	SW-846 6010C	1	161790635001	06/28/2016 21:51	Suzanne M Will	1
06045	Thallium	SW-846 6020A	1	161790639001A	06/29/2016 00:02	Tara L Snyder	1
00259	Mercury	SW-846 7470A	1	161795713002	06/29/2016 09:19	Damary Valentin	1
10635	ICP-WW, 3005A tot rec - U4	SW-846 3005A	1	161790635001	06/28/2016 07:40	James L Mertz	1
10639	ICPMS - Water, 3020A - U4	SW-846 3020A	1	161790639001	06/28/2016 07:40	James L Mertz	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	161795713002	06/28/2016 09:50	JoElla L Rice	1
08255	Total Cyanide water	SW-846 9012B	1	16180117101A	06/28/2016 13:58	Dein Bernot	1
08256	Cyanide Water Distillation	SW-846 9012B	1	16180117101A	06/28/2016 09:30	Nancy J Shoop	1
00276	Hexavalent Chromium	SW-846 7196A	1	16176027601A	06/24/2016 11:50	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/kg		ug/kg	ug/kg
Batch number: A161792AA	Sample number s : 8442800,8442803,8442806,8442813,8442815,8442819,8442823,8442827			
4-Methyl-2-pentanone	3	U	3	10
Batch number: A161792AB	Sample number s : 8442814			
4-Methyl-2-pentanone	3	U	3	10
	ug/l		ug/l	ug/l
Batch number: L161872AA	Sample number s : 8442828-8442831			
4-Methyl-2-pentanone	3	U	3	10
	ug/kg		ug/kg	ug/kg
Batch number: 16184SLB026	Sample number s : 8442798,8442801,8442804,8442807-8442809,8442816,8442820,8442824			
2-Chlorobenzaldehyde	33	U	33	170
2-Chlorobenzalmalononitrile	170	U	170	500
Quinoline	33	U	33	170
	ug/l		ug/l	ug/l
Batch number: 16178WAA026	Sample number s : 8442829-8442831			
2-Chlorobenzalmalononitrile	5	U	5	15
Batch number: 16178WAD026	Sample number s : 8442829-8442831			
2-Chlorobenzaldehyde	1	U	1	5
Quinoline	1	U	1	5
	ug/kg		ug/kg	ug/kg
Batch number: 161880010A	Sample number s : 8442799,8442802,8442805,8442810-8442812,8442818,8442822,8442826			
4-Amino-2,6-Dinitrotoluene	41	U	41	120
2-Amino-4,6-Dinitrotoluene	41	U	41	120
1,3-Dinitrobenzene	40	U	40	120
2,4-Dinitrotoluene	40	U	40	120
2,6-Dinitrotoluene	110	U	110	120
HM	210	U	210	300
Nitrobenzene	100	U	100	300
Nitroglycerin	800	U	800	2,400
2-Nitrotoluene	75	U	75	120
3-Nitrotoluene	110	U	110	120
4-Nitrotoluene	110	U	110	120
PETN	800	U	800	2,400
RD	40	U	40	120
Tetryl	100	U	100	300
1,3,5-Trinitrobenzene	40	U	40	120
2,4,6-Trinitrotoluene	44	U	44	120
	ug/l		ug/l	ug/l
Batch number: 161780001A	Sample number s : 8442829-8442831			

*- Outside of specification
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P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

Method Blank continued

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
4-Amino-2,6-Dinitrotoluene	0.23	U	0.23	0.60
2-Amino-4,6-Dinitrotoluene	0.23	U	0.23	0.60
1,3-Dinitrobenzene	0.25	U	0.25	0.60
2,4-Dinitrotoluene	0.20	U	0.20	0.60
2,6-Dinitrotoluene	0.40	U	0.40	0.60
HM	0.20	U	0.20	0.60
Nitrobenzene	0.44	U	0.44	0.60
Nitroglycerin	3.0	U	3.0	10
2-Nitrotoluene	0.40	U	0.40	0.60
3-Nitrotoluene	0.32	U	0.32	0.60
4-Nitrotoluene	0.32	U	0.32	0.60
PETN	3.0	U	3.0	10
RD	0.40	U	0.40	0.60
Tetryl	0.44	U	0.44	0.60
1,3,5-Trinitrobenzene	0.22	U	0.22	0.60
2,4,6-Trinitrotoluene	0.40	U	0.40	0.60
	ug/kg		ug/kg	ug/kg
Batch number: 161880035A	Sample number s : 8442818,8442822,8442826			
Perchlorate in Soil LC/MS/MS	2.1	U	2.1	5.0
	ug/l		ug/l	ug/l
Batch number: 161800005A	Sample number s : 8442829-8442831			
Perchlorate in Water LC/MS/MS	0.20	U	0.20	1.0
	mg/kg		mg/kg	mg/kg
Batch number: 161820638002	Sample number s : 8442816,8442820,8442824			
Mercury	0.0100	U	0.0100	0.100
Batch number: 161870637004	Sample number s : 8442817,8442821,8442825			
Aluminum	8.68	U	8.68	40.0
Antimony	0.700	U	0.700	4.00
Arsenic	0.970	U	0.970	4.00
Barium	0.0330	U	0.0330	1.00
Beryllium	0.0670	U	0.0670	1.00
Cadmium	0.0490	U	0.0490	1.00
Calcium	5.66	U	5.66	40.0
Chromium	0.140	U	0.140	3.00
Cobalt	0.120	U	0.120	1.00
Copper	0.230	U	0.230	2.00
Iron	4.12	U	4.12	40.0
Lead	0.550	U	0.550	3.00
Magnesium	1.90	U	1.90	20.0
Manganese	0.0830	U	0.0830	1.00
Nickel	0.300	U	0.300	2.00
Potassium	23.9	U	23.9	100
Selenium	0.900	U	0.900	4.00
Silver	0.150	U	0.150	1.00
Sodium	23.9	U	23.9	200
Vanadium	0.140	U	0.140	1.00
Zinc	0.680	U	0.680	4.00

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

Method Blank continued

Analysis Name	Result	MDL**	LOQ
	mg/kg	mg/kg	mg/kg
Batch number: 161870637004A	Sample number s : 8442817,8442821,8442825		
Thallium	0.0290 U	0.0290	0.200
	mg/l	mg/l	mg/l
Batch number: 161790635001	Sample number s : 8442829-8442831		
Aluminum	0.0868 U	0.0868	0.400
Antimony	0.0077 U	0.0077	0.0400
Arsenic	0.0097 U	0.0097	0.0400
Barium	0.0011 U	0.0011	0.0100
Beryllium	0.00067 U	0.00067	0.0100
Cadmium	0.00049 U	0.00049	0.0100
Calcium	0.0732 J	0.0382	0.400
Chromium	0.0018 U	0.0018	0.0300
Cobalt	0.0019 U	0.0019	0.0100
Copper	0.0047 J	0.0041	0.0200
Iron	0.0747 U	0.0747	0.400
Lead	0.0062 U	0.0062	0.0300
Magnesium	0.0190 U	0.0190	0.200
Manganese	0.0018 U	0.0018	0.0100
Nickel	0.0028 U	0.0028	0.0200
Potassium	0.160 U	0.160	1.00
Selenium	0.0097 U	0.0097	0.0400
Silver	0.0019 U	0.0019	0.0100
Sodium	0.173 U	0.173	2.00
Vanadium	0.0016 U	0.0016	0.0100
Zinc	0.0054 U	0.0054	0.0400
Batch number: 161790639001A	Sample number s : 8442829-8442831		
Thallium	0.00016 U	0.00016	0.0010
Batch number: 161795713002	Sample number s : 8442829-8442831		
Mercury	0.000050 U	0.000050	0.00020
	mg/kg	mg/kg	mg/kg
Batch number: 16182102201A	Sample number s : 8442816,8442820,8442824		
Total Cyanide solid	0.18 U	0.18	0.50
	mg/l	mg/l	mg/l
Batch number: 16180117101A	Sample number s : 8442829-8442831		
Total Cyanide water	0.0050 U	0.0050	0.010
	mg/kg	mg/kg	mg/kg
Batch number: 16187042501A	Sample number s : 8442816,8442820,8442824		
Hexavalent Chromium SOLIDS	0.50 U	0.50	1.5
	mg/l	mg/l	mg/l
Batch number: 16176027601A	Sample number s : 8442829-8442831		
Hexavalent Chromium	0.0070 U	0.0070	0.020

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: A161792AA	Sample number s : 8442800,8442803,8442806,8442813,8442815,8442819,8442823,8442827								
4-Methyl-2-pentanone	100	114.38	100	109.22	114	109	50-120	5	30
Batch number: A161792AB	Sample number s : 8442814								
4-Methyl-2-pentanone	100	117.14	100	122.54	117	123	50-120	5	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: L161872AA	Sample number s : 8442828-8442831								
4-Methyl-2-pentanone	100	108.79	100	109.11	109	109	47-133	0	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16184SLB026	Sample number s : 8442798,8442801,8442804,8442807-8442809,8442816,8442820,8442824								
2-Chlorobenzaldehyde	1666.67	1604.21	1666.67	1564.48	96	94	58-114	3	30
2-Chlorobenzalmalononitrile	1666.67	930.97	1666.67	1219.56	56	73	70-130	27	30
Quinoline	1666.67	1629.01			98		80-119		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16178WAA026	Sample number s : 8442829-8442831								
2-Chlorobenzalmalononitrile	50	24.68	50	28.7	49	57	25-125	15	30
Batch number: 16178WAD026	Sample number s : 8442829-8442831								
2-Chlorobenzaldehyde	50	44.99	50	47.61	90	95	73-106	6	30
Quinoline	50	53.4	50	54.75	107	109	82-109	3	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880010A	Sample number s : 8442799,8442802,8442805,8442810-8442812,8442818,8442822,8442826								
4-Amino-2,6-Dinitrotoluene	1946	1773.03			91		42-138		
2-Amino-4,6-Dinitrotoluene	1946	1725.6			89		43-141		
1,3-Dinitrobenzene	1946	2142.37			110		54-140		
2,4-Dinitrotoluene	1946	1662.91			85		52-137		
2,6-Dinitrotoluene	1946	1965.65			101		51-138		
HM	1946	1812.3			93		29-148		
Nitrobenzene	1946	2041.48			105		64-138		
Nitroglycerin	9728	8207.15			84		45-137		
2-Nitrotoluene	1946	1862.91			96		57-135		
3-Nitrotoluene	1946	1728.83			89		57-135		
4-Nitrotoluene	1946	1638.71			84		53-133		
PETN	9728	8688.54			89		36-143		
RD	1946	1519.28			78		45-145		
Tetryl	1946	799.43			41		38-152		
1,3,5-Trinitrobenzene	1946	1652.05			85		48-141		
2,4,6-Trinitrotoluene	1946	1640.17			84		47-140		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161780001A	Sample number s : 8442829-8442831								
4-Amino-2,6-Dinitrotoluene	10	9.96	10	9.86	100	99	70-130	1	30
2-Amino-4,6-Dinitrotoluene	10	9.59	10	9.64	96	96	70-130	0	30
1,3-Dinitrobenzene	10	11.29	10	11.28	113	113	70-130	0	30
2,4-Dinitrotoluene	10	9.27	10	9.26	93	93	70-130	0	30
2,6-Dinitrotoluene	10	10.54	10	10.5	105	105	70-130	0	30

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Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 09/08/2016 19:05

Group Number: 1675729

LCS/LCSD continued

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
HM	10	8.96	10	9.21	90	92	70-130	3	30
Nitrobenzene	10	10.73	10	10.56	107	106	70-130	2	30
Nitroglycerin	111	88.86	111	89.46	80	81	70-130	1	30
2-Nitrotoluene	10	10.27	10	10.17	103	102	70-130	1	30
3-Nitrotoluene	10	9.49	10	9.43	95	94	70-130	1	30
4-Nitrotoluene	10	9.15	10	9.12	91	91	70-130	0	30
PETN	110	107.83	110	106.74	98	97	70-130	1	30
RD	10	9.68	10	9.80	97	98	70-130	1	30
Tetryl	10	4.35	10	7.09	44	71	70-130	48	30
1,3,5-Trinitrobenzene	10	8.25	10	9.62	82	96	70-130	15	30
2,4,6-Trinitrotoluene	10	9.22	10	9.20	92	92	70-130	0	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880035A	Sample number s : 8442818,8442822,8442826								
Perchlorate in Soil LC/MS/MS	100	84.75			85		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161800005A	Sample number s : 8442829-8442831								
Perchlorate in Water LC/MS/MS	5.00	4.35			87		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161820638002	Sample number s : 8442816,8442820,8442824								
Mercury	0.100	0.0943			94		80-120		
Batch number: 161870637004	Sample number s : 8442817,8442821,8442825								
Aluminum	200	183.05			92		80-120		
Antimony	50	46.28			93		80-120		
Arsenic	15	14.05			94		80-120		
Barium	200	187.96			94		80-120		
Beryllium	5.00	4.66			93		80-120		
Cadmium	5.00	4.63			93		80-120		
Calcium	400	380.52			95		80-120		
Chromium	20	18.61			93		80-120		
Cobalt	50	46.58			93		80-120		
Copper	25	24.92			100		80-120		
Iron	100	93.17			93		80-120		
Lead	15	13.64			91		80-120		
Magnesium	200	184.91			92		80-120		
Manganese	50	46.51			93		80-120		
Nickel	50	47.29			95		80-120		
Potassium	1000	953.7			95		80-120		
Selenium	15	13.72			91		80-120		
Silver	5.00	4.54			91		80-120		
Sodium	1000	959.55			96		80-120		
Vanadium	50	46.52			93		80-120		
Zinc	50	45.8			92		80-120		
Batch number: 161870637004A	Sample number s : 8442817,8442821,8442825								
Thallium	0.200	0.195			98		80-120		

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

LCS/LCSD continued

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	mg/l	mg/l	mg/l	mg/l					
Batch number: 161790635001	Sample number s : 8442829-8442831								
Aluminum	2.00	2.12			106		80-120		
Antimony	0.500	0.498			100		80-120		
Arsenic	0.150	0.156			104		80-120		
Barium	2.00	1.97			99		80-120		
Beryllium	0.0500	0.0507			101		80-120		
Cadmium	0.0500	0.0513			103		80-120		
Calcium	4.00	4.06			102		80-120		
Chromium	0.200	0.197			99		80-120		
Cobalt	0.500	0.514			103		80-120		
Copper	0.250	0.268			107		80-120		
Iron	1.00	0.977			98		80-120		
Lead	0.150	0.153			102		80-120		
Magnesium	2.00	1.99			99		80-120		
Manganese	0.500	0.509			102		80-120		
Nickel	0.500	0.524			105		80-120		
Potassium	10	9.88			99		80-120		
Selenium	0.150	0.143			96		80-120		
Silver	0.0500	0.0442			88		80-120		
Sodium	10	10.08			101		80-120		
Vanadium	0.500	0.507			101		80-120		
Zinc	0.500	0.503			101		80-120		
Batch number: 161790639001A	Sample number s : 8442829-8442831								
Thallium	0.00200	0.00200			100		80-120		
Batch number: 161795713002	Sample number s : 8442829-8442831								
Mercury	0.00100	0.000956			96		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16182102201A	Sample number s : 8442816,8442820,8442824								
Total Cyanide solid	10	10.31			103		90-110		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16180117101A	Sample number s : 8442829-8442831								
Total Cyanide water	0.200	0.194			97		90-110		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16187042501A	Sample number s : 8442816,8442820,8442824								
Hexavalent Chromium SOLIDS	5.00	4.29			86		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16176027601A	Sample number s : 8442829-8442831								
Hexavalent Chromium	0.200	0.200	0.200	0.193	100	97	90-110	4	4
	m	m	m	m					
Batch number: 16188182101B	Sample number s : 8442816,8442820,8442824								
Oxidation Reduction Potential	427	428.5			100		98-102		

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

LCS/LCSD continued

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	Std. Units	Std. Units	Std. Units	Std. Units					
Batch number: 16188039401B	Sample number s : 8442816,8442820,8442824								
pH	7.00	7.01			100		95-105		
	%	%	%	%					
Batch number: 16231820011A	Sample number s : 8442807-8442827								
Moisture	89.5	89.47			100		99-101		
Moisture	89.5	89.47			100		99-101		
Moisture Duplicate	89.5	89.47			100		99-101		
Batch number: 16231820012B	Sample number s : 8442798-8442806								
Moisture	89.5	89.47			100		99-101		
Moisture	89.5	89.47			100		99-101		

MS/MSD

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: A161792AA	Sample number s : 8442800,8442803,8442806,8442813,8442815,8442819,8442823,8442827 UNSP : P442813									
4-Methyl-2-pentanone	4 U	255.1	243.91	179.86	188.93	96	105	50-120	25	30
Batch number: A161792AB	Sample number s : 8442814 UNSP : P442813									
4-Methyl-2-pentanone	4 U	255.1	243.91	179.86	188.93	96	105	50-120	25	30
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16184SLB026	Sample number s : 8442798,8442801,8442804,8442807-8442809,8442816,8442820,8442824 UNSP : 8442807									
Quinoline	170 U	1655.63	1147.01	1655.63	1228.01	69	74	80-119	7	30
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880010A	Sample number s : 8442799,8442802,8442805,8442810-8442812,8442818,8442822,8442826 UNSP : 8442810									
4-Amino-2,6-Dinitrotoluene	41 U	1990	1825.88	1940	1776.61	92	92	42-138	3	50
2-Amino-4,6-Dinitrotoluene	41 U	1990	1816.52	1940	1762	91	91	43-141	3	50
1,3-Dinitrobenzene	40 U	1990	2310.82	1940	2238.39	116	115	54-140	3	50
2,4-Dinitrotoluene	40 U	1990	1719.27	1940	1684.56	86	87	52-137	2	50
2,6-Dinitrotoluene	110 U	1990	1955.93	1940	1914.03	98	99	51-138	2	50
HM	210 U	1990	1726.71	1940	1772.97	87	91	29-148	3	50
Nitrobenzene	100 U	1990	2101.84	1950	2085.63	106	107	64-138	1	50
Nitroglycerin	800 U	21900	16410.88	21400	15461.85	75	72	45-137	6	50
2-Nitrotoluene	75 U	1990	1834.79	1940	1819.16	92	94	57-135	1	50
3-Nitrotoluene	110 U	1990	1897.54	1940	1861.64	95	96	57-135	2	50
4-Nitrotoluene	110 U	1990	1687.96	1940	1686.51	85	87	53-133	0	50

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

MS/MSD continued

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
PETN	800 U	21900	19753.51	21400	17916.25	90	84	36-143	10	50
RD	40 U	1990	1934.56	1940	1885.88	97	97	45-145	3	50
Tetryl	100 U	1990	1735.03	1940	1717.73	87	89	38-152	1	50
1,3,5-Trinitrobenzene	40 U	1980	307.46	1940	331.64	16	17	48-141	8	50
2,4,6-Trinitrotoluene	44 U	1990	1859.23	1940	1814.15	93	94	47-140	2	50
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880035A	Sample number s : 8442818,8442822,8442826 UNSP : P444082									
Perchlorate in Soil LC/MS/MS	2.1 U	100	113.32	100	100.41	113	100	70-130	12	15
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 161800005A	Sample number s : 8442829-8442831 UNSP : P437254									
Perchlorate in Water LC/MS/MS	5.77	5.00	10.68	5.00	9.48	98	74	80-120	12	15
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161820638002	Sample number s : 8442816,8442820,8442824 UNSP : P444071									
Mercury	0.0416	0.167	0.202	0.156	0.191	96	95	80-120	6	20
Batch number: 161870637004	Sample number s : 8442817,8442821,8442825 UNSP : P438360									
Aluminum	2980.19	185.19	4377.03	152.67	4494.66	754 2	992 2	75-125	3	20
Antimony	0.526 U	46.3	37.98	38.17	31.65	82	83	75-125	18	20
Arsenic	0.729 U	13.89	12.09	11.45	10.3	87	90	75-125	16	20
Barium	9.04	185.19	180.46	152.67	153.38	93	95	75-125	16	20
Beryllium	0.0820	4.63	4.32	3.82	3.64	92	93	75-125	17	20
Cadmium	0.142	4.63	4.38	3.82	3.75	92	95	75-125	15	20
Calcium	745.52	370.37	2213.76	305.34	2755.13	396	658	75-125	22	20
Chromium	4.30	18.52	23.87	15.27	18.39	106	92	75-125	26	20
Cobalt	0.280	46.3	42.08	38.17	35.14	90	91	75-125	18	20
Copper	5.18	23.15	33.06	19.08	26.25	120	110	75-125	23	20
Iron	2268.81	92.59	3033.51	76.34	2226.32	826 2	-56 2	75-125	31	20
Lead	8.23	13.89	21.4	11.45	18.44	95	89	75-125	15	20
Magnesium	216.57	185.19	520.91	152.67	538.2	164	211	75-125	3	20
Manganese	49.24	46.3	115.76	38.17	106.43	144	150	75-125	8	20
Nickel	1.57	46.3	44.5	38.17	36.97	93	93	75-125	18	20
Potassium	84.25	925.93	1041.49	763.36	922.57	103	110	75-125	12	20
Selenium	0.677 U	13.89	12.19	11.45	9.58	88	84	75-125	24	20
Silver	0.113 U	4.63	4.06	3.82	3.40	88	89	75-125	18	20
Sodium	18.0 U	925.93	897.34	763.36	769.25	97	101	75-125	15	20
Vanadium	3.30	46.3	45.58	38.17	39.06	91	94	75-125	15	20
Zinc	40.58	46.3	104	38.17	79.64	137	102	75-125	27	20
Batch number: 161870637004A	Sample number s : 8442817,8442821,8442825 UNSP : P438360									
Thallium	0.0218 U	0.370	0.425	0.305	0.387	115	127	75-125	9	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 161790635001	Sample number s : 8442829-8442831 UNSP : P444144									
Aluminum	0.0872	2.00	2.02	2.00	1.99	96	95	75-125	1	20
Antimony	0.0077 U	0.500	0.501	0.500	0.512	100	102	75-125	2	20

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

MS/MSD continued

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Arsenic	0.0131	0.150	0.164	0.150	0.167	100	102	75-125	2	20
Barium	0.286	2.00	2.24	2.00	2.26	98	99	75-125	1	20
Beryllium	0.00067 U	0.0500	0.0496	0.0500	0.0502	99	100	75-125	1	20
Cadmium	0.00049 U	0.0500	0.0493	0.0500	0.0499	99	100	75-125	1	20
Calcium	110.06	4.00	110.18	4.00	114.1 3 2		101 2	75-125	3	20
Chromium	0.0018 U	0.200	0.195	0.200	0.197	98	98	75-125	1	20
Cobalt	0.0019 U	0.500	0.488	0.500	0.493	98	99	75-125	1	20
Copper	0.0041 U	0.250	0.266	0.250	0.269	106	107	75-125	1	20
Iron	1.92	1.00	2.78	1.00	2.85	86	93	75-125	2	20
Lead	0.0062 U	0.150	0.153	0.150	0.156	102	104	75-125	2	20
Magnesium	40.52	2.00	40.98	2.00	42.56	23 2	102 2	75-125	4	20
Manganese	0.0946	0.500	0.586	0.500	0.591	98	99	75-125	1	20
Nickel	0.00287	0.500	0.495	0.500	0.501	98	100	75-125	1	20
Potassium	1.79	10	11.55	10	11.68	98	99	75-125	1	20
Selenium	0.0097 U	0.150	0.147	0.150	0.145	98	96	75-125	1	20
Silver	0.0019 U	0.0500	0.0441	0.0500	0.0451	88	90	75-125	2	20
Sodium	21.77	10	30.8	10	31.72	90	100	75-125	3	20
Vanadium	0.0016 U	0.500	0.501	0.500	0.504	100	101	75-125	1	20
Zinc	0.0054 U	0.500	0.489	0.500	0.497	98	99	75-125	2	20
Batch number: 161790639001A	Sample number s : 8442829-8442831 UNSP : P441460									
Thallium	0.00016 U	0.00200	0.00204	0.00200	0.00198	102	99	75-125	3	20
Batch number: 161795713002	Sample number s : 8442829-8442831 UNSP : P444555									
Mercury	0.000127	0.00100	0.000831	0.00100	0.000830	70	70	80-120	0	20
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16182102201A	Sample number s : 8442816,8442820,8442824 UNSP : P436970									
Total Cyanide solid	0.18 U	4.90	5.36			109		41-145		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16180117101A	Sample number s : 8442829-8442831 UNSP : P445371									
Total Cyanide water	0.0050 U	0.200	0.199			100		72-114		
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16187042501A	Sample number s : 8442816,8442820,8442824 UNSP : P438336									
Hexavalent Chromium SOLIDS	10.0 U	40.7	10.0 U			0		75-125		

Laboratory Duplicate

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

Laboratory Duplicate

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/kg	mg/kg		
Batch number: 161820638002	Sample number s : 8442816,8442820,8442824 B G: P444071			
Mercury	0.0416	0.0377	10 1	20
Batch number: 161870637004	Sample number s : 8442817,8442821,8442825 B G: P438360			
Aluminum	2980.19	3101.3	4	20
Antimony	0.526 U	2.19	200 1	20
Arsenic	0.729 U	0.915 U	0 1	20
Barium	9.04	11.29	22	20
Beryllium	0.0820	0.0811	1 1	20
Cadmium	0.142	0.121	16 1	20
Calcium	745.52	875.04	16	20
Chromium	4.30	4.85	12 1	20
Cobalt	0.280	0.342	20 1	20
Copper	5.18	7.23	33 1	20
Iron	2268.81	2878.33	24	20
Lead	8.23	9.73	17 1	20
Magnesium	216.57	232.59	7	20
Manganese	49.24	54.54	10	20
Nickel	1.57	2.07	27 1	20
Potassium	84.25	87.2	3 1	20
Selenium	0.677 U	0.849 U	0 1	20
Silver	0.113 U	0.142 U	0 1	20
Sodium	18.0 U	22.5 U	0 1	20
Vanadium	3.30	3.49	6 1	20
Zinc	40.58	50.93	23	20
Batch number: 161870637004A	Sample number s : 8442817,8442821,8442825 B G: P438360			
Thallium	0.0218 U	0.0274 U	0 1	20
	mg/l	mg/l		
Batch number: 161790635001	Sample number s : 8442829-8442831 B G: P444144			
Aluminum	0.0872	0.0868 U	200 1	20
Antimony	0.0077 U	0.0077 U	0 1	20
Arsenic	0.0131	0.0136	4 1	20
Barium	0.286	0.283	1	20
Beryllium	0.00067 U	0.00067 U	0 1	20
Cadmium	0.00049 U	0.00049 U	0 1	20
Calcium	110.06	107.26	3	20
Chromium	0.0018 U	0.00182	200 1	20
Cobalt	0.0019 U	0.0019 U	0 1	20
Copper	0.0041 U	0.0041 U	0 1	20
Iron	1.92	1.86	3 1	20
Lead	0.0062 U	0.0062 U	0 1	20
Magnesium	40.52	39.58	2	20
Manganese	0.0946	0.0928	2	20
Nickel	0.00287	0.0028 U	200 1	20
Potassium	1.79	1.73	3 1	20
Selenium	0.0097 U	0.0097 U	0 1	20
Silver	0.0019 U	0.0019 U	0 1	20
Sodium	21.77	21.21	3	20

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

Laboratory Duplicate continued

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Vanadium	0.0016 U	0.0016 U	0 1	20
Zinc	0.0054 U	0.0054 U	0 1	20
Batch number: 161790639001A	Sample number s : 8442829-8442831 B G: P441460			
Thallium	0.00016 U	0.00016 U	0 1	20
Batch number: 161795713002	Sample number s : 8442829-8442831 B G: P444555			
Mercury	0.000127	0.000130	2 1	20
	mg/kg	mg/kg		
Batch number: 16182102201A	Sample number s : 8442816,8442820,8442824 B G: P436970			
Total Cyanide solid	0.18 U	2.58	200 1	20
	mg/l	mg/l		
Batch number: 16180117101A	Sample number s : 8442829-8442831 B G: P445371			
Total Cyanide water	0.0050 U	0.0050 U	0 1	20
	mg/kg	mg/kg		
Batch number: 16187042501A	Sample number s : 8442816,8442820,8442824 B G: P438336			
Hexavalent Chromium SOLIDS	10.0 U	10.0 U	0 1	20
	m	m		
Batch number: 16188182101B	Sample number s : 8442816,8442820,8442824 B G: P438353			
Oxidation Reduction Potential	420.5	464.5	10	5
	Std. Units	Std. Units		
Batch number: 16188039401B	Sample number s : 8442816,8442820,8442824 B G: P438353			
pH	6.03	6.12	1	3
	%	%		
Batch number: 16231820011A	Sample number s : 8442807-8442827 B G: 8442807, P442807			
Moisture	0.672	0.680	1 1	5
Moisture	0.672	0.680	1 1	5
Moisture Duplicate	0.672	0.680	1 1	5
Batch number: 16231820012B	Sample number s : 8442798-8442806 B G: P438353			
Moisture	3.23	2.15	40 1	5
Moisture	3.23	2.15	40 1	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 4-Methyl-2-pentanone 8260C
Batch number: A161792AA

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Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 09/08/2016 19:05

Group Number: 1675729

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8442800	103	102	110	85
8442803	102	100	111	87
8442806	104	102	111	84
8442813	102	105	108	92
8442815	102	101	107	93
8442819	104	103	115	83
8442823	104	101	126	70
8442827	106	105	122	75
Blank	102	100	101	96
LCS	103	102	100	101
LCSD	102	102	100	101
MSD	102	101	107	93
MSRE	101	99	105	92
Limits:	50-141	54-135	52-141	50-131

Analysis Name: 4-Methyl-2-pentanone 8260C
Batch number: A161792AB

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8442814RE	101	99	105	92
Blank	102	101	101	96
LCS	102	104	101	100
LCSD	102	103	102	101
MSD	102	101	107	93
MSRE	101	99	105	92
Limits:	50-141	54-135	52-141	50-131

Analysis Name: 4-Methyl-2-pentanone 8260C
Batch number: L161872AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8442828	101	100	96	99
8442829	103	102	95	98
8442830	104	103	95	99
8442831	106	102	95	98
Blank	102	102	95	98
LCS	101	100	97	102
LCSD	102	102	97	101
Limits:	80-116	77-113	80-113	78-113

Analysis Name: CS Compound
Batch number: 16178WAA026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8442829	67	65	80
8442830	64	65	75
8442831	65	62	91
Blank	64	62	96
LCS	58	53	72

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Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 09/08/2016 19:05

Group Number: 1675729

Surrogate Quality Control continued

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
LCSD	68	67	94
Limits:	70-130	70-130	70-130

Analysis Name: SVOA 8270D water
Batch number: 16178WAD026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8442829	104	100	102
8442830	99	97	94
8442831	92	89	92
Blank	103	99	105
LCS	105	97	102
LCSD	107	100	105
Limits:	46-128	61-112	41-125

Analysis Name: SVOA 8270D microwave
Batch number: 16184SLB026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8442798	86	92	103	81	87	90
8442801	79	82	98	81	87	88
8442804	88	95	107	91	100	103
8442807	90	97	111	87	95	98
8442808	91	96	116	91	95	98
8442809	89	94	111	89	93	98
8442816	68	71	81	65	70	74
8442820	81	86	97	81	83	87
8442824	65	69	80	65	68	72
Blank	89	97	118	91	95	100
LCS	96	102	112	90	90	95
LCSD	88	96	117	89	95	99
MS	91	96	116	91	95	98
MSD	89	94	111	89	93	98
Limits:	58-122	57-126	35-136	54-123	63-117	59-129

Analysis Name: Nitroaromatics/Amines 8330B w
Batch number: 161780001A

	3,4-Dinitrotoluene
8442829	112
8442830	117
8442831	110
Blank	109
LCS	107
LCSD	109
Limits:	85-115

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675729
Reported: 09/08/2016 19:05

Surrogate Quality Control continued

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Nitroaromatics/Amines 8330B s
Batch number: 161880010A

	3,4-Dinitrotoluene
8442799	117
8442802	114
8442805	119
8442810	123
8442811	128
8442812	119
8442818	119
8442822	115
8442826	126
Blank	113
LCS	118
MS	128
MSD	119
Limits:	62-133

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Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only Apw 6/24/16

Acct. # 11372 Group # 1675729 Sample # 8442898 - 31

COC # 501334

Client Information		Matrix	Analysis Requested	For Lab Use Only
Client: CH2M HILL	Acct. #:		Preservation Codes	FSC:
Project Name/#: DOW WOODBINE	PWSID #:			SCR#:
Project Manager: MARK Sherrill	P.O. #:			
Sampler: J. Crostic, A. Shwartz	Quote #:			
State where samples were collected: Georgia	For Compliance: Yes ☐ No ☐			

Matrix: Soil/Sediment ☒, Tissue ☐, Water (Potable ☐, Ground ☐, Surface ☐, NPDES ☐), Other: ____

Preservation Codes: H=HCl, T=Thiosulfate, N=HNO_3, B=NaOH, S=H_2SO_4, O=Other

Remarks: Dioxins to be repackaged to Vista Labs

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	VOC	SVOC	Hex Chromium	Cyanide	Mercury/Metals	Perchlorate	Explosives	Moisture	pH/Cond	Dioxins/Furans	Remarks
RTPA-1	6-22-16	0816		X	6	X	X					X	X		X	
RTPA-2		0901		X	6	X	X					X	X		X	
RTPA-3		0851		X	6	X	X					X	X		X	
RTPA-4		0837		X	18	X	X					X	X		X	MS/MSD
DU-1-16-A		1100		X	6	X	X	X	X	X	X	X	X	X	X	no dioxins
DU-1-16-B		1345		X	6	X	X	X	X	X	X	X	X	X	X	no dioxins
DU-1-16-C		1530		X	6	X	X	X	X	X	X	X	X	X	X	no dioxins

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
J. Crostic	6-22-16	1800			
				Date: 6-24-16	Time: 930

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt 5.7-5.8 °C

Environmental Analysis Request/Chain of Custody

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Acct. # 11372 Group # 1675729 Sample # 8442798-31

COC # 501331

Client Information		Matrix	Analysis Requested	For Lab Use Only
Client: CH2MHILL	Acct. #:	Soil ☐ Sediment ☐ Tissue ☐ / Water ☐ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ / Other: QC	Preservation Codes: H / BO / N	FSC:
Project Name/#: Dow Wamsine	PWSID #:			SCR#:
Project Manager: Mark Sherrill	P.O. #:			
Sampler: J. Crosbie, A. Shwartz	Quote #:			
State where samples were collected: Georgia	For Compliance: Yes ☐ No ☐			

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	VOCs	Cyanide	Mercury/Metals	CS Compounds	Hex Chromium	SVOCs	Explosives	Perchlorate	Dioxins/Furans
TB-2	6-22-16	0800	X		2	X								
RTPA-EB		0900	X		14	X	X	X	X	X	X	X	X	X
RTPA-FB		0930	X		12	X	X	X	X	X	X	X	X	X
DU-1-6-FB		1200	X		12	X	X	X	X	X	X	X	X	

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks
Dioxins to be repackaged to Vista LAB

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
J. Crosbie	6-22-16	1800			
			[signature]	6-24-16	930

EDD Required? Yes No
If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt 5.7-5.8 °C

Client: CH2M HILL

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	06/24/2016 9:30
Number of Packages:	3	Number of Projects:	2
State/Province of Origin:	GA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	No		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	Yes		

Unpacked by Joseph Huber (7831) at 10:46 on 06/24/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	5.7	DT	Wet	Y	Bagged	N
2	DT121	5.6	DT	Wet	Y	Bagged	N
3	DT121	5.8	DT	Wet	Y	Bagged	N

Samples Not Intact Details

Sample ID on Label	Bottle Code	Bottle Quantity	Container Salvageable?	Comments
DU-1-6-C	6	1	Y	Lid cracked

Container Quantity Discrepancy Details

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
RTPA-1	5	6	
RTPA-2	5	6	
RTPA-3	5	6	
RTPA-4	15	18	MS/MSD

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Lancaster, PA 17605-2425
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F | 717-656-2681
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Sample Administration Receipt Documentation Log

Doc Log ID: 151531

Group Number(s): 1675729

Client: CH2M HILL

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	06/24/2016 9:30
Number of Packages:	3	Number of Projects:	2
State/Province of Origin:	GA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Joseph Huber (7831) at 10:46 on 06/24/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	5.7	DT	Wet	Y	Bagged	N
2	DT121	5.6	DT	Wet	Y	Bagged	N
3	DT121	5.8	DT	Wet	Y	Bagged	N

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Analysis Report

REVISED

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Report Date: September 01, 2016

Project: Woodbine Phase III MEC RFI

Submittal Date: 06/24/2016
Group Number: 1677901
SDG: DWD87
PO Number: 10381-7-113967
Release Number: DWD91
State of Sample Origin: GA

Client Sample Description	Lancaster Labs (LL) #
Metals Blank Grab Sand	8455242
Explosives/Perchlorate Blank Grab Sand	8455243

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	CH2M Hill, Inc.	Attn: Mark Sherrill
Electronic Copy To	CH2M Hill, Inc.	Attn: Chemistry Mailbox
Electronic Copy To	CH2M Hill, Inc.	Attn: Mark Stinnett

Respectfully Submitted,

Natalie R. Luciano
Senior Specialist

(717) 556-7258

REVISED

Sample Description: Metals Blank Grab Sand
Woodbine Phase III MEC RFI

LL Sample # SW 8455242
LL Group # 1677901
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/01/2016 08:19

D87B1 SDG#: DWD87-29BL

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	7.96	U	7.96	36.7	1
06944	Antimony	7440-36-0	0.642	U	0.642	3.67	1
06935	Arsenic	7440-38-2	0.890	U	0.890	3.67	1
06946	Barium	7440-39-3	0.0303	U	0.0303	0.917	1
06947	Beryllium	7440-41-7	0.0615	U	0.0615	0.917	1
06949	Cadmium	7440-43-9	0.0450	U	0.0450	0.917	1
01650	Calcium	7440-70-2	5.19	U	5.19	36.7	1
06951	Chromium	7440-47-3	0.128	U	0.128	2.75	1
06952	Cobalt	7440-48-4	0.110	U	0.110	0.917	1
06953	Copper	7440-50-8	0.211	U	0.211	1.83	1
01654	Iron	7439-89-6	3.78	U	3.78	36.7	1
06955	Lead	7439-92-1	0.505	U	0.505	2.75	1
01657	Magnesium	7439-95-4	1.74	U	1.74	18.3	1
06958	Manganese	7439-96-5	0.0761	U	0.0761	0.917	1
06961	Nickel	7440-02-0	0.275	U	0.275	1.83	1
01662	Potassium	7440-09-7	21.9	U	21.9	91.7	1
06936	Selenium	7782-49-2	0.826	U	0.826	3.67	1
06966	Silver	7440-22-4	0.138	U	0.138	0.917	1
01667	Sodium	7440-23-5	21.9	U	21.9	183	1
06971	Vanadium	7440-62-2	0.128	U	0.128	0.917	1
06972	Zinc	7440-66-6	0.624	U	0.624	3.67	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0266	U	0.0266	0.183	2

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was collected following the protocol specified by each method listed in the Laboratory Sample Analysis Record.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06944	Antimony	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06935	Arsenic	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06946	Barium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06947	Beryllium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1

*=This limit was used in the evaluation of the final result

REVISED

Sample Description: Metals Blank Grab Sand
Woodbine Phase III MEC RFI

LL Sample # SW 8455242
LL Group # 1677901
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/01/2016 08:19

D87B1 SDG#: DWD87-29BL

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
01650	Calcium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06951	Chromium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06952	Cobalt	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06953	Copper	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
01654	Iron	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06955	Lead	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
01657	Magnesium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06958	Manganese	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06961	Nickel	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
01662	Potassium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06936	Selenium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06966	Silver	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
01667	Sodium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06971	Vanadium	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06972	Zinc	SW-846 6010C	1	161870637004	07/07/2016 23:28	Elaine F Stoltzfus	1
06145	Thallium	SW-846 6020A	1	161870637004A	07/08/2016 00:55	Tara L Snyder	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161870637004	07/06/2016 08:45	James L Mertz	1

*=This limit was used in the evaluation of the final result

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Analysis Report

REVISED

Sample Description: Explosives/Perchlorate Blank Grab Sand
Woodbine Phase III MEC RFI

LL Sample # SW 8455243
LL Group # 1677901
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/01/2016 08:19

D87B2 SDG#: DWD87-30BL

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	40	U	40	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	40	U	40	120	1
13413	1,3-Dinitrobenzene	99-65-0	39	U	39	120	1
13413	2,4-Dinitrotoluene	121-14-2	39	U	39	120	1
13413	2,6-Dinitrotoluene	606-20-2	110	U	110	120	1
13413	HM	2691-41-0	210	U	210	290	1
13413	Nitrobenzene	98-95-3	98	U	98	290	1
13413	Nitroglycerin	55-63-0	790	U	790	2,400	1
13413	2-Nitrotoluene	88-72-2	74	U	74	120	1
13413	3-Nitrotoluene	99-08-1	110	U	110	120	1
13413	4-Nitrotoluene	99-99-0	110	U	110	120	1
13413	PETN	78-11-5	810	U	810	2,400	1
13413	RD	121-82-4	39	U	39	120	1
13413	Tetryl	479-45-8	98	U	98	290	1
13413	1,3,5-Trinitrobenzene	99-35-4	39	U	39	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	43	U	43	120	1
	Reporting limits were raised due to interference from the sample matrix.						
Perchlorate	SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.1	U	2.1	5.0	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was collected following the protocol specified by each method listed in the Laboratory Sample Analysis Record.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	08/03/2016 14:02	James H Place	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880033A	07/07/2016 23:33	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880033A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880010A	07/06/2016 21:00	David V Hershey Jr	1

*=This limit was used in the evaluation of the final result

REVISED

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1677901
Reported: 09/01/2016 08:19

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/kg		ug/kg	ug/kg
Batch number: 161880010A	Sample number s : 8455243			
4-Amino-2,6-Dinitrotoluene	41	U	41	120
2-Amino-4,6-Dinitrotoluene	41	U	41	120
1,3-Dinitrobenzene	40	U	40	120
2,4-Dinitrotoluene	40	U	40	120
2,6-Dinitrotoluene	110	U	110	120
HM	210	U	210	300
Nitrobenzene	100	U	100	300
Nitroglycerin	800	U	800	2,400
2-Nitrotoluene	75	U	75	120
3-Nitrotoluene	110	U	110	120
4-Nitrotoluene	110	U	110	120
PETN	800	U	800	2,400
RD	40	U	40	120
Tetryl	100	U	100	300
1,3,5-Trinitrobenzene	40	U	40	120
2,4,6-Trinitrotoluene	44	U	44	120
Batch number: 161880033A	Sample number s : 8455243			
Perchlorate in Soil LC/MS/MS	2.1	U	2.1	5.0
	mg/kg		mg/kg	mg/kg
Batch number: 161870637004	Sample number s : 8455242			
Aluminum	8.68	U	8.68	40.0
Antimony	0.700	U	0.700	4.00
Arsenic	0.970	U	0.970	4.00
Barium	0.0330	U	0.0330	1.00
Beryllium	0.0670	U	0.0670	1.00
Cadmium	0.0490	U	0.0490	1.00
Calcium	5.66	U	5.66	40.0
Chromium	0.140	U	0.140	3.00
Cobalt	0.120	U	0.120	1.00
Copper	0.230	U	0.230	2.00
Iron	4.12	U	4.12	40.0
Lead	0.550	U	0.550	3.00
Magnesium	1.90	U	1.90	20.0
Manganese	0.0830	U	0.0830	1.00
Nickel	0.300	U	0.300	2.00
Potassium	23.9	U	23.9	100
Selenium	0.900	U	0.900	4.00
Silver	0.150	U	0.150	1.00
Sodium	23.9	U	23.9	200
Vanadium	0.140	U	0.140	1.00
Zinc	0.680	U	0.680	4.00

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

REVISED

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 09/01/2016 08:19

Group Number: 1677901

Method Blank continued

Analysis Name	Result	MDL**	LOQ
	mg/kg	mg/kg	mg/kg
Batch number: 161870637004A	Sample number s : 8455242		
Thallium	0.0290 U	0.0290	0.200

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880010A	Sample number s : 8455243								
4-Amino-2,6-Dinitrotoluene	1946	1773.03			91		42-138		
2-Amino-4,6-Dinitrotoluene	1946	1725.6			89		43-141		
1,3-Dinitrobenzene	1946	2142.37			110		54-140		
2,4-Dinitrotoluene	1946	1662.91			85		52-137		
2,6-Dinitrotoluene	1946	1965.65			101		51-138		
HM	1946	1812.3			93		29-148		
Nitrobenzene	1946	2041.48			105		64-138		
Nitroglycerin	9728	8207.15			84		45-137		
2-Nitrotoluene	1946	1862.91			96		57-135		
3-Nitrotoluene	1946	1728.83			89		57-135		
4-Nitrotoluene	1946	1638.71			84		53-133		
PETN	9728	8688.54			89		36-143		
RD	1946	1519.28			78		45-145		
Tetryl	1946	799.43			41		38-152		
1,3,5-Trinitrobenzene	1946	1652.05			85		48-141		
2,4,6-Trinitrotoluene	1946	1640.17			84		47-140		
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880033A	Sample number s : 8455243								
Perchlorate in Soil LC/MS/MS	100	89.98			90		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161870637004	Sample number s : 8455242								
Aluminum	200	183.05			92		80-120		
Antimony	50	46.28			93		80-120		
Arsenic	15	14.05			94		80-120		
Barium	200	187.96			94		80-120		
Beryllium	5.00	4.66			93		80-120		
Cadmium	5.00	4.63			93		80-120		
Calcium	400	380.52			95		80-120		
Chromium	20	18.61			93		80-120		
Cobalt	50	46.58			93		80-120		
Copper	25	24.92			100		80-120		
Iron	100	93.17			93		80-120		
Lead	15	13.64			91		80-120		
Magnesium	200	184.91			92		80-120		
Manganese	50	46.51			93		80-120		
Nickel	50	47.29			95		80-120		

*- Outside of specification
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P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

REVISED

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1677901
Reported: 09/01/2016 08:19

LCS/LCSD continued

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Potassium	1000	953.7			95		80-120		
Selenium	15	13.72			91		80-120		
Silver	5.00	4.54			91		80-120		
Sodium	1000	959.55			96		80-120		
Vanadium	50	46.52			93		80-120		
Zinc	50	45.8			92		80-120		
Batch number: 161870637004A	Sample number s : 8455242								
Thallium	0.200	0.195			98		80-120		

MS/MSD

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 161880010A	Sample number s : 8455243 UNSP : P442810									
4-Amino-2,6-Dinitrotoluene	41 U	1990	1825.88	1940	1776.61	92	92	42-138	3	50
2-Amino-4,6-Dinitrotoluene	41 U	1990	1816.52	1940	1762	91	91	43-141	3	50
1,3-Dinitrobenzene	40 U	1990	2310.82	1940	2238.39	116	115	54-140	3	50
2,4-Dinitrotoluene	40 U	1990	1719.27	1940	1684.56	86	87	52-137	2	50
2,6-Dinitrotoluene	110 U	1990	1955.93	1940	1914.03	98	99	51-138	2	50
HM	210 U	1990	1726.71	1940	1772.97	87	91	29-148	3	50
Nitrobenzene	100 U	1990	2101.84	1950	2085.63	106	107	64-138	1	50
Nitroglycerin	800 U	21900	16410.88	21400	15461.85	75	72	45-137	6	50
2-Nitrotoluene	75 U	1990	1834.79	1940	1819.16	92	94	57-135	1	50
3-Nitrotoluene	110 U	1990	1897.54	1940	1861.64	95	96	57-135	2	50
4-Nitrotoluene	110 U	1990	1687.96	1940	1686.51	85	87	53-133	0	50
PETN	800 U	21900	19753.51	21400	17916.25	90	84	36-143	10	50
RD	40 U	1990	1934.56	1940	1885.88	97	97	45-145	3	50
Tetryl	100 U	1990	1735.03	1940	1717.73	87	89	38-152	1	50
1,3,5-Trinitrobenzene	40 U	1980	307.46	1940	331.64	16	17	48-141	8	50
2,4,6-Trinitrotoluene	44 U	1990	1859.23	1940	1814.15	93	94	47-140	2	50
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880033A	Sample number s : 8455243 UNSP : P438347									
Perchlorate in Soil LC/MS/MS	2.1 U	100	108.04	100	103.4	108	103	70-130	4	15
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161870637004	Sample number s : 8455242 UNSP : P438360									
Aluminum	2980.19	185.19	4377.03	152.67	4494.66	754 2	992 2	75-125	3	20
Antimony	0.526 U	46.3	37.98	38.17	31.65	82	83	75-125	18	20
Arsenic	0.729 U	13.89	12.09	11.45	10.3	87	90	75-125	16	20
Barium	9.04	185.19	180.46	152.67	153.38	93	95	75-125	16	20
Beryllium	0.0820	4.63	4.32	3.82	3.64	92	93	75-125	17	20

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1677901
Reported: 09/01/2016 08:19

MS/MSD continued

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Cadmium	0.142	4.63	4.38	3.82	3.75	92	95	75-125	15	20
Calcium	745.52	370.37	2213.76	305.34	2755.13	396	658	75-125	22	20
Chromium	4.30	18.52	23.87	15.27	18.39	106	92	75-125	26	20
Cobalt	0.280	46.3	42.08	38.17	35.14	90	91	75-125	18	20
Copper	5.18	23.15	33.06	19.08	26.25	120	110	75-125	23	20
Iron	2268.81	92.59	3033.51	76.34	2226.32	826 2	-56 2	75-125	31	20
Lead	8.23	13.89	21.4	11.45	18.44	95	89	75-125	15	20
Magnesium	216.57	185.19	520.91	152.67	538.2	164	211	75-125	3	20
Manganese	49.24	46.3	115.76	38.17	106.43	144	150	75-125	8	20
Nickel	1.57	46.3	44.5	38.17	36.97	93	93	75-125	18	20
Potassium	84.25	925.93	1041.49	763.36	922.57	103	110	75-125	12	20
Selenium	0.677 U	13.89	12.19	11.45	9.58	88	84	75-125	24	20
Silver	0.113 U	4.63	4.06	3.82	3.40	88	89	75-125	18	20
Sodium	18.0 U	925.93	897.34	763.36	769.25	97	101	75-125	15	20
Vanadium	3.30	46.3	45.58	38.17	39.06	91	94	75-125	15	20
Zinc	40.58	46.3	104	38.17	79.64	137	102	75-125	27	20
Batch number: 161870637004A	Sample number s : 8455242 UNSP : P438360									
Thallium	0.0218 U	0.370	0.425	0.305	0.387	115	127	75-125	9	20

Laboratory Duplicate

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161870637004	Sample number s : 8455242 B G: P438360			
Aluminum	2980.19	3101.3	4	20
Antimony	0.526 U	2.19	200 1	20
Arsenic	0.729 U	0.915 U	0 1	20
Barium	9.04	11.29	22	20
Beryllium	0.0820	0.0811	1 1	20
Cadmium	0.142	0.121	16 1	20
Calcium	745.52	875.04	16	20
Chromium	4.30	4.85	12 1	20
Cobalt	0.280	0.342	20 1	20
Copper	5.18	7.23	33 1	20
Iron	2268.81	2878.33	24	20
Lead	8.23	9.73	17 1	20
Magnesium	216.57	232.59	7	20
Manganese	49.24	54.54	10	20
Nickel	1.57	2.07	27 1	20
Potassium	84.25	87.2	3 1	20
Selenium	0.677 U	0.849 U	0 1	20
Silver	0.113 U	0.142 U	0 1	20

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REVISED

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1677901
Reported: 09/01/2016 08:19

Laboratory Duplicate continued

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Sodium	18.0 U	22.5 U	0 1	20
Vanadium	3.30	3.49	6 1	20
Zinc	40.58	50.93	23	20
Batch number: 161870637004A	Sample number s : 8455242 B G: P438360			
Thallium	0.0218 U	0.0274 U	0 1	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Nitroaromatics/Amines 8330B s
Batch number: 161880010A

	3,4-Dinitrotoluene
8455243	118
Blank	113
LCS	118
MS	128
MSD	119
Limits:	62-133

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Volatiles by GC/MS Data

Case Narrative/Conformance Summary

Volatiles by GC/MS

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

GC/MS Volatiles

Fraction: Volatiles by GC/MS

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8442800	RTPA-1		X	1.5	
8442803	RTPA-2		X	1.52	
8442806	RTPA-3		X	1.36	
8442813	RTPA-4		X	1.25	Unspiked
8442814	RTPA-4MS		X		Matrix Spike
8442815	RTPA-4MSD		X	1.8	Matrix Spike Duplicate
8442819	DU-1-6-A		X	1.94	
8442823	DU-1-6-B		X	1.51	
8442827	DU-1-6-C		X	1.52	
8442828	TB-2	X		1	Trip Blank
8442829	RTPA-EB	X		1	Equipment Blank
8442830	RTPA-FB	X		1	Field Blank
8442831	DU-1-6-FB	X		1	Field Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

(Sample number(s): 8442800, 8442803, 8442806, 8442813-8442815, 8442819, 8442823, 8442827:
Analysis: 11995)
The VOA soil weight is outside the acceptable weight range.
See the VOA Prep Summary Sheet for the affected sample(s).

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

GC/MS Volatiles

Fraction: Volatiles by GC/MS

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

LCS/LCSD

(Sample number(s): 8442814RE: Analysis: 11995)
The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

Batch#: A161792AB (Sample number(s): 8442814, UNSPK: 8442814RE)
The recovery(ies) for the following analyte(s) in the LCSD exceeds the acceptance window indicating a positive bias: 4-Methyl-2-pentanone
Since the recovery is high and no analytes are detected above the quantitation limit, the data is reported.

SAMPLE ANALYSIS:

(Sample number(s): 8442800, 8442803, 8442806, 8442819, 8442823, 8442827: Analysis: 11995)
The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: since this internal standard was not used to quantitate any target analytes, the data is reported.

(Sample number(s): 8442813: Analysis: 11995)
The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: since this internal standard was not used to quantitate any target analytes, the data is reported.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Volatiles by GC/MS

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Quality Control Reference List
GC/MS Volatiles

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Fraction: Volatiles by GC/MS

Analysis	Batch Number	Sample Number	Analysis Date
4-Methyl-2-pentanone 8260C	A161792AA	VBLKA32	06/27/2016 09:22:00
		LCSA32	06/27/2016 09:50:00
		LCDA32	06/27/2016 10:15:00
		8442800	06/27/2016 14:55:00
		8442803	06/27/2016 15:18:00
		8442806	06/27/2016 15:41:00
		8442813 UNSPK	06/27/2016 13:48:00
		8442815 MSD	06/27/2016 14:33:00
		8442819	06/27/2016 16:03:00
		8442823	06/27/2016 16:26:00
		8442827	06/27/2016 16:49:00
4-Methyl-2-pentanone 8260C	A161792AB	VBLKA41	07/06/2016 08:54:00
		LCSA41	07/06/2016 09:20:00
		LCDA41	07/06/2016 09:45:00
		8442814RE MS	07/06/2016 14:04:00
4-Methyl-2-pentanone 8260C	L161872AA	VBLKL14	07/05/2016 18:19:00
		LCSL14	07/05/2016 17:35:00
		LCDL14	07/05/2016 17:57:00
		8442828	07/05/2016 18:41:00
		8442829	07/05/2016 19:03:00
		8442830	07/05/2016 19:25:00
		8442831	07/05/2016 19:47:00

Fraction: Volatiles by GC/MS

A161792AA / VBLKA32 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	06/27/16	N.D.	ug/kg	3	10

A161792AB / VBLKA41 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	07/06/16	N.D.	ug/kg	3	10

Fraction: Volatiles by GC/MS

L161872AA / VBLKL14 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	07/05/16	N.D.	ug/l	3	10

Quality Control Summary
Surrogates
GC/MS Volatiles
SDG: DWD87
Matrix: SOLID

Fraction: Volatiles by GC/MS

A161792AA	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
VBLKA32	100	54 - 135	96	50 - 131	102	50 - 141	101	52 - 141
LCSA32	102	54 - 135	101	50 - 131	103	50 - 141	100	52 - 141
LCDA32	102	54 - 135	101	50 - 131	102	50 - 141	100	52 - 141
8442800	102	54 - 135	85	50 - 131	103	50 - 141	110	52 - 141
8442803	100	54 - 135	87	50 - 131	102	50 - 141	111	52 - 141
8442806	102	54 - 135	84	50 - 131	104	50 - 141	111	52 - 141
8442813 UNSPK	105	54 - 135	92	50 - 131	102	50 - 141	108	52 - 141
8442815 MSD	101	54 - 135	93	50 - 131	102	50 - 141	107	52 - 141
8442819	103	54 - 135	83	50 - 131	104	50 - 141	115	52 - 141
8442823	101	54 - 135	70	50 - 131	104	50 - 141	126	52 - 141
8442827	105	54 - 135	75	50 - 131	106	50 - 141	122	52 - 141

A161792AB	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
VBLKA41	101	54 - 135	96	50 - 131	102	50 - 141	101	52 - 141
LCSA41	104	54 - 135	100	50 - 131	102	50 - 141	101	52 - 141
LCDA41	103	54 - 135	101	50 - 131	102	50 - 141	102	52 - 141
8442814RE MS	99	54 - 135	92	50 - 131	101	50 - 141	105	52 - 141

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Quality Control Summary
Surrogates
GC/MS Volatiles
SDG: DWD87
Matrix: LIQUID

Fraction: Volatiles by GC/MS

L161872AA	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/l	Spike Added	50 ug/l	Spike Added	50 ug/l	Spike Added	50 ug/l
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
VBLKL14	102	77 - 113	98	78 - 113	102	80 - 116	95	80 - 113
LCSL14	100	77 - 113	102	78 - 113	101	80 - 116	97	80 - 113
LCDL14	102	77 - 113	101	78 - 113	102	80 - 116	97	80 - 113
8442828	100	77 - 113	99	78 - 113	101	80 - 116	96	80 - 113
8442829	102	77 - 113	98	78 - 113	103	80 - 116	95	80 - 113
8442830	103	77 - 113	99	78 - 113	104	80 - 116	95	80 - 113
8442831	102	77 - 113	98	78 - 113	106	80 - 116	95	80 - 113

GC/MS Volatiles

Fraction: Volatiles by GC/MS

UNSPK: 8442813 MS: 8442814RE MSD: 8442815 **Analyte**	Batch: **A161792AA** (Sample number(s): 8442800, 8442803, 8442806, 8442813, 8442815, 8442819, 8442823, 8442827) Batch: **A161792AB** (Sample number(s): 8442814) **Spike Added ug/kg MS/MSD**	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	255.1 / 179.86	N.D.	243.91	188.93	96	105	50-120	25	30

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: SOLID

GC/MS Volatiles

Fraction: Volatiles by GC/MS

LCS: LCSA32 LCSD: LCDA32	Batch: **A161792AA** (Sample number(s): 8442800, 8442803, 8442806, 8442813, 8442815, 8442819, 8442823, 8442827)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	100	114.38	109.22	114	109	50-120	5	30

LCS: LCSA41 LCSD: LCDA41	Batch: **A161792AB** (Sample number(s): 8442814)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	100	117.14	122.54	117	123 *	50-120	5	30

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: LIQUID

GC/MS Volatiles

Fraction: Volatiles by GC/MS

LCS: LCSL14 LCSD: LCDL14	Batch: **L161872AA** (Sample number(s): 8442828-8442831)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	100	108.79	109.11	109	109	47-133	0	30

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87___

Lab File ID: au20t01.d BFB Injection Date: 06/20/16

Instrument ID: HP09685 BFB Injection Time: 08:05

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.74
75	30.0 - 60.0% of mass 95	48.97
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.93
173	Less than 2.0% of mass 174	0.26 (0.34)1
174	Greater than 50.0% of mass 95	77.00
175	5.0 - 9.0% of mass 174	5.63 (7.31)1
176	Greater than 95.0%, but less than 101.0% of mass 174	76.51 (99.37)1
177	5.0 - 9.0% of mass 176	5.06 (6.61)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD300	au20i01.d	06/20/16	08:48
02	VSTD100	au20i02.d	06/20/16	09:12
03	VSTD50	au20i03.d	06/20/16	10:23
04	VSTD20	au20i04.d	06/20/16	10:49
05	VSTD10	au20i05.d	06/20/16	11:14
06	VSTD4	au20i06.d	06/20/16	12:06
07	VSTD1	au20i07.d	06/20/16	12:32
08	VSTD0.5	au20m01.d	06/20/16	12:58
09	LCSAICVC	au20v01.d	06/20/16	13:30
10	LCSA26	au20l01.d	06/20/16	14:36
11	LCDA26	au20l02.d	06/20/16	14:59
12	VBLKA26	au20b01.d	06/20/16	15:21
13	8416938	au20s09.d	06/20/16	15:58
14	8416934	au20s03.d	06/20/16	17:33
15	8416937	au20s04.d	06/20/16	17:55
16	8416945	au20s05.d	06/20/16	18:18
17	8416946	au20s06.d	06/20/16	18:41
18	8419253	au20s07.d	06/20/16	19:04
19	8414856	au20s08.d	06/20/16	19:26

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD87___

Lab File ID: au27t01.d BFB Injection Date: 06/27/16

Instrument ID: HP09685 BFB Injection Time: 07:57

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.29
75	30.0 - 60.0% of mass 95	50.28
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.68
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	80.95
175	5.0 - 9.0% of mass 174	5.64 (6.97)1
176	Greater than 95.0%, but less than 101.0% of mass 174	77.57 (95.82)1
177	5.0 - 9.0% of mass 176	5.19 (6.70)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD50	au27c01.d	06/27/16	08:37
02	VBLKA31	au27b01.d	06/27/16	09:22
03	VBLKA32	au27b02.d	06/27/16	09:22
04	LCSA31	au27l01.d	06/27/16	09:50
05	LCSA32	au27l31.d	06/27/16	09:50
06	LCDA31	au27l02.d	06/27/16	10:15
07	LCDA32	au27l32.d	06/27/16	10:15
08	8438367	au27s03.d	06/27/16	11:09
09	8438368MS	au27s04.d	06/27/16	11:32
10	8438369MSD	au27s05.d	06/27/16	11:55
11	8438324	au27s06.d	06/27/16	12:17
12	8438332	au27s07.d	06/27/16	12:40
13	8438373	au27s08.d	06/27/16	13:02
14	8438377	au27s09.d	06/27/16	13:25
15	8442813	au27s33.d	06/27/16	13:48
16	8442815MSD	au27s35.d	06/27/16	14:33
17	8442800	au27s36.d	06/27/16	14:55
18	8442803	au27s37.d	06/27/16	15:18
19	8442806	au27s38.d	06/27/16	15:41
20	8442819	au27s39.d	06/27/16	16:03
21	8442823	au27s40.d	06/27/16	16:26
22	8442827	au27s41.d	06/27/16	16:49

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87

Lab File ID: au27t01.d BFB Injection Date: 06/27/16

Instrument ID: HP09685 BFB Injection Time: 07:57

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.29
75	30.0 - 60.0% of mass 95	50.28
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.68
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	80.95
175	5.0 - 9.0% of mass 174	5.64 (6.97)1
176	Greater than 95.0%, but less than 101.0% of mass 174	77.57 (95.82)1
177	5.0 - 9.0% of mass 176	5.19 (6.70)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
23	8445672	au27s42.d	06/27/16	17:11
24	8445676	au27s43.d	06/27/16	17:34
25	8445680	au27s44.d	06/27/16	17:56
26	8438328	au27s10.d	06/27/16	18:19

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD87___

Lab File ID: al06t01.d BFB Injection Date: 07/06/16

Instrument ID: HP09685 BFB Injection Time: 07:23

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.07
75	30.0 - 60.0% of mass 95	47.70
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	7.04
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	79.61
175	5.0 - 9.0% of mass 174	5.48 (6.88)1
176	Greater than 95.0%, but less than 101.0% of mass 174	76.33 (95.88)1
177	5.0 - 9.0% of mass 176	5.13 (6.72)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD50	al06c01.d	07/06/16	08:09
02	VBLKA39	al06b01.d	07/06/16	08:54
03	VBLKA41	al06b02.d	07/06/16	08:54
04	LCSA39	al06l01.d	07/06/16	09:20
05	LCSA41	al06l61.d	07/06/16	09:20
06	LCDA39	al06l02.d	07/06/16	09:45
07	LCDA41	al06l62.d	07/06/16	09:45
08	8459953	al06s03.d	07/06/16	10:41
09	8459954	al06s04.d	07/06/16	11:03
10	8459958	al06s05.d	07/06/16	11:26
11	8459959	al06s06.d	07/06/16	11:49
12	8459960	al06s07.d	07/06/16	12:11
13	8459961	al06s08.d	07/06/16	12:34
14	8459962	al06s09.d	07/06/16	12:56
15	8459963	al06s10.d	07/06/16	13:19
16	SECC050	al06c02.d	07/06/16	13:42
17	8442814RE	al06s63.d	07/06/16	14:04
18	8457192	al06s64.d	07/06/16	14:27
19	8457196	al06s65.d	07/06/16	14:50
20	8457200	al06s66.d	07/06/16	15:12
21	8457204	al06s67.d	07/06/16	15:35
22	8457208	al06s68.d	07/06/16	15:57

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87

Lab File ID: al06t01.d BFB Injection Date: 07/06/16

Instrument ID: HP09685 BFB Injection Time: 07:23

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.07
75	30.0 - 60.0% of mass 95	47.70
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	7.04
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	79.61
175	5.0 - 9.0% of mass 174	5.48 (6.88)1
176	Greater than 95.0%, but less than 101.0% of mass 174	76.33 (95.88)1
177	5.0 - 9.0% of mass 176	5.13 (6.72)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
23	8457212	al06s69.d	07/06/16	16:20
24	LOD008 - LOD008	al06d02.d	07/06/16	17:05
25	LOD004 - LOD004	al06d03.d	07/06/16	17:28
26	LOD002 - LOD002	al06d04.d	07/06/16	17:50
27	LODS - LODS	al06d05.d	07/06/16	18:13
28	LOQV - LOQV	al06d06.d	07/06/16	18:36

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87

Lab File ID: la22t01.d BFB Injection Date: 04/22/16

Instrument ID: HP09915 BFB Injection Time: 09:13

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.66
75	30.0 - 60.0% of mass 95	47.86
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.71
173	Less than 2.0% of mass 174	0.58 (0.66)1
174	Greater than 50.0% of mass 95	87.40
175	5.0 - 9.0% of mass 174	5.94 (6.79)1
176	Greater than 95.0%, but less than 101.0% of mass 174	83.17 (95.16)1
177	5.0 - 9.0% of mass 176	5.11 (6.15)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD300	la22i01.d	04/22/16	09:55
02	VSTD100	la22i02.d	04/22/16	10:17
03	VSTD50	la22i03.d	04/22/16	10:39
04	VSTD20	la22i04.d	04/22/16	11:01
05	VSTD10	la22i05.d	04/22/16	11:23
06	VSTD4	la22i06.d	04/22/16	11:45
07	VSTD1	la22i07.d	04/22/16	12:07
08	MDL0.5 - MDL0.5	la22m01.d	04/22/16	12:29
09	LCS01	la22v01.d	04/22/16	12:51
10	VSTD300	la22i11.d	04/22/16	14:05
11	VSTD100	la22i12.d	04/22/16	14:27
12	VSTD50	la22i13.d	04/22/16	14:49
13	VSTD20	la22i14.d	04/22/16	15:11
14	VSTD10	la22i15.d	04/22/16	15:33
15	VSTD4	la22i16.d	04/22/16	15:55
16	MDL001 - MDL001	la22m02.d	04/22/16	16:17
17	LCS02	la22v02.d	04/22/16	16:39

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87

Lab File ID: l105t05.d BFB Injection Date: 07/05/16

Instrument ID: HP09915 BFB Injection Time: 16:32

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.91
75	30.0 - 60.0% of mass 95	45.88
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.46
173	Less than 2.0% of mass 174	0.59 (0.70)1
174	Greater than 50.0% of mass 95	84.60
175	5.0 - 9.0% of mass 174	6.35 (7.50)1
176	Greater than 95.0%, but less than 101.0% of mass 174	81.49 (96.32)1
177	5.0 - 9.0% of mass 176	5.42 (6.65)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD50	l105c05.d	07/05/16	17:13
02	LCSL14	l105s31.d	07/05/16	17:35
03	LCDL14	l105s32.d	07/05/16	17:57
04	VBLKL14	l105b05.d	07/05/16	18:19
05	8442828	l105s33.d	07/05/16	18:41
06	8442829	l105s34.d	07/05/16	19:03
07	8442830	l105s35.d	07/05/16	19:25
08	8442831	l105s36.d	07/05/16	19:47
09	8444113	l105s37.d	07/05/16	20:09
10	8444114	l105s38.d	07/05/16	20:31
11	8444115	l105s39.d	07/05/16	20:52
12	8444116	l105s40.d	07/05/16	21:14
13	8445666	l105s41.d	07/05/16	21:36
14	8445667	l105s42.d	07/05/16	21:58
15	8445668	l105s43.d	07/05/16	22:20
16	8449085	l105s44.d	07/05/16	22:42
17	8450968	l105s45.d	07/05/16	23:04
18	8451646	l105s46.d	07/05/16	23:26
19	8451647	l105s47.d	07/05/16	23:47
20	8451647DL	l105s48.d	07/06/16	00:09
21	8451648	l105s49.d	07/06/16	00:31
22	8451649	l105s50.d	07/06/16	00:53

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87___

Lab File ID: l105t05.d BFB Injection Date: 07/05/16

Instrument ID: HP09915 BFB Injection Time: 16:32

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.91
75	30.0 - 60.0% of mass 95	45.88
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.46
173	Less than 2.0% of mass 174	0.59 (0.70)1
174	Greater than 50.0% of mass 95	84.60
175	5.0 - 9.0% of mass 174	6.35 (7.50)1
176	Greater than 95.0%, but less than 101.0% of mass 174	81.49 (96.32)1
177	5.0 - 9.0% of mass 176	5.42 (6.65)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
23	8451650	l105s51.d	07/06/16	01:15
24	8451651	l105s52.d	07/06/16	01:37
25	8454720	l105s53.d	07/06/16	01:59
26	8457188	l105s54.d	07/06/16	02:20

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date(s): 06/20/16 06/20/16

Heated Purge: (Y/N) Y Calibration Times: 08:48 12:32

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = au20i07.d RRF 4 = au20i06.d RRF 10= au20i05.d
RRF 20= au20i04.d RRF 50= au20i03.d RRF100= au20i02.d RRF300= au20i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Dichlorodifluoromethane	#0.3015	0.4061	0.4347	0.4374	0.4139	0.3790	0.3721	0.3921	12	AVG #
Chloromethane	#0.3447	0.4453	0.4523	0.4173	0.4163	0.4043	0.3715	0.4074	9	AVG #
Vinyl Chloride	#0.2880	0.3897	0.4136	0.3999	0.3821	0.3636	0.3504	0.3696	11	AVG #
Bromomethane	#0.2231	0.2697	0.2762	0.2688	0.2576	0.2444	0.2169	0.2509	9	AVG #
Chloroethane	#0.1715	0.2217	0.2260	0.2194	0.2097	0.2000	0.1809	0.2042	10	AVG #
Dichlorofluoromethane	0.3851	0.4846	0.5016	0.4950	0.4828	0.4623	0.4563	0.4668	8	AVG
Trichlorofluoromethane	#0.3332	0.4472	0.4646	0.4680	0.4482	0.4096	0.4182	0.4270	11	AVG #
Ethanol	0.1832	0.1707	0.1917	0.1795	0.1769	0.1750	0.1818	0.1798	4	AVG
Freon 123a	0.2483	0.3140	0.3249	0.3171	0.3106	0.3000	0.3009	0.3023	8	AVG
Acrolein	2.4021	2.5457	3.3317	2.7087	2.6390	2.4547	2.5173	2.6570	12	AVG
1,1-Dichloroethene	#0.1624	0.2170	0.2212	0.2280	0.2345	0.2401	0.2326	0.2194	12	AVG #
1,1-Dichloroethene(2)	#0.0795	0.1177	0.1184	0.1226	0.1269	0.1265	0.1221	0.1162	14	AVG #
Acetone	#	1.3648	1.3025	1.3884	1.2412	1.2298	1.2487	1.2959	5	AVG #
Freon 113	#	0.2142	0.2000	0.2274	0.2423	0.2385	0.2319	0.2257	7	AVG #
2-Propanol	0.9644	0.9736	0.9905	1.0054	0.9555	0.9485	1.0546	0.9846	4	AVG
Methyl Iodide	0.3045	0.3904	0.4101	0.4170	0.4287	0.4403	0.4218	0.4018	11	AVG
Carbon Disulfide	#0.5631	0.6775	0.6999	0.7313	0.7775	0.8023	0.7824	0.7191	11	AVG #
Methyl Acetate	#0.1880	0.1928	0.2056	0.1771	0.1902	0.1950	0.1903	0.1913	4	AVG #
Allyl Chloride	0.3026	0.3903	0.4225	0.4162	0.4191	0.4249	0.4101	0.3979	11	AVG
Methylene Chloride	#0.3152	0.2782	0.2730	0.2658	0.2695	0.2770	0.2653	0.2777	6	AVG #
t-Butyl alcohol	1.5669	1.4165	1.4095	1.4042	1.3935	1.4328	1.6033	1.4610	6	AVG
Acrylonitrile	0.0554	0.0927	0.1014	0.0876	0.1013	0.1035	0.1021	0.0920	19	AVG
Methyl Tertiary Butyl Ether	#0.6256	0.6812	0.7136	0.6962	0.7418	0.7734	0.7514	0.7119	7	AVG #
trans-1,2-Dichloroethene	#0.1629	0.2384	0.2466	0.2505	0.2588	0.2682	0.2595	0.2407	15	AVG #
n-Hexane	0.2650	0.4265	0.3194	0.3732	0.4142	0.4110	0.3881	0.3710	16	AVG
1,1-Dichloroethane	#0.3556	0.4482	0.4614	0.4701	0.4818	0.4944	0.4785	0.4557	10	AVG #
di-Isopropyl ether	0.6921	0.7832	0.8484	0.8697	0.9005	0.9307	0.8961	0.8458	10	AVG
2-Chloro-1,3-butadiene		0.3403	0.3562	0.3861	0.4125	0.4290	0.4166	0.3901	9	AVG
Ethyl t-butyl ether	0.5878	0.6774	0.7142	0.7400	0.7689	0.7974	0.7678	0.7219	10	AVG
2-Butanone	#5.3778	5.5432	5.9079	5.9932	5.7792	5.7351	5.9830	5.7599	4	AVG #
cis-1,2-Dichloroethene	#0.2147	0.2639	0.2716	0.2783	0.2879	0.3005	0.2934	0.2729	10	AVG #
2,2-Dichloropropane	0.2106	0.3006	0.3103	0.3371	0.3623	0.3763	0.3666	0.3234	18	AVG
Propionitrile	1.6199	1.7320	1.7848	1.9565	1.7845	1.8265	1.9266	1.8044	6	AVG
Methacrylonitrile	0.0964	0.1016	0.1084	0.0992	0.1112	0.1162	0.1155	0.1069	7	AVG
Bromochloromethane	0.1064	0.1276	0.1385	0.1350	0.1372	0.1443	0.1420	0.1330	10	AVG
Tetrahydrofuran	1.1724	1.5211	1.5964	1.6479	1.6139	1.6360	1.7360	1.5605	12	AVG
Chloroform	#0.3505	0.4241	0.4358	0.4434	0.4544	0.4741	0.4608	0.4347	9	AVG #
1,1,1-Trichloroethane	#0.3137	0.4274	0.3786	0.4061	0.4007	0.4193	0.4129	0.3941	10	AVG #
Cyclohexane	#	0.4357	0.3897	0.4473	0.4847	0.4905	0.4714	0.4532	8	AVG #
Cyclohexane(2)	#	0.3584	0.3235	0.3751	0.4008	0.4034	0.3926	0.3756	8	AVG #
Cyclohexane(3)	#	0.1307	0.1149	0.1351	0.1464	0.1472	0.1446	0.1365	9	AVG #
1,1-Dichloropropene	0.2488	0.3298	0.3293	0.3588	0.3795	0.3962	0.3884	0.3473	15	AVG
Carbon Tetrachloride	#0.1802	0.2618	0.2580	0.2905	0.3194	0.3373	0.3430	0.2843	20	AVG #
Isobutyl Alcohol	0.4537	0.4876	0.4729	0.4960	0.4858	0.4892	0.5813	0.4952	8	AVG
Benzene	#1.0591	1.0676	1.0493	1.0817	1.1002	1.1301	1.0920	1.0828	3	AVG #
1,2-Dichloroethane	#0.3559	0.3433	0.3403	0.3384	0.3492	0.3571	0.3510	0.3479	2	AVG #
1,2-Dichloroethane(2)	#0.0836	0.0280	0.0309	0.0315	0.0317	0.0332	0.0332	0.0389	51	AVG #<-
t-Amyl methyl ether	0.5453	0.6221	0.6535	0.6637	0.7052	0.7391	0.7281	0.6653	10	AVG
n-Heptane		0.4539	0.3277	0.3804	0.4334	0.4308	0.3947	0.4035	11	AVG
n-Butanol		0.3671	0.3752	0.4078	0.4078	0.4315	0.5268	0.4194	14	AVG
Trichloroethene	#0.1915	0.2524	0.2448	0.2633	0.2741	0.2851	0.2829	0.2563	13	AVG #
Methylcyclohexane	#0.3180	0.4777	0.5098	0.4992	0.5058	0.5050	0.5200	0.4765	15	AVG #

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date(s): 06/20/16 06/20/16

Heated Purge: (Y/N) Y Calibration Times: 08:48 12:32

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = au20i07.d RRF 4 = au20i06.d RRF 10= au20i05.d
RRF 20= au20i04.d RRF 50= au20i03.d RRF100= au20i02.d RRF300= au20i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
1,2-Dichloropropane	#0.2283	0.2616	0.2721	0.2831	0.2954	0.3045	0.3019	0.2781	10	AVG #
Methyl Methacrylate	0.1288	0.1602	0.1738	0.1690	0.1936	0.2033	0.2122	0.1773	16	AVG
1,4-Dioxane	0.1229	0.1384	0.1470	0.1632	0.1530	0.1618	0.1818	0.1526	12	AVG
Dibromomethane	0.1386	0.1458	0.1526	0.1533	0.1616	0.1683	0.1697	0.1557	7	AVG
Bromodichloromethane	#0.2211	0.2624	0.2852	0.2990	0.3218	0.3417	0.3524	0.2977	16	AVG #
2-Nitropropane	1.7609	2.0810	2.2922	2.6388	2.8433	2.9702	3.3801	2.5666	22	2NDDEG
cis-1,3-Dichloropropene	#0.2846	0.3452	0.3783	0.4117	0.4489	0.4671	0.4741	0.4014	17	AVG #
4-Methyl-2-pentanone	#0.2068	0.2198	0.2590	0.2159	0.2657	0.2752	0.2759	0.2455	12	AVG #
Toluene	#0.7560	0.8874	0.8576	0.9211	0.9432	0.9638	0.9191	0.8926	8	AVG #
trans-1,3-Dichloropropene	#0.3248	0.4093	0.4524	0.4825	0.5294	0.5601	0.5632	0.4745	18	AVG #
Ethyl Methacrylate		0.3660	0.4073	0.3893	0.4908	0.5152	0.5243	0.4488	15	AVG
1,1,2-Trichloroethane	#0.2905	0.3023	0.3120	0.3081	0.3186	0.3279	0.3261	0.3122	4	AVG #
Tetrachloroethene	#0.2598	0.3623	0.3321	0.3727	0.3864	0.4021	0.3961	0.3588	14	AVG #
1,3-Dichloropropane	0.5018	0.5304	0.5583	0.5384	0.5684	0.5828	0.5684	0.5498	5	AVG
2-Hexanone	#0.1955	0.2066	0.2561	0.2023	0.2549	0.2669	0.2606	0.2347	13	AVG #
Dibromochloromethane	#0.2165	0.2557	0.2852	0.3061	0.3412	0.3658	0.3837	0.3077	20	AVG #
1,2-Dibromoethane	#0.2579	0.2860	0.3072	0.3028	0.3223	0.3377	0.3401	0.3077	10	AVG #
Chlorobenzene	#0.9042	1.0052	0.9846	1.0410	1.0695	1.1016	1.0659	1.0245	6	AVG #
1,1,1,2-Tetrachloroethane	0.2345	0.2750	0.2949	0.3186	0.3492	0.3722	0.3811	0.3179	17	AVG
Ethylbenzene	#1.2977	1.5878	1.5438	1.7403	1.8265	1.9162	1.7982	1.6729	13	AVG #
m+p-Xylene	#0.4795	0.6281	0.6196	0.6907	0.7249	0.7593	0.7180	0.6600	14	AVG #
o-Xylene	#0.4625	0.6030	0.6017	0.6770	0.7168	0.7432	0.7216	0.6465	15	AVG #
Styrene	#0.6754	0.9290	0.9813	1.0954	1.1792	1.2419	1.1979	1.0429	19	AVG #
Bromoform	#0.1436	0.1474	0.1716	0.1769	0.2111	0.2339	0.2632	0.1925	23	2NDDEG #
Isopropylbenzene	#	1.5815	1.4307	1.6569	1.7711	1.8488	1.7304	1.6699	9	AVG #
Cyclohexanone	0.5409	0.6101	0.6740	0.7496	0.7770	0.8206	0.9059	0.7254	17	AVG
1,1,2,2-Tetrachloroethane	#0.7474	0.7754	0.8373	0.7730	0.8265	0.8647	0.8985	0.8176	7	AVG #
Bromobenzene	0.6970	0.7970	0.8020	0.8480	0.8622	0.9139	0.9235	0.8348	9	AVG
trans-1,4-Dichloro-2-butene	0.1944	0.2169	0.2251	0.2132	0.2357	0.2552	0.2636	0.2291	11	AVG
1,2,3-Trichloropropane	0.2162	0.2305	0.2435	0.2209	0.2381	0.2467	0.2548	0.2358	6	AVG
n-Propylbenzene		3.9361	3.3856	3.8815	3.9988	4.2017	3.6867	3.8484	7	AVG
2-Chlorotoluene	0.5984	0.7674	0.7193	0.8021	0.8165	0.8469	0.8257	0.7680	11	AVG
1,3,5-Trimethylbenzene		2.7816	2.4478	2.8063	2.9309	3.0795	2.8518	2.8163	7	AVG
4-Chlorotoluene	0.6272	0.8053	0.7621	0.8281	0.8592	0.8941	0.8712	0.8067	11	AVG
tert-Butylbenzene		0.5948	0.4929	0.5695	0.6116	0.6547	0.6283	0.5920	10	AVG
Pentachloroethane	0.2918	0.3873	0.4509	0.4644	0.4949	0.5369	0.5575	0.4548	20	AVG
1,2,4-Trimethylbenzene		2.8554	2.5291	2.9113	3.0688	3.2519	3.0038	2.9367	8	AVG
sec-Butylbenzene		3.6375	3.0055	3.4821	3.7111	3.9143	3.4622	3.5355	9	AVG
1,3-Dichlorobenzene	#1.3743	1.5803	1.4548	1.6184	1.6810	1.7785	1.6905	1.5968	9	AVG #
p-Isopropyltoluene		3.0890	2.6079	3.0491	3.3204	3.5550	3.1344	3.1260	10	AVG
1,4-Dichlorobenzene	#1.4607	1.6670	1.5209	1.6591	1.7203	1.8160	1.7240	1.6526	7	AVG #
1,2,3-Trimethylbenzene	2.5652	2.9257	3.2590	3.1978	3.1772	3.3435	3.0668	3.0765	9	AVG
Benzyl Chloride	0.1354	0.1932	0.2361	0.2594	0.3234	0.3656	0.4101	0.2747	35	2NDDEG
1,3-Diethylbenzene	1.2868	1.7335	2.0046	1.9770	1.9763	2.0710	1.9646	1.8591	15	AVG
1,4-Diethylbenzene	1.2887	1.8115	2.0572	2.0125	2.0432	2.1507	2.0260	1.9128	15	AVG
n-Butylbenzene		1.6337	1.3216	1.5213	1.6516	1.7524	1.6079	1.5814	9	AVG
1,2-Dichlorobenzene	#1.3661	1.5139	1.4423	1.5534	1.5937	1.6831	1.6460	1.5426	7	AVG #
1,2-Diethylbenzene	1.1358	1.5333	1.7182	1.6667	1.6620	1.7360	1.6657	1.5882	13	AVG
1,2-Dibromo-3-chloropropane	#0.1183	0.1187	0.1357	0.1293	0.1521	0.1648	0.1796	0.1426	17	AVG #
1,3,5-Trichlorobenzene	0.9298	1.2419	1.0502	1.1716	1.2701	1.3590	1.3240	1.1924	13	AVG
1,2,4-Trichlorobenzene	#0.8273	1.0410	0.9037	1.0191	1.1385	1.2409	1.2292	1.0571	15	AVG #
Hexachlorobutadiene		0.5717	0.4320	0.4909	0.5649	0.6053	0.5773	0.5403	12	AVG

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date(s): 06/20/16 06/20/16

Heated Purge: (Y/N) Y Calibration Times: 08:48 12:32

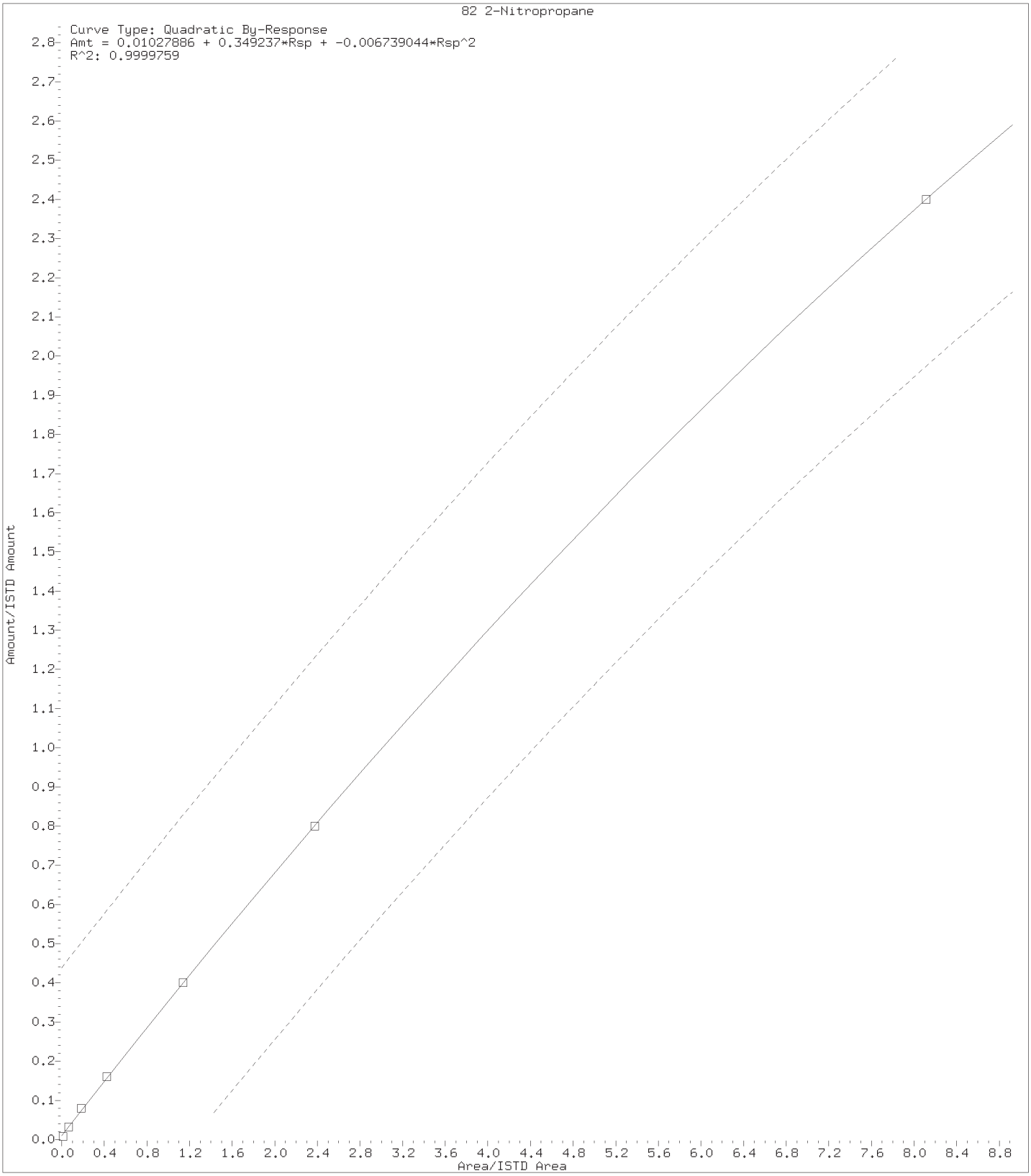
Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = au20i07.d RRF 4 = au20i06.d RRF 10= au20i05.d
RRF 20= au20i04.d RRF 50= au20i03.d RRF100= au20i02.d RRF300= au20i01.d

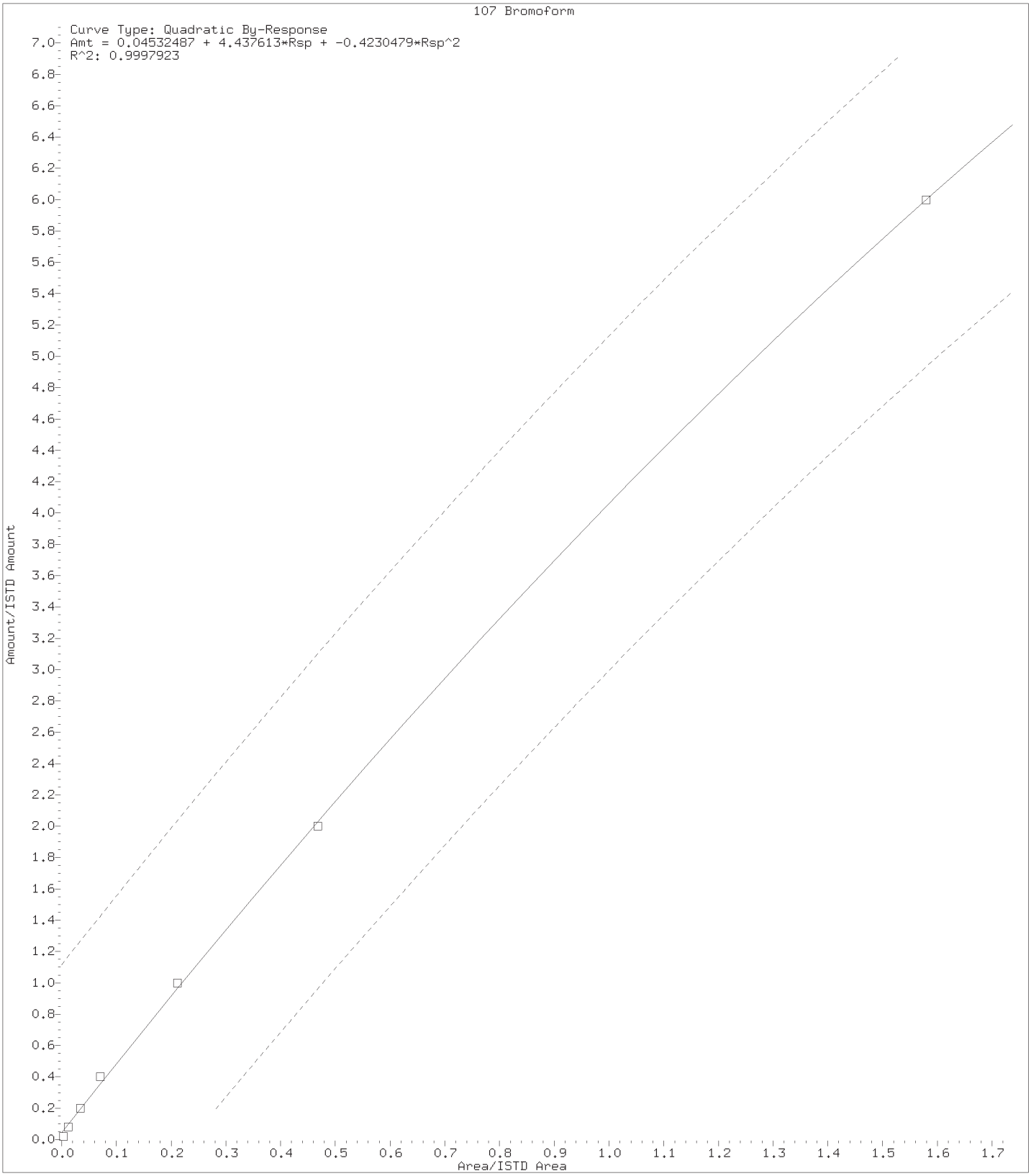
COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Naphthalene	1.6611	2.0874	2.1936	2.3059	2.6972	2.9378	2.8996	2.3975	20	AVG
1,2,3-Trichlorobenzene	0.7448	0.9699	0.8660	0.9346	1.0379	1.1291	1.1252	0.9725	14	AVG
2-Methylnaphthalene	0.3019	0.4877	0.6633	0.7839	1.2435	1.5532	1.5861	0.9456	55	1STDEG
Dibromofluoromethane	0.2254	0.2277	0.2258	0.2276	0.2305	0.2327	0.2331	0.2289	1	AVG
Dibromofluoromethane(2)	0.2327	0.2360	0.2329	0.2343	0.2354	0.2383	0.2383	0.2354	1	AVG
1,2-Dichloroethane-d4	0.0551	0.0551	0.0538	0.0546	0.0543	0.0544	0.0542	0.0545	1	AVG
1,2-Dichloroethane-d4(2)	0.2669	0.2682	0.2655	0.2542	0.2627	0.2630	0.2616	0.2631	2	AVG
1,2-Dichloroethane-d4(3)	0.0347	0.0345	0.0344	0.0340	0.0348	0.0345	0.0346	0.0345	1	AVG
Toluene-d8	1.3834	1.3782	1.3883	1.3847	1.3661	1.3475	1.3044	1.3647	2	AVG
Toluene-d8(2)	0.8882	0.8824	0.8909	0.8905	0.8809	0.8691	0.8385	0.8772	2	AVG
4-Bromofluorobenzene	0.4831	0.4854	0.4866	0.4874	0.4906	0.4859	0.4771	0.4851	1	AVG
4-Bromofluorobenzene(2)	0.3937	0.4007	0.3996	0.3994	0.4034	0.4011	0.3925	0.3986	1	AVG

Average %RSD 11

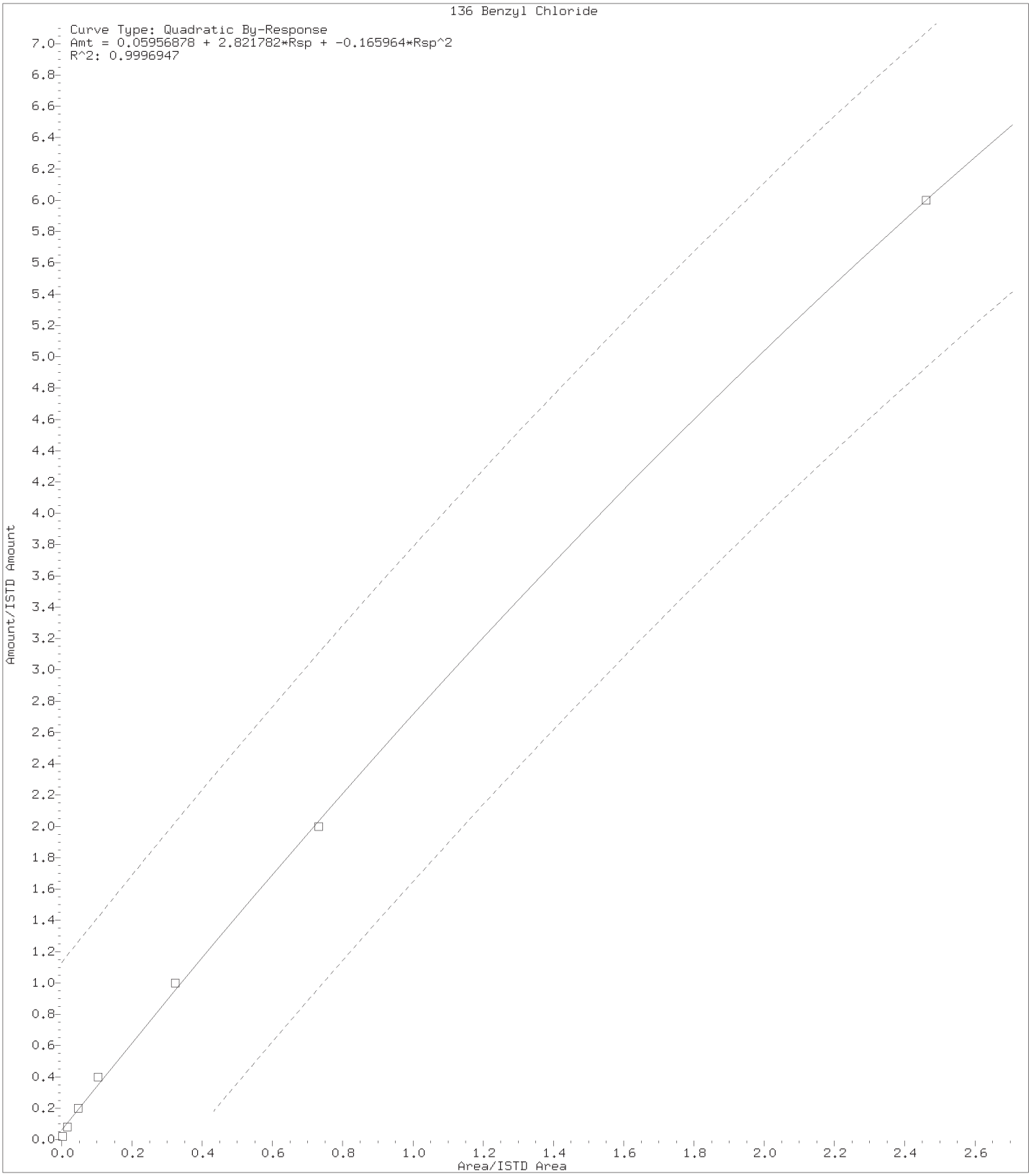
Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.



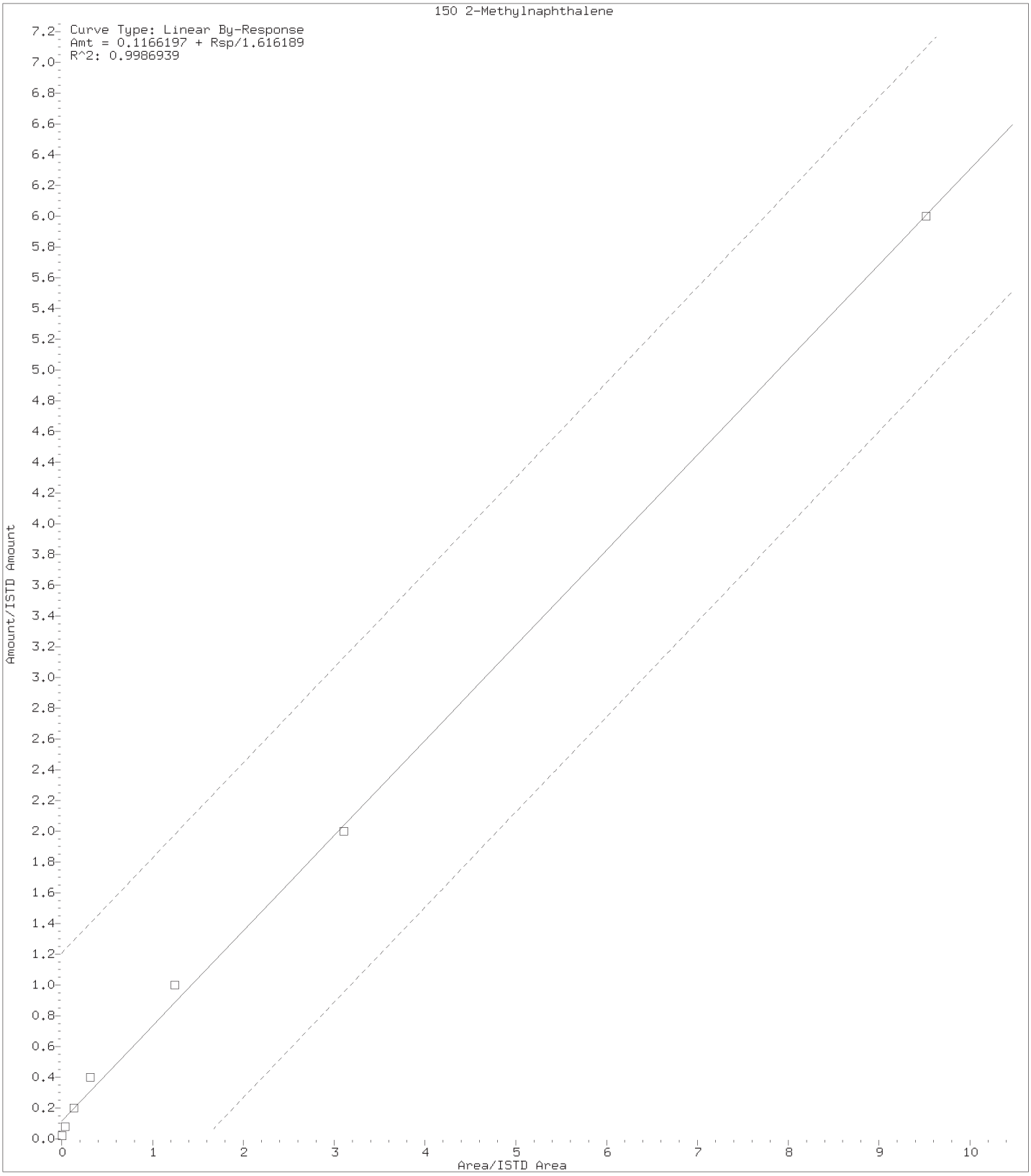
Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002



Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002



Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002



Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

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/chem2/HP09685.i/16jun20a.b/au20i02.d	VSTD100
/chem2/HP09685.i/16jun20a.b/au20i03.d	VSTD050
/chem2/HP09685.i/16jun20a.b/au20i04.d	VSTD020
/chem2/HP09685.i/16jun20a.b/au20i05.d	VSTD010
/chem2/HP09685.i/16jun20a.b/au20i06.d	VSTD004
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Area Summary

File ID:

Internal Standard Name	au20i01.d	au20i02.d	au20i03.d	au20i04.d	au20i05.d	au20i06.d	au20i07.d	Avg. Area	%RSD	In Spec
t-Butyl alcohol-d10	112141	118889	117913	89597	109332	104982	108967	108832	9	Yes
Fluorobenzene	1071415	1077063	1094634	1048020	1028410	1037340	1012750	1052805	3	Yes
Chlorobenzene-d5	824113	803173	812973	772869	750874	757792	737599	779913	4	Yes
1,4-Dichlorobenzene-d4	449572	427501	430819	399200	387544	389396	371801	407976	7	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

File ID:

Internal Standard Name	au20i01.d	au20i02.d	au20i03.d	au20i04.d	au20i05.d	au20i06.d	au20i07.d	Avg. RT
t-Butyl alcohol-d10	3.951	3.964	3.958	3.964	3.970	3.958	3.957	3.960
Fluorobenzene	7.456	7.449	7.449	7.456	7.456	7.449	7.455	7.453
Chlorobenzene-d5	11.015	11.008	11.008	11.015	11.015	11.008	11.008	11.011
1,4-Dichlorobenzene-d4	12.919	12.919	12.919	12.919	12.919	12.919	12.919	12.919

* indicates the retention time is greater than 30 seconds from the average RT.

Report generated on 06/20/2016 at 13:53.

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 ICV Date: 06/20/16 Time: 13:30

Lab File ID: au20v01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	$\overline{RRF}$	RRF	CONC.	CONC.	DRIFT	
# Dichlorodifluoromethane	0.3921	0.3638	18.56	20	-7	#
# Chloromethane	0.4074	0.3946	19.37	20	-3	#
# Vinyl Chloride	0.3696	0.3695	19.99	20	0	#
# Bromomethane	0.2509	0.2490	19.84	20	-1	#
# Chloroethane	0.2042	0.2043	20.02	20	0	#
Dichlorofluoromethane	0.4668	0.5158	22.10	20	10	
# Trichlorofluoromethane	0.4270	0.4531	21.22	20	6	#
Ethanol	0.1798	0.1844	1025.73	1000	3	
Freon 123a	0.3023	0.3352	22.18	20	11	
Acrolein	2.6570	2.4149	136.33	150	-9	
# 1,1-Dichloroethene	0.2194	0.2418	22.04	20	10	#
# Acetone	1.2959	1.2141	140.53	150	-6	#
# Freon 113	0.2257	0.2491	22.07	20	10	#
2-Propanol	0.9846	0.9493	144.62	150	-4	
Methyl Iodide	0.4018	0.4114	20.48	20	2	
# Carbon Disulfide	0.7191	0.7407	20.60	20	3	#
# Methyl Acetate	0.1913	0.1927	20.15	20	1	#
Allyl Chloride	0.3979	0.4110	20.66	20	3	
# Methylene Chloride	0.2777	0.2767	19.93	20	0	#
t-Butyl alcohol	1.4610	1.4421	197.42	200	-1	
Acrylonitrile	0.0920	0.0942	102.44	100	2	
# Methyl Tertiary Butyl Ether	0.7119	0.7282	20.46	20	2	#
# trans-1,2-Dichloroethene	0.2407	0.2693	22.37	20	12	#
n-Hexane	0.3710	0.4433	23.89	20	19	
# 1,1-Dichloroethane	0.4557	0.4894	21.48	20	7	#
di-Isopropyl ether	0.8458	0.8881	21.00	20	5	
2-Chloro-1,3-butadiene	0.3901	0.4070	20.87	20	4	
Ethyl t-butyl ether	0.7219	0.7383	20.45	20	2	
# 2-Butanone	5.7599	5.9380	154.64	150	3	#
# cis-1,2-Dichloroethene	0.2729	0.2892	21.20	20	6	#
2,2-Dichloropropane	0.3234	0.3365	20.81	20	4	
Propionitrile	1.8044	1.9077	158.59	150	6	
Methacrylonitrile	0.1069	0.1117	156.67	150	4	
Bromochloromethane	0.1330	0.1381	20.77	20	4	
Tetrahydrofuran	1.5605	1.6311	104.52	100	5	
# Chloroform	0.4347	0.4490	20.66	20	3	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 ICV Date: 06/20/16 Time: 13:30

Lab File ID: au20v01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
1,1,1-Trichloroethane	0.3941	0.4132	20.97	20	5	#
Cyclohexane	0.4532	0.5050	22.28	20	11	#
1,1-Dichloropropene	0.3473	0.3671	21.14	20	6	
Carbon Tetrachloride	0.2843	0.3143	22.11	20	11	#
Isobutyl Alcohol	0.4952	0.5147	519.64	500	4	
Benzene	1.0828	1.1066	20.44	20	2	#
1,2-Dichloroethane	0.3479	0.3457	19.88	20	-1	#
t-Amyl methyl ether	0.6653	0.6716	20.19	20	1	
n-Heptane	0.4035	0.4468	22.15	20	11	
n-Butanol	0.4194	0.4207	1003.18	1000	0	
Trichloroethene	0.2563	0.2793	21.80	20	9	#
Methylcyclohexane	0.4765	0.5018	21.06	20	5	#
1,2-Dichloropropane	0.2781	0.2947	21.19	20	6	#
Methyl Methacrylate	0.1773	0.1829	20.64	20	3	
1,4-Dioxane	0.1526	0.1626	532.63	500	7	
Dibromomethane	0.1557	0.1574	20.22	20	1	
Bromodichloromethane	0.2977	0.3111	20.90	20	5	#
2-Nitropropane	2.5666	2.3419	18.87	20	-6	
cis-1,3-Dichloropropene	0.4014	0.4084	20.35	20	2	#
4-Methyl-2-pentanone	0.2455	0.2530	103.07	100	3	#
Toluene	0.8926	0.9644	21.61	20	8	#
trans-1,3-Dichloropropene	0.4745	0.4934	20.79	20	4	#
Ethyl Methacrylate	0.4488	0.4612	20.55	20	3	
1,1,2-Trichloroethane	0.3122	0.3138	20.10	20	1	#
Tetrachloroethene	0.3588	0.4004	22.32	20	12	#
1,3-Dichloropropane	0.5498	0.5525	20.10	20	0	
2-Hexanone	0.2347	0.2460	104.83	100	5	#
Dibromochloromethane	0.3077	0.3055	19.85	20	-1	#
1,2-Dibromoethane	0.3077	0.3226	20.97	20	5	#
Chlorobenzene	1.0245	1.0872	21.22	20	6	#
1,1,1,2-Tetrachloroethane	0.3179	0.3264	20.53	20	3	
Ethylbenzene	1.6729	1.8247	21.81	20	9	#
m+p-Xylene	0.6600	0.7282	44.13	40	10	#
o-Xylene	0.6465	0.6974	21.57	20	8	#
Styrene	1.0429	1.1490	22.04	20	10	#
Bromoform	0.1925	0.1782	17.97	20	-10	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 ICV Date: 06/20/16 Time: 13:30

Lab File ID: au20v01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Isopropylbenzene	1.6699	1.8417	22.06	20	10	#
	Cyclohexanone	0.7254	0.6809	469.33	500	-6	
#	1,1,2,2-Tetrachloroethane	0.8176	0.8075	19.75	20	-1	#
	Bromobenzene	0.8348	0.8656	20.74	20	4	
	trans-1,4-Dichloro-2-butene	0.2291	0.2339	102.07	100	2	
	1,2,3-Trichloropropane	0.2358	0.2401	20.36	20	2	
	n-Propylbenzene	3.8484	4.1950	21.80	20	9	
	2-Chlorotoluene	0.7680	0.8406	21.89	20	9	
	1,3,5-Trimethylbenzene	2.8163	3.0219	21.46	20	7	
	4-Chlorotoluene	0.8067	0.8719	21.62	20	8	
	tert-Butylbenzene	0.5920	0.6353	21.46	20	7	
	Pentachloroethane	0.4548	0.4629	20.36	20	2	
	1,2,4-Trimethylbenzene	2.9367	3.1060	21.15	20	6	
	sec-Butylbenzene	3.5355	3.9235	22.19	20	11	
#	1,3-Dichlorobenzene	1.5968	1.6753	20.98	20	5	#
	p-Isopropyltoluene	3.1260	3.3377	21.35	20	7	
#	1,4-Dichlorobenzene	1.6526	1.7176	20.79	20	4	#
	1,2,3-Trimethylbenzene	3.0765	3.2218	20.94	20	5	
	Benzyl Chloride	0.2747	0.2649	17.83	20	-11	
	1,3-Diethylbenzene	1.8591	1.9511	20.99	20	5	
	1,4-Diethylbenzene	1.9128	2.0763	21.71	20	9	
	n-Butylbenzene	1.5814	1.7128	21.66	20	8	
#	1,2-Dichlorobenzene	1.5426	1.6123	20.90	20	5	#
	1,2-Diethylbenzene	1.5882	1.6740	21.08	20	5	
#	1,2-Dibromo-3-chloropropane	0.1426	0.1341	18.80	20	-6	#
	1,3,5-Trichlorobenzene	1.1924	1.2645	21.21	20	6	
#	1,2,4-Trichlorobenzene	1.0571	1.0995	20.80	20	4	#
	Hexachlorobutadiene	0.5403	0.5927	21.94	20	10	
	Naphthalene	2.3975	2.5002	20.86	20	4	
	1,2,3-Trichlorobenzene	0.9725	0.9948	20.46	20	2	
	2-Methylnaphthalene	0.9456	0.8872	16.81	20	-16	

Average %Drift 6

Compounds with required minimum RRF.
Maximum % Drift = 30 %

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6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date(s): 04/22/16 04/22/16

Heated Purge: (Y/N) Y Calibration Times: 09:55 12:07

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = la22i07.d RRF 4 = la22i06.d RRF 10= la22i05.d
RRF 20= la22i04.d RRF 50= la22i03.d RRF100= la22i02.d RRF300= la22i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD	
Dichlorodifluoromethane	#0.2870	0.3828	0.3893	0.3614	0.4075	0.3999	0.3699	0.3711	11	AVG	#
Chloromethane	#0.3320	0.3656	0.3714	0.3576	0.4022	0.4037	0.3767	0.3727	7	AVG	#
1,3-Butadiene	1.1325	0.9842	0.5645	0.5365	0.3908	0.3624	0.3065	0.6111	53	AVG	
Vinyl Chloride	#0.2958	0.3515	0.3575	0.3395	0.3770	0.3874	0.3532	0.3517	8	AVG	#
Bromomethane	#0.1986	0.2254	0.2372	0.2241	0.2420	0.2439	0.2250	0.2280	7	AVG	#
Chloroethane	#0.1753	0.1946	0.1922	0.1881	0.2064	0.2045	0.1861	0.1924	6	AVG	#
Dichlorofluoromethane	0.4077	0.4571	0.4349	0.4597	0.4592	0.4732	0.4544	0.4495	5	AVG	
n-Pentane	0.3891	0.4514	0.4094	0.4260	0.4534	0.4467	0.3920	0.4240	7	AVG	
Trichlorofluoromethane	#0.2826	0.3829	0.3851	0.3612	0.4022	0.3985	0.3803	0.3704	11	AVG	#
Ethyl ether	0.2529	0.2516	0.2591	0.2549	0.2699	0.2771	0.2737	0.2627	4	AVG	
Freon 123a	0.2777	0.3271	0.3039	0.3102	0.3135	0.3156	0.3028	0.3072	5	AVG	
Acrolein	2.1334	2.0442	2.2649	2.1023	2.1291	2.0899	2.2077	2.1388	3	AVG	
1,1-Dichloroethene	#0.1775	0.2115	0.2230	0.2222	0.2331	0.2339	0.2314	0.2189	9	AVG	#
1,1-Dichloroethene(2)	#0.0963	0.1136	0.1200	0.1180	0.1248	0.1254	0.1227	0.1173	9	AVG	#
Acetone	#0.8613	0.9062	1.0419	0.9788	0.9942	0.9364	0.9829	0.9574	6	AVG	#
Freon 113	#0.1527	0.2095	0.2284	0.2124	0.2261	0.2282	0.2160	0.2105	13	AVG	#
2-Propanol	0.7482	0.7228	0.6565	0.7423	0.7481	0.7671	0.7543	0.7342	5	AVG	
Methyl Iodide	0.3302	0.3840	0.4083	0.4067	0.4312	0.4400	0.4450	0.4065	10	AVG	
Carbon Disulfide	#0.6244	0.6879	0.7237	0.7328	0.7913	0.7973	0.7889	0.7352	9	AVG	#
Allyl Chloride	0.3373	0.3844	0.4165	0.4337	0.4556	0.4743	0.4591	0.4230	11	AVG	
Methyl Acetate	#0.3003	0.2670	0.2840	0.2884	0.3033	0.3155	0.3059	0.2949	6	AVG	#
Methylene Chloride	#0.2545	0.2542	0.2686	0.2638	0.2799	0.2836	0.2853	0.2700	5	AVG	#
t-Butyl alcohol	1.2726	1.1572	1.1518	1.1610	1.1772	1.2180	1.1969	1.1906	4	AVG	
Acrylonitrile	0.1390	0.1416	0.1550	0.1474	0.1519	0.1499	0.1572	0.1489	5	AVG	
trans-1,2-Dichloroethene	#0.1997	0.2320	0.2535	0.2507	0.2639	0.2709	0.2686	0.2484	10	AVG	#
Methyl Tertiary Butyl Ether	#0.7855	0.7876	0.8575	0.8357	0.8801	0.8958	0.8827	0.8464	5	AVG	#
n-Hexane	0.2773	0.3768	0.3853	0.3997	0.4208	0.4283	0.3998	0.3840	13	AVG	
1,1-Dichloroethane	#0.4097	0.4562	0.4870	0.4994	0.5326	0.5380	0.5292	0.4931	10	AVG	#
di-Isopropyl ether	0.8239	0.8699	0.9588	0.9544	1.0090	1.0226	0.9906	0.9470	8	AVG	
2-Chloro-1,3-butadiene	0.2883	0.3510	0.3935	0.3960	0.4291	0.4363	0.4288	0.3890	14	AVG	
Ethyl t-butyl ether	0.7478	0.7910	0.8677	0.8599	0.9198	0.9351	0.9155	0.8624	8	AVG	
cis-1,2-Dichloroethene	#0.2282	0.2629	0.2815	0.2814	0.2992	0.3037	0.3018	0.2798	10	AVG	#
2-Butanone	#0.1791	0.1803	0.2015	0.1881	0.1977	0.1949	0.2000	0.1917	5	AVG	#
2,2-Dichloropropane	0.2527	0.3028	0.3405	0.3452	0.3810	0.3918	0.3827	0.3424	15	AVG	
Propionitrile	1.4728	1.5239	1.5189	1.5568	1.5326	1.6033	1.5810	1.5413	3	AVG	
Methacrylonitrile	0.1377	0.1399	0.1450	0.1484	0.1526	0.1569	0.1538	0.1477	5	AVG	
Bromochloromethane	0.1237	0.1337	0.1414	0.1410	0.1489	0.1557	0.1543	0.1427	8	AVG	
Tetrahydrofuran	1.0707	1.2371	1.3781	1.3057	1.3311	1.3040	1.3979	1.2892	9	AVG	
Chloroform	#0.3918	0.4166	0.4485	0.4475	0.4724	0.4825	0.4775	0.4481	8	AVG	#
1,1,1-Trichloroethane	#0.3469	0.4069	0.4039	0.3995	0.4047	0.4135	0.4112	0.3981	6	AVG	#
Cyclohexane	#0.3435	0.4453	0.4651	0.4680	0.5054	0.5086	0.4768	0.4589	12	AVG	#
Cyclohexane(2)	#0.3252	0.3422	0.3653	0.3620	0.3916	0.3970	0.3688	0.3646	7	AVG	#
Cyclohexane(3)	#0.0975	0.1254	0.1364	0.1350	0.1453	0.1488	0.1401	0.1327	13	AVG	#
1,1-Dichloropropene	0.2986	0.3360	0.3681	0.3653	0.3979	0.4049	0.3951	0.3665	10	AVG	
Carbon Tetrachloride	#0.2265	0.2631	0.2897	0.3001	0.3298	0.3394	0.3380	0.2981	14	AVG	#
Isobutyl Alcohol	0.4163	0.4107	0.4018	0.4066	0.4148	0.4444	0.4375	0.4189	4	AVG	
Benzene	#0.9229	1.0064	1.0891	1.0779	1.1390	1.1605	1.1245	1.0743	8	AVG	#
1,2-Dichloroethane	#0.3957	0.3778	0.3982	0.3859	0.4022	0.4133	0.4088	0.3974	3	AVG	#
1,2-Dichloroethane(2)	#0.0310	0.0317	0.0355	0.0345	0.0359	0.0368	0.0367	0.0346	7	AVG	#<-
t-Amyl methyl ether	0.7072	0.7066	0.8032	0.8014	0.8459	0.8752	0.8531	0.7989	9	AVG	
n-Heptane	0.3508	0.4281	0.4293	0.4354	0.4536	0.4644	0.4173	0.4255	9	AVG	
n-Butanol	0.2782	0.3017	0.3098	0.3324	0.3411	0.3647	0.3577	0.3265	10	AVG	

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date(s): 04/22/16 04/22/16

Heated Purge: (Y/N) Y Calibration Times: 09:55 12:07

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = la22i07.d RRF 4 = la22i06.d RRF 10= la22i05.d
RRF 20= la22i04.d RRF 50= la22i03.d RRF100= la22i02.d RRF300= la22i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Trichloroethene	#0.2264	0.2535	0.2711	0.2713	0.2905	0.2951	0.2924	0.2715	9	AVG #
Methylcyclohexane	#0.3214	0.4266	0.4552	0.4635	0.4851	0.5025	0.4766	0.4473	14	AVG #
Methylcyclohexane(2)	#0.1499	0.1904	0.2036	0.2028	0.2190	0.2257	0.2153	0.2009	13	AVG #
1,2-Dichloropropane	#0.2499	0.2713	0.2981	0.2974	0.3151	0.3226	0.3159	0.2958	9	AVG #
Dibromomethane	0.1636	0.1712	0.1845	0.1791	0.1910	0.1968	0.1970	0.1833	7	AVG
1,4-Dioxane	0.0995	0.1062	0.1079	0.1102	0.1154	0.1198	0.1152	0.1106	6	AVG
Methyl Methacrylate	0.1854	0.2206	0.2502	0.2521	0.2674	0.2811	0.2782	0.2479	14	AVG
Bromodichloromethane	#0.2713	0.2876	0.3258	0.3276	0.3645	0.3795	0.3857	0.3346	13	AVG #
2-Nitropropane	0.0727	0.0753	0.0905	0.0915	0.1008	0.1035	0.1104	0.0921	15	AVG
2-Chloroethyl Vinyl Ether	0.1545	0.1805	0.2061	0.2051	0.2397	0.2485	0.2430	0.2111	17	AVG
cis-1,3-Dichloropropene	#0.3116	0.3583	0.4217	0.4373	0.4785	0.4970	0.4999	0.4292	17	AVG #
4-Methyl-2-pentanone	#0.3178	0.3502	0.4164	0.4053	0.4245	0.4161	0.4228	0.3933	11	AVG #
Toluene	#0.7746	0.8364	0.9016	0.9109	0.9437	0.9433	0.9176	0.8897	7	AVG #
trans-1,3-Dichloropropene	#0.3516	0.4233	0.4915	0.5342	0.5838	0.6087	0.6154	0.5155	19	AVG #
Ethyl Methacrylate	0.4405	0.4863	0.5708	0.5907	0.6250	0.6488	0.6355	0.5711	14	AVG
1,1,2-Trichloroethane	#0.3178	0.3216	0.3508	0.3414	0.3629	0.3646	0.3606	0.3457	6	AVG #
Tetrachloroethene	#0.3081	0.3519	0.3818	0.3816	0.4028	0.4052	0.4049	0.3766	9	AVG #
1,3-Dichloropropane	0.5449	0.5635	0.6223	0.6189	0.6430	0.6520	0.6408	0.6122	7	AVG
2-Hexanone	#0.3130	0.3278	0.3943	0.3980	0.4088	0.4008	0.4016	0.3778	10	AVG #
Dibromochloromethane	#0.2550	0.2765	0.3265	0.3422	0.3723	0.3920	0.4123	0.3395	17	AVG #
1,2-Dibromoethane	#0.3141	0.3392	0.3711	0.3759	0.3934	0.4026	0.4032	0.3713	9	AVG #
1-Chlorohexane	0.4522	0.4760	0.4969	0.5007	0.5275	0.5281	0.5124	0.4991	6	AVG
Chlorobenzene	#0.8769	0.9248	1.0194	1.0239	1.0673	1.0719	1.0638	1.0069	8	AVG #
1,1,1,2-Tetrachloroethane	0.2644	0.2911	0.3278	0.3373	0.3591	0.3713	0.3811	0.3332	13	AVG
Ethylbenzene	#1.3961	1.5924	1.7537	1.7724	1.8530	1.8631	1.7848	1.7165	10	AVG #
m+p-Xylene	#0.5302	0.5986	0.6784	0.6810	0.7111	0.7170	0.6968	0.6590	10	AVG #
o-Xylene	#0.5161	0.5895	0.6670	0.6653	0.6961	0.7083	0.6950	0.6482	11	AVG #
Styrene	#0.7989	0.9728	1.1154	1.1434	1.2039	1.2245	1.1840	1.0918	14	AVG #
Bromoform	#0.1831	0.1832	0.2089	0.2271	0.2540	0.2785	0.3018	0.2338	20	AVG #
Isopropylbenzene	#1.2543	1.5384	1.7097	1.7228	1.7909	1.8006	1.7339	1.6501	12	AVG #
Cyclohexanone	0.4397	0.4358	0.5803	0.5316	0.5203	0.5301	0.5326	0.5100	10	AVG
Bromobenzene	0.7529	0.7988	0.8533	0.8741	0.8985	0.9232	0.9146	0.8593	7	AVG
1,1,2,2-Tetrachloroethane	#0.9259	0.9395	1.0265	1.0311	1.0483	1.0805	1.0366	1.0126	6	AVG #
1,2,3-Trichloropropane	0.2909	0.2784	0.2897	0.2909	0.2957	0.3057	0.2960	0.2925	3	AVG
trans-1,4-Dichloro-2-butene	0.0404	0.0695	0.0962	0.1362	0.1644	0.2064	0.2318	0.1350	52	2NDDEG
n-Propylbenzene	3.1408	3.6653	3.9623	4.0646	4.1491	4.1511	3.7625	3.8422	9	AVG
2-Chlorotoluene	0.6777	0.7158	0.7826	0.8044	0.8207	0.8336	0.8200	0.7793	8	AVG
4-Chlorotoluene	0.6926	0.7664	0.8374	0.8476	0.8696	0.8866	0.8599	0.8229	8	AVG
1,3,5-Trimethylbenzene	2.1318	2.5246	2.7768	2.8631	2.9485	2.9754	2.8303	2.7215	11	AVG
tert-Butylbenzene	0.4613	0.5206	0.5523	0.5832	0.6023	0.6192	0.6041	0.5633	10	AVG
Pentachloroethane	0.3322	0.3941	0.4399	0.4759	0.5118	0.5515	0.5499	0.4650	18	AVG
1,2,4-Trimethylbenzene	2.2913	2.6289	2.8813	2.9487	3.0386	3.0853	2.9358	2.8300	10	AVG
sec-Butylbenzene	2.7720	3.3416	3.5031	3.6472	3.7339	3.7220	3.4234	3.4490	10	AVG
1,3-Dichlorobenzene	#1.4757	1.5232	1.6098	1.6526	1.6892	1.7213	1.6445	1.6166	5	AVG #
p-Isopropyltoluene	2.3507	2.8191	3.0347	3.1655	3.2336	3.2836	3.1108	2.9997	11	AVG
1,4-Dichlorobenzene	#1.5844	1.6105	1.7143	1.7158	1.7446	1.7731	1.6798	1.6889	4	AVG #
1,2,3-Trimethylbenzene	2.6174	2.7684	2.9411	3.0563	3.1132	3.2112	3.0087	2.9595	7	AVG
Benzyl Chloride	1.0881	1.3714	1.6479	1.8342	2.0342	2.1754	2.1461	1.7568	23	2NDDEG
1,3-Diethylbenzene	1.4843	1.7174	1.8059	1.8857	1.9136	1.9595	1.8592	1.8037	9	AVG
1,4-Diethylbenzene	1.5943	1.8034	1.8904	1.9651	1.9762	2.0236	1.9148	1.8811	8	AVG
1,2-Dichlorobenzene	#1.5095	1.5321	1.6250	1.6310	1.6384	1.6651	1.6164	1.6025	4	AVG #
n-Butylbenzene	1.3650	1.5046	1.5472	1.6079	1.6153	1.6132	1.4918	1.5350	6	AVG

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date(s): 04/22/16 04/22/16

Heated Purge: (Y/N) Y Calibration Times: 09:55 12:07

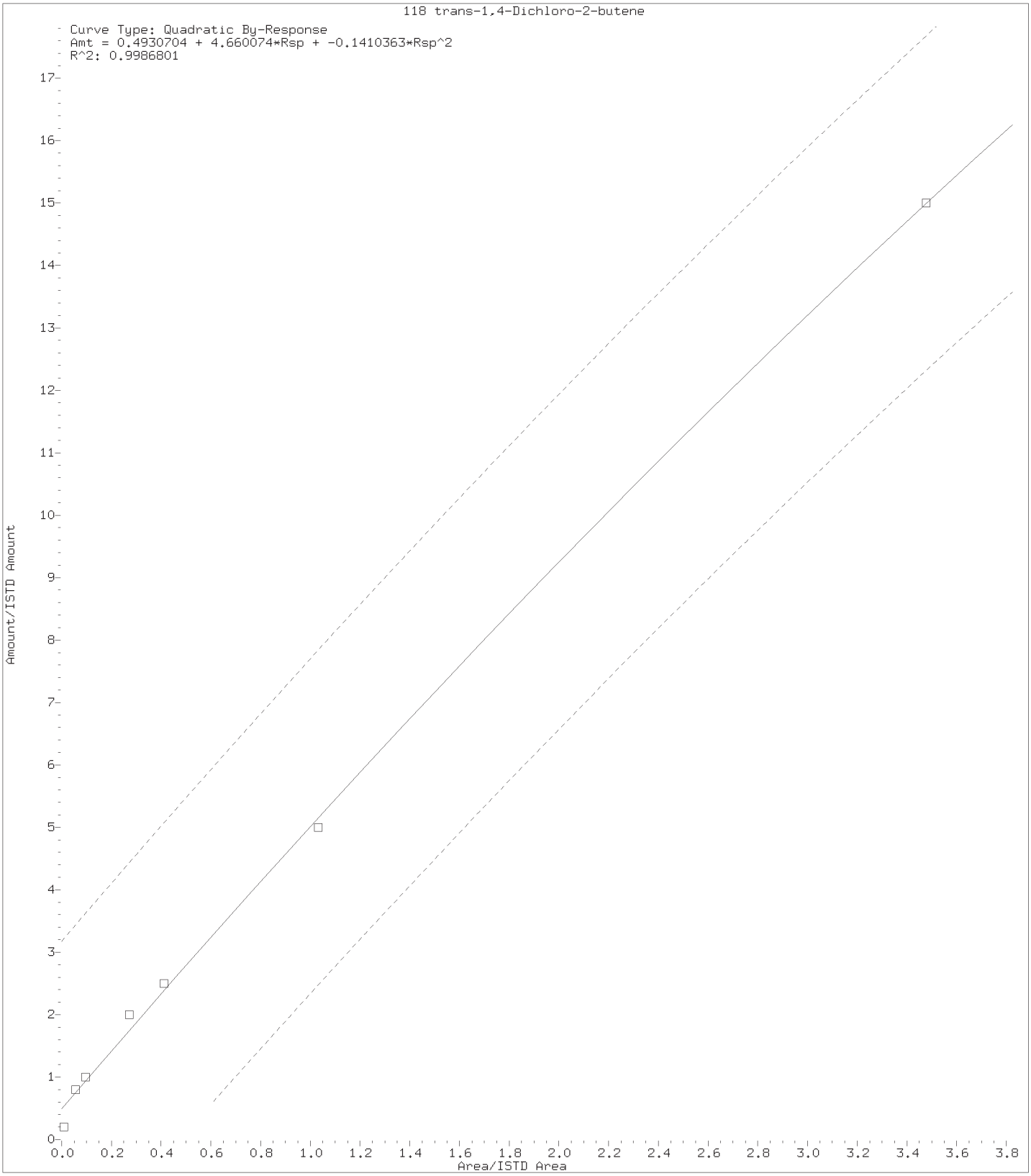
Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = la22i07.d RRF 4 = la22i06.d RRF 10= la22i05.d
RRF 20= la22i04.d RRF 50= la22i03.d RRF100= la22i02.d RRF300= la22i01.d

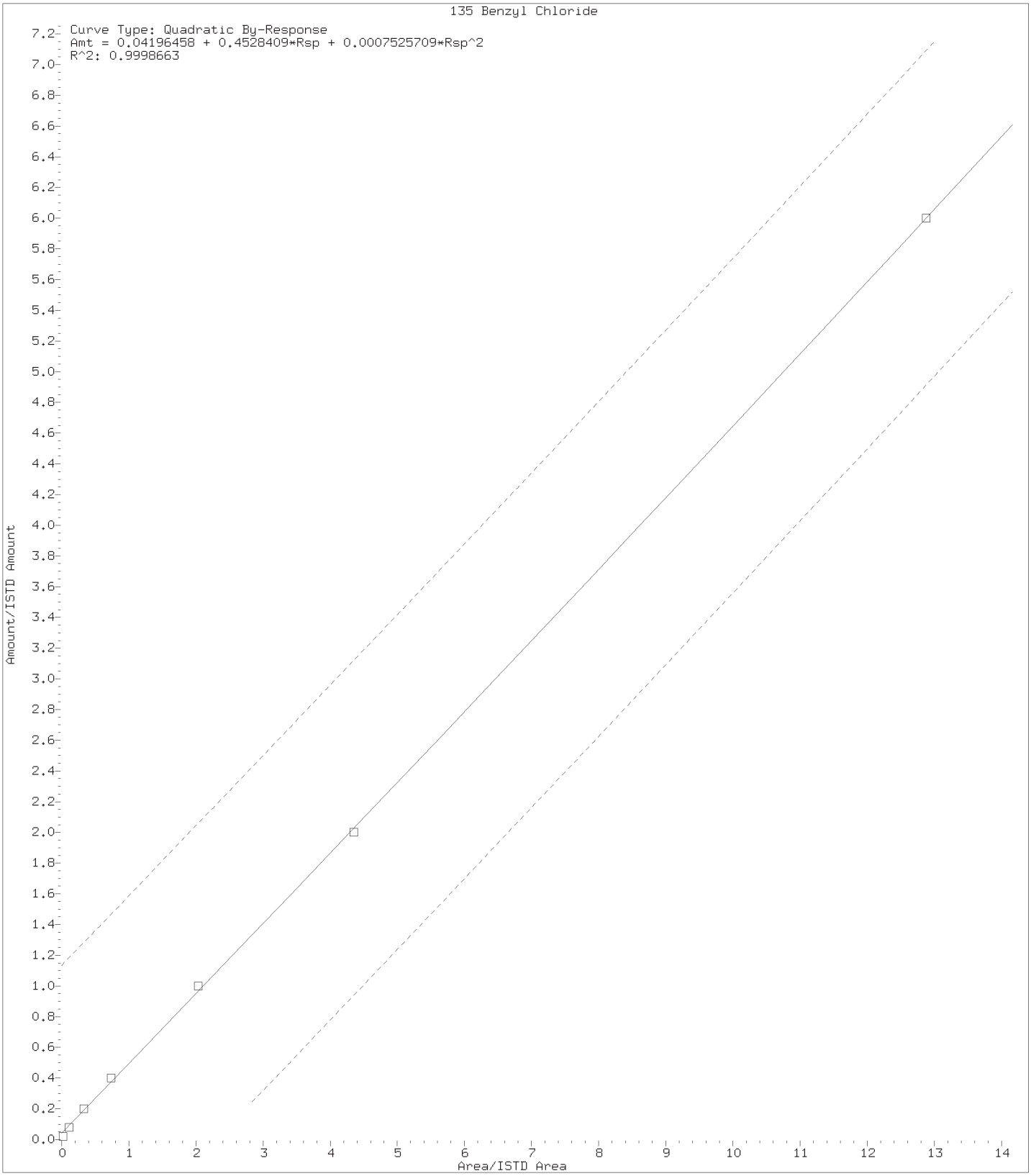
COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
1,2-Diethylbenzene	1.3225	1.4672	1.5421	1.5992	1.6106	1.6506	1.5771	1.5385	7	AVG
1,2-Dibromo-3-chloropropane	#0.1574	0.1700	0.1944	0.1980	0.2062	0.2228	0.2214	0.1957	13	AVG #
1,3,5-Trichlorobenzene	1.2631	1.1999	1.2685	1.2933	1.3000	1.3228	1.2797	1.2753	3	AVG
1,2,4-Trichlorobenzene	#1.3374	1.2075	1.2395	1.2630	1.2635	1.3040	1.2310	1.2637	4	AVG #
Hexachlorobutadiene	0.6454	0.5291	0.5122	0.5462	0.5263	0.5436	0.4748	0.5397	10	AVG
Naphthalene	3.1904	3.2213	3.4607	3.5124	3.5111	3.6599	3.2750	3.4044	5	AVG
1,2,3-Trichlorobenzene	1.2456	1.1501	1.1979	1.1964	1.1890	1.2328	1.1262	1.1911	4	AVG
2-Methylnaphthalene	2.2999	1.9798	2.0306	2.2775	2.1941	2.4127	1.6627	2.1225	12	AVG
Dibromofluoromethane	0.2376	0.2337	0.2391	0.2342	0.2404	0.2400	0.2377	0.2375	1	AVG
Dibromofluoromethane(2)	0.2444	0.2402	0.2448	0.2387	0.2441	0.2464	0.2436	0.2432	1	AVG
1,2-Dichloroethane-d4	0.0602	0.0599	0.0605	0.0595	0.0603	0.0604	0.0589	0.0600	1	AVG
1,2-Dichloroethane-d4(2)	0.3102	0.3070	0.3092	0.3013	0.3114	0.3084	0.3040	0.3073	1	AVG
1,2-Dichloroethane-d4(3)	0.0385	0.0381	0.0382	0.0376	0.0386	0.0381	0.0375	0.0381	1	AVG
Toluene-d8	1.3085	1.3151	1.3157	1.3199	1.3074	1.3027	1.2919	1.3088	1	AVG
Toluene-d8(2)	0.8506	0.8586	0.8547	0.8598	0.8471	0.8503	0.8445	0.8522	1	AVG
4-Bromofluorobenzene	0.4845	0.4849	0.4902	0.4836	0.4854	0.4830	0.4785	0.4843	1	AVG
4-Bromofluorobenzene(2)	0.4157	0.4147	0.4154	0.4124	0.4125	0.4070	0.4073	0.4121	1	AVG

Average %RSD 9

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.



Digitally signed by Brett W. Kenyon on 04/25/2016 at 16:07.
Target 3.5 esignature user ID: bwk03231



Digitally signed by Brett W. Kenyon on 04/25/2016 at 16:07.
Target 3.5 esignature user ID: bwk03231

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP09915.i/16apr22i.b/la22i01.d	VSTD300
/chem/HP09915.i/16apr22i.b/la22i02.d	VSTD100
/chem/HP09915.i/16apr22i.b/la22i03.d	VSTD050
/chem/HP09915.i/16apr22i.b/la22i04.d	VSTD020
/chem/HP09915.i/16apr22i.b/la22i05.d	VSTD010
/chem/HP09915.i/16apr22i.b/la22i06.d	VSTD004
/chem/HP09915.i/16apr22i.b/la22i07.d	VSTD001

Area Summary

File ID:

Internal Standard Name	la22i01.d	la22i02.d	la22i03.d	la22i04.d	la22i05.d	la22i06.d	la22i07.d	Avg. Area	%RSD	In Spec
t-Butyl alcohol-d10	230813	237588	239110	234793	222755	229317	220884	230751	3	Yes
Fluorobenzene	1256794	1268629	1288793	1295555	1231017	1298555	1242368	1268816	2	Yes
Chlorobenzene-d5	960626	972262	977519	964347	926964	970322	934821	958123	2	Yes
1,4-Dichlorobenzene-d4	517298	509521	514202	499944	492114	506851	490975	504415	2	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

File ID:

Internal Standard Name	la22i01.d	la22i02.d	la22i03.d	la22i04.d	la22i05.d	la22i06.d	la22i07.d	Avg. RT
t-Butyl alcohol-d10	4.012	3.993	3.990	3.996	3.993	3.993	4.009	3.998
Fluorobenzene	7.510	7.504	7.504	7.507	7.507	7.507	7.510	7.507
Chlorobenzene-d5	11.041	11.041	11.041	11.041	11.041	11.041	11.041	11.041
1,4-Dichlorobenzene-d4	12.938	12.935	12.938	12.935	12.938	12.935	12.935	12.936

* indicates the retention time is greater than 30 seconds from the average RT.

Report generated on 04/22/2016 at 13:38.

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 ICV Date: 04/22/16 Time: 12:51

Lab File ID: la22v01.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
# Dichlorodifluoromethane	0.3711	0.3115	16.78	20	-16	#
# Chloromethane	0.3727	0.3338	17.91	20	-10	#
1,3-Butadiene	0.6111	0.5293	17.32	20	-13	
# Vinyl Chloride	0.3517	0.3217	18.29	20	-9	#
# Bromomethane	0.2280	0.2031	17.81	20	-11	#
# Chloroethane	0.1924	0.1731	17.99	20	-10	#
Dichlorofluoromethane	0.4495	0.4047	18.01	20	-10	
n-Pentane	0.4240	0.4263	20.11	20	1	
# Trichlorofluoromethane	0.3704	0.3612	19.50	20	-2	#
Ethyl ether	0.2627	0.2668	20.31	20	2	
Freon 123a	0.3072	0.2804	18.25	20	-9	
Acrolein	2.1388	2.0638	144.74	150	-4	
# 1,1-Dichloroethene	0.2189	0.2240	20.47	20	2	#
# Acetone	0.9574	1.3094	205.15	150	37	#<-
# Freon 113	0.2105	0.2190	20.81	20	4	#
2-Propanol	0.7342	0.7487	152.96	150	2	
Methyl Iodide	0.4065	0.4033	19.84	20	-1	
# Carbon Disulfide	0.7352	0.7026	19.11	20	-4	#
Allyl Chloride	0.4230	0.4568	21.60	20	8	
# Methyl Acetate	0.2949	0.2937	19.92	20	0	#
# Methylene Chloride	0.2700	0.2743	20.32	20	2	#
t-Butyl alcohol	1.1906	1.1915	200.15	200	0	
Acrylonitrile	0.1489	0.1442	96.88	100	-3	
# trans-1,2-Dichloroethene	0.2484	0.2708	21.80	20	9	#
# Methyl Tertiary Butyl Ether	0.8464	0.8425	19.91	20	0	#
n-Hexane	0.3840	0.4115	21.44	20	7	
# 1,1-Dichloroethane	0.4931	0.5078	20.59	20	3	#
di-Isopropyl ether	0.9470	0.9965	21.05	20	5	
2-Chloro-1,3-butadiene	0.3890	0.4414	22.69	20	13	
Ethyl t-butyl ether	0.8624	0.8747	20.28	20	1	
# cis-1,2-Dichloroethene	0.2798	0.2972	21.24	20	6	#
# 2-Butanone	0.1917	0.2181	170.71	150	14	#
2,2-Dichloropropane	0.3424	0.3561	20.80	20	4	
Propionitrile	1.5413	1.6254	158.18	150	5	
Methacrylonitrile	0.1477	0.1546	156.95	150	5	
Bromochloromethane	0.1427	0.1464	20.53	20	3	

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 ICV Date: 04/22/16 Time: 12:51

Lab File ID: la22v01.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
Tetrahydrofuran	1.2892	1.3255	102.81	100	3	
# Chloroform	0.4481	0.4687	20.92	20	5	#
# 1,1,1-Trichloroethane	0.3981	0.4040	20.30	20	1	#
# Cyclohexane	0.4589	0.4841	21.10	20	5	#
1,1-Dichloropropene	0.3665	0.3654	19.93	20	0	
# Carbon Tetrachloride	0.2981	0.3125	20.97	20	5	#
Isobutyl Alcohol	0.4189	0.4211	502.62	500	1	
# Benzene	1.0743	1.1239	20.92	20	5	#
# 1,2-Dichloroethane	0.3974	0.4004	20.15	20	1	#
t-Amyl methyl ether	0.7989	0.8070	20.20	20	1	
n-Heptane	0.4255	0.4381	20.59	20	3	
n-Butanol	0.3265	0.3337	1022.09	1000	2	
# Trichloroethene	0.2715	0.2900	21.37	20	7	#
# Methylcyclohexane	0.4473	0.4906	21.94	20	10	#
# 1,2-Dichloropropane	0.2958	0.3121	21.10	20	6	#
Dibromomethane	0.1833	0.1840	20.07	20	0	
1,4-Dioxane	0.1106	0.1060	479.13	500	-4	
Methyl Methacrylate	0.2479	0.2459	19.84	20	-1	
# Bromodichloromethane	0.3346	0.3385	20.24	20	1	#
2-Nitropropane	0.0921	0.0858	18.63	20	-7	
2-Chloroethyl Vinyl Ether	0.2111	0.2174	20.60	20	3	
# cis-1,3-Dichloropropene	0.4292	0.4456	20.76	20	4	#
# 4-Methyl-2-pentanone	0.3933	0.4092	104.03	100	4	#
# Toluene	0.8897	0.9420	21.17	20	6	#
# trans-1,3-Dichloropropene	0.5155	0.5416	21.01	20	5	#
Ethyl Methacrylate	0.5711	0.6002	21.02	20	5	
# 1,1,2-Trichloroethane	0.3457	0.3536	20.46	20	2	#
# Tetrachloroethene	0.3766	0.3996	21.22	20	6	#
1,3-Dichloropropane	0.6122	0.6201	20.26	20	1	
# 2-Hexanone	0.3778	0.4137	109.50	100	10	#
# Dibromochloromethane	0.3395	0.3374	19.87	20	-1	#
# 1,2-Dibromoethane	0.3713	0.3836	20.66	20	3	#
1-Chlorohexane	0.4991	0.5187	20.78	20	4	
# Chlorobenzene	1.0069	1.0463	20.78	20	4	#
1,1,1,2-Tetrachloroethane	0.3332	0.3426	20.57	20	3	
# Ethylbenzene	1.7165	1.8147	21.14	20	6	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 ICV Date: 04/22/16 Time: 12:51

Lab File ID: la22v01.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	m+p-Xylene	0.6590	0.7026	42.65	40	7	#
#	o-Xylene	0.6482	0.6768	20.88	20	4	#
#	Styrene	1.0918	1.1651	21.34	20	7	#
#	Bromoform	0.2338	0.2201	18.83	20	-6	#
#	Isopropylbenzene	1.6501	1.7896	21.69	20	8	#
	Cyclohexanone	0.5100	0.4286	420.13	500	-16	
	Bromobenzene	0.8593	0.8833	20.56	20	3	
#	1,1,2,2-Tetrachloroethane	1.0126	1.0072	19.89	20	-1	#
	1,2,3-Trichloropropane	0.2925	0.2953	20.19	20	1	
	trans-1,4-Dichloro-2-butene	0.1350	0.1304	84.95	100	-15	
	n-Propylbenzene	3.8422	4.0837	21.26	20	6	
	2-Chlorotoluene	0.7793	0.8185	21.01	20	5	
	4-Chlorotoluene	0.8229	0.8474	20.60	20	3	
	1,3,5-Trimethylbenzene	2.7215	2.9057	21.35	20	7	
	tert-Butylbenzene	0.5633	0.5909	20.98	20	5	
	Pentachloroethane	0.4650	0.4842	20.82	20	4	
	1,2,4-Trimethylbenzene	2.8300	2.9549	20.88	20	4	
	sec-Butylbenzene	3.4490	3.6765	21.32	20	7	
#	1,3-Dichlorobenzene	1.6166	1.6408	20.30	20	1	#
	p-Isopropyltoluene	2.9997	3.1165	20.78	20	4	
#	1,4-Dichlorobenzene	1.6889	1.7215	20.39	20	2	#
	1,2,3-Trimethylbenzene	2.9595	3.1291	21.15	20	6	
	Benzyl Chloride	1.7568	1.7737	18.18	20	-9	
	1,3-Diethylbenzene	1.8037	1.8905	20.96	20	5	
	1,4-Diethylbenzene	1.8811	2.0058	21.33	20	7	
#	1,2-Dichlorobenzene	1.6025	1.6168	20.18	20	1	#
	n-Butylbenzene	1.5350	1.5804	20.59	20	3	
	1,2-Diethylbenzene	1.5385	1.6189	21.05	20	5	
#	1,2-Dibromo-3-chloropropane	0.1957	0.1875	19.15	20	-4	#
	1,3,5-Trichlorobenzene	1.2753	1.2558	19.69	20	-2	
#	1,2,4-Trichlorobenzene	1.2637	1.2019	19.02	20	-5	#
	Hexachlorobutadiene	0.5397	0.4853	17.99	20	-10	
	Naphthalene	3.4044	3.2790	19.26	20	-4	
	1,2,3-Trichlorobenzene	1.1911	1.1001	18.47	20	-8	
	2-Methylnaphthalene	2.1225	1.6045	15.12	20	-24	

Average %Drift 5

Compounds with required minimum RRF.
Maximum % Drift = 30 %

^

Lancaster Laboratories
Continuing Calibration Internal Standard Check

Initial Calibration Standards:

/chem2/HP09685.i/16jun20a.b/au20i07.d
/chem2/HP09685.i/16jun20a.b/au20i06.d
/chem2/HP09685.i/16jun20a.b/au20i05.d
/chem2/HP09685.i/16jun20a.b/au20i04.d
/chem2/HP09685.i/16jun20a.b/au20i03.d
/chem2/HP09685.i/16jun20a.b/au20i02.d
/chem2/HP09685.i/16jun20a.b/au20i01.d

File /chem2/HP09685.i/16jun20a.b/au20i03.d is Mid Level Calibration Standard used for comparison.

Current Continuing Calibration Standard:

/chem2/HP09685.i/16jun27a.b/au27c01.d

RT Summary

Internal Standard Name	File ID: au27c01.d	ICAL RT	In Spec
t-Butyl alcohol-d10	3.958	3.958	Yes
Fluorobenzene	7.456	7.449	Yes
Chlorobenzene-d5	11.014	11.008	Yes
1,4-Dichlorobenzene-d4	12.919	12.919	Yes

A "No" indicates the retention time is greater than 30 seconds from the referenced ICAL standard.

Area Summary

Internal Standard Name	File ID: au27c01.d	ICAL Area	Low Limit	High Limit	In Spec
t-Butyl alcohol-d10	82097	117913	58956	235826	Yes
Fluorobenzene	911986	1094634	547317	2189268	Yes
Chlorobenzene-d5	680844	812973	406486	1625946	Yes
1,4-Dichlorobenzene-d4	367832	430819	215410	861638	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

Comments: _____

report generated on 06/27/2016 at 09:06

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/27/16 Time: 08:37

Lab File ID: au27c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Dichlorodifluoromethane	0.3921	0.3706	47.25	50	-5	#
#	Chloromethane	0.4074	0.3770	46.27	50	-7	#
#	Vinyl Chloride	0.3696	0.3461	46.82	50	-6	#
#	Bromomethane	0.2509	0.2451	48.83	50	-2	#
#	Chloroethane	0.2042	0.1972	48.30	50	-3	#
#	Trichlorofluoromethane	0.4270	0.4300	50.35	50	1	#
	Ethanol	0.1798	0.1796	2496.53	2500	0	
	Acrolein	2.6570	2.7064	509.29	500	2	
#	1,1-Dichloroethene	0.2194	0.2103	47.93	50	-4	#
#	1,1-Dichloroethene(2)	0.1162	0.1173	50.47	50	1	#
#	Acetone	1.2959	1.3010	100.39	100	0	#
#	Freon 113	0.2257	0.2160	47.86	50	-4	#
	2-Propanol	0.9846	0.9680	245.78	250	-2	
	Methyl Iodide	0.4018	0.3762	46.81	50	-6	
#	Carbon Disulfide	0.7191	0.7193	50.01	50	0	#
#	Methyl Acetate	0.1913	0.1658	43.35	50	-13	#
	Allyl Chloride	0.3979	0.3869	48.61	50	-3	
#	Methylene Chloride	0.2777	0.2516	45.31	50	-9	#
	t-Butyl alcohol	1.4610	1.3635	233.32	250	-7	
	Acrylonitrile	0.0920	0.0912	49.58	50	-1	
#	Methyl Tertiary Butyl Ether	0.7119	0.6559	46.07	50	-8	#
#	trans-1,2-Dichloroethene	0.2407	0.2402	49.89	50	0	#
	n-Hexane	0.3710	0.3344	45.07	50	-10	
#	1,1-Dichloroethane	0.4557	0.4550	49.92	50	0	#
	di-Isopropyl ether	0.8458	0.8465	50.04	50	0	
	2-Chloro-1,3-butadiene	0.3901	0.3952	50.64	50	1	
	Ethyl t-butyl ether	0.7219	0.6849	47.43	50	-5	
#	2-Butanone	5.7599	6.1288	106.40	100	6	#
#	cis-1,2-Dichloroethene	0.2729	0.2697	49.41	50	-1	#
	2,2-Dichloropropane	0.3234	0.3320	51.33	50	3	
	Propionitrile	1.8044	1.9195	265.95	250	6	
	Methacrylonitrile	0.1069	0.0987	115.33	125	-8	
	Bromochloromethane	0.1330	0.1259	47.33	50	-5	
	Tetrahydrofuran	1.5605	1.6325	104.61	100	5	
#	Chloroform	0.4347	0.4415	50.78	50	2	#
#	1,1,1-Trichloroethane	0.3941	0.3847	48.81	50	-2	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/27/16 Time: 08:37

Lab File ID: au27c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# Cyclohexane	0.4532	0.4252	46.91	50	-6	#
# Cyclohexane(2)	0.3756	0.3459	46.04	50	-8	#
# Cyclohexane(3)	0.1365	0.1264	46.28	50	-7	#
1,1-Dichloropropene	0.3473	0.3560	51.26	50	3	
# Carbon Tetrachloride	0.2843	0.3043	53.52	50	7	#
Isobutyl Alcohol	0.4952	0.5303	669.31	625	7	
# Benzene	1.0828	1.0328	47.69	50	-5	#
# 1,2-Dichloroethane	0.3479	0.3418	49.13	50	-2	#
# 1,2-Dichloroethane(2)	0.0389	0.0299	38.44	50	-23	#<-
t-Amyl methyl ether	0.6653	0.6243	46.92	50	-6	
n-Heptane	0.4035	0.3660	45.36	50	-9	
n-Butanol	0.4194	0.4037	1203.15	1250	-4	
# Trichloroethene	0.2563	0.2570	50.15	50	0	#
# Methylcyclohexane	0.4765	0.4423	46.41	50	-7	#
# 1,2-Dichloropropane	0.2781	0.2805	50.43	50	1	#
Methyl Methacrylate	0.1773	0.1699	47.92	50	-4	
1,4-Dioxane	0.1526	0.1602	656.04	625	5	
Dibromomethane	0.1557	0.1534	49.27	50	-1	
# Bromodichloromethane	0.2977	0.3161	53.10	50	6	#
2-Nitropropane	2.5666	3.3668	117.10	100	17	
# cis-1,3-Dichloropropene	0.4014	0.4120	51.32	50	3	#
# 4-Methyl-2-pentanone	0.2455	0.2396	97.63	100	-2	#
# Toluene	0.8926	0.8874	49.71	50	-1	#
# trans-1,3-Dichloropropene	0.4745	0.4988	52.56	50	5	#
Ethyl Methacrylate	0.4488	0.4388	48.88	50	-2	
# 1,1,2-Trichloroethane	0.3122	0.2996	47.99	50	-4	#
# Tetrachloroethene	0.3588	0.3597	50.12	50	0	#
1,3-Dichloropropane	0.5498	0.5388	49.00	50	-2	
# 2-Hexanone	0.2347	0.2269	96.68	100	-3	#
# Dibromochloromethane	0.3077	0.3276	53.22	50	6	#
# 1,2-Dibromoethane	0.3077	0.3004	48.82	50	-2	#
# Chlorobenzene	1.0245	1.0267	50.10	50	0	#
1,1,1,2-Tetrachloroethane	0.3179	0.3348	52.65	50	5	
# Ethylbenzene	1.6729	1.7473	52.22	50	4	#
# m+p-Xylene	0.6600	0.6879	104.23	100	4	#
# o-Xylene	0.6465	0.6727	52.02	50	4	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/27/16 Time: 08:37

Lab File ID: au27c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Styrene	1.0429	1.1276	54.06	50	8	#
#	Bromoform	0.1925	0.2038	46.62	50	-7	#
#	Isopropylbenzene	1.6699	1.6685	49.96	50	0	#
	Cyclohexanone	0.7254	0.5962	513.67	625	-18	
#	1,1,2,2-Tetrachloroethane	0.8176	0.7728	47.26	50	-5	#
	Bromobenzene	0.8348	0.8237	49.34	50	-1	
	trans-1,4-Dichloro-2-butene	0.2291	0.2252	122.83	125	-2	
	1,2,3-Trichloropropane	0.2358	0.2203	46.70	50	-7	
	n-Propylbenzene	3.8484	3.7736	49.03	50	-2	
	2-Chlorotoluene	0.7680	0.7626	49.64	50	-1	
	1,3,5-Trimethylbenzene	2.8163	2.7459	48.75	50	-3	
	4-Chlorotoluene	0.8067	0.8050	49.89	50	0	
	tert-Butylbenzene	0.5920	0.5585	47.17	50	-6	
	Pentachloroethane	0.4548	0.4738	52.09	50	4	
	1,2,4-Trimethylbenzene	2.9367	2.8993	49.36	50	-1	
	sec-Butylbenzene	3.5355	3.3873	47.90	50	-4	
#	1,3-Dichlorobenzene	1.5968	1.5897	49.78	50	0	#
	p-Isopropyltoluene	3.1260	3.0509	48.80	50	-2	
#	1,4-Dichlorobenzene	1.6526	1.6473	49.84	50	0	#
	1,2,3-Trimethylbenzene	3.0765	3.0760	49.99	50	0	
	Benzyl Chloride	0.2747	0.2855	42.59	50	-15	
	1,3-Diethylbenzene	1.8591	1.9180	51.58	50	3	
	1,4-Diethylbenzene	1.9128	1.9653	51.37	50	3	
	n-Butylbenzene	1.5814	1.5233	48.16	50	-4	
#	1,2-Dichlorobenzene	1.5426	1.5333	49.70	50	-1	#
	1,2-Diethylbenzene	1.5882	1.6177	50.93	50	2	
#	1,2-Dibromo-3-chloropropane	0.1426	0.1401	49.11	50	-2	#
	1,3,5-Trichlorobenzene	1.1924	1.1706	49.09	50	-2	
#	1,2,4-Trichlorobenzene	1.0571	1.0484	49.59	50	-1	#
	Hexachlorobutadiene	0.5403	0.5201	48.13	50	-4	
	Naphthalene	2.3975	2.4845	51.81	50	4	
	1,2,3-Trichlorobenzene	0.9725	0.9832	50.55	50	1	
	2-Methylnaphthalene	0.9456	1.1802	42.34	50	-15	
	Dibromofluoromethane	0.2289	0.2437	53.22	50	6	
	Dibromofluoromethane(2)	0.2354	0.2494	52.97	50	6	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/27/16 Time: 08:37

Lab File ID: au27c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2-Dichloroethane-d4	0.0545	0.0582	53.41	50	7
1,2-Dichloroethane-d4(2)	0.2631	0.2955	56.15	50	12
1,2-Dichloroethane-d4(3)	0.0345	0.0372	53.85	50	8
Toluene-d8	1.3647	1.3810	50.60	50	1
Toluene-d8(2)	0.8772	0.8820	50.27	50	1
4-Bromofluorobenzene	0.4851	0.4933	50.84	50	2
4-Bromofluorobenzene(2)	0.3986	0.4114	51.60	50	3

Average %Drift 4

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

Lancaster Laboratories

Continuing Calibration Internal Standard Check

Initial Calibration Standards:

/chem2/HP09685.i/16jun20a.b/au20i07.d
/chem2/HP09685.i/16jun20a.b/au20i06.d
/chem2/HP09685.i/16jun20a.b/au20i05.d
/chem2/HP09685.i/16jun20a.b/au20i04.d
/chem2/HP09685.i/16jun20a.b/au20i03.d
/chem2/HP09685.i/16jun20a.b/au20i02.d
/chem2/HP09685.i/16jun20a.b/au20i01.d

File /chem2/HP09685.i/16jun20a.b/au20i03.d is Mid Level Calibration Standard used for comparison.

Current Continuing Calibration Standard:

/chem2/HP09685.i/16jul06a.b/al06c01.d

RT Summary

Internal Standard Name	File ID: al06c01.d	ICAL RT	In Spec
t-Butyl alcohol-d10	3.958	3.958	Yes
Fluorobenzene	7.456	7.449	Yes
Chlorobenzene-d5	11.015	11.008	Yes
1,4-Dichlorobenzene-d4	12.919	12.919	Yes

A "No" indicates the retention time is greater than 30 seconds from the referenced ICAL standard.

Area Summary

Internal Standard Name	File ID: al06c01.d	ICAL Area	Low Limit	High Limit	In Spec
t-Butyl alcohol-d10	95546	117913	58956	235826	Yes
Fluorobenzene	962411	1094634	547317	2189268	Yes
Chlorobenzene-d5	732907	812973	406486	1625946	Yes
1,4-Dichlorobenzene-d4	396433	430819	215410	861638	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

Comments:

report generated on 07/06/2016 at 09:50

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 07/06/16 Time: 08:09

Lab File ID: al06c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# Dichlorodifluoromethane	0.3921	0.4216	53.76	50	8	#
# Chloromethane	0.4074	0.4345	53.33	50	7	#
# Vinyl Chloride	0.3696	0.3982	53.87	50	8	#
# Bromomethane	0.2509	0.2716	54.13	50	8	#
# Chloroethane	0.2042	0.2225	54.48	50	9	#
# Trichlorofluoromethane	0.4270	0.4544	53.20	50	6	#
Ethanol	0.1798	0.1771	2461.54	2500	-2	
Acrolein	2.6570	2.8859	543.06	500	9	
# 1,1-Dichloroethene	0.2194	0.2422	55.20	50	10	#
# 1,1-Dichloroethene(2)	0.1162	0.1307	56.20	50	12	#
# Acetone	1.2959	1.3409	103.47	100	3	#
# Freon 113	0.2257	0.2421	53.62	50	7	#
2-Propanol	0.9846	1.0004	253.99	250	2	
Methyl Iodide	0.4018	0.4351	54.14	50	8	
# Carbon Disulfide	0.7191	0.8179	56.87	50	14	#
# Methyl Acetate	0.1913	0.1988	51.97	50	4	#
Allyl Chloride	0.3979	0.4464	56.09	50	12	
# Methylene Chloride	0.2777	0.2819	50.75	50	2	#
t-Butyl alcohol	1.4610	1.4124	241.69	250	-3	
Acrylonitrile	0.0920	0.1039	56.48	50	13	
# Methyl Tertiary Butyl Ether	0.7119	0.7438	52.24	50	4	#
# trans-1,2-Dichloroethene	0.2407	0.2694	55.97	50	12	#
n-Hexane	0.3710	0.4173	56.23	50	12	
# 1,1-Dichloroethane	0.4557	0.5069	55.62	50	11	#
di-Isopropyl ether	0.8458	0.9467	55.97	50	12	
2-Chloro-1,3-butadiene	0.3901	0.4324	55.42	50	11	
Ethyl t-butyl ether	0.7219	0.7748	53.66	50	7	
# 2-Butanone	5.7599	6.3659	110.52	100	11	#
# cis-1,2-Dichloroethene	0.2729	0.3026	55.44	50	11	#
2,2-Dichloropropane	0.3234	0.3683	56.95	50	14	
Propionitrile	1.8044	2.0431	283.08	250	13	
Methacrylonitrile	0.1069	0.1156	135.11	125	8	
Bromochloromethane	0.1330	0.1444	54.28	50	9	
Tetrahydrofuran	1.5605	1.7260	110.60	100	11	
# Chloroform	0.4347	0.4834	55.60	50	11	#
# 1,1,1-Trichloroethane	0.3941	0.3950	50.12	50	0	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 07/06/16 Time: 08:09

Lab File ID: al06c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# Cyclohexane	0.4532	0.4970	54.83	50	10	#
# Cyclohexane(2)	0.3756	0.4099	54.55	50	9	#
# Cyclohexane(3)	0.1365	0.1488	54.49	50	9	#
1,1-Dichloropropene	0.3473	0.3950	56.88	50	14	
# Carbon Tetrachloride	0.2843	0.3367	59.21	50	18	#
Isobutyl Alcohol	0.4952	0.5497	693.82	625	11	
# Benzene	1.0828	1.1522	53.20	50	6	#
# 1,2-Dichloroethane	0.3479	0.3683	52.93	50	6	#
# 1,2-Dichloroethane(2)	0.0389	0.0334	43.00	50	-14	#<-
t-Amyl methyl ether	0.6653	0.7060	53.06	50	6	
n-Heptane	0.4035	0.4628	57.35	50	15	
n-Butanol	0.4194	0.4349	1296.23	1250	4	
# Trichloroethene	0.2563	0.2861	55.81	50	12	#
# Methylcyclohexane	0.4765	0.5198	54.54	50	9	#
# 1,2-Dichloropropane	0.2781	0.3081	55.39	50	11	#
Methyl Methacrylate	0.1773	0.1972	55.63	50	11	
1,4-Dioxane	0.1526	0.1709	699.96	625	12	
Dibromomethane	0.1557	0.1690	54.29	50	9	
# Bromodichloromethane	0.2977	0.3470	58.28	50	17	#
2-Nitropropane	2.5666	3.4088	118.48	100	18	
# cis-1,3-Dichloropropene	0.4014	0.4637	57.75	50	16	#
# 4-Methyl-2-pentanone	0.2455	0.2796	113.89	100	14	#
# Toluene	0.8926	0.9533	53.40	50	7	#
# trans-1,3-Dichloropropene	0.4745	0.5395	56.84	50	14	#
Ethyl Methacrylate	0.4488	0.4897	54.56	50	9	
# 1,1,2-Trichloroethane	0.3122	0.3231	51.74	50	3	#
# Tetrachloroethene	0.3588	0.3943	54.95	50	10	#
1,3-Dichloropropane	0.5498	0.5815	52.89	50	6	
# 2-Hexanone	0.2347	0.2626	111.88	100	12	#
# Dibromochloromethane	0.3077	0.3535	57.43	50	15	#
# 1,2-Dibromoethane	0.3077	0.3283	53.34	50	7	#
# Chlorobenzene	1.0245	1.0940	53.39	50	7	#
1,1,1,2-Tetrachloroethane	0.3179	0.3560	55.99	50	12	
# Ethylbenzene	1.6729	1.8780	56.13	50	12	#
# m+p-Xylene	0.6600	0.7453	112.92	100	13	#
# o-Xylene	0.6465	0.7270	56.22	50	12	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract: _____

Lab Code: LANCAS Case No.: _____ SAS No.: _____ SDG No.: _____

Instrument ID: HP09685 Calibration Date: 07/06/16 Time: 08:09

Lab File ID: al06c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Styrene	1.0429	1.1970	57.39	50	15	#
#	Bromoform	0.1925	0.2171	49.45	50	-1	#
#	Isopropylbenzene	1.6699	1.8376	55.02	50	10	#
	Cyclohexanone	0.7254	0.6606	569.16	625	-9	
#	1,1,2,2-Tetrachloroethane	0.8176	0.8317	50.87	50	2	#
	Bromobenzene	0.8348	0.8649	51.81	50	4	
	trans-1,4-Dichloro-2-butene	0.2291	0.2367	129.14	125	3	
	1,2,3-Trichloropropane	0.2358	0.2377	50.40	50	1	
	n-Propylbenzene	3.8484	4.1199	53.53	50	7	
	2-Chlorotoluene	0.7680	0.8177	53.23	50	6	
	1,3,5-Trimethylbenzene	2.8163	2.9887	53.06	50	6	
	4-Chlorotoluene	0.8067	0.8553	53.01	50	6	
	tert-Butylbenzene	0.5920	0.6219	52.53	50	5	
	Pentachloroethane	0.4548	0.5128	56.38	50	13	
	1,2,4-Trimethylbenzene	2.9367	3.1272	53.24	50	6	
	sec-Butylbenzene	3.5355	3.8102	53.89	50	8	
#	1,3-Dichlorobenzene	1.5968	1.6838	52.72	50	5	#
	p-Isopropyltoluene	3.1260	3.3967	54.33	50	9	
#	1,4-Dichlorobenzene	1.6526	1.7212	52.08	50	4	#
	1,2,3-Trimethylbenzene	3.0765	3.2865	53.41	50	7	
	Benzyl Chloride	0.2747	0.3127	46.28	50	-7	
	1,3-Diethylbenzene	1.8591	2.1135	56.84	50	14	
	1,4-Diethylbenzene	1.9128	1.7082	44.65	50	-11	
	n-Butylbenzene	1.5814	1.7120	54.13	50	8	
#	1,2-Dichlorobenzene	1.5426	1.6035	51.97	50	4	#
	1,2-Diethylbenzene	1.5882	1.7097	53.82	50	8	
#	1,2-Dibromo-3-chloropropane	0.1426	0.1525	53.44	50	7	#
	1,3,5-Trichlorobenzene	1.1924	1.2787	53.62	50	7	
#	1,2,4-Trichlorobenzene	1.0571	1.1379	53.82	50	8	#
	Hexachlorobutadiene	0.5403	0.5968	55.23	50	10	
	Naphthalene	2.3975	2.6757	55.80	50	12	
	1,2,3-Trichlorobenzene	0.9725	1.0490	53.94	50	8	
	2-Methylnaphthalene	0.9456	1.1891	42.62	50	-15	
	Dibromofluoromethane	0.2289	0.2339	51.09	50	2	
	Dibromofluoromethane(2)	0.2354	0.2417	51.33	50	3	

Compounds with required minimum RRF.

All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:

Lab Code: LANCAS Case No.: SAS No.: SDG No.:

Instrument ID: HP09685 Calibration Date: 07/06/16 Time: 08:09

Lab File ID: al06c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2-Dichloroethane-d4	0.0545	0.0567	51.97	50	4
1,2-Dichloroethane-d4(2)	0.2631	0.2732	51.91	50	4
1,2-Dichloroethane-d4(3)	0.0345	0.0347	50.27	50	1
Toluene-d8	1.3647	1.3563	49.69	50	-1
Toluene-d8(2)	0.8772	0.8709	49.64	50	-1
4-Bromofluorobenzene	0.4851	0.4900	50.50	50	1
4-Bromofluorobenzene(2)	0.3986	0.4048	50.77	50	2

Average %Drift 8

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

Lancaster Laboratories
Continuing Calibration Internal Standard Check

Initial Calibration Standards:

/chem/HP09915.i/16apr22i.b/la22i07.d
/chem/HP09915.i/16apr22i.b/la22i06.d
/chem/HP09915.i/16apr22i.b/la22i05.d
/chem/HP09915.i/16apr22i.b/la22i04.d
/chem/HP09915.i/16apr22i.b/la22i03.d
/chem/HP09915.i/16apr22i.b/la22i02.d
/chem/HP09915.i/16apr22i.b/la22i01.d

File /chem/HP09915.i/16apr22i.b/la22i03.d is Mid Level Calibration Standard used for comparison.

Current Continuing Calibration Standard:

/chem/HP09915.i/16jul05b.b/ll05c05.d

RT Summary

Internal Standard Name	ll05c05.d File ID:	ICAL RT	In Spec
t-Butyl alcohol-d10	4.006	3.990	Yes
Fluorobenzene	7.514	7.504	Yes
Chlorobenzene-d5	11.041	11.041	Yes
1,4-Dichlorobenzene-d4	12.938	12.938	Yes

A "No" indicates the retention time is greater than 30 seconds from the referenced ICAL standard.

Area Summary

Internal Standard Name	ll05c05.d File ID:	ICAL Area	Low Limit	High Limit	In Spec
t-Butyl alcohol-d10	209480	239110	119555	478220	Yes
Fluorobenzene	1092308	1288793	644396	2577586	Yes
Chlorobenzene-d5	901632	977519	488760	1955038	Yes
1,4-Dichlorobenzene-d4	497736	514202	257101	1028404	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

Comments: _____

report generated on 07/05/2016 at 17:34

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date: 07/05/16 Time: 17:13

Lab File ID: l105c05.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Dichlorodifluoromethane	0.3711	0.3644	49.10	50	-2	#
#	Chloromethane	0.3727	0.3773	50.61	50	1	#
#	Vinyl Chloride	0.3517	0.3554	50.52	50	1	#
#	Bromomethane	0.2280	0.2393	52.46	50	5	#
#	Chloroethane	0.1924	0.2044	53.11	50	6	#
#	Trichlorofluoromethane	0.3704	0.4144	55.94	50	12	#
	Ethyl ether	0.2627	0.2701	51.39	50	3	
	Acrolein	2.1388	2.2149	517.79	500	4	
#	1,1-Dichloroethene	0.2189	0.2211	50.50	50	1	#
#	1,1-Dichloroethene(2)	0.1173	0.1192	50.82	50	2	#
#	Acetone	0.9574	0.9748	101.82	100	2	#
#	Freon 113	0.2105	0.2357	55.99	50	12	#
	2-Propanol	0.7342	0.7889	268.62	250	7	
	Methyl Iodide	0.4065	0.4329	53.24	50	6	
#	Carbon Disulfide	0.7352	0.7896	53.70	50	7	#
	Allyl Chloride	0.4230	0.4510	53.31	50	7	
#	Methyl Acetate	0.2949	0.2959	50.17	50	0	#
#	Methylene Chloride	0.2700	0.2716	50.30	50	1	#
	t-Butyl alcohol	1.1906	1.1645	244.50	250	-2	
	Acrylonitrile	0.1489	0.1554	52.18	50	4	
#	trans-1,2-Dichloroethene	0.2484	0.2580	51.92	50	4	#
#	Methyl Tertiary Butyl Ether	0.8464	0.8309	49.08	50	-2	#
	n-Hexane	0.3840	0.4167	54.26	50	9	
#	1,1-Dichloroethane	0.4931	0.4943	50.12	50	0	#
	di-Isopropyl ether	0.9470	0.9751	51.48	50	3	
	2-Chloro-1,3-butadiene	0.3890	0.4483	57.62	50	15	
	Ethyl t-butyl ether	0.8624	0.8579	49.74	50	-1	
#	cis-1,2-Dichloroethene	0.2798	0.2963	52.95	50	6	#
#	2-Butanone	0.1917	0.2034	106.13	100	6	#
	2,2-Dichloropropane	0.3424	0.3654	53.36	50	7	
	Propionitrile	1.5413	1.5906	257.99	250	3	
	Methacrylonitrile	0.1477	0.1573	133.10	125	6	
	Bromochloromethane	0.1427	0.1510	52.90	50	6	
	Tetrahydrofuran	1.2892	1.3474	104.51	100	5	
#	Chloroform	0.4481	0.4818	53.76	50	8	#
#	1,1,1-Trichloroethane	0.3981	0.4119	51.74	50	3	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date: 07/05/16 Time: 17:13

Lab File ID: l105c05.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Cyclohexane	0.4589	0.4948	53.91	50	8	#
#	Cyclohexane(2)	0.3646	0.3907	53.58	50	7	#
#	Cyclohexane(3)	0.1327	0.1426	53.76	50	8	#
	1,1-Dichloropropene	0.3665	0.3872	52.82	50	6	
#	Carbon Tetrachloride	0.2981	0.3314	55.59	50	11	#
	Isobutyl Alcohol	0.4189	0.4319	644.46	625	3	
#	Benzene	1.0743	1.1245	52.34	50	5	#
#	1,2-Dichloroethane	0.3974	0.4041	50.84	50	2	#
#	1,2-Dichloroethane(2)	0.0346	0.0353	50.99	50	2	#<-
	t-Amyl methyl ether	0.7989	0.8172	51.14	50	2	
	n-Heptane	0.4255	0.4756	55.89	50	12	
	n-Butanol	0.3265	0.3447	1319.55	1250	6	
#	Trichloroethene	0.2715	0.2831	52.14	50	4	#
#	Methylcyclohexane	0.4473	0.4883	54.58	50	9	#
#	Methylcyclohexane(2)	0.2009	0.2239	55.71	50	11	#
#	1,2-Dichloropropane	0.2958	0.3094	52.31	50	5	#
	Dibromomethane	0.1833	0.1917	52.29	50	5	
	1,4-Dioxane	0.1106	0.1209	683.14	625	9	
	Methyl Methacrylate	0.2479	0.2601	52.47	50	5	
#	Bromodichloromethane	0.3346	0.3571	53.36	50	7	#
	2-Nitropropane	0.0921	0.1045	113.43	100	13	
	2-Chloroethyl Vinyl Ether	0.2111	0.2349	55.65	50	11	
#	cis-1,3-Dichloropropene	0.4292	0.4755	55.39	50	11	#
#	4-Methyl-2-pentanone	0.3933	0.4399	111.84	100	12	#
#	Toluene	0.8897	0.8621	48.45	50	-3	#
#	trans-1,3-Dichloropropene	0.5155	0.5384	52.22	50	4	#
	Ethyl Methacrylate	0.5711	0.5711	50.00	50	0	
#	1,1,2-Trichloroethane	0.3457	0.3297	47.68	50	-5	#
#	Tetrachloroethene	0.3766	0.3735	49.59	50	-1	#
	1,3-Dichloropropane	0.6122	0.5905	48.23	50	-4	
#	2-Hexanone	0.3778	0.3889	102.95	100	3	#
#	Dibromochloromethane	0.3395	0.3551	52.30	50	5	#
#	1,2-Dibromoethane	0.3713	0.3628	48.85	50	-2	#
	1-Chlorohexane	0.4991	0.4811	48.19	50	-4	
#	Chlorobenzene	1.0069	0.9789	48.61	50	-3	#
	1,1,1,2-Tetrachloroethane	0.3332	0.3358	50.40	50	1	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date: 07/05/16 Time: 17:13

Lab File ID: l105c05.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Ethylbenzene	1.7165	1.6938	49.34	50	-1	#
#	m+p-Xylene	0.6590	0.6573	99.75	100	0	#
#	o-Xylene	0.6482	0.6482	50.00	50	0	#
#	Styrene	1.0918	1.1191	51.25	50	2	#
#	Bromoform	0.2338	0.2639	56.43	50	13	#
#	Isopropylbenzene	1.6501	1.6590	50.27	50	1	#
	Cyclohexanone	0.5100	0.4585	561.80	625	-10	
	Bromobenzene	0.8593	0.8109	47.18	50	-6	
#	1,1,2,2-Tetrachloroethane	1.0126	0.9420	46.51	50	-7	#
	1,2,3-Trichloropropane	0.2925	0.2695	46.07	50	-8	
	trans-1,4-Dichloro-2-butene	0.1350	0.2019	140.46	125	12	
	n-Propylbenzene	3.8422	3.6643	47.68	50	-5	
	2-Chlorotoluene	0.7793	0.7353	47.18	50	-6	
	4-Chlorotoluene	0.8229	0.7774	47.24	50	-6	
	1,3,5-Trimethylbenzene	2.7215	2.5876	47.54	50	-5	
	tert-Butylbenzene	0.5633	0.5368	47.64	50	-5	
	Pentachloroethane	0.4650	0.4954	53.27	50	7	
	1,2,4-Trimethylbenzene	2.8300	2.6796	47.34	50	-5	
	sec-Butylbenzene	3.4490	3.3017	47.86	50	-4	
#	1,3-Dichlorobenzene	1.6166	1.5193	46.99	50	-6	#
	p-Isopropyltoluene	2.9997	2.8877	48.13	50	-4	
#	1,4-Dichlorobenzene	1.6889	1.5703	46.49	50	-7	#
	1,2,3-Trimethylbenzene	2.9595	2.8983	48.97	50	-2	
	Benzyl Chloride	1.7568	1.8369	43.82	50	-12	
	1,3-Diethylbenzene	1.8037	1.7717	49.11	50	-2	
	1,4-Diethylbenzene	1.8811	1.8362	48.81	50	-2	
#	1,2-Dichlorobenzene	1.6025	1.4764	46.06	50	-8	#
	n-Butylbenzene	1.5350	1.4647	47.71	50	-5	
	1,2-Diethylbenzene	1.5385	1.4902	48.43	50	-3	
#	1,2-Dibromo-3-chloropropane	0.1957	0.1892	48.34	50	-3	#
	1,3,5-Trichlorobenzene	1.2753	1.1659	45.71	50	-9	
#	1,2,4-Trichlorobenzene	1.2637	1.0971	43.41	50	-13	#
	Hexachlorobutadiene	0.5397	0.4726	43.79	50	-12	
	Naphthalene	3.4044	3.0531	44.84	50	-10	
	1,2,3-Trichlorobenzene	1.1911	1.0228	42.93	50	-14	
	2-Methylnaphthalene	2.1225	1.7641	41.56	50	-17	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date: 07/05/16 Time: 17:13

Lab File ID: l105c05.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT
Dibromofluoromethane	0.2375	0.2463	51.84	50	4
Dibromofluoromethane(2)	0.2432	0.2522	51.86	50	4
1,2-Dichloroethane-d4	0.0600	0.0618	51.51	50	3
1,2-Dichloroethane-d4(2)	0.3073	0.3181	51.74	50	3
1,2-Dichloroethane-d4(3)	0.0381	0.0394	51.79	50	4
Toluene-d8	1.3088	1.2410	47.41	50	-5
Toluene-d8(2)	0.8522	0.8164	47.90	50	-4
4-Bromofluorobenzene	0.4843	0.4925	50.85	50	2
4-Bromofluorobenzene(2)	0.4121	0.4275	51.87	50	4

Average %Drift 5

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87___

Lab File ID (Standard): au27c01.d Date Analyzed: 06/27/16

Instrument ID: HP09685 Time Analyzed: 08:37

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA) AREA	#	IS1(TBA) RT	#	IS2(FBZ) AREA	#	IS2(FBZ) RT	#	IS3(CBZ) AREA	#	IS3(CBZ) RT	#	IS4(DCB) AREA	#	IS4(DCB) RT	#
12 HOUR STD	82097		3.958		911986		7.456		680844		11.014		367832		12.919	
UPPER LIMIT	164194		4.458		1823972		7.956		1361688		11.514		735664		13.419	
LOWER LIMIT	41048		3.458		455993		6.956		340422		10.514		183916		12.419	
LAB SAMPLE ID																
01 VBLKA31	75947		3.976		822304		7.456		617029		11.015		310190		12.919	
02 VBLKA32	75947		3.976		822304		7.456		617029		11.015		310190		12.919	
03 LCSA31	83696		3.970		856154		7.456		654039		11.014		357755		12.919	
04 LCSA32	83696		3.970		856154		7.456		654039		11.014		357755		12.919	
05 LCDA31	83630		3.958		871144		7.456		661136		11.008		353766		12.919	
06 LCDA32	83630		3.958		871144		7.456		661136		11.008		353766		12.919	
07 8438367	55295		3.958		869024		7.456		590703		11.008		233249		12.919	
08 8438368MS	60554		3.976		862462		7.456		630315		11.014		305953		12.919	
09 8438369MSD	56389		3.958		868933		7.450		620127		11.014		264803		12.919	
10 8438324	66824		3.964		843598		7.456		564891		11.014		204642		12.919	
11 8438332	56660		3.970		850006		7.456		611289		11.015		267118		12.919	
12 8438373	45226		3.964		833568		7.456		558813		11.015		213721		12.919	
13 8438377	46900		3.976		797821		7.456		522925		11.014		180041	*	12.919	
14 8442813	58060		3.970		691588		7.456		469091		11.014		171014	*	12.919	
15 8442815MSD	54095		3.964		851212		7.450		600233		11.015		249256		12.919	
16 8442800	65238		3.958		814467		7.450		530801		11.014		180401	*	12.919	
17 8442803	51010		3.970		796273		7.456		514630		11.014		175632	*	12.919	
18 8442806	60766		3.964		783767		7.450		503708		11.014		163172	*	12.919	
19 8442819	38041	*	3.964		784483		7.456		491163		11.008		152806	*	12.919	
20 8442823	32274	*	3.970		748131		7.462		409858		11.014		102166	*	12.919	
21 8442827	54690		3.970		738068		7.456		426675		11.015		114647	*	12.919	
22 8445672	48165		3.970		778865		7.456		514125		11.014		178368	*	12.919	

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87___

Lab File ID (Standard): au27c01.d Date Analyzed: 06/27/16

Instrument ID: HP09685 Time Analyzed: 08:37

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA) AREA #	IS1(TBA) RT #	IS2(FBZ) AREA #	IS2(FBZ) RT #	IS3(CBZ) AREA #	IS3(CBZ) RT #	IS4(DCB) AREA #	IS4(DCB) RT #
12 HOUR STD	82097	3.958	911986	7.456	680844	11.014	367832	12.919
UPPER LIMIT	164194	4.458	1823972	7.956	1361688	11.514	735664	13.419
LOWER LIMIT	41048	3.458	455993	6.956	340422	10.514	183916	12.419
LAB SAMPLE ID								
23 8445676	47536	3.964	786953	7.456	517715	11.015	173229 *	12.919
24 8445680	57000	3.964	751122	7.450	454973	11.015	133545 *	12.919
25 8438328	70658	3.964	784278	7.456	543108	11.014	212918	12.919

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87___

Lab File ID (Standard): al06c01.d Date Analyzed: 07/06/16

Instrument ID: HP09685 Time Analyzed: 08:09

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA) AREA #	RT #	IS2(FBZ) AREA #	RT #	IS3(CBZ) AREA #	RT #	IS4(DCB) AREA #	RT #
12 HOUR STD	95546	3.958	962411	7.456	732907	11.014	396433	12.919
UPPER LIMIT	191092	4.458	1924822	7.956	1465814	11.514	792866	13.419
LOWER LIMIT	47773	3.458	481206	6.956	366454	10.514	198216	12.419
LAB SAMPLE ID								
01 VBLKA39	87620	3.964	931745	7.456	691505	11.014	340882	12.919
02 VBLKA41	87620	3.964	931745	7.456	691505	11.014	340882	12.919
03 LCSA39	95650	3.952	953811	7.450	712607	11.008	378454	12.919
04 LCSA41	95650	3.952	953811	7.450	712607	11.008	378454	12.919
05 LCDA39	109181	3.951	975932	7.456	718091	11.008	378514	12.919
06 LCDA41	109181	3.951	975932	7.456	718091	11.008	378514	12.919
07 8459953	83066	3.951	959730	7.450	704130	11.008	345462	12.919
08 8459954	57681	3.958	934033	7.456	691690	11.015	336187	12.919
09 8459958	77066	3.976	912069	7.456	680719	11.015	334633	12.919
10 8459959	59944	3.958	897538	7.456	669586	11.015	326182	12.919
11 8459960	69309	3.976	885457	7.456	664801	11.015	323593	12.919
12 8459961	70333	3.970	863607	7.456	623395	11.015	277314	12.919
13 8459962	81730	3.970	773922	7.456	575750	11.015	253542	12.919
14 8459963	56455	3.976	833533	7.456	586498	11.015	234306	12.919
15 SECC050	76365	3.964	891617	7.456	670526	11.014	362938	12.919
16 8442814RE	56678	3.964	900291	7.456	638846	11.015	276036	12.919
17 8457192	60974	3.970	833920	7.456	486667	11.014	129477 *	12.919
18 8457196	54590	3.964	824778	7.456	498995	11.015	142731 *	12.919
19 8457200	54312	3.970	810326	7.456	491557	11.015	137755 *	12.919
20 8457204	37579 *	3.964	818214	7.456	532463	11.014	176280 *	12.919
21 8457208	65979	3.970	820568	7.456	548087	11.014	196486 *	12.919
22 8457212	56356	3.970	769282	7.456	467410	11.014	143768 *	12.919

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD87___

Lab File ID (Standard): al06c01.d Date Analyzed: 07/06/16

Instrument ID: HP09685 Time Analyzed: 08:09

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA) AREA #	RT #	IS2(FBZ) AREA #	RT #	IS3(CBZ) AREA #	RT #	IS4(DCB) AREA #	RT #
12 HOUR STD	95546	3.958	962411	7.456	732907	11.014	396433	12.919
UPPER LIMIT	191092	4.458	1924822	7.956	1465814	11.514	792866	13.419
LOWER LIMIT	47773	3.458	481206	6.956	366454	10.514	198216	12.419
	LAB SAMPLE ID							
23	LOD008 - LO	77458	3.951	856227	7.456	632666	11.014	332955	12.919
24	LOD004 - LO	73982	3.964	853366	7.456	629831	11.014	326359	12.919
25	LOD002 - LO	74864	3.970	842604	7.456	619971	11.015	317346	12.919
26	LODS - LODS	75332	3.964	839806	7.456	619581	11.015	324247	12.919
27	LOQV - LOQV	79151	3.958	845836	7.456	625675	11.014	327100	12.919

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87___

Lab File ID (Standard): l105c05.d Date Analyzed: 07/05/16

Instrument ID: HP09915 Time Analyzed: 17:13

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA) AREA #	RT #	IS2(FBZ) AREA #	RT #	IS3(CBZ) AREA #	RT #	IS4(DCB) AREA #	RT #
12 HOUR STD	209480	4.006	1092308	7.514	901632	11.041	497736	12.938
UPPER LIMIT	418960	4.506	2184616	8.014	1803264	11.541	995472	13.438
LOWER LIMIT	104740	3.506	546154	7.014	450816	10.541	248868	12.438
	LAB SAMPLE ID							
01	LCSL14	212366	4.002	1100570	7.507	887709	11.044	486915	12.938
02	LCDL14	223115	4.006	1106309	7.510	897419	11.041	483707	12.938
03	VBLKL14	211276	3.999	1102672	7.510	891167	11.041	471727	12.938
04	8442828	204520	3.996	1078699	7.510	861489	11.044	454196	12.938
05	8442829	202254	3.996	1071257	7.510	862417	11.041	462353	12.938
06	8442830	197810	4.006	1042238	7.510	843487	11.041	448018	12.938
07	8442831	188160	3.996	1025447	7.510	832328	11.044	443898	12.938
08	8444113	189061	4.015	1028296	7.514	832945	11.041	447171	12.938
09	8444114	191694	4.006	1030084	7.514	837193	11.041	449751	12.938
10	8444115	183373	4.012	989443	7.513	806200	11.044	435523	12.938
11	8444116	187430	4.006	1031727	7.513	832347	11.044	446250	12.938
12	8445666	182754	4.009	1001748	7.514	811629	11.044	437852	12.938
13	8445667	178039	3.999	974975	7.513	791133	11.044	424104	12.938
14	8445668	178398	3.999	1006422	7.510	812380	11.044	438661	12.938
15	8449085	174638	4.012	978859	7.514	786056	11.044	423280	12.938
16	8450968	174993	3.993	962499	7.510	784206	11.044	420457	12.938
17	8451646	193702	4.006	1011404	7.514	826643	11.044	447891	12.938
18	8451647	159400	4.002	1065835	7.510	878407	11.044	488918	12.938
19	8451647DL	179097	4.009	1135006	7.514	924144	11.044	494591	12.938
20	8451648	183542	3.996	1133785	7.510	912586	11.044	479012	12.938
21	8451649	199187	4.006	1139899	7.510	909184	11.044	484015	12.938
22	8451650	215388	4.015	1156384	7.514	931475	11.044	495108	12.938

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD87

Lab File ID (Standard): l105c05.d Date Analyzed: 07/05/16

Instrument ID: HP09915 Time Analyzed: 17:13

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA) AREA #	RT #	IS2(FBZ) AREA #	RT #	IS3(CBZ) AREA #	RT #	IS4(DCB) AREA #	RT #
12 HOUR STD	209480	4.006	1092308	7.514	901632	11.041	497736	12.938
UPPER LIMIT	418960	4.506	2184616	8.014	1803264	11.541	995472	13.438
LOWER LIMIT	104740	3.506	546154	7.014	450816	10.541	248868	12.438
LAB SAMPLE ID								
23 8451651	215620	3.996	1123483	7.514	918394	11.044	505255	12.938
24 8454720	213475	3.996	1138915	7.510	913232	11.041	478665	12.938
25 8457188	208631	3.999	1156166	7.510	923106	11.041	489145	12.938

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

Preparation and Run Logs

Volatiles by GC/MS

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09685 **HP #22**

Data Directory Path is - d:\data\16JUN20A\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jkh09052	AU20T01.D	BFB50NG	06/20/2016	08:05		
JKH09052	AU20X01.D	BLK	06/20/2016	08:20		
JKH09052	AU20I01.D	VSTD300	06/20/2016	08:48		
JKH09052	AU20I02.D	VSTD100	06/20/2016	09:12		
JKH09052	AU20I03.D	VSTD050	06/20/2016	10:23		
JKH09052	AU20I04.D	VSTD020	06/20/2016	10:49		
JKH09052	AU20I05.D	VSTD010	06/20/2016	11:14		
JKH09052	AU20I06.D	VSTD004	06/20/2016	12:06		
JKH09052	AU20I07.D	VSTD001	06/20/2016	12:32		
JKH09052	AU20M01.D	VSTD0.5	06/20/2016	12:58		
JKH09052	AU20V01.D	LCSAICVC	06/20/2016	13:30		
jkh09052	AU20L01.D	LCSA26	06/20/2016	14:36	A161721AA	
jkh09052	AU20L02.D	LCDA26	06/20/2016	14:59	A161721AA	
jkh09052	AU20B01.D	VBLKA26	06/20/2016	15:21	A161721AA	
jkh09052	AU20S09.D	8416938	06/20/2016	15:58	A161721AA	
jkh09052	AU20X02.D	VBLKA26	06/20/2016	16:25	A161721AA	
jkh09052	AU20X03.D	VBLKA26	06/20/2016	16:48	A161721AA	
jkh09052	AU20S03.D	8416934	06/20/2016	17:33	A161721AA	
jkh09052	AU20S04.D	8416937	06/20/2016	17:55	A161721AA	
jkh09052	AU20S05.D	8416945	06/20/2016	18:18	A161721AA	
jkh09052	AU20S06.D	8416946	06/20/2016	18:41	A161721AA	
jkh09052	AU20S07.D	8419253	06/20/2016	19:04	A161721AA	
jkh09052	AU20S08.D	8414856	06/20/2016	19:26	A161721AA	

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09685 **HP #22**

Data Directory Path is - d:\data\16JUN27A\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jkh09052	AU27T01.D	BFB50NG	06/27/2016	07:57		
jkh09052	AU27X00.D	VBLKA31	06/27/2016	08:12	A161791AA	
jkh09052	AU27C01.D	VSTD050	06/27/2016	08:37	A161791AA	
jkh09052	AU27X01.D	VBLKA31	06/27/2016	09:00	A161791AA	
jkh09052	AU27B01.D	VBLKA31	06/27/2016	09:22	A161791AA	
jkh09052	AU27L01.D	LCSA31	06/27/2016	09:50	A161791AA	
jkh09052	AU27L02.D	LCDA31	06/27/2016	10:15	A161791AA	
jkh09052	AU27S03.D	8438367	06/27/2016	11:09	A161791AA	
jkh09052	AU27S04.D	8438368MS	06/27/2016	11:32	A161791AA	
jkh09052	AU27S05.D	8438369MSD	06/27/2016	11:55	A161791AA	
jkh09052	AU27S06.D	8438324	06/27/2016	12:17	A161791AA	
jkh09052	AU27S07.D	8438332	06/27/2016	12:40	A161791AA	
jkh09052	AU27S08.D	8438373	06/27/2016	13:02	A161791AA	
jkh09052	AU27S09.D	8438377	06/27/2016	13:25	A161791AA	
jkh09052	AU27S33.D	8442813	06/27/2016	13:48	A161792AA	
jkh09052	AU27S34.D	8442814MS	06/27/2016	14:10	A161792AA	
jkh09052	AU27S35.D	8442815MSD	06/27/2016	14:33	A161792AA	
jkh09052	AU27S36.D	8442800	06/27/2016	14:55	A161792AA	
jkh09052	AU27S37.D	8442803	06/27/2016	15:18	A161792AA	
jkh09052	AU27S38.D	8442806	06/27/2016	15:41	A161792AA	
jkh09052	AU27S39.D	8442819	06/27/2016	16:03	A161792AA	
jkh09052	AU27S40.D	8442823	06/27/2016	16:26	A161792AA	
jkh09052	AU27S41.D	8442827	06/27/2016	16:49	A161792AA	
jkh09052	AU27S42.D	8445672	06/27/2016	17:11	A161792AA	
jkh09052	AU27S43.D	8445676	06/27/2016	17:34	A161792AA	
jkh09052	AU27S44.D	8445680	06/27/2016	17:56	A161792AA	
jkh09052	AU27S10.D	8438328	06/27/2016	18:19	A161791AA	

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09685 **HP #22**

Data Directory Path is - d:\data\16JUL06A\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jkh09052	AL06T01.D	BFB50NG	07/06/2016	07:23		
jkh09052	AL06X00.D	VBLKA39	07/06/2016	07:44	A161881AA	
jkh09052	AL06C01.D	VSTD050	07/06/2016	08:09	A161881AA	
jkh09052	AL06X01.D	VBLKA39	07/06/2016	08:32	A161881AA	
jkh09052	AL06B01.D	VBLKA39	07/06/2016	08:54	A161881AA	
jkh09052	AL06L01.D	LCSA39	07/06/2016	09:20	A161881AA	
jkh09052	AL06L02.D	LCDA39	07/06/2016	09:45	A161881AA	
jkh09052	AL06S03.D	8459953	07/06/2016	10:41	A161881AA	
jkh09052	AL06S04.D	8459954	07/06/2016	11:03	A161881AA	
jkh09052	AL06S05.D	8459958	07/06/2016	11:26	A161881AA	
jkh09052	AL06S06.D	8459959	07/06/2016	11:49	A161881AA	
jkh09052	AL06S07.D	8459960	07/06/2016	12:11	A161881AA	
jkh09052	AL06S08.D	8459961	07/06/2016	12:34	A161881AA	
jkh09052	AL06S09.D	8459962	07/06/2016	12:56	A161881AA	
jkh09052	AL06S10.D	8459963	07/06/2016	13:19	A161881AA	
jkh09052	AL06C02.D	SECC050	07/06/2016	13:42	A161881AA	
jkh09052	AL06S63.D	8442814MS	07/06/2016	14:04	A161792AB	
jkh09052	AL06S64.D	8457192	07/06/2016	14:27	A161792AB	
jkh09052	AL06S65.D	8457196	07/06/2016	14:50	A161792AB	
jkh09052	AL06S66.D	8457200	07/06/2016	15:12	A161792AB	
jkh09052	AL06S67.D	8457204	07/06/2016	15:35	A161792AB	
jkh09052	AL06S68.D	8457208	07/06/2016	15:57	A161792AB	
jkh09052	AL06S69.D	8457212	07/06/2016	16:20	A161792AB	
jkh09052	AL06D01.D	LOD020	07/06/2016	16:42	A161881AA	
jkh09052	AL06D02.D	LOD008	07/06/2016	17:05	A161881AA	
jkh09052	AL06D03.D	LOD004	07/06/2016	17:28	A161881AA	
jkh09052	AL06D04.D	LOD002	07/06/2016	17:50	A161881AA	
jkh09052	AL06D05.D	LODS	07/06/2016	18:13	A161881AA	
jkh09052	AL06D06.D	LOQV	07/06/2016	18:36	A161881AA	

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09915 **HP #23**

Data Directory Path is - d:\data\16APR22I\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
BWK03231	LA22T01.D	50NGBFB	04/22/2016	09:13		
BWK03231	LA22X01.D	BLK	04/22/2016	09:33		
BWK03231	LA22I01.D	VSTD300	04/22/2016	09:55		
BWK03231	LA22I02.D	VSTD100	04/22/2016	10:17		
BWK03231	LA22I03.D	VSTD050	04/22/2016	10:39		
BWK03231	LA22I04.D	VSTD020	04/22/2016	11:01		
BWK03231	LA22I05.D	VSTD010	04/22/2016	11:23		
BWK03231	LA22I06.D	VSTD004	04/22/2016	11:45		
BWK03231	LA22I07.D	VSTD001	04/22/2016	12:07		
BWK03231	LA22M01.D	MDL0.5	04/22/2016	12:29		
BWK03231	LA22V01.D	LCS01	04/22/2016	12:51		
BWK03231	LA22X02.D	BLK	04/22/2016	13:43		
BWK03231	LA22I11.D	VSTD300	04/22/2016	14:05		
BWK03231	LA22I12.D	VSTD100	04/22/2016	14:27		
BWK03231	LA22I13.D	VSTD050	04/22/2016	14:49		
BWK03231	LA22I14.D	VSTD020	04/22/2016	15:11		
BWK03231	LA22I15.D	VSTD010	04/22/2016	15:33		
BWK03231	LA22I16.D	VSTD004	04/22/2016	15:55		
BWK03231	LA22M02.D	MDL001	04/22/2016	16:17		
BWK03231	LA22V02.D	LCS02	04/22/2016	16:39		

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09915 **HP #23**

Data Directory Path is - d:\data\16JUL05B\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
MSK07970	LL05T05.D	50NGBFB	07/05/2016	16:32	L161872AA	
MSK07970	LL05X05.D	VBLKL14	07/05/2016	16:51	L161872AA	
MSK07970	LL05C05.D	VSTD050	07/05/2016	17:13	L161872AA	
MSK07970	LL05S31.D	LCSL14	07/05/2016	17:35	L161872AA	
MSK07970	LL05S32.D	LCDL14	07/05/2016	17:57	L161872AA	
MSK07970	LL05B05.D	VBLKL14	07/05/2016	18:19	L161872AA	
MSK07970	LL05S33.D	8442828	07/05/2016	18:41	L161872AA	
MSK07970	LL05S34.D	8442829	07/05/2016	19:03	L161872AA	
MSK07970	LL05S35.D	8442830	07/05/2016	19:25	L161872AA	
MSK07970	LL05S36.D	8442831	07/05/2016	19:47	L161872AA	
MSK07970	LL05S37.D	8444113	07/05/2016	20:09	L161872AA	
MSK07970	LL05S38.D	8444114	07/05/2016	20:31	L161872AA	
MSK07970	LL05S39.D	8444115	07/05/2016	20:52	L161872AA	
MSK07970	LL05S40.D	8444116	07/05/2016	21:14	L161872AA	
MSK07970	LL05S41.D	8445666	07/05/2016	21:36	L161872AA	
MSK07970	LL05S42.D	8445667	07/05/2016	21:58	L161872AA	
MSK07970	LL05S43.D	8445668	07/05/2016	22:20	L161872AA	
MSK07970	LL05S44.D	8449085	07/05/2016	22:42	L161872AA	
MSK07970	LL05S45.D	8450968	07/05/2016	23:04	L161872AA	
MSK07970	LL05S46.D	8451646	07/05/2016	23:26	L161872AA	
MSK07970	LL05S47.D	8451647	07/05/2016	23:47	L161872AA	
MSK07970	LL05S48.D	8451647DL	07/06/2016	00:09	L161872AA	10
MSK07970	LL05S49.D	8451648	07/06/2016	00:31	L161872AA	
MSK07970	LL05S50.D	8451649	07/06/2016	00:53	L161872AA	
MSK07970	LL05S51.D	8451650	07/06/2016	01:15	L161872AA	
MSK07970	LL05S52.D	8451651	07/06/2016	01:37	L161872AA	
MSK07970	LL05S53.D	8454720	07/06/2016	01:59	L161872AA	
MSK07970	LL05S54.D	8457188	07/06/2016	02:20	L161872AA	

eurofins | Lancaster Laboratories Environmental

VOA Prep Summary by SDG: DWD87

21 - GC/MS Volatiles

Sample Number	Bottle Code	Prep Analysis#	Vial ID	Used for Analysis?	Collected	Prepared	Initial Weight	Final Weight	Net soil weight	Weight requirement	Meets require-ments?	Preserv. lot #	Preservative (volume)	Final Extraction Vol (mL)	Problem Codes
8442800	150A	07320	16681297	Y	06/22/16 08:16	06/24/16 12:23	32.17 g	35.51 g	3.34 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442800	150B	07320	16681291	N	06/22/16 08:16	06/24/16 12:24	32.69 g	35.24 g	2.55 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442800	169A	07578	16688835	N	06/22/16 08:16	06/24/16 12:15	29.62 g	33.33 g	3.71 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8442803	150A	07320	16681277	Y	06/22/16 09:01	06/24/16 12:23	32.46 g	35.74 g	3.28 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442803	150B	07320	16681283	N	06/22/16 09:01	06/24/16 12:23	32.59 g	35.15 g	2.56 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442803	169A	07578	16688834	N	06/22/16 09:01	06/24/16 12:14	29.57 g	33.77 g	4.20 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8442806	150A	07320	16681292	Y	06/22/16 08:51	06/24/16 12:23	32.09 g	35.77 g	3.68 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442806	150B	07320	16681298	N	06/22/16 08:51	06/24/16 12:23	32.74 g	35.66 g	2.92 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442806	169A	07578	16688830	N	06/22/16 08:51	06/24/16 12:13	29.54 g	33.46 g	3.92 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8442813	150A	07320	16681290	N	06/22/16 08:37	06/24/16 12:23	32.21 g	34.74 g	2.53 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442813	150B	07320	16681296	Y	06/22/16 08:37	06/24/16 12:23	32.15 g	36.14 g	3.99 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442813	169A	07578	16688828	N	06/22/16 08:37	06/24/16 12:13	29.60 g	33.37 g	3.77 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8442814	150A	07320	16681302	Y	06/22/16 08:37	06/24/16 12:24	32.21 g	34.17 g	1.96 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8442814	150B	07320	16681301	N	06/22/16 08:37	06/24/16 12:24	32.17 g	35.99 g	3.82 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442814	169A	07578	16688836	N	06/22/16 08:37	06/24/16 12:21	29.54 g	32.79 g	3.25 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8442815	150A	07320	16681295	Y	06/22/16 08:37	06/24/16 12:24	32.33 g	35.11 g	2.78 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442815	150B	07320	16681289	N	06/22/16 08:37	06/24/16 12:24	32.19 g	34.73 g	2.54 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442815	169A	07578	16688832	N	06/22/16 08:37	06/24/16 12:22	29.50 g	33.09 g	3.59 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8442819	150A	07320	16681286	Y	06/22/16 11:00	06/24/16 12:06	32.49 g	35.07 g	2.58 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442819	150B	07320	16681280	N	06/22/16 11:00	06/24/16 12:06	32.67 g	35.08 g	2.41 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8442819	169A	07578	16688829	N	06/22/16 11:00	06/24/16 12:04	29.74 g	32.61 g	2.87 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8442823	150A	07320	16681285	Y	06/22/16 13:45	06/24/16 12:06	32.68 g	36.00 g	3.32 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442823	150B	07320	16681284	N	06/22/16 13:45	06/24/16 12:06	32.25 g	34.30 g	2.05 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442823	169A	07578	16688831	N	06/22/16 13:45	06/24/16 11:59	29.61 g	33.00 g	3.39 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8442827	150A	07320	16681279	Y	06/22/16 15:30	06/24/16 12:06	32.65 g	35.95 g	3.30 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A

Final Extraction Vol (mL) = Preservative Vol + Added MeOH (if applicable)

KEY to problem codes:

A = wt. does not meet requirements B = vial leaked C# where # = volume of MeOH added in mL due to sample not covered/matrix (lot #)
D = sampler not full E = effervescence observed F = pH >= 2 G = headspace in container

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VOA Prep Summary by SDG: DWD87

21 - GC/MS Volatiles

Sample Number	Bottle Code	Prep Analysis#	Vial ID	Used for Analysis?	Collected	Prepared	Initial Weight	Final Weight	Net soil weight	Weight requirement	Meets require-ments?	Preserv. lot #	Preservative (volume)	Final Extraction Vol (mL)	Problem Codes
8442827	150B	07320	16681278	N	06/22/16 15:30	06/24/16 12:06	32.53 g	35.06 g	2.53 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8442827	169A	07578	16688833	N	06/22/16 15:30	06/24/16 12:01	29.49 g	33.16 g	3.67 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8436970	169A	07578	16687654	N	06/20/16 09:45	06/21/16 21:15	29.57 g	33.74 g	4.17 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8436970	193A	08389	16687812	N	06/20/16 09:45	06/21/16 21:16	33.22 g	37.34 g	4.12 g	4.50 g - 5.50 g	N	2EL0328	NaHSO4 (5 mL)	5.000	A
8436970	193B	08389	16687799	Y	06/20/16 09:45	06/21/16 21:17	33.00 g	37.14 g	4.14 g	4.50 g - 5.50 g	N	2EL0328	NaHSO4 (5 mL)	5.000	A
8444086	150A	07320	16681319	N	06/23/16 13:00	06/24/16 18:04	32.22 g	34.59 g	2.37 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444086	150B	07320	16681320	Y	06/23/16 13:00	06/24/16 18:05	32.09 g	35.07 g	2.98 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444086	169A	07578	16688893	N	06/23/16 13:00	06/24/16 17:52	29.50 g	33.30 g	3.80 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8444087	150A	07320	16681253	Y	06/23/16 13:00	06/24/16 18:04	32.72 g	35.59 g	2.87 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444087	150B	07320	16681262	N	06/23/16 13:00	06/24/16 18:04	32.72 g	35.53 g	2.81 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444087	169A	07578	16688881	N	06/23/16 13:00	06/24/16 17:44	29.61 g	32.32 g	2.71 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A,D

Final Extraction Vol (mL) = Preservative Vol + Added MeOH (if applicable)

KEY to problem codes:

A = wt. does not meet requirements B = vial leaked C# where # = volume of MeOH added in mL due to sample not covered/matrix (lot #)
D = sampler not full E = effervescence observed F = pH >= 2 G = headspace in container

Semivolatiles by GC/MS Data

Case Narrative/Conformance Summary

Semivolatiles by GC/MS

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

SVOA 8270D (microwave)

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8442798	RTPA-1		X	5	
8442801	RTPA-2		X	5	
8442804	RTPA-3		X	5	
8442807	RTPA-4		X	5	Unspiked
8442808	RTPA-4MS		X	5	Matrix Spike
8442809	RTPA-4MSD		X	5	Matrix Spike Duplicate
8442816	DU-1-6-A		X	5	
8442820	DU-1-6-B		X	5	
8442824	DU-1-6-C		X	5	
8442829	RTPA-EB	X		1	Equipment Blank
8442830	RTPA-FB	X		1	Field Blank
8442831	DU-1-6-FB	X		1	Field Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

LCS/LCSD

Batch#: 16184SLB026 (Sample number(s): 8442798, 8442801, 8442804, 8442807-8442809, 8442816, 8442820, 8442824, UNSPK: 8442808-8442807)

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

The recovery(ies) for the following analyte(s) in the LCS is below the acceptance window:
2-Chlorobenzalmalononitrile

(Sample number(s): 8442798, 8442801, 8442804, 8442807, 8442816, 8442820, 8442824:
Analysis: 10726)
The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.

