

7C cont

Lab Name: Lancaster Laboratories

Lab Code: LANCAS

Instrument ID: HP20296

Lab File ID: 1g0231.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
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

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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

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: 07/07/16 Time: 08:45
Lab File ID: gg0343.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	0.260	30.310	30.0	1
Average %Drift:					1

FORM VII SV-1

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7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: Lancaster Laboratories Contract: _____
Lab Code: LANCAS Case No.: _____ SAS No.: _____ SDG No.: _____
Instrument ID: HP11165 Calibration Date: 07/07/16 Time: 08:18
Lab File ID: gg0342.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	0.364	29.120	30.0	-3
Average %Drift:					3

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/16jul07.b/gg0341.d
```

Area Summary

File ID:

=====

Internal Standard Name	gg0341.d	ICAL Area	Low Limit	High Limit	In Spec
=====	=====	=====	=====	=====	=====
1,4-Dichlorobenzene-d4	100453	70096	35048	140192	Yes
Naphthalene-d8	430807	296116	148058	592232	Yes
Acenaphthene-d10	278098	192522	96261	385044	Yes
Phenanthrene-d10	517626	374023	187012	748046	Yes
Pyrene-d10	586828	404786	202393	809572	Yes
Perylene-d12	467136	301130	150565	602260	Yes

A "No" indicates the internal standard area is outside acceptable QC limits.

RT Summary

File ID:

=====

Internal Standard Name	gg0341.d	ICAL RT	In Spec
=====	=====	=====	=====
1,4-Dichlorobenzene-d4	4.851	5.528	No
Naphthalene-d8	6.081	6.763	No
Acenaphthene-d10	7.775	8.475	No
Phenanthrene-d10	9.204	9.922	No
Pyrene-d10	10.563	11.310	No
Perylene-d12	13.092	13.939	No

A "No" indicates the retention time is greater than 30 seconds from the RT of the referenced standard.

Comments: ★ column maintenance

132 10208
7/7/16

7C cont

Lab Name: Lancaster Laboratories Contract: _____

Lab Code: LANCAS Case No.: _____ SAS No.: _____ SDG No.: _____

Instrument ID: HP11165 Calibration Date: 07/07/16 Time: 07:44

Lab File ID: gg0341.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Max %Drift for CCC(*) = 20%

COMPOUND	$\overline{\text{RRF}}$	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
2-Fluorobiphenyl	1.288	1.294	60.270	60.0	0
2,4,