MS/MSD

Please note that US EPA Methods for organic compounds do not require action by the laboratory based on out-of-specification MS/MSD results.

Batch#: 16184SLB026 (Sample number(s): 8442798, 8442801, 8442804, 8442807-8442809, 8442816, 8442820, 8442824, UNSPK: 8442808-8442807)
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: Quinoline

Refer to the QC Summary forms for more information.

SAMPLE ANALYSIS:

(Sample number(s): 8442798, 8442801, 8442804, 8442807, 8442816, 8442820, 8442824:
Analysis: 10726)
Reporting limits were raised due to interference from the sample matrix.

No other problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Semivolatiles by GC/MS

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Quality Control Reference List
GC/MS Semivolatiles

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Fraction: Semivolatiles by GC/MS

Analysis	Batch Number	Sample Number	Analysis Date
SVOA 8270D (microwave)	16184SLB026	SBLKLB184	07/06/2016 09:53:00
		184LBLCS	07/06/2016 10:20:00
		184LBLCS2	07/06/2016 10:46:00
		184LBLCSD2	07/06/2016 11:11:00
		184LBLCS3	07/06/2016 11:38:00
		184LBLCSD3	07/06/2016 12:04:00
		8442798	07/06/2016 13:47:00
		8442801	07/06/2016 14:13:00
		8442804	07/06/2016 14:38:00
		8442807 UNSPK	07/06/2016 12:30:00
		8442808 MS	07/06/2016 12:55:00
		8442809 MSD	07/06/2016 13:21:00
		8442816	07/06/2016 15:04:00
		8442820	07/06/2016 15:30:00
		8442824	07/06/2016 15:55:00
SVOA 8270D (water)	16178WAD026	SBLKWD178	07/08/2016 21:06:00
		178WDLCS	07/08/2016 21:35:00
		178WDLCSD	07/08/2016 22:03:00
		178WDLCS1	07/08/2016 22:31:00
		178WDLCSD1	07/08/2016 23:00:00
		8442829	07/09/2016 00:25:00
		8442830	07/09/2016 00:54:00
		8442831	07/09/2016 01:22:00

Fraction: Semivolatiles by GC/MS

10726: SVOA 8270D (microwave) Analyte Name	Default MDL	Default LOQ	Units
2-Chlorobenzaldehyde	33	170	ug/kg
Quinoline	33	170	ug/kg
2-Chlorobenzalmalononitrile	170	500	ug/kg

10461: SVOA 8270D (water) Analyte Name	Default MDL	Default LOQ	Units
2-Chlorobenzaldehyde	1	5	ug/l
Quinoline	1	5	ug/l

Quality Control Summary
Method Blank
GC/MS Semivolatiles
SDG: DWD87
Matrix: LIQUID

Fraction: Semivolatiles by GC/MS

16178WAD026 / SBLKWD178 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2-Chlorobenzaldehyde	07/08/16	N.D.	ug/l	1	5
Quinoline	07/08/16	N.D.	ug/l	1	5

Fraction: Semivolatiles by GC/MS

16184SLB026 / SBLKLB184 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2-Chlorobenzaldehyde	07/06/16	N.D.	ug/kg	33	170
Quinoline	07/06/16	N.D.	ug/kg	33	170
2-Chlorobenzalmalononitrile	07/06/16	N.D.	ug/kg	170	500

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Quality Control Summary
Surrogates
GC/MS Semivolatiles
SDG: DWD87
Matrix: LIQUID

Fraction: Semivolatiles by GC/MS

16178WAD026	2-Fluorobiphenyl		Nitrobenzene-d5		Terphenyl-d14	
	Spike Added	100 ug/l	Spike Added	100 ug/l	Spike Added	100 ug/l
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
SBLKWD178	99	61 - 112	103	46 - 128	105	41 - 125
178WDLCS	97	61 - 112	105	46 - 128	102	41 - 125
178WDLCSD	100	61 - 112	107	46 - 128	105	41 - 125
8442829	100	61 - 112	104	46 - 128	102	41 - 125
8442830	97	61 - 112	99	46 - 128	94	41 - 125
8442831	89	61 - 112	92	46 - 128	92	41 - 125

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Quality Control Summary
Surrogates
GC/MS Semivolatiles
SDG: DWD87
Matrix: SOLID

Fraction: Semivolatiles by GC/MS

16184SLB026	2,4,6-Tribromophenol		2-Fluorobiphenyl		2-Fluorophenol		Nitrobenzene-d5		Phenol-d6		Terphenyl-d14	
	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
SBLKLB184	118	35 - 136	95	63 - 117	97	57 - 126	91	54 - 123	89	58 - 122	100	59 - 129
184LBLCS	112	35 - 136	90	63 - 117	102	57 - 126	90	54 - 123	96	58 - 122	95	59 - 129
184LBLCSD2	117	35 - 136	95	63 - 117	96	57 - 126	89	54 - 123	88	58 - 122	99	59 - 129
8442798	103	35 - 136	87	63 - 117	92	57 - 126	81	54 - 123	86	58 - 122	90	59 - 129
8442801	98	35 - 136	87	63 - 117	82	57 - 126	81	54 - 123	79	58 - 122	88	59 - 129
8442804	107	35 - 136	100	63 - 117	95	57 - 126	91	54 - 123	88	58 - 122	103	59 - 129
8442807 UNSPK	111	35 - 136	95	63 - 117	97	57 - 126	87	54 - 123	90	58 - 122	98	59 - 129
8442808 MS	116	35 - 136	95	63 - 117	96	57 - 126	91	54 - 123	91	58 - 122	98	59 - 129
8442809 MSD	111	35 - 136	93	63 - 117	94	57 - 126	89	54 - 123	89	58 - 122	98	59 - 129
8442816	81	35 - 136	70	63 - 117	71	57 - 126	65	54 - 123	68	58 - 122	74	59 - 129
8442820	97	35 - 136	83	63 - 117	86	57 - 126	81	54 - 123	81	58 - 122	87	59 - 129
8442824	80	35 - 136	68	63 - 117	69	57 - 126	65	54 - 123	65	58 - 122	72	59 - 129

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

UNSPK: 8442807 MS: 8442808 MSD: 8442809 **Analyte**	Batch: **16184SLB026** (Sample number(s): 8442798, 8442801, 8442804, 8442807-8442809, 8442816, 8442820, 8442824)								
	Spike Added ug/kg	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	1655.63	N.D.	1147.01	1228.01	69 *	74 *	80-119	7	30

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate (LCSD)

SDG: DWD87
Matrix: LIQUID

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

LCS: 178WDLCS LCSD: 178WDLCSD	Batch: **16178WAD026** (Sample number(s): 8442829-8442831)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	50	53.4	54.75	107	109	82-109	3	30

LCS: 178WDLCS1 LCSD: 178WDLCSD1	Batch: **16178WAD026** (Sample number(s): 8442829-8442831)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzaldehyde	50	44.99	47.61	90	95	73-106	6	30

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

LCS: 184LBLCS	Batch: **16184SLB026** (Sample number(s): 8442798, 8442801, 8442804, 8442807-8442809, 8442816, 8442820, 8442824)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	1666.67	1629.01	NA	98	NA	80-119	NA	NA

LCS: 184LBLCS2 LCSD: 184LBLCSD2	Batch: **16184SLB026** (Sample number(s): 8442798, 8442801, 8442804, 8442807-8442809, 8442816, 8442820, 8442824)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzaldehyde	1666.67	1604.21	1564.48	96	94	58-114	3	30

LCS: 184LBLCS3 LCSD: 184LBLCSD3	Batch: **16184SLB026** (Sample number(s): 8442798, 8442801, 8442804, 8442807-8442809, 8442816, 8442820, 8442824)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzalmalononitrile	1666.67	930.97	1219.56	56 *	73	70-130	27	30

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf0200.d DFTPP Injection Date: 06/07/16

Instrument ID: HP11165 DFTPP Injection Time: 09:16

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	43.7
68	Less than 2.0% of mass 69	1.05 (1.88)1
69	Mass 69 relative abundance	55.9
70	Less than 2.0% of mass 69	0.45 (0.8)1
127	10.0 - 80.00% of mass 198	50.2
197	Less than 2.0% of mass 198	0.39
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	7.13
275	10.0 - 60.0% of mass 198	22.2
365	Greater than 1.00% of mass 198	2.94
441	Present, and less than mass 443	10.1
442	Greater than 50.00% of mass 198	60.5
443	15.00 - 24.00% of mass 442	11.4 (18.9)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gf0201.d	06/07/16	09:32
02	STD1526 - SSTD120	gf0202.d	06/07/16	09:59
03	STD1526 - SSTD80	gf0203.d	06/07/16	10:25
04	STD1526 - SSTD50	gf0204.d	06/07/16	10:51
05	STD1526 - SSTD15	gf0205.d	06/07/16	11:20
06	STD1526 - SSTD5	gf0206.d	06/07/16	11:47
07	STD1526 - SSTD1	gf0207.d	06/07/16	12:13
08	STD1526 - SSTD.5	gf0208.d	06/07/16	12:39
09	MDL1526 - SSTD00.5	gf0209.d	06/07/16	13:06
10	MDLPAH1526 - SSTD00.1	gf0210.d	06/07/16	13:32
11	ICV1376 - SSTD050	gf0211.d	06/07/16	14:00
12	ICVBAS0716 - SSTD050	gf0212.d	06/07/16	14:28

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf1000.d DFTPP Injection Date: 06/28/16

Instrument ID: HP11165 DFTPP Injection Time: 07:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.3
68	Less than 2.0% of mass 69	0.7 (1.42)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.33 (0.67)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.74
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.72
275	10.0 - 60.0% of mass 198	24.0
365	Greater than 1.00% of mass 198	2.51
441	Present, and less than mass 443	9.53
442	Greater than 50.00% of mass 198	62.5
443	15.00 - 24.00% of mass 442	12.6 (20.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gf1001.d	06/28/16	07:22
02	TRG1586 - SSTD120	gf1002.d	06/28/16	07:48
03	TRG1586 - SSTD80	gf1003.d	06/28/16	08:14
04	TRG1586 - SSTD50	gf1004.d	06/28/16	08:40
05	TRG1586 - SSTD30	gf1005.d	06/28/16	09:07
06	TRG1586 - SSTD15	gf1006.d	06/28/16	09:32
07	TRG1586 - SSTD5	gf1007.d	06/28/16	09:58
08	TRGMDL1586 - SSTD001	gf1008.d	06/28/16	10:25
09	SBLKWA178	gf1009.d	06/28/16	10:51
10	178WALCS	gf1010.d	06/28/16	11:18
11	178WALCSD	gf1011.d	06/28/16	11:44
12	8438378	gf1012.d	06/28/16	12:10
13	8438379	gf1013.d	06/28/16	12:37
14	8442829	gf1014.d	06/28/16	13:03
15	8442830	gf1015.d	06/28/16	13:29
16	8442831	gf1016.d	06/28/16	13:56
17	8444113	gf1017.d	06/28/16	14:22
18	8444115	gf1018.d	06/28/16	14:48

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf1000.d DFTPP Injection Date: 06/28/16

Instrument ID: HP11165 DFTPP Injection Time: 07:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.3
68	Less than 2.0% of mass 69	0.7 (1.42)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.33 (0.67)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.74
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.72
275	10.0 - 60.0% of mass 198	24.0
365	Greater than 1.00% of mass 198	2.51
441	Present, and less than mass 443	9.53
442	Greater than 50.00% of mass 198	62.5
443	15.00 - 24.00% of mass 442	12.6 (20.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8444116	gf1019.d	06/28/16	15:15
20	8445666	gf1020.d	06/28/16	15:41
21	8445667	gf1021.d	06/28/16	16:07

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0160.d DFTPP Injection Date: 07/05/16

Instrument ID: HP11165 DFTPP Injection Time: 06:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	41.0
68	Less than 2.0% of mass 69	0.61 (1.19)1
69	Mass 69 relative abundance	51.2
70	Less than 2.0% of mass 69	0.19 (0.37)1
127	10.0 - 80.00% of mass 198	45.8
197	Less than 2.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.58
275	10.0 - 60.0% of mass 198	23.7
365	Greater than 1.00% of mass 198	2.3
441	Present, and less than mass 443	9.31
442	Greater than 50.00% of mass 198	59.7
443	15.00 - 24.00% of mass 442	10.8 (18.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gg0161.d	07/05/16	06:21
02	TRG1566 - SSTD30	gg0162.d	07/05/16	06:47
03	CBZ1876 - SSTD120	gg0163.d	07/05/16	07:13
04	CBZ1876 - SSTD80	gg0164.d	07/05/16	07:38
05	CBZ1876 - SSTD50	gg0165.d	07/05/16	08:04
06	CBZ1876 - SSTD30	gg0166.d	07/05/16	08:29
07	CBZ1876 - SSTD15	gg0167.d	07/05/16	08:55
08	CBZ1876 - SSTD5	gg0168.d	07/05/16	09:20
09	CBZMDL1876 - SSTD001	gg0169.d	07/05/16	09:46
10	SBLKLF182	gg0170.d	07/05/16	10:13
11	182LFLCS	gg0171.d	07/05/16	10:40
12	182LFLCS2	gg0172.d	07/05/16	11:07
13	182LFLCSD2	gg0173.d	07/05/16	11:32
14	182LFLCS3	gg0174.d	07/05/16	11:58
15	182LFLCSD3	gg0175.d	07/05/16	12:24
16	8438353	gg0176.d	07/05/16	12:49
17	8438354MS	gg0177.d	07/05/16	13:14
18	8438355MSD	gg0178.d	07/05/16	13:41

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0160.d DFTPP Injection Date: 07/05/16

Instrument ID: HP11165 DFTPP Injection Time: 06:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	41.0
68	Less than 2.0% of mass 69	0.61 (1.19)1
69	Mass 69 relative abundance	51.2
70	Less than 2.0% of mass 69	0.19 (0.37)1
127	10.0 - 80.00% of mass 198	45.8
197	Less than 2.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.58
275	10.0 - 60.0% of mass 198	23.7
365	Greater than 1.00% of mass 198	2.3
441	Present, and less than mass 443	9.31
442	Greater than 50.00% of mass 198	59.7
443	15.00 - 24.00% of mass 442	10.8 (18.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8438321	gg0179.d	07/05/16	14:08
20	8438325	gg0180.d	07/05/16	14:35
21	8438329	gg0181.d	07/05/16	15:01
22	8438370	gg0182.d	07/05/16	15:26
23	8438374	gg0183.d	07/05/16	15:51

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0230.d DFTPP Injection Date: 07/06/16

Instrument ID: HP11165 DFTPP Injection Time: 05:10

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	40.6
68	Less than 2.0% of mass 69	0.33 (0.68)1
69	Mass 69 relative abundance	47.8
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.38
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.96
275	10.0 - 60.0% of mass 198	24.4
365	Greater than 1.00% of mass 198	2.38
441	Present, and less than mass 443	9.28
442	Greater than 50.00% of mass 198	62.2
443	15.00 - 24.00% of mass 442	12.4 (20.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gg0231.d	07/06/16	05:25
02	TRG1566 - SSTD30	gg0232.d	07/06/16	05:53
03	SSTD30	gg0233.d	07/06/16	06:19
04	SBLKLC184	gg0234.d	07/06/16	07:14
05	184LCLCS	gg0235.d	07/06/16	07:45
06	184LCLCS2	gg0236.d	07/06/16	08:10
07	184LCLCSD2	gg0237.d	07/06/16	08:35
08	184LCLCS3	gg0238.d	07/06/16	09:01
09	184LCLCSD3	gg0239.d	07/06/16	09:27
10	SBLKLB184	gg0240.d	07/06/16	09:53
11	184LBLCS	gg0241.d	07/06/16	10:20
12	184LBLCS2	gg0242.d	07/06/16	10:46
13	184LBLCSD2	gg0243.d	07/06/16	11:11
14	184LBLCS3	gg0244.d	07/06/16	11:38
15	184LBLCSD3	gg0245.d	07/06/16	12:04
16	8442807	gg0246.d	07/06/16	12:30
17	8442808MS	gg0247.d	07/06/16	12:55
18	8442809MSD	gg0248.d	07/06/16	13:21

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SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0230.d DFTPP Injection Date: 07/06/16

Instrument ID: HP11165 DFTPP Injection Time: 05:10

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	40.6
68	Less than 2.0% of mass 69	0.33 (0.68)1
69	Mass 69 relative abundance	47.8
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.38
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.96
275	10.0 - 60.0% of mass 198	24.4
365	Greater than 1.00% of mass 198	2.38
441	Present, and less than mass 443	9.28
442	Greater than 50.00% of mass 198	62.2
443	15.00 - 24.00% of mass 442	12.4 (20.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8442798	gg0249.d	07/06/16	13:47
20	8442801	gg0250.d	07/06/16	14:13
21	8442804	gg0251.d	07/06/16	14:38
22	8442816	gg0252.d	07/06/16	15:04
23	8442820	gg0253.d	07/06/16	15:30
24	8442824	gg0254.d	07/06/16	15:55
25	8444071	gg0255.d	07/06/16	16:21

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lf0940a.d DFTPP Injection Date: 06/27/16

Instrument ID: HP20296 DFTPP Injection Time: 15:39

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	52.1
68	Less than 2.0% of mass 69	0.85 (1.72)1
69	Mass 69 relative abundance	49.5
70	Less than 2.0% of mass 69	0.23 (0.47)1
127	40.0 - 60.0% of mass 198	49.1
197	Less than 1.0% of mass 198	0.24
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.44
275	10.0 - 30.0% of mass 198	19.4
365	Greater than 1.00% of mass 198	1.82
441	Present, and less than mass 443	7.84
442	Greater than 40.0 % of mass 198	50.3
443	17.0 - 23.0% of mass 442	9.79 (19.5)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	RVSTD1726 - SSTD7.5	lf0941a.d	06/27/16	15:52
02	RVSTD1726 - SSTD.125	lf0942.d	06/27/16	16:23
03	RVSTD1726 - SSTD30	lf0943.d	06/27/16	16:52
04	RVSTD1726 - SSTD20	lf0944.d	06/27/16	17:20
05	RVSTD1726 - SSTD12.5	lf0945.d	06/27/16	17:48
06	RVSTD1726 - SSTD3.75	lf0946.d	06/27/16	18:16
07	RVSTD1726 - SSTD1.25	lf0947.d	06/27/16	18:45
08	RVSTD1726 - SSTD.25	lf0948.d	06/27/16	19:13
09	MDLSTD1726 - SSTD0.125	lf0949.d	06/27/16	19:41
10	PAHMDL1726 - SSTD0.025	lf0950.d	06/27/16	20:09
11	RVBASICV0716 - SSTD12.5	lf0952.d	06/27/16	21:06

FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lf0970a.d DFTPP Injection Date: 06/28/16

Instrument ID: HP20296 DFTPP Injection Time: 16:45

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	56.2
68	Less than 2.0% of mass 69	0.69 (1.35)1
69	Mass 69 relative abundance	51.3
70	Less than 2.0% of mass 69	0.31 (0.6)1
127	40.0 - 60.0% of mass 198	47.0
197	Less than 1.0% of mass 198	0.94
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.39
275	10.0 - 30.0% of mass 198	19.5
365	Greater than 1.00% of mass 198	1.95
441	Present, and less than mass 443	8.68
442	Greater than 40.0 % of mass 198	54.2
443	17.0 - 23.0% of mass 442	10.3 (19.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	RVSTD1726 - SSTD7.5	lf0971.d	06/28/16	16:59
02	RVICV1376 - SSTD12.5	lf0972.d	06/28/16	17:34
03	SBLKWM175	lf0973.d	06/28/16	18:23
04	175WMLCS	lf0974.d	06/28/16	18:51
05	175WMLCSD	lf0975.d	06/28/16	19:19
06	8439625	lf0976.d	06/28/16	19:48
07	8439626	lf0977.d	06/28/16	20:16
08	8439627	lf0978.d	06/28/16	20:44
09	8439628	lf0979.d	06/28/16	21:12
10	8439629	lf0980.d	06/28/16	21:41
11	8439630	lf0981.d	06/28/16	22:09
12	8439631	lf0982.d	06/28/16	22:37
13	8439632	lf0983.d	06/28/16	23:06
14	8439633	lf0984.d	06/28/16	23:34
15	8439634	lf0985.d	06/29/16	00:02
16	8439635	lf0986.d	06/29/16	00:30
17	8439636	lf0987.d	06/29/16	00:59
18	8439637	lf0988.d	06/29/16	01:27

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lf0970a.d DFTPP Injection Date: 06/28/16

Instrument ID: HP20296 DFTPP Injection Time: 16:45

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	56.2
68	Less than 2.0% of mass 69	0.69 (1.35)1
69	Mass 69 relative abundance	51.3
70	Less than 2.0% of mass 69	0.31 (0.6)1
127	40.0 - 60.0% of mass 198	47.0
197	Less than 1.0% of mass 198	0.94
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.39
275	10.0 - 30.0% of mass 198	19.5
365	Greater than 1.00% of mass 198	1.95
441	Present, and less than mass 443	8.68
442	Greater than 40.0 % of mass 198	54.2
443	17.0 - 23.0% of mass 442	10.3 (19.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8439639	lf0989.d	06/29/16	01:55
20	8439640	lf0990.d	06/29/16	02:23

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lg0230.d DFTPP Injection Date: 07/08/16

Instrument ID: HP20296 DFTPP Injection Time: 17:02

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	48.6
68	Less than 2.0% of mass 69	0.72 (1.57)1
69	Mass 69 relative abundance	46.1
70	Less than 2.0% of mass 69	0.19 (0.41)1
127	40.0 - 60.0% of mass 198	47.2
197	Less than 1.0% of mass 198	0.57
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.65
275	10.0 - 30.0% of mass 198	21.3
365	Greater than 1.00% of mass 198	1.95
441	Present, and less than mass 443	9.92
442	Greater than 40.0 % of mass 198	62.2
443	17.0 - 23.0% of mass 442	11.2 (18.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	RVSTD1726 - SSTD7.5	lg0231.d	07/08/16	17:15
02	RVCLB1836 - SSTD30	lg0232.d	07/08/16	17:44
03	rvCLB1836 - SSTD20	lg0233.d	07/08/16	18:16
04	rvCLB1836 - SSTD12.5	lg0234.d	07/08/16	18:44
05	rvCLB1836 - SSTD7.5	lg0235.d	07/08/16	19:13
06	rvCLB1836 - SSTD3.75	lg0236.d	07/08/16	19:41
07	rvCLB1836 - SSTD1.25	lg0237.d	07/08/16	20:10
08	rvCLB1836 - SSTD0.25	lg0238.d	07/08/16	20:38
09	SBLKWD178	lg0239.d	07/08/16	21:06
10	178WDLCS	lg0240.d	07/08/16	21:35
11	178WDLCSD	lg0241.d	07/08/16	22:03
12	178WDLCS1	lg0242.d	07/08/16	22:31
13	178WDLCSD1	lg0243.d	07/08/16	23:00
14	8438378	lg0244.d	07/08/16	23:28
15	8438379	lg0245.d	07/08/16	23:57
16	8442829	lg0246.d	07/09/16	00:25
17	8442830	lg0247.d	07/09/16	00:54
18	8442831	lg0248.d	07/09/16	01:22

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lg0230.d DFTPP Injection Date: 07/08/16

Instrument ID: HP20296 DFTPP Injection Time: 17:02

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	48.6
68	Less than 2.0% of mass 69	0.72 (1.57)1
69	Mass 69 relative abundance	46.1
70	Less than 2.0% of mass 69	0.19 (0.41)1
127	40.0 - 60.0% of mass 198	47.2
197	Less than 1.0% of mass 198	0.57
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.65
275	10.0 - 30.0% of mass 198	21.3
365	Greater than 1.00% of mass 198	1.95
441	Present, and less than mass 443	9.92
442	Greater than 40.0 % of mass 198	62.2
443	17.0 - 23.0% of mass 442	11.2 (18.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8444113	lg0249.d	07/09/16	01:50
20	8444115	lg0250.d	07/09/16	02:19
21	8444116	lg0251.d	07/09/16	02:47
22	8445666	lg0252.d	07/09/16	03:15
23	8445667	lg0253.d	07/09/16	03:44

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	RRF	% RSD	CAL. METHOD
1,4-Dioxane			0.661	0.609	0.608	0.645	0.625	0.590	0.623	4	AVG
N-Nitrosodimethylamine				0.814	0.908	1.046	1.049	1.030	0.969	11	AVG
Pyridine			1.642	1.504	1.748	1.701	1.767	1.774	1.689	6	AVG
2-Picoline			1.434	1.697	1.787	1.862	1.767	1.837	1.731	9	AVG
N-Nitrosomethylethylamine			0.996	0.863	0.877	0.910	0.873	0.841	0.893	6	AVG
Methyl methanesulfonate			0.853	0.916	0.894	0.921	0.913	0.881	0.896	3	AVG
N-Nitrosodiethylamine		0.763	0.913	0.834	0.867	0.901	0.880	0.848	0.858	6	AVG
Ethyl methanesulfonate		0.916	0.865	0.817	0.841	0.835	0.844	0.811	0.847	4	AVG
Phenol		2.498	2.511	2.504	2.584	2.647	2.632	2.572	2.564	2	AVG
Aniline		2.670	2.981	2.889	2.948	2.951	2.973	2.876	2.898	4	AVG
a-methylstyrene			1.640	1.662	1.571	1.677	1.616	1.597	1.627	2	AVG
bis(2-Chloroethyl)ether		1.942	1.901	1.878	1.749	1.813	1.770	1.722	1.825	5	AVG
2-Chlorophenol		1.543	1.456	1.529	1.530	1.604	1.563	1.497	1.532	3	AVG
1,3-Dichlorobenzene		1.591	1.627	1.548	1.554	1.610	1.537	1.493	1.566	3	AVG
1,4-Dichlorobenzene		1.816	1.668	1.622	1.587	1.635	1.610	1.529	1.638	5	AVG
Benzyl alcohol		1.129	1.185	1.174	1.146	1.238	1.236	1.204	1.188	4	AVG
1,2-Dichlorobenzene		1.799	1.638	1.567	1.525	1.584	1.540	1.479	1.590	7	AVG
Indene			2.801	2.753	2.766	2.897	2.819	2.750	2.798	2	AVG
2-Methylphenol	1.623	1.431	1.595	1.614	1.608	1.638	1.648	1.582	1.592	4	AVG
2,2'-oxybis(1-Chloropropane)		2.473	2.029	1.950	1.918	1.988	1.959	1.907	2.032	10	AVG
bis(2-Chloroisopropyl)ether		2.473	2.029	1.950	1.918	1.988	1.959	1.907	2.032	10	AVG
N-Nitrosopyrrolidine		0.954	0.829	0.922	0.952	1.018	1.014	0.953	0.949	7	AVG
Acetophenone		2.132	2.508	2.368	2.457	2.572	2.565	2.453	2.436	6	AVG
4-Methylphenol		1.679	1.832	1.976	1.889	1.992	1.974	1.930	1.896	6	AVG
Total Cresols		1.555	1.713	1.795	1.749	1.815	1.811	1.756	1.742	5	AVG
N-Nitroso-di-n-propylamine		1.571	1.638	1.584	1.570	1.617	1.588	1.537	1.586	2	AVG
N-Nitrosomorpholine			1.089	1.099	1.133	1.145	1.192	1.107	1.128	3	AVG
o-Toluidine		2.454	2.820	2.904	2.790	2.856	2.849	2.783	2.780	5	AVG
Hexachloroethane			0.623	0.583	0.622	0.620	0.583	0.569	0.600	4	AVG
Nitrobenzene		0.476	0.509	0.494	0.494	0.497	0.482	0.490	0.492	2	AVG
N-Nitrosopiperidine		0.167	0.212	0.201	0.213	0.217	0.205	0.210	0.204	8	AVG
Isophorone		0.920	0.938	0.895	0.895	0.902	0.885	0.887	0.903	2	AVG
2-Nitrophenol		0.201	0.190	0.203	0.211	0.212	0.208	0.208	0.205	4	AVG
2,4-Dimethylphenol	0.429	0.354	0.402	0.431	0.413	0.430	0.406	0.414	0.410	6	AVG
O,O,O-Triethylphosphorothioate			0.201	0.182	0.186	0.185	0.181	0.183	0.186	4	AVG
bis(2-Chloroethoxy)methane		0.524	0.542	0.513	0.520	0.498	0.505	0.488	0.513	3	AVG
Benzoic acid			0.372	0.354	0.432	0.429	0.419	0.459	0.411	10	AVG
1,2,3,4-Tetrahydronaphthalene			0.580	0.562	0.591	0.578	0.574	0.591	0.580	2	AVG
2,4-Dichlorophenol		0.280	0.303	0.317	0.319	0.315	0.307	0.314	0.308	4	AVG
1,2,4-Trichlorobenzene			0.321	0.308	0.317	0.323	0.308	0.312	0.315	2	AVG
Naphthalene	1.073	1.130	1.100	1.090	1.071	1.093	1.060	1.088	1.088	2	AVG
4-Chloroaniline		0.434	0.490	0.464	0.497	0.478	0.471	0.493	0.475	5	AVG
2,6-Dichlorophenol		0.289	0.310	0.317	0.308	0.312	0.307	0.312	0.308	3	AVG
Hexachloropropene			0.146	0.154	0.160	0.156	0.155	0.163	0.156	4	AVG
Hexachlorobutadiene	0.163	0.160	0.152	0.151	0.150	0.155	0.145	0.146	0.153	4	AVG
Quinoline			0.788	0.766	0.754	0.772	0.766	0.750	0.766	2	AVG
Caprolactam			0.177	0.155	0.170	0.172	0.175	0.161	0.168	5	AVG
N-Nitrosodi-n-butylamine		0.440	0.384	0.425	0.456	0.449	0.443		0.433	6	AVG
4-Chloro-3-methylphenol		0.361	0.389	0.386	0.399	0.397	0.392	0.385	0.387	3	AVG
Safrole			0.290	0.291	0.297	0.300	0.297	0.299	0.296	1	AVG
2-Methylnaphthalene	0.930	0.743	0.821	0.779	0.786	0.781	0.771	0.764	0.797	7	AVG
1-Methylnaphthalene	0.790	0.724	0.767	0.716	0.729	0.734	0.716	0.714	0.736	4	AVG

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
Hexachlorocyclopentadiene			0.182	0.201	0.227	0.225	0.226	0.237	0.216	10	AVG
1,2,4,5-Tetrachlorobenzene		0.471	0.481	0.479	0.459	0.475	0.458	0.466	0.470	2	AVG
cis-Isosafrole			0.426	0.475	0.528	0.467	0.486	0.494	0.479	7	AVG
2,4,6-Trichlorophenol		0.356	0.344	0.369	0.355	0.361	0.357	0.362	0.358	2	AVG
2,4,5-Trichlorophenol		0.323	0.399	0.437	0.398	0.400	0.394	0.399	0.393	9	AVG
trans-Isosafrole			0.515	0.525	0.539	0.545	0.528	0.530	0.530	2	AVG
Isosafrole			0.500	0.517	0.537	0.531	0.521	0.524	0.522	2	AVG
1,1'-Biphenyl		1.509	1.513	1.485	1.496	1.516	1.510	1.498	1.504	1	AVG
2-Chloronaphthalene		1.134	1.134	1.117	1.286	1.154	1.043	1.173	1.149	6	AVG
1-Chloronaphthalene		1.017	1.164	1.204	1.091	1.081	1.157	1.039	1.107	6	AVG
Diphenyl ether		0.802	0.792	0.826	0.785	0.822	0.782	0.795	0.801	2	AVG
2-Nitroaniline		0.292	0.372	0.427	0.417	0.438	0.428	0.431	0.400	13	AVG
1,4-Naphthoquinone			0.466	0.515	0.533	0.530	0.519	0.510	0.512	5	AVG
1,4-Dinitrobenzene			0.183	0.218	0.216	0.234	0.235	0.239	0.221	9	AVG
Dimethylphthalate			1.468	1.426	1.371	1.375	1.363	1.328	1.389	4	AVG
1,3-Dinitrobenzene			0.228	0.250	0.248	0.259	0.258	0.258	0.250	5	AVG
2,6-Dinitrotoluene		0.256	0.329	0.338	0.328	0.341	0.330	0.337	0.323	9	AVG
Acenaphthylene	1.766	1.891	1.819	1.873	1.829	1.853	1.798	1.816	1.831	2	AVG
3-Nitroaniline		0.249	0.345	0.397	0.388	0.383	0.379	0.374	0.359	14	AVG
Acenaphthene	1.347	1.248	1.251	1.244	1.166	1.210	1.191	1.190	1.231	5	AVG
2,4-Dinitrophenol			0.200	0.227	0.236	0.239	0.247	0.252	0.234	8	AVG
4-Nitrophenol			0.203	0.215	0.211	0.221	0.212	0.238	0.217	5	AVG
Pentachlorobenzene		0.461	0.439	0.412	0.404	0.417	0.402	0.402	0.420	5	AVG
2,4-Dinitrotoluene			0.452	0.472	0.446	0.444	0.459	0.451	0.454	2	AVG
2,4_2,6-Dinitrotoluenes			0.390	0.405	0.387	0.393	0.395	0.394	0.394	2	AVG
Dibenzofuran		1.733	1.820	1.793	1.716	1.709	1.691	1.674	1.734	3	AVG
1-Naphthylamine			1.385	1.412	1.369	1.388	1.368	1.385	1.385	1	AVG
2,3,4,6-Tetrachlorophenol		0.282	0.316	0.333	0.308	0.316	0.310	0.308	0.311	5	AVG
2-Naphthylamine			1.353	1.408	1.356	1.382	1.336	1.353	1.365	2	AVG
Diethylphthalate			1.376	1.424	1.347	1.369	1.358	1.330	1.367	2	AVG
Thionazin			0.278	0.290	0.283	0.282	0.280	0.270	0.280	2	AVG
Fluorene	1.329	1.374	1.508	1.477	1.396	1.435	1.395	1.388	1.413	4	AVG
4-Chlorophenyl-phenylether		0.741	0.638	0.681	0.655	0.654	0.634	0.634	0.663	6	AVG
5-Nitro-o-toluidine		0.336	0.462	0.473	0.453	0.445	0.443	0.440	0.436	10	AVG
4-Nitroaniline		0.377	0.436	0.451	0.422	0.434	0.420	0.396	0.419	6	AVG
4,6-Dinitro-2-methylphenol			0.129	0.134	0.144	0.157	0.156	0.159	0.147	9	AVG
N-Nitrosodiphenylamine (1)	0.672	0.633	0.660	0.655	0.640	0.678	0.664	0.660	0.658	2	AVG
NDPA as diphenylamine	0.672	0.633	0.660	0.655	0.640	0.678	0.664	0.660	0.658	2	AVG
1,2-Diphenylhydrazine		0.965	0.859	0.869	0.879	0.922	0.909	0.898	0.900	4	AVG
Tetraethyldithiopyrophosphate			0.111	0.122	0.131	0.126	0.127	0.123	0.123	6	AVG
1,3,5-Trinitrobenzene			0.062	0.081	0.087	0.095	0.098	0.102	0.087	17	AVG
Diallate (peak 1)			0.407	0.394	0.401	0.410	0.404	0.411	0.405	2	AVG
Phorate		0.475	0.493	0.534	0.546	0.568	0.568	0.571	0.536	7	AVG
Phenacetin		0.384	0.433	0.431	0.441	0.439	0.437	0.433	0.428	5	AVG
4-Bromophenyl-phenylether			0.161	0.181	0.168	0.183	0.177	0.179	0.175	5	AVG
Diallate (peak 2)			0.396	0.393	0.394	0.398	0.404	0.380	0.394	2	AVG
Diallate trans/cis			0.405	0.393	0.400	0.408	0.404	0.406	0.403	1	AVG
Hexachlorobenzene	0.163	0.210	0.168	0.168	0.168	0.183	0.171	0.175	0.176	9	AVG
Dimethoate			0.337	0.370	0.373	0.386	0.358	0.360	0.364	5	AVG
Pentachlorophenol			0.129	0.126	0.129	0.133	0.130	0.133	0.130	2	AVG
4-Aminobiphenyl		0.591	0.617	0.628	0.582	0.545	0.517		0.580	7	AVG
Pentachloronitrobenzene			0.080	0.070	0.068	0.073	0.075	0.074	0.073	5	AVG

(1) Cannot be separated from Diphenylamine
4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
Pronamide		0.300	0.294	0.309	0.322	0.330	0.326	0.324	0.315	4	AVG
Dinoseb			0.127	0.167	0.199	0.209	0.210	0.220	0.189	19	AVG
Phenanthrene	1.139	1.246	1.133	1.125	1.078	1.147	1.121	1.113	1.138	4	AVG
Anthracene	1.028	1.067	1.106	1.130	1.117	1.167	1.130	1.131	1.109	4	AVG
Carbazole		1.078	1.087	1.104	1.060	1.130	1.104	1.084	1.093	2	AVG
Methyl parathion			0.212	0.252	0.274	0.278	0.265	0.268	0.258	9	AVG
Di-n-butylphthalate			1.182	1.219	1.241	1.299	1.288	1.249	1.246	3	AVG
Parathion			0.143	0.157	0.164	0.169	0.168	0.172	0.162	7	AVG
4-Nitroquinoline-1-oxide				0.096	0.109	0.128	0.122	0.131	0.117	13	AVG
Octachlorostyrene			0.064	0.056	0.059	0.062	0.062	0.062	0.061	5	AVG
Isodrin		0.124	0.112	0.114	0.114	0.120	0.119	0.117	0.117	3	AVG
Fluoranthene	1.202	1.134	1.183	1.214	1.157	1.244	1.203	1.176	1.189	3	AVG
Benzidine			0.764	0.791	0.829	0.835	0.805	0.830	0.809	3	AVG
Pyrene	1.307	1.304	1.180	1.158	1.143	1.121	1.120	1.140	1.184	7	AVG
p-Dimethylaminoazobenzene		0.148	0.182	0.200	0.216	0.220	0.222	0.224	0.202	14	AVG
Chlorobenzilate		0.304	0.320	0.323	0.337	0.329	0.326	0.332	0.325	3	AVG
3,3'-Dimethylbenzidine			0.612	0.602	0.641	0.666	0.623	0.760	0.651	9	AVG
Butylbenzylphthalate			0.491	0.501	0.538	0.527	0.521	0.529	0.518	4	AVG
2-Acetylaminofluorene			0.426	0.478	0.496	0.483	0.494	0.490	0.478	5	AVG
3,3'-Dichlorobenzidine			0.373	0.374	0.388	0.377	0.373	0.372	0.376	2	AVG
4,4'-Methylenebis(2-chloroani1			0.196	0.192	0.205	0.199	0.195	0.198	0.197	2	AVG
Benzo(a)anthracene	0.926	0.979	1.060	1.029	1.056	1.033	1.023	0.999	1.013	4	AVG
Chrysene	1.157	1.078	1.012	0.984	0.978	0.976	0.960	0.965	1.014	7	AVG
bis(2-Ethylhexyl)phthalate			0.675	0.692	0.747	0.722	0.722	0.731	0.715	4	AVG
6-Methylchrysene			0.699	0.680	0.708	0.709	0.703	0.704	0.701	2	AVG
Di-n-octylphthalate			1.309	1.474	1.724	1.689	1.628	1.706	1.588	10	AVG
Benzo(b)fluoranthene	1.166	1.232	1.250	1.298	1.277	1.304	1.293	1.273	1.262	4	AVG
7,12-Dimethylbenz[a]anthracene		0.470	0.533	0.601	0.657	0.640	0.597	0.622	0.589	11	AVG
Benzo(k)fluoranthene	1.118	1.171	1.253	1.264	1.360	1.318	1.206	1.263	1.244	6	AVG
Benzo(a)pyrene	0.967	1.131	1.198	1.237	1.245	1.262	1.206	1.200	1.181	8	AVG
3-Methylcholanthrene		0.489	0.481	0.514	0.538	0.558	0.526	0.535	0.520	5	AVG
Dibenz(a,h)acridine			0.808	0.833	0.948	0.952	0.923	0.925	0.898	7	AVG
Dibenz(a,j)acridine			0.920	0.898	1.020	0.985	0.934	0.953	0.951	5	AVG
Indeno(1,2,3-cd)pyrene	1.011	1.089	1.195	1.252	1.307	1.302	1.250	1.250	1.207	9	AVG
Dibenz(a,h)anthracene	0.944	0.963	1.028	1.044	1.106	1.097	1.066	1.047	1.037	6	AVG
Benzo(g,h,i)perylene	0.902	1.042	1.027	1.036	1.098	1.056	1.044	1.032	1.030	5	AVG
Total PAHs	1.053	1.061	1.107	1.132	1.177	1.182	1.129	1.171	1.127	4	AVG
2-Fluorophenol			1.506	1.494	1.480	1.544	1.493	1.458	1.496	2	AVG
Phenol-d6			2.191	2.221	2.188	2.236	2.265	2.182	2.214	1	AVG
Nitrobenzene-d5			0.475	0.466	0.475	0.482	0.465	0.470	0.472	1	AVG
2-Fluorobiphenyl			1.314	1.317	1.279	1.294	1.261	1.265	1.288	2	AVG
2,4,6-Tribromophenol			0.142	0.146	0.141	0.145	0.141	0.138	0.142	2	AVG
Terphenyl-d14			0.754	0.747	0.738	0.725	0.717	0.713	0.732	2	AVG

Average %RSD 5

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d SSTD030
/chem/HP11165.i/16jun07.b/gf0202.d SSTD120
/chem/HP11165.i/16jun07.b/gf0203.d SSTD080
/chem/HP11165.i/16jun07.b/gf0204.d SSTD050
/chem/HP11165.i/16jun07.b/gf0205.d SSTD015
/chem/HP11165.i/16jun07.b/gf0206.d SSTD005
/chem/HP11165.i/16jun07.b/gf0207.d SSTD001
/chem/HP11165.i/16jun07.b/gf0208.d SSTD00.5

Area Summary

File ID:

Internal Standard Name	gf0201.d	gf0202.d	gf0203.d	gf0204.d	gf0205.d	gf0206.d	gf0207.d	gf0208.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	70096	80056	69946	73872	74388	75855	70518	68894	72953	5	Yes
Naphthalene-d8	296116	339990	315991	325835	322701	324878	300737	292985	314904	5	Yes
Acenaphthene-d10	192522	219303	205887	212735	203039	209044	189605	188690	202603	6	Yes
Phenanthrene-d10	374023	412819	389703	400814	413018	417859	369222	370475	393492	5	Yes
Pyrene-d10	404786	440349	432286	456203	461359	456027	416814	425673	436687	5	Yes
Perylene-d12	301130	329460	331473	334394	351858	365369	345528	338486	337212	6	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

File ID:

Internal Standard Name	gf0201.d	gf0202.d	gf0203.d	gf0204.d	gf0205.d	gf0206.d	gf0207.d	gf0208.d	Avg. RT
1,4-Dichlorobenzene-d4	5.528	5.534	5.534	5.534	5.528	5.528	5.528	5.528	5.530
Naphthalene-d8	6.763	6.763	6.763	6.763	6.763	6.763	6.763	6.763	6.763
Acenaphthene-d10	8.475	8.475	8.475	8.475	8.475	8.469	8.475	8.469	8.473
Phenanthrene-d10	9.922	9.927	9.928	9.922	9.922	9.922	9.922	9.922	9.923
Pyrene-d10	11.310	11.310	11.310	11.310	11.304	11.304	11.304	11.304	11.307
Perylene-d12	13.939	13.945	13.945	13.945	13.939	13.939	13.939	13.939	13.941

Comments: _____

Report generated on 06/07/2016 at 18:24

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,4-Dioxane	50.00	53.67	7	30	YES
N-Nitrosodimethylamine	50.00	51.70	3	30	YES
Pyridine	50.00	55.26	11	30	YES
2-Picoline	50.00	51.90	4	30	YES
N-Nitrosomethylethylamine	50.00	41.43	-17	30	YES
Methyl methanesulfonate	50.00	52.74	5	30	YES
N-Nitrosodiethylamine	50.00	48.88	-2	30	YES
Ethyl methanesulfonate	50.00	49.75	-1	30	YES
Phenol	50.00	50.98	2	30	YES
Aniline	50.00	48.42	-3	30	YES
bis(2-Chloroethyl)ether	50.00	48.81	-2	30	YES
2-Chlorophenol	50.00	52.08	4	30	YES
1,3-Dichlorobenzene	50.00	52.08	4	30	YES
1,4-Dichlorobenzene	50.00	51.06	2	30	YES
Benzyl alcohol	50.00	51.04	2	30	YES
1,2-Dichlorobenzene	50.00	49.45	-1	30	YES
Indene	50.00	49.46	-1	30	YES
2-Methylphenol	50.00	53.12	6	30	YES
2,2'-oxybis(1-Chloropropane	50.00	51.97	4	30	YES
bis(2-Chloroisopropyl)ether	50.00	51.97	4	30	YES
N-Nitrosopyrrolidine	50.00	49.17	-2	30	YES
Acetophenone	50.00	49.36	-1	30	YES
4-Methylphenol	50.00	51.50	3	30	YES
N-Nitroso-di-n-propylamine	50.00	49.22	-2	30	YES
N-Nitrosomorpholine	50.00	50.77	2	30	YES
o-Toluidine	50.00	49.28	-1	30	YES
Total Cresols	100.00	104.63	5	30	YES
Hexachloroethane	50.00	50.96	2	30	YES
Nitrobenzene	50.00	48.91	-2	30	YES
N-Nitrosopiperidine	50.00	48.00	-4	30	YES
Isophorone	50.00	46.64	-7	30	YES
2-Nitrophenol	50.00	49.47	-1	30	YES
2,4-Dimethylphenol	50.00	45.31	-9	30	YES
bis(2-Chloroethoxy)methane	50.00	48.38	-3	30	YES
Benzoic acid	100.00	94.14	-6	30	YES
O,O,O-Triethylphosphorothio	50.00	46.81	-6	30	YES
2,4-Dichlorophenol	50.00	50.24	0	30	YES

NC = Could not calculate

Comments:

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP11165

Method: SW-846 8270D File ID: gf0211.d

ICV SAMPLE ID: ICV1376 BATCH: 16JUN07026 Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,2,4-Trichlorobenzene	50.00	50.78	2	30	YES
Naphthalene	50.00	49.34	-1	30	YES
4-Chloroaniline	50.00	50.91	2	30	YES
2,6-Dichlorophenol	50.00	49.38	-1	30	YES
Hexachloropropene	50.00	53.33	7	30	YES
Hexachlorobutadiene	50.00	49.70	-1	30	YES
Quinoline	50.00	47.91	-4	30	YES
N-Nitrosodi-n-butylamine	50.00	36.21	-28	30	YES
4-Chloro-3-methylphenol	50.00	48.54	-3	30	YES
Safrole	50.00	49.09	-2	30	YES
2-Methylnaphthalene	50.00	46.43	-7	30	YES
1-Methylnaphthalene	50.00	46.31	-7	30	YES
Hexachlorocyclopentadiene	100.00	90.59	-9	30	YES
1,2,4,5-Tetrachlorobenzene	50.00	50.80	2	30	YES
cis-Isosafrole	6.00	6.25	4	30	YES
2,4,6-Trichlorophenol	50.00	49.91	0	30	YES
2,4,5-Trichlorophenol	50.00	51.15	2	30	YES
trans-Isosafrole	44.00	46.22	5	30	YES
1,1'-Biphenyl	50.00	48.75	-3	30	YES
2-Chloronaphthalene	50.00	50.26	1	30	YES
Isosafrole	50.00	52.47	5	30	YES
1-Chloronaphthalene	50.00	49.36	-1	30	YES
Diphenyl ether	50.00	49.24	-2	30	YES
2-Nitroaniline	50.00	52.74	5	30	YES
1,4-Naphthoquinone	62.50	58.31	-7	30	YES
1,4-Dinitrobenzene	50.00	51.33	3	30	YES
Dimethylphthalate	50.00	48.55	-3	30	YES
1,3-Dinitrobenzene	50.00	50.59	1	30	YES
2,6-Dinitrotoluene	50.00	52.28	5	30	YES
Acenaphthylene	50.00	43.69	-13	30	YES
3-Nitroaniline	50.00	52.01	4	30	YES
Acenaphthene	50.00	48.87	-2	30	YES
2,4-Dinitrophenol	100.00	100.32	0	30	YES
4-Nitrophenol	50.00	52.72	5	30	YES
Pentachlorobenzene	50.00	49.86	0	30	YES
2,4-Dinitrotoluene	50.00	50.32	1	30	YES
Dibenzofuran	50.00	48.44	-3	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
2,4_2,6-Dinitrotoluenes	100.00	102.60	3	30	YES
1-Naphthylamine	100.00	94.52	-5	30	YES
2,3,4,6-Tetrachlorophenol	50.00	54.18	8	30	YES
2-Naphthylamine	100.00	91.56	-8	30	YES
Diethylphthalate	50.00	48.98	-2	30	YES
Thionazin	50.00	41.55	-17	30	YES
Fluorene	50.00	51.88	4	30	YES
4-Chlorophenyl-phenylether	50.00	49.68	-1	30	YES
5-Nitro-o-toluidine	50.00	50.51	1	30	YES
4-Nitroaniline	50.00	47.08	-6	30	YES
4,6-Dinitro-2-methylphenol	50.00	50.51	1	30	YES
N-Nitrosodiphenylamine	50.00	48.76	-2	30	YES
NDPA as diphenylamine	50.00	48.76	-2	30	YES
1,2-Diphenylhydrazine	50.00	48.83	-2	30	YES
Tetraethyldithiopyrophospha	50.00	46.53	-7	30	YES
1,3,5-Trinitrobenzene	50.00	49.05	-2	30	YES
Diallate (peak 1)	37.50	33.84	-10	30	YES
Phorate	50.00	49.55	-1	30	YES
Phenacetin	50.00	47.14	-6	30	YES
4-Bromophenyl-phenylether	50.00	49.76	0	30	YES
Diallate (peak 2)	12.50	11.62	-7	30	YES
Hexachlorobenzene	50.00	48.55	-3	30	YES
Diallate trans/cis	50.00	45.47	-9	30	YES
Dimethoate	50.00	44.62	-11	30	YES
Pentachlorophenol	50.00	52.02	4	30	YES
4-Aminobiphenyl	50.00	67.10	34	30	NO*
Pentachloronitrobenzene	50.00	47.02	-6	30	YES
Pronamide	50.00	47.53	-5	30	YES
Dinoseb	50.00	52.71	5	30	YES
Phenanthrene	50.00	47.06	-6	30	YES
Anthracene	50.00	49.49	-1	30	YES
Carbazole	50.00	48.06	-4	30	YES
Methyl parathion	50.00	47.81	-4	30	YES
Di-n-butylphthalate	50.00	48.97	-2	30	YES
Parathion	50.00	50.59	1	30	YES
4-Nitroquinoline-1-oxide	600.00	770.14	28	30	YES
Isodrin	50.00	46.43	-7	30	YES

NC = Could not calculate

Comments: *APPIX compound. Rerun any samples with hits for 4-Aminobiphenyl under valid ICV.

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Fluoranthene	50.00	49.03	-2	30	YES
Benzidine	250.00	248.93	0	30	YES
Pyrene	50.00	47.76	-4	30	YES
p-Dimethylaminoazobenzene	50.00	59.50	19	30	YES
Chlorobenzilate	50.00	49.10	-2	30	YES
3,3'-Dimethylbenzidine	100.00	104.27	4	30	YES
Butylbenzylphthalate	50.00	52.12	4	30	YES
2-Acetylaminofluorene	50.00	49.76	0	30	YES
3,3'-Dichlorobenzidine	50.00	47.12	-6	30	YES
Benzo(a)anthracene	50.00	51.44	3	30	YES
Chrysene	50.00	49.83	0	30	YES
4,4'-Methylenebis(2-chloroa	50.00	47.77	-4	30	YES
bis(2-Ethylhexyl)phthalate	50.00	50.47	1	30	YES
6-Methylchrysene	50.00	49.29	-1	30	YES
Di-n-octylphthalate	50.00	54.60	9	30	YES
Benzo(b)fluoranthene	50.00	53.49	7	30	YES
7,12-Dimethylbenz[a]anthrac	50.00	54.14	8	30	YES
Benzo(k)fluoranthene	50.00	57.36	15	30	YES
Benzo(a)pyrene	50.00	52.95	6	30	YES
3-Methylcholanthrene	50.00	63.50	27	30	YES
Dibenz(a,h)acridine	50.00	50.97	2	30	YES
Dibenz(a,j)acridine	50.00	50.12	0	30	YES
Indeno(1,2,3-cd)pyrene	50.00	56.11	12	30	YES
Dibenz(a,h)anthracene	50.00	55.58	11	30	YES
Benzo(g,h,i)perylene	50.00	54.71	9	30	YES
Total PAHs	900.00	911.32	1	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP1ll65

Method: SW-846 8270D File ID: gf0212.d

ICV SAMPLE ID: ICVBAS0716 BATCH: 16JUN07026 Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Caprolactam	50.00	44.50	-11	30	YES

NC = Could not calculate

Comments: _____

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/28/16 06/28/16

Calibration Times: 07:48 09:58

LAB FILE ID: RRF5 = gf1007.d RRF15 = gf1006.d

RRF30 = gf1005.d RRF50 = gf1004.d RRF80 = gf1003.d RRF120 = gf1002.d

COMPOUND	RRF	RRF	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
2-Chlorobenzalmalononitrile			0.373	0.369	0.378	0.374	0.376	0.382	0.375	1	AVG
								Average %RSD		1	

07-12-2016

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun28.b/gf1002.d SSTD120
/chem/HP11165.i/16jun28.b/gf1003.d SSTD080
/chem/HP11165.i/16jun28.b/gf1004.d SSTD050
/chem/HP11165.i/16jun28.b/gf1005.d SSTD030
/chem/HP11165.i/16jun28.b/gf1006.d SSTD015
/chem/HP11165.i/16jun28.b/gf1007.d SSTD005

Area Summary

	File ID:								
Internal Standard Name	gf1002.d	gf1003.d	gf1004.d	gf1005.d	gf1006.d	gf1007.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	69353	75067	81429	77374	76768	84981	77495	7	Yes
Naphthalene-d8	300636	313602	337965	327580	320228	357147	326193	6	Yes
Acenaphthene-d10	200693	208546	226613	225158	220824	240109	220324	6	Yes
Phenanthrene-d10	415370	427022	462700	443931	443085	487450	446593	6	Yes
Pyrene-d10	497800	513778	536406	523166	517538	581064	528292	5	Yes
Perylene-d12	427018	435295	432549	423115	415118	448269	430227	3	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:						
Internal Standard Name	gf1002.d	gf1003.d	gf1004.d	gf1005.d	gf1006.d	gf1007.d	Avg. RT
1,4-Dichlorobenzene-d4	5.151	5.151	5.152	5.151	5.151	5.151	5.151
Naphthalene-d8	6.387	6.386	6.387	6.386	6.381	6.381	6.385
Acenaphthene-d10	8.087	8.086	8.087	8.086	8.086	8.087	8.086
Phenanthrene-d10	9.528	9.527	9.528	9.527	9.528	9.528	9.528
Pyrene-d10	10.904	10.904	10.898	10.898	10.898	10.898	10.900
Perylene-d12	13.480	13.480	13.480	13.480	13.480	13.480	13.480

Comments: _____

Report generated on 06/28/2016 at 16:24

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 07/05/16 07/05/16

Calibration Times: 07:13 09:20

LAB FILE ID: RRF5 = gg0168.d RRF15 = gg0167.d
RRF30 = gg0166.d RRF50 = gg0165.d RRF80 = gg0164.d RRF120 = gg0163.d

COMPOUND	RRF	RRF	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
2-Chlorobenzaldehyde			0.224	0.263	0.256	0.265	0.267	0.270	0.257	7	AVG
								Average %RSD		4	

07-05-2016

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jul05.b/gg0163.d SSTD120
/chem/HP11165.i/16jul05.b/gg0164.d SSTD080
/chem/HP11165.i/16jul05.b/gg0165.d SSTD050
/chem/HP11165.i/16jul05.b/gg0166.d SSTD030
/chem/HP11165.i/16jul05.b/gg0167.d SSTD015
/chem/HP11165.i/16jul05.b/gg0168.d SSTD005

Area Summary

	File ID:								
Internal Standard Name	gg0163.d	gg0164.d	gg0165.d	gg0166.d	gg0167.d	gg0168.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	47137	51183	50572	51241	50923	52470	50588	4	Yes
Naphthalene-d8	201732	208877	212564	213177	210827	209380	209426	2	Yes
Acenaphthene-d10	131120	131752	132398	133283	131450	131673	131946	1	Yes
Phenanthrene-d10	259478	257521	267085	263821	257523	255200	260105	2	Yes
Pyrene-d10	300869	308649	314265	319659	311533	306987	310327	2	Yes
Perylene-d12	262779	280597	291691	282485	276925	275886	278394	3	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:						
Internal Standard Name	gg0163.d	gg0164.d	gg0165.d	gg0166.d	gg0167.d	gg0168.d	Avg. RT
1,4-Dichlorobenzene-d4	4.934	4.934	4.934	4.934	4.934	4.934	4.934
Naphthalene-d8	6.163	6.163	6.163	6.163	6.163	6.163	6.163
Acenaphthene-d10	7.857	7.857	7.857	7.857	7.857	7.857	7.857
Phenanthrene-d10	9.280	9.280	9.286	9.286	9.286	9.286	9.284
Pyrene-d10	10.645	10.645	10.645	10.645	10.645	10.645	10.645
Perylene-d12	13.186	13.186	13.186	13.186	13.186	13.186	13.186

Comments: _____

07-05-2015

Report generated on 07/05/2016 at 09:43

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date(s): 07/08/16 07/08/16

Calibration Times: 17:44 20:10

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30%

LAB FILE ID: RRF1.25 = lg0237.d RRF3.75 = lg0236.d
RRF7.5 = lg0235.d RRF12.5 = lg0234.d RRF20 = lg0233.d RRF30 = lg0232.d

COMPOUND	RRF	RRF	RRF1.25	RRF3.75	RRF7.5	RRF12.5	RRF20	RRF30	$\overline{RRF}$	% RSD	CAL. METHOD
2-Chlorobenzaldehyde			0.243	0.249	0.256	0.259	0.256	0.255	0.253	2	AVG
								Average %RSD		1	

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP20296.i/16jul08a.b/lg0232.d SSTD030
/chem/HP20296.i/16jul08a.b/lg0233.d SSTD020
/chem/HP20296.i/16jul08a.b/lg0234.d SSTD12.5
/chem/HP20296.i/16jul08a.b/lg0235.d SSTD7.5
/chem/HP20296.i/16jul08a.b/lg0236.d SSTD3.75
/chem/HP20296.i/16jul08a.b/lg0237.d SSTD1.25

Area Summary

	File ID:								
Internal Standard Name	lg0232.d	lg0233.d	lg0234.d	lg0235.d	lg0236.d	lg0237.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	212587	217135	211936	212342	212178	210640	212803	1	Yes
Naphthalene-d8	825527	825613	811349	822873	828683	819549	822266	1	Yes
Acenaphthene-d10	444991	443957	444593	446614	455572	454949	448446	1	Yes
Phenanthrene-d10	836989	813291	793869	790501	810058	796593	806884	2	Yes
Pyrene-d10	956605	955690	926450	921436	947264	935807	940542	2	Yes
Perylene-d12	760986	759536	740665	740532	765078	757924	754120	1	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:						
Internal Standard Name	lg0232.d	lg0233.d	lg0234.d	lg0235.d	lg0236.d	lg0237.d	Avg. RT
1,4-Dichlorobenzene-d4	6.842	6.847	6.842	6.842	6.842	6.842	6.843
Naphthalene-d8	8.832	8.832	8.831	8.826	8.831	8.831	8.831
Acenaphthene-d10	11.672	11.677	11.671	11.672	11.671	11.672	11.673
Phenanthrene-d10	13.597	13.602	13.597	13.597	13.597	13.597	13.598
Pyrene-d10	15.641	15.646	15.640	15.641	15.640	15.640	15.641
Perylene-d12	20.230	20.229	20.229	20.230	20.229	20.224	20.229

Comments: _____

_____

Report generated on 07/08/2016 at 20:40

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
N-Nitrosodimethylamine	0.969	1.078	33.380	30.0	11
Pyridine	1.689	1.832	32.540	30.0	8
2-Picoline	1.731	1.891	32.780	30.0	9
N-Nitrosomethylethylamine	0.893	0.770	25.850	30.0	-14
Methyl methanesulfonate	0.896	0.902	30.180	30.0	1
N-Nitrosodiethylamine	0.858	0.904	31.610	30.0	5
Ethyl methanesulfonate	0.847	0.813	28.810	30.0	-4
Phenol	2.564	2.379	27.830	30.0	-7
Aniline	2.898	2.863	29.630	30.0	-1
a-methylstyrene	1.627	1.704	31.410	30.0	5
bis(2-Chloroethyl)ether	1.825	1.843	30.300	30.0	1
2-Chlorophenol	1.532	1.551	30.370	30.0	1
1,3-Dichlorobenzene	1.566	1.622	31.080	30.0	4
1,4-Dichlorobenzene	1.638	1.643	30.090	30.0	0
Benzyl alcohol	1.188	1.274	32.200	30.0	7
1,2-Dichlorobenzene	1.590	1.526	28.780	30.0	-4
Indene	2.798	2.733	29.300	30.0	-2
2-Methylphenol	1.592	1.717	32.350	30.0	8
2,2'-oxybis(1-Chloropropane)	2.032	2.095	30.930	30.0	3
bis(2-Chloroisopropyl)ether	2.032	2.095	30.930	30.0	3
N-Nitrosopyrrolidine	0.949	1.036	32.770	30.0	9
Acetophenone	2.437	2.505	30.840	30.0	3
4-Methylphenol	1.896	1.864	29.490	30.0	-2
Total Cresols	1.742	1.791	61.850	60.0	3
N-Nitroso-di-n-propylamine	1.586	1.563	29.560	30.0	-1
N-Nitrosomorpholine	1.128	1.120	29.790	30.0	-1
o-Toluidine	2.780	2.879	31.070	30.0	4
Hexachloroethane	0.600	0.600	30.000	30.0	0
Nitrobenzene	0.492	0.490	29.870	30.0	0
N-Nitrosopiperidine	0.204	0.210	30.920	30.0	3
Isophorone	0.903	0.894	29.710	30.0	-1
2-Nitrophenol	0.205	0.205	30.040	30.0	0
2,4-Dimethylphenol	0.410	0.421	30.850	30.0	3
O,O,O-Triethylphosphorothioate	0.186	0.203	32.730	30.0	9
bis(2-Chloroethoxy)methane	0.513	0.497	29.060	30.0	-3
Benzoic acid	0.411	0.363	35.360	40.0	-12

FORM VII SV-1

JM6/346
7-6-16

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2,3,4-Tetrahydronaphthalene	0.580	0.581	30.070	30.0	0
2,4-Dichlorophenol	0.308	0.321	31.270	30.0	4
1,2,4-Trichlorobenzene	0.315	0.328	31.250	30.0	4
Naphthalene	1.088	1.077	29.680	30.0	-1
4-Chloroaniline	0.475	0.483	30.500	30.0	2
2,6-Dichlorophenol	0.308	0.310	30.200	30.0	1
Hexachloropropene	0.156	0.176	34.000	30.0	13
Hexachlorobutadiene	0.153	0.170	33.360	30.0	11
Quinoline	0.766	0.749	29.320	30.0	-2
Caprolactam	0.168	0.162	28.770	30.0	-4
N-Nitrosodi-n-butylamine	0.433	0.430	29.820	30.0	-1
4-Chloro-3-methylphenol	0.387	0.394	30.580	30.0	2
Safrole	0.296	0.307	31.140	30.0	4
2-Methylnaphthalene	0.797	0.784	29.520	30.0	-2
1-Methylnaphthalene	0.736	0.711	28.960	30.0	-3
Hexachlorocyclopentadiene	0.216	0.195	27.080	30.0	-10
1,2,4,5-Tetrachlorobenzene	0.470	0.528	33.740	30.0	12
cis-Isosafrole	0.479	0.525	5.590	5.1	10
2,4,6-Trichlorophenol	0.358	0.391	32.770	30.0	9
2,4,5-Trichlorophenol	0.393	0.427	32.650	30.0	9
trans-Isosafrole	0.530	0.569	26.740	24.9	7
Isosafrole	0.522	0.562	32.320	30.0	8
1,1'-Biphenyl	1.504	1.508	30.070	30.0	0
2-Chloronaphthalene	1.149	1.434	37.440	30.0	25
1-Chloronaphthalene	1.107	1.108	30.020	30.0	0
Diphenyl ether	0.801	0.833	31.230	30.0	4
2-Nitroaniline	0.400	0.431	32.280	30.0	8
1,4-Naphthoquinone	0.512	0.476	27.900	30.0	-7
1,4-Dinitrobenzene	0.221	0.225	30.520	30.0	2
Dimethylphthalate	1.389	1.361	29.400	30.0	-2
1,3-Dinitrobenzene	0.250	0.261	31.340	30.0	4
2,6-Dinitrotoluene	0.323	0.340	31.620	30.0	5
Acenaphthylene	1.831	1.808	29.630	30.0	-1
3-Nitroaniline	0.359	0.371	31.020	30.0	3
Acenaphthene	1.231	1.182	28.810	30.0	-4
2,4-Dinitrophenol	0.234	0.212	36.280	40.0	-9

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
4-Nitrophenol	0.217	0.217	30.070	30.0	0
Pentachlorobenzene	0.420	0.482	34.440	30.0	15
2,4-Dinitrotoluene	0.454	0.443	29.240	30.0	-3
2,4_2,6-Dinitrotoluenes	0.394	0.391	60.870	60.0	1
Dibenzofuran	1.734	1.717	29.700	30.0	-1
1-Naphthylamine	1.385	1.362	29.500	30.0	-2
2,3,4,6-Tetrachlorophenol	0.311	0.331	31.940	30.0	6
2-Naphthylamine	1.365	1.315	28.900	30.0	-4
Diethylphthalate	1.367	1.347	29.570	30.0	-1
Thionazin	0.280	0.290	30.990	30.0	3
Fluorene	1.413	1.445	30.700	30.0	2
4-Chlorophenyl-phenylether	0.663	0.685	31.000	30.0	3
5-Nitro-o-toluidine	0.436	0.428	29.420	30.0	-2
4-Nitroaniline	0.419	0.389	27.830	30.0	-7
4,6-Dinitro-2-methylphenol	0.147	0.148	30.260	30.0	1
N-Nitrosodiphenylamine (1)	0.658	0.665	30.320	30.0	1
NDPA as diphenylamine	0.658	0.665	30.320	30.0	1
1,2-Diphenylhydrazine	0.900	0.882	29.380	30.0	-2
Tetraethyldithiopyrophosphate	0.123	0.125	30.380	30.0	1
1,3,5-Trinitrobenzene	0.087	0.092	31.410	30.0	5
Diallate (peak 1)	0.405	0.398	24.500	24.9	-2
Phorate	0.536	0.771	43.140	30.0	44
Phenacetin	0.428	0.411	28.780	30.0	-4
4-Bromophenyl-phenylether	0.175	0.213	36.580	30.0	22
Diallate (peak 2)	0.394	0.372	4.820	5.1	-5
Diallate trans/cis	0.403	0.394	29.320	30.0	-2
Hexachlorobenzene	0.176	0.206	35.190	30.0	17
Dimethoate	0.364	0.375	30.900	30.0	3
Pentachlorophenol	0.130	0.127	29.230	30.0	-3
4-Aminobiphenyl	0.580	0.548	28.330	30.0	-6
Pentachloronitrobenzene	0.073	0.081	32.920	30.0	10
Pronamide	0.315	0.312	29.760	30.0	-1
Dinoseb	0.189	0.212	33.700	30.0	12
Phenanthrene	1.138	1.137	29.980	30.0	0
Anthracene	1.109	1.158	31.310	30.0	4
Carbazole	1.092	1.083	29.750	30.0	-1

(1) Cannot be Separated from Diphenylamine

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Methyl parathion	0.258	0.272	31.600	30.0	5
Di-n-butylphthalate	1.246	1.234	29.720	30.0	-1
Parathion	0.162	0.169	31.170	30.0	4
4-Nitroquinoline-1-oxide	0.117	0.078	19.980	30.0	-33
Octachlorostyrene	0.061	0.074	36.270	30.0	21
Isodrin	0.117	0.121	31.070	30.0	4
Fluoranthene	1.189	1.262	31.830	30.0	6
Benzidine	0.809	0.768	85.380	90.0	-5
Pyrene	1.184	1.106	28.020	30.0	-7
p-Dimethylaminoazobenzene	0.202	0.211	31.350	30.0	4
Chlorobenzilate	0.325	0.303	28.000	30.0	-7
3,3'-Dimethylbenzidine	0.651	0.669	30.830	30.0	3
Butylbenzylphthalate	0.518	0.469	27.170	30.0	-9
2-Acetylaminofluorene	0.478	0.465	29.210	30.0	-3
3,3'-Dichlorobenzidine	0.376	0.409	32.640	30.0	9
4,4'-Methylenebis(2-chloroanil	0.197	0.211	32.090	30.0	7
Benzo(a)anthracene	1.013	1.056	31.280	30.0	4
Chrysene	1.014	1.013	29.960	30.0	0
bis(2-Ethylhexyl)phthalate	0.715	0.659	27.660	30.0	-8
6-Methylchrysene	0.701	0.755	32.330	30.0	8
Di-n-octylphthalate	1.589	1.326	25.040	30.0	-17
Benzo(b)fluoranthene	1.262	1.150	27.350	30.0	-9
7,12-Dimethylbenz[a]anthracene	0.589	0.588	29.990	30.0	0
Benzo(k)fluoranthene	1.244	1.280	30.860	30.0	3
Benzo(a)pyrene	1.181	1.163	29.540	30.0	-2
3-Methylcholanthrene	0.520	0.528	30.420	30.0	1
Dibenz(a,h)acridine	0.898	0.901	30.110	30.0	0
Dibenz(a,j)acridine	0.951	0.999	31.490	30.0	5
Indeno(1,2,3-cd)pyrene	1.207	1.283	31.890	30.0	6
Dibenz(a,h)anthracene	1.037	1.077	31.160	30.0	4
Benzo(g,h,i)perylene	1.030	1.071	31.200	30.0	4
Total PAHs	1.127	1.033	541.680	540.0	0
2-Fluorophenol	1.496	1.568	62.900	60.0	5
Phenol-d6	2.214	2.233	60.510	60.0	1
Nitrobenzene-d5	0.472	0.465	59.070	60.0	-2

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Fluorobiphenyl	1.288	1.316	61.260	60.0	2
2,4,6-Tribromophenol	0.142	0.175	73.960	60.0	23
Terphenyl-d14	0.732	0.771	63.190	60.0	5
			Average %Drift:		5

Continuing Calibration
Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d **
/chem/HP11165.i/16jun07.b/gf0202.d
/chem/HP11165.i/16jun07.b/gf0203.d
/chem/HP11165.i/16jun07.b/gf0204.d
/chem/HP11165.i/16jun07.b/gf0205.d
/chem/HP11165.i/16jun07.b/gf0206.d
/chem/HP11165.i/16jun07.b/gf0207.d
/chem/HP11165.i/16jun07.b/gf0208.d

** indicates the Mid Level Calibration Standard.

Mid Level Calibration Standard is used for comparison.

Current Continuing Calibration Standard:

/chem/HP11165.i/16jul06.b/gg0231.d

Area Summary

File ID:

Internal Standard Name	gg0231.d	ICAL Area	Low Limit	High Limit	In Spec
1,4-Dichlorobenzene-d4	77254	70096	35048	140192	Yes
Naphthalene-d8	340561	296116	148058	592232	Yes
Acenaphthene-d10	217465	192522	96261	385044	Yes
Phenanthrene-d10	417213	374023	187012	748046	Yes
Pyrene-d10	490477	404786	202393	809572	Yes
Perylene-d12	422029	301130	150565	602260	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

File ID:

Internal Standard Name	gg0231.d	ICAL RT	In Spec
1,4-Dichlorobenzene-d4	4.892	5.528	No
Naphthalene-d8	6.122	6.763	No
Acenaphthene-d10	7.822	8.475	No
Phenanthrene-d10	9.251	9.922	No
Pyrene-d10	10.610	11.310	No
Perylene-d12	13.145	13.939	No

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments: V- Column Maintenance
SM6-546
7-6-16

Report generated on 07/06/2016 at 05:51

7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:53

Lab File ID: gg0232.d Init. Calib. Date(s): 06/28/16 06/28/16

Init. Calib. Times(s): 07:48 09:58

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Chlorobenzalmalononitrile	0.375	0.368	29.420	30.0	-2
			Average %Drift:		2

FORM VII SV-1

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 06:19

Lab File ID: gg0233.d Init. Calib. Date(s): 07/05/16 07/05/16

Init. Calib. Times(s): 07:13 09:20

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Chlorobenzaldehyde	0.257	0.256	29.810	30.0	-1
			Average %Drift:		1

JMG 7-6-16

FORM VII SV-1

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,4-Dioxane	0.606	0.621	7.680	7.5	2
N-Nitrosodimethylamine	0.987	1.024	7.780	7.5	4
Pyridine	1.609	1.549	7.220	7.5	-4
2-Picoline	1.758	1.824	7.780	7.5	4
N-Nitrosomethylethylamine	0.699	0.738	7.920	7.5	6
Methyl methanesulfonate	0.716	0.759	7.950	7.5	6
N-Nitrosodiethylamine	0.668	0.715	8.030	7.5	7
Ethyl methanesulfonate	0.703	0.758	8.080	7.5	8
Benzaldehyde	1.357	1.353	7.480	7.5	0
Phenol	2.161	2.225	7.720	7.5	3
Aniline	2.571	2.616	7.630	7.5	2
a-methylstyrene	1.471	1.752	8.930	7.5	19
bis(2-Chloroethyl)ether	1.593	1.651	7.770	7.5	4
2-Chlorophenol	1.328	1.374	7.760	7.5	3
1,3-Dichlorobenzene	1.499	1.492	7.470	7.5	0
1,4-Dichlorobenzene	1.545	1.531	7.430	7.5	-1
Benzyl alcohol	0.967	1.158	8.980	7.5	20
1,2-Dichlorobenzene	1.436	1.437	7.510	7.5	0
Indene	2.508	2.977	8.900	7.5	19
2-Methylphenol	1.365	1.418	7.790	7.5	4
2,2'-oxybis(1-Chloropropane)	2.811	2.842	7.580	7.5	1
bis(2-Chloroisopropyl)ether	2.811	2.842	7.580	7.5	1
N-Nitrosopyrrolidine	0.723	0.787	8.160	7.5	9
Acetophenone	2.076	2.263	8.180	7.5	9
4-Methylphenol	1.464	1.609	8.250	7.5	10
Total Cresols	1.414	1.513	16.030	15.0	7
N-Nitroso-di-n-propylamine	1.171	1.245	7.970	7.5	6
N-Nitrosomorpholine	1.058	1.101	7.810	7.5	4
o-Toluidine	2.411	2.479	7.710	7.5	3
Hexachloroethane	0.608	0.654	8.070	7.5	8
Nitrobenzene	0.443	0.456	7.710	7.5	3
N-Nitrosopiperidine	0.175	0.181	7.780	7.5	4
Isophorone	0.787	0.795	7.580	7.5	1
2-Nitrophenol	0.167	0.175	7.830	7.5	4
2,4-Dimethylphenol	0.373	0.385	7.750	7.5	3
O,O,O-Triethylphosphorothioate	0.164	0.166	7.570	7.5	1

7C
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
bis(2-Chloroethoxy)methane	0.489	0.508	7.790	7.5	4
Benzoic acid	0.249	0.191	7.920	10.0	-21
1,2,3,4-Tetrahydronaphthalene	0.565	0.667	8.850	7.5	18
2,4-Dichlorophenol	0.278	0.288	7.770	7.5	4
1,2,4-Trichlorobenzene	0.318	0.311	7.330	7.5	-2
Naphthalene	1.018	1.005	7.400	7.5	-1
4-Chloroaniline	0.421	0.414	7.380	7.5	-2
2,6-Dichlorophenol	0.263	0.273	7.790	7.5	4
Hexachloropropene	0.171	0.175	7.650	7.5	2
Hexachlorobutadiene	0.170	0.173	7.630	7.5	2
Quinoline	0.605	0.602	7.460	7.5	-1
Caprolactam	0.092	0.098	7.990	7.5	7
N-Nitrosodi-n-butylamine	0.294	0.287	7.310	7.5	-3
4-Chloro-3-methylphenol	0.320	0.336	7.860	7.5	5
Safrole	0.245	0.251	7.670	7.5	2
2-Methylnaphthalene	0.669	0.664	7.440	7.5	-1
1-Methylnaphthalene	0.590	0.613	7.800	7.5	4
Hexachlorocyclopentadiene	0.308	0.290	7.070	7.5	-6
1,2,4,5-Tetrachlorobenzene	0.541	0.568	7.870	7.5	5
cis-Isosafrole	0.472	0.477	1.290	1.3	1
2,4,6-Trichlorophenol	0.350	0.362	7.750	7.5	3
2,4,5-Trichlorophenol	0.380	0.389	7.680	7.5	2
trans-Isosafrole	0.471	0.483	6.390	6.2	3
Isosafrole	0.471	0.482	7.670	7.5	2
1,1'-Biphenyl	1.382	1.467	7.960	7.5	6
2-Chloronaphthalene	1.146	1.092	7.140	7.5	-5
1-Chloronaphthalene	1.046	1.085	7.780	7.5	4
Diphenyl ether	0.761	0.766	7.550	7.5	1
2-Nitroaniline	0.343	0.356	7.790	7.5	4
1,4-Naphthoquinone	0.445	0.443	7.470	7.5	0
1,4-Dinitrobenzene	0.171	0.174	7.600	7.5	1
Dimethylphthalate	1.213	1.227	7.590	7.5	1
1,3-Dinitrobenzene	0.191	0.199	7.830	7.5	4
2,6-Dinitrotoluene	0.272	0.274	7.550	7.5	1
Acenaphthylene	1.670	1.719	7.720	7.5	3
3-Nitroaniline	0.298	0.302	7.610	7.5	1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
Acenaphthene	1.172	1.181	7.560	7.5	1
2,4-Dinitrophenol	0.164	0.145	8.860	10.0	-11
4-Nitrophenol	0.201	0.200	7.460	7.5	-1
Pentachlorobenzene	0.419	0.439	7.850	7.5	5
2,4-Dinitrotoluene	0.362	0.375	7.760	7.5	4
2,4_2,6-Dinitrotoluenes	0.315	0.324	15.310	15.0	2
Dibenzofuran	1.560	1.599	7.690	7.5	2
1-Naphthylamine	1.139	1.167	7.680	7.5	2
2,3,4,6-Tetrachlorophenol	0.262	0.290	8.300	7.5	11
2-Naphthylamine	1.115	1.138	7.660	7.5	2
Diethylphthalate	1.200	1.210	7.560	7.5	1
Thionazin	0.231	0.253	8.230	7.5	10
Fluorene	1.243	1.271	7.670	7.5	2
4-Chlorophenyl-phenylether	0.587	0.598	7.630	7.5	2
5-Nitro-o-toluidine	0.325	0.342	7.880	7.5	5
4-Nitroaniline	0.307	0.298	7.280	7.5	-3
4,6-Dinitro-2-methylphenol	0.116	0.109	7.030	7.5	-6
N-Nitrosodiphenylamine (1)	0.578	0.605	7.840	7.5	5
NDPA as diphenylamine	0.578	0.605	7.840	7.5	5
1,2-Diphenylhydrazine	0.826	0.856	7.770	7.5	4
Tetraethyldithiopyrophosphate	0.128	0.133	7.780	7.5	4
1,3,5-Trinitrobenzene	0.072	0.073	7.590	7.5	1
Diallate (peak 1)	0.350	0.369	6.560	6.2	5
Phorate	0.518	0.560	8.110	7.5	8
Phenacetin	0.364	0.393	8.090	7.5	8
4-Bromophenyl-phenylether	0.161	0.178	8.280	7.5	10
Diallate (peak 2)	0.340	0.360	1.350	1.3	6
Diallate trans/cis	0.349	0.367	7.910	7.5	5
Hexachlorobenzene	0.167	0.183	8.230	7.5	10
Dimethoate	0.326	0.359	8.270	7.5	10
Atrazine	0.176	0.193	8.230	7.5	10
Pentachlorophenol	0.103	0.089	6.480	7.5	-14
4-Aminobiphenyl	0.335	0.359	8.060	7.5	7
Pentachloronitrobenzene	0.075	0.081	8.130	7.5	8
Pronamide	0.293	0.308	7.890	7.5	5
Dinoseb	0.162	0.150	6.940	7.5	-8

(1) Cannot be Separated from Diphenylamine

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
Phenanthrene	1.004	1.031	7.700	7.5	3
Anthracene	0.996	1.037	7.810	7.5	4
Carbazole	0.929	0.973	7.860	7.5	5
Methyl parathion	0.243	0.264	8.150	7.5	9
Di-n-butylphthalate	1.168	1.167	7.490	7.5	0
Parathion	0.150	0.164	8.190	7.5	9
4-Nitroquinoline-1-oxide	0.095	0.076	5.900	7.5	-21
Octachlorostyrene	0.060	0.077	9.700	7.5	29
Isodrin	0.118	0.116	7.390	7.5	-1
Fluoranthene	1.080	1.165	8.090	7.5	8
Benzidine	0.663	0.655	22.220	22.5	-1
Pyrene	1.020	1.019	7.490	7.5	0
p-Dimethylaminoazobenzene	0.147	0.157	7.980	7.5	6
Chlorobenzilate	0.294	0.301	7.690	7.5	3
3,3'-Dimethylbenzidine	0.624	0.624	7.500	7.5	0
Butylbenzylphthalate	0.462	0.449	7.290	7.5	-3
2-Acetylaminofluorene	0.377	0.388	7.720	7.5	3
3,3'-Dichlorobenzidine	0.321	0.332	7.760	7.5	4
4,4'-Methylenebis(2-chloroanil	0.174	0.178	7.680	7.5	2
Benzo(a)anthracene	0.882	0.948	8.060	7.5	7
Chrysene	0.838	0.882	7.900	7.5	5
bis(2-Ethylhexyl)phthalate	0.679	0.651	7.180	7.5	-4
6-Methylchrysene	0.584	0.596	7.650	7.5	2
Di-n-octylphthalate	1.608	1.474	6.880	7.5	-8
Benzo(b)fluoranthene	1.120	1.145	7.670	7.5	2
7,12-Dimethylbenz[a]anthracene	0.472	0.477	7.580	7.5	1
Benzo(k)fluoranthene	1.104	1.116	7.580	7.5	1
Benzo(a)pyrene	1.049	1.088	7.780	7.5	4
3-Methylcholanthrene	0.420	0.426	7.620	7.5	2
Dibenz(a,h)acridine	0.845	0.860	7.640	7.5	2
Dibenz(a,j)acridine	0.879	0.893	7.620	7.5	2
Indeno(1,2,3-cd)pyrene	1.186	1.224	7.740	7.5	3
Dibenz(a,h)anthracene	0.991	1.023	7.740	7.5	3
Benzo(g,h,i)perylene	1.015	1.010	7.460	7.5	0
Total PAHs	0.943	0.915	123.360	135.0	-9
2-Fluorophenol	1.390	1.429	15.420	15.0	3

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
Phenol-d6	1.808	1.906	15.810	15.0	5
Nitrobenzene-d5	0.430	0.452	15.760	15.0	5
2-Fluorobiphenyl	1.299	1.326	15.320	15.0	2
2,4,6-Tribromophenol	0.122	0.143	17.660	15.0	18
Terphenyl-d14	0.609	0.631	15.560	15.0	4
			Average %Drift:		5

Continuing Calibration
Internal Standard Area and Retention Time
Summary

Initial Calibration Standards:

/chem/HP20296.i/16jun23.b/lf0791.d **
/chem/HP20296.i/16jun23.b/lf0792.d
/chem/HP20296.i/16jun23.b/lf0793.d
/chem/HP20296.i/16jun23.b/lf0794.d
/chem/HP20296.i/16jun23.b/lf0795.d
/chem/HP20296.i/16jun23.b/lf0796.d
/chem/HP20296.i/16jun23.b/lf0797.d
/chem/HP20296.i/16jun23.b/lf0798.d

** indicates the Mid Level Calibration Standard.

Mid Level Calibration Standard is used for comparison.

Current Continuing Calibration Standard:

/chem/HP20296.i/16jul08a.b/lg0231.d

Area Summary

File ID:

Internal Standard Name	lg0231.d	ICAL Area	Low Limit	High Limit	In Spec
1,4-Dichlorobenzene-d4	204321	151712	75856	303424	Yes
Naphthalene-d8	814411	604755	302378	1209510	Yes
Acenaphthene-d10	451708	334029	167014	668058	Yes
Phenanthrene-d10	823450	602792	301396	1205584	Yes
Pyrene-d10	983022	684619	342310	1369238	Yes
Perylene-d12	759719	483990	241995	967980	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

File ID:

Internal Standard Name	lg0231.d	ICAL RT	In Spec
1,4-Dichlorobenzene-d4	6.847	7.093	Yes
Naphthalene-d8	8.832	9.083	Yes
Acenaphthene-d10	11.677	11.902	Yes
Phenanthrene-d10	13.603	13.838	Yes
Pyrene-d10	15.646	15.919	Yes
Perylene-d12	20.230	20.545	Yes

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments:_____

Report generated on 07/08/2016 at 17:44

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0231.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 05:25

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	77254	4.892	340561	6.122	217465	7.822
UPPER LIMIT	154508	5.392	681122	6.622	434930	8.322
LOWER LIMIT	38627	4.392	170281	5.622	108733	7.322
LLI SAMPLE NO.						
01 SBLKLC184	63487	4.893	252393	6.122	157678	7.816
02 184LCLCS	59416	4.893	260300	6.122	177899	7.822
03 184LCLCS2	61342	4.892	254094	6.122	162631	7.816
04 184LCLCSD2	60241	4.893	247021	6.122	156962	7.816
05 184LCLCS3	63735	4.893	251804	6.122	164399	7.816
06 184LCLCSD3	62513	4.887	261617	6.122	169257	7.816
07 SBLKLB184	63130	4.893	257239	6.122	162524	7.816
08 184LBLCS	57348	4.893	250474	6.122	170571	7.816
09 184LBLCS2	56990	4.887	233528	6.122	151422	7.816
10 184LBLCSD2	60280	4.887	246315	6.122	153669	7.816
11 184LBLCS3	58544	4.887	232981	6.122	146677	7.816
12 184LBLCSD3	58286	4.892	238637	6.122	147988	7.816
13 8442807	62863	4.892	269845	6.122	173936	7.816
14 8442808MS	58946	4.887	252478	6.122	158802	7.816
15 8442809MSD	68909	4.887	297109	6.122	188560	7.816
16 8442798	63585	4.887	278237	6.122	177368	7.816
17 8442801	67201	4.887	280262	6.122	174791	7.816

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0231.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 05:25

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	417213	9.251	490477	10.610	422029	13.145
UPPER LIMIT	834426	9.751	980954	11.110	844058	13.645
LOWER LIMIT	208607	8.751	245239	10.110	211015	12.645
LLI SAMPLE NO.						
01 SBLKLC184	309939	9.245	366957	10.604	324591	13.139
02 184LCLCS	340777	9.245	394743	10.610	313280	13.145
03 184LCLCS2	323875	9.245	385946	10.604	325810	13.139
04 184LCLCSD2	314523	9.239	373198	10.604	318257	13.139
05 184LCLCS3	325549	9.245	389526	10.604	321447	13.139
06 184LCLCSD3	331124	9.245	390763	10.604	324555	13.139
07 SBLKLB184	327462	9.239	382307	10.604	326965	13.139
08 184LBLCS	324524	9.245	379535	10.610	301528	13.145
09 184LBLCS2	299712	9.245	360710	10.604	301811	13.139
10 184LBLCSD2	313118	9.239	368294	10.604	311820	13.139
11 184LBLCS3	289084	9.239	338469	10.604	283982	13.139
12 184LBLCSD3	293186	9.239	339681	10.604	296678	13.139
13 8442807	333871	9.239	394488	10.604	340789	13.139
14 8442808MS	305435	9.245	358429	10.604	306005	13.139
15 8442809MSD	348101	9.245	388153	10.610	336423	13.139
16 8442798	329511	9.245	380483	10.604	313639	13.139
17 8442801	324614	9.245	372451	10.610	309344	13.139

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0231.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 05:25

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	77254	4.892	340561	6.122	217465	7.822
UPPER LIMIT	154508	5.392	681122	6.622	434930	8.322
LOWER LIMIT	38627	4.392	170281	5.622	108733	7.322
LLI SAMPLE NO.						
18 8442804	68713	4.893	291008	6.122	180926	7.816
19 8442816	70343	4.887	307097	6.122	189445	7.816
20 8442820	71696	4.892	298323	6.122	189462	7.816
21 8442824	70375	4.892	297716	6.122	183346	7.816
22 8444071	74551	4.892	309751	6.122	197838	7.816

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0231.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 05:25

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	417213	9.251	490477	10.610	422029	13.145
UPPER LIMIT	834426	9.751	980954	11.110	844058	13.645
LOWER LIMIT	208607	8.751	245239	10.110	211015	12.645
LLI SAMPLE NO.						
18 8442804	338104	9.245	391904	10.610	329586	13.139
19 8442816	349020	9.245	389612	10.610	329258	13.145
20 8442820	346478	9.245	392973	10.610	325030	13.145
21 8442824	335115	9.245	375202	10.610	314943	13.151
22 8444071	344977	9.245	394352	10.610	338981	13.151

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): lg0231.d Date Analyzed: 07/08/16

Instrument ID: HP20296 Time Analyzed: 17:15

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	204321	6.847	814411	8.832	451708	11.677
UPPER LIMIT	408642	7.347	1628822	9.332	903416	12.177
LOWER LIMIT	102161	6.347	407206	8.332	225854	11.177
LLI SAMPLE NO.						
01 SBLKWD178	187622	6.842	734483	8.831	396299	11.671
02 178WDLCS	182696	6.847	686562	8.832	386548	11.677
03 178WDLCSD	182855	6.847	697537	8.832	386823	11.677
04 178WDLCS1	200951	6.842	790565	8.831	436931	11.672
05 178WDLCSD1	185673	6.842	737103	8.826	405596	11.672
06 8438378	189148	6.842	727545	8.832	407753	11.672
07 8438379	196655	6.842	740916	8.826	409311	11.671
08 8442829	188662	6.842	748739	8.826	405369	11.672
09 8442830	178304	6.842	693703	8.826	378235	11.672
10 8442831	179005	6.842	694890	8.826	376286	11.672
11 8444113	175939	6.842	697652	8.826	378713	11.671
12 8444115	176803	6.842	692234	8.826	385030	11.672
13 8444116	186232	6.842	715920	8.826	398557	11.672
14 8445666	178357	6.842	700513	8.827	389836	11.672
15 8445667	183176	6.842	700546	8.826	385834	11.672

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): lg0231.d Date Analyzed: 07/08/16

Instrument ID: HP20296 Time Analyzed: 17:15

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	823450	13.603	983022	15.646	759719	20.230
UPPER LIMIT	1646900	14.103	1966044	16.146	1519438	20.730
LOWER LIMIT	411725	13.103	491511	15.146	379860	19.730
LLI SAMPLE NO.						
01 SBLKWD178	717498	13.597	834779	15.640	666442	20.224
02 178WDLCS	692951	13.603	825957	15.646	636796	20.230
03 178WDLCSD	714448	13.602	832834	15.640	654418	20.229
04 178WDLCS1	799942	13.597	920532	15.640	720792	20.224
05 178WDLCSD1	751556	13.597	839328	15.640	701699	20.224
06 8438378	734404	13.597	834930	15.640	679389	20.224
07 8438379	740349	13.597	866043	15.640	688058	20.224
08 8442829	734078	13.597	861062	15.641	678909	20.224
09 8442830	713357	13.597	810611	15.640	656647	20.224
10 8442831	697761	13.597	793813	15.640	640889	20.224
11 8444113	706365	13.597	788849	15.640	647695	20.224
12 8444115	719248	13.597	809024	15.640	655763	20.224
13 8444116	720457	13.597	820450	15.640	652032	20.224
14 8445666	710443	13.597	807281	15.641	657085	20.224
15 8445667	706223	13.597	794712	15.640	634985	20.224

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

Preparation and Run Logs

Semivolatiles by GC/MS

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jun07\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GF0200.D	DFTPP1116	06/07/2016	09:16		
jmg00346	GF0201.D	STD1526	06/07/2016	09:32		
jmg00346	GF0202.D	STD1526	06/07/2016	09:59		
jmg00346	GF0203.D	STD1526	06/07/2016	10:25		
jmg00346	GF0204.D	STD1526	06/07/2016	10:51		
jmg00346	GF0205.D	STD1526	06/07/2016	11:20		
jmg00346	GF0206.D	STD1526	06/07/2016	11:47		
jmg00346	GF0207.D	STD1526	06/07/2016	12:13		
jmg00346	GF0208.D	STD1526	06/07/2016	12:39		
jmg00346	GF0209.D	MDL1526	06/07/2016	13:06		
jmg00346	GF0210.D	MDLPAH1526	06/07/2016	13:32		
jmg00346	GF0211.D	ICV1376	06/07/2016	14:00		
jmg00346	GF0212.D	ICVBAS0716	06/07/2016	14:28		

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jun28\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GF1000.D	DFTPP1116	06/28/2016	07:05		
jmg00346	GF1001.D	STD1526	06/28/2016	07:22		
jmg00346	GF1002.D	TRG1586	06/28/2016	07:48		
jmg00346	GF1003.D	TRG1586	06/28/2016	08:14		
jmg00346	GF1004.D	TRG1586	06/28/2016	08:40		
jmg00346	GF1005.D	TRG1586	06/28/2016	09:07		
jmg00346	GF1006.D	TRG1586	06/28/2016	09:32		
jmg00346	GF1007.D	TRG1586	06/28/2016	09:58		
jmg00346	GF1008.D	TRGMDL1586	06/28/2016	10:25		
jmg00346	GF1009.D	SBLKWA178	06/28/2016	10:51	16178WAA	
jmg00346	GF1010.D	178WALCS	06/28/2016	11:18	16178WAA	
jmg00346	GF1011.D	178WALCSD	06/28/2016	11:44	16178WAA	
jmg00346	GF1012.D	8438378	06/28/2016	12:10	16178WAA	
jmg00346	GF1013.D	8438379	06/28/2016	12:37	16178WAA	
jmg00346	GF1014.D	8442829	06/28/2016	13:03	16178WAA	
jmg00346	GF1015.D	8442830	06/28/2016	13:29	16178WAA	
jmg00346	GF1016.D	8442831	06/28/2016	13:56	16178WAA	
jmg00346	GF1017.D	8444113	06/28/2016	14:22	16178WAA	
jmg00346	GF1018.D	8444115	06/28/2016	14:48	16178WAA	
jmg00346	GF1019.D	8444116	06/28/2016	15:15	16178WAA	
jmg00346	GF1020.D	8445666	06/28/2016	15:41	16178WAA	
jmg00346	GF1021.D	8445667	06/28/2016	16:07	16178WAA	

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jul05\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GG0162.D	TRG1566	07/05/2016	06:47		
jmg00346	GG0163.D	CBZ1876	07/05/2016	07:13		
jmg00346	GG0164.D	CBZ1876	07/05/2016	07:38		
jmg00346	GG0165.D	CBZ1876	07/05/2016	08:04		
jmg00346	GG0166.D	CBZ1876	07/05/2016	08:29		
jmg00346	GG0167.D	CBZ1876	07/05/2016	08:55		
jmg00346	GG0168.D	CBZ1876	07/05/2016	09:20		
jmg00346	GG0169.D	CBZMDL1876	07/05/2016	09:46		

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jul06\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GG0230.D	DFTPP1816	07/06/2016	05:10		
jmg00346	GG0231.D	STD1526	07/06/2016	05:25		
jmg00346	GG0232.D	TRG1566	07/06/2016	05:53		
jmg00346	GG0233.D	CBZ1876	07/06/2016	06:19		
jmg00346	GG0234.D	SBLKLC184	07/06/2016	07:14		
jmg00346	GG0235.D	184LCLCS	07/06/2016	07:45		
jmg00346	GG0236.D	184LCLCS2	07/06/2016	08:10		
jmg00346	GG0237.D	184LCLCSD2	07/06/2016	08:35	16184SLC	
jmg00346	GG0238.D	184LCLCS3	07/06/2016	09:01	16184SLC	
jmg00346	GG0239.D	184LCLCSD3	07/06/2016	09:27	16184SLC	
jmg00346	GG0240.D	SBLKLB184	07/06/2016	09:53	16184SLB	
jmg00346	GG0241.D	184LBLCS	07/06/2016	10:20	16184SLB	
jmg00346	GG0242.D	184LBLCS2	07/06/2016	10:46	16184SLB	
jmg00346	GG0243.D	184LBLCSD2	07/06/2016	11:11	16184SLB	
jmg00346	GG0244.D	184LBLCS3	07/06/2016	11:38	16184SLB	
jmg00346	GG0245.D	184LBLCSD3	07/06/2016	12:04	16184SLB	
jmg00346	GG0246.D	8442807	07/06/2016	12:30	16184SLB	5
jmg00346	GG0247.D	8442808	07/06/2016	12:55	16184SLB	5
jmg00346	GG0248.D	8442809	07/06/2016	13:21	16184SLB	5
jmg00346	GG0249.D	8442798	07/06/2016	13:47	16184SLB	5
jmg00346	GG0250.D	8442801	07/06/2016	14:13	16184SLB	5
jmg00346	GG0251.D	8442804	07/06/2016	14:38	16184SLB	5
jmg00346	GG0252.D	8442816	07/06/2016	15:04	16184SLB	5
jmg00346	GG0253.D	8442820	07/06/2016	15:30	16184SLB	5
jmg00346	GG0254.D	8442824	07/06/2016	15:55	16184SLB	5

←&l5.40C ←(s12H

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP20296 **HP #12**

Data Directory Path is - D:\data\16jun27a\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
kmb02125	LF0940.D	RVDFTPP1416	06/27/2016	14:38		
kmb02125	LF0941.D	RVSTD1726	06/27/2016	14:52		
kmb02125	LF0940a.D	RVDFTPP1416	06/27/2016	15:39		
kmb02125	LF0941a.D	RVSTD1726	06/27/2016	15:52		
kmb02125	LF0942.D	RVSTD1726	06/27/2016	16:23		
kmb02125	LF0943.D	RVSTD1726	06/27/2016	16:52		
kmb02125	LF0944.D	RVSTD1726	06/27/2016	17:20		
kmb02125	LF0945.D	RVSTD1726	06/27/2016	17:48		
kmb02125	LF0946.D	RVSTD1726	06/27/2016	18:16		
kmb02125	LF0947.D	RVSTD1726	06/27/2016	18:45		
kmb02125	LF0948.D	RVSTD1726	06/27/2016	19:13		
kmb02125	LF0949.D	MDLSTD1726	06/27/2016	19:41		
kmb02125	LF0950.D	PAHMDL1726	06/27/2016	20:09		
kmb02125	LF0951.D	RVICV1376	06/27/2016	20:38		
kmb02125	LF0952.D	RVBASICV0716	06/27/2016	21:06		

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP20296 **HP #12**

Data Directory Path is - D:\data\16jul08a\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
ceb05247	LG0230.D	RVDFTPP1796	07/08/2016	17:02		
ceb05247	LG0231.D	RVSTD1726	07/08/2016	17:15		
ceb05247	LG0232.D	RVCLB1836	07/08/2016	17:44		
ceb05247	LG0233.D	rvCLB1836	07/08/2016	18:16		
ceb05247	LG0234.D	rvCLB1836	07/08/2016	18:44		
ceb05247	LG0235.D	rvCLB1836	07/08/2016	19:13		
ceb05247	LG0236.D	rvCLB1836	07/08/2016	19:41		
ceb05247	LG0237.D	rvCLB1836	07/08/2016	20:10		
ceb05247	LG0238.D	rvCLB1836	07/08/2016	20:38		
ceb05247	LG0239.D	SBLKWD178	07/08/2016	21:06	16178WAD	
ceb05247	LG0240.D	178WDLCS	07/08/2016	21:35	16178WAD	
ceb05247	LG0241.D	178WDLCSD	07/08/2016	22:03	16178WAD	
ceb05247	LG0242.D	178WDLCS	07/08/2016	22:31	16178WAD	
ceb05247	LG0243.D	178WDLCSD	07/08/2016	23:00	16178WAD	
ceb05247	LG0244.D	8438378	07/08/2016	23:28	16178WAD	
ceb05247	LG0245.D	8438379	07/08/2016	23:57	16178WAD	
ceb05247	LG0246.D	8442829	07/09/2016	00:25	16178WAD	
ceb05247	LG0247.D	8442830	07/09/2016	00:54	16178WAD	
ceb05247	LG0248.D	8442831	07/09/2016	01:22	16178WAD	
ceb05247	LG0249.D	8444113	07/09/2016	01:50	16178WAD	
ceb05247	LG0250.D	8444115	07/09/2016	02:19	16178WAD	
ceb05247	LG0251.D	8444116	07/09/2016	02:47	16178WAD	
ceb05247	LG0252.D	8445666	07/09/2016	03:15	16178WAD	
ceb05247	LG0253.D	8445667	07/09/2016	03:44	16178WAD	

Organic Extraction Batchlog Assigned to: 6740 Jessica Cook

Reviewed by: CB 5247 7/8/16 Start Date: 6/28/16 Start time: 9:00

16178WAD026

Tech 1: KL 10217 Tech 2: _____

Dept: 26 Prep Analysis: 11010 8270D BNA Extraction — SVOAs by 8270D in Water

QC	Sample Code	Amt (mL)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH 2	pH 11	BC	Comments
BLANKA	SBLKWD178	250	~~SS1616526B~~ (8)A	1.0			1	✓	✓		TAP H2O
LCSA	178WDLCS	250	~~SS1616526B~~ (8)A		MS1617426A	1.0	1	✓	✓		
LCSALT	178WDLCS	250	~~SS1616526B~~ (8)A		~~MS1602726A~~	~~1.0~~ (8)B	1	✓	✓		
LCSDA	178WDLCSD	250	~~SS1616526B~~ (8)A		MS1617426A	1.0	1	✓	✓		
LCSDALT	178WDLCSD	250	~~SS1616526B~~ (8)A		MS1602726A	~~1.0~~ 0.25 (8)B KL10217 6/28/16	1	✓	✓		

KL10217 6/28/16

(8)A 5516175261A

Solvent Used	Lot No.
10N NaOH	2507A14
Methylene Chloride	163035
Sodium Sulfate	161754
Sulfuric Acid	158902

Spike Solutions: Witness: _____

MS1602726A ALTIMONT SPECIALS SPIKE

MS1617426A MINI SEP. LCS SPIKE #1

~~SS1616526B~~ (8)A MINI SEP. BNA SURROGATE

Sample #	Sample Code	Amt (mL)	SS/IS Sol.	Amt (mL)	FV (mL)	pH 2	pH 11	BC	Comments	Analyses	List	Due Date	Prio
1 8438378	D8634	245	~~SS1616526B~~ (8)A	1.0	1	✓	✓	153A	Clear	10461	19860	07/14/2016	N
2 8438379	D8635	244	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/14/2016	N
3 8442829	RT-EB	246	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/18/2016	N
4 8442830	RT-FB	238	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/18/2016	N
5 8442831	D16C1	245	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/18/2016	N
6 8444113	D25FD	245	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/18/2016	N
7 8444115	D22EB	246	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/18/2016	N
8 8444116	BG3EB	238	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/18/2016	N
9 8445666	D8901	246	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/19/2016	N
10 8445667	D8902	245	~~SS1616526B~~ (8)A		1	✓	✓	153A		10461	19860	07/19/2016	N

DWD87 Page 230 of 625

N/A

Rack ID:		Work Station	H206	Micro Temp 100?
Internal Standard	KKISTD1576	Balance #	15661	

S-bath ID	68 C	S-bath ID	C	N-Evap	C	M-vap	C	16178WAD026

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

Organic Extraction Batchlog Assigned to: 9874 Kayla Yuditsky Reviewed by: JM 7/6/16 Start Date: 7/5/16 Start time: 8:30

16184SLB026 Tech 1: Ky 9874 Tech 2:

Dept: 26 Prep Analysis: 10813 BNA Soil Microwave APP IX SVOA 8270D (microwave)

QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
8442808MS	RTP41	30.20	SS1616526A	1.0	MS1618126A	1.0	1	Z	Z	301A	Soil, brown
8442809MSD	RTP41	30.20	SS1616526A		MS1618126A	1.0	1	Z	Z	301A	
BLANKA	SBLKLB184	30	SS1616526A				1	Z	Z		Na2SO4
LCSA	184LBLCS	30	SS1616526A		MS1618126A	1.0	1	Z	Z		
LCSALT	184LBLCS	30	SS1616526A		MS1602726A		1	Z	Z		
LCSCS	184LBLCS	30	SS1616526A		MS1617326A		1	Z	Z		
LCSDALT	184LBLCSD	30	SS1616526A		MS1602726A		1	Z	Z		
LCSDCS	184LBLCSD	30	SS1616526A		MS1617326A		1	Z	Z		

Solvent Used	Lot No.
1:1 Methylene Chloride/Acetone	185062116A
Methylene Chloride	163036
Sodium Sulfate	16181A

Spike Solutions: Witness: N/A

MS1602726A ALTIMONT SPECIALS SPIKE
MS1617326A CS LCS SPIKE
MS1618126A LCS SPIKE MIX #1
SS1616526A BNA SURROGATE STANDARD

Sample #		Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1	8442798	RTP11	30.16	SS1616526A	1.0	1	Z	Z	301A	Soil;Sandy;Brown	10726	19863	07/18/2016	N
2	8442801	RTP21	30.09	SS1616526A		1	Z	Z	301A	Soil;Sandy;Brown	10726	19863	07/18/2016	N
3	8442804	RTP31	30.15	SS1616526A		5(8)	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N
4	8442807BKG	RTP41	30.18	SS1616526A		1	Z	Z	301A	Soil;Brown;Fuel Odor	10726	19863	07/18/2016	N
5	8442816	D16A1	30.06	SS1616526A		1	Z	Z	301A	Soil;Grey	10726	19863	07/18/2016	N
6	8442820	D16B1	30.00	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N
7	8442824	D16C1	30.46	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N

(8) Raised final volume, sample would not concentrate. Ky 9874 7/5/16

N/A

Rack ID:		Work Station	Micro	Micro Temp 100?
Internal Standard	LC197916V	Balance #	13	✓

S-bath ID 6 88 C | S-bath ID — C | N-Evap — C | M-vap — C | 16184SLB026

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

Semivolatiles by GC/MS-Specials Data

Case Narrative/Conformance Summary

Semivolatiles by GC/MS-Specials

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS-Specials

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8442829	RTPA-EB	X		1	Equipment Blank
8442830	RTPA-FB	X		1	Field Blank
8442831	DU-1-6-FB	X		1	Field Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Matrix QC may not be included if site-specific QC were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, laboratory spike data (LCS) are provided.

Surrogate

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Batch#: 16178WAA026 (Sample number(s): 8442829-8442831)
The recovery(ies) for the following surrogate(s) is below the acceptance window: 2-Fluorobiphenyl (178WALCS, 178WALCSD, 8442829, 8442830, 8442831, SBLKWA178), Nitrobenzene-d5 (178WALCS, 178WALCSD, 8442829, 8442830, 8442831, SBLKWA178)

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS-Specials

(Sample number(s): 8442829-8442831: Analysis: 02395)
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Semivolatiles by GC/MS-Specials

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Quality Control Reference List
GC/MS Semivolatiles

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Fraction: Semivolatiles by GC/MS-Specials

Analysis	Batch Number	Sample Number	Analysis Date
CS Compound	16178WAA026	SBLKWA178	06/28/2016 10:51:00
		178WALCS	06/28/2016 11:18:00
		178WALCSD	06/28/2016 11:44:00
		8442829	06/28/2016 13:03:00
		8442830	06/28/2016 13:29:00
		8442831	06/28/2016 13:56:00

Fraction: Semivolatiles by GC/MS-Specials

02395: CS Compound Analyte Name	Default MDL	Default LOQ	Units
2-Chlorobenzalmalononitrile	5	15	ug/l

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Quality Control Summary
Method Blank
GC/MS Semivolatiles
SDG: DWD87
Matrix: LIQUID

Fraction: Semivolatiles by GC/MS-Specials

16178WAA026 / SBLKWA178 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2-Chlorobenzalmalononitrile	06/28/16	N.D.	ug/l	5	15

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Quality Control Summary
Surrogates
GC/MS Semivolatiles
SDG: DWD87
Matrix: LIQUID

Fraction: Semivolatiles by GC/MS-Specials

16178WAA026	2-Fluorobiphenyl		Nitrobenzene-d5		Terphenyl-d14	
	Spike Added	100 ug/l	Spike Added	100 ug/l	Spike Added	100 ug/l
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
SBLKWA178	62 *	70 - 130	64 *	70 - 130	96	70 - 130
178WALCS	53 *	70 - 130	58 *	70 - 130	72	70 - 130
178WALCSD	67 *	70 - 130	68 *	70 - 130	94	70 - 130
8442829	65 *	70 - 130	67 *	70 - 130	80	70 - 130
8442830	65 *	70 - 130	64 *	70 - 130	75	70 - 130
8442831	62 *	70 - 130	65 *	70 - 130	91	70 - 130

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate (LCSD)

SDG: DWD87
Matrix: LIQUID

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS-Specials

LCS: 178WALCS LCSD: 178WALCSD	Batch: **16178WAA026** (Sample number(s): 8442829-8442831)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzalmalononitrile	50	24.68	28.7	49	57	25-125	15	30

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf0200.d DFTPP Injection Date: 06/07/16

Instrument ID: HP11165 DFTPP Injection Time: 09:16

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	43.7
68	Less than 2.0% of mass 69	1.05 (1.88)1
69	Mass 69 relative abundance	55.9
70	Less than 2.0% of mass 69	0.45 (0.8)1
127	10.0 - 80.00% of mass 198	50.2
197	Less than 2.0% of mass 198	0.39
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	7.13
275	10.0 - 60.0% of mass 198	22.2
365	Greater than 1.00% of mass 198	2.94
441	Present, and less than mass 443	10.1
442	Greater than 50.00% of mass 198	60.5
443	15.00 - 24.00% of mass 442	11.4 (18.9)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gf0201.d	06/07/16	09:32
02	STD1526 - SSTD120	gf0202.d	06/07/16	09:59
03	STD1526 - SSTD80	gf0203.d	06/07/16	10:25
04	STD1526 - SSTD50	gf0204.d	06/07/16	10:51
05	STD1526 - SSTD15	gf0205.d	06/07/16	11:20
06	STD1526 - SSTD5	gf0206.d	06/07/16	11:47
07	STD1526 - SSTD1	gf0207.d	06/07/16	12:13
08	STD1526 - SSTD.5	gf0208.d	06/07/16	12:39
09	MDL1526 - SSTD00.5	gf0209.d	06/07/16	13:06
10	MDLPAH1526 - SSTD00.1	gf0210.d	06/07/16	13:32
11	ICV1376 - SSTD050	gf0211.d	06/07/16	14:00
12	ICVBAS0716 - SSTD050	gf0212.d	06/07/16	14:28

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf1000.d DFTPP Injection Date: 06/28/16

Instrument ID: HP11165 DFTPP Injection Time: 07:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.3
68	Less than 2.0% of mass 69	0.7 (1.42)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.33 (0.67)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.74
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.72
275	10.0 - 60.0% of mass 198	24.0
365	Greater than 1.00% of mass 198	2.51
441	Present, and less than mass 443	9.53
442	Greater than 50.00% of mass 198	62.5
443	15.00 - 24.00% of mass 442	12.6 (20.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gf1001.d	06/28/16	07:22
02	TRG1586 - SSTD120	gf1002.d	06/28/16	07:48
03	TRG1586 - SSTD80	gf1003.d	06/28/16	08:14
04	TRG1586 - SSTD50	gf1004.d	06/28/16	08:40
05	TRG1586 - SSTD30	gf1005.d	06/28/16	09:07
06	TRG1586 - SSTD15	gf1006.d	06/28/16	09:32
07	TRG1586 - SSTD5	gf1007.d	06/28/16	09:58
08	TRGMDL1586 - SSTD001	gf1008.d	06/28/16	10:25
09	SBLKWA178	gf1009.d	06/28/16	10:51
10	178WALCS	gf1010.d	06/28/16	11:18
11	178WALCSD	gf1011.d	06/28/16	11:44
12	8438378	gf1012.d	06/28/16	12:10
13	8438379	gf1013.d	06/28/16	12:37
14	8442829	gf1014.d	06/28/16	13:03
15	8442830	gf1015.d	06/28/16	13:29
16	8442831	gf1016.d	06/28/16	13:56
17	8444113	gf1017.d	06/28/16	14:22
18	8444115	gf1018.d	06/28/16	14:48

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf1000.d DFTPP Injection Date: 06/28/16

Instrument ID: HP11165 DFTPP Injection Time: 07:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.3
68	Less than 2.0% of mass 69	0.7 (1.42)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.33 (0.67)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.74
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.72
275	10.0 - 60.0% of mass 198	24.0
365	Greater than 1.00% of mass 198	2.51
441	Present, and less than mass 443	9.53
442	Greater than 50.00% of mass 198	62.5
443	15.00 - 24.00% of mass 442	12.6 (20.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8444116	gf1019.d	06/28/16	15:15
20	8445666	gf1020.d	06/28/16	15:41
21	8445667	gf1021.d	06/28/16	16:07

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	RRF	% RSD	CAL. METHOD
1,4-Dioxane			0.661	0.609	0.608	0.645	0.625	0.590	0.623	4	AVG
N-Nitrosodimethylamine				0.814	0.908	1.046	1.049	1.030	0.969	11	AVG
Pyridine			1.642	1.504	1.748	1.701	1.767	1.774	1.689	6	AVG
2-Picoline			1.434	1.697	1.787	1.862	1.767	1.837	1.731	9	AVG
N-Nitrosomethylethylamine			0.996	0.863	0.877	0.910	0.873	0.841	0.893	6	AVG
Methyl methanesulfonate			0.853	0.916	0.894	0.921	0.913	0.881	0.896	3	AVG
N-Nitrosodiethylamine		0.763	0.913	0.834	0.867	0.901	0.880	0.848	0.858	6	AVG
Ethyl methanesulfonate		0.916	0.865	0.817	0.841	0.835	0.844	0.811	0.847	4	AVG
Phenol		2.498	2.511	2.504	2.584	2.647	2.632	2.572	2.564	2	AVG
Aniline		2.670	2.981	2.889	2.948	2.951	2.973	2.876	2.898	4	AVG
a-methylstyrene			1.640	1.662	1.571	1.677	1.616	1.597	1.627	2	AVG
bis(2-Chloroethyl)ether		1.942	1.901	1.878	1.749	1.813	1.770	1.722	1.825	5	AVG
2-Chlorophenol		1.543	1.456	1.529	1.530	1.604	1.563	1.497	1.532	3	AVG
1,3-Dichlorobenzene		1.591	1.627	1.548	1.554	1.610	1.537	1.493	1.566	3	AVG
1,4-Dichlorobenzene		1.816	1.668	1.622	1.587	1.635	1.610	1.529	1.638	5	AVG
Benzyl alcohol		1.129	1.185	1.174	1.146	1.238	1.236	1.204	1.188	4	AVG
1,2-Dichlorobenzene		1.799	1.638	1.567	1.525	1.584	1.540	1.479	1.590	7	AVG
Indene			2.801	2.753	2.766	2.897	2.819	2.750	2.798	2	AVG
2-Methylphenol	1.623	1.431	1.595	1.614	1.608	1.638	1.648	1.582	1.592	4	AVG
2,2'-oxybis(1-Chloropropane)		2.473	2.029	1.950	1.918	1.988	1.959	1.907	2.032	10	AVG
bis(2-Chloroisopropyl)ether		2.473	2.029	1.950	1.918	1.988	1.959	1.907	2.032	10	AVG
N-Nitrosopyrrolidine		0.954	0.829	0.922	0.952	1.018	1.014	0.953	0.949	7	AVG
Acetophenone		2.132	2.508	2.368	2.457	2.572	2.565	2.453	2.436	6	AVG
4-Methylphenol		1.679	1.832	1.976	1.889	1.992	1.974	1.930	1.896	6	AVG
Total Cresols		1.555	1.713	1.795	1.749	1.815	1.811	1.756	1.742	5	AVG
N-Nitroso-di-n-propylamine		1.571	1.638	1.584	1.570	1.617	1.588	1.537	1.586	2	AVG
N-Nitrosomorpholine			1.089	1.099	1.133	1.145	1.192	1.107	1.128	3	AVG
o-Toluidine		2.454	2.820	2.904	2.790	2.856	2.849	2.783	2.780	5	AVG
Hexachloroethane			0.623	0.583	0.622	0.620	0.583	0.569	0.600	4	AVG
Nitrobenzene		0.476	0.509	0.494	0.494	0.497	0.482	0.490	0.492	2	AVG
N-Nitrosopiperidine		0.167	0.212	0.201	0.213	0.217	0.205	0.210	0.204	8	AVG
Isophorone		0.920	0.938	0.895	0.895	0.902	0.885	0.887	0.903	2	AVG
2-Nitrophenol		0.201	0.190	0.203	0.211	0.212	0.208	0.208	0.205	4	AVG
2,4-Dimethylphenol	0.429	0.354	0.402	0.431	0.413	0.430	0.406	0.414	0.410	6	AVG
O,O,O-Triethylphosphorothioate			0.201	0.182	0.186	0.185	0.181	0.183	0.186	4	AVG
bis(2-Chloroethoxy)methane		0.524	0.542	0.513	0.520	0.498	0.505	0.488	0.513	3	AVG
Benzoic acid			0.372	0.354	0.432	0.429	0.419	0.459	0.411	10	AVG
1,2,3,4-Tetrahydronaphthalene			0.580	0.562	0.591	0.578	0.574	0.591	0.580	2	AVG
2,4-Dichlorophenol		0.280	0.303	0.317	0.319	0.315	0.307	0.314	0.308	4	AVG
1,2,4-Trichlorobenzene			0.321	0.308	0.317	0.323	0.308	0.312	0.315	2	AVG
Naphthalene	1.073	1.130	1.100	1.090	1.071	1.093	1.060	1.088	1.088	2	AVG
4-Chloroaniline		0.434	0.490	0.464	0.497	0.478	0.471	0.493	0.475	5	AVG
2,6-Dichlorophenol		0.289	0.310	0.317	0.308	0.312	0.307	0.312	0.308	3	AVG
Hexachloropropene			0.146	0.154	0.160	0.156	0.155	0.163	0.156	4	AVG
Hexachlorobutadiene	0.163	0.160	0.152	0.151	0.150	0.155	0.145	0.146	0.153	4	AVG
Quinoline			0.788	0.766	0.754	0.772	0.766	0.750	0.766	2	AVG
Caprolactam			0.177	0.155	0.170	0.172	0.175	0.161	0.168	5	AVG
N-Nitrosodi-n-butylamine		0.440	0.384	0.425	0.456	0.449	0.443		0.433	6	AVG
4-Chloro-3-methylphenol		0.361	0.389	0.386	0.399	0.397	0.392	0.385	0.387	3	AVG
Safrole			0.290	0.291	0.297	0.300	0.297	0.299	0.296	1	AVG
2-Methylnaphthalene	0.930	0.743	0.821	0.779	0.786	0.781	0.771	0.764	0.797	7	AVG
1-Methylnaphthalene	0.790	0.724	0.767	0.716	0.729	0.734	0.716	0.714	0.736	4	AVG

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
Hexachlorocyclopentadiene			0.182	0.201	0.227	0.225	0.226	0.237	0.216	10	AVG
1,2,4,5-Tetrachlorobenzene		0.471	0.481	0.479	0.459	0.475	0.458	0.466	0.470	2	AVG
cis-Isosafrole			0.426	0.475	0.528	0.467	0.486	0.494	0.479	7	AVG
2,4,6-Trichlorophenol		0.356	0.344	0.369	0.355	0.361	0.357	0.362	0.358	2	AVG
2,4,5-Trichlorophenol		0.323	0.399	0.437	0.398	0.400	0.394	0.399	0.393	9	AVG
trans-Isosafrole			0.515	0.525	0.539	0.545	0.528	0.530	0.530	2	AVG
Isosafrole			0.500	0.517	0.537	0.531	0.521	0.524	0.522	2	AVG
1,1'-Biphenyl		1.509	1.513	1.485	1.496	1.516	1.510	1.498	1.504	1	AVG
2-Chloronaphthalene		1.134	1.134	1.117	1.286	1.154	1.043	1.173	1.149	6	AVG
1-Chloronaphthalene		1.017	1.164	1.204	1.091	1.081	1.157	1.039	1.107	6	AVG
Diphenyl ether		0.802	0.792	0.826	0.785	0.822	0.782	0.795	0.801	2	AVG
2-Nitroaniline		0.292	0.372	0.427	0.417	0.438	0.428	0.431	0.400	13	AVG
1,4-Naphthoquinone			0.466	0.515	0.533	0.530	0.519	0.510	0.512	5	AVG
1,4-Dinitrobenzene			0.183	0.218	0.216	0.234	0.235	0.239	0.221	9	AVG
Dimethylphthalate			1.468	1.426	1.371	1.375	1.363	1.328	1.389	4	AVG
1,3-Dinitrobenzene			0.228	0.250	0.248	0.259	0.258	0.258	0.250	5	AVG
2,6-Dinitrotoluene		0.256	0.329	0.338	0.328	0.341	0.330	0.337	0.323	9	AVG
Acenaphthylene	1.766	1.891	1.819	1.873	1.829	1.853	1.798	1.816	1.831	2	AVG
3-Nitroaniline		0.249	0.345	0.397	0.388	0.383	0.379	0.374	0.359	14	AVG
Acenaphthene	1.347	1.248	1.251	1.244	1.166	1.210	1.191	1.190	1.231	5	AVG
2,4-Dinitrophenol			0.200	0.227	0.236	0.239	0.247	0.252	0.234	8	AVG
4-Nitrophenol			0.203	0.215	0.211	0.221	0.212	0.238	0.217	5	AVG
Pentachlorobenzene		0.461	0.439	0.412	0.404	0.417	0.402	0.402	0.420	5	AVG
2,4-Dinitrotoluene			0.452	0.472	0.446	0.444	0.459	0.451	0.454	2	AVG
2,4_2,6-Dinitrotoluenes			0.390	0.405	0.387	0.393	0.395	0.394	0.394	2	AVG
Dibenzofuran		1.733	1.820	1.793	1.716	1.709	1.691	1.674	1.734	3	AVG
1-Naphthylamine			1.385	1.412	1.369	1.388	1.368	1.385	1.385	1	AVG
2,3,4,6-Tetrachlorophenol		0.282	0.316	0.333	0.308	0.316	0.310	0.308	0.311	5	AVG
2-Naphthylamine			1.353	1.408	1.356	1.382	1.336	1.353	1.365	2	AVG
Diethylphthalate			1.376	1.424	1.347	1.369	1.358	1.330	1.367	2	AVG
Thionazin			0.278	0.290	0.283	0.282	0.280	0.270	0.280	2	AVG
Fluorene	1.329	1.374	1.508	1.477	1.396	1.435	1.395	1.388	1.413	4	AVG
4-Chlorophenyl-phenylether		0.741	0.638	0.681	0.655	0.654	0.634	0.634	0.663	6	AVG
5-Nitro-o-toluidine		0.336	0.462	0.473	0.453	0.445	0.443	0.440	0.436	10	AVG
4-Nitroaniline		0.377	0.436	0.451	0.422	0.434	0.420	0.396	0.419	6	AVG
4,6-Dinitro-2-methylphenol			0.129	0.134	0.144	0.157	0.156	0.159	0.147	9	AVG
N-Nitrosodiphenylamine (1)	0.672	0.633	0.660	0.655	0.640	0.678	0.664	0.660	0.658	2	AVG
NDPA as diphenylamine	0.672	0.633	0.660	0.655	0.640	0.678	0.664	0.660	0.658	2	AVG
1,2-Diphenylhydrazine		0.965	0.859	0.869	0.879	0.922	0.909	0.898	0.900	4	AVG
Tetraethyldithiopyrophosphate			0.111	0.122	0.131	0.126	0.127	0.123	0.123	6	AVG
1,3,5-Trinitrobenzene			0.062	0.081	0.087	0.095	0.098	0.102	0.087	17	AVG
Diallate (peak 1)			0.407	0.394	0.401	0.410	0.404	0.411	0.405	2	AVG
Phorate		0.475	0.493	0.534	0.546	0.568	0.568	0.571	0.536	7	AVG
Phenacetin		0.384	0.433	0.431	0.441	0.439	0.437	0.433	0.428	5	AVG
4-Bromophenyl-phenylether			0.161	0.181	0.168	0.183	0.177	0.179	0.175	5	AVG
Diallate (peak 2)			0.396	0.393	0.394	0.398	0.404	0.380	0.394	2	AVG
Diallate trans/cis			0.405	0.393	0.400	0.408	0.404	0.406	0.403	1	AVG
Hexachlorobenzene	0.163	0.210	0.168	0.168	0.168	0.183	0.171	0.175	0.176	9	AVG
Dimethoate			0.337	0.370	0.373	0.386	0.358	0.360	0.364	5	AVG
Pentachlorophenol			0.129	0.126	0.129	0.133	0.130	0.133	0.130	2	AVG
4-Aminobiphenyl		0.591	0.617	0.628	0.582	0.545	0.517		0.580	7	AVG
Pentachloronitrobenzene			0.080	0.070	0.068	0.073	0.075	0.074	0.073	5	AVG

(1) Cannot be separated from Diphenylamine
4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
Pronamide		0.300	0.294	0.309	0.322	0.330	0.326	0.324	0.315	4	AVG
Dinoseb			0.127	0.167	0.199	0.209	0.210	0.220	0.189	19	AVG
Phenanthrene	1.139	1.246	1.133	1.125	1.078	1.147	1.121	1.113	1.138	4	AVG
Anthracene	1.028	1.067	1.106	1.130	1.117	1.167	1.130	1.131	1.109	4	AVG
Carbazole		1.078	1.087	1.104	1.060	1.130	1.104	1.084	1.093	2	AVG
Methyl parathion			0.212	0.252	0.274	0.278	0.265	0.268	0.258	9	AVG
Di-n-butylphthalate			1.182	1.219	1.241	1.299	1.288	1.249	1.246	3	AVG
Parathion			0.143	0.157	0.164	0.169	0.168	0.172	0.162	7	AVG
4-Nitroquinoline-1-oxide				0.096	0.109	0.128	0.122	0.131	0.117	13	AVG
Octachlorostyrene			0.064	0.056	0.059	0.062	0.062	0.062	0.061	5	AVG
Isodrin		0.124	0.112	0.114	0.114	0.120	0.119	0.117	0.117	3	AVG
Fluoranthene	1.202	1.134	1.183	1.214	1.157	1.244	1.203	1.176	1.189	3	AVG
Benzidine			0.764	0.791	0.829	0.835	0.805	0.830	0.809	3	AVG
Pyrene	1.307	1.304	1.180	1.158	1.143	1.121	1.120	1.140	1.184	7	AVG
p-Dimethylaminoazobenzene		0.148	0.182	0.200	0.216	0.220	0.222	0.224	0.202	14	AVG
Chlorobenzilate		0.304	0.320	0.323	0.337	0.329	0.326	0.332	0.325	3	AVG
3,3'-Dimethylbenzidine			0.612	0.602	0.641	0.666	0.623	0.760	0.651	9	AVG
Butylbenzylphthalate			0.491	0.501	0.538	0.527	0.521	0.529	0.518	4	AVG
2-Acetylaminofluorene			0.426	0.478	0.496	0.483	0.494	0.490	0.478	5	AVG
3,3'-Dichlorobenzidine			0.373	0.374	0.388	0.377	0.373	0.372	0.376	2	AVG
4,4'-Methylenebis(2-chloroani1			0.196	0.192	0.205	0.199	0.195	0.198	0.197	2	AVG
Benzo(a)anthracene	0.926	0.979	1.060	1.029	1.056	1.033	1.023	0.999	1.013	4	AVG
Chrysene	1.157	1.078	1.012	0.984	0.978	0.976	0.960	0.965	1.014	7	AVG
bis(2-Ethylhexyl)phthalate			0.675	0.692	0.747	0.722	0.722	0.731	0.715	4	AVG
6-Methylchrysene			0.699	0.680	0.708	0.709	0.703	0.704	0.701	2	AVG
Di-n-octylphthalate			1.309	1.474	1.724	1.689	1.628	1.706	1.588	10	AVG
Benzo(b)fluoranthene	1.166	1.232	1.250	1.298	1.277	1.304	1.293	1.273	1.262	4	AVG
7,12-Dimethylbenz[a]anthracene		0.470	0.533	0.601	0.657	0.640	0.597	0.622	0.589	11	AVG
Benzo(k)fluoranthene	1.118	1.171	1.253	1.264	1.360	1.318	1.206	1.263	1.244	6	AVG
Benzo(a)pyrene	0.967	1.131	1.198	1.237	1.245	1.262	1.206	1.200	1.181	8	AVG
3-Methylcholanthrene		0.489	0.481	0.514	0.538	0.558	0.526	0.535	0.520	5	AVG
Dibenz(a,h)acridine			0.808	0.833	0.948	0.952	0.923	0.925	0.898	7	AVG
Dibenz(a,j)acridine			0.920	0.898	1.020	0.985	0.934	0.953	0.951	5	AVG
Indeno(1,2,3-cd)pyrene	1.011	1.089	1.195	1.252	1.307	1.302	1.250	1.250	1.207	9	AVG
Dibenz(a,h)anthracene	0.944	0.963	1.028	1.044	1.106	1.097	1.066	1.047	1.037	6	AVG
Benzo(g,h,i)perylene	0.902	1.042	1.027	1.036	1.098	1.056	1.044	1.032	1.030	5	AVG
Total PAHs	1.053	1.061	1.107	1.132	1.177	1.182	1.129	1.171	1.127	4	AVG
2-Fluorophenol			1.506	1.494	1.480	1.544	1.493	1.458	1.496	2	AVG
Phenol-d6			2.191	2.221	2.188	2.236	2.265	2.182	2.214	1	AVG
Nitrobenzene-d5			0.475	0.466	0.475	0.482	0.465	0.470	0.472	1	AVG
2-Fluorobiphenyl			1.314	1.317	1.279	1.294	1.261	1.265	1.288	2	AVG
2,4,6-Tribromophenol			0.142	0.146	0.141	0.145	0.141	0.138	0.142	2	AVG
Terphenyl-d14			0.754	0.747	0.738	0.725	0.717	0.713	0.732	2	AVG
								Average %RSD	5		

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d SSTD030
/chem/HP11165.i/16jun07.b/gf0202.d SSTD120
/chem/HP11165.i/16jun07.b/gf0203.d SSTD080
/chem/HP11165.i/16jun07.b/gf0204.d SSTD050
/chem/HP11165.i/16jun07.b/gf0205.d SSTD015
/chem/HP11165.i/16jun07.b/gf0206.d SSTD005
/chem/HP11165.i/16jun07.b/gf0207.d SSTD001
/chem/HP11165.i/16jun07.b/gf0208.d SSTD00.5

Area Summary

	File ID:									
Internal Standard Name	gf0201.d	gf0202.d	gf0203.d	gf0204.d	gf0205.d	gf0206.d	gf0207.d	gf0208.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	70096	80056	69946	73872	74388	75855	70518	68894	72953	5	Yes
Naphthalene-d8	296116	339990	315991	325835	322701	324878	300737	292985	314904	5	Yes
Acenaphthene-d10	192522	219303	205887	212735	203039	209044	189605	188690	202603	6	Yes
Phenanthrene-d10	374023	412819	389703	400814	413018	417859	369222	370475	393492	5	Yes
Pyrene-d10	404786	440349	432286	456203	461359	456027	416814	425673	436687	5	Yes
Perylene-d12	301130	329460	331473	334394	351858	365369	345528	338486	337212	6	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:								
Internal Standard Name	gf0201.d	gf0202.d	gf0203.d	gf0204.d	gf0205.d	gf0206.d	gf0207.d	gf0208.d	Avg. RT
1,4-Dichlorobenzene-d4	5.528	5.534	5.534	5.534	5.528	5.528	5.528	5.528	5.530
Naphthalene-d8	6.763	6.763	6.763	6.763	6.763	6.763	6.763	6.763	6.763
Acenaphthene-d10	8.475	8.475	8.475	8.475	8.475	8.469	8.475	8.469	8.473
Phenanthrene-d10	9.922	9.927	9.928	9.922	9.922	9.922	9.922	9.922	9.923
Pyrene-d10	11.310	11.310	11.310	11.310	11.304	11.304	11.304	11.304	11.307
Perylene-d12	13.939	13.945	13.945	13.945	13.939	13.939	13.939	13.939	13.941

Comments: _____

Report generated on 06/07/2016 at 18:24

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,4-Dioxane	50.00	53.67	7	30	YES
N-Nitrosodimethylamine	50.00	51.70	3	30	YES
Pyridine	50.00	55.26	11	30	YES
2-Picoline	50.00	51.90	4	30	YES
N-Nitrosomethylethylamine	50.00	41.43	-17	30	YES
Methyl methanesulfonate	50.00	52.74	5	30	YES
N-Nitrosodiethylamine	50.00	48.88	-2	30	YES
Ethyl methanesulfonate	50.00	49.75	-1	30	YES
Phenol	50.00	50.98	2	30	YES
Aniline	50.00	48.42	-3	30	YES
bis(2-Chloroethyl)ether	50.00	48.81	-2	30	YES
2-Chlorophenol	50.00	52.08	4	30	YES
1,3-Dichlorobenzene	50.00	52.08	4	30	YES
1,4-Dichlorobenzene	50.00	51.06	2	30	YES
Benzyl alcohol	50.00	51.04	2	30	YES
1,2-Dichlorobenzene	50.00	49.45	-1	30	YES
Indene	50.00	49.46	-1	30	YES
2-Methylphenol	50.00	53.12	6	30	YES
2,2'-oxybis(1-Chloropropane	50.00	51.97	4	30	YES
bis(2-Chloroisopropyl)ether	50.00	51.97	4	30	YES
N-Nitrosopyrrolidine	50.00	49.17	-2	30	YES
Acetophenone	50.00	49.36	-1	30	YES
4-Methylphenol	50.00	51.50	3	30	YES
N-Nitroso-di-n-propylamine	50.00	49.22	-2	30	YES
N-Nitrosomorpholine	50.00	50.77	2	30	YES
o-Toluidine	50.00	49.28	-1	30	YES
Total Cresols	100.00	104.63	5	30	YES
Hexachloroethane	50.00	50.96	2	30	YES
Nitrobenzene	50.00	48.91	-2	30	YES
N-Nitrosopiperidine	50.00	48.00	-4	30	YES
Isophorone	50.00	46.64	-7	30	YES
2-Nitrophenol	50.00	49.47	-1	30	YES
2,4-Dimethylphenol	50.00	45.31	-9	30	YES
bis(2-Chloroethoxy)methane	50.00	48.38	-3	30	YES
Benzoic acid	100.00	94.14	-6	30	YES
O,O,O-Triethylphosphorothio	50.00	46.81	-6	30	YES
2,4-Dichlorophenol	50.00	50.24	0	30	YES

NC = Could not calculate

Comments:

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,2,4-Trichlorobenzene	50.00	50.78	2	30	YES
Naphthalene	50.00	49.34	-1	30	YES
4-Chloroaniline	50.00	50.91	2	30	YES
2,6-Dichlorophenol	50.00	49.38	-1	30	YES
Hexachloropropene	50.00	53.33	7	30	YES
Hexachlorobutadiene	50.00	49.70	-1	30	YES
Quinoline	50.00	47.91	-4	30	YES
N-Nitrosodi-n-butylamine	50.00	36.21	-28	30	YES
4-Chloro-3-methylphenol	50.00	48.54	-3	30	YES
Safrole	50.00	49.09	-2	30	YES
2-Methylnaphthalene	50.00	46.43	-7	30	YES
1-Methylnaphthalene	50.00	46.31	-7	30	YES
Hexachlorocyclopentadiene	100.00	90.59	-9	30	YES
1,2,4,5-Tetrachlorobenzene	50.00	50.80	2	30	YES
cis-Isosafrole	6.00	6.25	4	30	YES
2,4,6-Trichlorophenol	50.00	49.91	0	30	YES
2,4,5-Trichlorophenol	50.00	51.15	2	30	YES
trans-Isosafrole	44.00	46.22	5	30	YES
1,1'-Biphenyl	50.00	48.75	-3	30	YES
2-Chloronaphthalene	50.00	50.26	1	30	YES
Isosafrole	50.00	52.47	5	30	YES
1-Chloronaphthalene	50.00	49.36	-1	30	YES
Diphenyl ether	50.00	49.24	-2	30	YES
2-Nitroaniline	50.00	52.74	5	30	YES
1,4-Naphthoquinone	62.50	58.31	-7	30	YES
1,4-Dinitrobenzene	50.00	51.33	3	30	YES
Dimethylphthalate	50.00	48.55	-3	30	YES
1,3-Dinitrobenzene	50.00	50.59	1	30	YES
2,6-Dinitrotoluene	50.00	52.28	5	30	YES
Acenaphthylene	50.00	43.69	-13	30	YES
3-Nitroaniline	50.00	52.01	4	30	YES
Acenaphthene	50.00	48.87	-2	30	YES
2,4-Dinitrophenol	100.00	100.32	0	30	YES
4-Nitrophenol	50.00	52.72	5	30	YES
Pentachlorobenzene	50.00	49.86	0	30	YES
2,4-Dinitrotoluene	50.00	50.32	1	30	YES
Dibenzofuran	50.00	48.44	-3	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
2,4_2,6-Dinitrotoluenes	100.00	102.60	3	30	YES
1-Naphthylamine	100.00	94.52	-5	30	YES
2,3,4,6-Tetrachlorophenol	50.00	54.18	8	30	YES
2-Naphthylamine	100.00	91.56	-8	30	YES
Diethylphthalate	50.00	48.98	-2	30	YES
Thionazin	50.00	41.55	-17	30	YES
Fluorene	50.00	51.88	4	30	YES
4-Chlorophenyl-phenylether	50.00	49.68	-1	30	YES
5-Nitro-o-toluidine	50.00	50.51	1	30	YES
4-Nitroaniline	50.00	47.08	-6	30	YES
4,6-Dinitro-2-methylphenol	50.00	50.51	1	30	YES
N-Nitrosodiphenylamine	50.00	48.76	-2	30	YES
NDPA as diphenylamine	50.00	48.76	-2	30	YES
1,2-Diphenylhydrazine	50.00	48.83	-2	30	YES
Tetraethyldithiopyrophospha	50.00	46.53	-7	30	YES
1,3,5-Trinitrobenzene	50.00	49.05	-2	30	YES
Diallate (peak 1)	37.50	33.84	-10	30	YES
Phorate	50.00	49.55	-1	30	YES
Phenacetin	50.00	47.14	-6	30	YES
4-Bromophenyl-phenylether	50.00	49.76	0	30	YES
Diallate (peak 2)	12.50	11.62	-7	30	YES
Hexachlorobenzene	50.00	48.55	-3	30	YES
Diallate trans/cis	50.00	45.47	-9	30	YES
Dimethoate	50.00	44.62	-11	30	YES
Pentachlorophenol	50.00	52.02	4	30	YES
4-Aminobiphenyl	50.00	67.10	34	30	NO*
Pentachloronitrobenzene	50.00	47.02	-6	30	YES
Pronamide	50.00	47.53	-5	30	YES
Dinoseb	50.00	52.71	5	30	YES
Phenanthrene	50.00	47.06	-6	30	YES
Anthracene	50.00	49.49	-1	30	YES
Carbazole	50.00	48.06	-4	30	YES
Methyl parathion	50.00	47.81	-4	30	YES
Di-n-butylphthalate	50.00	48.97	-2	30	YES
Parathion	50.00	50.59	1	30	YES
4-Nitroquinoline-1-oxide	600.00	770.14	28	30	YES
Isodrin	50.00	46.43	-7	30	YES

NC = Could not calculate

Comments: *APPIX compound. Rerun any samples with hits for 4-Aminobiphenyl under valid ICV.

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Fluoranthene	50.00	49.03	-2	30	YES
Benzidine	250.00	248.93	0	30	YES
Pyrene	50.00	47.76	-4	30	YES
p-Dimethylaminoazobenzene	50.00	59.50	19	30	YES
Chlorobenzilate	50.00	49.10	-2	30	YES
3,3'-Dimethylbenzidine	100.00	104.27	4	30	YES
Butylbenzylphthalate	50.00	52.12	4	30	YES
2-Acetylaminofluorene	50.00	49.76	0	30	YES
3,3'-Dichlorobenzidine	50.00	47.12	-6	30	YES
Benzo(a)anthracene	50.00	51.44	3	30	YES
Chrysene	50.00	49.83	0	30	YES
4,4'-Methylenebis(2-chloroa	50.00	47.77	-4	30	YES
bis(2-Ethylhexyl)phthalate	50.00	50.47	1	30	YES
6-Methylchrysene	50.00	49.29	-1	30	YES
Di-n-octylphthalate	50.00	54.60	9	30	YES
Benzo(b)fluoranthene	50.00	53.49	7	30	YES
7,12-Dimethylbenz[a]anthrac	50.00	54.14	8	30	YES
Benzo(k)fluoranthene	50.00	57.36	15	30	YES
Benzo(a)pyrene	50.00	52.95	6	30	YES
3-Methylcholanthrene	50.00	63.50	27	30	YES
Dibenz(a,h)acridine	50.00	50.97	2	30	YES
Dibenz(a,j)acridine	50.00	50.12	0	30	YES
Indeno(1,2,3-cd)pyrene	50.00	56.11	12	30	YES
Dibenz(a,h)anthracene	50.00	55.58	11	30	YES
Benzo(g,h,i)perylene	50.00	54.71	9	30	YES
Total PAHs	900.00	911.32	1	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP1ll65

Method: SW-846 8270D File ID: gf0212.d

ICV SAMPLE ID: ICVBAS0716 BATCH: 16JUN07026 Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Caprolactam	50.00	44.50	-11	30	YES

NC = Could not calculate

Comments: _____

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/28/16 06/28/16

Calibration Times: 07:48 09:58

LAB FILE ID: RRF5 = gf1007.d RRF15 = gf1006.d

RRF30 = gf1005.d RRF50 = gf1004.d RRF80 = gf1003.d RRF120 = gf1002.d

COMPOUND	RRF	RRF	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
2-Chlorobenzalmalononitrile			0.373	0.369	0.378	0.374	0.376	0.382	0.375	1	AVG
								Average %RSD		1	

07-12-2016

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun28.b/gf1002.d SSTD120
/chem/HP11165.i/16jun28.b/gf1003.d SSTD080
/chem/HP11165.i/16jun28.b/gf1004.d SSTD050
/chem/HP11165.i/16jun28.b/gf1005.d SSTD030
/chem/HP11165.i/16jun28.b/gf1006.d SSTD015
/chem/HP11165.i/16jun28.b/gf1007.d SSTD005

Area Summary

	File ID:								
Internal Standard Name	gf1002.d	gf1003.d	gf1004.d	gf1005.d	gf1006.d	gf1007.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	69353	75067	81429	77374	76768	84981	77495	7	Yes
Naphthalene-d8	300636	313602	337965	327580	320228	357147	326193	6	Yes
Acenaphthene-d10	200693	208546	226613	225158	220824	240109	220324	6	Yes
Phenanthrene-d10	415370	427022	462700	443931	443085	487450	446593	6	Yes
Pyrene-d10	497800	513778	536406	523166	517538	581064	528292	5	Yes
Perylene-d12	427018	435295	432549	423115	415118	448269	430227	3	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:						
Internal Standard Name	gf1002.d	gf1003.d	gf1004.d	gf1005.d	gf1006.d	gf1007.d	Avg. RT
1,4-Dichlorobenzene-d4	5.151	5.151	5.152	5.151	5.151	5.151	5.151
Naphthalene-d8	6.387	6.386	6.387	6.386	6.381	6.381	6.385
Acenaphthene-d10	8.087	8.086	8.087	8.086	8.086	8.087	8.086
Phenanthrene-d10	9.528	9.527	9.528	9.527	9.528	9.528	9.528
Pyrene-d10	10.904	10.904	10.898	10.898	10.898	10.898	10.900
Perylene-d12	13.480	13.480	13.480	13.480	13.480	13.480	13.480

Comments: _____

Report generated on 06/28/2016 at 16:24

7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
N-Nitrosodimethylamine	0.969	1.035	32.020	30.0	7
Pyridine	1.689	1.812	32.170	30.0	7
2-Picoline	1.731	1.985	34.410	30.0	15
N-Nitrosomethylethylamine	0.893	0.755	25.370	30.0	-15
Methyl methanesulfonate	0.896	0.970	32.480	30.0	8
N-Nitrosodiethylamine	0.858	0.910	31.810	30.0	6
Ethyl methanesulfonate	0.847	0.836	29.600	30.0	-1
Phenol	2.564	2.467	28.860	30.0	-4
Aniline	2.898	3.026	31.320	30.0	4
a-methylstyrene	1.627	1.743	32.140	30.0	7
bis(2-Chloroethyl)ether	1.825	1.867	30.680	30.0	2
2-Chlorophenol	1.532	1.601	31.350	30.0	4
1,3-Dichlorobenzene	1.566	1.648	31.570	30.0	5
1,4-Dichlorobenzene	1.638	1.694	31.020	30.0	3
Benzyl alcohol	1.188	1.234	31.180	30.0	4
1,2-Dichlorobenzene	1.590	1.591	30.010	30.0	0
Indene	2.798	2.806	30.080	30.0	0
2-Methylphenol	1.592	1.740	32.780	30.0	9
2,2'-oxybis(1-Chloropropane)	2.032	2.199	32.460	30.0	8
bis(2-Chloroisopropyl)ether	2.032	2.199	32.460	30.0	8
N-Nitrosopyrrolidine	0.949	1.032	32.650	30.0	9
Acetophenone	2.437	2.541	31.290	30.0	4
4-Methylphenol	1.896	2.038	32.240	30.0	7
Total Cresols	1.742	1.889	65.020	60.0	8
N-Nitroso-di-n-propylamine	1.586	1.662	31.440	30.0	5
N-Nitrosomorpholine	1.128	1.166	31.010	30.0	3
o-Toluidine	2.780	2.916	31.470	30.0	5
Hexachloroethane	0.600	0.625	31.220	30.0	4
Nitrobenzene	0.492	0.513	31.270	30.0	4
N-Nitrosopiperidine	0.204	0.215	31.620	30.0	5
Isophorone	0.903	0.940	31.230	30.0	4
2-Nitrophenol	0.205	0.204	29.850	30.0	0
2,4-Dimethylphenol	0.410	0.434	31.790	30.0	6
O,O,O-Triethylphosphorothioate	0.186	0.205	33.000	30.0	10
bis(2-Chloroethoxy)methane	0.513	0.545	31.890	30.0	6
Benzoic acid	0.411	0.404	39.310	40.0	-2

FORM VII SV-1

JM6/gf6
6-28-2016

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2,3,4-Tetrahydronaphthalene	0.580	0.608	31.490	30.0	5
2,4-Dichlorophenol	0.308	0.325	31.710	30.0	6
1,2,4-Trichlorobenzene	0.315	0.332	31.660	30.0	6
Naphthalene	1.088	1.096	30.220	30.0	1
4-Chloroaniline	0.475	0.487	30.720	30.0	2
2,6-Dichlorophenol	0.308	0.319	31.120	30.0	4
Hexachloropropene	0.156	0.171	32.920	30.0	10
Hexachlorobutadiene	0.153	0.173	33.960	30.0	13
Quinoline	0.766	0.770	30.150	30.0	1
Caprolactam	0.168	0.175	31.120	30.0	4
N-Nitrosodi-n-butylamine	0.433	0.466	32.310	30.0	8
4-Chloro-3-methylphenol	0.387	0.404	31.360	30.0	5
Safrole	0.296	0.312	31.620	30.0	5
2-Methylnaphthalene	0.797	0.771	29.030	30.0	-3
1-Methylnaphthalene	0.736	0.721	29.390	30.0	-2
Hexachlorocyclopentadiene	0.216	0.197	27.300	30.0	-9
1,2,4,5-Tetrachlorobenzene	0.470	0.525	33.500	30.0	12
cis-Isosafrole	0.479	0.507	5.400	5.1	6
2,4,6-Trichlorophenol	0.358	0.385	32.310	30.0	8
2,4,5-Trichlorophenol	0.393	0.425	32.450	30.0	8
trans-Isosafrole	0.530	0.544	25.540	24.9	3
Isosafrole	0.522	0.538	30.940	30.0	3
1,1'-Biphenyl	1.504	1.523	30.380	30.0	1
2-Chloronaphthalene	1.149	1.145	29.910	30.0	0
1-Chloronaphthalene	1.107	1.117	30.260	30.0	1
Diphenyl ether	0.801	0.838	31.420	30.0	5
2-Nitroaniline	0.400	0.426	31.880	30.0	6
1,4-Naphthoquinone	0.512	0.488	28.610	30.0	-5
1,4-Dinitrobenzene	0.221	0.229	31.080	30.0	4
Dimethylphthalate	1.389	1.391	30.040	30.0	0
1,3-Dinitrobenzene	0.250	0.258	30.960	30.0	3
2,6-Dinitrotoluene	0.323	0.336	31.250	30.0	4
Acenaphthylene	1.831	1.821	29.850	30.0	-1
3-Nitroaniline	0.359	0.387	32.290	30.0	8
Acenaphthene	1.231	1.215	29.600	30.0	-1
2,4-Dinitrophenol	0.234	0.222	38.000	40.0	-5

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
4-Nitrophenol	0.217	0.239	33.040	30.0	10
Pentachlorobenzene	0.420	0.491	35.070	30.0	17
2,4-Dinitrotoluene	0.454	0.460	30.390	30.0	1
2,4_2,6-Dinitrotoluenes	0.394	0.398	61.640	60.0	3
Dibenzofuran	1.734	1.710	29.590	30.0	-1
1-Naphthylamine	1.385	1.394	30.200	30.0	1
2,3,4,6-Tetrachlorophenol	0.311	0.361	34.870	30.0	16
2-Naphthylamine	1.365	1.357	29.830	30.0	-1
Diethylphthalate	1.367	1.382	30.330	30.0	1
Thionazin	0.280	0.297	31.760	30.0	6
Fluorene	1.413	1.462	31.040	30.0	3
4-Chlorophenyl-phenylether	0.663	0.695	31.490	30.0	5
5-Nitro-o-toluidine	0.436	0.441	30.330	30.0	1
4-Nitroaniline	0.419	0.401	28.660	30.0	-4
4,6-Dinitro-2-methylphenol	0.147	0.150	30.590	30.0	2
N-Nitrosodiphenylamine (1)	0.658	0.664	30.290	30.0	1
NDPA as diphenylamine	0.658	0.664	30.290	30.0	1
1,2-Diphenylhydrazine	0.900	0.894	29.810	30.0	-1
Tetraethyldithiopyrophosphate	0.123	0.127	30.780	30.0	3
1,3,5-Trinitrobenzene	0.087	0.097	33.190	30.0	11
Diallate (peak 1)	0.405	0.404	24.880	24.9	0
Phorate	0.536	0.801	44.800	30.0	49
Phenacetin	0.428	0.435	30.460	30.0	2
4-Bromophenyl-phenylether	0.175	0.205	35.210	30.0	17
Diallate (peak 2)	0.394	0.399	5.160	5.1	1
Diallate trans/cis	0.403	0.403	30.050	30.0	0
Hexachlorobenzene	0.176	0.201	34.320	30.0	14
Dimethoate	0.364	0.381	31.410	30.0	5
Pentachlorophenol	0.130	0.142	32.880	30.0	10
4-Aminobiphenyl	0.580	0.544	28.120	30.0	-6
Pentachloronitrobenzene	0.073	0.080	32.650	30.0	9
Pronamide	0.315	0.321	30.540	30.0	2
Dinoseb	0.189	0.209	33.200	30.0	11
Phenanthrene	1.138	1.146	30.200	30.0	1
Anthracene	1.109	1.175	31.790	30.0	6
Carbazole	1.092	1.112	30.520	30.0	2

(1) Cannot be Separated from Diphenylamine

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Methyl parathion	0.258	0.273	31.740	30.0	6
Di-n-butylphthalate	1.246	1.240	29.850	30.0	-1
Parathion	0.162	0.174	32.170	30.0	7
4-Nitroquinoline-1-oxide	0.117	0.084	21.470	30.0	-28
Octachlorostyrene	0.061	0.076	37.710	30.0	26
Isodrin	0.117	0.124	31.790	30.0	6
Fluoranthene	1.189	1.297	32.720	30.0	9
Benzidine	0.809	0.761	84.700	90.0	-6
Pyrene	1.184	1.125	28.490	30.0	-5
p-Dimethylaminoazobenzene	0.202	0.208	30.980	30.0	3
Chlorobenzilate	0.325	0.308	28.500	30.0	-5
3,3'-Dimethylbenzidine	0.651	0.646	29.760	30.0	-1
Butylbenzylphthalate	0.518	0.480	27.810	30.0	-7
2-Acetylaminofluorene	0.478	0.469	29.460	30.0	-2
3,3'-Dichlorobenzidine	0.376	0.408	32.580	30.0	9
4,4'-Methylenebis(2-chloroanil	0.197	0.209	31.820	30.0	6
Benzo(a)anthracene	1.013	1.067	31.590	30.0	5
Chrysene	1.014	1.003	29.670	30.0	-1
bis(2-Ethylhexyl)phthalate	0.715	0.671	28.150	30.0	-6
6-Methylchrysene	0.701	0.741	31.720	30.0	6
Di-n-octylphthalate	1.589	1.414	26.700	30.0	-11
Benzo(b)fluoranthene	1.262	1.217	28.930	30.0	-4
7,12-Dimethylbenz[a]anthracene	0.589	0.614	31.310	30.0	4
Benzo(k)fluoranthene	1.244	1.286	31.000	30.0	3
Benzo(a)pyrene	1.181	1.184	30.090	30.0	0
3-Methylcholanthrene	0.520	0.536	30.930	30.0	3
Dibenz(a,h)acridine	0.898	0.900	30.070	30.0	0
Dibenz(a,j)acridine	0.951	0.986	31.090	30.0	4
Indeno(1,2,3-cd)pyrene	1.207	1.280	31.820	30.0	6
Dibenz(a,h)anthracene	1.037	1.056	30.560	30.0	2
Benzo(g,h,i)perylene	1.030	1.055	30.730	30.0	2
Total PAHs	1.127	1.051	546.710	540.0	1
2-Fluorophenol	1.496	1.568	62.910	60.0	5
Phenol-d6	2.214	2.253	61.070	60.0	2
Nitrobenzene-d5	0.472	0.488	61.990	60.0	3

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Fluorobiphenyl	1.288	1.300	60.530	60.0	1
2,4,6-Tribromophenol	0.142	0.183	77.170	60.0	29
Terphenyl-d14	0.732	0.780	63.870	60.0	6
			Average %Drift:		6

Continuing Calibration
Internal Standard Area and Retention Time
Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d **
/chem/HP11165.i/16jun07.b/gf0202.d
/chem/HP11165.i/16jun07.b/gf0203.d
/chem/HP11165.i/16jun07.b/gf0204.d
/chem/HP11165.i/16jun07.b/gf0205.d
/chem/HP11165.i/16jun07.b/gf0206.d
/chem/HP11165.i/16jun07.b/gf0207.d
/chem/HP11165.i/16jun07.b/gf0208.d

** indicates the Mid Level Calibration Standard.

Mid Level Calibration Standard is used for comparison.

Current Continuing Calibration Standard:

/chem/HP11165.i/16jun28.b/gf1001.d

Area Summary

File ID:

Internal Standard Name	gf1001.d	ICAL Area	Low Limit	High Limit	In Spec
1,4-Dichlorobenzene-d4	80097	70096	35048	140192	Yes
Naphthalene-d8	351076	296116	148058	592232	Yes
Acenaphthene-d10	229111	192522	96261	385044	Yes
Phenanthrene-d10	454754	374023	187012	748046	Yes
Pyrene-d10	547731	404786	202393	809572	Yes
Perylene-d12	450607	301130	150565	602260	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

File ID:

Internal Standard Name	gf1001.d	ICAL RT	In Spec
1,4-Dichlorobenzene-d4	5.157	5.528	Yes
Naphthalene-d8	6.387	6.763	Yes
Acenaphthene-d10	8.092	8.475	Yes
Phenanthrene-d10	9.528	9.922	Yes
Pyrene-d10	10.904	11.310	Yes
Perylene-d12	13.486	13.939	Yes

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments: JM6/5H6
6-28-2016

Report generated on 06/28/2016 at 07:45

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gf1001.d Date Analyzed: 06/28/16

Instrument ID: HP11165 Time Analyzed: 07:22

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	80097	5.157	351076	6.387	229111	8.092
UPPER LIMIT	160194	5.657	702152	6.887	458222	8.592
LOWER LIMIT	40049	4.657	175538	5.887	114556	7.592
LLI SAMPLE NO.						
01 SBLKWA178	80148	5.151	339714	6.386	222101	8.086
02 178WALCS	80435	5.151	350695	6.381	234710	8.086
03 178WALCSD	73962	5.151	325371	6.381	209182	8.086
04 8438378	86109	5.151	372839	6.381	248891	8.086
05 8438379	84743	5.157	359685	6.381	244704	8.086
06 8442829	77455	5.151	335112	6.381	224553	8.086
07 8442830	77638	5.151	331373	6.381	215495	8.086
08 8442831	78672	5.151	333632	6.381	225695	8.086
09 8444113	75121	5.151	315508	6.381	211180	8.086
10 8444115	78360	5.151	328762	6.381	220643	8.087
11 8444116	77346	5.151	329393	6.381	224252	8.086
12 8445666	71351	5.151	301782	6.381	203136	8.087
13 8445667	70801	5.151	307388	6.381	208045	8.086

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gf1001.d Date Analyzed: 06/28/16

Instrument ID: HP11165 Time Analyzed: 07:22

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	454754	9.528	547731	10.904	450607	13.486
UPPER LIMIT	909508	10.028	1095462	11.404	901214	13.986
LOWER LIMIT	227377	9.028	273866	10.404	225304	12.986
LLI SAMPLE NO.						
01 SBLKWA178	444312	9.527	524164	10.898	453614	13.480
02 178WALCS	465114	9.528	552723	10.898	466913	13.480
03 178WALCSD	432911	9.522	505759	10.898	416324	13.480
04 8438378	498214	9.527	586989	10.898	466937	13.480
05 8438379	483458	9.528	562577	10.898	451911	13.480
06 8442829	450000	9.522	534921	10.898	435230	13.480
07 8442830	429268	9.527	504430	10.898	426858	13.480
08 8442831	458326	9.522	545923	10.898	462675	13.480
09 8444113	422492	9.522	510508	10.898	427004	13.480
10 8444115	449447	9.522	530050	10.898	466855	13.480
11 8444116	444562	9.522	542350	10.898	460095	13.474
12 8445666	402229	9.522	490595	10.898	440059	13.480
13 8445667	422634	9.522	500688	10.898	426369	13.474

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

Preparation and Run Logs

Semivolatiles by GC/MS-Specials

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jun07\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GF0200.D	DFTPP1116	06/07/2016	09:16		
jmg00346	GF0201.D	STD1526	06/07/2016	09:32		
jmg00346	GF0202.D	STD1526	06/07/2016	09:59		
jmg00346	GF0203.D	STD1526	06/07/2016	10:25		
jmg00346	GF0204.D	STD1526	06/07/2016	10:51		
jmg00346	GF0205.D	STD1526	06/07/2016	11:20		
jmg00346	GF0206.D	STD1526	06/07/2016	11:47		
jmg00346	GF0207.D	STD1526	06/07/2016	12:13		
jmg00346	GF0208.D	STD1526	06/07/2016	12:39		
jmg00346	GF0209.D	MDL1526	06/07/2016	13:06		
jmg00346	GF0210.D	MDLPAH1526	06/07/2016	13:32		
jmg00346	GF0211.D	ICV1376	06/07/2016	14:00		
jmg00346	GF0212.D	ICVBAS0716	06/07/2016	14:28		

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jun28\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GF1000.D	DFTPP1116	06/28/2016	07:05		
jmg00346	GF1001.D	STD1526	06/28/2016	07:22		
jmg00346	GF1002.D	TRG1586	06/28/2016	07:48		
jmg00346	GF1003.D	TRG1586	06/28/2016	08:14		
jmg00346	GF1004.D	TRG1586	06/28/2016	08:40		
jmg00346	GF1005.D	TRG1586	06/28/2016	09:07		
jmg00346	GF1006.D	TRG1586	06/28/2016	09:32		
jmg00346	GF1007.D	TRG1586	06/28/2016	09:58		
jmg00346	GF1008.D	TRGMDL1586	06/28/2016	10:25		
jmg00346	GF1009.D	SBLKWA178	06/28/2016	10:51	16178WAA	
jmg00346	GF1010.D	178WALCS	06/28/2016	11:18	16178WAA	
jmg00346	GF1011.D	178WALCSD	06/28/2016	11:44	16178WAA	
jmg00346	GF1012.D	8438378	06/28/2016	12:10	16178WAA	
jmg00346	GF1013.D	8438379	06/28/2016	12:37	16178WAA	
jmg00346	GF1014.D	8442829	06/28/2016	13:03	16178WAA	
jmg00346	GF1015.D	8442830	06/28/2016	13:29	16178WAA	
jmg00346	GF1016.D	8442831	06/28/2016	13:56	16178WAA	
jmg00346	GF1017.D	8444113	06/28/2016	14:22	16178WAA	
jmg00346	GF1018.D	8444115	06/28/2016	14:48	16178WAA	
jmg00346	GF1019.D	8444116	06/28/2016	15:15	16178WAA	
jmg00346	GF1020.D	8445666	06/28/2016	15:41	16178WAA	
jmg00346	GF1021.D	8445667	06/28/2016	16:07	16178WAA	

Organic Extraction Batchlog Assigned to: 701 Karen Beyer Reviewed by: JMO 6-25-16 Start Date: 6/27/16 Start time: 21:00

16178WAA026 Tech 1: MM Tech 2:

Dept: 26	Prep Analysis: 10475 BNA Water Extraction CS BZ							Specials in water by GC/MS			
QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
BLANKA	SBLKWA178	1000	SS1616526A	1.0			1.0	6	NA	NA	
LCSA	178WALCS	1010	SS1616526A	1.0	MS1617326A	1.0	1.0	8	NA	NA	
LCSDA	178WALCSD	1010	SS1616526A	1.0	MS1617326A	1.0	1.0	8	NA	NA	

Solvent Used	Lot No.
10N NaOH	—
Methylene Chloride	163135
Sodium Sulfate	16176A
Sulfuric Acid	—

MM 6/27/16

Spike Solutions: Witness: MM
MS1617326A CS LCS SPIKE
SS1616526A BNA SURROGATE STANDARD

6/27/16

Sample #	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1 8438378	D8634	1040	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/14/2016	N
2 8438379	D8635	1056	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/14/2016	N
3 8442829	RT-EB	1034	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
4 8442830	RT-FB	1009	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
5 8442831	D16C1	1045	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
6 8444113	D25FD	1057	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
7 8444115	D22EB	1002	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
8 8444116	BG3EB	1050	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
9 8445666	D8901	1043	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/19/2016	N
10 8445667	D8902	1037	SS1616526A	1.0	1.0	6	NA	Y3B	Clear	02395	19866	07/19/2016	N

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6/27/16

Rack ID:		Work Station	Bench 1	Micro Temp 100?	
Internal Standard	LC197960	Balance #	—		

Turbo B

S-bath ID	98.0 C	S-bath ID	—C	N-Evap	—C	M-vap	—C	16178WAA026

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

Explosives Data

Case Narrative/Conformance Summary

Explosives

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Pesticide Residue Analysis

Fraction: Explosives

Nitroaromatics/Amines 8330B(s)

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8442799	RTPA-1		X	1	
8442802	RTPA-2		X	1	
8442805	RTPA-3		X	1	
8442810	RTPA-4		X	1	Unspiked
8442811	RTPA-4MS		X	1	Matrix Spike
8442812	RTPA-4MSD		X	1	Matrix Spike Duplicate
8442818	DU-1-6-A		X	1	
8442822	DU-1-6-B		X	1	
8442826	DU-1-6-C		X	1	
8442829	RTPA-EB	X		1	Equipment Blank
8442830	RTPA-FB	X		1	Field Blank
8442831	DU-1-6-FB	X		1	Field Blank
8455243	Explosives/Perchlorate Blank		X	1	Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

(Sample number(s): 8442826, 8455243: Analysis: 13413)
The response for a target analyte(s) in the continuing calibration verification standard is outside the QC acceptance limits. Since the response is high indicating increased sensitivity, and the target analyte(s) is not detected in the sample, the data is reported.

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Pesticide Residue Analysis

Fraction: Explosives

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

LCS/LCSD

Batch#: 161780001A (Sample number(s): 8442829-8442831)
The relative percent difference(s) for the following analyte(s) in the LCS/LCSD is outside the acceptance window: Tetryl
The recovery(ies) for the following analyte(s) in the LCS is below the acceptance window: Tetryl

MS/MSD

Please note that US EPA Methods for organic compounds do not require action by the laboratory based on out-of-specification MS/MSD results.

Batch#: 161880010A (Sample number(s): 8442799, 8442802, 8442805, 8442810-8442812, 8442818, 8442822, 8442826, 8455243, UNSPK: 8442810)
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: 1,3,5-Trinitrobenzene
Refer to the QC Summary forms for more information.

Surrogate

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Batch#: 161780001A (Sample number(s): 8442829-8442831)
The recovery(ies) for the following surrogate(s) exceeds the acceptance window: 3,4-Dinitrotoluene (8442830)

SAMPLE ANALYSIS:

(Sample number(s): 8442818, 8455243: Analysis: 13413)
Reporting limits were raised due to interference from the sample matrix.

(Sample number(s): 8442826: Analysis: 13413)
This sample was used for the ISM triplicate. The individual %RSD is included in the data package for review.

(Sample number(s): 8442829-8442831: Analysis: 13395)
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Pesticide Residue Analysis

Fraction: Explosives

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Explosives

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Quality Control Reference List
Pesticide Residue Analysis

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Fraction: Explosives

Analysis	Batch Number	Sample Number	Analysis Date
Nitroaromatics/Amines 8330B(s)	161880010A	PBLK10188	08/03/2016 02:42:00
		LCSISM1Q	08/03/2016 04:07:00
		8442799	08/03/2016 05:32:00
		8442802	08/03/2016 06:15:00
		8442805	08/03/2016 06:57:00
		8442810 UNSPK	08/03/2016 07:40:00
		8442811 MS	08/03/2016 08:22:00
		8442812 MSD	08/03/2016 09:05:00
		8442818	08/03/2016 09:47:00
		8442822	08/03/2016 10:29:00
		8442826	08/03/2016 11:54:00
		8455243	08/03/2016 14:02:00
Nitroaromatics/Amines 8330B(w)	161780001A	PBLK01178	07/31/2016 20:18:00
		LCS01178	07/31/2016 21:01:00
		LCSD01178	07/31/2016 21:43:00
		8442829	07/31/2016 23:50:00
		8442830	08/01/2016 00:33:00
		8442831	08/01/2016 01:15:00

Fraction: Explosives

13413: Nitroaromatics/Amines 8330B(s) Analyte Name	Default MDL	Default LOQ	Units
HMX	210	300	ug/kg
Nitroglycerin	800	2,400	ug/kg
PETN	800	2,400	ug/kg
RDX	40	120	ug/kg
1,3,5-Trinitrobenzene	40	120	ug/kg
Tetryl	100	300	ug/kg
1,3-Dinitrobenzene	40	120	ug/kg
2,4,6-Trinitrotoluene	44	120	ug/kg
Nitrobenzene	100	300	ug/kg
4-Amino-2,6-Dinitrotoluene	41	120	ug/kg
2-Amino-4,6-Dinitrotoluene	41	120	ug/kg
2,6-Dinitrotoluene	110	120	ug/kg
2,4-Dinitrotoluene	40	120	ug/kg
2-Nitrotoluene	75	120	ug/kg
4-Nitrotoluene	110	120	ug/kg
3-Nitrotoluene	110	120	ug/kg

13395: Nitroaromatics/Amines 8330B(w) Analyte Name	Default MDL	Default LOQ	Units
HMX	0.20	0.60	ug/l
Nitroglycerin	3.0	10	ug/l
PETN	3.0	10	ug/l
RDX	0.40	0.60	ug/l
1,3,5-Trinitrobenzene	0.22	0.60	ug/l
Tetryl	0.44	0.60	ug/l
1,3-Dinitrobenzene	0.25	0.60	ug/l
2,4,6-Trinitrotoluene	0.40	0.60	ug/l
Nitrobenzene	0.44	0.60	ug/l
4-Amino-2,6-Dinitrotoluene	0.23	0.60	ug/l
2-Amino-4,6-Dinitrotoluene	0.23	0.60	ug/l
2,6-Dinitrotoluene	0.40	0.60	ug/l
2,4-Dinitrotoluene	0.20	0.60	ug/l
2-Nitrotoluene	0.40	0.60	ug/l
4-Nitrotoluene	0.32	0.60	ug/l
3-Nitrotoluene	0.32	0.60	ug/l

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: DWD87
Matrix: LIQUID

Fraction: Explosives

161780001A / PBLK01178 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
HMX	07/31/16	N.D.	ug/l	0.20	0.60
Nitroglycerin	07/31/16	N.D.	ug/l	3.0	10
PETN	07/31/16	N.D.	ug/l	3.0	10
RDX	07/31/16	N.D.	ug/l	0.40	0.60
1,3,5-Trinitrobenzene	07/31/16	N.D.	ug/l	0.22	0.60
Tetryl	07/31/16	N.D.	ug/l	0.44	0.60
1,3-Dinitrobenzene	07/31/16	N.D.	ug/l	0.25	0.60
2,4,6-Trinitrotoluene	07/31/16	N.D.	ug/l	0.40	0.60
Nitrobenzene	07/31/16	N.D.	ug/l	0.44	0.60
4-Amino-2,6-Dinitrotoluene	07/31/16	N.D.	ug/l	0.23	0.60
2-Amino-4,6-Dinitrotoluene	07/31/16	N.D.	ug/l	0.23	0.60
2,6-Dinitrotoluene	07/31/16	N.D.	ug/l	0.40	0.60
2,4-Dinitrotoluene	07/31/16	N.D.	ug/l	0.20	0.60
2-Nitrotoluene	07/31/16	N.D.	ug/l	0.40	0.60
4-Nitrotoluene	07/31/16	N.D.	ug/l	0.32	0.60
3-Nitrotoluene	07/31/16	N.D.	ug/l	0.32	0.60

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: DWD87
Matrix: SOLID

Fraction: Explosives

161880010A / PBLK10188 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
HMX	08/03/16	N.D.	ug/kg	210	300
Nitroglycerin	08/03/16	N.D.	ug/kg	800	2400
PETN	08/03/16	N.D.	ug/kg	800	2400
RDX	08/03/16	N.D.	ug/kg	40	120
1,3,5-Trinitrobenzene	08/03/16	N.D.	ug/kg	40	120
Tetryl	08/03/16	N.D.	ug/kg	100	300
1,3-Dinitrobenzene	08/03/16	N.D.	ug/kg	40	120
2,4,6-Trinitrotoluene	08/03/16	N.D.	ug/kg	44	120
4-Amino-2,6-Dinitrotoluene	08/03/16	N.D.	ug/kg	41	120
2-Amino-4,6-Dinitrotoluene	08/03/16	N.D.	ug/kg	41	120
2,4-Dinitrotoluene	08/03/16	N.D.	ug/kg	40	120
2,6-Dinitrotoluene	08/03/16	N.D.	ug/kg	110	120
Nitrobenzene	08/03/16	N.D.	ug/kg	100	300
2-Nitrotoluene	08/03/16	N.D.	ug/kg	75	120
3-Nitrotoluene	08/03/16	N.D.	ug/kg	110	120
4-Nitrotoluene	08/03/16	N.D.	ug/kg	110	120

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Quality Control Summary
Surrogates
Pesticide Residue Analysis
SDG: DWD87
Matrix: LIQUID

Fraction: Explosives

161780001A	3,4-Dinitrotoluene	
	Spike Added	20.1 ug/l
Sample	% Recovery	Limits
PBLK01178	109	85 - 115
LCS01178	107	85 - 115
LCSD01178	109	85 - 115
8442829	112	85 - 115
8442830	117 *	85 - 115
8442831	110	85 - 115

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Quality Control Summary
Surrogates
Pesticide Residue Analysis
SDG: DWD87
Matrix: SOLID

Fraction: Explosives

161880010A	3,4-Dinitrotoluene	
	Spike Added	1000 ug/kg
Sample	% Recovery	Limits
PBLK10188	113	62 - 133
LCSISM1Q	118	62 - 133
8442799	117	62 - 133
8442802	114	62 - 133
8442805	119	62 - 133
8442810 UNSPK	123	62 - 133
8442811 MS	128	62 - 133
8442812 MSD	119	62 - 133
8442818	119	62 - 133
8442822	115	62 - 133
8442826	126	62 - 133
8455243	118	62 - 133

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Pesticide Residue Analysis

Fraction: Explosives

UNSPK: 8442810 MS: 8442811 MSD: 8442812 **Analyte**	Batch: **161880010A** (Sample number(s): 8442799, 8442802, 8442805, 8442810-8442812, 8442818, 8442822, 8442826, 8455243)								
	Spike Added ug/kg MS/MSD	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	1990 / 1940	N.D.	1726.71	1772.96	87	91	29-148	3	50
Nitroglycerin	21900 / 21400	N.D.	16410.88	15461.85	75	72	45-137	6	50
PETN	21900 / 21400	N.D.	19753.51	17916.25	90	84	36-143	10	50
RDX	1990 / 1940	N.D.	1934.56	1885.88	97	97	45-145	3	50
1,3,5-Trinitrobenzene	1980 / 1940	N.D.	307.46	331.64	16 *	17 *	48-141	8	50
Tetryl	1990 / 1940	N.D.	1735.03	1717.73	87	89	38-152	1	50
1,3-Dinitrobenzene	1990 / 1940	N.D.	2310.82	2238.39	116	115	54-140	3	50
2,4,6-Trinitrotoluene	1990 / 1940	N.D.	1859.23	1814.15	93	94	47-140	2	50
2,4-Dinitrotoluene	1990 / 1940	N.D.	1719.27	1684.56	86	87	52-137	2	50
2,6-Dinitrotoluene	1990 / 1940	N.D.	1955.93	1914.03	98	99	51-138	2	50
2-Amino-4,6-Dinitrotoluene	1990 / 1940	N.D.	1816.52	1762.	91	91	43-141	3	50
2-Nitrotoluene	1990 / 1940	N.D.	1834.79	1819.16	92	94	57-135	1	50
3-Nitrotoluene	1990 / 1940	N.D.	1897.54	1861.64	95	96	57-135	2	50
4-Amino-2,6-Dinitrotoluene	1990 / 1940	N.D.	1825.88	1776.61	92	92	42-138	3	50
4-Nitrotoluene	1990 / 1940	N.D.	1687.96	1686.51	85	87	53-133	0	50
Nitrobenzene	1990 / 1950	N.D.	2101.84	2085.63	106	107	64-138	1	50

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

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Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: LIQUID

Pesticide Residue Analysis

Fraction: Explosives

LCS: LCS01178 LCSD: LCSD01178 **Analyte**	Batch: **161780001A** (Sample number(s): 8442829-8442831)							
	Spike Added ug/l	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	10	8.96	9.21	90	92	70-130	3	30
Nitroglycerin	111	88.86	89.46	80	81	70-130	1	30
PETN	110	107.83	106.74	98	97	70-130	1	30
RDX	10	9.68	9.80	97	98	70-130	1	30
1,3,5-Trinitrobenzene	10	8.25	9.62	82	96	70-130	15	30
Tetryl	10	4.35	7.09	44 *	71	70-130	48 *	30
1,3-Dinitrobenzene	10	11.29	11.28	113	113	70-130	0	30
2,4,6-Trinitrotoluene	10	9.22	9.20	92	92	70-130	0	30
Nitrobenzene	10	10.73	10.56	107	106	70-130	2	30
4-Amino-2,6-Dinitrotoluene	10	9.96	9.86	100	99	70-130	1	30
2-Amino-4,6-Dinitrotoluene	10	9.59	9.64	96	96	70-130	0	30
2,6-Dinitrotoluene	10	10.54	10.5	105	105	70-130	0	30
2,4-Dinitrotoluene	10	9.27	9.26	93	93	70-130	0	30
2-Nitrotoluene	10	10.27	10.17	103	102	70-130	1	30
4-Nitrotoluene	10	9.15	9.12	91	91	70-130	0	30
3-Nitrotoluene	10	9.49	9.43	95	94	70-130	1	30

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: SOLID

Pesticide Residue Analysis

Fraction: Explosives

LCS: LCSISM1Q	Batch: **161880010A** (Sample number(s): 8442799, 8442802, 8442805, 8442810-8442812, 8442818, 8442822, 8442826, 8455243)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	1946	1812.3	NA	93	NA	29-148	NA	NA
Nitroglycerin	9728	8207.15	NA	84	NA	45-137	NA	NA
PETN	9728	8688.54	NA	89	NA	36-143	NA	NA
RDX	1946	1519.28	NA	78	NA	45-145	NA	NA
1,3,5-Trinitrobenzene	1946	1652.05	NA	85	NA	48-141	NA	NA
Tetryl	1946	799.43	NA	41	NA	38-152	NA	NA
1,3-Dinitrobenzene	1946	2142.37	NA	110	NA	54-140	NA	NA
2,4,6-Trinitrotoluene	1946	1640.17	NA	84	NA	47-140	NA	NA
2,4-Dinitrotoluene	1946	1662.9	NA	85	NA	52-137	NA	NA
2,6-Dinitrotoluene	1946	1965.65	NA	101	NA	51-138	NA	NA
2-Amino-4,6-Dinitrotoluene	1946	1725.6	NA	89	NA	43-141	NA	NA
2-Nitrotoluene	1946	1862.91	NA	96	NA	57-135	NA	NA
3-Nitrotoluene	1946	1728.83	NA	89	NA	57-135	NA	NA
4-Amino-2,6-Dinitrotoluene	1946	1773.03	NA	91	NA	42-138	NA	NA
4-Nitrotoluene	1946	1638.71	NA	84	NA	53-133	NA	NA
Nitrobenzene	1946	2041.48	NA	105	NA	64-138	NA	NA

Triplicate summary form

Sample #	8442826	8442826DUP	8442826TRIP			
compound	result (ug/kg) trial1	result (ug/kg) trial2	result (ug/kg) trial3	AVERAGE	std dev	%rsd
4-AM-2,6-DNT	0	0	0	0	0	#DIV/0!
2-AM-4,6-DNT	0	0	0	0	0	#DIV/0!
1,3-DNB	0	0	0	0	0	#DIV/0!
2,4-DNT	0	0	0	0	0	#DIV/0!
2,6-DNT	0	0	0	0	0	#DIV/0!
HMX	0	0	0	0	0	#DIV/0!
Nitrobenzene	0	0	0	0	0	#DIV/0!
2-NT	0	0	0	0	0	#DIV/0!
3-NT	0	0	0	0	0	#DIV/0!
4-NT	0	0	0	0	0	#DIV/0!
RDX	0	0	0	0	0	#DIV/0!
1,3,5-TNB	0	0	0	0	0	#DIV/0!
2,4,6-TNT	0	0	0	0	0	#DIV/0!
Nitroglycerin	0	0	0	0	0	#DIV/0!
PETN	0	0	1100	366.6666667	635.0853	173%
Tetryl	0	0	0	0	0	#DIV/0!
3,5-DNA	0	0	0	0	0	#DIV/0!

6D
INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621101

GC Column (1) : CHROMPACK ID: 100 (mm) Update File:

Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT (Level 3) RT	(3) RT WINDOW FROM	TO
RDX	4.37	4.38	4.34	4.35	4.37	4.37	4.27	4.47
1,3,5-Trinitrobenzene	5.08	5.08	5.03	5.06	5.06	5.06	4.96	5.16
1,3-DNB	7.38	7.39	7.28	7.18	7.39	7.39	7.29	7.49
3,5-Dinitroaniline	7.76	7.78	7.66	7.40	7.52	7.52	7.19	7.86
Nitrobenzene	8.26	8.27	8.12	7.95	8.19	8.19	8.05	8.33
Tetryl	8.26	8.27	8.12	7.95	8.19	8.19	8.05	8.33
2,4,6-Trinitrotoluene	8.81	8.82	8.67	8.51	8.75	8.75	8.65	8.85
Tetryl breakdown	10.45	10.00	9.80	9.61	9.85	9.85	9.73	9.97
4-Amino-2,6-dinitrotoluene	10.72	10.75	10.53	10.47	10.79	10.79	10.65	10.94
2-Amino-4,6-dinitrotoluene	11.25	11.28	11.12	10.73	11.15	11.15	11.00	11.29
3,4-Dinitrotoluene	11.25	11.28	11.12	10.73	11.15	11.15	10.91	11.39
2,6-Dinitrotoluene	12.03	12.08	11.94	11.50	12.06	12.06	11.92	12.20
2,4-Dinitrotoluene	12.79	12.82	12.67	12.25	12.80	12.80	12.66	12.94
2-Nitrotoluene	14.65	14.71	14.18	14.07	14.68	14.68	14.54	14.82
4-Nitrotoluene	16.28	16.24	15.74	15.63	16.26	16.26	16.09	16.42
3-Nitrotoluene	17.05	17.06	16.54	16.43	17.08	17.08	16.92	17.24

(3) Jessica L. Miller
Senior Chemist

JUL 3 1 2016

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621101

GC Column (1) : CHROMPACK ID: 100 (mm) Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	CALIBRATION FACTORS						%RSD	
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN		
RDX	1.51E+02	9.26E+01	8.77E+01	8.83E+01	8.78E+01	1.02E+02	27	linear
1,3,5-Trinitrobenzene	2.05E+02	1.88E+02	1.94E+02	1.99E+02	1.97E+02	1.96E+02	3	
1,3-DNB	2.91E+02	2.50E+02	2.54E+02	2.41E+02	1.64E+02	2.40E+02	19	
3,5-Dinitroaniline	2.68E+02	2.24E+02	2.25E+02	2.69E+02	2.32E+02	2.44E+02	9	
Nitrobenzene	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15	
Tetryl	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15	
2,4,6-Trinitrotoluene	2.55E+02	1.98E+02	2.02E+02	2.13E+02	2.02E+02	2.14E+02	11	
Tetryl breakdown	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15	
4-Amino-2,6-dinitrotoluene	1.57E+02	1.29E+02	1.24E+02	1.24E+02	8.77E+01	1.24E+02	20	linear
2-Amino-4,6-dinitrotoluene	3.92E+02	3.09E+02	3.29E+02	3.01E+02	3.26E+02	3.31E+02	11	
3,4-Dinitrotoluene	3.89E+02	3.07E+02	3.27E+02	2.99E+02	3.24E+02	3.29E+02	11	
2,6-Dinitrotoluene	2.01E+02	1.39E+02	1.34E+02	1.29E+02	1.24E+02	1.45E+02	22	linear
2,4-Dinitrotoluene	3.50E+02	2.69E+02	2.85E+02	2.53E+02	2.56E+02	2.83E+02	14	
2-Nitrotoluene	1.97E+02	1.24E+02	1.13E+02	1.14E+02	1.12E+02	1.32E+02	28	linear
4-Nitrotoluene	1.34E+02	9.88E+01	9.34E+01	9.37E+01	9.09E+01	1.02E+02	18	
3-Nitrotoluene	1.66E+02	1.22E+02	1.26E+02	1.25E+02	1.24E+02	1.33E+02	14	
						Average % RSD:	16	

JUL 3 1 2016

File Name: V:\CP12\12eexp1621101.CAL
Version: 74

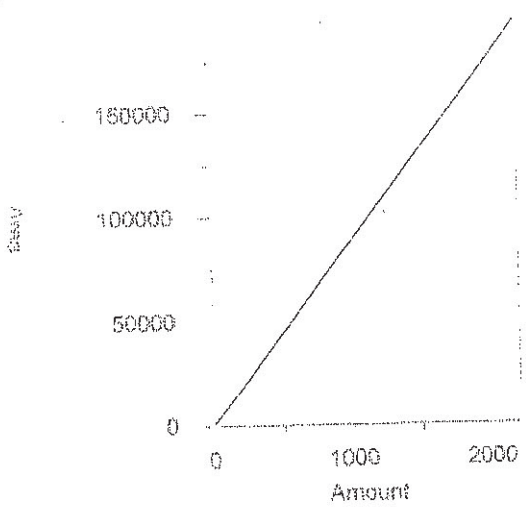
Creator:
Description:
Reason for change:

Internal standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 RDX



Expected retention time: 4.371 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

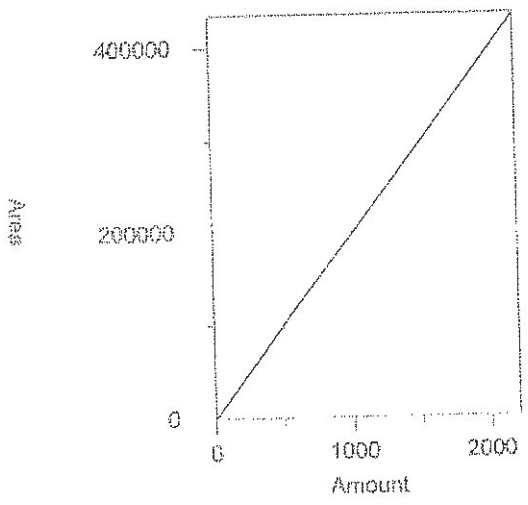
Single peak quantification by area

Y = 87.2768 X + 860.4011

Linear fit with equal weighting
Coefficient of determination: 0.9999437
Average error: 5.910%
Average CF: 101.5227
RSD: 27.484%

Level	Amount	Response	Cal Factor	Error, %	Source	Dat
1	25.1	3797.655	151.301	24.470	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND	7/3
2	100.4	9299.011	92.61963	-3.367	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND	7/3
3	502	44005.84	87.66103	-1.494	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND	7/3
4	1004	88628.66	88.27555	0.161	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND	7/3
5	2008	176214.8	87.75637	0.058	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND	7/3

2 1,3,5-TNB



Expected retention time: 5.055 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

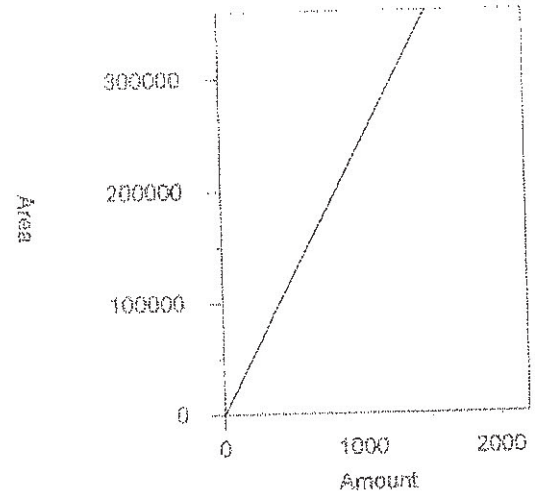
Single peak quantification by area

Y = 196.4074 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9999138
Average error: 2.287%
Average CF: 196.4074
RSD: 3.199%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5135.729	204.8147	4.281	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.3	18825.87	187.6956	-4.436	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	97235.12	193.8886	-1.282	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	199124.8	198.5292	1.080	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2006	395400.6	197.109	0.357	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

3 1,3-DNB



Expected retention time: 7.389 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

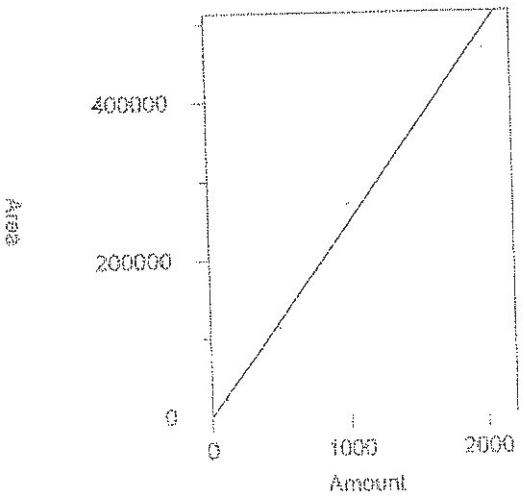
Single peak quantification by area

Y = 239.9322 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.6936649
Average error: 12.712%
Average CF: 239.9322
RSD: 19.431%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	7278.833	290.5722	21.106	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.2	25099.51	250.4941	4.402	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501	127354.2	254.2	5.947	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1002	241194.4	240.713	0.325	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2004	328018	163.6816	-31.780	Manual

4 3,5-dinitroaniline



Expected retention time: 7.524 minutes
Search window: 0.339 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

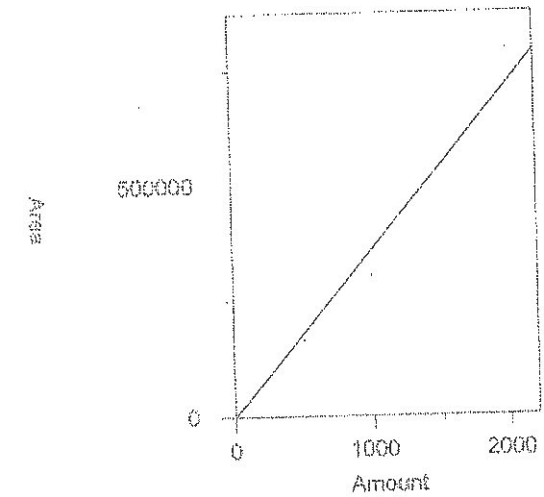
Single peak quantification by area

Y = 243.6005 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9915071
Average error: 8.231%
Average CF: 243.6005
RSD: 9.493%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	6729.358	268.1019	10.058	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.4	22465	223.755	-8.147	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502	112746.7	224.595	-7.802	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1004	270302	269.2251	10.519	Manual
5	2008	466510	232.3257	-4.628	Manual

5 Nitrobenzene



Expected retention time: 8.186 minutes
Search window: 0.14 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

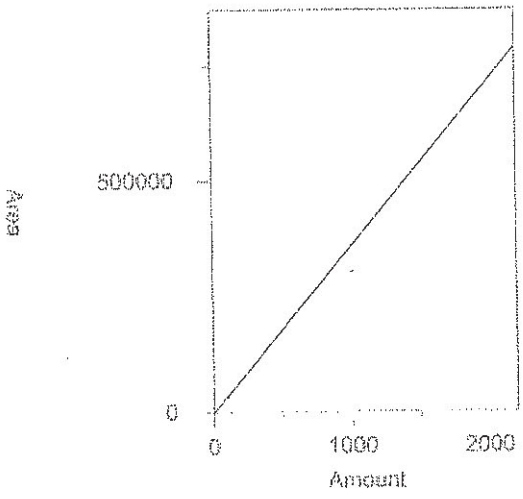
Single peak quantification by area

Y = 357.7505 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9777827
Average error: 12.583%
Average CF: 357.7505
RSD: 15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.075	10846	432.5424	20.906	Manual	7/31/2016 1:44:38 PM
2	100.3	33073	329.7408	-7.829	Manual	7/31/2016 12:56:30 PM
3	501.5	164995	329.003	-8.036	Manual	7/31/2016 1:02:59 PM
4	1003	302870	301.9641	-15.594	Manual	7/31/2016 1:15:46 PM
5	2006	793378	395.5025	10.553	Manual	7/31/2016 2:08:12 PM

6 Tetryl



Expected retention time:	8.187 minutes
Search window:	0.14 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

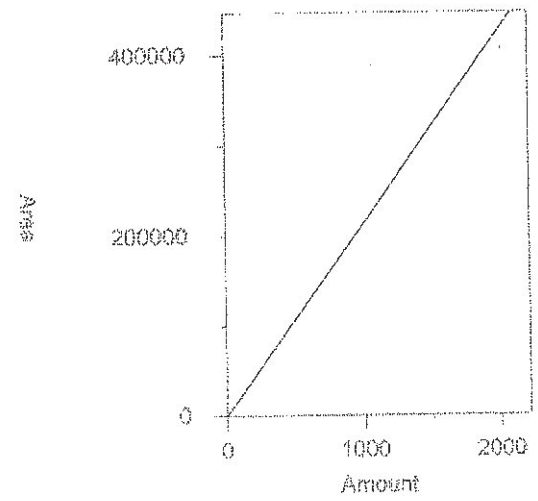
Y = 358.1076 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9777827
Average error:	12.583%
Average CF:	358.1076
RSD:	15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.05	10846	432.9741	20.906	Manual	7/31/2016 1:44:40 PM
2	100.2	33073	330.0699	-7.829	Manual	7/31/2016 12:56:33 PM
3	501	164995	329.3313	-8.036	Manual	7/31/2016 1:03:04 PM
4	1002	302870	302.2655	-15.594	Manual	7/31/2016 1:15:50 PM
5	2004	793378	395.8972	10.553	Manual	7/31/2016 2:08:14 PM

7 2,4,6-TNT



Expected retention time:	8.747 minutes
Search window:	0.1 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

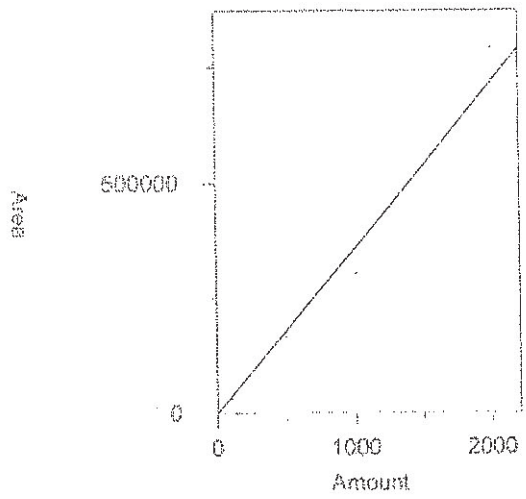
Y = 214.0261 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9945887
Average error:	7.605%
Average CF:	214.0261
RSD:	10.933%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	6399.85	254.7204	19.014	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.5	19912.04	198.1297	-7.427	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502.5	101539.5	202.0686	-5.587	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1005	213954.5	212.89	-0.531	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2010	406666.3	202.3215	-5.469	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

8 Tetryl breakdown



Expected retention time:	9.85 minutes
Search window:	0.121 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

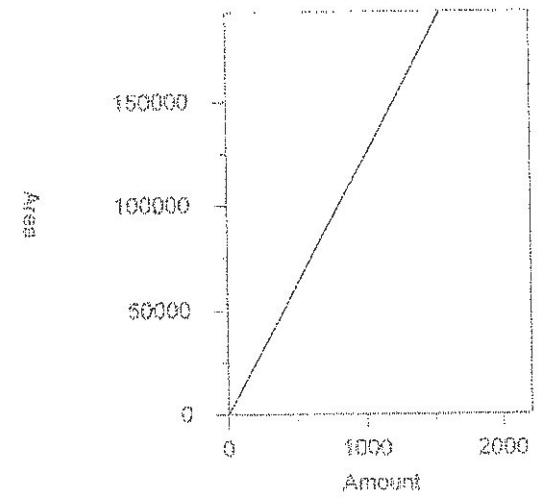
Y = 358.1076 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9777827
Average error:	12.583%
Average CF:	358.1076
RSD:	15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.05	10846	432.9741	20.906	Manual	7/31/2016 1:44:44 PM
2	100.2	33073	330.0699	-7.829	Manual	7/31/2016 12:56:41 PM
3	501	164995	329.3313	-8.036	Manual	7/31/2016 1:03:09 PM
4	1002	302870	302.2655	-15.594	Manual	7/31/2016 1:15:57 PM
5	2004	793378	395.8972	10.553	Manual	7/31/2016 2:08:16 PM

9 4-Am-2,6-DNT



Expected retention time:	10.794 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

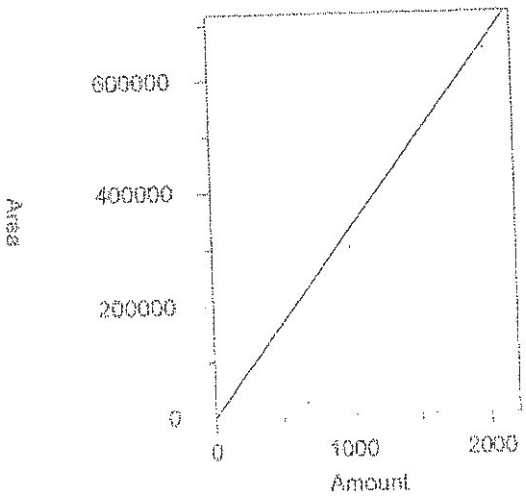
Y = 124.411 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.7492826
Average error:	12.083%
Average CF:	124.411
RSD:	19.915%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	3946	157.3679	26.490	Manual
2	100.3	12938.61	128.9991	3.688	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	62410.41	124.4475	0.029	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	123909	123.5384	-0.701	Manual
5	2006	175931	87.70239	-29.506	Manual

10 2-Am-4,6-DNT



Expected retention time:	11.146 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

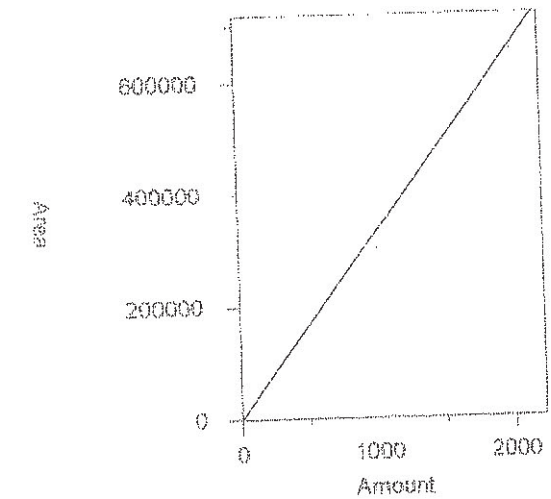
Single peak quantification by area

Y = 331.455 X + 0

Average CF fit with equal weighting, forced to origin	
Coefficient of determination:	0.9962868
Average error:	7.259%
Average CF:	331.455
RSD:	10.743%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	9800	391.6084	18.148	Manual
2	100.1	30903.33	308.7246	-6.858	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	500.5	164855.9	329.3824	-0.625	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1001	301678	301.3766	-9.075	Manual
5	2002	653018	326.1828	-1.591	Manual

11 3,4-Dinitrotoluene



Expected retention time:	11.147 minutes
Search window:	0.242 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

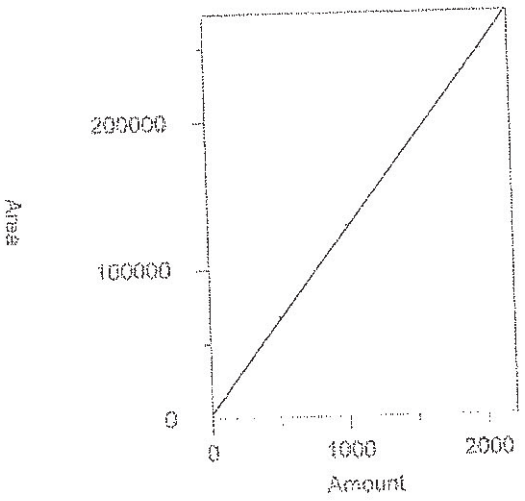
Single peak quantification by area

Y = 329.1532 X + 0

Average CF fit with equal weighting, forced to origin	
Coefficient of determination:	0.9962868
Average error:	7.259%
Average CF:	329.1532
RSD:	10.743%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.2	9800	388.8889	18.148	Manual	7/31/2016 2:12:02 PM
2	100.8	30903.33	306.5807	-6.858	Manual	7/31/2016 2:04:36 PM
3	504	164855.9	327.0951	-0.625	Manual	7/31/2016 2:04:39 PM
4	1008	301678	299.2837	-9.075	Manual	7/31/2016 2:09:50 PM
5	2016	653018	323.9177	-1.591	Manual	7/31/2016 2:08:35 PM

12 2,6-DNT



Expected retention time:	12.062 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

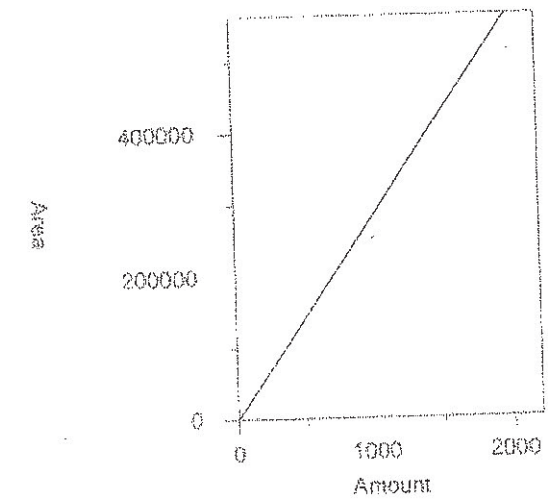
Single peak quantification by area

Y = 122.7019 X + 3330.402

Linear fit with equal weighting	
Coefficient of determination:	0.9995252
Average error:	7.593%
Average CF:	145.3016
RSD:	21.987%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5052.243	201.4853	-21.147	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.3	13962.72	139.2096	-10.709	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	67079.15	133.757	3.413	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	128937.6	128.5519	2.007	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2006	247749	123.504	-0.690	Manual

13 2,4-DNT



Expected retention time:	12.798 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

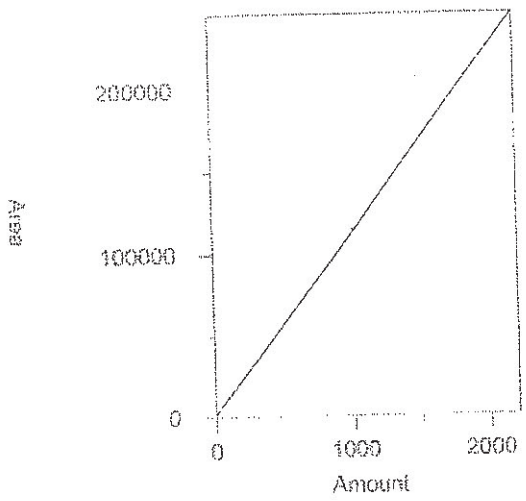
Single peak quantification by area

Y = 282.5082 X + 0

Average CF fit with equal weighting, forced to origin	
Coefficient of determination:	0.9784554
Average error:	9.870%
Average CF:	282.5082
RSD:	14.055%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	8756.587	349.9136	23.860	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.1	26893.81	268.6694	-4.899	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	500.5	142549.9	284.815	0.817	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1001	253228.9	252.9759	-10.454	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2002	512846.5	256.1671	-9.324	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

14 2-NT



Expected retention time: 14.682 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

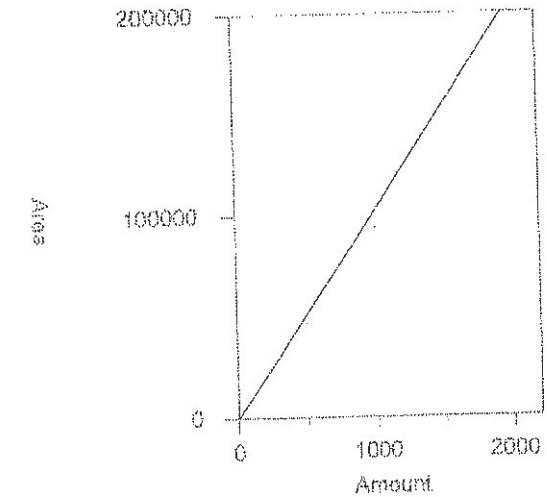
Single peak quantification by area

Y = 110.8549 X + 1788.915

Linear fit with equal weighting
Coefficient of determination: 0.999931
Average error: 2.804%
Average CF: 131.8325
RSD: 27.773%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	4943.087	196.7398	8.066	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.5	12460.69	123.987	-3.628	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502.5	56837.48	113.1094	-1.141	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1005	114344.8	113.7759	1.013	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2010	224216.7	111.5506	-0.174	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

15 4-NT



Expected retention time: 16.256 minutes
Search window: 0.162 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

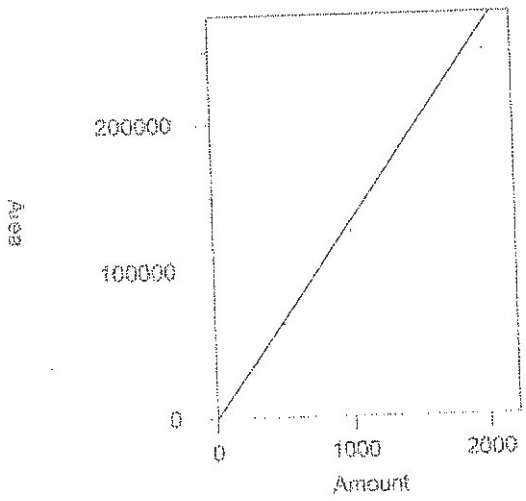
Single peak quantification by area

Y = 102.163 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9720693
Average error: 12.509%
Average CF: 102.163
RSD: 17.707%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	3356.179	134.1131	31.274	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.1	9887.746	98.77869	-3.313	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	500.5	46749.97	93.40653	-8.571	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1001	93749.27	93.65562	-8.327	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2002	181903.8	90.86104	-11.063	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

16 3-NT



Expected retention time: 17.078 minutes
Search window: 0.162 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

Single peak quantification by area

$Y = 132.7551\ X + 0$

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9910454
Average error: 10.013%
Average CF: 132.7551
RSD: 14.037%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	4166.31	165.9884	25.034	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.4	12271.74	122.2285	-7.929	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502	63316.97	126.1294	-4.991	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1004	125734.3	125.2334	-5.666	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2008	249384.6	124.1955	-6.448	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

6D
INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories
Contract:
Lab Code: Case No.: SAS No.: SDG No.:
Instrument: X6329B
Calibration File: 12EEXP1621101B
GC Column (2) : CHROMPACK ID: 100 (mm)
Update File:
Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT (Level 3) RT	RT WINDOW FROM	TO
HMX	2.73	2.71	2.71	2.70	2.70	2.70	2.60	2.80
Nitroglycerin	9.49	9.51	9.35	9.21	9.47	9.47	9.28	9.66
3,4-Dinitrotoluene	11.38	11.41	11.25	10.85	11.27	11.27	10.98	11.55
PETN	18.12	18.11	17.55	17.46	18.14	18.14	17.86	18.43

Jessica L. Miller
Senior Chemist

JUL 31 2016

6E
INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B Calibration File: 12EEXP1621101B

GC Column (2) : CHROMPACK ID: 100 (mm) Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	CALIBRATION FACTORS						%RSD
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	
HMX	2.23E+03	1.12E+03	8.95E+02	8.46E+02	8.22E+02	1.18E+03	51
Nitroglycerin	3.08E+02	2.75E+02	2.99E+02	2.75E+02	2.83E+02	2.88E+02	5
3,4-Dinitrotoluene	2.16E+03	2.09E+03	2.23E+03	2.30E+03	2.50E+03	2.26E+03	7
PETN	2.50E+02	2.73E+02	3.10E+02	2.56E+02	2.58E+02	2.70E+02	9
						Average % RSD:	18

JUL 3 1 2016

File Name: V:\CP12\12eexp1621101b.CAL
Version: 32

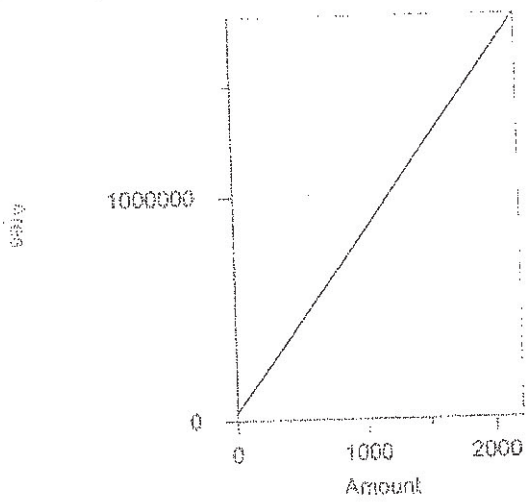
Creator:
Description:
Reason for change:

Internal standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time: 2.698 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

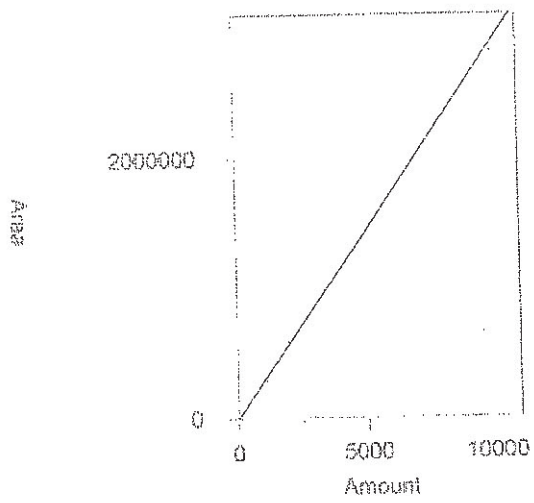
Single peak quantification by area

Y = 805.2766 X + 37388.52

Linear fit with equal weighting
Coefficient of determination: 0.9999336
Average error: 2.045%
Average CF: 1182.899
RSD: 50.515%

Level	Amount	Response	Cal Factor	Error, %	Source	D
1	25.015	55800.27	2230.672	-3.011	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0004.BND	7/
2	100.06	112141	1120.738	-4.937	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0005.BND	7/
3	500.3	447552.8	894.5689	1.655	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0006.BND	7/
4	1000.6	846707.3	846.1996	0.422	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0007.BND	7/
5	2001.2	1645620	822.3167	-0.199	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0008.BND	7/

2 Nitroglycerin



Expected retention time: 9.466 minutes
Search window: 0.19 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

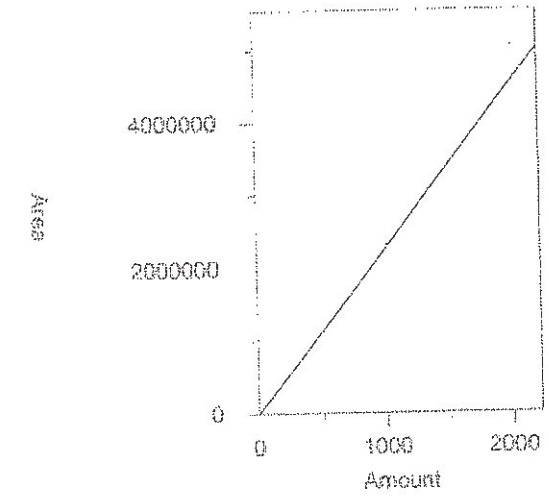
Single peak quantification by area

Y = 287.855 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9984417
Average error: 4.349%
Average CF: 287.855
RSD: 5.225%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	485.75	149840.5	308.4725	7.162	Manual	7/31/2016 2:13:36 PM
2	1063.86	292352.8	274.8038	-4.534	Manual	7/31/2016 2:13:45 PM
3	1947.18	581299.4	298.534	3.710	Manual	7/31/2016 2:13:49 PM
4	4857.82	1335512	274.92	-4.494	Manual	7/31/2016 2:13:56 PM
5	9956.51	2813161	282.5449	-1.845	Manual	7/31/2016 2:14:00 PM

3 3,4-Dinitrotoluene



Expected retention time: 11.266 minutes
Search window: 0.286 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

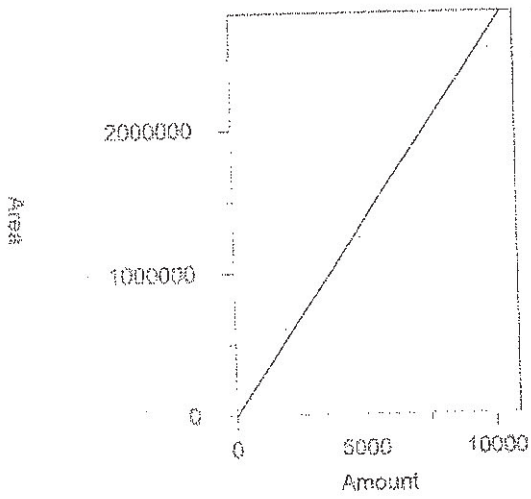
Single peak quantification by area

Y = 2258.673 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9853915
Average error: 5.118%
Average CF: 2258.673
RSD: 7.001%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.2	54453.62	2160.858	-4.331	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0004.BND
2	100.8	210800.4	2091.274	-7.411	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0005.BND
3	504	1126383	2234.887	-1.053	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0006.BND
4	1008	2321369	2302.946	1.960	Manual
5	2016	5046855	2503.4	10.835	Manual

4 PETN



Expected retention time:	18.141 minutes
Search window:	0.286 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

$Y = 269.6573\ X + 0$

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9940489
Average error:	6.588%
Average CF:	269.6573
RSD:	9.016%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	484.69	121312.6	250.289	-7.183	Manual	7/31/2016 2:14:24 PM
2	1061.44	290126.8	273.3332	1.363	Manual	7/31/2016 2:14:29 PM
3	1942.16	602831.4	310.3922	15.106	Manual	7/31/2016 2:14:32 PM
4	4845.76	1240206	255.9363	-5.088	Manual	7/31/2016 2:14:37 PM
5	9931.88	2565758	258.3356	-4.199	Manual	7/31/2016 2:14:44 PM

6D

INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621102

GC Column (1) : CHROMPACK ID: 100 (mm) Update File: 12EEXP16211002.0029.RAW

Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
RDX			4.06			4.06	3.96	4.16
1,3,5-Trinitrobenzene			4.71			4.71	4.61	4.81
1,3-DNB			6.82			6.82	6.72	6.92
3,5-Dinitroaniline			7.16			7.16	6.82	7.50
Nitrobenzene			7.62			7.62	7.48	7.76
Tetryl			7.62			7.62	7.48	7.76
2,4,6-Trinitrotoluene			8.13			8.13	8.03	8.23
Tetryl breakdown			9.20			9.20	9.08	9.32
4-Amino-2,6-dinitrotoluene			9.88			9.88	9.74	10.02
2-Amino-4,6-dinitrotoluene			10.40			10.40	10.25	10.54
3,4-Dinitrotoluene			10.40			10.40	10.15	10.64
2,6-Dinitrotoluene			11.14			11.14	11.00	11.28
2,4-Dinitrotoluene			11.83			11.83	11.69	11.97
2-Nitrotoluene			13.59			13.59	13.45	13.73
4-Nitrotoluene			15.06			15.06	14.90	15.22
3-Nitrotoluene			15.80			15.80	15.64	15.96

Co-elute

RT Update

File used : 12EEXP16211002.0029

Applies to : 12EEXP16211002.0001 — .0029

James H. Place
Senior Chemist

AUG 0 2 2016

Audited by:

AUG 0 2 2016

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621102

GC Column (1) : CHROMPACK ID: 100 (mm) Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	CALIBRATION FACTORS					MEAN	%RSD	
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5			
RDX	1.51E+02	9.26E+01	8.77E+01	8.83E+01	8.78E+01	1.02E+02	27	Linear
1,3,5-Trinitrobenzene	2.05E+02	1.88E+02	1.94E+02	1.99E+02	1.97E+02	1.96E+02	3	
1,3-DNB	2.91E+02	2.50E+02	2.54E+02	2.41E+02	1.64E+02	2.40E+02	19	
3,5-Dinitroaniline	2.68E+02	2.24E+02	2.25E+02	2.69E+02	2.32E+02	2.44E+02	9	
Nitrobenzene	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15	
Tetryl	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15	
2,4,6-Trinitrotoluene	2.55E+02	1.98E+02	2.02E+02	2.13E+02	2.02E+02	2.14E+02	11	
Tetryl breakdown	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15	
4-Amino-2,6-dinitrotoluene	1.57E+02	1.29E+02	1.24E+02	1.24E+02	8.77E+01	1.24E+02	20	
2-Amino-4,6-dinitrotoluene	3.92E+02	3.09E+02	3.29E+02	3.01E+02	3.26E+02	3.31E+02	11	
3,4-Dinitrotoluene	3.89E+02	3.07E+02	3.27E+02	2.99E+02	3.24E+02	3.29E+02	11	
2,6-Dinitrotoluene	2.01E+02	1.39E+02	1.34E+02	1.29E+02	1.24E+02	1.45E+02	22	Linear
2,4-Dinitrotoluene	3.50E+02	2.69E+02	2.85E+02	2.53E+02	2.56E+02	2.83E+02	14	
2-Nitrotoluene	1.97E+02	1.24E+02	1.13E+02	1.14E+02	1.12E+02	1.32E+02	28	Linear
4-Nitrotoluene	1.34E+02	9.88E+01	9.34E+01	9.37E+01	9.09E+01	1.02E+02	18	
3-Nitrotoluene	1.66E+02	1.22E+02	1.26E+02	1.25E+02	1.24E+02	1.33E+02	14	

Average % RSD: 16

Coelute

File Name: V:\CP12\12eexp1621102.CAL
Version: 2

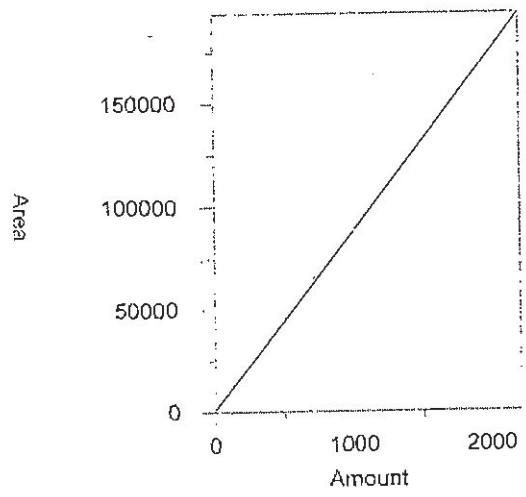
Creator:
Description:
Reason for change:

Internal standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 RDX



Expected retention time: 4.055 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

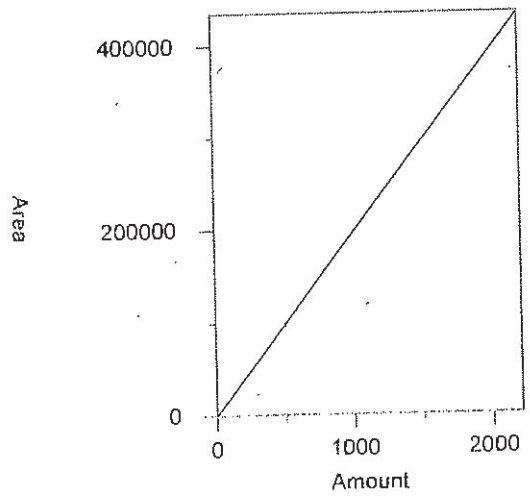
Single peak quantification by area

Y = 87.2768 X + 860.4011

Linear fit with equal weighting
Coefficient of determination: 0.9999437
Average error: 5.910%
Average CF: 101.5227
RSD: 27.484%

Level	Amount	Response	Cal Factor	Error, %	Source	Dat
1	25.1	3797.655	151.301	24.470	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621001.0004.BND	7/3
2	100.4	9299.011	92.61963	-3.367	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621001.0005.BND	7/3
3	502	44005.84	87.66103	-1.494	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621001.0006.BND	7/3
4	1004	88628.66	88.27555	0.161	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621001.0007.BND	7/3
5	2008	176214.8	87.75637	0.058	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621001.0008.BND	7/3

2 1,3,5-TNB



Expected retention time:	4.71 minutes
Search window: .	0.1 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

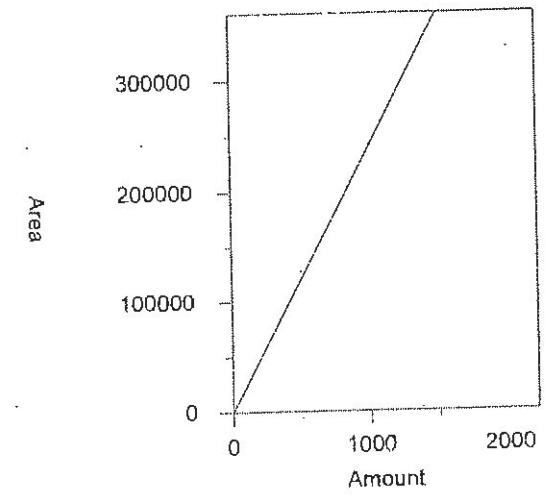
Y = 196.4074 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9999138
Average error:	2.287%
Average CF:	196.4074
RSD:	3.199%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5135.729	204.8147	4.281	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.3	18825.87	187.6956	-4.436	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	97235.12	193.8886	-1.282	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	199124.8	198.5292	1.080	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2006	395400.6	197.109	0.357	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

3 1,3-DNB



Expected retention time:	6.82 minutes
Search window:	0.1 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

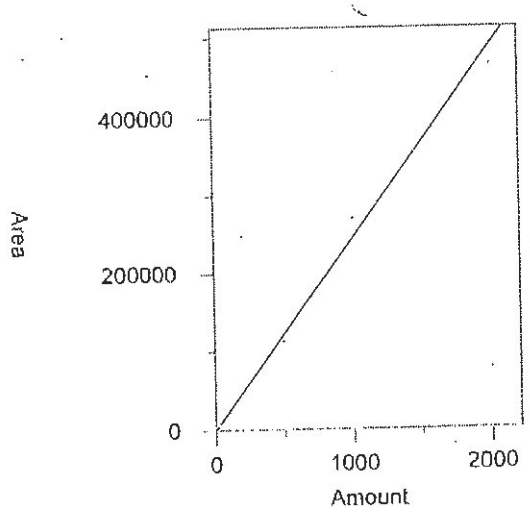
Y = 239.9322 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.6936649
Average error:	12.712%
Average CF:	239.9322
RSD:	19.431%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	7278.833	290.5722	21.106	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.2	25099.51	250.4941	4.402	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501	127354.2	254.2	5.947	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1002	241194.4	240.713	0.325	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2004	328018	163.6816	-31.780	Manual

4 3,5-dinitroaniline



Expected retention time:	7.159 minutes
Search window:	0.339 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

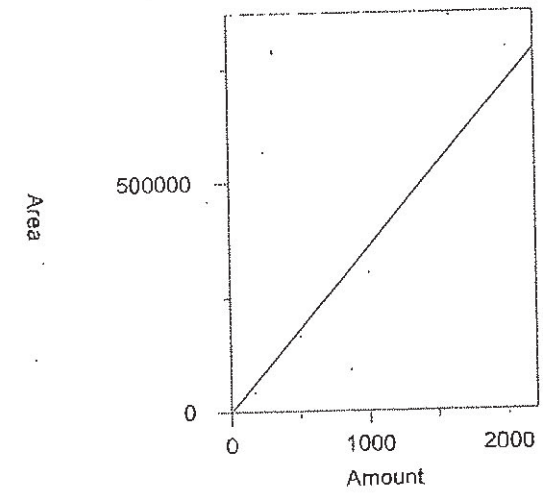
Y = 243.6005 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9915071
Average error:	8.231%
Average CF:	243.6005
RSD:	9.493%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	6729.358	268.1019	10.058	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.4	22465	223.755	-8.147	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502	112746.7	224.595	-7.802	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1004	270302	269.2251	10.519	Manual
5	2008	466510	232.3257	-4.628	Manual

5 Tetryl



Expected retention time:	7.621 minutes
Search window:	0.14 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

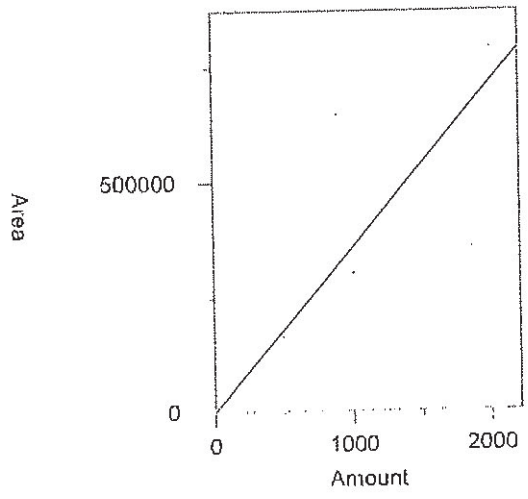
Y = 358.1076 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9777827
Average error:	12.583%
Average CF:	358.1076
RSD:	15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.05	10846	432.9741	20.906	Manual	7/31/2016 1:44:40 PM
2	100.2	33073	330.0699	-7.829	Manual	7/31/2016 12:56:33 PM
3	501	164995	329.3313	-8.036	Manual	7/31/2016 1:03:04 PM
4	1002	302870	302.2655	-15.594	Manual	7/31/2016 1:15:50 PM
5	2004	793378	395.8972	10.553	Manual	7/31/2016 2:08:14 PM

6 Nitrobenzene



Expected retention time: 7.622 minutes
Search window: 0.14 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

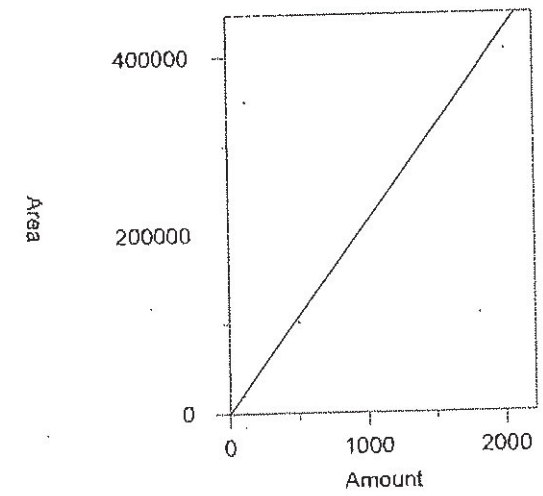
Single peak quantification by area

Y = 357.7505 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9777827
Average error: 12.583%
Average CF: 357.7505
RSD: 15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.075	10846	432.5424	20.906	Manual	7/31/2016 1:44:38 PM
2	100.3	33073	329.7408	-7.829	Manual	7/31/2016 12:56:30 PM
3	501.5	164995	329.003	-8.036	Manual	7/31/2016 1:02:59 PM
4	1003	302870	301.9641	-15.594	Manual	7/31/2016 1:15:46 PM
5	2006	793378	395.5025	10.553	Manual	7/31/2016 2:08:12 PM

7 2,4,6-TNT



Expected retention time: 8.131 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

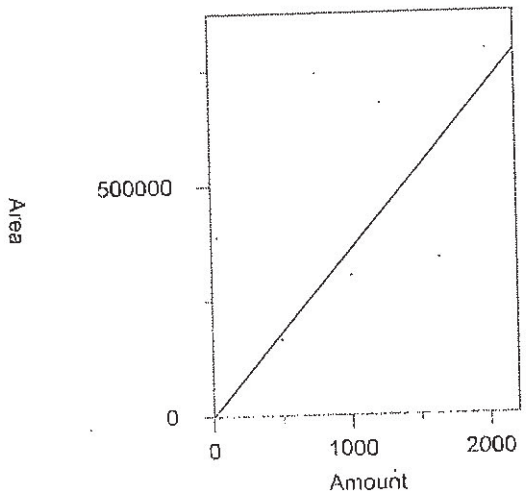
Single peak quantification by area

Y = 214.0261 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9945887
Average error: 7.605%
Average CF: 214.0261
RSD: 10.933%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	6399.85	254.7204	19.014	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.5	19912.04	198.1297	-7.427	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502.5	101539.5	202.0686	-5.587	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1005	213954.5	212.89	-0.531	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2010	406666.3	202.3215	-5.469	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

8 Tetryl breakdown



Expected retention time:	9.203 minutes
Search window:	0.121 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

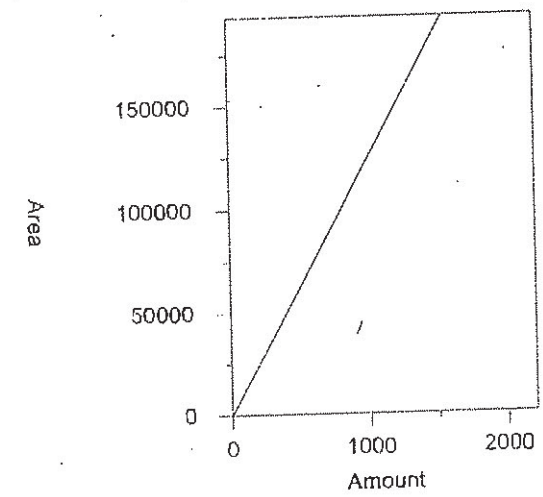
Y = 358.1076 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9777827
Average error:	12.583%
Average CF:	358.1076
RSD:	15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.05	10846	432.9741	20.906	Manual	7/31/2016 1:44:44 PM
2	100.2	33073	330.0699	-7.829	Manual	7/31/2016 12:56:41 PM
3	501	164995	329.3313	-8.036	Manual	7/31/2016 1:03:09 PM
4	1002	302870	302.2655	-15.594	Manual	7/31/2016 1:15:57 PM
5	2004	793378	395.8972	10.553	Manual	7/31/2016 2:08:16 PM

9 4-Am-2,6-DNT



Expected retention time:	9.878 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

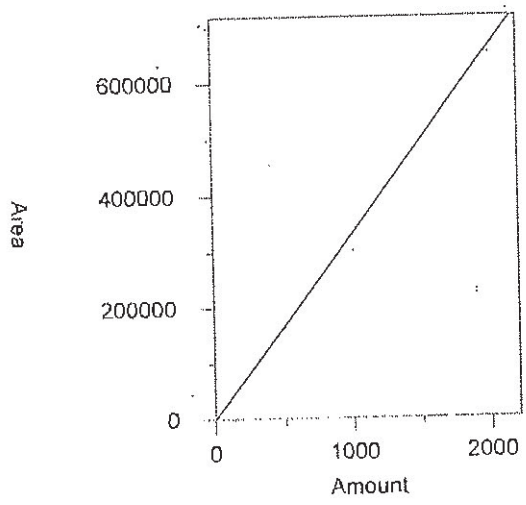
Y = 124.411 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.7492826
Average error:	12.083%
Average CF:	124.411
RSD:	19.915%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	3946	157.3679	26.490	Manual
2	100.3	12938.61	128.9991	3.688	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	62410.41	124.4475	0.029	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	123909	123.5384	-0.701	Manual
5	2006	175931	87.70239	-29.506	Manual

10 2-Am-4,6-DNT



Expected retention time: 10.395 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

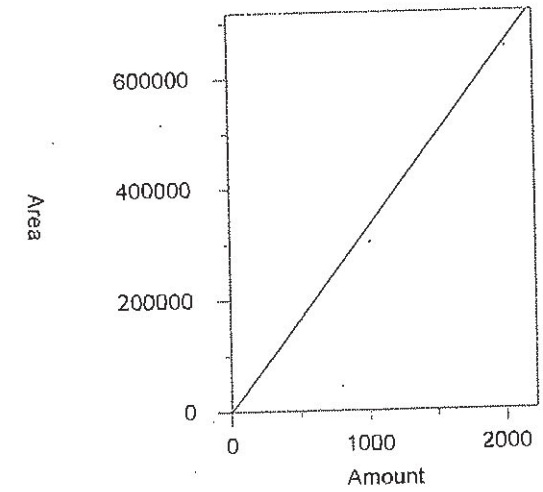
Single peak quantification by area

Y = 331.455 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9962868
Average error: 7.259%
Average CF: 331.455
RSD: 10.743%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	9800	391.6084	18.148	Manual
2	100.1	30903.33	308.7246	-6.858	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0005.BND
3	500.5	164855.9	329.3824	-0.625	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0006.BND
4	1001	301678	301.3766	-9.075	Manual
5	2002	653018	326.1828	-1.591	Manual

11 3,4-Dinitrotoluene



Expected retention time: 10.396 minutes
Search window: 0.242 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

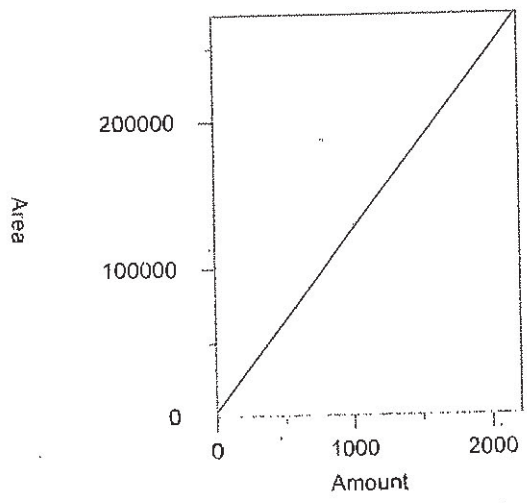
Single peak quantification by area

Y = 329.1532 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9962868
Average error: 7.259%
Average CF: 329.1532
RSD: 10.743%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.2	9800	388.8889	18.148	Manual	7/31/2016 2:12:02 PM
2	100.8	30903.33	306.5807	-6.858	Manual	7/31/2016 2:04:36 PM
3	504	164855.9	327.0951	-0.625	Manual	7/31/2016 2:04:39 PM
4	1008	301678	299.2837	-9.075	Manual	7/31/2016 2:09:50 PM
5	2016	653018	323.9177	-1.591	Manual	7/31/2016 2:08:35 PM

12 2,6-DNT



Expected retention time: 11.142 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

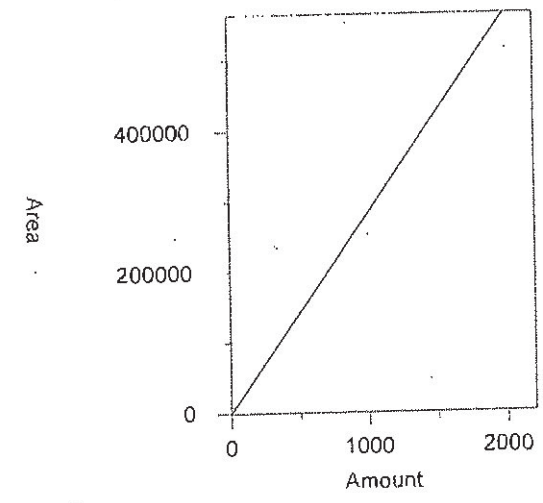
Single peak quantification by area

Y = 122.7019 X + 3330.402

Linear fit with equal weighting
Coefficient of determination: 0.9995252
Average error: 7.593%
Average CF: 145.3016
RSD: 21.987%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5052.243	201.4853	-21.147	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0004.BND
2	100.3	13962.72	139.2096	-10.709	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0005.BND
3	501.5	67079.15	133.757	3.413	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0006.BND
4	1003	128937.6	128.5519	2.007	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0007.BND
5	2006	247749	123.504	-0.690	Manual

13 2,4-DNT



Expected retention time: 11.832 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

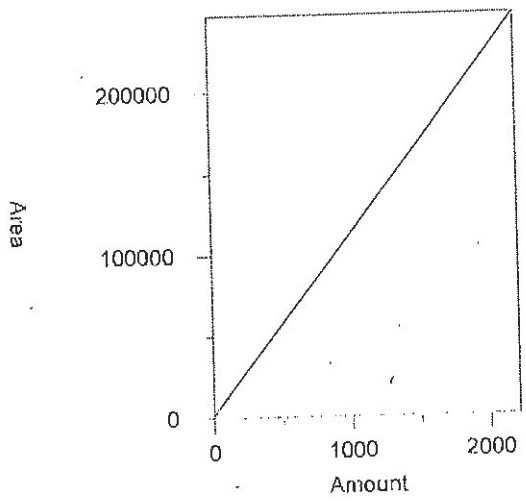
Single peak quantification by area

Y = 282.5082 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9784554
Average error: 9.870%
Average CF: 282.5082
RSD: 14.055%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	8756.587	349.9136	23.860	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0004.BND
2	100.1	26893.81	268.6694	-4.899	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0005.BND
3	500.5	142549.9	284.815	0.817	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0006.BND
4	1001	253228.9	252.9759	-10.454	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0007.BND
5	2002	512846.5	256.1671	-9.324	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP1621\001.0008.BND

14 2-NT



Expected retention time:	13.591 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

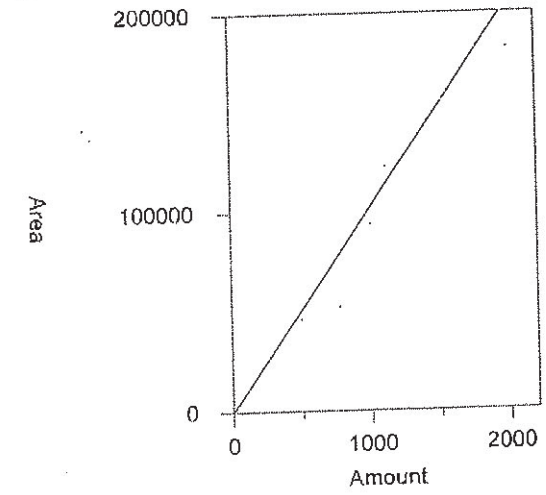
Single peak quantification by area

Y = 110.8549 X + 1788.915

Linear fit with equal weighting	
Coefficient of determination:	0.999931
Average error:	2.804%
Average CF:	131.8325
RSD:	27.773%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	4943.087	196.7398	8.066	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0004.BND
2	100.5	12460.69	123.987	-3.628	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0005.BND
3	502.5	56837.48	113.1094	-1.141	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0006.BND
4	1005	114344.8	113.7759	1.013	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0007.BND
5	2010	224216.7	111.5506	-0.174	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0008.BND

15 4-NT



Expected retention time:	15.058 minutes
Search window:	0.162 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

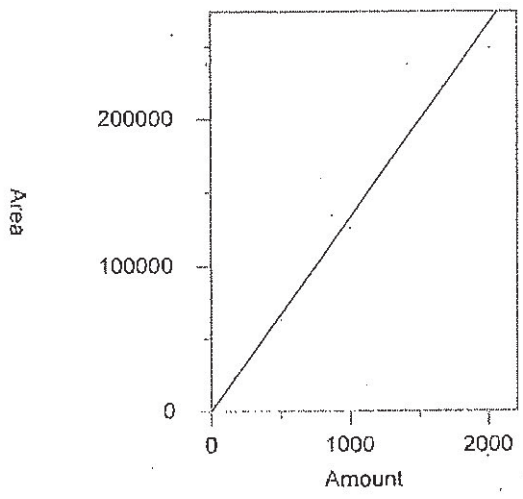
Single peak quantification by area

Y = 102.163 X + 0

Average CF fit with equal weighting, forced to origin	
Coefficient of determination:	0.9720693
Average error:	12.509%
Average CF:	102.163
RSD:	17.707%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	3356.179	134.1131	31.274	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0004.BND
2	100.1	9887.746	98.77869	-3.313	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0005.BND
3	500.5	46749.97	93.40653	-8.571	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0006.BND
4	1001	93749.27	93.65562	-8.327	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0007.BND
5	2002	181903.8	90.86104	-11.063	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0008.BND

16 3-NT



Expected retention time:	15.797 minutes
Search window:	0.162 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

$Y = 132.7551\ X + 0$

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9910454
Average error:	10.013%
Average CF:	132.7551
RSD:	14.037%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	4166.31	165.9884	25.034	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.4	12271.74	122.2285	-7.929	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502	63316.97	126.1294	-4.991	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1004	125734.3	125.2334	-5.666	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2008	249384.6	124.1955	-6.448	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

6D

INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B Calibration File: 12EEXP1621102B

GC Column (2) : CHROMPACK ID: 100 (mm) Update File: 12EEXP16211002B.0029.RAW

Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
HMX			2.53			2.53	2.43	2.63
Nitroglycerin			8.73			8.73	8.54	8.92
3,4-Dinitrotoluene			10.51			10.51	10.22	10.79
PETN			16.62			16.62	16.34	16.91

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B Calibration File: 12EEXP1621102B

GC Column (2) : CHROMPACK ID: 100 (mm) Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	2.23E+03	1.12E+03	8.95E+02	8.46E+02	8.22E+02	1.18E+03	51
Nitroglycerin	3.08E+02	2.75E+02	2.99E+02	2.75E+02	2.83E+02	2.88E+02	5
3,4-Dinitrotoluene	2.16E+03	2.09E+03	2.23E+03	2.30E+03	2.50E+03	2.26E+03	7
PETN	2.50E+02	2.73E+02	3.10E+02	2.56E+02	2.58E+02	2.70E+02	9

Average % RSD: 18

← Linear

James H. Place
Senior Chemist

AUG 0 2 2016

File Name: V:\CP12\12eexp1621102B.CAL
Version: 1

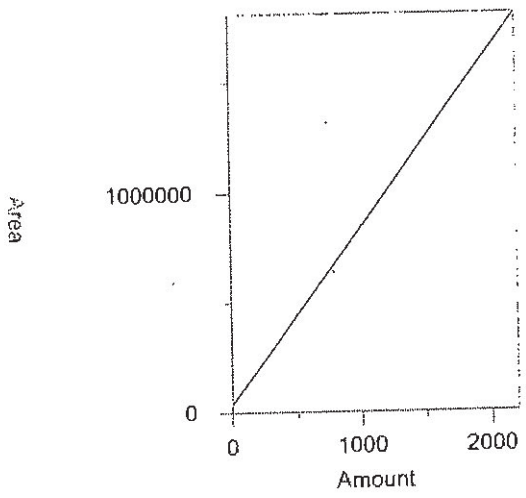
Creator:
Description:
Reason for change:

Internal standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time: 2.531 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

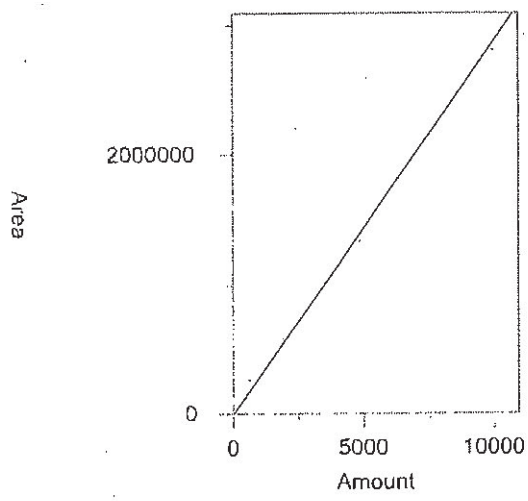
Single peak quantification by area

Y = 805.2766 X + 37388.52

Linear fit with equal weighting
Coefficient of determination: 0.9999336
Average error: 2.045%
Average CF: 1182.899
RSD: 50.515%

Level	Amount	Response	Cal Factor	Error, %	Source	D
1	25.015	55800.27	2230.672	-3.011	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0004.BND	7/
2	100.06	112141	1120.738	-4.937	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0005.BND	7/
3	500.3	447552.8	894.5689	1.655	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0006.BND	7/
4	1000.6	846707.3	846.1996	0.422	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0007.BND	7/
5	2001.2	1645620	822.3167	-0.199	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0008.BND	7/

2 Nitroglycerin



Expected retention time: 8.726 minutes
Search window: 0.19 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

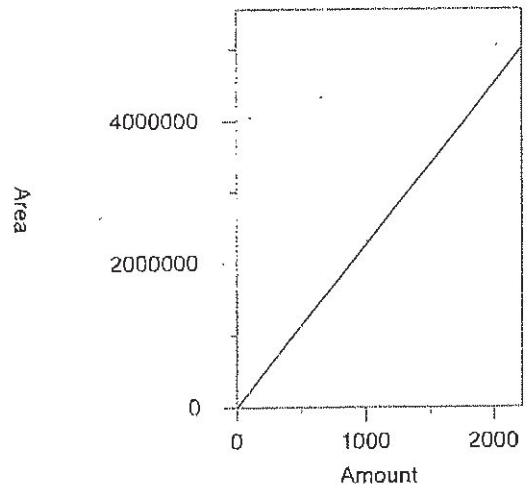
Single peak quantification by area

Y = 287.855 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9984417
Average error: 4.349%
Average CF: 287.855
RSD: 5.225%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	485.75	149840.5	308.4725	7.162	Manual	7/31/2016 2:13:36 PM
2	1063.86	292352.8	274.8038	-4.534	Manual	7/31/2016 2:13:45 PM
3	1947.18	581299.4	298.534	3.710	Manual	7/31/2016 2:13:49 PM
4	4857.82	1335512	274.92	-4.494	Manual	7/31/2016 2:13:56 PM
5	9956.51	2813161	282.5449	-1.845	Manual	7/31/2016 2:14:00 PM

3 3,4-Dinitrotoluene



Expected retention time: 10.507 minutes
Search window: 0.286 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

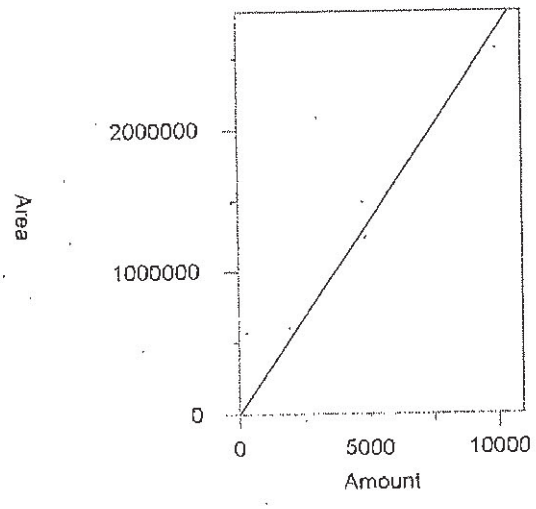
Single peak quantification by area

Y = 2258.673 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9853915
Average error: 5.118%
Average CF: 2258.673
RSD: 7.001%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.2	54453.62	2160.858	-4.331	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0004.BND
2	100.8	210800.4	2091.274	-7.411	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0005.BND
3	504	1126383	2234.887	-1.053	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0006.BND
4	1008	2321369	2302.946	1.960	Manual
5	2016	5046855	2503.4	10.835	Manual

4 PETN



Expected retention time:	16.621 minutes
Search window:	0.286 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

$Y = 269.6573\ X + 0$

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9940489
Average error:	6.588%
Average CF:	269.6573
RSD:	9.016%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	484.69	121312.6	250.289	-7.183	Manual	7/31/2016 2:14:24 PM
2	1061.44	290126.8	273.3332	1.363	Manual	7/31/2016 2:14:29 PM
3	1942.16	602831.4	310.3922	15.106	Manual	7/31/2016 2:14:32 PM
4	4845.76	1240206	255.9363	-5.088	Manual	7/31/2016 2:14:37 PM
5	9931.88	2565758	258.3356	-4.199	Manual	7/31/2016 2:14:44 PM

6D

INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621103

GC Column (1): CHROMPACK ID: 100 (mm) Update File: 12EEXP16211003.0048.RAW

Date(s) Analyzed: 8/3/2016 8/3/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
RDX			3.95			3.95	3.85	4.05
1,3,5-Trinitrobenzene			4.58			4.58	4.48	4.68
1,3-DNB			6.55			6.55	6.45	6.65
3,5-Dinitroaniline			6.84			6.84	6.51	7.18
Nitrobenzene			7.28			7.28	7.14	7.42
Tetryl			7.28			7.28	7.14	7.42
2,4,6-Trinitrotoluene			7.76			7.76	7.66	7.86
Tetryl breakdown			8.77			8.77	8.65	8.89
4-Amino-2,6-dinitrotoluene			9.39			9.39	9.24	9.53
2-Amino-4,6-dinitrotoluene			9.86			9.86	9.72	10.00
2,6-Dinitrotoluene			10.58			10.58	10.43	10.72
3,4-Dinitrotoluene			10.58			10.58	10.43	10.72
2,4-Dinitrotoluene			11.24			11.24	11.09	11.38
2-Nitrotoluene			12.87			12.87	12.72	13.01
4-Nitrotoluene			14.26			14.26	14.10	14.42
3-Nitrotoluene			14.97			14.97	14.81	15.14

Coelute

applies to: 12EEXP16211003.0001 →
old cal: 12EEXP1621102
New Cal: 12EEXP1621103
File used: 12EEXP16211003.0048

By:

James H. Plaso
Senior Chemist

AUG 0 8 2016

Audited By:

Jessica L. Miller
Senior Chemist

AUG 0 7 2016

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621103

GC Column (1) : CHROMPACK ID: 100 (mm) Date(s) Analyzed: 8/3/2016 8/3/2016

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	%RSD
RDX	1.51E+02	9.26E+01	8.77E+01	8.83E+01	8.78E+01	1.02E+02	27
1,3,5-Trinitrobenzene	2.05E+02	1.88E+02	1.94E+02	1.99E+02	1.97E+02	1.96E+02	3
1,3-DNB	2.91E+02	2.50E+02	2.54E+02	2.41E+02	1.64E+02	2.40E+02	19
3,5-Dinitroaniline	2.68E+02	2.24E+02	2.25E+02	2.69E+02	2.32E+02	2.44E+02	9
Nitrobenzene	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15
Tetryl	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15
2,4,6-Trinitrotoluene	2.55E+02	1.98E+02	2.02E+02	2.13E+02	2.02E+02	2.14E+02	11
Tetryl breakdown	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15
4-Amino-2,6-dinitrotoluene	1.57E+02	1.29E+02	1.24E+02	1.24E+02	8.77E+01	1.24E+02	20
2-Amino-4,6-dinitrotoluene	3.92E+02	3.09E+02	3.29E+02	3.01E+02	3.26E+02	3.31E+02	11
2,6-Dinitrotoluene	2.01E+02	1.39E+02	1.34E+02	1.29E+02	1.24E+02	1.45E+02	22
3,4-Dinitrotoluene	3.89E+02	3.07E+02	3.27E+02	2.99E+02	3.24E+02	3.29E+02	11
2,4-Dinitrotoluene	3.50E+02	2.69E+02	2.85E+02	2.53E+02	2.56E+02	2.83E+02	14
2-Nitrotoluene	1.97E+02	1.24E+02	1.13E+02	1.14E+02	1.12E+02	1.32E+02	28
4-Nitrotoluene	1.34E+02	9.88E+01	9.34E+01	9.37E+01	9.09E+01	1.02E+02	18
3-Nitrotoluene	1.66E+02	1.22E+02	1.26E+02	1.25E+02	1.24E+02	1.33E+02	14

Average % RSD: 16

Coelute

AUG 07 2018

File Name: V:\CP12\12eexp1621103.CAL
Version: 1

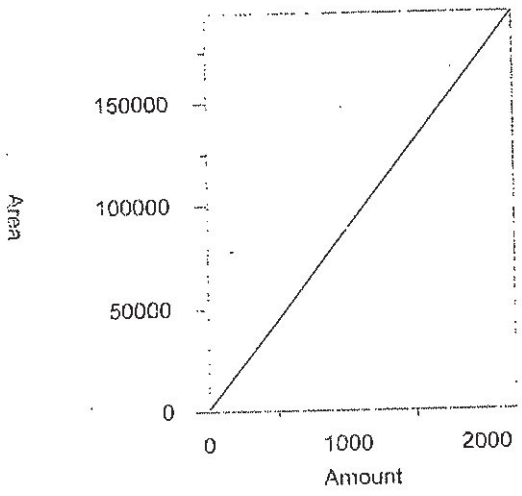
Creator:
Description:
Reason for change:

Internal standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 RDX



Expected retention time:	3.952 minutes
Search window:	0.1 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

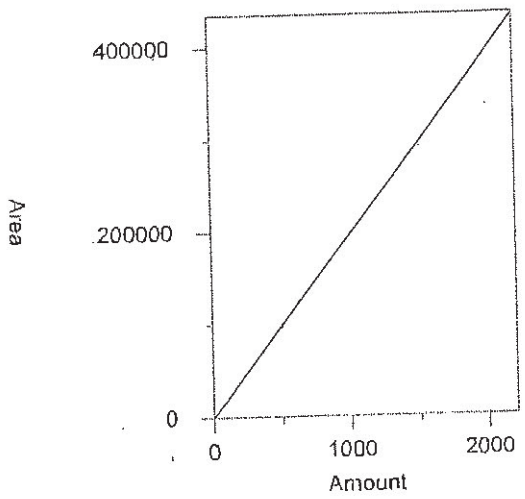
Y = 87.2768 X + 860.4011

Linear fit with equal weighting

Coefficient of determination:	0.9999437
Average error:	5.910%
Average CF:	101.5227
RSD:	27.484%

Level	Amount	Response	Cal Factor	Error, %	Source	Dat
1	25.1	3797.655	151.301	24.470	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND	7/3
2	100.4	9299.011	92.61963	-3.367	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND	7/3
3	502	44005.84	87.66103	-1.494	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND	7/3
4	1004	88628.66	88.27555	0.161	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND	7/3
5	2008	176214.8	87.75637	0.058	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND	7/3

2 1,3,5-TNB



Expected retention time:	4.575 minutes
Search window:	0.1 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

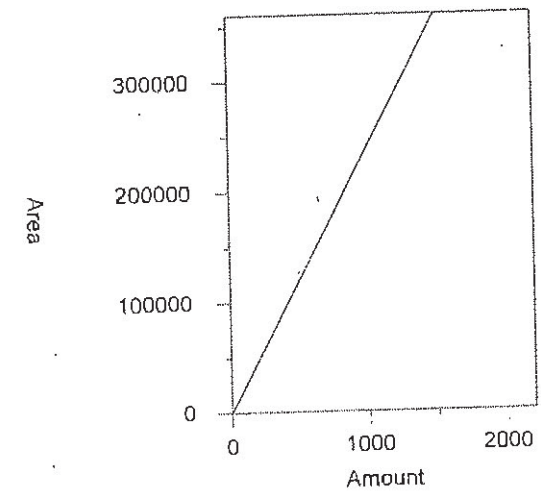
Y = 196.4074 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9999138
Average error:	2.287%
Average CF:	196.4074
RSD:	3.199%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5135.729	204.8147	4.281	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.3	18825.87	187.6956	-4.436	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	97235.12	193.8886	-1.282	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	199124.8	198.5292	1.080	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2006	395400.6	197.109	0.357	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

3 1,3-DNB



Expected retention time:	6.552 minutes
Search window:	0.1 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

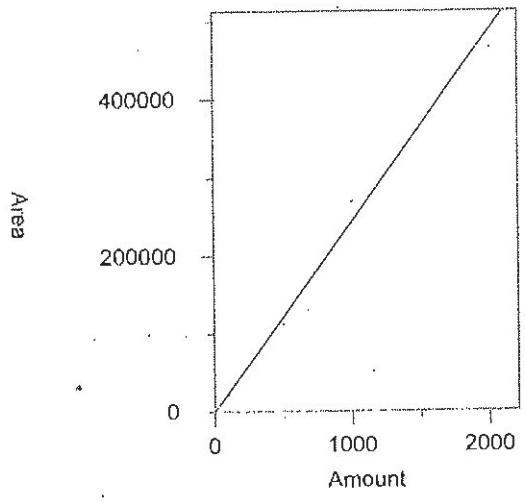
Y = 239.9322 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.6936649
Average error:	12.712%
Average CF:	239.9322
RSD:	19.431%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	7278.833	290.5722	21.106	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.2	25099.51	250.4941	4.402	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501	127354.2	254.2	5.947	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1002	241194.4	240.713	0.325	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2004	328018	163.6816	-31.780	Manual

4 3,5-dinitroaniline



Expected retention time: 6.844 minutes
Search window: 0.339 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

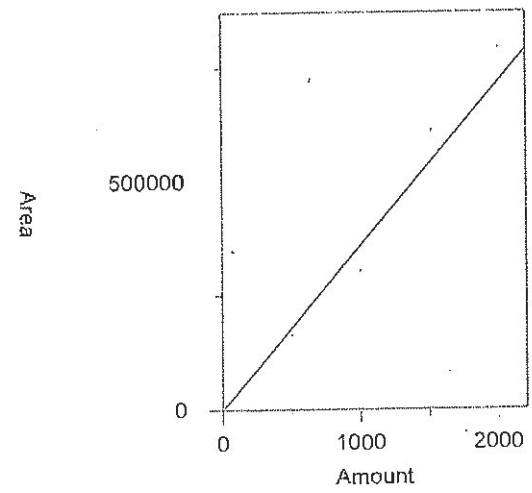
Single peak quantification by area

Y = 243.6005 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9915071
Average error: 8.231%
Average CF: 243.6005
RSD: 9.493%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	6729.358	268.1019	10.058	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.4	22465	223.755	-8.147	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502	112746.7	224.595	-7.802	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1004	270302	269.2251	10.519	Manual
5	2008	466510	232.3257	-4.628	Manual

5 Tetryl



Expected retention time: 7.276 minutes
Search window: 0.14 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

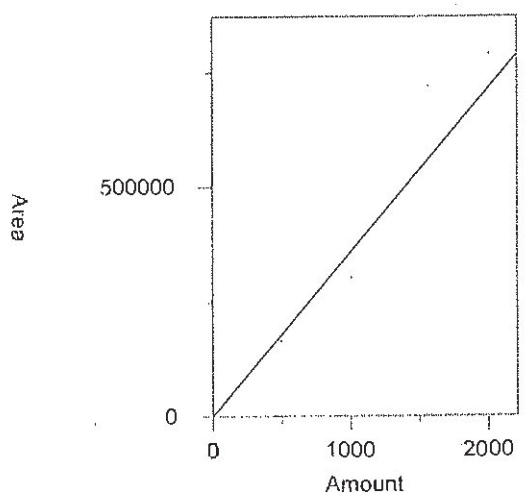
Single peak quantification by area

Y = 358.1076 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9777827
Average error: 12.583%
Average CF: 358.1076
RSD: 15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.05	10846	432.9741	20.906	Manual	7/31/2016 1:44:40 PM
2	100.2	33073	330.0699	-7.829	Manual	7/31/2016 12:56:33 PM
3	501	164995	329.3313	-8.036	Manual	7/31/2016 1:03:04 PM
4	1002	302870	302.2655	-15.594	Manual	7/31/2016 1:15:50 PM
5	2004	793378	395.8972	10.553	Manual	7/31/2016 2:08:14 PM

6 Nitrobenzene



Expected retention time: 7.277 minutes
Search window: 0.14 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

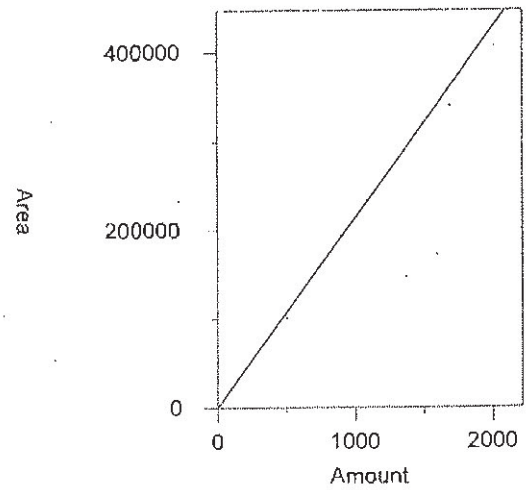
Single peak quantification by area

Y = 357.7505 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9777827
Average error: 12.583%
Average CF: 357.7505
RSD: 15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.075	10846	432.5424	20.906	Manual	7/31/2016 1:44:38 PM
2	100.3	33073	329.7408	-7.829	Manual	7/31/2016 12:56:30 PM
3	501.5	164995	329.003	-8.036	Manual	7/31/2016 1:02:59 PM
4	1003	302870	301.9641	-15.594	Manual	7/31/2016 1:15:46 PM
5	2006	793378	395.5025	10.553	Manual	7/31/2016 2:08:12 PM

7 2,4,6-TNT



Expected retention time: 7.762 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

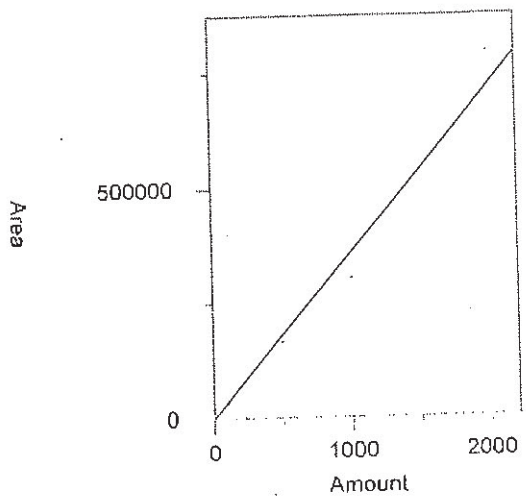
Single peak quantification by area

Y = 214.0261 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9945887
Average error: 7.605%
Average CF: 214.0261
RSD: 10.933%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	6399.85	254.7204	19.014	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.5	19912.04	198.1297	-7.427	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502.5	101539.5	202.0686	-5.587	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1005	213954.5	212.89	-0.531	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2010	406666.3	202.3215	-5.469	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

8 Tetryl breakdown



Expected retention time:	8.77 minutes
Search window:	0.121 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

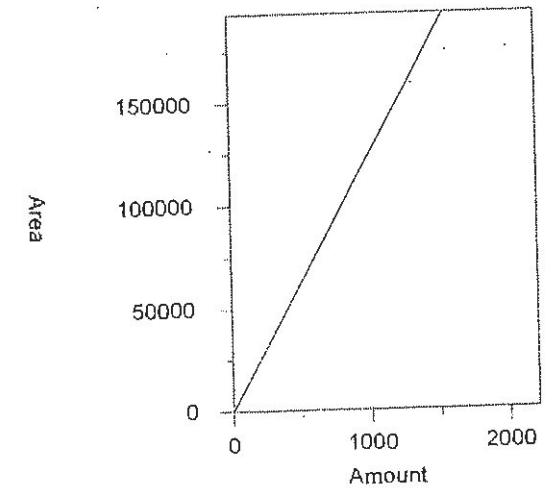
Y = 358.1076 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9777827
Average error:	12.583%
Average CF:	358.1076
RSD:	15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.05	10846	432.9741	20.906	Manual	7/31/2016 1:44:44 PM
2	100.2	33073	330.0699	-7.829	Manual	7/31/2016 12:56:41 PM
3	501	164995	329.3313	-8.036	Manual	7/31/2016 1:03:09 PM
4	1002	302870	302.2655	-15.594	Manual	7/31/2016 1:15:57 PM
5	2004	793378	395.8972	10.553	Manual	7/31/2016 2:08:16 PM

9 4-Am-2,6-DNT



Expected retention time:	9.385 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

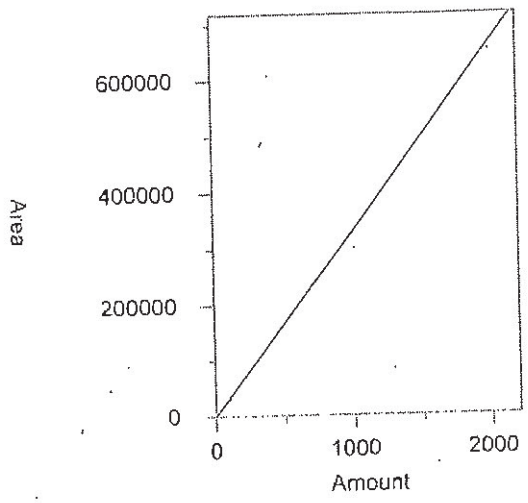
Y = 124.411 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.7492826
Average error:	12.083%
Average CF:	124.411
RSD:	19.915%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	3946	157.3679	26.490	Manual
2	100.3	12938.61	128.9991	3.688	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	62410.41	124.4475	0.029	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	123909	123.5384	-0.701	Manual
5	2006	175931	87.70239	-29.506	Manual

10 2-Am-4,6-DNT



Expected retention time: 9.862 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

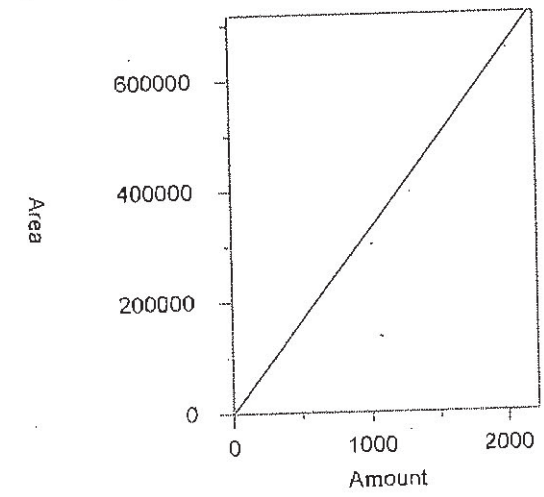
Single peak quantification by area

Y = 331.455 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9962868
Average error: 7.259%
Average CF: 331.455
RSD: 10.743%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	9800	391.6084	18.148	Manual
2	100.1	30903.33	308.7246	-6.858	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	500.5	164855.9	329.3824	-0.625	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1001	301678	301.3766	-9.075	Manual
5	2002	653018	326.1828	-1.591	Manual

11 3,4-Dinitrotoluene



Expected retention time: 9.863 minutes
Search window: 0.242 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

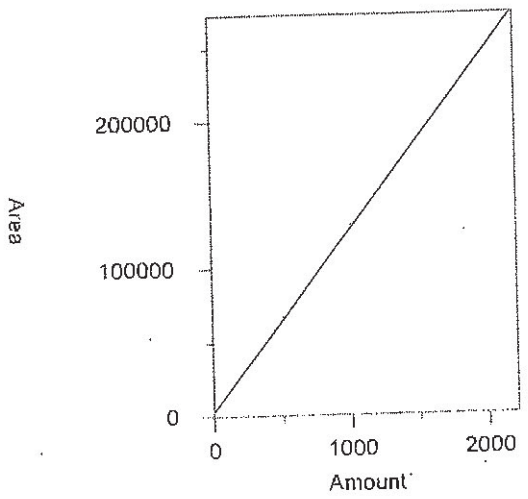
Single peak quantification by area

Y = 329.1532 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9962868
Average error: 7.259%
Average CF: 329.1532
RSD: 10.743%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.2	9800	388.8889	18.148	Manual	7/31/2016 2:12:02 PM
2	100.8	30903.33	306.5807	-6.858	Manual	7/31/2016 2:04:36 PM
3	504	164855.9	327.0951	-0.625	Manual	7/31/2016 2:04:39 PM
4	1008	301678	299.2837	-9.075	Manual	7/31/2016 2:09:50 PM
5	2016	653018	323.9177	-1.591	Manual	7/31/2016 2:08:35 PM

12 2,6-DNT



Expected retention time:	10.576 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

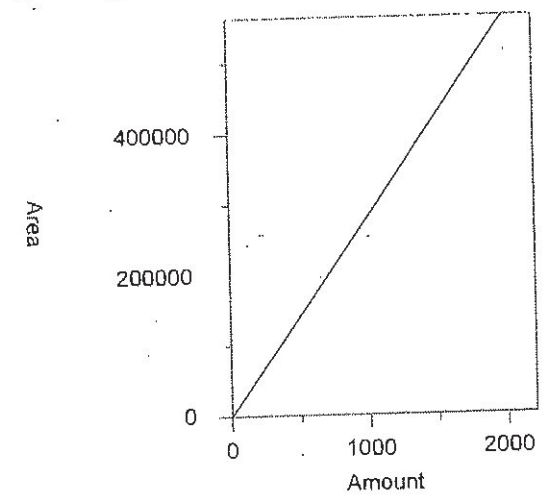
Single peak quantification by area

Y = 122.7019 X + 3330.402

Linear fit with equal weighting	
Coefficient of determination:	0.9995252
Average error:	7.593%
Average CF:	145.3016
RSD:	21.987%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5052.243	201.4853	-21.147	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.3	13962.72	139.2096	-10.709	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	67079.15	133.757	3.413	\\USLAN-CHRDMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	128937.6	128.5519	2.007	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2006	247749	123.504	-0.690	Manual

13 2,4-DNT



Expected retention time:	11.235 minutes
Search window:	0.142 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

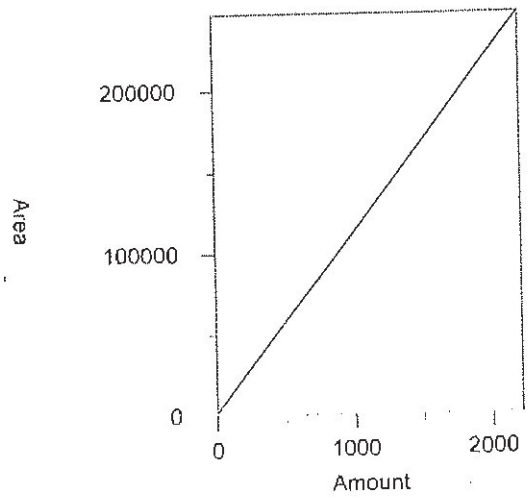
Single peak quantification by area

Y = 282.5082 X + 0

Average CF fit with equal weighting, forced to origin	
Coefficient of determination:	0.9784554
Average error:	9.870%
Average CF:	282.5082
RSD:	14.055%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	8756.587	349.9136	23.860	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.1	26893.81	268.6694	-4.899	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	500.5	142549.9	284.815	0.817	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1001	253228.9	252.9759	-10.454	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2002	512846.5	256.1671	-9.324	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

14 2-NT



Expected retention time: 12.866 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

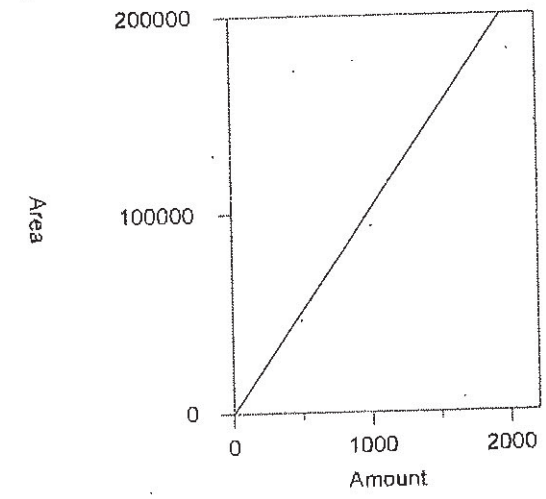
Single peak quantification by area

$Y = 110.8549\ X + 1788.915$

Linear fit with equal weighting
Coefficient of determination: 0.999931
Average error: 2.804%
Average CF: 131.8325
RSD: 27.773%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	4943.087	196.7398	8.066	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0004.BND
2	100.5	12460.69	123.987	-3.628	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0005.BND
3	502.5	56837.48	113.1094	-1.141	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0006.BND
4	1005	114344.8	113.7759	1.013	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0007.BND
5	2010	224216.7	111.5506	-0.174	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0008.BND

15 4-NT



Expected retention time: 14.259 minutes
Search window: 0.162 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

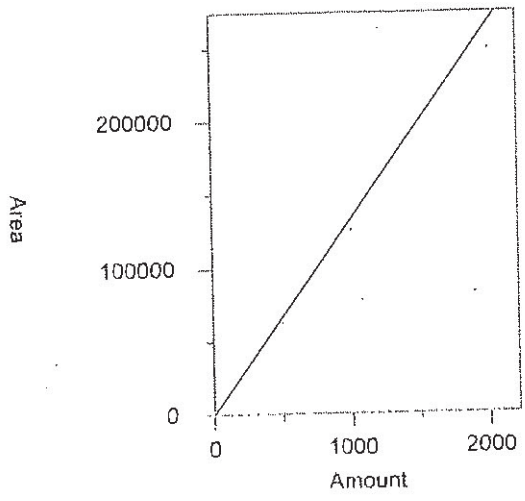
Single peak quantification by area

$Y = 102.163\ X + 0$

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9720693
Average error: 12.509%
Average CF: 102.163
RSD: 17.707%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	3356.179	134.1131	31.274	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0004.BND
2	100.1	9887.746	98.77869	-3.313	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0005.BND
3	500.5	46749.97	93.40653	-8.571	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0006.BND
4	1001	93749.27	93.65562	-8.327	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0007.BND
5	2002	181903.8	90.86104	-11.063	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162\1001.0008.BND

16 3-NT



Expected retention time:	14.973 minutes
Search window:	0.162 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

Y = 132.7551 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9910454
Average error:	10.013%
Average CF:	132.7551
RSD:	14.037%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	4166.31	165.9884	25.034	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.4	12271.74	122.2285	-7.929	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502	63316.97	126.1294	-4.991	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1004	125734.3	125.2334	-5.666	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2008	249384.6	124.1955	-6.448	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

6D

INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories
Contract:
Lab Code: Case No.: SAS No.: SDG No.:
Instrument: X6329B
Calibration File: 12EEXP1621103B
GC Column (2) : CHROMPACK ID: 100 (mm)
Update File: 12EEXP16211003B.0048.RAW
Date(s) Analyzed: 8/3/2016 8/3/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
HMX			2.50			2.50	2.40	2.60
Nitroglycerin			8.35			8.35	8.16	8.54
3,4-Dinitrotoluene			9.97			9.97	9.68	10.25
PETN			15.76			15.76	15.47	16.04

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B Calibration File: 12EEXP1621103B

GC Column (2) : CHROMPACK ID: 100 (mm) Date(s) Analyzed: 8/3/2016 8/3/2016

COMPOUND	CALIBRATION FACTORS					MEAN	%RSD
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5		
HMX	2.23E+03	1.12E+03	8.95E+02	8.46E+02	8.22E+02	1.18E+03	51
Nitroglycerin	3.08E+02	2.75E+02	2.99E+02	2.75E+02	2.83E+02	2.88E+02	5
3,4-Dinitrotoluene	2.16E+03	2.09E+03	2.23E+03	2.30E+03	2.50E+03	2.26E+03	7
PETN	2.50E+02	2.73E+02	3.10E+02	2.56E+02	2.58E+02	2.70E+02	9
						Average % RSD:	18

Means

AUG 07 2016

File Name: V:\CP12\12eexp1621103B.CAL
Version: 1

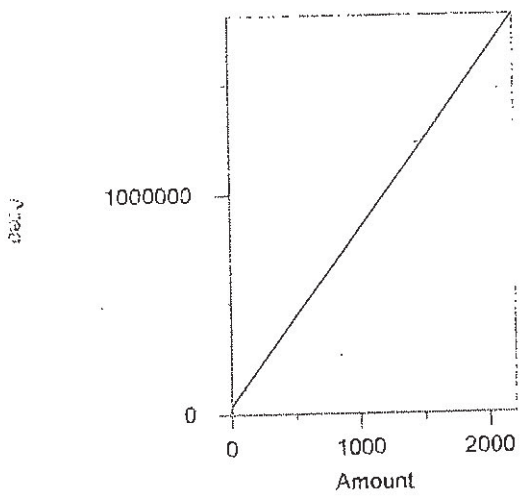
Creator:
Description:
Reason for change:

Internal standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time:	2.501 minutes
Search window:	0.1 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

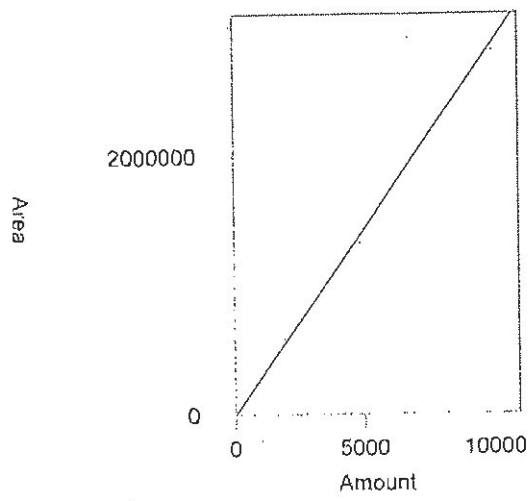
Y = 805.2766 X + 37388.52

Linear fit with equal weighting

Coefficient of determination:	0.9999336
Average error:	2.045%
Average CF:	1182.899
RSD:	50.515%

Level	Amount	Response	Cal Factor	Error, %	Source	D
1	25.015	55800.27	2230.672	-3.011	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0004.BND	7/
2	100.06	112141	1120.738	-4.937	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0005.BND	7/
3	500.3	447552.8	894.5689	1.655	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0006.BND	7/
4	1000.6	846707.3	846.1996	0.422	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0007.BND	7/
5	2001.2	1645620	822.3167	-0.199	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0008.BND	7/

2 Nitroglycerin



Expected retention time: 8.345 minutes
Search window: 0.19 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

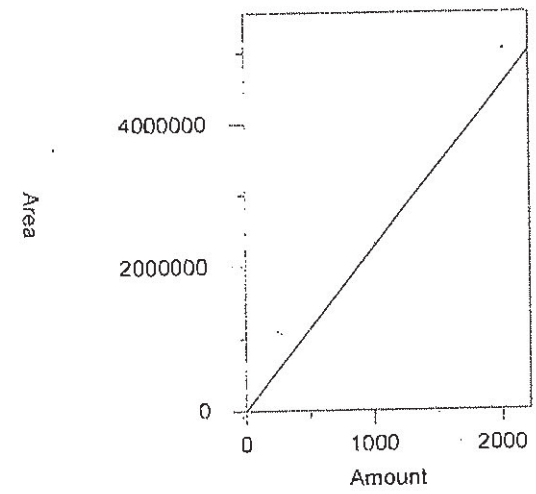
Single peak quantification by area

$Y = 287.855\ X + 0$

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9984417
Average error: 4.349%
Average CF: 287.855
RSD: 5.225%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	485.75	149840.5	308.4725	7.162	Manual	7/31/2016 2:13:36 PM
2	1063.86	292352.8	274.8038	-4.534	Manual	7/31/2016 2:13:45 PM
3	1947.18	581299.4	298.534	3.710	Manual	7/31/2016 2:13:49 PM
4	4857.82	1335512	274.92	-4.494	Manual	7/31/2016 2:13:56 PM
5	9956.51	2813161	282.5449	-1.845	Manual	7/31/2016 2:14:00 PM

3 3,4-Dinitrotoluene



Expected retention time: 9.966 minutes
Search window: 0.286 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

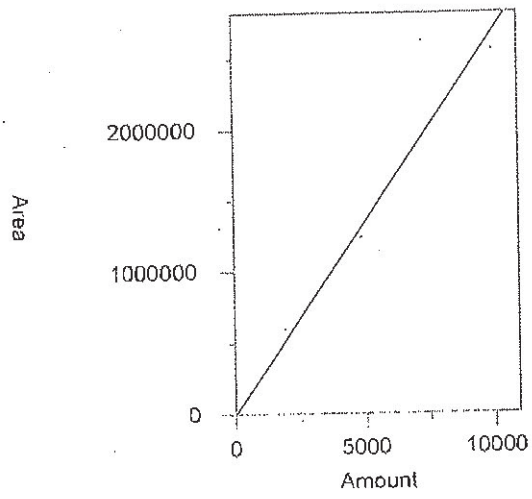
Single peak quantification by area

$Y = 2258.673\ X + 0$

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9853915
Average error: 5.118%
Average CF: 2258.673
RSD: 7.001%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.2	54453.62	2160.858	-4.331	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162110018.0004.BND
2	100.8	210800.4	2091.274	-7.411	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162110018.0005.BND
3	504	1126383	2234.887	-1.053	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP162110018.0006.BND
4	1008	2321369	2302.946	1.960	Manual
5	2016	5046855	2503.4	10.835	Manual

4 PETN



Expected retention time:	15.758 minutes
Search window:	0.286 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

$Y = 269.6573\ X + 0$

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9940489
Average error:	6.588%
Average CF:	269.6573
RSD:	9.016%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	484.69	121312.6	250.289	-7.183	Manual	7/31/2016 2:14:24 PM
2	1061.44	290126.8	273.3332	1.363	Manual	7/31/2016 2:14:29 PM
3	1942.16	602831.4	310.3922	15.106	Manual	7/31/2016 2:14:32 PM
4	4845.76	1240206	255.9363	-5.088	Manual	7/31/2016 2:14:37 PM
5	9931.88	2565758	258.3356	-4.199	Manual	7/31/2016 2:14:44 PM

6D
INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Calibration File: 12CEXP1621101

GC Column (3): CAPCELL CN ID: 250 (mm) Update File:

Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	RT OF STANDARDS					MIDPOINT RT Level 5	RT WINDOW	
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5		FROM	TO
HMX	3.90	3.91	3.90	3.89	3.90	3.90	3.80	4.00
RDX	4.75	4.80	4.78	4.79	4.82	4.82	4.72	4.92
3,5-Dinitroaniline	10.39	10.38	10.31	10.12	10.48	10.48	10.38	10.58
Nitrobenzene	11.75	11.82	11.81	11.29	11.90	11.90	11.74	12.06
2-Amino-4,6-dinitrotoluene	15.60	15.60	15.15	14.97	15.66	15.66	15.50	15.82
4-Amino-2,6-dinitrotoluene	15.60	15.60	15.15	14.97	15.66	15.66	15.50	15.82
1,3-DNB	17.51	17.39	17.15	17.02	17.46	17.46	17.31	17.61
2-Nitrotoluene	22.31	22.39	21.74	21.76	22.40	22.40	22.14	22.66
3-Nitrotoluene	25.77	25.59	24.91	24.98	25.55	25.55	25.29	25.81
4-Nitrotoluene	25.77	25.59	24.91	24.98	25.55	25.55	25.29	25.81
1,3,5-Trinitrobenzene	27.44	27.27	26.80	26.84	27.07	27.07	26.87	27.27
2,6-Dinitrotoluene	28.68	28.27	27.36	27.50	28.46	28.46	28.16	28.76
3,4-Dinitrotoluene	31.44	31.10	30.67	30.76	31.25	31.25	31.07	31.43
2,4-Dinitrotoluene	33.00	32.66	32.54	32.60	32.76	32.76	32.65	32.87
Tetryl	33.59	33.62	33.66	33.70	33.79	33.79	33.69	33.89
2,4,6-Trinitrotoluene	34.79	34.58	34.68	34.71	34.76	34.76	34.66	34.86

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6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

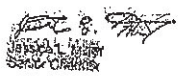
Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Calibration File: 12CEXP1621101

GC Column (3) : CAPCELL CN ID: 250 (mm) Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	CALIBRATION FACTORS						
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	%RSD
HMX	3.96E+01	9.40E+01	9.37E+01	9.77E+01	9.27E+01	8.35E+01	30
RDX	1.69E+02	1.30E+02	1.19E+02	1.12E+02	1.08E+02	1.28E+02	19
3,5-Dinitroaniline	4.07E+02	2.49E+02	2.31E+02	2.24E+02	2.20E+02	2.66E+02	30
Nitrobenzene	2.82E+02	1.82E+02	1.69E+02	1.63E+02	1.61E+02	1.91E+02	27
2-Amino-4,6-dinitrotoluene	4.76E+02	4.01E+02	3.66E+02	3.61E+02	3.53E+02	3.91E+02	13
4-Amino-2,6-dinitrotoluene	4.75E+02	4.00E+02	3.65E+02	3.61E+02	3.52E+02	3.91E+02	13
1,3-DNB	4.35E+02	3.22E+02	3.11E+02	3.01E+02	2.94E+02	3.33E+02	17
2-Nitrotoluene	2.33E+02	1.14E+02	1.12E+02	1.10E+02	1.06E+02	1.35E+02	41
3-Nitrotoluene	2.85E+02	1.90E+02	1.85E+02	1.66E+02	1.85E+02	2.02E+02	23
4-Nitrotoluene	2.86E+02	1.91E+02	1.86E+02	1.66E+02	1.86E+02	2.03E+02	23
1,3,5-Trinitrobenzene	2.59E+02	2.13E+02	2.26E+02	2.24E+02	2.57E+02	2.36E+02	9
2,6-Dinitrotoluene	2.34E+02	1.31E+02	1.41E+02	1.17E+02	1.29E+02	1.51E+02	32
3,4-Dinitrotoluene	1.93E+02	1.79E+02	1.05E+02	1.10E+02	1.16E+02	1.41E+02	30
2,4-Dinitrotoluene	1.67E+02	2.74E+02	2.59E+02	2.60E+02	2.57E+02	2.43E+02	18
Tetryl	1.65E+01	1.41E+02	1.57E+02	1.52E+02	1.58E+02	1.25E+02	49
2,4,6-Trinitrotoluene	1.04E+02	2.73E+02	2.09E+02	2.00E+02	1.95E+02	1.96E+02	31

Average % RSD: 25



JUL 3 1 2016

File Name: V:\CP12\12cexp1621101.CAL
Version: 40

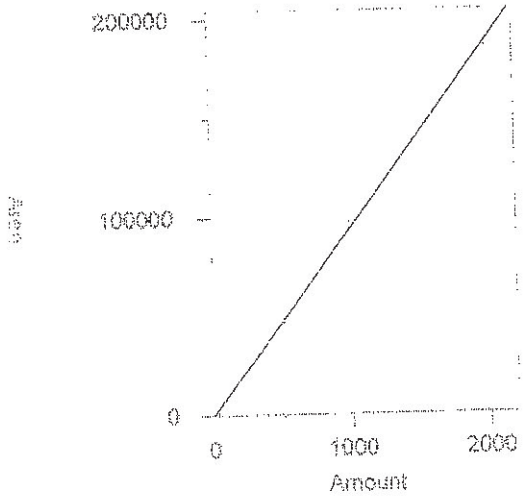
Creator:
Description:
Reason for change:

External standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time: 3.9 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

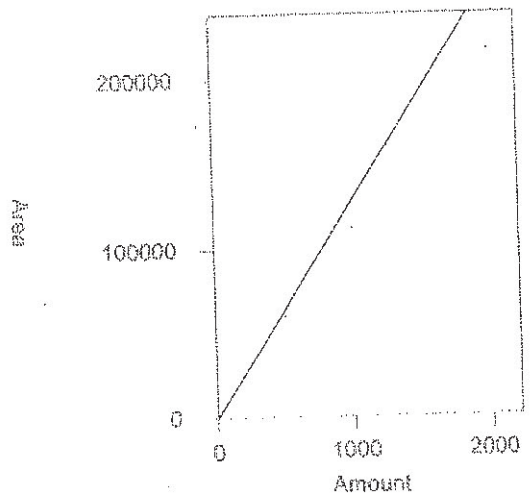
Single peak quantification by area

Y = 93.47101 X + 286.7556

Linear fit with equal weighting
Coefficient of determination: 0.9990436
Average error: 14.065%
Average CF: 83.52895
RSD: 29.509%

Level	Amount	Response	Cal Factor	Error, %	Source	Date
1	25.015	989.8299	39.56945	-62.291	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND	7/31/
2	100.06	9409.896	94.04254	-2.382	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND	7/31/
3	500.3	46854.54	93.65289	-0.416	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND	7/31/
4	1000.6	97772.98	97.71435	4.220	\\USLAN-CHROMPERFECT\CHRDMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND	7/31/
5	2001.2	185442.2	92.6655	-1.014	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND	7/31/

2 RDX



Expected retention time:	4.818 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

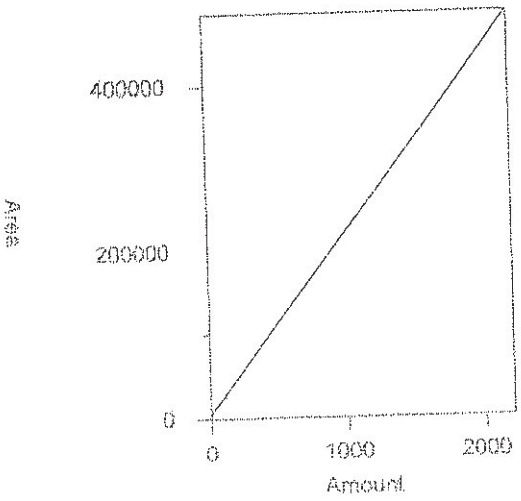
Y = 127.61 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9412987
Average error:	13.641%
Average CF:	127.61
RSD:	19.226%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	4240.228	168.9334	32.383	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.4	13032.28	129.8036	1.719	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502	59883.89	119.2906	-6.519	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1004	112280.9	111.8336	-12.363	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2008	217243.5	108.189	-15.219	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

3 3,5-dinitroaniline



Expected retention time:	10.48 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

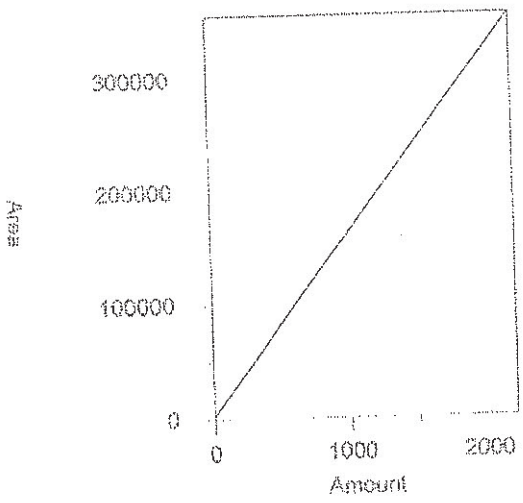
Y = 217.7032 X + 5084.649

Linear fit with equal weighting

Coefficient of determination:	0.9999126
Average error:	2.576%
Average CF:	266.3089
RSD:	29.810%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	10213	406.8924	-3.185	Manual
2	100.4	25019	249.1932	-7.138	Manual
3	502	116177.5	231.4293	1.579	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1004	225267.2	224.3697	0.719	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2008	441077.2	219.66	-0.261	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

4 Nitrobenzene



Expected retention time: 11.899 minutes
Search window: 0.16 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

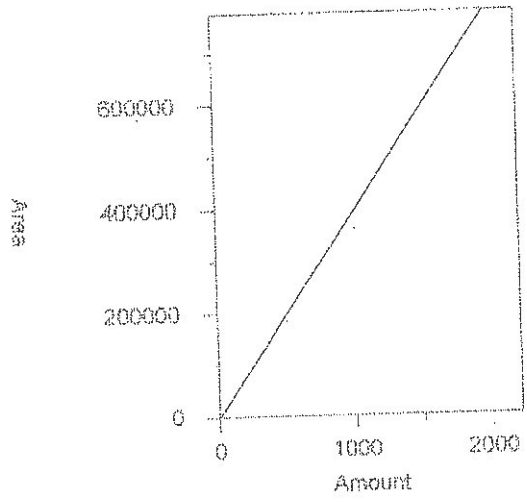
Single peak quantification by area

Y = 159.699 X + 3133.753

Linear fit with equal weighting
Coefficient of determination: 0.9999601
Average error: 1.494%
Average CF: 191.2579
RSD: 26.891%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	7074	282.1136	-0.899	Manual
2	100.3	18226	181.7148	-4.833	Manual
3	501.5	84554.1	168.6024	1.600	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1003	163200.3	162.7122	-0.068	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2006	323260	161.1466	-0.071	Manual

5 4-Am-2,6-DNT



Expected retention time: 15.658 minutes
Search window: 0.16 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

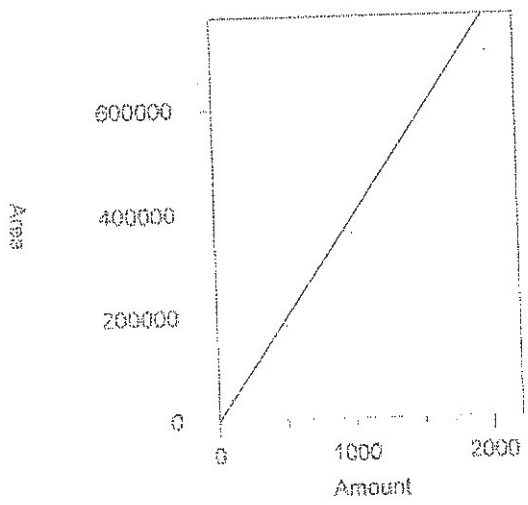
Single peak quantification by area

Y = 390.6894 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9783103
Average error: 9.634%
Average CF: 390.6894
RSD: 12.958%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	11912.02	475.0556	21.594	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.3	40161.76	400.4164	2.490	Manual
3	501.5	183130.3	365.1651	-6.533	Manual
4	1003	361759.3	360.6773	-7.682	Manual
5	2006	706378	352.1326	-9.869	Manual

6 2-Am-4,6-DNT



Expected retention time: 15.659 minutes
Search window: 0.16 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

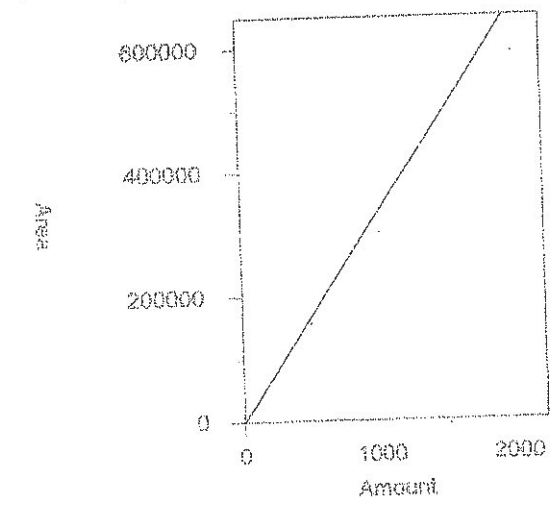
Single peak quantification by area

Y = 391.47 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9783103
Average error: 9.634%
Average CF: 391.47
RSD: 12.958%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	11912.02	476.0048	21.594	Manual
2	100.1	40161.76	401.2164	2.490	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	500.5	183130.3	365.8947	-6.533	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1001	361759.3	361.3979	-7.682	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2002	706378	352.8362	-9.869	Manual

7 1,3-DNB



Expected retention time: 17.458 minutes
Search window: 0.15 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

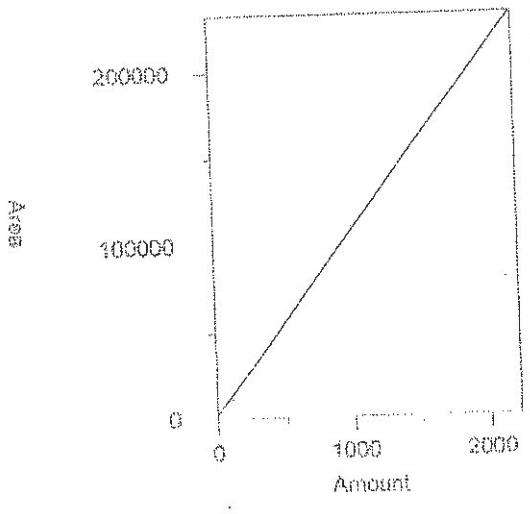
Single peak quantification by area

Y = 332.8964 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9687725
Average error: 12.247%
Average CF: 332.8964
RSD: 17.407%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	10892.23	434.8196	30.617	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.2	32300.18	322.3571	-3.166	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	501	156048.5	311.4741	-6.435	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1002	302065.9	301.463	-9.442	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2004	589914.3	294.3684	-11.574	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

8 2-NT



Expected retention time:	22.399 minutes
Search window:	0.26 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

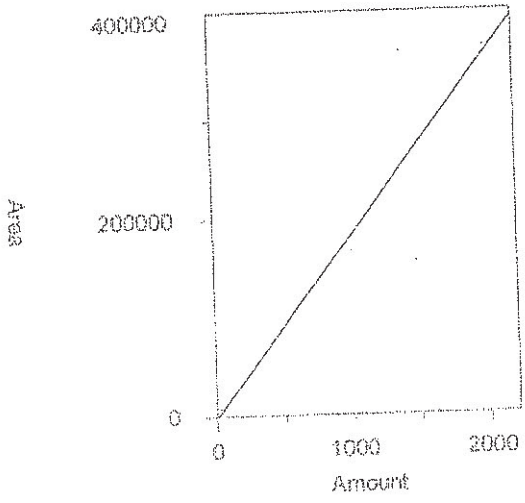
Single peak quantification by area

Y = 104.7342 X + 2906.16

Linear fit with equal weighting	
Coefficient of determination:	0.9996743
Average error:	4.859%
Average CF:	134.8939
RSD:	40.815%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	5859.8	233.2259	5.818	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.5	11450.75	113.9378	-14.750	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502.5	56340.11	112.1196	1.450	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1005	110084.5	109.5368	1.775	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2010	212355.5	105.6495	-0.500	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

9 4-NT



Expected retention time:	25.552 minutes
Search window:	0.26 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

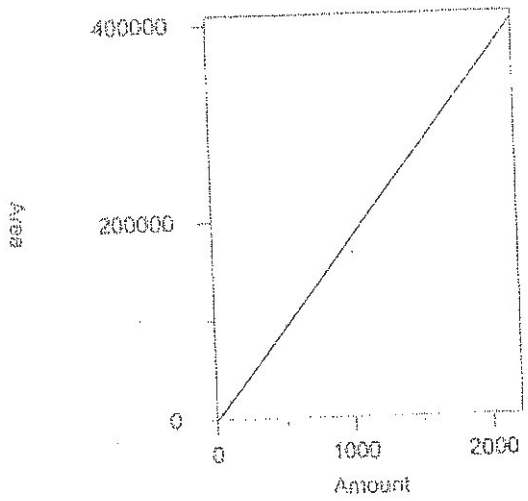
Single peak quantification by area

Y = 182.9801 X + -1257.135

Linear fit with equal weighting	
Coefficient of determination:	0.9965405
Average error:	28.124%
Average CF:	202.9486
RSD:	23.343%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	7158	286.034	115.476	Manual
2	100.1	19112	190.9291	12.034	Manual
3	500.5	92873	185.5604	2.822	Manual
4	1001	166606.3	166.4398	-8.411	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2002	371931	185.7797	1.880	Manual

10 3-NT



Expected retention time:	25.553 minutes
Search window:	0.26 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

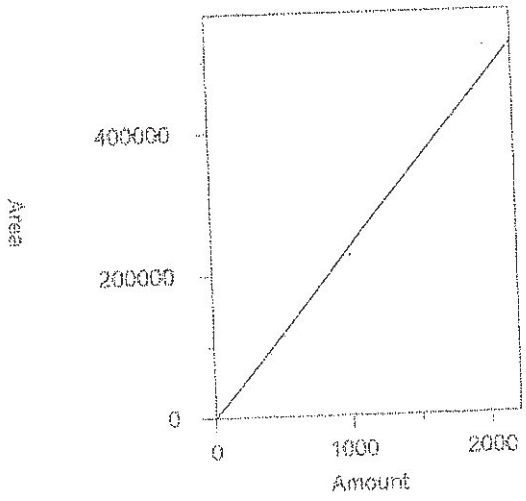
Single peak quantification by area

Y = 182.4333 X + -1257.155

Linear fit with equal weighting	
Coefficient of determination:	0.9965405
Average error:	28.125%
Average CF:	202.3422
RSD:	23.343%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.1	7158	285.1793	115.478	Manual	7/31/2016 4:56:35 PM
2	100.4	19112	190.3586	12.034	Manual	7/31/2016 4:57:30 PM
3	502	92873	185.006	2.822	Manual	7/31/2016 4:58:26 PM
4	1004	166606.3	165.9425	-8.411	Manual	7/31/2016 4:59:44 PM
5	2008	371931	185.2246	1.880	Manual	7/31/2016 5:01:09 PM

11 1,3,5-TNB



Expected retention time:	27.071 minutes
Search window:	0.2 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

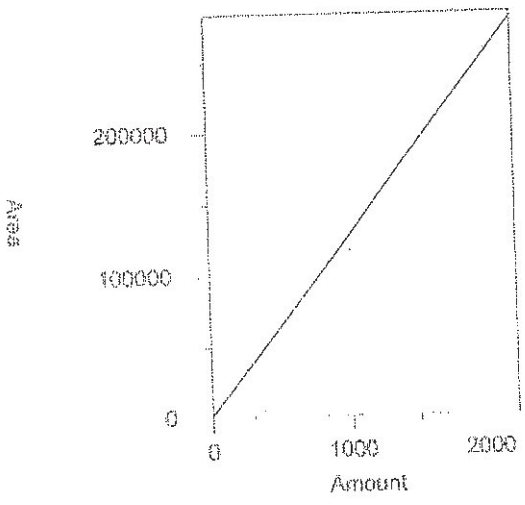
Single peak quantification by area

Y = 235.9349 X + 0

Average CF fit with equal weighting, forced to origin	
Coefficient of determination:	0.9885247
Average error:	7.520%
Average CF:	235.9349
RSD:	8.821%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.075	6493	258.9432	9.752	Manual	7/31/2016 4:56:40 PM
2	100.3	21403	213.3898	-9.556	Manual	7/31/2016 4:57:36 PM
3	501.5	113282	225.8863	-4.259	Manual	7/31/2016 4:58:49 PM
4	1003	224845	224.1725	-4.985	Manual	7/31/2016 4:59:49 PM
5	2006	516109	257.2827	9.048	Manual	7/31/2016 5:01:21 PM

12 2,6-DNT



Expected retention time:	27.933 minutes
Search window:	0.3 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

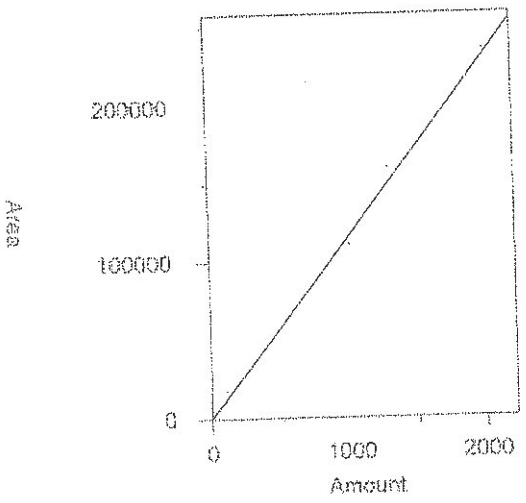
Single peak quantification by area

Y = 126.3104 X + 1347.232

Linear fit with equal weighting	
Coefficient of determination:	0.9962553
Average error:	11.138%
Average CF:	150.5242
RSD:	31.661%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5878.026	234.4178	30.204	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.3	13104	130.6481	-6.508	Manual
3	501.5	70879	141.334	9.564	Manual
4	1003	117796	117.4437	-7.998	Manual
5	2006	258328	128.7777	1.414	Manual

13 3,4-Dinitrotoluene



Expected retention time:	31.249 minutes
Search window:	0.18 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

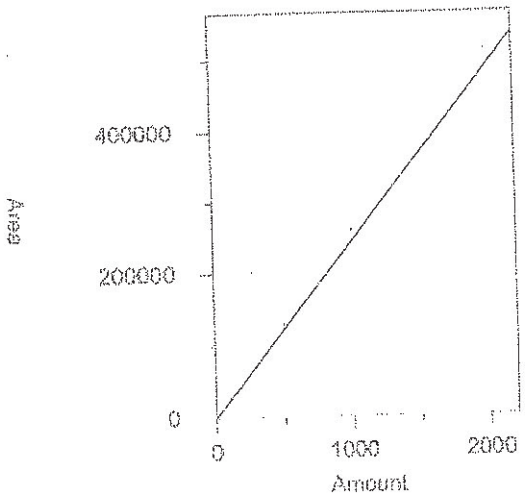
Single peak quantification by area

Y = 114.3201 X + 746.6834

Linear fit with equal weighting	
Coefficient of determination:	0.99705
Average error:	19.245%
Average CF:	140.6028
RSD:	29.730%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.2	4864	193.0159	34.085	Manual
2	100.8	18007.12	178.642	46.755	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	504	52826.8	104.8151	-9.487	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1008	110945	110.0645	-4.342	Manual
5	2016	234816.3	116.4763	1.557	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

14 2,4-DNT



Expected retention time: 32.757 minutes
Search window: 0.11 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

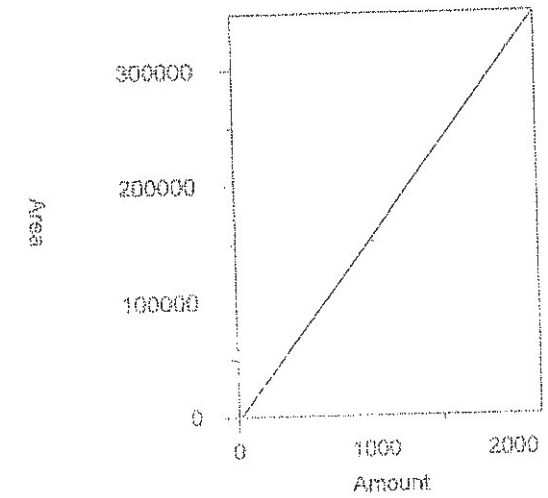
Single peak quantification by area

Y = 243.4707 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9938254
Average error: 12.519%
Average CF: 243.4707
RSD: 17.720%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	4186	167.2727	-31.297	Manual
2	100.1	27446.51	274.1909	12.618	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	500.5	129449.5	258.6404	6.231	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1001	260610.7	260.3503	6.933	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2002	514312.1	256.8991	5.515	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

15 Tetryl



Expected retention time: 33.791 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

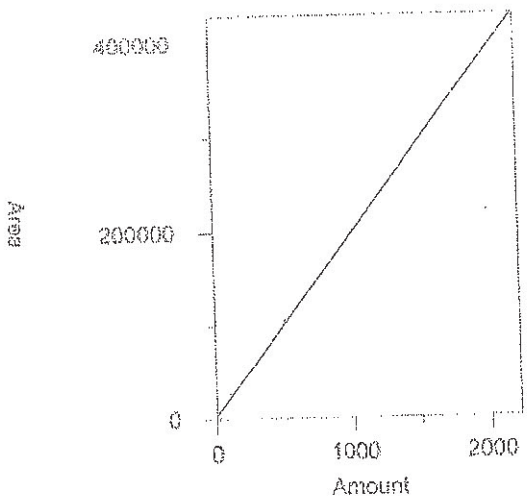
Single peak quantification by area

Y = 159.0213 X + -2990.364

Linear fit with equal weighting
Coefficient of determination: 0.9996614
Average error: 14.566%
Average CF: 124.8977
RSD: 48.832%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	413	16.48703	-58.414	Manual
2	100.2	14106.57	140.7841	8.985	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
3	501	78577.62	156.8416	2.476	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
4	1002	152437.5	152.1332	-2.502	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND
5	2004	317118.5	158.2428	0.453	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

16 2,4,6-TNT



Expected retention time:	34.758 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

Y = 193.2523 X + 4592.776

Linear fit with equal weighting	
Coefficient of determination:	0.9992185
Average error:	18.224%
Average CF:	196.0521
RSD:	30.652%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	2622	104.3582	-72.249	Manual
2	100.5	27397.48	272.6118	14.087	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502.5	104806.1	208.5694	3.052	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1005	201209.6	200.2086	1.206	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2010	390970.8	194.5128	-0.524	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

6D
INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:
Lab Code: Case No.: SAS No.: SDG No.:
Instrument: Y6329B Calibration File: 12CEXP1621101B
GC Column (4) : CAPCELL CN ID: 250 (mm) Update File:
Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT (3) RT (level 3)	RT WINDOW FROM	TO
HMX	4.05	4.05	4.04	4.03	4.03	4.03	3.93	4.13
Nitroglycerin	8.90	8.92	8.81	8.65	8.86	8.86	8.76	8.96
PETN	24.02	24.00	23.34	23.38	23.99	23.99	23.78	24.20

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6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B Calibration File: 12CEXP1621101B

GC Column (4) : CAPCELL CN ID: 250 (mm) Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	CALIBRATION FACTORS						%RSD
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	
HMX	4.80E+02	4.51E+02	4.42E+02	4.55E+02	4.31E+02	4.52E+02	4
Nitroglycerin	1.89E+02	1.64E+02	1.58E+02	1.61E+02	1.55E+02	1.65E+02	8
PETN	1.48E+02	1.34E+02	1.25E+02	1.18E+02	1.06E+02	1.26E+02	13
						Average % RSD:	8

File Name: V:\CP12\12cexp1621101B.CAL
Version: 24

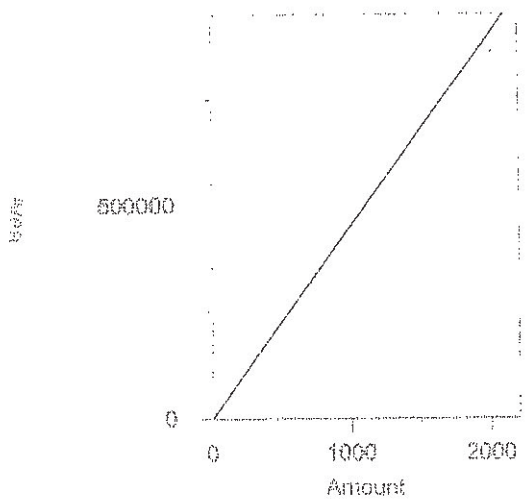
Creator:
Description:
Reason for change:

External standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time: 4.031 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

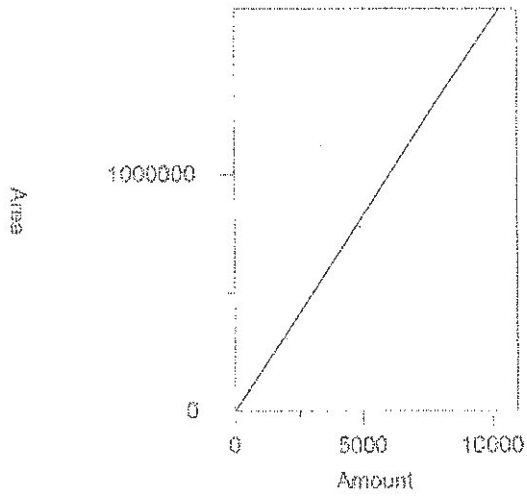
Single peak quantification by area

Y = 451.6414 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9963331
Average error: 2.773%
Average CF: 451.6414
RSD: 4.021%

Level	Amount	Response	Cal Factor	Error, %	Source	Da
1	25.015	11994.8	479.5043	6.169	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001B.0004.BND	7/3
2	100.06	45101.28	450.7424	-0.199	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001B.0005.BND	7/3
3	500.3	221258	442.2507	-2.079	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001B.0006.BND	7/3
4	1000.6	455362.5	455.0894	0.763	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001B.0007.BND	7/3
5	2001.2	861757.3	430.6203	-4.654	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001B.0008.BND	7/3

2 Nitroglycerin



Expected retention time:	8.858 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

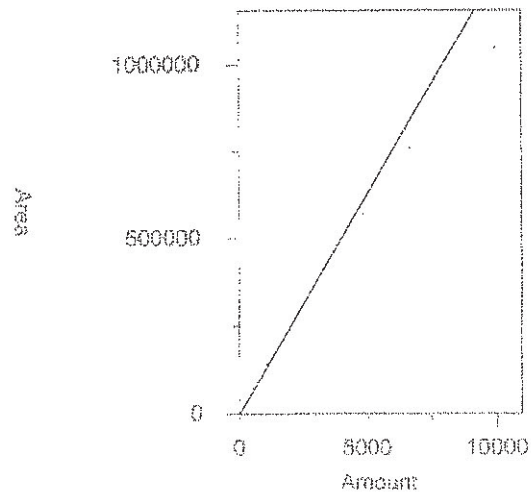
Y = 165.3441 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9924413
Average error:	5.680%
Average CF:	165.3441
RSD:	8.174%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	485.75	91720.05	188.8215	14.199	Manual	7/31/2016 4:55:02 PM
2	1063.86	174175.5	163.7203	-0.982	Manual	7/31/2016 4:55:07 PM
3	1947.18	307368	157.8529	-4.531	Manual	7/31/2016 4:55:10 PM
4	4857.82	782708.9	161.1235	-2.553	Manual	7/31/2016 4:55:14 PM
5	9956.51	1545275	155.2025	-6.134	Manual	7/31/2016 4:55:19 PM

3 PETN



Expected retention time:	23.992 minutes
Search window:	0.21 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

Y = 126.0229 X + 0

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9349322
Average error:	9.436%
Average CF:	126.0229
RSD:	12.677%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	484.69	71685	147.8987	17.359	Manual	7/31/2016 5:05:51 PM
2	1061.44	142101	133.8757	6.231	Manual	7/31/2016 5:06:02 PM
3	1942.16	242496.5	124.8592	-0.923	Manual	7/31/2016 4:55:35 PM
4	4845.76	570434	117.7182	-6.590	Manual	7/31/2016 4:55:42 PM
5	9931.88	1050426	105.7631	-16.076	Manual	7/31/2016 4:55:46 PM

6D

INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Calibration File: 12CEXP1621102

GC Column (3): CAPCELL CN ID: 250 (mm) Update File: 12CEXP16211002.0029.RAW

Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
HMX			4.07			4.07	3.97	4.17
RDX			4.99			4.99	4.89	5.09
3,5-Dinitroaniline			10.84			10.84	10.74	10.94
Nitrobenzene			12.39			12.39	12.23	12.55
4-Amino-2,6-dinitrotoluene			16.37			16.37	16.21	16.53
2-Amino-4,6-dinitrotoluene			16.38			16.38	16.22	16.54
1,3-DNB			18.32			18.32	18.17	18.47
2-Nitrotoluene			23.61			23.61	23.35	23.87
3-Nitrotoluene			26.97			26.97	26.71	27.23
4-Nitrotoluene			26.97			26.97	26.71	27.23
1,3,5-Trinitrobenzene			28.64			28.64	28.44	28.84
2,6-Dinitrotoluene			29.90			29.90	29.60	30.20
3,4-Dinitrotoluene			32.09			32.09	31.91	32.27
2,4-Dinitrotoluene			33.36			33.36	33.25	33.47
Tetryl			34.21			34.21	34.11	34.31
2,4,6-Trinitrotoluene			35.16			35.16	35.06	35.26

Coelute

RT Update

File used : 12CEXP16211002.0029

Applies to : 12CEXP16211002.0001-.0029

James H. Placo
Senior Chemist

AUG 0 2 2016

Auth. Validity

AUG 0 2 2016

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Calibration File: 12CEXP1621102

GC Column (3): CAPCELL CN ID: 250 (mm) Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	CALIBRATION FACTORS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	%RSD	
HMX	3.96E+01	9.40E+01	9.37E+01	9.77E+01	9.27E+01	8.35E+01	30	Linear
RDX	1.69E+02	1.30E+02	1.19E+02	1.12E+02	1.08E+02	1.28E+02	19	
3,5-Dinitroaniline	4.07E+02	2.49E+02	2.31E+02	2.24E+02	2.20E+02	2.66E+02	30	Linear
Nitrobenzene	2.82E+02	1.82E+02	1.69E+02	1.63E+02	1.61E+02	1.91E+02	27	
4-Amino-2,6-dinitrotoluene	4.75E+02	4.00E+02	3.65E+02	3.61E+02	3.52E+02	3.91E+02	13	
2-Amino-4,6-dinitrotoluene	4.76E+02	4.01E+02	3.66E+02	3.61E+02	3.53E+02	3.91E+02	13	
1,3-DNB	4.35E+02	3.22E+02	3.11E+02	3.01E+02	2.94E+02	3.33E+02	17	
2-Nitrotoluene	2.33E+02	1.14E+02	1.12E+02	1.10E+02	1.06E+02	1.35E+02	41	Linear
3-Nitrotoluene	2.85E+02	1.90E+02	1.85E+02	1.66E+02	1.85E+02	2.02E+02	23	
4-Nitrotoluene	2.86E+02	1.91E+02	1.86E+02	1.66E+02	1.86E+02	2.03E+02	23	
1,3,5-Trinitrobenzene	2.59E+02	2.13E+02	2.26E+02	2.24E+02	2.57E+02	2.36E+02	9	
2,6-Dinitrotoluene	2.34E+02	1.31E+02	1.41E+02	1.17E+02	1.29E+02	1.51E+02	32	Linear
3,4-Dinitrotoluene	1.93E+02	1.79E+02	1.05E+02	1.10E+02	1.16E+02	1.41E+02	30	
2,4-Dinitrotoluene	1.67E+02	2.74E+02	2.59E+02	2.60E+02	2.57E+02	2.43E+02	18	
Tetryl	1.65E+01	1.41E+02	1.57E+02	1.52E+02	1.58E+02	1.25E+02	49	Linear
2,4,6-Trinitrotoluene	1.04E+02	2.73E+02	2.09E+02	2.00E+02	1.95E+02	1.96E+02	31	

Average % RSD: 25

Calculate

James H. Place
Senior Chemist

AUG 0 2 2016

File Name: V:\CP12\12Cexp1621102.CAL
Version: 1

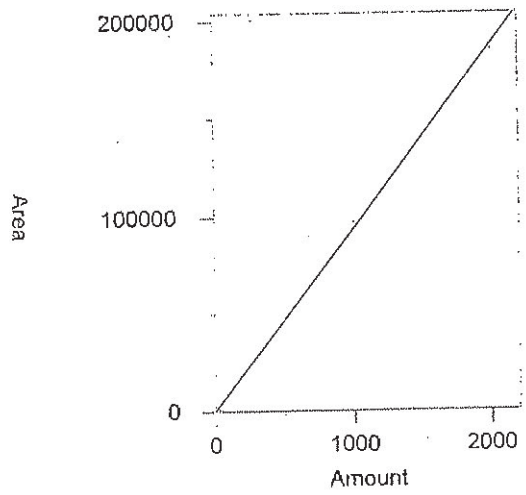
Creator:
Description:
Reason for change:

External standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time:	4.069 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

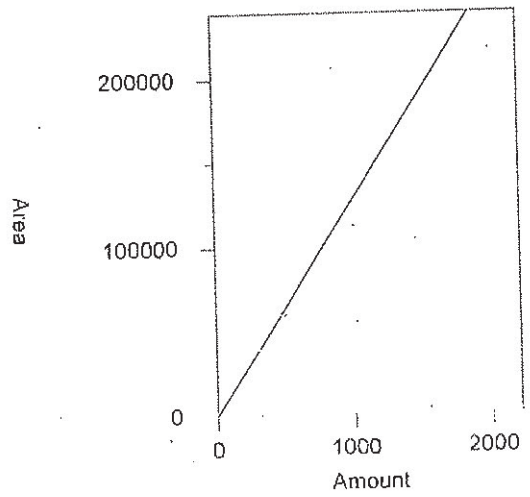
Y = 93.47101 X + 286.7556

Linear fit with equal weighting

Coefficient of determination:	0.9990436
Average error:	14.065%
Average CF:	83.52895
RSD:	29.509%

Level	Amount	Response	Cal Factor	Error, %	Source	Date
1	25.015	989.8299	39.56945	-62.291	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND	7/31/
2	100.06	9409.896	94.04254	-2.382	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND	7/31/
3	500.3	46854.54	93.65289	-0.416	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND	7/31/
4	1000.6	97772.98	97.71435	4.220	\\USLAN-CHRDMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND	7/31/
5	2001.2	185442.2	92.6655	-1.014	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND	7/31/

2 RDX



Expected retention time:	4.985 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

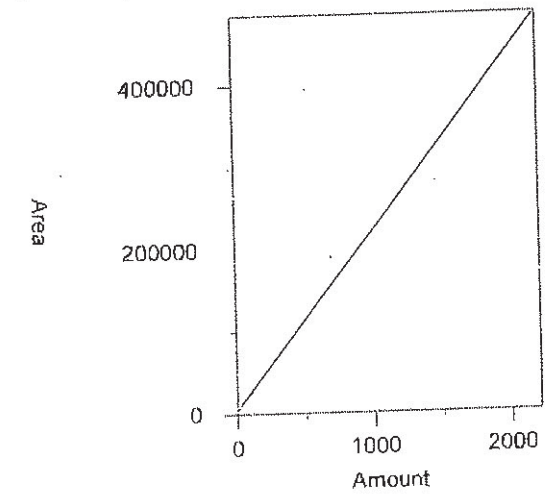
Single peak quantification by area

Y = 127.61 X + 0

Average CF fit with equal weighting, forced to origin	
Coefficient of determination:	0.9412987
Average error:	13.641%
Average CF:	127.61
RSD:	19.226%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	4240.228	168.9334	32.383	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.4	13032.28	129.8036	1.719	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502	59883.89	119.2906	-6.519	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1004	112280.9	111.8336	-12.363	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2008	217243.5	108.189	-15.219	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

3 3,5-dinitroaniline



Expected retention time:	10.843 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

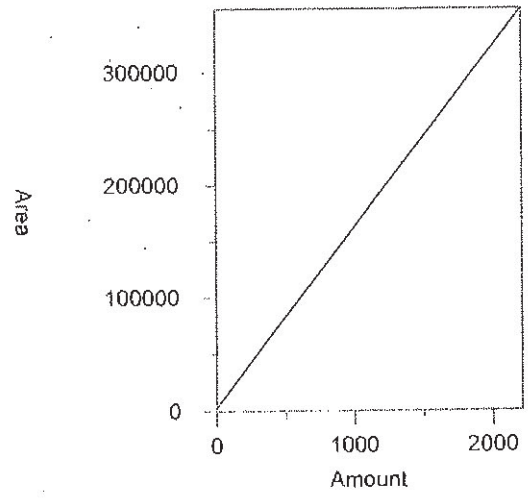
Single peak quantification by area

Y = 217.7032 X + 5084.649

Linear fit with equal weighting	
Coefficient of determination:	0.9999126
Average error:	2.576%
Average CF:	266.3089
RSD:	29.810%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	10213	406.8924	-3.185	Manual
2	100.4	25019	249.1932	-7.138	Manual
3	502	116177.5	231.4293	1.579	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
4	1004	225267.2	224.3697	0.719	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND
5	2008	441077.2	219.66	-0.261	

4 Nitrobenzene



Expected retention time:	12.388 minutes
Search window:	0.16 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

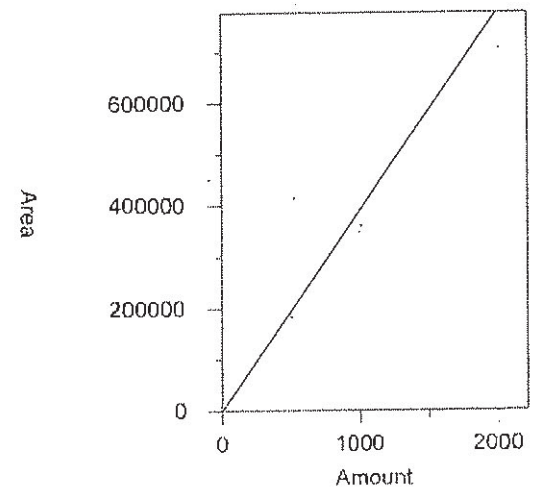
Single peak quantification by area

Y = 159.699 X + 3133.753

Linear fit with equal weighting	
Coefficient of determination:	0.9999601
Average error:	1.494%
Average CF:	191.2579
RSD:	26.891%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	7074	282.1136	-0.899	Manual
2	100.3	18226	181.7148	-4.833	Manual
3	501.5	84554.1	168.6024	1.600	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1003	163200.3	162.7122	-0.068	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2006	323260	161.1466	-0.071	Manual

5 4-Am-2,6-DNT



Expected retention time:	16.374 minutes
Search window:	0.16 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

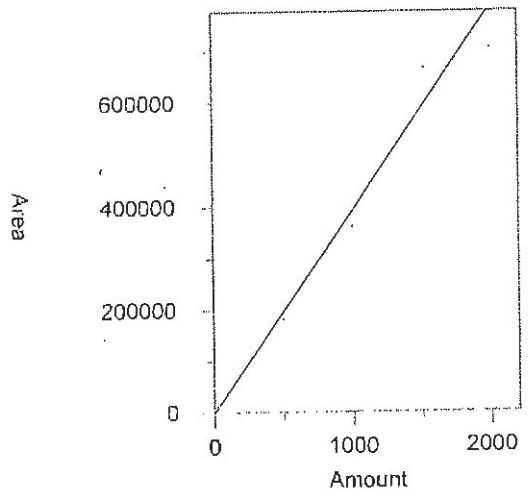
Single peak quantification by area

Y = 390.6894 X + 0

Average CF fit with equal weighting, forced to origin	
Coefficient of determination:	0.9783103
Average error:	9.634%
Average CF:	390.6894
RSD:	12.958%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	11912.02	475.0556	21.594	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.3	40161.76	400.4164	2.490	Manual
3	501.5	183130.3	365.1651	-6.533	Manual
4	1003	361759.3	360.6773	-7.682	Manual
5	2006	706378	352.1326	-9.869	Manual

6 2-Am-4,6-DNT



Expected retention time: 16.375 minutes
Search window: 0.16 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

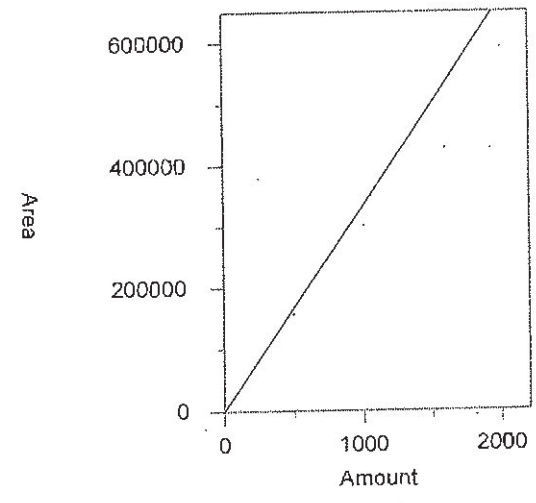
Single peak quantification by area

Y = 391.47 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9783103
Average error: 9.634%
Average CF: 391.47
RSD: 12.958%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	11912.02	476.0048	21.594	Manual
2	100.1	40161.76	401.2164	2.490	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	500.5	183130.3	365.8947	-6.533	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1001	361759.3	361.3979	-7.682	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2002	706378	352.8362	-9.869	Manual

7 1,3-DNB



Expected retention time: 18.323 minutes
Search window: 0.15 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

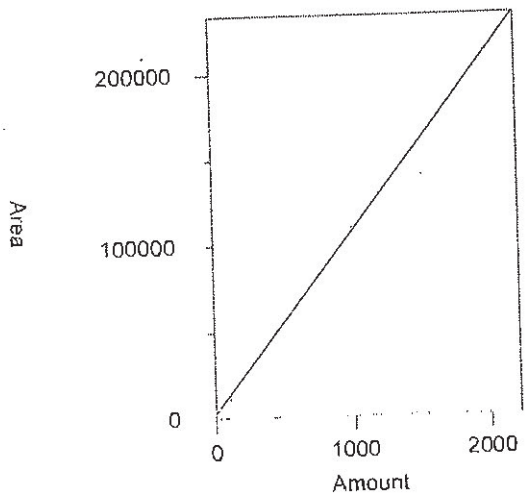
Single peak quantification by area

Y = 332.8964 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9687725
Average error: 12.247%
Average CF: 332.8964
RSD: 17.407%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	10892.23	434.8196	30.617	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.2	32300.18	322.3571	-3.166	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	501	156048.5	311.4741	-6.435	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1002	302065.9	301.463	-9.442	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2004	589914.3	294.3684	-11.574	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

8 2-NT



Expected retention time:	23.612 minutes
Search window:	0.26 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

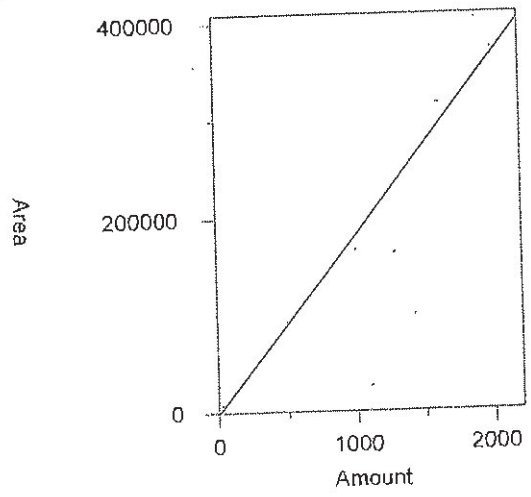
Single peak quantification by area

Y = 104.7342 X + 2906.16

Linear fit with equal weighting	
Coefficient of determination:	0.9996743
Average error:	4.859%
Average CF:	134.8939
RSD:	40.815%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	5859.8	233.2259	5.818	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.5	11450.75	113.9378	-14.750	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502.5	56340.11	112.1196	1.450	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1005	110084.5	109.5368	1.775	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2010	212355.5	105.6495	-0.500	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

9 4-NT



Expected retention time:	26.967 minutes
Search window:	0.26 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

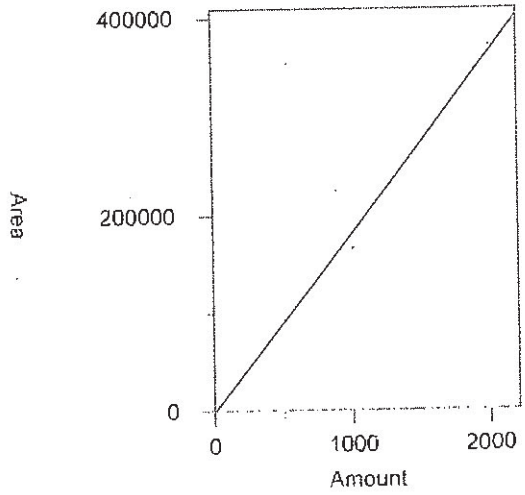
Single peak quantification by area

Y = 182.9801 X + -1257.135

Linear fit with equal weighting	
Coefficient of determination:	0.9965405
Average error:	28.124%
Average CF:	202.9486
RSD:	23.343%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	7158	286.034	115.476	Manual
2	100.1	19112	190.9291	12.034	Manual
3	500.5	92873	185.5604	2.822	Manual
4	1001	166606.3	166.4398	-8.411	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2002	371931	185.7797	1.880	Manual

10 3-NT



Expected retention time: 26.968 minutes
Search window: 0.26 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

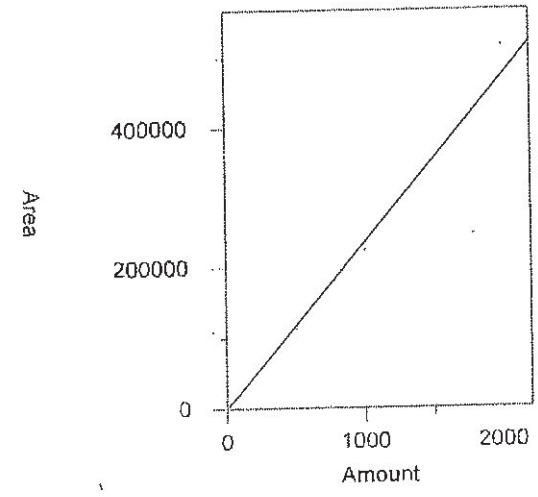
Single peak quantification by area

Y = 182.4333 X + -1257.155

Linear fit with equal weighting
Coefficient of determination: 0.9965405
Average error: 28.125%
Average CF: 202.3422
RSD: 23.343%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.1	7158	285.1793	115.478	Manual	7/31/2016 4:56:35 PM
2	100.4	19112	190.3586	12.034	Manual	7/31/2016 4:57:30 PM
3	502	92873	185.006	2.822	Manual	7/31/2016 4:58:26 PM
4	1004	166606.3	165.9425	-8.411	Manual	7/31/2016 4:59:44 PM
5	2008	371931	185.2246	1.880	Manual	7/31/2016 5:01:09 PM

11 1,3,5-TNB



Expected retention time: 28.639 minutes
Search window: 0.2 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

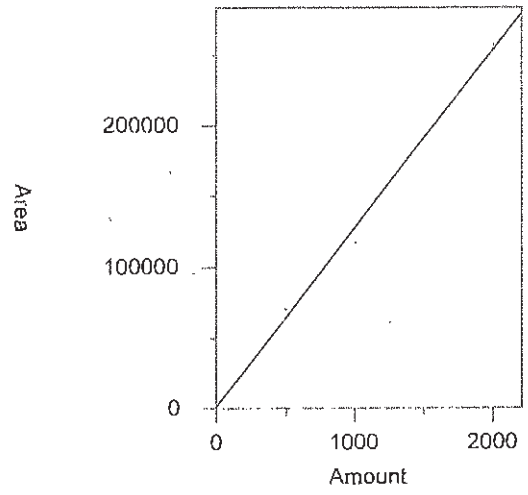
Single peak quantification by area

Y = 235.9349 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9885247
Average error: 7.520%
Average CF: 235.9349
RSD: 8.821%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.075	6493	258.9432	9.752	Manual	7/31/2016 4:56:40 PM
2	100.3	21403	213.3898	-9.556	Manual	7/31/2016 4:57:36 PM
3	501.5	113282	225.8863	-4.259	Manual	7/31/2016 4:58:49 PM
4	1003	224845	224.1725	-4.985	Manual	7/31/2016 4:59:49 PM
5	2006	516109	257.2827	9.048	Manual	7/31/2016 5:01:21 PM

12 2,6-DNT



Expected retention time:	29.897 minutes
Search window:	0.3 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

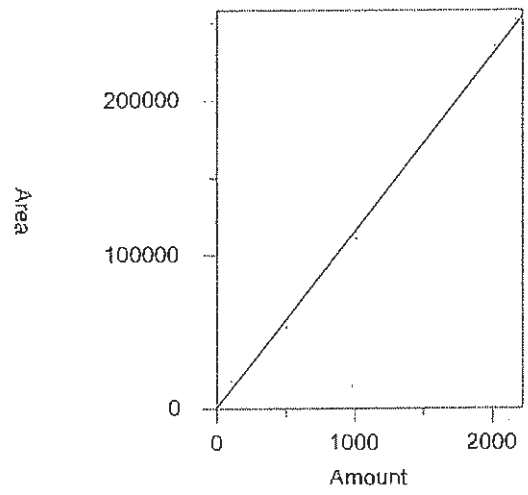
Single peak quantification by area

Y = 126.3104 X + 1347.232

Linear fit with equal weighting	
Coefficient of determination:	0.9962553
Average error:	11.138%
Average CF:	150.5242
RSD:	31.661%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5878.026	234.4178	30.204	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.3	13104	130.6481	-6.508	Manual
3	501.5	70879	141.334	9.564	Manual
4	1003	117796	117.4437	-7.998	Manual
5	2006	258328	128.7777	1.414	Manual

13 3,4-Dinitrotoluene



Expected retention time:	32.089 minutes
Search window:	0.18 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

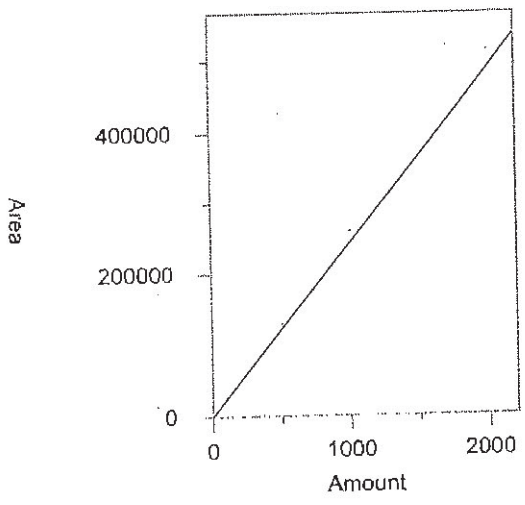
Single peak quantification by area

Y = 114.3201 X + 746.6834

Linear fit with equal weighting	
Coefficient of determination:	0.99705
Average error:	19.245%
Average CF:	140.6028
RSD:	29.730%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.2	4864	193.0159	34.085	Manual
2	100.8	18007.12	178.642	46.755	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	504	52826.8	104.8151	-9.487	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1008	110945	110.0645	-4.342	Manual
5	2016	234816.3	116.4763	1.557	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

14 2,4-DNT



Expected retention time: 33.36 minutes
Search window: 0.11 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

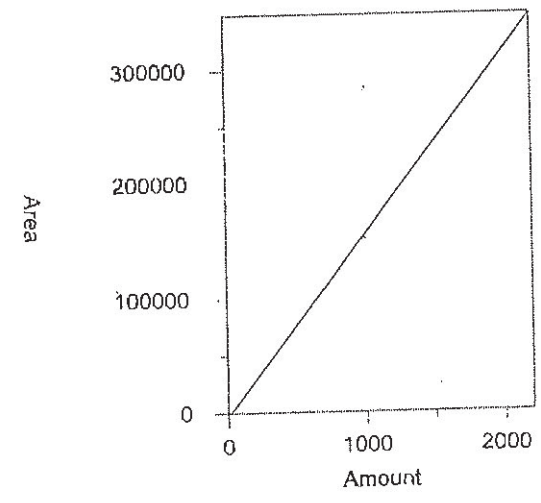
Single peak quantification by area

Y = 243.4707 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9938254
Average error: 12.519%
Average CF: 243.4707
RSD: 17.720%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	4186	167.2727	-31.297	Manual
2	100.1	27446.51	274.1909	12.618	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	500.5	129449.5	258.6404	6.231	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1001	260610.7	260.3503	6.933	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2002	514312.1	256.8991	5.515	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

15 Tetryl



Expected retention time: 34.21 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

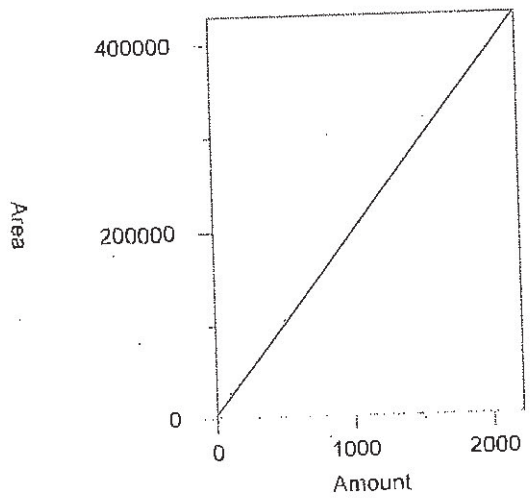
Single peak quantification by area

Y = 159.0213 X + -2990.364

Linear fit with equal weighting
Coefficient of determination: 0.9996614
Average error: 14.566%
Average CF: 124.8977
RSD: 48.832%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	413	16.48703	-58.414	Manual
2	100.2	14106.57	140.7841	8.985	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	501	78577.62	156.8416	2.476	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1002	152437.5	152.1332	-2.502	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2004	317118.5	158.2428	0.453	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

16 2,4,6-TNT



Expected retention time:	35.163 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

Y = 193.2523 X + 4592.776

Linear fit with equal weighting	
Coefficient of determination:	0.9992185
Average error:	18.224%
Average CF:	196.0521
RSD:	30.652%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	2622	104.3582	-72.249	Manual
2	100.5	27397.48	272.6118	14.087	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502.5	104806.1	208.5694	3.052	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1005	201209.6	200.2086	1.206	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2010	390970.8	194.5128	-0.524	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

6D
INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:
Lab Code: Case No.: SAS No.: SDG No.:
Instrument: Y6329B Calibration File: 12CEXP1621102B
GC Column (4) : CAPCELL CN ID: 250 (mm) Update File: 12CEXP16211002B.0029.RAW
Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
HMX			4.22			4.22	4.12	4.32
Nitroglycerin			9.29			9.29	9.19	9.39
PETN			25.20			25.20	24.99	25.41

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B Calibration File: 12CEXP1621102B

GC Column (4) : CAPCELL CN ID: 250 (mm) Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	CALIBRATION FACTORS					MEAN	%RSD
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5		
HMX	4.80E+02	4.51E+02	4.42E+02	4.55E+02	4.31E+02	4.52E+02	4
Nitroglycerin	1.89E+02	1.64E+02	1.58E+02	1.61E+02	1.55E+02	1.65E+02	8
PETN	1.48E+02	1.34E+02	1.25E+02	1.18E+02	1.06E+02	1.26E+02	13

Average %RSD: 8

File Name: V:\CP12\12Cexp1621102B.CAL
Version: 1

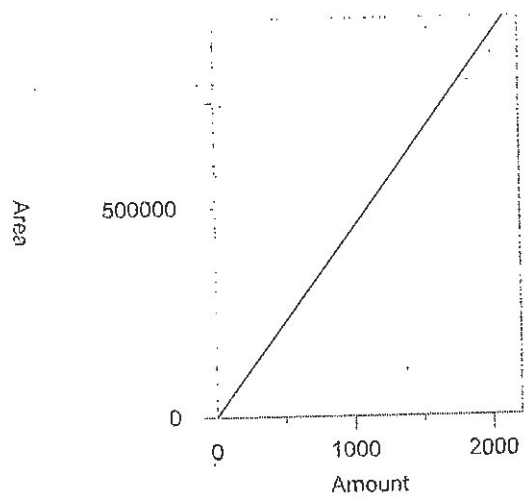
Creator:
Description:
Reason for change:

External standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time: 4.215 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

Single peak quantification by area

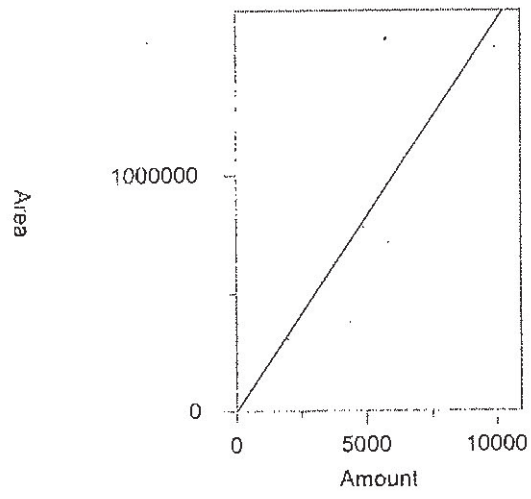
Y = 451.6414 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9963331
Average error: 2.773%
Average CF: 451.6414
RSD: 4.021%

Level	Amount	Response	Cal Factor	Error, %	Source	Dat
1	25.015	11994.8	479.5043	6.169	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0004.BND	7/3
2	100.06	45101.28	450.7424	-0.199	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0005.BND	7/3
3	500.3	221258	442.2507	-2.079	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0006.BND	7/3
4	1000.6	455362.5	455.0894	0.763	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0007.BND	7/3
5	2001.2	861757.3	430.6203	-4.654	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0008.BND	7/3

2 Nitroglycerin

Printed on 8/2/2016 4:04:59 PM



Expected retention time: 9.285 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

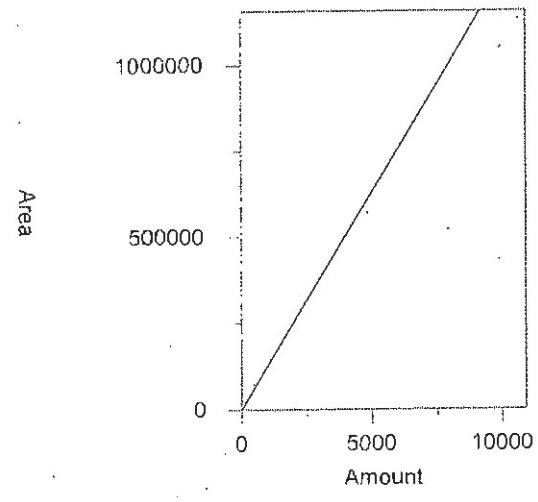
Single peak quantification by area

Y = 165.3441 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9924413
Average error: 5.680%
Average CF: 165.3441
RSD: 8.174%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	485.75	91720.05	188.8215	14.199	Manual	7/31/2016 4:55:02 PM
2	1063.86	174175.5	163.7203	-0.982	Manual	7/31/2016 4:55:07 PM
3	1947.18	307368	157.8529	-4.531	Manual	7/31/2016 4:55:10 PM
4	4857.82	782708.9	161.1235	-2.553	Manual	7/31/2016 4:55:14 PM
5	9956.51	1545275	155.2025	-6.134	Manual	7/31/2016 4:55:19 PM

3 PETN



Expected retention time: 25.196 minutes
Search window: 0.21 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

Single peak quantification by area

Y = 126.0229 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9349322
Average error: 9.436%
Average CF: 126.0229
RSD: 12.677%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	484.69	71685	147.8987	17.359	Manual	7/31/2016 5:05:51 PM
2	1061.44	142101	133.8757	6.231	Manual	7/31/2016 5:06:02 PM
3	1942.16	242496.5	124.8592	-0.923	Manual	7/31/2016 4:55:35 PM
4	4845.76	570434	117.7182	-6.590	Manual	7/31/2016 4:55:42 PM
5	9931.88	1050426	105.7631	-16.076	Manual	7/31/2016 4:55:46 PM

6D
INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:
Lab Code: Case No.: SAS No.: SDG No.:
Instrument: Y6329A Calibration File: 12CEXP1621103
GC Column (3) : CAPCELL CN ID: 250 (mm) Update File: 12CEXP16211003.0048.RAW
Date(s) Analyzed: 8/3/2016 8/3/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
HMX			4.09			4.09	3.99	4.19
RDX			5.01			5.01	4.91	5.11
3,5-Dinitroaniline			10.77			10.77	10.67	10.87
Nitrobenzene			12.29			12.29	12.13	12.45
2-Amino-4,6-dinitrotoluene			16.05			16.05	15.89	16.21
4-Amino-2,6-dinitrotoluene			16.05			16.05	15.89	16.21
1,3-DNB			18.18			18.18	18.03	18.33
2-Nitrotoluene			23.20			23.20	22.94	23.46
3-Nitrotoluene			26.61			26.61	26.35	26.87
4-Nitrotoluene			26.61			26.61	26.35	26.87
1,3,5-Trinitrobenzene			28.49			28.49	28.29	28.69
2,6-Dinitrotoluene			29.13			29.13	28.83	29.43
3,4-Dinitrotoluene			31.84			31.84	31.66	32.02
2,4-Dinitrotoluene			33.26			33.26	33.15	33.37
Tetryl			34.12			34.12	34.02	34.22
2,4,6-Trinitrotoluene			35.12			35.12	35.02	35.22

Coelute

Applies to: 12CEXP16211003.0001-7
old Cal: 12CEXP1621102
New Cal: 12CEXP1621103
File used: 12CEXP16211003.0048.

By: James H. Place, Senior Chemist AUG 08 2016

Audited By: AUG 07 2016

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Calibration File: 12CEXP1621103

GC Column (3) : CAPCELL CN ID: 250 (mm) Date(s) Analyzed: 8/3/2016 8/3/2016

COMPOUND	CALIBRATION FACTORS						%RSD	
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN		
HMX	3.96E+01	9.40E+01	9.37E+01	9.77E+01	9.27E+01	8.35E+01	30	Linear
RDX	1.69E+02	1.30E+02	1.19E+02	1.12E+02	1.08E+02	1.28E+02	19	
3,5-Dinitroaniline	4.07E+02	2.49E+02	2.31E+02	2.24E+02	2.20E+02	2.66E+02	30	Linear
Nitrobenzene	2.82E+02	1.82E+02	1.69E+02	1.63E+02	1.61E+02	1.91E+02	27	
2-Amino-4,6-dinitrotoluene	4.76E+02	4.01E+02	3.66E+02	3.61E+02	3.53E+02	3.91E+02	13	
4-Amino-2,6-dinitrotoluene	4.75E+02	4.00E+02	3.65E+02	3.61E+02	3.52E+02	3.91E+02	13	
1,3-DNB	4.35E+02	3.22E+02	3.11E+02	3.01E+02	2.94E+02	3.33E+02	17	
2-Nitrotoluene	2.33E+02	1.14E+02	1.12E+02	1.10E+02	1.06E+02	1.35E+02	41	Linear
3-Nitrotoluene	2.85E+02	1.90E+02	1.85E+02	1.66E+02	1.85E+02	2.02E+02	23	
4-Nitrotoluene	2.86E+02	1.91E+02	1.86E+02	1.66E+02	1.86E+02	2.03E+02	23	
1,3,5-Trinitrobenzene	2.59E+02	2.13E+02	2.26E+02	2.24E+02	2.57E+02	2.36E+02	9	
2,6-Dinitrotoluene	2.34E+02	1.31E+02	1.41E+02	1.17E+02	1.29E+02	1.51E+02	32	Linear
3,4-Dinitrotoluene	1.93E+02	1.79E+02	1.05E+02	1.10E+02	1.16E+02	1.41E+02	30	
2,4-Dinitrotoluene	1.67E+02	2.74E+02	2.59E+02	2.60E+02	2.57E+02	2.43E+02	18	
Tetryl	1.65E+01	1.41E+02	1.57E+02	1.52E+02	1.58E+02	1.25E+02	49	Linear
2,4,6-Trinitrotoluene	1.04E+02	2.73E+02	2.09E+02	2.00E+02	1.95E+02	1.96E+02	31	

Average % RSD: 25

Co-elute

James H. Place
Senior Chemist

AUG 0 8 2016

File Name: V:\CP12\12Cexp1621103.CAL
Version: 1

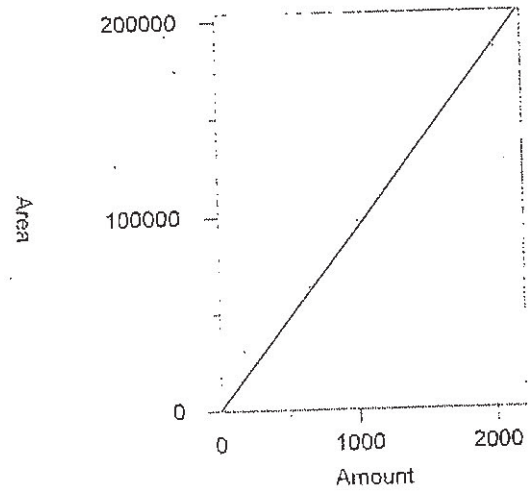
Creator:
Description:
Reason for change:

External standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time: 4.094 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

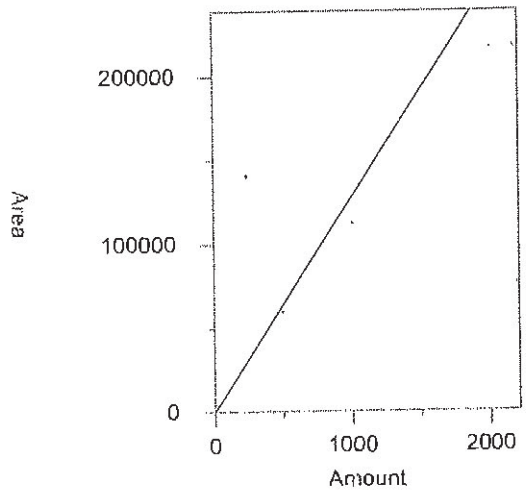
Single peak quantification by area

Y = 93.47101 X + 286.7556

Linear fit with equal weighting
Coefficient of determination: 0.9990436
Average error: 14.065%
Average CF: 83.52895
RSD: 29.509%

Level	Amount	Response	Cal Factor	Error, %	Source	Date
1	25.015	989.8299	39.56945	-62.291	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND	7/31/
2	100.06	9409.896	94.04254	-2.382	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND	7/31/
3	500.3	46854.54	93.65289	-0.416	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND	7/31/
4	1000.6	97772.98	97.71435	4.220	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND	7/31/
5	2001.2	185442.2	92.6655	-1.014	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND	7/31/

2 RDX



Expected retention time: 5.013 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

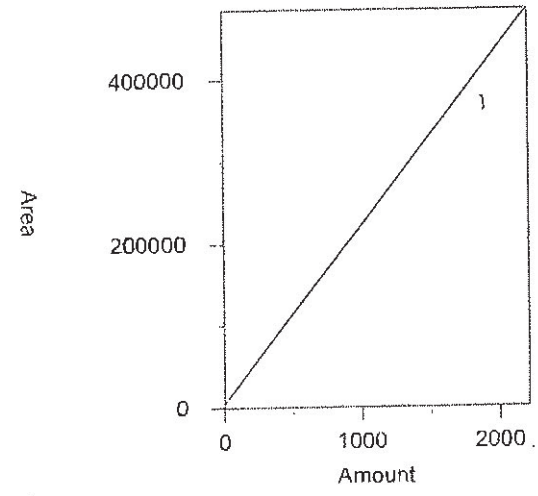
Single peak quantification by area

Y = 127.61 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9412987
Average error: 13.641%
Average CF: 127.61
RSD: 19.226%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	4240.228	168.9334	32.383	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.4	13032.28	129.8036	1.719	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502	59883.89	119.2906	-6.519	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1004	112280.9	111.8336	-12.363	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2008	217243.5	108.189	-15.219	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

3 3,5-dinitroaniline



Expected retention time: 10.769 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

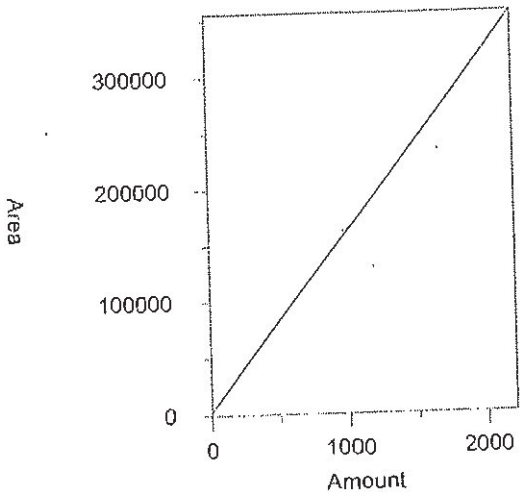
Single peak quantification by area

Y = 217.7032 X + 5084.649

Linear fit with equal weighting
Coefficient of determination: 0.9999126
Average error: 2.576%
Average CF: 266.3089
RSD: 29.810%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	10213	406.8924	-3.185	Manual
2	100.4	25019	249.1932	-7.138	Manual
3	502	116177.5	231.4293	1.579	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1004	225267.2	224.3697	0.719	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2008	441077.2	219.66	-0.261	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

4 Nitrobenzene



Expected retention time: 12.29 minutes
Search window: 0.16 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

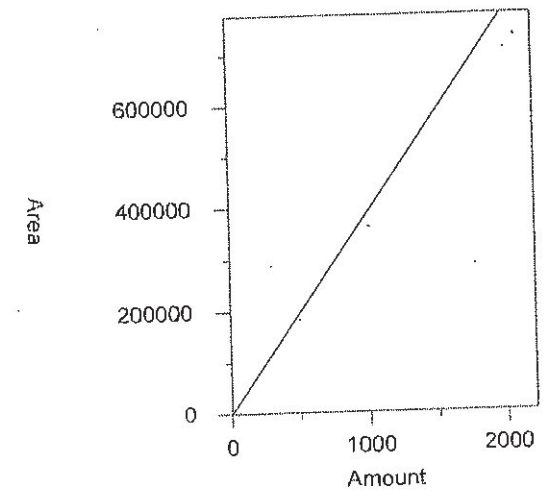
Single peak quantification by area

Y = 159.699 X + 3133.753

Linear fit with equal weighting
Coefficient of determination: 0.9999601
Average error: 1.494%
Average CF: 191.2579
RSD: 26.891%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	7074	282.1136	-0.899	Manual
2	100.3	18226	181.7148	-4.833	Manual
3	501.5	84554.1	168.6024	1.600	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1003	163200.3	162.7122	-0.068	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2006	323260	161.1466	-0.071	Manual

5 4-Am-2,6-DNT



Expected retention time: 16.046 minutes
Search window: 0.16 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

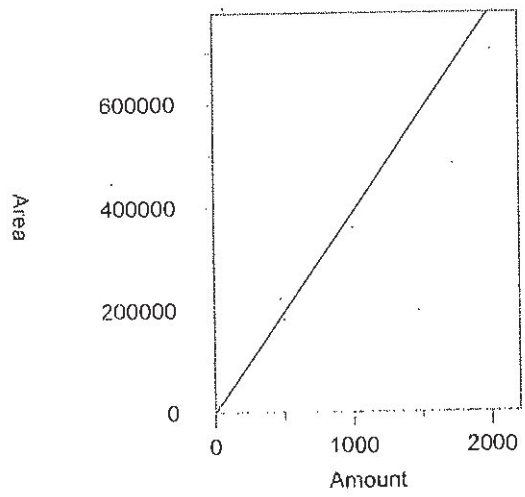
Single peak quantification by area

Y = 390.6894 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9783103
Average error: 9.634%
Average CF: 390.6894
RSD: 12.958%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	11912.02	475.0556	21.594	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.3	40161.76	400.4164	2.490	Manual
3	501.5	183130.3	365.1651	-6.533	Manual
4	1003	361759.3	360.6773	-7.682	Manual
5	2006	706378	352.1326	-9.869	Manual

6 2-Am-4,6-DNT



Expected retention time: 16.047 minutes
Search window: 0.16 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

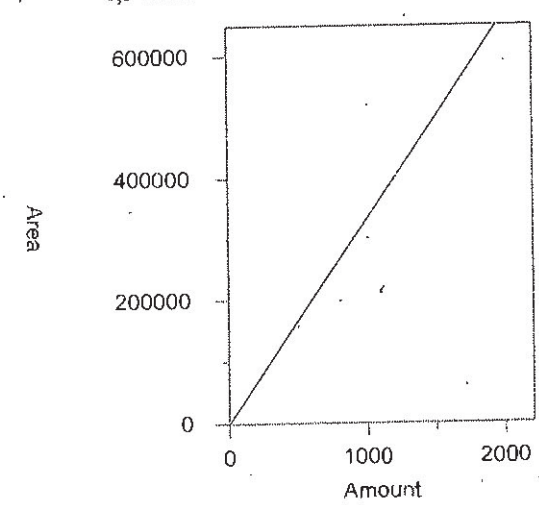
Single peak quantification by area

Y = 391.47 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9783103
Average error: 9.634%
Average CF: 391.47
RSD: 12.958%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	11912.02	476.0048	21.594	Manual
2	100.1	40161.76	401.2164	2.490	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	500.5	183130.3	365.8947	-6.533	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1001	361759.3	361.3979	-7.682	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2002	706378	352.8362	-9.869	Manual

7 1,3-DNB



Expected retention time: 18.18 minutes
Search window: 0.15 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

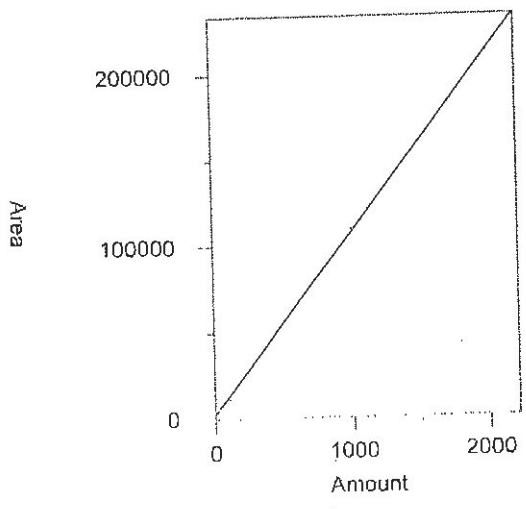
Single peak quantification by area

Y = 332.8964 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9687725
Average error: 12.247%
Average CF: 332.8964
RSD: 17.407%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	10892.23	434.8196	30.617	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.2	32300.18	322.3571	-3.166	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	501	156048.5	311.4741	-6.435	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1002	302065.9	301.463	-9.442	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2004	589914.3	294.3684	-11.574	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

8 2-NT



Expected retention time:	23.199 minutes
Search window:	0.26 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

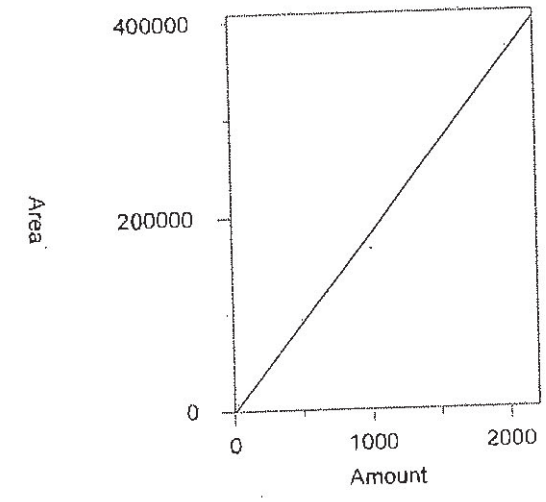
Single peak quantification by area

Y = 104.7342 X + 2906.16

Linear fit with equal weighting	
Coefficient of determination:	0.9996743
Average error:	4.859%
Average CF:	134.8939
RSD:	40.815%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	5859.8	233.2259	5.818	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.5	11450.75	113.9378	-14.750	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502.5	56340.11	112.1196	1.450	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1005	110084.5	109.5368	1.775	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2010	212355.5	105.6495	-0.500	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

9 4-NT



Expected retention time:	26.613 minutes
Search window:	0.26 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

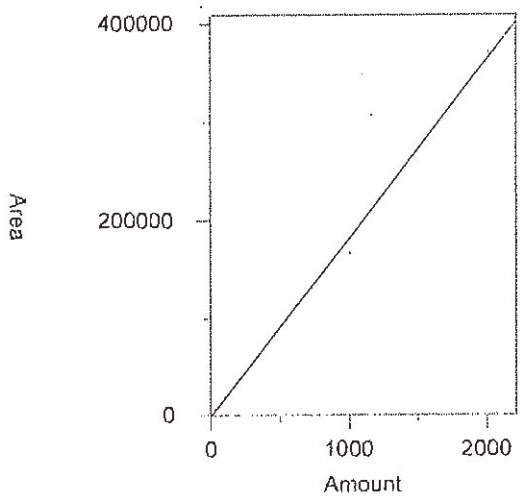
Single peak quantification by area

Y = 182.9801 X + -1257.135

Linear fit with equal weighting	
Coefficient of determination:	0.9965405
Average error:	28.124%
Average CF:	202.9486
RSD:	23.343%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	7158	286.034	115.476	Manual
2	100.1	19112	190.9291	12.034	Manual
3	500.5	92873	185.5604	2.822	Manual
4	1001	166606.3	166.4398	-8.411	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND.
5	2002	371931	185.7797	1.880	Manual

10 3-NT



Expected retention time: 26.614 minutes
Search window: 0.26 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

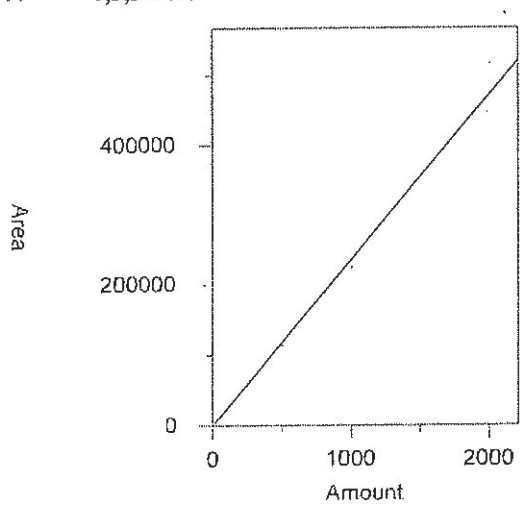
Single peak quantification by area

Y = 182.4333 X + -1257.155

Linear fit with equal weighting
Coefficient of determination: 0.9965405
Average error: 28.125%
Average CF: 202.3422
RSD: 23.343%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.1	7158	285.1793	115.478	Manual	7/31/2016 4:56:35 PM
2	100.4	19112	190.3586	12.034	Manual	7/31/2016 4:57:30 PM
3	502	92873	185.006	2.822	Manual	7/31/2016 4:58:26 PM
4	1004	166606.3	165.9425	-8.411	Manual	7/31/2016 4:59:44 PM
5	2008	371931	185.2246	1.880	Manual	7/31/2016 5:01:09 PM

11 1,3,5-TNB



Expected retention time: 28.49 minutes
Search window: 0.2 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

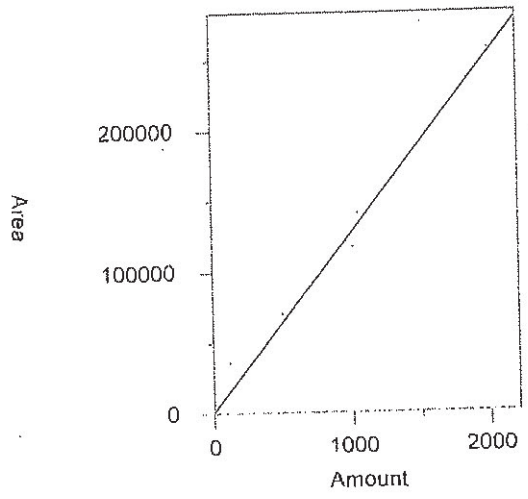
Single peak quantification by area

Y = 235.9349 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9885247
Average error: 7.520%
Average CF: 235.9349
RSD: 8.821%

Level	Amount	Respoose	Cal Factor	Error, %	Source	Date and time
1	25.075	6493	258.9432	9.752	Manual	7/31/2016 4:56:40 PM
2	100.3	21403	213.3898	-9.556	Manual	7/31/2016 4:57:36 PM
3	501.5	113282	225.8863	-4.259	Manual	7/31/2016 4:58:49 PM
4	1003	224845	224.1725	-4.985	Manual	7/31/2016 4:59:49 PM
5	2006	516109	257.2827	9.048	Manual	7/31/2016 5:01:21 PM

12 2,6-DNT



Expected retention time:	29.128 minutes
Search window:	0.3 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

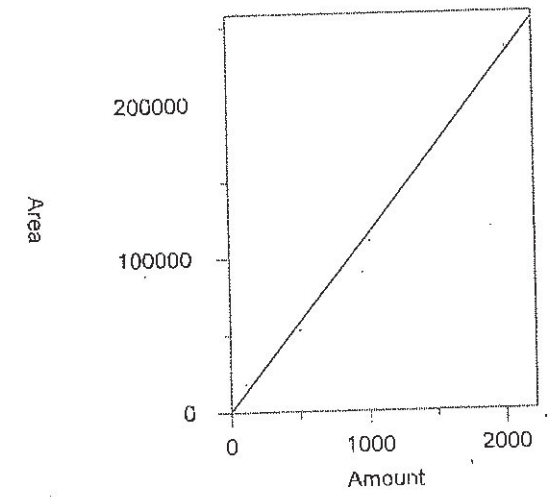
Single peak quantification by area

Y = 126.3104 X + 1347.232

Linear fit with equal weighting	
Coefficient of determination:	0.9962553
Average error:	11.138%
Average CF:	150.5242
RSD:	31.661%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5878.026	234.4178	30.204	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0004.BND
2	100.3	13104	130.6481	-6.508	Manual
3	501.5	70879	141.334	9.564	Manual
4	1003	117796	117.4437	-7.998	Manual
5	2006	258328	128.7777	1.414	Manual

13 3,4-Dinitrotoluene



Expected retention time:	31.844 minutes
Search window:	0.18 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

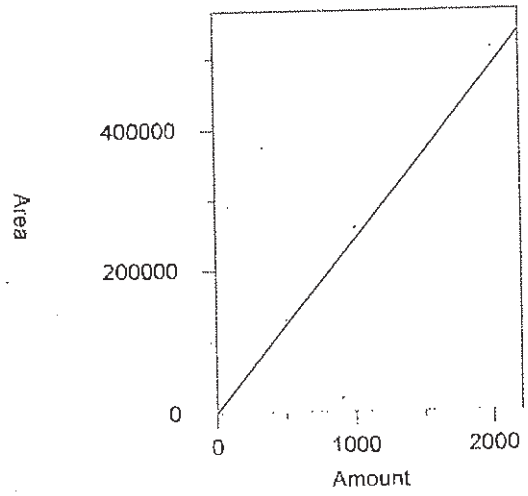
Single peak quantification by area

Y = 114.3201 X + 746.6834

Linear fit with equal weighting	
Coefficient of determination:	0.99705
Average error:	19.245%
Average CF:	140.6028
RSD:	29.730%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.2	4864	193.0159	34.085	Manual
2	100.8	18007.12	178.642	46.755	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	504	52826.8	104.8151	-9.487	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1008	110945	110.0645	-4.342	Manual
5	2016	234816.3	116.4763	1.557	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

14 2,4-DNT



Expected retention time: 33.264 minutes
Search window: 0.11 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

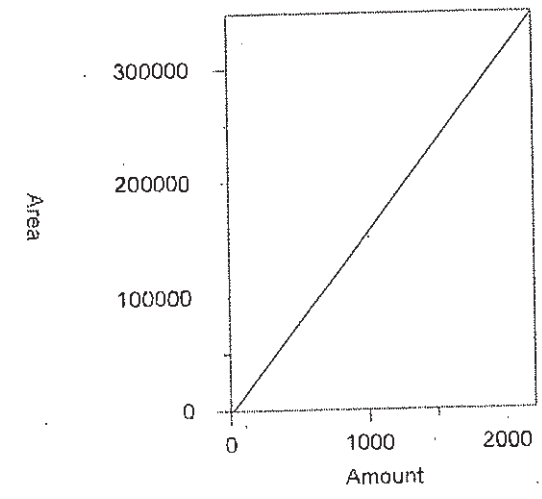
Single peak quantification by area

Y = 243.4707 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9938254
Average error: 12.519%
Average CF: 243.4707
RSD: 17.720%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	4186	167.2727	-31.297	Manual
2	100.1	27446.51	274.1909	12.618	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	500.5	129449.5	258.6404	6.231	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1001	260610.7	260.3503	6.933	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2002	514312.1	256.8991	5.515	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

15 Tetryl



Expected retention time: 34.124 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

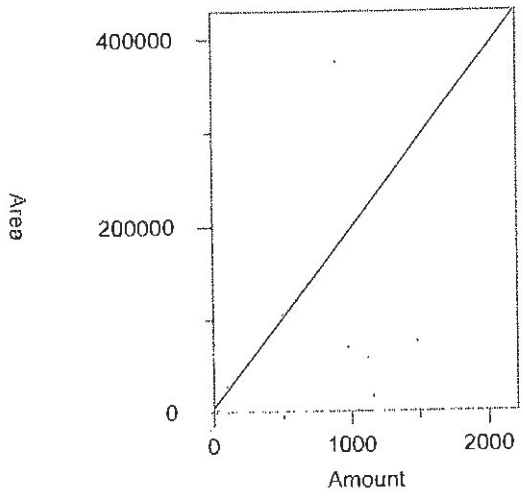
Single peak quantification by area

Y = 159.0213 X + -2990.364

Linear fit with equal weighting
Coefficient of determination: 0.9996614
Average error: 14.566%
Average CF: 124.8977
RSD: 48.832%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	413	16.48703	-58.414	Manual
2	100.2	14106.57	140.7841	8.985	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	501	78577.62	156.8416	2.476	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1002	152437.5	152.1332	-2.502	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2004	317118.5	158.2428	0.453	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

16 2,4,6-TNT



Expected retention time:	35.124 minutes
Search window:	0.1 minutes
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

Y = 193.2523 X + 4592.776

Linear fit with equal weighting	
Coefficient of determination:	0.9992185
Average error:	18.224%
Average CF:	196.0521
RSD:	30.652%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	2622	104.3582	-72.249	Manual
2	100.5	27397.48	272.6118	14.087	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0005.BND
3	502.5	104806.1	208.5694	3.052	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0006.BND
4	1005	201209.6	200.2086	1.206	\\USLAN-CHROMPERFECT\CHRDMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0007.BND
5	2010	390970.8	194.5128	-0.524	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp16211001.0008.BND

6D

INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B Calibration File: 12CEXP1621103B

GC Column (4): CAPCELL CN ID: 250 (mm) Update File: 12CEXP16211003B.0048.RAW

Date(s) Analyzed: 8/3/2016 8/3/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
HMX			4.25			4.25	4.15	4.35
Nitroglycerin			9.20			9.20	9.10	9.30
PETN			24.73			24.73	24.52	24.94

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B Calibration File: 12CEXP1621103B

GC Column (4) : CAPCELL CN ID: 250 (mm) Date(s) Analyzed: 8/3/2016 8/3/2016

COMPOUND	CALIBRATION FACTORS						%RSD
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	
HMX	4.80E+02	4.51E+02	4.42E+02	4.55E+02	4.31E+02	4.52E+02	4
Nitroglycerin	1.89E+02	1.64E+02	1.58E+02	1.61E+02	1.55E+02	1.65E+02	8
PETN	1.48E+02	1.34E+02	1.25E+02	1.18E+02	1.06E+02	1.26E+02	13

Average % RSD: 8

File Name: V:\CP12\12Cexp1621103B.CAL
Version: 1

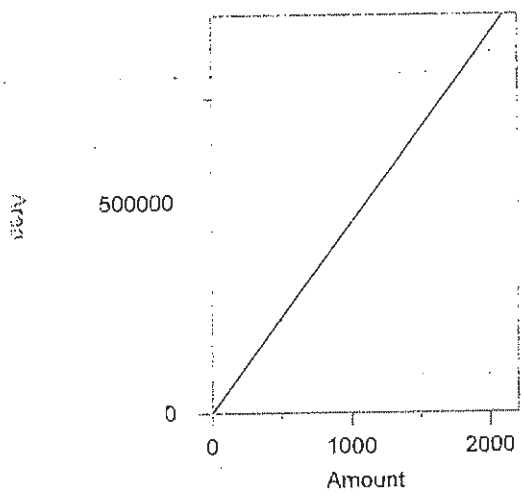
Creator:
Description:
Reason for change:

External standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time: 4.25 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

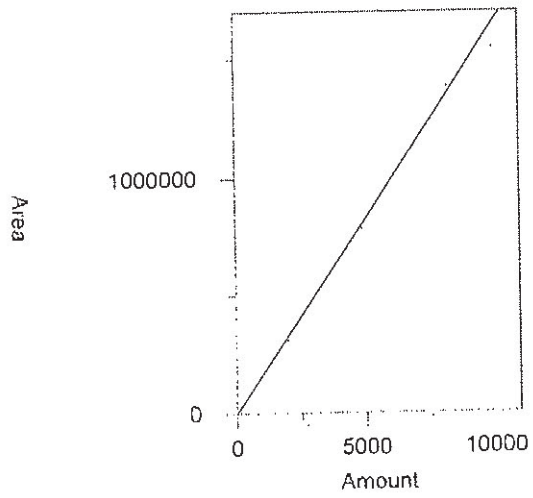
Single peak quantification by area

Y = 451.6414 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9963331
Average error: 2.773%
Average CF: 451.6414
RSD: 4.021%

Level	Amount	Response	Cal Factor	Error, %	Source	Da
1	25.015	11994.8	479.5043	6.169	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0004.BND	7/3
2	100.06	45101.28	450.7424	-0.199	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0005.BND	7/3
3	500.3	221258	442.2507	-2.079	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0006.BND	7/3
4	1000.6	455362.5	455.0894	0.763	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0007.BND	7/3
5	2001.2	861757.3	430.6203	-4.654	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12cexp1621001B.0008.BND	7/3

2 Nitroglycerin



Expected retention time: 9.203 minutes
Search window: 0.1 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

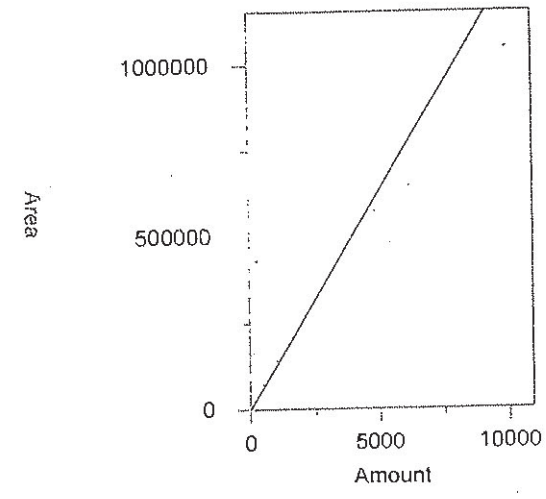
Single peak quantification by area

Y = 165.3441 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9924413
Average error: 5.680%
Average CF: 165.3441
RSD: 8.174%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	485.75	91720.05	188.8215	14.199	Manual	7/31/2016 4:55:02 PM
2	1063.86	174175.5	163.7203	-0.982	Manual	7/31/2016 4:55:07 PM
3	1947.18	307368	157.8529	-4.531	Manual	7/31/2016 4:55:10 PM
4	4857.82	782708.9	161.1235	-2.553	Manual	7/31/2016 4:55:14 PM
5	9956.51	1545275	155.2025	-6.134	Manual	7/31/2016 4:55:19 PM

3 PETN



Expected retention time: 24.732 minutes
Search window: 0.21 minutes
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

Single peak quantification by area

Y = 126.0229 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9349322
Average error: 9.436%
Average CF: 126.0229
RSD: 12.677%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	484.69	71685	147.8987	17.359	Manual	7/31/2016 5:05:51 PM
2	1061.44	142101	133.8757	6.231	Manual	7/31/2016 5:06:02 PM
3	1942.16	242496.5	124.8592	-0.923	Manual	7/31/2016 4:55:35 PM
4	4845.76	570434	117.7182	-6.590	Manual	7/31/2016 4:55:42 PM
5	9931.88	1050426	105.7631	-16.076	Manual	7/31/2016 4:55:46 PM

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:
Lab Code: Case No.: SAS No.: SDG No.:
Instrument: X6329A
GC Column (1) : CHROMPACK ID: 100 (mm)
Lab File ID: 12EEXP16211001.0010.RAW
Lab Standard ID: IC83XAA
Calibration: 12EEXP1621101

Date Analyzed: 07/29/16
Time Analyzed: 22:30
Initial Calibration: 12EEXP1621101
Init. Calib Date(s): 07/29/16 07/29/16

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
RDX	4.35	4.27	4.47	507.99	500.00	2
1,3,5-Trinitrobenzene	5.05	4.96	5.16	501.46	501.00	0
1,3-DNB	7.33	7.29	7.49	499.04	501.00	0
3,5-Dinitroaniline	7.59	7.19	7.86	466.31	502.00	-7
Nitrobenzene	8.20	8.05	8.33	444.28	500.00	-11
2,4,6-Trinitrotoluene	8.75	8.65	8.85	464.63	500.00	-7
4-Amino-2,6-dinitrotoluene	10.71	10.65	10.94	455.19	500.00	-9
2-Amino-4,6-dinitrotoluene	11.20	11.00	11.29	450.91	500.00	-10
2,6-Dinitrotoluene	12.04	11.92	12.20	486.41	500.00	-3
2,4-Dinitrotoluene	12.78	12.66	12.94	443.25	502.00	-12
2-Nitrotoluene	14.67	14.54	14.82	477.94	501.00	-5
4-Nitrotoluene	16.24	16.09	16.42	433.09	500.50	-13
3-Nitrotoluene	17.07	16.92	17.24	425.94	501.00	-15
					Average of %D:	7

Compounds 13

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B
Date Analyzed: 07/29/16

GC Column (2) : CHROMPACK ID: 100 (mm)
Time Analyzed: 22:30

Lab File ID: 12EEXP16211001B.0010.RAW
Initial Calibration: 12EEXP1621101B

Lab Standard ID: IC83XAA
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621101B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	2.69	2.60	2.80	506.95	500.80	1
Nitroglycerin	9.45	9.28	9.66	1807.07	2012.00	-10
3,4-Dinitrotoluene	11.33	10.98	11.55	468.07	504.00	-7
PETN	18.13	17.86	18.43	1885.54	2000.00	-6

Average of %D: 6

Compounds 4

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Date Analyzed: 07/29/16

GC Column (3) : CAPCELL CN ID: 250 (mm) Time Analyzed: 22:30

Lab File ID: 12CEXP16211001.0010.RAW Initial Calibration: 12CEXP1621101

Lab Standard ID: IC83XAA Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621101

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	3.90	3.80	4.00	492.11	500.80	-2
RDX	4.81	4.72	4.92	433.85	500.00	-13
3,5-Dinitroaniline	10.46	10.38	10.58	493.71	502.00	-2
Nitrobenzene	11.88	11.74	12.06	497.37	500.00	-1
4-Amino-2,6-dinitrotoluene	15.61	15.50	15.82	455.40	500.00	-9
1,3-DNB	17.45	17.31	17.61	470.57	501.00	-6
2-Nitrotoluene	22.46	22.14	22.66	504.31	501.00	1
4-Nitrotoluene	25.70	25.29	25.81	366.85	500.50	-27
1,3,5-Trinitrobenzene	27.25	26.87	27.27	381.54	501.00	-24
2,6-Dinitrotoluene	28.46	28.16	28.76	440.09	500.00	-12
3,4-Dinitrotoluene	31.26	31.07	31.43	539.44	504.00	7
2,4-Dinitrotoluene	32.79	32.65	32.87	527.30	502.00	5
Tetryl	33.83	33.69	33.89	505.98	500.00	1
2,4,6-Trinitrotoluene	34.79	34.66	34.86	485.55	500.00	-3
					Average of %D:	8

Compounds 14

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B
Date Analyzed: 07/29/16

GC Column (4) : CAPCELL CN ID: 250 (mm)
Time Analyzed: 22:30

Lab File ID: 12CEXP16211001B.0010.RAW
Initial Calibration: 12CEXP1621101B

Lab Standard ID: IC83XAA
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621101B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.04	3.93	4.13	477.03	500.80	-5
Nitroglycerin	8.87	8.76	8.96	1731.56	2012.00	-14
PETN	24.07	23.78	24.20	1884.72	2000.00	-6
					Average of %D:	8

Compounds 3

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A
Date Analyzed: 07/31/16

GC Column (1) : CHROMPACK ID: 100 (mm)
Time Analyzed: 19:36

Lab File ID: 12EEXP16211002.0007.RAW
Initial Calibration: 12EEXP1621101

Lab Standard ID: 83303KO
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621102

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
RDX	4.12	3.96	4.16	494.55	502.00	-1
1,3,5-Trinitrobenzene	4.79	4.61	4.81	498.72	501.50	-1
1,3-DNB	6.91	6.72	6.92	524.07	501.00	5
3,5-Dinitroaniline	7.24	6.82	7.50	470.27	502.00	-6
(8) Tetryl + tetryl breakdown	7.70	7.48	7.76	13,287 + 443.84 = 457.065	501.00	-11 (8) -9
2,4,6-Trinitrotoluene	8.21	8.03	8.23	482.56	502.50	-4
4-Amino-2,6-dinitrotoluene	9.92	9.74	10.02	482.21	501.50	-4
2-Amino-4,6-dinitrotoluene	10.43	10.25	10.54	460.87	500.50	-8
2,6-Dinitrotoluene	11.20	11.00	11.28	501.97	501.50	0
2,4-Dinitrotoluene	11.89	11.69	11.97	454.19	500.50	-9
2-Nitrotoluene	13.63	13.45	13.73	502.39	502.50	0
4-Nitrotoluene	15.09	14.90	15.22	459.97	500.50	-8
3-Nitrotoluene	15.84	15.64	15.96	492.37	502.00	-2
					Average of %D:	5

Compounds 13

(8) 

AUG 07 2016

(8) tetryl breakdown added.

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B Date Analyzed: 07/31/16

GC Column (2) : CHROMPACK ID: 100 (mm) Time Analyzed: 19:36

Lab File ID: 12EEXP16211002B.0007.RAW Initial Calibration: 12EEXP1621101B

Lab Standard ID: 83303KO Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621102B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	2.59	2.43	2.63	483.85	500.30	-3
Nitroglycerin	8.83	8.54	8.92	1885.52	1947.18	-3
3,4-Dinitrotoluene	10.54	10.22	10.79	457.84	504.00	-9
PETN	16.67	16.34	16.91	1902.16	1942.16	-2

Compounds 4 Average of %D: 4

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Date Analyzed: 08/01/16

GC Column (1) : CHROMPACK ID: 100 (mm) Time Analyzed: 3:23

Lab File ID: 12EEXP16211002.0018.RAW Initial Calibration: 12EEXP1621101

Lab Standard ID: 83303KP Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621102

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
RDX	4.06	3.96	4.16	511.81	502.00	2
1,3,5-Trinitrobenzene	4.71	4.61	4.81	512.25	501.50	2
1,3-DNB	6.83	6.72	6.92	523.62	501.00	5
3,5-Dinitroaniline	7.18	6.82	7.50	464.20	502.00	-8
(6) Tetryl + tetryl breakdown	7.63	7.48	7.76	10,136 + 434.86 = 449,996	501.00	~~-13~~ (8) -11
2,4,6-Trinitrotoluene	8.15	8.03	8.23	463.78	502.50	-8
4-Amino-2,6-dinitrotoluene	9.90	9.74	10.02	470.85	501.50	-6
2-Amino-4,6-dinitrotoluene	10.42	10.25	10.54	450.02	500.50	-10
2,6-Dinitrotoluene	11.18	11.00	11.28	480.99	501.50	-4
2,4-Dinitrotoluene	11.85	11.69	11.97	439.66	500.50	-12
2-Nitrotoluene	13.61	13.45	13.73	477.91	502.50	-5
4-Nitrotoluene	15.08	14.90	15.22	443.39	500.50	-11
3-Nitrotoluene	15.82	15.64	15.96	473.66	502.00	-6
					Average of %D:	7

Compounds 13

(6) [signature] 8/7/16

AUG 07 2016

(8) Tetryl breakdown added

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B
Date Analyzed: 08/01/16

GC Column (2) : CHROMPACK ID: 100 (mm)
Time Analyzed: 3:23

Lab File ID: 12EEXP16211002B.0018.RAW
Initial Calibration: 12EEXP1621101B

Lab Standard ID: 83303KP
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621102B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	2.53	2.43	2.63	460.55	500.30	-8
Nitroglycerin	8.74	8.54	8.92	1770.10	1947.18	-9
3,4-Dinitrotoluene	10.54	10.22	10.79	449.51	504.00	-11
PETN	16.64	16.34	16.91	1867.49	1942.16	-4
					Average of %D:	8

Compounds 4

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A
Date Analyzed: 07/31/16

GC Column (3) : CAPCELL CN ID: 250 (mm)
Time Analyzed: 19:36

Lab File ID: 12CEXP16211002.0007.RAW
Initial Calibration: 12CEXP1621101

Lab Standard ID: 83303KO
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621102

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	3.98	3.97	4.17	505.73	500.30	1
RDX	4.88	4.89	5.09	445.21	502.00	-11
3,5-Dinitroaniline	10.49	10.74	10.94	505.83	502.00	1
Nitrobenzene	11.99	12.23	12.55	519.78	501.50	4
4-Amino-2,6-dinitrotoluene	15.68	16.21	16.53	466.66	501.50	-7
1,3-DNB	17.75	18.17	18.47	467.26	501.00	-7
2-Nitrotoluene	22.66	23.35	23.87	509.64	502.50	1
4-Nitrotoluene	25.93	26.71	27.23	484.96	500.50	-3
1,3,5-Trinitrobenzene	27.76	28.44	28.84	483.26	501.50	-4
2,6-Dinitrotoluene	28.65	29.60	30.20	480.15	501.50	-4
3,4-Dinitrotoluene	31.43	31.91	32.27	523.32	504.00	4
2,4-Dinitrotoluene	32.97	33.25	33.47	541.09	500.50	8
Tetryl	33.93	34.11	34.31	516.29	501.00	3
2,4,6-Trinitrotoluene	34.92	35.06	35.26	497.92	502.50	-1
					Average of %D:	4

Compounds 14

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B Date Analyzed: 07/31/16

GC Column (4) : CAPCELL CN ID: 250 (mm) Time Analyzed: 19:36

Lab File ID: 12CEXP16211002B.0007.RAW Initial Calibration: 12CEXP1621101B

Lab Standard ID: 83303KO Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621102B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.13	4.12	4.32	461.90	500.30	-8
Nitroglycerin	9.00	9.19	9.39	1863.41	1947.18	-4
PETN	24.22	24.99	25.41	1909.30	1942.16	-2
					Average of %D:	5

Compounds 3

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Date Analyzed: 08/01/16

GC Column (3) : CAPCELL CN ID: 250 (mm) Time Analyzed: 3:23

Lab File ID: 12CEXP16211002.0018.RAW Initial Calibration: 12CEXP1621101

Lab Standard ID: 83303KP Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621102

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.07	3.97	4.17	507.31	500.30	1
RDX	5.00	4.89	5.09	467.82	502.00	-7
3,5-Dinitroaniline	10.89	10.74	10.94	504.92	502.00	1
Nitrobenzene	12.39	12.23	12.55	519.56	501.50	4
4-Amino-2,6-dinitrotoluene	16.35	16.21	16.53	465.49	501.50	-7
1,3-DNB	18.34	18.17	18.47	472.43	501.00	-6
2-Nitrotoluene	23.66	23.35	23.87	582.12	502.50	16
4-Nitrotoluene	27.06	26.71	27.23	389.73	500.50	-22
1,3,5-Trinitrobenzene	28.69	28.44	28.84	343.88	501.50	-31
2,6-Dinitrotoluene	30.01	29.60	30.20	382.40	501.50	-24
3,4-Dinitrotoluene	32.12	31.91	32.27	542.07	504.00	8
2,4-Dinitrotoluene	33.40	33.25	33.47	538.13	500.50	8
Tetryl	34.24	34.11	34.31	507.71	501.00	1
2,4,6-Trinitrotoluene	35.18	35.06	35.26	498.94	502.50	-1

Compounds 14 Average of %D: 10

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B Date Analyzed: 08/01/16

GC Column (4) : CAPCELL CN ID: 250 (mm) Time Analyzed: 3:23

Lab File ID: 12CEXP16211002B.0018.RAW Initial Calibration: 12CEXP1621101B

Lab Standard ID: 83303KP Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621102B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.21	4.12	4.32	450.50	500.30	-10
Nitroglycerin	9.29	9.19	9.39	1870.74	1947.18	-4
PETN	25.27	24.99	25.41	1850.56	1942.16	-5

Compounds 3 Average of %D: 6

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A

GC Column (1) : CHROMPACK ID: 100 (mm)

Lab File ID: 12EEXP16211003.0037.RAW

Lab Standard ID: 83303KZ

Calibration: 12EEXP1621103

Date Analyzed: 08/02/16

Time Analyzed: 19:38

Initial Calibration: 12EEXP1621103

Init. Calib Date(s): 07/29/16 07/29/16

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT	NOM AMOUNT	%D
RDX	3.95	3.85	4.05	493.76	502.00	-2
1,3,5-Trinitrobenzene	4.59	4.48	4.68	499.08	501.50	0
1,3-DNB	6.63	6.45	6.65	531.62	501.00	6
3,5-Dinitroaniline	6.94	6.51	7.18	458.77	502.00	-9
Tetryl + Tetryl Breakdown	7.40	7.14	7.42	16.608 + 433.60 = 450.208	501.00	~~-13~~ -10
2,4,6-Trinitrotoluene	7.89	7.66	7.86	469.42	502.50	-7
4-Amino-2,6-dinitrotoluene	9.57	9.24	9.53	470.95	501.50	-6
3,4-Dinitrotoluene	10.06	9.62	10.11	464.29	504.00	-8
2,6-Dinitrotoluene	10.79	10.43	10.72	493.59	501.50	-2
2,4-Dinitrotoluene	11.45	11.09	11.38	454.05	500.50	-9
2-Nitrotoluene	13.15	12.72	13.01	485.54	502.50	-3
4-Nitrotoluene	14.57	14.10	14.42	450.80	500.50	-10
3-Nitrotoluene	15.29	14.81	15.14	478.77	502.00	-5

Average of %D: 6

Compounds 13

(8) Tetryl Breakdown added

(8) Jessica L. Miller

AUG 10 2016

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B
Date Analyzed: 08/02/16

GC Column (2) : CHROMPACK ID: 100 (mm)
Time Analyzed: 19:38

Lab File ID: 12EEXP16211003B.0037.RAW
Initial Calibration: 12EEXP1621103B

Lab Standard ID: 83303KZ
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621103B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	2.48	2.40	2.60	485.53	500.30	-3
Nitroglycerin	8.48	8.16	8.54	1823.47	1947.18	-6
3,4-Dinitrotoluene	10.17	9.68	10.25	457.61	504.00	-9
PETN	16.11	15.47	16.04	1905.60	1942.16	-2

Average of %D: 5

Compounds 4

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A
Date Analyzed: 08/03/16

GC Column (1) : CHROMPACK ID: 100 (mm)
Time Analyzed: 3:25

Lab File ID: 12EEXP16211003.0048.RAW
Initial Calibration: 12EEXP1621103

Lab Standard ID: 83303LA
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621103

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
RDX	3.95	3.85	4.05	497.85	502.00	-1
1,3,5-Trinitrobenzene	4.57	4.48	4.68	501.95	501.50	0
1,3-DNB	6.55	6.45	6.65	539.76	501.00	8
3,5-Dinitroaniline	6.84	6.51	7.18	448.50	502.00	-11
Tetryl + Tetryl Breakdown	7.28	7.14	7.42	15.019 +442.15	=457.169 501.00	-12 (8)
2,4,6-Trinitrotoluene	7.76	7.66	7.86	479.34	502.50	-5
4-Amino-2,6-dinitrotoluene	9.38	9.24	9.53	462.89	501.50	-8
2-Amino-4,6-dinitrotoluene	9.86	9.72	10.00	467.57	500.50	-7
2,6-Dinitrotoluene	10.58	10.43	10.72	503.67	501.50	0
2,4-Dinitrotoluene	11.23	11.09	11.38	454.64	500.50	-9
2-Nitrotoluene	12.87	12.72	13.01	493.60	502.50	-2
4-Nitrotoluene	14.26	14.10	14.42	456.18	500.50	-9
3-Nitrotoluene	14.97	14.81	15.14	492.39	502.00	-2

Average of %D: 6

Compounds 13

(8) [signature]

AUG 10 2016

(8) Tetryl Breakdown

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B Date Analyzed: 08/03/16

GC Column (2) : CHROMPACK ID: 100 (mm) Time Analyzed: 3:25

Lab File ID: 12EEXP16211003B.0048.RAW Initial Calibration: 12EEXP1621103B

Lab Standard ID: 83303LA Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621103B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	2.50	2.40	2.60	499.00	500.30	0
Nitroglycerin	8.35	8.16	8.54	1803.17	1947.18	-7
3,4-Dinitrotoluene	9.97	9.68	10.25	464.90	504.00	-8
PETN	15.76	15.47	16.04	1927.67	1942.16	-1

Average of %D: 4

Compounds 4

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Date Analyzed: 08/03/16

GC Column (1) : CHROMPACK ID: 100 (mm) Time Analyzed: 11:12

Lab File ID: 12EEXP16211003.0059.RAW Initial Calibration: 12EEXP1621103

Lab Standard ID: 83303LB Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621103

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
RDX	3.86	3.85	4.05	501.86	502.00	0
1,3,5-Trinitrobenzene	4.48	4.48	4.68	511.67	501.50	2
1,3-DNB	6.39	6.45	6.65	575.82	501.00	15
3,5-Dinitroaniline	6.71	6.51	7.18	227.00	502.00	-55
Tetryl + Tetryl Breakdown	6.80	7.14	7.42	8.915 +562.14 = 571.054	501.00	14 -12 (8)
2,4,6-Trinitrotoluene	7.50	7.66	7.86	478.81	502.50	-5
4-Amino-2,6-dinitrotoluene	9.07	9.24	9.53	439.68	501.50	-12
3,4-Dinitrotoluene	9.53	9.62	10.11	468.81	504.00	-7
2,6-Dinitrotoluene	10.26	10.43	10.72	487.33	501.50	-3
2,4-Dinitrotoluene	10.94	11.09	11.38	457.35	500.50	-9
2-Nitrotoluene	12.53	12.72	13.01	503.00	502.50	0
4-Nitrotoluene	13.85	14.10	14.42	456.61	500.50	-9
3-Nitrotoluene	14.51	14.81	15.14	503.35	502.00	0

Compounds 13 Average of %D: 10

(8) Jessica L. Miller
Senior Chemist

AUG 30 2016

(8) Tetryl Breakdown added

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B

GC Column (2) : CHROMPACK ID: 100 (mm)

Lab File ID: 12EEXP16211003B.0059.RAW

Lab Standard ID: 83303LB

Calibration: 12EEXP1621103B

Date Analyzed: 08/03/16

Time Analyzed: 11:12

Initial Calibration: 12EEXP1621103B

Init. Calib Date(s): 07/29/16 07/29/16

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	2.47	2.40	2.60	511.85	500.30	2
Nitroglycerin	8.06	7.80	8.18	1771.36	1947.18	-9
3,4-Dinitrotoluene	9.63	9.17	9.75	451.53	504.00	-10
PETN	15.24	14.61	15.19	2062.90	1942.16	6
					Average of %D:	7

Compounds 4

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A
Date Analyzed: 08/03/16

GC Column (1) : CHROMPACK ID: 100 (mm)
Time Analyzed: 14:44

Lab File ID: 12EEXP16211003.0064.RAW
Initial Calibration: 12EEXP1621103

Lab Standard ID: 83303LC
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621103

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
RDX	3.78	3.85	4.05	497.93	502.00	-1
1,3,5-Trinitrobenzene	4.42	4.48	4.68	513.59	501.50	2
1,3-DNB	6.35	6.45	6.65	745.77	501.00	49
Tetryl + Tetryl Breakdown	6.75	7.14	7.42	13,414 +621.54 =635,484	501.00	~~24~~ (8) 27%
2,4,6-Trinitrotoluene	7.44	7.66	7.86	504.89	502.50	0
4-Amino-2,6-dinitrotoluene	9.03	9.24	9.53	456.25	501.50	-9
3,4-Dinitrotoluene	9.37	9.62	10.11	482.21	504.00	-4
2,6-Dinitrotoluene	10.09	10.43	10.72	506.00	501.50	1
2,4-Dinitrotoluene	10.75	11.09	11.38	470.67	500.50	-6
2-Nitrotoluene	12.28	12.72	13.01	516.34	502.50	3
4-Nitrotoluene	13.57	14.10	14.42	465.19	500.50	-7
3-Nitrotoluene	14.21	14.81	15.14	513.50	502.00	2

Average of %D: 9

Compounds 12

(8) [signature]

AUG 9 0 2016

(8) Tetryl Breakdown added.

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B
Date Analyzed: 08/03/16

GC Column (2) : CHROMPACK ID: 100 (mm)
Time Analyzed: 14:44

Lab File ID: 12EEXP16211003B.0064.RAW
Initial Calibration: 12EEXP1621103B

Lab Standard ID: 83303LC
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12EEXP1621103B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	2.46	2.40	2.60	521.69	500.30	4
Nitroglycerin	7.99	7.80	8.18	2179.43	1947.18	12
3,4-Dinitrotoluene	9.46	9.17	9.75	437.55	504.00	-13
PETN	14.90	14.61	15.19	2048.71	1942.16	5

Average of %D: 9

Compounds 4

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Date Analyzed: 08/02/16

GC Column (3) : CAPCELL CN ID: 250 (mm) Time Analyzed: 19:38

Lab File ID: 12CEXP16211003.0037.RAW Initial Calibration: 12CEXP1621103

Lab Standard ID: 83303KZ Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621103

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.10	3.99	4.19	509.79	500.30	2
RDX	5.04	4.91	5.11	447.02	502.00	-11
3,5-Dinitroaniline	10.91	10.48	10.68	502.74	502.00	0
Nitrobenzene	12.44	11.95	12.27	516.37	501.50	3
4-Amino-2,6-dinitrotoluene	16.35	15.44	15.76	461.54	501.50	-8
1,3-DNB	18.39	17.74	18.04	451.25	501.00	-10
2-Nitrotoluene	23.57	22.11	22.63	550.27	502.50	10
4-Nitrotoluene	27.01	25.51	26.03	366.93	500.50	-27
1,3,5-Trinitrobenzene	28.68	27.98	28.38	334.95	501.50	-33
2,6-Dinitrotoluene	29.87	28.16	28.76	326.09	501.50	-35
3,4-Dinitrotoluene	32.07	31.14	31.50	514.62	504.00	2
2,4-Dinitrotoluene	33.40	32.91	33.13	508.23	500.50	2
Tetryl	34.23	33.86	34.06	457.70	501.00	-9
2,4,6-Trinitrotoluene	35.20	34.96	35.16	466.16	502.50	-7
					Average of %D:	11

Compounds 14

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B
Date Analyzed: 08/02/16

GC Column (4) : CAPCELL CN ID: 250 (mm)
Time Analyzed: 19:38

Lab File ID: 12CEXP16211003B.0037.RAW
Initial Calibration: 12CEXP1621103B

Lab Standard ID: 83303KZ
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621103B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.23	4.15	4.35	471.07	500.30	-6
Nitroglycerin	9.32	8.92	9.12	1875.86	1947.18	-4
PETN	25.18	23.61	24.03	1626.32	1942.16	-16

Average of %D: 9

Compounds 3

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A
Date Analyzed: 08/03/16

GC Column (3) : CAPCELL CN ID: 250 (mm)
Time Analyzed: 3:25

Lab File ID: 12CEXP16211003.0048.RAW
Initial Calibration: 12CEXP1621103

Lab Standard ID: 83303LA
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621103

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.09	3.99	4.19	587.11	500.30	17
RDX	5.01	4.91	5.11	489.78	502.00	-2
3,5-Dinitroaniline	10.77	10.48	10.68	505.53	502.00	1
Nitrobenzene	12.29	11.95	12.27	514.14	501.50	3
4-Amino-2,6-dinitrotoluene	16.05	15.44	15.76	462.30	501.50	-8
1,3-DNB	18.18	17.74	18.04	461.71	501.00	-8
2-Nitrotoluene	23.20	22.11	22.63	518.43	502.50	3
4-Nitrotoluene	26.61	25.51	26.03	445.60	500.50	-11
1,3,5-Trinitrobenzene	28.49	27.98	28.38	409.30	501.50	-18
2,6-Dinitrotoluene	29.13	28.16	28.76	439.24	501.50	-12
3,4-Dinitrotoluene	31.84	31.14	31.50	480.24	504.00	-5
2,4-Dinitrotoluene	33.26	32.91	33.13	514.90	500.50	3
Tetryl	34.12	33.86	34.06	453.49	501.00	-9
2,4,6-Trinitrotoluene	35.12	34.96	35.16	467.64	502.50	-7

Compounds 14

Average of %D: 8

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B
Date Analyzed: 08/03/16

GC Column (4) : CAPCELL CN ID: 250 (mm)
Time Analyzed: 3:25

Lab File ID: 12CEXP16211003B.0048.RAW
Initial Calibration: 12CEXP1621103B

Lab Standard ID: 83303LA
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621103B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.25	4.15	4.35	482.31	500.30	-4
Nitroglycerin	9.20	8.92	9.12	1873.54	1947.18	-4
PETN	24.73	23.61	24.03	1688.29	1942.16	-13

Compounds 3

Average of %D: 7

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A
Date Analyzed: 08/03/16

GC Column (3) : CAPCELL CN ID: 250 (mm)
Time Analyzed: 11:12

Lab File ID: 12CEXP16211003.0059.RAW
Initial Calibration: 12CEXP1621103

Lab Standard ID: 83303LB
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621103

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.07	3.99	4.19	547.64	500.30	9
RDX	4.99	4.91	5.11	470.22	502.00	-6
3,5-Dinitroaniline	10.67	10.55	10.75	525.21	502.00	5
Nitrobenzene	12.23	12.04	12.36	551.86	501.50	10
4-Amino-2,6-dinitrotoluene	15.83	15.65	15.97	482.02	501.50	-4
1,3-DNB	18.06	17.85	18.15	482.96	501.00	-4
2-Nitrotoluene	22.81	22.59	23.11	530.84	502.50	6
4-Nitrotoluene	26.23	25.91	26.43	517.31	500.50	3
1,3,5-Trinitrobenzene	28.42	28.29	28.69	768.05	501.50	53
3,4-Dinitrotoluene	31.52	31.40	31.76	497.56	504.00	-1
2,4-Dinitrotoluene	33.12	33.02	33.24	523.53	500.50	5
Tetryl	34.05	33.93	34.13	477.03	501.00	-5
2,4,6-Trinitrotoluene	35.08	34.97	35.17	480.89	502.50	-4

Average of %D: 9

Compounds 13

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B
Date Analyzed: 08/03/16

GC Column (4) : CAPCELL CN ID: 250 (mm)
Time Analyzed: 11:12

Lab File ID: 12CEXP16211003B.0059.RAW
Initial Calibration: 12CEXP1621103B

Lab Standard ID: 83303LB
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621103B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.23	4.15	4.35	485.51	500.30	-3
Nitroglycerin	9.08	8.92	9.12	1822.52	1947.18	-6
PETN	24.31	23.61	24.03	1709.08	1942.16	-12

Compounds 3 Average of %D: 7

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329A Date Analyzed: 08/03/16

GC Column (3) : CAPCELL CN ID: 250 (mm) Time Analyzed: 14:44

Lab File ID: 12CEXP16211003.0064.RAW Initial Calibration: 12CEXP1621103

Lab Standard ID: 83303LC Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621103

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.02	3.99	4.19	542.88	500.30	9
RDX	4.96	4.91	5.11	466.53	502.00	-7
3,5-Dinitroaniline	10.58	10.55	10.75	522.42	502.00	4
Nitrobenzene	12.11	12.04	12.36	533.37	501.50	6
4-Amino-2,6-dinitrotoluene	15.60	15.65	15.97	484.79	501.50	-3
1,3-DNB	17.89	17.85	18.15	485.82	501.00	-3
2-Nitrotoluene	22.37	22.59	23.11	540.65	502.50	8
4-Nitrotoluene	25.77	25.91	26.43	550.71	500.50	10
1,3,5-Trinitrobenzene	28.18	28.29	28.69	818.48	501.50	63
3,4-Dinitrotoluene	31.32	31.40	31.76	487.02	504.00	-3
2,4-Dinitrotoluene	33.02	33.02	33.24	525.72	500.50	5
Tetryl	33.96	33.93	34.13	470.37	501.00	-6
2,4,6-Trinitrotoluene	35.06	34.97	35.17	465.12	502.50	-7

Compounds 13 Average of %D: 10

7E

CALIBRATION VERIFICATION SUMMARY

Lab Name: Lancaster Laboratories
Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: Y6329B
Date Analyzed: 08/03/16

GC Column (4) : CAPCELL CN ID: 250 (mm)
Time Analyzed: 14:44

Lab File ID: 12CEXP16211003B.0064.RAW
Initial Calibration: 12CEXP1621103B

Lab Standard ID: 83303LC
Init. Calib Date(s): 07/29/16 07/29/16

Calibration: 12CEXP1621103B

COMPOUND	RT	RT WINDOW FROM	TO	CALC AMOUNT	NOM AMOUNT	%D
HMX	4.17	4.15	4.35	458.71	500.30	-8
Nitroglycerin	9.02	8.92	9.12	1795.96	1947.18	-8
PETN	23.82	23.61	24.03	1220.60	1942.16	-37

Compounds 3

Average of %D: 18

Eurofins Lancaster Laboratories
Pesticide Residue Analysis
Runlog for 12EEXP16211001
Instrument CP12--X6329A

Data Directory Path is - \\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\

Operator	File	LLI#	Client ID	Analysis Date	Batch	Dilution Factor
1566	12EEXP16211001.0001	CONDITIONER		7/29/16 16:08	1621099999	1.00
1566	12EEXP16211001.0002	3,4-DNT	AA	7/29/16 16:50	1621099999	1.00
1566	12EEXP16211001.0003	3,5-DNA	AA	7/29/16 17:33	1621099999	1.00
1566	12EEXP16211001.0004	833011624C	83301AA	7/29/16 18:15	1621099999	1.00
1566	12EEXP16211001.0005	833021624C	83302AA	7/29/16 18:58	1621099999	1.00
1566	12EEXP16211001.0006	833031624C	83303AA	7/29/16 19:40	1621099999	1.00
1566	12EEXP16211001.0007	833041624C	83304AA	7/29/16 20:23	1621099999	1.00
1566	12EEXP16211001.0008	833051624C	83305AA	7/29/16 21:05	1621099999	1.00
1566	12EEXP16211001.0009	MD83X1624C	MD83XAA	7/29/16 21:48	1621099999	1.00
1566	12EEXP16211001.0010	IC83X1624C	IC83XAA	7/29/16 22:30	1621099999	1.00
1566	12EEXP16211001.0011	BLANKA 7/5/16 RI	PBLK27187	7/29/16 23:13	161870027A	40.00
1566	12EEXP16211001.0012	MDL1 7/5/16 RI		7/29/16 23:55	161870027A	40.00
1566	12EEXP16211001.0013	MDL2 7/5/16 RI		7/30/16 0:37	161870027A	40.00
1566	12EEXP16211001.0014	MDL3 7/5/16 RI		7/30/16 1:20	161870027A	40.00
1566	12EEXP16211001.0015	MDL4 7/5/16 RI		7/30/16 2:02	161870027A	40.00
1566	12EEXP16211001.0016	MDL5 7/5/16 RI		7/30/16 2:45	161870027A	40.00
1566	12EEXP16211001.0017	MDL6 7/5/16 RI		7/30/16 3:27	161870027A	40.00
1566	12EEXP16211001.0018	MDL7 7/5/16 RI		7/30/16 4:10	161870027A	40.00
1566	12EEXP16211001.0019	MDL8 7/5/16 RI		7/30/16 4:52	161870027A	40.00
1566	12EEXP16211001.0020	MDL9 7/5/16		7/30/16 5:35	161870027A	40.00
1566	12EEXP16211001.0021	833031624C	83303KN	7/30/16 6:17	1621099999	1.00
1566	12EEXP16211001.0022	MDL10 7/5/16 RI		7/30/16 7:00	161870027A	40.00
1566	12EEXP16211001.0023	MDL11 7/5/16		7/30/16 7:42	161870027A	40.00
1566	12EEXP16211001.0024	MDL12 7/5/16		7/30/16 8:25	161870027A	40.00
1566	12EEXP16211001.0025	MDL13 7/5/16		7/30/16 9:07	161870027A	40.00
1566	12EEXP16211001.0026	MDL14 7/5/16		7/30/16 9:50	161870027A	40.00
1566	12EEXP16211001.0027	BLANKA 7/6/16	PBLK22187	7/30/16 10:32	161870022A	10.00
1566	12EEXP16211001.0028	MDL1 7/6/16		7/30/16 11:14	161870022A	10.00
1566	12EEXP16211001.0029	MDL2 7/6/16		7/30/16 11:57	161870022A	10.00
1566	12EEXP16211001.0030	MDL3 7/6/16		7/30/16 12:39	161870022A	10.00
1566	12EEXP16211001.0031	MDL4 7/6/16		7/30/16 13:22	161870022A	10.00
1566	12EEXP16211001.0032	833031624C	83303KN	7/30/16 14:04	1621099999	1.00
1566	12EEXP16211001.0033	MDL5 7/6/16		7/30/16 14:47	161870022A	10.00
1566	12EEXP16211001.0034	MDL6 7/6/16		7/30/16 15:29	161870022A	10.00
1566	12EEXP16211001.0035	MDL7 7/6/16		7/30/16 16:12	161870022A	10.00
1566	12EEXP16211001.0036	PETN1 7/6/16		7/30/16 16:54	161870022A	10.00
1566	12EEXP16211001.0037	PETN2 7/6/16		7/30/16 17:37	161870022A	10.00
1566	12EEXP16211001.0038	PETN3 7/6/16		7/30/16 18:19	161870022A	10.00
1566	12EEXP16211001.0039	PETN4 7/6/16		7/30/16 19:02	161870022A	10.00
1566	12EEXP16211001.0040	PETN5 7/6/16		7/30/16 19:44	161870022A	10.00
1566	12EEXP16211001.0041	PETN6 7/6/16		7/30/16 20:27	161870022A	10.00
1566	12EEXP16211001.0042	PETN7 7/6/16		7/30/16 21:09	161870022A	10.00
1566	12EEXP16211001.0043	833031624C	83303KN	7/30/16 21:52	1621099999	1.00

Eurofins Lancaster Laboratories
Pesticide Residue Analysis
Runlog for 12EEXP16211002
Instrument CP12--X6329A

Data Directory Path is - \\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\

Operator	File	LLI#	Client ID	Analysis Date	Batch	Dilution Factor
1566	12EEXP16211002.0001	CONDITIONER		7/31/16 15:41	1621399999	1.00
1566	12EEXP16211002.0002	CONDITIONER		7/31/16 16:03	1621299999	1.00
1566	12EEXP16211002.0003	CONDITIONER		7/31/16 16:46	1621299999	1.00
1566	12EEXP16211002.0004	CONDITIONER		7/31/16 17:28	1621299999	1.00
1566	12EEXP16211002.0005	CONDITIONER		7/31/16 18:11	1621299999	1.00
1566	12EEXP16211002.0006	CONDITIONER		7/31/16 18:53	1621299999	1.00
1566	12EEXP16211002.0007	833031624C	83303KO	7/31/16 19:36	1621299999	1.00
1566	12EEXP16211002.0008	BLANKA 6/28/16 RI	PBLK01178	7/31/16 20:18	161780001A	10.00
1566	12EEXP16211002.0009	LCSA 6/28/16 RI	LCS01178	7/31/16 21:01	161780001A	10.00
1566	12EEXP16211002.0010	LCSDA 6/28/16 RI	LCSD01178	7/31/16 21:43	161780001A	10.00
1566	12EEXP16211002.0011	8438378 RI	D8634	7/31/16 22:26	161780001A	10.00
1566	12EEXP16211002.0012	8438379 RI	D8635	7/31/16 23:08	161780001A	10.00
1566	12EEXP16211002.0013	8442829 RI	RT-EB	7/31/16 23:50	161780001A	10.00
1566	12EEXP16211002.0014	8442830 RI	RT-FB	8/1/16 0:33	161780001A	10.00
1566	12EEXP16211002.0015	8442831 RI	D16C1	8/1/16 1:15	161780001A	10.00
1566	12EEXP16211002.0016	8444113 RI	D25FD	8/1/16 1:58	161780001A	10.00
1566	12EEXP16211002.0017	8444115 RI	D22EB	8/1/16 2:40	161780001A	10.00
1566	12EEXP16211002.0018	833031624C	83303KP	8/1/16 3:23	1621299999	1.00
1566	12EEXP16211002.0019	8444116 RI	BG3EB	8/1/16 4:05	161780001A	10.00
1566	12EEXP16211002.0020	8445666 RI	D8901	8/1/16 4:48	161780001A	10.00
1566	12EEXP16211002.0021	8445667 RI	D8902	8/1/16 5:30	161780001A	10.00
1566	12EEXP16211002.0022	BLANKA 7/5/16	PBLK19187	8/1/16 6:12	161870019A	40.00
1566	12EEXP16211002.0023	ISMLCS 7/5/16	LCS19187	8/1/16 6:55	161870019A	40.00
1566	12EEXP16211002.0024	LCSA 7/5/16	LCS19187	8/1/16 7:37	161870019A	40.00
1566	12EEXP16211002.0025	8438364	D8624	8/1/16 8:20	161870019A	40.00
1566	12EEXP16211002.0026	8438365MS	D8624	8/1/16 9:02	161870019A	40.00
1566	12EEXP16211002.0027	8438366MSD	D8624	8/1/16 9:45	161870019A	40.00
1566	12EEXP16211002.0028	8438372	D8628	8/1/16 10:27	161870019A	40.00
1566	12EEXP16211002.0029	833031624C	83303KQ	8/1/16 11:10	1621299999	1.00

Eurofins Lancaster Laboratories
Pesticide Residue Analysis
Runlog for 12EEXP16211003
Instrument CP12--X6329A

Data Directory Path is - \\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\

Operator	File	LLI#	Client ID	Analysis Date	Batch	Dilution Factor
1566	12EEXP16211003.0001	CONDITIONER		8/1/16 18:09	1621399999	1.00
1566	12EEXP16211003.0002	CONDITIONER		8/1/16 18:51	1621399999	1.00
1566	12EEXP16211003.0003	CONDITIONER		8/1/16 19:34	1621399999	1.00
1566	12EEXP16211003.0004	833031624C	83303KW	8/1/16 20:16	1621399999	1.00
1566	12EEXP16211003.0005	MDL6 7/5/16 RI		8/1/16 20:59	161870027A	40.00
1566	12EEXP16211003.0006	MDL11 7/5/16 RI		8/1/16 21:41	161870027A	40.00
1566	12EEXP16211003.0007	BLANKA 7/5/16	PBLK19187	8/1/16 22:24	161870019A	40.00
1566	12EEXP16211003.0008	ISMLCS 7/5/16	LCS19187	8/1/16 23:06	161870019A	40.00
1566	12EEXP16211003.0009	LCSA 7/5/16	LCS19187	8/1/16 23:49	161870019A	40.00
1566	12EEXP16211003.0010	8438364	D8624	8/2/16 0:31	161870019A	40.00
1566	12EEXP16211003.0011	8438365MS	D8624	8/2/16 1:13	161870019A	40.00
1566	12EEXP16211003.0012	8438366MSD	D8624	8/2/16 1:56	161870019A	40.00
1566	12EEXP16211003.0013	8438372	D8628	8/2/16 2:38	161870019A	40.00
1566	12EEXP16211003.0014	8438376	D8632	8/2/16 3:21	161870019A	40.00
1566	12EEXP16211003.0015	833031624C	83303KX	8/2/16 4:03	1621399999	1.00
1566	12EEXP16211003.0016	8438376	D8632DUP	8/2/16 4:46	161870019A	40.00
1566	12EEXP16211003.0017	8438376MS	D8632MS	8/2/16 5:28	161870019A	40.00
1566	12EEXP16211003.0018	BLANKA 7/5/16	PBLK18187	8/2/16 6:11	161870018A	40.00
1566	12EEXP16211003.0019	ISMLCS 7/5/16	LCS18187	8/2/16 6:53	161870018A	40.00
1566	12EEXP16211003.0020	LCSA 7/5/16	LCS18187	8/2/16 7:36	161870018A	40.00
1566	12EEXP16211003.0021	8438323	D8603	8/2/16 8:18	161870018A	40.00
1566	12EEXP16211003.0022	8438327	D8607	8/2/16 9:01	161870018A	40.00
1566	12EEXP16211003.0023	8438331	D8611	8/2/16 9:43	161870018A	40.00
1566	12EEXP16211003.0024	8438335	D8615	8/2/16 10:26	161870018A	40.00
1566	12EEXP16211003.0025	8438347	D8618	8/2/16 11:08	161870018A	40.00
1566	12EEXP16211003.0026	833031624C	83303KY	8/2/16 11:51	1621399999	1.00
1566	12EEXP16211003.0027	8438348MS	D8618	8/2/16 12:33	161870018A	40.00
1566	12EEXP16211003.0028	8438349MSD	D8618	8/2/16 13:15	161870018A	40.00
1566	12EEXP16211003.0029	8438352	D8621	8/2/16 13:58	161870018A	40.00
1566	12EEXP16211003.0030	8438352	D8621DUP	8/2/16 14:40	161870018A	40.00
1566	12EEXP16211003.0031	8438352MS	D8621MS	8/2/16 15:23	161870018A	40.00
1566	12EEXP16211003.0032	8455217	D86B2	8/2/16 16:05	161870018A	40.00
1566	12EEXP16211003.0033	BLANKA 7/6/16	PBLK09188	8/2/16 16:48	161880009A	40.00
1566	12EEXP16211003.0034	ISMLCS 7/6/16	LCS09188	8/2/16 17:30	161880009A	40.00
1566	12EEXP16211003.0035	LCSA 7/6/16	LCS09188	8/2/16 18:13	161880009A	40.00
1566	12EEXP16211003.0036	8444053	D25A3	8/2/16 18:55	161880009A	40.00
1566	12EEXP16211003.0037	833031624C	83303KZ	8/2/16 19:38	1621399999	1.00
1566	12EEXP16211003.0038	8444057	D25B3	8/2/16 20:20	161880009A	40.00
1566	12EEXP16211003.0039	8444057	D25B3DUP	8/2/16 21:03	161880009A	40.00
1566	12EEXP16211003.0040	8444057MS	D25B3MS	8/2/16 21:45	161880009A	40.00
1566	12EEXP16211003.0041	8444061	D25C3	8/2/16 22:27	161880009A	40.00
1566	12EEXP16211003.0042	8444065	D22A3	8/2/16 23:10	161880009A	40.00
1566	12EEXP16211003.0043	8444069	D22B3	8/2/16 23:52	161880009A	40.00
1566	12EEXP16211003.0044	8444082	D22C3	8/3/16 0:35	161880009A	40.00
1566	12EEXP16211003.0045	8444083MS	D22C3	8/3/16 1:17	161880009A	40.00
1566	12EEXP16211003.0046	8444084MSD	D22C3	8/3/16 2:00	161880009A	40.00
1566	12EEXP16211003.0047	BLANKA 7/6/16	PBLK10188	8/3/16 2:42	161880010A	40.00
1566	12EEXP16211003.0048	833031624C	83303LA	8/3/16 3:25	1621399999	1.00
1566	12EEXP16211003.0049	ISMLCS 7/6/16	LCS10188	8/3/16 4:07	161880010A	40.00
1566	12EEXP16211003.0050	LCSA 7/6/16	LCS10188	8/3/16 4:50	161880010A	40.00
1566	12EEXP16211003.0051	8442799	RTP12	8/3/16 5:32	161880010A	40.00
1566	12EEXP16211003.0052	8442802	RTP22	8/3/16 6:15	161880010A	40.00
1566	12EEXP16211003.0053	8442805	RTP32	8/3/16 6:57	161880010A	40.00
1566	12EEXP16211003.0054	8442810	RTP42	8/3/16 7:40	161880010A	40.00
1566	12EEXP16211003.0055	8442811MS	RTP42	8/3/16 8:22	161880010A	40.00
1566	12EEXP16211003.0056	8442812MSD	RTP42	8/3/16 9:05	161880010A	40.00

Operator	File	LLI#	Client ID	Analysis Date	Batch	Dilution Factor
1566	12EEXP16211003.0057	8442818	D16A3	8/3/16 9:47	161880010A	40.00
1566	12EEXP16211003.0058	8442822	D16B3	8/3/16 10:29	161880010A	40.00
1566	12EEXP16211003.0059	833031624C	83303LB	8/3/16 11:12	1621399999	1.00
1566	12EEXP16211003.0060	8442826	D16C3	8/3/16 11:54	161880010A	40.00
1566	12EEXP16211003.0061	8442826	D16C3DUP	8/3/16 12:37	161880010A	40.00
1566	12EEXP16211003.0062	8442826MS	D16C3MS	8/3/16 13:19	161880010A	40.00
1566	12EEXP16211003.0063	8455243	D87B2	8/3/16 14:02	161880010A	40.00
1566	12EEXP16211003.0064	833031624C	83303LC	8/3/16 14:44	1621399999	1.00

Eurofins Lancaster Laboratories
Pesticide Residue Analysis
Runlog for 12CEXP16211001
Instrument C12C--Y6329A

Data Directory Path is - \\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\

Operator	File	LLI#	Client ID	Analysis Date	Batch	Dilution Factor
1566	12CEXP16211001.0001	CONDITIONER		7/29/16 16:08	1621099999	1.00
1566	12CEXP16211001.0002	3,4-DNT	AA	7/29/16 16:50	1621099999	1.00
1566	12CEXP16211001.0003	3,5-DNA	AA	7/29/16 17:33	1621099999	1.00
1566	12CEXP16211001.0004	833011624C	83301AA	7/29/16 18:15	1621099999	1.00
1566	12CEXP16211001.0005	833021624C	83302AA	7/29/16 18:58	1621099999	1.00
1566	12CEXP16211001.0006	833031624C	83303AA	7/29/16 19:40	1621099999	1.00
1566	12CEXP16211001.0007	833041624C	83304AA	7/29/16 20:23	1621099999	1.00
1566	12CEXP16211001.0008	833051624C	83305AA	7/29/16 21:05	1621099999	1.00
1566	12CEXP16211001.0009	MD83X1624C	MD83XAA	7/29/16 21:48	1621099999	1.00
1566	12CEXP16211001.0010	IC83X1624C	IC83XAA	7/29/16 22:30	1621099999	1.00
1566	12CEXP16211001.0011	BLANKA 7/5/16 RI	PBLK27187	7/29/16 23:13	161870027A	40.00
1566	12CEXP16211001.0012	MDL1 7/5/16 RI		7/29/16 23:55	161870027A	40.00
1566	12CEXP16211001.0013	MDL2 7/5/16 RI		7/30/16 0:37	161870027A	40.00
1566	12CEXP16211001.0014	MDL3 7/5/16 RI		7/30/16 1:20	161870027A	40.00
1566	12CEXP16211001.0015	MDL4 7/5/16 RI		7/30/16 2:02	161870027A	40.00
1566	12CEXP16211001.0016	MDL5 7/5/16 RI		7/30/16 2:45	161870027A	40.00
1566	12CEXP16211001.0017	MDL6 7/5/16 RI		7/30/16 3:27	161870027A	40.00
1566	12CEXP16211001.0018	MDL7 7/5/16 RI		7/30/16 4:10	161870027A	40.00
1566	12CEXP16211001.0019	MDL8 7/5/16 RI		7/30/16 4:52	161870027A	40.00
1566	12CEXP16211001.0020	MDL9 7/5/16		7/30/16 5:35	161870027A	40.00
1566	12CEXP16211001.0021	833031624C	83303KN	7/30/16 6:17	1621099999	1.00
1566	12CEXP16211001.0022	MDL10 7/5/16 RI		7/30/16 7:00	161870027A	40.00
1566	12CEXP16211001.0023	MDL11 7/5/16		7/30/16 7:42	161870027A	40.00
1566	12CEXP16211001.0024	MDL12 7/5/16		7/30/16 8:25	161870027A	40.00
1566	12CEXP16211001.0025	MDL13 7/5/16		7/30/16 9:07	161870027A	40.00
1566	12CEXP16211001.0026	MDL14 7/5/16		7/30/16 9:50	161870027A	40.00
1566	12CEXP16211001.0027	BLANKA 7/6/16	PBLK22187	7/30/16 10:32	161870022A	10.00
1566	12CEXP16211001.0028	MDL1 7/6/16		7/30/16 11:14	161870022A	10.00
1566	12CEXP16211001.0029	MDL2 7/6/16		7/30/16 11:57	161870022A	10.00
1566	12CEXP16211001.0030	MDL3 7/6/16		7/30/16 12:39	161870022A	10.00
1566	12CEXP16211001.0031	MDL4 7/6/16		7/30/16 13:22	161870022A	10.00
1566	12CEXP16211001.0032	833031624C	83303KN	7/30/16 14:04	1621099999	1.00
1566	12CEXP16211001.0033	MDL5 7/6/16		7/30/16 14:47	161870022A	10.00
1566	12CEXP16211001.0034	MDL6 7/6/16		7/30/16 15:29	161870022A	10.00
1566	12CEXP16211001.0035	MDL7 7/6/16		7/30/16 16:12	161870022A	10.00
1566	12CEXP16211001.0036	PETN1 7/6/16		7/30/16 16:54	161870022A	10.00
1566	12CEXP16211001.0037	PETN2 7/6/16		7/30/16 17:37	161870022A	10.00
1566	12CEXP16211001.0038	PETN3 7/6/16		7/30/16 18:19	161870022A	10.00
1566	12CEXP16211001.0039	PETN4 7/6/16		7/30/16 19:02	161870022A	10.00
1566	12CEXP16211001.0040	PETN5 7/6/16		7/30/16 19:44	161870022A	10.00
1566	12CEXP16211001.0041	PETN6 7/6/16		7/30/16 20:27	161870022A	10.00
1566	12CEXP16211001.0042	PETN7 7/6/16		7/30/16 21:09	161870022A	10.00
1566	12CEXP16211001.0043	833031624C	83303KN	7/30/16 21:52	1621099999	1.00

Eurofins Lancaster Laboratories
Pesticide Residue Analysis
Runlog for 12CEXP16211002
Instrument C12C--Y6329A

Data Directory Path is - \\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\

Operator	File	LLI#	Client ID	Analysis Date	Batch	Dilution Factor
1566	12CEXP16211002.0001	CONDITIONER		7/31/16 15:41	1621399999	1.00
1566	12CEXP16211002.0002	CONDITIONER		7/31/16 16:03	1621299999	1.00
1566	12CEXP16211002.0003	CONDITIONER		7/31/16 16:46	1621299999	1.00
1566	12CEXP16211002.0004	CONDITIONER		7/31/16 17:28	1621299999	1.00
1566	12CEXP16211002.0005	CONDITIONER		7/31/16 18:11	1621299999	1.00
1566	12CEXP16211002.0006	CONDITIONER		7/31/16 18:53	1621299999	1.00
1566	12CEXP16211002.0007	833031624C	83303KO	7/31/16 19:36	1621299999	1.00
1566	12CEXP16211002.0008	BLANKA 6/28/16 RI	PBLK01178	7/31/16 20:18	161780001A	10.00
1566	12CEXP16211002.0009	LCSA 6/28/16 RI	LCS01178	7/31/16 21:01	161780001A	10.00
1566	12CEXP16211002.0010	LCSDA 6/28/16 RI	LCSD01178	7/31/16 21:43	161780001A	10.00
1566	12CEXP16211002.0011	8438378 RI	D8634	7/31/16 22:26	161780001A	10.00
1566	12CEXP16211002.0012	8438379 RI	D8635	7/31/16 23:08	161780001A	10.00
1566	12CEXP16211002.0013	8442829 RI	RT-EB	7/31/16 23:50	161780001A	10.00
1566	12CEXP16211002.0014	8442830 RI	RT-FB	8/1/16 0:33	161780001A	10.00
1566	12CEXP16211002.0015	8442831 RI	D16C1	8/1/16 1:15	161780001A	10.00
1566	12CEXP16211002.0016	8444113 RI	D25FD	8/1/16 1:58	161780001A	10.00
1566	12CEXP16211002.0017	8444115 RI	D22EB	8/1/16 2:40	161780001A	10.00
1566	12CEXP16211002.0018	833031624C	83303KP	8/1/16 3:23	1621299999	1.00
1566	12CEXP16211002.0019	8444116 RI	BG3EB	8/1/16 4:05	161780001A	10.00
1566	12CEXP16211002.0020	8445666 RI	D8901	8/1/16 4:48	161780001A	10.00
1566	12CEXP16211002.0021	8445667 RI	D8902	8/1/16 5:30	161780001A	10.00
1566	12CEXP16211002.0022	BLANKA 7/5/16	PBLK19187	8/1/16 6:12	161870019A	40.00
1566	12CEXP16211002.0023	ISMLCS 7/5/16	LCS19187	8/1/16 6:55	161870019A	40.00
1566	12CEXP16211002.0024	LCSA 7/5/16	LCS19187	8/1/16 7:37	161870019A	40.00
1566	12CEXP16211002.0025	8438364	D8624	8/1/16 8:20	161870019A	40.00
1566	12CEXP16211002.0026	8438365MS	D8624	8/1/16 9:02	161870019A	40.00
1566	12CEXP16211002.0027	8438366MSD	D8624	8/1/16 9:45	161870019A	40.00
1566	12CEXP16211002.0028	8438372	D8628	8/1/16 10:27	161870019A	40.00
1566	12CEXP16211002.0029	833031624C	83303KQ	8/1/16 11:10	1621299999	1.00

Eurofins Lancaster Laboratories
Pesticide Residue Analysis
Runlog for 12CEXP16211003
Instrument C12C--Y6329A

Data Directory Path is - \\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\

Operator	File	LLI#	Client ID	Analysis Date	Batch	Dilution Factor
1566	12CEXP16211003.0001	CONDITIONER		8/1/16 18:09	1621399999	1.00
1566	12CEXP16211003.0002	CONDITIONER		8/1/16 18:51	1621399999	1.00
1566	12CEXP16211003.0003	CONDITIONER		8/1/16 19:34	1621399999	1.00
1566	12CEXP16211003.0004	833031624C	83303KW	8/1/16 20:16	1621399999	1.00
1566	12CEXP16211003.0005	MDL6 7/5/16 RI		8/1/16 20:59	161870027A	40.00
1566	12CEXP16211003.0006	MDL11 7/5/16 RI		8/1/16 21:41	161870027A	40.00
1566	12CEXP16211003.0007	BLANKA 7/5/16	PBLK19187	8/1/16 22:24	161870019A	40.00
1566	12CEXP16211003.0008	ISMLCS 7/5/16	LCS19187	8/1/16 23:06	161870019A	40.00
1566	12CEXP16211003.0009	LCSA 7/5/16	LCS19187	8/1/16 23:49	161870019A	40.00
1566	12CEXP16211003.0010	8438364	D8624	8/2/16 0:31	161870019A	40.00
1566	12CEXP16211003.0011	8438365MS	D8624	8/2/16 1:13	161870019A	40.00
1566	12CEXP16211003.0012	8438366MSD	D8624	8/2/16 1:56	161870019A	40.00
1566	12CEXP16211003.0013	8438372	D8628	8/2/16 2:38	161870019A	40.00
1566	12CEXP16211003.0014	8438376	D8632	8/2/16 3:21	161870019A	40.00
1566	12CEXP16211003.0015	833031624C	83303KX	8/2/16 4:03	1621399999	1.00
1566	12CEXP16211003.0016	8438376	D8632DUP	8/2/16 4:46	161870019A	40.00
1566	12CEXP16211003.0017	8438376MS	D8632MS	8/2/16 5:28	161870019A	40.00
1566	12CEXP16211003.0018	BLANKA 7/5/16	PBLK18187	8/2/16 6:11	161870018A	40.00
1566	12CEXP16211003.0019	ISMLCS 7/5/16	LCS18187	8/2/16 6:53	161870018A	40.00
1566	12CEXP16211003.0020	LCSA 7/5/16	LCS18187	8/2/16 7:36	161870018A	40.00
1566	12CEXP16211003.0021	8438323	D8603	8/2/16 8:18	161870018A	40.00
1566	12CEXP16211003.0022	8438327	D8607	8/2/16 9:01	161870018A	40.00
1566	12CEXP16211003.0023	8438331	D8611	8/2/16 9:43	161870018A	40.00
1566	12CEXP16211003.0024	8438335	D8615	8/2/16 10:26	161870018A	40.00
1566	12CEXP16211003.0025	8438347	D8618	8/2/16 11:08	161870018A	40.00
1566	12CEXP16211003.0026	833031624C	83303KY	8/2/16 11:51	1621399999	1.00
1566	12CEXP16211003.0027	8438348MS	D8618	8/2/16 12:33	161870018A	40.00
1566	12CEXP16211003.0028	8438349MSD	D8618	8/2/16 13:15	161870018A	40.00
1566	12CEXP16211003.0029	8438352	D8621	8/2/16 13:58	161870018A	40.00
1566	12CEXP16211003.0030	8438352	D8621DUP	8/2/16 14:40	161870018A	40.00
1566	12CEXP16211003.0031	8438352MS	D8621MS	8/2/16 15:23	161870018A	40.00
1566	12CEXP16211003.0032	8455217	D86B2	8/2/16 16:05	161870018A	40.00
1566	12CEXP16211003.0033	BLANKA 7/6/16	PBLK09188	8/2/16 16:48	161880009A	40.00
1566	12CEXP16211003.0034	ISMLCS 7/6/16	LCS09188	8/2/16 17:30	161880009A	40.00
1566	12CEXP16211003.0035	LCSA 7/6/16	LCS09188	8/2/16 18:13	161880009A	40.00
1566	12CEXP16211003.0036	8444053	D25A3	8/2/16 18:55	161880009A	40.00
1566	12CEXP16211003.0037	833031624C	83303KZ	8/2/16 19:38	1621399999	1.00
1566	12CEXP16211003.0038	8444057	D25B3	8/2/16 20:20	161880009A	40.00
1566	12CEXP16211003.0039	8444057	D25B3DUP	8/2/16 21:03	161880009A	40.00
1566	12CEXP16211003.0040	8444057MS	D25B3MS	8/2/16 21:45	161880009A	40.00
1566	12CEXP16211003.0041	8444061	D25C3	8/2/16 22:27	161880009A	40.00
1566	12CEXP16211003.0042	8444065	D22A3	8/2/16 23:10	161880009A	40.00
1566	12CEXP16211003.0043	8444069	D22B3	8/2/16 23:52	161880009A	40.00
1566	12CEXP16211003.0044	8444082	D22C3	8/3/16 0:35	161880009A	40.00
1566	12CEXP16211003.0045	8444083MS	D22C3	8/3/16 1:17	161880009A	40.00
1566	12CEXP16211003.0046	8444084MSD	D22C3	8/3/16 2:00	161880009A	40.00
1566	12CEXP16211003.0047	BLANKA 7/6/16	PBLK10188	8/3/16 2:42	161880010A	40.00
1566	12CEXP16211003.0048	833031624C	83303LA	8/3/16 3:25	1621399999	1.00
1566	12CEXP16211003.0049	ISMLCS 7/6/16	LCS10188	8/3/16 4:07	161880010A	40.00
1566	12CEXP16211003.0050	LCSA 7/6/16	LCS10188	8/3/16 4:50	161880010A	40.00
1566	12CEXP16211003.0051	8442799	RTP12	8/3/16 5:32	161880010A	40.00
1566	12CEXP16211003.0052	8442802	RTP22	8/3/16 6:15	161880010A	40.00
1566	12CEXP16211003.0053	8442805	RTP32	8/3/16 6:57	161880010A	40.00
1566	12CEXP16211003.0054	8442810	RTP42	8/3/16 7:40	161880010A	40.00
1566	12CEXP16211003.0055	8442811MS	RTP42	8/3/16 8:22	161880010A	40.00
1566	12CEXP16211003.0056	8442812MSD	RTP42	8/3/16 9:05	161880010A	40.00

Operator	File	LLI#	Client ID	Analysis Date	Batch	Dilution Factor
1566	12CEXP16211003.0057	8442818	D16A3	8/3/16 9:47	161880010A	40.00
1566	12CEXP16211003.0058	8442822	D16B3	8/3/16 10:29	161880010A	40.00
1566	12CEXP16211003.0059	833031624C	83303LB	8/3/16 11:12	1621399999	1.00
1566	12CEXP16211003.0060	8442826	D16C3	8/3/16 11:54	161880010A	40.00
1566	12CEXP16211003.0061	8442826	D16C3DUP	8/3/16 12:37	161880010A	40.00
1566	12CEXP16211003.0062	8442826MS	D16C3MS	8/3/16 13:19	161880010A	40.00
1566	12CEXP16211003.0063	8455243	D87B2	8/3/16 14:02	161880010A	40.00
1566	12CEXP16211003.0064	833031624C	83303LC	8/3/16 14:44	1621399999	1.00

Preparation and Run Logs

Explosives

Organic Extraction Batchlog Assigned to: 1429 David Hershey

Reviewed by: JM2855 Start Date: 7/6/15 Start time: 21:00

161880010A

Tech 1: D.H 429 Tech 2: _____

Dept: 24 Prep Analysis: 13433 Nitroaromatic/Amine Ext 8330B Nitroaromatics/Amines 8330B(s)

QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
8442811MS	RTP42	10.08	SS1618224A	0.1	MS1615824A (5)	2	40	Z	Z	315A	
8442812MSD	RTP42	10.31	SS1618224A		MS1615824A (5)	2	40	Z	Z	315A	
8442826DUP 1	D16C3DUP	10.00	SS1618224A				40	Z	Z	315b	
8442826 DUP 2	D16C3MS	10.09	SS1618224A				40	Z	Z	315c	
BLANKA	PBLK10188	10.0	SS1618224A				40	Z	Z		
ISMLCS	LCS10188	10.25	SS1618224A		(5)		40	Z	Z		
LCSA	LCS10188	10.0	SS1618224A		MS1615824A (5)	2	40	Z	Z		
LCSDDIA	LCSD10188	10.0	SS1618224A		ST1614624A ST1614624B	.1 .1	40	Z	Z		
LCSDIA	LCS10188	10.0	SS1618224A		ST1614624A ST1614624B	.1 .1	40	Z	Z		

Solvent Used	Lot No.
Acetonitrile	157773
CaCl2 Sol'n	1429070615A
Syringe Filter	9724732

Chemical code NA

Spike Solutions: Witness: _____

ST1614624A 2,4-Diamino-6-nitrotoluene
ST1614624B 2,6-Diamino-4-nitrotoluene
~~MS1615824A~~ (5) 8330B EXPLOSIVE SPIKE
SS1618224A DH 8330B SURROGATE

Start Time: 21:00
Stop Time: 15:00
MS1618724C

Sample #	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1 8442799	RTP12	10.08	SS1618224A	0.1	40	Z	Z	315a	Soil;Brown	13413	19865	07/18/2016	N
2 8442802	RTP22	10.21	SS1618224A		40	Z	Z	315a	Soil;Brown	13413	19865	07/18/2016	N
3 8442805	RTP32	10.23	SS1618224A		40	Z	Z	315a	Soil;Brown	13413	19865	07/18/2016	N
4 8442810BKG	RTP42	10.00	SS1618224A		40	Z	Z	315A	Soil;Brown	13413	19865	07/18/2016	N
5 8442818	D16A3	10.34	SS1618224A		40	Z	Z	315A	Soil;Brown	13413	19865	07/18/2016	N
6 8442822	D16B3	10.01	SS1618224A		40	Z	Z	315A	Soil;Brown	13413	19865	07/18/2016	N
7 8442826	D16C3	10.00	SS1618224A		40	Z	Z	315a	Soil;Brown	13413	19865	07/18/2016	N
8 8455243	D87B2	10.19	SS1618224A		40	Z	Z	315A	Soil;Brown	13413	19865	07/18/2016	N

Sonic bath 14°C

Rack ID:		Work Station		Micro Temp 100?
Internal Standard		Balance #		

S-bath ID	C	S-bath ID	C	N-Evap	C	M-vap	C	161880010A

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

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Document Title: Sample Preparation of Solid Samples Using Incremental Sampling Methodology

Eurofins Document Reference: 1-P-QM-FOR-9010529 | Revision: 2 | Historical Reference: Form 6103

Effective date: Feb 5, 2015 | Status: Effective

Sample Number	Analysis	Wt of dried sample/ drying dish *	2nd Wt of sample/drying dish	Final Wt <0.05 g (Y or N)	Comp. Bottle Code	Metal 0390	Moist 0111	Total Sample Wt.	Unsieved sample Wt.	Unsieved Sample Description	entered	verified	Date	Time	Init./ Emp. #	Comments
~~8442817~~ ~~8442818~~ 8442812	13588	↑	↑	↑		NA	NA	↑	↑	roots	X	X	↑	↑		
	13564	3.29	3.27	↓	36			736.75	28.02	sticks	✓	✓	7/5/16	1000	BL 189	
	2203	↓	↓	↓	36			↓	↓	leaves	X	X	↓	↓		
8442817 8442818	13588	↑	↑	↑	34			↑	↑	roots	X	X	↑	↑		
	13564	318	3.17	↓	36			348.30	29.60	sticks	✓	✓	7/5/16	1005	BL 189	
	2203	↓	↓	↓	36			↓	↓	leaves	X	X	↓	↓		
8442821 8442822	13588	↑	↑	↑	34			↑	↑	roots	X	X	↑	↑		
	12564	3.32	3.33	↓	36			260.02	43.10	sticks	✓	✓	7/5/16	1020	BL 189	
	2203	↓	↓	↓	36			↓	↓	leaves	X	X	↓	↓		
8442825 8442826	13588	↑	↑	↑	34			↑	↑	roots	X	X	↑	↑		
	12564	3.28	3.28	↓	36			43.10	25.99	sticks	✓	✓	7/5/16	1020	BL 189	
	2203	↓	↓	↓	36			293.60	↓	leaves	X	Y	↓	↓		
8455248	(13588)				20	X				Metals Blank			7/5/16	1100	BL 189	96A - beginning - 0900 96B - end - 1035
8455249	(12564)				20	X				Sand blank			↓	↓		96A - beginning - 0905 96B - end - 1030
	(2203)					X										

Reviewed by: _____ Date: _____

(3) BL 189 1025 7/5/16

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Document Title: Sample Preparation of Solid Samples Using Incremental Sampling Methodology

Eurofins Document Reference: 1-P-QM-FOR-9010529 | Revision: 2 | Historical Reference: Form 5103

Effective date: Feb 5, 2015 | Status: Effective

Sample Number	Analysis	Wt of dried sample/ drying dish	2nd Wt of sample/drying dish	Final Wt <0.05 g (Y or N)	Comp. Bottle Code	Metal 0390	Moist 0111	Total Sample Wt.	Unsieved sample Wt.	Unsieved Sample Description	entered	verified	Date	Time	Init./ Emp. #	Comments
8442799	13588					NA	NA	↑	↑	roots	✓	✓	↑	↑	↑	
	13564	3.06	3.06	y	36			251.10	8.00	sticks	✓	✓	7/5/16	0910	30/189	
	2203	↓	↓	↓	36			↓	↓	leaves	✓	✓	↓	↓	↓	
8442802	13588							↑	↑	roots	✓	✓	↑	↑	↑	
	13564	3.18	3.18	y	36			332.65	17.28	sticks	✓	✓	7/5/16	0935	30/189	
	2203	↓	↓	↓	36			↓	↓	leaves	✓	✓	↓	↓	↓	
8442805	13588							↑	↑	roots	✓	✓	↑	↑	↑	
	12564	3.15	3.15	y	36			310.94	29.45	sticks	✓	✓	7/5/16	0945	30/189	
	2203	↓	↓	↓	36			↓	↓	leaves	✓	✓	↓	↓	↓	
8442810	13588							↑	↑	roots	✓	✓	↑	↑	↑	
	12564	3.28	3.28	y	36			736.75	28.02	sticks	✓	✓	7/5/16	1000	30/189	
	2203	↓	↓	↓	36			↓	↓	leaves	✓	✓	↓	↓	↓	
8442811	13588							↑	↑	roots	✓	✓	↑	↑	↑	
	12564	3.15	3.15	y	36			736.73	28.02	sticks	✓	✓	7/5/16	1000	30/189	
	2203	↓	↓	↓	36			↓	↓	leaves	✓	✓	↓	↓	↓	

Reviewed by: _____ Date: _____

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Document Title: Sample Preparation of Solid Samples Using Incremental Sampling Methodology

Eurofins Document Reference: 1-P-QM-FOR-9010529 | Revision: 2 | Historical Reference: Form 5103

Effective date: Feb 5, 2015 | Status: Effective

Sample Number	Analysis	Wt of dried sample/ drying dish	2nd Wt of sample/drying dish	Final Wt <0.05 g (Y or N)	Comp. Bottle Code	Metal 0390	Moist 0111	Total Sample Wt.	Unsieved sample Wt.	Unsieved Sample Description	entered	verified	Date	Time	Init./ Emp. #	Comments
84388361	13588				34	X	X	347.26	4.92	roots	X	X	1/14	1335	58880	
84388365	13564	3.01	3.01	Y	36	X	X			sticks	X	X				
	2203	↓	↓	↓	36	X	X	↓	↓	leaves	X	X		↓		
84388362	13588				34	X	X	347.26	4.92	roots	X	X		1340		
84388366	13564	3.19	3.17	Y	36	X	X			sticks	X	X				
	2203	↓	↓	↓	36	X	X	↓	↓	leaves	X	X		↓		
84388371	13588				34	X	X	189.51	8.56	roots	X	X		1350		
84388372	12564	3.24	3.24	Y	36	X	X			sticks	X	X				
	2203	↓	↓	↓	36	X	X	↓	↓	leaves	X	X		↓		
84388375	13588				34	X	X	393.05	11.03	roots	X	X		1300		
84388376	12564	3.18	3.18	Y	36	X	X			sticks	X	X				
	2203	↓	↓	↓	36	X	X	↓	↓	leaves	X	X		↓		
84155242	(13588)	—			20					Metals blank				1305		96A - beginning - 1210 96B - end - 1301
84155243	(12564)				20					Sand blank						96A - beginning - 1313 96B - end - 1304
	(2203)				Bottle Full					↓				↓	↓	

Reviewed by: _____ Date: _____

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Organic Extraction Batchlog Assigned to: 572 Edwin Ortiz

Reviewed by: JVBS Start Date: 6-28-16 Start time: 11:15

161780001A

Tech 1: ESM Tech 2: JCeo740

Dept: 24 Prep Analysis: 13432 Nitroaromatic/Amine Ext 8330B Nitroaromatics/Amines 8330B(w)

QC	Sample Code	Amt (mL)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
BLANKA	PBLK01178	500	SS1612624A	0.1	NA	NA	10				= DI H_2O
LCSA	LCS01178	500	SS1612624A		MS1615824A	0.5	10				
LCSDA	LCSD01178	500	SS1612624A		MS1615824A	0.5	10				
LCSDDIA	LCSD01178	500	SS1612624A		ST1614624A ST1614624B	0.1 0.1	10				
LCSDIA	LCS01178	500	SS1612624A		ST1614624A ST1614624B	0.1 0.1	10				

Solvent Used	Lot No.
ACN	157773
CaCl2 Sol'n	28940526/6A
Poropak cart.	4435336A
Syringe Filter	21844392

Spike Solutions: Witness: NA

ST1614624A 2,4-Diamino-6-nitrotoluene
ST1614624B 2,6-Diamino-4-nitrotoluene
MS1615824A 8330B EXPLOSIVE SPIKE
SS1612624A 8330B SURROGATE

	Sample #	Sample Code	Amt (mL)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1	8438378	D8634	500	SS1612624A	0.1	10			162a		13395	19864	07/14/2016	N
2	8438379	D8635	500	SS1612624A		10			162a		13395	19864	07/14/2016	N
3	8442829	RT-EB	500	SS1612624A		10			162a		13395	19864	07/18/2016	N
4	8442830	RT-FB	500	SS1612624A		10			162a		13395	19864	07/18/2016	N
5	8442831	D16C1	500	SS1612624A		10			162a		13395	19864	07/18/2016	N
6	8444113	D25FD	500	SS1612624A		10			162a		13395	19864	07/18/2016	N
7	8444115	D22EB	500	SS1612624A		10			162a		13395	19864	07/18/2016	N
8	8444116	BG3EB	500	SS1612624A		10			162a		13395	19864	07/18/2016	N
9	8445666	D8901	500	SS1612624A		10			162a		13395	19864	07/19/2016	N
10	8445667	D8902	500	SS1612624A		10			162a		13395	19864	07/19/2016	N

NA ESM 6-28-16

Rack ID:		Work Station	H_2O room	Micro Temp 100?	
Internal Standard		Balance #			

S-bath ID	C	S-bath ID	C	N-Evap	C	M-vap	C	161780001A

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

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Perchlorate Data

Case Narrative/Conformance Summary

Perchlorate

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Pesticide Residue Analysis

Fraction: Perchlorate

Perchlorate in Soil LC/MS/MS

		Matrix			
Sample #	Client ID	Liquid	Solid	DF	Comments
8442818	DU-1-6-A		X	1	
8442822	DU-1-6-B		X	1	
8442826	DU-1-6-C		X	1	
8442829	RTPA-EB	X		1	Equipment Blank
8442830	RTPA-FB	X		1	Field Blank
8442831	DU-1-6-FB	X		1	Field Blank
8455243	Explosives/Perchlorate Blank		X	1	Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Matrix QC may not be included if site-specific QC were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, laboratory spike data (LCS) are provided.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Pesticide Residue Analysis

Fraction: Perchlorate

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Perchlorate

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Quality Control Reference List
Pesticide Residue Analysis

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Fraction: Perchlorate

Analysis	Batch Number	Sample Number	Analysis Date
Perchlorate in Soil LC/MS/MS	161880033A	PBLK33188	07/07/2016 21:01:00
		LCS33188	07/07/2016 21:26:00
		8455243	07/07/2016 23:33:00
Perchlorate in Soil LC/MS/MS	161880035A	PBLK35188	07/08/2016 01:40:00
		LCS35188	07/08/2016 02:06:00
		8442818	07/08/2016 02:19:00
		8442822	07/08/2016 02:31:00
		8442826	07/08/2016 02:57:00
Perchlorate in Water LC/MS/MS	161800005A	PBLK05180	06/28/2016 14:14:00
		LCS05180	06/28/2016 14:27:00
		8442829	06/28/2016 16:09:00
		8442830	06/28/2016 16:22:00
		8442831	06/28/2016 16:34:00

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LOQ/MDL Summary
Pesticide Residue Analysis

SDG: DWD87

Fraction: Perchlorate

06557: Perchlorate in Soil LC/MS/MS Analyte Name	Default MDL	Default LOQ	Units
Perchlorate in Soil LC/MS/MS	2.1	5.0	ug/kg

06386: Perchlorate in Water LC/MS/MS Analyte Name	Default MDL	Default LOQ	Units
Perchlorate in Water LC/MS/MS	0.20	1.0	ug/l

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Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: DWD87
Matrix: LIQUID

Fraction: Perchlorate

161800005A / PBLK05180 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
Perchlorate in Water LC/MS/MS	06/28/16	N.D.	ug/l	0.20	1.0

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: DWD87
Matrix: SOLID

Fraction: Perchlorate

161880033A / PBLK33188 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
Perchlorate in Soil LC/MS/MS	07/07/16	N.D.	ug/kg	2.1	5.0

161880035A / PBLK35188 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
Perchlorate in Soil LC/MS/MS	07/08/16	N.D.	ug/kg	2.1	5.0

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Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: LIQUID

Pesticide Residue Analysis

Fraction: Perchlorate

LCS: LCS05180	Batch: **161800005A** (Sample number(s): 8442829-8442831)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Perchlorate in Water LC/MS/MS	5.00	4.35	NA	87	NA	80-120	NA	NA

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: SOLID

Pesticide Residue Analysis

Fraction: Perchlorate

LCS: LCS33188	Batch: **161880033A** (Sample number(s): 8455243)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Couc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Perchlorate in Soil LC/MS/MS	100	89.98	NA	90	NA	80-120	NA	NA

LCS: LCS35188	Batch: **161880035A** (Sample number(s): 8442818, 8442822, 8442826)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Perchlorate in Soil LC/MS/MS	100	84.75	NA	85	NA	80-120	NA	NA

Quant Calibration Report (ISTD)

Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p18016.batch.xml

Analysis Time	2016-06-29 08:47	**Analyst Name**	Administrator
Report Time	2016-06-29 08:48	**Reporter Name**	Administrator
Last Calib Update	2016-06-29 08:44	**Batch State**	ResultsDirty

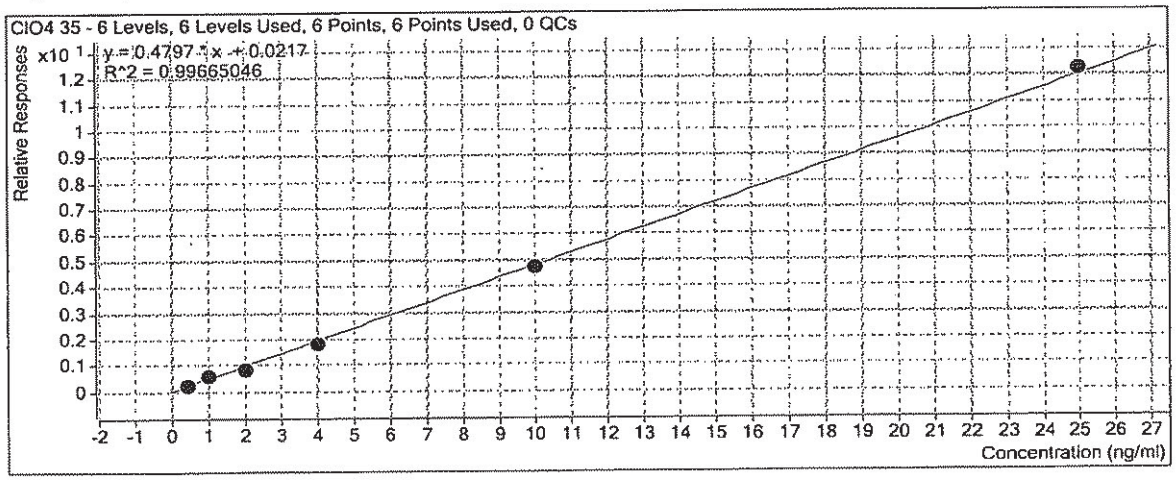
Calibration Info

ISTD Compound *ClO4 18*

36101

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p18016004.d	Calibration	L1	☑	34039	10.0000	3403.9137
ms5p18016005.d	Calibration	L2	☑	33814	10.0000	3381.3501
ms5p18016006.d	Calibration	L3	☑	33481	10.0000	3348.1000
ms5p18016007.d	Calibration	L4	☑	36242	10.0000	3624.2000
ms5p18016008.d	Calibration	L5	☑	36638	10.0000	3663.7920
ms5p18016009.d	Calibration	L6	☑	42392	10.0000	4239.2000

Target Compound *ClO4 35*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p18016004.d	Calibration	L1	☑	7147	0.4000	5.2491
ms5p18016005.d	Calibration	L2	☑	20451	1.0000	6.0480
ms5p18016006.d	Calibration	L3	☑	28828	2.0000	4.3052
ms5p18016007.d	Calibration	L4	☑	65343	4.0000	4.5074
ms5p18016008.d	Calibration	L5	☑	172792	10.0000	4.7162
ms5p18016009.d	Calibration	L6	☑	520400	25.0000	4.9104

ION RATIO USING LEVEL 4

3.11

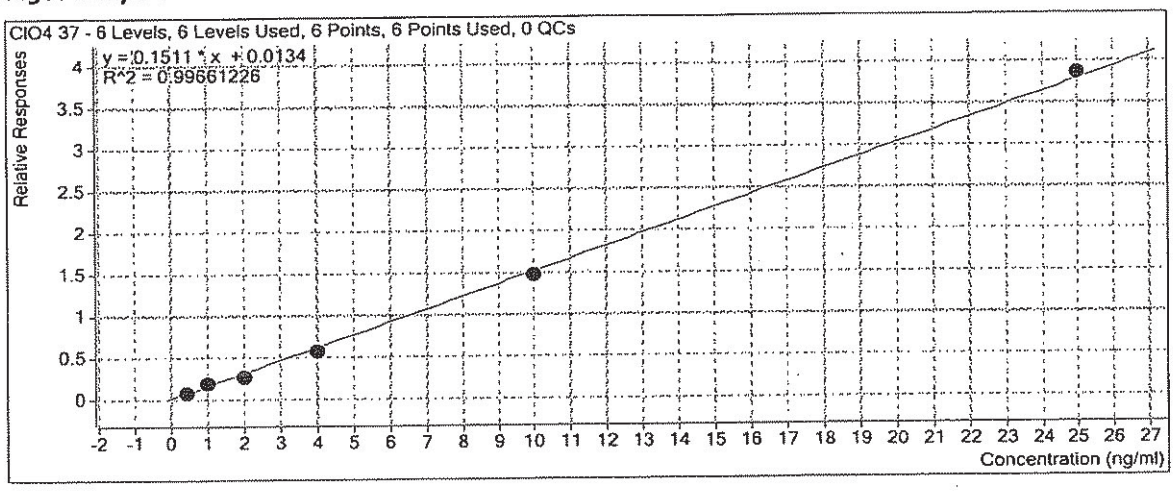
Valerie L. Tomayko
Principal Specialist

JUN 29 2016

DWA8K 6/29/16

Quant Calibration Report (ISTD)

Target Compound *ClO4 37*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p18016004.d	Calibration	L1	☑	2453	0.4000	1.8019
ms5p18016005.d	Calibration	L2	☑	6700	1.0000	1.9814
ms5p18016006.d	Calibration	L3	☑	9299	2.0000	1.3888
ms5p18016007.d	Calibration	L4	☑	21005	4.0000	1.4489
ms5p18016008.d	Calibration	L5	☑	54418	10.0000	1.4853
ms5p18016009.d	Calibration	L6	☑	164252	25.0000	1.5498

Quant Calibration Report (ISTD)

Batch Info

Batch Data Path	D:\MassHunter\Data\perchlorate\QuantResults\ms5p18916.batch.xml

Analysis Time	2016-07-08 08:31	**Analyst Name**	Administrator
Report Time	2016-07-08 08:33	**Reporter Name**	Administrator
Last Calib Update	2016-07-08 08:26	**Batch State**	ResultsDirty

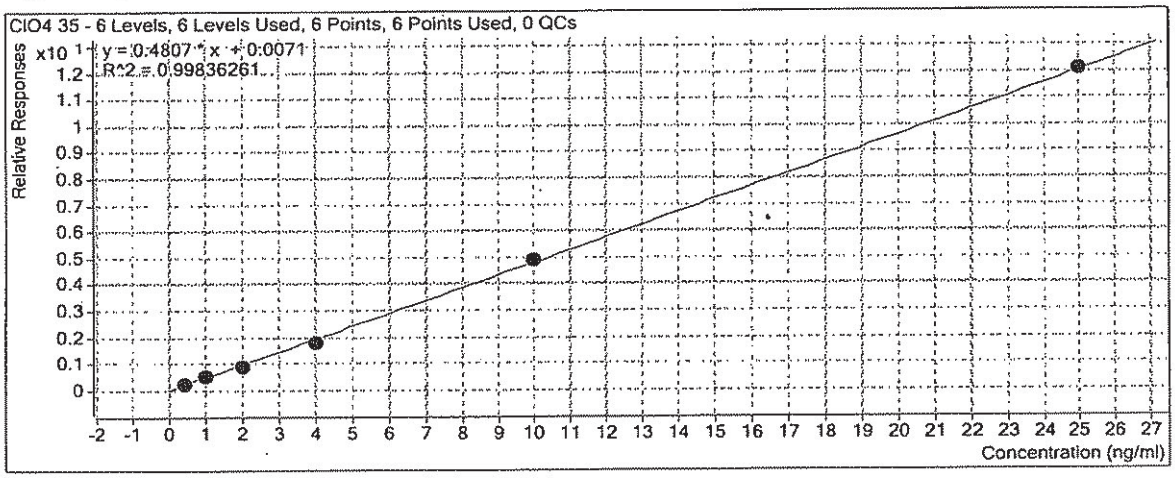
Calibration Info

ISTD Compound *ClO4 18*

33353

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p18916004.d	Calibration	L1	☑	30907	10.0000	3090.7346
ms5p18916005.d	Calibration	L2	☑	33794	10.0000	3379.3648
ms5p18916006.d	Calibration	L3	☑	32005	10.0000	3200.4561
ms5p18916007.d	Calibration	L4	☑	33216	10.0000	3321.5581
ms5p18916008.d	Calibration	L5	☑	33708	10.0000	3370.8222
ms5p18916009.d	Calibration	L6	☑	36485	10.0000	3648.4833

Target Compound *ClO4 35*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p18916004.d	Calibration	L1	☑	6659	0.4000	5.3863
ms5p18916005.d	Calibration	L2	☑	17541	1.0000	5.1907
ms5p18916006.d	Calibration	L3	☑	27738	2.0000	4.3335
ms5p18916007.d	Calibration	L4	☑	59527	4.0000	4.4803
ms5p18916008.d	Calibration	L5	☑	165811	10.0000	4.9190
ms5p18916009.d	Calibration	L6	☑	441933	25.0000	4.8451

ION RATIO USING LEVEL 4

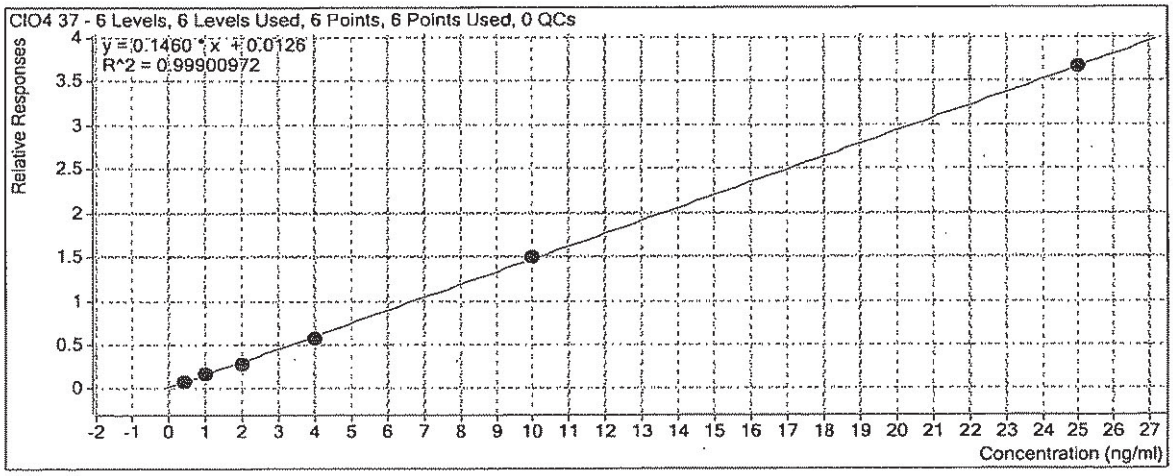
3.17

Susan M. Goshert
Susan M. Goshert
Manager

JUL 20 2016

Quant Calibration Report (ISTD)

Target Compound *ClO4 37*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p18916004.d	Calibration	L1	☑	2342	0.4000	1.8941
ms5p18916005.d	Calibration	L2	☑	5490	1.0000	1.6245
ms5p18916006.d	Calibration	L3	☑	8993	2.0000	1.4049
ms5p18916007.d	Calibration	L4	☑	18774	4.0000	1.4131
ms5p18916008.d	Calibration	L5	☑	50808	10.0000	1.5073
ms5p18916009.d	Calibration	L6	☑	134081	25.0000	1.4700

QQQ Autotune Report

Instrument Name	Instrument 1	**MS Model**	G6410A
Tune Date & Time	2016-06-28 10:43		
Data Path	D:\MassHunter\Tune\QQQ\atunes.TUNE.XML		
Ion Source	ESI		
Ionization Mode	ESI		

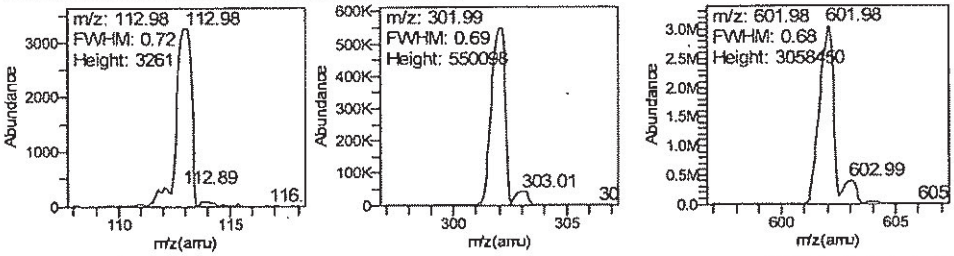
Source Parameters

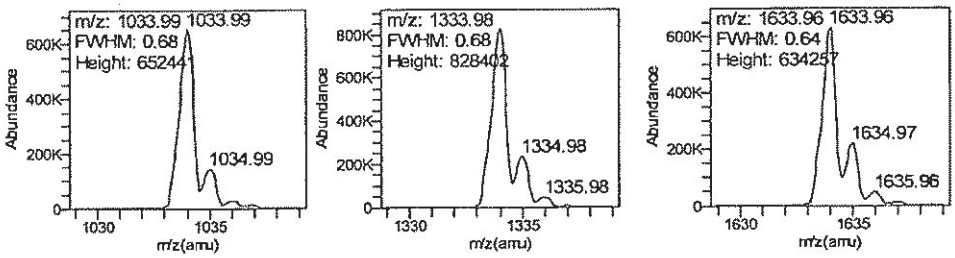
Parameter	Value
Gas Temp	350
Gas Flow	10
Nebulizer	30
Capillary	4000

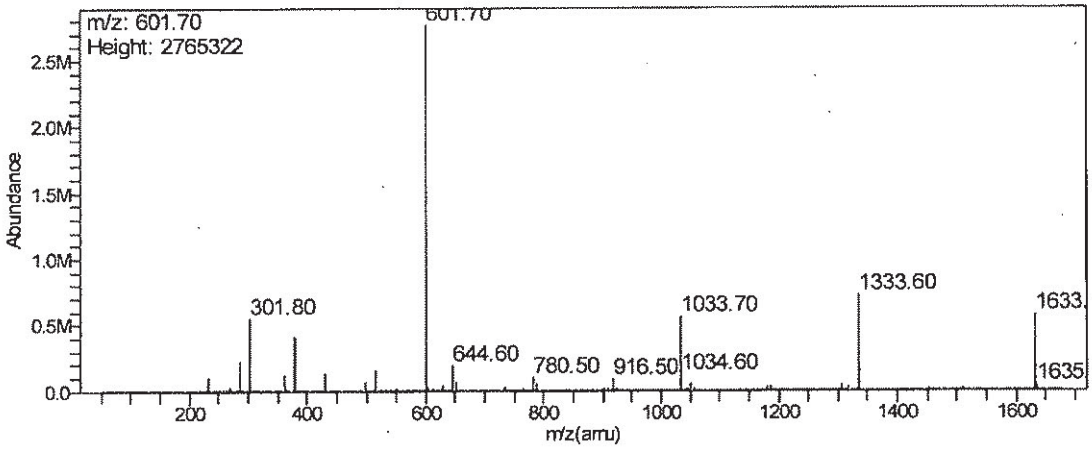
QQQ Autotune Report

Negative Results

Analyzer: *MS1* ***Polarity:*** *Negative* ***Width:*** *Unit*



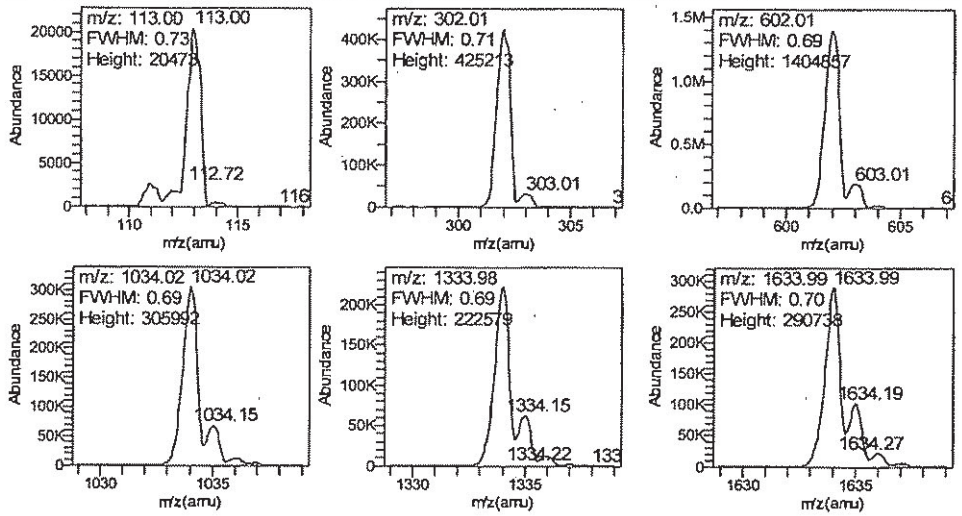


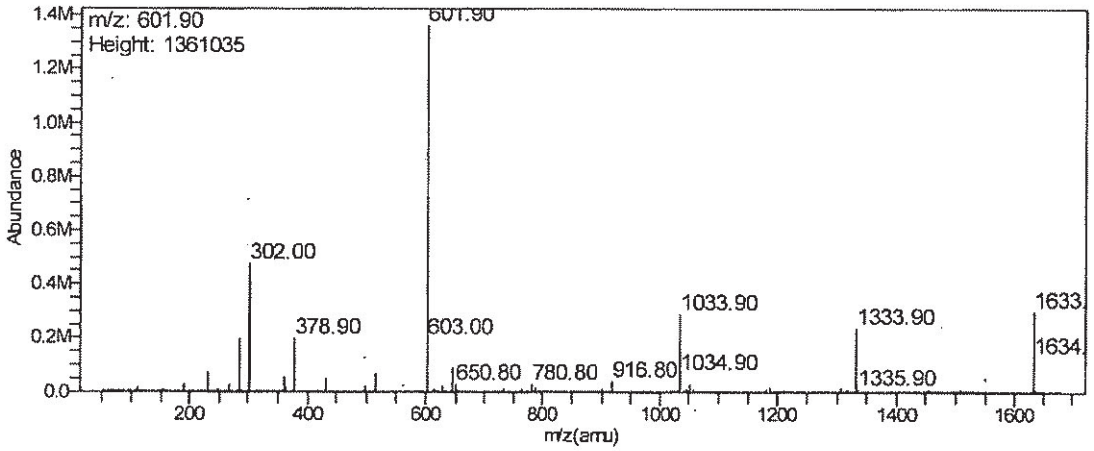


m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.98	112.99	0.72	0.70	3261
301.99	302.00	0.69	0.70	550098
601.98	601.98	0.68	0.70	3058451
1033.99	1033.99	0.68	0.70	652441
1333.99	1333.97	0.68	0.70	828402
1633.97	1633.95	0.64	0.70	634257

QQQ Autotune Report

Analyzer: *MS2* ***Polarity:*** *Negative* ***Width:*** *Unit*

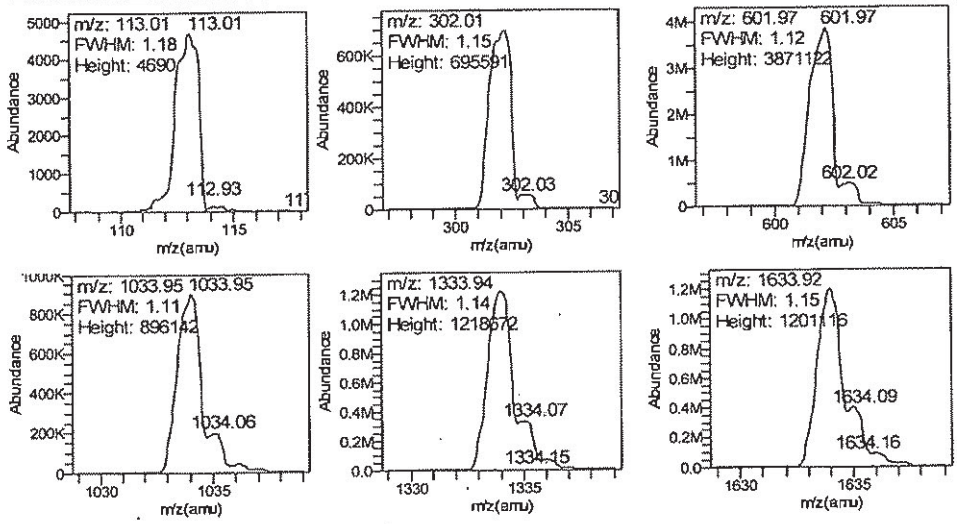




m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.00	112.99	0.73	0.70	20473
302.00	302.00	0.71	0.70	425213
602.00	601.98	0.69	0.70	1404857
1034.02	1033.99	0.69	0.70	305992
1333.99	1333.97	0.69	0.70	222579
1634.00	1633.95	0.70	0.70	290738

QQQ Autotune Report

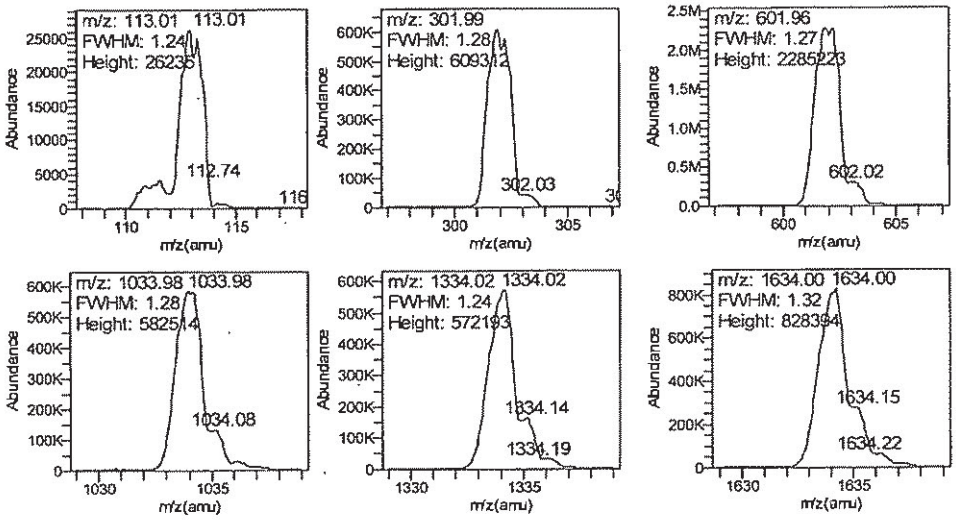
Analyzer: *MS1* ***Polarity:*** *Negative* ***Width:*** *Wide*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.01	112.99	1.18	1.20	4690
302.01	302.00	1.15	1.20	695591
601.97	601.98	1.12	1.20	3871122
1033.95	1033.99	1.11	1.20	896142
1333.95	1333.97	1.14	1.20	1218672
1633.93	1633.95	1.15	1.20	1201116

QQQ Autotune Report

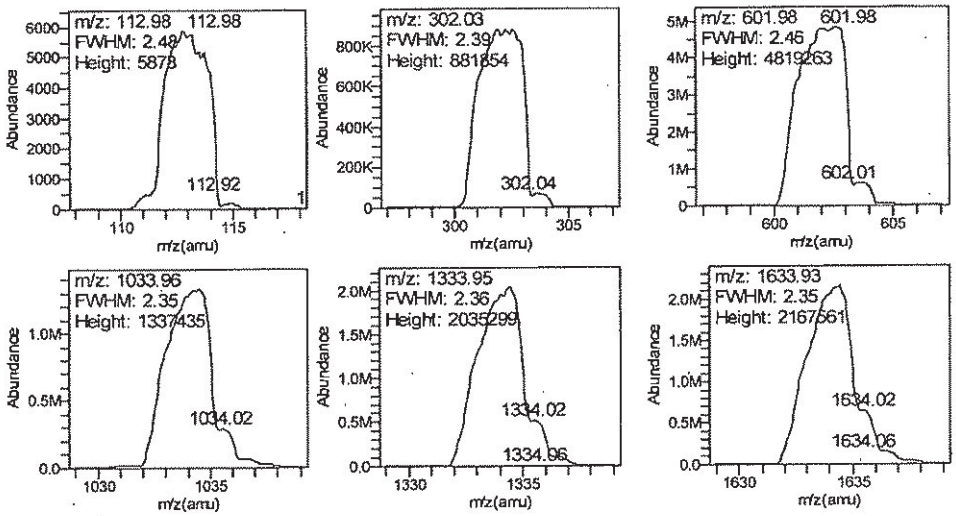
Analyzer: *MS2* ***Polarity:*** *Negative* ***Width:*** *Wide*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.01	112.99	1.24	1.20	26235
301.98	302.00	1.28	1.20	609312
601.96	601.98	1.27	1.20	2285223
1033.98	1033.99	1.28	1.20	582514
1334.03	1333.97	1.24	1.20	572193
1634.01	1633.95	1.33	1.20	828394

QQQ Autotune Report

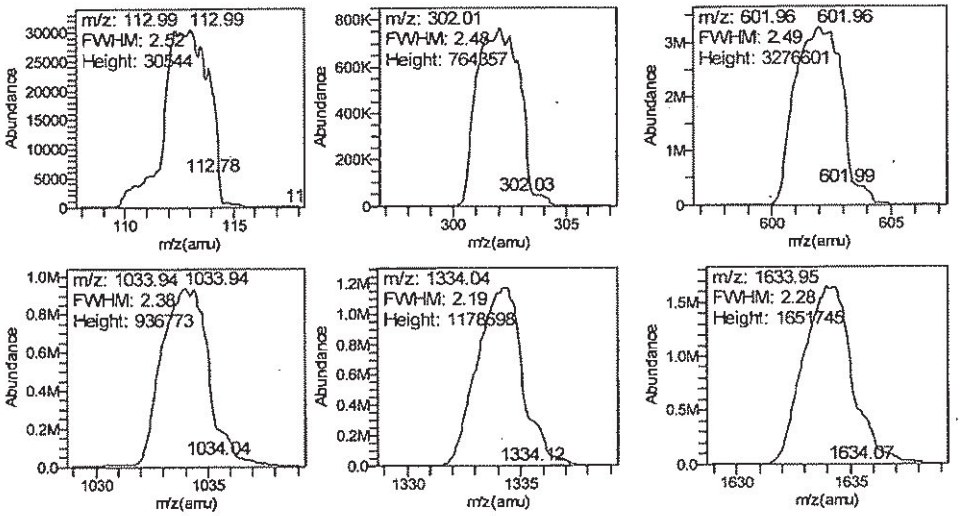
Analyzer: *MS1* ***Polarity:*** *Negative* ***Width:*** *Widest*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.98	112.99	2.48	2.50	5878
302.03	302.00	2.39	2.50	881854
601.97	601.98	2.46	2.50	4819263
1033.96	1033.99	2.35	2.50	1337435
1333.96	1333.97	2.36	2.50	2035299
1633.94	1633.95	2.35	2.50	2167561

QQQ Autotune Report

Analyzer: *MS2* ***Polarity:*** *Negative* ***Width:*** *Widest*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.99	112.99	2.52	2.50	30544
302.00	302.00	2.48	2.50	764357
601.95	601.98	2.49	2.50	3276601
1033.94	1033.99	2.38	2.50	936773
1334.05	1333.97	2.19	2.50	1178698
1633.96	1633.95	2.28	2.50	1651745

QQQ Autotune Report

Negative Parameters

Tune Parameters

Parameter	Setting
Fragmentor	135.00
Skimmer	15.00
Octopole DC	5.00
Octopole RF	600.00
Lens1	0.00
Lens2 DC	1.80
Lens2 RF Enable	1.00
Lens2 RF	318.00
Lens2 RF Phase	-108.00
MS1 DC	-3.00
MS1 PostFilter	-2.00
MS1 Axis Offset	0.79
MS1 Axis Gain	-29.20
MS1 Width Offset	0.10
MS1 Width Gain	31.20
MS1 Heater	100.00
MS2 DC	12.00
MS2 PreFilter	27.00
MS2 Axis Offset	0.72
MS2 Axis Gain	15.85
MS2 Width Offset	0.19
MS2 Width Gain	18.40
MS2 Heater	100.00
Cell Entry	0.00
Hexapole DC	0.00
Hexapole RF	400.00
Hexapole Accel	7.00
Cell Exit	8.00
Collision Gas	1.00
Iris	400.00
HED	10.00
EMV	1310.00
Collision Energy	0.00
Lens2 DC RF Off	29.50

Dynamic Ramp Tables

Lens2 DC

m/z	Setting
112.99	0.50
302.00	1.00
601.98	1.80
1033.99	2.90
1333.97	3.70
1633.95	4.50

Lens2 RF

QQQ Autotune Report

m/z	Setting
112.99	87.00
302.00	116.00
601.98	161.00
1033.99	227.00
1333.97	272.00
1633.95	318.00

MS1 Axis Offset

m/z	Setting
112.99	0.79
302.00	0.82
601.98	0.84
1033.99	0.84
1333.97	0.82
1633.95	0.79

MS1 Width Offset

m/z	Setting
112.99	0.10
302.00	0.11
601.98	0.16
1033.99	0.17
1333.97	0.18
1633.95	0.10

MS2 Axis Offset

m/z	Setting
112.99	0.72
302.00	0.74
601.98	0.76
1033.99	0.76
1333.97	0.72
1633.95	0.72

MS2 Width Offset

m/z	Setting
112.99	0.19
302.00	0.15
601.98	0.15
1033.99	0.19
1333.97	0.19
1633.95	0.19

MS1 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	-29.20	0.79	31.20	0.10
Wide	-29.45	0.99	31.50	0.46
Widest	-29.75	1.42	31.80	1.42

QQQ Autotune Report

MS2 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	15.85	0.72	18.40	0.19
Wide	15.70	0.93	19.00	0.56
Widest	15.20	1.38	19.30	1.44

QQQ Autotune Report

Instrument Name	Instrument 1	**MS Model**	G6410A
Tune Date & Time	2016-07-07 16:38		
Data Path	D:\MassHunter\Tune\QQQ\atunes.TUNE.XML		
Ion Source	ESI		
Ionization Mode	ESI		

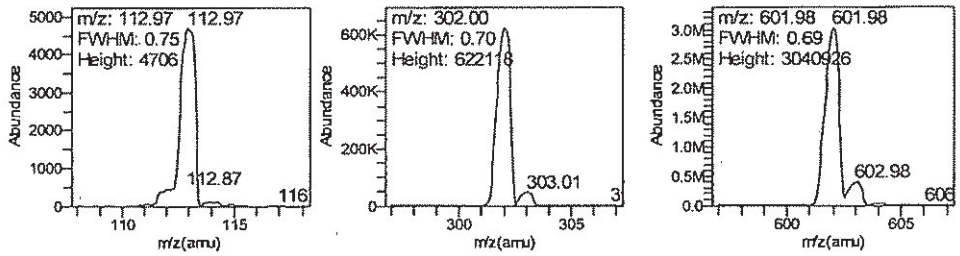
Source Parameters

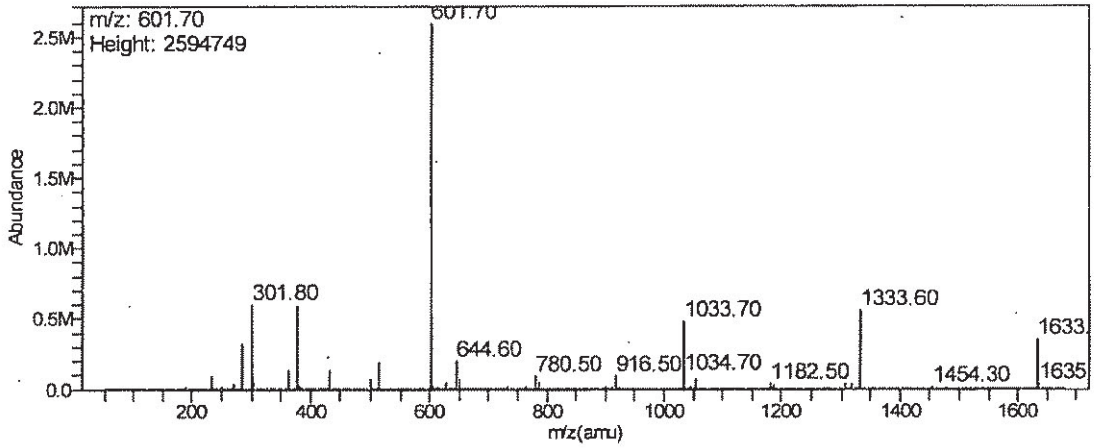
Parameter	Value
Gas Temp	350
Gas Flow	10
Nebulizer	30
Capillary	4000

QQQ Autotune Report

Negative Results

Analyzer: *MS1* ***Polarity:*** *Negative* ***Width:*** *Unit*

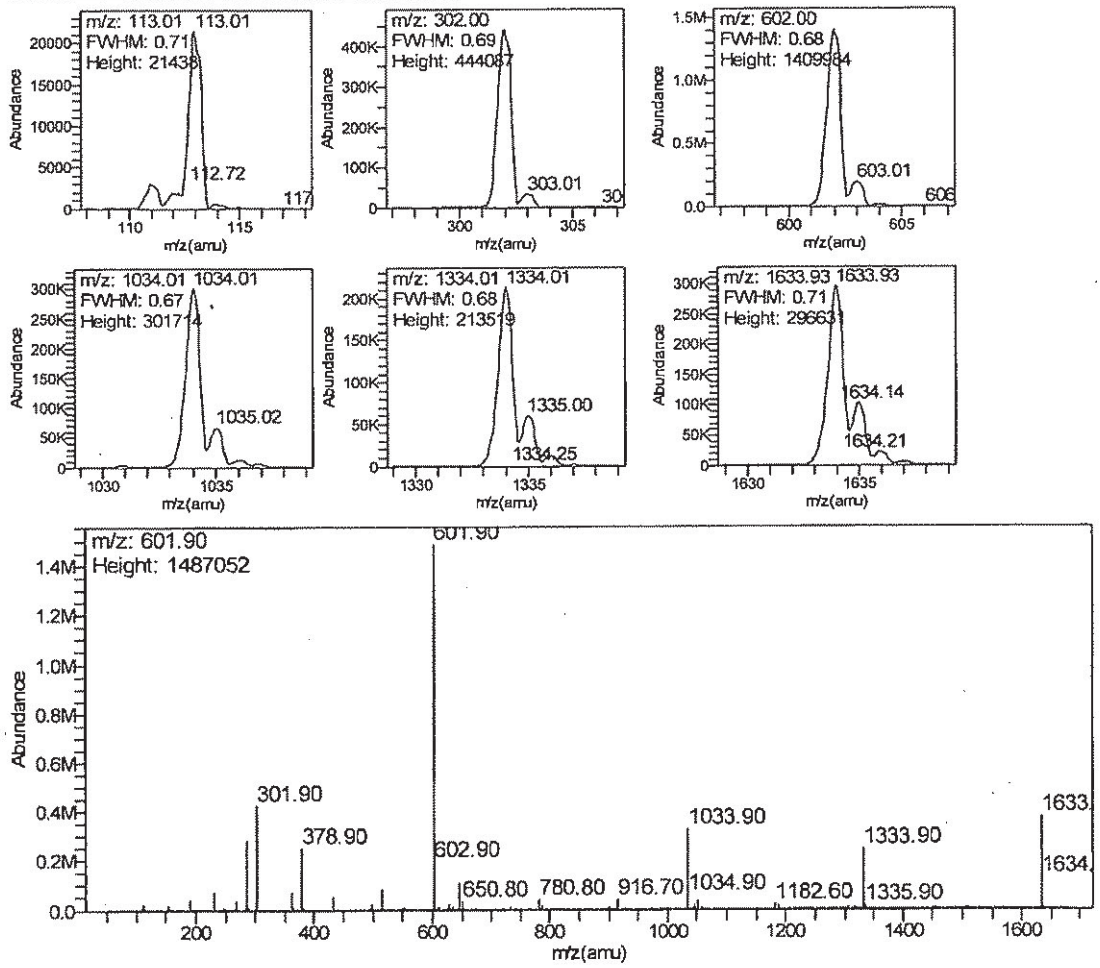




m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.97	112.99	0.75	0.70	4706
301.99	302.00	0.70	0.70	622118
601.97	601.98	0.69	0.70	3040926
1033.98	1033.99	0.69	0.70	619388
1333.97	1333.97	0.70	0.70	794466
1633.92	1633.95	0.65	0.70	479464

QQQ Autotune Report

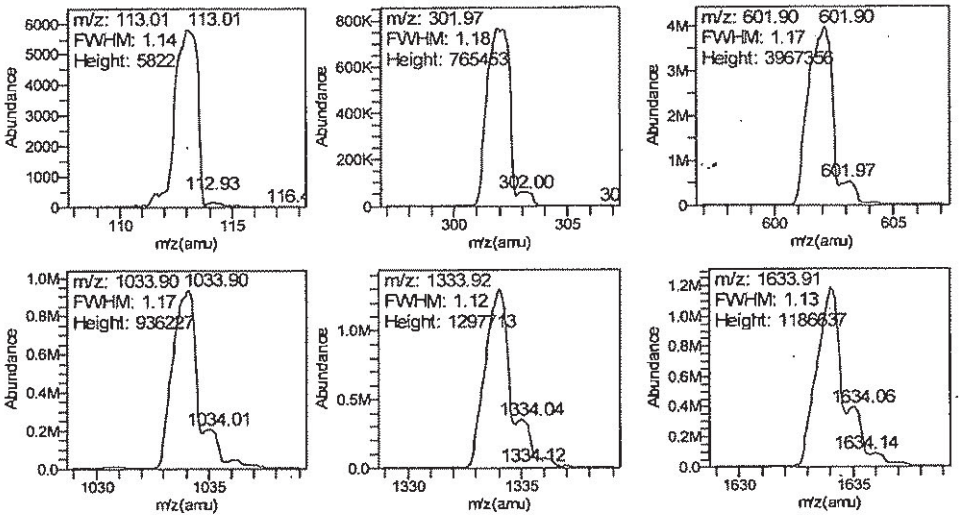
Analyzer: *MS2* ***Polarity:*** *Negative* ***Width:*** *Unit*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.01	112.99	0.71	0.70	21438
301.99	302.00	0.69	0.70	444087
602.00	601.98	0.68	0.70	1409984
1034.01	1033.99	0.67	0.70	301714
1334.02	1333.97	0.69	0.70	213519
1633.94	1633.95	0.71	0.70	296631

QQQ Autotune Report

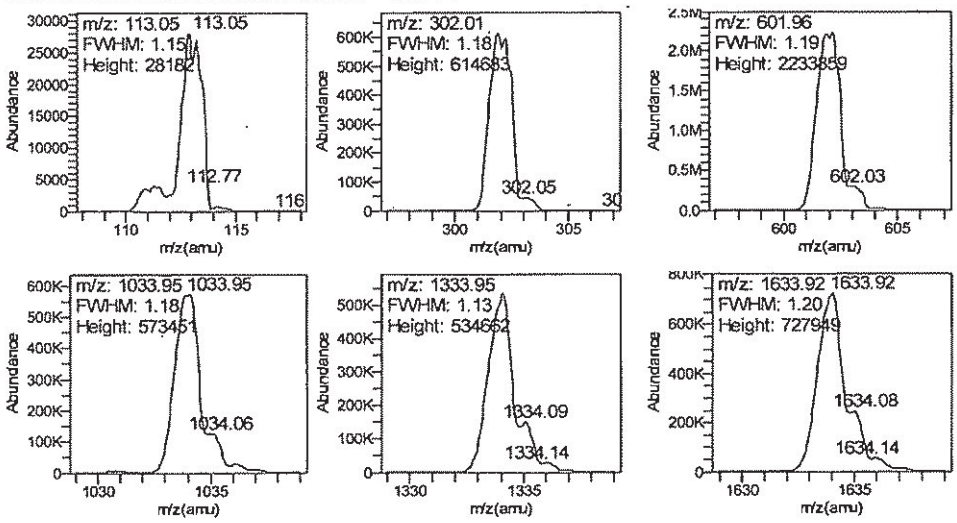
Analyzer: *MS1* ***Polarity:*** *Negative* ***Width:*** *Wide*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.02	112.99	1.14	1.20	5822
301.96	302.00	1.18	1.20	765453
601.90	601.98	1.17	1.20	3967356
1033.90	1033.99	1.17	1.20	936227
1333.94	1333.97	1.12	1.20	1297714
1633.92	1633.95	1.13	1.20	1186637

QQQ Autotune Report

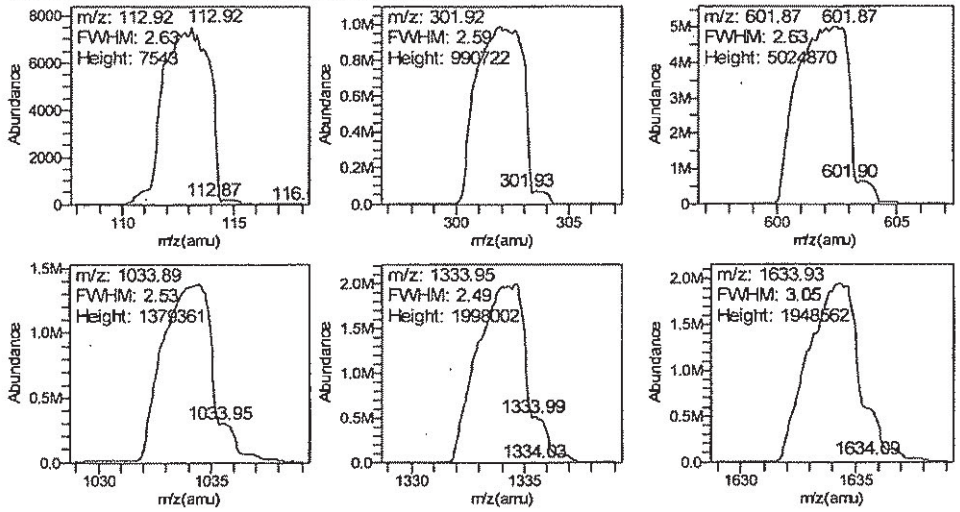
Analyzer: *MS2* ***Polarity:*** *Negative* ***Width:*** *Wide*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.06	112.99	1.15	1.20	28182
302.01	302.00	1.17	1.20	614683
601.96	601.98	1.19	1.20	2233859
1033.94	1033.99	1.18	1.20	573451
1333.96	1333.97	1.13	1.20	534662
1633.93	1633.95	1.20	1.20	727949

QQQ Autotune Report

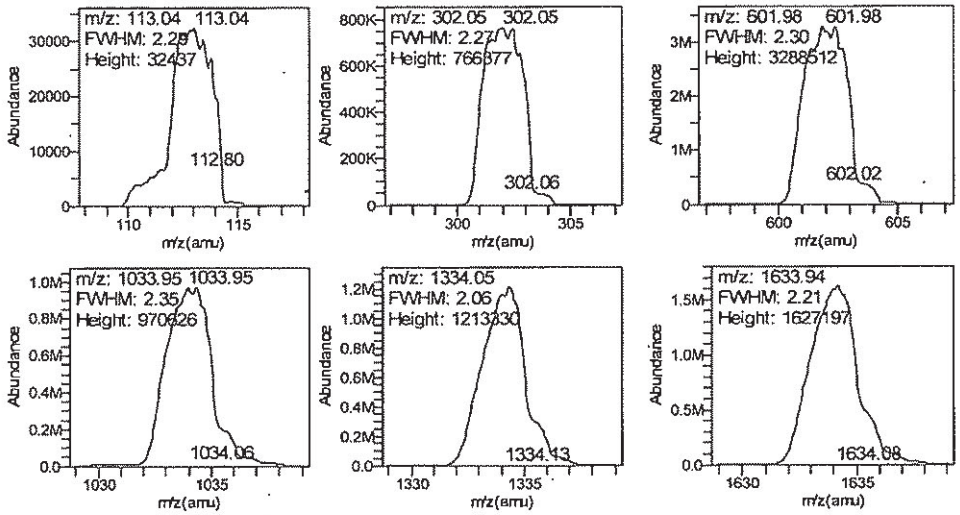
Analyzer: *MS1* ***Polarity:*** *Negative* ***Width:*** *Widest*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.92	112.99	2.63	2.50	7543
301.91	302.00	2.59	2.50	990722
601.86	601.98	2.63	2.50	5024870
1033.89	1033.99	2.53	2.50	1379361
1333.96	1333.97	2.49	2.50	1998001
1633.94	1633.95	3.05	2.50	1948562

QQQ Autotune Report

Analyzer: *MSZ* ***Polarity:*** *Negative* ***Width:*** *Widest*



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.04	112.99	2.29	2.50	32437
302.04	302.00	2.27	2.50	766377
601.98	601.98	2.30	2.50	3288512
1033.94	1033.99	2.35	2.50	970626
1334.07	1333.97	2.07	2.50	1213330
1633.96	1633.95	2.21	2.50	1627197

QQQ Autotune Report

Negative Parameters

Tune Parameters

Parameter	Setting
Fragmentor	135.00
Skimmer	15.00
Octopole DC	5.00
Octopole RF	600.00
Lens1	0.00
Lens2 DC	2.00
Lens2 RF Enable	1.00
Lens2 RF	317.00
Lens2 RF Phase	-180.00
MS1 DC	-3.00
MS1 PostFilter	-2.00
MS1 Axis Offset	0.78
MS1 Axis Gain	-29.25
MS1 Width Offset	0.17
MS1 Width Gain	30.70
MS1 Heater	100.00
MS2 DC	12.00
MS2 PreFilter	27.00
MS2 Axis Offset	0.71
MS2 Axis Gain	15.80
MS2 Width Offset	0.15
MS2 Width Gain	18.50
MS2 Heater	100.00
Cell Entry	0.00
Hexapole DC	0.00
Hexapole RF	400.00
Hexapole Accel	7.00
Cell Exit	8.00
Collision Gas	1.00
Iris	400.00
HED	10.00
EMV	1320.00
Collision Energy	0.00
Lens2 DC RF Off	29.50

Dynamic Ramp Tables

Lens2 DC

m/z	Setting
112.99	0.40
302.00	0.80
601.98	1.40
1033.99	2.30
1333.97	2.90
1633.95	3.50

Lens2 RF

m/z	Setting
112.99	84.00
302.00	113.00
601.98	159.00
1033.99	225.00
1333.97	271.00
1633.95	317.00

MS1 Axis Offset

m/z	Setting
112.99	0.78
302.00	0.84
601.98	0.87
1033.99	0.88
1333.97	0.85
1633.95	0.78

MS1 Width Offset

m/z	Setting
112.99	0.17
302.00	0.14
601.98	0.19
1033.99	0.22
1333.97	0.27
1633.95	0.17

MS2 Axis Offset

m/z	Setting
112.99	0.71
302.00	0.74
601.98	0.76
1033.99	0.78
1333.97	0.76
1633.95	0.71

MS2 Width Offset

m/z	Setting
112.99	0.15
302.00	0.13
601.98	0.12
1033.99	0.13
1333.97	0.12
1633.95	0.15

MS1 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	-29.25	0.78	30.70	0.17
Wide	-29.40	0.96	31.40	0.46
Widest	-29.50	1.36	31.70	1.55

QQQ Autotune Report

MS2 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	15.80	0.71	18.50	0.15
Wide	15.50	0.94	18.90	0.50
Widest	15.25	1.35	19.50	1.28

Continuing Calibration Method 6850

Run # ms5p18016

MS5P18016010		Found	Added		
RT (min)		ug/L	ug/L	%D	
1.86	perchlorate	3.4	4	-15%	ICV

MS5P18016021		Found	Added		
RT (min)		ug/L	ug/L	%D	
1.86	perchlorate	0.3	0.4	-25%	

MS5P18016030		Found	Added		
RT (min)		ug/L	ug/L	%D	
1.87	perchlorate	3.5	4	-13%	

entered by [signature] 6/29/16

verified by [signature] 6/29/16

Continuing Calibration Method 6850

Run # ms5p18916

		Found	Added		
MS5P18916010		ug/L	ug/L	%D	
RT (min)					
1.85	perchlorate	3.4	4	-15%	ICV
MS5P18916021		Found	Added		
RT (min)		ug/L	ug/L	%D	
1.85	perchlorate	0.35	0.4	-13%	
MS5P18916032		Found	Added		
RT (min)		ug/L	ug/L	%D	
1.85	perchlorate	3.7	4	-8%	
MS5P18916043		Found	Added		
RT (min)		ug/L	ug/L	%D	
1.85	perchlorate	0.34	0.4	-15%	
MS5P18916054		Found	Added		
RT (min)		ug/L	ug/L	%D	
1.85	perchlorate	3.5	4	-13%	

entered by _____ 7/8/16

Susan M. Goshort
Susan M. Goshort
Manager

verified by _____ JUL 20 2016

Worklist Report

Worklist Path:	D:\MassHunter\Worklists\ms5p18016.wkl

Worklist Run Parameters

Operator Name:	---
Run Type:	**Standard Start**
Part of Method to Run:	**Acquisition Only**
Execution for Acquisition-DA:	**Synchronous**
Acquisition Method Path:	**D:\MassHunter\methods**
DA Method Path:	**D:\MassHunter\methods**
Data File Path:	**D:\MassHunter\data**
Pre-Worklist Script:	---
Post-Worklist Script:	---
Acquisition Clean Up Script:	---
Overlapped Injection:	**Yes**
Clear sample selection after run:	**Yes**
Wait Time for Ready(Min):	**10**
Threshold Disk Value(MB):	**10240**
Comment:	---

Worklist Table

Sample Name	Sample Position	Method	Data File	Sample Type	Level Name	Dilution	Comment
Conditioner	P1-A1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016001.d	Sample		1	
Conditioner	P1-A1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016002.d	Sample		1	
Conditioner	P1-A2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016002a.d	Sample		1	
Conditioner	P1-A2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016002b.d	Sample		1	
Perc11624a	P1-A3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016003.d	Sample		1	
Perc21624a	P1-A4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016004.d	Calibration	L1	1	

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Perc31624a	P1-A5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016005.d	Calibration	L2	1	
Perc41624a	P1-A6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016006.d	Calibration	L3	1	
Perc51624a	P1-A7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016007.d	Calibration	L4	1	
Perc61624a	P1-A8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016008.d	Calibration	L5	1	
Perc71624a	P1-A9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016009.d	Calibration	L6	1	
lcperc51624a	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016010.d	Sample		1	
BLANKA	P1-B2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016011.d	Sample		10	161790008A
BLANKA IS	P1-B3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016012.d	Sample		10	161790008A
BLANKA	P1-B4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016013.d	Sample		1	161800005A
LCSA	P1-B5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016014.d	Sample		1	161800005A
8437254BKG	P1-B6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016015.d	Sample		1	161800005A
8437254MS	P1-B7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016016.d	Sample		1	161800005A
8437254MSD	P1-B8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016017.d	Sample		1	161800005A
8438378	P1-B9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016018.d	Sample		1	161800005A
8438379	P1-C1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016019.d	Sample		1	161800005A
8439643	P1-C2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016020.d	Sample		1	161800005A
lcperc21624a	P1-C3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016021.d	Sample		1	
8442829	P1-C4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016022.d	Sample		1	161800005A
8442830	P1-C5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016023.d	Sample		1	161800005A
8442831	P1-C6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016024.d	Sample		1	161800005A
8444113	P1-C7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016025.d	Sample		1	161800005A
8444115	P1-C8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016026.d	Sample		1	161800005A
8444166	P1-C9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016027.d	Sample		1	161800005A
8445666	P1-D1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016028.d	Sample		1	161800005A
8445667	P1-D2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016029.d	Sample		1	161800005A
lcperc51624a	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18016030.d	Sample		1	
SCP_InstrumentStandby(){Acquisition : AcqEngSystem : SCP_System}							

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Worklist Report

Worklist Path:	D:\MassHunter\Worklists\ms5p18916.wkl

Worklist Run Parameters

Operator Name:	---
Run Type:	Standard Start
Part of Method to Run:	Acquisition Only
Execution for Acquisition-DA:	Synchronous
Acquisition Method Path:	D:\MassHunter\methods
DA Method Path:	D:\MassHunter\methods
Data File Path:	D:\MassHunter\data
Pre-Worklist Script:	---
Post-Worklist Script:	---
Acquisition Clean Up Script:	---
Overlapped Injection:	Yes
Clear sample selection after run:	Yes
Wait Time for Ready(Min):	10
Threshold Disk Value(MB):	10240
Comment:	---

Worklist Table

Sample Name	Sample Position	Method	Data File	Sample Type	Level Name	Dilution	Comment	Barcode
Conditioner	P1-A1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916001.d	Sample		1		
Conditioner	P1-A1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916002.d	Sample		1		
Conditioner	P1-A2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916002a.d	Sample		1		
Conditioner	P1-A2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916002b.d	Sample		1		
Perc11624a	P1-A3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916003.d	Sample		1		
Perc21624a	P1-A4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916004.d	Calibration	L1	1		

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Perc31624a	P1-A5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916005.d	Calibration	L2	1		
Perc41624a	P1-A6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916006.d	Calibration	L3	1		
Perc51624a	P1-A7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916007.d	Calibration	L4	1		
Perc61624a	P1-A8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916008.d	Calibration	L5	1		
Perc71624a	P1-A9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916009.d	Calibration	L6	1		
lcperc51624a	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916010.d	Sample		1		
BLANKA	P1-B2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916011.d	Sample		10	161880036A	
LCSA	P1-B3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916012.d	Sample		10	161880036A	
LCSB	P1-B4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916013.d	Sample		10	161880036A	
LCSC	P1-B5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916014.d	Sample		10	161880036A	
LCSD	P1-B6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916015.d	Sample		10	161880036A	
BLANKA	P1-B7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916016.d	Sample		10	161880033A	
LCSA	P1-B8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916017.d	Sample		10	161880033A	
ISMLCS	P1-B9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916018.d	Sample		10	161880033A	
8438323	P1-C1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916019.d	Sample		10	161880033A	
8438327	P1-C2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916020.d	Sample		10	161880033A	
lcperc21624a	P1-C3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916021.d	Sample		1		
8438331	P1-C4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916022.d	Sample		10	161880033A	
8438335	P1-C5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916023.d	Sample		10	161880033A	
8438347BKG	P1-C6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916024.d	Sample		10	161880033A	
8438348MS	P1-C7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916025.d	Sample		10	161880033A	
8438349MSD	P1-C8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916026.d	Sample		10	161880033A	
8438352	P1-C9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916027.d	Sample		10	161880033A	
8455243	P1-D1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916028.d	Sample		10	161880033A	
BLANKA	P1-D2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916029.d	Sample		10	161880034A	
LCSA	P1-D3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916030.d	Sample		10	161880034A	
ISMLCS	P1-D4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916031.d	Sample		10	161880034A	
lcperc51624a	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916032.d	Sample		1		
8438364BKG	P1-D6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916033.d	Sample		10	161880034A	
8438365MS	P1-D7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916034.d	Sample		10	161880034A	
8438366MSD	P1-D8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916035.d	Sample		10	161880034A	
8438372	P1-D9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916036.d	Sample		10	161880034A	

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8438376	P1-E1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916037.d	Sample		10	161880034A	
BLANKA	P1-E2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916038.d	Sample		10	161880035A	
LCSA	P1-E3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916039.d	Sample		10	161880035A	
ISMLCS	P1-E4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916040.d	Sample		10	161880035A	
8442818	P1-E5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916041.d	Sample		10	161880035A	
8442822	P1-E6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916042.d	Sample		10	161880035A	
lcperc21624a	P1-C3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916043.d	Sample		1		
8442826	P1-E8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916044.d	Sample		10	161880035A	
8444053	P1-E9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916045.d	Sample		10	161880035A	
8444057	P1-F1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916046.d	Sample		10	161880035A	
8444061	P1-F2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916047.d	Sample		10	161880035A	
8444065	P1-F3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916048.d	Sample		10	161880035A	
8444069	P1-F4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916049.d	Sample		10	161880035A	
8444082BKG	P1-F5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916050.d	Sample		10	161880035A	
8444083MS	P1-F6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916051.d	Sample		10	161880035A	
8444084MSD	P1-F7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916052.d	Sample		10	161880035A	
8455249	P1-F8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916053.d	Sample		10	161880035A	
lcperc51624a	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p18916054.d	Sample		1		
SCP_InstrumentStandby(){Acquisition : AcqEngSystem : SCP_System}								

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Preparation and Run Logs

Perchlorate

Organic Extraction Batchlog Assigned to: 120 Richard Shober Reviewed by: WJ047 Start Date: 6/28/16 Start time: 1030

161800005A Tech 1: RSH Tech 2:

Dept: 24 Prep Analysis: 00000 Perchlorate in Water LC/MS/MS

QC	Sample Code	Amt (µl	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
8437254MSD	53671MSD		IS160224A		IN160924B					178A	
8437254MS	53671MS									178A	
BLANKA	PBLK05180										
LCSA	LCS05180										

Solvent Used	Lot No.

SYRINGE 6089854
SYRINGE FLUSH 9724732

Sample #	Sample Code	Amt (µl	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1 8437254	53671							099a		06386		07/01/2016	N
2 8438378	D8634							178A		06386		07/14/2016	N
3 8438379	D8635							178A		06386		07/14/2016	N
4 8439643	26422							099a		06386		07/05/2016	N
5 8442829	RT-EB							178A		06386		07/18/2016	N
6 8442830	RT-FB							178A		06386		07/18/2016	N
7 8442831	D16C1							178A		06386		07/18/2016	N
8 8444113	D25FD							178A		06386		07/18/2016	N
9 8444115	D22EB							178A		06386		07/18/2016	N
10 8444116	BG3EB							178A		06386		07/18/2016	N
11 8445666	D8901							178A		06386		07/19/2016	N
12 8445667	D8902							178A		06386		07/19/2016	N

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Rack ID:		Work Station		Micro Temp 100?	
Internal Standard		Balance #			

S-bath ID	C	S-bath ID	C	N-Evap	C	M-vap	C	161800005A

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

Organic Extraction Batchlog Assigned to: 300 Maria Davenport Reviewed by: [illegible] Start Date: 7/7/16 Start time: 9:00

161880033A

Tech 1: qce740 Tech 2: mp300

Dept: 24 Prep Analysis: 06568 Perchlorate Soil Prep — Perchlorate in Soil LC/MS/MS

QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
8438348MS	D8618	1.02	IN160192 4B IS160262 4A	0.1 0.02			10	Z	Z	305A	Brown Soil
8438349MSD	D8618	1.03	IN160192 4B IS160262 4A	0.1 0.02			10	Z	Z	305A	↓
BLANKA	PBLK33188	1.03	IS160262 4A	0.02			10	Z	Z	—	Ottawa sand
ISMLCS	LCS33188	1.17	IS160262 4A	0.02			10	Z	Z	#7	
LCSA	LCS33188	1.01	IN160192 4B IS160262 4A	0.1 0.02			10	Z	Z	—	Ottawa Sand

Solvent Used	Lot No.
Ottawa Sand	213240-AA
Synnge Filter	9660528

IS160262 4A: perchlorate INT STD

IN160192 4B: perchlorate intern.

Note: 0.02mL INT. STD added to 2mL of extract.

	Sample #	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1	8438323	D8603	1.01	IS160262 4A	0.02	10	Z	Z	305A	Soil;Brown	06557		07/14/2016	N
2	8438327	D8607	1.02			10	Z	Z	305A	Soil;Brown	06557		07/14/2016	N
3	8438331	D8611	1.01			10	Z	Z	305A	Soil;Brown	06557		07/14/2016	N
4	8438335	D8615	1.01			10	Z	Z	305A	Soil;Brown	06557		07/14/2016	N
5	8438347BKG	D8618	1.02			10	Z	Z	305A	Soil;Brown	06557		07/14/2016	N
6	8438352	D8621	1.03			10	Z	Z	305a	Soil;Brown	06557		07/14/2016	N
7	8455243	D87B2	~~1.00~~			10	Z	Z	~~090a~~ 20A	Brown soil	06557		07/18/2016	N

(3)F 7/7/16 (3)F 7/7/16

N/A

Rack ID:		Work Station		Micro Temp 100?
Internal Standard		Balance #	13	

DF = Dilution Factor, FV = Final Volume

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Sonic Bath: 17489

S-bath ID	C	S-bath ID	C	N-Evap	C	M-vap	C	161880033A

Documented temps are NIST corrected.

centrifuge: 8

Organic Extraction Batchlog Assigned to: 300 Maria Davenport

Reviewed by: JBW Start Date: 7/7/16 Start time: 9:00

161880035A

Tech 1: JC10740 Tech 2: MD300

Dept: 24 Prep Analysis: 06568 Perchlorate Soil Prep — Perchlorate in Soil LC/MS/MS

QC	Sample Code	Amt (G)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
8444083MS	D22C3	1.00	IN160192 4B	0.1			10	Z	Z	305A	Brown soil
			IS160262 4A	0.02							
8444084MSD	D22C3	1.04	IN160192 4B	0.1			10	Z	Z	305A	↓
			IS160262 4A	0.02							
BLANKA	PBLK35188	1.00	IS160262 4A	0.02			10	Z	Z	N/A	Ottawa sand
ISMLCS	LCS35188	1.00	IS160262 4A	0.02			10	Z	Z	#4	
LCSA	LCS35188	1.00	IN160192 4B	0.1			10	Z	Z	N/A	Ottawa Sand
			IS160262 4A	0.02							

Solvent Used	Lot No.
Ottawa Sand	213240-A6
Syringe Filter	9660528

IS160262 4A : perchlorate INT STD

IN160192 4B : perchlorate IN-tern.

Note: 0.02 mL int. std is added to 2 mL of extract.

Sample #	Sample Code	Amt (G)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1 8442818	D16A3	1.00	IS160262 4A	0.02	10	Z	Z	305a	Soil;Brown	06557		07/18/2016	N
2 8442822	D16B3	1.01	↓	↓	10	Z	Z	305A	Soil;Brown	06557		07/18/2016	N
3 8442826	D16C3	1.04			10	Z	Z	305a	Soil;Brown	06557		07/18/2016	N
4 8444053	D25A3	1.01			10	Z	Z	305a	Soil;Brown	06557		07/18/2016	N
5 8444057	D25B3	1.02			10	Z	Z	305A	Soil;Brown	06557		07/18/2016	N
6 8444061	D25C3	1.03			10	Z	Z	305A	Soil;Brown	06557		07/18/2016	N
7 8444065	D22A3	1.00			10	Z	Z	305a	Soil;Brown	06557		07/18/2016	N
8 8444069	D22B3	1.01			10	Z	Z	305A	Soil;Brown	06557		07/18/2016	N
9 8444082BKG	D22C3	1.01			10	Z	Z	305A	Soil;Brown	06557		07/18/2016	N
10 8455249	D88B2	1.02	↓	↓	10	Z	Z	20A	Brown soil	06557		07/18/2016	N

N/A

sonic bath : 17489

Rack ID:		Work Station		Micro Temp 100?
Internal Standard		Balance #	13	

S-bath ID	C	S-bath ID	C	N-Evap	C	M-vap	C	161880035A

Documented temps are NIST corrected.

centrifuge : 8

DF = Dilution Factor FV = Final Volume

Metals in Liquid Data

Case Narrative/Conformance Summary

Metals in Liquid

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

ICP Metals

Fraction: Metals in Liquid

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8442829	RTPA-EB	X		1	Equipment Blank
8442830	RTPA-FB	X		1	Field Blank
8442831	DU-1-6-FB	X		1	Field Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

Method Blank

For noncompliant preparation/method blanks, corrective action is not required if the sample is ND or > 10 times the blank concentration, unless otherwise specified in the method or by the client.

MS/MSD

Method defined actions are taken for any failed matrix QC.

Batch#: 161795713002 (Sample number(s): 8442829-8442831, UNSPK: P444555, BKG: P444555)
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: Mercury
Refer to the QC Summary forms for more information.

Batch#: 161790635001 (Sample number(s): 8442829-8442831, UNSPK: P444144, BKG: P444144)

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

ICP Metals

Fraction: Metals in Liquid

The recovery(ies) for the following analyte(s) in the MS is outside the acceptance window: Calcium, Magnesium

Sample Duplicate

Batch#: 161790635001 (Sample number(s): 8442829-8442831, UNSPK: P444144, BKG: P444144)
The duplicate RPD for the following analyte(s) is outside the acceptance window:
Aluminum, Chromium, Nickel

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

The instrument detection limits (IDLs) are used for determining the U flags on the initial and continuing calibration blanks. The highest IDL is selected when multiple instruments are used for an analysis. The method detection limits (MDLs) are used for determining all other U flags.

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

ICP Metals

Fraction: Metals in Liquid

Abbreviation Key

BKG – Background	AF - Cold Vapor Atomic Fluorescence
DUP – Duplicate	U - Below MDL
MS - Matrix Spike	B - Below LOQ
MSD - Matrix Spike Dup	N - Matrix Spike out of specifications
B – Blank	* - Duplicate out of specifications
Q - Laboratory Control Sample	E - Matrix Effects exist as proven by Serial Dilution or Spiked Dilution
Y - Laboratory Control Sample Duplicate	A - Post Digestion Spike
P - ICP Atomic Emission Spectrometer	L - Serial Dilution
MS - ICP Mass Spectrometry	R - Internal Standard Relative Intensity OOS
CV - Cold Vapor	NR - Not Required

Sample Data

Metals in Liquid

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: WATER Level (low/med): LOW

Lab Sample ID: 8442829 % Solids: 0.0
Concentration Units: UG/L Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	86.8	U		P
7440-36-0	Antimony	7.7	U		P
7440-38-2	Arsenic	13.1	B		P
7440-39-3	Barium	1.1	U		P
7440-41-7	Beryllium	0.67	U		P
7440-43-9	Cadmium	0.49	U		P
7440-70-2	Calcium	46.4	B		P
7440-47-3	Chromium	1.8	U		P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	5.1	B		P
7439-89-6	Iron	74.7	U		P
7439-92-1	Lead	6.2	U		P
7439-95-4	Magnesium	19.0	U		P
7439-96-5	Manganese	1.8	U		P
7439-97-6	Mercury	0.050	U		CV
7440-02-0	Nickel	2.8	U		P
7440-09-7	Potassium	160	U		P
7782-49-2	Selenium	9.7	U		P
7440-22-4	Silver	1.9	U		P
7440-23-5	Sodium	173	U		P
7440-28-0	Thallium	0.16	U		MS
7440-62-2	Vanadium	1.6	U		P
7440-66-6	Zinc	5.4	U		P

Comments:

_____
_____
_____
_____

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: WATER Level (low/med): LOW

Lab Sample ID: 8442830 % Solids: 0.0
Concentration Units: UG/L Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	86.8	U		P
7440-36-0	Antimony	7.7	U		P
7440-38-2	Arsenic	9.7	U		P
7440-39-3	Barium	1.1	U		P
7440-41-7	Beryllium	0.67	U		P
7440-43-9	Cadmium	0.49	U		P
7440-70-2	Calcium	61.8	B		P
7440-47-3	Chromium	1.8	U		P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	5.4	B		P
7439-89-6	Iron	74.7	U		P
7439-92-1	Lead	6.2	U		P
7439-95-4	Magnesium	19.0	U		P
7439-96-5	Manganese	5.9	B		P
7439-97-6	Mercury	0.050	U		CV
7440-02-0	Nickel	2.8	U		P
7440-09-7	Potassium	160	U		P
7782-49-2	Selenium	9.7	U		P
7440-22-4	Silver	1.9	U		P
7440-23-5	Sodium	173	U		P
7440-28-0	Thallium	0.16	U		MS
7440-62-2	Vanadium	1.6	U		P
7440-66-6	Zinc	5.4	U		P

Comments:

_____
_____
_____
_____

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: WATER Level (low/med): LOW

Lab Sample ID: 8442831 % Solids: 0.0
Concentration Units: UG/L Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	86.8	U		P
7440-36-0	Antimony	7.7	U		P
7440-38-2	Arsenic	9.7	U		P
7440-39-3	Barium	1.1	U		P
7440-41-7	Beryllium	0.67	U		P
7440-43-9	Cadmium	0.49	U		P
7440-70-2	Calcium	38.2	U		P
7440-47-3	Chromium	1.8	U		P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	5.2	B		P
7439-89-6	Iron	74.7	U		P
7439-92-1	Lead	6.2	U		P
7439-95-4	Magnesium	19.0	U		P
7439-96-5	Manganese	1.8	U		P
7439-97-6	Mercury	0.050	U		CV
7440-02-0	Nickel	2.8	U		P
7440-09-7	Potassium	160	U		P
7782-49-2	Selenium	9.7	U		P
7440-22-4	Silver	1.9	U		P
7440-23-5	Sodium	173	U		P
7440-28-0	Thallium	0.16	U		MS
7440-62-2	Vanadium	1.6	U		P
7440-66-6	Zinc	5.4	U		P

Comments:

_____
_____
_____
_____

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence
NR = Not Required

CONCENTRATION QUALIFIERS:
U = Below MDL,
B = Below LOQ

Quality Control and Calibration Summary Forms

Metals in Liquid

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QUALITY CONTROL REFERENCE LIST

SDG No.: DWD87
Matrix: WATER

Analyte	Batch Number	Lab Sample ID
Aluminum	161790635001	8442829
Antimony		8442830
Arsenic		8442831
Barium		P17935AB
Beryllium		P17935AQ
Cadmium		
Calcium		
Chromium		
Cobalt		
Copper		
Iron		
Lead		
Magnesium		
Manganese		
Nickel		
Potassium		
Selenium		
Silver		
Sodium		
Vanadium		
Zinc		

LEGEND:

BKG = Background	B = Blank
DUP = Duplicate	Q = Laboratory Control Sample
MS = Matrix Spike	Y = Laboratory Control Sample Duplicate
MSD = Matrix Spike Duplicate	

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QUALITY CONTROL REFERENCE LIST

SDG No.: DWD87
Matrix: WATER

Analyte	Batch Number	Lab Sample ID
Thallium	161790639001	8442829
		8442830
		8442831
		P17939AB
		P17939AQ

LEGEND:

BKG = Background	B = Blank
DUP = Duplicate	Q = Laboratory Control Sample
MS = Matrix Spike	Y = Laboratory Control Sample Duplicate
MSD = Matrix Spike Duplicate	

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QUALITY CONTROL REFERENCE LIST

SDG No.: DWD87
Matrix: WATER

Analyte	Batch Number	Lab Sample ID
Mercury	161795713002	8442829
		8442830
		8442831
		P17913BB
		P17913BQ

LEGEND:

BKG = Background	B = Blank
DUP = Duplicate	Q = Laboratory Control Sample
MS = Matrix Spike	Y = Laboratory Control Sample Duplicate
MSD = Matrix Spike Duplicate	

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: P
Run Name: 1618009T70
Calibration Date(s): 06/28/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Aluminum		30000.0	29326.20	97.8	25000.0	24609.08	98.4	25000.0	24177.03	96.7
Antimony		600.0	594.76	99.1	500.0	494.65	98.9	500.0	488.93	97.8
Arsenic		600.0	610.91	101.8	500.0	512.18	102.4	500.0	499.16	99.8
Barium		600.0	609.71	101.6	500.0	500.94	100.2	500.0	491.43	98.3
Beryllium		600.0	578.91	96.5	500.0	484.32	96.9	500.0	477.80	95.6
Cadmium		600.0	592.42	98.7	500.0	498.05	99.6	500.0	490.98	98.2
Calcium		30000.0	29191.48	97.3	25000.0	24544.93	98.2	25000.0	23938.26	95.8
Chromium		600.0	585.78	97.6	500.0	481.37	96.3	500.0	473.50	94.7
Cobalt		600.0	583.89	97.3	500.0	499.02	99.8	500.0	493.10	98.6
Copper		600.0	604.85	100.8	500.0	507.33	101.5	500.0	500.42	100.1
Iron		30000.0	28962.88	96.5	25000.0	24161.67	96.6	25000.0	23702.03	94.8
Lead		600.0	597.43	99.6	500.0	504.15	100.8	500.0	497.86	99.6
Magnesium		30000.0	29293.10	97.6	25000.0	24350.74	97.4	25000.0	23930.63	95.7
Manganese		600.0	599.46	99.9	500.0	497.41	99.5	500.0	487.65	97.5
Nickel		600.0	585.91	97.7	500.0	498.93	99.8	500.0	496.79	99.4
Potassium		30000.0	29250.88	97.5	25000.0	24352.57	97.4	25000.0	24021.86	96.1
Selenium		600.0	590.91	98.5	500.0	495.53	99.1	500.0	484.57	96.9
Silver		600.0	595.74	99.3	500.0	484.14	96.8	500.0	475.85	95.2
Sodium		30000.0	29349.21	97.8	25000.0	24497.58	98.0	25000.0	24197.11	96.8
Vanadium		600.0	596.12	99.4	500.0	495.87	99.2	500.0	487.07	97.4
Zinc		600.0	591.17	98.5	500.0	499.02	99.8	500.0	490.85	98.2

(1) Control Limits: 90 - 110
(2) Control Limits: 90 - 110
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: P
Run Name: 1618009T70
Calibration Date(s): 06/28/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Aluminum					25000.0	24467.62	97.9	25000.0	24660.61	98.6
Antimony					500.0	498.11	99.6	500.0	496.06	99.2
Arsenic					500.0	503.63	100.7	500.0	504.30	100.9
Barium					500.0	493.76	98.8	500.0	499.34	99.9
Beryllium					500.0	487.06	97.4	500.0	491.27	98.3
Cadmium					500.0	498.84	99.8	500.0	497.19	99.4
Calcium					25000.0	24196.91	96.8	25000.0	24574.98	98.3
Chromium					500.0	481.45	96.3	500.0	487.65	97.5
Cobalt					500.0	497.67	99.5	500.0	498.25	99.7
Copper					500.0	507.40	101.5	500.0	509.82	102.0
Iron					25000.0	23855.42	95.4	25000.0	24241.34	97.0
Lead					500.0	502.24	100.4	500.0	504.83	101.0
Magnesium					25000.0	24120.16	96.5	25000.0	24587.32	98.3
Manganese					500.0	492.65	98.5	500.0	497.69	99.5
Nickel					500.0	503.19	100.6	500.0	498.64	99.7
Potassium					25000.0	24240.20	97.0	25000.0	24557.23	98.2
Selenium					500.0	491.24	98.2	500.0	488.61	97.7
Silver					500.0	482.57	96.5	500.0	487.35	97.5
Sodium					25000.0	24397.20	97.6	25000.0	24730.27	98.9
Vanadium					500.0	494.43	98.9	500.0	495.89	99.2
Zinc					500.0	497.16	99.4	500.0	497.85	99.6

(1) Control Limits: 90 - 110
(2) Control Limits: 90 - 110
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: MS
Run Name: 1618006E03
Calibration Date(s): 6/28/2016 - 06/29/2016
Concentration Units: UG/L

		Initial Calibration			Continuing Calibration					
Analyte	Mass	True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Thallium	203	50.0	49.26	98.5	25.0	24.90	99.6	25.0	25.13	100.5

(1) Control Limits: 90 - 110
(2) Control Limits: 90 - 110
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: MS
Run Name: 1618006E03
Calibration Date(s): 6/28/2016 - 06/29/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Thallium	203				25.0	25.14	100.6	25.0	24.96	99.8

(1) Control Limits: 90 - 110
(2) Control Limits: 90 - 110
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: CV
Run Name: 1618101M07
Calibration Date(s): 06/29/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Mercury		2.5	2.58	103.2	1.0	1.01	101.0	1.0	0.98	98.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: CV
Run Name: 1618101M07
Calibration Date(s): 06/29/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Mercury					1.0	0.99	99.0	1.0	1.00	100.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: CV
Run Name: 1618101M07
Calibration Date(s): 06/29/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Mercury					1.0	0.99	99.0	1.0	0.98	98.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: CV
Run Name: 1618101M07
Calibration Date(s): 06/29/2016
Concentration Units: UG/L

		Initial Calibration			Continuing Calibration					
Analyte	Mass	True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Mercury					1.0	1.01	101.0	1.0	0.98	98.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 2B
LOW LEVEL CHECK STANDARD
SDG No.: DWD87

Method: P
Run Name: 1618009T70
Calibration Date(s): 06/28/2016
Concentration Units: UG/L

Analyte	Mass	Initial True	Initial Found	Initial %R	Final Found	Final %R
Aluminum		400.0	429.72	107.4	425.25	106.3
Antimony		40.0	40.79	102.0	39.23	98.1
Arsenic		40.0	49.67	124.2	45.03	112.6
Barium		10.0	13.16	131.6	13.13	131.3
Beryllium		10.0	9.52	95.2	9.72	97.2
Cadmium		10.0	9.98	99.8	9.95	99.5
Calcium		400.0	390.60	97.7	382.35	95.6
Chromium		30.0	28.56	95.2	29.05	96.8
Cobalt		10.0	10.45	104.5	10.34	103.4
Copper		20.0	23.83	119.2	23.00	115.0
Iron		400.0	384.56	96.1	373.82	93.5
Lead		30.0	29.13	97.1	28.72	95.7
Magnesium		200.0	193.12	96.6	196.98	98.5
Manganese		10.0	10.14	101.4	10.02	100.2
Nickel		20.0	19.67	98.4	21.47	107.4
Potassium		1000.0	1034.38	103.4	985.68	98.6
Selenium		40.0	40.50	101.3	32.47	81.2
Silver		10.0	8.90	89.0	8.83	88.3
Sodium		2000.0	2006.49	100.3	1987.32	99.4
Vanadium		10.0	9.34	93.4	8.94	89.4
Zinc		40.0	40.46	101.2	40.43	101.1

Control limits: 70% - 130%

For 6010B - Control limits apply to values up to 10 times the true value of the low level check standard. If LLC is out of specification, high, results < RL are acceptable.
For 6010C - If Low Level Check (LLC) is out of specification, results > CCV are acceptable. If LLC is out of specification, high, results < RL are acceptable.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 2B
LOW LEVEL CHECK STANDARD
SDG No.: DWD87

Method: MS
Run Name: 1618006E03
Calibration Date(s): 6/28/2016 - 06/29/2016
Concentration Units: UG/L

Analyte	Mass	Initial True	Initial Found	Initial %R	Final Found	Final %R
Thallium	203	1.0	0.99	99.0	1.03	103.0

Control limits: 70% - 130%

For 6010B - Control limits apply to values up to 10 times the true value of the low level check standard. If LLC is out of specification, high, results < RL are acceptable.
For 6010C - If Low Level Check (LLC) is out of specification, results > CCV are acceptable. If LLC is out of specification, high, results < RL are acceptable.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 2B
LOW LEVEL CHECK STANDARD
SDG No.: DWD87

Method: CV
Run Name: 1618101M07
Calibration Date(s): 06/29/2016
Concentration Units: UG/L

			Initial		Final	
Analyte	Mass	True	Found	%R	Found	%R
Mercury		0.2	0.20	100.0		

Control limits: 50% - 150%

For 6010B - Control limits apply to values up to 10 times the true value of the low level check standard. If LLC is out of specification, high, results < RL are acceptable.
For 6010C - If Low Level Check (LLC) is out of specification, results > CCV are acceptable. If LLC is out of specification, high, results < RL are acceptable.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: P
Run Name: 1618009T70
Calibration Date(s): 06/28/2016
Preparation Blank Matrix: WATER

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (UG/L)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Aluminum		44.6	U	55.5	B	66.4	B	52.9	B		86.800	U	161790635001
Antimony		4.5	U	4.5	U	4.5	U	4.5	U		7.700	U	161790635001
Arsenic		9.8	U	9.8	U	9.8	U	9.8	U		9.700	U	161790635001
Barium		0.33	U	0.33	U	0.33	U	0.33	U		1.100	U	161790635001
Beryllium		0.67	U	0.67	U	0.67	U	0.67	U		0.670	U	161790635001
Cadmium		0.49	U	0.49	U	0.49	U	0.49	U		0.490	U	161790635001
Calcium		33.4	U	33.4	U	33.4	U	33.4	U		73.190	B	161790635001
Chromium		0.79	U	0.79	U	0.79	U	0.79	U		1.800	U	161790635001
Cobalt		0.84	U	0.84	U	0.84	U	0.84	U		1.900	U	161790635001
Copper		4.5	B	4.4	B	5.1	B	4.7	B		4.650	B	161790635001
Iron		33.4	U	33.4	U	33.4	U	33.4	U		74.700	U	161790635001
Lead		3.7	U	3.7	U	3.7	U	3.7	U		6.200	U	161790635001
Magnesium		16.7	U	16.7	U	16.7	U	16.7	U		19.000	U	161790635001
Manganese		0.83	U	0.83	U	0.83	U	0.83	U		1.800	U	161790635001
Nickel		1.4	U	1.8	B	1.4	U	1.7	B		2.800	U	161790635001
Potassium		96.1	B	83.4	U	83.4	U	118	B		160.000	U	161790635001
Selenium		7.5	U	7.5	U	7.5	U	7.5	U		9.700	U	161790635001
Silver		0.73	U	0.73	U	0.73	U	0.73	U		1.900	U	161790635001
Sodium		167	U	167	U	167	U	167	U		173.000	U	161790635001
Vanadium		0.86	U	0.86	U	0.86	U	0.86	U		1.600	U	161790635001
Zinc		2.0	U	2.0	U	2.0	U	2.0	U		5.400	U	161790635001

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below IDL/MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: P
Run Name: 1618009T70
Calibration Date(s): 06/28/2016

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (UG/L)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Aluminum				58.5	B								
Antimony				4.5	U								
Arsenic				9.8	U								
Barium				0.33	U								
Beryllium				0.67	U								
Cadmium				0.49	U								
Calcium				33.4	U								
Chromium				-0.81	B								
Cobalt				0.84	U								
Copper				3.5	B								
Iron				33.4	U								
Lead				3.7	U								
Magnesium				16.7	U								
Manganese				0.83	U								
Nickel				1.7	B								
Potassium				92.9	B								
Selenium				7.5	U								
Silver				0.73	U								
Sodium				167	U								
Vanadium				-1.2	B								
Zinc				2.0	U								

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below IDL/MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: MS
Run Name: 1618006E03
Calibration Date(s): 06/28/2016 - 06/29/2016
Preparation Blank Matrix: WATER

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (UG/L)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Thallium	203	0.15	U	0.15	U	0.15	U	0.15	U	203	0.160	U	161790639001A

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence	U= Below IDL/MDL B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: MS
Run Name: 1618006E03
Calibration Date(s): 06/28/2016 - 06/29/2016

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (UG/L)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Thallium	203			0.15	U								

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence	U= Below IDL/MDL B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: CV
Run Name: 1618101M07
Calibration Date(s): 06/29/2016
Preparation Blank Matrix: WATER

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (UG/L)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Mercury		0.050	U	0.050	U	0.050	U	0.050	U		0.050	U	161795713002

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer	U= Below IDL/MDL
MS = ICP Mass Spectrometry	B= Below LOQ
CV = Cold Vapor	
AF = Cold Vapor Atomic Fluorescence	

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: CV
Run Name: 1618101M07
Calibration Date(s): 06/29/2016

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (UG/L)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Mercury				0.050	U	0.050	U	0.050	U				

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer	U= Below IDL/MDL
MS = ICP Mass Spectrometry	B= Below LOQ
CV = Cold Vapor	
AF = Cold Vapor Atomic Fluorescence	

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: CV
Run Name: 1618101M07
Calibration Date(s): 06/29/2016

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (UG/L)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Mercury				0.050	U	0.050	U						

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence	U= Below IDL/MDL B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 4A
ICP-AES INTERFERENCE CHECK SAMPLE
SDG No.: DWD87

Instrument ID: 11016
Run Name: 1618009T70
Concentration Units: ug/L

Analyte	True		Initial Found				Final Found			
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R	Sol. A	%R	Sol. AB	%R
Aluminum	500000	500000	504918	101.0	504751.3	101.0	507858	101.6	508435.1	101.7
Antimony	0	600	-7		594.6	99.1	-7		608.0	101.3
Arsenic	0	100	12		104.4	104.4	8		119.7	119.7
Barium	0	500	5		534.1	106.8	5		530.5	106.1
Beryllium	0	500	0		486.0	97.2	0		495.2	99.0
Cadmium	0	1000	1		942.9	94.3	1		949.2	94.9
Calcium	500000	500000	498933	99.8	499448.0	99.9	501665	100.3	501383.6	100.3
Chromium	0	500	6		480.7	96.1	5		483.7	96.7
Cobalt	0	500	2		474.3	94.9	3		478.4	95.7
Copper	0	500	7		558.6	111.7	6		560.3	112.1
Iron	200000	200000	200117	100.1	200399.1	100.2	202346	101.2	202373.3	101.2
Lead	0	50	6		47.9	95.8	6		52.8	105.6
Magnesium	500000	500000	451587	90.3	455960.6	91.2	464780	93.0	462273.1	92.5
Manganese	0	500	1		482.7	96.5	1		479.3	95.9
Nickel	0	1000	-2		931.6	93.2	-3		940.2	94.0
Potassium	0	0	129		85.4		65		112.0	
Selenium	0	50	3		42.2	84.4	-8		50.9	101.8
Silver	0	200	-3		214.0	107.0	-2		213.9	107.0
Sodium	0	0	353		349.7		318		317.9	
Vanadium	0	500	0		502.2	100.4	0		504.1	100.8
Zinc	0	1000	-2		971.2	97.1	-2		974.6	97.5

Control Limits: All Metals 80%-120%

QUALITY ASSURANCE SUMMARY
FORM 4B
ICP-MS INTERFERENCE CHECK SAMPLE
SDG No.: DWD87

Instrument ID: 11332
Run Name: 1618006E03
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	96420	96.4	97820.0	97.8
Calcium	44	300000	300000	305600	101.9	310900.0	103.6
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	250400	100.2	257400.0	103.0
Magnesium	24	100000	100000	96330	96.3	96540.0	96.5
Molybdenum	98	2000	2000	2013	100.7	2053.0	102.7
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	98720	98.7	99080.0	99.1
Sodium	23	250000	250000	259600	103.8	261800.0	104.7
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2206	110.3	2249.0	112.5

Control Limits: All Metals 80%-120%

QUALITY ASSURANCE SUMMARY
FORM 4B
ICP-MS INTERFERENCE CHECK SAMPLE
SDG No.: DWD87

Instrument ID: 11332
Run Name: 1618006E03
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	98090	98.1	98840.0	98.8
Calcium	44	300000	300000	310600	103.5	315800.0	105.3
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	250700	100.3	254900.0	102.0
Magnesium	24	100000	100000	97240	97.2	97830.0	97.8
Molybdenum	98	2000	2000	1975	98.8	2042.0	102.1
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	100400	100.4	101800.0	101.8
Sodium	23	250000	250000	261800	104.7	261900.0	104.8
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2221	111.1	2258.0	112.9

Control Limits: All Metals 80%-120%

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QUALITY ASSURANCE SUMMARY
FORM 7
LABORATORY CONTROL SAMPLE
SDG No.: DWD87
Matrix: WATER

Analyte	Mass	Batch Number	Units	True	Found	C	Control Limits (%)	%R	M	In Spec
Aluminum		161790635001	UG/L	2000.000	2117.150		80 - 120	106	P	Yes
Antimony		161790635001	UG/L	500.000	498.120		80 - 120	100	P	Yes
Arsenic		161790635001	UG/L	150.000	156.090		80 - 120	104	P	Yes
Barium		161790635001	UG/L	2000.000	1971.170		80 - 120	99	P	Yes
Beryllium		161790635001	UG/L	50.000	50.700		80 - 120	101	P	Yes
Cadmium		161790635001	UG/L	50.000	51.260		80 - 120	103	P	Yes
Calcium		161790635001	UG/L	4000.000	4060.300		80 - 120	102	P	Yes
Chromium		161790635001	UG/L	200.000	197.440		80 - 120	99	P	Yes
Cobalt		161790635001	UG/L	500.000	513.910		80 - 120	103	P	Yes
Copper		161790635001	UG/L	250.000	267.550		80 - 120	107	P	Yes
Iron		161790635001	UG/L	1000.000	977.160		80 - 120	98	P	Yes
Lead		161790635001	UG/L	150.000	153.230		80 - 120	102	P	Yes
Magnesium		161790635001	UG/L	2000.000	1985.710		80 - 120	99	P	Yes
Manganese		161790635001	UG/L	500.000	509.140		80 - 120	102	P	Yes
Mercury		161795713002	UG/L	1.000	0.956		80 - 120	96	CV	Yes
Nickel		161790635001	UG/L	500.000	524.440		80 - 120	105	P	Yes
Potassium		161790635001	UG/L	10000.000	9876.520		80 - 120	99	P	Yes
Selenium		161790635001	UG/L	150.000	143.450		80 - 120	96	P	Yes
Silver		161790635001	UG/L	50.000	44.180		80 - 120	88	P	Yes
Sodium		161790635001	UG/L	10000.000	10084.510		80 - 120	101	P	Yes
Thallium	203	161790639001	UG/L	2.000	1.996		80 - 120	100	MS	Yes
Vanadium		161790635001	UG/L	500.000	506.600		80 - 120	101	P	Yes
Zinc		161790635001	UG/L	500.000	502.760		80 - 120	101	P	Yes

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

Method: P
Instrument ID: 11016
Date: 04/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Aluminum	308.21		44.6
Antimony	206.83		4.5
Arsenic	189.04		9.8
Barium	455.40		0.33
Beryllium	313.04		0.67
Cadmium	226.50		0.49
Calcium	317.93		33.4
Chromium	267.72		0.79
Cobalt	228.62		0.84
Copper	327.40		1.7
Iron	261.19		33.4
Lead	220.35		3.7
Magnesium	285.21		16.7
Manganese	257.61		0.83
Nickel	231.60		1.4
Potassium	766.49		83.4
Selenium	196.09		7.5
Silver	328.06		0.73
Sodium	589.59		167
Vanadium	292.40		0.86
Zinc	213.86		2.0

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: MS
Instrument ID: 11332
Date: 04/2016

Analyte	MASS (amu)	Background	IDL (UG/L)
Thallium	203		0.15

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: CV
Instrument ID: 17384
Date: 04/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Mercury	254.00		0.050

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD87
Matrix: WATER

Method: P
Date: 06/2016

Analyte	Wavelength (nm)	Background	LOQ (UG/L)	MDL (UG/L)
Aluminum	308.21		400	86.8
Antimony	206.83		40.0	7.7
Arsenic	189.04		40.0	9.7
Barium	455.40		10.0	1.1
Beryllium	313.04		10.0	0.67
Cadmium	226.50		10.0	0.49
Calcium	317.93		400	38.2
Chromium	267.72		30.0	1.8
Cobalt	228.62		10.0	1.9
Copper	327.40		20.0	4.1
Iron	261.19		400	74.7
Lead	220.35		30.0	6.2
Magnesium	285.21		200	19.0
Manganese	257.61		10.0	1.8
Nickel	231.60		20.0	2.8
Potassium	766.49		1000	160
Selenium	196.09		40.0	9.7
Silver	328.06		10.0	1.9
Sodium	589.59		2000	173
Vanadium	292.40		10.0	1.6
Zinc	213.86		40.0	5.4

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD87
Matrix: WATER

Method: MS
Date: 06/2016

Analyte	Mass	Background	LOQ (UG/L)	MDL (UG/L)
Thallium	203		1.0	0.16

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD87
Matrix: WATER

Method: CV
Date: 07/2015

Analyte	Wavelength (nm)	Background	LOQ (UG/L)	MDL (UG/L)
Mercury	254.00		0.20	0.050

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD87

Instrument ID: 11016
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: AL	CA	FE	MG	B
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.83	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000370	0.0000000	0.0000010	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0001490	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	327.40	0.0000000	0.0000000	-0.0000540	0.0000000	0.0000000
Lead	220.35	0.0002990	0.0000000	0.0000580	0.0000000	0.0000000
Magnesium	285.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.09	0.0000000	0.0000000	0.0000580	0.0000000	0.0000000
Silver	328.06	0.0000000	0.0000000	-0.0001830	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000220	0.0000000	0.0000000
Zinc	213.86	0.0000000	0.0000000	0.0001200	0.0000000	0.0000000

Comments:
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QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD87

Instrument ID: 11016
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: CO	CR	CU	MO	NI
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0152150	0.0000000
Antimony	206.83	0.0000000	0.0088700	0.0000000	-0.0077500	0.0000000
Arsenic	189.04	0.0000000	0.0019910	0.0000000	0.0022820	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	327.40	0.0000000	0.0000000	0.0000000	-0.0006700	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0050300	-0.0006000	0.0000000
Magnesium	285.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.09	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.06	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	-0.0114250	0.0000000
Zinc	213.86	0.0000000	0.0000000	0.0000000	0.0000000	0.0062000

Comments:
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QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD87

Instrument ID: 11016
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: SI	TH	TI	V	W
Aluminum	308.21	0.0000000	0.0661760	0.0000000	0.0271200	0.0000000
Antimony	206.83	0.0000000	0.0000000	0.0000000	0.0000000	0.0004580
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0003960
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	-0.0204000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0002500
Cobalt	228.62	0.0000000	0.0000000	0.0020000	0.0000000	0.0000000
Copper	327.40	0.0000000	0.0266500	-0.0028180	0.0000000	0.0000000
Lead	220.35	0.0005460	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	285.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	-0.0004000	0.0000000	0.0000000	-0.0001250
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.09	0.0000000	0.0000000	0.0000000	0.0000000	0.0077900
Silver	328.06	0.0000000	-0.0133000	-0.0002270	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0012000	0.0005910	0.0000000	0.0001040
Zinc	213.86	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:
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QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD87

Instrument ID: 11016
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: ZR	--	--	--	--
Aluminum	308.21	0.0000000				
Antimony	206.83	-0.0010210				
Arsenic	189.04	0.0000000				
Beryllium	313.04	0.0000000				
Cadmium	226.50	0.0000000				
Calcium	317.93	0.0000000				
Chromium	267.72	0.0000000				
Cobalt	228.62	0.0000000				
Copper	327.40	-0.0013050				
Lead	220.35	0.0000000				
Magnesium	285.21	0.0000000				
Manganese	257.61	0.0000000				
Nickel	231.60	0.0000000				
Potassium	766.49	0.0000000				
Selenium	196.09	0.0000000				
Silver	328.06	0.0065740				
Vanadium	292.40	0.0000000				
Zinc	213.86	0.0000000				

Comments:
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QUALITY ASSURANCE SUMMARY
FORM 12
LINEAR RANGES
SDG No.: DWD87

Method: P
Instrument ID: 11016
Date: 04/2016

Analyte	Wavelength (nm)	Integration Time (Sec.)	Concentration (ug/L)
Aluminum	308.21	10.00	600000.0
Antimony	206.83	10.00	20000.0
Arsenic	189.04	10.00	20000.0
Barium	455.4	10.00	5000.0
Beryllium	313.04	10.00	10000.0
Cadmium	226.5	10.00	20000.0
Calcium	317.93	10.00	600000.0
Chromium	267.72	10.00	20000.0
Cobalt	228.62	10.00	20000.0
Copper	327.4	10.00	20000.0
Iron	261.19	10.00	300000.0
Lead	220.35	10.00	20000.0
Magnesium	285.21	10.00	600000.0
Manganese	257.61	10.00	20000.0
Nickel	231.6	10.00	20000.0
Potassium	766.49	10.00	500000.0
Selenium	196.09	10.00	20000.0
Silver	328.06	10.00	10000.0
Sodium	589.59	10.00	500000.0
Vanadium	292.4	10.00	20000.0
Zinc	213.86	10.00	20000.0

Comments:
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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 15
ICP-MS TUNE
SDG No.: DWD87
Matrix: WATER

Instrument ID: 11332
Date: 06/28/2016

Analyte	Mass	Avg. Measured Mass (amu)	Avg. Peak Width at 5% Peak Height (amu)	%RSD
Lithium	6.000	6.10	0.45	1.9
Magnesium	24.000	24.05	0.50	3.0
Rhodium	103.000	103.05	0.45	2.3
Indium	115.000	115.05	0.40	2.8
Cerium	140.000	140.05	0.40	1.5
Lead	208.000	207.95	0.40	2.1
Uranium	238.000	237.95	0.45	2.0

Comments:

_____
_____
_____
_____

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QUALITY ASSURANCE SUMMARY
FORM 16
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
SDG No.: DWD87

Instrument ID: 11332
Run Name: 1618006E03

Start Date: 06/28/2016
End Date: 06/29/2016

Standard	Elements Applies to	Standard	Elements Applies to
BI-1-209	TL		

Lab Sample ID	Time	Internal Standards %RI For: Element BI-1-209	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q
S0	22:58	100													
S	22:59	98													
CCS	23:01	99													
CCS	23:03	100													
ICV	23:04	98													
ICB	23:06	101													
LLC	23:08	100													
ICSA	23:09	86													
ICSAB	23:11	85													
ZZZZZZ	23:13														
CCV	23:14	98													
CCB	23:16	98													
P17939AB	23:18	99													
P17939AQ	23:19	97													
ZZZZZZ	23:21														
ZZZZZZ	23:23														
ZZZZZZ	23:24														
ZZZZZZ	23:26														
ZZZZZZ	23:28														
ZZZZZZ	23:30														
ZZZZZZ	23:31														
ZZZZZZ	23:33														
CCV	23:35	96													
CCB	23:36	98													
ZZZZZZ	23:38														
ZZZZZZ	23:40														
ZZZZZZ	23:42														
ZZZZZZ	23:43														
ZZZZZZ	23:45														
ZZZZZZ	23:47														
ZZZZZZ	23:48														
ZZZZZZ	23:50														
ZZZZZZ	23:52														

LEGEND:
BKG = Background
DUP = Duplicate
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike
FLAG:
R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:
BE = Beryllium
BI = Bismuth
GE = Germanium
HO = Holmium
IN = Indium
LI = Lithium
SC = Scandium
TB = Terbium
Y = Yttrium

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QUALITY ASSURANCE SUMMARY
FORM 16
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
SDG No.: DWD87

Instrument ID: 11332
Run Name: 1618006E03

Start Date: 06/28/2016
End Date: 06/29/2016

Standard	Elements Applies to	Standard	Elements Applies to
BI-1-209	TL		

Lab Sample ID	Time	Internal Standards %RI For: Element BI-1-209	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q
ZZZZZZ	23:54														
CCV	23:55	96													
CCB	23:57	100													
8442829	23:59	99													
8442830	00:00	100													
8442831	00:02	101													
ZZZZZZ	00:04														
ZZZZZZ	00:05														
LLC	00:07	100													
ICSA	00:09	86													
ICSAB	00:10	85													
ZZZZZZ	00:12														
CCV	00:14	100													
CCB	00:16	103													

LEGEND:
BKG = Background
DUP = Duplicate
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike

FLAG:
R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:
BE = Beryllium
BI = Bismuth
GE = Germanium
HO = Holmium
IN = Indium
LI = Lithium
SC = Scandium
TB = Terbium
Y = Yttrium

Preparation and Run Logs

Metals in Liquid

Method: P
Batch Number: 161790635001

Lab Sample ID	Date	Initial Volume(ml)	Final Volume(ml)
8442829	06/28/2016	50.00	50
8442830	06/28/2016	50.00	50
8442831	06/28/2016	50.00	50
P17935AB	06/28/2016	50.00	50
P17935AQ	06/28/2016	1.00	1

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

LEGEND:
BKG = Background
DUP = Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate

Method: MS
Batch Number: 161790639001

Lab Sample ID	Date	Initial Volume(ml)	Final Volume(ml)
8442829	06/28/2016	50.00	50
8442830	06/28/2016	50.00	50
8442831	06/28/2016	50.00	50
P17939AB	06/28/2016	50.00	50
P17939AQ	06/28/2016	1.00	1

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

LEGEND:
BKG = Background
DUP = Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate

Method: CV
Batch Number: 161795713002

Lab Sample ID	Date	Initial Volume(ml)	Final Volume(ml)
8442829	06/28/2016	40.00	40
8442830	06/28/2016	40.00	40
8442831	06/28/2016	40.00	40
P17913BB	06/28/2016	40.00	40
P17913BQ	06/28/2016	1.00	1

METHODS:	LEGEND:
P = ICP Atomic Emission Spectrometer	BKG = Background
MS = ICP Mass Spectrometry	DUP = Duplicate
CV = Cold Vapor	MS = Matrix Spike
AF = Cold Vapor Atomic Fluorescence	MSD = Matrix Spike Duplicate
	B = Blank
	Q = Laboratory Control Sample
	Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: P
Instrument ID: 11016
Run Name: 1618009T70

Run Start Date: 06/28/2016
Run End Date: 06/28/2016

Lab Sample ID	D/F	Time	Analytes																												
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
S0	1.00	19:51	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
S	1.00	19:54	X						X				X		X				X			X										
S	1.00	19:57			X	X	X	X			X	X		X		X		X		X	X				X							
S	1.00	20:00		X						X														X								
ICV	1.00	20:03	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ICB	1.00	20:06	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
LLC	1.00	20:10	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ICSA	1.00	20:13	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ICSAB	1.00	20:16	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
CCV	1.00	20:19	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
CCB	1.00	20:22	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
P17935AB	1.00	20:25	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
P17935AQ	1.00	20:28	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ZZZZZZ	1.00	20:31																														
ZZZZZZ	1.00	20:34																														
ZZZZZZ	1.00	20:37																														
ZZZZZZ	1.00	20:40																														
ZZZZZZ	1.00	20:44																														
ZZZZZZ	5.00	20:47																														
ZZZZZZ	1.00	20:50																														
ZZZZZZ	1.00	20:53																														
CCV	1.00	20:56	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
CCB	1.00	20:59	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ZZZZZZ	1.00	21:02																														
ZZZZZZ	1.00	21:06																														
ZZZZZZ	1.00	21:09																														
ZZZZZZ	1.00	21:12																														
ZZZZZZ	1.00	21:15																														
ZZZZZZ	1.00	21:18																														
ZZZZZZ	1.00	21:21																														
ZZZZZZ	1.00	21:24																														
ZZZZZZ	1.00	21:27																														
ZZZZZZ	1.00	21:30																														
CCV	1.00	21:33	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
CCB	1.00	21:36	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ZZZZZZ	1.00	21:39																														
ZZZZZZ	1.00	21:42																														
8442829	1.00	21:45	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							

METHODS:
- P = ICP Atomic Emission Spectrometer
- MS = ICP Mass Spectrometry
- CV = Cold Vapor
- AF = Cold Vapor Atomic Fluorescence

LEGEND:
- BKG = Background
- DUP = Duplicate
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- A = Post Digest Spike
- L = Serial Dilution
- B = Blank
- Q = Laboratory Control Sample
- Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: P
Instrument ID: 11016
Run Name: 1618009T70

Run Start Date: 06/28/2016
Run End Date: 06/28/2016

Lab Sample ID	D/F	Time	Analytes																												
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
8442830	1.00	21:48	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
8442831	1.00	21:51	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ZZZZZZ	1.00	21:55																														
ZZZZZZ	1.00	21:58																														
LLC	1.00	22:01	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ICSA	1.00	22:04	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
ICSAB	1.00	22:07	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
CCV	1.00	22:10	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							
CCB	1.00	22:13	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X							

METHODS:
- P = ICP Atomic Emission Spectrometer
- MS = ICP Mass Spectrometry
- CV = Cold Vapor
- AF = Cold Vapor Atomic Fluorescence

LEGEND:
- BKG = Background
- DUP = Duplicate
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- A = Post Digest Spike
- L = Serial Dilution
- B = Blank
- Q = Laboratory Control Sample
- Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: MS
Instrument ID: 11332
Run Name: 1618006E03

Run Start Date: 06/28/2016
Run End Date: 06/29/2016

Lab Sample ID	D/F	Time	Analytes																												
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
S0	1.00	22:58																					X									
S	1.00	22:59																					X									
CCS	1.00	23:01																					X									
CCS	1.00	23:03																					X									
ICV	1.00	23:04																					X									
ICB	1.00	23:06																					X									
LLC	1.00	23:08																					X									
ICSA	1.00	23:09																					X									
ICSAB	1.00	23:11																					X									
ZZZZZZ	1.00	23:13																														
CCV	1.00	23:14																					X									
CCB	1.00	23:16																					X									
P17939AB	1.00	23:18																					X									
P17939AQ	1.00	23:19																					X									
ZZZZZZ	1.00	23:21																														
ZZZZZZ	1.00	23:23																														
ZZZZZZ	1.00	23:24																														
ZZZZZZ	1.00	23:26																														
ZZZZZZ	1.00	23:28																														
ZZZZZZ	5.00	23:30																														
ZZZZZZ	1.00	23:31																														
ZZZZZZ	1.00	23:33																														
CCV	1.00	23:35																					X									
CCB	1.00	23:36																					X									
ZZZZZZ	1.00	23:38																														
ZZZZZZ	1.00	23:40																														
ZZZZZZ	1.00	23:42																														
ZZZZZZ	1.00	23:43																														
ZZZZZZ	1.00	23:45																														
ZZZZZZ	1.00	23:47																														
ZZZZZZ	1.00	23:48																														
ZZZZZZ	1.00	23:50																														
ZZZZZZ	1.00	23:52																														
ZZZZZZ	1.00	23:54																														
CCV	1.00	23:55																					X									
CCB	1.00	23:57																					X									
8442829	1.00	23:59																					X									
8442830	1.00	00:00																					X									

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

LEGEND:
BKG = Background
DUP = Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: MS
Instrument ID: 11332
Run Name: 1618006E03

Run Start Date: 06/28/2016
Run End Date: 06/29/2016

Lab Sample ID	D/F	Time	Analytes																												
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	NG	NI	K	SE	AG	NA	TL	V	ZN							
8442831	1.00	00:02																					X									
ZZZZZZ	1.00	00:04																														
ZZZZZZ	1.00	00:05																														
LLC	1.00	00:07																					X									
ICSA	1.00	00:09																					X									
ICSAB	1.00	00:10																					X									
ZZZZZZ	1.00	00:12																														
CCV	1.00	00:14																					X									
CCB	1.00	00:16																					X									

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

LEGEND:
BKG = Background
DUP = Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: CV
Instrument ID: 17384
Run Name: 1618101M07

Run Start Date: 06/29/2016
Run End Date: 06/29/2016

Lab Sample ID	D/F	Time	Analytes																													
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
S0	1.00	06:03															X															
S0.2	1.00	06:08															X															
S0.5	1.00	06:10															X															
S1.0	1.00	06:12															X															
S2.5	1.00	06:14															X															
S5.0	1.00	06:16															X															
ICV	1.00	06:26															X															
ICB	1.00	06:28															X															
CRA	1.00	06:30															X															
CCV	1.00	06:32															X															
CCB	1.00	06:34															X															
ZZZZZZ	1.00	06:36																														
ZZZZZZ	1.00	06:38																														
ZZZZZZ	1.00	06:40																														
ZZZZZZ	1.00	06:42																														
ZZZZZZ	1.00	06:44																														
ZZZZZZ	1.00	06:46																														
ZZZZZZ	1.00	06:49																														
ZZZZZZ	1.00	06:51																														
ZZZZZZ	1.00	06:53																														
ZZZZZZ	1.00	06:55																														
CCV	1.00	06:57															X															
CCB	1.00	06:59															X															
ZZZZZZ	1.00	07:01																														
ZZZZZZ	1.00	07:03																														
ZZZZZZ	1.00	07:05																														
ZZZZZZ	1.00	07:07																														
ZZZZZZ	1.00	07:09																														
ZZZZZZ	1.00	07:11																														
ZZZZZZ	1.00	07:13																														
ZZZZZZ	1.00	07:15																														
ZZZZZZ	1.00	07:17																														
ZZZZZZ	1.00	07:19																														
CCV	1.00	07:21															X															
CCB	1.00	07:23															X															
ZZZZZZ	1.00	07:25																														
ZZZZZZ	1.00	07:27																														
ZZZZZZ	1.00	07:29																														

METHODS:
- P = ICP Atomic Emission Spectrometer
- MS = ICP Mass Spectrometry
- CV = Cold Vapor
- AF = Cold Vapor Atomic Fluorescence

LEGEND:
- BKG = Background
- DUP = Duplicate
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- A = Post Digest Spike
- L = Serial Dilution
- B = Blank
- Q = Laboratory Control Sample
- Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: CV
Instrument ID: 17384
Run Name: 1618101M07

Run Start Date: 06/29/2016
Run End Date: 06/29/2016

Lab Sample ID	D/F	Time	Analytes																													
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
ZZZZZZ	1.00	07:31																														
ZZZZZZ	1.00	07:33																														
ZZZZZZ	1.00	07:35																														
ZZZZZZ	1.00	07:37																														
ZZZZZZ	1.00	07:39																														
ZZZZZZ	1.00	07:42																														
ZZZZZZ	1.00	07:44																														
CCV	1.00	07:46															X															
CCB	1.00	07:48															X															
ZZZZZZ	1.00	07:50																														
ZZZZZZ	1.00	07:52																														
ZZZZZZ	1.00	07:54																														
ZZZZZZ	1.00	07:56																														
ZZZZZZ	1.00	07:58																														
ZZZZZZ	1.00	08:00																														
ZZZZZZ	1.00	08:02																														
ZZZZZZ	1.00	08:04																														
ZZZZZZ	1.00	08:06																														
ZZZZZZ	1.00	08:08																														
CCV	1.00	08:10															X															
CCB	1.00	08:12															X															
ZZZZZZ	1.00	08:14																														
ZZZZZZ	1.00	08:16																														
ZZZZZZ	1.00	08:18																														
ZZZZZZ	1.00	08:20																														
ZZZZZZ	1.00	08:22																														
ZZZZZZ	1.00	08:24																														
ZZZZZZ	1.00	08:27																														
ZZZZZZ	1.00	08:29																														
ZZZZZZ	1.00	08:31																														
ZZZZZZ	1.00	08:33																														
CCV	1.00	08:35															X															
CCB	1.00	08:37															X															
ZZZZZZ	1.00	08:39																														
P17913BB	1.00	08:41															X															
P17913BQ	1.00	08:43															X															
ZZZZZZ	1.00	08:45																														
ZZZZZZ	1.00	08:47																														

METHODS:
- P = ICP Atomic Emission Spectrometer
- MS = ICP Mass Spectrometry
- CV = Cold Vapor
- AF = Cold Vapor Atomic Fluorescence

LEGEND:
- BKG = Background
- DUP = Duplicate
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- A = Post Digest Spike
- L = Serial Dilution
- B = Blank
- Q = Laboratory Control Sample
- Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: CV
Instrument ID: 17384
Run Name: 1618101M07

Run Start Date: 06/29/2016
Run End Date: 06/29/2016

Lab Sample ID	D/F	Time	Analytes																												
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
ZZZZZZ	1.00	08:49																													
ZZZZZZ	1.00	08:51																													
ZZZZZZ	1.00	08:53																													
ZZZZZZ	1.00	08:55																													
ZZZZZZ	1.00	08:57																													
CCV	1.00	08:59															X														
CCB	1.00	09:01															X														
ZZZZZZ	1.00	09:05																													
ZZZZZZ	1.00	09:07																													
ZZZZZZ	1.00	09:09																													
ZZZZZZ	1.00	09:11																													
ZZZZZZ	1.00	09:13																													
8442829	1.00	09:15															X														
8442830	1.00	09:17															X														
8442831	1.00	09:19															X														
ZZZZZZ	1.00	09:21																													
ZZZZZZ	1.00	09:23																													
CCV	1.00	09:25															X														
CCB	1.00	09:27															X														

METHODS:
- P = ICP Atomic Emission Spectrometer
- MS = ICP Mass Spectrometry
- CV = Cold Vapor
- AF = Cold Vapor Atomic Fluorescence

LEGEND:
- BKG = Background
- DUP = Duplicate
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- A = Post Digest Spike
- L = Serial Dilution
- B = Blank
- Q = Laboratory Control Sample
- Y = Laboratory Control Sample Duplicate

Metals in Solid Data

Case Narrative/Conformance Summary

Metals in Solid

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

ICP Metals

Fraction: Metals in Solid

Sample #	Client ID	Matrix Liquid	Matrix Solid	Comments
8442816	DU-1-6-A		X	
8442817	DU-1-6-A		X	
8442820	DU-1-6-B		X	
8442821	DU-1-6-B		X	
8442824	DU-1-6-C		X	
8442825	DU-1-6-C		X	
8455242	Metals Blank		X	Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Method defined actions are taken for any failed matrix QC.

Batch#: 161870637004A (Sample number(s): 8442817, 8442821, 8442825, 8455242, UNSPK: P438361, BKG: P438363)
The recovery(ies) for the following analyte(s) in the MSD is outside the acceptance window: Thallium

Batch#: 161870637004 (Sample number(s): 8442817, 8442821, 8442825, 8455242, UNSPK: P438361, BKG: P438363)

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

ICP Metals

Fraction: Metals in Solid

The relative percent difference(s) for the following analyte(s) in the MS/MSD is outside the acceptance window: Calcium, Chromium, Copper, Iron, Selenium, Zinc
The recovery(ies) for the following analyte(s) in the MS is outside the acceptance window: Zinc
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: Aluminum, Calcium, Iron, Magnesium, Manganese
Refer to the QC Summary forms for more information.

Sample Duplicate

Batch#: 161870637004 (Sample number(s): 8442817, 8442821, 8442825, 8455242, UNSPK: P438361, BKG: P438363)
The duplicate RPD for the following analyte(s) is outside the acceptance window: Antimony, Barium, Copper, Iron, Nickel, Zinc

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Refer to analysis run log for samples requiring dilutions.

The instrument detection limits (IDLs) are used for determining the U flags on the initial and continuing calibration blanks. The highest IDL is selected when multiple instruments are used for an analysis. The method detection limits (MDLs) are used for determining all other U flags.

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

ICP Metals

Fraction: Metals in Solid

Abbreviation Key

BKG – Background	AF - Cold Vapor Atomic Fluorescence
DUP – Duplicate	U - Below MDL
MS - Matrix Spike	B - Below LOQ
MSD - Matrix Spike Dup	N - Matrix Spike out of specifications
B – Blank	* - Duplicate out of specifications
Q - Laboratory Control Sample	E - Matrix Effects exist as proven by Serial Dilution or Spiked Dilution
Y - Laboratory Control Sample Duplicate	A - Post Digestion Spike
P - ICP Atomic Emission Spectrometer	L - Serial Dilution
MS - ICP Mass Spectrometry	R - Internal Standard Relative Intensity OOS
CV - Cold Vapor	NR - Not Required

Sample Data

Metals in Solid

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8442816 % Solids: 100.0
Concentration Units: MG/KG Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.024	B		CV

Comments:

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METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8442817 % Solids: 100.0
Concentration Units: MG/KG Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1100			P
7440-36-0	Antimony	0.69	U		P
7440-38-2	Arsenic	0.96	U		P
7440-39-3	Barium	4.0			P
7440-41-7	Beryllium	0.066	U		P
7440-43-9	Cadmium	0.049	U		P
7440-70-2	Calcium	260			P
7440-47-3	Chromium	1.6	B		P
7440-48-4	Cobalt	0.12	U		P
7440-50-8	Copper	3.2			P
7439-89-6	Iron	559			P
7439-92-1	Lead	3.8			P
7439-95-4	Magnesium	83.9			P
7439-96-5	Manganese	18.4			P
7440-02-0	Nickel	0.37	B		P
7440-09-7	Potassium	56.1	B		P
7782-49-2	Selenium	0.89	U		P
7440-22-4	Silver	0.15	U		P
7440-23-5	Sodium	23.7	U		P
7440-28-0	Thallium	0.029	U		MS
7440-62-2	Vanadium	2.4			P
7440-66-6	Zinc	1.8	B		P

Comments:

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METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8442820 % Solids: 100.0
Concentration Units: MG/KG Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.036	B		CV

Comments:

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METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8442821 % Solids: 100.0
Concentration Units: MG/KG Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1100			P
7440-36-0	Antimony	0.69	U		P
7440-38-2	Arsenic	0.96	U		P
7440-39-3	Barium	4.7			P
7440-41-7	Beryllium	0.066	U		P
7440-43-9	Cadmium	0.049	U		P
7440-70-2	Calcium	398			P
7440-47-3	Chromium	1.5	B		P
7440-48-4	Cobalt	0.12	U		P
7440-50-8	Copper	2.5			P
7439-89-6	Iron	587			P
7439-92-1	Lead	3.5			P
7439-95-4	Magnesium	106			P
7439-96-5	Manganese	22.8			P
7440-02-0	Nickel	0.53	B		P
7440-09-7	Potassium	75.6	B		P
7782-49-2	Selenium	0.89	U		P
7440-22-4	Silver	0.15	U		P
7440-23-5	Sodium	23.7	U		P
7440-28-0	Thallium	0.029	U		MS
7440-62-2	Vanadium	2.3			P
7440-66-6	Zinc	2.5	B		P

Comments:

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METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8442824 % Solids: 100.0
Concentration Units: MG/KG Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.031	B		CV

Comments:

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METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8442825 % Solids: 100.0
Concentration Units: MG/KG Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	806			P
7440-36-0	Antimony	0.69	U		P
7440-38-2	Arsenic	0.95	U		P
7440-39-3	Barium	3.6			P
7440-41-7	Beryllium	0.066	U		P
7440-43-9	Cadmium	0.048	U		P
7440-70-2	Calcium	260			P
7440-47-3	Chromium	1.2	B		P
7440-48-4	Cobalt	0.12	U		P
7440-50-8	Copper	2.4			P
7439-89-6	Iron	543			P
7439-92-1	Lead	3.2			P
7439-95-4	Magnesium	75.5			P
7439-96-5	Manganese	17.4			P
7440-02-0	Nickel	0.32	B		P
7440-09-7	Potassium	53.6	B		P
7782-49-2	Selenium	0.88	U		P
7440-22-4	Silver	0.15	U		P
7440-23-5	Sodium	23.4	U		P
7440-28-0	Thallium	0.028	U		MS
7440-62-2	Vanadium	2.2			P
7440-66-6	Zinc	5.4			P

Comments:

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METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 1
INORGANIC ANALYSIS DATA SHEET
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8455242 % Solids: 100.0
Concentration Units: MG/KG Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8.0	U		P
7440-36-0	Antimony	0.64	U		P
7440-38-2	Arsenic	0.89	U		P
7440-39-3	Barium	0.030	U		P
7440-41-7	Beryllium	0.061	U		P
7440-43-9	Cadmium	0.045	U		P
7440-70-2	Calcium	5.2	U		P
7440-47-3	Chromium	0.13	U		P
7440-48-4	Cobalt	0.11	U		P
7440-50-8	Copper	0.21	U		P
7439-89-6	Iron	3.8	U		P
7439-92-1	Lead	0.50	U		P
7439-95-4	Magnesium	1.7	U		P
7439-96-5	Manganese	0.076	U		P
7440-02-0	Nickel	0.28	U		P
7440-09-7	Potassium	21.9	U		P
7782-49-2	Selenium	0.83	U		P
7440-22-4	Silver	0.14	U		P
7440-23-5	Sodium	21.9	U		P
7440-28-0	Thallium	0.027	U		MS
7440-62-2	Vanadium	0.13	U		P
7440-66-6	Zinc	0.62	U		P

Comments:

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METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence NR = Not Required	U = Below MDL, B = Below LOQ

Quality Control and Calibration Summary Forms

Metals in Solid

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QUALITY CONTROL REFERENCE LIST

SDG No.: DWD87
Matrix: SOIL

Analyte	Batch Number	Lab Sample ID
Aluminum	161870637004	*38360BKG
Antimony		*38360MS
Arsenic		*38360MSD
Barium		*38360DUP
Beryllium		8442817
Cadmium		8442821
Calcium		8442825
Chromium		8455242
Cobalt		P18737DB
Copper		P18737DQ
Iron		
Lead		
Magnesium		
Manganese		
Nickel		
Potassium		
Selenium		
Silver		
Sodium		
Vanadium		
Zinc		

LEGEND:

BKG = Background	B = Blank
DUP = Duplicate	Q = Laboratory Control Sample
MS = Matrix Spike	Y = Laboratory Control Sample Duplicate
MSD = Matrix Spike Duplicate	

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QUALITY CONTROL REFERENCE LIST

SDG No.: DWD87
Matrix: SOIL

Analyte	Batch Number	Lab Sample ID
Thallium	161870637004	*38360BKG
		*38360MS
		*38360MSD
		*38360DUP
		8442817
		8442821
		8442825
		8455242
		P18737DB
		P18737DQ

LEGEND:

BKG = Background	B = Blank
DUP = Duplicate	Q = Laboratory Control Sample
MS = Matrix Spike	Y = Laboratory Control Sample Duplicate
MSD = Matrix Spike Duplicate	

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QUALITY CONTROL REFERENCE LIST

SDG No.: DWD87
Matrix: SOIL

Analyte	Batch Number	Lab Sample ID
Mercury	161820638002	8442816
		8442820
		8442824
		*44071BKG
		*44071MS
		*44071MSD
		*44071DUP
		P18238BB
		P18238BQ

LEGEND:

BKG = Background	B = Blank
DUP = Duplicate	Q = Laboratory Control Sample
MS = Matrix Spike	Y = Laboratory Control Sample Duplicate
MSD = Matrix Spike Duplicate	

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: P
Run Name: 1618907T72
Calibration Date(s): 07/07/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Aluminum		30000.0	30254.73	100.8	25000.0	25253.67	101.0	25000.0	25386.03	101.5
Antimony		600.0	617.58	102.9	500.0	507.96	101.6	500.0	503.08	100.6
Arsenic		600.0	602.22	100.4	500.0	505.35	101.1	500.0	501.63	100.3
Barium		600.0	606.57	101.1	500.0	497.33	99.5	500.0	500.48	100.1
Beryllium		600.0	589.09	98.2	500.0	484.22	96.8	500.0	490.15	98.0
Cadmium		600.0	600.83	100.1	500.0	498.84	99.8	500.0	498.65	99.7
Calcium		30000.0	30245.17	100.8	25000.0	25410.31	101.6	25000.0	25466.35	101.9
Chromium		600.0	590.96	98.5	500.0	491.04	98.2	500.0	494.13	98.8
Cobalt		600.0	588.79	98.1	500.0	494.97	99.0	500.0	495.60	99.1
Copper		600.0	606.33	101.1	500.0	507.98	101.6	500.0	509.74	101.9
Iron		30000.0	30094.22	100.3	25000.0	25123.93	100.5	25000.0	25219.70	100.9
Lead		600.0	580.61	96.8	500.0	481.92	96.4	500.0	483.91	96.8
Magnesium		30000.0	30204.69	100.7	25000.0	24827.93	99.3	25000.0	25415.33	101.7
Manganese		600.0	597.51	99.6	500.0	490.21	98.0	500.0	499.02	99.8
Nickel		600.0	593.58	98.9	500.0	494.80	99.0	500.0	495.75	99.2
Potassium		30000.0	30625.03	102.1	25000.0	25665.51	102.7	25000.0	25604.57	102.4
Selenium		600.0	593.51	98.9	500.0	488.01	97.6	500.0	498.13	99.6
Silver		600.0	602.19	100.4	500.0	494.00	98.8	500.0	497.77	99.6
Sodium		30000.0	30542.04	101.8	25000.0	25575.46	102.3	25000.0	25639.40	102.6
Vanadium		600.0	611.67	101.9	500.0	502.58	100.5	500.0	509.35	101.9
Zinc		600.0	599.22	99.9	500.0	496.41	99.3	500.0	497.26	99.5

(1) Control Limits: 90 - 110
(2) Control Limits: 90 - 110
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: P
Run Name: 1618907T72
Calibration Date(s): 07/07/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Aluminum					25000.0	25542.48	102.2			
Antimony					500.0	498.23	99.6			
Arsenic					500.0	504.77	101.0			
Barium					500.0	505.60	101.1			
Beryllium					500.0	489.43	97.9			
Cadmium					500.0	493.50	98.7			
Calcium					25000.0	25493.42	102.0			
Chromium					500.0	500.15	100.0			
Cobalt					500.0	491.39	98.3			
Copper					500.0	512.88	102.6			
Iron					25000.0	25175.08	100.7			
Lead					500.0	478.86	95.8			
Magnesium					25000.0	25293.54	101.2			
Manganese					500.0	501.70	100.3			
Nickel					500.0	488.31	97.7			
Potassium					25000.0	25816.93	103.3			
Selenium					500.0	490.20	98.0			
Silver					500.0	503.57	100.7			
Sodium					25000.0	25880.29	103.5			
Vanadium					500.0	510.31	102.1			
Zinc					500.0	490.51	98.1			

(1) Control Limits: 90 - 110
(2) Control Limits: 90 - 110
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: MS
Run Name: 1619001E03
Calibration Date(s): 07/08/2016
Concentration Units: UG/L

		Initial Calibration			Continuing Calibration					
Analyte	Mass	True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Thallium	203	50.0	48.70	97.4	25.0	25.34	101.4	25.0	25.16	100.6

(1) Control Limits: 90 - 110
(2) Control Limits: 90 - 110
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: MS
Run Name: 1619001E03
Calibration Date(s): 07/08/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Thallium	203				25.0	24.71	98.8			

(1) Control Limits: 90 - 110
(2) Control Limits: 90 - 110
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Mercury		2.5	2.42	96.8	1.0	0.94	94.0	1.0	0.94	94.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Mercury					1.0	0.94	94.0	1.0	0.92	92.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

		Initial Calibration			Continuing Calibration					
Analyte	Mass	True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Mercury					1.0	0.93	93.0	1.0	0.89	89.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Mercury					1.0	0.93	93.0	1.0	0.94	94.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION
SDG No.: DWD87

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(2)	True	Found	%R(2)
Mercury					1.0	0.94	94.0	1.0	0.94	94.0

(1) Control Limits: 90 - 110
(2) Control Limits: 80 - 120
* Outside Limits. If Continuing Calibration is outside limits, high, only ND samples are accepted.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 2B
LOW LEVEL CHECK STANDARD
SDG No.: DWD87

Method: P
Run Name: 1618907T72
Calibration Date(s): 07/07/2016
Concentration Units: UG/L

Analyte	Mass	Initial True	Initial Found	Initial %R	Final Found	Final %R
Aluminum		400.0	371.01	92.8	367.76	91.9
Antimony		40.0	39.07	97.7	38.71	96.8
Arsenic		40.0	36.76	91.9	43.25	108.1
Barium		10.0	10.49	104.9	10.44	104.4
Beryllium		10.0	9.94	99.4	9.94	99.4
Cadmium		10.0	9.77	97.7	9.30	93.0
Calcium		400.0	387.86	97.0	384.72	96.2
Chromium		30.0	30.34	101.1	29.78	99.3
Cobalt		10.0	9.88	98.8	9.80	98.0
Copper		20.0	20.10	100.5	19.40	97.0
Iron		400.0	392.32	98.1	401.84	100.5
Lead		30.0	31.32	104.4	26.25	87.5
Magnesium		200.0	186.44	93.2	183.57	91.8
Manganese		10.0	10.12	101.2	10.23	102.3
Nickel		20.0	19.73	98.7	19.86	99.3
Potassium		1000.0	1057.49	105.7	1039.09	103.9
Selenium		40.0	36.01	90.0	40.22	100.6
Silver		10.0	9.66	96.6	9.75	97.5
Sodium		2000.0	2054.43	102.7	2057.16	102.9
Vanadium		10.0	11.25	112.5	10.79	107.9
Zinc		40.0	38.88	97.2	38.34	95.9

Control limits: 70% - 130%

For 6010B - Control limits apply to values up to 10 times the true value of the low level check standard. If LLC is out of specification, high, results < RL are acceptable.
For 6010C - If Low Level Check (LLC) is out of specification, results > CCV are acceptable. If LLC is out of specification, high, results < RL are acceptable.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 2B
LOW LEVEL CHECK STANDARD
SDG No.: DWD87

Method: MS
Run Name: 1619001E03
Calibration Date(s): 07/08/2016
Concentration Units: UG/L

Analyte	Mass	Initial True	Initial Found	Initial %R	Final Found	Final %R
Thallium	203	1.0	1.22	122.0	1.12	112.0

Control limits: 70% - 130%

For 6010B - Control limits apply to values up to 10 times the true value of the low level check standard. If LLC is out of specification, high, results < RL are acceptable.
For 6010C - If Low Level Check (LLC) is out of specification, results > CCV are acceptable. If LLC is out of specification, high, results < RL are acceptable.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 2B
LOW LEVEL CHECK STANDARD
SDG No.: DWD87

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial True	Initial Found	Initial %R	Final Found	Final %R
Mercury		0.2	0.20	100.0	0.20	100.0

Control limits: 70% - 130%

For 6010B - Control limits apply to values up to 10 times the true value of the low level check standard. If LLC is out of specification, high, results < RL are acceptable.
For 6010C - If Low Level Check (LLC) is out of specification, results > CCV are acceptable. If LLC is out of specification, high, results < RL are acceptable.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: P
Run Name: 1618907T72
Calibration Date(s): 07/07/2016
Preparation Blank Matrix: SOIL

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Aluminum		45.0	U	45.0	U	45.0	U	45.0	U		8.700	U	161870637004
Antimony		3.3	U	3.3	U	3.3	U	3.3	U		0.700	U	161870637004
Arsenic		3.6	U	3.6	U	3.6	U	3.6	U		0.970	U	161870637004
Barium		0.33	U	0.33	U	0.33	U	0.33	U		0.033	U	161870637004
Beryllium		0.67	U	0.67	U	0.67	U	0.67	U		0.067	U	161870637004
Cadmium		-0.54	B	-0.46	B	-0.48	B	-0.43	B		-0.052	B	161870637004
Calcium		33.4	U	33.4	U	33.4	U	33.4	U		5.700	U	161870637004
Chromium		0.75	U	0.75	U	0.75	U	0.75	U		0.140	U	161870637004
Cobalt		0.50	U	0.50	U	0.50	U	0.50	U		0.120	U	161870637004
Copper		1.7	U	-1.7	B	1.7	U	1.7	U		0.230	U	161870637004
Iron		33.4	U	33.4	U	33.4	U	33.4	U		4.100	U	161870637004
Lead		1.7	U	-3.0	B	-3.8	B	-2.7	B		0.550	U	161870637004
Magnesium		16.7	U	24.9	B	16.7	U	19.9	B		1.900	U	161870637004
Manganese		0.83	U	0.83	U	0.83	U	0.83	U		0.083	U	161870637004
Nickel		-1.1	B	0.80	U	0.80	U	0.80	U		0.300	U	161870637004
Potassium		83.4	U	83.4	U	83.4	U	83.4	U		23.900	U	161870637004
Selenium		-7.2	B	6.5	U	6.5	U	6.5	U		0.900	U	161870637004
Silver		0.83	U	0.83	U	0.83	U	0.83	U		0.150	U	161870637004
Sodium		167	U	167	U	167	U	167	U		23.900	U	161870637004
Vanadium		0.90	B	1.1	B	1.3	B	0.87	B		0.140	U	161870637004
Zinc		2.0	U	2.0	U	2.0	U	2.0	U		0.680	U	161870637004

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below IDL/MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: MS
Run Name: 1619001E03
Calibration Date(s): 07/08/2016
Preparation Blank Matrix: SOIL

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Thallium	203	0.15	U	0.15	U	0.15	U	0.15	U	203	0.029	U	161870637004A

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below IDL/MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Preparation Blank Matrix: SOIL

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Mercury		0.050	U	0.050	U	0.050	U	0.050	U		0.010	U	161820638002

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer	U= Below IDL/MDL
MS = ICP Mass Spectrometry	B= Below LOQ
CV = Cold Vapor	
AF = Cold Vapor Atomic Fluorescence	

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Mercury				0.050	U	0.050	U	0.050	U				

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer	U= Below IDL/MDL
MS = ICP Mass Spectrometry	B= Below LOQ
CV = Cold Vapor	
AF = Cold Vapor Atomic Fluorescence	

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Mercury				0.050	U	0.050	U	0.050	U				

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer	U= Below IDL/MDL
MS = ICP Mass Spectrometry	B= Below LOQ
CV = Cold Vapor	
AF = Cold Vapor Atomic Fluorescence	

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QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD87

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016

		Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)			
Analyte	Mass		C	1	C	2	C	3	C	Mass		C	Batch Number
Mercury				0.050	U								

METHODS:	CONCENTRATION QUALIFIERS:
P = ICP Atomic Emission Spectrometer MS = ICP Mass Spectrometry CV = Cold Vapor AF = Cold Vapor Atomic Fluorescence	U= Below IDL/MDL B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 4A
ICP-AES INTERFERENCE CHECK SAMPLE
SDG No.: DWD87

Instrument ID: 16417
Run Name: 1618907T72
Concentration Units: ug/L

Analyte	True		Initial Found				Final Found			
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R	Sol. A	%R	Sol. AB	%R
Aluminum	500000	500000	543484	108.7	531141.5	106.2	543796	108.8	536778.6	107.4
Antimony	0	600	-6		632.4	105.4	-4		621.9	103.7
Arsenic	0	100	-6		98.5	98.5	-4		97.2	97.2
Barium	0	500	4		497.8	99.6	4		503.0	100.6
Beryllium	0	500	0		498.2	99.6	0		502.8	100.6
Cadmium	0	1000	-8		912.1	91.2	-8		906.5	90.7
Calcium	500000	500000	542763	108.6	533939.1	106.8	539649	107.9	533226.7	106.6
Chromium	0	500	8		481.6	96.3	8		489.3	97.9
Cobalt	0	500	1		449.2	89.8	1		447.0	89.4
Copper	0	500	1		521.9	104.4	2		523.8	104.8
Iron	200000	200000	219214	109.6	214962.3	107.5	218964	109.5	215077.8	107.5
Lead	0	50	3		52.6	105.2	14		50.4	100.8
Magnesium	500000	500000	524554	104.9	508934.5	101.8	530356	106.1	516083.5	103.2
Manganese	0	500	1		470.6	94.1	1		479.2	95.8
Nickel	0	1000	-2		885.5	88.6	-2		876.0	87.6
Potassium	0	0	128		49.0		26		46.2	
Selenium	0	50	-2		45.4	90.8	4		51.9	103.8
Silver	0	200	0		220.0	110.0	0		220.3	110.2
Sodium	0	0	232		221.5		229		210.4	
Vanadium	0	500	1		503.1	100.6	0		508.1	101.6
Zinc	0	1000	0		1004.7	100.5	0		997.9	99.8

Control Limits: All Metals 80%-120%

QUALITY ASSURANCE SUMMARY
FORM 4B
ICP-MS INTERFERENCE CHECK SAMPLE
SDG No.: DWD87

Instrument ID: 11332
Run Name: 1619001E03
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	99720	99.7	100600.0	100.6
Calcium	44	300000	300000	309700	103.2	317200.0	105.7
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	247000	98.8	253900.0	101.6
Magnesium	24	100000	100000	99120	99.1	99670.0	99.7
Molybdenum	98	2000	2000	2025	101.3	2028.0	101.4
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	100100	100.1	102500.0	102.5
Sodium	23	250000	250000	261200	104.5	264300.0	105.7
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2153	107.7	2238.0	111.9

Control Limits: All Metals 80%-120%

QUALITY ASSURANCE SUMMARY
FORM 4B
ICP-MS INTERFERENCE CHECK SAMPLE
SDG No.: DWD87

Instrument ID: 11332
Run Name: 1619001E03
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	101800	101.8	99360.0	99.4
Calcium	44	300000	300000	317800	105.9	310600.0	103.5
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	251000	100.4	243300.0	97.3
Magnesium	24	100000	100000	98480	98.5	96040.0	96.0
Molybdenum	98	2000	2000	1991	99.6	1939.0	97.0
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	102200	102.2	101000.0	101.0
Sodium	23	250000	250000	259200	103.7	257100.0	102.8
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2246	112.3	2161.0	108.1

Control Limits: All Metals 80%-120%

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QUALITY ASSURANCE SUMMARY
FORM 5A(MS/MSD)
MATRIX SPIKE/MATRIX SPIKE DUPLICATE
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: *38360BKG Matrix Spike Lab Sample ID: *38360MS Matrix Spike Duplicate Lab Sample ID: *38360MSD
Batch Number(s): 161870637004

		BKG Sample		MS Sample		MSD Sample		MS Spike	MSD Spike		MS		MSD				Control Limit		
Analyte	Mass	Result	C	Result	C	Result	C	Added	Added	Units	%R	Q	%R	Q	RPD	Q	%R	RPD	M
Aluminum		2980.1940		4377.0343		4494.6634		185.1852	152.6718	MG/KG	754		992		3			20	P
Antimony		0.5263	U	37.9750		31.6504		46.2963	38.1679	MG/KG	82		83		18		75 - 125	20	P
Arsenic		0.7293	U	12.0898		10.3023		13.8889	11.4504	MG/KG	87		90		16		75 - 125	20	P
Barium		9.0368		180.4565		153.3786		185.1852	152.6718	MG/KG	93		95		16		75 - 125	20	P
Beryllium		0.0820	B	4.3185		3.6389		4.6296	3.8168	MG/KG	92		93		17		75 - 125	20	P
Cadmium		0.1421	B	4.3833		3.7542		4.6296	3.8168	MG/KG	92		95		15		75 - 125	20	P
Calcium		745.5218		2213.7565		2755.1260		370.3704	305.3435	MG/KG	396	N	658	N	22	*	75 - 125	20	P
Chromium		4.2955		23.8667		18.3924		18.5185	15.2672	MG/KG	106		92		26	*	75 - 125	20	P
Cobalt		0.2805	B	42.0787		35.1412		46.2963	38.1679	MG/KG	90		91		18		75 - 125	20	P
Copper		5.1842		33.0639		26.2496		23.1481	19.0840	MG/KG	120		110		23	*	75 - 125	20	P
Iron		2268.8053		3033.5120		2226.3237		92.5926	76.3359	MG/KG	826		-56		31	*		20	P
Lead		8.2286		21.4000		18.4443		13.8889	11.4504	MG/KG	95		89		15		75 - 125	20	P
Magnesium		216.5692		520.9139		538.1969		185.1852	152.6718	MG/KG	164	N	211	N	3		75 - 125	20	P
Manganese		49.2421		115.7630		106.4305		46.2963	38.1679	MG/KG	144	N	150	N	8		75 - 125	20	P
Nickel		1.5744		44.5000		36.9733		46.2963	38.1679	MG/KG	93		93		18		75 - 125	20	P
Potassium		84.2459		1041.4926		922.5702		925.9259	763.3588	MG/KG	103		110		12		75 - 125	20	P
Selenium		0.6767	U	12.1935		9.5771		13.8889	11.4504	MG/KG	88		84		24	*	75 - 125	20	P
Silver		0.1128	U	4.0602		3.3977		4.6296	3.8168	MG/KG	88		89		18		75 - 125	20	P
Sodium		17.9699	U	897.3370		769.2450		925.9259	763.3588	MG/KG	97		101		15		75 - 125	20	P
Thallium	203	0.0218	U	0.4254		0.3873		0.3704	0.3053	MG/KG	115		127	N	9		75 - 125	20	MS
Vanadium		3.3045		45.5778		39.0565		46.2963	38.1679	MG/KG	91		94		15		75 - 125	20	P
Zinc		40.5820		103.9954		79.6427		46.2963	38.1679	MG/KG	137	N	102		27	*	75 - 125	20	P

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer CV = Cold Vapor
MS = ICP Mass Spectrometry AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL, B= Below LOQ
FLAGS:
N = Matrix Spike OOS, * = Duplicate OOS

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QUALITY ASSURANCE SUMMARY
FORM 5A(MS/MSD)
MATRIX SPIKE/MATRIX SPIKE DUPLICATE
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: *44071BKG Matrix Spike Lab Sample ID: *44071MS Matrix Spike Duplicate Lab Sample ID: *44071MSD
Batch Number(s): 161820638002

		BKG Sample		MS Sample		MSD Sample		MS Spike	MSD Spike		MS		MSD				Control Limit		
Analyte	Mass	Result	C	Result	C	Result	C	Added	Added	Units	%R	Q	%R	Q	RPD	Q	%R	RPD	M
Mercury		0.0416	B	0.2020		0.1905		0.1667	0.1563	MG/KG	96		95		6		80 - 120	20	CV

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer CV = Cold Vapor
MS = ICP Mass Spectrometry AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL, B= Below LOQ
FLAGS:
N = Matrix Spike OOS, * = Duplicate OOS

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QUALITY ASSURANCE SUMMARY
FORM 5B
POST DIGEST SPIKE SAMPLE RECOVERY
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: *38360BKG Post Digest Spike Lab Sample ID: *38360A
Batch Number(s): 161870637004
Concentration Units: UG/L

Analyte	Mass	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Calcium			10674.2700		9915.4400		1000.0000	76		P
Magnesium			3755.4800		2880.3700		1000.0000	88		P
Manganese			695.4900		654.9200		60.0000	68		P
Thallium	203		1.0910		0.1450	U	1.0000	109		MS
Zinc			636.6200		539.7400		120.0000	81		P

Comments:

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 6
DUPLICATES
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: *38360BKG Duplicate Lab Sample ID: *38360DUP
Batch Number(s): 161870637004
Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum			2980.1940		3101.2981		4		P
Antimony			0.5263	U	2.1925	B	200		P
Arsenic			0.7293	U	0.9151	U			P
Barium			9.0368		11.2925		22	*	P
Beryllium			0.0820	B	0.0811	B	1		P
Cadmium			0.1421	B	0.1208	B	16		P
Calcium			745.5218		875.0377		16		P
Chromium		2.3	4.2955		4.8472		12		P
Cobalt			0.2805	B	0.3425	B	20		P
Copper		1.5	5.1842		7.2349		33	*	P
Iron			2268.8053		2878.3274		24	*	P
Lead		2.3	8.2286		9.7321		17		P
Magnesium			216.5692		232.5877		7		P
Manganese			49.2421		54.5434		10		P
Nickel		1.5	1.5744		2.0698		27		P
Potassium		75.2	84.2459		87.2000	B	3		P
Selenium			0.6767	U	0.8491	U			P
Silver			0.1128	U	0.1415	U			P
Sodium			17.9699	U	22.5472	U			P
Thallium	203		0.0218	U	0.0274	U			MS
Vanadium		0.8	3.3045		3.4915		6		P
Zinc			40.5820		50.9274		23	*	P

NOTE: An asterisk (*) in column "Q" indicates poor duplicate precision (RPD > 20% OR |(S) - (D)| > LOQ for values < 5x LOQ).
The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample.

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

FLAGS:
* = Duplicate Out of Spec

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QUALITY ASSURANCE SUMMARY
FORM 6
DUPLICATES
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: *44071BKG Duplicate Lab Sample ID: *44071DUP
Batch Number(s): 161820638002
Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Mercury			0.0416	B	0.0377	B	10		CV

NOTE: An asterisk (*) in column "Q" indicates poor duplicate precision (RPD > 20% OR |(S) - (D)| > LOQ for values < 5x LOQ).
The data are considered to be valid because the laboratory control sample is within the control limits. See the Laboratory Control Sample.

Note: Results shown are reported on an as-received basis.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

FLAGS:
* = Duplicate Out of Spec

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QUALITY ASSURANCE SUMMARY
FORM 7
LABORATORY CONTROL SAMPLE
SDG No.: DWD87
Matrix: SOIL

Analyte	Mass	Batch Number	Units	True	Found	C	Control Limits (%)	%R	M	In Spec
Aluminum		161870637004	MG/KG	200.000	183.048		80 - 120	92	P	Yes
Antimony		161870637004	MG/KG	50.000	46.283		80 - 120	93	P	Yes
Arsenic		161870637004	MG/KG	15.000	14.051		80 - 120	94	P	Yes
Barium		161870637004	MG/KG	200.000	187.961		80 - 120	94	P	Yes
Beryllium		161870637004	MG/KG	5.000	4.659		80 - 120	93	P	Yes
Cadmium		161870637004	MG/KG	5.000	4.626		80 - 120	93	P	Yes
Calcium		161870637004	MG/KG	400.000	380.524		80 - 120	95	P	Yes
Chromium		161870637004	MG/KG	20.000	18.610		80 - 120	93	P	Yes
Cobalt		161870637004	MG/KG	50.000	46.576		80 - 120	93	P	Yes
Copper		161870637004	MG/KG	25.000	24.919		80 - 120	100	P	Yes
Iron		161870637004	MG/KG	100.000	93.172		80 - 120	93	P	Yes
Lead		161870637004	MG/KG	15.000	13.642		80 - 120	91	P	Yes
Magnesium		161870637004	MG/KG	200.000	184.908		80 - 120	92	P	Yes
Manganese		161870637004	MG/KG	50.000	46.505		80 - 120	93	P	Yes
Mercury		161820638002	MG/KG	0.100	0.094		80 - 120	94	CV	Yes
Nickel		161870637004	MG/KG	50.000	47.290		80 - 120	95	P	Yes
Potassium		161870637004	MG/KG	1000.000	953.695		80 - 120	95	P	Yes
Selenium		161870637004	MG/KG	15.000	13.724		80 - 120	91	P	Yes
Silver		161870637004	MG/KG	5.000	4.542		80 - 120	91	P	Yes
Sodium		161870637004	MG/KG	1000.000	959.550		80 - 120	96	P	Yes
Thallium	203	161870637004	MG/KG	0.200	0.195	B	80 - 120	98	MS	Yes
Vanadium		161870637004	MG/KG	50.000	46.521		80 - 120	93	P	Yes
Zinc		161870637004	MG/KG	50.000	45.798		80 - 120	92	P	Yes

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ

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QUALITY ASSURANCE SUMMARY
FORM 9
SERIAL DILUTIONS
SDG No.: DWD87
Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: *38360BKG Serial Dilution Lab Sample ID: *38360L
Batch Number(s): 161870637004
Concentration Units: UG/L

Analyte	Mass	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Diff.	Q	M
Aluminum		39636.5800		39557.0500		0		P
Antimony		7.0000	U	35.0000	U			P
Arsenic		9.7000	U	48.5000	U			P
Barium		120.1900		120.5500		0		P
Beryllium		1.0900	B	3.3500	U	100		P
Cadmium		1.8900	B	2.4500	U	100		P
Calcium		9915.4400		9831.0500		1		P
Chromium		57.1300		59.7000	B	4		P
Cobalt		3.7300	B	6.0000	U	100		P
Copper		68.9500		64.9500	B	6		P
Iron		30175.1100		29746.1500		1		P
Lead		109.4400		95.0000	B	13		P
Magnesium		2880.3700		2803.6000		3		P
Manganese		654.9200		660.7500		1		P
Nickel		20.9400		19.8000	B	5		P
Potassium		1120.4700		1214.2000	B	8		P
Selenium		9.0000	U	45.0000	U			P
Silver		1.5000	U	7.5000	U			P
Sodium		239.0000	U	1195.0000	U			P
Thallium	203	0.1450	U	0.7250	U			MS
Vanadium		43.9500		47.6500	B	8		P
Zinc		539.7400		524.1000		3		P

NOTE: An E in column Q indicates the presence of a chemical or physical interference in the matrix when the % difference is greater than 10%. This applies only when (I) is greater than or equal to 50x MDL for ICP, 100x MDL for ICP-MS (6020), 50x MDL for ICP-MS (200.8), or 25x MDL for GFAA.

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry

CONCENTRATION QUALIFIERS:
U= Below MDL
B= Below LOQ
FLAGS:
E = Matrix Effects exist as proven by Serial Dilution or Spiked Dilution

Method: P
Instrument ID: 16417
Date: 04/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Aluminum	308.21		45.0
Antimony	206.83		3.3
Arsenic	189.04		3.6
Barium	455.40		0.33
Beryllium	313.04		0.67
Cadmium	226.50		0.33
Calcium	317.93		33.4
Chromium	267.72		0.75
Cobalt	228.62		0.50
Copper	327.40		1.7
Iron	261.19		33.4
Lead	220.35		1.7
Magnesium	285.21		16.7
Manganese	257.61		0.83
Nickel	231.60		0.80
Potassium	766.49		83.4
Selenium	196.09		6.5
Silver	328.06		0.83
Sodium	589.59		167
Vanadium	292.40		0.75
Zinc	213.86		2.0

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

Method: MS
Instrument ID: 11332
Date: 04/2016

Analyte	MASS (amu)	Background	IDL (UG/L)
Thallium	203		0.15

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10
INSTRUMENT DETECTION LIMITS (QUARTERLY)
SDG No.: DWD87

Method: CV
Instrument ID: 19302
Date: 04/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Mercury			0.050

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD87
Matrix: SOIL

Method: P
Date: 06/2016

Analyte	Wavelength (nm)	Background	LOQ (UG/L)	MDL (UG/L)
Aluminum	308.21		400	86.8
Antimony	206.83		40.0	7.0
Arsenic	189.04		40.0	9.7
Barium	455.40		10.0	0.33
Beryllium	313.04		10.0	0.67
Cadmium	226.50		10.0	0.49
Calcium	317.93		400	56.6
Chromium	267.72		30.0	1.4
Cobalt	228.62		10.0	1.2
Copper	327.40		20.0	2.3
Iron	261.19		400	41.2
Lead	220.35		30.0	5.5
Magnesium	285.21		200	19.0
Manganese	257.61		10.0	0.83
Nickel	231.60		20.0	3.0
Potassium	766.49		1000	239
Selenium	196.09		40.0	9.0
Silver	328.06		10.0	1.5
Sodium	589.59		2000	239
Vanadium	292.40		10.0	1.4
Zinc	213.86		40.0	6.8

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD87
Matrix: SOIL

Method: MS
Date: 06/2016

Analyte	Mass	Background	LOQ (UG/L)	MDL (UG/L)
Thallium	203		1.0	0.15

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD87
Matrix: SOIL

Method: CV
Date: 07/2015

Analyte	Wavelength (nm)	Background	LOQ (UG/L)	MDL (UG/L)
Mercury			0.60	0.060

The LOQ/MDL must be adjusted for % Solids and Sample Weight for samples reporting in mg/kg and ug/L.

Comments:

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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD87

Instrument ID: 16417
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: AL	CA	FE	MG	CO
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.83	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	-0.0001600	0.0000000	0.0000000
Barium	455.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0001170	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	327.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0002550
Iron	261.19	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0002270	0.0000000	0.0000000	0.0000000	-0.0003780
Magnesium	285.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.09	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.06	0.0000000	0.0000000	-0.0004180	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000190	0.0000000	0.0000000
Zinc	213.86	0.0000000	0.0000000	0.0001080	0.0000000	0.0000000

Comments:
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QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD87

Instrument ID: 16417
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: CR	MO	NI	SI	TI
Aluminum	308.21	0.0000000	0.0197250	0.0000000	0.0000000	0.0000000
Antimony	206.83	0.0203250	-0.0071940	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0010380	0.0017140	0.0000000	0.0000000	0.0000000
Barium	455.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0022370
Copper	327.40	0.0000000	-0.0009140	0.0000000	0.0000000	0.0000000
Iron	261.19	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0000000	-0.0026860	0.0000000	0.0000910	0.0000000
Magnesium	285.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.09	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.06	0.0000000	0.0000000	0.0000000	0.0000000	-0.0004780
Vanadium	292.40	0.0000000	-0.0127040	0.0000000	0.0000000	0.0007100
Zinc	213.86	0.0000000	0.0000000	0.0047920	0.0000000	0.0000000

Comments:
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QUALITY ASSURANCE SUMMARY
FORM 11
ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)
SDG No.: DWD87

Instrument ID: 16417
Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for: V	ZR	--	--	--
Aluminum	308.21	0.0244560	0.0000000			
Antimony	206.83	0.0000000	-0.0009840			
Arsenic	189.04	0.0000000	0.0000000			
Barium	455.40	0.0000000	0.0005290			
Beryllium	313.04	0.0000000	0.0000000			
Cadmium	226.50	0.0000000	0.0000000			
Calcium	317.93	0.0000000	0.0000000			
Chromium	267.72	0.0000000	0.0000000			
Cobalt	228.62	0.0000000	0.0000000			
Copper	327.40	0.0000000	-0.0005790			
Iron	261.19	0.0000000	0.0000000			
Lead	220.35	0.0000000	0.0000000			
Magnesium	285.21	0.0000000	0.0000000			
Nickel	231.60	0.0000000	0.0000000			
Selenium	196.09	0.0000000	0.0000000			
Silver	328.06	0.0000000	0.0054810			
Vanadium	292.40	0.0000000	0.0000000			
Zinc	213.86	0.0000000	0.0000000			

Comments:
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QUALITY ASSURANCE SUMMARY
FORM 12
LINEAR RANGES
SDG No.: DWD87

Method: P
Instrument ID: 16417
Date: 04/2016

Analyte	Wavelength (nm)	Integration Time (Sec.)	Concentration (ug/L)
Aluminum	308.21	10.00	600000.0
Antimony	206.83	10.00	20000.0
Arsenic	189.04	10.00	20000.0
Barium	455.4	10.00	10000.0
Beryllium	313.04	10.00	10000.0
Cadmium	226.5	10.00	20000.0
Calcium	317.93	10.00	600000.0
Chromium	267.72	10.00	20000.0
Cobalt	228.62	10.00	20000.0
Copper	327.4	10.00	20000.0
Iron	261.19	10.00	300000.0
Lead	220.35	10.00	20000.0
Magnesium	285.21	10.00	600000.0
Manganese	257.61	10.00	20000.0
Nickel	231.6	10.00	20000.0
Potassium	766.49	10.00	500000.0
Selenium	196.09	10.00	20000.0
Silver	328.06	10.00	10000.0
Sodium	589.59	10.00	500000.0
Vanadium	292.4	10.00	20000.0
Zinc	213.86	10.00	20000.0

Comments:
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METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

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QUALITY ASSURANCE SUMMARY
FORM 15
ICP-MS TUNE
SDG No.: DWD87
Matrix: SOIL

Instrument ID: 11332
Date: 07/08/2016

Analyte	Mass	Avg. Measured Mass (amu)	Avg. Peak Width at 5% Peak Height (amu)	%RSD
Lithium	6.000	5.95	0.70	1.6
Magnesium	24.000	24.05	0.70	1.8
Rhodium	103.000	103.05	0.65	1.6
Indium	115.000	115.05	0.65	1.7
Cerium	140.000	140.05	0.65	1.5
Lead	208.000	208.00	0.65	1.2
Uranium	238.000	238.00	0.60	1.5

Comments:

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QUALITY ASSURANCE SUMMARY
FORM 16
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
SDG No.: DWD87

Instrument ID: 11332
Run Name: 1619001E03

Start Date: 07/08/2016
End Date: 07/08/2016

Standard	Elements Applies to	Standard	Elements Applies to
BI-1-209	TL		

Lab Sample ID	Time	Internal Standards %RI For: Element BI-1-209	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q
S0	00:22	100													
S	00:24	97													
CCS	00:25	99													
CCS	00:26	98													
ICV	00:28	98													
ICB	00:29	97													
LLC	00:30	98													
ICSA	00:32	92													
ICSAB	00:33	90													
ZZZZZZ	00:35														
CCV	00:36	96													
CCB	00:37	98													
P18737DB	00:39	100													
P18737DQ	00:40	101													
*38360BKG	00:41	101													
*38360A	00:43	102													
*38360DUP	00:44	103													
*38360MS	00:45	100													
*38360MSD	00:47	103													
*38360L	00:48	104													
ZZZZZZ	00:50														
ZZZZZZ	00:51														
CCV	00:52	98													
CCB	00:54	99													
8455242	00:55	99													
8442817	00:56	103													
8442821	00:58	104													
8442825	00:59	102													
LLC	01:01	100													
ICSA	01:02	94													
ICSAB	01:03	91													
ZZZZZZ	01:05														
CCV	01:06	101													

LEGEND:
BKG = Background
DUP = Duplicate
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike

FLAG:
R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:
BE = Beryllium
BI = Bismuth
GE = Germanium
HO = Holmium
IN = Indium
LI = Lithium
SC = Scandium
TB = Terbium
Y = Yttrium

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QUALITY ASSURANCE SUMMARY
FORM 16
ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY
SDG No.: DWD87

Instrument ID: 11332
Run Name: 1619001E03

Start Date: 07/08/2016
End Date: 07/08/2016

Standard	Elements Applies to	Standard	Elements Applies to
BI-1-209	TL		

Lab Sample ID	Time	Internal Standards %RI For: Element BI-1-209	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q	Element	Q
CCB	01:07	101													

LEGEND:
BKG = Background
DUP = Duplicate
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike
FLAG:
R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:
BE = Beryllium
BI = Bismuth
GE = Germanium
HO = Holmium
IN = Indium
LI = Lithium
SC = Scandium
TB = Terbium
Y = Yttrium

Preparation and Run Logs

Metals in Solid

Method: P
Batch Number: 161870637004

Lab Sample ID	Date	Sample Weight(gram)	Final Volume(ml)
8442817	07/06/2016	1.01	100
8442821	07/06/2016	1.01	100
8442825	07/06/2016	1.02	100
8455242	07/06/2016	1.09	100
*38360BKG	07/06/2016	1.33	100
*38360DUP	07/06/2016	1.06	100
*38360MSD	07/06/2016	1.31	100
*38360MS	07/06/2016	1.08	100
P18737DB	07/06/2016	1.00	100
P18737DQ	07/06/2016	1.00	100

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

LEGEND:
BKG = Background
DUP = Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate

Method: MS
Batch Number: 161870637004

Lab Sample ID	Date	Sample Weight(gram)	Final Volume(ml)
8442817	07/06/2016	1.01	100
8442821	07/06/2016	1.01	100
8442825	07/06/2016	1.02	100
8455242	07/06/2016	1.09	100
*38360BKG	07/06/2016	1.33	100
*38360DUP	07/06/2016	1.06	100
*38360MSD	07/06/2016	1.31	100
*38360MS	07/06/2016	1.08	100
P18737DB	07/06/2016	1.00	100
P18737DQ	07/06/2016	1.00	100

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

LEGEND:
BKG = Background
DUP = Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate

Method: CV
Batch Number: 161820638002

Lab Sample ID	Date	Sample Weight(gram)	Final Volume(ml)
8442816	07/01/2016	0.63	100
8442820	07/01/2016	0.63	100
8442824	07/01/2016	0.60	100
*44071BKG	07/01/2016	0.64	100
*44071DUP	07/01/2016	0.63	100
*44071MSD	07/01/2016	0.64	100
*44071MS	07/01/2016	0.60	100
P18238BB	07/01/2016	0.60	100
P18238BQ	07/01/2016	1.00	100

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

LEGEND:
BKG = Background
DUP = Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: P
Instrument ID: 16417
Run Name: 1618907T72

Run Start Date: 07/07/2016
Run End Date: 07/07/2016

Lab Sample ID	D/F	Time	Analytes																														
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN								
S0	1.00	22:16	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
S	1.00	22:19	X						X				X		X				X			X											
S	1.00	22:22			X	X	X	X			X	X		X		X		X		X	X				X								
S	1.00	22:25		X						X														X									
ICV	1.00	22:28	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
ICB	1.00	22:31	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
LLC	1.00	22:35	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
ICSA	1.00	22:38	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
ICSAB	1.00	22:41	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
CCV	1.00	22:44	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
CCB	1.00	22:47	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
P18737DB	1.00	22:51	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
P18737DQ	1.00	22:54	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
*38360BKG	1.00	22:57	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
*38360A	1.00	23:00							X						X	X									X								
*38360DUP	1.00	23:03	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
*38360MS	1.00	23:06	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
*38360MSD	1.00	23:09	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
*38360L	5.00	23:12	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
ZZZZZZ	1.00	23:16																															
ZZZZZZ	1.00	23:19																															
CCV	1.00	23:22	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
CCB	1.00	23:25	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
8455242	1.00	23:28	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
8442817	1.00	23:31	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
8442821	1.00	23:34	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
8442825	1.00	23:37	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
LLC	1.00	23:40	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
ICSA	1.00	23:43	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
ICSAB	1.00	23:47	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
CCV	1.00	23:50	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								
CCB	1.00	23:53	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X								

METHODS:	LEGEND:
P = ICP Atomic Emission Spectrometer	BKG = Background
MS = ICP Mass Spectrometry	DUP = Duplicate
CV = Cold Vapor	MS = Matrix Spike
AF = Cold Vapor Atomic Fluorescence	MSD = Matrix Spike Duplicate
	A = Post Digest Spike
	L = Serial Dilution
	B = Blank
	Q = Laboratory Control Sample
	Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: MS
Instrument ID: 11332
Run Name: 1619001E03

Run Start Date: 07/08/2016
Run End Date: 07/08/2016

Lab Sample ID	D/F	Time	Analytes																												
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
S0	1.00	00:22																					X									
S	1.00	00:24																					X									
CCS	1.00	00:25																					X									
CCS	1.00	00:26																					X									
ICV	1.00	00:28																					X									
ICB	1.00	00:29																					X									
LLC	1.00	00:30																					X									
ICSA	1.00	00:32																					X									
ICSAB	1.00	00:33																					X									
ZZZZZZ	1.00	00:35																														
CCV	1.00	00:36																					X									
CCB	1.00	00:37																					X									
P18737DB	2.00	00:39																					X									
P18737DQ	2.00	00:40																					X									
*38360BKG	2.00	00:41																					X									
*38360A	2.00	00:43																					X									
*38360DUP	2.00	00:44																					X									
*38360MS	2.00	00:45																					X									
*38360MSD	2.00	00:47																					X									
*38360L	10.00	00:48																					X									
ZZZZZZ	2.00	00:50																														
ZZZZZZ	2.00	00:51																														
CCV	1.00	00:52																					X									
CCB	1.00	00:54																					X									
8455242	2.00	00:55																					X									
8442817	2.00	00:56																					X									
8442821	2.00	00:58																					X									
8442825	2.00	00:59																					X									
LLC	1.00	01:01																					X									
ICSA	1.00	01:02																					X									
ICSAB	1.00	01:03																					X									
ZZZZZZ	1.00	01:05																														
CCV	1.00	01:06																					X									
CCB	1.00	01:07																					X									

METHODS:
- P = ICP Atomic Emission Spectrometer
- MS = ICP Mass Spectrometry
- CV = Cold Vapor
- AF = Cold Vapor Atomic Fluorescence

LEGEND:
- BKG = Background
- DUP = Duplicate
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- A = Post Digest Spike
- L = Serial Dilution
- B = Blank
- Q = Laboratory Control Sample
- Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: CV
Instrument ID: 19302
Run Name: 1618401M08

Run Start Date: 07/02/2016
Run End Date: 07/02/2016

Lab Sample ID	D/F	Time	Analytes																													
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
S0	1.00	06:00															X															
S0.2	1.00	06:02															X															
S0.5	1.00	06:04															X															
S1.0	1.00	06:07															X															
S2.5	1.00	06:09															X															
S5.0	1.00	06:11															X															
ICV	1.00	06:13															X															
ICB	1.00	06:15															X															
CRA	1.00	06:22															X															
CCV	1.00	06:24															X															
CCB	1.00	06:39															X															
ZZZZZZ	1.00	06:41																														
ZZZZZZ	1.00	06:43																														
ZZZZZZ	1.00	06:45																														
ZZZZZZ	200.00	06:52																														
ZZZZZZ	200.00	06:56																														
ZZZZZZ	200.00	06:58																														
ZZZZZZ	200.00	07:00																														
ZZZZZZ	200.00	07:02																														
ZZZZZZ	100.00	07:04																														
ZZZZZZ	1.00	07:06																														
CCV	1.00	07:08															X															
CCB	1.00	07:10															X															
ZZZZZZ	1.00	07:12																														
ZZZZZZ	1.00	07:15																														
ZZZZZZ	1.00	07:17																														
ZZZZZZ	1.00	07:19																														
ZZZZZZ	1.00	07:21																														
ZZZZZZ	1.00	07:23																														
ZZZZZZ	1.00	07:25																														
ZZZZZZ	1.00	07:27																														
ZZZZZZ	1.00	07:29																														
ZZZZZZ	1.00	07:31																														
CCV	1.00	07:33															X															
CCB	1.00	07:35															X															
ZZZZZZ	1.00	07:37																														
ZZZZZZ	1.00	07:39																														
ZZZZZZ	1.00	07:42																														

METHODS:
- P = ICP Atomic Emission Spectrometer
- MS = ICP Mass Spectrometry
- CV = Cold Vapor
- AF = Cold Vapor Atomic Fluorescence

LEGEND:
- BKG = Background
- DUP = Duplicate
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- A = Post Digest Spike
- L = Serial Dilution
- B = Blank
- Q = Laboratory Control Sample
- Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: CV
Instrument ID: 19302
Run Name: 1618401M08

Run Start Date: 07/02/2016
Run End Date: 07/02/2016

Lab Sample ID	D/F	Time	Analytes																													
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
ZZZZZZ	1.00	07:44																														
ZZZZZZ	1.00	07:47																														
ZZZZZZ	1.00	07:49																														
ZZZZZZ	1.00	07:51																														
ZZZZZZ	1.00	07:56																														
ZZZZZZ	1000.00	07:58																														
ZZZZZZ	50.00	08:00																														
CCV	1.00	08:02															X															
CCB	1.00	08:04															X															
ZZZZZZ	25.00	08:06																														
ZZZZZZ	50.00	08:08																														
ZZZZZZ	25.00	08:10																														
ZZZZZZ	1.00	08:12																														
ZZZZZZ	1.00	08:14																														
ZZZZZZ	1.00	08:16																														
ZZZZZZ	1.00	08:19																														
ZZZZZZ	1.00	08:21																														
ZZZZZZ	1.00	08:23																														
ZZZZZZ	1.00	08:25																														
CCV	1.00	08:27															X															
CCB	1.00	08:29															X															
ZZZZZZ	1.00	08:31																														
ZZZZZZ	1.00	08:33																														
ZZZZZZ	2.50	08:35																														
ZZZZZZ	1.00	08:37																														
ZZZZZZ	5.00	08:39																														
ZZZZZZ	1.00	08:41																														
ZZZZZZ	1.00	08:43																														
ZZZZZZ	1.00	08:45																														
ZZZZZZ	1.00	08:47																														
ZZZZZZ	1.00	08:49																														
CCV	1.00	08:51															X															
CCB	1.00	08:53															X															
ZZZZZZ	2.50	08:55																														
ZZZZZZ	1.00	08:57																														
ZZZZZZ	1.00	08:59																														
ZZZZZZ	1.00	09:01																														
ZZZZZZ	1.00	09:03																														

METHODS:
- P = ICP Atomic Emission Spectrometer
- MS = ICP Mass Spectrometry
- CV = Cold Vapor
- AF = Cold Vapor Atomic Fluorescence

LEGEND:
- BKG = Background
- DUP = Duplicate
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- A = Post Digest Spike
- L = Serial Dilution
- B = Blank
- Q = Laboratory Control Sample
- Y = Laboratory Control Sample Duplicate

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QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD87

Method: CV
Instrument ID: 19302
Run Name: 1618401M08

Run Start Date: 07/02/2016
Run End Date: 07/02/2016

Lab Sample ID	D/F	Time	Analytes																												
			AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN							
ZZZZZZ	1.00	09:05																													
ZZZZZZ	1.00	09:07																													
ZZZZZZ	1.00	09:09																													
ZZZZZZ	5.00	09:11																													
ZZZZZZ	2.50	09:13																													
CCV	1.00	09:15															X														
CCB	1.00	09:17															X														
ZZZZZZ	5.00	09:19																													
P18238BB	1.00	09:22															X														
P18238BQ	1.00	09:24															X														
*44071BKG	1.00	09:26															X														
*44071A	1.00	09:28																													
*44071DUP	1.00	09:30															X														
*44071MS	1.00	09:32															X														
*44071MSD	1.00	09:34															X														
ZZZZZZ	1.00	09:36																													
ZZZZZZ	1.00	09:38																													
CCV	1.00	09:40															X														
CCB	1.00	09:42															X														
ZZZZZZ	1.00	09:44																													
ZZZZZZ	1.00	09:46																													
ZZZZZZ	1.00	09:48																													
8442816	1.00	09:50															X														
8442820	1.00	09:52															X														
8442824	1.00	09:54															X														
ZZZZZZ	1.00	09:56																													
ZZZZZZ	1.00	09:58																													
ZZZZZZ	1.00	10:00																													
ZZZZZZ	1.00	10:02																													
CCV	1.00	10:04															X														
CCB	1.00	10:06															X														
ZZZZZZ	1.00	10:08																													
ZZZZZZ	1.00	10:10																													
CRA	1.00	10:12															X														
CCV	1.00	10:14															X														
CCB	1.00	10:16															X														

METHODS:
P = ICP Atomic Emission Spectrometer
MS = ICP Mass Spectrometry
CV = Cold Vapor
AF = Cold Vapor Atomic Fluorescence

LEGEND:
BKG = Background
DUP = Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate
A = Post Digest Spike
L = Serial Dilution
B = Blank
Q = Laboratory Control Sample
Y = Laboratory Control Sample Duplicate

Instrumental Wet Chemistry Data

Case Narrative/Conformance Summary

Instrumental Wet Chemistry

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8442816	DU-1-6-A		X	1	
8442820	DU-1-6-B		X	1	
8442824	DU-1-6-C		X	1	
8442829	RTPA-EB	X		1	Equipment Blank
8442830	RTPA-FB	X		1	Field Blank
8442831	DU-1-6-FB	X		1	Field Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

Sample Duplicate

Method defined actions are taken for any failed matrix QC.

Batch#: 16182102201A (Sample number(s): 8442816, 8442820, 8442824, UNSPK: P436970, BKG: P436970)
The duplicate RPD for the following analyte(s) is outside the acceptance window: Total Cyanide (solid)

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

U = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
R = Matrix Spike (MS)	MDL = Method Detection Limit
M = Matrix Spike Duplicate (MSD)	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	NA = Not Applicable
HS = High Spike	ME = Method
LS = Low Spike	CO = Colorimetric
SS = Soluble Spike	G = Gravimetric
IS = Insoluble Spike	IR = Infrared Spectrophotometry
ISD = Insoluble Spike Duplicate	MTR = Meter
PDS = Post Digestion Spike	OD = Oven Dried
* = Out of Specification	TI = Titration
V = Visual	TOC = Total Organic Carbon
AK = Alpkem	IC = Ion Chromatography
TC = Total Carbon	RA = Rapid Analyzer

Quality Control and Calibration Summary Forms

Instrumental Wet Chemistry

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Quality Control Reference List
Instrumental Water Quality

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Fraction: Instrumental Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
Total Cyanide (solid)	16182102201A	P18202AB	07/02/2016 12:53:00
		P18202AQ	07/02/2016 12:52:00
		8442816	07/02/2016 12:59:00
		8442820	07/02/2016 13:00:00
		8442824	07/02/2016 13:01:00
		P436970 UNSPK/BKG	07/02/2016 12:54:00
		P436970 DUP	07/02/2016 12:56:00
		P436970 MS	07/02/2016 12:57:00
Total Cyanide (water)	16180117101A	P18017AB	06/28/2016 13:51:00
		P18017AQ	06/28/2016 13:50:00
		8442829	06/28/2016 13:56:00
		8442830	06/28/2016 13:57:00
		8442831	06/28/2016 13:58:00
		P445371 UNSPK/BKG	06/28/2016 14:05:00
		P445371 DUP	06/28/2016 14:06:00
		P445371 MS	06/28/2016 14:07:00

Quality Control Summary
Method Blank
Instrumental Water Quality
SDG: DWD87
Matrix: SOLID

Fraction: Instrumental Wet Chemistry

16182102201A / P18202AB Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Total Cyanide (solid)	AK	07/02/16	N.D.	mg/kg	0.18	0.50

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Quality Control Summary
Method Blank
Instrumental Water Quality
SDG: DWD87
Matrix: LIQUID

Fraction: Instrumental Wet Chemistry

16180117101A / P18017AB Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Total Cyanide (water)	AK	06/28/16	N.D.	mg/l	0.0050	0.010

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

UNSPK: P436970 MS: P436970	Batch: **16182102201A** (Sample number(s): 8442816, 8442820, 8442824)									
Parameter	**ME**	**Spike Added mg/kg**	**Unspiked Conc mg/kg**	**MS Conc mg/kg**	**MSD Conc mg/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (solid)	AK	4.90	N.D.	5.36	NA	109	NA	41-145	NA	NA

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

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Quality Control Summary
Duplicate

SDG: DWD87
Matrix: SOLID

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

BKG: P436970 DUP: P436970	Batch: **16182102201A** (Sample number(s): 8442816, 8442820, 8442824)				
Parameter	**ME**	**Unspiked Conc mg/kg**	**DUP Conc mg/kg**	**%RPD**	**%RPD Limits**
Total Cyanide (solid)	AK	N.D.	2.58	200* (1)	20

Comments:
(1) The sample and/or duplicate result is less than five times the LOQ.
* = Out of Specification

Results are being reported on an as received basis.

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

UNSPK: P445371 MS: P445371	Batch: **16180117101A** (Sample number(s): 8442829-8442831)									
Parameter	**ME**	**Spike Added mg/l**	**Unspiked Conc mg/l**	**MS Conc mg/l**	**MSD Conc mg/l**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (water)	AK	0.200	N.D.	0.199	NA	100	NA	72-114	NA	NA

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

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Quality Control Summary
Duplicate

SDG: DWD87
Matrix: LIQUID

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

BKG: P445371 DUP: P445371	Batch: **16180117101A** (Sample number(s): 8442829-8442831)				
Parameter	**ME**	**Unspiked Conc mg/l**	**DUP Conc mg/l**	**%RPD**	**%RPD Limits**
Total Cyanide (water)	AK	N.D.	N.D.	0 (1)	20

Comments:
(1) The sample and/or duplicate result is less than five times the LOQ.
* = Out of Specification

Results are being reported on an as received basis.

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Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: SOLID

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

LCS: P18202AQ	Batch: **16182102201A** (Sample number(s): 8442816, 8442820, 8442824)								
Parameter	**ME**	**Spike Added mg/kg**	**LCS Conc mg/kg**	**LCSD Conc mg/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (solid)	AK	10	10.31	NA	103	NA	90-110	NA	NA

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Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: LIQUID

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

LCS: P18017AQ	Batch: **16180117101A** (Sample number(s): 8442829-8442831)								
Parameter	**ME**	**Spike Added mg/l**	**LCS Conc mg/l**	**LCSD Conc mg/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Total Cyanide (water)	AK	0.200	0.194	NA	97	NA	90-110	NA	NA

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Quality Control Summary
Initial And Continuing Calibration
Instrumental Analysis/TCN

SDG: DWD87

Instrument ID: 09037
Calibration Date: 07/02/2016

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	AUTO CAL6	CC
Total Cyanide	0.3809	0.4420	0.6136	0.8997	1.4799	2.3576	1.0000

Acceptance Range:
ICV/CCV: +/- 10%
ICB/CCB: < MDL

Concentration units: mg/L

Batch Numbers: 16182102201A
Run Start Dates: 07/02/2016
Run Names: 1618401C01

	Total Cyanide		
Sample	True	Result	%Rec
ICV	0.15	0.14370	96
ICB	0	ND	NA
CCV2	0.15	0.14100	94
CCB 1	0	ND	NA

* = Out of Specifications

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Quality Control Summary
Initial And Continuing Calibration
Instrumental Analysis/SCN

SDG: DWD87

Instrument ID: 09037
Calibration Date: 06/28/2016

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	AUTO CAL6	CC
Total Cyanide	0.3904	0.4597	0.6452	0.9539	1.5721	2.5459	0.9999

Acceptance Range:
ICV/CCV: +/- 10%
ICB/CCB: < MDL

Concentration units: mg/L

Batch Numbers: 16180117101A
Run Start Dates: 06/28/2016
Run Names: 1618001C01

	Total Cyanide		
Sample	True	Result	%Rec
ICV	0.15	0.15110	101
ICB	0	ND	NA
CCV2	0.15	0.15090	101
CCB 3	0	ND	NA
CCV2	0.15	0.15430	103
CCB 4	0	ND	NA

* = Out of Specifications

Fraction: Instrumental Wet Chemistry

05895: Total Cyanide (solid) Analyte Name	Default MDL	Default LOQ	Units
Total Cyanide (solid)	0.18	0.50	mg/kg

08255: Total Cyanide (water) Analyte Name	Default MDL	Default LOQ	Units
Total Cyanide (water)	0.0050	0.010	mg/l

Extraction/Distillation/Digestion Logs

Instrumental Wet Chemistry

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Raw Data Logbook
Total Cyanide/Distillations
Analysis #492, 5896, 8256

Start Time: 0930
Cool Time: 1115
Finish: 1130

Batch No. 161801 | 117 | 101 |

Enter 102 for Analysis 492, 5896
Enter 117 for Analysis 8256

Analysis: 8256 Date: 6-28-16 Analyst: MJS 1203

Std. Ref. (Book/Page/Line): 220405 p. 63 l. 1-2

Bottle Code	Sample Number	Initial Volume (mL)	Initial Weight (g)	Comments/True Values	SDG
	LCSW	50		+.5 ml 20 mg/L KCN	
	PBW	50			
02A	8437224	50			ABQ73
02A	8438378	50			DWD86
02A	8438379	50			+
02A	8442829	50			DWD87
02A	8442830	50			↓
02A	8442831	50			↓
02A	8444113	50			DWD
02A	8444115	50			↓
02A	8444116	50			↓
02A	8445371 (4)	50			GPA02
+	8445371 (D)	50			↓
	8445371 (A)	50		+.5 ml 20 mg/L KCN	
02A	8445372 (4)	50			
	8445372 (D)	50			
+	8445372 (A)	50		+.5 ml 20 mg/L KCN	
02A	8445373	50			↓
02A	8445666	50			DWD89
02A	8445667	50			+

Please Note: Final extraction volume is 50 mL

Verified: SM/347 Date: 6/29/16

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Raw Data Logbook
Total Cyanide/Distillations
Analysis #492, 5896, 8256

Start Time: 0900 MS 6/30/16
Cool Time: 1045
Finish: ~~1100~~ 1115 (3)

Batch No. 16182 | 102 | 201 | A

Enter 102 for Analysis 492, 5896
Enter 117 for Analysis 8256

Analysis: 5896 Date: 6·30·16 Analyst: MS 123

Std. Ref. (Book/Page/Line): 220405 p. 64 l. 5-6

Bottle Code	Sample Number	Initial Volume (mL)	Initial Weight (g)	Comments/True Values	SDG
	LCSS		1.00	+.5ml 20 mg/L KCN	
	PBS		2.00		
36A	8436970 (A)		2.03		
↓	8436970 (D)		2.00		
	8436970 (X)		2.04	+.5ml 20 mg/L KCN	
36A	8436971		2.01		
20A	8442816		2.06		DWD 87
20A	8442820		2.05		
20A	8442824		2.09		↓

Please Note: Final extraction volume is 50 mL

Verified: SM/347 Date: 7/5/16

Wet Chemistry Data

Case Narrative/Conformance Summary

Wet Chemistry

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Water Quality

Fraction: Wet Chemistry

Sample #	Client ID	Matrix Liquid	Matrix Solid	Comments
8442816	DU-1-6-A		X	
8442820	DU-1-6-B		X	
8442824	DU-1-6-C		X	
8442829	RTPA-EB	X		Equipment Blank
8442830	RTPA-FB	X		Field Blank
8442831	DU-1-6-FB	X		Field Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Matrix QC may not be included if site-specific QC were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, laboratory spike data (LCS) are provided.

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Water Quality

Fraction: Wet Chemistry

SAMPLE ANALYSIS:

Samples	Hexavalent Chromium	Hexavalent Chromium (SOLIDS)	Oxidation Reduction Potential	pH
8442816		DF10	DF1	DF1
8442820		DF20	DF1	DF1
8442824		DF20	DF1	DF1
8442829	DF1			
8442830	DF1			
8442831	DF1			

No problems were encountered with the analysis of the samples.

(Sample number(s): 8442820: Analysis: 00394)
The pH was measured in water at 20.1 C.

(Sample number(s): 8442824: Analysis: 00394)
The pH was measured in water at 20 C.

(Sample number(s): 8442816: Analysis: 00394)
The pH was measured in water at 19.7 C.

(Sample number(s): 8442816, 8442820, 8442824: Analysis: 00425)
Reporting limits were raised due to interference from the sample matrix.

Abbreviation Key

U = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
R = Matrix Spike (MS)	MDL = Method Detection Limit
M = Matrix Spike Duplicate (MSD)	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	NA = Not Applicable
HS = High Spike	ME = Method
LS = Low Spike	CO = Colorimetric
SS = Soluble Spike	G = Gravimetric
IS = Insoluble Spike	IR = Infrared Spectrophotometry
ISD = Insoluble Spike Duplicate	MTR = Meter
PDS = Post Digestion Spike	OD = Oven Dried
* = Out of Specification	TI = Titration
V = Visual	TOC = Total Organic Carbon
AK = Alpkem	IC = Ion Chromatography
TC = Total Carbon	RA = Rapid Analyzer

QC Summary

Wet Chemistry

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Quality Control Reference List
Water Quality

CLIENT: CH2M Hill, Inc.
SDG: DWD87

Fraction: Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
Hexavalent Chromium	16176027601A	P176027B	06/24/2016 11:50:00
		P176027Q	06/24/2016 11:50:00
		P176027Y	06/24/2016 11:50:00
		8442829	06/24/2016 11:50:00
		8442830	06/24/2016 11:50:00
		8442831	06/24/2016 11:50:00
Hexavalent Chromium (SOLIDS)	16187042501A	P187042B	07/05/2016 20:45:00
		P187042Q	07/05/2016 20:45:00
		8442816	07/05/2016 20:45:00
		8442820	07/05/2016 20:45:00
		8442824	07/05/2016 20:45:00
Oxidation Reduction Potential	16188182101A	P188182Q	07/06/2016 20:00:00
Oxidation Reduction Potential	16188182101B	8442816	07/06/2016 20:00:00
		8442820	07/06/2016 20:00:00
		8442824	07/06/2016 20:00:00
pH	16188039401A	P188039Q	07/06/2016 20:00:00
pH	16188039401B	8442816	07/06/2016 20:00:00
		8442820	07/06/2016 20:00:00
		8442824	07/06/2016 20:00:00

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Quality Control Summary
Method Blank
Water Quality
SDG: DWD87
Matrix: LIQUID

Fraction: Wet Chemistry

16176027601A / P176027B Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Hexavalent Chromium	CO	06/24/16	N.D.	mg/l	0.0070	0.020

Quality Control Summary
Method Blank
Water Quality
SDG: DWD87
Matrix: SOLID

Fraction: Wet Chemistry

16187042501A / P187042B Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Hexavalent Chromium (SOLIDS)	CO	07/05/16	N.D.	mg/kg	0.50	1.5

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Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: LIQUID

Water Quality
Fraction: Wet Chemistry

LCS: P176027Q LCSD: P176027Y	Batch: **16176027601A** (Sample number(s): 8442829-8442831)								
Parameter	**ME**	**Spike Added mg/l**	**LCS Conc mg/l**	**LCSD Conc mg/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Hexavalent Chromium	CO	0.200	0.200	0.193	100	97	90-110	4	4

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD87
Matrix: SOLID

Water Quality
Fraction: Wet Chemistry

LCS: P187042Q	Batch: **16187042501A** (Sample number(s): 8442816, 8442820, 8442824)								
Parameter	**ME**	**Spike Added mg/kg**	**LCS Conc mg/kg**	**LCSD Conc mg/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Hexavalent Chromium (SOLIDS)	CO	5.00	4.29	NA	86	NA	80-120	NA	NA

LCS: P188039Q	Batch: **16188039401B** (Sample number(s): 8442816, 8442820, 8442824)								
Parameter	**ME**	**Spike Added NA**	**LCS Conc NA**	**LCSD Conc NA**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
pH	MTR	7.00	7.01	NA	100	NA	95-105	NA	NA

LCS: P188182Q	Batch: **16188182101B** (Sample number(s): 8442816, 8442820, 8442824)								
Parameter	**ME**	**Spike Added mV**	**LCS Conc mV**	**LCSD Conc mV**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Oxidation Reduction Potential	TI	427	428.5	NA	100	NA	98-102	NA	NA

Fraction: Wet Chemistry

00276: Hexavalent Chromium Analyte Name	Default MDL	Default LOQ	Units
Hexavalent Chromium	0.0070	0.020	mg/l

00425: Hexavalent Chromium (SOLIDS) Analyte Name	Default MDL	Default LOQ	Units
Hexavalent Chromium (SOLIDS)	0.50	1.5	mg/kg

01821: Oxidation Reduction Potential Analyte Name	Default MDL	Default LOQ	Units
Oxidation Reduction Potential	10.0	10.0	mV

00394: pH Analyte Name	Default MDL	Default LOQ	Units
pH	0.0100	0.0100	Std. Units

Moisture Data

MOISTURE

SAMPLE NUMBERS:

Sample #	Sample Code
8442798	RTP11
8442799	RTP12
8442800	RTP13
8442801	RTP21
8442802	RTP22
8442803	RTP23
8442804	RTP31
8442805	RTP32
8442806	RTP33
8442807	RTP41BKG
8442808	RTP41MS
8442809	RTP41MSD
8442810	RTP42BKG
8442811	RTP42MS
8442812	RTP42MSD
8442813	RTP43BKG
8442814	RTP43MS
8442815	RTP43MSD
8442816	D16A1
8442817	D16A2
8442818	D16A3
8442819	D16A4
8442820	D16B1
8442821	D16B2
8442822	D16B3
8442823	D16B4
8442824	D16C1
8442825	D16C2
8442826	D16C3
8442827	D16C4

COMMENTS:

Method defined actions are taken for any failed matrix QC.

Laboratory Compliance Quality Control

Analysis Name	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16231820011A	Sample number(s): 8442807-8442827, 8442807-8442827				
Moisture	100		99-101		
Moisture	100		99-101		
Moisture Duplicate	100		99-101		
Batch number: 16231820012B	Sample number(s): 8442798-8442806, 8442798-8442806				
Moisture	100		99-101		
Moisture	100		99-101		

MOISTURE

Sample Matrix Quality Control

Analysis Name	BKG Conc	DUP Conc	RPD	RPD Max
Batch number: 16231820011A	Sample number(s):		8442807-8442827, 8442807-8442827	
Moisture	0.67	0.68	1 (1)	5
Moisture	0.67	0.68	1 (1)	5
Moisture Duplicate	0.67	0.68	1 (1)	5
Batch number: 16231820012B	Sample number(s):		8442798-8442806, 8442798-8442806	
Moisture	3.2	2.1	40* (1)	5
Moisture	3.2	2.2	40* (1)	5

* - Outside of specification

(1) - The result for one or both determinations was less than five times the LOQ.

Moisture Data Report

Batch #: 16231820011

Sample ID	Batch ID	Analysis#	Tare Wt	Sample Wt	Dry Wt	%Moisture	Analysis Date (Emp#)	Verified Date (Emp#)
8442807BKG	A	00111	1.0473	7.3365	8.3345	0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442808MS	A	00118				0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442809MSD	A	00118				0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442809MSD	A	00121	1.0665	7.8208	8.8341	0.68	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442810BKG	A	00118				0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442811MS	A	00118				0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442812MSD	A	00118				0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442813BKG	A	00118				0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442814MS	A	00118				0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442815MSD	A	00118				0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442816	A	00111	1.0825	9.3292	9.9405	5.05	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442817	A	00118				5.05	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442818	A	00118				5.05	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442819	A	00118				5.05	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442820	A	00111	1.0723	6.3409	6.8366	9.09	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442821	A	00118				9.09	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442822	A	00118				9.09	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442823	A	00118				9.09	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442824	A	00111	1.0471	8.0282	8.4792	7.43	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442825	A	00118				7.43	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442826	A	00118				7.43	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8442827	A	00118				7.43	8/18/16 (1201/SWF)	8/23/16 (236/CW)
LCS 89.5% Std.		00111	1.0660	5.0125	1.5937	89.47	8/18/16 (1201/SWF)	8/23/16 (236/CW)

Batch #: 16231820012

Sample ID	Batch ID	Analysis#	Tare Wt	Sample Wt	Dry Wt	%Moisture	Analysis Date (Emp#)	Verified Date (Emp#)
8442798	B	00111	1.1084	7.7636	8.6935	2.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8442799	B	00118				2.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8442800	B	00118				2.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8442801	B	00111	1.0895	7.0116	8.0802	0.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8442802	B	00118				0.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8442803	B	00118				0.30	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8442804	B	00111	1.0429	7.0199	8.0319	0.44	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8442805	B	00118				0.44	8/18/16 (1201/SWF)	8/22/16 (236/CW)
8442806	B	00118				0.44	8/18/16 (1201/SWF)	8/22/16 (236/CW)
LCS 89.5% Std.		00111	1.0396	5.0025	1.5666	89.47	8/18/16 (1201/SWF)	8/22/16 (236/CW)

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Type I (No Raw Data) Data Package

Prepared for:

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Project: Woodbine Phase III MEC RFI
Sand, Soil and Water Samples
Collected on 06/23/16

SDG# DWD88

GROUP	SAMPLE NUMBERS
165-855	84440-178444116
165590-	84--248784--249

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by: Dana M Kauffman **Date:** 09/12/2016

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Natalie Luciano at (515)--6752-8.

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Sample Reference List for SDG Number DWD88
7 itwa Data hacPake gTpe of yJN- DOgO

AA132 I CH2M Hill, ync.

Project: Woodbine Phase III MEC RFI

Lab Sample Number	Client Sample yD	Collection Date	Date Received
8444051	DU-2-5-A	06/23/2016 08:45	06/24/2016 09:30
8444052	DU-2-5-A	06/23/2016 08:45	06/24/2016 09:30
8444053	DU-2-5-A	06/23/2016 08:45	06/24/2016 09:30
8444054	DU-2-5-A	06/23/2016 08:45	06/24/2016 09:30
8444055	DU-2-5-B	06/23/2016 09:30	06/24/2016 09:30
8444056	DU-2-5-B	06/23/2016 09:30	06/24/2016 09:30
8444057	DU-2-5-B	06/23/2016 09:30	06/24/2016 09:30
8444058	DU-2-5-B	06/23/2016 09:30	06/24/2016 09:30
8444059	DU-2-5-C	06/23/2016 10:15	06/24/2016 09:30
8444060	DU-2-5-C	06/23/2016 10:15	06/24/2016 09:30
8444061	DU-2-5-C	06/23/2016 10:15	06/24/2016 09:30
8444062	DU-2-5-C	06/23/2016 10:15	06/24/2016 09:30
8444063	DU-2-2-A	06/23/2016 11:15	06/24/2016 09:30
8444064	DU-2-2-A	06/23/2016 11:15	06/24/2016 09:30
8444065	DU-2-2-A	06/23/2016 11:15	06/24/2016 09:30
8444066	DU-2-2-A	06/23/2016 11:15	06/24/2016 09:30
8444067	DU-2-2-B	06/23/2016 12:05	06/24/2016 09:30
8444068	DU-2-2-B	06/23/2016 12:05	06/24/2016 09:30
8444069	DU-2-2-B	06/23/2016 12:05	06/24/2016 09:30
8444070	DU-2-2-B	06/23/2016 12:05	06/24/2016 09:30
8444071	DU-2-2-C	06/23/2016 13:00	06/24/2016 09:30
8444072	DU-2-2-C MS	06/23/2016 13:00	06/24/2016 09:30
8444073	DU-2-2-C MSD	06/23/2016 13:00	06/24/2016 09:30
8444074	DU-2-2-C SS	06/23/2016 13:00	06/24/2016 09:30
8444075	DU-2-2-C IS	06/23/2016 13:00	06/24/2016 09:30
8444076	DU-2-2-C PDS	06/23/2016 13:00	06/24/2016 09:30
8444077	DU-2-2-C DUP	06/23/2016 13:00	06/24/2016 09:30
8444078	DU-2-2-C	06/23/2016 13:00	06/24/2016 09:30
8444079	DU-2-2-C MS	06/23/2016 13:00	06/24/2016 09:30
8444080	DU-2-2-C MSD	06/23/2016 13:00	06/24/2016 09:30
8444081	DU-2-2-C DUP	06/23/2016 13:00	06/24/2016 09:30
8444082	DU-2-2-C	06/23/2016 13:00	06/24/2016 09:30
8444083	DU-2-2-C MS	06/23/2016 13:00	06/24/2016 09:30
8444084	DU-2-2-C MSD	06/23/2016 13:00	06/24/2016 09:30
8444085	DU-2-2-C	06/23/2016 13:00	06/24/2016 09:30
8444086	DU-2-2-C MS	06/23/2016 13:00	06/24/2016 09:30
8444087	DU-2-2-C MSD	06/23/2016 13:00	06/24/2016 09:30
8444088	BGA-1	06/23/2016 15:15	06/24/2016 09:30
8444089	BGA-1	06/23/2016 15:15	06/24/2016 09:30
8444090	BGA-1	06/23/2016 15:15	06/24/2016 09:30
8444091	BGA-1	06/23/2016 15:15	06/24/2016 09:30
8444092	BGA-2	06/23/2016 16:00	06/24/2016 09:30
8444093	BGA-2	06/23/2016 16:00	06/24/2016 09:30

Lab Sample Number	Client Sample ID	Collection Date	Date Received
8444094	BGA-2	06/23/2016 16:00	06/24/2016 09:30
8444095	BGA-2	06/23/2016 16:00	06/24/2016 09:30
8444096	BGA-3	06/23/2016 16:45	06/24/2016 09:30
8444097	BGA-3 MS	06/23/2016 16:45	06/24/2016 09:30
8444098	BGA-3 MSD	06/23/2016 16:45	06/24/2016 09:30
8444099	BGA-3 SS	06/23/2016 16:45	06/24/2016 09:30
8444100	BGA-3 IS	06/23/2016 16:45	06/24/2016 09:30
8444101	BGA-3 PDS	06/23/2016 16:45	06/24/2016 09:30
8444102	BGA-3 DUP	06/23/2016 16:45	06/24/2016 09:30
8444103	BGA-3	06/23/2016 16:45	06/24/2016 09:30
8444104	BGA-3 MS	06/23/2016 16:45	06/24/2016 09:30
8444105	BGA-3 MSD	06/23/2016 16:45	06/24/2016 09:30
8444106	BGA-3 DUP	06/23/2016 16:45	06/24/2016 09:30
8444107	BGA-3	06/23/2016 16:45	06/24/2016 09:30
8444108	BGA-3 MS	06/23/2016 16:45	06/24/2016 09:30
8444109	BGA-3 MSD	06/23/2016 16:45	06/24/2016 09:30
8444110	BGA-3	06/23/2016 16:45	06/24/2016 09:30
8444111	BGA-3 MS	06/23/2016 16:45	06/24/2016 09:30
8444112	BGA-3 MSD	06/23/2016 16:45	06/24/2016 09:30
8444113	DU-2-5-FB	06/23/2016 11:15	06/24/2016 09:30
8444114	TB-3	06/23/2016 08:00	06/24/2016 09:30
8444115	DU-2-2-EB	06/23/2016 14:00	06/24/2016 09:30
8444116	BGA-3-EB	06/23/2016 17:00	06/24/2016 09:30
8455248	Metals Blank		06/24/2016 09:30
8455249	Explosives/Perchlorate Blank		06/24/2016 09:30

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Sample pH Log

SDG: DWD88

LLI Sample Number	Bottle Code	Actual pH	Exp. pH	pH Check Code	Adj. pH	Adjusted Date	Adjusted Time	Preservative Added	Preservative Lot #	LLI Supplied Bottle?	Sulfide Present?	Corrective Substance	CS Lot #	Res. Cl. Present?	Corrective Substance	CS Lot #	Record Date	Employee
8444113	002A	>12	>12	PK	NA	NA	NA	NA	NA	Y	N	NA	NA	N	NA	NA	6/24/2016 3:53:12PM	0
8444113	008A	<2	<2	PK	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	6/24/2016 3:53:36PM	0
8444113	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731
8444114	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731
8444115	002A	>12	>12	PK	NA	NA	NA	NA	NA	Y	N	NA	NA	N	NA	NA	6/24/2016 3:55:11PM	0
8444115	008A	<2	<2	PK	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	6/24/2016 3:55:32PM	0
8444115	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731
8444116	002A	>12	>12	PK	NA	NA	NA	NA	NA	Y	N	NA	NA	N	NA	NA	6/24/2016 3:54:02PM	0
8444116	008A	<2	<2	PK	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	6/24/2016 3:54:21PM	0
8444116	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731

Check Code Key
PK = Original container checked - pH is within the correct range. (No preservative was added)
PA = Original container checked - pH adjusted to correct range. (Preservative was added)
PV = Volatile container checked
PC = pH checked (unpreserved container)
SPK = Subsampled from an original container. Original container checked - pH is within correct range
SPA = Subsampled from an original container. Subsample container checked - pH adjusted to correct range.
SPC = Subsampled from an original container. pH checked (unpreserved container).
SUP = Subsampled from original container. Unable to be preserved due to the matrix of the sample.
UP = Unable to preserve due to matrix of the sample.
NA = Not applicable

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 · 717-656-2300 Fax: 717-656-2681 · www.lancasterlabs.com

01163 GC/MS VOA Water Prep

An undiluted aliquot of the water sample or a dilution of the sample is purged with an inert gas and the volatiles are collected on an adsorbent trap that is subsequently desorbed onto a gas chromatographic column.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 5030B, December 1996.

11997 VOCs- 5ml Water by 8260C

The water sample is purged and the volatile compounds are collected on a sorbent trap that is subsequently desorbed onto the GC/MS system for chromatographic and mass spectral analysis.

Reference: Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS), SW-846 Method 8260C, August 2006.

11995 VOCs- Solid by 8260C

The soil sample is purged and the volatile compounds are collected on a sorbent trap that is subsequently desorbed onto the GC/MS system for chromatographic and mass spectral analysis.

Reference: Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS), SW-846 Method 8260C, August 2006.

00259 Mercury

The solution resulting from the mercury digestion is analyzed by Cold Vapor AA.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7470A, September 1994

10638 Hg - SW, 7471B - U4
00159 Mercury

The solution resulting from the mercury digestion is analyzed by Cold Vapor AA.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7471B, February 2007

10635 ICP-WW, 3005A (tot rec) - U4

The sample is digested with nitric acid and hydrochloric acid.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3005A, July 1992

10639 ICPMS - Water, 3020A - U4

The sample is digested with nitric and hydrochloric acid.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3020A, July 1992

05713 WW SW846 Hg Digest

The sample is heated at 95 c with nitric acid, sulfuric acid, potassium persulfate, and potassium permanganate. Excess potassium permanganate is reduced with sodium chloride/hydroxylamine hydrochloride. Mercuric ions are reduced to mercury metal using stannous chloride.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7470A, September 1994

01643 Aluminum
01743 Aluminum
06944 Antimony
07044 Antimony
07035 Arsenic
06935 Arsenic
07046 Barium
06946 Barium
07047 Beryllium
06947 Beryllium
06949 Cadmium
07049 Cadmium
01650 Calcium
01750 Calcium
07051 Chromium
06951 Chromium
06952 Cobalt
07052 Cobalt
07053 Copper
06953 Copper
01754 Iron
01654 Iron
07055 Lead
06955 Lead
01657 Magnesium
01757 Magnesium
07058 Manganese
06958 Manganese
06961 Nickel
07061 Nickel
01762 Potassium
01662 Potassium
07036 Selenium
06936 Selenium
06966 Silver
07066 Silver
01767 Sodium
01667 Sodium
06971 Vanadium
07071 Vanadium
06972 Zinc
07072 Zinc

The solution resulting from the metals digestion is analyzed by Trace ICP.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 6010C, February 2007.

06145 Thallium
06045 Thallium

The solution resulting from the metals digestion is analyzed by ICP/MS.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 6020A, February 2007.

10637 ICP/ICPMS-SW, 3050B - U4

The sample is digested with nitric acid, hydrochloric acid and hydrogen peroxide.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3050B, December 1996

13432 Nitroaromatic/Amine Ext 8330B

The sample is passed through a Porapak RDX cartridge. The cartridge is then eluted with acetonitrile and the extract is brought to 5 mL. The extract is diluted to 10 mL using a calcium chloride solution.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8330B, Revision 2, October 2006.

13395 Nitroaromatics/Amines 8330B(w)

The sample is extracted into acetonitrile using SPE on a Porapak RDX cartridge. The extract is analyzed using High Performance Liquid Chromatography with UV detection at two wavelengths for optimum sensitivity for all target compounds 214 and 254 nm. Confirmation of presumptive peaks is performed on a second column at the same two wavelengths.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8330B, Revision 2, October 2006.

13433 Nitroaromatic/Amine Ext 8330B

The sample is extracted with acetonitrile in a vial using a chilled ultrasonic bath. The vial is centrifuged and the acetonitrile removed. The extract is brought to volume with calcium chloride solution and filtered prior to analysis.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8330B, Revision 2, October 2006.

13413 Nitroaromatics/Amines 8330B(s)

The sample is extracted into acetonitrile using an ultrasonic bath. The extract is analyzed using High Performance Liquid Chromatography (HPLC) with UV detection at two wavelengths for optimum sensitivity for all target compounds 214 and 254 nm. Confirmation of presumptive peaks is performed on a second column at the same two wavelengths.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8330B, Revision 2, October 2006.

06386 Perchlorate in Water LC/MS/MS
06568 Perchlorate Soil Prep

Water samples are filtered through a 0.45-um syringe filter, followed by direct injection into a LC/MS/MS system followed by multiple reaction monitoring. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

06557 Perchlorate in Soil LC/MS/MS

Soil samples are extracted with water, then filtered through a 0.45-um syringe filter and analyzed by LC/MS/MS. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

11010 8270D BNA Extraction

10475 BNA Water Extraction CS BZ

The sample aliquot is extracted with methylene chloride by either separatory funnel or liquid/liquid apparatus. Extraction is performed at both a pH of 11 and 2. The extract is concentrated prior to analysis.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3510C, Rev 3, December 1996

02395 Specials in water by GC/MS
10726 SVOA 8270D (microwave)
10461 SVOAs by 8270D in Water

The sample extract is analyzed by capillary column Gas Chromatography/Mass Spectrometry.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 8270D, February 2007.

10813 BNA Soil Microwave APP IX

The sample aliquot is extracted using microwave extraction with 1:1 methylene chloride and acetone. The extract is concentrated prior to analysis.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3546, Revision 0, February 2007.

05895 Total Cyanide (solid)
08255 Total Cyanide (water)

During the distillation step, complex cyanides are converted to hydrogen cyanide which readily reacts with chloramine T. Simple cyanides are converted to cyanogen chloride by reaction with chloramine T. This reacts with pyridine and barbituric acid to give a red colored complex determined colorimetrically.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9012B Rev. 2, November 2004.

05896 Cyanide Solid Distillation
08256 Cyanide Water Distillation

The sample is acidified and distilled. Cyanide is released as hydrogen cyanide and is absorbed in a sodium hydroxide solution.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9012B Rev. 2, November 2004.

00276 Hexavalent Chromium

Hexavalent chromium is determined colorimetrically using diphenylcarbazide to produce a red-violet color. The absorbance is read at 540 nm and compared to a standard curve.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7196A, July 1992.

00394 pH

A 1:1 slurry is prepared. The activity of hydrogen ions in the supernatant is measured using a glass electrode and a reference electrode.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9045D Modified, November 2004.

00425 Hexavalent Chromium (SOLIDS)

The filtrate from method #7825 is analyzed colorimetrically using diphenylcarbazide to produce a red-violet color. The absorbance is read at 540 nm and compared to a standard curve.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7196A, July 1992.

01821 Oxidation Reduction Potential

The oxidation-reduction potential is measured using a platinum electrode and a reference electrode. The potential reported is the electromotive force between the platinum electrode and the reference electrode, referred to the standard hydrogen scale.

Reference: Annual Book of ASTM Standards, Method D 1498

07825 Hexavalent Cr (Extraction)

The sample is digested using a 3% sodium carbonate - 2% sodium hydroxide solution and then filtered through a 0.45 micron filter.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3060A, December 1996

00111 Moisture
00118 Moisture
00121 Moisture Duplicate

A well-mixed sample is placed in a tared container and dried to a constant weight in an oven at 103-105C. The increase in weight is the total solids.

Reference: Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998, Method 2540 G-1997

07320 GC/MS - LL DIH2O Encore Prep

Two EnCore samples are collected per sample. The vials used for preparation are pre-preserved and pre-weighed. Two aliquots are extruded into DI water. The vials are re-weighed and the weight of the sample should be 5-g +/- .5 g. The prepared samples are then delivered to the lab for analysis. DI vials are frozen after they are weighed to complete preservation step.

Reference: Test Methods for Evaluating Solid Wastes, SW-846, Method 5035A, Revision 1, July 2002.

07578 GC/MS-HL Encore Prep-NC

The sample is collected in an EnCore sampler and is submitted to the laboratory. A vial containing 5-ml methanol is prepared for each sample and weighed prior to adding the sample. After the sample is added to the vial, the vial is reweighed and the weight of sample is determined by difference. The weight of the sample should be 5-g +/- .5 g. The sample vial is then delivered to the lab for analysis.

Reference: Test Methods for Evaluating Solid Wastes, SW-846, Method 5035A, Revision 1, July 2002.

Analysis Reports / Field Chain of Custody

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Report Date: August 29, 2016

Project: Woodbine Phase III MEC RFI

Submittal Date: 06/24/2016
Group Number: 1675877
SDG: DWD88
PO Number: 10381-7-113967
Release Number: DWD88
State of Sample Origin: GA

Client Sample Description	Lancaster Labs (LL) #
DU-2-5-A Composite Soil	8444051
DU-2-5-A Composite Soil	8444052
DU-2-5-A Composite Soil	8444053
DU-2-5-A Composite Soil	8444054
DU-2-5-B Composite Soil	8444055
DU-2-5-B Composite Soil	8444056
DU-2-5-B Composite Soil	8444057
DU-2-5-B Composite Soil	8444058
DU-2-5-C Composite Soil	8444059
DU-2-5-C Composite Soil	8444060
DU-2-5-C Composite Soil	8444061
DU-2-5-C Composite Soil	8444062
DU-2-2-A Composite Soil	8444063
DU-2-2-A Composite Soil	8444064
DU-2-2-A Composite Soil	8444065
DU-2-2-A Composite Soil	8444066
DU-2-2-B Composite Soil	8444067
DU-2-2-B Composite Soil	8444068
DU-2-2-B Composite Soil	8444069
DU-2-2-B Composite Soil	8444070
DU-2-2-C Composite Soil	8444071
DU-2-2-C MS Composite Soil	8444072
DU-2-2-C MSD Composite Soil	8444073
DU-2-2-C SS Composite Soil	8444074
DU-2-2-C IS Composite Soil	8444075
DU-2-2-C PDS Composite Soil	8444076
DU-2-2-C DUP Composite Soil	8444077
DU-2-2-C Composite Soil	8444078
DU-2-2-C MS Composite Soil	8444079
DU-2-2-C MSD Composite Soil	8444080

DU-2-2-C DUP Composite Soil	8444081
DU-2-2-C Composite Soil	8444082
DU-2-2-C MS Composite Soil	8444083
DU-2-2-C MSD Composite Soil	8444084
DU-2-2-C Composite Soil	8444085
DU-2-2-C MS Composite Soil	8444086
DU-2-2-C MSD Composite Soil	8444087
BGA-1 Composite Soil	8444088
BGA-1 Composite Soil	8444089
BGA-1 Composite Soil	8444090
BGA-1 Composite Soil	8444091
BGA-2 Composite Soil	8444092
BGA-2 Composite Soil	8444093
BGA-2 Composite Soil	8444094
BGA-2 Composite Soil	8444095
BGA-3 Composite Soil	8444096
BGA-3 MS Composite Soil	8444097
BGA-3 MSD Composite Soil	8444098
BGA-3 SS Composite Soil	8444099
BGA-3 IS Composite Soil	8444100
BGA-3 PDS Composite Soil	8444101
BGA-3 DUP Composite Soil	8444102
BGA-3 Composite Soil	8444103
BGA-3 MS Composite Soil	8444104
BGA-3 MSD Composite Soil	8444105
BGA-3 DUP Composite Soil	8444106
BGA-3 Composite Soil	8444107
BGA-3 MS Composite Soil	8444108
BGA-3 MSD Composite Soil	8444109
BGA-3 Composite Soil	8444110
BGA-3 MS Composite Soil	8444111
BGA-3 MSD Composite Soil	8444112
DU-2-5-FB Grab Water	8444113
TB-3 Water	8444114
DU-2-2-EB Grab Water	8444115
BGA-3-EB Grab Water	8444116

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	CH2M Hill, Inc.	Attn: Mark Sherrill
Electronic Copy To	CH2M Hill, Inc.	Attn: Chemistry Mailbox
Electronic Copy To	CH2M Hill, Inc.	Attn: Mark Stinnett

Respectfully Submitted,



Natalie R. Luciano
Senior Specialist

(717) 556-7258

Sample Description: DU-2-5-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444051
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 08:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25A1 SDG#: DWD88-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	190	U	190	930	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	930	U	930	2,800	5
10726	Quinoline	91-22-5	190	U	190	930	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0133	J	0.0108	0.108	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.20	U	0.20	0.55	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	545		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	5.6	U	5.6	16.8	10
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	6.03		0.0100	0.0100	1
	The pH was measured in water at 19.9 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	10.6		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/06/2016 23:55	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444051
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 08:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25A1 SDG#: DWD88-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:36	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16183102201A	07/02/2016 13:21	Brianna A White	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16183102201A	07/01/2016 09:25	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16188182101B	07/06/2016 20:00	Michelle L Lalli	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16187042501A	07/05/2016 20:45	Daniel S Smith	10
00394	pH	SW-846 9045D modified	1	16188039401B	07/06/2016 20:00	Michelle L Lalli	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16187042501A	07/05/2016 12:40	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444052
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 08:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25A2 SDG#: DWD88-02

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals		SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum		7429-90-5	2,680		9.25	42.6	1
06944	Antimony		7440-36-0	0.746	U	0.746	4.26	1
06935	Arsenic		7440-38-2	1.05	J	1.03	4.26	1
06946	Barium		7440-39-3	15.2		0.0352	1.07	1
06947	Beryllium		7440-41-7	0.0714	U	0.0714	1.07	1
06949	Cadmium		7440-43-9	0.185	J	0.0522	1.07	1
01650	Calcium		7440-70-2	1,790		6.03	42.6	1
06951	Chromium		7440-47-3	5.39		0.149	3.20	1
06952	Cobalt		7440-48-4	0.158	J	0.128	1.07	1
06953	Copper		7440-50-8	24.1		0.245	2.13	1
01654	Iron		7439-89-6	3,090		4.39	42.6	1
06955	Lead		7439-92-1	3.45		0.586	3.20	1
01657	Magnesium		7439-95-4	140		2.02	21.3	1
06958	Manganese		7439-96-5	32.7		0.0884	1.07	1
06961	Nickel		7440-02-0	1.19	J	0.320	2.13	1
01662	Potassium		7440-09-7	132		25.5	107	1
06936	Selenium		7782-49-2	0.959	U	0.959	4.26	1
06966	Silver		7440-22-4	0.160	U	0.160	1.07	1
01667	Sodium		7440-23-5	45.3	J	25.5	213	1
06971	Vanadium		7440-62-2	2.34		0.149	1.07	1
06972	Zinc		7440-66-6	29.3		0.724	4.26	1
		SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium		7440-28-0	0.0309	U	0.0309	0.213	2
Wet Chemistry		SM 2540 G-1997		%		%	%	
00118	Moisture		n.a.	10.6		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444052
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 08:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25A2 SDG#: DWD88-02

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 08:57	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:14	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-5-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444053
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 08:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25A3 SDG#: DWD88-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		**ug/kg**		**ug/kg**	**ug/kg**	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	45	U	45	130	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	45	U	45	130	1
13413	1,3-Dinitrobenzene	99-65-0	44	U	44	130	1
13413	2,4-Dinitrotoluene	121-14-2	44	U	44	130	1
13413	2,6-Dinitrotoluene	606-20-2	120	U	120	130	1
13413	HM	2691-41-0	230	U	230	330	1
13413	Nitrobenzene	98-95-3	110	U	110	330	1
13413	Nitroglycerin	55-63-0	870	U	870	2,600	1
13413	2-Nitrotoluene	88-72-2	82	U	82	130	1
13413	3-Nitrotoluene	99-08-1	120	U	120	130	1
13413	4-Nitrotoluene	99-99-0	120	U	120	130	1
13413	PETN	78-11-5	870	U	870	2,600	1
13413	RD	121-82-4	44	U	44	130	1
13413	Tetryl	479-45-8	110	U	110	330	1
13413	1,3,5-Trinitrobenzene	99-35-4	140	U	140	140	1
13413	2,4,6-Trinitrotoluene	118-96-7	48	U	48	130	1
	Reporting limits were raised due to interference from the sample matrix.						
Perchlorate	**SW-846 6850 1/2007**		**ug/kg**		**ug/kg**	**ug/kg**	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.3	U	2.3	5.6	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00118	Moisture	n.a.	10.6		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	08/02/2016 18:55	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 03:10	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-5-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444054
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 08:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25A4 SDG#: DWD88-04

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	5	U	5	18	1.59
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	10.6		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	B161811AA	06/29/2016 12:34	Jennifer Howe	1.59
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:56	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444055
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 09:30 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25B1 SDG#: DWD88-05

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	910	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	910	U	910	2,700	5
10726	Quinoline	91-22-5	180	U	180	910	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0184	J	0.0103	0.103	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.20	U	0.20	0.54	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	552		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	5.5	U	5.5	16.4	10
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	5.61		0.0100	0.0100	1
	The pH was measured in water at 19.8 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	8.7		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/07/2016 00:20	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444055
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 09:30 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25B1 SDG#: DWD88-05

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:38	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16183102201A	07/02/2016 13:22	Brianna A White	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16183102201A	07/01/2016 09:25	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16188182101B	07/06/2016 20:00	Michelle L Lalli	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16187042501A	07/05/2016 20:45	Daniel S Smith	10
00394	pH	SW-846 9045D modified	1	16188039401B	07/06/2016 20:00	Michelle L Lalli	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16187042501A	07/05/2016 12:40	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444056
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 09:30 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25B2 SDG#: DWD88-06

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	3,640		6.42	29.6	1
06944	Antimony	7440-36-0	0.518	U	0.518	2.96	1
06935	Arsenic	7440-38-2	0.830	J	0.718	2.96	1
06946	Barium	7440-39-3	25.7		0.0244	0.740	1
06947	Beryllium	7440-41-7	0.0644	J	0.0496	0.740	1
06949	Cadmium	7440-43-9	0.500	J	0.0363	0.740	1
01650	Calcium	7440-70-2	520		4.19	29.6	1
06951	Chromium	7440-47-3	6.58		0.104	2.22	1
06952	Cobalt	7440-48-4	0.177	J	0.0888	0.740	1
06953	Copper	7440-50-8	11.0		0.170	1.48	1
01654	Iron	7439-89-6	3,440		3.05	29.6	1
06955	Lead	7439-92-1	3.02		0.407	2.22	1
01657	Magnesium	7439-95-4	185		1.41	14.8	1
06958	Manganese	7439-96-5	35.3		0.0614	0.740	1
06961	Nickel	7440-02-0	1.24	J	0.222	1.48	1
01662	Potassium	7440-09-7	116		17.7	74.0	1
06936	Selenium	7782-49-2	0.666	U	0.666	2.96	1
06966	Silver	7440-22-4	0.111	U	0.111	0.740	1
01667	Sodium	7440-23-5	18.6	J	17.7	148	1
06971	Vanadium	7440-62-2	3.04		0.104	0.740	1
06972	Zinc	7440-66-6	45.4		0.503	2.96	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0247	J	0.0215	0.148	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	8.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444056
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 09:30 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25B2 SDG#: DWD88-06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 09:00	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:16	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444057
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 09:30 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25B3 SDG#: DWD88-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	44	U	44	130	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	44	U	44	130	1
13413	1,3-Dinitrobenzene	99-65-0	43	U	43	130	1
13413	2,4-Dinitrotoluene	121-14-2	43	U	43	130	1
13413	2,6-Dinitrotoluene	606-20-2	120	U	120	130	1
13413	HM	2691-41-0	230	U	230	330	1
13413	Nitrobenzene	98-95-3	110	U	110	330	1
13413	Nitroglycerin	55-63-0	2,100	J	870	2,600	1
13413	2-Nitrotoluene	88-72-2	81	U	81	130	1
13413	3-Nitrotoluene	99-08-1	120	U	120	130	1
13413	4-Nitrotoluene	99-99-0	120	U	120	130	1
13413	PETN	78-11-5	870	U	870	2,600	1
13413	RD	121-82-4	43	U	43	130	1
13413	Tetryl	479-45-8	110	U	110	330	1
13413	1,3,5-Trinitrobenzene	99-35-4	43	U	43	130	1
13413	2,4,6-Trinitrotoluene	118-96-7	48	U	48	130	1
	This sample was used for the ISM triplicate. The individual RSD is included in the data package for review.						
Perchlorate	**SW-846 6850 1/2007**		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.3	U	2.3	5.5	1
Wet Chemistry	**SM 2540 G-1997**		%		%	%	
00118	Moisture	n.a.	8.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	08/02/2016 20:20	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 03:22	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-5-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444058
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 09:30 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25B4 SDG#: DWD88-08

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	230	U	230	770	70.03
For the initial calibration, the following analyte s was calibrated using a uadratic fit: 4-methyl-2-pentanone.							
Reporting limits were raised due to interference from the sample matrix.							
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	8.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	R161811AA	06/29/2016 11:48	Anita M Dale	70.03
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:58	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444059
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 10:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25C1 SDG#: DWD88-09

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	890	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	890	U	890	2,700	5
10726	Quinoline	91-22-5	180	U	180	890	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0169	J	0.0099	0.0989	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.19	U	0.19	0.54	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	527		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	0.54	U	0.54	1.6	1
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	6.91		0.0100	0.0100	1
	The pH was measured in water at 19.8 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	6.7		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/07/2016 00:46	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:44	Damary Valentin	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444059
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 10:15 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25C1 SDG#: DWD88-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201A	07/06/2016 11:52	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201A	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16188182101B	07/06/2016 20:00	Michelle L Lalli	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16187042501A	07/05/2016 20:45	Daniel S Smith	1
00394	pH	SW-846 9045D modified	1	16188039401B	07/06/2016 20:00	Michelle L Lalli	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16187042501A	07/05/2016 12:40	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-5-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444060
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 10:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25C2 SDG#: DWD88-10

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	3,260		8.23	37.9	1
06944	Antimony	7440-36-0	0.664	U	0.664	3.79	1
06935	Arsenic	7440-38-2	0.920	U	0.920	3.79	1
06946	Barium	7440-39-3	9.89		0.0313	0.949	1
06947	Beryllium	7440-41-7	0.0683	J	0.0635	0.949	1
06949	Cadmium	7440-43-9	0.113	J	0.0465	0.949	1
01650	Calcium	7440-70-2	2,260		5.37	37.9	1
06951	Chromium	7440-47-3	4.27		0.133	2.85	1
06952	Cobalt	7440-48-4	0.114	U	0.114	0.949	1
06953	Copper	7440-50-8	4.91		0.218	1.90	1
01654	Iron	7439-89-6	709		3.91	37.9	1
06955	Lead	7439-92-1	3.82		0.522	2.85	1
01657	Magnesium	7439-95-4	135		1.80	19.0	1
06958	Manganese	7439-96-5	9.38		0.0787	0.949	1
06961	Nickel	7440-02-0	0.805	J	0.285	1.90	1
01662	Potassium	7440-09-7	73.1	J	22.7	94.9	1
06936	Selenium	7782-49-2	0.854	U	0.854	3.79	1
06966	Silver	7440-22-4	0.142	U	0.142	0.949	1
01667	Sodium	7440-23-5	22.7	U	22.7	190	1
06971	Vanadium	7440-62-2	2.85		0.133	0.949	1
06972	Zinc	7440-66-6	17.4		0.645	3.79	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0275	U	0.0275	0.190	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444060
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 10:15 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25C2 SDG#: DWD88-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 09:09	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:21	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444061
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 10:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25C3 SDG#: DWD88-11

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	44	U	44	130	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	44	U	44	130	1
13413	1,3-Dinitrobenzene	99-65-0	43	U	43	130	1
13413	2,4-Dinitrotoluene	121-14-2	43	U	43	130	1
13413	2,6-Dinitrotoluene	606-20-2	120	U	120	130	1
13413	HM	2691-41-0	230	U	230	320	1
13413	Nitrobenzene	98-95-3	110	U	110	320	1
13413	Nitroglycerin	55-63-0	850	U	850	2,600	1
13413	2-Nitrotoluene	88-72-2	80	U	80	130	1
13413	3-Nitrotoluene	99-08-1	120	U	120	130	1
13413	4-Nitrotoluene	99-99-0	120	U	120	130	1
13413	PETN	78-11-5	850	U	850	2,600	1
13413	RD	121-82-4	43	U	43	130	1
13413	Tetryl	479-45-8	110	U	110	320	1
13413	1,3,5-Trinitrobenzene	99-35-4	43	U	43	130	1
13413	2,4,6-Trinitrotoluene	118-96-7	47	U	47	130	1
Perchlorate	SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.3	U	2.3	5.4	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	08/02/2016 22:27	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 03:35	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-5-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444062
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 10:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25C4 SDG#: DWD88-12

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	4	U	4	12	1.15
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161802AA	06/28/2016 13:56	Jennifer Howe	1.15
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 18:00	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444063
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22A1 SDG#: DWD88-13

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	210	U	210	1,000	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	1,000	U	1,000	3,100	5
10726	Quinoline	91-22-5	210	U	210	1,000	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0526	J	0.0126	0.126	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.23	U	0.23	0.63	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	530		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	12.6	U	12.6	37.8	20
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	4.17		0.0100	0.0100	1
	The pH was measured in water at 19.8 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	20.6		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/07/2016 01:12	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444063
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22A1 SDG#: DWD88-13

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:46	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201A	07/06/2016 11:55	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201A	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16188182101B	07/06/2016 20:00	Michelle L Lalli	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16187042501A	07/05/2016 20:45	Daniel S Smith	20
00394	pH	SW-846 9045D modified	1	16188039401B	07/06/2016 20:00	Michelle L Lalli	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16187042501A	07/05/2016 12:40	Nathan T Morgan	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444064
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22A2 SDG#: DWD88-14

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	330		10.4	48.0	1
06944	Antimony	7440-36-0	0.840	U	0.840	4.80	1
06935	Arsenic	7440-38-2	1.16	U	1.16	4.80	1
06946	Barium	7440-39-3	3.16		0.0396	1.20	1
06947	Beryllium	7440-41-7	0.0804	U	0.0804	1.20	1
06949	Cadmium	7440-43-9	0.0588	U	0.0588	1.20	1
01650	Calcium	7440-70-2	633		6.79	48.0	1
06951	Chromium	7440-47-3	1.06	J	0.168	3.60	1
06952	Cobalt	7440-48-4	0.144	U	0.144	1.20	1
06953	Copper	7440-50-8	4.94		0.276	2.40	1
01654	Iron	7439-89-6	269		4.94	48.0	1
06955	Lead	7439-92-1	3.12	J	0.660	3.60	1
01657	Magnesium	7439-95-4	111		2.28	24.0	1
06958	Manganese	7439-96-5	15.7		0.0996	1.20	1
06961	Nickel	7440-02-0	0.360	U	0.360	2.40	1
01662	Potassium	7440-09-7	86.1	J	28.7	120	1
06936	Selenium	7782-49-2	1.08	U	1.08	4.80	1
06966	Silver	7440-22-4	0.180	U	0.180	1.20	1
01667	Sodium	7440-23-5	32.8	J	28.7	240	1
06971	Vanadium	7440-62-2	1.90		0.168	1.20	1
06972	Zinc	7440-66-6	3.43	J	0.816	4.80	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0348	U	0.0348	0.240	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	20.6		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444064
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22A2 SDG#: DWD88-14

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 09:12	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:23	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444065
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22A3 SDG#: DWD88-15

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	52	U	52	150	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	52	U	52	150	1
13413	1,3-Dinitrobenzene	99-65-0	50	U	50	150	1
13413	2,4-Dinitrotoluene	121-14-2	50	U	50	150	1
13413	2,6-Dinitrotoluene	606-20-2	140	U	140	150	1
13413	HM	2691-41-0	270	U	270	380	1
13413	Nitrobenzene	98-95-3	130	U	130	380	1
13413	Nitroglycerin	55-63-0	1,000	U	1,000	3,000	1
13413	2-Nitrotoluene	88-72-2	94	U	94	150	1
13413	3-Nitrotoluene	99-08-1	140	U	140	150	1
13413	4-Nitrotoluene	99-99-0	140	U	140	150	1
13413	PETN	78-11-5	1,000	U	1,000	3,000	1
13413	RD	121-82-4	50	U	50	150	1
13413	Tetryl	479-45-8	130	U	130	380	1
13413	1,3,5-Trinitrobenzene	99-35-4	50	U	50	150	1
13413	2,4,6-Trinitrotoluene	118-96-7	55	U	55	150	1
Perchlorate	**SW-846 6850 1/2007**		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.6	U	2.6	6.3	1
Wet Chemistry	**SM 2540 G-1997**		%		%	%	
00118	Moisture	n.a.	20.6		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	08/02/2016 23:10	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 03:48	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444066
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22A4 SDG#: DWD88-16

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	6	U	6	20	1.58
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	20.6		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161802AA	06/28/2016 12:26	Jennifer Howe	1.58
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 18:02	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444067
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 12:05 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22B1 SDG#: DWD88-17

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	200	U	200	1,000	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	1,000	U	1,000	3,100	5
10726	Quinoline	91-22-5	200	U	200	1,000	5
Trial ID: RE							
10726	2-Chlorobenzaldehyde	89-98-5	41	U	41	200	1
10726	2-Chlorobenzalmalononitrile	2698-41-1	200	U	200	610	1
10726	Quinoline	91-22-5	41	U	41	200	1

The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.

Reporting limits were raised due to interference from the sample matrix.

The recovery for the sample surrogate s is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method re uired holding time and the QC is compliant. All results are reported.
Similar results were obtained in both trials.

Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0492	J	0.0121	0.121	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.22	U	0.22	0.60	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	533		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	12.3	U	12.3	36.9	20
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	4.60		0.0100	0.0100	1
	The pH was measured in water at 19.7 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	18.7		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444067
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 12:05 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22B1 SDG#: DWD88-17

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/07/2016 01:37	William H Saadeh	5
10726	SVOA 8270D microwave	SW-846 8270D	2-RE	16194SLB026	07/13/2016 22:53	Anthony P Bauer	1
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1
10813	BNA Soil Microwave APP I	SW-846 3546	2	16194SLB026	07/13/2016 09:00	ate E Lutte	1
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:48	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201A	07/06/2016 11:56	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201A	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16188182101B	07/06/2016 20:00	Michelle L Lalli	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042501A	07/11/2016 19:30	Daniel S Smith	20
00394	pH	SW-846 9045D modified	1	16188039401B	07/06/2016 20:00	Michelle L Lalli	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042501A	07/07/2016 20:35	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444068
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 12:05 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22B2 SDG#: DWD88-18

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	579		10.1	46.4	1
06944	Antimony	7440-36-0	0.812	U	0.812	4.64	1
06935	Arsenic	7440-38-2	1.13	U	1.13	4.64	1
06946	Barium	7440-39-3	3.43		0.0383	1.16	1
06947	Beryllium	7440-41-7	0.0777	U	0.0777	1.16	1
06949	Cadmium	7440-43-9	0.0569	U	0.0569	1.16	1
01650	Calcium	7440-70-2	783		6.57	46.4	1
06951	Chromium	7440-47-3	1.34	J	0.162	3.48	1
06952	Cobalt	7440-48-4	0.139	U	0.139	1.16	1
06953	Copper	7440-50-8	4.59		0.267	2.32	1
01654	Iron	7439-89-6	352		4.78	46.4	1
06955	Lead	7439-92-1	3.83		0.638	3.48	1
01657	Magnesium	7439-95-4	113		2.20	23.2	1
06958	Manganese	7439-96-5	28.4		0.0963	1.16	1
06961	Nickel	7440-02-0	0.348	U	0.348	2.32	1
01662	Potassium	7440-09-7	82.4	J	27.7	116	1
06936	Selenium	7782-49-2	1.04	U	1.04	4.64	1
06966	Silver	7440-22-4	0.174	U	0.174	1.16	1
01667	Sodium	7440-23-5	27.7	U	27.7	232	1
06971	Vanadium	7440-62-2	2.03		0.162	1.16	1
06972	Zinc	7440-66-6	3.43	J	0.789	4.64	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0337	U	0.0337	0.232	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444068
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 12:05 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22B2 SDG#: DWD88-18

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 09:15	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:25	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444069
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 12:05 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22B3 SDG#: DWD88-19

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	49	U	49	140	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	49	U	49	140	1
13413	1,3-Dinitrobenzene	99-65-0	48	U	48	140	1
13413	2,4-Dinitrotoluene	121-14-2	48	U	48	140	1
13413	2,6-Dinitrotoluene	606-20-2	140	U	140	140	1
13413	HM	2691-41-0	250	U	250	360	1
13413	Nitrobenzene	98-95-3	120	U	120	360	1
13413	Nitroglycerin	55-63-0	960	U	960	2,900	1
13413	2-Nitrotoluene	88-72-2	90	U	90	140	1
13413	3-Nitrotoluene	99-08-1	130	U	130	140	1
13413	4-Nitrotoluene	99-99-0	130	U	130	140	1
13413	PETN	78-11-5	960	U	960	2,900	1
13413	RD	121-82-4	48	U	48	140	1
13413	Tetryl	479-45-8	120	U	120	360	1
13413	1,3,5-Trinitrobenzene	99-35-4	48	U	48	140	1
13413	2,4,6-Trinitrotoluene	118-96-7	53	U	53	140	1
Perchlorate	**SW-846 6850 1/2007**		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.6	U	2.6	6.2	1
Wet Chemistry	**SM 2540 G-1997**		%		%	%	
00118	Moisture	n.a.	18.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	08/02/2016 23:52	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 04:00	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444070
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 12:05 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22B4 SDG#: DWD88-20

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	5	U	5	17	1.37
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161802AA	06/28/2016 14:19	Jennifer Howe	1.37
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:54	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011A	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444071
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C1 SDG#: DWD88-21B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	200	U	200	1,000	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	1,000	U	1,000	3,000	5
10726	Quinoline	91-22-5	200	U	200	1,000	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0509	J	0.0115	0.115	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.21	U	0.21	0.59	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	626		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	12.2	U	12.2	36.7	20
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	4.57		0.0100	0.0100	1
	The pH was measured in water at 20.7 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	18.2		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/06/2016 16:21	Joseph M Gambler	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444071
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C1 SDG#: DWD88-21B G

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:26	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201A	07/06/2016 11:57	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201A	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16189182101B	07/07/2016 12:30	Nathan T Morgan	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042501A	07/11/2016 19:30	Daniel S Smith	20
00394	pH	SW-846 9045D modified	1	16189039401B	07/07/2016 12:30	Nathan T Morgan	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042501A	07/07/2016 20:35	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444072
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C1 SDG#: DWD88-21MS

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	200	U	200	1,000	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	1,000	U	1,000	3,000	5
10726	Quinoline	91-22-5	950	J	200	1,000	5
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.247		0.0122	0.122	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	6.1		0.22	0.61	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/06/2016 23:03	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:32	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201A	07/06/2016 11:59	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201A	07/05/2016 09:15	Nancy J Shoop	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-C MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444073
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C1 SDG#: DWD88-21MSD

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	200	U	200	1,000	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	1,000	U	1,000	3,000	5
10726	Quinoline	91-22-5	1,200		200	1,000	5
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.233		0.0115	0.115	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/06/2016 23:29	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:34	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-C SS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444074
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C1 SDG#: DWD88-21SS

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Wet Chemistry	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	12.2	U	12.2	36.7	20
	Reporting limits were raised due to interference from the sample matrix.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042501A	07/11/2016 19:30	Daniel S Smith	20
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042501A	07/07/2016 20:35	Daniel S Smith	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-C IS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444075
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C1 SDG#: DWD88-21IS

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Wet Chemistry	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	18.5	J	12.2	36.7	20
	Reporting limits were raised due to interference from the sample matrix.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042501A	07/11/2016 19:30	Daniel S Smith	20
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042501A	07/07/2016 20:35	Daniel S Smith	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-C PDS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444076
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C1 SDG#: DWD88-21PDS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Wet Chemistry	SW-846 7196A		mg/kg	mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	244	12.2	36.7	20
	Reporting limits were raised due to interference from the sample matrix.					
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	18.2	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042501A	07/11/2016 19:30	Daniel S Smith	20
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042501A	07/07/2016 20:35	Daniel S Smith	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C DUP Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444077
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C1 SDG#: DWD88-21DUP

CAT No.	Analysis Name		CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals		SW-846 7471B		mg/kg	mg/kg	mg/kg	
00159	Mercury		7439-97-6	0.0460 J	0.0116	0.116	1
Wet Chemistry		SW-846 9012B		mg/kg	mg/kg	mg/kg	
05895	Total Cyanide solid		57-12-5	0.22 U	0.22	0.60	1
		ASTM D1498		m	m	m	
01821	Oxidation Reduction Potential		n.a.	621	10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
		SW-846 7196A		mg/kg	mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS		18540-29-9	12.2 U	12.2	36.7	20
	Reporting limits were raised due to interference from the sample matrix.						
		SW-846 9045D modified		Std. Units	Std. Units	Std. Units	
00394	pH		n.a.	4.55	0.0100	0.0100	1
	The pH was measured in water at 20.7 C.						
Wet Chemistry		SM 2540 G-1997		%	%	%	
00118	Moisture		n.a.	18.2	0.50	0.50	1
00121	Moisture Duplicate		n.a.	16.3	0.50	0.50	1
	The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161820638002	07/02/2016 09:30	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161820638002	07/01/2016 10:30	Lisa J Cooke	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201A	07/06/2016 12:00	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201A	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16189182101B	07/07/2016 12:30	Nathan T Morgan	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042501A	07/11/2016 19:30	Daniel S Smith	20

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C DUP Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444077
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C1 SDG#: DWD88-21DUP

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00394	pH	SW-846 9045D modified	1	16189039401B	07/07/2016 12:30	Nathan T Morgan	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042501A	07/07/2016 20:35	Daniel S Smith	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1
00121	Moisture Duplicate	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444078
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C2 SDG#: DWD88-22B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	744		10.6	48.9	1
06944	Antimony	7440-36-0	0.856	U	0.856	4.89	1
06935	Arsenic	7440-38-2	1.19	U	1.19	4.89	1
06946	Barium	7440-39-3	3.81		0.0403	1.22	1
06947	Beryllium	7440-41-7	0.0819	U	0.0819	1.22	1
06949	Cadmium	7440-43-9	0.0599	U	0.0599	1.22	1
01650	Calcium	7440-70-2	1,140		6.92	48.9	1
06951	Chromium	7440-47-3	1.36	J	0.171	3.67	1
06952	Cobalt	7440-48-4	0.147	U	0.147	1.22	1
06953	Copper	7440-50-8	3.92		0.281	2.44	1
01654	Iron	7439-89-6	375		5.04	48.9	1
06955	Lead	7439-92-1	3.88		0.672	3.67	1
01657	Magnesium	7439-95-4	155		2.32	24.4	1
06958	Manganese	7439-96-5	31.9		0.101	1.22	1
06961	Nickel	7440-02-0	0.367	U	0.367	2.44	1
01662	Potassium	7440-09-7	107	J	29.2	122	1
06936	Selenium	7782-49-2	1.10	U	1.10	4.89	1
06966	Silver	7440-22-4	0.183	U	0.183	1.22	1
01667	Sodium	7440-23-5	31.5	J	29.2	244	1
06971	Vanadium	7440-62-2	2.06		0.171	1.22	1
06972	Zinc	7440-66-6	4.05	J	0.831	4.89	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0355	U	0.0355	0.244	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444078
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C2 SDG#: DWD88-22B G

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 08:38	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:03	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444079
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C2 SDG#: DWD88-22MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg	mg/kg	mg/kg	
01643	Aluminum	7429-90-5	1,300	10.5	48.4	1
06944	Antimony	7440-36-0	55.8	0.847	4.84	1
06935	Arsenic	7440-38-2	17.7	1.17	4.84	1
06946	Barium	7440-39-3	250	0.0399	1.21	1
06947	Beryllium	7440-41-7	6.24	0.0811	1.21	1
06949	Cadmium	7440-43-9	6.21	0.0593	1.21	1
01650	Calcium	7440-70-2	1,570	6.85	48.4	1
06951	Chromium	7440-47-3	25.6	0.169	3.63	1
06952	Cobalt	7440-48-4	61.5	0.145	1.21	1
06953	Copper	7440-50-8	35.6	0.278	2.42	1
01654	Iron	7439-89-6	481	4.99	48.4	1
06955	Lead	7439-92-1	22.8	0.666	3.63	1
01657	Magnesium	7439-95-4	407	2.30	24.2	1
06958	Manganese	7439-96-5	91.3	0.100	1.21	1
06961	Nickel	7440-02-0	62.3	0.363	2.42	1
01662	Potassium	7440-09-7	1,380	28.9	121	1
06936	Selenium	7782-49-2	17.1	1.09	4.84	1
06966	Silver	7440-22-4	6.09	0.182	1.21	1
01667	Sodium	7440-23-5	1,290	28.9	242	1
06971	Vanadium	7440-62-2	63.3	0.169	1.21	1
06972	Zinc	7440-66-6	64.3	0.823	4.84	1
	SW-846 6020A		mg/kg	mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.714	0.0351	0.242	2
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	18.2	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444079
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C2 SDG#: DWD88-22MS

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 08:47	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:09	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444080
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C2 SDG#: DWD88-22MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg	mg/kg	mg/kg	
01643	Aluminum	7429-90-5	1,190	9.92	45.7	1
06944	Antimony	7440-36-0	54.2	0.800	4.57	1
06935	Arsenic	7440-38-2	17.5	1.11	4.57	1
06946	Barium	7440-39-3	240	0.0377	1.14	1
06947	Beryllium	7440-41-7	6.02	0.0765	1.14	1
06949	Cadmium	7440-43-9	5.96	0.0560	1.14	1
01650	Calcium	7440-70-2	1,390	6.47	45.7	1
06951	Chromium	7440-47-3	24.4	0.160	3.43	1
06952	Cobalt	7440-48-4	59.2	0.137	1.14	1
06953	Copper	7440-50-8	34.0	0.263	2.29	1
01654	Iron	7439-89-6	429	4.71	45.7	1
06955	Lead	7439-92-1	20.8	0.628	3.43	1
01657	Magnesium	7439-95-4	378	2.17	22.9	1
06958	Manganese	7439-96-5	86.9	0.0948	1.14	1
06961	Nickel	7440-02-0	60.0	0.343	2.29	1
01662	Potassium	7440-09-7	1,320	27.3	114	1
06936	Selenium	7782-49-2	16.3	1.03	4.57	1
06966	Silver	7440-22-4	5.79	0.171	1.14	1
01667	Sodium	7440-23-5	1,230	27.3	229	1
06971	Vanadium	7440-62-2	60.6	0.160	1.14	1
06972	Zinc	7440-66-6	61.7	0.777	4.57	1
	SW-846 6020A		mg/kg	mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.626	0.0331	0.229	2
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	18.2	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444080
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C2 SDG#: DWD88-22MSD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 08:50	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:10	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C DUP Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444081
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C2 SDG#: DWD88-22DUP

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	727		10.2	47.0	1
06944	Antimony	7440-36-0	0.823	U	0.823	4.70	1
06935	Arsenic	7440-38-2	1.14	U	1.14	4.70	1
06946	Barium	7440-39-3	3.66		0.0388	1.18	1
06947	Beryllium	7440-41-7	0.0788	U	0.0788	1.18	1
06949	Cadmium	7440-43-9	0.0576	U	0.0576	1.18	1
01650	Calcium	7440-70-2	1,050		6.65	47.0	1
06951	Chromium	7440-47-3	1.29	J	0.165	3.53	1
06952	Cobalt	7440-48-4	0.141	U	0.141	1.18	1
06953	Copper	7440-50-8	3.95		0.270	2.35	1
01654	Iron	7439-89-6	365		4.84	47.0	1
06955	Lead	7439-92-1	3.64		0.647	3.53	1
01657	Magnesium	7439-95-4	146		2.23	23.5	1
06958	Manganese	7439-96-5	28.5		0.0976	1.18	1
06961	Nickel	7440-02-0	0.353	U	0.353	2.35	1
01662	Potassium	7440-09-7	104	J	28.1	118	1
06936	Selenium	7782-49-2	1.06	U	1.06	4.70	1
06966	Silver	7440-22-4	0.176	U	0.176	1.18	1
01667	Sodium	7440-23-5	29.6	J	28.1	235	1
06971	Vanadium	7440-62-2	1.98		0.165	1.18	1
06972	Zinc	7440-66-6	3.49	J	0.799	4.70	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0341	U	0.0341	0.235	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C DUP Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444081
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22C2 SDG#: DWD88-22DUP

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01654	Iron	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 08:44	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:07	Choon Y Tian	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161940637001	07/13/2016 06:18	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444082
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C3 SDG#: DWD88-23B G

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives		SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene		19406-51-0	49	U	49	140	1
13413	2-Amino-4,6-Dinitrotoluene		35572-78-2	49	U	49	140	1
13413	1,3-Dinitrobenzene		99-65-0	48	U	48	140	1
13413	2,4-Dinitrotoluene		121-14-2	48	U	48	140	1
13413	2,6-Dinitrotoluene		606-20-2	140	U	140	140	1
13413	HM		2691-41-0	260	U	260	360	1
13413	Nitrobenzene		98-95-3	120	U	120	360	1
13413	Nitroglycerin		55-63-0	970	U	970	2,900	1
13413	2-Nitrotoluene		88-72-2	91	U	91	140	1
13413	3-Nitrotoluene		99-08-1	130	U	130	140	1
13413	4-Nitrotoluene		99-99-0	130	U	130	140	1
13413	PETN		78-11-5	970	U	970	2,900	1
13413	RD		121-82-4	48	U	48	140	1
13413	Tetryl		479-45-8	120	U	120	360	1
13413	1,3,5-Trinitrobenzene		99-35-4	48	U	48	140	1
13413	2,4,6-Trinitrotoluene		118-96-7	53	U	53	140	1
Perchlorate		SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil	LC/MS/MS	14797-73-0	2.6	U	2.6	6.1	1
Wet Chemistry		SM 2540 G-1997		%		%	%	
00118	Moisture		n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	08/03/2016 00:35	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 04:13	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-C MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444083
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C3 SDG#: DWD88-23MS

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives		SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene		19406-51-0	1,800		50	140	1
13413	2-Amino-4,6-Dinitrotoluene		35572-78-2	1,800		50	140	1
13413	1,3-Dinitrobenzene		99-65-0	1,400		48	140	1
13413	2,4-Dinitrotoluene		121-14-2	1,500		48	140	1
13413	2,6-Dinitrotoluene		606-20-2	1,800		140	140	1
13413	HM		2691-41-0	1,300		260	360	1
13413	Nitrobenzene		98-95-3	2,100		120	360	1
13413	Nitroglycerin		55-63-0	17,000		970	2,900	1
13413	2-Nitrotoluene		88-72-2	1,900		91	140	1
13413	3-Nitrotoluene		99-08-1	1,800		130	140	1
13413	4-Nitrotoluene		99-99-0	1,700		130	140	1
13413	PETN		78-11-5	24,000		970	2,900	1
13413	RD		121-82-4	2,300		48	140	1
13413	Tetryl		479-45-8	610		120	360	1
13413	1,3,5-Trinitrobenzene		99-35-4	48	U	48	140	1
13413	2,4,6-Trinitrotoluene		118-96-7	1,400		53	140	1
Perchlorate		SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil	LC/MS/MS	14797-73-0	140		2.6	6.1	1
Wet Chemistry		SM 2540 G-1997		%		%	%	
00118	Moisture		n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	08/03/2016 01:17	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 04:26	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-C MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444084
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C3 SDG#: DWD88-23MSD

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	1,900		50	150	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	1,800		50	150	1
13413	1,3-Dinitrobenzene	99-65-0	1,500		49	150	1
13413	2,4-Dinitrotoluene	121-14-2	1,500		49	150	1
13413	2,6-Dinitrotoluene	606-20-2	1,900		140	150	1
13413	HM	2691-41-0	1,300		260	370	1
13413	Nitrobenzene	98-95-3	2,300		120	370	1
13413	Nitroglycerin	55-63-0	17,000		980	2,900	1
13413	2-Nitrotoluene	88-72-2	2,000		92	150	1
13413	3-Nitrotoluene	99-08-1	1,800		130	150	1
13413	4-Nitrotoluene	99-99-0	1,700		130	150	1
13413	PETN	78-11-5	23,000		980	2,900	1
13413	RD	121-82-4	2,400		49	150	1
13413	Tetryl	479-45-8	940		120	370	1
13413	1,3,5-Trinitrobenzene	99-35-4	49	U	49	150	1
13413	2,4,6-Trinitrotoluene	118-96-7	1,500		54	150	1
Perchlorate	SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	120		2.6	6.1	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	08/03/2016 02:00	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 04:39	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161880009A	07/06/2016 21:00	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444085
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C3 SDG#: DWD88-24B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	6	U	6	19	1.53
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	18.2		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161802AA	06/28/2016 12:49	Jennifer Howe	1.53
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:50	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

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Analysis Report

Sample Description: DU-2-2-C MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444086
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C3 SDG#: DWD88-24MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg	ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	190	6	21	1.68
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	18.2	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161802AA	06/28/2016 13:11	Jennifer Howe	1.68
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:05	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:52	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: DU-2-2-C MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444087
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 13:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D22C3 SDG#: DWD88-24MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg	ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	210	6	21	1.74
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	18.2	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161802AA	06/28/2016 13:34	Jennifer Howe	1.74
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:44	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444088
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 15:15 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA11 SDG#: DWD88-25

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	230	U	230	1,200	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	1,200	U	1,200	3,500	5
10726	Quinoline	91-22-5	230	U	230	1,200	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0305	J	0.0141	0.141	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.25	U	0.25	0.71	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	669		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	14.1	U	14.1	42.4	20
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	3.79	J	0.0100	0.0100	1
	The pH was measured in water at 20.8 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	29.3		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/07/2016 02:03	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444088
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 15:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA11 SDG#: DWD88-25

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161950638002	07/15/2016 12:35	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161950638002	07/14/2016 10:50	Ann Borg	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201A	07/06/2016 12:01	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201A	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16189182101A	07/07/2016 12:30	Nathan T Morgan	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042501A	07/11/2016 19:30	Daniel S Smith	20
00394	pH	SW-846 9045D modified	1	16189039401A	07/07/2016 12:30	Nathan T Morgan	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042501A	07/07/2016 20:35	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: BGA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444089
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 15:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA12 SDG#: DWD88-26

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	408		12.2	56.0	1
06944	Antimony	7440-36-0	0.980	U	0.980	5.60	1
06935	Arsenic	7440-38-2	1.36	U	1.36	5.60	1
06946	Barium	7440-39-3	6.57		0.0462	1.40	1
06947	Beryllium	7440-41-7	0.0938	U	0.0938	1.40	1
06949	Cadmium	7440-43-9	0.0686	U	0.0686	1.40	1
01650	Calcium	7440-70-2	108		7.93	56.0	1
06951	Chromium	7440-47-3	0.738	J	0.196	4.20	1
06952	Cobalt	7440-48-4	0.168	U	0.168	1.40	1
06953	Copper	7440-50-8	0.646	J	0.322	2.80	1
01654	Iron	7439-89-6	527		5.77	56.0	1
06955	Lead	7439-92-1	5.02		0.770	4.20	1
01657	Magnesium	7439-95-4	48.2		2.66	28.0	1
06958	Manganese	7439-96-5	1.16	J	0.116	1.40	1
06961	Nickel	7440-02-0	0.420	U	0.420	2.80	1
01662	Potassium	7440-09-7	44.7	J	33.5	140	1
06936	Selenium	7782-49-2	1.26	U	1.26	5.60	1
06966	Silver	7440-22-4	0.210	U	0.210	1.40	1
01667	Sodium	7440-23-5	46.5	J	33.5	280	1
06971	Vanadium	7440-62-2	1.34	J	0.196	1.40	1
06972	Zinc	7440-66-6	0.958	J	0.952	5.60	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0406	U	0.0406	0.280	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	29.3		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06944	Antimony	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06935	Arsenic	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06946	Barium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06947	Beryllium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444089
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 15:15 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA12 SDG#: DWD88-26

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
01650	Calcium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06951	Chromium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06952	Cobalt	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06953	Copper	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
01654	Iron	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06955	Lead	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
01657	Magnesium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06958	Manganese	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06961	Nickel	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
01662	Potassium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06936	Selenium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06966	Silver	SW-846 6010C	1	161950637002	07/15/2016 15:07	Cindy M Gehman	1
01667	Sodium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06971	Vanadium	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06972	Zinc	SW-846 6010C	1	161950637002	07/15/2016 03:35	Matthew R Machtinger	1
06145	Thallium	SW-846 6020A	1	161950637002A	07/15/2016 05:34	Scott P Cuff	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161950637002	07/14/2016 07:00	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444090
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 15:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA13 SDG#: DWD88-27

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	57	U	57	170	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	57	U	57	170	1
13413	1,3-Dinitrobenzene	99-65-0	56	U	56	170	1
13413	2,4-Dinitrotoluene	121-14-2	56	U	56	170	1
13413	2,6-Dinitrotoluene	606-20-2	160	U	160	170	1
13413	HM	2691-41-0	300	U	300	420	1
13413	Nitrobenzene	98-95-3	140	U	140	420	1
13413	Nitroglycerin	55-63-0	1,100	U	1,100	3,400	1
13413	2-Nitrotoluene	88-72-2	110	U	110	170	1
13413	3-Nitrotoluene	99-08-1	150	U	150	170	1
13413	4-Nitrotoluene	99-99-0	150	U	150	170	1
13413	PETN	78-11-5	1,100	U	1,100	3,400	1
13413	RD	121-82-4	56	U	56	170	1
13413	Tetryl	479-45-8	140	U	140	420	1
13413	1,3,5-Trinitrobenzene	99-35-4	56	U	56	170	1
13413	2,4,6-Trinitrotoluene	118-96-7	62	U	62	170	1
Perchlorate	SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS The stated QC limits are advisory.	14797-73-0	3.0	U	3.0	7.1	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	29.3		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	08/17/2016 02:08	James H Place	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 14:12	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161890045A	07/09/2016 06:50	Maria Davenport	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	07/08/2016 21:30	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-1 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444091
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 15:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA14 SDG#: DWD88-28

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	4	U	4	13	0.95
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	29.3		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	B161811AA	06/29/2016 13:20	Jennifer Howe	0.95
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:46	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444092
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA21 SDG#: DWD88-29

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	910	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	910	U	910	2,700	5
10726	Quinoline	91-22-5	180	U	180	910	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0174	J	0.0106	0.106	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.19	U	0.19	0.52	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	663		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	2.8	U	2.8	8.3	5
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	4.45		0.0100	0.0100	1
	The pH was measured in water at 20.9 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	9.1		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16184SLC026	07/07/2016 02:29	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16184SLC026	07/05/2016 08:30	ayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444092
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA21 SDG#: DWD88-29

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161950638002	07/15/2016 12:37	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161950638002	07/14/2016 10:50	Ann Borg	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201A	07/06/2016 12:02	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201A	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16189182101A	07/07/2016 12:30	Nathan T Morgan	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042501A	07/11/2016 19:30	Daniel S Smith	5
00394	pH	SW-846 9045D modified	1	16189039401A	07/07/2016 12:30	Nathan T Morgan	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042501A	07/07/2016 20:35	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444093
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA22 SDG#: DWD88-30

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	441		9.45	43.6	1
06944	Antimony	7440-36-0	0.762	U	0.762	4.36	1
06935	Arsenic	7440-38-2	1.06	U	1.06	4.36	1
06946	Barium	7440-39-3	1.70		0.0359	1.09	1
06947	Beryllium	7440-41-7	0.0730	U	0.0730	1.09	1
06949	Cadmium	7440-43-9	0.0534	U	0.0534	1.09	1
01650	Calcium	7440-70-2	39.2	J	6.16	43.6	1
06951	Chromium	7440-47-3	0.540	J	0.152	3.27	1
06952	Cobalt	7440-48-4	0.131	U	0.131	1.09	1
06953	Copper	7440-50-8	0.364	J	0.251	2.18	1
01654	Iron	7439-89-6	408		4.49	43.6	1
06955	Lead	7439-92-1	2.80	J	0.599	3.27	1
01657	Magnesium	7439-95-4	17.0	J	2.07	21.8	1
06958	Manganese	7439-96-5	1.01	J	0.0904	1.09	1
06961	Nickel	7440-02-0	0.327	U	0.327	2.18	1
01662	Potassium	7440-09-7	26.0	U	26.0	109	1
06936	Selenium	7782-49-2	0.980	U	0.980	4.36	1
06966	Silver	7440-22-4	0.164	J	0.163	1.09	1
01667	Sodium	7440-23-5	26.0	U	26.0	218	1
06971	Vanadium	7440-62-2	0.943	J	0.152	1.09	1
06972	Zinc	7440-66-6	0.741	U	0.741	4.36	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0316	U	0.0316	0.218	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	9.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06944	Antimony	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06935	Arsenic	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06946	Barium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06947	Beryllium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444093
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA22 SDG#: DWD88-30

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
01650	Calcium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06951	Chromium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06952	Cobalt	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06953	Copper	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
01654	Iron	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06955	Lead	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
01657	Magnesium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06958	Manganese	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06961	Nickel	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
01662	Potassium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06936	Selenium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06966	Silver	SW-846 6010C	1	161950637002	07/15/2016 15:10	Cindy M Gehman	1
01667	Sodium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06971	Vanadium	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06972	Zinc	SW-846 6010C	1	161950637002	07/15/2016 03:38	Matthew R Machtinger	1
06145	Thallium	SW-846 6020A	1	161950637002A	07/15/2016 05:36	Scott P Cuff	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161950637002	07/14/2016 07:00	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: BGA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444094
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA23 SDG#: DWD88-31

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	45	U	45	130	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	45	U	45	130	1
13413	1,3-Dinitrobenzene	99-65-0	44	U	44	130	1
13413	2,4-Dinitrotoluene	121-14-2	44	U	44	130	1
13413	2,6-Dinitrotoluene	606-20-2	120	U	120	130	1
13413	HM	2691-41-0	230	U	230	330	1
13413	Nitrobenzene	98-95-3	110	U	110	330	1
13413	Nitroglycerin	55-63-0	880	U	880	2,600	1
13413	2-Nitrotoluene	88-72-2	82	U	82	130	1
13413	3-Nitrotoluene	99-08-1	120	U	120	130	1
13413	4-Nitrotoluene	99-99-0	120	U	120	130	1
13413	PETN	78-11-5	880	U	880	2,600	1
13413	RD	121-82-4	44	U	44	130	1
13413	Tetryl	479-45-8	110	U	110	330	1
13413	1,3,5-Trinitrobenzene	99-35-4	44	U	44	130	1
13413	2,4,6-Trinitrotoluene	118-96-7	48	U	48	130	1
Perchlorate	**SW-846 6850 1/2007**		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS The stated QC limits are advisory.	14797-73-0	2.3	U	2.3	5.5	1
Wet Chemistry	**SM 2540 G-1997**		%		%	%	
00118	Moisture	n.a.	9.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	08/17/2016 02:50	James H Place	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 14:25	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161890045A	07/09/2016 06:50	Maria Davenport	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	07/08/2016 21:30	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-2 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444095
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA24 SDG#: DWD88-32

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	4	U	4	12	1.13
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	9.1		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	B161811AA	06/29/2016 12:57	Jennifer Howe	1.13
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:48	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16231820011B	08/18/2016 21:57	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444096
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA31 SDG#: DWD88-33B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	890	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	890	U	890	2,700	5
10726	Quinoline	91-22-5	180	U	180	890	5
	The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.						
	Reporting limits were raised due to interference from the sample matrix.						
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.0327	J	0.0105	0.105	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.19	U	0.19	0.53	1
	ASTM D1498		m		m	m	
01821	Oxidation Reduction Potential	n.a.	656		10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	10.7	U	10.7	32.2	20
	Reporting limits were raised due to interference from the sample matrix.						
	SW-846 9045D modified		Std. Units		Std. Units	Std. Units	
00394	pH	n.a.	4.77		0.0100	0.0100	1
	The pH was measured in water at 20.6 C.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00111	Moisture	n.a.	6.7		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16187SLE026	07/07/2016 02:54	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16187SLE026	07/06/2016 08:00	Bradley W VanLeuven	1

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Sample Description: BGA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444096
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA31 SDG#: DWD88-33B G

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161950638002	07/15/2016 12:25	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161950638002	07/14/2016 10:50	Ann Borg	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201B	07/06/2016 12:14	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201B	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16189182101A	07/07/2016 12:30	Nathan T Morgan	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042502A	07/11/2016 20:20	Daniel S Smith	20
00394	pH	SW-846 9045D modified	1	16189039401A	07/07/2016 12:30	Nathan T Morgan	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042502A	07/07/2016 20:35	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-3 MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444097
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA31 SDG#: DWD88-33MS

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	890	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	890	U	890	2,700	5
10726	Quinoline	91-22-5	830	J	180	890	5
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.214		0.0107	0.107	1
Wet Chemistry	SW-846 9012B		mg/kg		mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	4.3		0.19	0.54	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16187SLE026	07/07/2016 03:20	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16187SLE026	07/06/2016 08:00	Bradley W VanLeuven	1
00159	Mercury	SW-846 7471B	1	161950638002	07/15/2016 12:31	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161950638002	07/14/2016 10:50	Ann Borg	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201B	07/06/2016 12:15	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201B	07/05/2016 09:15	Nancy J Shoop	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444098
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA31 SDG#: DWD88-33MSD

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS Semivolatiles	SW-846 8270D		ug/kg		ug/kg	ug/kg	
10726	2-Chlorobenzaldehyde	89-98-5	180	U	180	890	5
10726	2-Chlorobenzalmalononitrile	2698-41-1	890	U	890	2,700	5
10726	Quinoline	91-22-5	1,000		180	890	5
Metals	SW-846 7471B		mg/kg		mg/kg	mg/kg	
00159	Mercury	7439-97-6	0.189		0.0099	0.0989	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10726	SVOA 8270D microwave	SW-846 8270D	1	16187SLE026	07/07/2016 03:45	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16187SLE026	07/06/2016 08:00	Bradley W VanLeuven	1
00159	Mercury	SW-846 7471B	1	161950638002	07/15/2016 12:33	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161950638002	07/14/2016 10:50	Ann Borg	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-3 SS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444099
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA31 SDG#: DWD88-33SS

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Wet Chemistry	SW-846 7196A		mg/kg		mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	10.7	U	10.7	32.2	20
	Reporting limits were raised due to interference from the sample matrix.						
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042502A	07/11/2016 20:20	Daniel S Smith	20
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042502A	07/07/2016 20:35	Daniel S Smith	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-3 IS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444100
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA31 SDG#: DWD88-33IS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Wet Chemistry	SW-846 7196A		mg/kg	mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	408	10.7	32.2	20
	Reporting limits were raised due to interference from the sample matrix.					
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	6.7	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042502A	07/11/2016 20:20	Daniel S Smith	20
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042502A	07/07/2016 20:35	Daniel S Smith	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-3 PDS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444101
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA31 SDG#: DWD88-33PDS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Wet Chemistry	SW-846 7196A		mg/kg	mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS	18540-29-9	209	10.7	32.2	20
	Reporting limits were raised due to interference from the sample matrix.					
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	6.7	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042502A	07/11/2016 20:20	Daniel S Smith	20
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042502A	07/07/2016 20:35	Daniel S Smith	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-3 DUP Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444102
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA31 SDG#: DWD88-33DUP

CAT No.	Analysis Name		CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals		SW-846 7471B		mg/kg	mg/kg	mg/kg	
00159	Mercury		7439-97-6	0.0327 J	0.0105	0.105	1
Wet Chemistry		SW-846 9012B		mg/kg	mg/kg	mg/kg	
05895	Total Cyanide solid		57-12-5	0.19 U	0.19	0.54	1
		ASTM D1498		m	m	m	
01821	Oxidation Reduction Potential		n.a.	674	10.0	10.0	1
	The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.						
		SW-846 7196A		mg/kg	mg/kg	mg/kg	
00425	Hexavalent Chromium SOLIDS		18540-29-9	10.7 U	10.7	32.2	20
	Reporting limits were raised due to interference from the sample matrix.						
		SW-846 9045D modified		Std. Units	Std. Units	Std. Units	
00394	pH		n.a.	4.75	0.0100	0.0100	1
	The pH was measured in water at 20.6 C.						
Wet Chemistry		SM 2540 G-1997		%	%	%	
00118	Moisture		n.a.	6.7	0.50	0.50	1
00121	Moisture Duplicate		n.a.	6.9	0.50	0.50	1
	The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.						

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00159	Mercury	SW-846 7471B	1	161950638002	07/15/2016 12:29	Damary Valentin	1
10638	Hg - SW, 7471B - U4	SW-846 7471B	1	161950638002	07/14/2016 10:50	Ann Borg	1
05895	Total Cyanide solid	SW-846 9012B	1	16187102201B	07/06/2016 12:57	Dein Bernot	1
05896	Cyanide Solid Distillation	SW-846 9012B	1	16187102201B	07/05/2016 09:15	Nancy J Shoop	1
01821	Oxidation Reduction Potential	ASTM D1498	1	16189182101A	07/07/2016 12:30	Nathan T Morgan	1
00425	Hexavalent Chromium SOLIDS	SW-846 7196A	1	16189042502A	07/11/2016 20:20	Daniel S Smith	20

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 DUP Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444102
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA31 SDG#: DWD88-33DUP

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00394	pH	SW-846 9045D modified	1	16189039401A	07/07/2016 12:30	Nathan T Morgan	1
07825	Hexavalent Cr Extraction	SW-846 3060A	1	16189042502A	07/07/2016 20:35	Daniel S Smith	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1
00121	Moisture Duplicate	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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Analysis Report

Sample Description: BGA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444103
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA32 SDG#: DWD88-34B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	1,420		9.21	42.4	1
06944	Antimony	7440-36-0	0.743	U	0.743	4.24	1
06935	Arsenic	7440-38-2	1.03	U	1.03	4.24	1
06946	Barium	7440-39-3	4.29		0.0350	1.06	1
06947	Beryllium	7440-41-7	0.0711	U	0.0711	1.06	1
06949	Cadmium	7440-43-9	0.0520	U	0.0520	1.06	1
01650	Calcium	7440-70-2	77.9		6.01	42.4	1
06951	Chromium	7440-47-3	1.69	J	0.149	3.18	1
06952	Cobalt	7440-48-4	0.127	U	0.127	1.06	1
06953	Copper	7440-50-8	0.835	J	0.244	2.12	1
01654	Iron	7439-89-6	373		4.37	42.4	1
06955	Lead	7439-92-1	6.24		0.584	3.18	1
01657	Magnesium	7439-95-4	53.5		2.02	21.2	1
06958	Manganese	7439-96-5	3.92		0.0881	1.06	1
06961	Nickel	7440-02-0	0.414	J	0.318	2.12	1
01662	Potassium	7440-09-7	44.7	J	25.4	106	1
06936	Selenium	7782-49-2	0.955	U	0.955	4.24	1
06966	Silver	7440-22-4	0.159	U	0.159	1.06	1
01667	Sodium	7440-23-5	25.4	U	25.4	212	1
06971	Vanadium	7440-62-2	1.83		0.149	1.06	1
06972	Zinc	7440-66-6	3.13	J	0.722	4.24	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0308	U	0.0308	0.212	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06944	Antimony	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06935	Arsenic	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06946	Barium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06947	Beryllium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444103
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BGA32 SDG#: DWD88-34B G

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
01650	Calcium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06951	Chromium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06952	Cobalt	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06953	Copper	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
01654	Iron	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06955	Lead	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
01657	Magnesium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06958	Manganese	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06961	Nickel	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
01662	Potassium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06936	Selenium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06966	Silver	SW-846 6010C	1	161950637002	07/18/2016 20:31	Suzanne M Will	1
01667	Sodium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06971	Vanadium	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06972	Zinc	SW-846 6010C	1	161950637002	07/15/2016 03:15	Matthew R Machtinger	1
06145	Thallium	SW-846 6020A	1	161950637002A	07/15/2016 05:23	Scott P Cuff	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161950637002	07/14/2016 07:00	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: BGA-3 MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444104
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA32 SDG#: DWD88-34MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg	mg/kg	mg/kg	
01643	Aluminum	7429-90-5	1,730	9.30	42.9	1
06944	Antimony	7440-36-0	47.5	0.750	4.29	1
06935	Arsenic	7440-38-2	14.3	1.04	4.29	1
06946	Barium	7440-39-3	212	0.0354	1.07	1
06947	Beryllium	7440-41-7	5.26	0.0718	1.07	1
06949	Cadmium	7440-43-9	5.13	0.0525	1.07	1
01650	Calcium	7440-70-2	478	6.07	42.9	1
06951	Chromium	7440-47-3	21.4	0.150	3.22	1
06952	Cobalt	7440-48-4	51.9	0.129	1.07	1
06953	Copper	7440-50-8	27.3	0.247	2.14	1
01654	Iron	7439-89-6	446	4.42	42.9	1
06955	Lead	7439-92-1	20.4	0.589	3.22	1
01657	Magnesium	7439-95-4	268	2.04	21.4	1
06958	Manganese	7439-96-5	55.7	0.0890	1.07	1
06961	Nickel	7440-02-0	52.4	0.322	2.14	1
01662	Potassium	7440-09-7	1,120	25.6	107	1
06936	Selenium	7782-49-2	13.6	0.965	4.29	1
06966	Silver	7440-22-4	5.64	0.161	1.07	1
01667	Sodium	7440-23-5	1,070	25.6	214	1
06971	Vanadium	7440-62-2	52.6	0.150	1.07	1
06972	Zinc	7440-66-6	52.8	0.729	4.29	1
	SW-846 6020A		mg/kg	mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.405	0.0311	0.214	2
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	6.7	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06944	Antimony	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06935	Arsenic	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06946	Barium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06947	Beryllium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444104
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA32 SDG#: DWD88-34MS

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
01650	Calcium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06951	Chromium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06952	Cobalt	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06953	Copper	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
01654	Iron	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06955	Lead	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
01657	Magnesium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06958	Manganese	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06961	Nickel	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
01662	Potassium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06936	Selenium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06966	Silver	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
01667	Sodium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06971	Vanadium	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06972	Zinc	SW-846 6010C	1	161950637002	07/15/2016 03:25	Matthew R Machtinger	1
06145	Thallium	SW-846 6020A	1	161950637002A	07/15/2016 05:29	Scott P Cuff	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161950637002	07/14/2016 07:00	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: BGA-3 MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444105
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA32 SDG#: DWD88-34MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg	mg/kg	mg/kg	
01643	Aluminum	7429-90-5	2,060	9.30	42.9	1
06944	Antimony	7440-36-0	46.8	0.750	4.29	1
06935	Arsenic	7440-38-2	14.0	1.04	4.29	1
06946	Barium	7440-39-3	217	0.0354	1.07	1
06947	Beryllium	7440-41-7	5.38	0.0718	1.07	1
06949	Cadmium	7440-43-9	5.09	0.0525	1.07	1
01650	Calcium	7440-70-2	489	6.07	42.9	1
06951	Chromium	7440-47-3	22.0	0.150	3.22	1
06952	Cobalt	7440-48-4	51.5	0.129	1.07	1
06953	Copper	7440-50-8	28.3	0.247	2.14	1
01654	Iron	7439-89-6	512	4.42	42.9	1
06955	Lead	7439-92-1	20.7	0.589	3.22	1
01657	Magnesium	7439-95-4	280	2.04	21.4	1
06958	Manganese	7439-96-5	56.5	0.0890	1.07	1
06961	Nickel	7440-02-0	52.3	0.322	2.14	1
01662	Potassium	7440-09-7	1,110	25.6	107	1
06936	Selenium	7782-49-2	14.4	0.965	4.29	1
06966	Silver	7440-22-4	5.58	0.161	1.07	1
01667	Sodium	7440-23-5	1,060	25.6	214	1
06971	Vanadium	7440-62-2	53.7	0.150	1.07	1
06972	Zinc	7440-66-6	53.5	0.729	4.29	1
	SW-846 6020A		mg/kg	mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.414	0.0311	0.214	2
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	6.7	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06944	Antimony	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06935	Arsenic	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06946	Barium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06947	Beryllium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444105
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA32 SDG#: DWD88-34MSD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
01650	Calcium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06951	Chromium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06952	Cobalt	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06953	Copper	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
01654	Iron	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06955	Lead	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
01657	Magnesium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06958	Manganese	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06961	Nickel	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
01662	Potassium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06936	Selenium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06966	Silver	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
01667	Sodium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06971	Vanadium	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06972	Zinc	SW-846 6010C	1	161950637002	07/15/2016 03:28	Matthew R Machtinger	1
06145	Thallium	SW-846 6020A	1	161950637002A	07/15/2016 05:30	Scott P Cuff	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161950637002	07/14/2016 07:00	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 DUP Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444106
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA32 SDG#: DWD88-34DUP

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	1,330		9.12	42.0	1
06944	Antimony	7440-36-0	0.736	U	0.736	4.20	1
06935	Arsenic	7440-38-2	1.02	U	1.02	4.20	1
06946	Barium	7440-39-3	3.93		0.0347	1.05	1
06947	Beryllium	7440-41-7	0.0704	U	0.0704	1.05	1
06949	Cadmium	7440-43-9	0.0515	U	0.0515	1.05	1
01650	Calcium	7440-70-2	80.1		5.95	42.0	1
06951	Chromium	7440-47-3	1.56	J	0.147	3.15	1
06952	Cobalt	7440-48-4	0.126	U	0.126	1.05	1
06953	Copper	7440-50-8	0.782	J	0.242	2.10	1
01654	Iron	7439-89-6	352		4.33	42.0	1
06955	Lead	7439-92-1	5.45		0.578	3.15	1
01657	Magnesium	7439-95-4	49.9		2.00	21.0	1
06958	Manganese	7439-96-5	2.82		0.0872	1.05	1
06961	Nickel	7440-02-0	0.370	J	0.315	2.10	1
01662	Potassium	7440-09-7	43.6	J	25.1	105	1
06936	Selenium	7782-49-2	0.946	U	0.946	4.20	1
06966	Silver	7440-22-4	0.162	J	0.158	1.05	1
01667	Sodium	7440-23-5	25.1	U	25.1	210	1
06971	Vanadium	7440-62-2	1.47		0.147	1.05	1
06972	Zinc	7440-66-6	3.50	J	0.715	4.20	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0305	U	0.0305	0.210	2
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06944	Antimony	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06935	Arsenic	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06946	Barium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06947	Beryllium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 DUP Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444106
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA32 SDG#: DWD88-34DUP

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
01650	Calcium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06951	Chromium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06952	Cobalt	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06953	Copper	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
01654	Iron	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06955	Lead	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
01657	Magnesium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06958	Manganese	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06961	Nickel	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
01662	Potassium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06936	Selenium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06966	Silver	SW-846 6010C	1	161950637002	07/15/2016 15:00	Cindy M Gehman	1
01667	Sodium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06971	Vanadium	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06972	Zinc	SW-846 6010C	1	161950637002	07/15/2016 03:22	Matthew R Machtinger	1
06145	Thallium	SW-846 6020A	1	161950637002A	07/15/2016 05:27	Scott P Cuff	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161950637002	07/14/2016 07:00	James L Mertz	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444107
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA33 SDG#: DWD88-35B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	44	U	44	130	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	44	U	44	130	1
13413	1,3-Dinitrobenzene	99-65-0	43	U	43	130	1
13413	2,4-Dinitrotoluene	121-14-2	43	U	43	130	1
13413	2,6-Dinitrotoluene	606-20-2	120	U	120	130	1
13413	HM	2691-41-0	230	U	230	320	1
13413	Nitrobenzene	98-95-3	110	U	110	320	1
13413	Nitroglycerin	55-63-0	850	U	850	2,600	1
13413	2-Nitrotoluene	88-72-2	80	U	80	130	1
13413	3-Nitrotoluene	99-08-1	120	U	120	130	1
13413	4-Nitrotoluene	99-99-0	120	U	120	130	1
13413	PETN	78-11-5	850	U	850	2,600	1
13413	RD	121-82-4	43	U	43	130	1
13413	Tetryl	479-45-8	110	U	110	320	1
13413	1,3,5-Trinitrobenzene	99-35-4	43	U	43	130	1
13413	2,4,6-Trinitrotoluene	118-96-7	47	U	47	130	1
Perchlorate	**SW-846 6850 1/2007**		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS The stated QC limits are advisory.	14797-73-0	2.3	U	2.3	5.4	1
Wet Chemistry	**SM 2540 G-1997**		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	08/17/2016 03:33	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 14:38	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161890045A	07/09/2016 06:50	Maria Davenport	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	07/08/2016 21:30	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444108
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA33 SDG#: DWD88-35MS

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	900		42	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	960		42	120	1
13413	1,3-Dinitrobenzene	99-65-0	800		41	120	1
13413	2,4-Dinitrotoluene	121-14-2	740		41	120	1
13413	2,6-Dinitrotoluene	606-20-2	780		120	120	1
13413	HM	2691-41-0	1,700		220	310	1
13413	Nitrobenzene	98-95-3	840		100	310	1
13413	Nitroglycerin	55-63-0	9,600		830	2,500	1
13413	2-Nitrotoluene	88-72-2	900		78	120	1
13413	3-Nitrotoluene	99-08-1	830		110	120	1
13413	4-Nitrotoluene	99-99-0	850		110	120	1
13413	PETN	78-11-5	15,000		830	2,500	1
13413	RD	121-82-4	1,400		41	120	1
13413	Tetryl	479-45-8	880		100	310	1
13413	1,3,5-Trinitrobenzene	99-35-4	110	J	41	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	730		45	120	1
Perchlorate	SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS The stated QC limits are advisory.	14797-73-0	95		2.3	5.4	1
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	08/17/2016 04:15	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 14:51	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161890045A	07/09/2016 06:50	Maria Davenport	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	07/08/2016 21:30	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444109
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA33 SDG#: DWD88-35MSD

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
Explosives	**SW-846 8330B Rev.2 Oct. 2006**		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	1,000		44	130	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	1,100		44	130	1
13413	1,3-Dinitrobenzene	99-65-0	920		43	130	1
13413	2,4-Dinitrotoluene	121-14-2	830		43	130	1
13413	2,6-Dinitrotoluene	606-20-2	910		120	130	1
13413	HM	2691-41-0	1,700		230	320	1
13413	Nitrobenzene	98-95-3	910		110	320	1
13413	Nitroglycerin	55-63-0	10,000		860	2,600	1
13413	2-Nitrotoluene	88-72-2	1,000		80	130	1
13413	3-Nitrotoluene	99-08-1	940		120	130	1
13413	4-Nitrotoluene	99-99-0	950		120	130	1
13413	PETN	78-11-5	17,000		860	2,600	1
13413	RD	121-82-4	1,600		43	130	1
13413	Tetryl	479-45-8	930		110	320	1
13413	1,3,5-Trinitrobenzene	99-35-4	120	J	43	130	1
13413	2,4,6-Trinitrotoluene	118-96-7	800		47	130	1
Perchlorate	**SW-846 6850 1/2007**		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS The stated QC limits are advisory.	14797-73-0	85		2.3	5.4	1
Wet Chemistry	**SM 2540 G-1997**		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	08/17/2016 04:57	Jessica L Miller	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 15:03	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161890045A	07/09/2016 06:50	Maria Davenport	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161890022A	07/08/2016 21:30	David V Hershey Jr	1
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444110
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA34 SDG#: DWD88-36B G

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg		ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	4	U	4	13	1.25
Wet Chemistry	SM 2540 G-1997		%		%	%	
00118	Moisture	n.a.	6.7		0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161801AA	06/28/2016 10:33	Jennifer Howe	1.25
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:36	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: BGA-3 MS Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444111
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA34 SDG#: DWD88-36MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg	ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	150	4	13	1.21
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	6.7	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161801AA	06/28/2016 10:55	Jennifer Howe	1.21
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:38	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3 MSD Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8444112
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 16:45 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BGA34 SDG#: DWD88-36MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/kg	ug/kg	ug/kg	
11995	4-Methyl-2-pentanone	108-10-1	120	4	13	1.23
Wet Chemistry	SM 2540 G-1997		%	%	%	
00118	Moisture	n.a.	6.7	0.50	0.50	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	A161801AA	06/28/2016 11:18	Jennifer Howe	1.23
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	1	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07320	GC/MS - LL DIH2O Encore Prep	SW-846 5035A	2	201617641613	06/24/2016 18:04	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617641613	06/24/2016 17:40	atelyn C Shober	n.a.
00118	Moisture	SM 2540 G-1997	1	16232820001A	08/19/2016 20:37	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444113
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25FD SDG#: DWD88-37FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/l		ug/l	ug/l	
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
GC/MS Semivolatiles	SW-846 8270D		ug/l		ug/l	ug/l	
10461	2-Chlorobenzaldehyde	89-98-5	1	U	1	5	1
02395	2-Chlorobenzalmalononitrile	2698-41-1	5	U	5	14	1
10461	Quinoline	91-22-5	1	U	1	5	1
	The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/l		ug/l	ug/l	
13395	4-Amino-2,6-Dinitrotoluene	19406-51-0	0.23	U	0.23	0.60	1
13395	2-Amino-4,6-Dinitrotoluene	35572-78-2	0.23	U	0.23	0.60	1
13395	1,3-Dinitrobenzene	99-65-0	0.25	U	0.25	0.60	1
13395	2,4-Dinitrotoluene	121-14-2	0.20	U	0.20	0.60	1
13395	2,6-Dinitrotoluene	606-20-2	0.40	U	0.40	0.60	1
13395	HM	2691-41-0	0.20	U	0.20	0.60	1
13395	Nitrobenzene	98-95-3	0.44	U	0.44	0.90	1
13395	Nitroglycerin	55-63-0	3.0	U	3.0	10	1
13395	2-Nitrotoluene	88-72-2	0.40	U	0.40	0.80	1
13395	3-Nitrotoluene	99-08-1	0.32	U	0.32	0.70	1
13395	4-Nitrotoluene	99-99-0	0.32	U	0.32	0.70	1
13395	PETN	78-11-5	3.0	U	3.0	10	1
13395	RD	121-82-4	0.40	U	0.40	0.80	1
13395	Tetryl	479-45-8	0.44	U	0.44	0.90	1
13395	1,3,5-Trinitrobenzene	99-35-4	0.22	U	0.22	0.60	1
13395	2,4,6-Trinitrotoluene	118-96-7	0.40	U	0.40	0.80	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Perchlorate	SW-846 6850 1/2007		ug/l		ug/l	ug/l	
06386	Perchlorate in Water LC/MS/MS	14797-73-0	0.20	U	0.20	1.0	1
Metals	SW-846 6010C		mg/l		mg/l	mg/l	
01743	Aluminum	7429-90-5	0.101	J	0.0868	0.400	1
07044	Antimony	7440-36-0	0.0077	U	0.0077	0.0400	1
07035	Arsenic	7440-38-2	0.0097	U	0.0097	0.0400	1
07046	Barium	7440-39-3	0.0011	U	0.0011	0.0100	1
07047	Beryllium	7440-41-7	0.00067	U	0.00067	0.0100	1
07049	Cadmium	7440-43-9	0.00049	U	0.00049	0.0100	1
01750	Calcium	7440-70-2	0.143	J	0.0382	0.400	1
07051	Chromium	7440-47-3	0.0018	U	0.0018	0.0300	1
07052	Cobalt	7440-48-4	0.0019	U	0.0019	0.0100	1
07053	Copper	7440-50-8	0.0050	J	0.0041	0.0200	1
01754	Iron	7439-89-6	0.0747	U	0.0747	0.400	1
07055	Lead	7439-92-1	0.0062	U	0.0062	0.0300	1
01757	Magnesium	7439-95-4	0.0190	U	0.0190	0.200	1
07058	Manganese	7439-96-5	0.0018	U	0.0018	0.0100	1
07061	Nickel	7440-02-0	0.0028	U	0.0028	0.0200	1
01762	Potassium	7440-09-7	0.160	U	0.160	1.00	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444113
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

D25FD SDG#: DWD88-37FB

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals		SW-846 6010C		mg/l	mg/l	mg/l	
07036	Selenium		7782-49-2	0.0097 U	0.0097	0.0400	1
07066	Silver		7440-22-4	0.0019 U	0.0019	0.0100	1
01767	Sodium		7440-23-5	0.173 U	0.173	2.00	1
07071	Vanadium		7440-62-2	0.0016 U	0.0016	0.0100	1
07072	Zinc		7440-66-6	0.0054 U	0.0054	0.0400	1
		SW-846 6020A		mg/l	mg/l	mg/l	
06045	Thallium		7440-28-0	0.00016 U	0.00016	0.0010	1
		SW-846 7470A		mg/l	mg/l	mg/l	
00259	Mercury		7439-97-6	0.000050 U	0.000050	0.00020	1
Wet Chemistry		SW-846 9012B		mg/l	mg/l	mg/l	
08255	Total Cyanide water		57-12-5	0.0050 U	0.0050	0.010	1
		SW-846 7196A		mg/l	mg/l	mg/l	
00276	Hexavalent Chromium		18540-29-9	0.0070 U	0.0070	0.020	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	L161872AA	07/05/2016 20:09	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 20:09	Matthew S rause	1
02395	CS Compound	SW-846 8270D	1	16178WAA026	06/28/2016 14:22	Joseph M Gambler	1
10461	SVOA 8270D water	SW-846 8270D	1	16178WAD026	07/09/2016 01:50	Catherine E Bachman	1
10475	BNA Water Extraction CS BZ	SW-846 3510C	1	16178WAA026	06/27/2016 21:00	aren L Beyer	1
11010	8270D BNA Extraction	SW-846 3510C	1	16178WAD026	06/28/2016 09:00	Andrea J ramer	1
13395	Nitroaromatics/Amines 8330B w	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	08/01/2016 01:58	James H Place	1
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	161800005A	06/28/2016 16:47	Richard A Shober	1
13432	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	06/28/2016 11:15	Edwin Ortiz	1
01743	Aluminum	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07044	Antimony	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07035	Arsenic	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07046	Barium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-5-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444113
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 11:15 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D25FD SDG#: DWD88-37FB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07047	Beryllium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07049	Cadmium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
01750	Calcium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07051	Chromium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07052	Cobalt	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07053	Copper	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
01754	Iron	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07055	Lead	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07058	Manganese	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07061	Nickel	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07036	Selenium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07066	Silver	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07071	Vanadium	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
07072	Zinc	SW-846 6010C	1	161790635001	06/28/2016 21:30	Suzanne M Will	1
06045	Thallium	SW-846 6020A	1	161790639001A	06/28/2016 23:50	Tara L Snyder	1
00259	Mercury	SW-846 7470A	1	161795713002	06/29/2016 09:09	Damary Valentin	1
10635	ICP-WW, 3005A tot rec - U4	SW-846 3005A	1	161790635001	06/28/2016 07:40	James L Mertz	1
10639	ICPMS - Water, 3020A - U4	SW-846 3020A	1	161790639001	06/28/2016 07:40	James L Mertz	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	161795713002	06/28/2016 09:50	JoElla L Rice	1
08255	Total Cyanide water	SW-846 9012B	1	16180117101A	06/28/2016 13:59	Dein Bernot	1
08256	Cyanide Water Distillation	SW-846 9012B	1	16180117101A	06/28/2016 09:30	Nancy J Shoop	1
00276	Hexavalent Chromium	SW-846 7196A	1	16176027601A	06/24/2016 11:50	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

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Analysis Report

Sample Description: TB-3 Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444114
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 08:00

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

TB-03 SDG#: DWD88-38TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/l		ug/l	ug/l	
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	4-Methyl-2-pentanone	SW-846 8260C	1	L161872AA	07/05/2016 20:31	Matthew S rause	1
01163	GC/MS VOA Water Prep 8260C	SW-846 5030B	1	L161872AA	07/05/2016 20:31	Matthew S rause	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444115
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 14:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22EB SDG#: DWD88-39EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/l		ug/l	ug/l	
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
GC/MS Semivolatiles	SW-846 8270D		ug/l		ug/l	ug/l	
10461	2-Chlorobenzaldehyde	89-98-5	1	U	1	5	1
02395	2-Chlorobenzalmalononitrile	2698-41-1	5	U	5	15	1
10461	Quinoline	91-22-5	1	U	1	5	1
	The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/l		ug/l	ug/l	
13395	4-Amino-2,6-Dinitrotoluene	19406-51-0	0.23	U	0.23	0.60	1
13395	2-Amino-4,6-Dinitrotoluene	35572-78-2	0.23	U	0.23	0.60	1
13395	1,3-Dinitrobenzene	99-65-0	0.25	U	0.25	0.60	1
13395	2,4-Dinitrotoluene	121-14-2	0.20	U	0.20	0.60	1
13395	2,6-Dinitrotoluene	606-20-2	0.40	U	0.40	0.60	1
13395	HM	2691-41-0	0.20	U	0.20	0.60	1
13395	Nitrobenzene	98-95-3	0.44	U	0.44	0.90	1
13395	Nitroglycerin	55-63-0	3.0	U	3.0	10	1
13395	2-Nitrotoluene	88-72-2	0.40	U	0.40	0.80	1
13395	3-Nitrotoluene	99-08-1	0.32	U	0.32	0.70	1
13395	4-Nitrotoluene	99-99-0	0.32	U	0.32	0.70	1
13395	PETN	78-11-5	3.0	U	3.0	10	1
13395	RD	121-82-4	0.40	U	0.40	0.80	1
13395	Tetryl	479-45-8	0.44	U	0.44	0.90	1
13395	1,3,5-Trinitrobenzene	99-35-4	0.22	U	0.22	0.60	1
13395	2,4,6-Trinitrotoluene	118-96-7	0.40	U	0.40	0.80	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Perchlorate	SW-846 6850 1/2007		ug/l		ug/l	ug/l	
06386	Perchlorate in Water LC/MS/MS	14797-73-0	0.20	U	0.20	1.0	1
Metals	SW-846 6010C		mg/l		mg/l	mg/l	
01743	Aluminum	7429-90-5	0.0868	U	0.0868	0.400	1
07044	Antimony	7440-36-0	0.0077	U	0.0077	0.0400	1
07035	Arsenic	7440-38-2	0.0097	U	0.0097	0.0400	1
07046	Barium	7440-39-3	0.0011	U	0.0011	0.0100	1
07047	Beryllium	7440-41-7	0.00067	U	0.00067	0.0100	1
07049	Cadmium	7440-43-9	0.00049	U	0.00049	0.0100	1
01750	Calcium	7440-70-2	0.0480	J	0.0382	0.400	1
07051	Chromium	7440-47-3	0.0018	U	0.0018	0.0300	1
07052	Cobalt	7440-48-4	0.0019	U	0.0019	0.0100	1
07053	Copper	7440-50-8	0.0042	J	0.0041	0.0200	1
01754	Iron	7439-89-6	0.0747	U	0.0747	0.400	1
07055	Lead	7439-92-1	0.0062	U	0.0062	0.0300	1
01757	Magnesium	7439-95-4	0.0190	U	0.0190	0.200	1
07058	Manganese	7439-96-5	0.0018	U	0.0018	0.0100	1
07061	Nickel	7440-02-0	0.0028	U	0.0028	0.0200	1
01762	Potassium	7440-09-7	0.160	U	0.160	1.00	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444115
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 14:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22EB SDG#: DWD88-39EB

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals		SW-846 6010C		mg/l	mg/l	mg/l	
07036	Selenium		7782-49-2	0.0097 U	0.0097	0.0400	1
07066	Silver		7440-22-4	0.0019 U	0.0019	0.0100	1
01767	Sodium		7440-23-5	0.173 U	0.173	2.00	1
07071	Vanadium		7440-62-2	0.0016 U	0.0016	0.0100	1
07072	Zinc		7440-66-6	0.0054 U	0.0054	0.0400	1
		SW-846 6020A		mg/l	mg/l	mg/l	
06045	Thallium		7440-28-0	0.00016 U	0.00016	0.0010	1
		SW-846 7470A		mg/l	mg/l	mg/l	
00259	Mercury		7439-97-6	0.000050 U	0.000050	0.00020	1
Wet Chemistry		SW-846 9012B		mg/l	mg/l	mg/l	
08255	Total Cyanide water		57-12-5	0.0050 U	0.0050	0.010	1
		SW-846 7196A		mg/l	mg/l	mg/l	
00276	Hexavalent Chromium		18540-29-9	0.0070 U	0.0070	0.020	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	L161872AA	07/05/2016 20:52	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 20:52	Matthew S rause	1
02395	CS Compound	SW-846 8270D	1	16178WAA026	06/28/2016 14:48	Joseph M Gambler	1
10461	SVOA 8270D water	SW-846 8270D	1	16178WAD026	07/09/2016 02:19	Catherine E Bachman	1
10475	BNA Water Extraction CS BZ	SW-846 3510C	1	16178WAA026	06/27/2016 21:00	aren L Beyer	1
11010	8270D BNA Extraction	SW-846 3510C	1	16178WAD026	06/28/2016 09:00	Andrea J ramer	1
13395	Nitroaromatics/Amines 8330B w	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	08/01/2016 02:40	James H Place	1
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	161800005A	06/28/2016 17:00	Richard A Shober	1
13432	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	06/28/2016 11:15	Edwin Ortiz	1
01743	Aluminum	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07044	Antimony	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07035	Arsenic	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07046	Barium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1

*=This limit was used in the evaluation of the final result

Sample Description: DU-2-2-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444115
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 14:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

D22EB SDG#: DWD88-39EB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07047	Beryllium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07049	Cadmium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
01750	Calcium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07051	Chromium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07052	Cobalt	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07053	Copper	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
01754	Iron	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07055	Lead	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07058	Manganese	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07061	Nickel	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07036	Selenium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07066	Silver	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07071	Vanadium	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
07072	Zinc	SW-846 6010C	1	161790635001	06/28/2016 21:39	Suzanne M Will	1
06045	Thallium	SW-846 6020A	1	161790639001A	06/28/2016 23:52	Tara L Snyder	1
00259	Mercury	SW-846 7470A	1	161795713002	06/29/2016 09:11	Damary Valentin	1
10635	ICP-WW, 3005A tot rec - U4	SW-846 3005A	1	161790635001	06/28/2016 07:40	James L Mertz	1
10639	ICPMS - Water, 3020A - U4	SW-846 3020A	1	161790639001	06/28/2016 07:40	James L Mertz	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	161795713002	06/28/2016 09:50	JoElla L Rice	1
08255	Total Cyanide water	SW-846 9012B	1	16180117101A	06/28/2016 14:00	Dein Bernot	1
08256	Cyanide Water Distillation	SW-846 9012B	1	16180117101A	06/28/2016 09:30	Nancy J Shoop	1
00276	Hexavalent Chromium	SW-846 7196A	1	16176027601A	06/24/2016 11:50	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444116
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 17:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BG3EB SDG#: DWD88-40EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS olatiles	SW-846 8260C		ug/l		ug/l	ug/l	
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
GC/MS Semivolatiles	SW-846 8270D		ug/l		ug/l	ug/l	
10461	2-Chlorobenzaldehyde	89-98-5	1	U	1	5	1
02395	2-Chlorobenzalmalononitrile	2698-41-1	5	U	5	14	1
10461	Quinoline	91-22-5	1	U	1	5	1
	The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/l		ug/l	ug/l	
13395	4-Amino-2,6-Dinitrotoluene	19406-51-0	0.23	U	0.23	0.60	1
13395	2-Amino-4,6-Dinitrotoluene	35572-78-2	0.23	U	0.23	0.60	1
13395	1,3-Dinitrobenzene	99-65-0	0.25	U	0.25	0.60	1
13395	2,4-Dinitrotoluene	121-14-2	0.20	U	0.20	0.60	1
13395	2,6-Dinitrotoluene	606-20-2	0.40	U	0.40	0.60	1
13395	HM	2691-41-0	0.20	U	0.20	0.60	1
13395	Nitrobenzene	98-95-3	0.44	U	0.44	0.90	1
13395	Nitroglycerin	55-63-0	3.0	U	3.0	10	1
13395	2-Nitrotoluene	88-72-2	0.40	U	0.40	0.80	1
13395	3-Nitrotoluene	99-08-1	0.32	U	0.32	0.70	1
13395	4-Nitrotoluene	99-99-0	0.32	U	0.32	0.70	1
13395	PETN	78-11-5	3.0	U	3.0	10	1
13395	RD	121-82-4	0.40	U	0.40	0.80	1
13395	Tetryl	479-45-8	0.44	U	0.44	0.90	1
13395	1,3,5-Trinitrobenzene	99-35-4	0.22	U	0.22	0.60	1
13395	2,4,6-Trinitrotoluene	118-96-7	0.40	U	0.40	0.80	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Perchlorate	SW-846 6850 1/2007		ug/l		ug/l	ug/l	
06386	Perchlorate in Water LC/MS/MS	14797-73-0	0.20	U	0.20	1.0	1
Metals	SW-846 6010C		mg/l		mg/l	mg/l	
01743	Aluminum	7429-90-5	0.0868	U	0.0868	0.400	1
07044	Antimony	7440-36-0	0.0077	U	0.0077	0.0400	1
07035	Arsenic	7440-38-2	0.0097	U	0.0097	0.0400	1
07046	Barium	7440-39-3	0.0011	U	0.0011	0.0100	1
07047	Beryllium	7440-41-7	0.00067	U	0.00067	0.0100	1
07049	Cadmium	7440-43-9	0.00049	U	0.00049	0.0100	1
01750	Calcium	7440-70-2	0.0529	J	0.0382	0.400	1
07051	Chromium	7440-47-3	0.0018	U	0.0018	0.0300	1
07052	Cobalt	7440-48-4	0.0019	U	0.0019	0.0100	1
07053	Copper	7440-50-8	0.0050	J	0.0041	0.0200	1
01754	Iron	7439-89-6	0.0747	U	0.0747	0.400	1
07055	Lead	7439-92-1	0.0062	U	0.0062	0.0300	1
01757	Magnesium	7439-95-4	0.0190	U	0.0190	0.200	1
07058	Manganese	7439-96-5	0.0018	U	0.0018	0.0100	1
07061	Nickel	7440-02-0	0.0028	U	0.0028	0.0200	1
01762	Potassium	7440-09-7	0.160	U	0.160	1.00	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444116
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 17:00 by JC

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

BG3EB SDG#: DWD88-40EB

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals		SW-846 6010C		mg/l	mg/l	mg/l	
07036	Selenium		7782-49-2	0.0097 U	0.0097	0.0400	1
07066	Silver		7440-22-4	0.0019 U	0.0019	0.0100	1
01767	Sodium		7440-23-5	0.173 U	0.173	2.00	1
07071	Vanadium		7440-62-2	0.0016 U	0.0016	0.0100	1
07072	Zinc		7440-66-6	0.0054 U	0.0054	0.0400	1
		SW-846 6020A		mg/l	mg/l	mg/l	
06045	Thallium		7440-28-0	0.00016 U	0.00016	0.0010	1
		SW-846 7470A		mg/l	mg/l	mg/l	
00259	Mercury		7439-97-6	0.000050 U	0.000050	0.00020	1
Wet Chemistry		SW-846 9012B		mg/l	mg/l	mg/l	
08255	Total Cyanide water		57-12-5	0.0050 U	0.0050	0.010	1
		SW-846 7196A		mg/l	mg/l	mg/l	
00276	Hexavalent Chromium		18540-29-9	0.0070 U	0.0070	0.020	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	4-Methyl-2-pentanone 8260C	SW-846 8260C	1	L161872AA	07/05/2016 21:14	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 21:14	Matthew S rause	1
02395	CS Compound	SW-846 8270D	1	16178WAA026	06/28/2016 15:15	Joseph M Gambler	1
10461	SVOA 8270D water	SW-846 8270D	1	16178WAD026	07/09/2016 02:47	Catherine E Bachman	1
10475	BNA Water Extraction CS BZ	SW-846 3510C	1	16178WAA026	06/27/2016 21:00	aren L Beyer	1
11010	8270D BNA Extraction	SW-846 3510C	1	16178WAD026	06/28/2016 09:00	Andrea J ramer	1
13395	Nitroaromatics/Amines 8330B w	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	08/01/2016 04:05	James H Place	1
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	161800005A	06/28/2016 17:13	Richard A Shober	1
13432	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	161780001A	06/28/2016 11:15	Edwin Ortiz	1
01743	Aluminum	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07044	Antimony	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07035	Arsenic	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07046	Barium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1

*=This limit was used in the evaluation of the final result

Sample Description: BGA-3-EB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8444116
LL Group # 1675877
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/23/2016 17:00 by JC

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 08/29/2016 09:12

BG3EB SDG#: DWD88-40EB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07047	Beryllium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07049	Cadmium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
01750	Calcium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07051	Chromium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07052	Cobalt	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07053	Copper	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
01754	Iron	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07055	Lead	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07058	Manganese	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07061	Nickel	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07036	Selenium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07066	Silver	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07071	Vanadium	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
07072	Zinc	SW-846 6010C	1	161790635001	06/28/2016 21:42	Suzanne M Will	1
06045	Thallium	SW-846 6020A	1	1617906390001A	06/28/2016 23:54	Tara L Snyder	1
00259	Mercury	SW-846 7470A	1	161795713002	06/29/2016 09:13	Damary Valentin	1
10635	ICP-WW, 3005A tot rec - U4	SW-846 3005A	1	161790635001	06/28/2016 07:40	James L Mertz	1
10639	ICPMS - Water, 3020A - U4	SW-846 3020A	1	161790639001	06/28/2016 07:40	James L Mertz	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	161795713002	06/28/2016 09:50	JoElla L Rice	1
08255	Total Cyanide water	SW-846 9012B	2	16181117101A	07/02/2016 15:32	Brianna A White	1
08256	Cyanide Water Distillation	SW-846 9012B	2	16181117101A	06/29/2016 14:45	Barbara A Washington	1
00276	Hexavalent Chromium	SW-846 7196A	1	16176027601A	06/24/2016 11:50	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:12

Group Number: 1675877

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/kg		ug/kg	ug/kg
Batch number: A161801AA	Sample number s : 8444110-8444112			
4-Methyl-2-pentanone	3	U	3	10
Batch number: A161802AA	Sample number s : 8444062,8444066,8444070,8444085-8444087			
4-Methyl-2-pentanone	3	U	3	10
Batch number: B161811AA	Sample number s : 8444054,8444091,8444095			
4-Methyl-2-pentanone	3	U	3	10
Batch number: R161811AA	Sample number s : 8444058			
4-Methyl-2-pentanone	150	U	150	500
	ug/l		ug/l	ug/l
Batch number: L161872AA	Sample number s : 8444113-8444116			
4-Methyl-2-pentanone	3	U	3	10
	ug/kg		ug/kg	ug/kg
Batch number: 16184SLC026	Sample number s : 8444051,8444055,8444059,8444063,8444067,8444071-8444073,8444088,8444092			
2-Chlorobenzaldehyde	33	U	33	170
2-Chlorobenzalmalononitrile	170	U	170	500
Quinoline	33	U	33	170
Batch number: 16187SLE026	Sample number s : 8444096-8444098			
2-Chlorobenzaldehyde	33	U	33	170
2-Chlorobenzalmalononitrile	170	U	170	500
Quinoline	33	U	33	170
Batch number: 16194SLB026	Sample number s : 8444067			
2-Chlorobenzaldehyde	33	U	33	170
2-Chlorobenzalmalononitrile	170	U	170	500
Quinoline	33	U	33	170
	ug/l		ug/l	ug/l
Batch number: 16178WAA026	Sample number s : 8444113,8444115-8444116			
2-Chlorobenzalmalononitrile	5	U	5	15
Batch number: 16178WAD026	Sample number s : 8444113,8444115-8444116			
2-Chlorobenzaldehyde	1	U	1	5
Quinoline	1	U	1	5
	ug/kg		ug/kg	ug/kg
Batch number: 161880009A	Sample number s : 8444053,8444057,8444061,8444065,8444069,8444082-8444084			
4-Amino-2,6-Dinitrotoluene	41	U	41	120
2-Amino-4,6-Dinitrotoluene	41	U	41	120
1,3-Dinitrobenzene	40	U	40	120
2,4-Dinitrotoluene	40	U	40	120

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Method Blank continued

Analysis Name	Result		MDL**	LOQ
	ug/kg		ug/kg	ug/kg
2,6-Dinitrotoluene	110	U	110	120
HM	210	U	210	300
Nitrobenzene	100	U	100	300
Nitroglycerin	800	U	800	2,400
2-Nitrotoluene	75	U	75	120
3-Nitrotoluene	110	U	110	120
4-Nitrotoluene	110	U	110	120
PETN	800	U	800	2,400
RD	40	U	40	120
Tetryl	100	U	100	300
1,3,5-Trinitrobenzene	40	U	40	120
2,4,6-Trinitrotoluene	44	U	44	120
Batch number: 161890022A	Sample number s : 8444090,8444094,8444107-8444109			
4-Amino-2,6-Dinitrotoluene	41	U	41	120
2-Amino-4,6-Dinitrotoluene	41	U	41	120
1,3-Dinitrobenzene	40	U	40	120
2,4-Dinitrotoluene	40	U	40	120
2,6-Dinitrotoluene	110	U	110	120
HM	210	U	210	300
Nitrobenzene	100	U	100	300
Nitroglycerin	800	U	800	2,400
2-Nitrotoluene	75	U	75	120
3-Nitrotoluene	110	U	110	120
4-Nitrotoluene	110	U	110	120
PETN	800	U	800	2,400
RD	40	U	40	120
Tetryl	100	U	100	300
1,3,5-Trinitrobenzene	40	U	40	120
2,4,6-Trinitrotoluene	44	U	44	120
	ug/l		ug/l	ug/l
Batch number: 161780001A	Sample number s : 8444113,8444115-8444116			
4-Amino-2,6-Dinitrotoluene	0.23	U	0.23	0.60
2-Amino-4,6-Dinitrotoluene	0.23	U	0.23	0.60
1,3-Dinitrobenzene	0.25	U	0.25	0.60
2,4-Dinitrotoluene	0.20	U	0.20	0.60
2,6-Dinitrotoluene	0.40	U	0.40	0.60
HM	0.20	U	0.20	0.60
Nitrobenzene	0.44	U	0.44	0.60
Nitroglycerin	3.0	U	3.0	10
2-Nitrotoluene	0.40	U	0.40	0.60
3-Nitrotoluene	0.32	U	0.32	0.60
4-Nitrotoluene	0.32	U	0.32	0.60
PETN	3.0	U	3.0	10
RD	0.40	U	0.40	0.60
Tetryl	0.44	U	0.44	0.60
1,3,5-Trinitrobenzene	0.22	U	0.22	0.60
2,4,6-Trinitrotoluene	0.40	U	0.40	0.60
	ug/kg		ug/kg	ug/kg
Batch number: 161880035A	Sample number s : 8444053,8444057,8444061,8444065,8444069,8444082-8444084			

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Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:12

Group Number: 1675877

Method Blank continued

Analysis Name	Result		MDL**	LOQ
	ug/kg		ug/kg	ug/kg
Perchlorate in Soil LC/MS/MS	2.1	U	2.1	5.0
Batch number: 161890045A	Sample number s : 8444090,8444094,8444107-8444109			
Perchlorate in Soil LC/MS/MS	2.1	U	2.1	5.0
	ug/l		ug/l	ug/l
Batch number: 161800005A	Sample number s : 8444113,8444115-8444116			
Perchlorate in Water LC/MS/MS	0.20	U	0.20	1.0
	mg/kg		mg/kg	mg/kg
Batch number: 161820638002	Sample number s : 8444051,8444055,8444059,8444063,8444067,8444071-8444073,8444077			
Mercury	0.0100	U	0.0100	0.100
Batch number: 161940637001	Sample number s : 8444052,8444056,8444060,8444064,8444068,8444078-8444081			
Aluminum	8.94	J	8.68	40.0
Antimony	0.700	U	0.700	4.00
Arsenic	0.970	U	0.970	4.00
Barium	0.0820	J	0.0330	1.00
Beryllium	0.0670	U	0.0670	1.00
Cadmium	0.0490	U	0.0490	1.00
Calcium	22.1	J	5.66	40.0
Chromium	0.140	U	0.140	3.00
Cobalt	0.120	U	0.120	1.00
Copper	0.230	U	0.230	2.00
Iron	4.12	U	4.12	40.0
Lead	0.550	U	0.550	3.00
Magnesium	2.81	J	1.90	20.0
Manganese	0.0830	U	0.0830	1.00
Nickel	0.300	U	0.300	2.00
Potassium	23.9	U	23.9	100
Selenium	0.900	U	0.900	4.00
Silver	0.150	U	0.150	1.00
Sodium	23.9	U	23.9	200
Vanadium	0.140	U	0.140	1.00
Zinc	0.680	U	0.680	4.00
Batch number: 161940637001A	Sample number s : 8444052,8444056,8444060,8444064,8444068,8444078-8444081			
Thallium	0.0290	U	0.0290	0.200
Batch number: 161950637002	Sample number s : 8444089,8444093,8444103-8444106			
Aluminum	8.68	U	8.68	40.0
Antimony	0.700	U	0.700	4.00
Arsenic	0.970	U	0.970	4.00
Barium	0.0330	U	0.0330	1.00
Beryllium	0.0670	U	0.0670	1.00
Cadmium	0.0490	U	0.0490	1.00
Calcium	5.66	U	5.66	40.0
Chromium	0.140	U	0.140	3.00
Cobalt	0.120	U	0.120	1.00
Copper	0.230	U	0.230	2.00
Iron	4.12	U	4.12	40.0
Lead	0.631	J	0.550	3.00
Magnesium	1.90	U	1.90	20.0

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Method Blank continued

Analysis Name	Result	MDL**	LOQ
	mg/kg	mg/kg	mg/kg
Manganese	0.0830 U	0.0830	1.00
Nickel	0.300 U	0.300	2.00
Potassium	23.9 U	23.9	100
Selenium	0.900 U	0.900	4.00
Silver	0.191 J	0.150	1.00
Sodium	23.9 U	23.9	200
Vanadium	0.140 U	0.140	1.00
Zinc	0.680 U	0.680	4.00
Batch number: 161950637002A	Sample number s : 8444089,8444093,8444103-8444106		
Thallium	0.0290 U	0.0290	0.200
Batch number: 161950638002	Sample number s : 8444088,8444092,8444096-8444098,8444102		
Mercury	0.0100 U	0.0100	0.100
	mg/l	mg/l	mg/l
Batch number: 161790635001	Sample number s : 8444113,8444115-8444116		
Aluminum	0.0868 U	0.0868	0.400
Antimony	0.0077 U	0.0077	0.0400
Arsenic	0.0097 U	0.0097	0.0400
Barium	0.0011 U	0.0011	0.0100
Beryllium	0.00067 U	0.00067	0.0100
Cadmium	0.00049 U	0.00049	0.0100
Calcium	0.0732 J	0.0382	0.400
Chromium	0.0018 U	0.0018	0.0300
Cobalt	0.0019 U	0.0019	0.0100
Copper	0.0047 J	0.0041	0.0200
Iron	0.0747 U	0.0747	0.400
Lead	0.0062 U	0.0062	0.0300
Magnesium	0.0190 U	0.0190	0.200
Manganese	0.0018 U	0.0018	0.0100
Nickel	0.0028 U	0.0028	0.0200
Potassium	0.160 U	0.160	1.00
Selenium	0.0097 U	0.0097	0.0400
Silver	0.0019 U	0.0019	0.0100
Sodium	0.173 U	0.173	2.00
Vanadium	0.0016 U	0.0016	0.0100
Zinc	0.0054 U	0.0054	0.0400
Batch number: 161790639001A	Sample number s : 8444113,8444115-8444116		
Thallium	0.00016 U	0.00016	0.0010
Batch number: 161795713002	Sample number s : 8444113,8444115-8444116		
Mercury	0.000050 U	0.000050	0.00020
	mg/kg	mg/kg	mg/kg
Batch number: 16183102201A	Sample number s : 8444051,8444055		
Total Cyanide solid	0.18 U	0.18	0.50
Batch number: 16187102201A	Sample number s : 8444059,8444063,8444067,8444071-8444072,8444077,8444088,8444092		
Total Cyanide solid	0.18 U	0.18	0.50
Batch number: 16187102201B	Sample number s : 8444096-8444097,8444102		
Total Cyanide solid	0.18 U	0.18	0.50

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Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:12

Group Number: 1675877

Method Blank continued

Analysis Name	Result	MDL**	LOQ
	mg/kg	mg/kg	mg/kg
	mg/l	mg/l	mg/l
Batch number: 16180117101A	Sample number s : 8444113,8444115		
Total Cyanide water	0.0050 U	0.0050	0.010
Batch number: 16181117101A	Sample number s : 8444116		
Total Cyanide water	0.0050 U	0.0050	0.010
	mg/kg	mg/kg	mg/kg
Batch number: 16187042501A	Sample number s : 8444051,8444055,8444059,8444063		
Hexavalent Chromium SOLIDS	0.50 U	0.50	1.5
Batch number: 16189042501A	Sample number s : 8444067,8444071,8444074-8444077,8444088,8444092		
Hexavalent Chromium SOLIDS	0.50 U	0.50	1.5
Batch number: 16189042502A	Sample number s : 8444096,8444099-8444102		
Hexavalent Chromium SOLIDS	0.50 U	0.50	1.5
	mg/l	mg/l	mg/l
Batch number: 16176027601A	Sample number s : 8444113,8444115-8444116		
Hexavalent Chromium	0.0070 U	0.0070	0.020

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: A161801AA	Sample number s : 8444110-8444112								
4-Methyl-2-pentanone	100	111.55	100	105	112	105	50-120	6	30
Batch number: A161802AA	Sample number s : 8444062,8444066,8444070,8444085-8444087								
4-Methyl-2-pentanone	100	111.55	100	105	112	105	50-120	6	30
Batch number: B161811AA	Sample number s : 8444054,8444091,8444095								
4-Methyl-2-pentanone	100	89.1	100	91.37	89	91	50-120	3	30
Batch number: R161811AA	Sample number s : 8444058								
4-Methyl-2-pentanone	5000	2918.86	5000	3349.16	58	67	50-120	14	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: L161872AA	Sample number s : 8444113-8444116								
4-Methyl-2-pentanone	100	108.79	100	109.11	109	109	47-133	0	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16184SLC026	Sample number s : 8444051,8444055,8444059,8444063,8444067,8444071-8444073,8444088,8444092								
2-Chlorobenzaldehyde	1666.67	1636.45	1666.67	1136.22	98	68	58-114	36	30
2-Chlorobenzalmalononitrile	1666.67	1199.86	1666.67	1154.53	72	69	70-130	4	30
Quinoline	1666.67	1700.99			102		80-119		

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

LCS/LCSD continued

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16187SLE026	Sample number s : 8444096-8444098								
2-Chlorobenzaldehyde	1666.67	1660.15	1666.67	1532.52	100	92	58-114	8	30
2-Chlorobenzalmalononitrile	1666.67	1141.51	1666.67	1262.4	68	76	70-130	10	30
Quinoline	1666.67	1702.06			102		80-119		
Batch number: 16194SLB026	Sample number s : 8444067								
2-Chlorobenzaldehyde	1666.67	1602.23	1666.67	1590.96	96	95	58-114	1	30
2-Chlorobenzalmalononitrile	1666.67	1215.62	1666.67	1171.4	73	70	70-130	4	30
Quinoline	1666.67	1542			93		80-119		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16178WAA026	Sample number s : 8444113,8444115-8444116								
2-Chlorobenzalmalononitrile	50	24.68	50	28.7	49	57	25-125	15	30
Batch number: 16178WAD026	Sample number s : 8444113,8444115-8444116								
2-Chlorobenzaldehyde	50	44.99	50	47.61	90	95	73-106	6	30
Quinoline	50	53.4	50	54.75	107	109	82-109	3	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880009A	Sample number s : 8444053,8444057,8444061,8444065,8444069,8444082-8444084								
4-Amino-2,6-Dinitrotoluene	1944	1831.68			94		42-138		
2-Amino-4,6-Dinitrotoluene	1944	1742.83			90		43-141		
1,3-Dinitrobenzene	1944	2140.89			110		54-140		
2,4-Dinitrotoluene	1944	1701.81			88		52-137		
2,6-Dinitrotoluene	1944	1965.66			101		51-138		
HM	1944	1838.97			95		29-148		
Nitrobenzene	1944	2055.67			106		64-138		
Nitroglycerin	9718	8392.78			86		45-137		
2-Nitrotoluene	1944	1882.79			97		57-135		
3-Nitrotoluene	1944	1750.13			90		57-135		
4-Nitrotoluene	1944	1669.93			86		53-133		
PETN	9718	8794.33			90		36-143		
RD	1944	1579.36			81		45-145		
Tetryl	1944	1116.8			57		38-152		
1,3,5-Trinitrobenzene	1944	1841.12			95		48-141		
2,4,6-Trinitrotoluene	1944	1670.58			86		47-140		
Batch number: 161890022A	Sample number s : 8444090,8444094,8444107-8444109								
4-Amino-2,6-Dinitrotoluene	1972	1353.7			69		42-138		
2-Amino-4,6-Dinitrotoluene	1972	1311.14			66		43-141		
1,3-Dinitrobenzene	1972	1572.72			80		54-140		
2,4-Dinitrotoluene	1972	1283.86			65		52-137		
2,6-Dinitrotoluene	1972	1441.01			73		51-138		
HM	1972	1335.47			68		29-148		
Nitrobenzene	1972	1349.58			68		64-138		
Nitroglycerin	9862	6196.75			63		45-137		
2-Nitrotoluene	1972	1423.9			72		57-135		
3-Nitrotoluene	1972	1309.3			66		57-135		
4-Nitrotoluene	1972	1235.99			63		53-133		
PETN	9862	9810.06			99		36-143		
RD	1972	1222.92			62		45-145		

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

LCS/LCSD continued

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg					
Tetryl	1972	1079.9			55		38-152		
1,3,5-Trinitrobenzene	1972	1431.21			73		48-141		
2,4,6-Trinitrotoluene	1972	1248.87			63		47-140		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161780001A	Sample number s : 8444113,8444115-8444116								
4-Amino-2,6-Dinitrotoluene	10	9.96	10	9.86	100	99	70-130	1	30
2-Amino-4,6-Dinitrotoluene	10	9.59	10	9.64	96	96	70-130	0	30
1,3-Dinitrobenzene	10	11.29	10	11.28	113	113	70-130	0	30
2,4-Dinitrotoluene	10	9.27	10	9.26	93	93	70-130	0	30
2,6-Dinitrotoluene	10	10.54	10	10.5	105	105	70-130	0	30
HM	10	8.96	10	9.21	90	92	70-130	3	30
Nitrobenzene	10	10.73	10	10.56	107	106	70-130	2	30
Nitroglycerin	111	88.86	111	89.46	80	81	70-130	1	30
2-Nitrotoluene	10	10.27	10	10.17	103	102	70-130	1	30
3-Nitrotoluene	10	9.49	10	9.43	95	94	70-130	1	30
4-Nitrotoluene	10	9.15	10	9.12	91	91	70-130	0	30
PETN	110	107.83	110	106.74	98	97	70-130	1	30
RD	10	9.68	10	9.80	97	98	70-130	1	30
Tetryl	10	4.35	10	7.09	44	71	70-130	48	30
1,3,5-Trinitrobenzene	10	8.25	10	9.62	82	96	70-130	15	30
2,4,6-Trinitrotoluene	10	9.22	10	9.20	92	92	70-130	0	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880035A	Sample number s : 8444053,8444057,8444061,8444065,8444069,8444082-8444084								
Perchlorate in Soil LC/MS/MS	100	84.75			85		80-120		
Batch number: 161890045A	Sample number s : 8444090,8444094,8444107-8444109								
Perchlorate in Soil LC/MS/MS	100	58.6			59		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161800005A	Sample number s : 8444113,8444115-8444116								
Perchlorate in Water LC/MS/MS	5.00	4.35			87		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161820638002	Sample number s : 8444051,8444055,8444059,8444063,8444067,8444071-8444073,8444077								
Mercury	0.100	0.0943			94		80-120		
Batch number: 161940637001	Sample number s : 8444052,8444056,8444060,8444064,8444068,8444078-8444081								
Aluminum	200	209.06			105		80-120		
Antimony	50	49.6			99		80-120		
Arsenic	15	16.11			107		80-120		
Barium	200	203.2			102		80-120		
Beryllium	5.00	5.12			102		80-120		
Cadmium	5.00	5.07			101		80-120		
Calcium	400	431.2			108		80-120		
Chromium	20	19.93			100		80-120		
Cobalt	50	50.68			101		80-120		
Copper	25	27.11			108		80-120		
Iron	100	100			100		80-120		

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

LCS/LCSD continued

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Lead	15	14.82			99		80-120		
Magnesium	200	208.65			104		80-120		
Manganese	50	51.53			103		80-120		
Nickel	50	51.41			103		80-120		
Potassium	1000	1046.01			105		80-120		
Selenium	15	15.58			104		80-120		
Silver	5.00	5.06			101		80-120		
Sodium	1000	1032.68			103		80-120		
Vanadium	50	50.7			101		80-120		
Zinc	50	50.74			101		80-120		
Batch number: 161940637001A	Sample number s : 8444052,8444056,8444060,8444064,8444068,8444078-8444081								
Thallium	0.200	0.179			90		80-120		
Batch number: 161950637002	Sample number s : 8444089,8444093,8444103-8444106								
Aluminum	200	194.3			97		80-120		
Antimony	50	46.5			93		80-120		
Arsenic	15	13.54			90		80-120		
Barium	200	196.88			98		80-120		
Beryllium	5.00	4.85			97		80-120		
Cadmium	5.00	4.83			97		80-120		
Calcium	400	389.67			97		80-120		
Chromium	20	18.94			95		80-120		
Cobalt	50	49.13			98		80-120		
Copper	25	25.06			100		80-120		
Iron	100	97.74			98		80-120		
Lead	15	14.81			99		80-120		
Magnesium	200	197.5			99		80-120		
Manganese	50	49.55			99		80-120		
Nickel	50	49.29			99		80-120		
Potassium	1000	987.07			99		80-120		
Selenium	15	13.47			90		80-120		
Silver	5.00	5.26			105		80-120		
Sodium	1000	994.96			99		80-120		
Vanadium	50	48.03			96		80-120		
Zinc	50	47.3			95		80-120		
Batch number: 161950637002A	Sample number s : 8444089,8444093,8444103-8444106								
Thallium	0.200	0.214			107		80-120		
Batch number: 161950638002	Sample number s : 8444088,8444092,8444096-8444098,8444102								
Mercury	0.100	0.0946			95		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 161790635001	Sample number s : 8444113,8444115-8444116								
Aluminum	2.00	2.12			106		80-120		
Antimony	0.500	0.498			100		80-120		
Arsenic	0.150	0.156			104		80-120		
Barium	2.00	1.97			99		80-120		
Beryllium	0.0500	0.0507			101		80-120		
Cadmium	0.0500	0.0513			103		80-120		

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

LCS/LCSD continued

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	mg/l	mg/l	mg/l	mg/l					
Calcium	4.00	4.06			102		80-120		
Chromium	0.200	0.197			99		80-120		
Cobalt	0.500	0.514			103		80-120		
Copper	0.250	0.268			107		80-120		
Iron	1.00	0.977			98		80-120		
Lead	0.150	0.153			102		80-120		
Magnesium	2.00	1.99			99		80-120		
Manganese	0.500	0.509			102		80-120		
Nickel	0.500	0.524			105		80-120		
Potassium	10	9.88			99		80-120		
Selenium	0.150	0.143			96		80-120		
Silver	0.0500	0.0442			88		80-120		
Sodium	10	10.08			101		80-120		
Vanadium	0.500	0.507			101		80-120		
Zinc	0.500	0.503			101		80-120		
Batch number: 161790639001A	Sample number s : 8444113,8444115-8444116								
Thallium	0.00200	0.00200			100		80-120		
Batch number: 161795713002	Sample number s : 8444113,8444115-8444116								
Mercury	0.00100	0.000956			96		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16183102201A	Sample number s : 8444051,8444055								
Total Cyanide solid	10	10.13			101		90-110		
Batch number: 16187102201A	Sample number s : 8444059,8444063,8444067,8444071-8444072,8444077,8444088,8444092								
Total Cyanide solid	10	9.97			100		90-110		
Batch number: 16187102201B	Sample number s : 8444096-8444097,8444102								
Total Cyanide solid	10	9.97			100		90-110		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16180117101A	Sample number s : 8444113,8444115								
Total Cyanide water	0.200	0.194			97		90-110		
Batch number: 16181117101A	Sample number s : 8444116								
Total Cyanide water	0.200	0.215			108		90-110		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16187042501A	Sample number s : 8444051,8444055,8444059,8444063								
Hexavalent Chromium SOLIDS	5.00	4.29			86		80-120		
Batch number: 16189042501A	Sample number s : 8444067,8444071,8444074-8444077,8444088,8444092								
Hexavalent Chromium SOLIDS	5.00	4.74			95		80-120		
Batch number: 16189042502A	Sample number s : 8444096,8444099-8444102								
Hexavalent Chromium SOLIDS	5.00	4.63			93		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16176027601A	Sample number s : 8444113,8444115-8444116								

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

LCS/LCSD continued

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Hexavalent Chromium	0.200	0.200	0.200	0.193	100	97	90-110	4	4
	m	m	m	m					
Batch number: 16188182101B	Sample number s : 8444051,8444055,8444059,8444063,8444067								
Oxidation Reduction Potential	427	428.5			100		98-102		
Batch number: 16189182101A	Sample number s : 8444088,8444092,8444096,8444102								
Oxidation Reduction Potential	427	426			100		98-102		
Batch number: 16189182101B	Sample number s : 8444071,8444077								
Oxidation Reduction Potential	427	426			100		98-102		
	Std. Units	Std. Units	Std. Units	Std. Units					
Batch number: 16188039401B	Sample number s : 8444051,8444055,8444059,8444063,8444067								
pH	7.00	7.01			100		95-105		
Batch number: 16189039401A	Sample number s : 8444088,8444092,8444096,8444102								
pH	7.00	7.00			100		95-105		
Batch number: 16189039401B	Sample number s : 8444071,8444077								
pH	7.00	7.00			100		95-105		
	%	%	%	%					
Batch number: 16231820011A	Sample number s : 8444051-8444070								
Moisture	89.5	89.47			100		99-101		
Moisture	89.5	89.47			100		99-101		
Batch number: 16231820011B	Sample number s : 8444071-8444095								
Moisture	89.5	89.47			100		99-101		
Moisture	89.5	89.47			100		99-101		
Moisture Duplicate	89.5	89.47			100		99-101		
Batch number: 16232820001A	Sample number s : 8444096-8444112								
Moisture	89.5	89.46			100		99-101		
Moisture	89.5	89.46			100		99-101		
Moisture Duplicate	89.5	89.46			100		99-101		

MS/MSD

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: A161801AA	Sample number s : 8444110-8444112 UNSP : 8444110									
4-Methyl-2-pentanone	4 U	121.36	135.6	123.15	111.03	112	90	50-120	20	30
Batch number: A161802AA	Sample number s : 8444062,8444066,8444070,8444085-8444087 UNSP : 8444085									

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

MS/MSD continued

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
4-Methyl-2-pentanone	5 U	167.79	157.31	174.22	168.9	94	97	50-120	7	30
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16184SLC026	Sample number s : 8444051,8444055,8444059,8444063,8444067,8444071-8444073,8444088,8444092 UNSP : 8444071									
Quinoline	170 U	1656.18	780.17	1654.53	1017.37	47	61	80-119	26	30
Batch number: 16187SLE026	Sample number s : 8444096-8444098 UNSP : 8444096									
Quinoline	170 U	1656.73	773.6	1661.13	932.37	47	56	80-119	19	30
Batch number: 16194SLB026	Sample number s : 8444067 UNSP : P468616									
Quinoline	33 U	1666.67	1250.14	1666.67	1215.04	75	73	80-119	3	30
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880009A	Sample number s : 8444053,8444057,8444061,8444065,8444069,8444082-8444084 UNSP : 8444082									
4-Amino-2,6-Dinitrotoluene	40 U	1980	1487.87	2000	1524.43	75	76	42-138	2	50
2-Amino-4,6-Dinitrotoluene	40 U	1980	1489.27	2000	1450.62	75	73	43-141	3	50
1,3-Dinitrobenzene	39 U	1980	1109.61	2000	1260.77	56	63	54-140	13	50
2,4-Dinitrotoluene	39 U	1980	1221.56	2010	1248.85	62	62	52-137	2	50
2,6-Dinitrotoluene	110 U	1980	1462.44	2000	1558.09	74	78	51-138	6	50
HM	210 U	1980	1069.03	2000	1087.56	54	54	29-148	2	50
Nitrobenzene	99 U	1990	1679.34	2010	1857.19	84	92	64-138	10	50
Nitroglycerin	790 U	21800	13827.25	22100	14285.63	63	65	45-137	3	50
2-Nitrotoluene	74 U	1980	1561.7	2000	1605.96	79	80	57-135	3	50
3-Nitrotoluene	110 U	1980	1477.68	2000	1499.93	75	75	57-135	1	50
4-Nitrotoluene	110 U	1980	1357.34	2000	1389.31	69	69	53-133	2	50
PETN	790 U	21800	19573.99	22100	18908.22	90	86	36-143	3	50
RD	39 U	1980	1919.73	2000	1923.71	97	96	45-145	0	50
Tetryl	99 U	1980	495.11	2000	766.19	25	38	38-152	43	50
1,3,5-Trinitrobenzene	39 U	1980	40 U	2000	40 U	0	0	48-141	0	50
2,4,6-Trinitrotoluene	43 U	1980	1169.94	2000	1223.24	59	61	47-140	4	50
Batch number: 161890022A	Sample number s : 8444090,8444094,8444107-8444109 UNSP : 8444107									
4-Amino-2,6-Dinitrotoluene	41 U	1930	840.59	2000	931.62	44	47	42-138	10	50
2-Amino-4,6-Dinitrotoluene	41 U	1940	892.68	2000	993.77	46	50	43-141	11	50
1,3-Dinitrobenzene	40 U	1940	750.05	2000	862.47	39	43	54-140	14	50
2,4-Dinitrotoluene	40 U	1940	686.03	2010	775.23	35	39	52-137	12	50
2,6-Dinitrotoluene	110 U	1940	730.22	2010	849.45	38	42	51-138	15	50
HM	210 U	1930	1580.99	2000	1560.31	82	78	29-148	1	50
Nitrobenzene	99 U	1940	787.31	2000	848.67	41	42	64-138	8	50
Nitroglycerin	790 U	19400	8924.3	20100	9746.58	46	48	45-137	9	50
2-Nitrotoluene	74 U	1940	837.6	2000	968.81	43	48	57-135	15	50
3-Nitrotoluene	110 U	1940	771.92	2010	877.66	40	44	57-135	13	50
4-Nitrotoluene	110 U	1940	795.63	2020	882.16	41	44	53-133	10	50
PETN	790 U	19500	14329.48	20200	15473.5	73	77	36-143	8	50
RD	40 U	1930	1334.52	2000	1463.8	69	73	45-145	9	50

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

MS/MSD continued

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Tetryl	99 U	1950	817.58	2020	870.95	42	43	38-152	6	50
2,4,6-Trinitrotoluene	44 U	1940	681.23	2010	751.05	35	37	47-140	10	50
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880035A	Sample number s : 8444053,8444057,8444061,8444065,8444069,8444082-8444084 UNSP : 8444082									
Perchlorate in Soil LC/MS/MS	2.1 U	100	113.32	100	100.41	113	100	70-130	12	15
Batch number: 161890045A	Sample number s : 8444090,8444094,8444107-8444109 UNSP : 8444107									
Perchlorate in Soil LC/MS/MS	2.1 U	100	88.41	100	79.56	88	80	80-120	11	15
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 161800005A	Sample number s : 8444113,8444115-8444116 UNSP : P437254									
Perchlorate in Water LC/MS/MS	5.77	5.00	10.68	5.00	9.48	98	74	80-120	12	15
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161820638002	Sample number s : 8444051,8444055,8444059,8444063,8444067,8444071-8444073,8444077 UNSP : 8444071									
Mercury	0.0416	0.167	0.202	0.156	0.191	96	95	80-120	6	20
Batch number: 161940637001	Sample number s : 8444052,8444056,8444060,8444064,8444068,8444078-8444081 UNSP : 8444078									
Aluminum	608.74	198.02	1059.35	186.92	973.49	228	195	75-125	8	20
Antimony	0.700 U	49.5	45.68	46.73	44.35	92	95	75-125	3	20
Arsenic	0.970 U	14.85	14.45	14.02	14.34	97	102	75-125	1	20
Barium	3.12	198.02	204.73	186.92	196.7	102	104	75-125	4	20
Beryllium	0.0670 U	4.95	5.11	4.67	4.92	103	105	75-125	4	20
Cadmium	0.0490 U	4.95	5.08	4.67	4.87	103	104	75-125	4	20
Calcium	934.89	396.04	1280.2	373.83	1137.86	87	54	75-125	12	20
Chromium	1.11	19.8	20.97	18.69	19.98	100	101	75-125	5	20
Cobalt	0.120 U	49.5	50.3	46.73	48.42	102	104	75-125	4	20
Copper	3.21	24.75	29.11	23.36	27.77	105	105	75-125	5	20
Iron	306.38	99.01	393.52	93.46	351.22	88	48	75-125	11	20
Lead	3.17	14.85	18.66	14.02	17.02	104	99	75-125	9	20
Magnesium	126.59	198.02	332.78	186.92	309.53	104	98	75-125	7	20
Manganese	26.06	49.5	74.67	46.73	71.09	98	96	75-125	5	20
Nickel	0.300 U	49.5	50.99	46.73	49.1	103	105	75-125	4	20
Potassium	87.81	990.1	1127.24	934.58	1079.47	105	106	75-125	4	20
Selenium	0.900 U	14.85	14.01	14.02	13.31	94	95	75-125	5	20
Silver	0.150 U	4.95	4.98	4.67	4.74	101	101	75-125	5	20
Sodium	25.75	990.1	1053.37	934.58	1007.32	104	105	75-125	4	20
Vanadium	1.68	49.5	51.8	46.73	49.54	101	102	75-125	4	20
Zinc	3.31	49.5	52.62	46.73	50.44	100	101	75-125	4	20
Batch number: 161940637001A	Sample number s : 8444052,8444056,8444060,8444064,8444068,8444078-8444081 UNSP : 8444078									
Thallium	0.0290 U	0.396	0.584	0.374	0.512	148	137	75-125	13	20
Batch number: 161950637002	Sample number s : 8444089,8444093,8444103-8444106 UNSP : 8444103									

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

MS/MSD continued

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Aluminum	1322.61	200	1614.79	200	1921.26	146 2	299 2	75-125	17	20
Antimony	0.693 U	50	44.28	50	43.7	89	87	75-125	1	20
Arsenic	0.960 U	15	13.34	15	13.05	89	87	75-125	2	20
Barium	4.01	200	198.25	200	202.12	97	99	75-125	2	20
Beryllium	0.0663 U	5.00	4.90	5.00	5.02	98	100	75-125	2	20
Cadmium	0.0485 U	5.00	4.79	5.00	4.75	96	95	75-125	1	20
Calcium	72.72	400	445.53	400	456.41	93	96	75-125	2	20
Chromium	1.58	20	19.99	20	20.53	92	95	75-125	3	20
Cobalt	0.119 U	50	48.4	50	48.09	97	96	75-125	1	20
Copper	0.779	25	25.44	25	26.41	99	103	75-125	4	20
Iron	348.1	100	415.69	100	478.13	68	130	75-125	14	20
Lead	5.82	15	19	15	19.29	88	90	75-125	2	20
Magnesium	49.94	200	249.75	200	261.45	100	106	75-125	5	20
Manganese	3.66	50	51.98	50	52.73	97	98	75-125	1	20
Nickel	0.386	50	48.9	50	48.79	97	97	75-125	0	20
Potassium	41.75	1000	1041.02	1000	1039.74	100	100	75-125	0	20
Selenium	0.891 U	15	12.71	15	13.42	85	89	75-125	5	20
Silver	0.149 U	5.00	5.27	5.00	5.21	105	104	75-125	1	20
Sodium	23.7 U	1000	997.49	1000	993.55	100	99	75-125	0	20
Vanadium	1.71	50	49.1	50	50.07	95	97	75-125	2	20
Zinc	2.92	50	49.26	50	49.93	93	94	75-125	1	20
Batch number: 161950637002A	Sample number s : 8444089,8444093,8444103-8444106 UNSP : 8444103									
Thallium	0.0287 U	0.400	0.377	0.400	0.386	94	97	75-125	2	20
Batch number: 161950638002	Sample number s : 8444088,8444092,8444096-8444098,8444102 UNSP : 8444096									
Mercury	0.0305	0.167	0.199	0.154	0.177	101	95	80-120	12	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 161790635001	Sample number s : 8444113,8444115-8444116 UNSP : P444144									
Aluminum	0.0872	2.00	2.02	2.00	1.99	96	95	75-125	1	20
Antimony	0.0077 U	0.500	0.501	0.500	0.512	100	102	75-125	2	20
Arsenic	0.0131	0.150	0.164	0.150	0.167	100	102	75-125	2	20
Barium	0.286	2.00	2.24	2.00	2.26	98	99	75-125	1	20
Beryllium	0.00067 U	0.0500	0.0496	0.0500	0.0502	99	100	75-125	1	20
Cadmium	0.00049 U	0.0500	0.0493	0.0500	0.0499	99	100	75-125	1	20
Calcium	110.06	4.00	110.18	4.00	114.1 3 2	101 2		75-125	3	20
Chromium	0.0018 U	0.200	0.195	0.200	0.197	98	98	75-125	1	20
Cobalt	0.0019 U	0.500	0.488	0.500	0.493	98	99	75-125	1	20
Copper	0.0041 U	0.250	0.266	0.250	0.269	106	107	75-125	1	20
Iron	1.92	1.00	2.78	1.00	2.85	86	93	75-125	2	20
Lead	0.0062 U	0.150	0.153	0.150	0.156	102	104	75-125	2	20
Magnesium	40.52	2.00	40.98	2.00	42.56 23 2	102 2		75-125	4	20
Manganese	0.0946	0.500	0.586	0.500	0.591	98	99	75-125	1	20
Nickel	0.00287	0.500	0.495	0.500	0.501	98	100	75-125	1	20
Potassium	1.79	10	11.55	10	11.68	98	99	75-125	1	20
Selenium	0.0097 U	0.150	0.147	0.150	0.145	98	96	75-125	1	20
Silver	0.0019 U	0.0500	0.0441	0.0500	0.0451	88	90	75-125	2	20
Sodium	21.77	10	30.8	10	31.72	90	100	75-125	3	20

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

MS/MSD continued

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	mg/l	mg/l	mg/l	mg/l	mg/l					
Vanadium	0.0016 U	0.500	0.501	0.500	0.504	100	101	75-125	1	20
Zinc	0.0054 U	0.500	0.489	0.500	0.497	98	99	75-125	2	20
Batch number: 161790639001A	Sample number s : 8444113,8444115-8444116 UNSP : P441460									
Thallium	0.00016 U	0.00200	0.00204	0.00200	0.00198	102	99	75-125	3	20
Batch number: 161795713002	Sample number s : 8444113,8444115-8444116 UNSP : P444555									
Mercury	0.000127	0.00100	0.000831	0.00100	0.000830	70	70	80-120	0	20
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16183102201A	Sample number s : 8444051,8444055 UNSP : P438336									
Total Cyanide solid	0.216	5.00	5.06			97		41-145		
Batch number: 16187102201A	Sample number s : 8444059,8444063,8444067,8444071-8444072,8444077,8444088,8444092 UNSP : 8444071									
Total Cyanide solid	0.17 U	4.98	4.98			100		41-145		
Batch number: 16187102201B	Sample number s : 8444096-8444097,8444102 UNSP : 8444096									
Total Cyanide solid	0.18 U	5.03	4.03			80		41-145		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16180117101A	Sample number s : 8444113,8444115 UNSP : P445371									
Total Cyanide water	0.0050 U	0.200	0.199			100		72-114		
Batch number: 16181117101A	Sample number s : 8444116 UNSP : P450506									
Total Cyanide water	0.0050 U	0.200	0.205			102		72-114		
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16187042501A	Sample number s : 8444051,8444055,8444059,8444063 UNSP : P438336									
Hexavalent Chromium SOLIDS	10.0 U	40.7	10.0 U			0		75-125		
Batch number: 16189042501A	Sample number s : 8444067,8444071,8444074-8444077,8444088,8444092 UNSP : P189042									
Hexavalent Chromium SOLIDS	10.0 U	39.7	10.0 U			0		75-125		
Batch number: 16189042502A	Sample number s : 8444096,8444099-8444102 UNSP : 8444096									
Hexavalent Chromium SOLIDS	0.50 U	40.3	0.50 U			0		75-125		

Laboratory Duplicate

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/kg	mg/kg		

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Laboratory Duplicate

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161820638002	Sample number s : 8444051,8444055,8444059,8444063,8444067,8444071-8444073,8444077 B G: 8444071			
Mercury	0.0416	0.0377	10 1	20
Batch number: 161940637001	Sample number s : 8444052,8444056,8444060,8444064,8444068,8444078-8444081 B G: 8444078			
Aluminum	608.74	594.43	2	20
Antimony	0.700 U	0.673 U	0 1	20
Arsenic	0.970 U	0.933 U	0 1	20
Barium	3.12	3.00	4 1	20
Beryllium	0.0670 U	0.0644 U	0 1	20
Cadmium	0.0490 U	0.0471 U	0 1	20
Calcium	934.89	860.95	8	20
Chromium	1.11	1.06	5 1	20
Cobalt	0.120 U	0.115 U	0 1	20
Copper	3.21	3.23	1 1	20
Iron	306.38	298.88	2	20
Lead	3.17	2.98	6 1	20
Magnesium	126.59	119.51	6	20
Manganese	26.06	23.32	11	20
Nickel	0.300 U	0.288 U	0 1	20
Potassium	87.81	84.68	4 1	20
Selenium	0.900 U	0.865 U	0 1	20
Silver	0.150 U	0.144 U	0 1	20
Sodium	25.75	24.23	6 1	20
Vanadium	1.68	1.62	4 1	20
Zinc	3.31	2.86	15 1	20
Batch number: 161940637001A	Sample number s : 8444052,8444056,8444060,8444064,8444068,8444078-8444081 B G: 8444078			
Thallium	0.0290 U	0.0279 U	0 1	20
Batch number: 161950637002	Sample number s : 8444089,8444093,8444103-8444106 B G: 8444103			
Aluminum	1322.61	1244.03	6	20
Antimony	0.693 U	0.686 U	0 1	20
Arsenic	0.960 U	0.951 U	0 1	20
Barium	4.01	3.67	9 1	20
Beryllium	0.0663 U	0.0657 U	0 1	20
Cadmium	0.0485 U	0.0480 U	0 1	20
Calcium	72.72	74.75	3 1	20
Chromium	1.58	1.45	8 1	20
Cobalt	0.119 U	0.118 U	0 1	20
Copper	0.779	0.729	7 1	20
Iron	348.1	328.3	6	20
Lead	5.82	5.09	13 1	20
Magnesium	49.94	46.54	7 1	20
Manganese	3.66	2.63	33 1	20
Nickel	0.386	0.345	11 1	20
Potassium	41.75	40.68	3 1	20
Selenium	0.891 U	0.882 U	0 1	20

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Laboratory Duplicate continued

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/kg	mg/kg		
Silver	0.149 U	0.151	200 1	20
Sodium	23.7 U	23.4 U	0 1	20
Vanadium	1.71	1.37	22 1	20
Zinc	2.92	3.27	11 1	20
Batch number: 161950637002A	Sample number s : 8444089,8444093,8444103-8444106 B G: 8444103			
Thallium	0.0287 U	0.0284 U	0 1	20
Batch number: 161950638002	Sample number s : 8444088,8444092,8444096-8444098,8444102 B G: 8444096			
Mercury	0.0305	0.0305	0 1	20
	mg/l	mg/l		
Batch number: 161790635001	Sample number s : 8444113,8444115-8444116 B G: P444144			
Aluminum	0.0872	0.0868 U	200 1	20
Antimony	0.0077 U	0.0077 U	0 1	20
Arsenic	0.0131	0.0136	4 1	20
Barium	0.286	0.283	1	20
Beryllium	0.00067 U	0.00067 U	0 1	20
Cadmium	0.00049 U	0.00049 U	0 1	20
Calcium	110.06	107.26	3	20
Chromium	0.0018 U	0.00182	200 1	20
Cobalt	0.0019 U	0.0019 U	0 1	20
Copper	0.0041 U	0.0041 U	0 1	20
Iron	1.92	1.86	3 1	20
Lead	0.0062 U	0.0062 U	0 1	20
Magnesium	40.52	39.58	2	20
Manganese	0.0946	0.0928	2	20
Nickel	0.00287	0.0028 U	200 1	20
Potassium	1.79	1.73	3 1	20
Selenium	0.0097 U	0.0097 U	0 1	20
Silver	0.0019 U	0.0019 U	0 1	20
Sodium	21.77	21.21	3	20
Vanadium	0.0016 U	0.0016 U	0 1	20
Zinc	0.0054 U	0.0054 U	0 1	20
Batch number: 161790639001A	Sample number s : 8444113,8444115-8444116 B G: P441460			
Thallium	0.00016 U	0.00016 U	0 1	20
Batch number: 161795713002	Sample number s : 8444113,8444115-8444116 B G: P444555			
Mercury	0.000127	0.000130	2 1	20
	mg/kg	mg/kg		
Batch number: 16183102201A	Sample number s : 8444051,8444055 B G: P438336			
Total Cyanide solid	0.216	0.17 U	200 1	20
Batch number: 16187102201A	Sample number s : 8444059,8444063,8444067,8444071-8444072,8444077,8444088,8444092 B G: 8444071			
Total Cyanide solid	0.17 U	0.18 U	0 1	20
Batch number: 16187102201B	Sample number s : 8444096-8444097,8444102 B G: 8444096			
Total Cyanide solid	0.18 U	0.18 U	0 1	20

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Laboratory Duplicate continued

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/kg	mg/kg		
	mg/l	mg/l		
Batch number: 16180117101A	Sample number s : 8444113,8444115 B G: P445371			
Total Cyanide water	0.0050 U	0.0050 U	0 1	20
Batch number: 16181117101A	Sample number s : 8444116 B G: P450506			
Total Cyanide water	0.0050 U	0.0050 U	0 1	20
	mg/kg	mg/kg		
Batch number: 16187042501A	Sample number s : 8444051,8444055,8444059,8444063 B G: P438336			
Hexavalent Chromium SOLIDS	10.0 U	10.0 U	0 1	20
Batch number: 16189042501A	Sample number s : 8444067,8444071,8444074-8444077,8444088,8444092 B G: P189042			
Hexavalent Chromium SOLIDS	10.0 U	10.0 U	0 1	20
Batch number: 16189042502A	Sample number s : 8444096,8444099-8444102 B G: 8444096			
Hexavalent Chromium SOLIDS	0.50 U	0.50 U	0 1	20
	m	m		
Batch number: 16188182101B	Sample number s : 8444051,8444055,8444059,8444063,8444067 B G: P438353			
Oxidation Reduction Potential	420.5	464.5	10	5
Batch number: 16189182101A	Sample number s : 8444088,8444092,8444096,8444102 B G: 8444096			
Oxidation Reduction Potential	656	673.5	3	5
Batch number: 16189182101B	Sample number s : 8444071,8444077 B G: 8444071			
Oxidation Reduction Potential	625.5	621	1	5
	Std. Units	Std. Units		
Batch number: 16188039401B	Sample number s : 8444051,8444055,8444059,8444063,8444067 B G: P438353			
pH	6.03	6.12	1	3
Batch number: 16189039401A	Sample number s : 8444088,8444092,8444096,8444102 B G: 8444096			
pH	4.77	4.75	0	3
Batch number: 16189039401B	Sample number s : 8444071,8444077 B G: 8444071			
pH	4.57	4.55	0	3
	%	%		
Batch number: 16231820011A	Sample number s : 8444051-8444070 B G: P442807			
Moisture	0.672	0.680	1 1	5
Moisture	0.672	0.680	1 1	5
Batch number: 16231820011B	Sample number s : 8444071-8444095 B G: 8444071, P444071			
Moisture	18.22	16.25	11	5
Moisture	18.22	16.25	11	5
Moisture Duplicate	18.22	16.25	11	5
Batch number: 16232820001A	Sample number s : 8444096-8444112 B G: 8444096, P444096			
Moisture	6.73	6.93	3	5
Moisture	6.73	6.93	3	5

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Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Laboratory Duplicate continued

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc %	DUP Conc %	DUP RPD	DUP RPD Max
Moisture Duplicate	6.73	6.93	3	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 4-Methyl-2-pentanone 8260C
Batch number: A161801AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8444110	105	105	118	76
8444111	105	103	120	78
8444112	103	98	120	80
Blank	102	100	101	96
LCS	103	103	100	101
LCSD	102	101	101	100
MS	105	103	120	78
MSD	103	98	120	80
Limits:	50-141	54-135	52-141	50-131

Analysis Name: 4-Methyl-2-pentanone 8260C
Batch number: A161802AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8444062	103	103	107	87
8444066	105	100	133	67
8444070	105	104	124	73
8444085	105	102	122	70
8444086	103	101	122	76
8444087	105	101	121	77
Blank	102	100	101	96
LCS	103	103	100	101
LCSD	102	101	101	100
MS	103	101	122	76
MSD	105	101	121	77
Limits:	50-141	54-135	52-141	50-131

Analysis Name: 4-Methyl-2-pentanone 8260C
Batch number: B161811AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8444054	113	118	116	75
8444091	112	106	135	66
8444095	109	110	114	77
Blank	104	106	101	90
LCS	103	105	104	95

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Surrogate Quality Control continued

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
LCSD	105	106	104	98
Limits:	50-141	54-135	52-141	50-131

Analysis Name: 4-Methyl-2-pentanone 8260C
Batch number: L161872AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8444113	105	104	94	98
8444114	105	105	94	99
8444115	105	104	94	97
8444116	105	103	95	97
Blank	102	102	95	98
LCS	101	100	97	102
LCSD	102	102	97	101
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 4-Methyl-2-pentanone 8260C
Batch number: R161811AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8444058	83	86	87	84
Blank	89	93	92	88
LCS	90	90	93	94
LCSD	105	104	105	105
Limits:	50-141	54-135	52-141	50-131

Analysis Name: CS Compound
Batch number: 16178WAA026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8444113	71	71	81
8444115	57	57	76
8444116	65	63	75
Blank	64	62	96
LCS	58	53	72
LCSD	68	67	94
Limits:	70-130	70-130	70-130

Analysis Name: SVOA 8270D water
Batch number: 16178WAD026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8444113	101	100	100
8444115	91	87	93
8444116	101	95	101
Blank	103	99	105
LCS	105	97	102
LCSD	107	100	105

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Surrogate Quality Control continued

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Limits: 46-128 61-112 41-125

Analysis Name: SVOA 8270D microwave
Batch number: 16184SLC026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8444051	97	100	114	90	91	94
8444055	88	92	103	85	83	87
8444059	101	103	119	92	90	100
8444063	76	79	86	75	72	77
8444067	56	62	72	62	64	69
8444071	67	76	84	77	78	81
8444072	79	83	96	78	79	84
8444073	82	89	103	86	86	93
8444088	88	93	102	82	83	88
8444092	86	89	98	82	82	86
Blank	85	93	111	89	93	99
LCS	100	107	116	95	94	97
LCSD	90	98	118	91	94	99
MS	79	83	96	78	79	84
MSD	82	89	103	86	86	93
Limits:	58-122	57-126	35-136	54-123	63-117	59-129

Analysis Name: SVOA 8270D microwave
Batch number: 16187SLE026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8444096	85	89	100	81	82	87
8444097	85	87	93	81	77	83
8444098	87	88	99	81	80	89
Blank	95	103	130	91	96	104
LCS	97	101	122	89	90	100
LCSD	87	94	118	85	89	97
MS	85	87	93	81	77	83
MSD	87	88	99	81	80	89
Limits:	58-122	57-126	35-136	54-123	63-117	59-129

Analysis Name: SVOA 8270D microwave
Batch number: 16194SLB026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8444067RE	64	70	75	61	67	67
Blank	82	91	109	81	90	95
LCS	87	96	106	81	91	93
LCSD	87	95	115	81	92	97
MS	72	78	87	68	77	76
MSD	69	76	90	67	75	75
Limits:	58-122	57-126	35-136	54-123	63-117	59-129

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1675877
Reported: 08/29/2016 09:12

Surrogate Quality Control continued

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Nitroaromatics/Amines 8330B w
Batch number: 161780001A

	3,4-Dinitrotoluene
8444113	110
8444115	110
8444116	111
Blank	109
LCS	107
LCSD	109
Limits:	85-115

Analysis Name: Nitroaromatics/Amines 8330B s
Batch number: 161880009A

	3,4-Dinitrotoluene
8444053	113
8444057	121
8444061	117
8444065	119
8444069	117
8444082	113
8444083	80
8444084	81
Blank	112
LCS	118
MS	80
MSD	81
Limits:	62-133

Analysis Name: Nitroaromatics/Amines 8330B s
Batch number: 161890022A

	3,4-Dinitrotoluene
8444090	119
8444094	126
8444107	125
8444108	58
8444109	67
Blank	123
LCS	94
MS	58
MSD	67
Limits:	62-133

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 11372 Group # 167587 Sample # 8444051-116

COC # 501333

Client Information

Client: CH2MHILL

Project Name/#: DOW WOODBINE

Project Manager: MARK SHERRELL

Sampler: J. Crostic A. Shwartz

State where samples were collected: Georgia

For Compliance: Yes ☐ No ☐

Acct. #:

PWSID #:

P.O. #:

Quote #:

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Dioxins to be repackaged to Vista LAB

Sample Identification	Collected Date	Collected Time	Grab	Composite	Matrix: Soil/Sediment	Matrix: Tissue	Matrix: Potable Water	Matrix: Ground	Matrix: NPDES	Matrix: Surface	Matrix: Other	Total # of Containers	VOC	SVOC	Hex Chromium	Cyanide	Mercury	Metals	Perchlorate	Explosives	Moisture	pH/ORP	Dioxins/Furans	Remarks
DW-2-5-A	6-23-16	0845		X	X							6	X	X	X	X	X		X	X	X	X	X	
DW-2-5-B		0930		X	X							6	X	X	X	X	X		X	X	X	X	X	
DW-2-5-C		1015		X	X							6	X	X	X	X	X		X	X	X	X	X	
DW-2-2-A		1145		X	X							6	X	X	X	X	X		X	X	X	X		
DW-2-2-B		1205		X	X							6	X	X	X	X	X		X	X	X	X		
DW-2-2-C		1300		X	X							18	X	X	X	X	X		X	X	X	X		MS/MSD
BGA-1		1515		X	X							6	X	X	X	X	X		X	X	X	X	X	
BGA-2		1600		X	X							6	X	X	X	X	X		X	X	X	X	X	
BGA-3	V	1645		X	X							18	X	X	X	X	X		X	X	X	X	X	MS/MSD

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

	Relinquished by	Date	Time	Received by	Date	Time
1	J Crostic	6-23-16	1900			
2						
3						
4						
5				Krista Abel	6/24/16	0930

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx ✓ Other _____

Temperature upon receipt 0.6 °C

Environmental Analysis Request/Chain of Custody

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Lancaster Laboratories Environmental

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Acct. # 11372 Group # 1675877 Sample # 8444051-116

COC # 501335

Client Information

Client: CH2M HILL

Acct. #:

Project Name/#: DOW WOODBINE

PWSID #:

Project Manager: Mark Sherrill

P.O. #:

Sampler: A Shwartz, S. Crosbie

Quote #:

State where samples were collected: Georgia

For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐

Water Potable ☐ Ground ☐ NPDES ☐ Surface ☐

Other: QC

Total # of Containers

Analysis Requested

Preservation Codes

H | — | BO | N | —

VOCs | SVOCs | Cyanide | Mercury | Metals | CS Compounds | Hex Chromium | Explosives Perchlorate | Dioxins/Furans

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	VOCs	SVOCs	Cyanide	Mercury	Metals	CS Compounds	Hex Chromium	Explosives Perchlorate	Dioxins/Furans	Remarks
DU-2-5-FB	6/23/16	1115	X		14	X	X	X	X	X	X	X	X	X	Dioxins to be repackaged to Vista Lab
TB-3		0800	X		2	X									
DU-2-2-EB		1400	X		12	X	X	X	X	X	X	X	X	X	no dioxins
BGA-3-EB	↓	1700	X		12	X	X	X	X	X	X	X	X	X	

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Dioxins to be repackaged to Vista Lab

no dioxins

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address:

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
A. Crosbie	6/23/16	1900			
				6/24/16	0930

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS FedEx Other

Temperature upon receipt 0.6 °C / 1.7

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Sample Administration Receipt Documentation Log

Doc Log ID: 151540

Group Number(s): 1675877

Client: CH2M

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	06/24/2016 9:30
Number of Packages:	4	Number of Projects:	1
State/Province of Origin:	GA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Krista Abel (3058) at 11:55 on 06/24/2016

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.0	DT	Wet	Y	Bagged	N
2	DT146	0.6	DT	Wet	Y	Bagged	N
3	DT146	1.7	DT	Wet	Y	Bagged	N
4	DT146	0.6	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Report Date: September 08, 2016

Project: Woodbine Phase III MEC RFI

Submittal Date: 06/24/2016
Group Number: 1677905
SDG: DWD88
PO Number: 10381-7-113967
Release Number: DWD87
State of Sample Origin: GA

Client Sample Description	Lancaster Labs (LL) #
Metals Blank Grab Sand	8455248
Explosives/Perchlorate Blank Grab Sand	8455249

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	CH2M Hill, Inc.	Attn: Mark Sherrill
Electronic Copy To	CH2M Hill, Inc.	Attn: Chemistry Mailbox
Electronic Copy To	CH2M Hill, Inc.	Attn: Mark Stinnett

Respectfully Submitted,

Natalie R. Luciano
Senior Specialist

(717) 556-7258

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

Sample Description: Metals Blank Grab Sand
Woodbine Phase III MEC RFI

LL Sample # SW 8455248
LL Group # 1677905
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:03

D88B1 SDG#: DWD88-41BL

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-846 6010C		mg/kg		mg/kg	mg/kg	
01643	Aluminum	7429-90-5	7.82	U	7.82	36.0	1
06944	Antimony	7440-36-0	0.631	U	0.631	3.60	1
06935	Arsenic	7440-38-2	0.874	U	0.874	3.60	1
06946	Barium	7440-39-3	0.0297	U	0.0297	0.901	1
06947	Beryllium	7440-41-7	0.0604	U	0.0604	0.901	1
06949	Cadmium	7440-43-9	0.0441	U	0.0441	0.901	1
01650	Calcium	7440-70-2	5.10	U	5.10	36.0	1
06951	Chromium	7440-47-3	0.126	U	0.126	2.70	1
06952	Cobalt	7440-48-4	0.108	U	0.108	0.901	1
06953	Copper	7440-50-8	0.207	U	0.207	1.80	1
01654	Iron	7439-89-6	3.71	U	3.71	36.0	1
06955	Lead	7439-92-1	0.495	U	0.495	2.70	1
01657	Magnesium	7439-95-4	1.71	U	1.71	18.0	1
06958	Manganese	7439-96-5	0.0748	U	0.0748	0.901	1
06961	Nickel	7440-02-0	0.270	U	0.270	1.80	1
01662	Potassium	7440-09-7	21.5	U	21.5	90.1	1
06936	Selenium	7782-49-2	0.811	U	0.811	3.60	1
06966	Silver	7440-22-4	0.142	J	0.135	0.901	1
01667	Sodium	7440-23-5	21.5	U	21.5	180	1
06971	Vanadium	7440-62-2	0.126	U	0.126	0.901	1
06972	Zinc	7440-66-6	0.613	U	0.613	3.60	1
	SW-846 6020A		mg/kg		mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0261	U	0.0261	0.180	2

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was collected following the protocol specified by each method listed in the Laboratory Sample Analysis Record.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01643	Aluminum	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06944	Antimony	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06935	Arsenic	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06946	Barium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06947	Beryllium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1

*=This limit was used in the evaluation of the final result

Sample Description: Metals Blank Grab Sand
Woodbine Phase III MEC RFI

LL Sample # SW 8455248
LL Group # 1677905
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:03

D88B1 SDG#: DWD88-41BL

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06949	Cadmium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
01650	Calcium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06951	Chromium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06952	Cobalt	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06953	Copper	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
01654	Iron	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06955	Lead	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
01657	Magnesium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06958	Manganese	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06961	Nickel	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
01662	Potassium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06936	Selenium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06966	Silver	SW-846 6010C	1	161950637002	07/15/2016 15:13	Cindy M Gehman	1
01667	Sodium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06971	Vanadium	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06972	Zinc	SW-846 6010C	1	161950637002	07/15/2016 03:48	Matthew R Machtinger	1
06145	Thallium	SW-846 6020A	1	161950637002A	07/15/2016 05:41	Scott P Cuff	2
10637	ICP/ICPMS-SW, 3050B - U4	SW-846 3050B	1	161950637002	07/14/2016 07:00	James L Mertz	1

*=This limit was used in the evaluation of the final result

Sample Description: Explosives/Perchlorate Blank Grab Sand
Woodbine Phase III MEC RFI

LL Sample # SW 8455249
LL Group # 1677905
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/24/2016 09:30
Reported: 09/08/2016 19:03

D88B2 SDG#: DWD88-42BL

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Explosives	SW-846 8330B Rev.2 Oct. 2006		ug/kg		ug/kg	ug/kg	
13413	4-Amino-2,6-Dinitrotoluene	19406-51-0	41	U	41	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	41	U	41	120	1
13413	1,3-Dinitrobenzene	99-65-0	40	U	40	120	1
13413	2,4-Dinitrotoluene	121-14-2	40	U	40	120	1
13413	2,6-Dinitrotoluene	606-20-2	110	U	110	120	1
13413	HM	2691-41-0	210	U	210	300	1
13413	Nitrobenzene	98-95-3	99	U	99	300	1
13413	Nitroglycerin	55-63-0	790	U	790	2,400	1
13413	2-Nitrotoluene	88-72-2	74	U	74	120	1
13413	3-Nitrotoluene	99-08-1	110	U	110	120	1
13413	4-Nitrotoluene	99-99-0	110	U	110	120	1
13413	PETN	78-11-5	790	U	790	2,400	1
13413	RD	121-82-4	40	U	40	120	1
13413	Tetryl	479-45-8	99	U	99	300	1
13413	1,3,5-Trinitrobenzene	99-35-4	40	U	40	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	44	U	44	120	1
	This sample was used for the ISM triplicate. The individual RSD is included in the data package for review.						
Perchlorate	SW-846 6850 1/2007		ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.1	U	2.1	5.0	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.
This sample was collected following the protocol specified by each method listed in the Laboratory Sample Analysis Record.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
13413	Nitroaromatics/Amines 8330B s	SW-846 8330B Rev.2 Oct. 2006	1	162500017A	09/08/2016 03:12	James H Place	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161880035A	07/08/2016 04:51	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	1	161880035A	07/07/2016 09:00	Jessica M Cook	1
13433	Nitroaromatic/Amine Ext 8330B	SW-846 8330B Rev.2 Oct. 2006	1	162500017A	09/06/2016 12:00	David V Hershey Jr	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1677905
Reported: 09/08/2016 19:03

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/kg		ug/kg	ug/kg
Batch number: 162500017A	Sample number s : 8455249			
4-Amino-2,6-Dinitrotoluene	41	U	41	120
2-Amino-4,6-Dinitrotoluene	41	U	41	120
1,3-Dinitrobenzene	40	U	40	120
2,4-Dinitrotoluene	40	U	40	120
2,6-Dinitrotoluene	110	U	110	120
HM	210	U	210	300
Nitrobenzene	100	U	100	300
Nitroglycerin	800	U	800	2,400
2-Nitrotoluene	75	U	75	120
3-Nitrotoluene	110	U	110	120
4-Nitrotoluene	110	U	110	120
PETN	800	U	800	2,400
RD	40	U	40	120
Tetryl	100	U	100	300
1,3,5-Trinitrobenzene	40	U	40	120
2,4,6-Trinitrotoluene	44	U	44	120
Batch number: 161880035A	Sample number s : 8455249			
Perchlorate in Soil LC/MS/MS	2.1	U	2.1	5.0
	mg/kg		mg/kg	mg/kg
Batch number: 161950637002	Sample number s : 8455248			
Aluminum	8.68	U	8.68	40.0
Antimony	0.700	U	0.700	4.00
Arsenic	0.970	U	0.970	4.00
Barium	0.0330	U	0.0330	1.00
Beryllium	0.0670	U	0.0670	1.00
Cadmium	0.0490	U	0.0490	1.00
Calcium	5.66	U	5.66	40.0
Chromium	0.140	U	0.140	3.00
Cobalt	0.120	U	0.120	1.00
Copper	0.230	U	0.230	2.00
Iron	4.12	U	4.12	40.0
Lead	0.631	J	0.550	3.00
Magnesium	1.90	U	1.90	20.0
Manganese	0.0830	U	0.0830	1.00
Nickel	0.300	U	0.300	2.00
Potassium	23.9	U	23.9	100
Selenium	0.900	U	0.900	4.00
Silver	0.191	J	0.150	1.00
Sodium	23.9	U	23.9	200
Vanadium	0.140	U	0.140	1.00
Zinc	0.680	U	0.680	4.00

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 09/08/2016 19:03

Group Number: 1677905

Method Blank continued

Analysis Name	Result	MDL**	LOQ
	mg/kg	mg/kg	mg/kg
Batch number: 161950637002A	Sample number s : 8455248		
Thallium	0.0290 U	0.0290	0.200

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 162500017A	Sample number s : 8455249								
4-Amino-2,6-Dinitrotoluene	1961	2229.06			114		42-138		
2-Amino-4,6-Dinitrotoluene	1961	1703.64			87		43-141		
1,3-Dinitrobenzene	1961	2236.41			114		54-140		
2,4-Dinitrotoluene	1961	1726.32			88		52-137		
2,6-Dinitrotoluene	1961	2082.13			106		51-138		
HM	1961	1794.76			92		29-148		
Nitrobenzene	1961	1988.37			101		64-138		
Nitroglycerin	9804	8163.75			83		45-137		
2-Nitrotoluene	1961	1952.13			100		57-135		
3-Nitrotoluene	1961	1676.49			85		57-135		
4-Nitrotoluene	1961	1644.3			84		53-133		
PETN	9804	8392.06			86		36-143		
RD	1961	1638.53			84		45-145		
Tetryl	1961	1357.65			69		38-152		
1,3,5-Trinitrobenzene	1961	1958.28			100		48-141		
2,4,6-Trinitrotoluene	1961	1599.43			82		47-140		
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161880035A	Sample number s : 8455249								
Perchlorate in Soil LC/MS/MS	100	84.75			85		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161950637002	Sample number s : 8455248								
Aluminum	200	194.3			97		80-120		
Antimony	50	46.5			93		80-120		
Arsenic	15	13.54			90		80-120		
Barium	200	196.88			98		80-120		
Beryllium	5.00	4.85			97		80-120		
Cadmium	5.00	4.83			97		80-120		
Calcium	400	389.67			97		80-120		
Chromium	20	18.94			95		80-120		
Cobalt	50	49.13			98		80-120		
Copper	25	25.06			100		80-120		
Iron	100	97.74			98		80-120		
Lead	15	14.81			99		80-120		
Magnesium	200	197.5			99		80-120		
Manganese	50	49.55			99		80-120		
Nickel	50	49.29			99		80-120		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1677905
Reported: 09/08/2016 19:03

LCS/LCSD continued

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Potassium	1000	987.07			99		80-120		
Selenium	15	13.47			90		80-120		
Silver	5.00	5.26			105		80-120		
Sodium	1000	994.96			99		80-120		
Vanadium	50	48.03			96		80-120		
Zinc	50	47.3			95		80-120		
Batch number: 161950637002A	Sample number s : 8455248								
Thallium	0.200	0.214			107		80-120		

MS/MSD

Unspiked UNSP the sample used in con unction with the matrix spike

Analysis Name	Unspiked Conc ug/kg	MS Spike Added ug/kg	MS Conc ug/kg	MSD Spike Added ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 161880035A	Sample number s : 8455249 UNSP : P444082									
Perchlorate in Soil LC/MS/MS	2.1 U	100	113.32	100	100.41	113	100	70-130	12	15
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161950637002	Sample number s : 8455248 UNSP : P444103									
Aluminum	1322.61	200	1614.79	200	1921.26	146 2	299 2	75-125	17	20
Antimony	0.693 U	50	44.28	50	43.7	89	87	75-125	1	20
Arsenic	0.960 U	15	13.34	15	13.05	89	87	75-125	2	20
Barium	4.01	200	198.25	200	202.12	97	99	75-125	2	20
Beryllium	0.0663 U	5.00	4.90	5.00	5.02	98	100	75-125	2	20
Cadmium	0.0485 U	5.00	4.79	5.00	4.75	96	95	75-125	1	20
Calcium	72.72	400	445.53	400	456.41	93	96	75-125	2	20
Chromium	1.58	20	19.99	20	20.53	92	95	75-125	3	20
Cobalt	0.119 U	50	48.4	50	48.09	97	96	75-125	1	20
Copper	0.779	25	25.44	25	26.41	99	103	75-125	4	20
Iron	348.1	100	415.69	100	478.13	68	130	75-125	14	20
Lead	5.82	15	19	15	19.29	88	90	75-125	2	20
Magnesium	49.94	200	249.75	200	261.45	100	106	75-125	5	20
Manganese	3.66	50	51.98	50	52.73	97	98	75-125	1	20
Nickel	0.386	50	48.9	50	48.79	97	97	75-125	0	20
Potassium	41.75	1000	1041.02	1000	1039.74	100	100	75-125	0	20
Selenium	0.891 U	15	12.71	15	13.42	85	89	75-125	5	20
Silver	0.149 U	5.00	5.27	5.00	5.21	105	104	75-125	1	20
Sodium	23.7 U	1000	997.49	1000	993.55	100	99	75-125	0	20
Vanadium	1.71	50	49.1	50	50.07	95	97	75-125	2	20
Zinc	2.92	50	49.26	50	49.93	93	94	75-125	1	20
Batch number: 161950637002A	Sample number s : 8455248 UNSP : P444103									
Thallium	0.0287 U	0.400	0.377	0.400	0.386	94	97	75-125	2	20

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: CH2M Hill, Inc. Group Number: 1677905
Reported: 09/08/2016 19:03

Laboratory Duplicate

Background B G the sample used in con unction with the duplicate

Analysis Name	B G Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161950637002	Sample number s : 8455248 B G: P444103			
Aluminum	1322.61	1244.03	6	20
Antimony	0.693 U	0.686 U	0 1	20
Arsenic	0.960 U	0.951 U	0 1	20
Barium	4.01	3.67	9 1	20
Beryllium	0.0663 U	0.0657 U	0 1	20
Cadmium	0.0485 U	0.0480 U	0 1	20
Calcium	72.72	74.75	3 1	20
Chromium	1.58	1.45	8 1	20
Cobalt	0.119 U	0.118 U	0 1	20
Copper	0.779	0.729	7 1	20
Iron	348.1	328.3	6	20
Lead	5.82	5.09	13 1	20
Magnesium	49.94	46.54	7 1	20
Manganese	3.66	2.63	33 1	20
Nickel	0.386	0.345	11 1	20
Potassium	41.75	40.68	3 1	20
Selenium	0.891 U	0.882 U	0 1	20
Silver	0.149 U	0.151	200 1	20
Sodium	23.7 U	23.4 U	0 1	20
Vanadium	1.71	1.37	22 1	20
Zinc	2.92	3.27	11 1	20
Batch number: 161950637002A	Sample number s : 8455248 B G: P444103			
Thallium	0.0287 U	0.0284 U	0 1	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Nitroaromatics/Amines 8330B s
Batch number: 162500017A

	3,4-Dinitrotoluene
8455249	127
Blank	124
LCS	126
Limits:	62-133

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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Volatiles by GC/MS Data

Case Narrative/Conformance Summary

Volatiles by GC/MS

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8444054	DU-2-5-A		X	1.59	
8444058	DU-2-5-B		X	70.03	
8444062	DU-2-5-C		X	1.15	
8444066	DU-2-2-A		X	1.58	
8444070	DU-2-2-B		X	1.37	
8444085	DU-2-2-C		X	1.53	Unspiked
8444086	DU-2-2-C MS		X	1.68	Matrix Spike
8444087	DU-2-2-C MSD		X	1.74	Matrix Spike Duplicate
8444091	BGA-1		X	0.95	
8444095	BGA-2		X	1.13	
8444110	BGA-3		X	1.25	
8444111	BGA-3 MS		X	1.21	Matrix Spike
8444112	BGA-3 MSD		X	1.23	Matrix Spike Duplicate
8444113	DU-2-5-FB	X		1	Field Blank
8444114	TB-3	X		1	Trip Blank
8444115	DU-2-2-EB	X		1	Equipment Blank
8444116	BGA-3-EB	X		1	Equipment Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

(Sample number(s): 8444054, 8444062, 8444066, 8444070, 8444085-8444087, 8444095, 8444110-8444112: Analysis: 11995)
The VOA soil weight is outside the acceptable weight range.
See the VOA Prep Summary Sheet for the affected sample(s).

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

(Sample number(s): 8444058: Analysis: 11995)
For the initial calibration, the following analyte(s) was calibrated using a quadratic fit: 4-methyl-2-pentanone.

Reporting limits were raised due to interference from the sample matrix.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

All QC is within specification.

SAMPLE ANALYSIS:

(Sample number(s): 8444054, 8444066, 8444070, 8444085-8444087, 8444091, 8444095: Analysis: 11995)
The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: Since this internal standard was not used to quantitate any target analytes, the data is reported.

(Sample number(s): 8444110-8444112: Analysis: 11995)
The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: since this internal standard was not used to quantitate any target analytes, the data is reported.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Volatiles by GC/MS

eurofins | Lancaster Laboratories Environmental

Quality Control Reference List
GC/MS Volatiles

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Fraction: Volatiles by GC/MS

Analysis	Batch Number	Sample Number	Analysis Date
4-Methyl-2-pentanone 8260C	A161801AA	VBLKA33	06/28/2016 08:35:00
		LCSA33	06/28/2016 09:03:00
		LCDA33	06/28/2016 09:26:00
		8444110 UNSPK	06/28/2016 10:33:00
		8444111 MS	06/28/2016 10:55:00
		8444112 MSD	06/28/2016 11:18:00
4-Methyl-2-pentanone 8260C	A161802AA	VBLKA34	06/28/2016 08:35:00
		LCSA34	06/28/2016 09:03:00
		LCDA34	06/28/2016 09:26:00
		8444062	06/28/2016 13:56:00
		8444066	06/28/2016 12:26:00
		8444070	06/28/2016 14:19:00
		8444085 UNSPK	06/28/2016 12:49:00
		8444086 MS	06/28/2016 13:11:00
		8444087 MSD	06/28/2016 13:34:00
4-Methyl-2-pentanone 8260C	B161811AA	VBLKB09	06/29/2016 08:57:00
		LCSB09	06/29/2016 09:24:00
		LCDB09	06/29/2016 09:51:00
		8444054	06/29/2016 12:34:00
		8444091	06/29/2016 13:20:00
		8444095	06/29/2016 12:57:00
4-Methyl-2-pentanone 8260C	L161872AA	VBLKL14	07/05/2016 18:19:00
		LCSL14	07/05/2016 17:35:00
		LCDL14	07/05/2016 17:57:00
		8444113	07/05/2016 20:09:00
		8444114	07/05/2016 20:31:00
		8444115	07/05/2016 20:52:00
		8444116	07/05/2016 21:14:00
4-Methyl-2-pentanone 8260C	R161811AA	VBLKR75	06/29/2016 09:12:00
		LCSR75	06/29/2016 08:02:00
		LCDR75	06/29/2016 08:26:00
		8444058	06/29/2016 11:48:00

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Quality Control Summary
Method Blank
GC/MS Volatiles
SDG: DWD88
Matrix: SOLID

Fraction: Volatiles by GC/MS

A161801AA / VBLKA33 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	06/28/16	N.D.	ug/kg	3	10

A161802AA / VBLKA34 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	06/28/16	N.D.	ug/kg	3	10

B161811AA / VBLKB09 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	06/29/16	N.D.	ug/kg	3	10

R161811AA / VBLKR75 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	06/29/16	N.D.	ug/kg	150	500

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Quality Control Summary
Method Blank
GC/MS Volatiles
SDG: DWD88
Matrix: LIQUID

Fraction: Volatiles by GC/MS

L161872AA / VBLKL14 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	07/05/16	N.D.	ug/l	3	10

Fraction: Volatiles by GC/MS

A161801AA	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
VBLKA33	100	54 - 135	96	50 - 131	102	50 - 141	101	52 - 141
LCSA33	103	54 - 135	101	50 - 131	103	50 - 141	100	52 - 141
LCDA33	101	54 - 135	100	50 - 131	102	50 - 141	101	52 - 141
8444110 UNSPK	105	54 - 135	76	50 - 131	105	50 - 141	118	52 - 141
8444111 MS	103	54 - 135	78	50 - 131	105	50 - 141	120	52 - 141
8444112 MSD	98	54 - 135	80	50 - 131	103	50 - 141	120	52 - 141

A161802AA	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
VBLKA34	100	54 - 135	96	50 - 131	102	50 - 141	101	52 - 141
LCSA34	103	54 - 135	101	50 - 131	103	50 - 141	100	52 - 141
LCDA34	101	54 - 135	100	50 - 131	102	50 - 141	101	52 - 141
8444062	103	54 - 135	87	50 - 131	103	50 - 141	107	52 - 141
8444066	100	54 - 135	67	50 - 131	105	50 - 141	133	52 - 141
8444070	104	54 - 135	73	50 - 131	105	50 - 141	124	52 - 141
8444085 UNSPK	102	54 - 135	70	50 - 131	105	50 - 141	122	52 - 141
8444086 MS	101	54 - 135	76	50 - 131	103	50 - 141	122	52 - 141
8444087 MSD	101	54 - 135	77	50 - 131	105	50 - 141	121	52 - 141

B161811AA	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
VBLKB09	106	54 - 135	90	50 - 131	104	50 - 141	101	52 - 141
LCSB09	105	54 - 135	95	50 - 131	103	50 - 141	104	52 - 141
LCDB09	106	54 - 135	98	50 - 131	105	50 - 141	104	52 - 141
8444054	118	54 - 135	75	50 - 131	113	50 - 141	116	52 - 141
8444091	106	54 - 135	66	50 - 131	112	50 - 141	135	52 - 141
8444095	110	54 - 135	77	50 - 131	109	50 - 141	114	52 - 141

R161811AA	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
VBLKR75	93	54 - 135	88	50 - 131	89	50 - 141	92	52 - 141
LCSR75	90	54 - 135	94	50 - 131	90	50 - 141	93	52 - 141

Quality Control Summary
Surrogates
GC/MS Volatiles
SDG: DWD88
Matrix: SOLID

Fraction: Volatiles by GC/MS

R161811AA	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg	Spike Added	50 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
LCDR75	104	54 - 135	105	50 - 131	105	50 - 141	105	52 - 141
8444058	86	54 - 135	84	50 - 131	83	50 - 141	87	52 - 141

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Quality Control Summary
Surrogates
GC/MS Volatiles
SDG: DWD88
Matrix: LIQUID

Fraction: Volatiles by GC/MS

L161872AA	1,2-Dichloroethane-d4		4-Bromofluorobenzene		Dibromofluoromethane		Toluene-d8	
	Spike Added	50 ug/l	Spike Added	50 ug/l	Spike Added	50 ug/l	Spike Added	50 ug/l
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
VBLKL14	102	77 - 113	98	78 - 113	102	80 - 116	95	80 - 113
LCSL14	100	77 - 113	102	78 - 113	101	80 - 116	97	80 - 113
LCDL14	102	77 - 113	101	78 - 113	102	80 - 116	97	80 - 113
8444113	104	77 - 113	98	78 - 113	105	80 - 116	94	80 - 113
8444114	105	77 - 113	99	78 - 113	105	80 - 116	94	80 - 113
8444115	104	77 - 113	97	78 - 113	105	80 - 116	94	80 - 113
8444116	103	77 - 113	97	78 - 113	105	80 - 116	95	80 - 113

GC/MS Volatiles

Fraction: Volatiles by GC/MS

UNSPK: 8444110 MS: 8444111 MSD: 8444112 **Analyte**	Batch: **A161801AA** (Sample number(s): 8444110-8444112)								
	Spike Added ug/kg MS/MSD	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	121.36 / 123.15	N.D.	135.6	111.03	112	90	50-120	20	30

UNSPK: 8444085 MS: 8444086 MSD: 8444087 **Analyte**	Batch: **A161802AA** (Sample number(s): 8444062, 8444066, 8444070, 8444085-8444087)								
	Spike Added ug/kg MS/MSD	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	167.79 / 174.22	N.D.	157.31	168.9	94	97	50-120	7	30

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

GC/MS Volatiles

Fraction: Volatiles by GC/MS

LCS: LCSA33 LCSD: LCDA33	Batch: **A161801AA** (Sample number(s): 8444110-8444112)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	100	111.55	105	112	105	50-120	6	30

LCS: LCSA34 LCSD: LCDA34	Batch: **A161802AA** (Sample number(s): 8444062, 8444066, 8444070, 8444085-8444087)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	100	111.55	105	112	105	50-120	6	30

LCS: LCSB09 LCSD: LCDB09	Batch: **B161811AA** (Sample number(s): 8444054, 8444091, 8444095)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	100	89.1	91.37	89	91	50-120	3	30

LCS: LCSR75 LCSD: LCDR75	Batch: **R161811AA** (Sample number(s): 8444058)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	5000	2918.86	3349.16	58	67	50-120	14	30

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD88
Matrix: LIQUID

GC/MS Volatiles

Fraction: Volatiles by GC/MS

LCS: LCSL14 LCSD: LCDL14	Batch: **L161872AA** (Sample number(s): 8444113-8444116)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
4-Methyl-2-pentanone	100	108.79	109.11	109	109	47-133	0	30

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD88

Lab File ID: au20t01.d BFB Injection Date: 06/20/16

Instrument ID: HP09685 BFB Injection Time: 08:05

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.74
75	30.0 - 60.0% of mass 95	48.97
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.93
173	Less than 2.0% of mass 174	0.26 (0.34)1
174	Greater than 50.0% of mass 95	77.00
175	5.0 - 9.0% of mass 174	5.63 (7.31)1
176	Greater than 95.0%, but less than 101.0% of mass 174	76.51 (99.37)1
177	5.0 - 9.0% of mass 176	5.06 (6.61)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD300	au20i01.d	06/20/16	08:48
02	VSTD100	au20i02.d	06/20/16	09:12
03	VSTD50	au20i03.d	06/20/16	10:23
04	VSTD20	au20i04.d	06/20/16	10:49
05	VSTD10	au20i05.d	06/20/16	11:14
06	VSTD4	au20i06.d	06/20/16	12:06
07	VSTD1	au20i07.d	06/20/16	12:32
08	VSTD0.5	au20m01.d	06/20/16	12:58
09	LCSAICVC	au20v01.d	06/20/16	13:30
10	LCSA26	au20l01.d	06/20/16	14:36
11	LCDA26	au20l02.d	06/20/16	14:59
12	VBLKA26	au20b01.d	06/20/16	15:21
13	8416938	au20s09.d	06/20/16	15:58
14	8416934	au20s03.d	06/20/16	17:33
15	8416937	au20s04.d	06/20/16	17:55
16	8416945	au20s05.d	06/20/16	18:18
17	8416946	au20s06.d	06/20/16	18:41
18	8419253	au20s07.d	06/20/16	19:04
19	8414856	au20s08.d	06/20/16	19:26

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD88

Lab File ID: au28t01.d BFB Injection Date: 06/28/16

Instrument ID: HP09685 BFB Injection Time: 07:06

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.80
75	30.0 - 60.0% of mass 95	49.95
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.60
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	76.65
175	5.0 - 9.0% of mass 174	5.57 (7.26)1
176	Greater than 95.0%, but less than 101.0% of mass 174	75.03 (97.89)1
177	5.0 - 9.0% of mass 176	5.06 (6.75)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD50	au28c01.d	06/28/16	07:50
02	VBLKA33	au28b01.d	06/28/16	08:35
03	VBLKA34	au28b02.d	06/28/16	08:35
04	LCSA33	au28l01.d	06/28/16	09:03
05	LCSA34	au28l31.d	06/28/16	09:03
06	LCDA33	au28l02.d	06/28/16	09:26
07	LCDA34	au28l32.d	06/28/16	09:26
08	MDL050 - MDL050	au28m01.d	06/28/16	09:53
09	8444110	au28s03.d	06/28/16	10:33
10	8444111MS	au28s04.d	06/28/16	10:55
11	8444112MSD	au28s05.d	06/28/16	11:18
12	8441953	au28s33.d	06/28/16	11:41
13	8441954	au28s34.d	06/28/16	12:03
14	8444066	au28s35.d	06/28/16	12:26
15	8444085	au28s36.d	06/28/16	12:49
16	8444086MS	au28s37.d	06/28/16	13:11
17	8444087MSD	au28s38.d	06/28/16	13:34
18	8444062	au28s39.d	06/28/16	13:56
19	8444070	au28s40.d	06/28/16	14:19

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD88___

Lab File ID: bf10t05.d BFB Injection Date: 02/10/16

Instrument ID: HP09953 BFB Injection Time: 19:35

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.09
75	30.0 - 60.0% of mass 95	54.82
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.53
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	87.24
175	5.0 - 9.0% of mass 174	6.46 (7.40)1
176	Greater than 95.0%, but less than 101.0% of mass 174	86.90 (99.61)1
177	5.0 - 9.0% of mass 176	5.76 (6.63)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD300	bf10i01.d	02/10/16	20:22
02	VSTD100	bf10i02.d	02/10/16	20:45
03	VSTD50	bf10i03.d	02/10/16	21:08
04	VSTD20	bf10i04.d	02/10/16	21:30
05	VSTD10	bf10i05.d	02/10/16	21:53
06	VSTD4	bf10i06.d	02/10/16	22:16
07	VSTD1	bf10i07.d	02/10/16	22:38
08	MDL0.5 - MDL0.5	bf10m01.d	02/10/16	23:01
09	LCS1ICV	bf10v01.d	02/10/16	23:24
10	1MDL#1 - MDL0.5	bf10m02.d	02/11/16	00:33
11	1MDL#2 - MDL0.5	bf10m03.d	02/11/16	00:56
12	1MDL#3 - MDL0.5	bf10m04.d	02/11/16	01:19
13	1MDL#4 - MDL0.5	bf10m05.d	02/11/16	01:41
14	1MDL#5 - MDL0.5	bf10m06.d	02/11/16	02:04
15	1MDL#6 - MDL0.5	bf10m07.d	02/11/16	02:27
16	1MDL#7 - MDL0.5	bf10m08.d	02/11/16	02:49

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD88___

Lab File ID: bu29t01.d BFB Injection Date: 06/29/16

Instrument ID: HP09953 BFB Injection Time: 07:28

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.13
75	30.0 - 60.0% of mass 95	52.90
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.97
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	91.05
175	5.0 - 9.0% of mass 174	6.69 (7.35)1
176	Greater than 95.0%, but less than 101.0% of mass 174	87.33 (95.92)1
177	5.0 - 9.0% of mass 176	5.98 (6.84)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD50	bu29c01.d	06/29/16	08:12
02	VBLKB09	bu29b01.d	06/29/16	08:57
03	LCSB09	bu29l01.d	06/29/16	09:24
04	LCDB09	bu29l02.d	06/29/16	09:51
05	MDL050 - MDL050	bu29m01.d	06/29/16	10:16
06	8449093	bu29s04.d	06/29/16	11:16
07	8449089	bu29s05.d	06/29/16	11:39
08	8447197	bu29s06.d	06/29/16	12:11
09	8444054	bu29s07.d	06/29/16	12:34
10	8444095	bu29s08.d	06/29/16	12:57
11	8444091	bu29s09.d	06/29/16	13:20

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD88___

Lab File ID: ra05t01.d BFB Injection Date: 04/05/16

Instrument ID: HP07566 BFB Injection Time: 09:15

Matrix: (soil/water) SOIL Level: (low/med) MED Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.45
75	30.0 - 60.0% of mass 95	49.55
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.89
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	74.96
175	5.0 - 9.0% of mass 174	5.70 (7.61)1
176	Greater than 95.0%, but less than 101.0% of mass 174	75.33 (100.50
177	5.0 - 9.0% of mass 176	4.85 (6.44)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD1	ra05i01.d	04/05/16	10:14
02	VSTD4	ra05i02.d	04/05/16	11:02
03	VSTD10	ra05i03.d	04/05/16	11:26
04	VSTD20	ra05i04.d	04/05/16	11:50
05	VSTD50	ra05i05.d	04/05/16	12:14
06	VSTD100	ra05i06.d	04/05/16	12:38
07	VSTD300	ra05i07.d	04/05/16	13:02
08	RICV	ra05v01.d	04/05/16	13:51
09	MDL0.5 - MDL0.5	ma05m01.d	04/05/16	14:15
10	VSTD50	ra05c01.d	04/05/16	14:39
11	MDL0.5 - MDL0.5	ra05m21.d	04/05/16	15:03

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD88___

Lab File ID: ru29t01.d BFB Injection Date: 06/29/16

Instrument ID: HP07566 BFB Injection Time: 07:05

Matrix: (soil/water) SOIL Level: (low/med) MED Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.00
75	30.0 - 60.0% of mass 95	48.67
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.88
173	Less than 2.0% of mass 174	0.00 (0.00)1
174	Greater than 50.0% of mass 95	76.16
175	5.0 - 9.0% of mass 174	5.68 (7.45)1
176	Greater than 95.0%, but less than 101.0% of mass 174	74.37 (97.64)1
177	5.0 - 9.0% of mass 176	4.90 (6.59)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD50	ru29c01.d	06/29/16	07:38
02	LCSR75	ru29l01.d	06/29/16	08:02
03	LCDR75	ru29l02.d	06/29/16	08:26
04	VSTD1.0	ru29m01.d	06/29/16	08:49
05	VBLKR75	ru29b01.d	06/29/16	09:12
06	8444319	ru29s04.d	06/29/16	09:51
07	8437368	ru29s05.d	06/29/16	10:14
08	8444058	ru29s09.d	06/29/16	11:48
09	8440096	ru29s10.d	06/29/16	12:11
10	8449097	ru29s01.d	06/29/16	13:20
11	8447197DL	ru29s21.d	06/29/16	15:32

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD88___

Lab File ID: la22t01.d BFB Injection Date: 04/22/16

Instrument ID: HP09915 BFB Injection Time: 09:13

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.66
75	30.0 - 60.0% of mass 95	47.86
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.71
173	Less than 2.0% of mass 174	0.58 (0.66)1
174	Greater than 50.0% of mass 95	87.40
175	5.0 - 9.0% of mass 174	5.94 (6.79)1
176	Greater than 95.0%, but less than 101.0% of mass 174	83.17 (95.16)1
177	5.0 - 9.0% of mass 176	5.11 (6.15)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD300	la22i01.d	04/22/16	09:55
02	VSTD100	la22i02.d	04/22/16	10:17
03	VSTD50	la22i03.d	04/22/16	10:39
04	VSTD20	la22i04.d	04/22/16	11:01
05	VSTD10	la22i05.d	04/22/16	11:23
06	VSTD4	la22i06.d	04/22/16	11:45
07	VSTD1	la22i07.d	04/22/16	12:07
08	MDL0.5 - MDL0.5	la22m01.d	04/22/16	12:29
09	LCS01	la22v01.d	04/22/16	12:51
10	VSTD300	la22i11.d	04/22/16	14:05
11	VSTD100	la22i12.d	04/22/16	14:27
12	VSTD50	la22i13.d	04/22/16	14:49
13	VSTD20	la22i14.d	04/22/16	15:11
14	VSTD10	la22i15.d	04/22/16	15:33
15	VSTD4	la22i16.d	04/22/16	15:55
16	MDL001 - MDL001	la22m02.d	04/22/16	16:17
17	LCS02	la22v02.d	04/22/16	16:39

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD88___

Lab File ID: l105t05.d BFB Injection Date: 07/05/16

Instrument ID: HP09915 BFB Injection Time: 16:32

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.91
75	30.0 - 60.0% of mass 95	45.88
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.46
173	Less than 2.0% of mass 174	0.59 (0.70)1
174	Greater than 50.0% of mass 95	84.60
175	5.0 - 9.0% of mass 174	6.35 (7.50)1
176	Greater than 95.0%, but less than 101.0% of mass 174	81.49 (96.32)1
177	5.0 - 9.0% of mass 176	5.42 (6.65)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD50	l105c05.d	07/05/16	17:13
02	LCSL14	l105s31.d	07/05/16	17:35
03	LCDL14	l105s32.d	07/05/16	17:57
04	VBLKL14	l105b05.d	07/05/16	18:19
05	8442828	l105s33.d	07/05/16	18:41
06	8442829	l105s34.d	07/05/16	19:03
07	8442830	l105s35.d	07/05/16	19:25
08	8442831	l105s36.d	07/05/16	19:47
09	8444113	l105s37.d	07/05/16	20:09
10	8444114	l105s38.d	07/05/16	20:31
11	8444115	l105s39.d	07/05/16	20:52
12	8444116	l105s40.d	07/05/16	21:14
13	8445666	l105s41.d	07/05/16	21:36
14	8445667	l105s42.d	07/05/16	21:58
15	8445668	l105s43.d	07/05/16	22:20
16	8449085	l105s44.d	07/05/16	22:42
17	8450968	l105s45.d	07/05/16	23:04
18	8451646	l105s46.d	07/05/16	23:26
19	8451647	l105s47.d	07/05/16	23:47
20	8451647DL	l105s48.d	07/06/16	00:09
21	8451648	l105s49.d	07/06/16	00:31
22	8451649	l105s50.d	07/06/16	00:53

FORM V VOA

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD88___

Lab File ID: l105t05.d BFB Injection Date: 07/05/16

Instrument ID: HP09915 BFB Injection Time: 16:32

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.91
75	30.0 - 60.0% of mass 95	45.88
95	Base peak, 100% relative abundance	100.00
96	5.0 - 9.0% of mass 95	6.46
173	Less than 2.0% of mass 174	0.59 (0.70)1
174	Greater than 50.0% of mass 95	84.60
175	5.0 - 9.0% of mass 174	6.35 (7.50)1
176	Greater than 95.0%, but less than 101.0% of mass 174	81.49 (96.32)1
177	5.0 - 9.0% of mass 176	5.42 (6.65)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
23	8451650	l105s51.d	07/06/16	01:15
24	8451651	l105s52.d	07/06/16	01:37
25	8454720	l105s53.d	07/06/16	01:59
26	8457188	l105s54.d	07/06/16	02:20

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date(s): 06/20/16 06/20/16

Heated Purge: (Y/N) Y Calibration Times: 08:48 12:32

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = au20i07.d RRF 4 = au20i06.d RRF 10= au20i05.d
RRF 20= au20i04.d RRF 50= au20i03.d RRF100= au20i02.d RRF300= au20i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Dichlorodifluoromethane	#0.3015	0.4061	0.4347	0.4374	0.4139	0.3790	0.3721	0.3921	12	AVG #
Chloromethane	#0.3447	0.4453	0.4523	0.4173	0.4163	0.4043	0.3715	0.4074	9	AVG #
Vinyl Chloride	#0.2880	0.3897	0.4136	0.3999	0.3821	0.3636	0.3504	0.3696	11	AVG #
Bromomethane	#0.2231	0.2697	0.2762	0.2688	0.2576	0.2444	0.2169	0.2509	9	AVG #
Chloroethane	#0.1715	0.2217	0.2260	0.2194	0.2097	0.2000	0.1809	0.2042	10	AVG #
Dichlorofluoromethane	0.3851	0.4846	0.5016	0.4950	0.4828	0.4623	0.4563	0.4668	8	AVG
Trichlorofluoromethane	#0.3332	0.4472	0.4646	0.4680	0.4482	0.4096	0.4182	0.4270	11	AVG #
Ethanol	0.1832	0.1707	0.1917	0.1795	0.1769	0.1750	0.1818	0.1798	4	AVG
Freon 123a	0.2483	0.3140	0.3249	0.3171	0.3106	0.3000	0.3009	0.3023	8	AVG
Acrolein	2.4021	2.5457	3.3317	2.7087	2.6390	2.4547	2.5173	2.6570	12	AVG
1,1-Dichloroethene	#0.1624	0.2170	0.2212	0.2280	0.2345	0.2401	0.2326	0.2194	12	AVG #
1,1-Dichloroethene(2)	#0.0795	0.1177	0.1184	0.1226	0.1269	0.1265	0.1221	0.1162	14	AVG #
Acetone	#	1.3648	1.3025	1.3884	1.2412	1.2298	1.2487	1.2959	5	AVG #
Freon 113	#	0.2142	0.2000	0.2274	0.2423	0.2385	0.2319	0.2257	7	AVG #
2-Propanol	0.9644	0.9736	0.9905	1.0054	0.9555	0.9485	1.0546	0.9846	4	AVG
Methyl Iodide	0.3045	0.3904	0.4101	0.4170	0.4287	0.4403	0.4218	0.4018	11	AVG
Carbon Disulfide	#0.5631	0.6775	0.6999	0.7313	0.7775	0.8023	0.7824	0.7191	11	AVG #
Methyl Acetate	#0.1880	0.1928	0.2056	0.1771	0.1902	0.1950	0.1903	0.1913	4	AVG #
Allyl Chloride	0.3026	0.3903	0.4225	0.4162	0.4191	0.4249	0.4101	0.3979	11	AVG
Methylene Chloride	#0.3152	0.2782	0.2730	0.2658	0.2695	0.2770	0.2653	0.2777	6	AVG #
t-Butyl alcohol	1.5669	1.4165	1.4095	1.4042	1.3935	1.4328	1.6033	1.4610	6	AVG
Acrylonitrile	0.0554	0.0927	0.1014	0.0876	0.1013	0.1035	0.1021	0.0920	19	AVG
Methyl Tertiary Butyl Ether	#0.6256	0.6812	0.7136	0.6962	0.7418	0.7734	0.7514	0.7119	7	AVG #
trans-1,2-Dichloroethene	#0.1629	0.2384	0.2466	0.2505	0.2588	0.2682	0.2595	0.2407	15	AVG #
n-Hexane	0.2650	0.4265	0.3194	0.3732	0.4142	0.4110	0.3881	0.3710	16	AVG
1,1-Dichloroethane	#0.3556	0.4482	0.4614	0.4701	0.4818	0.4944	0.4785	0.4557	10	AVG #
di-Isopropyl ether	0.6921	0.7832	0.8484	0.8697	0.9005	0.9307	0.8961	0.8458	10	AVG
2-Chloro-1,3-butadiene		0.3403	0.3562	0.3861	0.4125	0.4290	0.4166	0.3901	9	AVG
Ethyl t-butyl ether	0.5878	0.6774	0.7142	0.7400	0.7689	0.7974	0.7678	0.7219	10	AVG
2-Butanone	#5.3778	5.5432	5.9079	5.9932	5.7792	5.7351	5.9830	5.7599	4	AVG #
cis-1,2-Dichloroethene	#0.2147	0.2639	0.2716	0.2783	0.2879	0.3005	0.2934	0.2729	10	AVG #
2,2-Dichloropropane	0.2106	0.3006	0.3103	0.3371	0.3623	0.3763	0.3666	0.3234	18	AVG
Propionitrile	1.6199	1.7320	1.7848	1.9565	1.7845	1.8265	1.9266	1.8044	6	AVG
Methacrylonitrile	0.0964	0.1016	0.1084	0.0992	0.1112	0.1162	0.1155	0.1069	7	AVG
Bromochloromethane	0.1064	0.1276	0.1385	0.1350	0.1372	0.1443	0.1420	0.1330	10	AVG
Tetrahydrofuran	1.1724	1.5211	1.5964	1.6479	1.6139	1.6360	1.7360	1.5605	12	AVG
Chloroform	#0.3505	0.4241	0.4358	0.4434	0.4544	0.4741	0.4608	0.4347	9	AVG #
1,1,1-Trichloroethane	#0.3137	0.4274	0.3786	0.4061	0.4007	0.4193	0.4129	0.3941	10	AVG #
Cyclohexane	#	0.4357	0.3897	0.4473	0.4847	0.4905	0.4714	0.4532	8	AVG #
Cyclohexane(2)	#	0.3584	0.3235	0.3751	0.4008	0.4034	0.3926	0.3756	8	AVG #
Cyclohexane(3)	#	0.1307	0.1149	0.1351	0.1464	0.1472	0.1446	0.1365	9	AVG #
1,1-Dichloropropene	0.2488	0.3298	0.3293	0.3588	0.3795	0.3962	0.3884	0.3473	15	AVG
Carbon Tetrachloride	#0.1802	0.2618	0.2580	0.2905	0.3194	0.3373	0.3430	0.2843	20	AVG #
Isobutyl Alcohol	0.4537	0.4876	0.4729	0.4960	0.4858	0.4892	0.5813	0.4952	8	AVG
Benzene	#1.0591	1.0676	1.0493	1.0817	1.1002	1.1301	1.0920	1.0828	3	AVG #
1,2-Dichloroethane	#0.3559	0.3433	0.3403	0.3384	0.3492	0.3571	0.3510	0.3479	2	AVG #
1,2-Dichloroethane(2)	#0.0836	0.0280	0.0309	0.0315	0.0317	0.0332	0.0332	0.0389	51	AVG #<-
t-Amyl methyl ether	0.5453	0.6221	0.6535	0.6637	0.7052	0.7391	0.7281	0.6653	10	AVG
n-Heptane		0.4539	0.3277	0.3804	0.4334	0.4308	0.3947	0.4035	11	AVG
n-Butanol		0.3671	0.3752	0.4078	0.4078	0.4315	0.5268	0.4194	14	AVG
Trichloroethene	#0.1915	0.2524	0.2448	0.2633	0.2741	0.2851	0.2829	0.2563	13	AVG #
Methylcyclohexane	#0.3180	0.4777	0.5098	0.4992	0.5058	0.5050	0.5200	0.4765	15	AVG #

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date(s): 06/20/16 06/20/16

Heated Purge: (Y/N) Y Calibration Times: 08:48 12:32

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = au20i07.d RRF 4 = au20i06.d RRF 10= au20i05.d
RRF 20= au20i04.d RRF 50= au20i03.d RRF100= au20i02.d RRF300= au20i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
1,2-Dichloropropane	#0.2283	0.2616	0.2721	0.2831	0.2954	0.3045	0.3019	0.2781	10	AVG #
Methyl Methacrylate	0.1288	0.1602	0.1738	0.1690	0.1936	0.2033	0.2122	0.1773	16	AVG
1,4-Dioxane	0.1229	0.1384	0.1470	0.1632	0.1530	0.1618	0.1818	0.1526	12	AVG
Dibromomethane	0.1386	0.1458	0.1526	0.1533	0.1616	0.1683	0.1697	0.1557	7	AVG
Bromodichloromethane	#0.2211	0.2624	0.2852	0.2990	0.3218	0.3417	0.3524	0.2977	16	AVG #
2-Nitropropane	1.7609	2.0810	2.2922	2.6388	2.8433	2.9702	3.3801	2.5666	22	2NDDEG
cis-1,3-Dichloropropene	#0.2846	0.3452	0.3783	0.4117	0.4489	0.4671	0.4741	0.4014	17	AVG #
4-Methyl-2-pentanone	#0.2068	0.2198	0.2590	0.2159	0.2657	0.2752	0.2759	0.2455	12	AVG #
Toluene	#0.7560	0.8874	0.8576	0.9211	0.9432	0.9638	0.9191	0.8926	8	AVG #
trans-1,3-Dichloropropene	#0.3248	0.4093	0.4524	0.4825	0.5294	0.5601	0.5632	0.4745	18	AVG #
Ethyl Methacrylate		0.3660	0.4073	0.3893	0.4908	0.5152	0.5243	0.4488	15	AVG
1,1,2-Trichloroethane	#0.2905	0.3023	0.3120	0.3081	0.3186	0.3279	0.3261	0.3122	4	AVG #
Tetrachloroethene	#0.2598	0.3623	0.3321	0.3727	0.3864	0.4021	0.3961	0.3588	14	AVG #
1,3-Dichloropropane	0.5018	0.5304	0.5583	0.5384	0.5684	0.5828	0.5684	0.5498	5	AVG
2-Hexanone	#0.1955	0.2066	0.2561	0.2023	0.2549	0.2669	0.2606	0.2347	13	AVG #
Dibromochloromethane	#0.2165	0.2557	0.2852	0.3061	0.3412	0.3658	0.3837	0.3077	20	AVG #
1,2-Dibromoethane	#0.2579	0.2860	0.3072	0.3028	0.3223	0.3377	0.3401	0.3077	10	AVG #
Chlorobenzene	#0.9042	1.0052	0.9846	1.0410	1.0695	1.1016	1.0659	1.0245	6	AVG #
1,1,1,2-Tetrachloroethane	0.2345	0.2750	0.2949	0.3186	0.3492	0.3722	0.3811	0.3179	17	AVG
Ethylbenzene	#1.2977	1.5878	1.5438	1.7403	1.8265	1.9162	1.7982	1.6729	13	AVG #
m+p-Xylene	#0.4795	0.6281	0.6196	0.6907	0.7249	0.7593	0.7180	0.6600	14	AVG #
o-Xylene	#0.4625	0.6030	0.6017	0.6770	0.7168	0.7432	0.7216	0.6465	15	AVG #
Styrene	#0.6754	0.9290	0.9813	1.0954	1.1792	1.2419	1.1979	1.0429	19	AVG #
Bromoform	#0.1436	0.1474	0.1716	0.1769	0.2111	0.2339	0.2632	0.1925	23	2NDDEG #
Isopropylbenzene	#	1.5815	1.4307	1.6569	1.7711	1.8488	1.7304	1.6699	9	AVG #
Cyclohexanone	0.5409	0.6101	0.6740	0.7496	0.7770	0.8206	0.9059	0.7254	17	AVG
1,1,2,2-Tetrachloroethane	#0.7474	0.7754	0.8373	0.7730	0.8265	0.8647	0.8985	0.8176	7	AVG #
Bromobenzene	0.6970	0.7970	0.8020	0.8480	0.8622	0.9139	0.9235	0.8348	9	AVG
trans-1,4-Dichloro-2-butene	0.1944	0.2169	0.2251	0.2132	0.2357	0.2552	0.2636	0.2291	11	AVG
1,2,3-Trichloropropane	0.2162	0.2305	0.2435	0.2209	0.2381	0.2467	0.2548	0.2358	6	AVG
n-Propylbenzene		3.9361	3.3856	3.8815	3.9988	4.2017	3.6867	3.8484	7	AVG
2-Chlorotoluene	0.5984	0.7674	0.7193	0.8021	0.8165	0.8469	0.8257	0.7680	11	AVG
1,3,5-Trimethylbenzene		2.7816	2.4478	2.8063	2.9309	3.0795	2.8518	2.8163	7	AVG
4-Chlorotoluene	0.6272	0.8053	0.7621	0.8281	0.8592	0.8941	0.8712	0.8067	11	AVG
tert-Butylbenzene		0.5948	0.4929	0.5695	0.6116	0.6547	0.6283	0.5920	10	AVG
Pentachloroethane	0.2918	0.3873	0.4509	0.4644	0.4949	0.5369	0.5575	0.4548	20	AVG
1,2,4-Trimethylbenzene		2.8554	2.5291	2.9113	3.0688	3.2519	3.0038	2.9367	8	AVG
sec-Butylbenzene		3.6375	3.0055	3.4821	3.7111	3.9143	3.4622	3.5355	9	AVG
1,3-Dichlorobenzene	#1.3743	1.5803	1.4548	1.6184	1.6810	1.7785	1.6905	1.5968	9	AVG #
p-Isopropyltoluene		3.0890	2.6079	3.0491	3.3204	3.5550	3.1344	3.1260	10	AVG
1,4-Dichlorobenzene	#1.4607	1.6670	1.5209	1.6591	1.7203	1.8160	1.7240	1.6526	7	AVG #
1,2,3-Trimethylbenzene	2.5652	2.9257	3.2590	3.1978	3.1772	3.3435	3.0668	3.0765	9	AVG
Benzyl Chloride	0.1354	0.1932	0.2361	0.2594	0.3234	0.3656	0.4101	0.2747	35	2NDDEG
1,3-Diethylbenzene	1.2868	1.7335	2.0046	1.9770	1.9763	2.0710	1.9646	1.8591	15	AVG
1,4-Diethylbenzene	1.2887	1.8115	2.0572	2.0125	2.0432	2.1507	2.0260	1.9128	15	AVG
n-Butylbenzene		1.6337	1.3216	1.5213	1.6516	1.7524	1.6079	1.5814	9	AVG
1,2-Dichlorobenzene	#1.3661	1.5139	1.4423	1.5534	1.5937	1.6831	1.6460	1.5426	7	AVG #
1,2-Diethylbenzene	1.1358	1.5333	1.7182	1.6667	1.6620	1.7360	1.6657	1.5882	13	AVG
1,2-Dibromo-3-chloropropane	#0.1183	0.1187	0.1357	0.1293	0.1521	0.1648	0.1796	0.1426	17	AVG #
1,3,5-Trichlorobenzene	0.9298	1.2419	1.0502	1.1716	1.2701	1.3590	1.3240	1.1924	13	AVG
1,2,4-Trichlorobenzene	#0.8273	1.0410	0.9037	1.0191	1.1385	1.2409	1.2292	1.0571	15	AVG #
Hexachlorobutadiene		0.5717	0.4320	0.4909	0.5649	0.6053	0.5773	0.5403	12	AVG

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date(s): 06/20/16 06/20/16

Heated Purge: (Y/N) Y Calibration Times: 08:48 12:32

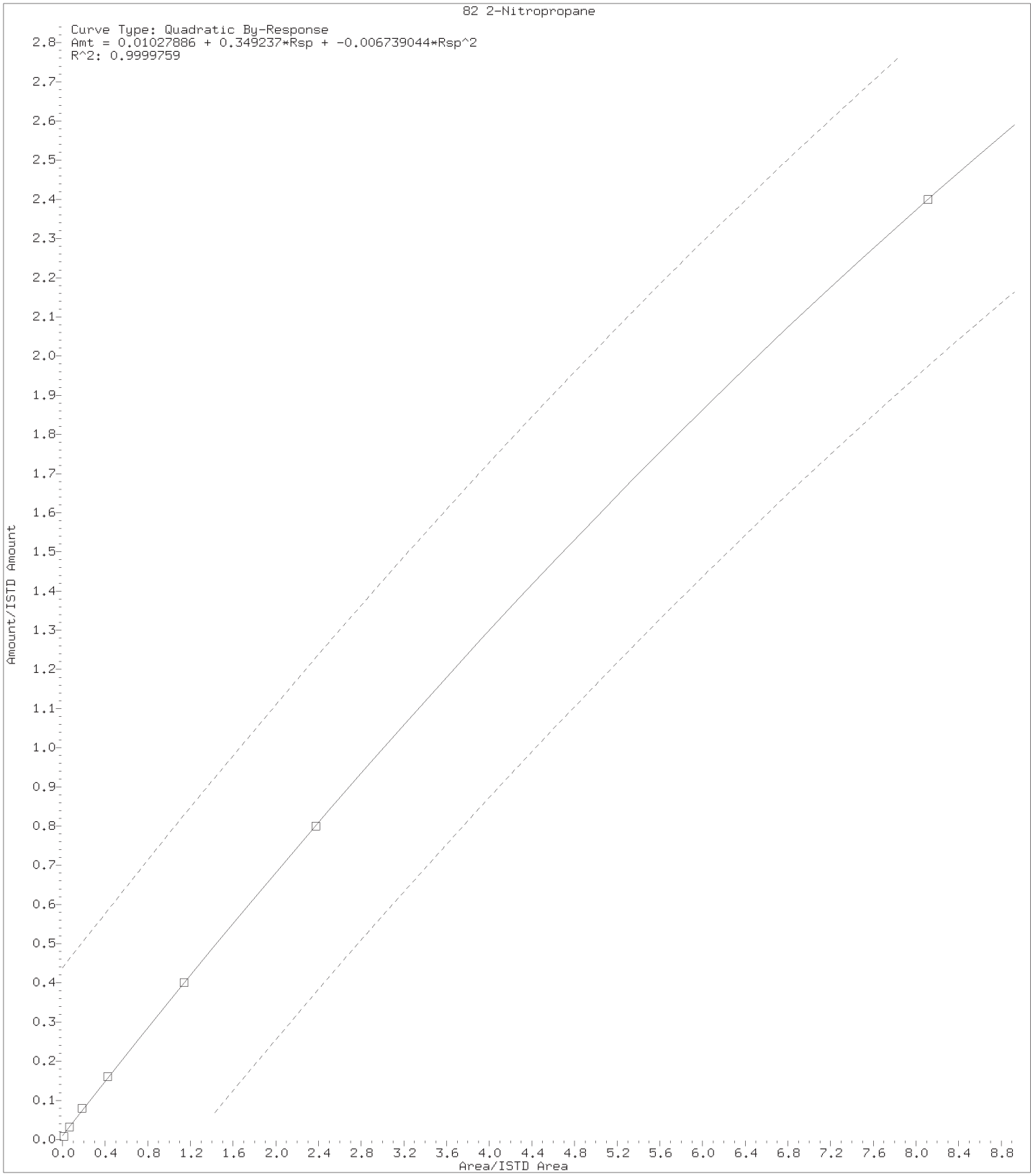
Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = au20i07.d RRF 4 = au20i06.d RRF 10= au20i05.d
RRF 20= au20i04.d RRF 50= au20i03.d RRF100= au20i02.d RRF300= au20i01.d

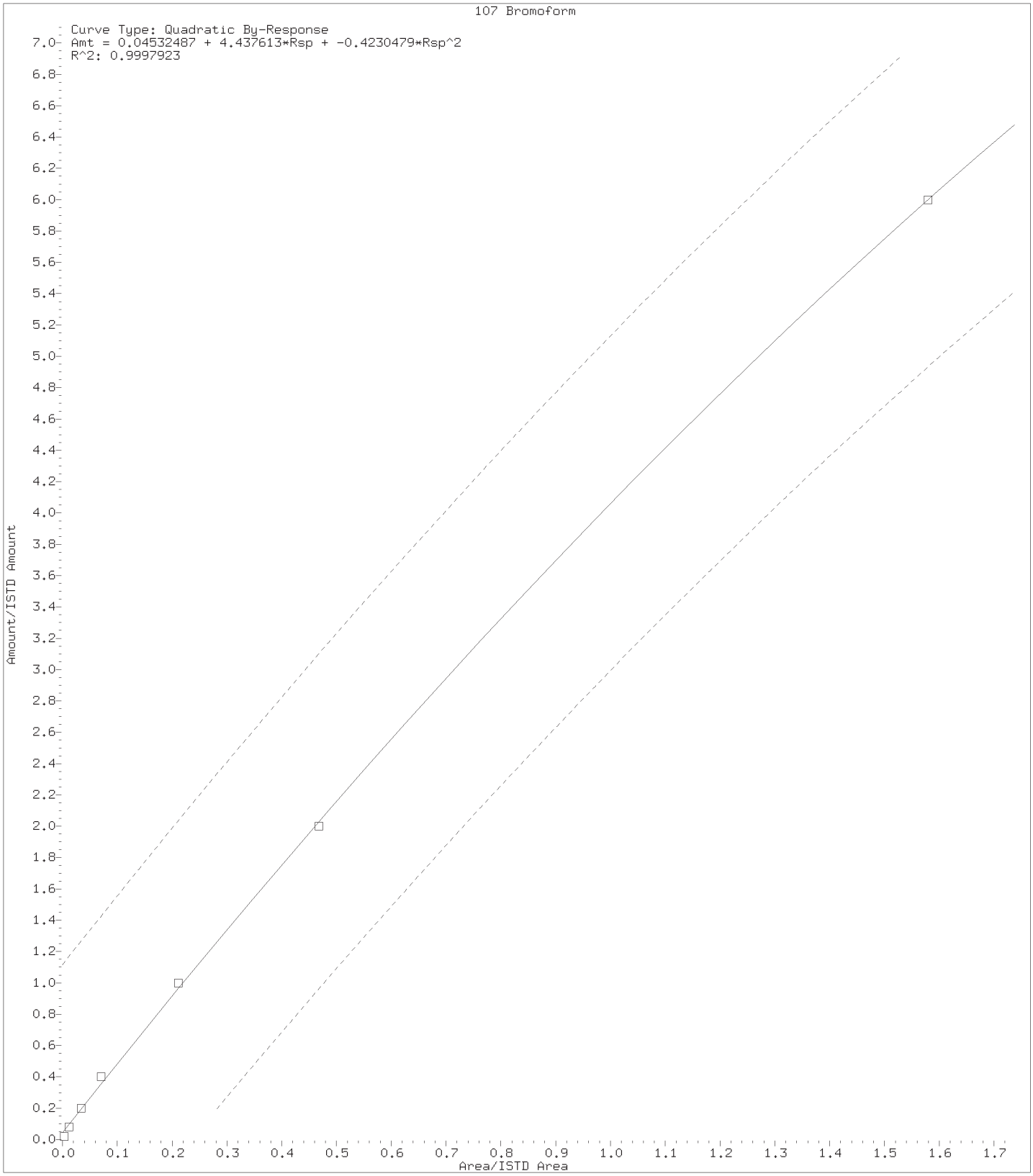
COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Naphthalene	1.6611	2.0874	2.1936	2.3059	2.6972	2.9378	2.8996	2.3975	20	AVG
1,2,3-Trichlorobenzene	0.7448	0.9699	0.8660	0.9346	1.0379	1.1291	1.1252	0.9725	14	AVG
2-Methylnaphthalene	0.3019	0.4877	0.6633	0.7839	1.2435	1.5532	1.5861	0.9456	55	1STDEG
Dibromofluoromethane	0.2254	0.2277	0.2258	0.2276	0.2305	0.2327	0.2331	0.2289	1	AVG
Dibromofluoromethane(2)	0.2327	0.2360	0.2329	0.2343	0.2354	0.2383	0.2383	0.2354	1	AVG
1,2-Dichloroethane-d4	0.0551	0.0551	0.0538	0.0546	0.0543	0.0544	0.0542	0.0545	1	AVG
1,2-Dichloroethane-d4(2)	0.2669	0.2682	0.2655	0.2542	0.2627	0.2630	0.2616	0.2631	2	AVG
1,2-Dichloroethane-d4(3)	0.0347	0.0345	0.0344	0.0340	0.0348	0.0345	0.0346	0.0345	1	AVG
Toluene-d8	1.3834	1.3782	1.3883	1.3847	1.3661	1.3475	1.3044	1.3647	2	AVG
Toluene-d8(2)	0.8882	0.8824	0.8909	0.8905	0.8809	0.8691	0.8385	0.8772	2	AVG
4-Bromofluorobenzene	0.4831	0.4854	0.4866	0.4874	0.4906	0.4859	0.4771	0.4851	1	AVG
4-Bromofluorobenzene(2)	0.3937	0.4007	0.3996	0.3994	0.4034	0.4011	0.3925	0.3986	1	AVG

Average %RSD 11

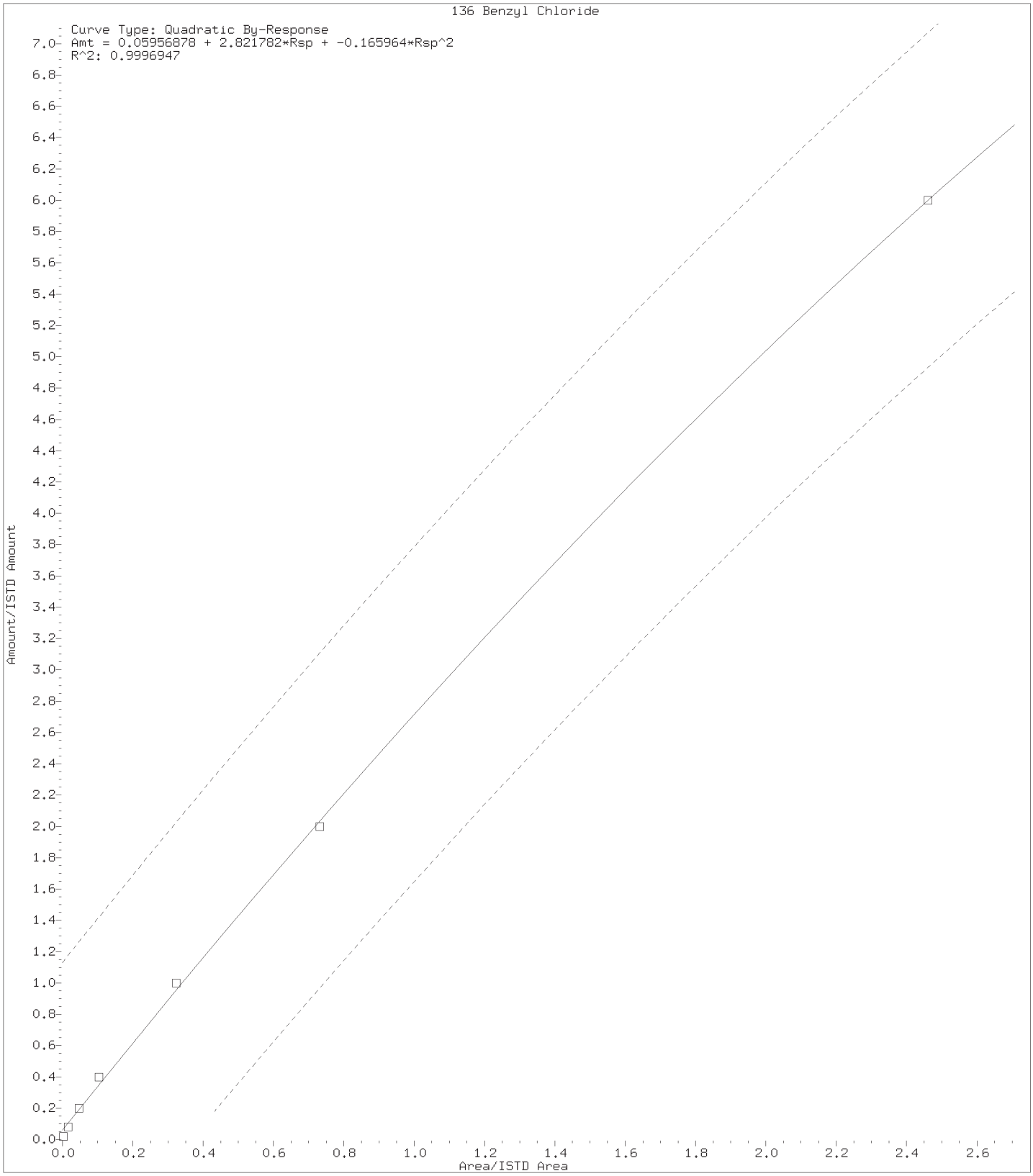
Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.



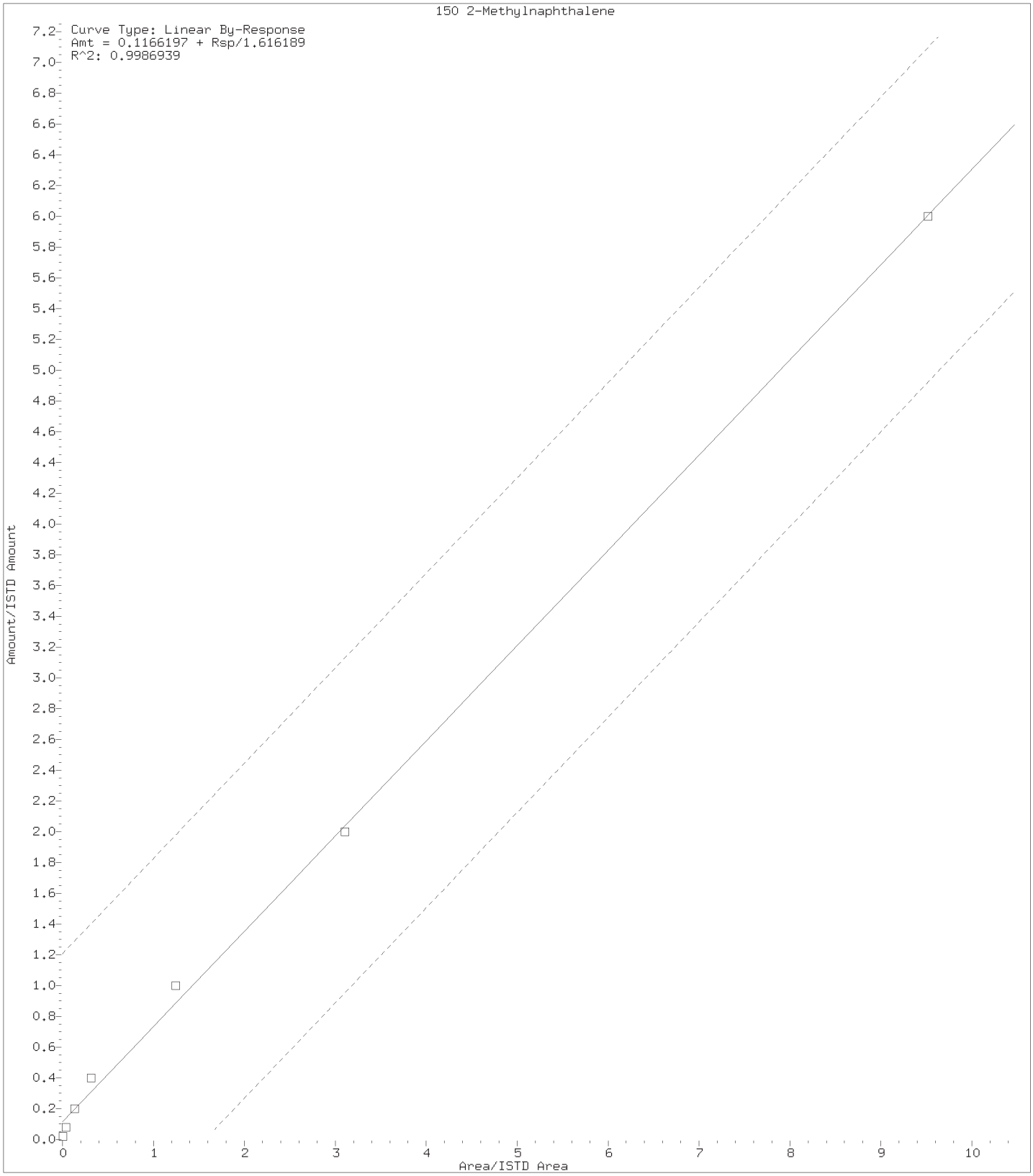
Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002



Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002



Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002



Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem2/HP09685.i/16jun20a.b/au20i01.d	VSTD300
/chem2/HP09685.i/16jun20a.b/au20i02.d	VSTD100
/chem2/HP09685.i/16jun20a.b/au20i03.d	VSTD050
/chem2/HP09685.i/16jun20a.b/au20i04.d	VSTD020
/chem2/HP09685.i/16jun20a.b/au20i05.d	VSTD010
/chem2/HP09685.i/16jun20a.b/au20i06.d	VSTD004
/chem2/HP09685.i/16jun20a.b/au20i07.d	VSTD001

Area Summary

File ID:

Internal Standard Name	au20i01.d	au20i02.d	au20i03.d	au20i04.d	au20i05.d	au20i06.d	au20i07.d	Avg. Area	%RSD	In Spec
t-Butyl alcohol-d10	112141	118889	117913	89597	109332	104982	108967	108832	9	Yes
Fluorobenzene	1071415	1077063	1094634	1048020	1028410	1037340	1012750	1052805	3	Yes
Chlorobenzene-d5	824113	803173	812973	772869	750874	757792	737599	779913	4	Yes
1,4-Dichlorobenzene-d4	449572	427501	430819	399200	387544	389396	371801	407976	7	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

File ID:

Internal Standard Name	au20i01.d	au20i02.d	au20i03.d	au20i04.d	au20i05.d	au20i06.d	au20i07.d	Avg. RT
t-Butyl alcohol-d10	3.951	3.964	3.958	3.964	3.970	3.958	3.957	3.960
Fluorobenzene	7.456	7.449	7.449	7.456	7.456	7.449	7.455	7.453
Chlorobenzene-d5	11.015	11.008	11.008	11.015	11.015	11.008	11.008	11.011
1,4-Dichlorobenzene-d4	12.919	12.919	12.919	12.919	12.919	12.919	12.919	12.919

* indicates the retention time is greater than 30 seconds from the average RT.

Report generated on 06/20/2016 at 13:53.

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 ICV Date: 06/20/16 Time: 13:30

Lab File ID: au20v01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	$\overline{RRF}$	RRF	CONC.	CONC.	DRIFT	
# Dichlorodifluoromethane	0.3921	0.3638	18.56	20	-7	#
# Chloromethane	0.4074	0.3946	19.37	20	-3	#
# Vinyl Chloride	0.3696	0.3695	19.99	20	0	#
# Bromomethane	0.2509	0.2490	19.84	20	-1	#
# Chloroethane	0.2042	0.2043	20.02	20	0	#
Dichlorofluoromethane	0.4668	0.5158	22.10	20	10	
# Trichlorofluoromethane	0.4270	0.4531	21.22	20	6	#
Ethanol	0.1798	0.1844	1025.73	1000	3	
Freon 123a	0.3023	0.3352	22.18	20	11	
Acrolein	2.6570	2.4149	136.33	150	-9	
# 1,1-Dichloroethene	0.2194	0.2418	22.04	20	10	#
# Acetone	1.2959	1.2141	140.53	150	-6	#
# Freon 113	0.2257	0.2491	22.07	20	10	#
2-Propanol	0.9846	0.9493	144.62	150	-4	
Methyl Iodide	0.4018	0.4114	20.48	20	2	
# Carbon Disulfide	0.7191	0.7407	20.60	20	3	#
# Methyl Acetate	0.1913	0.1927	20.15	20	1	#
Allyl Chloride	0.3979	0.4110	20.66	20	3	
# Methylene Chloride	0.2777	0.2767	19.93	20	0	#
t-Butyl alcohol	1.4610	1.4421	197.42	200	-1	
Acrylonitrile	0.0920	0.0942	102.44	100	2	
# Methyl Tertiary Butyl Ether	0.7119	0.7282	20.46	20	2	#
# trans-1,2-Dichloroethene	0.2407	0.2693	22.37	20	12	#
n-Hexane	0.3710	0.4433	23.89	20	19	
# 1,1-Dichloroethane	0.4557	0.4894	21.48	20	7	#
di-Isopropyl ether	0.8458	0.8881	21.00	20	5	
2-Chloro-1,3-butadiene	0.3901	0.4070	20.87	20	4	
Ethyl t-butyl ether	0.7219	0.7383	20.45	20	2	
# 2-Butanone	5.7599	5.9380	154.64	150	3	#
# cis-1,2-Dichloroethene	0.2729	0.2892	21.20	20	6	#
2,2-Dichloropropane	0.3234	0.3365	20.81	20	4	
Propionitrile	1.8044	1.9077	158.59	150	6	
Methacrylonitrile	0.1069	0.1117	156.67	150	4	
Bromochloromethane	0.1330	0.1381	20.77	20	4	
Tetrahydrofuran	1.5605	1.6311	104.52	100	5	
# Chloroform	0.4347	0.4490	20.66	20	3	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 ICV Date: 06/20/16 Time: 13:30

Lab File ID: au20v01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
# 1,1,1-Trichloroethane	0.3941	0.4132	20.97	20	5	#
# Cyclohexane	0.4532	0.5050	22.28	20	11	#
1,1-Dichloropropene	0.3473	0.3671	21.14	20	6	
# Carbon Tetrachloride	0.2843	0.3143	22.11	20	11	#
Isobutyl Alcohol	0.4952	0.5147	519.64	500	4	
# Benzene	1.0828	1.1066	20.44	20	2	#
# 1,2-Dichloroethane	0.3479	0.3457	19.88	20	-1	#
t-Amyl methyl ether	0.6653	0.6716	20.19	20	1	
n-Heptane	0.4035	0.4468	22.15	20	11	
n-Butanol	0.4194	0.4207	1003.18	1000	0	
# Trichloroethene	0.2563	0.2793	21.80	20	9	#
# Methylcyclohexane	0.4765	0.5018	21.06	20	5	#
# 1,2-Dichloropropane	0.2781	0.2947	21.19	20	6	#
Methyl Methacrylate	0.1773	0.1829	20.64	20	3	
1,4-Dioxane	0.1526	0.1626	532.63	500	7	
Dibromomethane	0.1557	0.1574	20.22	20	1	
# Bromodichloromethane	0.2977	0.3111	20.90	20	5	#
2-Nitropropane	2.5666	2.3419	18.87	20	-6	
# cis-1,3-Dichloropropene	0.4014	0.4084	20.35	20	2	#
# 4-Methyl-2-pentanone	0.2455	0.2530	103.07	100	3	#
# Toluene	0.8926	0.9644	21.61	20	8	#
# trans-1,3-Dichloropropene	0.4745	0.4934	20.79	20	4	#
Ethyl Methacrylate	0.4488	0.4612	20.55	20	3	
# 1,1,2-Trichloroethane	0.3122	0.3138	20.10	20	1	#
# Tetrachloroethene	0.3588	0.4004	22.32	20	12	#
1,3-Dichloropropane	0.5498	0.5525	20.10	20	0	
# 2-Hexanone	0.2347	0.2460	104.83	100	5	#
# Dibromochloromethane	0.3077	0.3055	19.85	20	-1	#
# 1,2-Dibromoethane	0.3077	0.3226	20.97	20	5	#
# Chlorobenzene	1.0245	1.0872	21.22	20	6	#
1,1,1,2-Tetrachloroethane	0.3179	0.3264	20.53	20	3	
# Ethylbenzene	1.6729	1.8247	21.81	20	9	#
# m+p-Xylene	0.6600	0.7282	44.13	40	10	#
# o-Xylene	0.6465	0.6974	21.57	20	8	#
# Styrene	1.0429	1.1490	22.04	20	10	#
# Bromoform	0.1925	0.1782	17.97	20	-10	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 ICV Date: 06/20/16 Time: 13:30

Lab File ID: au20v01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Isopropylbenzene	1.6699	1.8417	22.06	20	10	#
	Cyclohexanone	0.7254	0.6809	469.33	500	-6	
#	1,1,2,2-Tetrachloroethane	0.8176	0.8075	19.75	20	-1	#
	Bromobenzene	0.8348	0.8656	20.74	20	4	
	trans-1,4-Dichloro-2-butene	0.2291	0.2339	102.07	100	2	
	1,2,3-Trichloropropane	0.2358	0.2401	20.36	20	2	
	n-Propylbenzene	3.8484	4.1950	21.80	20	9	
	2-Chlorotoluene	0.7680	0.8406	21.89	20	9	
	1,3,5-Trimethylbenzene	2.8163	3.0219	21.46	20	7	
	4-Chlorotoluene	0.8067	0.8719	21.62	20	8	
	tert-Butylbenzene	0.5920	0.6353	21.46	20	7	
	Pentachloroethane	0.4548	0.4629	20.36	20	2	
	1,2,4-Trimethylbenzene	2.9367	3.1060	21.15	20	6	
	sec-Butylbenzene	3.5355	3.9235	22.19	20	11	
#	1,3-Dichlorobenzene	1.5968	1.6753	20.98	20	5	#
	p-Isopropyltoluene	3.1260	3.3377	21.35	20	7	
#	1,4-Dichlorobenzene	1.6526	1.7176	20.79	20	4	#
	1,2,3-Trimethylbenzene	3.0765	3.2218	20.94	20	5	
	Benzyl Chloride	0.2747	0.2649	17.83	20	-11	
	1,3-Diethylbenzene	1.8591	1.9511	20.99	20	5	
	1,4-Diethylbenzene	1.9128	2.0763	21.71	20	9	
	n-Butylbenzene	1.5814	1.7128	21.66	20	8	
#	1,2-Dichlorobenzene	1.5426	1.6123	20.90	20	5	#
	1,2-Diethylbenzene	1.5882	1.6740	21.08	20	5	
#	1,2-Dibromo-3-chloropropane	0.1426	0.1341	18.80	20	-6	#
	1,3,5-Trichlorobenzene	1.1924	1.2645	21.21	20	6	
#	1,2,4-Trichlorobenzene	1.0571	1.0995	20.80	20	4	#
	Hexachlorobutadiene	0.5403	0.5927	21.94	20	10	
	Naphthalene	2.3975	2.5002	20.86	20	4	
	1,2,3-Trichlorobenzene	0.9725	0.9948	20.46	20	2	
	2-Methylnaphthalene	0.9456	0.8872	16.81	20	-16	

Average %Drift 6

Compounds with required minimum RRF.
Maximum % Drift = 30 %

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 Calibration Date(s): 02/10/16 02/10/16

Heated Purge: (Y/N) Y Calibration Times: 20:22 22:38

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

LAB FILE ID: RRF 1 = bf10i07.d RRF 4 = bf10i06.d RRF 10= bf10i05.d
RRF 20= bf10i04.d RRF 50= bf10i03.d RRF100= bf10i02.d RRF300= bf10i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD	
Dichlorodifluoromethane	#0.4417	0.5810	0.4382	0.5523	0.5539	0.4389	0.5745	0.5115	13	AVG	#
Chloromethane	#0.5243	0.6030	0.4750	0.5536	0.5486	0.4500	0.5345	0.5270	10	AVG	#
Vinyl Chloride	#0.3943	0.4901	0.3779	0.4665	0.4683	0.3778	0.4432	0.4312	11	AVG	#
Bromomethane	#0.2886	0.3497	0.2828	0.3165	0.3224	0.2611	0.3244	0.3065	10	AVG	#
Chloroethane	#0.2318	0.2719	0.2208	0.2590	0.2592	0.2067	0.2524	0.2431	10	AVG	#
Dichlorofluoromethane		0.6958	0.5829	0.6557	0.7125	0.6618	0.6438	0.6588	7	AVG	
Trichlorofluoromethane	#0.5161	0.6543	0.5185	0.6380	0.6431	0.5084	0.6754	0.5934	13	AVG	#
Ethanol		0.1330	0.1325	0.1321	0.1287	0.1208	0.1041	0.1252	9	AVG	
Freon 123a	0.3717	0.4288	0.3340	0.3904	0.4273	0.3932	0.3899	0.3908	8	AVG	
Acrolein	2.4475	2.4310	2.3533	2.3759	2.3482	2.2586	2.0630	2.3253	6	AVG	
1,1-Dichloroethene	#0.2718	0.3174	0.2360	0.2840	0.3290	0.3129	0.3036	0.2935	11	AVG	#
Acetone	#	1.1362	1.0542	1.0859	0.9997	0.9948	0.9298	1.0334	7	AVG	#
Freon 113	#0.2384	0.3194	0.2382	0.2867	0.3585	0.3348	0.3409	0.3024	16	AVG	#
2-Propanol		1.0120	1.0352	1.0475	1.1496	1.2466	1.1773	1.1114	8	AVG	
Methyl Iodide	0.5354	0.6060	0.5165	0.5785	0.6526	0.6286	0.5984	0.5880	8	AVG	
Carbon Disulfide	#1.0669	1.0388	0.7871	0.9402	1.1085	1.0604	0.9965	0.9998	11	AVG	#
Methyl Acetate	#0.3647	0.2555	0.2404	0.2128	0.2319	0.2294	0.2377	0.2532	20	AVG	#
Allyl Chloride	0.6075	0.5276	0.4565	0.5269	0.5698	0.5500	0.5261	0.5378	9	AVG	
Methylene Chloride	#0.3199	0.3491	0.3014	0.3161	0.3588	0.3419	0.3224	0.3299	6	AVG	#
t-Butyl alcohol	1.4340	1.4429	1.5105	1.3404	1.3430	1.3104	1.1932	1.3678	8	AVG	
Acrylonitrile	0.1371	0.1262	0.1178	0.1107	0.1167	0.1105	0.1136	0.1189	8	AVG	
Methyl Tertiary Butyl Ether	#1.0259	1.0231	0.9816	0.9452	1.0710	1.0374	1.0037	1.0126	4	AVG	#
trans-1,2-Dichloroethene	#0.2915	0.3367	0.2727	0.3090	0.3563	0.3383	0.3214	0.3180	9	AVG	#
n-Hexane	0.3773	0.4799	0.3560	0.4342	0.5277	0.4876	0.4886	0.4502	14	AVG	
1,1-Dichloroethane	#0.5382	0.6476	0.5523	0.6081	0.6940	0.6630	0.6241	0.6182	9	AVG	#
di-Isopropyl ether	1.0404	1.1790	1.0691	1.1110	1.2399	1.1900	1.1015	1.1330	6	AVG	
2-Chloro-1,3-butadiene	0.4750	0.5872	0.4455	0.5364	0.6293	0.6014	0.5777	0.5504	12	AVG	
Ethyl t-butyl ether	1.0847	1.1529	1.0773	1.0900	1.2267	1.1930	1.1248	1.1356	5	AVG	
2-Butanone	#5.8902	6.4684	5.9659	5.8778	5.7441	5.6116	5.3629	5.8458	6	AVG	#
cis-1,2-Dichloroethene	#0.3081	0.3520	0.3113	0.3434	0.3886	0.3669	0.3501	0.3458	8	AVG	#
2,2-Dichloropropane	0.4757	0.5872	0.4734	0.5458	0.6420	0.6124	0.5926	0.5613	12	AVG	
Propionitrile	1.4506	1.5288	1.5222	1.5694	1.6437	1.6174	1.4640	1.5423	5	AVG	
Methacrylonitrile	0.1071	0.1093	0.1104	0.1049	0.1215	0.1172	0.1194	0.1128	6	AVG	
Bromochloromethane	0.1461	0.1676	0.1568	0.1589	0.1766	0.1748	0.1703	0.1644	7	AVG	
Tetrahydrofuran	1.4066	1.4549	1.3830	1.4784	1.4144	1.4175	1.3417	1.4138	3	AVG	
Chloroform	#0.5626	0.6163	0.5370	0.5874	0.6700	0.6384	0.6114	0.6033	7	AVG	#
1,1,1-Trichloroethane	#0.5923	0.6944	0.5083	0.6013	0.6598	0.6278	0.6240	0.6154	10	AVG	#
Cyclohexane	#0.4929	0.6273	0.4260	0.5220	0.6634	0.6121	0.6051	0.5641	15	AVG	#
Cyclohexane(2)	#0.4048	0.4901	0.3361	0.4210	0.6350	0.4881	0.5962	0.4816	22	AVG	#
Cyclohexane(3)	#0.1470	0.1791	0.1236	0.1540	0.1974	0.1847	0.1844	0.1672	16	AVG	#
1,1-Dichloropropene	0.4030	0.4936	0.3782	0.4434	0.5289	0.5007	0.4868	0.4621	12	AVG	
Carbon Tetrachloride	#0.3761	0.4857	0.3664	0.4490	0.5431	0.5234	0.5275	0.4673	16	AVG	#
Isobutyl Alcohol	0.4499	0.4428	0.4566	0.4470	0.4679	0.4767	0.4443	0.4550	3	AVG	
Benzene	#1.3087	1.3484	1.1412	1.2391	1.4251	1.3401	1.2605	1.2947	7	AVG	#
1,2-Dichloroethane	#0.5544	0.5411	0.4911	0.4938	0.5582	0.5430	0.5281	0.5299	5	AVG	#
1,2-Dichloroethane(2)	#0.0185	0.0364	0.0341	0.0342	0.0404	0.0391	0.0384	0.0344	22	AVG	#<-
t-Amyl methyl ether	0.8949	0.9510	0.9135	0.9108	1.0414	1.0260	0.9907	0.9612	6	AVG	
n-Heptane	0.5026	0.5779	0.4668	0.5208	0.6315	0.5657	0.5920	0.5510	10	AVG	
n-Butanol	0.2605	0.3061	0.3123	0.3254	0.3586	0.3637	0.3400	0.3238	11	AVG	
Trichloroethene	#0.3063	0.3592	0.2911	0.3305	0.3875	0.3685	0.3613	0.3435	10	AVG	#
Methylcyclohexane	#0.4549	0.5851	0.4220	0.5264	0.6086	0.5782	0.6008	0.5394	14	AVG	#
1,2-Dichloropropane	#0.2825	0.3318	0.3014	0.3200	0.3718	0.3518	0.3332	0.3275	9	AVG	#

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 Calibration Date(s): 02/10/16 02/10/16

Heated Purge: (Y/N) Y Calibration Times: 20:22 22:38

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

LAB FILE ID: RRF 1 = bf10i07.d RRF 4 = bf10i06.d RRF 10= bf10i05.d
RRF 20= bf10i04.d RRF 50= bf10i03.d RRF100= bf10i02.d RRF300= bf10i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Methyl Methacrylate	0.1825	0.1979	0.1953	0.1903	0.2230	0.2196	0.2253	0.2048	8	AVG
1,4-Dioxane		0.1124	0.1165	0.1318	0.1325	0.1340	0.1210	0.1247	7	AVG
Dibromomethane	0.1899	0.2017	0.1897	0.1890	0.2166	0.2110	0.2086	0.2009	6	AVG
Bromodichloromethane	#0.3862	0.4288	0.4059	0.4306	0.5084	0.4967	0.4917	0.4498	11	AVG #
2-Nitropropane	4.2781	3.8792	3.8403	4.0204	4.0941	4.0765	3.9534	4.0203	4	AVG
2-Chloroethyl Vinyl Ether	0.1497	0.1735	0.1892	0.1849	0.2108	0.2037	0.2117	0.1891	12	AVG
cis-1,3-Dichloropropene	#0.4178	0.5133	0.4760	0.5016	0.5899	0.5738	0.5515	0.5177	12	AVG #
4-Methyl-2-pentanone	#	0.3002	0.3148	0.2982	0.3339	0.3170	0.3429	0.3178	6	AVG #
Toluene	#0.9370	1.1040	0.9226	1.0295	1.1729	1.1139	1.0509	1.0473	9	AVG #
trans-1,3-Dichloropropene	#0.5151	0.5930	0.5750	0.6153	0.7064	0.6915	0.6679	0.6234	11	AVG #
Ethyl Methacrylate		0.4681	0.4855	0.4867	0.5754	0.5596	0.5527	0.5213	9	AVG
1,1,2-Trichloroethane	#0.3078	0.3388	0.3272	0.3371	0.3775	0.3643	0.3501	0.3433	7	AVG #
Tetrachloroethene	#0.4308	0.4942	0.3923	0.4653	0.5516	0.5241	0.5119	0.4814	12	AVG #
1,3-Dichloropropane	0.5704	0.6117	0.5826	0.5874	0.6627	0.6400	0.6070	0.6088	5	AVG
2-Hexanone	#	0.2798	0.2946	0.2777	0.3012	0.2917	0.3089	0.2923	4	AVG #
Dibromochloromethane	#0.3354	0.3861	0.3842	0.4106	0.4833	0.4785	0.4759	0.4220	14	AVG #
1,2-Dibromoethane	#0.3162	0.3532	0.3483	0.3548	0.4003	0.3912	0.3808	0.3635	8	AVG #
1-Chlorohexane	0.4790	0.5808	0.4400	0.5375	0.6548	0.6155	0.5952	0.5575	14	AVG
Chlorobenzene	#1.1016	1.2403	1.0492	1.1391	1.3021	1.2456	1.1728	1.1787	8	AVG #
1,1,1,2-Tetrachloroethane	0.3368	0.3925	0.3772	0.4172	0.4903	0.4807	0.4696	0.4235	14	AVG
Ethylbenzene	#1.8422	2.1950	1.7787	2.0241	2.3597	2.2419	2.0445	2.0694	10	AVG #
m+p-Xylene	#0.6901	0.8306	0.6927	0.7749	0.9036	0.8648	0.8156	0.7960	10	AVG #
o-Xylene	#0.7031	0.8247	0.6874	0.7776	0.9028	0.8688	0.8343	0.7998	10	AVG #
Styrene	#1.1125	1.2734	1.1478	1.2561	1.4742	1.4343	1.3465	1.2921	11	AVG #
Bromoform	#0.2205	0.2594	0.2532	0.2651	0.3236	0.3282	0.3416	0.2845	16	AVG #
Isopropylbenzene	#1.8183	2.1925	1.7769	2.0492	2.4234	2.2797	2.0631	2.0861	11	AVG #
Cyclohexanone		0.4133	0.4300	0.4370	0.4510	0.4322	0.4207	0.4307	3	AVG
1,1,2,2-Tetrachloroethane	#0.7843	0.8018	0.8191	0.7917	0.9215	0.8806	0.8406	0.8342	6	AVG #
Bromobenzene	0.9373	0.9744	0.8782	0.9300	1.0820	1.0089	0.9324	0.9633	7	AVG
trans-1,4-Dichloro-2-butene	0.2488	0.2853	0.2883	0.2930	0.3355	0.3297	0.3161	0.2995	10	AVG
1,2,3-Trichloropropane	0.2257	0.2387	0.2428	0.2356	0.2712	0.2559	0.2465	0.2452	6	AVG
n-Propylbenzene	3.7701	4.7497	3.8247	4.3450	5.0474	4.6155	3.6733	4.2894	13	AVG
2-Chlorotoluene	0.8508	0.9418	0.7680	0.8557	0.9938	0.9400	0.8634	0.8876	9	AVG
1,3,5-Trimethylbenzene	2.7269	3.4376	2.7952	3.2085	3.7671	3.5308	3.0619	3.2183	12	AVG
4-Chlorotoluene	0.8272	0.9811	0.7891	0.8759	1.0435	0.9806	0.9191	0.9166	10	AVG
tert-Butylbenzene	0.5903	0.7319	0.6217	0.7009	0.8316	0.7830	0.7591	0.7169	12	AVG
Pentachloroethane	0.4511	0.5458	0.5262	0.5781	0.6826	0.6790	0.6782	0.5916	15	AVG
1,2,4-Trimethylbenzene	2.9587	3.4614	2.9180	3.2573	3.8473	3.5776	3.0658	3.2980	11	AVG
sec-Butylbenzene	3.6973	4.4297	3.5901	4.0749	4.8116	4.3720	3.5504	4.0751	12	AVG
1,3-Dichlorobenzene	#1.8176	1.9473	1.6501	1.8086	2.0822	1.9410	1.7622	1.8584	8	AVG #
p-Isopropyltoluene	3.1193	3.8059	3.2304	3.6228	4.2694	3.9335	3.3427	3.6177	11	AVG
1,4-Dichlorobenzene	#1.9582	2.0268	1.7258	1.8197	2.1044	1.9728	1.8082	1.9166	7	AVG #
1,2,3-Trimethylbenzene	3.0651	3.6353	3.2286	3.4687	3.8538	3.6274	3.0698	3.4212	9	AVG
Benzyl Chloride	0.2408	0.2914	0.3193	0.3320	0.4066	0.4002	0.4064	0.3424	19	AVG
1,3-Diethylbenzene	1.8228	2.2311	1.9740	2.2305	2.4716	2.3203	2.1272	2.1682	10	AVG
1,4-Diethylbenzene	1.9344	2.3498	2.0600	2.3371	2.5818	2.4562	2.2804	2.2857	10	AVG
n-Butylbenzene	1.6615	1.9291	1.6386	1.8403	2.1486	1.9881	1.8413	1.8639	10	AVG
1,2-Dichlorobenzene	#1.7014	1.8895	1.6697	1.7267	2.0192	1.9008	1.7837	1.8130	7	AVG #
1,2-Diethylbenzene	1.5803	1.9246	1.6782	1.8746	2.0690	1.9732	1.7809	1.8401	9	AVG
1,2-Dibromo-3-chloropropane	#0.1628	0.1903	0.1741	0.1739	0.2106	0.2010	0.2072	0.1886	10	AVG #
1,3,5-Trichlorobenzene	1.5040	1.6650	1.4386	1.5283	1.8134	1.7080	1.5666	1.6034	8	AVG
1,2,4-Trichlorobenzene	#1.5695	1.5533	1.3361	1.4362	1.6739	1.5737	1.4414	1.5120	7	AVG #

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 Calibration Date(s): 02/10/16 02/10/16

Heated Purge: (Y/N) Y Calibration Times: 20:22 22:38

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

LAB FILE ID: RRF 1 = bf10i07.d RRF 4 = bf10i06.d RRF 10= bf10i05.d
RRF 20= bf10i04.d RRF 50= bf10i03.d RRF100= bf10i02.d RRF300= bf10i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Hexachlorobutadiene	0.8181	0.8795	0.7638	0.8170	0.9949	0.9135	0.8847	0.8673	9	AVG
Naphthalene	3.2090	3.0777	2.9230	2.9447	3.4507	3.2408	2.8019	3.0925	7	AVG
1,2,3-Trichlorobenzene	1.3663	1.3334	1.2215	1.2790	1.5035	1.4161	1.2853	1.3436	7	AVG
2-Methylnaphthalene	1.5934	1.6161	1.5831	1.7125	2.0481	2.0337	1.8019	1.7698	11	AVG
Dibromofluoromethane	0.2561	0.2560	0.2564	0.2541	0.2545	0.2566	0.2608	0.2564	1	AVG
Dibromofluoromethane(2)	0.2629	0.2588	0.2623	0.2615	0.2606	0.2660	0.2649	0.2624	1	AVG
1,2-Dichloroethane-d4	0.0546	0.0522	0.0535	0.0532	0.0520	0.0517	0.0498	0.0524	3	AVG
1,2-Dichloroethane-d4(2)	0.3392	0.3343	0.3384	0.3334	0.3205	0.3250	0.3405	0.3331	2	AVG
1,2-Dichloroethane-d4(3)	0.0340	0.0329	0.0336	0.0329	0.0337	0.0334	0.0335	0.0334	1	AVG
Toluene-d8	1.3106	1.3183	1.3211	1.3366	1.3089	1.3108	1.2820	1.3126	1	AVG
Toluene-d8(2)	0.8311	0.8472	0.8410	0.8544	0.8483	0.8395	0.8333	0.8421	1	AVG
4-Bromofluorobenzene	0.5124	0.5151	0.5086	0.5117	0.5061	0.5122	0.5089	0.5107	1	AVG
4-Bromofluorobenzene(2)	0.4468	0.4529	0.4503	0.4487	0.4430	0.4446	0.4459	0.4475	1	AVG

Average %RSD 9

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem2/HP09953.i/16feb10b.b/bf10i01.d	VSTD300
/chem2/HP09953.i/16feb10b.b/bf10i02.d	VSTD100
/chem2/HP09953.i/16feb10b.b/bf10i03.d	VSTD050
/chem2/HP09953.i/16feb10b.b/bf10i04.d	VSTD020
/chem2/HP09953.i/16feb10b.b/bf10i05.d	VSTD010
/chem2/HP09953.i/16feb10b.b/bf10i06.d	VSTD004
/chem2/HP09953.i/16feb10b.b/bf10i07.d	VSTD001

Area Summary

File ID:

Internal Standard Name	bf10i01.d	bf10i02.d	bf10i03.d	bf10i04.d	bf10i05.d	bf10i06.d	bf10i07.d	Avg. Area	%RSD	In Spec
t-Butyl alcohol-d10	158959	143095	143440	136482	144945	143264	158802	146998	6	Yes
Fluorobenzene	1098402	1131470	1110917	1153753	1105288	1109390	1150527	1122821	2	Yes
Chlorobenzene-d5	852696	862927	845405	866004	841372	836304	876469	854454	2	Yes
1,4-Dichlorobenzene-d4	519779	500476	476672	492180	481991	476838	502391	492904	3	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

File ID:

Internal Standard Name	bf10i01.d	bf10i02.d	bf10i03.d	bf10i04.d	bf10i05.d	bf10i06.d	bf10i07.d	Avg. RT
t-Butyl alcohol-d10	1.960	1.948	1.942	1.942	1.942	1.948	1.942	1.947
Fluorobenzene	3.992	3.986	3.980	3.980	3.980	3.980	3.980	3.983
Chlorobenzene-d5	7.186	7.180	7.180	7.180	7.180	7.180	7.180	7.181
1,4-Dichlorobenzene-d4	9.255	9.255	9.255	9.255	9.255	9.255	9.255	9.255

* indicates the retention time is greater than 30 seconds from the average RT.

Report generated on 02/10/2016 at 23:53.

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 ICV Date: 02/10/16 Time: 23:24

Lab File ID: bf10v01.d Init. Calib. Date(s): 02/10/16 02/10/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
# Dichlorodifluoromethane	0.5115	0.4967	19.42	20	-3	#
# Chloromethane	0.5270	0.5220	19.81	20	-1	#
# Vinyl Chloride	0.4312	0.4442	20.61	20	3	#
# Bromomethane	0.3065	0.3277	21.38	20	7	#
# Chloroethane	0.2431	0.2456	20.21	20	1	#
Dichlorofluoromethane	0.6588	0.5799	17.60	20	-12	
# Trichlorofluoromethane	0.5934	0.6460	21.77	20	9	#
Ethanol	0.1252	0.0972	776.55	1000	-22	
Freon 123a	0.3908	0.3620	18.53	20	-7	
Acrolein	2.3253	1.9787	127.64	150	-15	
# 1,1-Dichloroethene	0.2935	0.2998	20.42	20	2	#
# Acetone	1.0334	0.8707	126.38	150	-16	#
# Freon 113	0.3024	0.3293	21.78	20	9	#
2-Propanol	1.1114	0.9035	121.94	150	-19	
Methyl Iodide	0.5880	0.6087	20.71	20	4	
# Carbon Disulfide	0.9998	0.9596	19.20	20	-4	#
# Methyl Acetate	0.2532	0.2267	17.91	20	-10	#
Allyl Chloride	0.5378	0.5176	19.25	20	-4	
# Methylene Chloride	0.3299	0.3330	20.19	20	1	#
t-Butyl alcohol	1.3678	1.5290	223.57	200	12	
Acrylonitrile	0.1189	0.1030	86.64	100	-13	
# Methyl Tertiary Butyl Ether	1.0126	1.0079	19.91	20	0	#
# trans-1,2-Dichloroethene	0.3180	0.3331	20.95	20	5	#
n-Hexane	0.4502	0.4882	21.69	20	8	
# 1,1-Dichloroethane	0.6182	0.6320	20.45	20	2	#
di-Isopropyl ether	1.1330	1.1956	21.11	20	6	
2-Chloro-1,3-butadiene	0.5504	0.5353	19.45	20	-3	
Ethyl t-butyl ether	1.1356	1.1411	20.10	20	0	
# 2-Butanone	5.8458	5.1217	131.42	150	-12	#
# cis-1,2-Dichloroethene	0.3458	0.3560	20.59	20	3	#
2,2-Dichloropropane	0.5613	0.5779	20.59	20	3	
Propionitrile	1.5423	1.4947	145.37	150	-3	
Methacrylonitrile	0.1128	0.1184	157.36	150	5	
Bromochloromethane	0.1644	0.1724	20.96	20	5	
Tetrahydrofuran	1.4138	1.2998	91.94	100	-8	
# Chloroform	0.6033	0.6288	20.85	20	4	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 ICV Date: 02/10/16 Time: 23:24

Lab File ID: bf10v01.d Init. Calib. Date(s): 02/10/16 02/10/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
1,1,1-Trichloroethane	0.6154	0.6450	20.96	20	5	#
Cyclohexane	0.5641	0.6003	21.28	20	6	#
1,1-Dichloropropene	0.4621	0.4599	19.91	20	0	
Carbon Tetrachloride	0.4673	0.4963	21.24	20	6	#
Isobutyl Alcohol	0.4550	0.4316	474.25	500	-5	
Benzene	1.2947	1.3089	20.22	20	1	#
1,2-Dichloroethane	0.5299	0.5268	19.88	20	-1	#
t-Amyl methyl ether	0.9612	0.9734	20.25	20	1	
n-Heptane	0.5510	0.5584	20.27	20	1	
n-Butanol	0.3238	0.3131	966.87	1000	-3	
Trichloroethene	0.3435	0.3618	21.07	20	5	#
Methylcyclohexane	0.5394	0.5788	21.46	20	7	#
1,2-Dichloropropane	0.3275	0.3412	20.84	20	4	#
Methyl Methacrylate	0.2048	0.2051	20.03	20	0	
1,4-Dioxane	0.1247	0.1185	475.25	500	-5	
Dibromomethane	0.2009	0.1991	19.82	20	-1	
Bromodichloromethane	0.4498	0.4513	20.07	20	0	#
2-Nitropropane	4.0203	3.3807	16.82	20	-16	
2-Chloroethyl Vinyl Ether	0.1891	0.1952	20.65	20	3	
cis-1,3-Dichloropropene	0.5177	0.5308	20.51	20	3	#
4-Methyl-2-pentanone	0.3178	0.3258	102.50	100	3	#
Toluene	1.0473	1.0872	20.76	20	4	#
trans-1,3-Dichloropropene	0.6234	0.6368	20.43	20	2	#
Ethyl Methacrylate	0.5213	0.5207	19.98	20	0	
1,1,2-Trichloroethane	0.3433	0.3461	20.16	20	1	#
Tetrachloroethene	0.4814	0.5052	20.99	20	5	#
1,3-Dichloropropane	0.6088	0.6015	19.76	20	-1	
2-Hexanone	0.2923	0.2957	101.15	100	1	#
Dibromochloromethane	0.4220	0.4170	19.76	20	-1	#
1,2-Dibromoethane	0.3635	0.3772	20.75	20	4	#
1-Chlorohexane	0.5575	0.5800	20.80	20	4	
Chlorobenzene	1.1787	1.1698	19.85	20	-1	#
1,1,1,2-Tetrachloroethane	0.4235	0.4334	20.47	20	2	
Ethylbenzene	2.0694	2.1399	20.68	20	3	#
m+p-Xylene	0.7960	0.8208	41.24	40	3	#
o-Xylene	0.7998	0.8192	20.48	20	2	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 ICV Date: 02/10/16 Time: 23:24

Lab File ID: bf10v01.d Init. Calib. Date(s): 02/10/16 02/10/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

			ACTUAL	TRUE	%	
COMPOUND	$\overline{RRF}$	RRF	CONC.	CONC.	DRIFT	
# Styrene	1.2921	1.3361	20.68	20	3	#
# Bromoform	0.2845	0.2747	19.31	20	-3	#
# Isopropylbenzene	2.0861	2.2372	21.45	20	7	#
Cyclohexanone	0.4307	0.4042	469.21	500	-6	
# 1,1,2,2-Tetrachloroethane	0.8342	0.8592	20.60	20	3	#
Bromobenzene	0.9633	0.9919	20.59	20	3	
trans-1,4-Dichloro-2-butene	0.2995	0.3121	104.19	100	4	
1,2,3-Trichloropropane	0.2452	0.2553	20.82	20	4	
n-Propylbenzene	4.2894	4.6214	21.55	20	8	
2-Chlorotoluene	0.8876	0.9133	20.58	20	3	
1,3,5-Trimethylbenzene	3.2183	3.4113	21.20	20	6	
4-Chlorotoluene	0.9166	0.9301	20.29	20	1	
tert-Butylbenzene	0.7169	0.7537	21.03	20	5	
Pentachloroethane	0.5916	0.6143	20.77	20	4	
1,2,4-Trimethylbenzene	3.2980	3.4599	20.98	20	5	
sec-Butylbenzene	4.0751	4.3024	21.12	20	6	
# 1,3-Dichlorobenzene	1.8584	1.8543	19.96	20	0	#
p-Isopropyltoluene	3.6177	3.7661	20.82	20	4	
# 1,4-Dichlorobenzene	1.9166	1.9111	19.94	20	0	#
1,2,3-Trimethylbenzene	3.4212	3.5556	20.79	20	4	
Benzyl Chloride	0.3424	0.3487	20.37	20	2	
1,3-Diethylbenzene	2.1682	2.2442	20.70	20	4	
1,4-Diethylbenzene	2.2857	2.4002	21.00	20	5	
n-Butylbenzene	1.8639	1.8868	20.25	20	1	
# 1,2-Dichlorobenzene	1.8130	1.8272	20.16	20	1	#
1,2-Diethylbenzene	1.8401	1.9244	20.92	20	5	
# 1,2-Dibromo-3-chloropropane	0.1886	0.1802	19.11	20	-4	#
1,3,5-Trichlorobenzene	1.6034	1.5824	19.74	20	-1	
# 1,2,4-Trichlorobenzene	1.5120	1.4350	18.98	20	-5	#
Hexachlorobutadiene	0.8673	0.8483	19.56	20	-2	
Naphthalene	3.0925	3.0917	19.99	20	0	
1,2,3-Trichlorobenzene	1.3436	1.2829	19.10	20	-5	
2-Methylnaphthalene	1.7698	1.6228	18.34	20	-8	
			Average %Drift		5	

Compounds with required minimum RRF.
Maximum % Drift = 30 %

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 Calibration Date(s): 04/05/16 04/05/16

Heated Purge: (Y/N) N Calibration Times: 10:14 13:02

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

LAB FILE ID: RRF 1 = ra05i01.d RRF 4 = ra05i02.d RRF 10= ra05i03.d
RRF 20= ra05i04.d RRF 50= ra05i05.d RRF100= ra05i06.d RRF300= ra05i07.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Dichlorodifluoromethane	#0.1811	0.3265	0.2946	0.3389	0.3357	0.3007	0.2983	0.2965	18	AVG #
Chloromethane	#0.4269	0.4589	0.4375	0.4852	0.4526	0.4020	0.3996	0.4375	7	AVG #
Vinyl Chloride	#0.2982	0.4115	0.3591	0.3987	0.3883	0.3447	0.3436	0.3634	11	AVG #
Bromomethane	#	5.5601	4.5098	4.6933	4.5102	3.9249	3.6813	4.4799	15	AVG #
Chloroethane	#	3.8562	3.3900	3.5909	3.3032	2.9674	2.6971	3.3008	13	AVG #
Dichlorofluoromethane		0.4159	0.3388	0.3556	0.3525	0.3075	0.3050	0.3459	12	AVG
Trichlorofluoromethane	#0.2453	0.3840	0.3540	0.3582	0.3698	0.3236	0.3268	0.3374	14	AVG #
n-Pentane	0.2468	0.2873	0.2429	0.2503	0.2279	0.2032	0.2001	0.2369	13	AVG
Ethanol		0.1796	0.1437	0.1412	0.1471	0.1276	0.1211	0.1434	14	AVG
Freon 123a	0.2945	0.3346	0.3012	0.3206	0.3160	0.2806	0.2858	0.3047	6	AVG
Acrolein	2.7887	2.9416	2.7484	2.8483	3.3235	2.7613	2.4148	2.8324	10	AVG
1,1-Dichloroethene	#0.1992	0.2507	0.2234	0.2388	0.2354	0.2234	0.2258	0.2281	7	AVG #
1,1-Dichloroethene(2)	#0.1267	0.1440	0.1237	0.1387	0.1328	0.1256	0.1272	0.1312	6	AVG #
Acetone	#	1.1774	1.1434	1.1903	1.4616	1.1672	1.0037	1.1906	13	AVG #
Freon 113	#0.0959	0.1706	0.1543	0.1759	0.1799	0.1691	0.1741	0.1600	18	AVG #
2-Propanol	1.0541	1.1386	0.9280	0.8438	0.8868	0.8296	0.8358	0.9309	13	AVG
Methyl Iodide	0.3693	0.4381	0.3931	0.4335	0.4254	0.4024	0.4157	0.4111	6	AVG
Carbon Disulfide	#0.5984	0.7667	0.7071	0.7725	0.7775	0.7409	0.7531	0.7309	9	AVG #
Methyl Acetate	#0.3570	0.3297	0.2294	0.2464	0.2687	0.2352	0.2357	0.2717	19	AVG #
Allyl Chloride	0.5099	0.5337	0.4639	0.4739	0.4679	0.4445	0.4481	0.4774	7	AVG
Methylene Chloride	#0.2800	0.3016	0.2621	0.2894	0.2810	0.2580	0.2621	0.2763	6	AVG #
t-Butyl alcohol	1.4722	1.5829	1.3675	1.2170	1.1935	1.1220	1.1078	1.2947	14	AVG
Acrylonitrile		0.1434	0.1324	0.1401	0.1772	0.1356	0.1252	0.1423	13	AVG
Methyl Tertiary Butyl Ether	#0.7590	0.8885	0.8035	0.8685	0.8655	0.7931	0.8090	0.8267	6	AVG #
trans-1,2-Dichloroethene	#0.2164	0.2672	0.2477	0.2636	0.2592	0.2444	0.2474	0.2494	7	AVG #
n-Hexane	0.1067	0.1901	0.1639	0.1955	0.2070	0.1822	0.1982	0.1777	19	AVG
1,1-Dichloroethane	#0.4451	0.5358	0.4961	0.5426	0.5526	0.5022	0.5202	0.5135	7	AVG #
di-Isopropyl ether	0.9666	1.1228	1.0225	1.0819	1.1057	1.0041	1.0083	1.0446	6	AVG
2-Chloro-1,3-butadiene	0.3291	0.4194	0.4041	0.4216	0.4361	0.4013	0.4156	0.4039	9	AVG
Ethyl t-butyl ether	0.8733	1.0201	0.9146	0.9708	0.9755	0.8943	0.9232	0.9388	6	AVG
2-Butanone	#7.7687	7.4775	6.5882	6.3262	9.2072	6.7633	5.6542	7.1122	16	AVG #
2-Butanone(2)	#0.3108	1.3856	1.3030	1.4066	2.0824	1.5471	1.3001	1.3336	39	AVG #
cis-1,2-Dichloroethene	#0.2426	0.2962	0.2791	0.2956	0.2986	0.2680	0.2809	0.2801	7	AVG #
2,2-Dichloropropane	0.3415	0.4194	0.3958	0.4191	0.4258	0.3873	0.4014	0.3986	7	AVG
Propionitrile	0.0455	0.0530	0.0499	0.0479	0.0490	0.0433	0.0457	0.0478	7	AVG
Methacrylonitrile	0.1226	0.1414	0.1316	0.1293	0.1350	0.1203	0.1236	0.1291	6	AVG
Bromochloromethane	0.1178	0.1366	0.1350	0.1371	0.1448	0.1294	0.1354	0.1337	6	AVG
Tetrahydrofuran	0.9482	1.5095	1.4317	1.5049	2.0808	1.5386	1.3336	1.4782	23	2NDDEG
Chloroform	#0.4021	0.4831	0.4416	0.4716	0.4988	0.4502	0.4558	0.4576	7	AVG #
1,1,1-Trichloroethane	#0.3205	0.4371	0.3788	0.4079	0.4153	0.3856	0.3884	0.3905	9	AVG #
Cyclohexane	#0.2364	0.3300	0.2977	0.3150	0.3215	0.3047	0.3065	0.3017	10	AVG #
Cyclohexane(2)	#0.1014	0.2547	0.2224	0.2372	0.2440	0.2310	0.2357	0.2181	24	AVG #
Cyclohexane(3)	#0.0412	0.0935	0.0844	0.0905	0.0944	0.0892	0.0903	0.0834	23	AVG #<-
1,1-Dichloropropene	0.2884	0.3769	0.3387	0.3618	0.3640	0.3467	0.3455	0.3460	8	AVG
Carbon Tetrachloride	#0.2413	0.3298	0.2988	0.3269	0.3339	0.3227	0.3288	0.3117	11	AVG #
Isobutyl Alcohol	0.4894	0.5451	0.4664	0.4182	0.4276	0.4184	0.4201	0.4550	11	AVG
Benzene	#0.9683	1.1688	1.0610	1.1248	1.1319	1.0473	1.0382	1.0772	6	AVG #
1,2-Dichloroethane	#0.3571	0.4457	0.3927	0.4222	0.4346	0.3930	0.3950	0.4057	7	AVG #
1,2-Dichloroethane(2)	#0.0152	0.0343	0.0320	0.0347	0.0353	0.0326	0.0331	0.0310	23	AVG #<-
t-Amyl methyl ether	0.7627	0.8900	0.7676	0.8658	0.8776	0.8261	0.8189	0.8298	6	AVG
n-Heptane	0.1999	0.2400	0.1851	0.2199	0.2230	0.2051	0.2175	0.2129	8	AVG
n-Butanol	0.3309	0.3894	0.3689	0.3285	0.3403	0.3467	0.3442	0.3498	6	AVG

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 Calibration Date(s): 04/05/16 04/05/16

Heated Purge: (Y/N) N Calibration Times: 10:14 13:02

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

LAB FILE ID: RRF 1 = ra05i01.d RRF 4 = ra05i02.d RRF 10= ra05i03.d
RRF 20= ra05i04.d RRF 50= ra05i05.d RRF100= ra05i06.d RRF300= ra05i07.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Trichloroethene	#0.2290	0.2810	0.2519	0.2623	0.2712	0.2578	0.2514	0.2578	6	AVG #
Methylcyclohexane	#0.1263	0.2135	0.1916	0.2070	0.2191	0.2079	0.2121	0.1968	16	AVG #
1,2-Dichloropropane	#0.2632	0.3094	0.2870	0.3070	0.3136	0.2992	0.2956	0.2964	6	AVG #
Methyl Methacrylate	0.1507	0.2050	0.1958	0.2202	0.2374	0.2292	0.2302	0.2098	14	AVG
1,4-Dioxane	0.0804	0.1426	0.1305	0.1223	0.1316	0.1272	0.1195	0.1220	16	AVG
Dibromomethane	0.1460	0.1737	0.1609	0.1780	0.1867	0.1776	0.1731	0.1708	8	AVG
Bromodichloromethane	#0.2755	0.3313	0.3061	0.3469	0.3755	0.3655	0.3695	0.3386	11	AVG #
2-Nitropropane	3.8079	3.5051	3.1637	3.3094	5.4380	4.2070	3.3803	3.8302	21	2NDDEG
2-Chloroethyl Vinyl Ether	0.1437	0.1829	0.1742	0.1948	0.2135	0.2043	0.2029	0.1881	13	AVG
cis-1,3-Dichloropropene	#0.3604	0.4400	0.4201	0.4668	0.4999	0.4778	0.4703	0.4479	10	AVG #
4-Methyl-2-pentanone	#0.3009	0.3411	0.3327	0.3709	0.5948	0.4319	0.3289	0.3859	26	2NDDEG #
Toluene	#0.7381	0.9195	0.8082	0.8918	0.9008	0.8475	0.8521	0.8511	7	AVG #
trans-1,3-Dichloropropene	#0.4742	0.5767	0.5242	0.5910	0.6562	0.6086	0.6143	0.5779	11	AVG #
Ethyl Methacrylate	0.3560	0.5140	0.4863	0.5645	0.6091	0.5740	0.5771	0.5258	16	AVG
1,1,2-Trichloroethane	#0.2930	0.3415	0.3152	0.3415	0.3582	0.3353	0.3298	0.3306	6	AVG #
Tetrachloroethene	#0.2398	0.2952	0.2698	0.2905	0.3056	0.2899	0.2908	0.2831	8	AVG #
1,3-Dichloropropane	0.5431	0.6530	0.5852	0.6277	0.6524	0.6163	0.6080	0.6122	6	AVG
2-Hexanone	#0.3153	0.3246	0.3190	0.3510	0.5901	0.4242	0.3306	0.3792	26	2NDDEG #
Dibromochloromethane	#0.2301	0.3080	0.3023	0.3583	0.3988	0.3957	0.4106	0.3434	19	AVG #
1,2-Dibromoethane	#0.3028	0.3405	0.3262	0.3614	0.3794	0.3577	0.3573	0.3465	7	AVG #
1-Chlorohexane	0.3680	0.3426	0.3090	0.3219	0.3246	0.3077	0.3134	0.3267	7	AVG
Chlorobenzene	#0.8702	0.9764	0.8847	0.9598	0.9589	0.9184	0.9159	0.9263	4	AVG #
1,1,1,2-Tetrachloroethane	0.2737	0.3261	0.3093	0.3554	0.3645	0.3447	0.3526	0.3323	10	AVG
Ethylbenzene	#1.2072	1.4898	1.3822	1.4993	1.5121	1.4074	1.4118	1.4157	7	AVG #
m+p-Xylene	#0.4541	0.5446	0.5289	0.5697	0.5728	0.5375	0.5486	0.5366	7	AVG #
o-Xylene	#0.4576	0.5660	0.5277	0.5786	0.5905	0.5533	0.5574	0.5473	8	AVG #
Styrene	#	0.9296	0.9031	0.9910	1.0360	0.9902	0.9994	0.9749	5	AVG #
Bromoform	#0.1303	0.1699	0.1775	0.2187	0.2537	0.2600	0.2763	0.2123	26	2NDDEG #
Isopropylbenzene	#1.0136	1.2006	1.1058	1.2230	1.2266	1.1588	1.1731	1.1574	7	AVG #
Cyclohexanone	0.3958	0.4714	0.4410	0.4645	0.5101	0.4604	0.4236	0.4524	8	AVG
1,1,2,2-Tetrachloroethane	#0.8835	1.0680	0.9459	1.0912	1.1085	1.0423	1.0022	1.0202	8	AVG #
Bromobenzene	0.7691	0.9410	0.8446	0.9064	0.9176	0.8566	0.8405	0.8680	7	AVG
trans-1,4-Dichloro-2-butene	0.3334	0.4409	0.4068	0.3751	0.3789	0.3538	0.3359	0.3750	10	AVG
1,2,3-Trichloropropane	0.3008	0.3502	0.3020	0.3278	0.3374	0.3114	0.3051	0.3192	6	AVG
n-Propylbenzene	2.6128	3.3932	2.9946	3.1951	3.2280	2.9516	2.9251	3.0429	8	AVG
2-Chlorotoluene	0.6100	0.7452	0.6679	0.7236	0.7201	0.6919	0.6807	0.6913	6	AVG
1,3,5-Trimethylbenzene	1.8982	2.3499	2.1867	2.3752	2.3454	2.2638	2.2250	2.2349	7	AVG
4-Chlorotoluene	0.6082	0.7832	0.7306	0.7697	0.7624	0.7463	0.7364	0.7338	8	AVG
tert-Butylbenzene	0.3769	0.4501	0.4387	0.4630	0.4646	0.4374	0.4451	0.4394	7	AVG
Pentachloroethane	0.3851	0.4744	0.4485	0.4975	0.5202	0.5127	0.5219	0.4800	10	AVG
1,2,4-Trimethylbenzene	1.9991	2.5030	2.3329	2.5283	2.4639	2.3582	2.3361	2.3602	8	AVG
sec-Butylbenzene	2.0212	2.5566	2.3628	2.5906	2.5245	2.3595	2.3796	2.3993	8	AVG
1,3-Dichlorobenzene	#1.1957	1.4051	1.2516	1.3781	1.3762	1.2940	1.2933	1.3134	6	AVG #
p-Isopropyltoluene	1.8098	2.2565	2.0571	2.2860	2.2763	2.1484	2.1634	2.1425	8	AVG
1,4-Dichlorobenzene	#1.2722	1.5157	1.3585	1.4681	1.4560	1.3803	1.3639	1.4021	6	AVG #
1,2,3-Trimethylbenzene	2.1847	2.7357	2.4847	2.6463	2.6642	2.5082	2.4822	2.5294	7	AVG
Benzyl Chloride	0.3244	0.3812	0.3896	0.4502	0.4770	0.4601	0.4669	0.4213	14	AVG
1,3-Diethylbenzene	1.0947	1.3230	1.2624	1.3471	1.3496	1.2633	1.2662	1.2723	7	AVG
1,4-Diethylbenzene	1.0841	1.3340	1.2654	1.3421	1.3566	1.2599	1.2672	1.2727	7	AVG
n-Butylbenzene		1.1002	0.9822	1.0935	1.0708	0.9835	1.0011	1.0385	5	AVG
1,2-Dichlorobenzene	#1.2834	1.4241	1.2696	1.4209	1.4122	1.3334	1.3196	1.3519	5	AVG #
1,2-Diethylbenzene	0.9282	1.1957	1.0693	1.1421	1.1473	1.0807	1.0725	1.0908	8	AVG

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 Calibration Date(s): 04/05/16 04/05/16

Heated Purge: (Y/N) N Calibration Times: 10:14 13:02

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

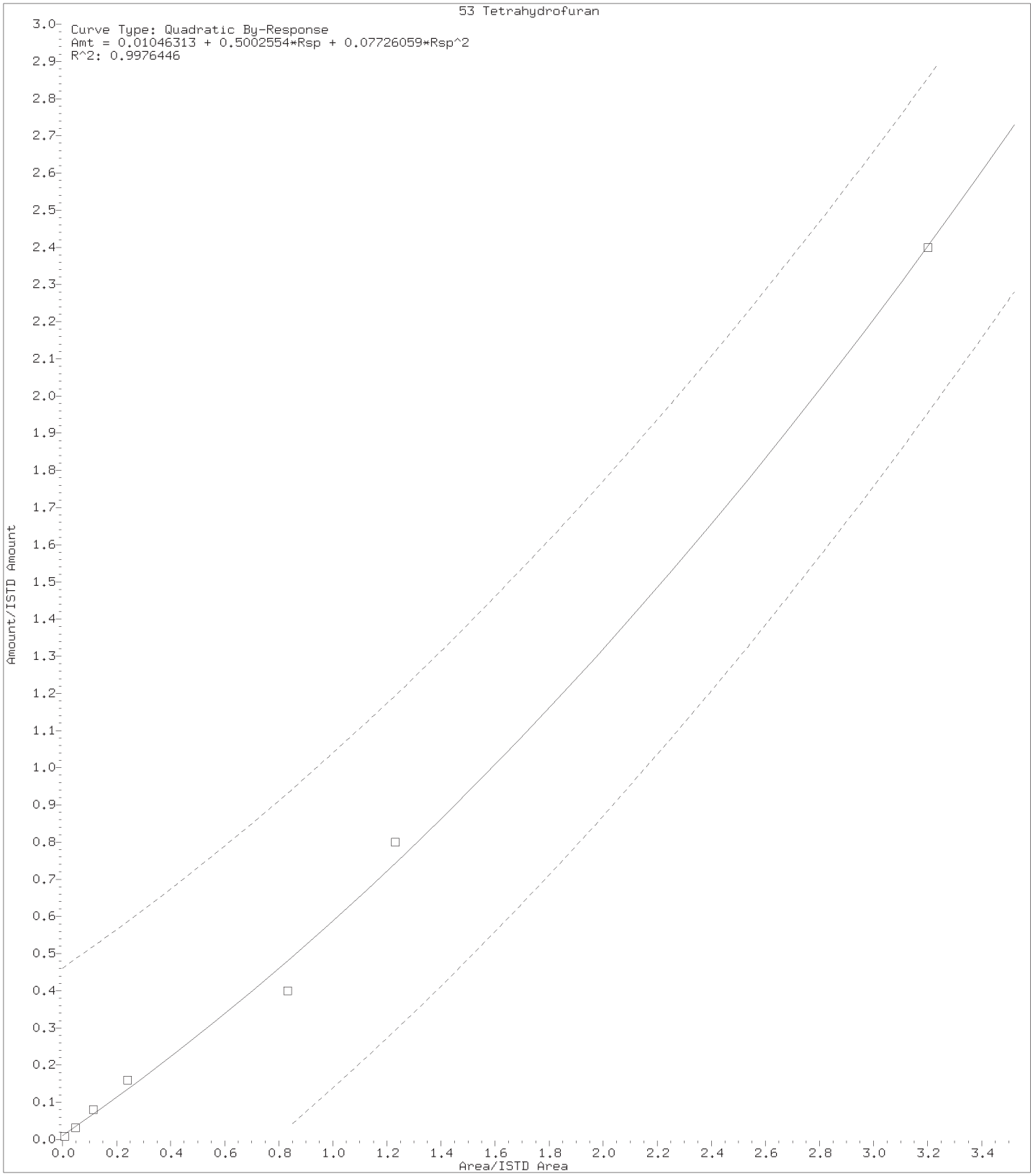
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RRF 20= ra05i04.d RRF 50= ra05i05.d RRF100= ra05i06.d RRF300= ra05i07.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
1,2-Dibromo-3-chloropropane#	0.1717	0.2035	0.1747	0.2109	0.2141	0.2128	0.2113	0.1999	9	AVG #
1,3,5-Trichlorobenzene	0.7098	0.8769	0.7519	0.8782	0.8294	0.7923	0.7993	0.8054	8	AVG
1,2,4-Trichlorobenzene#	0.6882	0.8385	0.7388	0.8425	0.8231	0.7620	0.7881	0.7830	7	AVG #
Hexachlorobutadiene		0.3988	0.3335	0.3930	0.3722	0.3432	0.3621	0.3672	7	AVG
Naphthalene		2.5426	2.2542	2.6558	2.6992	2.4899	2.4963	2.5230	6	AVG
1,2,3-Trichlorobenzene	0.7028	0.7994	0.6991	0.7862	0.7858	0.7256	0.7494	0.7498	6	AVG
2-Methylnaphthalene	1.0877	1.2236	1.0944	1.2280	1.3304	1.2562	1.2933	1.2162	8	AVG
Dibromofluoromethane	0.2157	0.2692	0.2488	0.2632	0.2759	0.2498	0.2502	0.2533	8	AVG
Dibromofluoromethane(2)	0.2162	0.2786	0.2603	0.2742	0.2829	0.2551	0.2577	0.2607	9	AVG
1,2-Dichloroethane-d4		0.0702	0.0637	0.0674	0.0677	0.0615	0.0619	0.0654	5	AVG
1,2-Dichloroethane-d4(2)	0.3252	0.3768	0.3413	0.3554	0.3573	0.3235	0.3239	0.3433	6	AVG
1,2-Dichloroethane-d4(3)	0.0167	0.0458	0.0400	0.0425	0.0432	0.0390	0.0401	0.0382	26	AVG
Toluene-d8	1.1821	1.4430	1.2917	1.3908	1.4083	1.2789	1.2903	1.3264	7	AVG
Toluene-d8(2)	0.7722	0.9453	0.8470	0.8958	0.9058	0.8299	0.8328	0.8612	7	AVG
4-Bromofluorobenzene	0.4296	0.4740	0.4415	0.4772	0.4843	0.4394	0.4658	0.4588	5	AVG
4-Bromofluorobenzene(2)	0.3119	0.3703	0.3428	0.3716	0.3821	0.3460	0.3722	0.3567	7	AVG

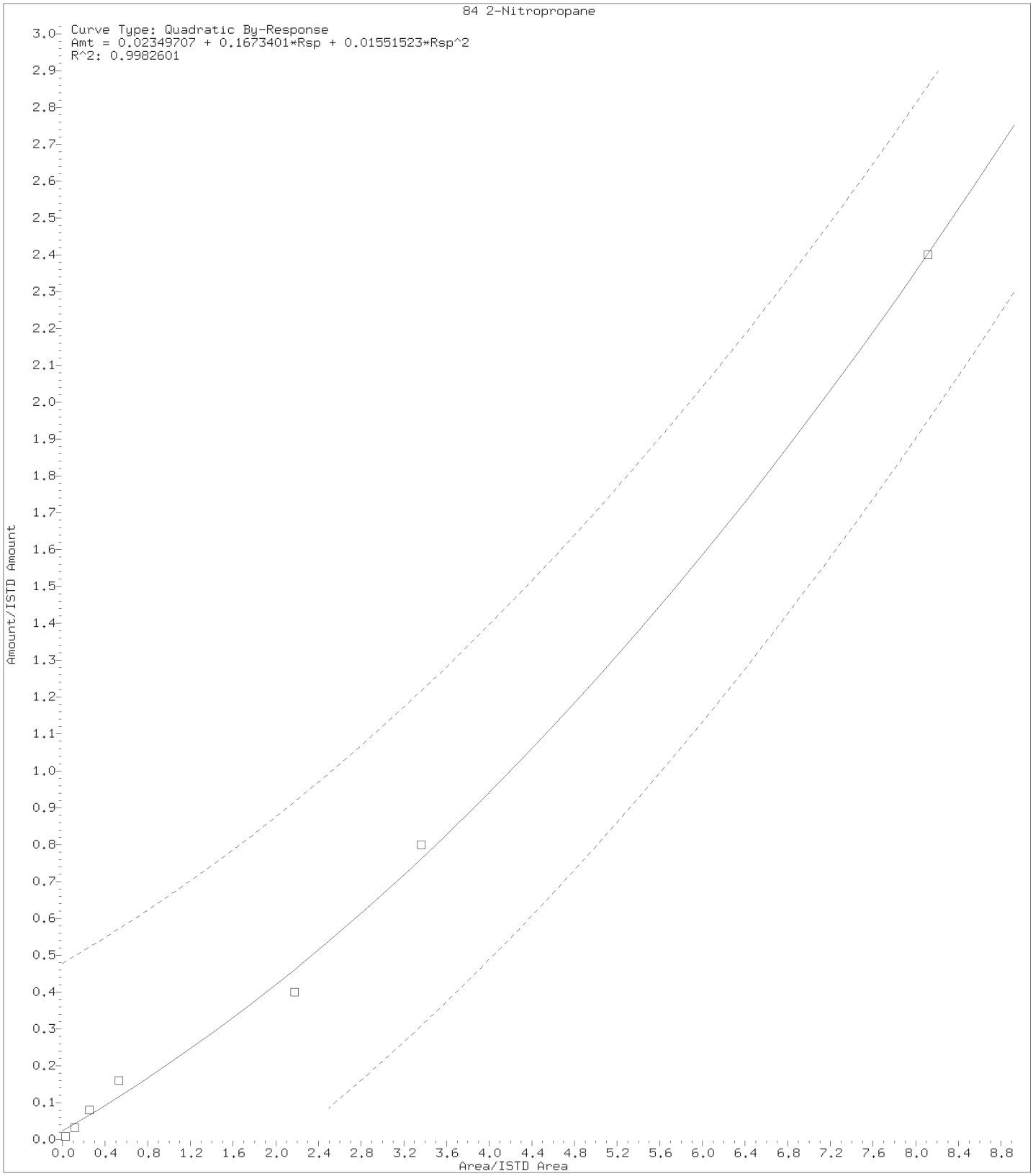
Average %RSD 10

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

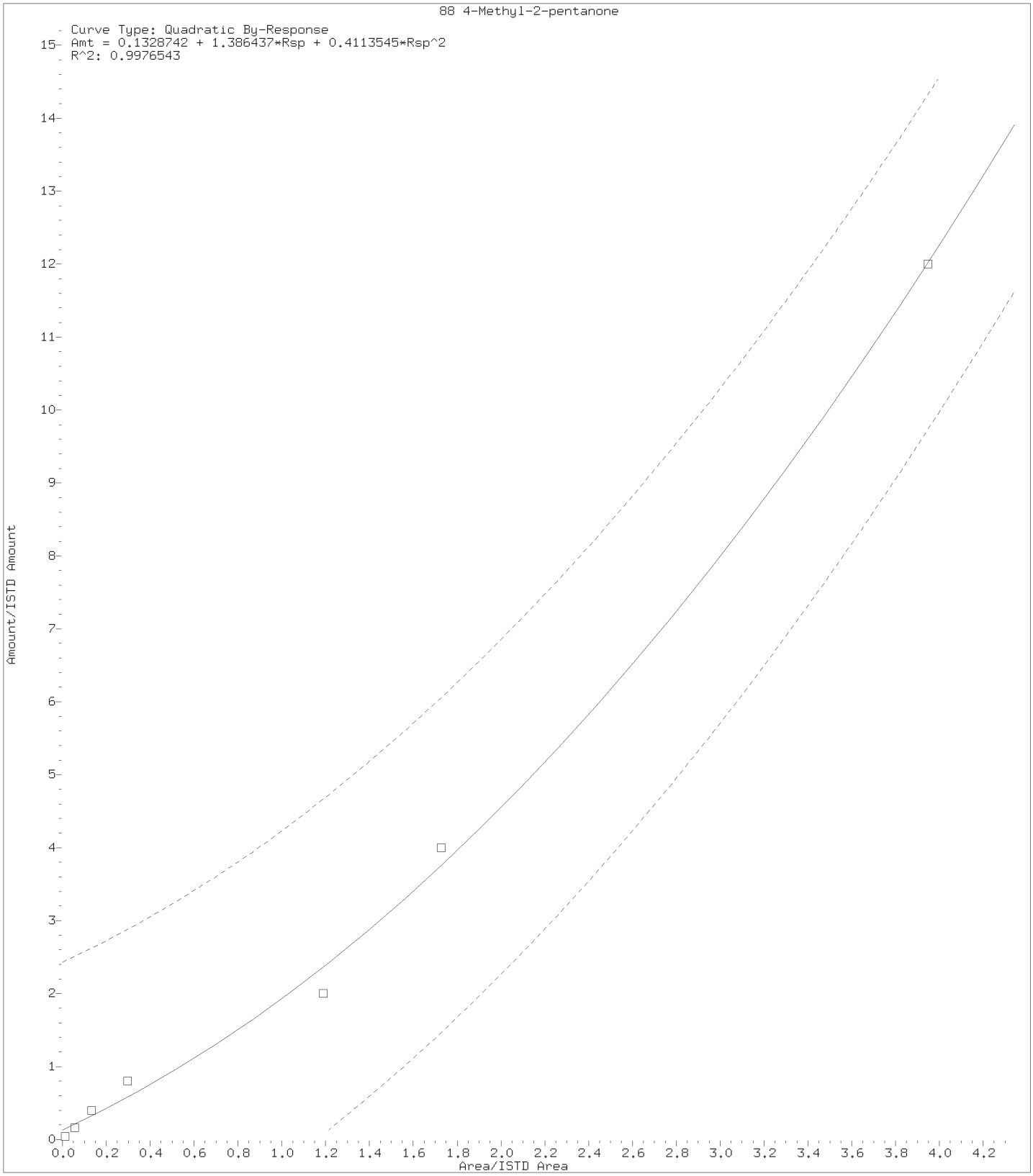
FORM VI VOA



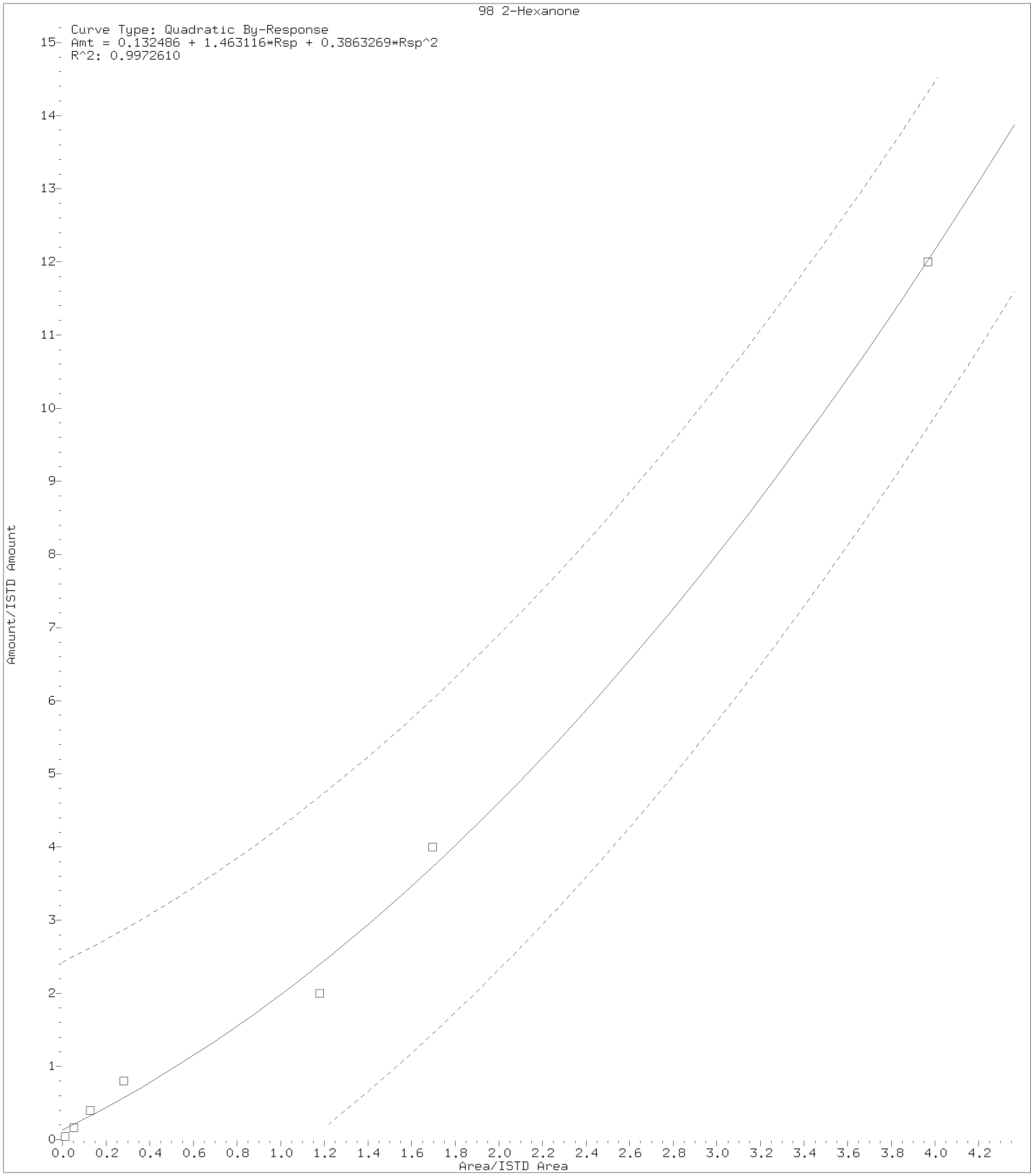
Digitally signed by Kevin A. Sposito on 04/06/2016 at 20:20.
Target 3.5 esignature user ID: kas02648



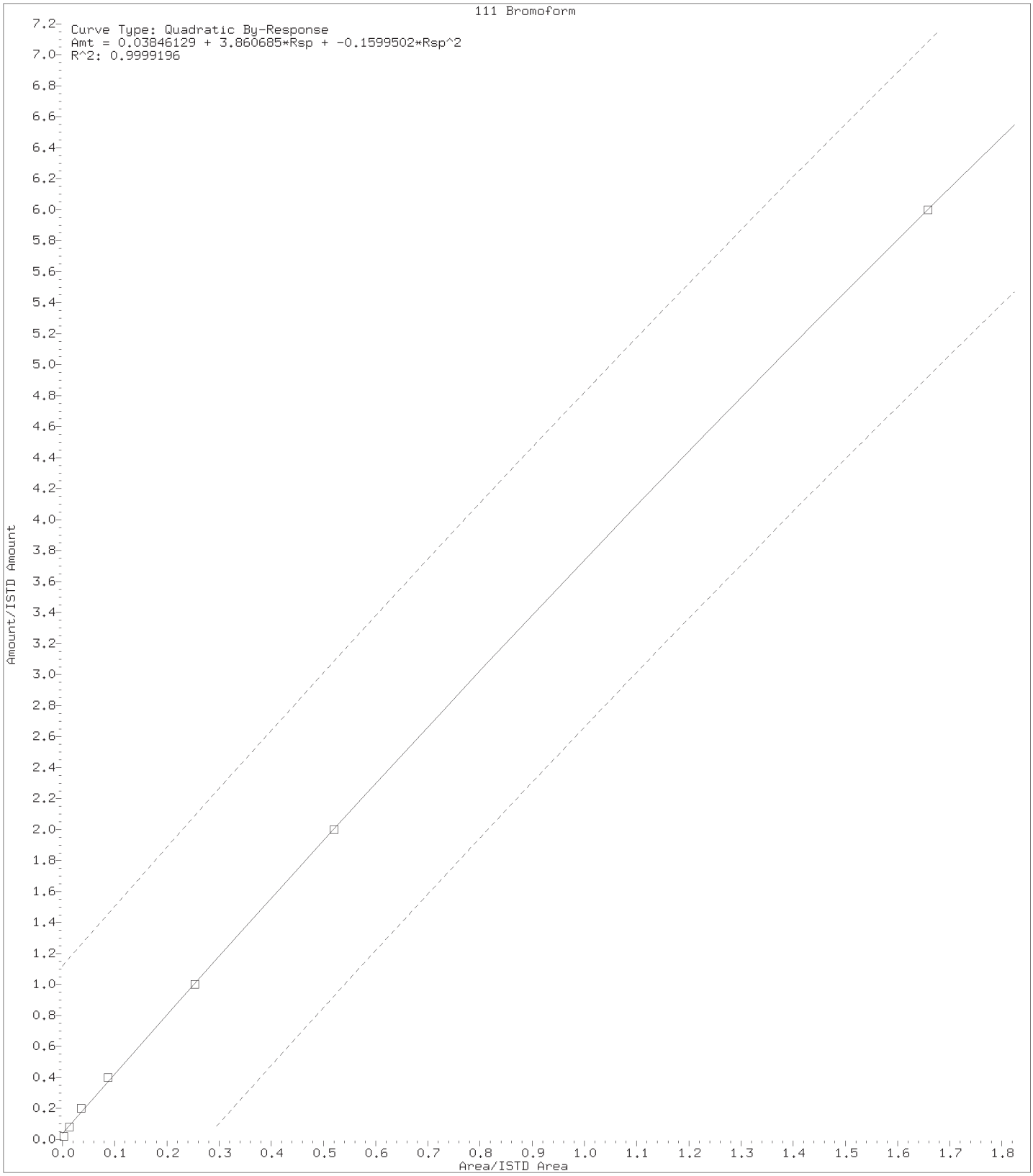
Digitally signed by Kevin A. Sposito on 04/06/2016 at 20:20.
Target 3.5 esignature user ID: kas02648



Digitally signed by Kevin A. Sposito on 04/06/2016 at 20:20.
Target 3.5 esignature user ID: kas02648



Digitally signed by Kevin A. Sposito on 04/06/2016 at 20:20.
Target 3.5 esignature user ID: kas02648



Digitally signed by Kevin A. Sposito on 04/06/2016 at 20:20.
Target 3.5 esignature user ID: kas02648

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP07566.i/16apr05i.b/ra05i01.d	VSTD001
/chem/HP07566.i/16apr05i.b/ra05i02.d	VSTD004
/chem/HP07566.i/16apr05i.b/ra05i03.d	VSTD010
/chem/HP07566.i/16apr05i.b/ra05i04.d	VSTD020
/chem/HP07566.i/16apr05i.b/ra05i05.d	VSTD050
/chem/HP07566.i/16apr05i.b/ra05i06.d	VSTD100
/chem/HP07566.i/16apr05i.b/ra05i07.d	VSTD300

Area Summary

File ID:

Internal Standard Name	ra05i01.d	ra05i02.d	ra05i03.d	ra05i04.d	ra05i05.d	ra05i06.d	ra05i07.d	Avg. Area	%RSD	In Spec
t-Butyl alcohol-d10	149623	134215	150510	140063	137258	152748	156727	145878	6	Yes
Fluorobenzene	1093004	979900	1127460	1025373	1006307	1154235	1125343	1073089	6	Yes
Chlorobenzene-d5	771730	696484	809552	743546	730351	851584	798622	771696	7	Yes
1,4-Dichlorobenzene-d4	328765	283780	336335	308818	318867	362342	355182	327727	8	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

File ID:

Internal Standard Name	ra05i01.d	ra05i02.d	ra05i03.d	ra05i04.d	ra05i05.d	ra05i06.d	ra05i07.d	Avg. RT
t-Butyl alcohol-d10	4.089	4.075	4.081	4.071	4.073	4.070	4.082	4.077
Fluorobenzene	7.545	7.544	7.543	7.546	7.542	7.545	7.544	7.544
Chlorobenzene-d5	11.078	11.076	11.076	11.079	11.078	11.078	11.077	11.077
1,4-Dichlorobenzene-d4	12.981	12.979	12.982	12.978	12.981	12.981	12.980	12.980

* indicates the retention time is greater than 30 seconds from the average RT.

Report generated on 04/07/2016 at 07:11.

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 ICV Date: 04/05/16 Time: 13:51

Lab File ID: ra05v01.d Init. Calib. Date(s): 04/05/16 04/05/16

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
# Dichlorodifluoromethane	0.2965	0.2563	17.29	20	-14	#
# Chloromethane	0.4375	0.4559	20.84	20	4	#
# Vinyl Chloride	0.3634	0.3960	21.79	20	9	#
# Bromomethane	4.4799	4.5237	20.20	20	1	#
# Chloroethane	3.3008	3.2218	19.52	20	-2	#
Dichlorofluoromethane	0.3459	0.4298	24.85	20	24	
# Trichlorofluoromethane	0.3374	0.3713	22.01	20	10	#
n-Pentane	0.2369	0.2235	18.87	20	-6	
Ethanol	0.1434	0.1748	1219.37	1000	22	
Freon 123a	0.3047	0.3625	23.79	20	19	
Acrolein	2.8324	2.7742	146.92	150	-2	
# 1,1-Dichloroethene	0.2281	0.2495	21.88	20	9	#
# Acetone	1.1906	1.2078	152.17	150	1	#
# Freon 113	0.1600	0.1649	20.62	20	3	#
2-Propanol	0.9309	0.8660	139.53	150	-7	
Methyl Iodide	0.4111	0.4439	21.60	20	8	
# Carbon Disulfide	0.7309	0.7658	20.96	20	5	#
# Methyl Acetate	0.2717	0.2768	20.37	20	2	#
Allyl Chloride	0.4774	0.5776	24.20	20	21	
# Methylene Chloride	0.2763	0.3031	21.94	20	10	#
t-Butyl alcohol	1.2947	1.3351	206.24	200	3	
Acrylonitrile	0.1423	0.1372	96.40	100	-4	
# Methyl Tertiary Butyl Ether	0.8267	0.9366	22.66	20	13	#
# trans-1,2-Dichloroethene	0.2494	0.2927	23.47	20	17	#
n-Hexane	0.1777	0.1627	18.31	20	-8	
# 1,1-Dichloroethane	0.5135	0.5721	22.28	20	11	#
di-Isopropyl ether	1.0446	1.1848	22.69	20	13	
2-Chloro-1,3-butadiene	0.4039	0.4932	24.42	20	22	
Ethyl t-butyl ether	0.9388	1.0028	21.36	20	7	
# 2-Butanone	7.1122	6.5982	139.16	150	-7	#
# cis-1,2-Dichloroethene	0.2801	0.3114	22.23	20	11	#
2,2-Dichloropropane	0.3986	0.4452	22.34	20	12	
Propionitrile	0.0478	0.0532	167.03	150	11	
Methacrylonitrile	0.1291	0.1432	166.34	150	11	
Bromochloromethane	0.1337	0.1560	23.33	20	17	
Tetrahydrofuran	1.4782	1.4497	81.63	100	-18	

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 ICV Date: 04/05/16 Time: 13:51

Lab File ID: ra05v01.d Init. Calib. Date(s): 04/05/16 04/05/16

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
# Chloroform	0.4576	0.5173	22.61	20	13	#
# 1,1,1-Trichloroethane	0.3905	0.4621	23.67	20	18	#
# Cyclohexane	0.3017	0.3189	21.14	20	6	#
1,1-Dichloropropene	0.3460	0.3664	21.18	20	6	
# Carbon Tetrachloride	0.3117	0.3527	22.63	20	13	#
Isobutyl Alcohol	0.4550	0.4312	473.80	500	-5	
# Benzene	1.0772	1.1613	21.56	20	8	#
# 1,2-Dichloroethane	0.4057	0.4471	22.04	20	10	#
t-Amyl methyl ether	0.8298	0.9208	22.19	20	11	
n-Heptane	0.2129	0.1827	17.16	20	-14	
n-Butanol	0.3498	0.3444	984.39	1000	-2	
# Trichloroethene	0.2578	0.2891	22.42	20	12	#
# Methylcyclohexane	0.1968	0.2197	22.33	20	12	#
# 1,2-Dichloropropane	0.2964	0.3379	22.80	20	14	#
Methyl Methacrylate	0.2098	0.2351	22.41	20	12	
1,4-Dioxane	0.1220	0.1314	538.30	500	8	
Dibromomethane	0.1708	0.1904	22.29	20	11	
# Bromodichloromethane	0.3386	0.3800	22.44	20	12	#
2-Nitropropane	3.8302	3.0227	16.22	20	-19	
2-Chloroethyl Vinyl Ether	0.1881	0.2136	22.71	20	14	
# cis-1,3-Dichloropropene	0.4479	0.5211	23.27	20	16	#
# 4-Methyl-2-pentanone	0.3859	0.3825	71.70	100	-28	#
# Toluene	0.8511	0.9342	21.95	20	10	#
# trans-1,3-Dichloropropene	0.5779	0.6471	22.40	20	12	#
Ethyl Methacrylate	0.5258	0.5982	22.75	20	14	
# 1,1,2-Trichloroethane	0.3306	0.3592	21.73	20	9	#
# Tetrachloroethene	0.2831	0.3177	22.44	20	12	#
1,3-Dichloropropane	0.6122	0.6562	21.44	20	7	
# 2-Hexanone	0.3792	0.3748	72.32	100	-28	#
# Dibromochloromethane	0.3434	0.3792	22.08	20	10	#
# 1,2-Dibromoethane	0.3465	0.3881	22.40	20	12	#
1-Chlorohexane	0.3267	0.3486	21.34	20	7	
# Chlorobenzene	0.9263	1.0008	21.61	20	8	#
1,1,1,2-Tetrachloroethane	0.3323	0.3655	22.00	20	10	
# Ethylbenzene	1.4157	1.5586	22.02	20	10	#
# m+p-Xylene	0.5366	0.6017	44.85	40	12	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 ICV Date: 04/05/16 Time: 13:51

Lab File ID: ra05v01.d Init. Calib. Date(s): 04/05/16 04/05/16

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

	COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	o-Xylene	0.5473	0.5957	21.77	20	9	#
#	Styrene	0.9749	1.0344	21.22	20	6	#
#	Bromoform	0.2123	0.2313	19.72	20	-1	#
#	Isopropylbenzene	1.1574	1.2863	22.23	20	11	#
	Cyclohexanone	0.4524	0.4807	531.28	500	6	
#	1,1,2,2-Tetrachloroethane	1.0202	1.1509	22.56	20	13	#
	Bromobenzene	0.8680	0.9435	21.74	20	9	
	trans-1,4-Dichloro-2-butene	0.3750	0.3830	102.13	100	2	
	1,2,3-Trichloropropane	0.3192	0.3516	22.03	20	10	
	n-Propylbenzene	3.0429	3.3614	22.09	20	10	
	2-Chlorotoluene	0.6913	0.7698	22.27	20	11	
	1,3,5-Trimethylbenzene	2.2349	2.5245	22.59	20	13	
	4-Chlorotoluene	0.7338	0.8176	22.28	20	11	
	tert-Butylbenzene	0.4394	0.5054	23.01	20	15	
	Pentachloroethane	0.4800	0.5440	22.66	20	13	
	1,2,4-Trimethylbenzene	2.3602	2.6542	22.49	20	12	
	sec-Butylbenzene	2.3993	2.8199	23.51	20	18	
#	1,3-Dichlorobenzene	1.3134	1.4634	22.28	20	11	#
	p-Isopropyltoluene	2.1425	2.4605	22.97	20	15	
#	1,4-Dichlorobenzene	1.4021	1.5789	22.52	20	13	#
	1,2,3-Trimethylbenzene	2.5294	2.8234	22.32	20	12	
	Benzyl Chloride	0.4213	0.4709	22.35	20	12	
	1,3-Diethylbenzene	1.2723	1.5037	23.64	20	18	
	1,4-Diethylbenzene	1.2727	1.5615	24.54	20	23	
	n-Butylbenzene	1.0385	1.2361	23.80	20	19	
#	1,2-Dichlorobenzene	1.3519	1.5014	22.21	20	11	#
	1,2-Diethylbenzene	1.0908	1.3067	23.96	20	20	
#	1,2-Dibromo-3-chloropropane	0.1999	0.2137	21.39	20	7	#
	1,3,5-Trichlorobenzene	0.8054	0.9666	24.00	20	20	
#	1,2,4-Trichlorobenzene	0.7830	0.9625	24.58	20	23	#
	Hexachlorobutadiene	0.3672	0.5248	28.59	20	43	<-
	Naphthalene	2.5230	2.8223	22.37	20	12	
	1,2,3-Trichlorobenzene	0.7498	0.9154	24.42	20	22	
	2-Methylnaphthalene	1.2162	1.6063	26.41	20	32	<-

Average %Drift 12

Compounds with required minimum RRF.
Maximum % Drift = 30 %

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date(s): 04/22/16 04/22/16

Heated Purge: (Y/N) Y Calibration Times: 09:55 12:07

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = la22i07.d RRF 4 = la22i06.d RRF 10= la22i05.d
RRF 20= la22i04.d RRF 50= la22i03.d RRF100= la22i02.d RRF300= la22i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD	
Dichlorodifluoromethane	#0.2870	0.3828	0.3893	0.3614	0.4075	0.3999	0.3699	0.3711	11	AVG	#
Chloromethane	#0.3320	0.3656	0.3714	0.3576	0.4022	0.4037	0.3767	0.3727	7	AVG	#
1,3-Butadiene	1.1325	0.9842	0.5645	0.5365	0.3908	0.3624	0.3065	0.6111	53	AVG	
Vinyl Chloride	#0.2958	0.3515	0.3575	0.3395	0.3770	0.3874	0.3532	0.3517	8	AVG	#
Bromomethane	#0.1986	0.2254	0.2372	0.2241	0.2420	0.2439	0.2250	0.2280	7	AVG	#
Chloroethane	#0.1753	0.1946	0.1922	0.1881	0.2064	0.2045	0.1861	0.1924	6	AVG	#
Dichlorofluoromethane	0.4077	0.4571	0.4349	0.4597	0.4592	0.4732	0.4544	0.4495	5	AVG	
n-Pentane	0.3891	0.4514	0.4094	0.4260	0.4534	0.4467	0.3920	0.4240	7	AVG	
Trichlorofluoromethane	#0.2826	0.3829	0.3851	0.3612	0.4022	0.3985	0.3803	0.3704	11	AVG	#
Ethyl ether	0.2529	0.2516	0.2591	0.2549	0.2699	0.2771	0.2737	0.2627	4	AVG	
Freon 123a	0.2777	0.3271	0.3039	0.3102	0.3135	0.3156	0.3028	0.3072	5	AVG	
Acrolein	2.1334	2.0442	2.2649	2.1023	2.1291	2.0899	2.2077	2.1388	3	AVG	
1,1-Dichloroethene	#0.1775	0.2115	0.2230	0.2222	0.2331	0.2339	0.2314	0.2189	9	AVG	#
1,1-Dichloroethene(2)	#0.0963	0.1136	0.1200	0.1180	0.1248	0.1254	0.1227	0.1173	9	AVG	#
Acetone	#0.8613	0.9062	1.0419	0.9788	0.9942	0.9364	0.9829	0.9574	6	AVG	#
Freon 113	#0.1527	0.2095	0.2284	0.2124	0.2261	0.2282	0.2160	0.2105	13	AVG	#
2-Propanol	0.7482	0.7228	0.6565	0.7423	0.7481	0.7671	0.7543	0.7342	5	AVG	
Methyl Iodide	0.3302	0.3840	0.4083	0.4067	0.4312	0.4400	0.4450	0.4065	10	AVG	
Carbon Disulfide	#0.6244	0.6879	0.7237	0.7328	0.7913	0.7973	0.7889	0.7352	9	AVG	#
Allyl Chloride	0.3373	0.3844	0.4165	0.4337	0.4556	0.4743	0.4591	0.4230	11	AVG	
Methyl Acetate	#0.3003	0.2670	0.2840	0.2884	0.3033	0.3155	0.3059	0.2949	6	AVG	#
Methylene Chloride	#0.2545	0.2542	0.2686	0.2638	0.2799	0.2836	0.2853	0.2700	5	AVG	#
t-Butyl alcohol	1.2726	1.1572	1.1518	1.1610	1.1772	1.2180	1.1969	1.1906	4	AVG	
Acrylonitrile	0.1390	0.1416	0.1550	0.1474	0.1519	0.1499	0.1572	0.1489	5	AVG	
trans-1,2-Dichloroethene	#0.1997	0.2320	0.2535	0.2507	0.2639	0.2709	0.2686	0.2484	10	AVG	#
Methyl Tertiary Butyl Ether	#0.7855	0.7876	0.8575	0.8357	0.8801	0.8958	0.8827	0.8464	5	AVG	#
n-Hexane	0.2773	0.3768	0.3853	0.3997	0.4208	0.4283	0.3998	0.3840	13	AVG	
1,1-Dichloroethane	#0.4097	0.4562	0.4870	0.4994	0.5326	0.5380	0.5292	0.4931	10	AVG	#
di-Isopropyl ether	0.8239	0.8699	0.9588	0.9544	1.0090	1.0226	0.9906	0.9470	8	AVG	
2-Chloro-1,3-butadiene	0.2883	0.3510	0.3935	0.3960	0.4291	0.4363	0.4288	0.3890	14	AVG	
Ethyl t-butyl ether	0.7478	0.7910	0.8677	0.8599	0.9198	0.9351	0.9155	0.8624	8	AVG	
cis-1,2-Dichloroethene	#0.2282	0.2629	0.2815	0.2814	0.2992	0.3037	0.3018	0.2798	10	AVG	#
2-Butanone	#0.1791	0.1803	0.2015	0.1881	0.1977	0.1949	0.2000	0.1917	5	AVG	#
2,2-Dichloropropane	0.2527	0.3028	0.3405	0.3452	0.3810	0.3918	0.3827	0.3424	15	AVG	
Propionitrile	1.4728	1.5239	1.5189	1.5568	1.5326	1.6033	1.5810	1.5413	3	AVG	
Methacrylonitrile	0.1377	0.1399	0.1450	0.1484	0.1526	0.1569	0.1538	0.1477	5	AVG	
Bromochloromethane	0.1237	0.1337	0.1414	0.1410	0.1489	0.1557	0.1543	0.1427	8	AVG	
Tetrahydrofuran	1.0707	1.2371	1.3781	1.3057	1.3311	1.3040	1.3979	1.2892	9	AVG	
Chloroform	#0.3918	0.4166	0.4485	0.4475	0.4724	0.4825	0.4775	0.4481	8	AVG	#
1,1,1-Trichloroethane	#0.3469	0.4069	0.4039	0.3995	0.4047	0.4135	0.4112	0.3981	6	AVG	#
Cyclohexane	#0.3435	0.4453	0.4651	0.4680	0.5054	0.5086	0.4768	0.4589	12	AVG	#
Cyclohexane(2)	#0.3252	0.3422	0.3653	0.3620	0.3916	0.3970	0.3688	0.3646	7	AVG	#
Cyclohexane(3)	#0.0975	0.1254	0.1364	0.1350	0.1453	0.1488	0.1401	0.1327	13	AVG	#
1,1-Dichloropropene	0.2986	0.3360	0.3681	0.3653	0.3979	0.4049	0.3951	0.3665	10	AVG	
Carbon Tetrachloride	#0.2265	0.2631	0.2897	0.3001	0.3298	0.3394	0.3380	0.2981	14	AVG	#
Isobutyl Alcohol	0.4163	0.4107	0.4018	0.4066	0.4148	0.4444	0.4375	0.4189	4	AVG	
Benzene	#0.9229	1.0064	1.0891	1.0779	1.1390	1.1605	1.1245	1.0743	8	AVG	#
1,2-Dichloroethane	#0.3957	0.3778	0.3982	0.3859	0.4022	0.4133	0.4088	0.3974	3	AVG	#
1,2-Dichloroethane(2)	#0.0310	0.0317	0.0355	0.0345	0.0359	0.0368	0.0367	0.0346	7	AVG	#<-
t-Amyl methyl ether	0.7072	0.7066	0.8032	0.8014	0.8459	0.8752	0.8531	0.7989	9	AVG	
n-Heptane	0.3508	0.4281	0.4293	0.4354	0.4536	0.4644	0.4173	0.4255	9	AVG	
n-Butanol	0.2782	0.3017	0.3098	0.3324	0.3411	0.3647	0.3577	0.3265	10	AVG	

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date(s): 04/22/16 04/22/16

Heated Purge: (Y/N) Y Calibration Times: 09:55 12:07

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

LAB FILE ID: RRF 1 = la22i07.d RRF 4 = la22i06.d RRF 10= la22i05.d
RRF 20= la22i04.d RRF 50= la22i03.d RRF100= la22i02.d RRF300= la22i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
Trichloroethene	#0.2264	0.2535	0.2711	0.2713	0.2905	0.2951	0.2924	0.2715	9	AVG #
Methylcyclohexane	#0.3214	0.4266	0.4552	0.4635	0.4851	0.5025	0.4766	0.4473	14	AVG #
Methylcyclohexane(2)	#0.1499	0.1904	0.2036	0.2028	0.2190	0.2257	0.2153	0.2009	13	AVG #
1,2-Dichloropropane	#0.2499	0.2713	0.2981	0.2974	0.3151	0.3226	0.3159	0.2958	9	AVG #
Dibromomethane	0.1636	0.1712	0.1845	0.1791	0.1910	0.1968	0.1970	0.1833	7	AVG
1,4-Dioxane	0.0995	0.1062	0.1079	0.1102	0.1154	0.1198	0.1152	0.1106	6	AVG
Methyl Methacrylate	0.1854	0.2206	0.2502	0.2521	0.2674	0.2811	0.2782	0.2479	14	AVG
Bromodichloromethane	#0.2713	0.2876	0.3258	0.3276	0.3645	0.3795	0.3857	0.3346	13	AVG #
2-Nitropropane	0.0727	0.0753	0.0905	0.0915	0.1008	0.1035	0.1104	0.0921	15	AVG
2-Chloroethyl Vinyl Ether	0.1545	0.1805	0.2061	0.2051	0.2397	0.2485	0.2430	0.2111	17	AVG
cis-1,3-Dichloropropene	#0.3116	0.3583	0.4217	0.4373	0.4785	0.4970	0.4999	0.4292	17	AVG #
4-Methyl-2-pentanone	#0.3178	0.3502	0.4164	0.4053	0.4245	0.4161	0.4228	0.3933	11	AVG #
Toluene	#0.7746	0.8364	0.9016	0.9109	0.9437	0.9433	0.9176	0.8897	7	AVG #
trans-1,3-Dichloropropene	#0.3516	0.4233	0.4915	0.5342	0.5838	0.6087	0.6154	0.5155	19	AVG #
Ethyl Methacrylate	0.4405	0.4863	0.5708	0.5907	0.6250	0.6488	0.6355	0.5711	14	AVG
1,1,2-Trichloroethane	#0.3178	0.3216	0.3508	0.3414	0.3629	0.3646	0.3606	0.3457	6	AVG #
Tetrachloroethene	#0.3081	0.3519	0.3818	0.3816	0.4028	0.4052	0.4049	0.3766	9	AVG #
1,3-Dichloropropane	0.5449	0.5635	0.6223	0.6189	0.6430	0.6520	0.6408	0.6122	7	AVG
2-Hexanone	#0.3130	0.3278	0.3943	0.3980	0.4088	0.4008	0.4016	0.3778	10	AVG #
Dibromochloromethane	#0.2550	0.2765	0.3265	0.3422	0.3723	0.3920	0.4123	0.3395	17	AVG #
1,2-Dibromoethane	#0.3141	0.3392	0.3711	0.3759	0.3934	0.4026	0.4032	0.3713	9	AVG #
1-Chlorohexane	0.4522	0.4760	0.4969	0.5007	0.5275	0.5281	0.5124	0.4991	6	AVG
Chlorobenzene	#0.8769	0.9248	1.0194	1.0239	1.0673	1.0719	1.0638	1.0069	8	AVG #
1,1,1,2-Tetrachloroethane	0.2644	0.2911	0.3278	0.3373	0.3591	0.3713	0.3811	0.3332	13	AVG
Ethylbenzene	#1.3961	1.5924	1.7537	1.7724	1.8530	1.8631	1.7848	1.7165	10	AVG #
m+p-Xylene	#0.5302	0.5986	0.6784	0.6810	0.7111	0.7170	0.6968	0.6590	10	AVG #
o-Xylene	#0.5161	0.5895	0.6670	0.6653	0.6961	0.7083	0.6950	0.6482	11	AVG #
Styrene	#0.7989	0.9728	1.1154	1.1434	1.2039	1.2245	1.1840	1.0918	14	AVG #
Bromoform	#0.1831	0.1832	0.2089	0.2271	0.2540	0.2785	0.3018	0.2338	20	AVG #
Isopropylbenzene	#1.2543	1.5384	1.7097	1.7228	1.7909	1.8006	1.7339	1.6501	12	AVG #
Cyclohexanone	0.4397	0.4358	0.5803	0.5316	0.5203	0.5301	0.5326	0.5100	10	AVG
Bromobenzene	0.7529	0.7988	0.8533	0.8741	0.8985	0.9232	0.9146	0.8593	7	AVG
1,1,2,2-Tetrachloroethane	#0.9259	0.9395	1.0265	1.0311	1.0483	1.0805	1.0366	1.0126	6	AVG #
1,2,3-Trichloropropane	0.2909	0.2784	0.2897	0.2909	0.2957	0.3057	0.2960	0.2925	3	AVG
trans-1,4-Dichloro-2-butene	0.0404	0.0695	0.0962	0.1362	0.1644	0.2064	0.2318	0.1350	52	2NDDEG
n-Propylbenzene	3.1408	3.6653	3.9623	4.0646	4.1491	4.1511	3.7625	3.8422	9	AVG
2-Chlorotoluene	0.6777	0.7158	0.7826	0.8044	0.8207	0.8336	0.8200	0.7793	8	AVG
4-Chlorotoluene	0.6926	0.7664	0.8374	0.8476	0.8696	0.8866	0.8599	0.8229	8	AVG
1,3,5-Trimethylbenzene	2.1318	2.5246	2.7768	2.8631	2.9485	2.9754	2.8303	2.7215	11	AVG
tert-Butylbenzene	0.4613	0.5206	0.5523	0.5832	0.6023	0.6192	0.6041	0.5633	10	AVG
Pentachloroethane	0.3322	0.3941	0.4399	0.4759	0.5118	0.5515	0.5499	0.4650	18	AVG
1,2,4-Trimethylbenzene	2.2913	2.6289	2.8813	2.9487	3.0386	3.0853	2.9358	2.8300	10	AVG
sec-Butylbenzene	2.7720	3.3416	3.5031	3.6472	3.7339	3.7220	3.4234	3.4490	10	AVG
1,3-Dichlorobenzene	#1.4757	1.5232	1.6098	1.6526	1.6892	1.7213	1.6445	1.6166	5	AVG #
p-Isopropyltoluene	2.3507	2.8191	3.0347	3.1655	3.2336	3.2836	3.1108	2.9997	11	AVG
1,4-Dichlorobenzene	#1.5844	1.6105	1.7143	1.7158	1.7446	1.7731	1.6798	1.6889	4	AVG #
1,2,3-Trimethylbenzene	2.6174	2.7684	2.9411	3.0563	3.1132	3.2112	3.0087	2.9595	7	AVG
Benzyl Chloride	1.0881	1.3714	1.6479	1.8342	2.0342	2.1754	2.1461	1.7568	23	2NDDEG
1,3-Diethylbenzene	1.4843	1.7174	1.8059	1.8857	1.9136	1.9595	1.8592	1.8037	9	AVG
1,4-Diethylbenzene	1.5943	1.8034	1.8904	1.9651	1.9762	2.0236	1.9148	1.8811	8	AVG
1,2-Dichlorobenzene	#1.5095	1.5321	1.6250	1.6310	1.6384	1.6651	1.6164	1.6025	4	AVG #
n-Butylbenzene	1.3650	1.5046	1.5472	1.6079	1.6153	1.6132	1.4918	1.5350	6	AVG

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date(s): 04/22/16 04/22/16

Heated Purge: (Y/N) Y Calibration Times: 09:55 12:07

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

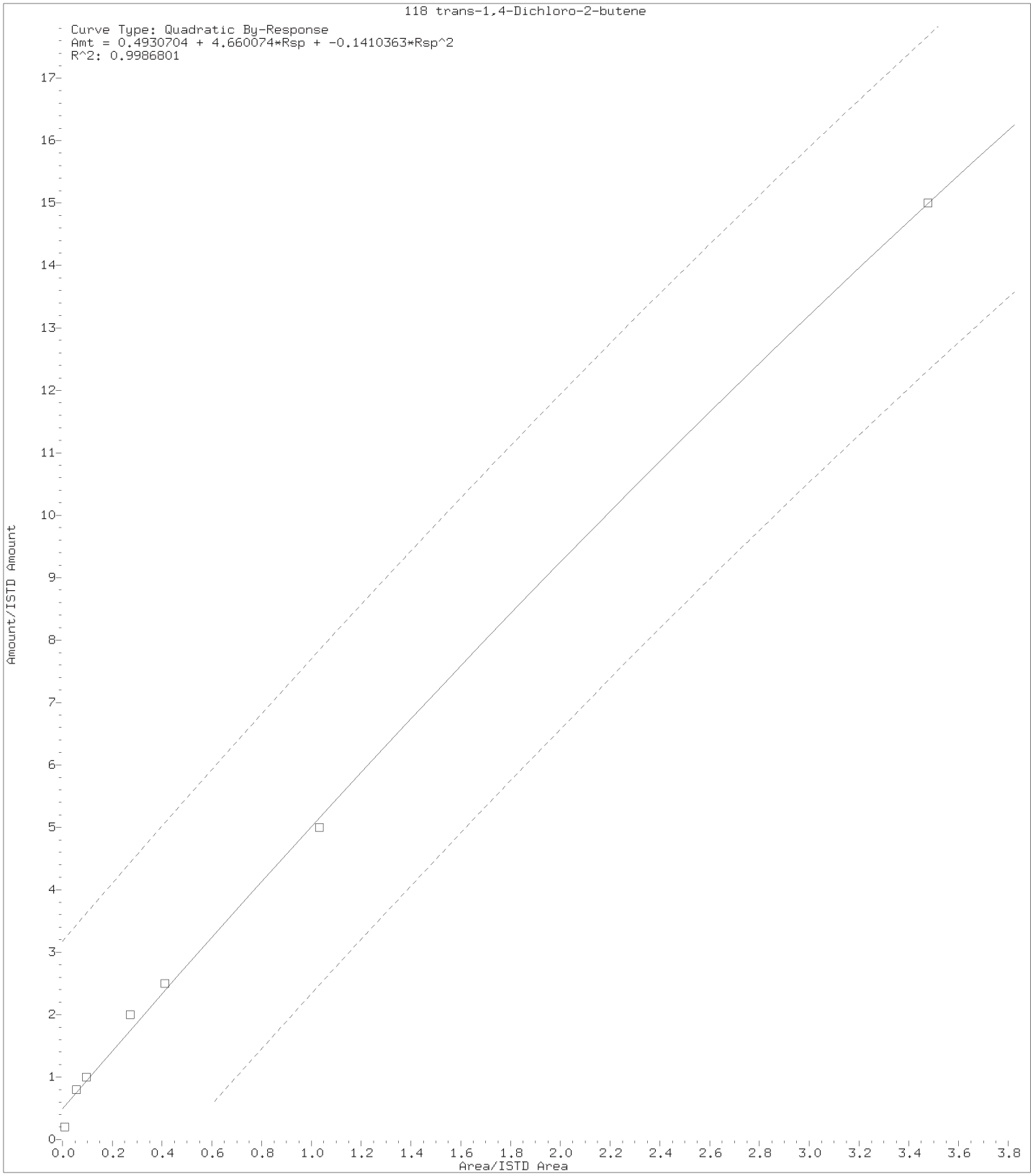
LAB FILE ID: RRF 1 = la22i07.d RRF 4 = la22i06.d RRF 10= la22i05.d
RRF 20= la22i04.d RRF 50= la22i03.d RRF100= la22i02.d RRF300= la22i01.d

COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	% RSD	CAL. METHOD
1,2-Diethylbenzene	1.3225	1.4672	1.5421	1.5992	1.6106	1.6506	1.5771	1.5385	7	AVG
1,2-Dibromo-3-chloropropane	#0.1574	0.1700	0.1944	0.1980	0.2062	0.2228	0.2214	0.1957	13	AVG #
1,3,5-Trichlorobenzene	1.2631	1.1999	1.2685	1.2933	1.3000	1.3228	1.2797	1.2753	3	AVG
1,2,4-Trichlorobenzene	#1.3374	1.2075	1.2395	1.2630	1.2635	1.3040	1.2310	1.2637	4	AVG #
Hexachlorobutadiene	0.6454	0.5291	0.5122	0.5462	0.5263	0.5436	0.4748	0.5397	10	AVG
Naphthalene	3.1904	3.2213	3.4607	3.5124	3.5111	3.6599	3.2750	3.4044	5	AVG
1,2,3-Trichlorobenzene	1.2456	1.1501	1.1979	1.1964	1.1890	1.2328	1.1262	1.1911	4	AVG
2-Methylnaphthalene	2.2999	1.9798	2.0306	2.2775	2.1941	2.4127	1.6627	2.1225	12	AVG
Dibromofluoromethane	0.2376	0.2337	0.2391	0.2342	0.2404	0.2400	0.2377	0.2375	1	AVG
Dibromofluoromethane(2)	0.2444	0.2402	0.2448	0.2387	0.2441	0.2464	0.2436	0.2432	1	AVG
1,2-Dichloroethane-d4	0.0602	0.0599	0.0605	0.0595	0.0603	0.0604	0.0589	0.0600	1	AVG
1,2-Dichloroethane-d4(2)	0.3102	0.3070	0.3092	0.3013	0.3114	0.3084	0.3040	0.3073	1	AVG
1,2-Dichloroethane-d4(3)	0.0385	0.0381	0.0382	0.0376	0.0386	0.0381	0.0375	0.0381	1	AVG
Toluene-d8	1.3085	1.3151	1.3157	1.3199	1.3074	1.3027	1.2919	1.3088	1	AVG
Toluene-d8(2)	0.8506	0.8586	0.8547	0.8598	0.8471	0.8503	0.8445	0.8522	1	AVG
4-Bromofluorobenzene	0.4845	0.4849	0.4902	0.4836	0.4854	0.4830	0.4785	0.4843	1	AVG
4-Bromofluorobenzene(2)	0.4157	0.4147	0.4154	0.4124	0.4125	0.4070	0.4073	0.4121	1	AVG

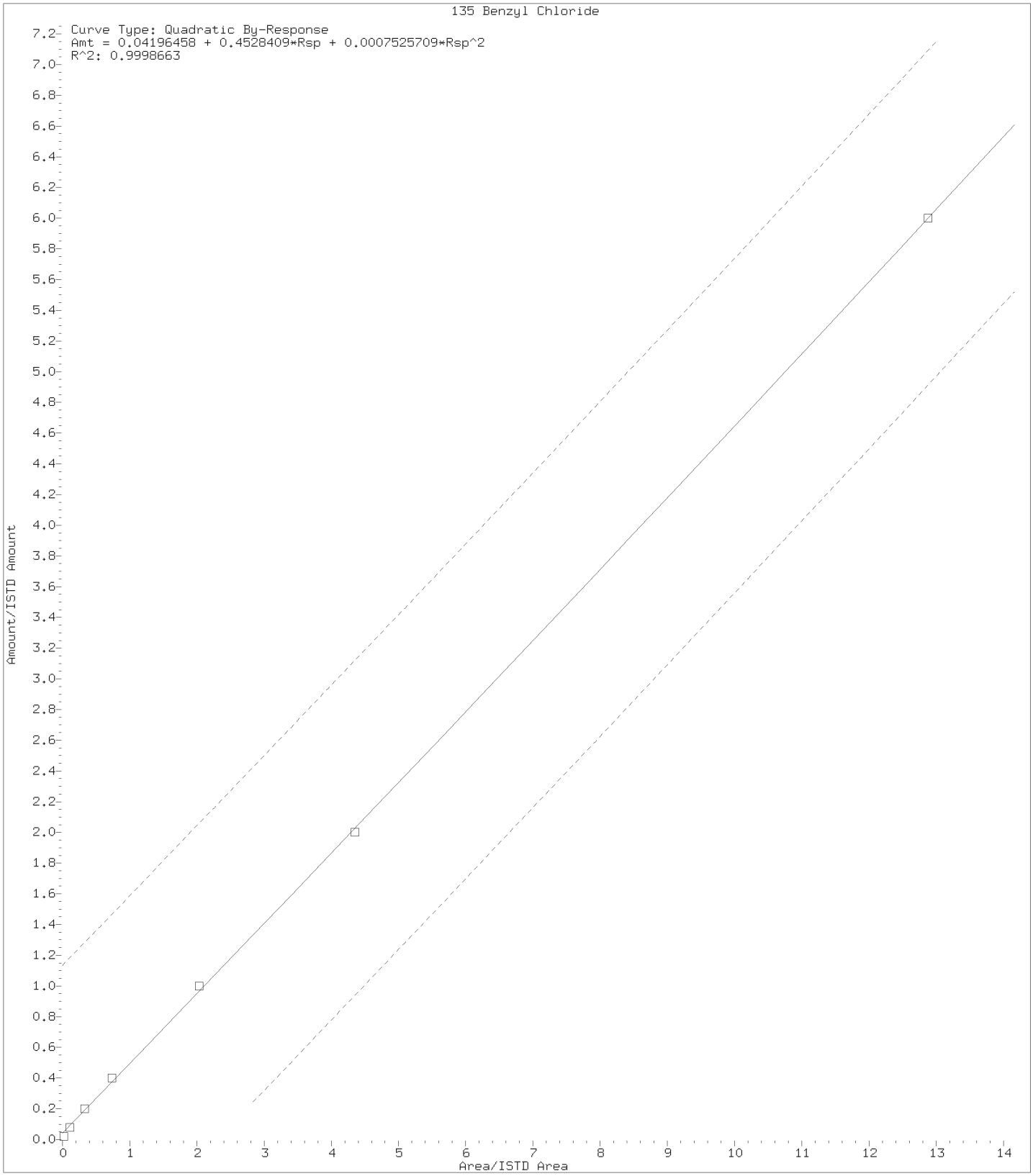
Average %RSD 9

Compounds with required minimum RRF.
All compounds must meet a maximum %RSD of 20.

FORM VI VOA



Digitally signed by Brett W. Kenyon on 04/25/2016 at 16:07.
Target 3.5 esignature user ID: bwk03231



Digitally signed by Brett W. Kenyon on 04/25/2016 at 16:07.
Target 3.5 esignature user ID: bwk03231

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP09915.i/16apr22i.b/la22i01.d	VSTD300
/chem/HP09915.i/16apr22i.b/la22i02.d	VSTD100
/chem/HP09915.i/16apr22i.b/la22i03.d	VSTD050
/chem/HP09915.i/16apr22i.b/la22i04.d	VSTD020
/chem/HP09915.i/16apr22i.b/la22i05.d	VSTD010
/chem/HP09915.i/16apr22i.b/la22i06.d	VSTD004
/chem/HP09915.i/16apr22i.b/la22i07.d	VSTD001

Area Summary

File ID:

Internal Standard Name	la22i01.d	la22i02.d	la22i03.d	la22i04.d	la22i05.d	la22i06.d	la22i07.d	Avg. Area	%RSD	In Spec
t-Butyl alcohol-d10	230813	237588	239110	234793	222755	229317	220884	230751	3	Yes
Fluorobenzene	1256794	1268629	1288793	1295555	1231017	1298555	1242368	1268816	2	Yes
Chlorobenzene-d5	960626	972262	977519	964347	926964	970322	934821	958123	2	Yes
1,4-Dichlorobenzene-d4	517298	509521	514202	499944	492114	506851	490975	504415	2	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

File ID:

Internal Standard Name	la22i01.d	la22i02.d	la22i03.d	la22i04.d	la22i05.d	la22i06.d	la22i07.d	Avg. RT
t-Butyl alcohol-d10	4.012	3.993	3.990	3.996	3.993	3.993	4.009	3.998
Fluorobenzene	7.510	7.504	7.504	7.507	7.507	7.507	7.510	7.507
Chlorobenzene-d5	11.041	11.041	11.041	11.041	11.041	11.041	11.041	11.041
1,4-Dichlorobenzene-d4	12.938	12.935	12.938	12.935	12.938	12.935	12.935	12.936

* indicates the retention time is greater than 30 seconds from the average RT.

Report generated on 04/22/2016 at 13:38.

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 ICV Date: 04/22/16 Time: 12:51

Lab File ID: la22v01.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
# Dichlorodifluoromethane	0.3711	0.3115	16.78	20	-16	#
# Chloromethane	0.3727	0.3338	17.91	20	-10	#
1,3-Butadiene	0.6111	0.5293	17.32	20	-13	
# Vinyl Chloride	0.3517	0.3217	18.29	20	-9	#
# Bromomethane	0.2280	0.2031	17.81	20	-11	#
# Chloroethane	0.1924	0.1731	17.99	20	-10	#
Dichlorofluoromethane	0.4495	0.4047	18.01	20	-10	
n-Pentane	0.4240	0.4263	20.11	20	1	
# Trichlorofluoromethane	0.3704	0.3612	19.50	20	-2	#
Ethyl ether	0.2627	0.2668	20.31	20	2	
Freon 123a	0.3072	0.2804	18.25	20	-9	
Acrolein	2.1388	2.0638	144.74	150	-4	
# 1,1-Dichloroethene	0.2189	0.2240	20.47	20	2	#
# Acetone	0.9574	1.3094	205.15	150	37	#<-
# Freon 113	0.2105	0.2190	20.81	20	4	#
2-Propanol	0.7342	0.7487	152.96	150	2	
Methyl Iodide	0.4065	0.4033	19.84	20	-1	
# Carbon Disulfide	0.7352	0.7026	19.11	20	-4	#
Allyl Chloride	0.4230	0.4568	21.60	20	8	
# Methyl Acetate	0.2949	0.2937	19.92	20	0	#
# Methylene Chloride	0.2700	0.2743	20.32	20	2	#
t-Butyl alcohol	1.1906	1.1915	200.15	200	0	
Acrylonitrile	0.1489	0.1442	96.88	100	-3	
# trans-1,2-Dichloroethene	0.2484	0.2708	21.80	20	9	#
# Methyl Tertiary Butyl Ether	0.8464	0.8425	19.91	20	0	#
n-Hexane	0.3840	0.4115	21.44	20	7	
# 1,1-Dichloroethane	0.4931	0.5078	20.59	20	3	#
di-Isopropyl ether	0.9470	0.9965	21.05	20	5	
2-Chloro-1,3-butadiene	0.3890	0.4414	22.69	20	13	
Ethyl t-butyl ether	0.8624	0.8747	20.28	20	1	
# cis-1,2-Dichloroethene	0.2798	0.2972	21.24	20	6	#
# 2-Butanone	0.1917	0.2181	170.71	150	14	#
2,2-Dichloropropane	0.3424	0.3561	20.80	20	4	
Propionitrile	1.5413	1.6254	158.18	150	5	
Methacrylonitrile	0.1477	0.1546	156.95	150	5	
Bromochloromethane	0.1427	0.1464	20.53	20	3	

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 ICV Date: 04/22/16 Time: 12:51

Lab File ID: la22v01.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	$\overline{RRF}$	RRF	ACTUAL CONC.	TRUE CONC.	% DRIFT	
Tetrahydrofuran	1.2892	1.3255	102.81	100	3	
# Chloroform	0.4481	0.4687	20.92	20	5	#
# 1,1,1-Trichloroethane	0.3981	0.4040	20.30	20	1	#
# Cyclohexane	0.4589	0.4841	21.10	20	5	#
1,1-Dichloropropene	0.3665	0.3654	19.93	20	0	
# Carbon Tetrachloride	0.2981	0.3125	20.97	20	5	#
Isobutyl Alcohol	0.4189	0.4211	502.62	500	1	
# Benzene	1.0743	1.1239	20.92	20	5	#
# 1,2-Dichloroethane	0.3974	0.4004	20.15	20	1	#
t-Amyl methyl ether	0.7989	0.8070	20.20	20	1	
n-Heptane	0.4255	0.4381	20.59	20	3	
n-Butanol	0.3265	0.3337	1022.09	1000	2	
# Trichloroethene	0.2715	0.2900	21.37	20	7	#
# Methylcyclohexane	0.4473	0.4906	21.94	20	10	#
# 1,2-Dichloropropane	0.2958	0.3121	21.10	20	6	#
Dibromomethane	0.1833	0.1840	20.07	20	0	
1,4-Dioxane	0.1106	0.1060	479.13	500	-4	
Methyl Methacrylate	0.2479	0.2459	19.84	20	-1	
# Bromodichloromethane	0.3346	0.3385	20.24	20	1	#
2-Nitropropane	0.0921	0.0858	18.63	20	-7	
2-Chloroethyl Vinyl Ether	0.2111	0.2174	20.60	20	3	
# cis-1,3-Dichloropropene	0.4292	0.4456	20.76	20	4	#
# 4-Methyl-2-pentanone	0.3933	0.4092	104.03	100	4	#
# Toluene	0.8897	0.9420	21.17	20	6	#
# trans-1,3-Dichloropropene	0.5155	0.5416	21.01	20	5	#
Ethyl Methacrylate	0.5711	0.6002	21.02	20	5	
# 1,1,2-Trichloroethane	0.3457	0.3536	20.46	20	2	#
# Tetrachloroethene	0.3766	0.3996	21.22	20	6	#
1,3-Dichloropropane	0.6122	0.6201	20.26	20	1	
# 2-Hexanone	0.3778	0.4137	109.50	100	10	#
# Dibromochloromethane	0.3395	0.3374	19.87	20	-1	#
# 1,2-Dibromoethane	0.3713	0.3836	20.66	20	3	#
1-Chlorohexane	0.4991	0.5187	20.78	20	4	
# Chlorobenzene	1.0069	1.0463	20.78	20	4	#
1,1,1,2-Tetrachloroethane	0.3332	0.3426	20.57	20	3	
# Ethylbenzene	1.7165	1.8147	21.14	20	6	#

Compounds with required minimum RRF.
Maximum % Drift = 30 %

INITIAL CALIBRATION VERIFICATION

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 ICV Date: 04/22/16 Time: 12:51

Lab File ID: la22v01.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	$\overline{RRF}$	RRF	CONC.	CONC.	DRIFT	
# m+p-Xylene	0.6590	0.7026	42.65	40	7	#
# o-Xylene	0.6482	0.6768	20.88	20	4	#
# Styrene	1.0918	1.1651	21.34	20	7	#
# Bromoform	0.2338	0.2201	18.83	20	-6	#
# Isopropylbenzene	1.6501	1.7896	21.69	20	8	#
Cyclohexanone	0.5100	0.4286	420.13	500	-16	
Bromobenzene	0.8593	0.8833	20.56	20	3	
# 1,1,2,2-Tetrachloroethane	1.0126	1.0072	19.89	20	-1	#
1,2,3-Trichloropropane	0.2925	0.2953	20.19	20	1	
trans-1,4-Dichloro-2-butene	0.1350	0.1304	84.95	100	-15	
n-Propylbenzene	3.8422	4.0837	21.26	20	6	
2-Chlorotoluene	0.7793	0.8185	21.01	20	5	
4-Chlorotoluene	0.8229	0.8474	20.60	20	3	
1,3,5-Trimethylbenzene	2.7215	2.9057	21.35	20	7	
tert-Butylbenzene	0.5633	0.5909	20.98	20	5	
Pentachloroethane	0.4650	0.4842	20.82	20	4	
1,2,4-Trimethylbenzene	2.8300	2.9549	20.88	20	4	
sec-Butylbenzene	3.4490	3.6765	21.32	20	7	
# 1,3-Dichlorobenzene	1.6166	1.6408	20.30	20	1	#
p-Isopropyltoluene	2.9997	3.1165	20.78	20	4	
# 1,4-Dichlorobenzene	1.6889	1.7215	20.39	20	2	#
1,2,3-Trimethylbenzene	2.9595	3.1291	21.15	20	6	
Benzyl Chloride	1.7568	1.7737	18.18	20	-9	
1,3-Diethylbenzene	1.8037	1.8905	20.96	20	5	
1,4-Diethylbenzene	1.8811	2.0058	21.33	20	7	
# 1,2-Dichlorobenzene	1.6025	1.6168	20.18	20	1	#
n-Butylbenzene	1.5350	1.5804	20.59	20	3	
1,2-Diethylbenzene	1.5385	1.6189	21.05	20	5	
# 1,2-Dibromo-3-chloropropane	0.1957	0.1875	19.15	20	-4	#
1,3,5-Trichlorobenzene	1.2753	1.2558	19.69	20	-2	
# 1,2,4-Trichlorobenzene	1.2637	1.2019	19.02	20	-5	#
Hexachlorobutadiene	0.5397	0.4853	17.99	20	-10	
Naphthalene	3.4044	3.2790	19.26	20	-4	
1,2,3-Trichlorobenzene	1.1911	1.1001	18.47	20	-8	
2-Methylnaphthalene	2.1225	1.6045	15.12	20	-24	

Average %Drift 5

Compounds with required minimum RRF.
Maximum % Drift = 30 %

Lancaster Laboratories
Continuing Calibration Internal Standard Check

Initial Calibration Standards:

/chem2/HP09685.i/16jun20a.b/au20i07.d
/chem2/HP09685.i/16jun20a.b/au20i06.d
/chem2/HP09685.i/16jun20a.b/au20i05.d
/chem2/HP09685.i/16jun20a.b/au20i04.d
/chem2/HP09685.i/16jun20a.b/au20i03.d
/chem2/HP09685.i/16jun20a.b/au20i02.d
/chem2/HP09685.i/16jun20a.b/au20i01.d

File /chem2/HP09685.i/16jun20a.b/au20i03.d is Mid Level Calibration Standard used for comparison.

Current Continuing Calibration Standard:

/chem2/HP09685.i/16jun28a.b/au28c01.d

RT Summary

Internal Standard Name	File ID: au28c01.d	ICAL RT	In Spec
t-Butyl alcohol-d10	3.964	3.958	Yes
Fluorobenzene	7.450	7.449	Yes
Chlorobenzene-d5	11.009	11.008	Yes
1,4-Dichlorobenzene-d4	12.919	12.919	Yes

A "No" indicates the retention time is greater than 30 seconds from the referenced ICAL standard.

Area Summary

Internal Standard Name	File ID: au28c01.d	ICAL Area	Low Limit	High Limit	In Spec
t-Butyl alcohol-d10	76906	117913	58956	235826	Yes
Fluorobenzene	834416	1094634	547317	2189268	Yes
Chlorobenzene-d5	643361	812973	406486	1625946	Yes
1,4-Dichlorobenzene-d4	353535	430819	215410	861638	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

Comments:

report generated on 06/28/2016 at 08:40

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/28/16 Time: 07:50

Lab File ID: au28c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# Dichlorodifluoromethane	0.3921	0.3096	39.48	50	-21	#<-
# Chloromethane	0.4074	0.3414	41.89	50	-16	#
# Vinyl Chloride	0.3696	0.3321	44.92	50	-10	#
# Bromomethane	0.2509	0.2409	48.01	50	-4	#
# Chloroethane	0.2042	0.1966	48.13	50	-4	#
# Trichlorofluoromethane	0.4270	0.4267	49.96	50	0	#
Ethanol	0.1798	0.1934	2688.46	2500	8	
Acrolein	2.6570	2.8309	532.71	500	7	
# 1,1-Dichloroethene	0.2194	0.2387	54.40	50	9	#
# 1,1-Dichloroethene(2)	0.1162	0.1346	57.88	50	16	#
# Acetone	1.2959	1.3851	106.88	100	7	#
# Freon 113	0.2257	0.2363	52.35	50	5	#
2-Propanol	0.9846	1.0414	264.41	250	6	
Methyl Iodide	0.4018	0.4239	52.74	50	5	
# Carbon Disulfide	0.7191	0.7966	55.39	50	11	#
# Methyl Acetate	0.1913	0.1959	51.21	50	2	#
Allyl Chloride	0.3979	0.4620	58.04	50	16	
# Methylene Chloride	0.2777	0.2822	50.81	50	2	#
t-Butyl alcohol	1.4610	1.4386	246.18	250	-2	
Acrylonitrile	0.0920	0.1000	54.36	50	9	
# Methyl Tertiary Butyl Ether	0.7119	0.7259	50.99	50	2	#
# trans-1,2-Dichloroethene	0.2407	0.2684	55.75	50	11	#
n-Hexane	0.3710	0.3670	49.46	50	-1	
# 1,1-Dichloroethane	0.4557	0.5059	55.50	50	11	#
di-Isopropyl ether	0.8458	0.9431	55.75	50	11	
2-Chloro-1,3-butadiene	0.3901	0.4361	55.89	50	12	
Ethyl t-butyl ether	0.7219	0.7680	53.19	50	6	
# 2-Butanone	5.7599	6.5127	113.07	100	13	#
# cis-1,2-Dichloroethene	0.2729	0.3004	55.04	50	10	#
2,2-Dichloropropane	0.3234	0.3741	57.83	50	16	
Propionitrile	1.8044	2.0710	286.94	250	15	
Methacrylonitrile	0.1069	0.1096	128.10	125	2	
Bromochloromethane	0.1330	0.1457	54.77	50	10	
Tetrahydrofuran	1.5605	1.7359	111.24	100	11	
# Chloroform	0.4347	0.4900	56.35	50	13	#
# 1,1,1-Trichloroethane	0.3941	0.4050	51.38	50	3	#

Compounds with required minimum RRF.

All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/28/16 Time: 07:50

Lab File ID: au28c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# Cyclohexane	0.4532	0.4635	51.13	50	2	#
# Cyclohexane(2)	0.3756	0.3774	50.23	50	0	#
# Cyclohexane(3)	0.1365	0.1370	50.18	50	0	#
1,1-Dichloropropene	0.3473	0.3982	57.34	50	15	
# Carbon Tetrachloride	0.2843	0.3380	59.45	50	19	#
Isobutyl Alcohol	0.4952	0.5777	729.12	625	17	
# Benzene	1.0828	1.1484	53.03	50	6	#
# 1,2-Dichloroethane	0.3479	0.3751	53.91	50	8	#
# 1,2-Dichloroethane(2)	0.0389	0.0327	42.11	50	-16	#<-
t-Amyl methyl ether	0.6653	0.6991	52.54	50	5	
n-Heptane	0.4035	0.3903	48.37	50	-3	
n-Butanol	0.4194	0.4310	1284.77	1250	3	
# Trichloroethene	0.2563	0.2889	56.36	50	13	#
# Methylcyclohexane	0.4765	0.5364	56.28	50	13	#
# 1,2-Dichloropropane	0.2781	0.3077	55.31	50	11	#
Methyl Methacrylate	0.1773	0.1867	52.67	50	5	
1,4-Dioxane	0.1526	0.1731	708.97	625	13	
Dibromomethane	0.1557	0.1684	54.07	50	8	
# Bromodichloromethane	0.2977	0.3476	58.39	50	17	#
2-Nitropropane	2.5666	3.4777	120.76	100	21	<-
# cis-1,3-Dichloropropene	0.4014	0.4526	56.37	50	13	#
# 4-Methyl-2-pentanone	0.2455	0.2613	106.45	100	6	#
# Toluene	0.8926	0.9541	53.45	50	7	#
# trans-1,3-Dichloropropene	0.4745	0.5244	55.25	50	11	#
Ethyl Methacrylate	0.4488	0.4637	51.65	50	3	
# 1,1,2-Trichloroethane	0.3122	0.3201	51.27	50	3	#
# Tetrachloroethene	0.3588	0.3910	54.49	50	9	#
1,3-Dichloropropane	0.5498	0.5685	51.70	50	3	
# 2-Hexanone	0.2347	0.2404	102.44	100	2	#
# Dibromochloromethane	0.3077	0.3435	55.81	50	12	#
# 1,2-Dibromoethane	0.3077	0.3164	51.41	50	3	#
# Chlorobenzene	1.0245	1.1020	53.78	50	8	#
1,1,1,2-Tetrachloroethane	0.3179	0.3577	56.25	50	12	
# Ethylbenzene	1.6729	1.8707	55.91	50	12	#
# m+p-Xylene	0.6600	0.7403	112.16	100	12	#
# o-Xylene	0.6465	0.7164	55.40	50	11	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/28/16 Time: 07:50

Lab File ID: au28c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Styrene	1.0429	1.1997	57.52	50	15	#
#	Bromoform	0.1925	0.2125	48.46	50	-3	#
#	Isopropylbenzene	1.6699	1.7843	53.43	50	7	#
	Cyclohexanone	0.7254	0.5972	514.46	625	-18	
#	1,1,2,2-Tetrachloroethane	0.8176	0.8052	49.24	50	-2	#
	Bromobenzene	0.8348	0.8564	51.29	50	3	
	trans-1,4-Dichloro-2-butene	0.2291	0.2299	125.40	125	0	
	1,2,3-Trichloropropane	0.2358	0.2283	48.40	50	-3	
	n-Propylbenzene	3.8484	3.9604	51.46	50	3	
	2-Chlorotoluene	0.7680	0.8051	52.41	50	5	
	1,3,5-Trimethylbenzene	2.8163	2.8919	51.34	50	3	
	4-Chlorotoluene	0.8067	0.8450	52.38	50	5	
	tert-Butylbenzene	0.5920	0.5813	49.09	50	-2	
	Pentachloroethane	0.4548	0.5071	55.75	50	11	
	1,2,4-Trimethylbenzene	2.9367	3.0443	51.83	50	4	
	sec-Butylbenzene	3.5355	3.5645	50.41	50	1	
#	1,3-Dichlorobenzene	1.5968	1.6765	52.49	50	5	#
	p-Isopropyltoluene	3.1260	3.1944	51.09	50	2	
#	1,4-Dichlorobenzene	1.6526	1.7317	52.39	50	5	#
	1,2,3-Trimethylbenzene	3.0765	3.3490	54.43	50	9	
	Benzyl Chloride	0.2747	0.2983	44.33	50	-11	
	1,3-Diethylbenzene	1.8591	2.0823	56.00	50	12	
	1,4-Diethylbenzene	1.9128	2.1475	56.13	50	12	
	n-Butylbenzene	1.5814	1.6002	50.59	50	1	
#	1,2-Dichlorobenzene	1.5426	1.6021	51.93	50	4	#
	1,2-Diethylbenzene	1.5882	1.7500	55.09	50	10	
#	1,2-Dibromo-3-chloropropane	0.1426	0.1435	50.30	50	1	#
	1,3,5-Trichlorobenzene	1.1924	1.2411	52.04	50	4	
#	1,2,4-Trichlorobenzene	1.0571	1.1032	52.18	50	4	#
	Hexachlorobutadiene	0.5403	0.5216	48.27	50	-3	
	Naphthalene	2.3975	2.5687	53.57	50	7	
	1,2,3-Trichlorobenzene	0.9725	1.0259	52.75	50	5	
	2-Methylnaphthalene	0.9456	1.1048	40.01	50	-20	
	Dibromofluoromethane	0.2289	0.2357	51.48	50	3	
	Dibromofluoromethane(2)	0.2354	0.2430	51.60	50	3	

Compounds with required minimum RRF.

All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/28/16 Time: 07:50

Lab File ID: au28c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2-Dichloroethane-d4	0.0545	0.0553	50.73	50	1
1,2-Dichloroethane-d4(2)	0.2631	0.2803	53.27	50	7
1,2-Dichloroethane-d4(3)	0.0345	0.0357	51.67	50	3
Toluene-d8	1.3647	1.3458	49.31	50	-1
Toluene-d8(2)	0.8772	0.8629	49.18	50	-2
4-Bromofluorobenzene	0.4851	0.4971	51.24	50	2
4-Bromofluorobenzene(2)	0.3986	0.4102	51.45	50	3

Average %Drift 7

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

Lancaster Laboratories

Continuing Calibration Internal Standard Check

Initial Calibration Standards:

/chem2/HP09685.i/16jun20a.b/au20i07.d
/chem2/HP09685.i/16jun20a.b/au20i06.d
/chem2/HP09685.i/16jun20a.b/au20i05.d
/chem2/HP09685.i/16jun20a.b/au20i04.d
/chem2/HP09685.i/16jun20a.b/au20i03.d
/chem2/HP09685.i/16jun20a.b/au20i02.d
/chem2/HP09685.i/16jun20a.b/au20i01.d

File /chem2/HP09685.i/16jun20a.b/au20i03.d is Mid Level Calibration Standard used for comparison.

Current Continuing Calibration Standard:

/chem2/HP09685.i/16jun28a.b/au28c01.d

RT Summary

Internal Standard Name	File ID: au28c01.d	ICAL RT	In Spec
t-Butyl alcohol-d10	3.964	3.958	Yes
Fluorobenzene	7.450	7.449	Yes
Chlorobenzene-d5	11.009	11.008	Yes
1,4-Dichlorobenzene-d4	12.919	12.919	Yes

A "No" indicates the retention time is greater than 30 seconds from the referenced ICAL standard.

Area Summary

Internal Standard Name	File ID: au28c01.d	ICAL Area	Low Limit	High Limit	In Spec
t-Butyl alcohol-d10	76906	117913	58956	235826	Yes
Fluorobenzene	834416	1094634	547317	2189268	Yes
Chlorobenzene-d5	643361	812973	406486	1625946	Yes
1,4-Dichlorobenzene-d4	353535	430819	215410	861638	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

Comments: _____

report generated on 06/28/2016 at 08:40

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/28/16 Time: 07:50

Lab File ID: au28c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Dichlorodifluoromethane	0.3921	0.3096	39.48	50	-21	#<-
#	Chloromethane	0.4074	0.3414	41.89	50	-16	#
#	Vinyl Chloride	0.3696	0.3321	44.92	50	-10	#
#	Bromomethane	0.2509	0.2409	48.01	50	-4	#
#	Chloroethane	0.2042	0.1966	48.13	50	-4	#
#	Trichlorofluoromethane	0.4270	0.4267	49.96	50	0	#
	Ethanol	0.1798	0.1934	2688.46	2500	8	
	Acrolein	2.6570	2.8309	532.71	500	7	
#	1,1-Dichloroethene	0.2194	0.2387	54.40	50	9	#
#	1,1-Dichloroethene(2)	0.1162	0.1346	57.88	50	16	#
#	Acetone	1.2959	1.3851	106.88	100	7	#
#	Freon 113	0.2257	0.2363	52.35	50	5	#
	2-Propanol	0.9846	1.0414	264.41	250	6	
	Methyl Iodide	0.4018	0.4239	52.74	50	5	
#	Carbon Disulfide	0.7191	0.7966	55.39	50	11	#
#	Methyl Acetate	0.1913	0.1959	51.21	50	2	#
	Allyl Chloride	0.3979	0.4620	58.04	50	16	
#	Methylene Chloride	0.2777	0.2822	50.81	50	2	#
	t-Butyl alcohol	1.4610	1.4386	246.18	250	-2	
	Acrylonitrile	0.0920	0.1000	54.36	50	9	
#	Methyl Tertiary Butyl Ether	0.7119	0.7259	50.99	50	2	#
#	trans-1,2-Dichloroethene	0.2407	0.2684	55.75	50	11	#
	n-Hexane	0.3710	0.3670	49.46	50	-1	
#	1,1-Dichloroethane	0.4557	0.5059	55.50	50	11	#
	di-Isopropyl ether	0.8458	0.9431	55.75	50	11	
	2-Chloro-1,3-butadiene	0.3901	0.4361	55.89	50	12	
	Ethyl t-butyl ether	0.7219	0.7680	53.19	50	6	
#	2-Butanone	5.7599	6.5127	113.07	100	13	#
#	cis-1,2-Dichloroethene	0.2729	0.3004	55.04	50	10	#
	2,2-Dichloropropane	0.3234	0.3741	57.83	50	16	
	Propionitrile	1.8044	2.0710	286.94	250	15	
	Methacrylonitrile	0.1069	0.1096	128.10	125	2	
	Bromochloromethane	0.1330	0.1457	54.77	50	10	
	Tetrahydrofuran	1.5605	1.7359	111.24	100	11	
#	Chloroform	0.4347	0.4900	56.35	50	13	#
#	1,1,1-Trichloroethane	0.3941	0.4050	51.38	50	3	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/28/16 Time: 07:50

Lab File ID: au28c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# Cyclohexane	0.4532	0.4635	51.13	50	2	#
# Cyclohexane(2)	0.3756	0.3774	50.23	50	0	#
# Cyclohexane(3)	0.1365	0.1370	50.18	50	0	#
1,1-Dichloropropene	0.3473	0.3982	57.34	50	15	
# Carbon Tetrachloride	0.2843	0.3380	59.45	50	19	#
Isobutyl Alcohol	0.4952	0.5777	729.12	625	17	
# Benzene	1.0828	1.1484	53.03	50	6	#
# 1,2-Dichloroethane	0.3479	0.3751	53.91	50	8	#
# 1,2-Dichloroethane(2)	0.0389	0.0327	42.11	50	-16	#<-
t-Amyl methyl ether	0.6653	0.6991	52.54	50	5	
n-Heptane	0.4035	0.3903	48.37	50	-3	
n-Butanol	0.4194	0.4310	1284.77	1250	3	
# Trichloroethene	0.2563	0.2889	56.36	50	13	#
# Methylcyclohexane	0.4765	0.5364	56.28	50	13	#
# 1,2-Dichloropropane	0.2781	0.3077	55.31	50	11	#
Methyl Methacrylate	0.1773	0.1867	52.67	50	5	
1,4-Dioxane	0.1526	0.1731	708.97	625	13	
Dibromomethane	0.1557	0.1684	54.07	50	8	
# Bromodichloromethane	0.2977	0.3476	58.39	50	17	#
2-Nitropropane	2.5666	3.4777	120.76	100	21	<-
# cis-1,3-Dichloropropene	0.4014	0.4526	56.37	50	13	#
# 4-Methyl-2-pentanone	0.2455	0.2613	106.45	100	6	#
# Toluene	0.8926	0.9541	53.45	50	7	#
# trans-1,3-Dichloropropene	0.4745	0.5244	55.25	50	11	#
Ethyl Methacrylate	0.4488	0.4637	51.65	50	3	
# 1,1,2-Trichloroethane	0.3122	0.3201	51.27	50	3	#
# Tetrachloroethene	0.3588	0.3910	54.49	50	9	#
1,3-Dichloropropane	0.5498	0.5685	51.70	50	3	
# 2-Hexanone	0.2347	0.2404	102.44	100	2	#
# Dibromochloromethane	0.3077	0.3435	55.81	50	12	#
# 1,2-Dibromoethane	0.3077	0.3164	51.41	50	3	#
# Chlorobenzene	1.0245	1.1020	53.78	50	8	#
1,1,1,2-Tetrachloroethane	0.3179	0.3577	56.25	50	12	
# Ethylbenzene	1.6729	1.8707	55.91	50	12	#
# m+p-Xylene	0.6600	0.7403	112.16	100	12	#
# o-Xylene	0.6465	0.7164	55.40	50	11	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/28/16 Time: 07:50

Lab File ID: au28c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Styrene	1.0429	1.1997	57.52	50	15	#
#	Bromoform	0.1925	0.2125	48.46	50	-3	#
#	Isopropylbenzene	1.6699	1.7843	53.43	50	7	#
	Cyclohexanone	0.7254	0.5972	514.46	625	-18	
#	1,1,2,2-Tetrachloroethane	0.8176	0.8052	49.24	50	-2	#
	Bromobenzene	0.8348	0.8564	51.29	50	3	
	trans-1,4-Dichloro-2-butene	0.2291	0.2299	125.40	125	0	
	1,2,3-Trichloropropane	0.2358	0.2283	48.40	50	-3	
	n-Propylbenzene	3.8484	3.9604	51.46	50	3	
	2-Chlorotoluene	0.7680	0.8051	52.41	50	5	
	1,3,5-Trimethylbenzene	2.8163	2.8919	51.34	50	3	
	4-Chlorotoluene	0.8067	0.8450	52.38	50	5	
	tert-Butylbenzene	0.5920	0.5813	49.09	50	-2	
	Pentachloroethane	0.4548	0.5071	55.75	50	11	
	1,2,4-Trimethylbenzene	2.9367	3.0443	51.83	50	4	
	sec-Butylbenzene	3.5355	3.5645	50.41	50	1	
#	1,3-Dichlorobenzene	1.5968	1.6765	52.49	50	5	#
	p-Isopropyltoluene	3.1260	3.1944	51.09	50	2	
#	1,4-Dichlorobenzene	1.6526	1.7317	52.39	50	5	#
	1,2,3-Trimethylbenzene	3.0765	3.3490	54.43	50	9	
	Benzyl Chloride	0.2747	0.2983	44.33	50	-11	
	1,3-Diethylbenzene	1.8591	2.0823	56.00	50	12	
	1,4-Diethylbenzene	1.9128	2.1475	56.13	50	12	
	n-Butylbenzene	1.5814	1.6002	50.59	50	1	
#	1,2-Dichlorobenzene	1.5426	1.6021	51.93	50	4	#
	1,2-Diethylbenzene	1.5882	1.7500	55.09	50	10	
#	1,2-Dibromo-3-chloropropane	0.1426	0.1435	50.30	50	1	#
	1,3,5-Trichlorobenzene	1.1924	1.2411	52.04	50	4	
#	1,2,4-Trichlorobenzene	1.0571	1.1032	52.18	50	4	#
	Hexachlorobutadiene	0.5403	0.5216	48.27	50	-3	
	Naphthalene	2.3975	2.5687	53.57	50	7	
	1,2,3-Trichlorobenzene	0.9725	1.0259	52.75	50	5	
	2-Methylnaphthalene	0.9456	1.1048	40.01	50	-20	
	Dibromofluoromethane	0.2289	0.2357	51.48	50	3	
	Dibromofluoromethane(2)	0.2354	0.2430	51.60	50	3	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09685 Calibration Date: 06/28/16 Time: 07:50

Lab File ID: au28c01.d Init. Calib. Date(s): 06/20/16 06/20/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2-Dichloroethane-d4	0.0545	0.0553	50.73	50	1
1,2-Dichloroethane-d4(2)	0.2631	0.2803	53.27	50	7
1,2-Dichloroethane-d4(3)	0.0345	0.0357	51.67	50	3
Toluene-d8	1.3647	1.3458	49.31	50	-1
Toluene-d8(2)	0.8772	0.8629	49.18	50	-2
4-Bromofluorobenzene	0.4851	0.4971	51.24	50	2
4-Bromofluorobenzene(2)	0.3986	0.4102	51.45	50	3

Average %Drift 7

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

Lancaster Laboratories
Continuing Calibration Internal Standard Check

Initial Calibration Standards:

/chem2/HP09953.i/16feb10b.b/bf10i07.d
/chem2/HP09953.i/16feb10b.b/bf10i06.d
/chem2/HP09953.i/16feb10b.b/bf10i05.d
/chem2/HP09953.i/16feb10b.b/bf10i04.d
/chem2/HP09953.i/16feb10b.b/bf10i03.d
/chem2/HP09953.i/16feb10b.b/bf10i02.d
/chem2/HP09953.i/16feb10b.b/bf10i01.d

File /chem2/HP09953.i/16feb10b.b/bf10i03.d is Mid Level Calibration Standard used for comparison.

Current Continuing Calibration Standard:

/chem2/HP09953.i/16jun29a.b/bu29c01.d

RT Summary

File ID:

Internal Standard Name	bu29c01.d	ICAL RT	In Spec
t-Butyl alcohol-d10	1.960	1.942	Yes
Fluorobenzene	3.986	3.980	Yes
Chlorobenzene-d5	7.180	7.180	Yes
1,4-Dichlorobenzene-d4	9.255	9.255	Yes

A "No" indicates the retention time is greater than 30 seconds from the referenced ICAL standard.

Area Summary

File ID:

Internal Standard Name	bu29c01.d	ICAL Area	Low Limit	High Limit	In Spec
t-Butyl alcohol-d10	109205	143440	71720	286880	Yes
Fluorobenzene	1013017	1110917	555458	2221834	Yes
Chlorobenzene-d5	765020	845405	422702	1690810	Yes
1,4-Dichlorobenzene-d4	452718	476672	238336	953344	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

Comments:

report generated on 07/01/2016 at 08:30

7A

VOLATILE CONTINUING CALIBRATION CHECK

15 Failed

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 Calibration Date: 06/29/16 Time: 08:12

Lab File ID: bu29c01.d Init. Calib. Date(s): 02/10/16 02/10/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# Dichlorodifluoromethane	0.5115	0.4356	42.58	50	-15	#
# Chloromethane	0.5270	0.4309	40.88	50	-18	#
# Vinyl Chloride	0.4312	0.3581	41.52	50	-17	#
# Bromomethane	0.3065	0.2567	41.88	50	-16	#
# Chloroethane	0.2431	0.2042	42.00	50	-16	#
# Trichlorofluoromethane	0.5934	0.4825	40.65	50	-19	#
Ethanol	0.1252	0.1314	2623.27	2500	5	
Acrolein	2.3253	2.2968	493.87	500	-1	
# 1,1-Dichloroethene	0.2935	0.2301	39.19	50	-22	#<-
# Acetone	1.0334	1.0545	102.04	100	2	#
# Freon 113	0.3024	0.2415	39.93	50	-20	#
2-Propanol	1.1114	1.0078	226.70	250	-9	
Methyl Iodide	0.5880	0.5120	43.53	50	-13	
# Carbon Disulfide	0.9998	0.7570	37.86	50	-24	#<-
# Methyl Acetate	0.2532	0.1852	36.57	50	-27	#<-
Allyl Chloride	0.5378	0.4325	40.21	50	-20	
# Methylene Chloride	0.3299	0.2689	40.75	50	-19	#
t-Butyl alcohol	1.3678	1.2560	229.57	250	-8	
Acrylonitrile	0.1189	0.0930	39.11	50	-22	<-
# Methyl Tertiary Butyl Ether	1.0126	0.7992	39.46	50	-21	#<-
# trans-1,2-Dichloroethene	0.3180	0.2594	40.78	50	-18	#
n-Hexane	0.4502	0.3771	41.88	50	-16	
# 1,1-Dichloroethane	0.6182	0.5436	43.96	50	-12	#
di-Isopropyl ether	1.1330	1.0362	45.73	50	-9	
2-Chloro-1,3-butadiene	0.5504	0.5080	46.15	50	-8	
Ethyl t-butyl ether	1.1356	0.9568	42.13	50	-16	
# 2-Butanone	5.8458	6.2251	106.49	100	6	#
# cis-1,2-Dichloroethene	0.3458	0.3153	45.60	50	-9	#
2,2-Dichloropropane	0.5613	0.4728	42.11	50	-16	
Propionitrile	1.5423	1.7223	279.18	250	12	
Methacrylonitrile	0.1128	0.1027	113.82	125	-9	
Bromochloromethane	0.1644	0.1592	48.40	50	-3	
Tetrahydrofuran	1.4138	1.4321	101.29	100	1	
# Chloroform	0.6033	0.5468	45.32	50	-9	#
# 1,1,1-Trichloroethane	0.6154	0.5137	41.74	50	-17	#
# Cyclohexane	0.5641	0.4660	41.30	50	-17	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 Calibration Date: 06/29/16 Time: 08:12

Lab File ID: bu29c01.d Init. Calib. Date(s): 02/10/16 02/10/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Cyclohexane(2)	0.4816	0.3838	39.84	50	-20	#
#	Cyclohexane(3)	0.1672	0.1390	41.56	50	-17	#
	1,1-Dichloropropene	0.4621	0.4077	44.12	50	-12	
#	Carbon Tetrachloride	0.4673	0.4213	45.08	50	-10	#
	Isobutyl Alcohol	0.4550	0.4724	648.94	625	4	
#	Benzene	1.2947	1.1113	42.92	50	-14	#
#	1,2-Dichloroethane	0.5299	0.4608	43.47	50	-13	#
#	1,2-Dichloroethane(2)	0.0344	0.0328	47.62	50	-5	#<-
	t-Amyl methyl ether	0.9612	0.8192	42.61	50	-15	
	n-Heptane	0.5510	0.4089	37.11	50	-26	<-
	n-Butanol	0.3238	0.3259	1258.35	1250	1	
#	Trichloroethene	0.3435	0.2991	43.54	50	-13	#
#	Methylcyclohexane	0.5394	0.4841	44.87	50	-10	#
#	1,2-Dichloropropane	0.3275	0.2981	45.51	50	-9	#
	Methyl Methacrylate	0.2048	0.1753	42.79	50	-14	
	1,4-Dioxane	0.1247	0.1396	699.68	625	12	
	Dibromomethane	0.2009	0.1803	44.88	50	-10	
#	Bromodichloromethane	0.4498	0.3889	43.23	50	-14	#
	2-Nitropropane	4.0203	3.7289	92.75	100	-7	
	2-Chloroethyl Vinyl Ether	0.1891	0.1429	37.78	50	-24	<-
#	cis-1,3-Dichloropropene	0.5177	0.4760	45.97	50	-8	#
#	4-Methyl-2-pentanone	0.3178	0.2707	85.16	100	-15	#
#	Toluene	1.0473	0.9196	43.91	50	-12	#
#	trans-1,3-Dichloropropene	0.6234	0.5741	46.05	50	-8	#
	Ethyl Methacrylate	0.5213	0.4397	42.17	50	-16	
#	1,1,2-Trichloroethane	0.3433	0.3173	46.23	50	-8	#
#	Tetrachloroethene	0.4814	0.4512	46.86	50	-6	#
	1,3-Dichloropropane	0.6088	0.5551	45.58	50	-9	
#	2-Hexanone	0.2923	0.2409	82.41	100	-18	#
#	Dibromochloromethane	0.4220	0.4099	48.57	50	-3	#
#	1,2-Dibromoethane	0.3635	0.3380	46.49	50	-7	#
	1-Chlorohexane	0.5575	0.4609	41.33	50	-17	
#	Chlorobenzene	1.1787	1.0655	45.20	50	-10	#
	1,1,1,2-Tetrachloroethane	0.4235	0.4071	48.06	50	-4	
#	Ethylbenzene	2.0694	1.8068	43.66	50	-13	#
#	m+p-Xylene	0.7960	0.7028	88.29	100	-12	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 Calibration Date: 06/29/16 Time: 08:12

Lab File ID: bu29c01.d Init. Calib. Date(s): 02/10/16 02/10/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# o-Xylene	0.7998	0.7015	43.86	50	-12	#
# Styrene	1.2921	1.1713	45.33	50	-9	#
# Bromoform	0.2845	0.2772	48.71	50	-3	#
# Isopropylbenzene	2.0861	1.7852	42.79	50	-14	#
Cyclohexanone	0.4307	0.6328	918.31	625	47	<-
# 1,1,2,2-Tetrachloroethane	0.8342	0.7214	43.24	50	-14	#
Bromobenzene	0.9633	0.8640	44.85	50	-10	
trans-1,4-Dichloro-2-butene	0.2995	0.2504	104.49	125	-16	
1,2,3-Trichloropropane	0.2452	0.2151	43.86	50	-12	
n-Propylbenzene	4.2894	3.5877	41.82	50	-16	
2-Chlorotoluene	0.8876	0.7482	42.14	50	-16	
1,3,5-Trimethylbenzene	3.2183	2.6846	41.71	50	-17	
4-Chlorotoluene	0.9166	0.7844	42.79	50	-14	
tert-Butylbenzene	0.7169	0.5953	41.52	50	-17	
Pentachloroethane	0.5916	0.5633	47.61	50	-5	
1,2,4-Trimethylbenzene	3.2980	2.7489	41.67	50	-17	
sec-Butylbenzene	4.0751	3.2556	39.94	50	-20	
# 1,3-Dichlorobenzene	1.8584	1.6015	43.09	50	-14	#
p-Isopropyltoluene	3.6177	2.9536	40.82	50	-18	
# 1,4-Dichlorobenzene	1.9166	1.6376	42.72	50	-15	#
1,2,3-Trimethylbenzene	3.4212	2.8775	42.05	50	-16	
Benzyl Chloride	0.3424	0.3036	44.33	50	-11	
1,3-Diethylbenzene	2.1682	1.8354	42.33	50	-15	
1,4-Diethylbenzene	2.2857	1.9136	41.86	50	-16	
n-Butylbenzene	1.8639	1.4360	38.52	50	-23	<-
# 1,2-Dichlorobenzene	1.8130	1.5730	43.38	50	-13	#
1,2-Diethylbenzene	1.8401	1.5416	41.89	50	-16	
# 1,2-Dibromo-3-chloropropane	0.1886	0.1416	37.56	50	-25	#<-
1,3,5-Trichlorobenzene	1.6034	1.2871	40.14	50	-20	
# 1,2,4-Trichlorobenzene	1.5120	1.1469	37.93	50	-24	#<-
Hexachlorobutadiene	0.8673	0.5898	34.00	50	-32	<-
Naphthalene	3.0925	2.3500	37.99	50	-24	<-
1,2,3-Trichlorobenzene	1.3436	1.0579	39.37	50	-21	<-
2-Methylnaphthalene	1.7698	1.1995	33.89	50	-32	<-
Dibromofluoromethane	0.2564	0.2680	52.27	50	5	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09953 Calibration Date: 06/29/16 Time: 08:12

Lab File ID: bu29c01.d Init. Calib. Date(s): 02/10/16 02/10/16

Matrix: (soil/water) SOIL Level: (low/med) LOW GC Column: DB-624 ID: .18

COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT
Dibromofluoromethane(2)	0.2624	0.2722	51.86	50	4
1,2-Dichloroethane-d4	0.0524	0.0567	54.08	50	8
1,2-Dichloroethane-d4(2)	0.3331	0.3217	48.30	50	-3
1,2-Dichloroethane-d4(3)	0.0334	0.0348	52.00	50	4
Toluene-d8	1.3126	1.3545	51.60	50	3
Toluene-d8(2)	0.8421	0.8678	51.53	50	3
4-Bromofluorobenzene	0.5107	0.4981	48.76	50	-2
4-Bromofluorobenzene(2)	0.4475	0.4823	53.89	50	8

Average %Drift 13

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

Lancaster Laboratories
Continuing Calibration Internal Standard Check

Initial Calibration Standards:

/chem/HP07566.i/16apr05i.b/ra05i01.d
/chem/HP07566.i/16apr05i.b/ra05i02.d
/chem/HP07566.i/16apr05i.b/ra05i03.d
/chem/HP07566.i/16apr05i.b/ra05i04.d
/chem/HP07566.i/16apr05i.b/ra05i05.d
/chem/HP07566.i/16apr05i.b/ra05i06.d
/chem/HP07566.i/16apr05i.b/ra05i07.d

File /chem/HP07566.i/16apr05i.b/ra05i05.d is Mid Level Calibration Standard used for comparison.

Current Continuing Calibration Standard:

/chem/HP07566.i/16jun29a.b/ru29c01.d

RT Summary

Internal Standard Name	File ID: ru17c01.d	ICAL RT	In Spec
t-Butyl alcohol-d10	4.045	4.073	Yes
Fluorobenzene	7.543	7.542	Yes
Chlorobenzene-d5	11.072	11.078	Yes
1,4-Dichlorobenzene-d4	12.975	12.981	Yes

A "No" indicates the retention time is greater than 30 seconds from the referenced ICAL standard.

Area Summary

Internal Standard Name	File ID: ru17c01.d	ICAL Area	Low Limit	High Limit	In Spec
t-Butyl alcohol-d10	124939	137258	68629	274516	Yes
Fluorobenzene	984053	1006307	503154	2012614	Yes
Chlorobenzene-d5	648483	730351	365176	1460702	Yes
1,4-Dichlorobenzene-d4	281685	318867	159434	637734	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

Comments: _____

report generated on 06/17/2016 at 07:39

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 Calibration Date: 06/29/16 Time: 07:38

Lab File ID: ru29c01.d Init. Calib. Date(s): 04/05/16 04/05/16

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
# Dichlorodifluoromethane	0.2965	0.3171	53.47	50	7	#
# Chloromethane	0.4375	0.4226	48.29	50	-3	#
# Vinyl Chloride	0.3634	0.3464	47.66	50	-5	#
# Bromomethane	4.4799	4.4430	49.59	50	-1	#
# Chloroethane	3.3008	3.2762	49.63	50	-1	#
Dichlorofluoromethane	0.3459	0.3412	49.32	50	-1	
# Trichlorofluoromethane	0.3374	0.3245	48.08	50	-4	#
Ethanol	0.1434	0.1591	2774.21	2500	11	
Freon 123a	0.3047	0.3279	53.79	50	8	
Acrolein	2.8324	3.0382	536.33	500	7	
# 1,1-Dichloroethene	0.2281	0.2120	46.46	50	-7	#
# 1,1-Dichloroethene(2)	0.1312	0.1204	45.88	50	-8	#
# Acetone	1.1906	1.2618	105.98	100	6	#
# Freon 113	0.1600	0.1587	49.61	50	-1	#
2-Propanol	0.9309	0.8535	229.20	250	-8	
Methyl Iodide	0.4111	0.3831	46.60	50	-7	
# Carbon Disulfide	0.7309	0.6910	47.27	50	-5	#
# Methyl Acetate	0.2717	0.2755	50.69	50	1	#
Allyl Chloride	0.4774	0.5083	53.24	50	6	
# Methylene Chloride	0.2763	0.2636	47.70	50	-5	#
t-Butyl alcohol	1.2947	1.2076	233.18	250	-7	
Acrylonitrile	0.1423	0.1358	47.72	50	-5	
# Methyl Tertiary Butyl Ether	0.8267	0.8275	50.05	50	0	#
# trans-1,2-Dichloroethene	0.2494	0.2437	48.86	50	-2	#
n-Hexane	0.1777	0.1714	48.24	50	-4	
# 1,1-Dichloroethane	0.5135	0.5331	51.91	50	4	#
di-Isopropyl ether	1.0446	1.1092	53.09	50	6	
2-Chloro-1,3-butadiene	0.4039	0.4525	56.02	50	12	
Ethyl t-butyl ether	0.9388	0.9459	50.38	50	1	
# 2-Butanone	7.1122	6.6861	94.01	100	-6	#
# 2-Butanone(2)	1.3336	1.5156	113.64	100	14	#
# cis-1,2-Dichloroethene	0.2801	0.2891	51.61	50	3	#
2,2-Dichloropropane	0.3986	0.3744	46.97	50	-6	
Propionitrile	0.0478	0.0492	257.37	250	3	
Methacrylonitrile	0.1291	0.1331	128.84	125	3	
Bromochloromethane	0.1337	0.1398	52.28	50	5	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 Calibration Date: 06/29/16 Time: 07:38

Lab File ID: ru29c01.d Init. Calib. Date(s): 04/05/16 04/05/16

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

			ACTUAL	TRUE	%	
COMPOUND	RRF	RRF50	CONC.	CONC.	DRIFT	
Tetrahydrofuran	1.4782	1.4976	84.47	100	-16	
# Chloroform	0.4576	0.4727	51.65	50	3	#
# 1,1,1-Trichloroethane	0.3905	0.3689	47.23	50	-6	#
# Cyclohexane	0.3017	0.2880	47.73	50	-5	#
# Cyclohexane(2)	0.2181	0.2161	49.55	50	-1	#
# Cyclohexane(3)	0.0834	0.0835	50.07	50	0	#<-
1,1-Dichloropropene	0.3460	0.3434	49.63	50	-1	
# Carbon Tetrachloride	0.3117	0.3055	49.00	50	-2	#
Isobutyl Alcohol	0.4550	0.4239	582.25	625	-7	
# Benzene	1.0772	1.1010	51.10	50	2	#
# 1,2-Dichloroethane	0.4057	0.4173	51.42	50	3	#
# 1,2-Dichloroethane(2)	0.0310	0.0342	55.05	50	10	#<-
t-Amyl methyl ether	0.8298	0.8554	51.54	50	3	
n-Heptane	0.2129	0.1634	38.36	50	-23	<-
n-Butanol	0.3498	0.3196	1141.92	1250	-9	
# Trichloroethene	0.2578	0.2534	49.15	50	-2	#
# Methylcyclohexane	0.1968	0.2118	53.81	50	8	#
# 1,2-Dichloropropane	0.2964	0.3076	51.88	50	4	#
Methyl Methacrylate	0.2098	0.2163	51.54	50	3	
1,4-Dioxane	0.1220	0.1194	611.74	625	-2	
Dibromomethane	0.1708	0.1750	51.23	50	2	
# Bromodichloromethane	0.3386	0.3524	52.04	50	4	#
2-Nitropropane	3.8302	3.6093	74.36	100	-26	<-
2-Chloroethyl Vinyl Ether	0.1881	0.2110	56.09	50	12	
# cis-1,3-Dichloropropene	0.4479	0.4660	52.02	50	4	#
# 4-Methyl-2-pentanone	0.3859	0.3362	62.56	100	-37	#<-
# Toluene	0.8511	0.9521	55.93	50	12	#
# trans-1,3-Dichloropropene	0.5779	0.6649	57.53	50	15	#
Ethyl Methacrylate	0.5258	0.6075	57.77	50	16	
# 1,1,2-Trichloroethane	0.3306	0.3593	54.34	50	9	#
# Tetrachloroethene	0.2831	0.3018	53.30	50	7	#
1,3-Dichloropropane	0.6122	0.6787	55.43	50	11	
# 2-Hexanone	0.3792	0.3540	68.10	100	-32	#<-
# Dibromochloromethane	0.3434	0.4016	58.47	50	17	#
# 1,2-Dibromoethane	0.3465	0.3702	53.42	50	7	#
1-Chlorohexane	0.3267	0.3052	46.70	50	-7	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 Calibration Date: 06/29/16 Time: 07:38

Lab File ID: ru29c01.d Init. Calib. Date(s): 04/05/16 04/05/16

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Chlorobenzene	0.9263	0.9329	50.36	50	1	#
	1,1,1,2-Tetrachloroethane	0.3323	0.3510	52.81	50	6	
#	Ethylbenzene	1.4157	1.4928	52.72	50	5	#
#	m+p-Xylene	0.5366	0.5807	108.22	100	8	#
#	o-Xylene	0.5473	0.5886	53.77	50	8	#
#	Styrene	0.9749	1.0190	52.26	50	5	#
#	Bromoform	0.2123	0.2650	52.51	50	5	#
#	Isopropylbenzene	1.1574	1.2246	52.91	50	6	#
	Cyclohexanone	0.4524	0.3815	527.07	625	-16	
#	1,1,2,2-Tetrachloroethane	1.0202	1.0809	52.97	50	6	#
	Bromobenzene	0.8680	0.8704	50.14	50	0	
	trans-1,4-Dichloro-2-butene	0.3750	0.3725	124.19	125	-1	
	1,2,3-Trichloropropane	0.3192	0.3254	50.96	50	2	
	n-Propylbenzene	3.0429	3.1132	51.15	50	2	
	2-Chlorotoluene	0.6913	0.7042	50.93	50	2	
	1,3,5-Trimethylbenzene	2.2349	2.3296	52.12	50	4	
	4-Chlorotoluene	0.7338	0.7467	50.88	50	2	
	tert-Butylbenzene	0.4394	0.4528	51.52	50	3	
	Pentachloroethane	0.4800	0.4954	51.60	50	3	
	1,2,4-Trimethylbenzene	2.3602	2.4655	52.23	50	4	
	sec-Butylbenzene	2.3993	2.4781	51.64	50	3	
#	1,3-Dichlorobenzene	1.3134	1.3352	50.83	50	2	#
	p-Isopropyltoluene	2.1425	2.1870	51.04	50	2	
#	1,4-Dichlorobenzene	1.4021	1.4127	50.38	50	1	#
	1,2,3-Trimethylbenzene	2.5294	2.6179	51.75	50	3	
	Benzyl Chloride	0.4213	0.3842	45.59	50	-9	
	1,3-Diethylbenzene	1.2723	1.2872	50.58	50	1	
	1,4-Diethylbenzene	1.2727	1.3001	51.08	50	2	
	n-Butylbenzene	1.0385	1.0493	50.52	50	1	
#	1,2-Dichlorobenzene	1.3519	1.3665	50.54	50	1	#
	1,2-Diethylbenzene	1.0908	1.1233	51.49	50	3	
#	1,2-Dibromo-3-chloropropane	0.1999	0.1944	48.64	50	-3	#
	1,3,5-Trichlorobenzene	0.8054	0.8177	50.76	50	2	
#	1,2,4-Trichlorobenzene	0.7830	0.7770	49.61	50	-1	#
	Hexachlorobutadiene	0.3672	0.3645	49.64	50	-1	
	Naphthalene	2.5230	2.3357	46.29	50	-7	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP07566 Calibration Date: 06/29/16 Time: 07:38

Lab File ID: ru29c01.d Init. Calib. Date(s): 04/05/16 04/05/16

Matrix: (soil/water) SOIL Level: (low/med) MED GC Column: DB-624 ID: .25

COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
1,2,3-Trichlorobenzene	0.7498	0.7095	47.32	50	-5	
2-Methylnaphthalene	1.2162	0.8990	36.96	50	-26	<-
Dibromofluoromethane	0.2533	0.2279	44.99	50	-10	
Dibromofluoromethane(2)	0.2607	0.2344	44.95	50	-10	
1,2-Dichloroethane-d4	0.0654	0.0594	45.45	50	-9	
1,2-Dichloroethane-d4(2)	0.3433	0.3117	45.40	50	-9	
1,2-Dichloroethane-d4(3)	0.0382	0.0372	48.69	50	-3	
Toluene-d8	1.3264	1.2961	48.85	50	-2	
Toluene-d8(2)	0.8612	0.8333	48.38	50	-3	
4-Bromofluorobenzene	0.4588	0.4327	47.15	50	-6	
4-Bromofluorobenzene(2)	0.3567	0.3325	46.61	50	-7	

Average %Drift 6

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

Lancaster Laboratories
Continuing Calibration Internal Standard Check

Initial Calibration Standards:

/chem/HP09915.i/16apr22i.b/la22i07.d
/chem/HP09915.i/16apr22i.b/la22i06.d
/chem/HP09915.i/16apr22i.b/la22i05.d
/chem/HP09915.i/16apr22i.b/la22i04.d
/chem/HP09915.i/16apr22i.b/la22i03.d
/chem/HP09915.i/16apr22i.b/la22i02.d
/chem/HP09915.i/16apr22i.b/la22i01.d

File /chem/HP09915.i/16apr22i.b/la22i03.d is Mid Level Calibration Standard used for comparison.

Current Continuing Calibration Standard:

/chem/HP09915.i/16jul05b.b/ll05c05.d

RT Summary

Internal Standard Name	ll05c05.d File ID:	ICAL RT	In Spec
t-Butyl alcohol-d10	4.006	3.990	Yes
Fluorobenzene	7.514	7.504	Yes
Chlorobenzene-d5	11.041	11.041	Yes
1,4-Dichlorobenzene-d4	12.938	12.938	Yes

A "No" indicates the retention time is greater than 30 seconds from the referenced ICAL standard.

Area Summary

Internal Standard Name	ll05c05.d File ID:	ICAL Area	Low Limit	High Limit	In Spec
t-Butyl alcohol-d10	209480	239110	119555	478220	Yes
Fluorobenzene	1092308	1288793	644396	2577586	Yes
Chlorobenzene-d5	901632	977519	488760	1955038	Yes
1,4-Dichlorobenzene-d4	497736	514202	257101	1028404	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

Comments: _____

report generated on 07/05/2016 at 17:34

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date: 07/05/16 Time: 17:13

Lab File ID: l105c05.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Dichlorodifluoromethane	0.3711	0.3644	49.10	50	-2	#
#	Chloromethane	0.3727	0.3773	50.61	50	1	#
#	Vinyl Chloride	0.3517	0.3554	50.52	50	1	#
#	Bromomethane	0.2280	0.2393	52.46	50	5	#
#	Chloroethane	0.1924	0.2044	53.11	50	6	#
#	Trichlorofluoromethane	0.3704	0.4144	55.94	50	12	#
	Ethyl ether	0.2627	0.2701	51.39	50	3	
	Acrolein	2.1388	2.2149	517.79	500	4	
#	1,1-Dichloroethene	0.2189	0.2211	50.50	50	1	#
#	1,1-Dichloroethene(2)	0.1173	0.1192	50.82	50	2	#
#	Acetone	0.9574	0.9748	101.82	100	2	#
#	Freon 113	0.2105	0.2357	55.99	50	12	#
	2-Propanol	0.7342	0.7889	268.62	250	7	
	Methyl Iodide	0.4065	0.4329	53.24	50	6	
#	Carbon Disulfide	0.7352	0.7896	53.70	50	7	#
	Allyl Chloride	0.4230	0.4510	53.31	50	7	
#	Methyl Acetate	0.2949	0.2959	50.17	50	0	#
#	Methylene Chloride	0.2700	0.2716	50.30	50	1	#
	t-Butyl alcohol	1.1906	1.1645	244.50	250	-2	
	Acrylonitrile	0.1489	0.1554	52.18	50	4	
#	trans-1,2-Dichloroethene	0.2484	0.2580	51.92	50	4	#
#	Methyl Tertiary Butyl Ether	0.8464	0.8309	49.08	50	-2	#
	n-Hexane	0.3840	0.4167	54.26	50	9	
#	1,1-Dichloroethane	0.4931	0.4943	50.12	50	0	#
	di-Isopropyl ether	0.9470	0.9751	51.48	50	3	
	2-Chloro-1,3-butadiene	0.3890	0.4483	57.62	50	15	
	Ethyl t-butyl ether	0.8624	0.8579	49.74	50	-1	
#	cis-1,2-Dichloroethene	0.2798	0.2963	52.95	50	6	#
#	2-Butanone	0.1917	0.2034	106.13	100	6	#
	2,2-Dichloropropane	0.3424	0.3654	53.36	50	7	
	Propionitrile	1.5413	1.5906	257.99	250	3	
	Methacrylonitrile	0.1477	0.1573	133.10	125	6	
	Bromochloromethane	0.1427	0.1510	52.90	50	6	
	Tetrahydrofuran	1.2892	1.3474	104.51	100	5	
#	Chloroform	0.4481	0.4818	53.76	50	8	#
#	1,1,1-Trichloroethane	0.3981	0.4119	51.74	50	3	#

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date: 07/05/16 Time: 17:13

Lab File ID: l105c05.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Cyclohexane	0.4589	0.4948	53.91	50	8	#
#	Cyclohexane(2)	0.3646	0.3907	53.58	50	7	#
#	Cyclohexane(3)	0.1327	0.1426	53.76	50	8	#
	1,1-Dichloropropene	0.3665	0.3872	52.82	50	6	
#	Carbon Tetrachloride	0.2981	0.3314	55.59	50	11	#
	Isobutyl Alcohol	0.4189	0.4319	644.46	625	3	
#	Benzene	1.0743	1.1245	52.34	50	5	#
#	1,2-Dichloroethane	0.3974	0.4041	50.84	50	2	#
#	1,2-Dichloroethane(2)	0.0346	0.0353	50.99	50	2	#<-
	t-Amyl methyl ether	0.7989	0.8172	51.14	50	2	
	n-Heptane	0.4255	0.4756	55.89	50	12	
	n-Butanol	0.3265	0.3447	1319.55	1250	6	
#	Trichloroethene	0.2715	0.2831	52.14	50	4	#
#	Methylcyclohexane	0.4473	0.4883	54.58	50	9	#
#	Methylcyclohexane(2)	0.2009	0.2239	55.71	50	11	#
#	1,2-Dichloropropane	0.2958	0.3094	52.31	50	5	#
	Dibromomethane	0.1833	0.1917	52.29	50	5	
	1,4-Dioxane	0.1106	0.1209	683.14	625	9	
	Methyl Methacrylate	0.2479	0.2601	52.47	50	5	
#	Bromodichloromethane	0.3346	0.3571	53.36	50	7	#
	2-Nitropropane	0.0921	0.1045	113.43	100	13	
	2-Chloroethyl Vinyl Ether	0.2111	0.2349	55.65	50	11	
#	cis-1,3-Dichloropropene	0.4292	0.4755	55.39	50	11	#
#	4-Methyl-2-pentanone	0.3933	0.4399	111.84	100	12	#
#	Toluene	0.8897	0.8621	48.45	50	-3	#
#	trans-1,3-Dichloropropene	0.5155	0.5384	52.22	50	4	#
	Ethyl Methacrylate	0.5711	0.5711	50.00	50	0	
#	1,1,2-Trichloroethane	0.3457	0.3297	47.68	50	-5	#
#	Tetrachloroethene	0.3766	0.3735	49.59	50	-1	#
	1,3-Dichloropropane	0.6122	0.5905	48.23	50	-4	
#	2-Hexanone	0.3778	0.3889	102.95	100	3	#
#	Dibromochloromethane	0.3395	0.3551	52.30	50	5	#
#	1,2-Dibromoethane	0.3713	0.3628	48.85	50	-2	#
	1-Chlorohexane	0.4991	0.4811	48.19	50	-4	
#	Chlorobenzene	1.0069	0.9789	48.61	50	-3	#
	1,1,1,2-Tetrachloroethane	0.3332	0.3358	50.40	50	1	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date: 07/05/16 Time: 17:13

Lab File ID: l105c05.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

	COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT	
#	Ethylbenzene	1.7165	1.6938	49.34	50	-1	#
#	m+p-Xylene	0.6590	0.6573	99.75	100	0	#
#	o-Xylene	0.6482	0.6482	50.00	50	0	#
#	Styrene	1.0918	1.1191	51.25	50	2	#
#	Bromoform	0.2338	0.2639	56.43	50	13	#
#	Isopropylbenzene	1.6501	1.6590	50.27	50	1	#
	Cyclohexanone	0.5100	0.4585	561.80	625	-10	
	Bromobenzene	0.8593	0.8109	47.18	50	-6	
#	1,1,2,2-Tetrachloroethane	1.0126	0.9420	46.51	50	-7	#
	1,2,3-Trichloropropane	0.2925	0.2695	46.07	50	-8	
	trans-1,4-Dichloro-2-butene	0.1350	0.2019	140.46	125	12	
	n-Propylbenzene	3.8422	3.6643	47.68	50	-5	
	2-Chlorotoluene	0.7793	0.7353	47.18	50	-6	
	4-Chlorotoluene	0.8229	0.7774	47.24	50	-6	
	1,3,5-Trimethylbenzene	2.7215	2.5876	47.54	50	-5	
	tert-Butylbenzene	0.5633	0.5368	47.64	50	-5	
	Pentachloroethane	0.4650	0.4954	53.27	50	7	
	1,2,4-Trimethylbenzene	2.8300	2.6796	47.34	50	-5	
	sec-Butylbenzene	3.4490	3.3017	47.86	50	-4	
#	1,3-Dichlorobenzene	1.6166	1.5193	46.99	50	-6	#
	p-Isopropyltoluene	2.9997	2.8877	48.13	50	-4	
#	1,4-Dichlorobenzene	1.6889	1.5703	46.49	50	-7	#
	1,2,3-Trimethylbenzene	2.9595	2.8983	48.97	50	-2	
	Benzyl Chloride	1.7568	1.8369	43.82	50	-12	
	1,3-Diethylbenzene	1.8037	1.7717	49.11	50	-2	
	1,4-Diethylbenzene	1.8811	1.8362	48.81	50	-2	
#	1,2-Dichlorobenzene	1.6025	1.4764	46.06	50	-8	#
	n-Butylbenzene	1.5350	1.4647	47.71	50	-5	
	1,2-Diethylbenzene	1.5385	1.4902	48.43	50	-3	
#	1,2-Dibromo-3-chloropropane	0.1957	0.1892	48.34	50	-3	#
	1,3,5-Trichlorobenzene	1.2753	1.1659	45.71	50	-9	
#	1,2,4-Trichlorobenzene	1.2637	1.0971	43.41	50	-13	#
	Hexachlorobutadiene	0.5397	0.4726	43.79	50	-12	
	Naphthalene	3.4044	3.0531	44.84	50	-10	
	1,2,3-Trichlorobenzene	1.1911	1.0228	42.93	50	-14	
	2-Methylnaphthalene	2.1225	1.7641	41.56	50	-17	

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP09915 Calibration Date: 07/05/16 Time: 17:13

Lab File ID: l105c05.d Init. Calib. Date(s): 04/22/16 04/22/16

Matrix: (soil/water) WATER Level: (low/med) LOW GC Column: Rxi-624Sil .25

COMPOUND	RRF	RRF50	ACTUAL CONC.	TRUE CONC.	% DRIFT
Dibromofluoromethane	0.2375	0.2463	51.84	50	4
Dibromofluoromethane(2)	0.2432	0.2522	51.86	50	4
1,2-Dichloroethane-d4	0.0600	0.0618	51.51	50	3
1,2-Dichloroethane-d4(2)	0.3073	0.3181	51.74	50	3
1,2-Dichloroethane-d4(3)	0.0381	0.0394	51.79	50	4
Toluene-d8	1.3088	1.2410	47.41	50	-5
Toluene-d8(2)	0.8522	0.8164	47.90	50	-4
4-Bromofluorobenzene	0.4843	0.4925	50.85	50	2
4-Bromofluorobenzene(2)	0.4121	0.4275	51.87	50	4

Average %Drift 5

Compounds with required minimum RRF.
All compounds must meet a maximum % Drift of 20.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.: DWD88___

Lab File ID (Standard): au28c01.d Date Analyzed: 06/28/16

Instrument ID: HP09685 Time Analyzed: 07:50

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

	LAB SAMPLE ID	IS1(TBA) AREA	#	IS1(TBA) RT	#	IS2(FBZ) AREA	#	IS2(FBZ) RT	#	IS3(CBZ) AREA	#	IS3(CBZ) RT	#	IS4(DCB) AREA	#	IS4(DCB) RT	#
	12 HOUR STD	76906		3.964		834416		7.450		643361		11.008		353535		12.919	
	UPPER LIMIT	153812		4.464		1668832		7.950		1286722		11.508		707070		13.419	
	LOWER LIMIT	38453		3.464		417208		6.950		321680		10.508		176768		12.419	
01	VBLKA33	63741		3.958		807590		7.456		605326		11.014		299322		12.919	
02	VBLKA34	63741		3.958		807590		7.456		605326		11.014		299322		12.919	
03	LCSA33	81143		3.958		850705		7.450		648317		11.008		348858		12.919	
04	LCSA34	81143		3.958		850705		7.450		648317		11.008		348858		12.919	
05	LCDA33	78775		3.964		865260		7.456		652198		11.014		349636		12.918	
06	LCDA34	78775		3.964		865260		7.456		652198		11.014		349636		12.918	
07	MDL050 - MD	83361		3.976		849856		7.456		634599		11.015		314054		12.919	
08	8444110	52521		3.976		776429		7.456		458968		11.014		128713	*	12.919	
09	8444111MS	42023		3.964		810003		7.456		491248		11.014		147233	*	12.919	
10	8444112MSD	43125		3.952		805284		7.450		485243		11.015		152725	*	12.919	
11	8441953	65240		3.970		871095		7.456		642209		11.014		309186		12.919	
12	8441954	99628		3.964		870941		7.456		653460		11.014		319917		12.919	
13	8444066	24952	*	3.970		726164		7.456		372931		11.015		90161	*	12.919	
14	8444085	37406	*	3.964		754591		7.456		427289		11.015		112366	*	12.919	
15	8444086MS	33510	*	3.945		803366		7.456		473121		11.014		137081	*	12.919	
16	8444087MSD	48816		3.964		806671		7.456		477940		11.014		140150	*	12.919	
17	8444062	71860		3.970		850129		7.456		583869		11.014		219522		12.919	
18	8444070	40288		3.970		757629		7.456		421687		11.014		109852	*	12.919	

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD88___

Lab File ID (Standard): bu29c01.d Date Analyzed: 06/29/16

Instrument ID: HP09953 Time Analyzed: 08:12

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA)		IS2(FBZ)		IS3(CBZ)		IS4(DCB)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	109205	1.960	1013017	3.986	765020	7.180	452718	9.255
UPPER LIMIT	218410	2.460	2026034	4.486	1530040	7.680	905436	9.755
LOWER LIMIT	54602	1.460	506508	3.486	382510	6.680	226359	8.755
LAB SAMPLE ID								
01 VBLKB09	96543	1.948	915052	3.980	690391	7.180	376591	9.254
02 LCSB09	98863	1.954	926079	3.986	693863	7.180	403407	9.254
03 LCDB09	106164	1.954	966937	3.980	729230	7.180	436388	9.255
04 MDL050 - MD	102203	1.954	915100	3.986	692473	7.180	400709	9.255
05 8449093	55730	1.948	840633	3.980	509535	7.180	174038 *	9.255
06 8449089	52234 *	1.966	832569	3.986	491719	7.180	149694 *	9.255
07 8447197	78803	1.942	718246	3.980	401152	7.180	151023 *	9.249
08 8444054	105724	1.948	744036	3.980	454724	7.180	184036 *	9.255
09 8444095	70725	1.954	833335	3.986	528173	7.180	193309 *	9.254
10 8444091	29121 *	1.966	712906	3.986	355106 *	7.186	98699 *	9.254

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD88___

Lab File ID (Standard): ru29c01.d Date Analyzed: 06/29/16

Instrument ID: HP07566 Time Analyzed: 07:38

Matrix: (soil/water) SOIL Level: (low/med) MED Column: (pack/cap) CAP

	IS1(TBA) AREA	#	RT	#	IS2(FBZ) AREA	#	RT	#	IS3(CBZ) AREA	#	RT	#	IS4(DCB) AREA	#	RT	#
	12 HOUR STD	124939		4.045	984053		7.543		648483		11.072		281685		12.975	
	UPPER LIMIT	249878		4.545	1968106		8.043		1296966		11.572		563370		13.475	
	LOWER LIMIT	62470		3.545	492026		7.043		324242		10.572		140842		12.475	
	LAB SAMPLE ID															
01	LCSR75	134881		4.052	1076340		7.544		745391		11.073		308641		12.976	
02	LCDR75	124441		4.050	917238		7.544		648186		11.074		264007		12.977	
03	VSTD1.0	134625		4.051	1026709		7.545		755371		11.072		305986		12.975	
04	VBLKR75	122475		4.045	950311		7.540		656635		11.073		264275		12.976	
05	8444319	125221		4.054	977269		7.545		701306		11.075		278010		12.978	
06	8437368	127094		4.046	992832		7.544		750589		11.074		282770		12.976	
07	8444058	118759		4.042	955351		7.540		664010		11.073		274467		12.975	
08	8440096	113002		4.046	871326		7.544		614292		11.073		265457		12.976	
09	8449097	123094		4.053	938666		7.541		648988		11.074		267461		12.977	
10	8447197DL	118711		4.048	911055		7.539		641072		11.072		307260		12.978	

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD88___

Lab File ID (Standard): l105c05.d Date Analyzed: 07/05/16

Instrument ID: HP09915 Time Analyzed: 17:13

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA) AREA #	RT #	IS2(FBZ) AREA #	RT #	IS3(CBZ) AREA #	RT #	IS4(DCB) AREA #	RT #
12 HOUR STD	209480	4.006	1092308	7.514	901632	11.041	497736	12.938
UPPER LIMIT	418960	4.506	2184616	8.014	1803264	11.541	995472	13.438
LOWER LIMIT	104740	3.506	546154	7.014	450816	10.541	248868	12.438
	LAB SAMPLE ID							
01	LCSL14	212366	4.002	1100570	7.507	887709	11.044	486915	12.938
02	LCDL14	223115	4.006	1106309	7.510	897419	11.041	483707	12.938
03	VBLKL14	211276	3.999	1102672	7.510	891167	11.041	471727	12.938
04	8442828	204520	3.996	1078699	7.510	861489	11.044	454196	12.938
05	8442829	202254	3.996	1071257	7.510	862417	11.041	462353	12.938
06	8442830	197810	4.006	1042238	7.510	843487	11.041	448018	12.938
07	8442831	188160	3.996	1025447	7.510	832328	11.044	443898	12.938
08	8444113	189061	4.015	1028296	7.514	832945	11.041	447171	12.938
09	8444114	191694	4.006	1030084	7.514	837193	11.041	449751	12.938
10	8444115	183373	4.012	989443	7.513	806200	11.044	435523	12.938
11	8444116	187430	4.006	1031727	7.513	832347	11.044	446250	12.938
12	8445666	182754	4.009	1001748	7.514	811629	11.044	437852	12.938
13	8445667	178039	3.999	974975	7.513	791133	11.044	424104	12.938
14	8445668	178398	3.999	1006422	7.510	812380	11.044	438661	12.938
15	8449085	174638	4.012	978859	7.514	786056	11.044	423280	12.938
16	8450968	174993	3.993	962499	7.510	784206	11.044	420457	12.938
17	8451646	193702	4.006	1011404	7.514	826643	11.044	447891	12.938
18	8451647	159400	4.002	1065835	7.510	878407	11.044	488918	12.938
19	8451647DL	179097	4.009	1135006	7.514	924144	11.044	494591	12.938
20	8451648	183542	3.996	1133785	7.510	912586	11.044	479012	12.938
21	8451649	199187	4.006	1139899	7.510	909184	11.044	484015	12.938
22	8451650	215388	4.015	1156384	7.514	931475	11.044	495108	12.938

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD88___

Lab File ID (Standard): l105c05.d Date Analyzed: 07/05/16

Instrument ID: HP09915 Time Analyzed: 17:13

Matrix: (soil/water) WATER Level: (low/med) LOW Column: (pack/cap) CAP

	IS1(TBA) AREA #	RT #	IS2(FBZ) AREA #	RT #	IS3(CBZ) AREA #	RT #	IS4(DCB) AREA #	RT #
12 HOUR STD	209480	4.006	1092308	7.514	901632	11.041	497736	12.938
UPPER LIMIT	418960	4.506	2184616	8.014	1803264	11.541	995472	13.438
LOWER LIMIT	104740	3.506	546154	7.014	450816	10.541	248868	12.438
LAB SAMPLE ID								
23 8451651	215620	3.996	1123483	7.514	918394	11.044	505255	12.938
24 8454720	213475	3.996	1138915	7.510	913232	11.041	478665	12.938
25 8457188	208631	3.999	1156166	7.510	923106	11.041	489145	12.938

IS1 (TBA)=t-Butyl alcohol-d10
IS2 (FBZ)=Fluorobenzene
IS3 (CBZ)=Chlorobenzene-d5
IS4 (DCB)=1,4-Dichlorobenzene-d4

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

Preparation and Run Logs

Volatiles by GC/MS

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09685 **HP #22**

Data Directory Path is - d:\data\16JUN20A\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jkh09052	AU20T01.D	BFB50NG	06/20/2016	08:05		
JKH09052	AU20X01.D	BLK	06/20/2016	08:20		
JKH09052	AU20I01.D	VSTD300	06/20/2016	08:48		
JKH09052	AU20I02.D	VSTD100	06/20/2016	09:12		
JKH09052	AU20I03.D	VSTD050	06/20/2016	10:23		
JKH09052	AU20I04.D	VSTD020	06/20/2016	10:49		
JKH09052	AU20I05.D	VSTD010	06/20/2016	11:14		
JKH09052	AU20I06.D	VSTD004	06/20/2016	12:06		
JKH09052	AU20I07.D	VSTD001	06/20/2016	12:32		
JKH09052	AU20M01.D	VSTD0.5	06/20/2016	12:58		
JKH09052	AU20V01.D	LCSAICVC	06/20/2016	13:30		
jkh09052	AU20L01.D	LCSA26	06/20/2016	14:36	A161721AA	
jkh09052	AU20L02.D	LCDA26	06/20/2016	14:59	A161721AA	
jkh09052	AU20B01.D	VBLKA26	06/20/2016	15:21	A161721AA	
jkh09052	AU20S09.D	8416938	06/20/2016	15:58	A161721AA	
jkh09052	AU20X02.D	VBLKA26	06/20/2016	16:25	A161721AA	
jkh09052	AU20X03.D	VBLKA26	06/20/2016	16:48	A161721AA	
jkh09052	AU20S03.D	8416934	06/20/2016	17:33	A161721AA	
jkh09052	AU20S04.D	8416937	06/20/2016	17:55	A161721AA	
jkh09052	AU20S05.D	8416945	06/20/2016	18:18	A161721AA	
jkh09052	AU20S06.D	8416946	06/20/2016	18:41	A161721AA	
jkh09052	AU20S07.D	8419253	06/20/2016	19:04	A161721AA	
jkh09052	AU20S08.D	8414856	06/20/2016	19:26	A161721AA	

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09685 **HP #22**

Data Directory Path is - d:\data\16JUN28A\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jkh09052	AU28T01.D	BFB50NG	06/28/2016	07:06		
jkh09052	AU28X00.D	VBLKA33	06/28/2016	07:21	A161801AA	
jkh09052	AU28C01.D	VSTD050	06/28/2016	07:50	A161801AA	
jkh09052	AU28X01.D	VBLKA33	06/28/2016	08:13	A161801AA	
jkh09052	AU28B01.D	VBLKA33	06/28/2016	08:35	A161801AA	
jkh09052	AU28L01.D	LCSA33	06/28/2016	09:03	A161801AA	
jkh09052	AU28L02.D	LCDA33	06/28/2016	09:26	A161801AA	
jkh09052	AU28M01.D	MDL050	06/28/2016	09:53	A161801AA	
jkh09052	AU28S03.D	8444110	06/28/2016	10:33	A161801AA	
jkh09052	AU28S04.D	8444111MS	06/28/2016	10:55	A161801AA	
jkh09052	AU28S05.D	8444112MSD	06/28/2016	11:18	A161801AA	
jkh09052	AU28S33.D	8441953	06/28/2016	11:41	A161802AA	
jkh09052	AU28S34.D	8441954	06/28/2016	12:03	A161802AA	
jkh09052	AU28S35.D	8444066	06/28/2016	12:26	A161802AA	
jkh09052	AU28S36.D	8444085	06/28/2016	12:49	A161802AA	
jkh09052	AU28S37.D	8444086MS	06/28/2016	13:11	A161802AA	
jkh09052	AU28S38.D	8444087MSD	06/28/2016	13:34	A161802AA	
jkh09052	AU28S39.D	8444062	06/28/2016	13:56	A161802AA	
jkh09052	AU28S40.D	8444070	06/28/2016	14:19	A161802AA	

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09953 **HP #24**

Data Directory Path is - c:\msdchem\1\data\16FEB10B\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
CGT03258	BF10T05.D	50NGBFB	02/10/2016	19:35	B160402AA	
CGT03258	BF10X05.D	CLNBLK	02/10/2016	20:00		
CGT03258	BF10I01.D	VSTD300	02/10/2016	20:22		
CGT03258	BF10I02.D	VSTD100	02/10/2016	20:45		
CGT03258	BF10I03.D	VSTD050	02/10/2016	21:08		
CGT03258	BF10I04.D	VSTD020	02/10/2016	21:30		
CGT03258	BF10I05.D	VSTD010	02/10/2016	21:53		
CGT03258	BF10I06.D	VSTD004	02/10/2016	22:16		
CGT03258	BF10I07.D	VSTD001	02/10/2016	22:38		
CGT03258	BF10M01.D	MDL0.5	02/10/2016	23:01		
CGT03258	BF10V01.D	LCS1ICV	02/10/2016	23:24		
CGT03258	BF10X06.D	VBLKB33	02/10/2016	23:48	B150151AA	
CGT03258	BF10B05.D	VBLKB33	02/11/2016	00:11	B150151AA	
CGT03258	BF10M02.D	1MDL#1	02/11/2016	00:33	B150151AA	
CGT03258	BF10M03.D	1MDL#1	02/11/2016	00:56	B150151AA	
CGT03258	BF10M04.D	1MDL#1	02/11/2016	01:19	B150151AA	
CGT03258	BF10M05.D	1MDL#1	02/11/2016	01:41	B150151AA	
CGT03258	BF10M06.D	1MDL#1	02/11/2016	02:04	B150151AA	
CGT03258	BF10M07.D	1MDL#1	02/11/2016	02:27	B150151AA	
CGT03258	BF10M08.D	1MDL#1	02/11/2016	02:49	B150151AA	

Lancaster Laboratories
Volatiles
Runlog for Agilent GC/MS System HP09953 **HP #24**

Data Directory Path is - c:\msdchem\1\data\16jun29a\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
JKH09052	BU29T01.D	50 ng BFB	06/29/2016	07:28		
jkh09052	BU29X00.D	VBLKB09	06/29/2016	07:46	B161811AA	
jkh09052	BU29C01.D	VSTD050	06/29/2016	08:12	B161811AA	
jkh09052	BU29X01.D	VBLKB09	06/29/2016	08:35	B161811AA	
jkh09052	BU29B01.D	VBLKB09	06/29/2016	08:57	B161811AA	
jkh09052	BU29L01.D	LCSB09	06/29/2016	09:24	B161811AA	
jkh09052	BU29L02.D	LCDB09	06/29/2016	09:51	B161811AA	
jkh09052	BU29M01.D	MDL050	06/29/2016	10:16	B161811AA	
jkh09052	BU29S03.D	8447197	06/29/2016	10:53	B161811AA	
jkh09052	BU29S04.D	8449093	06/29/2016	11:16	B161811AA	
jkh09052	BU29S05.D	8449089	06/29/2016	11:39	B161811AA	
jkh09052	BU29S06.D	8447197	06/29/2016	12:11	B161811AA	
jkh09052	BU29S07.D	8444054	06/29/2016	12:34	B161811AA	
jkh09052	BU29S08.D	8444095	06/29/2016	12:57	B161811AA	
jkh09052	BU29S09.D	8444091	06/29/2016	13:20	B161811AA	

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Volatiles
Runlog for Hewlett Packard GC/MS System HP07566 **HP #15**

Data Directory Path is - D:\DATA\16apr05i\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
amd00492	RA05X00.D	blk	04/05/2016	08:36		
amd00492	RA05T01.D	50NGbfb	04/05/2016	09:15		50
amd00492	RA05X01.D	blk	04/05/2016	09:26		
amd00492	RA05II1.D	VSTD001	04/05/2016	09:50		50
amd00492	RA05I01.D	VSTD001	04/05/2016	10:14		50
amd00492	RA05II2.D	VSTD004	04/05/2016	10:38		50
amd00492	RA05I02.D	VSTD004	04/05/2016	11:02		50
amd00492	RA05I03.D	VSTD010	04/05/2016	11:26		50
amd00492	RA05I04.D	VSTD020	04/05/2016	11:50		50
amd00492	RA05I05.D	VSTD050	04/05/2016	12:14		50
amd00492	RA05I06.D	VSTD100	04/05/2016	12:38		50
amd00492	RA05I07.D	VSTD300	04/05/2016	13:02		50
amd00492	RA05X02.D	blk	04/05/2016	13:26		
amd00492	RA05V01.D	RICV	04/05/2016	13:51		50
amd00492	MA05M01.D	MDL0.5	04/05/2016	14:15		
amd00492	RA05C01.D	VSTD050	04/05/2016	14:39		50
amd00492	RA05M21.D	MDL0.5	04/05/2016	15:03		

Lancaster Laboratories
Volatiles
Runlog for Hewlett Packard GC/MS System HP07566 **HP #15**

Data Directory Path is - d:\data\16jun29a\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
amd00492	RU29T01.D	50NGBFB	06/29/2016	07:05	R161811AA	
amd00492	RU29X00.D	blk	06/29/2016	07:16		50
amd00492	RU29C01.D	VSTD050	06/29/2016	07:38	R161811AA	
amd00492	RU29L01.D	LCSR75	06/29/2016	08:02	R161811AA	50
amd00492	RU29L02.D	LCDR75	06/29/2016	08:26	R161811AA	50
amd00492	RU29M01.D	VSTD1.0	06/29/2016	08:49	R161811AA	
amd00492	RU29B01.D	VBLKR75	06/29/2016	09:12	R161811AA	50
amd00492	RU29S04.D	8444319	06/29/2016	09:51	R161811AA	50
amd00492	RU29S05.D	8437368	06/29/2016	10:14	R161811AA	50
amd00492	RU29S06.D	8444054	06/29/2016	10:38	R161811AA	50
amd00492	RU29S07.D	8444095	06/29/2016	11:01	R161811AA	50
amd00492	RU29S08.D	8444091	06/29/2016	11:24	R161811AA	1000
amd00492	RU29S09.D	8444058	06/29/2016	11:48	R161811AA	50
amd00492	RU29S10.D	8440096	06/29/2016	12:11	R161811AA	500
amd00492	RU29X01.D	blk	06/29/2016	12:34		50
amd00492	RU29X02.D	blk	06/29/2016	12:57		50
amd00492	RU29S01.D	8449097	06/29/2016	13:20	R161811AA	1000
amd00492	RU29S02.D	8449093	06/29/2016	13:44	R161811AA	1000
amd00492	RU29S03.D	8449089	06/29/2016	14:07	R161811AA	1000
amd00492	RU29S21.D	8447197DL	06/29/2016	15:32	R161811AA	50

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Volatiles
Runlog for Agilent GC/MS System HP09915 **HP #23**

Data Directory Path is - d:\data\16APR22I\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
BWK03231	LA22T01.D	50NGBFB	04/22/2016	09:13		
BWK03231	LA22X01.D	BLK	04/22/2016	09:33		
BWK03231	LA22I01.D	VSTD300	04/22/2016	09:55		
BWK03231	LA22I02.D	VSTD100	04/22/2016	10:17		
BWK03231	LA22I03.D	VSTD050	04/22/2016	10:39		
BWK03231	LA22I04.D	VSTD020	04/22/2016	11:01		
BWK03231	LA22I05.D	VSTD010	04/22/2016	11:23		
BWK03231	LA22I06.D	VSTD004	04/22/2016	11:45		
BWK03231	LA22I07.D	VSTD001	04/22/2016	12:07		
BWK03231	LA22M01.D	MDL0.5	04/22/2016	12:29		
BWK03231	LA22V01.D	LCS01	04/22/2016	12:51		
BWK03231	LA22X02.D	BLK	04/22/2016	13:43		
BWK03231	LA22I11.D	VSTD300	04/22/2016	14:05		
BWK03231	LA22I12.D	VSTD100	04/22/2016	14:27		
BWK03231	LA22I13.D	VSTD050	04/22/2016	14:49		
BWK03231	LA22I14.D	VSTD020	04/22/2016	15:11		
BWK03231	LA22I15.D	VSTD010	04/22/2016	15:33		
BWK03231	LA22I16.D	VSTD004	04/22/2016	15:55		
BWK03231	LA22M02.D	MDL001	04/22/2016	16:17		
BWK03231	LA22V02.D	LCS02	04/22/2016	16:39		

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Volatiles
Runlog for Agilent GC/MS System HP09915 **HP #23**

Data Directory Path is - d:\data\16JUL05B\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
MSK07970	LL05T05.D	50NGBFB	07/05/2016	16:32	L161872AA	
MSK07970	LL05X05.D	VBLKL14	07/05/2016	16:51	L161872AA	
MSK07970	LL05C05.D	VSTD050	07/05/2016	17:13	L161872AA	
MSK07970	LL05S31.D	LCSL14	07/05/2016	17:35	L161872AA	
MSK07970	LL05S32.D	LCDL14	07/05/2016	17:57	L161872AA	
MSK07970	LL05B05.D	VBLKL14	07/05/2016	18:19	L161872AA	
MSK07970	LL05S33.D	8442828	07/05/2016	18:41	L161872AA	
MSK07970	LL05S34.D	8442829	07/05/2016	19:03	L161872AA	
MSK07970	LL05S35.D	8442830	07/05/2016	19:25	L161872AA	
MSK07970	LL05S36.D	8442831	07/05/2016	19:47	L161872AA	
MSK07970	LL05S37.D	8444113	07/05/2016	20:09	L161872AA	
MSK07970	LL05S38.D	8444114	07/05/2016	20:31	L161872AA	
MSK07970	LL05S39.D	8444115	07/05/2016	20:52	L161872AA	
MSK07970	LL05S40.D	8444116	07/05/2016	21:14	L161872AA	
MSK07970	LL05S41.D	8445666	07/05/2016	21:36	L161872AA	
MSK07970	LL05S42.D	8445667	07/05/2016	21:58	L161872AA	
MSK07970	LL05S43.D	8445668	07/05/2016	22:20	L161872AA	
MSK07970	LL05S44.D	8449085	07/05/2016	22:42	L161872AA	
MSK07970	LL05S45.D	8450968	07/05/2016	23:04	L161872AA	
MSK07970	LL05S46.D	8451646	07/05/2016	23:26	L161872AA	
MSK07970	LL05S47.D	8451647	07/05/2016	23:47	L161872AA	
MSK07970	LL05S48.D	8451647DL	07/06/2016	00:09	L161872AA	10
MSK07970	LL05S49.D	8451648	07/06/2016	00:31	L161872AA	
MSK07970	LL05S50.D	8451649	07/06/2016	00:53	L161872AA	
MSK07970	LL05S51.D	8451650	07/06/2016	01:15	L161872AA	
MSK07970	LL05S52.D	8451651	07/06/2016	01:37	L161872AA	
MSK07970	LL05S53.D	8454720	07/06/2016	01:59	L161872AA	
MSK07970	LL05S54.D	8457188	07/06/2016	02:20	L161872AA	

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VOA Prep Summary by SDG: DWD88

21 - GC/MS Volatiles

Sample Number	Bottle Code	Prep Analysis#	Vial ID	Used for Analysis?	Collected	Prepared	Initial Weight	Final Weight	Net soil weight	Weight requirement	Meets require-ments?	Preserv. lot #	Preservative (volume)	Final Extraction Vol (mL)	Problem Codes
8444054	150A	07320	16681266	N	06/23/16 08:45	06/24/16 18:05	32.46 g	35.27 g	2.81 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444054	150B	07320	16681274	Y	06/23/16 08:45	06/24/16 18:05	32.72 g	35.86 g	3.14 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444054	169A	07578	16688868	N	06/23/16 08:45	06/24/16 17:56	29.60 g	33.36 g	3.76 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A,D
8444058	150A	07320	16681254	N	06/23/16 09:30	06/24/16 18:05	32.55 g	35.93 g	3.38 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444058	150B	07320	16681268	N	06/23/16 09:30	06/24/16 18:05	32.61 g	34.70 g	2.09 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444058	169A	07578	16688862	Y	06/23/16 09:30	06/24/16 17:58	29.60 g	33.17 g	3.57 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8444062	150A	07320	16681270	Y	06/23/16 10:15	06/24/16 18:05	32.61 g	36.94 g	4.33 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8444062	150B	07320	16681273	N	06/23/16 10:15	06/24/16 18:05	32.68 g	35.38 g	2.70 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444062	169A	07578	16688894	N	06/23/16 10:15	06/24/16 18:00	29.68 g	33.14 g	3.46 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8444066	150A	07320	16681321	N	06/23/16 11:15	06/24/16 18:05	32.41 g	35.02 g	2.61 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444066	150B	07320	16681260	Y	06/23/16 11:15	06/24/16 18:05	32.72 g	35.89 g	3.17 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444066	169A	07578	16688869	N	06/23/16 11:15	06/24/16 18:02	29.69 g	32.98 g	3.29 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A,D
8444070	150A	07320	16681261	Y	06/23/16 12:05	06/24/16 18:05	32.56 g	36.22 g	3.66 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8444070	150B	07320	16681259	N	06/23/16 12:05	06/24/16 18:05	32.72 g	36.10 g	3.38 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444070	169A	07578	16688827	N	06/23/16 12:05	06/24/16 17:54	29.63 g	33.33 g	3.70 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A,D
8444085	150A	07320	16681257	N	06/23/16 13:00	06/24/16 18:04	32.63 g	35.86 g	3.23 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444085	150B	07320	16681263	Y	06/23/16 13:00	06/24/16 18:04	32.62 g	35.89 g	3.27 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444085	169A	07578	16688887	N	06/23/16 13:00	06/24/16 17:50	29.49 g	32.84 g	3.35 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A,D
8444086	150A	07320	16681319	N	06/23/16 13:00	06/24/16 18:04	32.22 g	34.59 g	2.37 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444086	150B	07320	16681320	Y	06/23/16 13:00	06/24/16 18:05	32.09 g	35.07 g	2.98 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444086	169A	07578	16688893	N	06/23/16 13:00	06/24/16 17:52	29.50 g	33.30 g	3.80 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8444087	150A	07320	16681253	Y	06/23/16 13:00	06/24/16 18:04	32.72 g	35.59 g	2.87 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444087	150B	07320	16681262	N	06/23/16 13:00	06/24/16 18:04	32.72 g	35.53 g	2.81 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444087	169A	07578	16688881	N	06/23/16 13:00	06/24/16 17:44	29.61 g	32.32 g	2.71 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A,D

Final Extraction Vol (mL) = Preservative Vol + Added MeOH (if applicable)

KEY to problem codes:

A = wt. does not meet requirements B = vial leaked C# where # = volume of MeOH added in mL due to sample not covered/matrix (lot #)
D = sampler not full E = effervescence observed F = pH >= 2 G = headspace in container

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VOA Prep Summary by SDG: DWD88

21 - GC/MS Volatiles

Sample Number	Bottle Code	Prep Analysis#	Vial ID	Used for Analysis?	Collected	Prepared	Initial Weight	Final Weight	Net soil weight	Weight requirement	Meets require-ments?	Preserv. lot #	Preservative (volume)	Final Extraction Vol (mL)	Problem Codes
8444091	150A	07320	16681251	Y	06/23/16 15:15	06/24/16 18:04	32.47 g	37.73 g	5.26 g	4.50 g - 5.50 g	Y	9-08-15	DI Water (5 mL)	5.000	
8444091	150B	07320	16681265	N	06/23/16 15:15	06/24/16 18:04	32.68 g	37.35 g	4.67 g	4.50 g - 5.50 g	Y	9-08-15	DI Water (5 mL)	5.000	
8444091	169A	07578	16688875	N	06/23/16 15:15	06/24/16 17:46	29.49 g	34.41 g	4.92 g	4.50 g - 5.50 g	Y	16158	MeOH w/surrogate (5 mL)	5.000	
8444095	150A	07320	16681267	Y	06/23/16 16:00	06/24/16 18:04	32.65 g	37.07 g	4.42 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8444095	150B	07320	16681264	N	06/23/16 16:00	06/24/16 18:04	32.67 g	36.88 g	4.21 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8444095	169A	07578	16688826	N	06/23/16 16:00	06/24/16 17:48	29.55 g	33.79 g	4.24 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8444110	150A	07320	16681307	N	06/23/16 16:45	06/24/16 18:04	32.68 g	36.28 g	3.60 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444110	150B	07320	16681313	Y	06/23/16 16:45	06/24/16 18:04	32.19 g	36.20 g	4.01 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444110	169A	07578	16688825	N	06/23/16 16:45	06/24/16 17:36	29.66 g	32.98 g	3.32 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A,D
8444111	150A	07320	16681256	N	06/23/16 16:45	06/24/16 18:04	32.08 g	35.96 g	3.88 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8444111	150B	07320	16681258	Y	06/23/16 16:45	06/24/16 18:04	32.69 g	36.81 g	4.12 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8444111	169A	07578	16688892	N	06/23/16 16:45	06/24/16 17:38	29.60 g	33.82 g	4.22 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8444112	150A	07320	16681271	N	06/23/16 16:45	06/24/16 18:04	32.42 g	36.15 g	3.73 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8444112	150B	07320	16681272	Y	06/23/16 16:45	06/24/16 18:04	32.08 g	36.14 g	4.06 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8444112	169A	07578	16688843	N	06/23/16 16:45	06/24/16 17:40	29.53 g	33.19 g	3.66 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A

Final Extraction Vol (mL) = Preservative Vol + Added MeOH (if applicable)

KEY to problem codes:

A = wt. does not meet requirements B = vial leaked C# where # = volume of MeOH added in mL due to sample not covered/matrix (lot #)
D = sampler not full E = effervescence observed F = pH >= 2 G = headspace in container

Semivolatiles by GC/MS Data

Case Narrative/Conformance Summary

Semivolatiles by GC/MS

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

SVOA 8270D (microwave)

		Matrix			
Sample #	Client ID	Liquid	Solid	DF	Comments
8444051	DU-2-5-A		X	5	
8444055	DU-2-5-B		X	5	
8444059	DU-2-5-C		X	5	
8444063	DU-2-2-A		X	5	
8444067	DU-2-2-B		X	5	
8444071	DU-2-2-C		X	5	Unspiked
8444072	DU-2-2-C MS		X	5	Matrix Spike
8444073	DU-2-2-C MSD		X	5	Matrix Spike Duplicate
8444088	BGA-1		X	5	
8444092	BGA-2		X	5	
8444096	BGA-3		X	5	
8444097	BGA-3 MS		X	5	Matrix Spike
8444098	BGA-3 MSD		X	5	Matrix Spike Duplicate
8444113	DU-2-5-FB	X		1	Field Blank
8444115	DU-2-2-EB	X		1	Equipment Blank
8444116	BGA-3-EB	X		1	Equipment Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

LCS/LCSD

Batch#: 16184SLC026 (Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071-8444073, 8444088, 8444092, UNSPK: 8444072-8444071)
The relative percent difference(s) for the following analyte(s) in the LCS/LCSD is outside the acceptance window: 2-Chlorobenzaldehyde

The recovery(ies) for the following analyte(s) in the LCSD is below the acceptance window: 2-Chlorobenzalmalononitrile

Batch#: 16187SLE026 (Sample number(s): 8444096-8444098, UNSPK: 8444097-8444096)
The recovery(ies) for the following analyte(s) in the LCS is below the acceptance window: 2-Chlorobenzalmalononitrile

(Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071, 8444088, 8444092, 8444096: Analysis: 10726)
The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.

The % RPD for target analyte(s) in the Laboratory Control Spike/Spike Duplicate is outside the QC acceptance limits as noted on the QC Summary. Since the individual % recovery is within the acceptance limits, the data is reported.

MS/MSD

Please note that US EPA Methods for organic compounds do not require action by the laboratory based on out-of-specification MS/MSD results.

Batch#: 16187SLE026 (Sample number(s): 8444096-8444098, UNSPK: 8444097-8444096)
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: Quinoline
Refer to the QC Summary forms for more information.

Batch#: 16184SLC026 (Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071-8444073, 8444088, 8444092, UNSPK: 8444072-8444071)
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: Quinoline

Refer to the QC Summary forms for more information.

Surrogate

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

Batch#: 16184SLC026 (Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071-8444073, 8444088, 8444092, UNSPK: 8444072-8444071)
The recovery(ies) for the following surrogate(s) is below the acceptance window: Phenol-d6 (8444067)

(Sample number(s): 8444067: Analysis: 10726)
The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported.
Similar results were obtained in both trials.

SAMPLE ANALYSIS:

(Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071, 8444088, 8444092, 8444096: Analysis: 10726)
Reporting limits were raised due to interference from the sample matrix.

No other problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Semivolatiles by GC/MS

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Quality Control Reference List
GC/MS Semivolatiles

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Fraction: Semivolatiles by GC/MS

Analysis	Batch Number	Sample Number	Analysis Date
SVOA 8270D (microwave)	16184SLC026	SBLKLC184	07/06/2016 07:14:00
		184LCLCS	07/06/2016 07:45:00
		184LCLCS2	07/06/2016 08:10:00
		184LCLCSD2	07/06/2016 08:35:00
		184LCLCS3	07/06/2016 09:01:00
		184LCLCSD3	07/06/2016 09:27:00
		8444051	07/06/2016 23:55:00
		8444055	07/07/2016 00:20:00
		8444059	07/07/2016 00:46:00
		8444063	07/07/2016 01:12:00
		8444067	07/07/2016 01:37:00
		8444071 UNSPK	07/06/2016 16:21:00
		8444072 MS	07/06/2016 23:03:00
		8444073 MSD	07/06/2016 23:29:00
		8444088	07/07/2016 02:03:00
		8444092	07/07/2016 02:29:00
SVOA 8270D (microwave)	16187SLE026	SBLKLE187	07/06/2016 20:27:00
		187LELCS	07/06/2016 20:53:00
		187LELCS2	07/06/2016 21:19:00
		187LELCSD2	07/06/2016 21:45:00
		187LELCS3	07/06/2016 22:10:00
		187LELCSD3	07/06/2016 22:38:00
		8444096 UNSPK	07/07/2016 02:54:00
		8444097 MS	07/07/2016 03:20:00
		8444098 MSD	07/07/2016 03:45:00
SVOA 8270D (microwave)	16194SLB026	SBLKLB194	07/13/2016 19:21:00
		194LBLCS	07/13/2016 19:44:00
		194LBLCS1	07/13/2016 20:08:00
		194LBLCSD1	07/13/2016 20:31:00
		194LBLCS2	07/13/2016 20:54:00
		194LBLCSD2	07/13/2016 21:17:00
		8444067RE	07/13/2016 22:53:00
SVOA 8270D (water)	16178WAD026	SBLKWD178	07/08/2016 21:06:00
		178WDLCS	07/08/2016 21:35:00
		178WDLCSD	07/08/2016 22:03:00
		178WDLCS1	07/08/2016 22:31:00
		178WDLCSD1	07/08/2016 23:00:00
		8444113	07/09/2016 01:50:00
		8444115	07/09/2016 02:19:00
		8444116	07/09/2016 02:47:00

Fraction: Semivolatiles by GC/MS

10726: SVOA 8270D (microwave) Analyte Name	Default MDL	Default LOQ	Units
2-Chlorobenzaldehyde	33	170	ug/kg
Quinoline	33	170	ug/kg
2-Chlorobenzalmalononitrile	170	500	ug/kg

10461: SVOA 8270D (water) Analyte Name	Default MDL	Default LOQ	Units
2-Chlorobenzaldehyde	1	5	ug/l
Quinoline	1	5	ug/l

Quality Control Summary
Method Blank
GC/MS Semivolatiles
SDG: DWD88
Matrix: LIQUID

Fraction: Semivolatiles by GC/MS

16178WAD026 / SBLKWD178 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2-Chlorobenzaldehyde	07/08/16	N.D.	ug/l	1	5
Quinoline	07/08/16	N.D.	ug/l	1	5

Fraction: Semivolatiles by GC/MS

16184SLC026 / SBLKLC184 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2-Chlorobenzaldehyde	07/06/16	N.D.	ug/kg	33	170
Quinoline	07/06/16	N.D.	ug/kg	33	170
2-Chlorobenzalmalononitrile	07/06/16	N.D.	ug/kg	170	500

16187SLE026 / SBLKLE187 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2-Chlorobenzaldehyde	07/06/16	N.D.	ug/kg	33	170
Quinoline	07/06/16	N.D.	ug/kg	33	170
2-Chlorobenzalmalononitrile	07/06/16	N.D.	ug/kg	170	500

16194SLB026 / SBLKLB194 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2-Chlorobenzaldehyde	07/13/16	N.D.	ug/kg	33	170
Quinoline	07/13/16	N.D.	ug/kg	33	170
2-Chlorobenzalmalononitrile	07/13/16	N.D.	ug/kg	170	500

Quality Control Summary
Surrogates
GC/MS Semivolatiles
SDG: DWD88
Matrix: LIQUID

Fraction: Semivolatiles by GC/MS

16178WAD026	2-Fluorobiphenyl		Nitrobenzene-d5		Terphenyl-d14	
	Spike Added	100 ug/l	Spike Added	100 ug/l	Spike Added	100 ug/l
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
SBLKWD178	99	61 - 112	103	46 - 128	105	41 - 125
178WDLCS	97	61 - 112	105	46 - 128	102	41 - 125
178WDLCSD	100	61 - 112	107	46 - 128	105	41 - 125
8444113	100	61 - 112	101	46 - 128	100	41 - 125
8444115	87	61 - 112	91	46 - 128	93	41 - 125
8444116	95	61 - 112	101	46 - 128	101	41 - 125

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Quality Control Summary
Surrogates
GC/MS Semivolatiles
SDG: DWD88
Matrix: SOLID

Fraction: Semivolatiles by GC/MS

16184SLC026	2,4,6-Tribromophenol		2-Fluorobiphenyl		2-Fluorophenol		Nitrobenzene-d5		Phenol-d6		Terphenyl-d14	
	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
SBLKLC184	111	35 - 136	93	63 - 117	93	57 - 126	89	54 - 123	85	58 - 122	99	59 - 129
184LCLCS	116	35 - 136	94	63 - 117	107	57 - 126	95	54 - 123	100	58 - 122	97	59 - 129
184LCLCSD2	118	35 - 136	94	63 - 117	98	57 - 126	91	54 - 123	90	58 - 122	99	59 - 129
8444051	114	35 - 136	91	63 - 117	100	57 - 126	90	54 - 123	97	58 - 122	94	59 - 129
8444055	103	35 - 136	83	63 - 117	92	57 - 126	85	54 - 123	88	58 - 122	87	59 - 129
8444059	119	35 - 136	90	63 - 117	103	57 - 126	92	54 - 123	101	58 - 122	100	59 - 129
8444063	86	35 - 136	72	63 - 117	79	57 - 126	75	54 - 123	76	58 - 122	77	59 - 129
8444067	72	35 - 136	64	63 - 117	62	57 - 126	62	54 - 123	56 *	58 - 122	69	59 - 129
8444071 UNSPK	84	35 - 136	78	63 - 117	76	57 - 126	77	54 - 123	67	58 - 122	81	59 - 129
8444072 MS	96	35 - 136	79	63 - 117	83	57 - 126	78	54 - 123	79	58 - 122	84	59 - 129
8444073 MSD	103	35 - 136	86	63 - 117	89	57 - 126	86	54 - 123	82	58 - 122	93	59 - 129
8444088	102	35 - 136	83	63 - 117	93	57 - 126	82	54 - 123	88	58 - 122	88	59 - 129
8444092	98	35 - 136	82	63 - 117	89	57 - 126	82	54 - 123	86	58 - 122	86	59 - 129

16187SLE026	2,4,6-Tribromophenol		2-Fluorobiphenyl		2-Fluorophenol		Nitrobenzene-d5		Phenol-d6		Terphenyl-d14	
	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
SBLKLE187	130	35 - 136	96	63 - 117	103	57 - 126	91	54 - 123	95	58 - 122	104	59 - 129
187LELCS	122	35 - 136	90	63 - 117	101	57 - 126	89	54 - 123	97	58 - 122	100	59 - 129
187LELCSD2	118	35 - 136	89	63 - 117	94	57 - 126	85	54 - 123	87	58 - 122	97	59 - 129
8444096 UNSPK	100	35 - 136	82	63 - 117	89	57 - 126	81	54 - 123	85	58 - 122	87	59 - 129
8444097 MS	93	35 - 136	77	63 - 117	87	57 - 126	81	54 - 123	85	58 - 122	83	59 - 129
8444098 MSD	99	35 - 136	80	63 - 117	88	57 - 126	81	54 - 123	87	58 - 122	89	59 - 129

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Fraction: Semivolatiles by GC/MS

16194SLB026	2,4,6-Tribromophenol		2-Fluorobiphenyl		2-Fluorophenol		Nitrobenzene-d5		Phenol-d6		Terphenyl-d14	
	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg	Spike Added	6666.667 ug/kg	Spike Added	3333.333 ug/kg
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
SBLKLB194	109	35 - 136	90	63 - 117	91	57 - 126	81	54 - 123	82	58 - 122	95	59 - 129
194LBLCS	106	35 - 136	91	63 - 117	96	57 - 126	81	54 - 123	87	58 - 122	93	59 - 129
194LBLCSD1	115	35 - 136	92	63 - 117	95	57 - 126	81	54 - 123	87	58 - 122	97	59 - 129
8444067RE	75	35 - 136	67	63 - 117	70	57 - 126	61	54 - 123	64	58 - 122	67	59 - 129

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

UNSPK: 8444071 MS: 8444072 MSD: 8444073 **Analyte**	Batch: **16184SLC026** (Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071-8444073, 8444088, 8444092)								
	Spike Added ug/kg MS/MSD	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	1656.18 / 1654.53	N.D.	780.17 J	1017.37	47 *	61 *	80-119	26	30

UNSPK: 8444096 MS: 8444097 MSD: 8444098 **Analyte**	Batch: **16187SLE026** (Sample number(s): 8444096-8444098)								
	Spike Added ug/kg MS/MSD	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	1656.73 / 1661.13	N.D.	773.6 J	932.37	47 *	56 *	80-119	19	30

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate (LCSD)

SDG: DWD88
Matrix: LIQUID

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

LCS: 178WDLCS LCSD: 178WDLCSD	Batch: **16178WAD026** (Sample number(s): 8444113, 8444115-8444116)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	50	53.4	54.75	107	109	82-109	3	30

LCS: 178WDLCS1 LCSD: 178WDLCSD1	Batch: **16178WAD026** (Sample number(s): 8444113, 8444115-8444116)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzaldehyde	50	44.99	47.61	90	95	73-106	6	30

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

LCS: 184LCLCS	Batch: **16184SLC026** (Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071-8444073, 8444088, 8444092)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	1666.67	1700.99	NA	102	NA	80-119	NA	NA

LCS: 184LCLCS2 LCSD: 184LCLCSD2	Batch: **16184SLC026** (Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071-8444073, 8444088, 8444092)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzaldehyde	1666.67	1636.45	1136.22	98	68	58-114	36 *	30

LCS: 184LCLCS3 LCSD: 184LCLCSD3	Batch: **16184SLC026** (Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067, 8444071-8444073, 8444088, 8444092)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzalmalononitrile	1666.67	1199.86	1154.53	72	69 *	70-130	4	30

LCS: 187LELCS	Batch: **16187SLE026** (Sample number(s): 8444096-8444098)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	1666.67	1702.06	NA	102	NA	80-119	NA	NA

LCS: 187LELCS2 LCSD: 187LELCSD2	Batch: **16187SLE026** (Sample number(s): 8444096-8444098)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzaldehyde	1666.67	1660.15	1532.52	100	92	58-114	8	30

LCS: 187LELCS3 LCSD: 187LELCSD3	Batch: **16187SLE026** (Sample number(s): 8444096-8444098)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzalmalononitrile	1666.67	1141.51	1262.4	68 *	76	70-130	10	30

LCS: 194LBLCS	Batch: **16194SLB026** (Sample number(s): 8444067)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
Quinoline	1666.67	1542	NA	93	NA	80-119	NA	NA

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

LCS: 194LBLCS1 LCSD: 194LBLCSD1	Batch: **16194SLB026** (Sample number(s): 8444067)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzaldehyde	1666.67	1602.23	1590.96	96	95	58-114	1	30

LCS: 194LBLCS2 LCSD: 194LBLCSD2	Batch: **16194SLB026** (Sample number(s): 8444067)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzalmalononitrile	1666.67	1215.62	1171.4	73	70	70-130	4	30

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf0200.d DFTPP Injection Date: 06/07/16

Instrument ID: HP11165 DFTPP Injection Time: 09:16

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	43.7
68	Less than 2.0% of mass 69	1.05 (1.88)1
69	Mass 69 relative abundance	55.9
70	Less than 2.0% of mass 69	0.45 (0.8)1
127	10.0 - 80.00% of mass 198	50.2
197	Less than 2.0% of mass 198	0.39
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	7.13
275	10.0 - 60.0% of mass 198	22.2
365	Greater than 1.00% of mass 198	2.94
441	Present, and less than mass 443	10.1
442	Greater than 50.00% of mass 198	60.5
443	15.00 - 24.00% of mass 442	11.4 (18.9)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gf0201.d	06/07/16	09:32
02	STD1526 - SSTD120	gf0202.d	06/07/16	09:59
03	STD1526 - SSTD80	gf0203.d	06/07/16	10:25
04	STD1526 - SSTD50	gf0204.d	06/07/16	10:51
05	STD1526 - SSTD15	gf0205.d	06/07/16	11:20
06	STD1526 - SSTD5	gf0206.d	06/07/16	11:47
07	STD1526 - SSTD1	gf0207.d	06/07/16	12:13
08	STD1526 - SSTD.5	gf0208.d	06/07/16	12:39
09	MDL1526 - SSTD00.5	gf0209.d	06/07/16	13:06
10	MDLPAH1526 - SSTD00.1	gf0210.d	06/07/16	13:32
11	ICV1376 - SSTD050	gf0211.d	06/07/16	14:00
12	ICVBAS0716 - SSTD050	gf0212.d	06/07/16	14:28

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf1000.d DFTPP Injection Date: 06/28/16

Instrument ID: HP11165 DFTPP Injection Time: 07:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.3
68	Less than 2.0% of mass 69	0.7 (1.42)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.33 (0.67)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.74
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.72
275	10.0 - 60.0% of mass 198	24.0
365	Greater than 1.00% of mass 198	2.51
441	Present, and less than mass 443	9.53
442	Greater than 50.00% of mass 198	62.5
443	15.00 - 24.00% of mass 442	12.6 (20.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gf1001.d	06/28/16	07:22
02	TRG1586 - SSTD120	gf1002.d	06/28/16	07:48
03	TRG1586 - SSTD80	gf1003.d	06/28/16	08:14
04	TRG1586 - SSTD50	gf1004.d	06/28/16	08:40
05	TRG1586 - SSTD30	gf1005.d	06/28/16	09:07
06	TRG1586 - SSTD15	gf1006.d	06/28/16	09:32
07	TRG1586 - SSTD5	gf1007.d	06/28/16	09:58
08	TRGMDL1586 - SSTD001	gf1008.d	06/28/16	10:25
09	SBLKWA178	gf1009.d	06/28/16	10:51
10	178WALCS	gf1010.d	06/28/16	11:18
11	178WALCSD	gf1011.d	06/28/16	11:44
12	8438378	gf1012.d	06/28/16	12:10
13	8438379	gf1013.d	06/28/16	12:37
14	8442829	gf1014.d	06/28/16	13:03
15	8442830	gf1015.d	06/28/16	13:29
16	8442831	gf1016.d	06/28/16	13:56
17	8444113	gf1017.d	06/28/16	14:22
18	8444115	gf1018.d	06/28/16	14:48

FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf1000.d DFTPP Injection Date: 06/28/16

Instrument ID: HP11165 DFTPP Injection Time: 07:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.3
68	Less than 2.0% of mass 69	0.7 (1.42)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.33 (0.67)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.74
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.72
275	10.0 - 60.0% of mass 198	24.0
365	Greater than 1.00% of mass 198	2.51
441	Present, and less than mass 443	9.53
442	Greater than 50.00% of mass 198	62.5
443	15.00 - 24.00% of mass 442	12.6 (20.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8444116	gf1019.d	06/28/16	15:15
20	8445666	gf1020.d	06/28/16	15:41
21	8445667	gf1021.d	06/28/16	16:07

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0160.d DFTPP Injection Date: 07/05/16

Instrument ID: HP11165 DFTPP Injection Time: 06:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	41.0
68	Less than 2.0% of mass 69	0.61 (1.19)1
69	Mass 69 relative abundance	51.2
70	Less than 2.0% of mass 69	0.19 (0.37)1
127	10.0 - 80.00% of mass 198	45.8
197	Less than 2.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.58
275	10.0 - 60.0% of mass 198	23.7
365	Greater than 1.00% of mass 198	2.3
441	Present, and less than mass 443	9.31
442	Greater than 50.00% of mass 198	59.7
443	15.00 - 24.00% of mass 442	10.8 (18.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gg0161.d	07/05/16	06:21
02	TRG1566 - SSTD30	gg0162.d	07/05/16	06:47
03	CBZ1876 - SSTD120	gg0163.d	07/05/16	07:13
04	CBZ1876 - SSTD80	gg0164.d	07/05/16	07:38
05	CBZ1876 - SSTD50	gg0165.d	07/05/16	08:04
06	CBZ1876 - SSTD30	gg0166.d	07/05/16	08:29
07	CBZ1876 - SSTD15	gg0167.d	07/05/16	08:55
08	CBZ1876 - SSTD5	gg0168.d	07/05/16	09:20
09	CBZMDL1876 - SSTD001	gg0169.d	07/05/16	09:46
10	SBLKLF182	gg0170.d	07/05/16	10:13
11	182LFLCS	gg0171.d	07/05/16	10:40
12	182LFLCS2	gg0172.d	07/05/16	11:07
13	182LFLCSD2	gg0173.d	07/05/16	11:32
14	182LFLCS3	gg0174.d	07/05/16	11:58
15	182LFLCSD3	gg0175.d	07/05/16	12:24
16	8438353	gg0176.d	07/05/16	12:49
17	8438354MS	gg0177.d	07/05/16	13:14
18	8438355MSD	gg0178.d	07/05/16	13:41

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0160.d DFTPP Injection Date: 07/05/16

Instrument ID: HP11165 DFTPP Injection Time: 06:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	41.0
68	Less than 2.0% of mass 69	0.61 (1.19)1
69	Mass 69 relative abundance	51.2
70	Less than 2.0% of mass 69	0.19 (0.37)1
127	10.0 - 80.00% of mass 198	45.8
197	Less than 2.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.58
275	10.0 - 60.0% of mass 198	23.7
365	Greater than 1.00% of mass 198	2.3
441	Present, and less than mass 443	9.31
442	Greater than 50.00% of mass 198	59.7
443	15.00 - 24.00% of mass 442	10.8 (18.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8438321	gg0179.d	07/05/16	14:08
20	8438325	gg0180.d	07/05/16	14:35
21	8438329	gg0181.d	07/05/16	15:01
22	8438370	gg0182.d	07/05/16	15:26
23	8438374	gg0183.d	07/05/16	15:51

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0230.d DFTPP Injection Date: 07/06/16

Instrument ID: HP11165 DFTPP Injection Time: 05:10

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	40.6
68	Less than 2.0% of mass 69	0.33 (0.68)1
69	Mass 69 relative abundance	47.8
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.38
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.96
275	10.0 - 60.0% of mass 198	24.4
365	Greater than 1.00% of mass 198	2.38
441	Present, and less than mass 443	9.28
442	Greater than 50.00% of mass 198	62.2
443	15.00 - 24.00% of mass 442	12.4 (20.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gg0231.d	07/06/16	05:25
02	TRG1566 - SSTD30	gg0232.d	07/06/16	05:53
03	SSTD30	gg0233.d	07/06/16	06:19
04	SBLKLC184	gg0234.d	07/06/16	07:14
05	184LCLCS	gg0235.d	07/06/16	07:45
06	184LCLCS2	gg0236.d	07/06/16	08:10
07	184LCLCSD2	gg0237.d	07/06/16	08:35
08	184LCLCS3	gg0238.d	07/06/16	09:01
09	184LCLCSD3	gg0239.d	07/06/16	09:27
10	SBLKLB184	gg0240.d	07/06/16	09:53
11	184LBLCS	gg0241.d	07/06/16	10:20
12	184LBLCS2	gg0242.d	07/06/16	10:46
13	184LBLCSD2	gg0243.d	07/06/16	11:11
14	184LBLCS3	gg0244.d	07/06/16	11:38
15	184LBLCSD3	gg0245.d	07/06/16	12:04
16	8442807	gg0246.d	07/06/16	12:30
17	8442808MS	gg0247.d	07/06/16	12:55
18	8442809MSD	gg0248.d	07/06/16	13:21

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0230.d DFTPP Injection Date: 07/06/16

Instrument ID: HP11165 DFTPP Injection Time: 05:10

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	40.6
68	Less than 2.0% of mass 69	0.33 (0.68)1
69	Mass 69 relative abundance	47.8
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.38
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.96
275	10.0 - 60.0% of mass 198	24.4
365	Greater than 1.00% of mass 198	2.38
441	Present, and less than mass 443	9.28
442	Greater than 50.00% of mass 198	62.2
443	15.00 - 24.00% of mass 442	12.4 (20.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8442798	gg0249.d	07/06/16	13:47
20	8442801	gg0250.d	07/06/16	14:13
21	8442804	gg0251.d	07/06/16	14:38
22	8442816	gg0252.d	07/06/16	15:04
23	8442820	gg0253.d	07/06/16	15:30
24	8442824	gg0254.d	07/06/16	15:55
25	8444071	gg0255.d	07/06/16	16:21

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0290.d DFTPP Injection Date: 07/06/16

Instrument ID: HP11165 DFTPP Injection Time: 18:25

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	34.9
68	Less than 2.0% of mass 69	0.58 (1.28)1
69	Mass 69 relative abundance	45.7
70	Less than 2.0% of mass 69	0.15 (0.32)1
127	10.0 - 80.00% of mass 198	44.0
197	Less than 2.0% of mass 198	0.41
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.48
275	10.0 - 60.0% of mass 198	24.9
365	Greater than 1.00% of mass 198	2.5
441	Present, and less than mass 443	10.8
442	Greater than 50.00% of mass 198	66.9
443	15.00 - 24.00% of mass 442	13.6 (20.4)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gg0291.d	07/06/16	18:52
02	TRG1566 - SSTD30	gg0292.d	07/06/16	19:19
03	CBZ1876 - SSTD30	gg0293.d	07/06/16	19:45
04	SBLKLE187	gg0294.d	07/06/16	20:27
05	187LELCS	gg0295.d	07/06/16	20:53
06	187LELCS2	gg0296.d	07/06/16	21:19
07	187LELCSD2	gg0297.d	07/06/16	21:45
08	187LELCS3	gg0298.d	07/06/16	22:10
09	187LELCSD3	gg0299.d	07/06/16	22:38
10	8444072MS	gg0300.d	07/06/16	23:03
11	8444073MSD	gg0301.d	07/06/16	23:29
12	8444051	gg0302.d	07/06/16	23:55
13	8444055	gg0303.d	07/07/16	00:20
14	8444059	gg0304.d	07/07/16	00:46
15	8444063	gg0305.d	07/07/16	01:12
16	8444067	gg0306.d	07/07/16	01:37
17	8444088	gg0307.d	07/07/16	02:03
18	8444092	gg0308.d	07/07/16	02:29

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0290.d DFTPP Injection Date: 07/06/16

Instrument ID: HP11165 DFTPP Injection Time: 18:25

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	34.9
68	Less than 2.0% of mass 69	0.58 (1.28)1
69	Mass 69 relative abundance	45.7
70	Less than 2.0% of mass 69	0.15 (0.32)1
127	10.0 - 80.00% of mass 198	44.0
197	Less than 2.0% of mass 198	0.41
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.48
275	10.0 - 60.0% of mass 198	24.9
365	Greater than 1.00% of mass 198	2.5
441	Present, and less than mass 443	10.8
442	Greater than 50.00% of mass 198	66.9
443	15.00 - 24.00% of mass 442	13.6 (20.4)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8444096	gg0309.d	07/07/16	02:54
20	8444097MS	gg0310.d	07/07/16	03:20
21	8444098MSD	gg0311.d	07/07/16	03:45
22	8445669	gg0312.d	07/07/16	04:11
23	8445673	gg0313.d	07/07/16	04:36
24	8445677	gg0314.d	07/07/16	05:02
25	8449086	gg0315.d	07/07/16	05:27
26	8449090	gg0316.d	07/07/16	05:53

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0570.d DFTPP Injection Date: 07/13/16

Instrument ID: HP11165 DFTPP Injection Time: 15:36

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.0
68	Less than 2.0% of mass 69	0.91 (1.95)1
69	Mass 69 relative abundance	46.8
70	Less than 2.0% of mass 69	0.35 (0.75)1
127	10.0 - 80.00% of mass 198	44.6
197	Less than 2.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.82
275	10.0 - 60.0% of mass 198	23.9
365	Greater than 1.00% of mass 198	2.35
441	Present, and less than mass 443	9.21
442	Greater than 50.00% of mass 198	65.2
443	15.00 - 24.00% of mass 442	12.6 (19.4)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD30	gg0571.d	07/13/16	15:52
02	TRG1566 - SSTD30	gg0572.d	07/13/16	16:52
03	CBZ1876 - SSTD30	gg0573.d	07/13/16	17:15
04	SBLKWN194	gg0574.d	07/13/16	17:49
05	194WNLCS	gg0575.d	07/13/16	18:11
06	SBLKLB194	gg0578.d	07/13/16	19:21
07	194LBLCS	gg0579.d	07/13/16	19:44
08	194LBLCS1	gg0580.d	07/13/16	20:08
09	194LBLCSD1	gg0581.d	07/13/16	20:31
10	194LBLCS2	gg0582.d	07/13/16	20:54
11	194LBLCSD2	gg0583.d	07/13/16	21:17
12	8468616	gg0584.d	07/13/16	21:41
13	8468616MS	gg0585.d	07/13/16	22:05
14	8468616MSD	gg0586.d	07/13/16	22:28
15	8444067RE	gg0587.d	07/13/16	22:53
16	8457189	gg0588.d	07/13/16	23:17
17	8457193	gg0589.d	07/13/16	23:42
18	8457197	gg0590.d	07/14/16	00:07

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gg0570.d DFTPP Injection Date: 07/13/16

Instrument ID: HP11165 DFTPP Injection Time: 15:36

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.0
68	Less than 2.0% of mass 69	0.91 (1.95)1
69	Mass 69 relative abundance	46.8
70	Less than 2.0% of mass 69	0.35 (0.75)1
127	10.0 - 80.00% of mass 198	44.6
197	Less than 2.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.82
275	10.0 - 60.0% of mass 198	23.9
365	Greater than 1.00% of mass 198	2.35
441	Present, and less than mass 443	9.21
442	Greater than 50.00% of mass 198	65.2
443	15.00 - 24.00% of mass 442	12.6 (19.4)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8457201	gg0591.d	07/14/16	00:32
20	8457205	gg0592.d	07/14/16	00:57
21	8457209	gg0593.d	07/14/16	01:22
22	8466599	gg0594.d	07/14/16	01:48
23	8466599MS	gg0595.d	07/14/16	02:13
24	8466599MSD	gg0596.d	07/14/16	02:39
25	8466590	gg0598.d	07/14/16	03:30

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lf0790.d DFTPP Injection Date: 06/23/16

Instrument ID: HP20296 DFTPP Injection Time: 07:14

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	49.9
68	Less than 2.0% of mass 69	0.81 (1.71)1
69	Mass 69 relative abundance	47.4
70	Less than 2.0% of mass 69	0.23 (0.49)1
127	40.0 - 60.0% of mass 198	47.4
197	Less than 1.0% of mass 198	1.17
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.66
275	10.0 - 30.0% of mass 198	20.2
365	Greater than 1.00% of mass 198	1.96
441	Present, and less than mass 443	9.19
442	Greater than 40.0 % of mass 198	54.7
443	17.0 - 23.0% of mass 442	10.7 (19.5)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	RVSTD1726 - SSTD7.5	lf0791.d	06/23/16	07:32
02	RVSTD1726 - SSTD.125	lf0792.d	06/23/16	08:05
03	RVSTD1726 - SSTD30	lf0793.d	06/23/16	08:33
04	RVSTD1726 - SSTD20	lf0794.d	06/23/16	09:01
05	RVSTD1726 - SSTD12.5	lf0795.d	06/23/16	09:30
06	RVSTD1726 - SSTD3.75	lf0796.d	06/23/16	09:58
07	RVSTD1726 - SSTD1.25	lf0797.d	06/23/16	10:26
08	RVSTD1726 - SSTD.25	lf0798.d	06/23/16	10:54
09	MDLSTD1726 - SSTD0.125	lf0799.d	06/23/16	11:22
10	PAHMDL1726 - SSTD0.025	lf0800.d	06/23/16	11:51
11	RVICV1376 - SSTD12.5	lf0801.d	06/23/16	12:19
12	RVBASICV0716 - SSTD12.5	lf0802.d	06/23/16	12:47
13	SBLKWE171	lf0803.d	06/23/16	13:21
14	171WELCS	lf0804.d	06/23/16	13:49
15	8429288	lf0805.d	06/23/16	14:17
16	8429289MS	lf0806.d	06/23/16	14:46
17	8429290MSD	lf0807.d	06/23/16	15:14
18	8429286	lf0808.d	06/23/16	15:42

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lf0790.d DFTPP Injection Date: 06/23/16

Instrument ID: HP20296 DFTPP Injection Time: 07:14

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	49.9
68	Less than 2.0% of mass 69	0.81 (1.71)1
69	Mass 69 relative abundance	47.4
70	Less than 2.0% of mass 69	0.23 (0.49)1
127	40.0 - 60.0% of mass 198	47.4
197	Less than 1.0% of mass 198	1.17
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.66
275	10.0 - 30.0% of mass 198	20.2
365	Greater than 1.00% of mass 198	1.96
441	Present, and less than mass 443	9.19
442	Greater than 40.0 % of mass 198	54.7
443	17.0 - 23.0% of mass 442	10.7 (19.5)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8429287	lf0809.d	06/23/16	16:10
20	8429292	lf0810.d	06/23/16	16:38
21	8429293	lf0811.d	06/23/16	17:07
22	8429797	lf0812.d	06/23/16	17:35

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lg0230.d DFTPP Injection Date: 07/08/16

Instrument ID: HP20296 DFTPP Injection Time: 17:02

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	48.6
68	Less than 2.0% of mass 69	0.72 (1.57)1
69	Mass 69 relative abundance	46.1
70	Less than 2.0% of mass 69	0.19 (0.41)1
127	40.0 - 60.0% of mass 198	47.2
197	Less than 1.0% of mass 198	0.57
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.65
275	10.0 - 30.0% of mass 198	21.3
365	Greater than 1.00% of mass 198	1.95
441	Present, and less than mass 443	9.92
442	Greater than 40.0 % of mass 198	62.2
443	17.0 - 23.0% of mass 442	11.2 (18.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	RVSTD1726 - SSTD7.5	lg0231.d	07/08/16	17:15
02	RVCLB1836 - SSTD30	lg0232.d	07/08/16	17:44
03	rvCLB1836 - SSTD20	lg0233.d	07/08/16	18:16
04	rvCLB1836 - SSTD12.5	lg0234.d	07/08/16	18:44
05	rvCLB1836 - SSTD7.5	lg0235.d	07/08/16	19:13
06	rvCLB1836 - SSTD3.75	lg0236.d	07/08/16	19:41
07	rvCLB1836 - SSTD1.25	lg0237.d	07/08/16	20:10
08	rvCLB1836 - SSTD0.25	lg0238.d	07/08/16	20:38
09	SBLKWD178	lg0239.d	07/08/16	21:06
10	178WDLCS	lg0240.d	07/08/16	21:35
11	178WDLCSD	lg0241.d	07/08/16	22:03
12	178WDLCS1	lg0242.d	07/08/16	22:31
13	178WDLCSD1	lg0243.d	07/08/16	23:00
14	8438378	lg0244.d	07/08/16	23:28
15	8438379	lg0245.d	07/08/16	23:57
16	8442829	lg0246.d	07/09/16	00:25
17	8442830	lg0247.d	07/09/16	00:54
18	8442831	lg0248.d	07/09/16	01:22

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: lg0230.d DFTPP Injection Date: 07/08/16

Instrument ID: HP20296 DFTPP Injection Time: 17:02

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	48.6
68	Less than 2.0% of mass 69	0.72 (1.57)1
69	Mass 69 relative abundance	46.1
70	Less than 2.0% of mass 69	0.19 (0.41)1
127	40.0 - 60.0% of mass 198	47.2
197	Less than 1.0% of mass 198	0.57
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.65
275	10.0 - 30.0% of mass 198	21.3
365	Greater than 1.00% of mass 198	1.95
441	Present, and less than mass 443	9.92
442	Greater than 40.0 % of mass 198	62.2
443	17.0 - 23.0% of mass 442	11.2 (18.0)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8444113	lg0249.d	07/09/16	01:50
20	8444115	lg0250.d	07/09/16	02:19
21	8444116	lg0251.d	07/09/16	02:47
22	8445666	lg0252.d	07/09/16	03:15
23	8445667	lg0253.d	07/09/16	03:44

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
1,4-Dioxane			0.661	0.609	0.608	0.645	0.625	0.590	0.623	4	AVG
N-Nitrosodimethylamine				0.814	0.908	1.046	1.049	1.030	0.969	11	AVG
Pyridine			1.642	1.504	1.748	1.701	1.767	1.774	1.689	6	AVG
2-Picoline			1.434	1.697	1.787	1.862	1.767	1.837	1.731	9	AVG
N-Nitrosomethylethylamine			0.996	0.863	0.877	0.910	0.873	0.841	0.893	6	AVG
Methyl methanesulfonate			0.853	0.916	0.894	0.921	0.913	0.881	0.896	3	AVG
N-Nitrosodiethylamine		0.763	0.913	0.834	0.867	0.901	0.880	0.848	0.858	6	AVG
Ethyl methanesulfonate		0.916	0.865	0.817	0.841	0.835	0.844	0.811	0.847	4	AVG
Phenol		2.498	2.511	2.504	2.584	2.647	2.632	2.572	2.564	2	AVG
Aniline		2.670	2.981	2.889	2.948	2.951	2.973	2.876	2.898	4	AVG
a-methylstyrene			1.640	1.662	1.571	1.677	1.616	1.597	1.627	2	AVG
bis(2-Chloroethyl)ether		1.942	1.901	1.878	1.749	1.813	1.770	1.722	1.825	5	AVG
2-Chlorophenol		1.543	1.456	1.529	1.530	1.604	1.563	1.497	1.532	3	AVG
1,3-Dichlorobenzene		1.591	1.627	1.548	1.554	1.610	1.537	1.493	1.566	3	AVG
1,4-Dichlorobenzene		1.816	1.668	1.622	1.587	1.635	1.610	1.529	1.638	5	AVG
Benzyl alcohol		1.129	1.185	1.174	1.146	1.238	1.236	1.204	1.188	4	AVG
1,2-Dichlorobenzene		1.799	1.638	1.567	1.525	1.584	1.540	1.479	1.590	7	AVG
Indene			2.801	2.753	2.766	2.897	2.819	2.750	2.798	2	AVG
2-Methylphenol	1.623	1.431	1.595	1.614	1.608	1.638	1.648	1.582	1.592	4	AVG
2,2'-oxybis(1-Chloropropane)		2.473	2.029	1.950	1.918	1.988	1.959	1.907	2.032	10	AVG
bis(2-Chloroisopropyl)ether		2.473	2.029	1.950	1.918	1.988	1.959	1.907	2.032	10	AVG
N-Nitrosopyrrolidine		0.954	0.829	0.922	0.952	1.018	1.014	0.953	0.949	7	AVG
Acetophenone		2.132	2.508	2.368	2.457	2.572	2.565	2.453	2.436	6	AVG
4-Methylphenol		1.679	1.832	1.976	1.889	1.992	1.974	1.930	1.896	6	AVG
Total Cresols		1.555	1.713	1.795	1.749	1.815	1.811	1.756	1.742	5	AVG
N-Nitroso-di-n-propylamine		1.571	1.638	1.584	1.570	1.617	1.588	1.537	1.586	2	AVG
N-Nitrosomorpholine			1.089	1.099	1.133	1.145	1.192	1.107	1.128	3	AVG
o-Toluidine		2.454	2.820	2.904	2.790	2.856	2.849	2.783	2.780	5	AVG
Hexachloroethane			0.623	0.583	0.622	0.620	0.583	0.569	0.600	4	AVG
Nitrobenzene		0.476	0.509	0.494	0.494	0.497	0.482	0.490	0.492	2	AVG
N-Nitrosopiperidine		0.167	0.212	0.201	0.213	0.217	0.205	0.210	0.204	8	AVG
Isophorone		0.920	0.938	0.895	0.895	0.902	0.885	0.887	0.903	2	AVG
2-Nitrophenol		0.201	0.190	0.203	0.211	0.212	0.208	0.208	0.205	4	AVG
2,4-Dimethylphenol	0.429	0.354	0.402	0.431	0.413	0.430	0.406	0.414	0.410	6	AVG
O,O,O-Triethylphosphorothioate			0.201	0.182	0.186	0.185	0.181	0.183	0.186	4	AVG
bis(2-Chloroethoxy)methane		0.524	0.542	0.513	0.520	0.498	0.505	0.488	0.513	3	AVG
Benzoic acid			0.372	0.354	0.432	0.429	0.419	0.459	0.411	10	AVG
1,2,3,4-Tetrahydronaphthalene			0.580	0.562	0.591	0.578	0.574	0.591	0.580	2	AVG
2,4-Dichlorophenol		0.280	0.303	0.317	0.319	0.315	0.307	0.314	0.308	4	AVG
1,2,4-Trichlorobenzene			0.321	0.308	0.317	0.323	0.308	0.312	0.315	2	AVG
Naphthalene	1.073	1.130	1.100	1.090	1.071	1.093	1.060	1.088	1.088	2	AVG
4-Chloroaniline		0.434	0.490	0.464	0.497	0.478	0.471	0.493	0.475	5	AVG
2,6-Dichlorophenol		0.289	0.310	0.317	0.308	0.312	0.307	0.312	0.308	3	AVG
Hexachloropropene			0.146	0.154	0.160	0.156	0.155	0.163	0.156	4	AVG
Hexachlorobutadiene	0.163	0.160	0.152	0.151	0.150	0.155	0.145	0.146	0.153	4	AVG
Quinoline			0.788	0.766	0.754	0.772	0.766	0.750	0.766	2	AVG
Caprolactam			0.177	0.155	0.170	0.172	0.175	0.161	0.168	5	AVG
N-Nitrosodi-n-butylamine		0.440	0.384	0.425	0.456	0.449	0.443		0.433	6	AVG
4-Chloro-3-methylphenol		0.361	0.389	0.386	0.399	0.397	0.392	0.385	0.387	3	AVG
Safrole			0.290	0.291	0.297	0.300	0.297	0.299	0.296	1	AVG
2-Methylnaphthalene	0.930	0.743	0.821	0.779	0.786	0.781	0.771	0.764	0.797	7	AVG
1-Methylnaphthalene	0.790	0.724	0.767	0.716	0.729	0.734	0.716	0.714	0.736	4	AVG

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
Hexachlorocyclopentadiene			0.182	0.201	0.227	0.225	0.226	0.237	0.216	10	AVG
1,2,4,5-Tetrachlorobenzene		0.471	0.481	0.479	0.459	0.475	0.458	0.466	0.470	2	AVG
cis-Isosafrole			0.426	0.475	0.528	0.467	0.486	0.494	0.479	7	AVG
2,4,6-Trichlorophenol		0.356	0.344	0.369	0.355	0.361	0.357	0.362	0.358	2	AVG
2,4,5-Trichlorophenol		0.323	0.399	0.437	0.398	0.400	0.394	0.399	0.393	9	AVG
trans-Isosafrole			0.515	0.525	0.539	0.545	0.528	0.530	0.530	2	AVG
Isosafrole			0.500	0.517	0.537	0.531	0.521	0.524	0.522	2	AVG
1,1'-Biphenyl		1.509	1.513	1.485	1.496	1.516	1.510	1.498	1.504	1	AVG
2-Chloronaphthalene		1.134	1.134	1.117	1.286	1.154	1.043	1.173	1.149	6	AVG
1-Chloronaphthalene		1.017	1.164	1.204	1.091	1.081	1.157	1.039	1.107	6	AVG
Diphenyl ether		0.802	0.792	0.826	0.785	0.822	0.782	0.795	0.801	2	AVG
2-Nitroaniline		0.292	0.372	0.427	0.417	0.438	0.428	0.431	0.400	13	AVG
1,4-Naphthoquinone			0.466	0.515	0.533	0.530	0.519	0.510	0.512	5	AVG
1,4-Dinitrobenzene			0.183	0.218	0.216	0.234	0.235	0.239	0.221	9	AVG
Dimethylphthalate			1.468	1.426	1.371	1.375	1.363	1.328	1.389	4	AVG
1,3-Dinitrobenzene			0.228	0.250	0.248	0.259	0.258	0.258	0.250	5	AVG
2,6-Dinitrotoluene		0.256	0.329	0.338	0.328	0.341	0.330	0.337	0.323	9	AVG
Acenaphthylene	1.766	1.891	1.819	1.873	1.829	1.853	1.798	1.816	1.831	2	AVG
3-Nitroaniline		0.249	0.345	0.397	0.388	0.383	0.379	0.374	0.359	14	AVG
Acenaphthene	1.347	1.248	1.251	1.244	1.166	1.210	1.191	1.190	1.231	5	AVG
2,4-Dinitrophenol			0.200	0.227	0.236	0.239	0.247	0.252	0.234	8	AVG
4-Nitrophenol			0.203	0.215	0.211	0.221	0.212	0.238	0.217	5	AVG
Pentachlorobenzene		0.461	0.439	0.412	0.404	0.417	0.402	0.402	0.420	5	AVG
2,4-Dinitrotoluene			0.452	0.472	0.446	0.444	0.459	0.451	0.454	2	AVG
2,4_2,6-Dinitrotoluenes			0.390	0.405	0.387	0.393	0.395	0.394	0.394	2	AVG
Dibenzofuran		1.733	1.820	1.793	1.716	1.709	1.691	1.674	1.734	3	AVG
1-Naphthylamine			1.385	1.412	1.369	1.388	1.368	1.385	1.385	1	AVG
2,3,4,6-Tetrachlorophenol		0.282	0.316	0.333	0.308	0.316	0.310	0.308	0.311	5	AVG
2-Naphthylamine			1.353	1.408	1.356	1.382	1.336	1.353	1.365	2	AVG
Diethylphthalate			1.376	1.424	1.347	1.369	1.358	1.330	1.367	2	AVG
Thionazin			0.278	0.290	0.283	0.282	0.280	0.270	0.280	2	AVG
Fluorene	1.329	1.374	1.508	1.477	1.396	1.435	1.395	1.388	1.413	4	AVG
4-Chlorophenyl-phenylether		0.741	0.638	0.681	0.655	0.654	0.634	0.634	0.663	6	AVG
5-Nitro-o-toluidine		0.336	0.462	0.473	0.453	0.445	0.443	0.440	0.436	10	AVG
4-Nitroaniline		0.377	0.436	0.451	0.422	0.434	0.420	0.396	0.419	6	AVG
4,6-Dinitro-2-methylphenol			0.129	0.134	0.144	0.157	0.156	0.159	0.147	9	AVG
N-Nitrosodiphenylamine (1)	0.672	0.633	0.660	0.655	0.640	0.678	0.664	0.660	0.658	2	AVG
NDPA as diphenylamine	0.672	0.633	0.660	0.655	0.640	0.678	0.664	0.660	0.658	2	AVG
1,2-Diphenylhydrazine		0.965	0.859	0.869	0.879	0.922	0.909	0.898	0.900	4	AVG
Tetraethyldithiopyrophosphate			0.111	0.122	0.131	0.126	0.127	0.123	0.123	6	AVG
1,3,5-Trinitrobenzene			0.062	0.081	0.087	0.095	0.098	0.102	0.087	17	AVG
Diallate (peak 1)			0.407	0.394	0.401	0.410	0.404	0.411	0.405	2	AVG
Phorate		0.475	0.493	0.534	0.546	0.568	0.568	0.571	0.536	7	AVG
Phenacetin		0.384	0.433	0.431	0.441	0.439	0.437	0.433	0.428	5	AVG
4-Bromophenyl-phenylether			0.161	0.181	0.168	0.183	0.177	0.179	0.175	5	AVG
Diallate (peak 2)			0.396	0.393	0.394	0.398	0.404	0.380	0.394	2	AVG
Diallate trans/cis			0.405	0.393	0.400	0.408	0.404	0.406	0.403	1	AVG
Hexachlorobenzene	0.163	0.210	0.168	0.168	0.168	0.183	0.171	0.175	0.176	9	AVG
Dimethoate			0.337	0.370	0.373	0.386	0.358	0.360	0.364	5	AVG
Pentachlorophenol			0.129	0.126	0.129	0.133	0.130	0.133	0.130	2	AVG
4-Aminobiphenyl		0.591	0.617	0.628	0.582	0.545	0.517		0.580	7	AVG
Pentachloronitrobenzene			0.080	0.070	0.068	0.073	0.075	0.074	0.073	5	AVG

(1) Cannot be separated from Diphenylamine
4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
Pronamide		0.300	0.294	0.309	0.322	0.330	0.326	0.324	0.315	4	AVG
Dinoseb			0.127	0.167	0.199	0.209	0.210	0.220	0.189	19	AVG
Phenanthrene	1.139	1.246	1.133	1.125	1.078	1.147	1.121	1.113	1.138	4	AVG
Anthracene	1.028	1.067	1.106	1.130	1.117	1.167	1.130	1.131	1.109	4	AVG
Carbazole		1.078	1.087	1.104	1.060	1.130	1.104	1.084	1.093	2	AVG
Methyl parathion			0.212	0.252	0.274	0.278	0.265	0.268	0.258	9	AVG
Di-n-butylphthalate			1.182	1.219	1.241	1.299	1.288	1.249	1.246	3	AVG
Parathion			0.143	0.157	0.164	0.169	0.168	0.172	0.162	7	AVG
4-Nitroquinoline-1-oxide				0.096	0.109	0.128	0.122	0.131	0.117	13	AVG
Octachlorostyrene			0.064	0.056	0.059	0.062	0.062	0.062	0.061	5	AVG
Isodrin		0.124	0.112	0.114	0.114	0.120	0.119	0.117	0.117	3	AVG
Fluoranthene	1.202	1.134	1.183	1.214	1.157	1.244	1.203	1.176	1.189	3	AVG
Benzidine			0.764	0.791	0.829	0.835	0.805	0.830	0.809	3	AVG
Pyrene	1.307	1.304	1.180	1.158	1.143	1.121	1.120	1.140	1.184	7	AVG
p-Dimethylaminoazobenzene		0.148	0.182	0.200	0.216	0.220	0.222	0.224	0.202	14	AVG
Chlorobenzilate		0.304	0.320	0.323	0.337	0.329	0.326	0.332	0.325	3	AVG
3,3'-Dimethylbenzidine			0.612	0.602	0.641	0.666	0.623	0.760	0.651	9	AVG
Butylbenzylphthalate			0.491	0.501	0.538	0.527	0.521	0.529	0.518	4	AVG
2-Acetylaminofluorene			0.426	0.478	0.496	0.483	0.494	0.490	0.478	5	AVG
3,3'-Dichlorobenzidine			0.373	0.374	0.388	0.377	0.373	0.372	0.376	2	AVG
4,4'-Methylenebis(2-chloroani1			0.196	0.192	0.205	0.199	0.195	0.198	0.197	2	AVG
Benzo(a)anthracene	0.926	0.979	1.060	1.029	1.056	1.033	1.023	0.999	1.013	4	AVG
Chrysene	1.157	1.078	1.012	0.984	0.978	0.976	0.960	0.965	1.014	7	AVG
bis(2-Ethylhexyl)phthalate			0.675	0.692	0.747	0.722	0.722	0.731	0.715	4	AVG
6-Methylchrysene			0.699	0.680	0.708	0.709	0.703	0.704	0.701	2	AVG
Di-n-octylphthalate			1.309	1.474	1.724	1.689	1.628	1.706	1.588	10	AVG
Benzo(b)fluoranthene	1.166	1.232	1.250	1.298	1.277	1.304	1.293	1.273	1.262	4	AVG
7,12-Dimethylbenz[a]anthracene		0.470	0.533	0.601	0.657	0.640	0.597	0.622	0.589	11	AVG
Benzo(k)fluoranthene	1.118	1.171	1.253	1.264	1.360	1.318	1.206	1.263	1.244	6	AVG
Benzo(a)pyrene	0.967	1.131	1.198	1.237	1.245	1.262	1.206	1.200	1.181	8	AVG
3-Methylcholanthrene		0.489	0.481	0.514	0.538	0.558	0.526	0.535	0.520	5	AVG
Dibenz(a,h)acridine			0.808	0.833	0.948	0.952	0.923	0.925	0.898	7	AVG
Dibenz(a,j)acridine			0.920	0.898	1.020	0.985	0.934	0.953	0.951	5	AVG
Indeno(1,2,3-cd)pyrene	1.011	1.089	1.195	1.252	1.307	1.302	1.250	1.250	1.207	9	AVG
Dibenz(a,h)anthracene	0.944	0.963	1.028	1.044	1.106	1.097	1.066	1.047	1.037	6	AVG
Benzo(g,h,i)perylene	0.902	1.042	1.027	1.036	1.098	1.056	1.044	1.032	1.030	5	AVG
Total PAHs	1.053	1.061	1.107	1.132	1.177	1.182	1.129	1.171	1.127	4	AVG
2-Fluorophenol			1.506	1.494	1.480	1.544	1.493	1.458	1.496	2	AVG
Phenol-d6			2.191	2.221	2.188	2.236	2.265	2.182	2.214	1	AVG
Nitrobenzene-d5			0.475	0.466	0.475	0.482	0.465	0.470	0.472	1	AVG
2-Fluorobiphenyl			1.314	1.317	1.279	1.294	1.261	1.265	1.288	2	AVG
2,4,6-Tribromophenol			0.142	0.146	0.141	0.145	0.141	0.138	0.142	2	AVG
Terphenyl-d14			0.754	0.747	0.738	0.725	0.717	0.713	0.732	2	AVG

Average %RSD 5

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d SSTD030
/chem/HP11165.i/16jun07.b/gf0202.d SSTD120
/chem/HP11165.i/16jun07.b/gf0203.d SSTD080
/chem/HP11165.i/16jun07.b/gf0204.d SSTD050
/chem/HP11165.i/16jun07.b/gf0205.d SSTD015
/chem/HP11165.i/16jun07.b/gf0206.d SSTD005
/chem/HP11165.i/16jun07.b/gf0207.d SSTD001
/chem/HP11165.i/16jun07.b/gf0208.d SSTD00.5

Area Summary

	File ID:									
Internal Standard Name	gf0201.d	gf0202.d	gf0203.d	gf0204.d	gf0205.d	gf0206.d	gf0207.d	gf0208.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	70096	80056	69946	73872	74388	75855	70518	68894	72953	5	Yes
Naphthalene-d8	296116	339990	315991	325835	322701	324878	300737	292985	314904	5	Yes
Acenaphthene-d10	192522	219303	205887	212735	203039	209044	189605	188690	202603	6	Yes
Phenanthrene-d10	374023	412819	389703	400814	413018	417859	369222	370475	393492	5	Yes
Pyrene-d10	404786	440349	432286	456203	461359	456027	416814	425673	436687	5	Yes
Perylene-d12	301130	329460	331473	334394	351858	365369	345528	338486	337212	6	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:								
Internal Standard Name	gf0201.d	gf0202.d	gf0203.d	gf0204.d	gf0205.d	gf0206.d	gf0207.d	gf0208.d	Avg. RT
1,4-Dichlorobenzene-d4	5.528	5.534	5.534	5.534	5.528	5.528	5.528	5.528	5.530
Naphthalene-d8	6.763	6.763	6.763	6.763	6.763	6.763	6.763	6.763	6.763
Acenaphthene-d10	8.475	8.475	8.475	8.475	8.475	8.469	8.475	8.469	8.473
Phenanthrene-d10	9.922	9.927	9.928	9.922	9.922	9.922	9.922	9.922	9.923
Pyrene-d10	11.310	11.310	11.310	11.310	11.304	11.304	11.304	11.304	11.307
Perylene-d12	13.939	13.945	13.945	13.945	13.939	13.939	13.939	13.939	13.941

Comments: _____

Report generated on 06/07/2016 at 18:24

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,4-Dioxane	50.00	53.67	7	30	YES
N-Nitrosodimethylamine	50.00	51.70	3	30	YES
Pyridine	50.00	55.26	11	30	YES
2-Picoline	50.00	51.90	4	30	YES
N-Nitrosomethylethylamine	50.00	41.43	-17	30	YES
Methyl methanesulfonate	50.00	52.74	5	30	YES
N-Nitrosodiethylamine	50.00	48.88	-2	30	YES
Ethyl methanesulfonate	50.00	49.75	-1	30	YES
Phenol	50.00	50.98	2	30	YES
Aniline	50.00	48.42	-3	30	YES
bis(2-Chloroethyl)ether	50.00	48.81	-2	30	YES
2-Chlorophenol	50.00	52.08	4	30	YES
1,3-Dichlorobenzene	50.00	52.08	4	30	YES
1,4-Dichlorobenzene	50.00	51.06	2	30	YES
Benzyl alcohol	50.00	51.04	2	30	YES
1,2-Dichlorobenzene	50.00	49.45	-1	30	YES
Indene	50.00	49.46	-1	30	YES
2-Methylphenol	50.00	53.12	6	30	YES
2,2'-oxybis(1-Chloropropane	50.00	51.97	4	30	YES
bis(2-Chloroisopropyl)ether	50.00	51.97	4	30	YES
N-Nitrosopyrrolidine	50.00	49.17	-2	30	YES
Acetophenone	50.00	49.36	-1	30	YES
4-Methylphenol	50.00	51.50	3	30	YES
N-Nitroso-di-n-propylamine	50.00	49.22	-2	30	YES
N-Nitrosomorpholine	50.00	50.77	2	30	YES
o-Toluidine	50.00	49.28	-1	30	YES
Total Cresols	100.00	104.63	5	30	YES
Hexachloroethane	50.00	50.96	2	30	YES
Nitrobenzene	50.00	48.91	-2	30	YES
N-Nitrosopiperidine	50.00	48.00	-4	30	YES
Isophorone	50.00	46.64	-7	30	YES
2-Nitrophenol	50.00	49.47	-1	30	YES
2,4-Dimethylphenol	50.00	45.31	-9	30	YES
bis(2-Chloroethoxy)methane	50.00	48.38	-3	30	YES
Benzoic acid	100.00	94.14	-6	30	YES
O,O,O-Triethylphosphorothio	50.00	46.81	-6	30	YES
2,4-Dichlorophenol	50.00	50.24	0	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,2,4-Trichlorobenzene	50.00	50.78	2	30	YES
Naphthalene	50.00	49.34	-1	30	YES
4-Chloroaniline	50.00	50.91	2	30	YES
2,6-Dichlorophenol	50.00	49.38	-1	30	YES
Hexachloropropene	50.00	53.33	7	30	YES
Hexachlorobutadiene	50.00	49.70	-1	30	YES
Quinoline	50.00	47.91	-4	30	YES
N-Nitrosodi-n-butylamine	50.00	36.21	-28	30	YES
4-Chloro-3-methylphenol	50.00	48.54	-3	30	YES
Safrole	50.00	49.09	-2	30	YES
2-Methylnaphthalene	50.00	46.43	-7	30	YES
1-Methylnaphthalene	50.00	46.31	-7	30	YES
Hexachlorocyclopentadiene	100.00	90.59	-9	30	YES
1,2,4,5-Tetrachlorobenzene	50.00	50.80	2	30	YES
cis-Isosafrole	6.00	6.25	4	30	YES
2,4,6-Trichlorophenol	50.00	49.91	0	30	YES
2,4,5-Trichlorophenol	50.00	51.15	2	30	YES
trans-Isosafrole	44.00	46.22	5	30	YES
1,1'-Biphenyl	50.00	48.75	-3	30	YES
2-Chloronaphthalene	50.00	50.26	1	30	YES
Isosafrole	50.00	52.47	5	30	YES
1-Chloronaphthalene	50.00	49.36	-1	30	YES
Diphenyl ether	50.00	49.24	-2	30	YES
2-Nitroaniline	50.00	52.74	5	30	YES
1,4-Naphthoquinone	62.50	58.31	-7	30	YES
1,4-Dinitrobenzene	50.00	51.33	3	30	YES
Dimethylphthalate	50.00	48.55	-3	30	YES
1,3-Dinitrobenzene	50.00	50.59	1	30	YES
2,6-Dinitrotoluene	50.00	52.28	5	30	YES
Acenaphthylene	50.00	43.69	-13	30	YES
3-Nitroaniline	50.00	52.01	4	30	YES
Acenaphthene	50.00	48.87	-2	30	YES
2,4-Dinitrophenol	100.00	100.32	0	30	YES
4-Nitrophenol	50.00	52.72	5	30	YES
Pentachlorobenzene	50.00	49.86	0	30	YES
2,4-Dinitrotoluene	50.00	50.32	1	30	YES
Dibenzofuran	50.00	48.44	-3	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
2,4_2,6-Dinitrotoluenes	100.00	102.60	3	30	YES
1-Naphthylamine	100.00	94.52	-5	30	YES
2,3,4,6-Tetrachlorophenol	50.00	54.18	8	30	YES
2-Naphthylamine	100.00	91.56	-8	30	YES
Diethylphthalate	50.00	48.98	-2	30	YES
Thionazin	50.00	41.55	-17	30	YES
Fluorene	50.00	51.88	4	30	YES
4-Chlorophenyl-phenylether	50.00	49.68	-1	30	YES
5-Nitro-o-toluidine	50.00	50.51	1	30	YES
4-Nitroaniline	50.00	47.08	-6	30	YES
4,6-Dinitro-2-methylphenol	50.00	50.51	1	30	YES
N-Nitrosodiphenylamine	50.00	48.76	-2	30	YES
NDPA as diphenylamine	50.00	48.76	-2	30	YES
1,2-Diphenylhydrazine	50.00	48.83	-2	30	YES
Tetraethyldithiopyrophospha	50.00	46.53	-7	30	YES
1,3,5-Trinitrobenzene	50.00	49.05	-2	30	YES
Diallate (peak 1)	37.50	33.84	-10	30	YES
Phorate	50.00	49.55	-1	30	YES
Phenacetin	50.00	47.14	-6	30	YES
4-Bromophenyl-phenylether	50.00	49.76	0	30	YES
Diallate (peak 2)	12.50	11.62	-7	30	YES
Hexachlorobenzene	50.00	48.55	-3	30	YES
Diallate trans/cis	50.00	45.47	-9	30	YES
Dimethoate	50.00	44.62	-11	30	YES
Pentachlorophenol	50.00	52.02	4	30	YES
4-Aminobiphenyl	50.00	67.10	34	30	NO*
Pentachloronitrobenzene	50.00	47.02	-6	30	YES
Pronamide	50.00	47.53	-5	30	YES
Dinoseb	50.00	52.71	5	30	YES
Phenanthrene	50.00	47.06	-6	30	YES
Anthracene	50.00	49.49	-1	30	YES
Carbazole	50.00	48.06	-4	30	YES
Methyl parathion	50.00	47.81	-4	30	YES
Di-n-butylphthalate	50.00	48.97	-2	30	YES
Parathion	50.00	50.59	1	30	YES
4-Nitroquinoline-1-oxide	600.00	770.14	28	30	YES
Isodrin	50.00	46.43	-7	30	YES

NC = Could not calculate

Comments: *APPIX compound. Rerun any samples with hits for 4-Aminobiphenyl under valid ICV.

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Fluoranthene	50.00	49.03	-2	30	YES
Benzidine	250.00	248.93	0	30	YES
Pyrene	50.00	47.76	-4	30	YES
p-Dimethylaminoazobenzene	50.00	59.50	19	30	YES
Chlorobenzilate	50.00	49.10	-2	30	YES
3,3'-Dimethylbenzidine	100.00	104.27	4	30	YES
Butylbenzylphthalate	50.00	52.12	4	30	YES
2-Acetylaminofluorene	50.00	49.76	0	30	YES
3,3'-Dichlorobenzidine	50.00	47.12	-6	30	YES
Benzo(a)anthracene	50.00	51.44	3	30	YES
Chrysene	50.00	49.83	0	30	YES
4,4'-Methylenebis(2-chloroa	50.00	47.77	-4	30	YES
bis(2-Ethylhexyl)phthalate	50.00	50.47	1	30	YES
6-Methylchrysene	50.00	49.29	-1	30	YES
Di-n-octylphthalate	50.00	54.60	9	30	YES
Benzo(b)fluoranthene	50.00	53.49	7	30	YES
7,12-Dimethylbenz[a]anthrac	50.00	54.14	8	30	YES
Benzo(k)fluoranthene	50.00	57.36	15	30	YES
Benzo(a)pyrene	50.00	52.95	6	30	YES
3-Methylcholanthrene	50.00	63.50	27	30	YES
Dibenz(a,h)acridine	50.00	50.97	2	30	YES
Dibenz(a,j)acridine	50.00	50.12	0	30	YES
Indeno(1,2,3-cd)pyrene	50.00	56.11	12	30	YES
Dibenz(a,h)anthracene	50.00	55.58	11	30	YES
Benzo(g,h,i)perylene	50.00	54.71	9	30	YES
Total PAHs	900.00	911.32	1	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP1ll65

Method: SW-846 8270D File ID: gf0212.d

ICV SAMPLE ID: ICVBAS0716 BATCH: 16JUN07026 Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Caprolactam	50.00	44.50	-11	30	YES

NC = Could not calculate

Comments: _____

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/28/16 06/28/16

Calibration Times: 07:48 09:58

LAB FILE ID: RRF5 = gf1007.d RRF15 = gf1006.d

RRF30 = gf1005.d RRF50 = gf1004.d RRF80 = gf1003.d RRF120 = gf1002.d

COMPOUND	RRF	RRF	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
2-Chlorobenzalmalononitrile			0.373	0.369	0.378	0.374	0.376	0.382	0.375	1	AVG
								Average %RSD		1	

07-12-2016

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun28.b/gf1002.d SSTD120
/chem/HP11165.i/16jun28.b/gf1003.d SSTD080
/chem/HP11165.i/16jun28.b/gf1004.d SSTD050
/chem/HP11165.i/16jun28.b/gf1005.d SSTD030
/chem/HP11165.i/16jun28.b/gf1006.d SSTD015
/chem/HP11165.i/16jun28.b/gf1007.d SSTD005

Area Summary

	File ID:								
Internal Standard Name	gf1002.d	gf1003.d	gf1004.d	gf1005.d	gf1006.d	gf1007.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	69353	75067	81429	77374	76768	84981	77495	7	Yes
Naphthalene-d8	300636	313602	337965	327580	320228	357147	326193	6	Yes
Acenaphthene-d10	200693	208546	226613	225158	220824	240109	220324	6	Yes
Phenanthrene-d10	415370	427022	462700	443931	443085	487450	446593	6	Yes
Pyrene-d10	497800	513778	536406	523166	517538	581064	528292	5	Yes
Perylene-d12	427018	435295	432549	423115	415118	448269	430227	3	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:						
Internal Standard Name	gf1002.d	gf1003.d	gf1004.d	gf1005.d	gf1006.d	gf1007.d	Avg. RT
1,4-Dichlorobenzene-d4	5.151	5.151	5.152	5.151	5.151	5.151	5.151
Naphthalene-d8	6.387	6.386	6.387	6.386	6.381	6.381	6.385
Acenaphthene-d10	8.087	8.086	8.087	8.086	8.086	8.087	8.086
Phenanthrene-d10	9.528	9.527	9.528	9.527	9.528	9.528	9.528
Pyrene-d10	10.904	10.904	10.898	10.898	10.898	10.898	10.900
Perylene-d12	13.480	13.480	13.480	13.480	13.480	13.480	13.480

Comments: _____

Report generated on 06/28/2016 at 16:24

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 07/05/16 07/05/16

Calibration Times: 07:13 09:20

LAB FILE ID: RRF5 = gg0168.d RRF15 = gg0167.d
RRF30 = gg0166.d RRF50 = gg0165.d RRF80 = gg0164.d RRF120 = gg0163.d

COMPOUND	RRF	RRF	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	RRF	% RSD	CAL. METHOD
2-Chlorobenzaldehyde			0.224	0.263	0.256	0.265	0.267	0.270	0.257	7	AVG
								Average %RSD		4	

07-05-2016

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jul05.b/gg0163.d SSTD120
/chem/HP11165.i/16jul05.b/gg0164.d SSTD080
/chem/HP11165.i/16jul05.b/gg0165.d SSTD050
/chem/HP11165.i/16jul05.b/gg0166.d SSTD030
/chem/HP11165.i/16jul05.b/gg0167.d SSTD015
/chem/HP11165.i/16jul05.b/gg0168.d SSTD005

Area Summary

	File ID:								
Internal Standard Name	gg0163.d	gg0164.d	gg0165.d	gg0166.d	gg0167.d	gg0168.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	47137	51183	50572	51241	50923	52470	50588	4	Yes
Naphthalene-d8	201732	208877	212564	213177	210827	209380	209426	2	Yes
Acenaphthene-d10	131120	131752	132398	133283	131450	131673	131946	1	Yes
Phenanthrene-d10	259478	257521	267085	263821	257523	255200	260105	2	Yes
Pyrene-d10	300869	308649	314265	319659	311533	306987	310327	2	Yes
Perylene-d12	262779	280597	291691	282485	276925	275886	278394	3	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:						
Internal Standard Name	gg0163.d	gg0164.d	gg0165.d	gg0166.d	gg0167.d	gg0168.d	Avg. RT
1,4-Dichlorobenzene-d4	4.934	4.934	4.934	4.934	4.934	4.934	4.934
Naphthalene-d8	6.163	6.163	6.163	6.163	6.163	6.163	6.163
Acenaphthene-d10	7.857	7.857	7.857	7.857	7.857	7.857	7.857
Phenanthrene-d10	9.280	9.280	9.286	9.286	9.286	9.286	9.284
Pyrene-d10	10.645	10.645	10.645	10.645	10.645	10.645	10.645
Perylene-d12	13.186	13.186	13.186	13.186	13.186	13.186	13.186

Comments: _____

07-05-2015

Report generated on 07/05/2016 at 09:43

6B
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date(s): 06/23/16 06/23/16

Calibration Times: 07:32 10:54

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30%

LAB FILE ID:RRF0.125 = 1f0792.d RRF0.25 = 1f0798.d RRF1.25 = 1f0797.d RRF3.75 = 1f0796.d
RRF7.5 = 1f0791.d RRF12.5 = 1f0795.d RRF20 = 1f0794.d RRF30 = 1f0793.d

COMPOUND	RRF0.125	RRF0.25	RRF1.25	RRF3.75	RRF7.5	RRF12.5	RRF20	RRF30	$\overline{RRF}$	% RSD	CAL. METHOD
1,4-Dioxane			0.592	0.582	0.603	0.625	0.609	0.626	0.606	3	AVG
N-Nitrosodimethylamine			0.951	0.957	0.972	1.028	0.988	1.028	0.987	3	AVG
Pyridine			1.612	1.519	1.564	1.626	1.641	1.690	1.609	4	AVG
2-Picoline			1.822	1.727	1.718	1.803	1.702	1.773	1.758	3	AVG
N-Nitrosomethylethylamine			0.691	0.683	0.689	0.716	0.694	0.720	0.699	2	AVG
Methyl methanesulfonate			0.725	0.704	0.712	0.722	0.706	0.725	0.716	1	AVG
N-Nitrosodiethylamine		0.619	0.664	0.663	0.672	0.692	0.672	0.693	0.668	4	AVG
Ethyl methanesulfonate		0.731	0.744	0.680	0.697	0.705	0.671	0.696	0.703	4	AVG
Benzaldehyde			1.340	1.323	1.384	1.443	1.350	1.300	1.357	4	AVG
Phenol		2.194	2.222	2.146	2.142	2.194	2.080	2.146	2.161	2	AVG
Aniline		2.735	2.613	2.511	2.542	2.584	2.477	2.535	2.571	3	AVG
a-methylstyrene			1.370	1.408	1.710	1.442	1.577	1.321	1.471	10	AVG
bis(2-Chloroethyl)ether		1.664	1.696	1.579	1.574	1.588	1.497	1.555	1.593	4	AVG
2-Chlorophenol		1.280	1.307	1.347	1.323	1.381	1.317	1.337	1.328	2	AVG
1,3-Dichlorobenzene		1.596	1.558	1.482	1.480	1.501	1.410	1.465	1.499	4	AVG
1,4-Dichlorobenzene		1.791	1.580	1.524	1.467	1.525	1.442	1.485	1.545	8	AVG
Benzyl alcohol			0.919	0.926	1.104	0.948	1.037	0.869	0.967	9	AVG
1,2-Dichlorobenzene		1.499	1.500	1.431	1.426	1.433	1.363	1.397	1.436	3	AVG
Indene			2.324	2.400	2.901	2.462	2.683	2.278	2.508	10	AVG
2-Methylphenol		1.430	1.376	1.361	1.348	1.372	1.317	1.354	1.365	3	AVG
2,2'-oxybis(1-Chloropropane)		2.995	2.882	2.777	2.786	2.805	2.682	2.750	2.811	4	AVG
bis(2-Chloroisopropyl)ether		2.995	2.882	2.777	2.786	2.805	2.682	2.750	2.811	4	AVG
N-Nitrosopyrrolidine		0.705	0.676	0.721	0.716	0.760	0.734	0.746	0.723	4	AVG
Acetophenone		1.880	2.085	2.028	2.165	2.201	2.082	2.088	2.076	5	AVG
4-Methylphenol		1.375	1.607	1.562	1.440	1.446	1.390	1.425	1.464	6	AVG
Total Cresols		1.402	1.492	1.461	1.394	1.409	1.354	1.389	1.414	3	AVG
N-Nitroso-di-n-propylamine		1.188	1.202	1.154	1.169	1.184	1.138	1.163	1.171	2	AVG
N-Nitrosomorpholine			1.118	1.027	1.050	1.082	1.030	1.039	1.058	3	AVG
o-Toluidine		2.586	2.440	2.354	2.393	2.431	2.326	2.348	2.411	4	AVG
Hexachloroethane			0.612	0.599	0.609	0.621	0.597	0.610	0.608	1	AVG
Nitrobenzene		0.432	0.451	0.445	0.438	0.460	0.434	0.444	0.443	2	AVG
N-Nitrosopiperidine		0.178	0.176	0.171	0.170	0.181	0.172	0.174	0.175	2	AVG
Isophorone		0.799	0.772	0.773	0.773	0.810	0.783	0.795	0.787	2	AVG
2-Nitrophenol		0.127	0.167	0.168	0.170	0.184	0.178	0.179	0.167	11	AVG
2,4-Dimethylphenol		0.344	0.366	0.373	0.373	0.395	0.376	0.383	0.373	4	AVG
O,O,O-Triethylphosphorothioate			0.162	0.163	0.164	0.169	0.163	0.164	0.164	2	AVG
bis(2-Chloroethoxy)methane		0.509	0.488	0.490	0.481	0.504	0.466	0.483	0.489	3	AVG
Benzoic acid			0.124	0.207	0.256	0.298	0.309	0.298	0.249	29	1STDEG
1,2,3,4-Tetrahydronaphthalene			0.519	0.550	0.644	0.559	0.615	0.505	0.565	10	AVG
2,4-Dichlorophenol		0.253	0.281	0.285	0.276	0.291	0.281	0.282	0.278	4	AVG
1,2,4-Trichlorobenzene		0.351	0.309	0.312	0.311	0.328	0.304	0.313	0.318	5	AVG
Naphthalene	1.065	1.059	1.013	1.005	0.985	1.036	0.986	0.997	1.018	3	AVG
4-Chloroaniline		0.421	0.418	0.430	0.412	0.430	0.414	0.421	0.421	2	AVG
2,6-Dichlorophenol		0.236	0.263	0.266	0.261	0.281	0.268	0.267	0.263	5	AVG
Hexachloropropene			0.165	0.170	0.167	0.180	0.171	0.175	0.171	3	AVG
Hexachlorobutadiene		0.176	0.169	0.168	0.164	0.175	0.166	0.171	0.170	3	AVG
Quinoline			0.597	0.615	0.591	0.629	0.592	0.605	0.605	2	AVG
Caprolactam			0.081	0.090	0.093	0.099	0.093	0.093	0.092	6	AVG
N-Nitrosodi-n-butylamine			0.265	0.270	0.267	0.289	0.335	0.340	0.294	12	AVG
4-Chloro-3-methylphenol		0.299	0.306	0.323	0.319	0.340	0.325	0.330	0.320	4	AVG
Safrole			0.238	0.244	0.244	0.255	0.242	0.249	0.245	2	AVG
2-Methylnaphthalene	0.693	0.719	0.653	0.662	0.656	0.671	0.647	0.653	0.669	4	AVG

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date(s): 06/23/16 06/23/16

Calibration Times: 07:32 10:54

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30%

LAB FILE ID: RRF0.125 = 1f0792.d RRF0.25 = 1f0798.d RRF1.25 = 1f0797.d RRF3.75 = 1f0796.d
RRF7.5 = 1f0791.d RRF12.5 = 1f0795.d RRF20 = 1f0794.d RRF30 = 1f0793.d

COMPOUND	RRF0.125	RRF0.25	RRF1.25	RRF3.75	RRF7.5	RRF12.5	RRF20	RRF30	$\overline{RRF}$	% RSD	CAL. METHOD
1-Methylnaphthalene	0.548	0.614	0.594	0.592	0.585	0.614	0.581	0.592	0.590	4	AVG
Hexachlorocyclopentadiene			0.286	0.306	0.308	0.320	0.312	0.318	0.308	4	AVG
1,2,4,5-Tetrachlorobenzene		0.564	0.540	0.545	0.539	0.546	0.518	0.533	0.541	3	AVG
cis-Isosafrole			0.472	0.463	0.480	0.485	0.453	0.482	0.472	3	AVG
2,4,6-Trichlorophenol		0.332	0.328	0.350	0.352	0.370	0.347	0.372	0.350	5	AVG
2,4,5-Trichlorophenol		0.365	0.361	0.382	0.383	0.398	0.377	0.390	0.380	3	AVG
trans-Isosafrole			0.445	0.478	0.476	0.488	0.455	0.483	0.471	4	AVG
Isosafrole			0.450	0.475	0.477	0.488	0.455	0.483	0.471	3	AVG
1,1'-Biphenyl		1.331	1.335	1.363	1.432	1.457	1.375	1.383	1.382	3	AVG
2-Chloronaphthalene		1.120	1.099	1.153	1.167	1.186	1.114	1.184	1.146	3	AVG
1-Chloronaphthalene		1.138	1.105	1.030	1.008	1.025	1.009	1.007	1.046	5	AVG
Diphenyl ether		0.829	0.786	0.744	0.750	0.755	0.722	0.741	0.761	5	AVG
2-Nitroaniline		0.293	0.326	0.342	0.358	0.372	0.346	0.365	0.343	8	AVG
1,4-Naphthoquinone			0.395	0.428	0.452	0.480	0.456	0.461	0.445	7	AVG
1,4-Dinitrobenzene			0.140	0.168	0.178	0.180	0.175	0.186	0.171	9	AVG
Dimethylphthalate			1.216	1.238	1.225	1.237	1.156	1.203	1.213	3	AVG
1,3-Dinitrobenzene			0.170	0.189	0.192	0.197	0.192	0.203	0.191	6	AVG
2,6-Dinitrotoluene		0.241	0.281	0.274	0.276	0.285	0.268	0.280	0.272	5	AVG
Acenaphthylene	1.608	1.684	1.626	1.660	1.688	1.729	1.657	1.711	1.670	2	AVG
3-Nitroaniline		0.257	0.281	0.300	0.305	0.316	0.308	0.317	0.298	7	AVG
Acenaphthene	1.254	1.247	1.169	1.148	1.140	1.174	1.109	1.136	1.172	4	AVG
2,4-Dinitrophenol				0.145	0.151	0.170	0.172	0.181	0.164	9	AVG
4-Nitrophenol				0.188	0.179	0.217	0.206	0.216	0.201	8	AVG
Pentachlorobenzene		0.454	0.421	0.425	0.410	0.417	0.394	0.412	0.419	4	AVG
2,4-Dinitrotoluene			0.336	0.355	0.363	0.375	0.364	0.376	0.362	4	AVG
2,4_2,6-Dinitrotoluenes		0.291	0.308	0.315	0.320	0.330	0.316	0.328	0.315	4	AVG
Dibenzofuran		1.636	1.541	1.552	1.579	1.584	1.496	1.534	1.560	3	AVG
1-Naphthylamine				1.117	1.139	1.152	1.114	1.174	1.139	2	AVG
2,3,4,6-Tetrachlorophenol		0.217	0.255	0.260	0.272	0.278	0.272	0.281	0.262	8	AVG
2-Naphthylamine				1.109	1.091	1.124	1.094	1.155	1.115	2	AVG
Diethylphthalate			1.193	1.175	1.185	1.232	1.186	1.228	1.200	2	AVG
Thionazin			0.235	0.241	0.212	0.246	0.211	0.240	0.231	7	AVG
Fluorene	1.310	1.333	1.237	1.230	1.236	1.229	1.169	1.204	1.243	4	AVG
4-Chlorophenyl-phenylether		0.622	0.599	0.595	0.589	0.592	0.551	0.564	0.587	4	AVG
5-Nitro-o-toluidine		0.304	0.308	0.322	0.328	0.346	0.330	0.340	0.325	5	AVG
4-Nitroaniline		0.285	0.298	0.310	0.320	0.315	0.305	0.314	0.307	4	AVG
4,6-Dinitro-2-methylphenol				0.109	0.108	0.120	0.124	0.121	0.116	6	AVG
N-Nitrosodiphenylamine (1)		0.567	0.587	0.587	0.578	0.577	0.575	0.577	0.578	1	AVG
NDPA as diphenylamine		0.567	0.587	0.587	0.578	0.577	0.575	0.577	0.578	1	AVG
1,2-Diphenylhydrazine		0.808	0.824	0.840	0.829	0.836	0.825	0.822	0.826	1	AVG
Tetraethyldithiopyrophosphate			0.131	0.126	0.128	0.131	0.127	0.125	0.128	2	AVG
1,3,5-Trinitrobenzene				0.065	0.069	0.075	0.076	0.077	0.072	7	AVG
Diallate (peak 1)			0.357	0.352	0.345	0.350	0.349	0.347	0.350	1	AVG
Phorate		0.484	0.505	0.526	0.516	0.539	0.530	0.524	0.518	4	AVG
Phenacetin		0.282	0.350	0.375	0.373	0.393	0.392	0.383	0.364	11	AVG
4-Bromophenyl-phenylether		0.147	0.174	0.165	0.159	0.163	0.159	0.158	0.161	5	AVG
Diallate (peak 2)			0.315	0.346	0.348	0.344	0.342	0.346	0.340	4	AVG
Diallate trans/cis			0.350	0.351	0.346	0.349	0.348	0.347	0.349	1	AVG
Hexachlorobenzene	0.175	0.169	0.171	0.169	0.161	0.166	0.164	0.161	0.167	3	AVG
Dimethoate			0.304	0.329	0.324	0.337	0.336	0.324	0.326	4	AVG
Atrazine			0.173	0.183	0.180	0.184	0.176	0.159	0.176	5	AVG
Pentachlorophenol			0.081	0.099	0.105	0.112	0.111	0.111	0.103	11	AVG

(1) Cannot be separated from Diphenylamine
4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date(s): 06/23/16 06/23/16

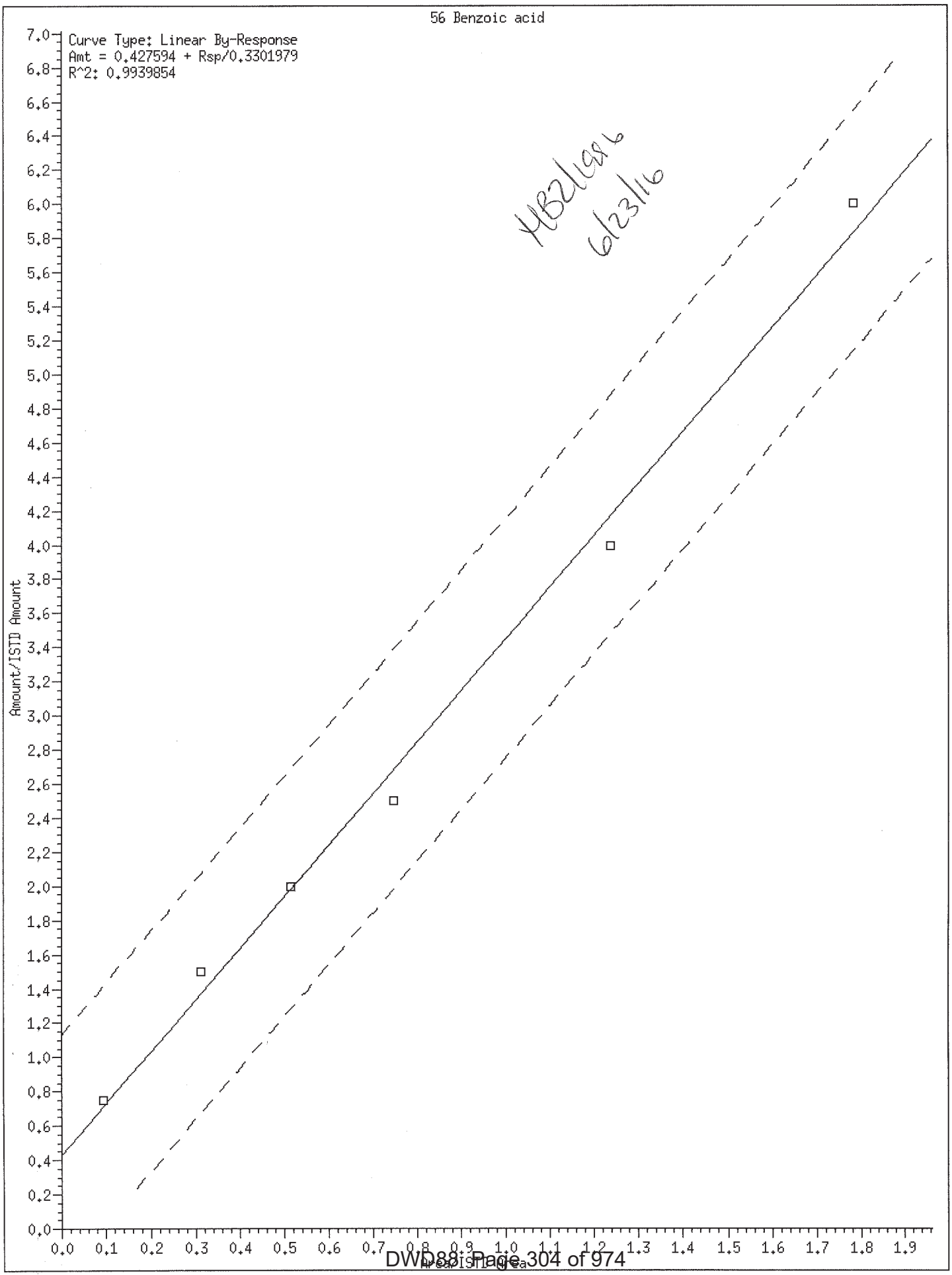
Calibration Times: 07:32 10:54

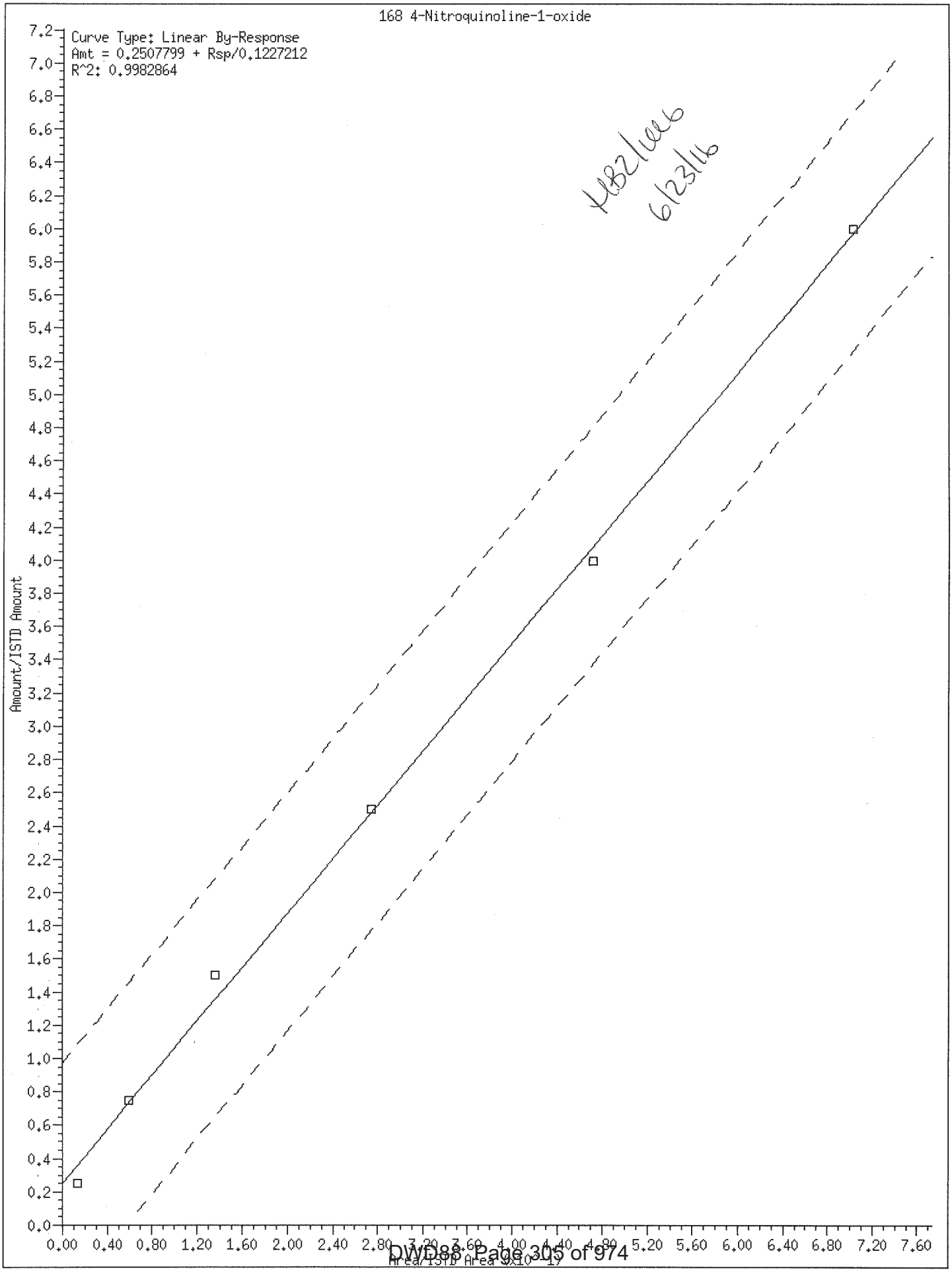
Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30%

LAB FILE ID:RRF0.125 = lf0792.d RRF0.25 = lf0798.d RRF1.25 = lf0797.d RRF3.75 = lf0796.d
RRF7.5 = lf0791.d RRF12.5 = lf0795.d RRF20 = lf0794.d RRF30 = lf0793.d

COMPOUND	RRF0.125	RF0.25	RRF1.25	RRF3.75	RRF7.5	RRF12.5	RRF20	RRF30	$\overline{RRF}$	% RSD	CAL. METHOD
4-Aminobiphenyl		0.314	0.330	0.340	0.338	0.354	0.341	0.325	0.335	4	AVG
Pentachloronitrobenzene			0.068	0.080	0.074	0.077	0.077	0.075	0.075	5	AVG
Pronamide		0.243	0.278	0.296	0.303	0.314	0.310	0.305	0.293	9	AVG
Dinoseb			0.125	0.146	0.158	0.176	0.183	0.184	0.162	15	AVG
Phenanthrene	0.971	1.047	1.010	1.008	0.982	1.012	0.999	1.002	1.004	2	AVG
Anthracene	0.969	1.001	0.980	0.997	1.000	1.011	1.011	1.001	0.996	1	AVG
Carbazole		0.827	0.922	0.941	0.941	0.967	0.960	0.946	0.929	5	AVG
Methyl parathion			0.204	0.246	0.238	0.256	0.262	0.254	0.243	9	AVG
Di-n-butylphthalate			1.075	1.166	1.152	1.211	1.208	1.197	1.168	4	AVG
Parathion			0.126	0.143	0.149	0.159	0.164	0.158	0.150	9	AVG
4-Nitroquinoline-1-oxide			0.054	0.080	0.091	0.110	0.118	0.117	0.095	26	1STDEG
Octachlorostyrene			0.058	0.060	0.069	0.057	0.064	0.052	0.060	10	AVG
Isodrin		0.131	0.114	0.121	0.115	0.118	0.116	0.113	0.118	5	AVG
Fluoranthene	1.000	1.054	1.055	1.086	1.097	1.127	1.118	1.101	1.080	4	AVG
Benzidine				0.660	0.652	0.677	0.669	0.657	0.663	1	AVG
Pyrene	1.084	1.032	1.011	1.018	1.007	1.018	0.994	0.997	1.020	3	AVG
p-Dimethylaminoazobenzene		0.117	0.126	0.148	0.151	0.164	0.165	0.162	0.147	13	AVG
Chlorobenzilate			0.267	0.297	0.290	0.303	0.304	0.300	0.294	5	AVG
3,3'-Dimethylbenzidine			0.504	0.618	0.614	0.665	0.666	0.677	0.624	10	AVG
Butylbenzylphthalate			0.427	0.460	0.450	0.482	0.478	0.474	0.462	5	AVG
2-Acetylaminofluorene			0.316	0.363	0.353	0.403	0.409	0.418	0.377	10	AVG
3,3'-Dichlorobenzidine			0.294	0.316	0.315	0.334	0.333	0.332	0.321	5	AVG
4,4'-Methylenebis(2-chloroanil				0.175	0.168	0.179	0.177	0.172	0.174	3	AVG
Benzo(a)anthracene	0.736	0.888	0.879	0.927	0.895	0.917	0.910	0.904	0.882	7	AVG
Chrysene	0.762	0.826	0.851	0.854	0.837	0.866	0.847	0.857	0.838	4	AVG
bis(2-Ethylhexyl)phthalate			0.612	0.676	0.646	0.712	0.714	0.716	0.679	6	AVG
6-Methylchrysene			0.553	0.581	0.562	0.600	0.600	0.609	0.584	4	AVG
Di-n-octylphthalate			1.415	1.553	1.590	1.695	1.698	1.695	1.608	7	AVG
Benzo(b)fluoranthene	1.011	1.110	1.135	1.106	1.133	1.148	1.145	1.169	1.120	4	AVG
7,12-Dimethylbenz[a]anthracene		0.398	0.455	0.457	0.497	0.493	0.505	0.501	0.472	8	AVG
Benzo(k)fluoranthene	0.999	1.059	1.129	1.139	1.145	1.136	1.130	1.098	1.104	5	AVG
Benzo(a)pyrene	0.909	0.973	1.034	1.067	1.076	1.106	1.119	1.112	1.049	7	AVG
3-Methylcholanthrene		0.339	0.394	0.417	0.429	0.447	0.456	0.458	0.420	10	AVG
Dibenz(a,h)acridine			0.779	0.824	0.822	0.870	0.880	0.894	0.845	5	AVG
Dibenz(a,j)acridine			0.828	0.885	0.858	0.899	0.898	0.908	0.879	3	AVG
Indeno(1,2,3-cd)pyrene	1.072	1.183	1.171	1.218	1.164	1.231	1.226	1.219	1.186	4	AVG
Dibenz(a,h)anthracene	0.890	0.952	0.988	1.032	1.001	1.033	1.021	1.010	0.991	5	AVG
Benzo(g,h,i)perylene	0.995	0.963	1.039	1.042	1.010	1.033	1.028	1.011	1.015	3	AVG
Total PAHs	0.953	0.962	0.939	0.938	0.975	0.948	0.914	0.913	0.943	2	AVG
2-Fluorophenol		1.398	1.390	1.361	1.385	1.427	1.363	1.408	1.390	2	AVG
Phenol-d6		1.792	1.805	1.804	1.811	1.862	1.773	1.808	1.808	1	AVG
Nitrobenzene-d5		0.418	0.428	0.433	0.421	0.449	0.427	0.432	0.430	2	AVG
2-Fluorobiphenyl		1.390	1.308	1.268	1.275	1.320	1.251	1.280	1.299	4	AVG
2,4,6-Tribromophenol			0.116	0.121	0.120	0.125	0.123	0.127	0.122	3	AVG
Terphenyl-d14		0.607	0.615	0.615	0.605	0.615	0.605	0.598	0.609	1	AVG
							Average %RSD			5	

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.


56 Benzoic acid
Curve Type: Linear By-Response
Amt = 0.427594 + Rsp/0.3301979
R^2: 0.9939854
Amount/ISTD Amount
Area/ISTD Area


168 4-Nitroquinoline-1-oxide
Curve Type: Linear By-Response
Amt = 0.2507799 + Rsp/0.1227212
R^2: 0.9982864
MB21006
6/23/16
Amount/ISTD Amount
Area/ISTD Area 9x10^-19

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP20296.i/16jun23.b/1f0791.d SSTD7.5
/chem/HP20296.i/16jun23.b/1f0792.d SSTD0.125
/chem/HP20296.i/16jun23.b/1f0793.d SSTD030
/chem/HP20296.i/16jun23.b/1f0794.d SSTD020
/chem/HP20296.i/16jun23.b/1f0795.d SSTD12.5
/chem/HP20296.i/16jun23.b/1f0796.d SSTD3.75
/chem/HP20296.i/16jun23.b/1f0797.d SSTD1.25
/chem/HP20296.i/16jun23.b/1f0798.d SSTD0.25

Area Summary

	File ID:										
Internal Standard Name	1f0791.d	1f0792.d	1f0793.d	1f0794.d	1f0795.d	1f0796.d	1f0797.d	1f0798.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	151712	150253	151252	148475	155371	150986	148572	142792	149927	2	Yes
Naphthalene-d8	604755	592424	591156	573043	596434	581390	595928	574019	588644	2	Yes
Acenaphthene-d10	334029	325898	325788	321894	334693	325730	334851	320794	327960	2	Yes
Phenanthrene-d10	602792	581190	601632	569891	609964	571680	596336	566152	587455	3	Yes
Pyrene-d10	684619	649945	687794	667770	698321	658598	685009	639323	671422	3	Yes
Perylene-d12	483990	459770	530688	510375	524942	497777	504129	471912	497948	5	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:								
Internal Standard Name	1f0791.d	1f0792.d	1f0793.d	1f0794.d	1f0795.d	1f0796.d	1f0797.d	1f0798.d	Avg. RT
1,4-Dichlorobenzene-d4	7.093	7.088	7.088	7.088	7.088	7.088	7.088	7.088	7.089
Naphthalene-d8	9.083	9.078	9.083	9.083	9.077	9.077	9.078	9.078	9.080
Acenaphthene-d10	11.902	11.902	11.907	11.902	11.901	11.901	11.902	11.902	11.902
Phenanthrene-d10	13.838	13.832	13.838	13.838	13.838	13.832	13.833	13.833	13.835
Pyrene-d10	15.919	15.918	15.924	15.919	15.918	15.913	15.913	15.913	15.917
Perylene-d12	20.545	20.545	20.550	20.545	20.550	20.545	20.545	20.545	20.546

Comments: _____

Report generated on 06/23/2016 at 13:33

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP20296

Method: SW-846 8270D MINI File ID: lf0801.d

ICV SAMPLE ID: RVICV1376 BATCH: 16JUN23026 Sample Name: SSTDl2.5

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,4-Dioxane	12.50	14.21	14	30	YES
N-Nitrosodimethylamine	12.50	13.32	7	30	YES
Pyridine	12.50	14.05	12	30	YES
2-Picoline	12.50	13.69	9	30	YES
N-Nitrosomethylethylamine	12.50	13.82	11	30	YES
Methyl methanesulfonate	12.50	15.61	25	30	YES
N-Nitrosodiethylamine	12.50	13.92	11	30	YES
Ethyl methanesulfonate	12.50	13.26	6	30	YES
Phenol	12.50	13.52	8	30	YES
Aniline	12.50	12.93	3	30	YES
bis(2-Chloroethyl)ether	12.50	13.24	6	30	YES
2-Chlorophenol	12.50	13.85	11	30	YES
1,3-Dichlorobenzene	12.50	13.41	7	30	YES
1,4-Dichlorobenzene	12.50	13.53	8	30	YES
Benzyl alcohol	12.50	13.88	11	30	YES
1,2-Dichlorobenzene	12.50	13.78	10	30	YES
Indene	12.50	13.70	10	30	YES
2-Methylphenol	12.50	13.89	11	30	YES
2,2'-oxybis(1-Chloropropane	12.50	14.08	13	30	YES
bis(2-Chloroisopropyl)ether	12.50	14.08	13	30	YES
N-Nitrosopyrrolidine	12.50	13.76	10	30	YES
Acetophenone	12.50	13.73	10	30	YES
4-Methylphenol	12.50	13.12	5	30	YES
N-Nitroso-di-n-propylamine	12.50	13.45	8	30	YES
N-Nitrosomorpholine	12.50	13.40	7	30	YES
o-Toluidine	12.50	13.05	4	30	YES
Total Cresols	25.00	27.01	8	30	YES
Hexachloroethane	12.50	13.89	11	30	YES
Nitrobenzene	12.50	13.43	7	30	YES
N-Nitrosopiperidine	12.50	13.24	6	30	YES
Isophorone	12.50	12.88	3	30	YES
2-Nitrophenol	12.50	14.32	15	30	YES
2,4-Dimethylphenol	12.50	12.75	2	30	YES
bis(2-Chloroethoxy)methane	12.50	13.56	9	30	YES
Benzoic acid	25.00	23.29	-7	30	YES
O,O,O-Triethylphosphorothio	12.50	13.23	6	30	YES
2,4-Dichlorophenol	12.50	13.76	10	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP20296

Method: SW-846 8270D MINI File ID: 1f0801.d

ICV SAMPLE ID: RVICV1376 BATCH: 16JUN23026 Sample Name: SSTD12.5

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,2,4-Trichlorobenzene	12.50	13.47	8	30	YES
Naphthalene	12.50	13.41	7	30	YES
4-Chloroaniline	12.50	13.36	7	30	YES
2,6-Dichlorophenol	12.50	13.99	12	30	YES
Hexachloropropene	12.50	16.39	31	30	NO#
Hexachlorobutadiene	12.50	13.97	12	30	YES
Quinoline	12.50	13.93	11	30	YES
N-Nitrosodi-n-butylamine	12.50	12.23	-2	30	YES
4-Chloro-3-methylphenol	12.50	13.77	10	30	YES
Safrole	12.50	13.92	11	30	YES
2-Methylnaphthalene	12.50	12.81	3	30	YES
1-Methylnaphthalene	12.50	13.65	9	30	YES
Hexachlorocyclopentadiene	25.00	23.03	-8	30	YES
1,2,4,5-Tetrachlorobenzene	12.50	13.42	7	30	YES
cis-Isosafrole	1.50	1.80	20	30	YES
2,4,6-Trichlorophenol	12.50	14.18	13	30	YES
2,4,5-Trichlorophenol	12.50	13.61	9	30	YES
trans-Isosafrole	11.00	13.84	26	30	YES
1,1'-Biphenyl	12.50	13.72	10	30	YES
2-Chloronaphthalene	12.50	13.97	12	30	YES
Isosafrole	12.50	15.63	25	30	YES
1-Chloronaphthalene	12.50	13.29	6	30	YES
Diphenyl ether	12.50	13.22	6	30	YES
2-Nitroaniline	12.50	14.23	14	30	YES
1,4-Naphthoquinone	15.63	16.57	6	30	YES
1,4-Dinitrobenzene	12.50	14.10	13	30	YES
Dimethylphthalate	12.50	13.27	6	30	YES
1,3-Dinitrobenzene	12.50	13.91	11	30	YES
2,6-Dinitrotoluene	12.50	14.07	13	30	YES
Acenaphthylene	12.50	12.21	-2	30	YES
3-Nitroaniline	12.50	14.27	14	30	YES
Acenaphthene	12.50	13.55	8	30	YES
2,4-Dinitrophenol	25.00	27.99	12	30	YES
4-Nitrophenol	12.50	14.27	14	30	YES
Pentachlorobenzene	12.50	13.43	7	30	YES
2,4-Dinitrotoluene	12.50	13.85	11	30	YES
Dibenzofuran	12.50	13.41	7	30	YES

NC = Could not calculate

Comments:

#RX any hits

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP20296

Method: SW-846 8270D MINI File ID: 1f0801.d

ICV SAMPLE ID: RVICV1376 BATCH: 16JUN23026 Sample Name: SSTD12.5

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
2,4_2,6-Dinitrotoluenes	25.00	27.92	12	30	YES
1-Naphthylamine	25.00	25.72	3	30	YES
2,3,4,6-Tetrachlorophenol	12.50	15.07	21	30	YES
2-Naphthylamine	25.00	25.71	3	30	YES
Diethylphthalate	12.50	13.49	8	30	YES
Thionazin	12.50	12.92	3	30	YES
Fluorene	12.50	13.41	7	30	YES
4-Chlorophenyl-phenylether	12.50	13.29	6	30	YES
5-Nitro-o-toluidine	12.50	14.47	16	30	YES
4-Nitroaniline	12.50	13.57	9	30	YES
4,6-Dinitro-2-methylphenol	12.50	14.03	12	30	YES
N-Nitrosodiphenylamine	12.50	12.93	3	30	YES
NDPA as diphenylamine	12.50	12.93	3	30	YES
1,2-Diphenylhydrazine	12.50	13.48	8	30	YES
Tetraethyldithiopyrophospha	12.50	12.90	3	30	YES
1,3,5-Trinitrobenzene	12.50	13.56	9	30	YES
Diallate (peak 1)	9.38	9.49	1	30	YES
Phorate	12.50	13.36	7	30	YES
Phenacetin	12.50	14.20	14	30	YES
4-Bromophenyl-phenylether	12.50	13.32	7	30	YES
Diallate (peak 2)	3.13	3.20	2	30	YES
Hexachlorobenzene	12.50	13.03	4	30	YES
Diallate trans/cis	12.50	12.68	1	30	YES
Dimethoate	12.50	13.84	11	30	YES
Pentachlorophenol	12.50	15.09	21	30	YES
4-Aminobiphenyl	12.50	27.63	121	30	NO#
Pentachloronitrobenzene	12.50	13.44	8	30	YES
Pronamide	12.50	14.07	13	30	YES
Dinoseb	12.50	14.79	18	30	YES
Phenanthrene	12.50	13.01	4	30	YES
Anthracene	12.50	13.54	8	30	YES
Carbazole	12.50	13.54	8	30	YES
Methyl parathion	12.50	14.36	15	30	YES
Di-n-butylphthalate	12.50	13.92	11	30	YES
Parathion	12.50	14.26	14	30	YES
4-Nitroquinoline-1-oxide	150.00	170.31	14	30	YES
Isodrin	12.50	12.70	2	30	YES

NC = Could not calculate

Comments: _____

#RX any hits

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP20296

Method: SW-846 8270D MINI File ID: lf0801.d

ICV SAMPLE ID: RVICV1376 BATCH: 16JUN23026 Sample Name: SSTD12.5

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Fluoranthene	12.50	13.75	10	30	YES
Benzidine	62.50	65.20	4	30	YES
Pyrene	12.50	13.17	5	30	YES
p-Dimethylaminoazobenzene	12.50	17.79	42	30	NO#
Chlorobenzilate	12.50	13.96	12	30	YES
3,3'-Dimethylbenzidine	25.00	26.89	8	30	YES
Butylbenzylphthalate	12.50	14.33	15	30	YES
2-Acetylaminofluorene	12.50	14.69	17	30	YES
3,3'-Dichlorobenzidine	12.50	13.58	9	30	YES
Benzo(a)anthracene	12.50	14.22	14	30	YES
Chrysene	12.50	14.50	16	30	YES
4,4'-Methylenebis(2-chloroa	12.50	13.86	11	30	YES
bis(2-Ethylhexyl)phthalate	12.50	14.43	15	30	YES
6-Methylchrysene	12.50	13.81	10	30	YES
Di-n-octylphthalate	12.50	15.15	21	30	YES
Benzo(b)fluoranthene	12.50	14.74	18	30	YES
7,12-Dimethylbenz[a]anthrac	12.50	14.91	19	30	YES
Benzo(k)fluoranthene	12.50	14.28	14	30	YES
Benzo(a)pyrene	12.50	14.24	14	30	YES
3-Methylcholanthrene	12.50	18.73	50	30	NO#
Dibenz(a,h)acridine	12.50	14.47	16	30	YES
Dibenz(a,j)acridine	12.50	13.05	4	30	YES
Indeno(1,2,3-cd)pyrene	12.50	14.38	15	30	YES
Dibenz(a,h)anthracene	12.50	14.90	19	30	YES
Benzo(g,h,i)perylene	12.50	14.53	16	30	YES
Total PAHs	225.00	219.30	-3	30	YES

NC = Could not calculate

Comments: _____

#RX any hits

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP20296

Method: SW-846 8270D MINI File ID: 1f0802.d

ICV SAMPLE ID: RVBASICV0716 BATCH: 16JUN23026 Sample Name: SSTD12.5

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Benzaldehyde	12.50	13.82	11	30	YES
Caprolactam	12.50	13.29	6	30	YES
Atrazine	12.50	13.27	6	30	YES

NC = Could not calculate

Comments: _____

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
N-Nitrosodimethylamine	0.969	1.078	33.380	30.0	11
Pyridine	1.689	1.832	32.540	30.0	8
2-Picoline	1.731	1.891	32.780	30.0	9
N-Nitrosomethylethylamine	0.893	0.770	25.850	30.0	-14
Methyl methanesulfonate	0.896	0.902	30.180	30.0	1
N-Nitrosodiethylamine	0.858	0.904	31.610	30.0	5
Ethyl methanesulfonate	0.847	0.813	28.810	30.0	-4
Phenol	2.564	2.379	27.830	30.0	-7
Aniline	2.898	2.863	29.630	30.0	-1
a-methylstyrene	1.627	1.704	31.410	30.0	5
bis(2-Chloroethyl)ether	1.825	1.843	30.300	30.0	1
2-Chlorophenol	1.532	1.551	30.370	30.0	1
1,3-Dichlorobenzene	1.566	1.622	31.080	30.0	4
1,4-Dichlorobenzene	1.638	1.643	30.090	30.0	0
Benzyl alcohol	1.188	1.274	32.200	30.0	7
1,2-Dichlorobenzene	1.590	1.526	28.780	30.0	-4
Indene	2.798	2.733	29.300	30.0	-2
2-Methylphenol	1.592	1.717	32.350	30.0	8
2,2'-oxybis(1-Chloropropane)	2.032	2.095	30.930	30.0	3
bis(2-Chloroisopropyl)ether	2.032	2.095	30.930	30.0	3
N-Nitrosopyrrolidine	0.949	1.036	32.770	30.0	9
Acetophenone	2.437	2.505	30.840	30.0	3
4-Methylphenol	1.896	1.864	29.490	30.0	-2
Total Cresols	1.742	1.791	61.850	60.0	3
N-Nitroso-di-n-propylamine	1.586	1.563	29.560	30.0	-1
N-Nitrosomorpholine	1.128	1.120	29.790	30.0	-1
o-Toluidine	2.780	2.879	31.070	30.0	4
Hexachloroethane	0.600	0.600	30.000	30.0	0
Nitrobenzene	0.492	0.490	29.870	30.0	0
N-Nitrosopiperidine	0.204	0.210	30.920	30.0	3
Isophorone	0.903	0.894	29.710	30.0	-1
2-Nitrophenol	0.205	0.205	30.040	30.0	0
2,4-Dimethylphenol	0.410	0.421	30.850	30.0	3
O,O,O-Triethylphosphorothioate	0.186	0.203	32.730	30.0	9
bis(2-Chloroethoxy)methane	0.513	0.497	29.060	30.0	-3
Benzoic acid	0.411	0.363	35.360	40.0	-12

FORM VII SV-1

JM6/346
7-6-16

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2,3,4-Tetrahydronaphthalene	0.580	0.581	30.070	30.0	0
2,4-Dichlorophenol	0.308	0.321	31.270	30.0	4
1,2,4-Trichlorobenzene	0.315	0.328	31.250	30.0	4
Naphthalene	1.088	1.077	29.680	30.0	-1
4-Chloroaniline	0.475	0.483	30.500	30.0	2
2,6-Dichlorophenol	0.308	0.310	30.200	30.0	1
Hexachloropropene	0.156	0.176	34.000	30.0	13
Hexachlorobutadiene	0.153	0.170	33.360	30.0	11
Quinoline	0.766	0.749	29.320	30.0	-2
Caprolactam	0.168	0.162	28.770	30.0	-4
N-Nitrosodi-n-butylamine	0.433	0.430	29.820	30.0	-1
4-Chloro-3-methylphenol	0.387	0.394	30.580	30.0	2
Safrole	0.296	0.307	31.140	30.0	4
2-Methylnaphthalene	0.797	0.784	29.520	30.0	-2
1-Methylnaphthalene	0.736	0.711	28.960	30.0	-3
Hexachlorocyclopentadiene	0.216	0.195	27.080	30.0	-10
1,2,4,5-Tetrachlorobenzene	0.470	0.528	33.740	30.0	12
cis-Isosafrole	0.479	0.525	5.590	5.1	10
2,4,6-Trichlorophenol	0.358	0.391	32.770	30.0	9
2,4,5-Trichlorophenol	0.393	0.427	32.650	30.0	9
trans-Isosafrole	0.530	0.569	26.740	24.9	7
Isosafrole	0.522	0.562	32.320	30.0	8
1,1'-Biphenyl	1.504	1.508	30.070	30.0	0
2-Chloronaphthalene	1.149	1.434	37.440	30.0	25
1-Chloronaphthalene	1.107	1.108	30.020	30.0	0
Diphenyl ether	0.801	0.833	31.230	30.0	4
2-Nitroaniline	0.400	0.431	32.280	30.0	8
1,4-Naphthoquinone	0.512	0.476	27.900	30.0	-7
1,4-Dinitrobenzene	0.221	0.225	30.520	30.0	2
Dimethylphthalate	1.389	1.361	29.400	30.0	-2
1,3-Dinitrobenzene	0.250	0.261	31.340	30.0	4
2,6-Dinitrotoluene	0.323	0.340	31.620	30.0	5
Acenaphthylene	1.831	1.808	29.630	30.0	-1
3-Nitroaniline	0.359	0.371	31.020	30.0	3
Acenaphthene	1.231	1.182	28.810	30.0	-4
2,4-Dinitrophenol	0.234	0.212	36.280	40.0	-9

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
4-Nitrophenol	0.217	0.217	30.070	30.0	0
Pentachlorobenzene	0.420	0.482	34.440	30.0	15
2,4-Dinitrotoluene	0.454	0.443	29.240	30.0	-3
2,4_2,6-Dinitrotoluenes	0.394	0.391	60.870	60.0	1
Dibenzofuran	1.734	1.717	29.700	30.0	-1
1-Naphthylamine	1.385	1.362	29.500	30.0	-2
2,3,4,6-Tetrachlorophenol	0.311	0.331	31.940	30.0	6
2-Naphthylamine	1.365	1.315	28.900	30.0	-4
Diethylphthalate	1.367	1.347	29.570	30.0	-1
Thionazin	0.280	0.290	30.990	30.0	3
Fluorene	1.413	1.445	30.700	30.0	2
4-Chlorophenyl-phenylether	0.663	0.685	31.000	30.0	3
5-Nitro-o-toluidine	0.436	0.428	29.420	30.0	-2
4-Nitroaniline	0.419	0.389	27.830	30.0	-7
4,6-Dinitro-2-methylphenol	0.147	0.148	30.260	30.0	1
N-Nitrosodiphenylamine (1)	0.658	0.665	30.320	30.0	1
NDPA as diphenylamine	0.658	0.665	30.320	30.0	1
1,2-Diphenylhydrazine	0.900	0.882	29.380	30.0	-2
Tetraethyldithiopyrophosphate	0.123	0.125	30.380	30.0	1
1,3,5-Trinitrobenzene	0.087	0.092	31.410	30.0	5
Diallate (peak 1)	0.405	0.398	24.500	24.9	-2
Phorate	0.536	0.771	43.140	30.0	44
Phenacetin	0.428	0.411	28.780	30.0	-4
4-Bromophenyl-phenylether	0.175	0.213	36.580	30.0	22
Diallate (peak 2)	0.394	0.372	4.820	5.1	-5
Diallate trans/cis	0.403	0.394	29.320	30.0	-2
Hexachlorobenzene	0.176	0.206	35.190	30.0	17
Dimethoate	0.364	0.375	30.900	30.0	3
Pentachlorophenol	0.130	0.127	29.230	30.0	-3
4-Aminobiphenyl	0.580	0.548	28.330	30.0	-6
Pentachloronitrobenzene	0.073	0.081	32.920	30.0	10
Pronamide	0.315	0.312	29.760	30.0	-1
Dinoseb	0.189	0.212	33.700	30.0	12
Phenanthrene	1.138	1.137	29.980	30.0	0
Anthracene	1.109	1.158	31.310	30.0	4
Carbazole	1.092	1.083	29.750	30.0	-1

(1) Cannot be Separated from Diphenylamine

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Methyl parathion	0.258	0.272	31.600	30.0	5
Di-n-butylphthalate	1.246	1.234	29.720	30.0	-1
Parathion	0.162	0.169	31.170	30.0	4
4-Nitroquinoline-1-oxide	0.117	0.078	19.980	30.0	-33
Octachlorostyrene	0.061	0.074	36.270	30.0	21
Isodrin	0.117	0.121	31.070	30.0	4
Fluoranthene	1.189	1.262	31.830	30.0	6
Benzidine	0.809	0.768	85.380	90.0	-5
Pyrene	1.184	1.106	28.020	30.0	-7
p-Dimethylaminoazobenzene	0.202	0.211	31.350	30.0	4
Chlorobenzilate	0.325	0.303	28.000	30.0	-7
3,3'-Dimethylbenzidine	0.651	0.669	30.830	30.0	3
Butylbenzylphthalate	0.518	0.469	27.170	30.0	-9
2-Acetylaminofluorene	0.478	0.465	29.210	30.0	-3
3,3'-Dichlorobenzidine	0.376	0.409	32.640	30.0	9
4,4'-Methylenebis(2-chloroanil	0.197	0.211	32.090	30.0	7
Benzo(a)anthracene	1.013	1.056	31.280	30.0	4
Chrysene	1.014	1.013	29.960	30.0	0
bis(2-Ethylhexyl)phthalate	0.715	0.659	27.660	30.0	-8
6-Methylchrysene	0.701	0.755	32.330	30.0	8
Di-n-octylphthalate	1.589	1.326	25.040	30.0	-17
Benzo(b)fluoranthene	1.262	1.150	27.350	30.0	-9
7,12-Dimethylbenz[a]anthracene	0.589	0.588	29.990	30.0	0
Benzo(k)fluoranthene	1.244	1.280	30.860	30.0	3
Benzo(a)pyrene	1.181	1.163	29.540	30.0	-2
3-Methylcholanthrene	0.520	0.528	30.420	30.0	1
Dibenz(a,h)acridine	0.898	0.901	30.110	30.0	0
Dibenz(a,j)acridine	0.951	0.999	31.490	30.0	5
Indeno(1,2,3-cd)pyrene	1.207	1.283	31.890	30.0	6
Dibenz(a,h)anthracene	1.037	1.077	31.160	30.0	4
Benzo(g,h,i)perylene	1.030	1.071	31.200	30.0	4
Total PAHs	1.127	1.033	541.680	540.0	0
2-Fluorophenol	1.496	1.568	62.900	60.0	5
Phenol-d6	2.214	2.233	60.510	60.0	1
Nitrobenzene-d5	0.472	0.465	59.070	60.0	-2

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:25

Lab File ID: gg0231.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Fluorobiphenyl	1.288	1.316	61.260	60.0	2
2,4,6-Tribromophenol	0.142	0.175	73.960	60.0	23
Terphenyl-d14	0.732	0.771	63.190	60.0	5
			Average %Drift:		5

Continuing Calibration
Internal Standard Area and Retention Time
Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d **
/chem/HP11165.i/16jun07.b/gf0202.d
/chem/HP11165.i/16jun07.b/gf0203.d
/chem/HP11165.i/16jun07.b/gf0204.d
/chem/HP11165.i/16jun07.b/gf0205.d
/chem/HP11165.i/16jun07.b/gf0206.d
/chem/HP11165.i/16jun07.b/gf0207.d
/chem/HP11165.i/16jun07.b/gf0208.d

** indicates the Mid Level Calibration Standard.

Mid Level Calibration Standard is used for comparison.

Current Continuing Calibration Standard:

/chem/HP11165.i/16jul06.b/gg0231.d

Area Summary

File ID:

Internal Standard Name	gg0231.d	ICAL Area	Low Limit	High Limit	In Spec
1,4-Dichlorobenzene-d4	77254	70096	35048	140192	Yes
Naphthalene-d8	340561	296116	148058	592232	Yes
Acenaphthene-d10	217465	192522	96261	385044	Yes
Phenanthrene-d10	417213	374023	187012	748046	Yes
Pyrene-d10	490477	404786	202393	809572	Yes
Perylene-d12	422029	301130	150565	602260	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

File ID:

Internal Standard Name	gg0231.d	ICAL RT	In Spec
1,4-Dichlorobenzene-d4	4.892	5.528	No
Naphthalene-d8	6.122	6.763	No
Acenaphthene-d10	7.822	8.475	No
Phenanthrene-d10	9.251	9.922	No
Pyrene-d10	10.610	11.310	No
Perylene-d12	13.145	13.939	No

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments: V- Column Maintenance
SM6-346
7-6-16

7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 05:53

Lab File ID: gg0232.d Init. Calib. Date(s): 06/28/16 06/28/16

Init. Calib. Times(s): 07:48 09:58

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Chlorobenzalmalononitrile	0.375	0.368	29.420	30.0	-2
			Average %Drift:		2

FORM VII SV-1

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 06:19

Lab File ID: gg0233.d Init. Calib. Date(s): 07/05/16 07/05/16

Init. Calib. Times(s): 07:13 09:20

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Chlorobenzaldehyde	0.257	0.256	29.810	30.0	-1
			Average %Drift:		1

JMG 7-6-16

FORM VII SV-1

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 18:52

Lab File ID: gg0291.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
N-Nitrosodimethylamine	0.969	1.074	33.240	30.0	11
Pyridine	1.689	1.744	30.970	30.0	3
2-Picoline	1.731	1.827	31.670	30.0	6
N-Nitrosomethylethylamine	0.893	0.808	27.150	30.0	-10
Methyl methanesulfonate	0.896	0.932	31.210	30.0	4
N-Nitrosodiethylamine	0.858	0.900	31.460	30.0	5
Ethyl methanesulfonate	0.847	0.863	30.570	30.0	2
Phenol	2.564	2.443	28.590	30.0	-5
Aniline	2.898	2.917	30.190	30.0	1
a-methylstyrene	1.627	1.708	31.490	30.0	5
bis(2-Chloroethyl)ether	1.825	1.894	31.130	30.0	4
2-Chlorophenol	1.532	1.559	30.540	30.0	2
1,3-Dichlorobenzene	1.566	1.615	30.940	30.0	3
1,4-Dichlorobenzene	1.638	1.652	30.250	30.0	1
Benzyl alcohol	1.188	1.303	32.920	30.0	10
1,2-Dichlorobenzene	1.590	1.585	29.900	30.0	0
Indene	2.798	2.771	29.710	30.0	-1
2-Methylphenol	1.592	1.750	32.980	30.0	10
2,2'-oxybis(1-Chloropropane)	2.032	2.095	30.930	30.0	3
bis(2-Chloroisopropyl)ether	2.032	2.095	30.930	30.0	3
N-Nitrosopyrrolidine	0.949	1.088	34.400	30.0	15
Acetophenone	2.437	2.586	31.840	30.0	6
4-Methylphenol	1.896	1.952	30.890	30.0	3
Total Cresols	1.742	1.851	63.870	60.0	6
N-Nitroso-di-n-propylamine	1.586	1.672	31.620	30.0	5
N-Nitrosomorpholine	1.128	1.171	31.160	30.0	4
o-Toluidine	2.780	2.945	31.790	30.0	6
Hexachloroethane	0.600	0.607	30.330	30.0	1
Nitrobenzene	0.492	0.488	29.770	30.0	-1
N-Nitrosopiperidine	0.204	0.214	31.520	30.0	5
Isophorone	0.903	0.923	30.660	30.0	2
2-Nitrophenol	0.205	0.210	30.690	30.0	2
2,4-Dimethylphenol	0.410	0.431	31.580	30.0	5
O,O,O-Triethylphosphorothioate	0.186	0.210	33.740	30.0	12
bis(2-Chloroethoxy)methane	0.513	0.532	31.140	30.0	4
Benzoic acid	0.411	0.388	37.760	40.0	-6

FORM VII SV-1

7C
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 18:52

Lab File ID: gg0291.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2,3,4-Tetrahydronaphthalene	0.580	0.580	30.020	30.0	0
2,4-Dichlorophenol	0.308	0.331	32.300	30.0	8
1,2,4-Trichlorobenzene	0.315	0.329	31.350	30.0	4
Naphthalene	1.088	1.084	29.870	30.0	0
4-Chloroaniline	0.475	0.497	31.350	30.0	5
2,6-Dichlorophenol	0.308	0.315	30.760	30.0	3
Hexachloropropene	0.156	0.178	34.390	30.0	15
Hexachlorobutadiene	0.153	0.168	32.980	30.0	10
Quinoline	0.766	0.786	30.790	30.0	3
Caprolactam	0.168	0.173	30.830	30.0	3
N-Nitrosodi-n-butylamine	0.433	0.357	24.760	30.0	-17
4-Chloro-3-methylphenol	0.387	0.411	31.900	30.0	6
Safrole	0.296	0.323	32.710	30.0	9
2-Methylnaphthalene	0.797	0.791	29.790	30.0	-1
1-Methylnaphthalene	0.736	0.726	29.570	30.0	-1
Hexachlorocyclopentadiene	0.216	0.200	27.760	30.0	-7
1,2,4,5-Tetrachlorobenzene	0.470	0.506	32.340	30.0	8
cis-Isosafrole	0.479	0.489	5.210	5.1	2
2,4,6-Trichlorophenol	0.358	0.379	31.810	30.0	6
2,4,5-Trichlorophenol	0.393	0.413	31.590	30.0	5
trans-Isosafrole	0.530	0.515	24.180	24.9	-3
Isosafrole	0.522	0.511	29.390	30.0	-2
1,1'-Biphenyl	1.504	1.447	28.860	30.0	-4
2-Chloronaphthalene	1.149	1.094	28.580	30.0	-5
1-Chloronaphthalene	1.107	1.106	29.950	30.0	0
Diphenyl ether	0.801	0.807	30.250	30.0	1
2-Nitroaniline	0.400	0.417	31.260	30.0	4
1,4-Naphthoquinone	0.512	0.483	28.270	30.0	-6
1,4-Dinitrobenzene	0.221	0.226	30.720	30.0	2
Dimethylphthalate	1.389	1.363	29.440	30.0	-2
1,3-Dinitrobenzene	0.250	0.246	29.460	30.0	-2
2,6-Dinitrotoluene	0.323	0.324	30.070	30.0	0
Acenaphthylene	1.831	1.760	28.840	30.0	-4
3-Nitroaniline	0.359	0.366	30.570	30.0	2
Acenaphthene	1.231	1.146	27.920	30.0	-7
2,4-Dinitrophenol	0.234	0.218	37.310	40.0	-7

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 18:52

Lab File ID: gg0291.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
4-Nitrophenol	0.217	0.209	28.980	30.0	-3
Pentachlorobenzene	0.420	0.467	33.380	30.0	11
2,4-Dinitrotoluene	0.454	0.452	29.870	30.0	0
2,4_2,6-Dinitrotoluenes	0.394	0.388	59.940	60.0	0
Dibenzofuran	1.734	1.674	28.970	30.0	-3
1-Naphthylamine	1.385	1.332	28.870	30.0	-4
2,3,4,6-Tetrachlorophenol	0.311	0.347	33.500	30.0	12
2-Naphthylamine	1.365	1.333	29.300	30.0	-2
Diethylphthalate	1.367	1.339	29.390	30.0	-2
Thionazin	0.280	0.290	30.970	30.0	3
Fluorene	1.413	1.436	30.500	30.0	2
4-Chlorophenyl-phenylether	0.663	0.677	30.660	30.0	2
5-Nitro-o-toluidine	0.436	0.422	29.060	30.0	-3
4-Nitroaniline	0.419	0.399	28.560	30.0	-5
4,6-Dinitro-2-methylphenol	0.147	0.149	30.500	30.0	2
N-Nitrosodiphenylamine (1)	0.658	0.654	29.850	30.0	-1
NDPA as diphenylamine	0.658	0.654	29.850	30.0	-1
1,2-Diphenylhydrazine	0.900	0.847	28.220	30.0	-6
Tetraethyldithiopyrophosphate	0.123	0.123	29.990	30.0	0
1,3,5-Trinitrobenzene	0.087	0.094	32.210	30.0	7
Diallate (peak 1)	0.405	0.395	24.290	24.9	-2
Phorate	0.536	0.562	31.400	30.0	5
Phenacetin	0.428	0.399	27.930	30.0	-7
4-Bromophenyl-phenylether	0.175	0.206	35.370	30.0	18
Diallate (peak 2)	0.394	0.379	4.900	5.1	-4
Diallate trans/cis	0.403	0.392	29.190	30.0	-3
Hexachlorobenzene	0.176	0.205	34.970	30.0	17
Dimethoate	0.364	0.364	30.010	30.0	0
Pentachlorophenol	0.130	0.132	30.400	30.0	1
4-Aminobiphenyl	0.580	0.552	28.570	30.0	-5
Pentachloronitrobenzene	0.073	0.079	32.210	30.0	7
Pronamide	0.315	0.313	29.840	30.0	-1
Dinoseb	0.189	0.211	33.550	30.0	12
Phenanthrene	1.138	1.133	29.880	30.0	0
Anthracene	1.109	1.144	30.940	30.0	3
Carbazole	1.092	1.074	29.500	30.0	-2

(1) Cannot be Separated from Diphenylamine

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 18:52

Lab File ID: gg0291.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Methyl parathion	0.258	0.264	30.700	30.0	2
Di-n-butylphthalate	1.246	1.235	29.740	30.0	-1
Parathion	0.162	0.167	30.950	30.0	3
4-Nitroquinoline-1-oxide	0.117	0.086	22.070	30.0	-26
Octachlorostyrene	0.061	0.076	37.480	30.0	25
Isodrin	0.117	0.124	31.840	30.0	6
Fluoranthene	1.189	1.250	31.540	30.0	5
Benzidine	0.809	0.773	86.000	90.0	-4
Pyrene	1.184	1.106	28.030	30.0	-7
p-Dimethylaminoazobenzene	0.202	0.223	33.150	30.0	10
Chlorobenzilate	0.325	0.301	27.810	30.0	-7
3,3'-Dimethylbenzidine	0.651	0.689	31.740	30.0	6
Butylbenzylphthalate	0.518	0.471	27.260	30.0	-9
2-Acetylaminofluorene	0.478	0.451	28.330	30.0	-6
3,3'-Dichlorobenzidine	0.376	0.405	32.300	30.0	8
4,4'-Methylenebis(2-chloroanil	0.197	0.207	31.410	30.0	5
Benzo(a)anthracene	1.013	1.037	30.710	30.0	2
Chrysene	1.014	1.004	29.700	30.0	-1
bis(2-Ethylhexyl)phthalate	0.715	0.654	27.430	30.0	-9
6-Methylchrysene	0.701	0.751	32.170	30.0	7
Di-n-octylphthalate	1.589	1.393	26.310	30.0	-12
Benzo(b)fluoranthene	1.262	1.182	28.120	30.0	-6
7,12-Dimethylbenz[a]anthracene	0.589	0.594	30.260	30.0	1
Benzo(k)fluoranthene	1.244	1.264	30.470	30.0	2
Benzo(a)pyrene	1.181	1.166	29.630	30.0	-1
3-Methylcholanthrene	0.520	0.523	30.190	30.0	1
Dibenz(a,h)acridine	0.898	0.896	29.940	30.0	0
Dibenz(a,j)acridine	0.951	0.990	31.230	30.0	4
Indeno(1,2,3-cd)pyrene	1.207	1.266	31.450	30.0	5
Dibenz(a,h)anthracene	1.037	1.071	30.980	30.0	3
Benzo(g,h,i)perylene	1.030	1.056	30.750	30.0	3
Total PAHs	1.127	1.040	538.670	540.0	0
2-Fluorophenol	1.496	1.546	62.010	60.0	3
Phenol-d6	2.214	2.267	61.450	60.0	2
Nitrobenzene-d5	0.472	0.462	58.690	60.0	-2

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 18:52

Lab File ID: gg0291.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Fluorobiphenyl	1.288	1.258	58.580	60.0	-2
2,4,6-Tribromophenol	0.142	0.179	75.530	60.0	26
Terphenyl-d14	0.732	0.779	63.800	60.0	6
			Average %Drift:		5

FORM VII SV-1

Continuing Calibration
Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d **
/chem/HP11165.i/16jun07.b/gf0202.d
/chem/HP11165.i/16jun07.b/gf0203.d
/chem/HP11165.i/16jun07.b/gf0204.d
/chem/HP11165.i/16jun07.b/gf0205.d
/chem/HP11165.i/16jun07.b/gf0206.d
/chem/HP11165.i/16jun07.b/gf0207.d
/chem/HP11165.i/16jun07.b/gf0208.d

** indicates the Mid Level Calibration Standard.

Mid Level Calibration Standard is used for comparison.

Current Continuing Calibration Standard:

/chem/HP11165.i/16jul06a.b/gg0291.d

Area Summary

File ID:

Internal Standard Name	gg0291.d	ICAL Area	Low Limit	High Limit	In Spec
1,4-Dichlorobenzene-d4	79224	70096	35048	140192	Yes
Naphthalene-d8	356602	296116	148058	592232	Yes
Acenaphthene-d10	247511	192522	96261	385044	Yes
Phenanthrene-d10	484765	374023	187012	748046	Yes
Pyrene-d10	565469	404786	202393	809572	Yes
Perylene-d12	468688	301130	150565	602260	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

File ID:

Internal Standard Name	gg0291.d	ICAL RT	In Spec	
1,4-Dichlorobenzene-d4	4.869	5.528	No	*
Naphthalene-d8	6.104	6.763	No	
Acenaphthene-d10	7.798	8.475	No	
Phenanthrene-d10	9.228	9.922	No	
Pyrene-d10	10.592	11.310	No	
Perylene-d12	13.122	13.939	No	

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments: * Column maintenance

ws 2491 7/8/16

Report generated on 07/06/2016 at 19:19

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 19:19

Lab File ID: gg0292.d Init. Calib. Date(s): 06/28/16 06/28/16

Init. Calib. Times(s): 07:48 09:58

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Chlorobenzalmalononitrile	0.375	0.374	49.880	50.0	0
			Average %Drift:		0

FORM VII SV-1

page 1 of 1

7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/06/16 Time: 19:45

Lab File ID: gg0293.d Init. Calib. Date(s): 07/05/16 07/05/16

Init. Calib. Times(s): 07:13 09:20

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Chlorobenzaldehyde	0.257	0.272	52.800	50.0	6
			Average %Drift:		6

FORM VII SV-1

7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/13/16 Time: 15:52

Lab File ID: gg0571.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,4-Dioxane	0.623	0.599	28.830	30.0	-4
N-Nitrosodimethylamine	0.969	0.917	28.390	30.0	-5
Pyridine	1.689	1.543	27.400	30.0	-9
2-Picoline	1.731	1.520	26.340	30.0	-12
N-Nitrosomethylethylamine	0.893	0.684	22.980	30.0	-23
Methyl methanesulfonate	0.896	0.696	23.300	30.0	-22
N-Nitrosodiethylamine	0.858	0.777	27.160	30.0	-9
Ethyl methanesulfonate	0.847	0.750	26.570	30.0	-11
Phenol	2.564	2.207	25.830	30.0	-14
Aniline	2.898	2.639	27.320	30.0	-9
a-methylstyrene	1.627	1.631	30.080	30.0	0
bis(2-Chloroethyl)ether	1.825	1.663	27.330	30.0	-9
2-Chlorophenol	1.532	1.419	27.790	30.0	-7
1,3-Dichlorobenzene	1.566	1.519	29.110	30.0	-3
1,4-Dichlorobenzene	1.638	1.575	28.850	30.0	-4
Benzyl alcohol	1.188	1.160	29.310	30.0	-2
1,2-Dichlorobenzene	1.590	1.467	27.680	30.0	-8
Indene	2.798	2.636	28.270	30.0	-6
2-Methylphenol	1.592	1.576	29.690	30.0	-1
2,2'-oxybis(1-Chloropropane)	2.032	1.854	27.380	30.0	-9
bis(2-Chloroisopropyl)ether	2.032	1.854	27.380	30.0	-9
N-Nitrosopyrrolidine	0.949	0.899	28.440	30.0	-5
Acetophenone	2.437	2.379	29.300	30.0	-2
4-Methylphenol	1.896	1.698	26.870	30.0	-10
Total Cresols	1.742	1.637	56.560	60.0	-6
N-Nitroso-di-n-propylamine	1.586	1.357	25.670	30.0	-14
N-Nitrosomorpholine	1.128	0.969	25.790	30.0	-14
o-Toluidine	2.780	2.547	27.490	30.0	-8
Hexachloroethane	0.600	0.548	27.400	30.0	-9
Nitrobenzene	0.492	0.428	26.100	30.0	-13
N-Nitrosopiperidine	0.204	0.192	28.300	30.0	-6
Isophorone	0.903	0.828	27.510	30.0	-8
2-Nitrophenol	0.205	0.190	27.840	30.0	-7
2,4-Dimethylphenol	0.410	0.388	28.400	30.0	-5
O,O,O-Triethylphosphorothioate	0.186	0.197	31.710	30.0	6
bis(2-Chloroethoxy)methane	0.513	0.488	28.560	30.0	-5

FORM VII SV-1

7C
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/13/16 Time: 15:52

Lab File ID: gg0571.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Benzoic acid	0.411	0.339	33.050	40.0	-17
1,2,3,4-Tetrahydronaphthalene	0.580	0.560	29.000	30.0	-3
2,4-Dichlorophenol	0.308	0.314	30.560	30.0	2
1,2,4-Trichlorobenzene	0.315	0.319	30.410	30.0	1
Naphthalene	1.088	1.030	28.410	30.0	-5
4-Chloroaniline	0.475	0.461	29.130	30.0	-3
2,6-Dichlorophenol	0.308	0.300	29.300	30.0	-2
Hexachloropropene	0.156	0.154	29.750	30.0	-1
Hexachlorobutadiene	0.153	0.162	31.830	30.0	6
Quinoline	0.766	0.710	27.800	30.0	-7
Caprolactam	0.168	0.160	28.420	30.0	-5
N-Nitrosodi-n-butylamine	0.433	0.286	19.800	30.0	-34
4-Chloro-3-methylphenol	0.387	0.356	27.580	30.0	-8
Safrole	0.296	0.297	30.150	30.0	0
2-Methylnaphthalene	0.797	0.742	27.930	30.0	-7
1-Methylnaphthalene	0.736	0.686	27.960	30.0	-7
Hexachlorocyclopentadiene	0.216	0.188	26.040	30.0	-13
1,2,4,5-Tetrachlorobenzene	0.470	0.486	31.070	30.0	4
cis-Isosafrole	0.479	0.426	4.540	5.1	-11
2,4,6-Trichlorophenol	0.358	0.347	29.090	30.0	-3
2,4,5-Trichlorophenol	0.393	0.371	28.370	30.0	-5
trans-Isosafrole	0.530	0.682	32.000	24.9	29
Isosafrole	0.522	0.638	36.530	30.0	22
1,1'-Biphenyl	1.504	1.405	28.040	30.0	-7
2-Chloronaphthalene	1.149	1.279	33.410	30.0	11
1-Chloronaphthalene	1.107	1.092	29.590	30.0	-1
Diphenyl ether	0.801	0.729	27.320	30.0	-9
2-Nitroaniline	0.400	0.372	27.860	30.0	-7
1,4-Naphthoquinone	0.512	0.424	24.830	30.0	-17
1,4-Dinitrobenzene	0.221	0.196	26.580	30.0	-11
Dimethylphthalate	1.389	1.243	26.850	30.0	-10
1,3-Dinitrobenzene	0.250	0.226	27.040	30.0	-10
2,6-Dinitrotoluene	0.323	0.299	27.770	30.0	-7
Acenaphthylene	1.831	1.624	26.620	30.0	-11
3-Nitroaniline	0.359	0.338	28.200	30.0	-6
Acenaphthene	1.231	1.071	26.100	30.0	-13

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/13/16 Time: 15:52

Lab File ID: gg0571.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2,4-Dinitrophenol	0.234	0.192	32.940	40.0	-18
4-Nitrophenol	0.217	0.152	21.060	30.0	-30
Pentachlorobenzene	0.420	0.457	32.670	30.0	9
2,4-Dinitrotoluene	0.454	0.403	26.630	30.0	-11
2,4_2,6-Dinitrotoluenes	0.394	0.351	54.400	60.0	-9
Dibenzofuran	1.734	1.569	27.150	30.0	-10
1-Naphthylamine	1.385	1.242	26.900	30.0	-10
2,3,4,6-Tetrachlorophenol	0.311	0.298	28.760	30.0	-4
2-Naphthylamine	1.365	1.235	27.150	30.0	-10
Diethylphthalate	1.367	1.197	26.260	30.0	-12
Thionazin	0.280	0.246	26.260	30.0	-12
Fluorene	1.413	1.319	28.000	30.0	-7
4-Chlorophenyl-phenylether	0.663	0.648	29.320	30.0	-2
5-Nitro-o-toluidine	0.436	0.381	26.180	30.0	-13
4-Nitroaniline	0.419	0.361	25.850	30.0	-14
4,6-Dinitro-2-methylphenol	0.147	0.133	27.110	30.0	-10
N-Nitrosodiphenylamine (1)	0.658	0.607	27.700	30.0	-8
NDPA as diphenylamine	0.658	0.607	27.700	30.0	-8
1,2-Diphenylhydrazine	0.900	0.731	24.360	30.0	-19
Tetraethyldithiopyrophosphate	0.123	0.101	24.450	30.0	-18
1,3,5-Trinitrobenzene	0.087	0.088	30.350	30.0	1
Diallate (peak 1)	0.405	0.336	20.700	24.9	-17
Phorate	0.536	0.476	26.620	30.0	-11
Phenacetin	0.428	0.358	25.090	30.0	-16
4-Bromophenyl-phenylether	0.175	0.189	32.410	30.0	8
Diallate (peak 2)	0.394	0.320	4.140	5.1	-19
Diallate trans/cis	0.403	0.334	24.840	30.0	-17
Hexachlorobenzene	0.176	0.197	33.540	30.0	12
Dimethoate	0.364	0.314	25.850	30.0	-14
Pentachlorophenol	0.130	0.114	26.250	30.0	-12
4-Aminobiphenyl	0.580	0.340	17.600	30.0	-41
Pentachloronitrobenzene	0.073	0.069	28.160	30.0	-6
Pronamide	0.315	0.277	26.360	30.0	-12
Dinoseb	0.189	0.183	29.180	30.0	-3
Phenanthrene	1.138	1.049	27.650	30.0	-8
Anthracene	1.109	1.052	28.460	30.0	-5

(1) Cannot be Separated from Diphenylamine

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/13/16 Time: 15:52

Lab File ID: gg0571.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Carbazole	1.092	0.997	27.390	30.0	-9
Methyl parathion	0.258	0.224	25.980	30.0	-13
Di-n-butylphthalate	1.246	1.080	26.000	30.0	-13
Parathion	0.162	0.144	26.680	30.0	-11
4-Nitroquinoline-1-oxide	0.117	0.071	18.190	30.0	-39
Octachlorostyrene	0.061	0.073	35.900	30.0	20
Isodrin	0.117	0.110	28.310	30.0	-6
Fluoranthene	1.189	1.164	29.370	30.0	-2
Benzidine	0.809	0.676	75.160	90.0	-16
Pyrene	1.184	1.032	26.140	30.0	-13
p-Dimethylaminoazobenzene	0.202	0.193	28.690	30.0	-4
Chlorobenzilate	0.325	0.253	23.380	30.0	-22
3,3'-Dimethylbenzidine	0.651	0.638	29.390	30.0	-2
Butylbenzylphthalate	0.518	0.429	24.840	30.0	-17
2-Acetylaminofluorene	0.478	0.397	24.900	30.0	-17
3,3'-Dichlorobenzidine	0.376	0.383	30.550	30.0	2
4,4'-Methylenebis(2-chloroanil	0.197	0.186	28.350	30.0	-5
Benzo(a)anthracene	1.013	0.961	28.450	30.0	-5
Chrysene	1.014	0.938	27.760	30.0	-7
bis(2-Ethylhexyl)phthalate	0.715	0.578	24.270	30.0	-19
6-Methylchrysene	0.701	0.686	29.370	30.0	-2
Di-n-octylphthalate	1.589	1.224	23.130	30.0	-23
Benzo(b)fluoranthene	1.262	1.106	26.290	30.0	-12
7,12-Dimethylbenz[a]anthracene	0.589	0.576	29.380	30.0	-2
Benzo(k)fluoranthene	1.244	1.238	29.860	30.0	0
Benzo(a)pyrene	1.181	1.108	28.160	30.0	-6
3-Methylcholanthrene	0.520	0.472	27.230	30.0	-9
Dibenz(a,h)acridine	0.898	0.826	27.610	30.0	-8
Dibenz(a,j)acridine	0.951	0.936	29.500	30.0	-2
Indeno(1,2,3-cd)pyrene	1.207	1.207	30.000	30.0	0
Dibenz(a,h)anthracene	1.037	1.009	29.190	30.0	-3
Benzo(g,h,i)perylene	1.030	1.017	29.630	30.0	-1
Total PAHs	1.127	0.981	505.980	540.0	-6
2-Fluorophenol	1.496	1.408	56.490	60.0	-6
Phenol-d6	2.214	1.946	52.730	60.0	-12

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/13/16 Time: 15:52

Lab File ID: gg0571.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Nitrobenzene-d5	0.472	0.410	52.060	60.0	-13
2-Fluorobiphenyl	1.288	1.204	56.060	60.0	-7
2,4,6-Tribromophenol	0.142	0.166	70.030	60.0	17
Terphenyl-d14	0.732	0.716	58.670	60.0	-2
			Average %Drift:		10

Continuing Calibration
Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d **
/chem/HP11165.i/16jun07.b/gf0202.d
/chem/HP11165.i/16jun07.b/gf0203.d
/chem/HP11165.i/16jun07.b/gf0204.d
/chem/HP11165.i/16jun07.b/gf0205.d
/chem/HP11165.i/16jun07.b/gf0206.d
/chem/HP11165.i/16jun07.b/gf0207.d
/chem/HP11165.i/16jun07.b/gf0208.d

** indicates the Mid Level Calibration Standard.

Mid Level Calibration Standard is used for comparison.

Current Continuing Calibration Standard:

/chem/HP11165.i/16jul13a.b/gg0571.d

Area Summary

File ID:

Internal Standard Name	gg0571.d	ICAL Area	Low Limit	High Limit	In Spec
1,4-Dichlorobenzene-d4	76961	70096	35048	140192	Yes
Naphthalene-d8	327649	296116	148058	592232	Yes
Acenaphthene-d10	225360	192522	96261	385044	Yes
Phenanthrene-d10	439277	374023	187012	748046	Yes
Pyrene-d10	514259	404786	202393	809572	Yes
Perylene-d12	424255	301130	150565	602260	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

File ID:

Internal Standard Name	gg0571.d	ICAL RT	In Spec
1,4-Dichlorobenzene-d4	4.693	5.528	No
Naphthalene-d8	5.928	6.763	No
Acenaphthene-d10	7.616	8.475	No
Phenanthrene-d10	9.039	9.922	No
Pyrene-d10	10.392	11.310	No
Perylene-d12	12.898	13.939	No

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments: * column maintenance
APB 10206 7/13/16

Report generated on 07/13/2016 at 18:25

7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/13/16 Time: 16:52

Lab File ID: gg0572.d Init. Calib. Date(s): 06/28/16 06/28/16

Init. Calib. Times(s): 07:48 09:58

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Chlorobenzalmalononitrile	0.375	0.355	47.280	50.0	-5
			Average %Drift:		5

FORM VII SV-1

page 1 of 1

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 07/13/16 Time: 17:15

Lab File ID: gg0573.d Init. Calib. Date(s): 07/05/16 07/05/16

Init. Calib. Times(s): 07:13 09:20

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Chlorobenzaldehyde	0.257	0.910	53.040	15.0	254
			Average %Drift:		254

FORM VII SV-1

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,4-Dioxane	0.606	0.621	7.680	7.5	2
N-Nitrosodimethylamine	0.987	1.024	7.780	7.5	4
Pyridine	1.609	1.549	7.220	7.5	-4
2-Picoline	1.758	1.824	7.780	7.5	4
N-Nitrosomethylethylamine	0.699	0.738	7.920	7.5	6
Methyl methanesulfonate	0.716	0.759	7.950	7.5	6
N-Nitrosodiethylamine	0.668	0.715	8.030	7.5	7
Ethyl methanesulfonate	0.703	0.758	8.080	7.5	8
Benzaldehyde	1.357	1.353	7.480	7.5	0
Phenol	2.161	2.225	7.720	7.5	3
Aniline	2.571	2.616	7.630	7.5	2
a-methylstyrene	1.471	1.752	8.930	7.5	19
bis(2-Chloroethyl)ether	1.593	1.651	7.770	7.5	4
2-Chlorophenol	1.328	1.374	7.760	7.5	3
1,3-Dichlorobenzene	1.499	1.492	7.470	7.5	0
1,4-Dichlorobenzene	1.545	1.531	7.430	7.5	-1
Benzyl alcohol	0.967	1.158	8.980	7.5	20
1,2-Dichlorobenzene	1.436	1.437	7.510	7.5	0
Indene	2.508	2.977	8.900	7.5	19
2-Methylphenol	1.365	1.418	7.790	7.5	4
2,2'-oxybis(1-Chloropropane)	2.811	2.842	7.580	7.5	1
bis(2-Chloroisopropyl)ether	2.811	2.842	7.580	7.5	1
N-Nitrosopyrrolidine	0.723	0.787	8.160	7.5	9
Acetophenone	2.076	2.263	8.180	7.5	9
4-Methylphenol	1.464	1.609	8.250	7.5	10
Total Cresols	1.414	1.513	16.030	15.0	7
N-Nitroso-di-n-propylamine	1.171	1.245	7.970	7.5	6
N-Nitrosomorpholine	1.058	1.101	7.810	7.5	4
o-Toluidine	2.411	2.479	7.710	7.5	3
Hexachloroethane	0.608	0.654	8.070	7.5	8
Nitrobenzene	0.443	0.456	7.710	7.5	3
N-Nitrosopiperidine	0.175	0.181	7.780	7.5	4
Isophorone	0.787	0.795	7.580	7.5	1
2-Nitrophenol	0.167	0.175	7.830	7.5	4
2,4-Dimethylphenol	0.373	0.385	7.750	7.5	3
O,O,O-Triethylphosphorothioate	0.164	0.166	7.570	7.5	1

7C
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
bis(2-Chloroethoxy)methane	0.489	0.508	7.790	7.5	4
Benzoic acid	0.249	0.191	7.920	10.0	-21
1,2,3,4-Tetrahydronaphthalene	0.565	0.667	8.850	7.5	18
2,4-Dichlorophenol	0.278	0.288	7.770	7.5	4
1,2,4-Trichlorobenzene	0.318	0.311	7.330	7.5	-2
Naphthalene	1.018	1.005	7.400	7.5	-1
4-Chloroaniline	0.421	0.414	7.380	7.5	-2
2,6-Dichlorophenol	0.263	0.273	7.790	7.5	4
Hexachloropropene	0.171	0.175	7.650	7.5	2
Hexachlorobutadiene	0.170	0.173	7.630	7.5	2
Quinoline	0.605	0.602	7.460	7.5	-1
Caprolactam	0.092	0.098	7.990	7.5	7
N-Nitrosodi-n-butylamine	0.294	0.287	7.310	7.5	-3
4-Chloro-3-methylphenol	0.320	0.336	7.860	7.5	5
Safrole	0.245	0.251	7.670	7.5	2
2-Methylnaphthalene	0.669	0.664	7.440	7.5	-1
1-Methylnaphthalene	0.590	0.613	7.800	7.5	4
Hexachlorocyclopentadiene	0.308	0.290	7.070	7.5	-6
1,2,4,5-Tetrachlorobenzene	0.541	0.568	7.870	7.5	5
cis-Isosafrole	0.472	0.477	1.290	1.3	1
2,4,6-Trichlorophenol	0.350	0.362	7.750	7.5	3
2,4,5-Trichlorophenol	0.380	0.389	7.680	7.5	2
trans-Isosafrole	0.471	0.483	6.390	6.2	3
Isosafrole	0.471	0.482	7.670	7.5	2
1,1'-Biphenyl	1.382	1.467	7.960	7.5	6
2-Chloronaphthalene	1.146	1.092	7.140	7.5	-5
1-Chloronaphthalene	1.046	1.085	7.780	7.5	4
Diphenyl ether	0.761	0.766	7.550	7.5	1
2-Nitroaniline	0.343	0.356	7.790	7.5	4
1,4-Naphthoquinone	0.445	0.443	7.470	7.5	0
1,4-Dinitrobenzene	0.171	0.174	7.600	7.5	1
Dimethylphthalate	1.213	1.227	7.590	7.5	1
1,3-Dinitrobenzene	0.191	0.199	7.830	7.5	4
2,6-Dinitrotoluene	0.272	0.274	7.550	7.5	1
Acenaphthylene	1.670	1.719	7.720	7.5	3
3-Nitroaniline	0.298	0.302	7.610	7.5	1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
Acenaphthene	1.172	1.181	7.560	7.5	1
2,4-Dinitrophenol	0.164	0.145	8.860	10.0	-11
4-Nitrophenol	0.201	0.200	7.460	7.5	-1
Pentachlorobenzene	0.419	0.439	7.850	7.5	5
2,4-Dinitrotoluene	0.362	0.375	7.760	7.5	4
2,4_2,6-Dinitrotoluenes	0.315	0.324	15.310	15.0	2
Dibenzofuran	1.560	1.599	7.690	7.5	2
1-Naphthylamine	1.139	1.167	7.680	7.5	2
2,3,4,6-Tetrachlorophenol	0.262	0.290	8.300	7.5	11
2-Naphthylamine	1.115	1.138	7.660	7.5	2
Diethylphthalate	1.200	1.210	7.560	7.5	1
Thionazin	0.231	0.253	8.230	7.5	10
Fluorene	1.243	1.271	7.670	7.5	2
4-Chlorophenyl-phenylether	0.587	0.598	7.630	7.5	2
5-Nitro-o-toluidine	0.325	0.342	7.880	7.5	5
4-Nitroaniline	0.307	0.298	7.280	7.5	-3
4,6-Dinitro-2-methylphenol	0.116	0.109	7.030	7.5	-6
N-Nitrosodiphenylamine (1)	0.578	0.605	7.840	7.5	5
NDPA as diphenylamine	0.578	0.605	7.840	7.5	5
1,2-Diphenylhydrazine	0.826	0.856	7.770	7.5	4
Tetraethyldithiopyrophosphate	0.128	0.133	7.780	7.5	4
1,3,5-Trinitrobenzene	0.072	0.073	7.590	7.5	1
Diallate (peak 1)	0.350	0.369	6.560	6.2	5
Phorate	0.518	0.560	8.110	7.5	8
Phenacetin	0.364	0.393	8.090	7.5	8
4-Bromophenyl-phenylether	0.161	0.178	8.280	7.5	10
Diallate (peak 2)	0.340	0.360	1.350	1.3	6
Diallate trans/cis	0.349	0.367	7.910	7.5	5
Hexachlorobenzene	0.167	0.183	8.230	7.5	10
Dimethoate	0.326	0.359	8.270	7.5	10
Atrazine	0.176	0.193	8.230	7.5	10
Pentachlorophenol	0.103	0.089	6.480	7.5	-14
4-Aminobiphenyl	0.335	0.359	8.060	7.5	7
Pentachloronitrobenzene	0.075	0.081	8.130	7.5	8
Pronamide	0.293	0.308	7.890	7.5	5
Dinoseb	0.162	0.150	6.940	7.5	-8

(1) Cannot be Separated from Diphenylamine

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
Phenanthrene	1.004	1.031	7.700	7.5	3
Anthracene	0.996	1.037	7.810	7.5	4
Carbazole	0.929	0.973	7.860	7.5	5
Methyl parathion	0.243	0.264	8.150	7.5	9
Di-n-butylphthalate	1.168	1.167	7.490	7.5	0
Parathion	0.150	0.164	8.190	7.5	9
4-Nitroquinoline-1-oxide	0.095	0.076	5.900	7.5	-21
Octachlorostyrene	0.060	0.077	9.700	7.5	29
Isodrin	0.118	0.116	7.390	7.5	-1
Fluoranthene	1.080	1.165	8.090	7.5	8
Benzidine	0.663	0.655	22.220	22.5	-1
Pyrene	1.020	1.019	7.490	7.5	0
p-Dimethylaminoazobenzene	0.147	0.157	7.980	7.5	6
Chlorobenzilate	0.294	0.301	7.690	7.5	3
3,3'-Dimethylbenzidine	0.624	0.624	7.500	7.5	0
Butylbenzylphthalate	0.462	0.449	7.290	7.5	-3
2-Acetylaminofluorene	0.377	0.388	7.720	7.5	3
3,3'-Dichlorobenzidine	0.321	0.332	7.760	7.5	4
4,4'-Methylenebis(2-chloroanil	0.174	0.178	7.680	7.5	2
Benzo(a)anthracene	0.882	0.948	8.060	7.5	7
Chrysene	0.838	0.882	7.900	7.5	5
bis(2-Ethylhexyl)phthalate	0.679	0.651	7.180	7.5	-4
6-Methylchrysene	0.584	0.596	7.650	7.5	2
Di-n-octylphthalate	1.608	1.474	6.880	7.5	-8
Benzo(b)fluoranthene	1.120	1.145	7.670	7.5	2
7,12-Dimethylbenz[a]anthracene	0.472	0.477	7.580	7.5	1
Benzo(k)fluoranthene	1.104	1.116	7.580	7.5	1
Benzo(a)pyrene	1.049	1.088	7.780	7.5	4
3-Methylcholanthrene	0.420	0.426	7.620	7.5	2
Dibenz(a,h)acridine	0.845	0.860	7.640	7.5	2
Dibenz(a,j)acridine	0.879	0.893	7.620	7.5	2
Indeno(1,2,3-cd)pyrene	1.186	1.224	7.740	7.5	3
Dibenz(a,h)anthracene	0.991	1.023	7.740	7.5	3
Benzo(g,h,i)perylene	1.015	1.010	7.460	7.5	0
Total PAHs	0.943	0.915	123.360	135.0	-9
2-Fluorophenol	1.390	1.429	15.420	15.0	3

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP20296 Calibration Date: 07/08/16 Time: 17:15

Lab File ID: lg0231.d Init. Calib. Date(s): 06/23/16 06/23/16

Init. Calib. Times(s): 07:32 10:54

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF7.5	ACTUAL CONC.	TRUE CONC.	% DRIFT
Phenol-d6	1.808	1.906	15.810	15.0	5
Nitrobenzene-d5	0.430	0.452	15.760	15.0	5
2-Fluorobiphenyl	1.299	1.326	15.320	15.0	2
2,4,6-Tribromophenol	0.122	0.143	17.660	15.0	18
Terphenyl-d14	0.609	0.631	15.560	15.0	4
			Average %Drift:		5

Continuing Calibration
Internal Standard Area and Retention Time
Summary

Initial Calibration Standards:

/chem/HP20296.i/16jun23.b/lf0791.d **
/chem/HP20296.i/16jun23.b/lf0792.d
/chem/HP20296.i/16jun23.b/lf0793.d
/chem/HP20296.i/16jun23.b/lf0794.d
/chem/HP20296.i/16jun23.b/lf0795.d
/chem/HP20296.i/16jun23.b/lf0796.d
/chem/HP20296.i/16jun23.b/lf0797.d
/chem/HP20296.i/16jun23.b/lf0798.d

** indicates the Mid Level Calibration Standard.

Mid Level Calibration Standard is used for comparison.

Current Continuing Calibration Standard:

/chem/HP20296.i/16jul08a.b/lg0231.d

Area Summary

Internal Standard Name	File ID: lg0231.d	ICAL Area	Low Limit	High Limit	In Spec
1,4-Dichlorobenzene-d4	204321	151712	75856	303424	Yes
Naphthalene-d8	814411	604755	302378	1209510	Yes
Acenaphthene-d10	451708	334029	167014	668058	Yes
Phenanthrene-d10	823450	602792	301396	1205584	Yes
Pyrene-d10	983022	684619	342310	1369238	Yes
Perylene-d12	759719	483990	241995	967980	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

Internal Standard Name	File ID: lg0231.d	ICAL RT	In Spec
1,4-Dichlorobenzene-d4	6.847	7.093	Yes
Naphthalene-d8	8.832	9.083	Yes
Acenaphthene-d10	11.677	11.902	Yes
Phenanthrene-d10	13.603	13.838	Yes
Pyrene-d10	15.646	15.919	Yes
Perylene-d12	20.230	20.545	Yes

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments: _____

Report generated on 07/08/2016 at 17:44

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0231.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 05:25

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	77254	4.892	340561	6.122	217465	7.822
UPPER LIMIT	154508	5.392	681122	6.622	434930	8.322
LOWER LIMIT	38627	4.392	170281	5.622	108733	7.322
LLI SAMPLE NO.						
01 SBLKLC184	63487	4.893	252393	6.122	157678	7.816
02 184LCLCS	59416	4.893	260300	6.122	177899	7.822
03 184LCLCS2	61342	4.892	254094	6.122	162631	7.816
04 184LCLCSD2	60241	4.893	247021	6.122	156962	7.816
05 184LCLCS3	63735	4.893	251804	6.122	164399	7.816
06 184LCLCSD3	62513	4.887	261617	6.122	169257	7.816
07 SBLKLB184	63130	4.893	257239	6.122	162524	7.816
08 184LBLCS	57348	4.893	250474	6.122	170571	7.816
09 184LBLCS2	56990	4.887	233528	6.122	151422	7.816
10 184LBLCSD2	60280	4.887	246315	6.122	153669	7.816
11 184LBLCS3	58544	4.887	232981	6.122	146677	7.816
12 184LBLCSD3	58286	4.892	238637	6.122	147988	7.816
13 8442807	62863	4.892	269845	6.122	173936	7.816
14 8442808MS	58946	4.887	252478	6.122	158802	7.816
15 8442809MSD	68909	4.887	297109	6.122	188560	7.816
16 8442798	63585	4.887	278237	6.122	177368	7.816
17 8442801	67201	4.887	280262	6.122	174791	7.816

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0231.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 05:25

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	417213	9.251	490477	10.610	422029	13.145
UPPER LIMIT	834426	9.751	980954	11.110	844058	13.645
LOWER LIMIT	208607	8.751	245239	10.110	211015	12.645
LLI SAMPLE NO.						
01 SBLKLC184	309939	9.245	366957	10.604	324591	13.139
02 184LCLCS	340777	9.245	394743	10.610	313280	13.145
03 184LCLCS2	323875	9.245	385946	10.604	325810	13.139
04 184LCLCSD2	314523	9.239	373198	10.604	318257	13.139
05 184LCLCS3	325549	9.245	389526	10.604	321447	13.139
06 184LCLCSD3	331124	9.245	390763	10.604	324555	13.139
07 SBLKLB184	327462	9.239	382307	10.604	326965	13.139
08 184LBLCS	324524	9.245	379535	10.610	301528	13.145
09 184LBLCS2	299712	9.245	360710	10.604	301811	13.139
10 184LBLCSD2	313118	9.239	368294	10.604	311820	13.139
11 184LBLCS3	289084	9.239	338469	10.604	283982	13.139
12 184LBLCSD3	293186	9.239	339681	10.604	296678	13.139
13 8442807	333871	9.239	394488	10.604	340789	13.139
14 8442808MS	305435	9.245	358429	10.604	306005	13.139
15 8442809MSD	348101	9.245	388153	10.610	336423	13.139
16 8442798	329511	9.245	380483	10.604	313639	13.139
17 8442801	324614	9.245	372451	10.610	309344	13.139

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0231.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 05:25

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	77254	4.892	340561	6.122	217465	7.822
UPPER LIMIT	154508	5.392	681122	6.622	434930	8.322
LOWER LIMIT	38627	4.392	170281	5.622	108733	7.322
LLI SAMPLE NO.						
18 8442804	68713	4.893	291008	6.122	180926	7.816
19 8442816	70343	4.887	307097	6.122	189445	7.816
20 8442820	71696	4.892	298323	6.122	189462	7.816
21 8442824	70375	4.892	297716	6.122	183346	7.816
22 8444071	74551	4.892	309751	6.122	197838	7.816

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0231.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 05:25

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	417213	9.251	490477	10.610	422029	13.145
UPPER LIMIT	834426	9.751	980954	11.110	844058	13.645
LOWER LIMIT	208607	8.751	245239	10.110	211015	12.645
LLI SAMPLE NO.						
18 8442804	338104	9.245	391904	10.610	329586	13.139
19 8442816	349020	9.245	389612	10.610	329258	13.145
20 8442820	346478	9.245	392973	10.610	325030	13.145
21 8442824	335115	9.245	375202	10.610	314943	13.151
22 8444071	344977	9.245	394352	10.610	338981	13.151

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0291.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 18:52

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	79224	4.869	356602	6.104	247511	7.798
UPPER LIMIT	158448	5.369	713204	6.604	495022	8.298
LOWER LIMIT	39612	4.369	178301	5.604	123756	7.298
LLI SAMPLE NO.						
01 SBLKLE187	67270	4.869	292616	6.098	190368	7.792
02 187LELCS	59814	4.869	268163	6.104	198293	7.798
03 187LELCS2	63723	4.869	265811	6.098	180117	7.792
04 187LELCSD2	65442	4.869	278198	6.098	182356	7.792
05 187LELCS3	60014	4.869	262511	6.098	176200	7.792
06 187LELCSD3	67725	4.869	276763	6.098	180477	7.792
07 8444072MS	68016	4.869	305412	6.098	208018	7.798
08 8444073MSD	71249	4.869	316895	6.098	213858	7.798
09 8444051	66733	4.869	305224	6.098	205195	7.798
10 8444055	67620	4.869	302299	6.098	205582	7.798
11 8444059	67343	4.869	310230	6.104	213869	7.798
12 8444063	73362	4.869	326132	6.104	220058	7.798
13 8444067	70820	4.869	321274	6.104	219228	7.798
14 8444088	73571	4.869	326815	6.104	212704	7.798
15 8444092	71178	4.869	317975	6.104	212101	7.798
16 8444096	70452	4.869	316561	6.104	212459	7.798
17 8444097MS	72663	4.869	328683	6.104	226194	7.798

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0291.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 18:52

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	484765	9.228	565469	10.592	468688	13.122
UPPER LIMIT	969530	9.728	1130938	11.092	937376	13.622
LOWER LIMIT	242383	8.728	282735	10.092	234344	12.622
LLI SAMPLE NO.						
01 SBLKLE187	418502	9.222	517967	10.586	429856	13.116
02 187LELCS	411065	9.227	476107	10.586	365225	13.115
03 187LELCS2	397050	9.222	496404	10.586	411914	13.115
04 187LELCSD2	376896	9.222	466202	10.586	385681	13.115
05 187LELCS3	389533	9.222	496465	10.586	417275	13.116
06 187LELCSD3	370017	9.222	444164	10.586	377291	13.116
07 8444072MS	392461	9.222	434682	10.586	320761	13.115
08 8444073MSD	406794	9.222	451985	10.586	322476	13.115
09 8444051	401168	9.222	455711	10.586	318061	13.115
10 8444055	387413	9.222	430222	10.586	307070	13.122
11 8444059	414356	9.222	456027	10.586	319925	13.116
12 8444063	407337	9.228	434926	10.586	295726	13.121
13 8444067	406292	9.228	442185	10.586	307638	13.121
14 8444088	391950	9.228	415770	10.592	296854	13.121
15 8444092	387061	9.228	422252	10.592	301861	13.121
16 8444096	393084	9.228	420214	10.592	293699	13.121
17 8444097MS	401837	9.228	436008	10.592	307248	13.121

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0291.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 18:52

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	79224	4.869	356602	6.104	247511	7.798
UPPER LIMIT	158448	5.369	713204	6.604	495022	8.298
LOWER LIMIT	39612	4.369	178301	5.604	123756	7.298
LLI SAMPLE NO.						
18 8444098MSD	73477	4.869	328037	6.104	226420	7.798
19 8445669	71363	4.869	311752	6.104	216249	7.798
20 8445673	69765	4.869	315959	6.104	213842	7.798
21 8445677	69974	4.869	318414	6.104	213917	7.798
22 8449086	69427	4.875	311259	6.104	208089	7.798
23 8449090	75097	4.869	336370	6.104	227146	7.798

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0291.d Date Analyzed: 07/06/16

Instrument ID: HP11165 Time Analyzed: 18:52

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	484765	9.228	565469	10.592	468688	13.122
UPPER LIMIT	969530	9.728	1130938	11.092	937376	13.622
LOWER LIMIT	242383	8.728	282735	10.092	234344	12.622
LLI SAMPLE NO.						
18 8444098MSD	411277	9.228	441297	10.592	305849	13.121
19 8445669	406563	9.228	445851	10.592	319401	13.121
20 8445673	406285	9.228	446844	10.592	307434	13.121
21 8445677	398756	9.228	427159	10.592	299651	13.121
22 8449086	387149	9.227	411596	10.592	291061	13.127
23 8449090	399995	9.228	419507	10.592	294465	13.127

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0571.d Date Analyzed: 07/13/16

Instrument ID: HP11165 Time Analyzed: 15:52

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	76961	4.693	327649	5.928	225360	7.616
UPPER LIMIT	153922	5.193	655298	6.428	450720	8.116
LOWER LIMIT	38481	4.193	163825	5.428	112680	7.116
LLI SAMPLE NO.						
01 SBLKWN194	68385	4.692	288828	5.928	194637	7.616
02 194WNLCS	68966	4.698	286387	5.928	189824	7.622
03 SBLKLB194	70903	4.698	286378	5.928	186831	7.616
04 194LBLCS	77620	4.698	330230	5.928	218013	7.622
05 194LBLCS1	67951	4.698	281673	5.928	186540	7.616
06 194LBLCSD1	65362	4.699	278868	5.928	178592	7.616
07 194LBLCS2	67201	4.698	273823	5.928	174967	7.616
08 194LBLCSD2	71460	4.693	298363	5.928	186312	7.616
09 8468616	69443	4.698	293263	5.928	184181	7.616
10 8468616MS	74341	4.698	317825	5.928	202773	7.622
11 8468616MSD	71820	4.698	304471	5.933	190739	7.622
12 8444067RE	74048	4.698	319957	5.928	197985	7.616
13 8457189	70845	4.698	300220	5.934	190427	7.622
14 8457193	73626	4.698	308386	5.934	199610	7.622
15 8457197	154540*	4.698	676758*	5.933	443652	7.622
16 8457201	79186	4.704	326496	5.934	201896	7.622
17 8457205	74343	4.704	316797	5.934	197077	7.622

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0571.d Date Analyzed: 07/13/16

Instrument ID: HP11165 Time Analyzed: 15:52

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	439277	9.039	514259	10.392	424255	12.898
UPPER LIMIT	878554	9.539	1028518	10.892	848510	13.398
LOWER LIMIT	219639	8.539	257130	9.892	212128	12.398
LLI SAMPLE NO.						
01 SBLKWN194	389732	9.033	452483	10.392	397166	12.892
02 194WNLCS	359078	9.039	420016	10.392	343229	12.898
03 SBLKLB194	382867	9.033	445387	10.392	355285	12.892
04 194LBLCS	409213	9.039	459744	10.392	347139	12.898
05 194LBLCS1	374372	9.033	432168	10.392	346160	12.892
06 194LBLCSD1	356304	9.034	416985	10.392	326145	12.892
07 194LBLCS2	364226	9.033	421248	10.392	325736	12.892
08 194LBLCSD2	376841	9.033	444285	10.392	355980	12.892
09 8468616	348459	9.033	362124	10.392	267522	12.904
10 8468616MS	367220	9.039	378228	10.392	280431	12.904
11 8468616MSD	350804	9.039	364297	10.398	274058	12.904
12 8444067RE	339719	9.039	336912	10.392	246040	12.904
13 8457189	338119	9.039	351821	10.398	255594	12.904
14 8457193	366120	9.039	399937	10.398	282072	12.904
15 8457197	777711	9.045	777677	10.398	478627	12.910
16 8457201	350705	9.045	354278	10.398	258918	12.910
17 8457205	331862	9.045	338431	10.404	246806	12.916

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0571.d Date Analyzed: 07/13/16

Instrument ID: HP11165 Time Analyzed: 15:52

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	76961	4.693	327649	5.928	225360	7.616
UPPER LIMIT	153922	5.193	655298	6.428	450720	8.116
LOWER LIMIT	38481	4.193	163825	5.428	112680	7.116
LLI SAMPLE NO.						
18 8457209	73242	4.704	310060	5.934	194839	7.628
19 8466599	68823	4.704	296231	5.940	198813	7.628
20 8466599MS	78563	4.704	338958	5.939	215748	7.627
21 8466599MSD	82168	4.704	352766	5.939	224162	7.628
22 8466590	71498	4.704	308170	5.933	205250	7.627

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gg0571.d Date Analyzed: 07/13/16

Instrument ID: HP11165 Time Analyzed: 15:52

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	439277	9.039	514259	10.392	424255	12.898
UPPER LIMIT	878554	9.539	1028518	10.892	848510	13.398
LOWER LIMIT	219639	8.539	257130	9.892	212128	12.398
LLI SAMPLE NO.						
18 8457209	339511	9.045	342092	10.404	250895	12.916
19 8466599	377032	9.051	404141	10.404	274433	12.916
20 8466599MS	396801	9.057	401150	10.410	268580	12.915
21 8466599MSD	411584	9.057	422947	10.410	295677	12.916
22 8466590	391108	9.051	432344	10.404	307553	12.915

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): lg0231.d Date Analyzed: 07/08/16

Instrument ID: HP20296 Time Analyzed: 17:15

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	204321	6.847	814411	8.832	451708	11.677
UPPER LIMIT	408642	7.347	1628822	9.332	903416	12.177
LOWER LIMIT	102161	6.347	407206	8.332	225854	11.177
LLI SAMPLE NO.						
01 SBLKWD178	187622	6.842	734483	8.831	396299	11.671
02 178WDLCS	182696	6.847	686562	8.832	386548	11.677
03 178WDLCSD	182855	6.847	697537	8.832	386823	11.677
04 178WDLCS1	200951	6.842	790565	8.831	436931	11.672
05 178WDLCSD1	185673	6.842	737103	8.826	405596	11.672
06 8438378	189148	6.842	727545	8.832	407753	11.672
07 8438379	196655	6.842	740916	8.826	409311	11.671
08 8442829	188662	6.842	748739	8.826	405369	11.672
09 8442830	178304	6.842	693703	8.826	378235	11.672
10 8442831	179005	6.842	694890	8.826	376286	11.672
11 8444113	175939	6.842	697652	8.826	378713	11.671
12 8444115	176803	6.842	692234	8.826	385030	11.672
13 8444116	186232	6.842	715920	8.826	398557	11.672
14 8445666	178357	6.842	700513	8.827	389836	11.672
15 8445667	183176	6.842	700546	8.826	385834	11.672

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): lg0231.d Date Analyzed: 07/08/16

Instrument ID: HP20296 Time Analyzed: 17:15

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	823450	13.603	983022	15.646	759719	20.230
UPPER LIMIT	1646900	14.103	1966044	16.146	1519438	20.730
LOWER LIMIT	411725	13.103	491511	15.146	379860	19.730
LLI SAMPLE NO.						
01 SBLKWD178	717498	13.597	834779	15.640	666442	20.224
02 178WDLCS	692951	13.603	825957	15.646	636796	20.230
03 178WDLCSD	714448	13.602	832834	15.640	654418	20.229
04 178WDLCS1	799942	13.597	920532	15.640	720792	20.224
05 178WDLCSD1	751556	13.597	839328	15.640	701699	20.224
06 8438378	734404	13.597	834930	15.640	679389	20.224
07 8438379	740349	13.597	866043	15.640	688058	20.224
08 8442829	734078	13.597	861062	15.641	678909	20.224
09 8442830	713357	13.597	810611	15.640	656647	20.224
10 8442831	697761	13.597	793813	15.640	640889	20.224
11 8444113	706365	13.597	788849	15.640	647695	20.224
12 8444115	719248	13.597	809024	15.640	655763	20.224
13 8444116	720457	13.597	820450	15.640	652032	20.224
14 8445666	710443	13.597	807281	15.641	657085	20.224
15 8445667	706223	13.597	794712	15.640	634985	20.224

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

Preparation and Run Logs

Semivolatiles by GC/MS

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jun07\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GF0200.D	DFTPP1116	06/07/2016	09:16		
jmg00346	GF0201.D	STD1526	06/07/2016	09:32		
jmg00346	GF0202.D	STD1526	06/07/2016	09:59		
jmg00346	GF0203.D	STD1526	06/07/2016	10:25		
jmg00346	GF0204.D	STD1526	06/07/2016	10:51		
jmg00346	GF0205.D	STD1526	06/07/2016	11:20		
jmg00346	GF0206.D	STD1526	06/07/2016	11:47		
jmg00346	GF0207.D	STD1526	06/07/2016	12:13		
jmg00346	GF0208.D	STD1526	06/07/2016	12:39		
jmg00346	GF0209.D	MDL1526	06/07/2016	13:06		
jmg00346	GF0210.D	MDLPAH1526	06/07/2016	13:32		
jmg00346	GF0211.D	ICV1376	06/07/2016	14:00		
jmg00346	GF0212.D	ICVBAS0716	06/07/2016	14:28		

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jun28\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GF1000.D	DFTPP1116	06/28/2016	07:05		
jmg00346	GF1001.D	STD1526	06/28/2016	07:22		
jmg00346	GF1002.D	TRG1586	06/28/2016	07:48		
jmg00346	GF1003.D	TRG1586	06/28/2016	08:14		
jmg00346	GF1004.D	TRG1586	06/28/2016	08:40		
jmg00346	GF1005.D	TRG1586	06/28/2016	09:07		
jmg00346	GF1006.D	TRG1586	06/28/2016	09:32		
jmg00346	GF1007.D	TRG1586	06/28/2016	09:58		
jmg00346	GF1008.D	TRGMDL1586	06/28/2016	10:25		
jmg00346	GF1009.D	SBLKWA178	06/28/2016	10:51	16178WAA	
jmg00346	GF1010.D	178WALCS	06/28/2016	11:18	16178WAA	
jmg00346	GF1011.D	178WALCSD	06/28/2016	11:44	16178WAA	
jmg00346	GF1012.D	8438378	06/28/2016	12:10	16178WAA	
jmg00346	GF1013.D	8438379	06/28/2016	12:37	16178WAA	
jmg00346	GF1014.D	8442829	06/28/2016	13:03	16178WAA	
jmg00346	GF1015.D	8442830	06/28/2016	13:29	16178WAA	
jmg00346	GF1016.D	8442831	06/28/2016	13:56	16178WAA	
jmg00346	GF1017.D	8444113	06/28/2016	14:22	16178WAA	
jmg00346	GF1018.D	8444115	06/28/2016	14:48	16178WAA	
jmg00346	GF1019.D	8444116	06/28/2016	15:15	16178WAA	
jmg00346	GF1020.D	8445666	06/28/2016	15:41	16178WAA	
jmg00346	GF1021.D	8445667	06/28/2016	16:07	16178WAA	

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jul05\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GG0162.D	TRG1566	07/05/2016	06:47		
jmg00346	GG0163.D	CBZ1876	07/05/2016	07:13		
jmg00346	GG0164.D	CBZ1876	07/05/2016	07:38		
jmg00346	GG0165.D	CBZ1876	07/05/2016	08:04		
jmg00346	GG0166.D	CBZ1876	07/05/2016	08:29		
jmg00346	GG0167.D	CBZ1876	07/05/2016	08:55		
jmg00346	GG0168.D	CBZ1876	07/05/2016	09:20		
jmg00346	GG0169.D	CBZMDL1876	07/05/2016	09:46		

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jul06\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GG0230.D	DFTPP1816	07/06/2016	05:10		
jmg00346	GG0231.D	STD1526	07/06/2016	05:25		
jmg00346	GG0232.D	TRG1566	07/06/2016	05:53		
jmg00346	GG0233.D	CBZ1876	07/06/2016	06:19		
jmg00346	GG0234.D	SBLKLC184	07/06/2016	07:14		
jmg00346	GG0235.D	184LCLCS	07/06/2016	07:45		
jmg00346	GG0236.D	184LCLCS2	07/06/2016	08:10		
jmg00346	GG0237.D	184LCLCSD2	07/06/2016	08:35	16184SLC	
jmg00346	GG0238.D	184LCLCS3	07/06/2016	09:01	16184SLC	
jmg00346	GG0239.D	184LCLCSD3	07/06/2016	09:27	16184SLC	
jmg00346	GG0240.D	SBLKLB184	07/06/2016	09:53	16184SLB	
jmg00346	GG0241.D	184LBLCS	07/06/2016	10:20	16184SLB	
jmg00346	GG0242.D	184LBLCS2	07/06/2016	10:46	16184SLB	
jmg00346	GG0243.D	184LBLCSD2	07/06/2016	11:11	16184SLB	
jmg00346	GG0244.D	184LBLCS3	07/06/2016	11:38	16184SLB	
jmg00346	GG0245.D	184LBLCSD3	07/06/2016	12:04	16184SLB	
jmg00346	GG0246.D	8442807	07/06/2016	12:30	16184SLB	5
jmg00346	GG0247.D	8442808	07/06/2016	12:55	16184SLB	5
jmg00346	GG0248.D	8442809	07/06/2016	13:21	16184SLB	5
jmg00346	GG0249.D	8442798	07/06/2016	13:47	16184SLB	5
jmg00346	GG0250.D	8442801	07/06/2016	14:13	16184SLB	5
jmg00346	GG0251.D	8442804	07/06/2016	14:38	16184SLB	5
jmg00346	GG0252.D	8442816	07/06/2016	15:04	16184SLB	5
jmg00346	GG0253.D	8442820	07/06/2016	15:30	16184SLB	5
jmg00346	GG0254.D	8442824	07/06/2016	15:55	16184SLB	5

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jul06a\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
whs02991	GG0290.D	DFTPP1816	07/06/2016	18:25		
whs02991	GG0291.D	STD1526	07/06/2016	18:52		
whs02991	GG0292.D	TRG1566	07/06/2016	19:19		
whs02991	GG0293.D	CBZ1876	07/06/2016	19:45		
whs02991	GG0294.D	SBLKLE187	07/06/2016	20:27		
whs02991	GG0295.D	187LELCS	07/06/2016	20:53		
whs02991	GG0296.D	187LELCS2	07/06/2016	21:19		
whs02991	GG0297.D	187LELCSD2	07/06/2016	21:45		
whs02991	GG0298.D	187LELCS3	07/06/2016	22:10		
whs02991	GG0299.D	187LELCSD3	07/06/2016	22:38	16187SLE	
whs02991	GG0300.D	8444072	07/06/2016	23:03	16184SLC	5
whs02991	GG0301.D	8444073	07/06/2016	23:29	16184SLC	5
whs02991	GG0302.D	8444051	07/06/2016	23:55	16184SLC	5
whs02991	GG0303.D	8444055	07/07/2016	00:20	16184SLC	5
whs02991	GG0304.D	8444059	07/07/2016	00:46	16184SLC	5
whs02991	GG0305.D	8444063	07/07/2016	01:12	16184SLC	5
whs02991	GG0306.D	8444067	07/07/2016	01:37	16184SLC	5
whs02991	GG0307.D	8444088	07/07/2016	02:03	16184SLC	5
whs02991	GG0308.D	8444092	07/07/2016	02:29	16184SLC	5
whs02991	GG0309.D	8444096	07/07/2016	02:54		5
whs02991	GG0310.D	8444097	07/07/2016	03:20		5
whs02991	GG0311.D	8444098	07/07/2016	03:45		5
whs02991	GG0312.D	8445669	07/07/2016	04:11		5
whs02991	GG0313.D	8445673	07/07/2016	04:36		5
whs02991	GG0314.D	8445677	07/07/2016	05:02		5
whs02991	GG0315.D	8449086	07/07/2016	05:27		5
whs02991	GG0316.D	8449090	07/07/2016	05:53		5

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jul13a\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
apb10206	GG0570.D	DFTPP1816	07/13/2016	15:36		
apb10206	GG0571.D	STD1886	07/13/2016	15:52		
apb10206	GG0571a.D	STD1886	07/13/2016	16:24		
apb10206	GG0572.D	TRG1566	07/13/2016	16:52		
apb10206	GG0573.D	CBZ1876	07/13/2016	17:15		
apb10206	GG0574.D	SBLKWN194	07/13/2016	17:49	16194WAN	
apb10206	GG0575.D	194WNLCS	07/13/2016	18:11	16194WAN	
apb10206	GG0576.D	194WNLCS	07/13/2016	18:34	16194WAN	
apb10206	GG0577.D	194WNLCSD	07/13/2016	18:58	16194WAN	
apb10206	GG0578.D	SBLKLB194	07/13/2016	19:21	16194SLB	
apb10206	GG0579.D	194LBLCS	07/13/2016	19:44	16194SLB	
apb10206	GG0584.D	8468616	07/13/2016	21:41	16194SLB	
apb10206	GG0585.D	8468616	07/13/2016	22:05	16194SLB	
apb10206	GG0586.D	8468616	07/13/2016	22:28	16194SLB	
apb10206	GG0587.D	8444067RE	07/13/2016	22:53	16194SLB	
apb10206	GG0588.D	8457189	07/13/2016	23:17	16194SLB	
apb10206	GG0589.D	8457193	07/13/2016	23:42	16194SLB	
apb10206	GG0590.D	8457197	07/14/2016	00:07	16194SLB	
apb10206	GG0591.D	8457201	07/14/2016	00:32	16194SLB	
apb10206	GG0592.D	8457205	07/14/2016	00:57	16194SLB	
apb10206	GG0593.D	8457209	07/14/2016	01:22	16194SLB	
apb10206	GG0594.D	8466599	07/14/2016	01:48	16194WAN	
apb10206	GG0595.D	8466599	07/14/2016	02:13	16194WAN	
apb10206	GG0596.D	8466599	07/14/2016	02:39	16194WAN	
apb10206	GG0597.D	8466587	07/14/2016	03:04	16194WAN	
apb10206	GG0598.D	8466590	07/14/2016	03:30	16194WAN	
apb10206	GG0599.D	8466593	07/14/2016	03:56	16194WAN	

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP20296 **HP #12**

Data Directory Path is - D:\data\16jun23\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
hbz01996	LF0790.D	RVDFTPP1416	06/23/2016	07:14		
hbz01996	LF0791.D	RVSTD1726	06/23/2016	07:32		
hbz01996	LF0792.D	RVSTD1726	06/23/2016	08:05		
hbz01996	LF0793.D	RVSTD1726	06/23/2016	08:33		
hbz01996	LF0794.D	RVSTD1726	06/23/2016	09:01		
hbz01996	LF0795.D	RVSTD1726	06/23/2016	09:30		
hbz01996	LF0796.D	RVSTD1726	06/23/2016	09:58		
hbz01996	LF0797.D	RVSTD1726	06/23/2016	10:26		
hbz01996	LF0798.D	RVSTD1726	06/23/2016	10:54		
hbz01996	LF0799.D	MDLSTD1726	06/23/2016	11:22		
hbz01996	LF0800.D	PAHMDL1726	06/23/2016	11:51		
hbz01996	LF0801.D	RVICV1376	06/23/2016	12:19		
hbz01996	LF0802.D	RVBASICV0716	06/23/2016	12:47		

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP20296 **HP #12**

Data Directory Path is - D:\data\16jul08a\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
ceb05247	LG0230.D	RVDFTPP1796	07/08/2016	17:02		
ceb05247	LG0231.D	RVSTD1726	07/08/2016	17:15		
ceb05247	LG0232.D	RVCLB1836	07/08/2016	17:44		
ceb05247	LG0233.D	rvCLB1836	07/08/2016	18:16		
ceb05247	LG0234.D	rvCLB1836	07/08/2016	18:44		
ceb05247	LG0235.D	rvCLB1836	07/08/2016	19:13		
ceb05247	LG0236.D	rvCLB1836	07/08/2016	19:41		
ceb05247	LG0237.D	rvCLB1836	07/08/2016	20:10		
ceb05247	LG0238.D	rvCLB1836	07/08/2016	20:38		
ceb05247	LG0239.D	SBLKWD178	07/08/2016	21:06	16178WAD	
ceb05247	LG0240.D	178WDLCS	07/08/2016	21:35	16178WAD	
ceb05247	LG0241.D	178WDLCSD	07/08/2016	22:03	16178WAD	
ceb05247	LG0242.D	178WDLCS	07/08/2016	22:31	16178WAD	
ceb05247	LG0243.D	178WDLCSD	07/08/2016	23:00	16178WAD	
ceb05247	LG0244.D	8438378	07/08/2016	23:28	16178WAD	
ceb05247	LG0245.D	8438379	07/08/2016	23:57	16178WAD	
ceb05247	LG0246.D	8442829	07/09/2016	00:25	16178WAD	
ceb05247	LG0247.D	8442830	07/09/2016	00:54	16178WAD	
ceb05247	LG0248.D	8442831	07/09/2016	01:22	16178WAD	
ceb05247	LG0249.D	8444113	07/09/2016	01:50	16178WAD	
ceb05247	LG0250.D	8444115	07/09/2016	02:19	16178WAD	
ceb05247	LG0251.D	8444116	07/09/2016	02:47	16178WAD	
ceb05247	LG0252.D	8445666	07/09/2016	03:15	16178WAD	
ceb05247	LG0253.D	8445667	07/09/2016	03:44	16178WAD	

Organic Extraction Batchlog Assigned to: 9874 Kayla Yuditsky Reviewed by: SM6/2016 7/6/16 Start Date: 7/5/16 Start time: 8:30

16184SLC026 Tech 1: Ky 9874 Tech 2:

Dept: 26 Prep Analysis: 10813 BNA Soil Microwave APP IX SVOA 8270D (microwave)

QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
8444072MS	D22C1	30.19	SS1616526A	1.0	MS1618126A	1.0	1	Z	Z	301A	Sol. brown
8444073MSD	D22C1	30.22	SS1616526A		MS1618126A	1.0	1	Z	Z	301A	↓
BLANKA	SBLKLC184	30	SS1616526A				1	Z	Z		Na2SO4
LCSA	184LCLCS	30	SS1616526A		MS1618126A	1.0	1	Z	Z		
LCSALT	184LCLCS	30	SS1616526A		MS1602726A		1	Z	Z		
LCSCS	184LCLCS	30	SS1616526A		MS1617326A		1	Z	Z		
LCSDALT	184LCLCSD	30	SS1616526A		MS1602726A		1	Z	Z		
LCSDCS	184LCLCSD	30	SS1616526A		MS1617326A		1	Z	Z		

Solvent Used	Lot No.
1:1 Methylene Chloride/Acetone	185062116A
Methylene Chloride	163036
Sodium Sulfate	161811A

Spike Solutions: Witness: N/A

MS1602726A ALTIMONT SPECIALS SPIKE
MS1617326A CS LCS SPIKE
MS1618126A LCS SPIKE MIX #1
SS1616526A BNA SURROGATE STANDARD

Sample #		Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1	8444051	D25A1	30.16	SS1616526A	1.0	1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N
2	8444055	D25B1	30.12	SS1616526A		1	Z	Z	301A	Organic Matter;Soil;Brown	10726	19863	07/18/2016	N
3	8444059	D25C1	30.15	SS1616526A		1	Z	Z	301A	Organic Matter;Soil;Brown	10726	19863	07/18/2016	N
4	8444063	D22A1	30.12	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N
5	8444067	D22B1	30.07	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N
6	8444071BKG	D22C1	30.12	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N
7	8444088	BGA11	30.22	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N
8	8444092	BGA21	30.17	SS1616526A	↓	1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N

N/A

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Rack ID:		Work Station	Micro	Micro Temp 100?
Internal Standard	LL197960	Balance #	13	✓

S-bath ID	6	88 C	S-bath ID	— C	N-Evap	— C	M-vap	C	16184SLC026

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

Organic Extraction Batchlog Assigned to: 2894 David Schrum Reviewed by: WS 7/6/16 Start Date: 7/6/16 Start time: 8:00

16187SLE026 Tech 1: BV 9121 Tech 2:

Dept: 26	Prep Analysis: 10813 BNA Soil Microwave APP IX								SVOA 8270D (microwave)		
QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
8444097MS	BGA31	30.18	SS1616526A	1.0	MS1618126A	1.0	1	Z	Z	301A	Bromsoil
8444098MSD	BGA31	30.1	SS1616526A		MS1618126A	1.0	1	Z	Z	020a	+
BLANKA	SBLKLE187	30.6	SS1616526A				1	Z	Z		Na2SO4
LCSA	187LELCS	30.0	SS1616526A		MS1618126A	1.0	1	Z	Z		
LCSALT	187LELCS	30.0	SS1616526A		MS1602726A		1	Z	Z		
LCSCS	187LELCS	30.0	SS1616526A		MS1617326A		1	Z	Z		
LCSDALT	187LELCSD	30.0	SS1616526A		MS1602726A		1	Z	Z		
LCSDCS	187LELCSD	30.0	SS1616526A		MS1617326A		1	Z	Z		

Solvent Used	Lot No.
1:1 Methylene Chloride/Acetone	185062116A
Methylene Chloride	163036
Sodium Sulfate	16180A

Spike Solutions: Witness: N/A

MS1602726A	ALTIMONT SPECIALS SPIKE
MS1617326A	CS LCS SPIKE
MS1618126A	LCS SPIKE MIX #1
SS1616526A	BNA SURROGATE STANDARD

Sample #	Sample Code	Amt ( )	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1 8444096BKG	BGA31	30.11	SS1616526A	1.0	1	Z	Z	301A	Soil;Brown	10726	19863	07/18/2016	N
2 8445669	D8904	30.36	SS1616526A		1	Z	Z	301a	Soil;Grey	10726	19863	07/19/2016	N
3 8445673	D8908	30.04	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/19/2016	N
4 8445677	D8912	30.33	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/19/2016	N
5 8449086	D19A1	30.24	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/20/2016	N
6 8449090	D19B1	30.40	SS1616526A		1	Z	Z	301A	Organic Matter;Soil;Brown	10726	19863	07/20/2016	N
7 8449094	D19C1	30.41	SS1616526A		1	Z	Z	301A	Soil;Brown	10726	19863	07/20/2016	N
8 8450969	15A-1	30.0	SS1616526A		1	Z	Z	20A		10726	19863	07/21/2016	N
9 8450973	15B-1	30.0	SS1616526A		1	Z	Z	20A		10726	19863	07/21/2016	N
10 8450977	15C-1	30.2	SS1616526A		1	Z	Z	20A		10726	19863	07/21/2016	N
11 8454721	D9102	30.3	SS1616526A		1	Z	Z	20A		10726	19863	07/22/2016	N
12 8454725	D9106	30.0	SS1616526A		1	Z	Z	20A		10726	19863	07/22/2016	N
13 8454729	D9110	30.0	SS1616526A		1	Z	Z	20A		10726	19863	07/22/2016	N
14 8454733	D9114	30.4	SS1616526A		1	Z	Z	20A		10726	19863	07/22/2016	N
15 8454737	D9118	30.1	SS1616526A		1	Z	Z	20A		10726	19863	07/22/2016	N

Rack ID:	—	Work Station	Micro	Micro Temp 100?
Internal Standard	LC197961	Balance #	13	✓

S-bath ID b 88 C | S-bath ID C | N-Evap C | M-vap C | 16187SLE026

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

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Sample #	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
16 8454741	D9122	30.1	SS1616526A	10	1	Z	Z	20A	Brown Soil	10726	19863	07/22/2016	N

N/A

Rack ID:		Work Station	Micro	Micro Temp 100?	
Internal Standard	LC19796 ✓	Balance #	13		√

S-bath ID 6	88 C	S-bath ID	C	N-Evap	C	M-vap	C	16187SLE026

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

Organic Extraction Batchlog Assigned to: 6740 Jessica Cook Reviewed by: APB 10206 Start Date: 7/13/16 Start time: 9:00

16194SLB026 Tech 1: KL10217 Tech 2:

Dept: 26 Prep Analysis: 10813 BNA Soil Microwave APP IX SVOA 8270D (microwave)

QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
8468616MSD	3509-MSD	30.0	SS1616526A	1.0	MS1618126A	1.0	1	Z	Z	099a	Small Gray Rock
8468616MS	3509-MS	30.0	SS1616526A		MS1618126A	1.0	1	Z	Z	099a	↓
BLANKA	SBLKLB194	30.0	SS1616526A				1	Z	Z		Na2SO4
LCSA	194LBLCS	30.0	SS1616526A		MS1618126A	1.0	1	Z	Z		
LCSALT	194LBLCS	30.0	SS1616526A		MS1602726A	1.0	1	Z	Z		
LCSCS	194LBLCS	30.0	SS1616526A		MS1617326A	1.0	1	Z	Z		
LCSDALT	194LBLCSD	30.0	SS1616526A		MS1602726A	1.0	1	Z	Z		
LCSDCS	194LBLCSD	30.0	SS1616526A	↓	MS1617326A	1.0	1	Z	Z		↓

Solvent Used	Lot No.
1:1 Methylene Chloride/Acetone	185062816A
Methylene Chloride	163582
Sodium Sulfate	16190A

Spike Solutions: Witness: JCC0740

MS1602726A ALTIMONT SPECIALS SPIKE
MS1617326A CS LCS SPIKE
MS1618126A LCS SPIKE MIX #1
SS1616526A BNA SURROGATE STANDARD

Sample #		Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1	8444067 R	D22B1	30.1	SS1616526A	1.0	1	Z	Z	020A	Sandy; Gray	10726	19863	07/18/2016	N
2	8457189	13A-1	30.0	SS1616526A		5	Z	Z	020A	Sandy; Gray	10726	19863	07/25/2016	N
3	8457193	13B-1	30.0	SS1616526A		5	Z	Z	020A	Sandy; Gray	10726	19863	07/25/2016	N
4	8457197	13C-1	30.0	SS1616526A		5	Z	Z	020A	Sandy; Gray	10726	19863	07/25/2016	N
5	8457201	12A-1	30.1	SS1616526A		1	Z	Z	020A	Sandy; Gray	10726	19863	07/25/2016	N
6	8457205	12B-1	30.1	SS1616526A		1	Z	Z	020A	Sandy; Gray	10726	19863	07/25/2016	N
7	8457209	12C-1	30.0	SS1616526A		1	Z	Z	020A	Sandy; Gray	10726	19863	07/25/2016	N
8	8468616	3509-	30.2	SS1616526A	↓	1	Z	Z	099a	Small Gray Rock	10726	1591	07/15/2016	N

N/A

Rack ID:	—	Work Station	Micro	Micro Temp 100? ✓
Internal Standard	LC19796Y	Balance #	17609	

S-bath ID 6 98 C S-bath ID — C N-Evap C M-vap C 16194SLB026

Documented temps are NIST corrected.

DF = Dilution Factor FV = Final Volume

Semivolatiles by GC/MS-Specials Data

Case Narrative/Conformance Summary

Semivolatiles by GC/MS-Specials

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS-Specials

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8444113	DU-2-5-FB	X		1	Field Blank
8444115	DU-2-2-EB	X		1	Equipment Blank
8444116	BGA-3-EB	X		1	Equipment Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Matrix QC may not be included if site-specific QC were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, laboratory spike data (LCS) are provided.

Surrogate

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Batch#: 16178WAA026 (Sample number(s): 8444113, 8444115-8444116)
The recovery(ies) for the following surrogate(s) is below the acceptance window: 2-Fluorobiphenyl (178WALCS, 178WALCSD, 8444115, 8444116, SBLKWA178), Nitrobenzene-d5 (178WALCS, 178WALCSD, 8444115, 8444116, SBLKWA178)

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS-Specials

(Sample number(s): 8444113, 8444115-8444116: Analysis: 02395)
The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Semivolatiles by GC/MS-Specials

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Quality Control Reference List
GC/MS Semivolatiles

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Fraction: Semivolatiles by GC/MS-Specials

Analysis	Batch Number	Sample Number	Analysis Date
CS Compound	16178WAA026	SBLKWA178	06/28/2016 10:51:00
		178WALCS	06/28/2016 11:18:00
		178WALCSD	06/28/2016 11:44:00
		8444113	06/28/2016 14:22:00
		8444115	06/28/2016 14:48:00
		8444116	06/28/2016 15:15:00

Fraction: Semivolatiles by GC/MS-Specials

02395: CS Compound Analyte Name	Default MDL	Default LOQ	Units
2-Chlorobenzalmalononitrile	5	15	ug/l

Fraction: Semivolatiles by GC/MS-Specials

16178WAA026 / SBLKWA178 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2-Chlorobenzalmalononitrile	06/28/16	N.D.	ug/l	5	15

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Quality Control Summary
Surrogates
GC/MS Semivolatiles
SDG: DWD88
Matrix: LIQUID

Fraction: Semivolatiles by GC/MS-Specials

16178WAA026	2-Fluorobiphenyl		Nitrobenzene-d5		Terphenyl-d14	
	Spike Added	100 ug/l	Spike Added	100 ug/l	Spike Added	100 ug/l
Sample	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
SBLKWA178	62 *	70 - 130	64 *	70 - 130	96	70 - 130
178WALCS	53 *	70 - 130	58 *	70 - 130	72	70 - 130
178WALCSD	67 *	70 - 130	68 *	70 - 130	94	70 - 130
8444113	71	70 - 130	71	70 - 130	81	70 - 130
8444115	57 *	70 - 130	57 *	70 - 130	76	70 - 130
8444116	63 *	70 - 130	65 *	70 - 130	75	70 - 130

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate (LCSD)

SDG: DWD88
Matrix: LIQUID

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS-Specials

LCS: 178WALCS LCSD: 178WALCSD	Batch: **16178WAA026** (Sample number(s): 8444113, 8444115-8444116)							
Analyte	**Spike Added ug/l**	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
2-Chlorobenzalmalononitrile	50	24.68	28.7	49	57	25-125	15	30

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf0200.d DFTPP Injection Date: 06/07/16

Instrument ID: HP11165 DFTPP Injection Time: 09:16

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	43.7
68	Less than 2.0% of mass 69	1.05 (1.88)1
69	Mass 69 relative abundance	55.9
70	Less than 2.0% of mass 69	0.45 (0.8)1
127	10.0 - 80.00% of mass 198	50.2
197	Less than 2.0% of mass 198	0.39
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	7.13
275	10.0 - 60.0% of mass 198	22.2
365	Greater than 1.00% of mass 198	2.94
441	Present, and less than mass 443	10.1
442	Greater than 50.00% of mass 198	60.5
443	15.00 - 24.00% of mass 442	11.4 (18.9)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gf0201.d	06/07/16	09:32
02	STD1526 - SSTD120	gf0202.d	06/07/16	09:59
03	STD1526 - SSTD80	gf0203.d	06/07/16	10:25
04	STD1526 - SSTD50	gf0204.d	06/07/16	10:51
05	STD1526 - SSTD15	gf0205.d	06/07/16	11:20
06	STD1526 - SSTD5	gf0206.d	06/07/16	11:47
07	STD1526 - SSTD1	gf0207.d	06/07/16	12:13
08	STD1526 - SSTD.5	gf0208.d	06/07/16	12:39
09	MDL1526 - SSTD00.5	gf0209.d	06/07/16	13:06
10	MDLPAH1526 - SSTD00.1	gf0210.d	06/07/16	13:32
11	ICV1376 - SSTD050	gf0211.d	06/07/16	14:00
12	ICVBAS0716 - SSTD050	gf0212.d	06/07/16	14:28

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf1000.d DFTPP Injection Date: 06/28/16

Instrument ID: HP11165 DFTPP Injection Time: 07:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.3
68	Less than 2.0% of mass 69	0.7 (1.42)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.33 (0.67)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.74
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.72
275	10.0 - 60.0% of mass 198	24.0
365	Greater than 1.00% of mass 198	2.51
441	Present, and less than mass 443	9.53
442	Greater than 50.00% of mass 198	62.5
443	15.00 - 24.00% of mass 442	12.6 (20.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	STD1526 - SSTD30	gf1001.d	06/28/16	07:22
02	TRG1586 - SSTD120	gf1002.d	06/28/16	07:48
03	TRG1586 - SSTD80	gf1003.d	06/28/16	08:14
04	TRG1586 - SSTD50	gf1004.d	06/28/16	08:40
05	TRG1586 - SSTD30	gf1005.d	06/28/16	09:07
06	TRG1586 - SSTD15	gf1006.d	06/28/16	09:32
07	TRG1586 - SSTD5	gf1007.d	06/28/16	09:58
08	TRGMDL1586 - SSTD001	gf1008.d	06/28/16	10:25
09	SBLKWA178	gf1009.d	06/28/16	10:51
10	178WALCS	gf1010.d	06/28/16	11:18
11	178WALCSD	gf1011.d	06/28/16	11:44
12	8438378	gf1012.d	06/28/16	12:10
13	8438379	gf1013.d	06/28/16	12:37
14	8442829	gf1014.d	06/28/16	13:03
15	8442830	gf1015.d	06/28/16	13:29
16	8442831	gf1016.d	06/28/16	13:56
17	8444113	gf1017.d	06/28/16	14:22
18	8444115	gf1018.d	06/28/16	14:48

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID: gf1000.d DFTPP Injection Date: 06/28/16

Instrument ID: HP11165 DFTPP Injection Time: 07:05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	39.3
68	Less than 2.0% of mass 69	0.7 (1.42)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.33 (0.67)1
127	10.0 - 80.00% of mass 198	45.0
197	Less than 2.0% of mass 198	0.74
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.72
275	10.0 - 60.0% of mass 198	24.0
365	Greater than 1.00% of mass 198	2.51
441	Present, and less than mass 443	9.53
442	Greater than 50.00% of mass 198	62.5
443	15.00 - 24.00% of mass 442	12.6 (20.1)2

1-Value is % mass 69 2-Value is % mass of 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
19	8444116	gf1019.d	06/28/16	15:15
20	8445666	gf1020.d	06/28/16	15:41
21	8445667	gf1021.d	06/28/16	16:07

FORM V SV

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	RRF	% RSD	CAL. METHOD
1,4-Dioxane			0.661	0.609	0.608	0.645	0.625	0.590	0.623	4	AVG
N-Nitrosodimethylamine				0.814	0.908	1.046	1.049	1.030	0.969	11	AVG
Pyridine			1.642	1.504	1.748	1.701	1.767	1.774	1.689	6	AVG
2-Picoline			1.434	1.697	1.787	1.862	1.767	1.837	1.731	9	AVG
N-Nitrosomethylethylamine			0.996	0.863	0.877	0.910	0.873	0.841	0.893	6	AVG
Methyl methanesulfonate			0.853	0.916	0.894	0.921	0.913	0.881	0.896	3	AVG
N-Nitrosodiethylamine		0.763	0.913	0.834	0.867	0.901	0.880	0.848	0.858	6	AVG
Ethyl methanesulfonate		0.916	0.865	0.817	0.841	0.835	0.844	0.811	0.847	4	AVG
Phenol		2.498	2.511	2.504	2.584	2.647	2.632	2.572	2.564	2	AVG
Aniline		2.670	2.981	2.889	2.948	2.951	2.973	2.876	2.898	4	AVG
a-methylstyrene			1.640	1.662	1.571	1.677	1.616	1.597	1.627	2	AVG
bis(2-Chloroethyl)ether		1.942	1.901	1.878	1.749	1.813	1.770	1.722	1.825	5	AVG
2-Chlorophenol		1.543	1.456	1.529	1.530	1.604	1.563	1.497	1.532	3	AVG
1,3-Dichlorobenzene		1.591	1.627	1.548	1.554	1.610	1.537	1.493	1.566	3	AVG
1,4-Dichlorobenzene		1.816	1.668	1.622	1.587	1.635	1.610	1.529	1.638	5	AVG
Benzyl alcohol		1.129	1.185	1.174	1.146	1.238	1.236	1.204	1.188	4	AVG
1,2-Dichlorobenzene		1.799	1.638	1.567	1.525	1.584	1.540	1.479	1.590	7	AVG
Indene			2.801	2.753	2.766	2.897	2.819	2.750	2.798	2	AVG
2-Methylphenol	1.623	1.431	1.595	1.614	1.608	1.638	1.648	1.582	1.592	4	AVG
2,2'-oxybis(1-Chloropropane)		2.473	2.029	1.950	1.918	1.988	1.959	1.907	2.032	10	AVG
bis(2-Chloroisopropyl)ether		2.473	2.029	1.950	1.918	1.988	1.959	1.907	2.032	10	AVG
N-Nitrosopyrrolidine		0.954	0.829	0.922	0.952	1.018	1.014	0.953	0.949	7	AVG
Acetophenone		2.132	2.508	2.368	2.457	2.572	2.565	2.453	2.436	6	AVG
4-Methylphenol		1.679	1.832	1.976	1.889	1.992	1.974	1.930	1.896	6	AVG
Total Cresols		1.555	1.713	1.795	1.749	1.815	1.811	1.756	1.742	5	AVG
N-Nitroso-di-n-propylamine		1.571	1.638	1.584	1.570	1.617	1.588	1.537	1.586	2	AVG
N-Nitrosomorpholine			1.089	1.099	1.133	1.145	1.192	1.107	1.128	3	AVG
o-Toluidine		2.454	2.820	2.904	2.790	2.856	2.849	2.783	2.780	5	AVG
Hexachloroethane			0.623	0.583	0.622	0.620	0.583	0.569	0.600	4	AVG
Nitrobenzene		0.476	0.509	0.494	0.494	0.497	0.482	0.490	0.492	2	AVG
N-Nitrosopiperidine		0.167	0.212	0.201	0.213	0.217	0.205	0.210	0.204	8	AVG
Isophorone		0.920	0.938	0.895	0.895	0.902	0.885	0.887	0.903	2	AVG
2-Nitrophenol		0.201	0.190	0.203	0.211	0.212	0.208	0.208	0.205	4	AVG
2,4-Dimethylphenol	0.429	0.354	0.402	0.431	0.413	0.430	0.406	0.414	0.410	6	AVG
O,O,O-Triethylphosphorothioate			0.201	0.182	0.186	0.185	0.181	0.183	0.186	4	AVG
bis(2-Chloroethoxy)methane		0.524	0.542	0.513	0.520	0.498	0.505	0.488	0.513	3	AVG
Benzoic acid			0.372	0.354	0.432	0.429	0.419	0.459	0.411	10	AVG
1,2,3,4-Tetrahydronaphthalene			0.580	0.562	0.591	0.578	0.574	0.591	0.580	2	AVG
2,4-Dichlorophenol		0.280	0.303	0.317	0.319	0.315	0.307	0.314	0.308	4	AVG
1,2,4-Trichlorobenzene			0.321	0.308	0.317	0.323	0.308	0.312	0.315	2	AVG
Naphthalene	1.073	1.130	1.100	1.090	1.071	1.093	1.060	1.088	1.088	2	AVG
4-Chloroaniline		0.434	0.490	0.464	0.497	0.478	0.471	0.493	0.475	5	AVG
2,6-Dichlorophenol		0.289	0.310	0.317	0.308	0.312	0.307	0.312	0.308	3	AVG
Hexachloropropene			0.146	0.154	0.160	0.156	0.155	0.163	0.156	4	AVG
Hexachlorobutadiene	0.163	0.160	0.152	0.151	0.150	0.155	0.145	0.146	0.153	4	AVG
Quinoline			0.788	0.766	0.754	0.772	0.766	0.750	0.766	2	AVG
Caprolactam			0.177	0.155	0.170	0.172	0.175	0.161	0.168	5	AVG
N-Nitrosodi-n-butylamine		0.440	0.384	0.425	0.456	0.449	0.443		0.433	6	AVG
4-Chloro-3-methylphenol		0.361	0.389	0.386	0.399	0.397	0.392	0.385	0.387	3	AVG
Safrole			0.290	0.291	0.297	0.300	0.297	0.299	0.296	1	AVG
2-Methylnaphthalene	0.930	0.743	0.821	0.779	0.786	0.781	0.771	0.764	0.797	7	AVG
1-Methylnaphthalene	0.790	0.724	0.767	0.716	0.729	0.734	0.716	0.714	0.736	4	AVG

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
Hexachlorocyclopentadiene			0.182	0.201	0.227	0.225	0.226	0.237	0.216	10	AVG
1,2,4,5-Tetrachlorobenzene		0.471	0.481	0.479	0.459	0.475	0.458	0.466	0.470	2	AVG
cis-Isosafrole			0.426	0.475	0.528	0.467	0.486	0.494	0.479	7	AVG
2,4,6-Trichlorophenol		0.356	0.344	0.369	0.355	0.361	0.357	0.362	0.358	2	AVG
2,4,5-Trichlorophenol		0.323	0.399	0.437	0.398	0.400	0.394	0.399	0.393	9	AVG
trans-Isosafrole			0.515	0.525	0.539	0.545	0.528	0.530	0.530	2	AVG
Isosafrole			0.500	0.517	0.537	0.531	0.521	0.524	0.522	2	AVG
1,1'-Biphenyl		1.509	1.513	1.485	1.496	1.516	1.510	1.498	1.504	1	AVG
2-Chloronaphthalene		1.134	1.134	1.117	1.286	1.154	1.043	1.173	1.149	6	AVG
1-Chloronaphthalene		1.017	1.164	1.204	1.091	1.081	1.157	1.039	1.107	6	AVG
Diphenyl ether		0.802	0.792	0.826	0.785	0.822	0.782	0.795	0.801	2	AVG
2-Nitroaniline		0.292	0.372	0.427	0.417	0.438	0.428	0.431	0.400	13	AVG
1,4-Naphthoquinone			0.466	0.515	0.533	0.530	0.519	0.510	0.512	5	AVG
1,4-Dinitrobenzene			0.183	0.218	0.216	0.234	0.235	0.239	0.221	9	AVG
Dimethylphthalate			1.468	1.426	1.371	1.375	1.363	1.328	1.389	4	AVG
1,3-Dinitrobenzene			0.228	0.250	0.248	0.259	0.258	0.258	0.250	5	AVG
2,6-Dinitrotoluene		0.256	0.329	0.338	0.328	0.341	0.330	0.337	0.323	9	AVG
Acenaphthylene	1.766	1.891	1.819	1.873	1.829	1.853	1.798	1.816	1.831	2	AVG
3-Nitroaniline		0.249	0.345	0.397	0.388	0.383	0.379	0.374	0.359	14	AVG
Acenaphthene	1.347	1.248	1.251	1.244	1.166	1.210	1.191	1.190	1.231	5	AVG
2,4-Dinitrophenol			0.200	0.227	0.236	0.239	0.247	0.252	0.234	8	AVG
4-Nitrophenol			0.203	0.215	0.211	0.221	0.212	0.238	0.217	5	AVG
Pentachlorobenzene		0.461	0.439	0.412	0.404	0.417	0.402	0.402	0.420	5	AVG
2,4-Dinitrotoluene			0.452	0.472	0.446	0.444	0.459	0.451	0.454	2	AVG
2,4_2,6-Dinitrotoluenes			0.390	0.405	0.387	0.393	0.395	0.394	0.394	2	AVG
Dibenzofuran		1.733	1.820	1.793	1.716	1.709	1.691	1.674	1.734	3	AVG
1-Naphthylamine			1.385	1.412	1.369	1.388	1.368	1.385	1.385	1	AVG
2,3,4,6-Tetrachlorophenol		0.282	0.316	0.333	0.308	0.316	0.310	0.308	0.311	5	AVG
2-Naphthylamine			1.353	1.408	1.356	1.382	1.336	1.353	1.365	2	AVG
Diethylphthalate			1.376	1.424	1.347	1.369	1.358	1.330	1.367	2	AVG
Thionazin			0.278	0.290	0.283	0.282	0.280	0.270	0.280	2	AVG
Fluorene	1.329	1.374	1.508	1.477	1.396	1.435	1.395	1.388	1.413	4	AVG
4-Chlorophenyl-phenylether		0.741	0.638	0.681	0.655	0.654	0.634	0.634	0.663	6	AVG
5-Nitro-o-toluidine		0.336	0.462	0.473	0.453	0.445	0.443	0.440	0.436	10	AVG
4-Nitroaniline		0.377	0.436	0.451	0.422	0.434	0.420	0.396	0.419	6	AVG
4,6-Dinitro-2-methylphenol			0.129	0.134	0.144	0.157	0.156	0.159	0.147	9	AVG
N-Nitrosodiphenylamine (1)	0.672	0.633	0.660	0.655	0.640	0.678	0.664	0.660	0.658	2	AVG
NDPA as diphenylamine	0.672	0.633	0.660	0.655	0.640	0.678	0.664	0.660	0.658	2	AVG
1,2-Diphenylhydrazine		0.965	0.859	0.869	0.879	0.922	0.909	0.898	0.900	4	AVG
Tetraethyldithiopyrophosphate			0.111	0.122	0.131	0.126	0.127	0.123	0.123	6	AVG
1,3,5-Trinitrobenzene			0.062	0.081	0.087	0.095	0.098	0.102	0.087	17	AVG
Diallate (peak 1)			0.407	0.394	0.401	0.410	0.404	0.411	0.405	2	AVG
Phorate		0.475	0.493	0.534	0.546	0.568	0.568	0.571	0.536	7	AVG
Phenacetin		0.384	0.433	0.431	0.441	0.439	0.437	0.433	0.428	5	AVG
4-Bromophenyl-phenylether			0.161	0.181	0.168	0.183	0.177	0.179	0.175	5	AVG
Diallate (peak 2)			0.396	0.393	0.394	0.398	0.404	0.380	0.394	2	AVG
Diallate trans/cis			0.405	0.393	0.400	0.408	0.404	0.406	0.403	1	AVG
Hexachlorobenzene	0.163	0.210	0.168	0.168	0.168	0.183	0.171	0.175	0.176	9	AVG
Dimethoate			0.337	0.370	0.373	0.386	0.358	0.360	0.364	5	AVG
Pentachlorophenol			0.129	0.126	0.129	0.133	0.130	0.133	0.130	2	AVG
4-Aminobiphenyl		0.591	0.617	0.628	0.582	0.545	0.517		0.580	7	AVG
Pentachloronitrobenzene			0.080	0.070	0.068	0.073	0.075	0.074	0.073	5	AVG

(1) Cannot be separated from Diphenylamine
4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/07/16 06/07/16

Calibration Times: 09:32 12:39

LAB FILE ID: RRF0.5 = gf0208.d RRF1 = gf0207.d RRF5 = gf0206.d RRF15 = gf0205.d
RRF30 = gf0201.d RRF50 = gf0204.d RRF80 = gf0203.d RRF120 = gf0202.d

COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
Pronamide		0.300	0.294	0.309	0.322	0.330	0.326	0.324	0.315	4	AVG
Dinoseb			0.127	0.167	0.199	0.209	0.210	0.220	0.189	19	AVG
Phenanthrene	1.139	1.246	1.133	1.125	1.078	1.147	1.121	1.113	1.138	4	AVG
Anthracene	1.028	1.067	1.106	1.130	1.117	1.167	1.130	1.131	1.109	4	AVG
Carbazole		1.078	1.087	1.104	1.060	1.130	1.104	1.084	1.093	2	AVG
Methyl parathion			0.212	0.252	0.274	0.278	0.265	0.268	0.258	9	AVG
Di-n-butylphthalate			1.182	1.219	1.241	1.299	1.288	1.249	1.246	3	AVG
Parathion			0.143	0.157	0.164	0.169	0.168	0.172	0.162	7	AVG
4-Nitroquinoline-1-oxide				0.096	0.109	0.128	0.122	0.131	0.117	13	AVG
Octachlorostyrene			0.064	0.056	0.059	0.062	0.062	0.062	0.061	5	AVG
Isodrin		0.124	0.112	0.114	0.114	0.120	0.119	0.117	0.117	3	AVG
Fluoranthene	1.202	1.134	1.183	1.214	1.157	1.244	1.203	1.176	1.189	3	AVG
Benzidine			0.764	0.791	0.829	0.835	0.805	0.830	0.809	3	AVG
Pyrene	1.307	1.304	1.180	1.158	1.143	1.121	1.120	1.140	1.184	7	AVG
p-Dimethylaminoazobenzene		0.148	0.182	0.200	0.216	0.220	0.222	0.224	0.202	14	AVG
Chlorobenzilate		0.304	0.320	0.323	0.337	0.329	0.326	0.332	0.325	3	AVG
3,3'-Dimethylbenzidine			0.612	0.602	0.641	0.666	0.623	0.760	0.651	9	AVG
Butylbenzylphthalate			0.491	0.501	0.538	0.527	0.521	0.529	0.518	4	AVG
2-Acetylaminofluorene			0.426	0.478	0.496	0.483	0.494	0.490	0.478	5	AVG
3,3'-Dichlorobenzidine			0.373	0.374	0.388	0.377	0.373	0.372	0.376	2	AVG
4,4'-Methylenebis(2-chloroani1			0.196	0.192	0.205	0.199	0.195	0.198	0.197	2	AVG
Benzo(a)anthracene	0.926	0.979	1.060	1.029	1.056	1.033	1.023	0.999	1.013	4	AVG
Chrysene	1.157	1.078	1.012	0.984	0.978	0.976	0.960	0.965	1.014	7	AVG
bis(2-Ethylhexyl)phthalate			0.675	0.692	0.747	0.722	0.722	0.731	0.715	4	AVG
6-Methylchrysene			0.699	0.680	0.708	0.709	0.703	0.704	0.701	2	AVG
Di-n-octylphthalate			1.309	1.474	1.724	1.689	1.628	1.706	1.588	10	AVG
Benzo(b)fluoranthene	1.166	1.232	1.250	1.298	1.277	1.304	1.293	1.273	1.262	4	AVG
7,12-Dimethylbenz[a]anthracene		0.470	0.533	0.601	0.657	0.640	0.597	0.622	0.589	11	AVG
Benzo(k)fluoranthene	1.118	1.171	1.253	1.264	1.360	1.318	1.206	1.263	1.244	6	AVG
Benzo(a)pyrene	0.967	1.131	1.198	1.237	1.245	1.262	1.206	1.200	1.181	8	AVG
3-Methylcholanthrene		0.489	0.481	0.514	0.538	0.558	0.526	0.535	0.520	5	AVG
Dibenz(a,h)acridine			0.808	0.833	0.948	0.952	0.923	0.925	0.898	7	AVG
Dibenz(a,j)acridine			0.920	0.898	1.020	0.985	0.934	0.953	0.951	5	AVG
Indeno(1,2,3-cd)pyrene	1.011	1.089	1.195	1.252	1.307	1.302	1.250	1.250	1.207	9	AVG
Dibenz(a,h)anthracene	0.944	0.963	1.028	1.044	1.106	1.097	1.066	1.047	1.037	6	AVG
Benzo(g,h,i)perylene	0.902	1.042	1.027	1.036	1.098	1.056	1.044	1.032	1.030	5	AVG
Total PAHs	1.053	1.061	1.107	1.132	1.177	1.182	1.129	1.171	1.127	4	AVG
2-Fluorophenol			1.506	1.494	1.480	1.544	1.493	1.458	1.496	2	AVG
Phenol-d6			2.191	2.221	2.188	2.236	2.265	2.182	2.214	1	AVG
Nitrobenzene-d5			0.475	0.466	0.475	0.482	0.465	0.470	0.472	1	AVG
2-Fluorobiphenyl			1.314	1.317	1.279	1.294	1.261	1.265	1.288	2	AVG
2,4,6-Tribromophenol			0.142	0.146	0.141	0.145	0.141	0.138	0.142	2	AVG
Terphenyl-d14			0.754	0.747	0.738	0.725	0.717	0.713	0.732	2	AVG

Average %RSD 5

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d SSTD030
/chem/HP11165.i/16jun07.b/gf0202.d SSTD120
/chem/HP11165.i/16jun07.b/gf0203.d SSTD080
/chem/HP11165.i/16jun07.b/gf0204.d SSTD050
/chem/HP11165.i/16jun07.b/gf0205.d SSTD015
/chem/HP11165.i/16jun07.b/gf0206.d SSTD005
/chem/HP11165.i/16jun07.b/gf0207.d SSTD001
/chem/HP11165.i/16jun07.b/gf0208.d SSTD00.5

Area Summary

File ID:

Internal Standard Name	gf0201.d	gf0202.d	gf0203.d	gf0204.d	gf0205.d	gf0206.d	gf0207.d	gf0208.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	70096	80056	69946	73872	74388	75855	70518	68894	72953	5	Yes
Naphthalene-d8	296116	339990	315991	325835	322701	324878	300737	292985	314904	5	Yes
Acenaphthene-d10	192522	219303	205887	212735	203039	209044	189605	188690	202603	6	Yes
Phenanthrene-d10	374023	412819	389703	400814	413018	417859	369222	370475	393492	5	Yes
Pyrene-d10	404786	440349	432286	456203	461359	456027	416814	425673	436687	5	Yes
Perylene-d12	301130	329460	331473	334394	351858	365369	345528	338486	337212	6	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

File ID:

Internal Standard Name	gf0201.d	gf0202.d	gf0203.d	gf0204.d	gf0205.d	gf0206.d	gf0207.d	gf0208.d	Avg. RT
1,4-Dichlorobenzene-d4	5.528	5.534	5.534	5.534	5.528	5.528	5.528	5.528	5.530
Naphthalene-d8	6.763	6.763	6.763	6.763	6.763	6.763	6.763	6.763	6.763
Acenaphthene-d10	8.475	8.475	8.475	8.475	8.475	8.469	8.475	8.469	8.473
Phenanthrene-d10	9.922	9.927	9.928	9.922	9.922	9.922	9.922	9.922	9.923
Pyrene-d10	11.310	11.310	11.310	11.310	11.304	11.304	11.304	11.304	11.307
Perylene-d12	13.939	13.945	13.945	13.945	13.939	13.939	13.939	13.939	13.941

Comments: _____

Report generated on 06/07/2016 at 18:24

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,4-Dioxane	50.00	53.67	7	30	YES
N-Nitrosodimethylamine	50.00	51.70	3	30	YES
Pyridine	50.00	55.26	11	30	YES
2-Picoline	50.00	51.90	4	30	YES
N-Nitrosomethylethylamine	50.00	41.43	-17	30	YES
Methyl methanesulfonate	50.00	52.74	5	30	YES
N-Nitrosodiethylamine	50.00	48.88	-2	30	YES
Ethyl methanesulfonate	50.00	49.75	-1	30	YES
Phenol	50.00	50.98	2	30	YES
Aniline	50.00	48.42	-3	30	YES
bis(2-Chloroethyl)ether	50.00	48.81	-2	30	YES
2-Chlorophenol	50.00	52.08	4	30	YES
1,3-Dichlorobenzene	50.00	52.08	4	30	YES
1,4-Dichlorobenzene	50.00	51.06	2	30	YES
Benzyl alcohol	50.00	51.04	2	30	YES
1,2-Dichlorobenzene	50.00	49.45	-1	30	YES
Indene	50.00	49.46	-1	30	YES
2-Methylphenol	50.00	53.12	6	30	YES
2,2'-oxybis(1-Chloropropane	50.00	51.97	4	30	YES
bis(2-Chloroisopropyl)ether	50.00	51.97	4	30	YES
N-Nitrosopyrrolidine	50.00	49.17	-2	30	YES
Acetophenone	50.00	49.36	-1	30	YES
4-Methylphenol	50.00	51.50	3	30	YES
N-Nitroso-di-n-propylamine	50.00	49.22	-2	30	YES
N-Nitrosomorpholine	50.00	50.77	2	30	YES
o-Toluidine	50.00	49.28	-1	30	YES
Total Cresols	100.00	104.63	5	30	YES
Hexachloroethane	50.00	50.96	2	30	YES
Nitrobenzene	50.00	48.91	-2	30	YES
N-Nitrosopiperidine	50.00	48.00	-4	30	YES
Isophorone	50.00	46.64	-7	30	YES
2-Nitrophenol	50.00	49.47	-1	30	YES
2,4-Dimethylphenol	50.00	45.31	-9	30	YES
bis(2-Chloroethoxy)methane	50.00	48.38	-3	30	YES
Benzoic acid	100.00	94.14	-6	30	YES
O,O,O-Triethylphosphorothio	50.00	46.81	-6	30	YES
2,4-Dichlorophenol	50.00	50.24	0	30	YES

NC = Could not calculate

Comments:

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
1,2,4-Trichlorobenzene	50.00	50.78	2	30	YES
Naphthalene	50.00	49.34	-1	30	YES
4-Chloroaniline	50.00	50.91	2	30	YES
2,6-Dichlorophenol	50.00	49.38	-1	30	YES
Hexachloropropene	50.00	53.33	7	30	YES
Hexachlorobutadiene	50.00	49.70	-1	30	YES
Quinoline	50.00	47.91	-4	30	YES
N-Nitrosodi-n-butylamine	50.00	36.21	-28	30	YES
4-Chloro-3-methylphenol	50.00	48.54	-3	30	YES
Safrole	50.00	49.09	-2	30	YES
2-Methylnaphthalene	50.00	46.43	-7	30	YES
1-Methylnaphthalene	50.00	46.31	-7	30	YES
Hexachlorocyclopentadiene	100.00	90.59	-9	30	YES
1,2,4,5-Tetrachlorobenzene	50.00	50.80	2	30	YES
cis-Isosafrole	6.00	6.25	4	30	YES
2,4,6-Trichlorophenol	50.00	49.91	0	30	YES
2,4,5-Trichlorophenol	50.00	51.15	2	30	YES
trans-Isosafrole	44.00	46.22	5	30	YES
1,1'-Biphenyl	50.00	48.75	-3	30	YES
2-Chloronaphthalene	50.00	50.26	1	30	YES
Isosafrole	50.00	52.47	5	30	YES
1-Chloronaphthalene	50.00	49.36	-1	30	YES
Diphenyl ether	50.00	49.24	-2	30	YES
2-Nitroaniline	50.00	52.74	5	30	YES
1,4-Naphthoquinone	62.50	58.31	-7	30	YES
1,4-Dinitrobenzene	50.00	51.33	3	30	YES
Dimethylphthalate	50.00	48.55	-3	30	YES
1,3-Dinitrobenzene	50.00	50.59	1	30	YES
2,6-Dinitrotoluene	50.00	52.28	5	30	YES
Acenaphthylene	50.00	43.69	-13	30	YES
3-Nitroaniline	50.00	52.01	4	30	YES
Acenaphthene	50.00	48.87	-2	30	YES
2,4-Dinitrophenol	100.00	100.32	0	30	YES
4-Nitrophenol	50.00	52.72	5	30	YES
Pentachlorobenzene	50.00	49.86	0	30	YES
2,4-Dinitrotoluene	50.00	50.32	1	30	YES
Dibenzofuran	50.00	48.44	-3	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
2,4_2,6-Dinitrotoluenes	100.00	102.60	3	30	YES
1-Naphthylamine	100.00	94.52	-5	30	YES
2,3,4,6-Tetrachlorophenol	50.00	54.18	8	30	YES
2-Naphthylamine	100.00	91.56	-8	30	YES
Diethylphthalate	50.00	48.98	-2	30	YES
Thionazin	50.00	41.55	-17	30	YES
Fluorene	50.00	51.88	4	30	YES
4-Chlorophenyl-phenylether	50.00	49.68	-1	30	YES
5-Nitro-o-toluidine	50.00	50.51	1	30	YES
4-Nitroaniline	50.00	47.08	-6	30	YES
4,6-Dinitro-2-methylphenol	50.00	50.51	1	30	YES
N-Nitrosodiphenylamine	50.00	48.76	-2	30	YES
NDPA as diphenylamine	50.00	48.76	-2	30	YES
1,2-Diphenylhydrazine	50.00	48.83	-2	30	YES
Tetraethyldithiopyrophospha	50.00	46.53	-7	30	YES
1,3,5-Trinitrobenzene	50.00	49.05	-2	30	YES
Diallate (peak 1)	37.50	33.84	-10	30	YES
Phorate	50.00	49.55	-1	30	YES
Phenacetin	50.00	47.14	-6	30	YES
4-Bromophenyl-phenylether	50.00	49.76	0	30	YES
Diallate (peak 2)	12.50	11.62	-7	30	YES
Hexachlorobenzene	50.00	48.55	-3	30	YES
Diallate trans/cis	50.00	45.47	-9	30	YES
Dimethoate	50.00	44.62	-11	30	YES
Pentachlorophenol	50.00	52.02	4	30	YES
4-Aminobiphenyl	50.00	67.10	34	30	NO*
Pentachloronitrobenzene	50.00	47.02	-6	30	YES
Pronamide	50.00	47.53	-5	30	YES
Dinoseb	50.00	52.71	5	30	YES
Phenanthrene	50.00	47.06	-6	30	YES
Anthracene	50.00	49.49	-1	30	YES
Carbazole	50.00	48.06	-4	30	YES
Methyl parathion	50.00	47.81	-4	30	YES
Di-n-butylphthalate	50.00	48.97	-2	30	YES
Parathion	50.00	50.59	1	30	YES
4-Nitroquinoline-1-oxide	600.00	770.14	28	30	YES
Isodrin	50.00	46.43	-7	30	YES

NC = Could not calculate

Comments: *APPIX compound. Rerun any samples with hits for 4-Aminobiphenyl under valid ICV.

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS | LAB CODE: LANCAS | INSTRUMENT: HP11165

Method: SW-846 8270D | File ID: gf0211.d

ICV SAMPLE ID: ICV1376 | BATCH: 16JUN07026 | Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Fluoranthene	50.00	49.03	-2	30	YES
Benzidine	250.00	248.93	0	30	YES
Pyrene	50.00	47.76	-4	30	YES
p-Dimethylaminoazobenzene	50.00	59.50	19	30	YES
Chlorobenzilate	50.00	49.10	-2	30	YES
3,3'-Dimethylbenzidine	100.00	104.27	4	30	YES
Butylbenzylphthalate	50.00	52.12	4	30	YES
2-Acetylaminofluorene	50.00	49.76	0	30	YES
3,3'-Dichlorobenzidine	50.00	47.12	-6	30	YES
Benzo(a)anthracene	50.00	51.44	3	30	YES
Chrysene	50.00	49.83	0	30	YES
4,4'-Methylenebis(2-chloroa	50.00	47.77	-4	30	YES
bis(2-Ethylhexyl)phthalate	50.00	50.47	1	30	YES
6-Methylchrysene	50.00	49.29	-1	30	YES
Di-n-octylphthalate	50.00	54.60	9	30	YES
Benzo(b)fluoranthene	50.00	53.49	7	30	YES
7,12-Dimethylbenz[a]anthrac	50.00	54.14	8	30	YES
Benzo(k)fluoranthene	50.00	57.36	15	30	YES
Benzo(a)pyrene	50.00	52.95	6	30	YES
3-Methylcholanthrene	50.00	63.50	27	30	YES
Dibenz(a,h)acridine	50.00	50.97	2	30	YES
Dibenz(a,j)acridine	50.00	50.12	0	30	YES
Indeno(1,2,3-cd)pyrene	50.00	56.11	12	30	YES
Dibenz(a,h)anthracene	50.00	55.58	11	30	YES
Benzo(g,h,i)perylene	50.00	54.71	9	30	YES
Total PAHs	900.00	911.32	1	30	YES

NC = Could not calculate

Comments: _____

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS LAB CODE: LANCAS INSTRUMENT: HP1l165

Method: SW-846 8270D File ID: gf0212.d

ICV SAMPLE ID: ICVBAS0716 BATCH: 16JUN07026 Sample Name: SSTD050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
Caprolactam	50.00	44.50	-11	30	YES

NC = Could not calculate

Comments: _____

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date(s): 06/28/16 06/28/16

Calibration Times: 07:48 09:58

LAB FILE ID: RRF5 = gf1007.d RRF15 = gf1006.d

RRF30 = gf1005.d RRF50 = gf1004.d RRF80 = gf1003.d RRF120 = gf1002.d

COMPOUND	RRF	RRF	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	$\overline{RRF}$	% RSD	CAL. METHOD
2-Chlorobenzalmalononitrile			0.373	0.369	0.378	0.374	0.376	0.382	0.375	1	AVG
								Average %RSD		1	

07-12-2016

4,6-Dinitro-2-methylphenol and 4-Nitrophenol are at 10 ng/ul in the 5 standard.
Benzidine Levels in the 5,15,30,50,80,120 standards are 15,45,90,150,240,360 ng/ul, respectively.
Benzoic acid and 2,4-Dinitrophenol are at 15 ng/ul, 30 ng/ul,40 ng/ul in the 5,15,30 standards.

Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun28.b/gf1002.d SSTD120
/chem/HP11165.i/16jun28.b/gf1003.d SSTD080
/chem/HP11165.i/16jun28.b/gf1004.d SSTD050
/chem/HP11165.i/16jun28.b/gf1005.d SSTD030
/chem/HP11165.i/16jun28.b/gf1006.d SSTD015
/chem/HP11165.i/16jun28.b/gf1007.d SSTD005

Area Summary

	File ID:								
Internal Standard Name	gf1002.d	gf1003.d	gf1004.d	gf1005.d	gf1006.d	gf1007.d	Avg. Area	%RSD	In Spec
1,4-Dichlorobenzene-d4	69353	75067	81429	77374	76768	84981	77495	7	Yes
Naphthalene-d8	300636	313602	337965	327580	320228	357147	326193	6	Yes
Acenaphthene-d10	200693	208546	226613	225158	220824	240109	220324	6	Yes
Phenanthrene-d10	415370	427022	462700	443931	443085	487450	446593	6	Yes
Pyrene-d10	497800	513778	536406	523166	517538	581064	528292	5	Yes
Perylene-d12	427018	435295	432549	423115	415118	448269	430227	3	Yes

%RSD of internal standard area is flagged out of spec if greater than 30.

RT Summary

	File ID:						
Internal Standard Name	gf1002.d	gf1003.d	gf1004.d	gf1005.d	gf1006.d	gf1007.d	Avg. RT
1,4-Dichlorobenzene-d4	5.151	5.151	5.152	5.151	5.151	5.151	5.151
Naphthalene-d8	6.387	6.386	6.387	6.386	6.381	6.381	6.385
Acenaphthene-d10	8.087	8.086	8.087	8.086	8.086	8.087	8.086
Phenanthrene-d10	9.528	9.527	9.528	9.527	9.528	9.528	9.528
Pyrene-d10	10.904	10.904	10.898	10.898	10.898	10.898	10.900
Perylene-d12	13.480	13.480	13.480	13.480	13.480	13.480	13.480

Comments: _____

Report generated on 06/28/2016 at 16:24

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
N-Nitrosodimethylamine	0.969	1.035	32.020	30.0	7
Pyridine	1.689	1.812	32.170	30.0	7
2-Picoline	1.731	1.985	34.410	30.0	15
N-Nitrosomethylethylamine	0.893	0.755	25.370	30.0	-15
Methyl methanesulfonate	0.896	0.970	32.480	30.0	8
N-Nitrosodiethylamine	0.858	0.910	31.810	30.0	6
Ethyl methanesulfonate	0.847	0.836	29.600	30.0	-1
Phenol	2.564	2.467	28.860	30.0	-4
Aniline	2.898	3.026	31.320	30.0	4
a-methylstyrene	1.627	1.743	32.140	30.0	7
bis(2-Chloroethyl)ether	1.825	1.867	30.680	30.0	2
2-Chlorophenol	1.532	1.601	31.350	30.0	4
1,3-Dichlorobenzene	1.566	1.648	31.570	30.0	5
1,4-Dichlorobenzene	1.638	1.694	31.020	30.0	3
Benzyl alcohol	1.188	1.234	31.180	30.0	4
1,2-Dichlorobenzene	1.590	1.591	30.010	30.0	0
Indene	2.798	2.806	30.080	30.0	0
2-Methylphenol	1.592	1.740	32.780	30.0	9
2,2'-oxybis(1-Chloropropane)	2.032	2.199	32.460	30.0	8
bis(2-Chloroisopropyl)ether	2.032	2.199	32.460	30.0	8
N-Nitrosopyrrolidine	0.949	1.032	32.650	30.0	9
Acetophenone	2.437	2.541	31.290	30.0	4
4-Methylphenol	1.896	2.038	32.240	30.0	7
Total Cresols	1.742	1.889	65.020	60.0	8
N-Nitroso-di-n-propylamine	1.586	1.662	31.440	30.0	5
N-Nitrosomorpholine	1.128	1.166	31.010	30.0	3
o-Toluidine	2.780	2.916	31.470	30.0	5
Hexachloroethane	0.600	0.625	31.220	30.0	4
Nitrobenzene	0.492	0.513	31.270	30.0	4
N-Nitrosopiperidine	0.204	0.215	31.620	30.0	5
Isophorone	0.903	0.940	31.230	30.0	4
2-Nitrophenol	0.205	0.204	29.850	30.0	0
2,4-Dimethylphenol	0.410	0.434	31.790	30.0	6
O,O,O-Triethylphosphorothioate	0.186	0.205	33.000	30.0	10
bis(2-Chloroethoxy)methane	0.513	0.545	31.890	30.0	6
Benzoic acid	0.411	0.404	39.310	40.0	-2

FORM VII SV-1

JM6/gf6
6-28-2016

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
1,2,3,4-Tetrahydronaphthalene	0.580	0.608	31.490	30.0	5
2,4-Dichlorophenol	0.308	0.325	31.710	30.0	6
1,2,4-Trichlorobenzene	0.315	0.332	31.660	30.0	6
Naphthalene	1.088	1.096	30.220	30.0	1
4-Chloroaniline	0.475	0.487	30.720	30.0	2
2,6-Dichlorophenol	0.308	0.319	31.120	30.0	4
Hexachloropropene	0.156	0.171	32.920	30.0	10
Hexachlorobutadiene	0.153	0.173	33.960	30.0	13
Quinoline	0.766	0.770	30.150	30.0	1
Caprolactam	0.168	0.175	31.120	30.0	4
N-Nitrosodi-n-butylamine	0.433	0.466	32.310	30.0	8
4-Chloro-3-methylphenol	0.387	0.404	31.360	30.0	5
Safrole	0.296	0.312	31.620	30.0	5
2-Methylnaphthalene	0.797	0.771	29.030	30.0	-3
1-Methylnaphthalene	0.736	0.721	29.390	30.0	-2
Hexachlorocyclopentadiene	0.216	0.197	27.300	30.0	-9
1,2,4,5-Tetrachlorobenzene	0.470	0.525	33.500	30.0	12
cis-Isosafrole	0.479	0.507	5.400	5.1	6
2,4,6-Trichlorophenol	0.358	0.385	32.310	30.0	8
2,4,5-Trichlorophenol	0.393	0.425	32.450	30.0	8
trans-Isosafrole	0.530	0.544	25.540	24.9	3
Isosafrole	0.522	0.538	30.940	30.0	3
1,1'-Biphenyl	1.504	1.523	30.380	30.0	1
2-Chloronaphthalene	1.149	1.145	29.910	30.0	0
1-Chloronaphthalene	1.107	1.117	30.260	30.0	1
Diphenyl ether	0.801	0.838	31.420	30.0	5
2-Nitroaniline	0.400	0.426	31.880	30.0	6
1,4-Naphthoquinone	0.512	0.488	28.610	30.0	-5
1,4-Dinitrobenzene	0.221	0.229	31.080	30.0	4
Dimethylphthalate	1.389	1.391	30.040	30.0	0
1,3-Dinitrobenzene	0.250	0.258	30.960	30.0	3
2,6-Dinitrotoluene	0.323	0.336	31.250	30.0	4
Acenaphthylene	1.831	1.821	29.850	30.0	-1
3-Nitroaniline	0.359	0.387	32.290	30.0	8
Acenaphthene	1.231	1.215	29.600	30.0	-1
2,4-Dinitrophenol	0.234	0.222	38.000	40.0	-5

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
4-Nitrophenol	0.217	0.239	33.040	30.0	10
Pentachlorobenzene	0.420	0.491	35.070	30.0	17
2,4-Dinitrotoluene	0.454	0.460	30.390	30.0	1
2,4_2,6-Dinitrotoluenes	0.394	0.398	61.640	60.0	3
Dibenzofuran	1.734	1.710	29.590	30.0	-1
1-Naphthylamine	1.385	1.394	30.200	30.0	1
2,3,4,6-Tetrachlorophenol	0.311	0.361	34.870	30.0	16
2-Naphthylamine	1.365	1.357	29.830	30.0	-1
Diethylphthalate	1.367	1.382	30.330	30.0	1
Thionazin	0.280	0.297	31.760	30.0	6
Fluorene	1.413	1.462	31.040	30.0	3
4-Chlorophenyl-phenylether	0.663	0.695	31.490	30.0	5
5-Nitro-o-toluidine	0.436	0.441	30.330	30.0	1
4-Nitroaniline	0.419	0.401	28.660	30.0	-4
4,6-Dinitro-2-methylphenol	0.147	0.150	30.590	30.0	2
N-Nitrosodiphenylamine (1)	0.658	0.664	30.290	30.0	1
NDPA as diphenylamine	0.658	0.664	30.290	30.0	1
1,2-Diphenylhydrazine	0.900	0.894	29.810	30.0	-1
Tetraethyldithiopyrophosphate	0.123	0.127	30.780	30.0	3
1,3,5-Trinitrobenzene	0.087	0.097	33.190	30.0	11
Diallate (peak 1)	0.405	0.404	24.880	24.9	0
Phorate	0.536	0.801	44.800	30.0	49
Phenacetin	0.428	0.435	30.460	30.0	2
4-Bromophenyl-phenylether	0.175	0.205	35.210	30.0	17
Diallate (peak 2)	0.394	0.399	5.160	5.1	1
Diallate trans/cis	0.403	0.403	30.050	30.0	0
Hexachlorobenzene	0.176	0.201	34.320	30.0	14
Dimethoate	0.364	0.381	31.410	30.0	5
Pentachlorophenol	0.130	0.142	32.880	30.0	10
4-Aminobiphenyl	0.580	0.544	28.120	30.0	-6
Pentachloronitrobenzene	0.073	0.080	32.650	30.0	9
Pronamide	0.315	0.321	30.540	30.0	2
Dinoseb	0.189	0.209	33.200	30.0	11
Phenanthrene	1.138	1.146	30.200	30.0	1
Anthracene	1.109	1.175	31.790	30.0	6
Carbazole	1.092	1.112	30.520	30.0	2

(1) Cannot be Separated from Diphenylamine

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Methyl parathion	0.258	0.273	31.740	30.0	6
Di-n-butylphthalate	1.246	1.240	29.850	30.0	-1
Parathion	0.162	0.174	32.170	30.0	7
4-Nitroquinoline-1-oxide	0.117	0.084	21.470	30.0	-28
Octachlorostyrene	0.061	0.076	37.710	30.0	26
Isodrin	0.117	0.124	31.790	30.0	6
Fluoranthene	1.189	1.297	32.720	30.0	9
Benzidine	0.809	0.761	84.700	90.0	-6
Pyrene	1.184	1.125	28.490	30.0	-5
p-Dimethylaminoazobenzene	0.202	0.208	30.980	30.0	3
Chlorobenzilate	0.325	0.308	28.500	30.0	-5
3,3'-Dimethylbenzidine	0.651	0.646	29.760	30.0	-1
Butylbenzylphthalate	0.518	0.480	27.810	30.0	-7
2-Acetylaminofluorene	0.478	0.469	29.460	30.0	-2
3,3'-Dichlorobenzidine	0.376	0.408	32.580	30.0	9
4,4'-Methylenebis(2-chloroanil	0.197	0.209	31.820	30.0	6
Benzo(a)anthracene	1.013	1.067	31.590	30.0	5
Chrysene	1.014	1.003	29.670	30.0	-1
bis(2-Ethylhexyl)phthalate	0.715	0.671	28.150	30.0	-6
6-Methylchrysene	0.701	0.741	31.720	30.0	6
Di-n-octylphthalate	1.589	1.414	26.700	30.0	-11
Benzo(b)fluoranthene	1.262	1.217	28.930	30.0	-4
7,12-Dimethylbenz[a]anthracene	0.589	0.614	31.310	30.0	4
Benzo(k)fluoranthene	1.244	1.286	31.000	30.0	3
Benzo(a)pyrene	1.181	1.184	30.090	30.0	0
3-Methylcholanthrene	0.520	0.536	30.930	30.0	3
Dibenz(a,h)acridine	0.898	0.900	30.070	30.0	0
Dibenz(a,j)acridine	0.951	0.986	31.090	30.0	4
Indeno(1,2,3-cd)pyrene	1.207	1.280	31.820	30.0	6
Dibenz(a,h)anthracene	1.037	1.056	30.560	30.0	2
Benzo(g,h,i)perylene	1.030	1.055	30.730	30.0	2
Total PAHs	1.127	1.051	546.710	540.0	1
2-Fluorophenol	1.496	1.568	62.910	60.0	5
Phenol-d6	2.214	2.253	61.070	60.0	2
Nitrobenzene-d5	0.472	0.488	61.990	60.0	3

FORM VII SV-1

7C cont
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Instrument ID: HP11165 Calibration Date: 06/28/16 Time: 07:22

Lab File ID: gf1001.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Min RRF for SPCC(#) = 0.050 Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Fluorobiphenyl	1.288	1.300	60.530	60.0	1
2,4,6-Tribromophenol	0.142	0.183	77.170	60.0	29
Terphenyl-d14	0.732	0.780	63.870	60.0	6
			Average %Drift:		6

Continuing Calibration
Internal Standard Area and Retention Time Summary

Initial Calibration Standards:

/chem/HP11165.i/16jun07.b/gf0201.d **
/chem/HP11165.i/16jun07.b/gf0202.d
/chem/HP11165.i/16jun07.b/gf0203.d
/chem/HP11165.i/16jun07.b/gf0204.d
/chem/HP11165.i/16jun07.b/gf0205.d
/chem/HP11165.i/16jun07.b/gf0206.d
/chem/HP11165.i/16jun07.b/gf0207.d
/chem/HP11165.i/16jun07.b/gf0208.d

** indicates the Mid Level Calibration Standard.

Mid Level Calibration Standard is used for comparison.

Current Continuing Calibration Standard:

/chem/HP11165.i/16jun28.b/gf1001.d

Area Summary

File ID:

Internal Standard Name	gf1001.d	ICAL Area	Low Limit	High Limit	In Spec
1,4-Dichlorobenzene-d4	80097	70096	35048	140192	Yes
Naphthalene-d8	351076	296116	148058	592232	Yes
Acenaphthene-d10	229111	192522	96261	385044	Yes
Phenanthrene-d10	454754	374023	187012	748046	Yes
Pyrene-d10	547731	404786	202393	809572	Yes
Perylene-d12	450607	301130	150565	602260	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

File ID:

Internal Standard Name	gf1001.d	ICAL RT	In Spec
1,4-Dichlorobenzene-d4	5.157	5.528	Yes
Naphthalene-d8	6.387	6.763	Yes
Acenaphthene-d10	8.092	8.475	Yes
Phenanthrene-d10	9.528	9.922	Yes
Pyrene-d10	10.904	11.310	Yes
Perylene-d12	13.486	13.939	Yes

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments: JM6/5H6
6-28-2016

Report generated on 06/28/2016 at 07:45

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gf1001.d Date Analyzed: 06/28/16

Instrument ID: HP11165 Time Analyzed: 07:22

	IS1(DCB)		IS2(NPT)		IS3(ANT)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	80097	5.157	351076	6.387	229111	8.092
UPPER LIMIT	160194	5.657	702152	6.887	458222	8.592
LOWER LIMIT	40049	4.657	175538	5.887	114556	7.592
LLI SAMPLE NO.						
01 SBLKWA178	80148	5.151	339714	6.386	222101	8.086
02 178WALCS	80435	5.151	350695	6.381	234710	8.086
03 178WALCSD	73962	5.151	325371	6.381	209182	8.086
04 8438378	86109	5.151	372839	6.381	248891	8.086
05 8438379	84743	5.157	359685	6.381	244704	8.086
06 8442829	77455	5.151	335112	6.381	224553	8.086
07 8442830	77638	5.151	331373	6.381	215495	8.086
08 8442831	78672	5.151	333632	6.381	225695	8.086
09 8444113	75121	5.151	315508	6.381	211180	8.086
10 8444115	78360	5.151	328762	6.381	220643	8.087
11 8444116	77346	5.151	329393	6.381	224252	8.086
12 8445666	71351	5.151	301782	6.381	203136	8.087
13 8445667	70801	5.151	307388	6.381	208045	8.086

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: LANCASTER LABS Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____

Lab File ID (Standard): gf1001.d Date Analyzed: 06/28/16

Instrument ID: HP11165 Time Analyzed: 07:22

	IS4(PHN)		IS5(PYR)		IS6(PRY)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD	454754	9.528	547731	10.904	450607	13.486
UPPER LIMIT	909508	10.028	1095462	11.404	901214	13.986
LOWER LIMIT	227377	9.028	273866	10.404	225304	12.986
LLI SAMPLE NO.						
01 SBLKWA178	444312	9.527	524164	10.898	453614	13.480
02 178WALCS	465114	9.528	552723	10.898	466913	13.480
03 178WALCSD	432911	9.522	505759	10.898	416324	13.480
04 8438378	498214	9.527	586989	10.898	466937	13.480
05 8438379	483458	9.528	562577	10.898	451911	13.480
06 8442829	450000	9.522	534921	10.898	435230	13.480
07 8442830	429268	9.527	504430	10.898	426858	13.480
08 8442831	458326	9.522	545923	10.898	462675	13.480
09 8444113	422492	9.522	510508	10.898	427004	13.480
10 8444115	449447	9.522	530050	10.898	466855	13.480
11 8444116	444562	9.522	542350	10.898	460095	13.474
12 8445666	402229	9.522	490595	10.898	440059	13.480
13 8445667	422634	9.522	500688	10.898	426369	13.474

IS4 (PHN) = Phenanthrene-d10
IS5 (PYR) = Pyrene-d10
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag internal standard are and RT values with an asterisk
* Values outside of QC limits.

Preparation and Run Logs

Semivolatiles by GC/MS-Specials

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jun07\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GF0200.D	DFTPP1116	06/07/2016	09:16		
jmg00346	GF0201.D	STD1526	06/07/2016	09:32		
jmg00346	GF0202.D	STD1526	06/07/2016	09:59		
jmg00346	GF0203.D	STD1526	06/07/2016	10:25		
jmg00346	GF0204.D	STD1526	06/07/2016	10:51		
jmg00346	GF0205.D	STD1526	06/07/2016	11:20		
jmg00346	GF0206.D	STD1526	06/07/2016	11:47		
jmg00346	GF0207.D	STD1526	06/07/2016	12:13		
jmg00346	GF0208.D	STD1526	06/07/2016	12:39		
jmg00346	GF0209.D	MDL1526	06/07/2016	13:06		
jmg00346	GF0210.D	MDLPAH1526	06/07/2016	13:32		
jmg00346	GF0211.D	ICV1376	06/07/2016	14:00		
jmg00346	GF0212.D	ICVBAS0716	06/07/2016	14:28		

Lancaster Laboratories
Semi-Volatiles
Runlog for Agilent GC/MS System HP11165 **HP #07**

Data Directory Path is - C:\msdchem\1\data\16jun28\

OPERATOR	FILE	LLI#	DATE	TIME	BATCH	DILUTION FACTOR
jmg00346	GF1000.D	DFTPP1116	06/28/2016	07:05		
jmg00346	GF1001.D	STD1526	06/28/2016	07:22		
jmg00346	GF1002.D	TRG1586	06/28/2016	07:48		
jmg00346	GF1003.D	TRG1586	06/28/2016	08:14		
jmg00346	GF1004.D	TRG1586	06/28/2016	08:40		
jmg00346	GF1005.D	TRG1586	06/28/2016	09:07		
jmg00346	GF1006.D	TRG1586	06/28/2016	09:32		
jmg00346	GF1007.D	TRG1586	06/28/2016	09:58		
jmg00346	GF1008.D	TRGMDL1586	06/28/2016	10:25		
jmg00346	GF1009.D	SBLKWA178	06/28/2016	10:51	16178WAA	
jmg00346	GF1010.D	178WALCS	06/28/2016	11:18	16178WAA	
jmg00346	GF1011.D	178WALCSD	06/28/2016	11:44	16178WAA	
jmg00346	GF1012.D	8438378	06/28/2016	12:10	16178WAA	
jmg00346	GF1013.D	8438379	06/28/2016	12:37	16178WAA	
jmg00346	GF1014.D	8442829	06/28/2016	13:03	16178WAA	
jmg00346	GF1015.D	8442830	06/28/2016	13:29	16178WAA	
jmg00346	GF1016.D	8442831	06/28/2016	13:56	16178WAA	
jmg00346	GF1017.D	8444113	06/28/2016	14:22	16178WAA	
jmg00346	GF1018.D	8444115	06/28/2016	14:48	16178WAA	
jmg00346	GF1019.D	8444116	06/28/2016	15:15	16178WAA	
jmg00346	GF1020.D	8445666	06/28/2016	15:41	16178WAA	
jmg00346	GF1021.D	8445667	06/28/2016	16:07	16178WAA	

Organic Extraction Batchlog Assigned to: 701 Karen Beyer Reviewed by: JMO 6-25-16 Start Date: 6/27/16 Start time: 21:00

16178WAA026 Tech 1: MM Tech 2:

Dept: 26	Prep Analysis: 10475 BNA Water Extraction CS BZ							Specials in water by GC/MS			
QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
BLANKA	SBLKWA178	1000	SS1616526A	1.0			1.0	6	NA	NA	
LCSA	178WALCS	1010	SS1616526A	1.0	MS1617326A	1.0	1.0	8	NA	NA	
LCSDA	178WALCSD	1010	SS1616526A	1.0	MS1617326A	1.0	1.0	8	NA	NA	

Solvent Used	Lot No.
10N NaOH	—
Methylene Chloride	163135
Sodium Sulfate	16176A
Sulfuric Acid	—

MM 6/27/16

Spike Solutions: Witness: MM
MS1617326A CS LCS SPIKE
SS1616526A BNA SURROGATE STANDARD

6/27/16

Sample #	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments	Analyses	List	Due Date	Prio
1 8438378	D8634	1040	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/14/2016	N
2 8438379	D8635	1056	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/14/2016	N
3 8442829	RT-EB	1034	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
4 8442830	RT-FB	1009	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
5 8442831	D16C1	1045	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
6 8444113	D25FD	1057	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
7 8444115	D22EB	1002	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
8 8444116	BG3EB	1050	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/18/2016	N
9 8445666	D8901	1043	SS1616526A	1.0	1.0	6	NA	Y3A	Clear	02395	19866	07/19/2016	N
10 8445667	D8902	1037	SS1616526A	1.0	1.0	6	NA	Y3B	Clear	02395	19866	07/19/2016	N

MM 6/27/16

6/27/16

Rack ID:		Work Station	Bench 1	Micro Temp 100?	
Internal Standard	LC197960	Balance #	—		

DF = Dilution Factor FV = Final Volume

Turbo B

~~S-bath ID~~	98.0 C	S-bath ID	—C	N-Evap	—C	M-vap	—C	16178WAA026

Documented temps are NIST corrected.

Explosives Data

Case Narrative/Conformance Summary

Explosives

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Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Pesticide Residue Analysis

Fraction: Explosives

Nitroaromatics/Amines 8330B(s)

Sample #	Client ID	Matrix Liquid	Matrix Solid	DF	Comments
8444053	DU-2-5-A		X	1	
8444057	DU-2-5-B		X	1	
8444061	DU-2-5-C		X	1	
8444065	DU-2-2-A		X	1	
8444069	DU-2-2-B		X	1	
8444082	DU-2-2-C		X	1	Unspiked
8444083	DU-2-2-C MS		X	1	Matrix Spike
8444084	DU-2-2-C MSD		X	1	Matrix Spike Duplicate
8444090	BGA-1		X	1	
8444094	BGA-2		X	1	
8444107	BGA-3		X	1	
8444108	BGA-3 MS		X	1	Matrix Spike
8444109	BGA-3 MSD		X	1	Matrix Spike Duplicate
8444113	DU-2-5-FB	X		1	Field Blank
8444115	DU-2-2-EB	X		1	Equipment Blank
8444116	BGA-3-EB	X		1	Equipment Blank
8455249	Explosives/Perchlorate Blank		X	1	Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Pesticide Residue Analysis

Fraction: Explosives

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

LCS/LCSD

Batch#: 161780001A (Sample number(s): 8444113, 8444115-8444116)
The relative percent difference(s) for the following analyte(s) in the LCS/LCSD is outside the acceptance window: Tetryl
The recovery(ies) for the following analyte(s) in the LCS is below the acceptance window: Tetryl

MS/MSD

(Sample number(s): 8444090, 8444094, 8444107-8444109: Analysis: 13413)
Due to an error in the preparation of the matrix spiking solution, 1,3,5-trinitrobenzene is not spiked into the MS or MSD.
It is included in the LCS.

Please note that US EPA Methods for organic compounds do not require action by the laboratory based on out-of-specification MS/MSD results.

Batch#: 161890022A (Sample number(s): 8444090, 8444094, 8444107-8444109, UNSPK: 8444108-8444107)
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: 1,3-Dinitrobenzene, 2,4,6-Trinitrotoluene, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Nitrotoluene, 3-Nitrotoluene, 4-Nitrotoluene, Nitrobenzene
Refer to the QC Summary forms for more information.

Batch#: 161880009A (Sample number(s): 8444053, 8444057, 8444061, 8444065, 8444069, 8444082-8444084, UNSPK: 8444082)
The recovery(ies) for the following analyte(s) in the MS is outside the acceptance window: Tetryl
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: 1,3,5-Trinitrobenzene
Refer to the QC Summary forms for more information.

Surrogate

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Batch#: 161890022A (Sample number(s): 8444090, 8444094, 8444107-8444109, UNSPK: 8444108-8444107)
The recovery(ies) for the following surrogate(s) is below the acceptance window: 3,4-Dinitrotoluene (8444108)

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Pesticide Residue Analysis

Fraction: Explosives

SAMPLE ANALYSIS:

(Sample number(s): 8444053: Analysis: 13413)
Reporting limits were raised due to interference from the sample matrix.

(Sample number(s): 8444057, 8455249: Analysis: 13413)
This sample was used for the ISM triplicate. The individual %RSD is included in the data package for review.

(Sample number(s): 8444113, 8444115-8444116: Analysis: 13395)
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
+MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Explosives

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Quality Control Reference List
Pesticide Residue Analysis

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Fraction: Explosives

Analysis	Batch Number	Sample Number	Analysis Date
Nitroaromatics/Amines 8330B(s)	161880009A	PBLK09188	08/02/2016 16:48:00
		LCS188Q	08/02/2016 17:30:00
		8444053	08/02/2016 18:55:00
		8444057	08/02/2016 20:20:00
		8444061	08/02/2016 22:27:00
		8444065	08/02/2016 23:10:00
		8444069	08/02/2016 23:52:00
		8444082 UNSPK	08/03/2016 00:35:00
		8444083 MS	08/03/2016 01:17:00
		8444084 MSD	08/03/2016 02:00:00
Nitroaromatics/Amines 8330B(s)	161890022A	PBLK22189	08/17/2016 00:00:00
		LCS189Q	08/17/2016 00:43:00
		8444090	08/17/2016 02:08:00
		8444094	08/17/2016 02:50:00
		8444107 UNSPK	08/17/2016 03:33:00
		8444108 MS	08/17/2016 04:15:00
		8444109 MSD	08/17/2016 04:57:00
Nitroaromatics/Amines 8330B(s)	162500017A	PBLK17250	09/07/2016 23:40:00
		LCS250Q	09/08/2016 01:47:00
		8455249	09/08/2016 03:12:00
Nitroaromatics/Amines 8330B(w)	161780001A	PBLK01178	07/31/2016 20:18:00
		LCS01178	07/31/2016 21:01:00
		LCSD01178	07/31/2016 21:43:00
		8444113	08/01/2016 01:58:00
		8444115	08/01/2016 02:40:00
		8444116	08/01/2016 04:05:00

Fraction: Explosives

13413: Nitroaromatics/Amines 8330B(s) Analyte Name	Default MDL	Default LOQ	Units
HMX	210	300	ug/kg
Nitroglycerin	800	2,400	ug/kg
PETN	800	2,400	ug/kg
RDX	40	120	ug/kg
1,3,5-Trinitrobenzene	40	120	ug/kg
Tetryl	100	300	ug/kg
1,3-Dinitrobenzene	40	120	ug/kg
2,4,6-Trinitrotoluene	44	120	ug/kg
Nitrobenzene	100	300	ug/kg
4-Amino-2,6-Dinitrotoluene	41	120	ug/kg
2-Amino-4,6-Dinitrotoluene	41	120	ug/kg
2,6-Dinitrotoluene	110	120	ug/kg
2,4-Dinitrotoluene	40	120	ug/kg
2-Nitrotoluene	75	120	ug/kg
4-Nitrotoluene	110	120	ug/kg
3-Nitrotoluene	110	120	ug/kg

13395: Nitroaromatics/Amines 8330B(w) Analyte Name	Default MDL	Default LOQ	Units
HMX	0.20	0.60	ug/l
Nitroglycerin	3.0	10	ug/l
PETN	3.0	10	ug/l
RDX	0.40	0.60	ug/l
1,3,5-Trinitrobenzene	0.22	0.60	ug/l
Tetryl	0.44	0.60	ug/l
1,3-Dinitrobenzene	0.25	0.60	ug/l
2,4,6-Trinitrotoluene	0.40	0.60	ug/l
Nitrobenzene	0.44	0.60	ug/l
4-Amino-2,6-Dinitrotoluene	0.23	0.60	ug/l
2-Amino-4,6-Dinitrotoluene	0.23	0.60	ug/l
2,6-Dinitrotoluene	0.40	0.60	ug/l
2,4-Dinitrotoluene	0.20	0.60	ug/l
2-Nitrotoluene	0.40	0.60	ug/l
4-Nitrotoluene	0.32	0.60	ug/l
3-Nitrotoluene	0.32	0.60	ug/l

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Quality Control Summary
Method Blank
Pesticide Residne Analysis
SDG: DWD88
Matrix: LIQUID

Fraction: Explosives

161780001A / PBLK01178 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
HMX	07/31/16	N.D.	ug/l	0.20	0.60
Nitroglycerin	07/31/16	N.D.	ug/l	3.0	10
PETN	07/31/16	N.D.	ug/l	3.0	10
RDX	07/31/16	N.D.	ug/l	0.40	0.60
1,3,5-Trinitrobenzene	07/31/16	N.D.	ug/l	0.22	0.60
Tetryl	07/31/16	N.D.	ug/l	0.44	0.60
1,3-Dinitrobenzene	07/31/16	N.D.	ug/l	0.25	0.60
2,4,6-Trinitrotoluene	07/31/16	N.D.	ug/l	0.40	0.60
Nitrobenzene	07/31/16	N.D.	ug/l	0.44	0.60
4-Amino-2,6-Dinitrotoluene	07/31/16	N.D.	ug/l	0.23	0.60
2-Amino-4,6-Dinitrotoluene	07/31/16	N.D.	ug/l	0.23	0.60
2,6-Dinitrotoluene	07/31/16	N.D.	ug/l	0.40	0.60
2,4-Dinitrotoluene	07/31/16	N.D.	ug/l	0.20	0.60
2-Nitrotoluene	07/31/16	N.D.	ug/l	0.40	0.60
4-Nitrotoluene	07/31/16	N.D.	ug/l	0.32	0.60
3-Nitrotoluene	07/31/16	N.D.	ug/l	0.32	0.60

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Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: DWD88
Matrix: SOLID

Fraction: Explosives

161880009A / PBLK09188 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
HMX	08/02/16	N.D.	ug/kg	210	300
Nitroglycerin	08/02/16	N.D.	ug/kg	800	2400
PETN	08/02/16	N.D.	ug/kg	800	2400
RDX	08/02/16	N.D.	ug/kg	40	120
1,3,5-Trinitrobenzene	08/02/16	N.D.	ug/kg	40	120
Tetryl	08/02/16	N.D.	ug/kg	100	300
1,3-Dinitrobenzene	08/02/16	N.D.	ug/kg	40	120
2,4,6-Trinitrotoluene	08/02/16	N.D.	ug/kg	44	120
4-Amino-2,6-Dinitrotoluene	08/02/16	N.D.	ug/kg	41	120
2-Amino-4,6-Dinitrotoluene	08/02/16	N.D.	ug/kg	41	120
2,4-Dinitrotoluene	08/02/16	N.D.	ug/kg	40	120
2,6-Dinitrotoluene	08/02/16	N.D.	ug/kg	110	120
Nitrobenzene	08/02/16	N.D.	ug/kg	100	300
2-Nitrotoluene	08/02/16	N.D.	ug/kg	75	120
3-Nitrotoluene	08/02/16	N.D.	ug/kg	110	120
4-Nitrotoluene	08/02/16	N.D.	ug/kg	110	120

161890022A / PBLK22189 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
HMX	08/17/16	N.D.	ug/kg	210	300
Nitroglycerin	08/17/16	N.D.	ug/kg	800	2400
PETN	08/17/16	N.D.	ug/kg	800	2400
RDX	08/17/16	N.D.	ug/kg	40	120
1,3,5-Trinitrobenzene	08/17/16	N.D.	ug/kg	40	120
Tetryl	08/17/16	N.D.	ug/kg	100	300
1,3-Dinitrobenzene	08/17/16	N.D.	ug/kg	40	120
2,4,6-Trinitrotoluene	08/17/16	N.D.	ug/kg	44	120
4-Amino-2,6-Dinitrotoluene	08/17/16	N.D.	ug/kg	41	120
2-Amino-4,6-Dinitrotoluene	08/17/16	N.D.	ug/kg	41	120
2,4-Dinitrotoluene	08/17/16	N.D.	ug/kg	40	120
2,6-Dinitrotoluene	08/17/16	N.D.	ug/kg	110	120
Nitrobenzene	08/17/16	N.D.	ug/kg	100	300
2-Nitrotoluene	08/17/16	N.D.	ug/kg	75	120
3-Nitrotoluene	08/17/16	N.D.	ug/kg	110	120
4-Nitrotoluene	08/17/16	N.D.	ug/kg	110	120

162500017A / PBLK17250 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
HMX	09/07/16	N.D.	ug/kg	210	300
Nitroglycerin	09/07/16	N.D.	ug/kg	800	2400
PETN	09/07/16	N.D.	ug/kg	800	2400
RDX	09/07/16	N.D.	ug/kg	40	120
1,3,5-Trinitrobenzene	09/07/16	N.D.	ug/kg	40	120
Tetryl	09/07/16	N.D.	ug/kg	100	300
1,3-Dinitrobenzene	09/07/16	N.D.	ug/kg	40	120

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: DWD88
Matrix: SOLID

Fraction: Explosives

162500017A / PBLK17250 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
2,4,6-Trinitrotoluene	09/07/16	N.D.	ug/kg	44	120
4-Amino-2,6-Dinitrotoluene	09/07/16	N.D.	ug/kg	41	120
2-Amino-4,6-Dinitrotoluene	09/07/16	N.D.	ug/kg	41	120
2,4-Dinitrotoluene	09/07/16	N.D.	ug/kg	40	120
2,6-Dinitrotoluene	09/07/16	N.D.	ug/kg	110	120
Nitrobenzene	09/07/16	N.D.	ug/kg	100	300
2-Nitrotoluene	09/07/16	N.D.	ug/kg	75	120
3-Nitrotoluene	09/07/16	N.D.	ug/kg	110	120
4-Nitrotoluene	09/07/16	N.D.	ug/kg	110	120

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Quality Control Summary
Surrogates
Pesticide Residue Analysis
SDG: DWD88
Matrix: LIQUID

Fraction: Explosives

161780001A	3,4-Dinitrotoluene	
	Spike Added	20.1 ug/l
Sample	% Recovery	Limits
PBLK01178	109	85 - 115
LCS01178	107	85 - 115
LCSD01178	109	85 - 115
8444113	110	85 - 115
8444115	110	85 - 115
8444116	111	85 - 115

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Quality Control Summary
Surrogates
Pesticide Residue Analysis
SDG: DWD88
Matrix: SOLID

Fraction: Explosives

161880009A	3,4-Dinitrotoluene	
	Spike Added	1000 ug/kg
Sample	% Recovery	Limits
PBLK09188	112	62 - 133
LCS188Q	118	62 - 133
8444053	113	62 - 133
8444057	121	62 - 133
8444061	117	62 - 133
8444065	119	62 - 133
8444069	117	62 - 133
8444082 UNSPK	113	62 - 133
8444083 MS	80	62 - 133
8444084 MSD	81	62 - 133

161890022A	3,4-Dinitrotoluene	
	Spike Added	1000 ug/kg
Sample	% Recovery	Limits
PBLK22189	123	62 - 133
LCS189Q	94	62 - 133
8444090	119	62 - 133
8444094	126	62 - 133
8444107 UNSPK	125	62 - 133
8444108 MS	58 *	62 - 133
8444109 MSD	67	62 - 133

162500017A	3,4-Dinitrotoluene	
	Spike Added	1000 ug/kg
Sample	% Recovery	Limits
PBLK17250	124	62 - 133
LCS250Q	126	62 - 133
8455249	127	62 - 133

Surrogate recoveries that are noncompliant are confirmed unless attributed to a dilution or otherwise noted.

Pesticide Residue Analysis

Fraction: Explosives

UNSPK: 8444082 MS: 8444083 MSD: 8444084 **Analyte**	Batch: **161880009A** (Sample number(s): 8444053, 8444057, 8444061, 8444065, 8444069, 8444082-8444084)								
	Spike Added ug/kg MS/MSD	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	1980 / 2000	N.D.	1069.03	1087.56	54	54	29-148	2	50
Nitroglycerin	21800 / 22100	N.D.	13827.25	14285.63	63	65	45-137	3	50
PETN	21800 / 22100	N.D.	19573.99	18908.22	90	86	36-143	3	50
RDX	1980 / 2000	N.D.	1919.73	1923.71	97	96	45-145	0	50
1,3,5-Trinitrobenzene	1980 / 2000	N.D.	N.D.	N.D.	0 *	0 *	48-141	0	50
Tetryl	1980 / 2000	N.D.	495.11	766.19	25 *	38	38-152	43	50
1,3-Dinitrobenzene	1980 / 2000	N.D.	1109.61	1260.77	56	63	54-140	13	50
2,4,6-Trinitrotoluene	1980 / 2000	N.D.	1169.94	1223.24	59	61	47-140	4	50
2,4-Dinitrotoluene	1980 / 2010	N.D.	1221.56	1248.85	62	62	52-137	2	50
2,6-Dinitrotoluene	1980 / 2000	N.D.	1462.44	1558.09	74	78	51-138	6	50
2-Amino-4,6-Dinitrotoluene	1980 / 2000	N.D.	1489.27	1450.62	75	73	43-141	3	50
2-Nitrotoluene	1980 / 2000	N.D.	1561.7	1605.96	79	80	57-135	3	50
3-Nitrotoluene	1980 / 2000	N.D.	1477.68	1499.93	75	75	57-135	1	50
4-Amino-2,6-Dinitrotoluene	1980 / 2000	N.D.	1487.87	1524.43	75	76	42-138	2	50
4-Nitrotoluene	1980 / 2000	N.D.	1357.34	1389.31	69	69	53-133	2	50
Nitrobenzene	1990 / 2010	N.D.	1679.34	1857.18	84	92	64-138	10	50

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

Pesticide Residue Analysis

Fraction: Explosives

UNSPK: 8444107 MS: 8444108 MSD: 8444109 **Analyte**	Batch: **161890022A** (Sample number(s): 8444090, 8444094, 8444107-8444109)								
	Spike Added ug/kg MS/MSD	**Unspiked Conc ug/kg**	**MS Conc ug/kg**	**MSD Conc ug/kg**	**MS %Rec**	**MSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	1930 / 2000	N.D.	1580.99	1560.31	82	78	29-148	1	50
Nitroglycerin	19400 / 20100	N.D.	8924.3	9746.58	46	48	45-137	9	50
PETN	19500 / 20200	N.D.	14329.48	15473.5	73	77	36-143	8	50
RDX	1930 / 2000	N.D.	1334.52	1463.8	69	73	45-145	9	50
Tetryl	1950 / 2020	N.D.	817.58	870.95	42	43	38-152	6	50
1,3-Dinitrobenzene	1940 / 2000	N.D.	750.05	862.47	39 *	43 *	54-140	14	50
2,4,6-Trinitrotoluene	1940 / 2010	N.D.	681.23	751.05	35 *	37 *	47-140	10	50
2,4-Dinitrotoluene	1940 / 2010	N.D.	686.03	775.23	35 *	39 *	52-137	12	50
2,6-Dinitrotoluene	1940 / 2010	N.D.	730.22	849.45	38 *	42 *	51-138	15	50
2-Amino-4,6-Dinitrotoluene	1940 / 2000	N.D.	892.68	993.77	46	50	43-141	11	50
2-Nitrotoluene	1940 / 2000	N.D.	837.6	968.81	43 *	48 *	57-135	15	50
3-Nitrotoluene	1940 / 2010	N.D.	771.92	877.66	40 *	44 *	57-135	13	50
4-Amino-2,6-Dinitrotoluene	1930 / 2000	N.D.	840.59	931.62	44	47	42-138	10	50
4-Nitrotoluene	1940 / 2020	N.D.	795.63	882.16	41 *	44 *	53-133	10	50
Nitrobenzene	1940 / 2000	N.D.	787.31	848.67	41 *	42 *	64-138	8	50

Comments:
(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD88
Matrix: LIQUID

Pesticide Residue Analysis

Fraction: Explosives

LCS: LCS01178 LCSD: LCSD01178 Analyte	Batch: **161780001A** (Sample number(s): 8444113, 8444115-8444116)							
	Spike Added ug/l	**LCS Conc ug/l**	**LCSD Conc ug/l**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	10	8.96	9.21	90	92	70-130	3	30
Nitroglycerin	111	88.86	89.46	80	81	70-130	1	30
PETN	110	107.83	106.74	98	97	70-130	1	30
RDX	10	9.68	9.80	97	98	70-130	1	30
1,3,5-Trinitrobenzene	10	8.25	9.62	82	96	70-130	15	30
Tetryl	10	4.35	7.09	44 *	71	70-130	48 *	30
1,3-Dinitrobenzene	10	11.29	11.28	113	113	70-130	0	30
2,4,6-Trinitrotoluene	10	9.22	9.20	92	92	70-130	0	30
Nitrobenzene	10	10.73	10.56	107	106	70-130	2	30
4-Amino-2,6-Dinitrotoluene	10	9.96	9.86	100	99	70-130	1	30
2-Amino-4,6-Dinitrotoluene	10	9.59	9.64	96	96	70-130	0	30
2,6-Dinitrotoluene	10	10.54	10.5	105	105	70-130	0	30
2,4-Dinitrotoluene	10	9.27	9.26	93	93	70-130	0	30
2-Nitrotoluene	10	10.27	10.17	103	102	70-130	1	30
4-Nitrotoluene	10	9.15	9.12	91	91	70-130	0	30
3-Nitrotoluene	10	9.49	9.43	95	94	70-130	1	30

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD88
Matrix: SOLID

Pesticide Residue Analysis
Fraction: Explosives

LCS: LCS188Q	Batch: **161880009A** (Sample number(s): 8444053, 8444057, 8444061, 8444065, 8444069, 8444082-8444084)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	1944	1838.97	NA	95	NA	29-148	NA	NA
Nitroglycerin	9718	8392.78	NA	86	NA	45-137	NA	NA
PETN	9718	8794.33	NA	90	NA	36-143	NA	NA
RDX	1944	1579.36	NA	81	NA	45-145	NA	NA
1,3,5-Trinitrobenzene	1944	1841.12	NA	95	NA	48-141	NA	NA
Tetryl	1944	1116.8	NA	57	NA	38-152	NA	NA
1,3-Dinitrobenzene	1944	2140.89	NA	110	NA	54-140	NA	NA
2,4,6-Trinitrotoluene	1944	1670.58	NA	86	NA	47-140	NA	NA
2,4-Dinitrotoluene	1944	1701.81	NA	88	NA	52-137	NA	NA
2,6-Dinitrotoluene	1944	1965.66	NA	101	NA	51-138	NA	NA
2-Amino-4,6-Dinitrotoluene	1944	1742.83	NA	90	NA	43-141	NA	NA
2-Nitrotoluene	1944	1882.79	NA	97	NA	57-135	NA	NA
3-Nitrotoluene	1944	1750.13	NA	90	NA	57-135	NA	NA
4-Amino-2,6-Dinitrotoluene	1944	1831.68	NA	94	NA	42-138	NA	NA
4-Nitrotoluene	1944	1669.93	NA	86	NA	53-133	NA	NA
Nitrobenzene	1944	2055.66	NA	106	NA	64-138	NA	NA

LCS: LCS189Q	Batch: **161890022A** (Sample number(s): 8444090, 8444094, 8444107-8444109)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	1972	1335.47	NA	68	NA	29-148	NA	NA
Nitroglycerin	9862	6196.75	NA	63	NA	45-137	NA	NA
PETN	9862	9810.06	NA	99	NA	36-143	NA	NA
RDX	1972	1222.92	NA	62	NA	45-145	NA	NA
1,3,5-Trinitrobenzene	1972	1431.21	NA	73	NA	48-141	NA	NA
Tetryl	1972	1079.9	NA	55	NA	38-152	NA	NA
1,3-Dinitrobenzene	1972	1572.72	NA	80	NA	54-140	NA	NA
2,4,6-Trinitrotoluene	1972	1248.87	NA	63	NA	47-140	NA	NA
2,4-Dinitrotoluene	1972	1283.86	NA	65	NA	52-137	NA	NA
2,6-Dinitrotoluene	1972	1441.01	NA	73	NA	51-138	NA	NA
2-Amino-4,6-Dinitrotoluene	1972	1311.14	NA	66	NA	43-141	NA	NA
2-Nitrotoluene	1972	1423.9	NA	72	NA	57-135	NA	NA
3-Nitrotoluene	1972	1309.3	NA	66	NA	57-135	NA	NA
4-Amino-2,6-Dinitrotoluene	1972	1353.7	NA	69	NA	42-138	NA	NA
4-Nitrotoluene	1972	1235.99	NA	63	NA	53-133	NA	NA
Nitrobenzene	1972	1349.58	NA	68	NA	64-138	NA	NA

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: DWD88
Matrix: SOLID

Pesticide Residue Analysis

Fraction: Explosives

LCS: LCS250Q	Batch: **162500017A** (Sample number(s): 8455249)							
Analyte	**Spike Added ug/kg**	**LCS Conc ug/kg**	**LCSD Conc ug/kg**	**LCS %Rec**	**LCSD %Rec**	**%Rec Limits**	**%RPD**	**%RPD Limits**
HMX	1961	1794.76	NA	92	NA	29-148	NA	NA
Nitroglycerin	9804	8163.75	NA	83	NA	45-137	NA	NA
PETN	9804	8392.06	NA	86	NA	36-143	NA	NA
RDX	1961	1638.53	NA	84	NA	45-145	NA	NA
1,3,5-Trinitrobenzene	1961	1958.28	NA	100	NA	48-141	NA	NA
Tetryl	1961	1357.65	NA	69	NA	38-152	NA	NA
1,3-Dinitrobenzene	1961	2236.41	NA	114	NA	54-140	NA	NA
2,4,6-Trinitrotoluene	1961	1599.43	NA	82	NA	47-140	NA	NA
2,4-Dinitrotoluene	1961	1726.32	NA	88	NA	52-137	NA	NA
2,6-Dinitrotoluene	1961	2082.13	NA	106	NA	51-138	NA	NA
2-Amino-4,6-Dinitrotoluene	1961	1703.64	NA	87	NA	43-141	NA	NA
2-Nitrotoluene	1961	1952.12	NA	100	NA	57-135	NA	NA
3-Nitrotoluene	1961	1676.48	NA	85	NA	57-135	NA	NA
4-Amino-2,6-Dinitrotoluene	1961	2229.06	NA	114	NA	42-138	NA	NA
4-Nitrotoluene	1961	1644.3	NA	84	NA	53-133	NA	NA
Nitrobenzene	1961	1988.37	NA	101	NA	64-138	NA	NA

Triplicate summary form

Sample #	8444057	8444057DUP	8444057TRIP			
compound	result (ug/kg) trial1	result (ug/kg) trial2	result (ug/kg) trial3	AVERAGE	std dev	%rsd
4-AM-2,6-DNT	0	0	0	0	0	#DIV/0!
2-AM-4,6-DNT	0	0	0	0	0	#DIV/0!
1,3-DNB	0	0	0	0	0	#DIV/0!
2,4-DNT	0	0	0	0	0	#DIV/0!
2,6-DNT	0	0	0	0	0	#DIV/0!
HMX	0	0	0	0	0	#DIV/0!
Nitrobenzene	0	0	0	0	0	#DIV/0!
2-NT	0	0	0	0	0	#DIV/0!
3-NT	0	0	0	0	0	#DIV/0!
4-NT	0	0	0	0	0	#DIV/0!
RDX	0	0	0	0	0	#DIV/0!
1,3,5-TNB	0	0	0	0	0	#DIV/0!
2,4,6-TNT	0	0	0	0	0	#DIV/0!
Nitroglycerin	1927.256	974.4129	1280.557	1394.0753	486.4589	35%
PETN	0	0	0	0	0	#DIV/0!
Tetryl	0	0	0	0	0	#DIV/0!
3,5-DNA	0	0	0	0	0	#DIV/0!

Triplicate summary form

Sample #	8445671	8445671DUP	8445671trip			
compound	result (ug/kg) trial1	result (ug/kg) trial2	result (ug/kg) trial3	AVERAGE	std dev	%rsd
4-AM-2,6-DNT	0	0	0	0	0	#DIV/0!
2-AM-4,6-DNT	0	0	0	0	0	#DIV/0!
1,3-DNB	0	0	0	0	0	#DIV/0!
2,4-DNT	0	0	0	0	0	#DIV/0!
2,6-DNT	0	0	0	0	0	#DIV/0!
HMX	0	0	0	0	0	#DIV/0!
Nitrobenzene	0	0	0	0	0	#DIV/0!
2-NT	0	0	0	0	0	#DIV/0!
3-NT	0	0	0	0	0	#DIV/0!
4-NT	0	0	0	0	0	#DIV/0!
RDX	0	0	0	0	0	#DIV/0!
1,3,5-TNB	0	0	0	0	0	#DIV/0!
2,4,6-TNT	0	0	0	0	0	#DIV/0!
Nitroglycerin	0	0	0	0	0	#DIV/0!
PETN	0	0	0	0	0	#DIV/0!
Tetryl	0	0	0	0	0	#DIV/0!
3,5-DNA	0	0	0	0	0	#DIV/0!

Triplicate summary form

TRIP

Sample #	8455249DUP	8455249	8455249MS			
compound	result (ug/kg) trial1	result (ug/kg) trial2	result (ug/kg) trial3	AVERAGE	std dev	%rsd
4-AM-2,6-DNT	0	0	0	0	0	#DIV/0!
2-AM-4,6-DNT	0	0	0	0	0	#DIV/0!
1,3-DNB	0	0	0	0	0	#DIV/0!
2,4-DNT	0	0	0	0	0	#DIV/0!
2,6-DNT	0	0	0	0	0	#DIV/0!
HMX	0	0	0	0	0	#DIV/0!
Nitrobenzene	0	0	0	0	0	#DIV/0!
2-NT	0	0	0	0	0	#DIV/0!
3-NT	0	0	0	0	0	#DIV/0!
4-NT	0	0	0	0	0	#DIV/0!
RDX	0	0	0	0	0	#DIV/0!
1,3,5-TNB	0	0	0	0	0	#DIV/0!
2,4,6-TNT	0	0	0	0	0	#DIV/0!
Nitroglycerin	0	0	0	0	0	#DIV/0!
PETN	0	0	0	0	0	#DIV/0!
Tetryl	0	0	0	0	0	#DIV/0!
3,5-DNA	0	0	0	0	0	#DIV/0!

6D
INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621101

GC Column (1) : CHROMPACK ID: 100 (mm) Update File:

Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	~~MIDPOINT~~ Level 3 RT	(3) RT WINDOW FROM	TO
RDX	4.37	4.38	4.34	4.35	4.37	4.37	4.27	4.47
1,3,5-Trinitrobenzene	5.08	5.08	5.03	5.06	5.06	5.06	4.96	5.16
1,3-DNB	7.38	7.39	7.28	7.18	7.39	7.39	7.29	7.49
3,5-Dinitroaniline	7.76	7.78	7.66	7.40	7.52	7.52	7.19	7.86
Nitrobenzene	8.26	8.27	8.12	7.95	8.19	8.19	8.05	8.33
Tetryl	8.26	8.27	8.12	7.95	8.19	8.19	8.05	8.33
2,4,6-Trinitrotoluene	8.81	8.82	8.67	8.51	8.75	8.75	8.65	8.85
Tetryl breakdown	10.45	10.00	9.80	9.61	9.85	9.85	9.73	9.97
4-Amino-2,6-dinitrotoluene	10.72	10.75	10.53	10.47	10.79	10.79	10.65	10.94
2-Amino-4,6-dinitrotoluene	11.25	11.28	11.12	10.73	11.15	11.15	11.00	11.29
3,4-Dinitrotoluene	11.25	11.28	11.12	10.73	11.15	11.15	10.91	11.39
2,6-Dinitrotoluene	12.03	12.08	11.94	11.50	12.06	12.06	11.92	12.20
2,4-Dinitrotoluene	12.79	12.82	12.67	12.25	12.80	12.80	12.66	12.94
2-Nitrotoluene	14.65	14.71	14.18	14.07	14.68	14.68	14.54	14.82
4-Nitrotoluene	16.28	16.24	15.74	15.63	16.26	16.26	16.09	16.42
3-Nitrotoluene	17.05	17.06	16.54	16.43	17.08	17.08	16.92	17.24

(3) Jessica L. Miller
Senior Chemist

JUL 3 1 2016

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621101

GC Column (1) : CHROMPACK ID: 100 (mm) Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	CALIBRATION FACTORS						%RSD
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	
RDX	1.51E+02	9.26E+01	8.77E+01	8.83E+01	8.78E+01	1.02E+02	27
1,3,5-Trinitrobenzene	2.05E+02	1.88E+02	1.94E+02	1.99E+02	1.97E+02	1.96E+02	3
1,3-DNB	2.91E+02	2.50E+02	2.54E+02	2.41E+02	1.64E+02	2.40E+02	19
3,5-Dinitroaniline	2.68E+02	2.24E+02	2.25E+02	2.69E+02	2.32E+02	2.44E+02	9
Nitrobenzene	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15
Tetryl	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15
2,4,6-Trinitrotoluene	2.55E+02	1.98E+02	2.02E+02	2.13E+02	2.02E+02	2.14E+02	11
Tetryl breakdown	4.33E+02	3.30E+02	3.29E+02	3.02E+02	3.96E+02	3.58E+02	15
4-Amino-2,6-dinitrotoluene	1.57E+02	1.29E+02	1.24E+02	1.24E+02	8.77E+01	1.24E+02	20
2-Amino-4,6-dinitrotoluene	3.92E+02	3.09E+02	3.29E+02	3.01E+02	3.26E+02	3.31E+02	11
3,4-Dinitrotoluene	3.89E+02	3.07E+02	3.27E+02	2.99E+02	3.24E+02	3.29E+02	11
2,6-Dinitrotoluene	2.01E+02	1.39E+02	1.34E+02	1.29E+02	1.24E+02	1.45E+02	22
2,4-Dinitrotoluene	3.50E+02	2.69E+02	2.85E+02	2.53E+02	2.56E+02	2.83E+02	14
2-Nitrotoluene	1.97E+02	1.24E+02	1.13E+02	1.14E+02	1.12E+02	1.32E+02	28
4-Nitrotoluene	1.34E+02	9.88E+01	9.34E+01	9.37E+01	9.09E+01	1.02E+02	18
3-Nitrotoluene	1.66E+02	1.22E+02	1.26E+02	1.25E+02	1.24E+02	1.33E+02	14

Average % RSD: 16

JUL 31 2016

File Name: V:\CP12\12eexp1621101.CAL
Version: 74

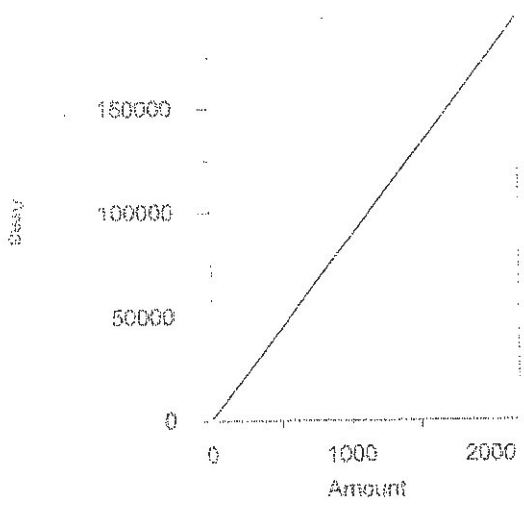
Creator:
Description:
Reason for change:

Internal standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 RDX



Expected retention time: 4.371 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

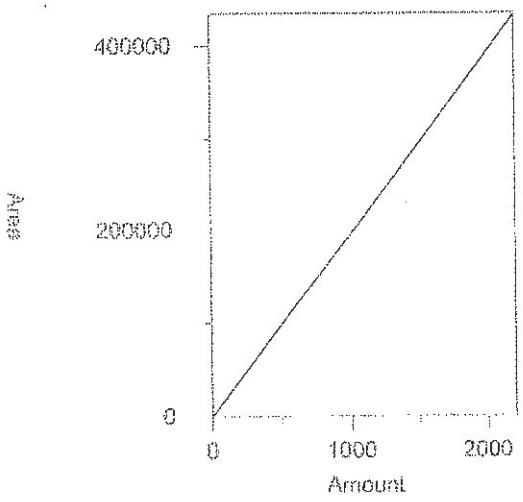
Single peak quantification by area

Y = 87.2768 X + 860.4011

Linear fit with equal weighting
Coefficient of determination: 0.9999437
Average error: 5.910%
Average CF: 101.5227
RSD: 27.484%

Level	Amount	Response	Cal Factor	Error, %	Source	Dat
1	25.1	3797.655	151.301	24.470	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND	7/3
2	100.4	9299.011	92.61963	-3.367	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND	7/3
3	502	44005.84	87.66103	-1.494	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND	7/3
4	1004	88628.66	88.27555	0.161	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND	7/3
5	2008	176214.8	87.75637	0.058	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND	7/3

2 1,3,5-TNB



Expected retention time: 5.055 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

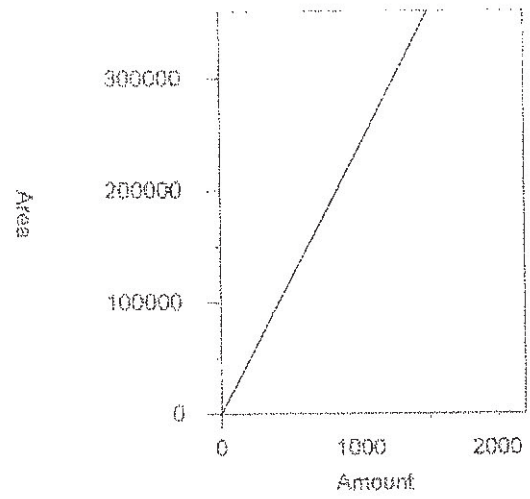
Single peak quantification by area

Y = 196.4074 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9999138
Average error: 2.287%
Average CF: 196.4074
RSD: 3.199%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5135.729	204.8147	4.281	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.3	18825.87	187.6956	-4.436	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	97235.12	193.8886	-1.282	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	199124.8	198.5292	1.080	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2006	395400.6	197.109	0.357	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

3 1,3-DNB



Expected retention time: 7.389 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

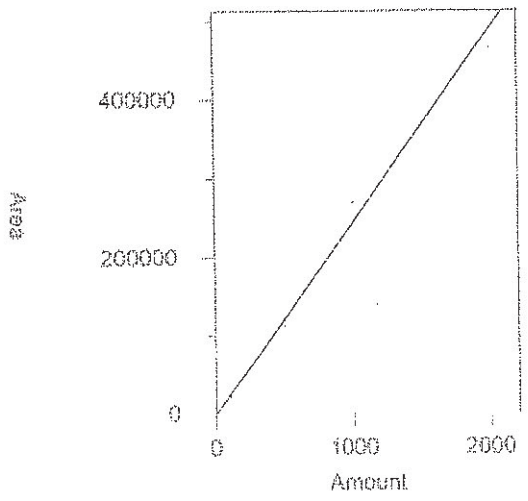
Single peak quantification by area

Y = 239.9322 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.6936649
Average error: 12.712%
Average CF: 239.9322
RSD: 19.431%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.05	7278.833	290.5722	21.106	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.2	25099.51	250.4941	4.402	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501	127354.2	254.2	5.947	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1002	241194.4	240.713	0.325	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2004	328018	163.6816	-31.780	Manual

4 3,5-dinitroaniline



Expected retention time: 7.524 minutes
Search window: 0.339 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

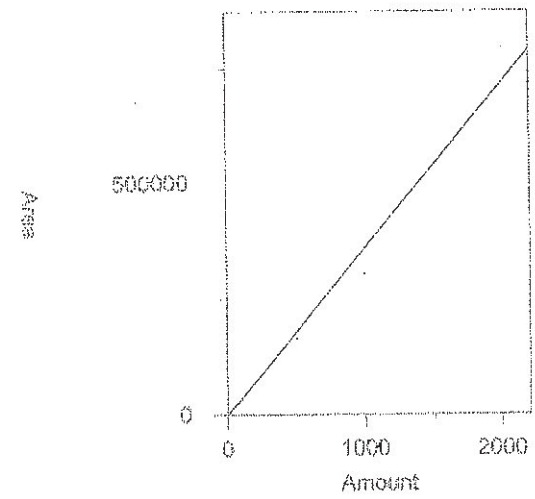
Single peak quantification by area

Y = 243.6005 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9915071
Average error: 8.231%
Average CF: 243.6005
RSD: 9.493%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	6729.358	268.1019	10.058	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.4	22465	223.755	-8.147	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502	112746.7	224.595	-7.802	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1004	270302	269.2251	10.519	Manual
5	2008	466510	232.3257	-4.628	Manual

5 Nitrobenzene



Expected retention time: 8.186 minutes
Search window: 0.14 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

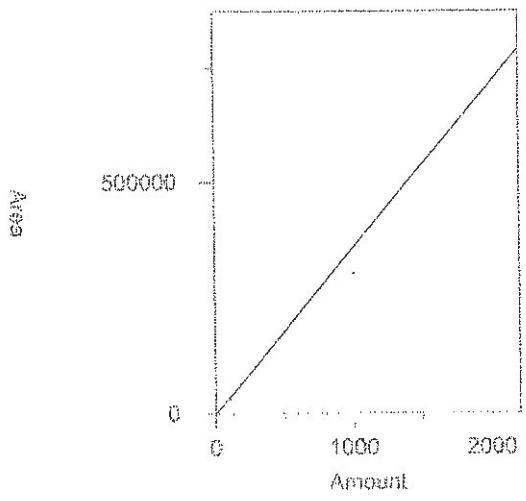
Single peak quantification by area

Y = 357.7505 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9777827
Average error: 12.583%
Average CF: 357.7505
RSD: 15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.075	10846	432.5424	20.906	Manual	7/31/2016 1:44:38 PM
2	100.3	33073	329.7408	-7.829	Manual	7/31/2016 12:56:30 PM
3	501.5	164995	329.003	-8.036	Manual	7/31/2016 1:02:59 PM
4	1003	302870	301.9641	-15.594	Manual	7/31/2016 1:15:46 PM
5	2006	793378	395.5025	10.553	Manual	7/31/2016 2:08:12 PM

6 Tetryl



Expected retention time: 8.187 minutes
Search window: 0.14 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

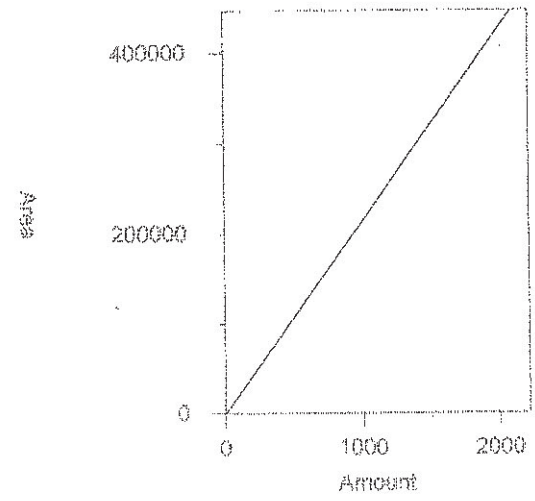
Single peak quantification by area

Y = 358.1076 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9777827
Average error: 12.583%
Average CF: 358.1076
RSD: 15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.05	10846	432.9741	20.906	Manual	7/31/2016 1:44:40 PM
2	100.2	33073	330.0699	-7.829	Manual	7/31/2016 12:56:33 PM
3	501	164995	329.3313	-8.036	Manual	7/31/2016 1:03:04 PM
4	1002	302870	302.2655	-15.594	Manual	7/31/2016 1:15:50 PM
5	2004	793378	395.8972	10.553	Manual	7/31/2016 2:08:14 PM

7 2,4,6-TNT



Expected retention time: 8.747 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

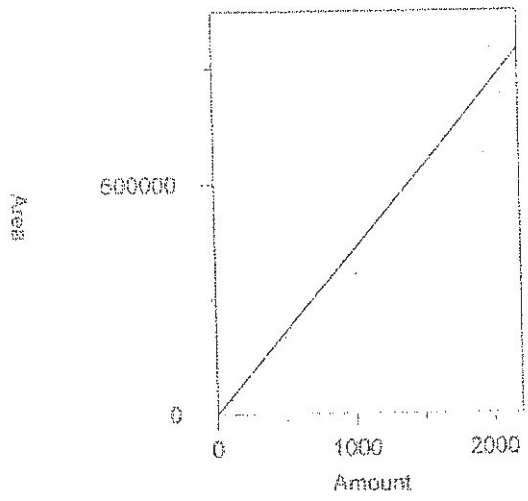
Single peak quantification by area

Y = 214.0261 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9945887
Average error: 7.605%
Average CF: 214.0261
RSD: 10.933%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	6399.85	254.7204	19.014	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.5	19912.04	198.1297	-7.427	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502.5	101539.5	202.0686	-5.587	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1005	213954.5	212.89	-0.531	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2010	406666.3	202.3215	-5.469	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

8 Tetryl breakdown



Expected retention time: 9.85 minutes
Search window: 0.121 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

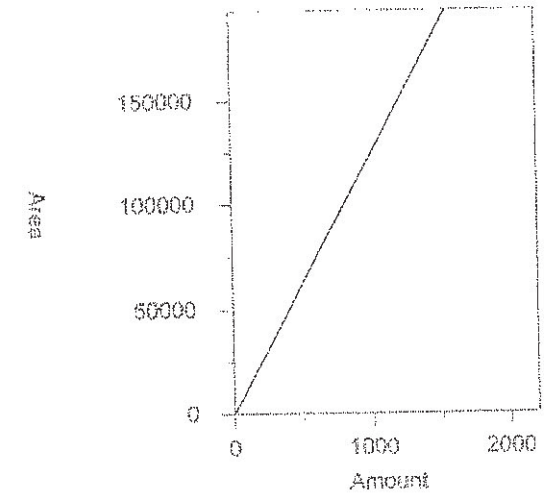
Single peak quantification by area

$Y = 358.1076\ X + 0$

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9777827
Average error: 12.583%
Average CF: 358.1076
RSD: 15.145%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.05	10846	432.9741	20.906	Manual	7/31/2016 1:44:44 PM
2	100.2	33073	330.0699	-7.829	Manual	7/31/2016 12:56:41 PM
3	501	164995	329.3313	-8.036	Manual	7/31/2016 1:03:09 PM
4	1002	302870	302.2655	-15.594	Manual	7/31/2016 1:15:57 PM
5	2004	793378	395.8972	10.553	Manual	7/31/2016 2:08:16 PM

9 4-Am-2,6-DNT



Expected retention time: 10.794 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

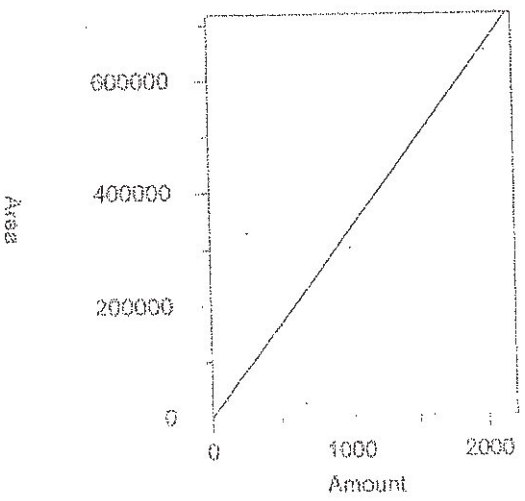
Single peak quantification by area

$Y = 124.411\ X + 0$

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.7492826
Average error: 12.083%
Average CF: 124.411
RSD: 19.915%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	3946	157.3679	26.490	Manual
2	100.3	12938.61	128.9991	3.688	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	62410.41	124.4475	0.029	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	123909	123.5384	-0.701	Manual
5	2006	175931	87.70239	-29.506	Manual

10 2-Am-4,6-DNT



Expected retention time: 11.146 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

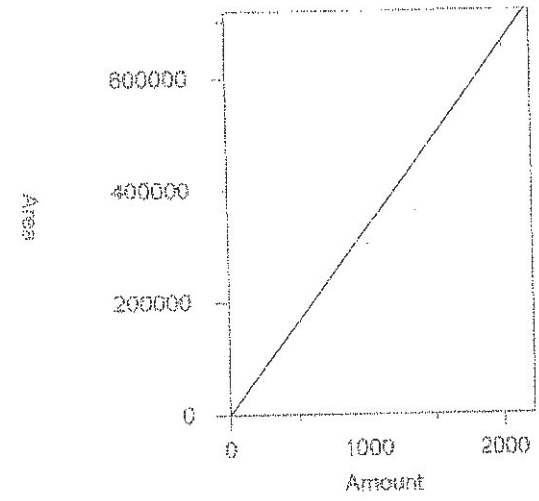
Single peak quantification by area

Y = 331.455 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9962868
Average error: 7.259%
Average CF: 331.455
RSD: 10.743%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	9800	391.6084	18.148	Manual
2	100.1	30903.33	308.7246	-6.858	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	500.5	164855.9	329.3824	-0.625	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1001	301678	301.3766	-9.075	Manual
5	2002	653018	326.1828	-1.591	Manual

11 3,4-Dinitrotoluene



Expected retention time: 11.147 minutes
Search window: 0.242 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

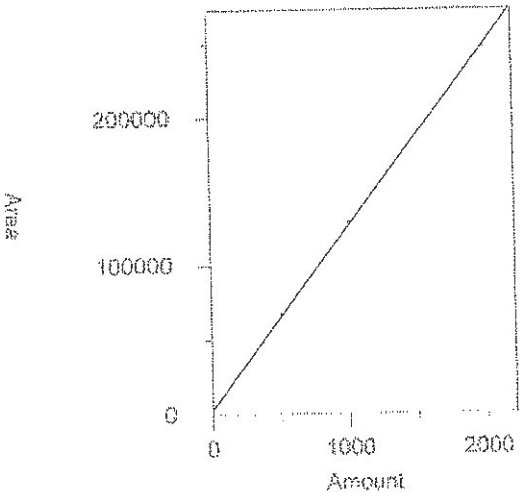
Single peak quantification by area

Y = 329.1532 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9962868
Average error: 7.259%
Average CF: 329.1532
RSD: 10.743%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	25.2	9800	388.8889	18.148	Manual	7/31/2016 2:12:02 PM
2	100.8	30903.33	306.5807	-6.858	Manual	7/31/2016 2:04:36 PM
3	504	164855.9	327.0951	-0.625	Manual	7/31/2016 2:04:39 PM
4	1008	301678	299.2837	-9.075	Manual	7/31/2016 2:09:50 PM
5	2016	653018	323.9177	-1.591	Manual	7/31/2016 2:08:35 PM

12 2,6-DNT



Expected retention time: 12.062 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

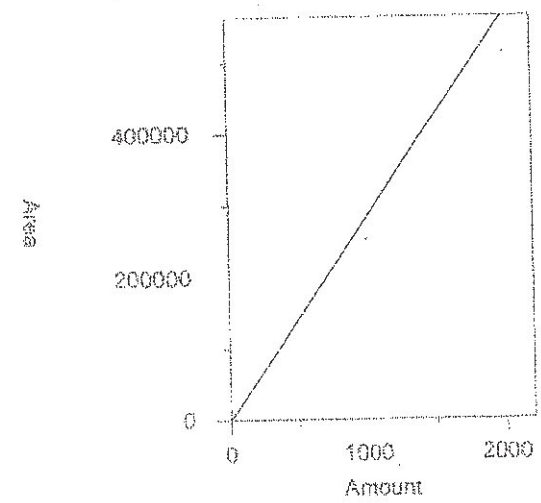
Single peak quantification by area

Y = 122.7019 X + 3330.402

Linear fit with equal weighting
Coefficient of determination: 0.9995252
Average error: 7.593%
Average CF: 145.3016
RSD: 21.987%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.075	5052.243	201.4853	-21.147	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.3	13962.72	139.2096	-10.709	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	501.5	67079.15	133.757	3.413	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1003	128937.6	128.5519	2.007	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2006	247749	123.504	-0.690	Manual

13 2,4-DNT



Expected retention time: 12.798 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

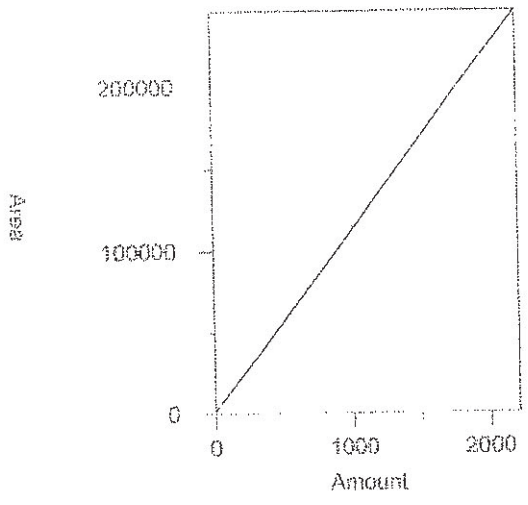
Single peak quantification by area

Y = 282.5082 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9784554
Average error: 9.870%
Average CF: 282.5082
RSD: 14.055%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	8756.587	349.9136	23.860	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.1	26893.81	268.6694	-4.899	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	500.5	142549.9	284.815	0.817	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1001	253228.9	252.9759	-10.454	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2002	512846.5	256.1671	-9.324	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

14 2-NT



Expected retention time: 14.682 minutes
Search window: 0.142 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

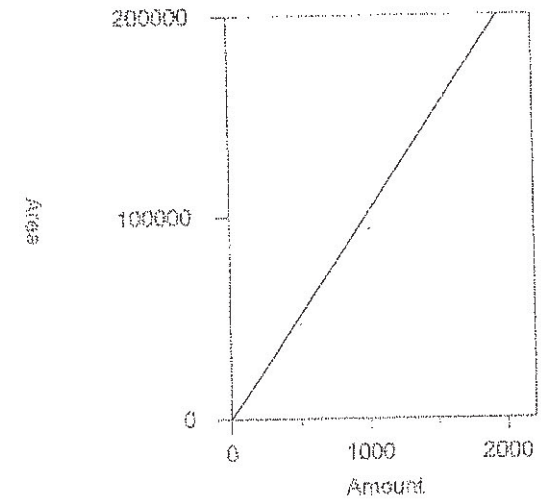
Single peak quantification by area

Y = 110.8549 X + 1788.915

Linear fit with equal weighting
Coefficient of determination: 0.999931
Average error: 2.804%
Average CF: 131.8325
RSD: 27.773%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.125	4943.087	196.7398	8.066	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.5	12460.69	123.987	-3.628	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502.5	56837.48	113.1094	-1.141	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1005	114344.8	113.7759	1.013	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2010	224216.7	111.5506	-0.174	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

15 4-NT



Expected retention time: 16.256 minutes
Search window: 0.162 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

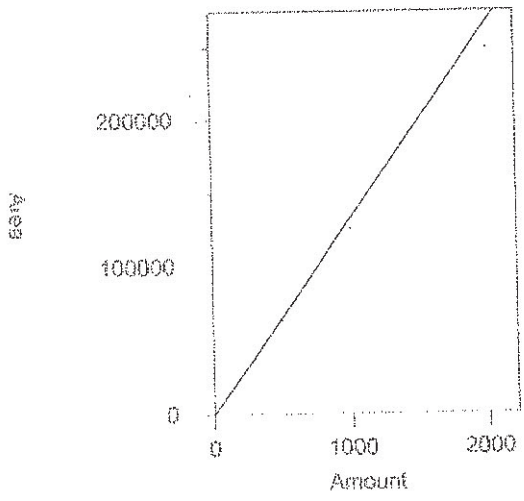
Single peak quantification by area

Y = 102.163 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9720693
Average error: 12.509%
Average CF: 102.163
RSD: 17.707%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.025	3356.179	134.1131	31.274	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.1	9887.746	98.77869	-3.313	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	500.5	46749.97	93.40653	-8.571	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1001	93749.27	93.65562	-8.327	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2002	181903.8	90.86104	-11.063	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

16 3-NT



Expected retention time:	17.078 minutes
Search window:	0.162 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

$Y = 132.7551\ X + 0$

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9910454
Average error:	10.013%
Average CF:	132.7551
RSD:	14.037%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.1	4166.31	165.9884	25.034	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0004.BND
2	100.4	12271.74	122.2285	-7.929	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0005.BND
3	502	63316.97	126.1294	-4.991	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0006.BND
4	1004	125734.3	125.2334	-5.666	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0007.BND
5	2008	249384.6	124.1955	-6.448	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001.0008.BND

6D

INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B Calibration File: 12EEXP1621101B

GC Column (2) : CHROMPACK ID: 100 (mm) Update File:

Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	RT OF STANDARDS					MIDPOINT (3) RT	RT WINDOW FROM	RT WINDOW TO
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5			
HMX	2.73	2.71	2.71	2.70	2.70	2.70	2.60	2.80
Nitroglycerin	9.49	9.51	9.35	9.21	9.47	9.47	9.28	9.66
3,4-Dinitrotoluene	11.38	11.41	11.25	10.85	11.27	11.27	10.98	11.55
PETN	18.12	18.11	17.55	17.46	18.14	18.14	17.86	18.43

(3) Jessica L. Miller
Senior Chemist

JUL 3 1 2016

6E

INITIAL CALIBRATION - CALIBRATION FACTOR SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329B Calibration File: 12EEXP1621101B

GC Column (2) : CHROMPACK ID: 100 (mm) Date(s) Analyzed: 7/29/2016 7/29/2016

COMPOUND	CALIBRATION FACTORS						%RSD
	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MEAN	
HMX	2.23E+03	1.12E+03	8.95E+02	8.46E+02	8.22E+02	1.18E+03	51
Nitroglycerin	3.08E+02	2.75E+02	2.99E+02	2.75E+02	2.83E+02	2.88E+02	5
3,4-Dinitrotoluene	2.16E+03	2.09E+03	2.23E+03	2.30E+03	2.50E+03	2.26E+03	7
PETN	2.50E+02	2.73E+02	3.10E+02	2.56E+02	2.58E+02	2.70E+02	9

Average % RSD: 18

JUL 3 1 2016

File Name: V:\CP12\12eexp1621101b.CAL
Version: 32

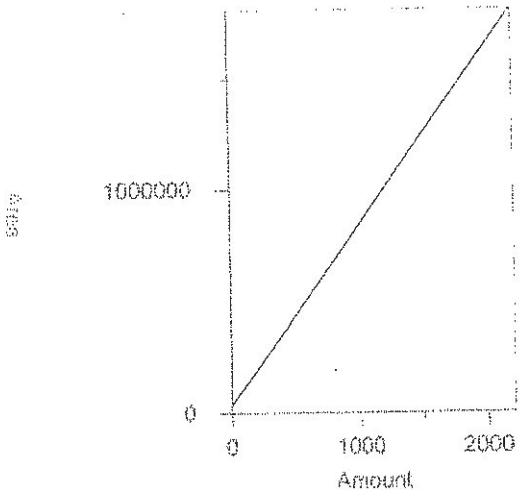
Creator:
Description:
Reason for change:

Internal standard calibration
Standard injection volume: 1
No sample weight correction
Area reject threshold: 0
Reference peak area reject threshold: 500
Amount units: ug/L
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 HMX



Expected retention time: 2.698 minutes
Search window: 0.1 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

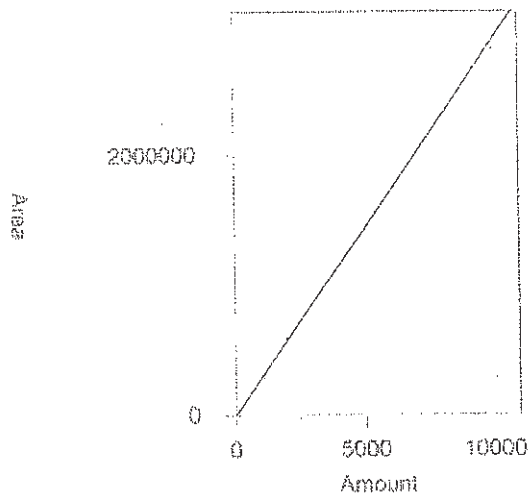
Single peak quantification by area

Y = 805.2766 X + 37388.52

Linear fit with equal weighting
Coefficient of determination: 0.9999336
Average error: 2.045%
Average CF: 1182.899
RSD: 50.515%

Level	Amount	Response	Cal Factor	Error, %	Source	D
1	25.015	55800.27	2230.672	-3.011	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0004.BND	7/
2	100.06	112141	1120.738	-4.937	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0005.BND	7/
3	500.3	447552.8	894.5689	1.655	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0006.BND	7/
4	1000.6	846707.3	846.1996	0.422	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0007.BND	7/
5	2001.2	1645620	822.3167	-0.199	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0008.BND	7/

2 Nitroglycerin



Expected retention time: 9.466 minutes
Search window: 0.19 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

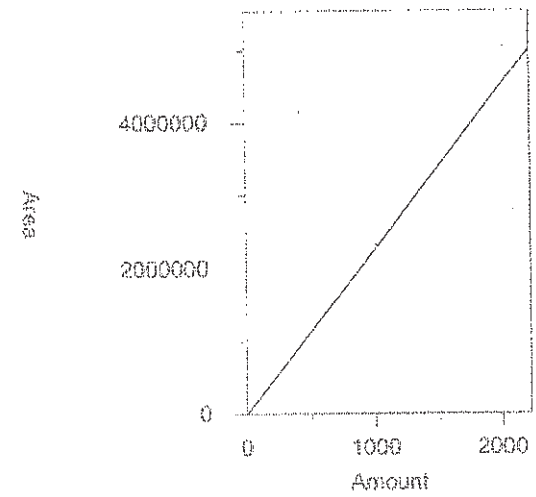
Single peak quantification by area

Y = 287.855 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9984417
Average error: 4.349%
Average CF: 287.855
RSD: 5.225%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	485.75	149840.5	308.4725	7.162	Manual	7/31/2016 2:13:36 PM
2	1063.86	292352.8	274.8038	-4.534	Manual	7/31/2016 2:13:45 PM
3	1947.18	581299.4	298.534	3.710	Manual	7/31/2016 2:13:49 PM
4	4857.82	1335512	274.92	-4.494	Manual	7/31/2016 2:13:56 PM
5	9956.51	2813161	282.5449	-1.845	Manual	7/31/2016 2:14:00 PM

3 3,4-Dinitrotoluene



Expected retention time: 11.266 minutes
Search window: 0.286 minutes
No internal standard component
No retention time reference component
No response proxy component
Group number: 0

High alarm limit: 0
Low alarm limit: 0
Component constant: 0

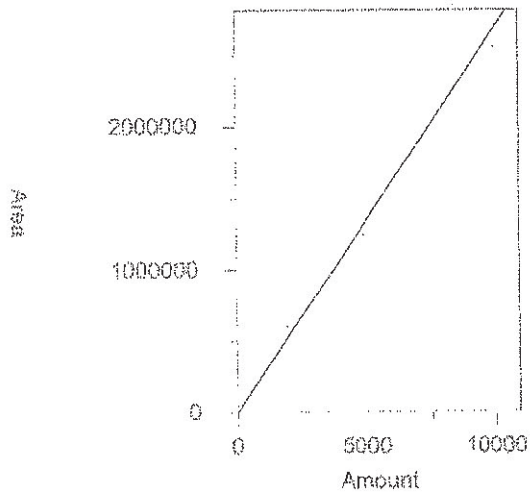
Single peak quantification by area

Y = 2258.673 X + 0

Average CF fit with equal weighting, forced to origin
Coefficient of determination: 0.9853915
Average error: 5.118%
Average CF: 2258.673
RSD: 7.001%

Level	Amount	Response	Cal Factor	Error, %	Source
1	25.2	54453.62	2160.858	-4.331	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0004.BND
2	100.8	210800.4	2091.274	-7.411	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0005.BND
3	504	1126383	2234.887	-1.053	\\USLAN-CHROMPERFECT\CHROMPERFECT-DATA\DEPT-24\ACTIVE\CP12\12EEXP16211001B.0006.BND
4	1008	2321369	2302.946	1.960	Manual
5	2016	5046855	2503.4	10.835	Manual

4 PETN



Expected retention time:	18.141 minutes
Search window:	0.286 minutes
No internal standard component	
No retention time reference component	
No response proxy component	
Group number:	0
High alarm limit:	0
Low alarm limit:	0
Component constant:	0

Single peak quantification by area

$Y = 269.6573\ X + 0$

Average CF fit with equal weighting, forced to origin

Coefficient of determination:	0.9940489
Average error:	6.588%
Average CF:	269.6573
RSD:	9.016%

Level	Amount	Response	Cal Factor	Error, %	Source	Date and time
1	484.69	121312.6	250.289	-7.183	Manual	7/31/2016 2:14:24 PM
2	1061.44	290126.8	273.3332	1.363	Manual	7/31/2016 2:14:29 PM
3	1942.16	602831.4	310.3922	15.106	Manual	7/31/2016 2:14:32 PM
4	4845.76	1240206	255.9363	-5.088	Manual	7/31/2016 2:14:37 PM
5	9931.88	2565758	258.3356	-4.199	Manual	7/31/2016 2:14:44 PM

6D

INITIAL CALIBRATION - RETENTION TIME SUMMARY

Lab Name: Lancaster Laboratories Contract:

Lab Code: Case No.: SAS No.: SDG No.:

Instrument: X6329A Calibration File: 12EEXP1621102

GC Column (1) : CHROMPACK ID: 100 (mm) Update File: 12EEXP16211002.0029.RAW

Date(s) Analyzed: 8/1/2016 8/1/2016

COMPOUND	RT OF STANDARDS LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	MIDPOINT RT	RT WINDOW FROM	TO
RDX			4.06			4.06	3.96	4.16
1,3,5-Trinitrobenzene			4.71			4.71	4.61	4.81
1,3-DNB			6.82			6.82	6.72	6.92
3,5-Dinitroaniline			7.16			7.16	6.82	7.50
Nitrobenzene			7.62			7.62	7.48	7.76
Tetryl			7.62			7.62	7.48	7.76
2,4,6-Trinitrotoluene			8.13			8.13	8.03	8.23
Tetryl breakdown			9.20			9.20	9.08	9.32
4-Amino-2,6-dinitrotoluene			9.88			9.88	9.74	10.02
2-Amino-4,6-dinitrotoluene			10.40			10.40	10.25	10.54
3,4-Dinitrotoluene			10.40			10.40	10.15	10.64
2,6-Dinitrotoluene			11.14			11.14	11.00	11.28
2,4-Dinitrotoluene			11.83			11.83	11.69	11.97
2-Nitrotoluene			13.59			13.59	13.45	13.73
4-Nitrotoluene			15.06			15.06	14.90	15.22
3-Nitrotoluene			15.80			15.80	15.64	15.96

Co-elute

RT Update

File used : 12EEXP16211002.0029

Applies to : 12EEXP16211002.0001 — .0029

James H. Place
Senior Chemist

AUG 0 2 2016

Audited By:

AUG 0 2 2016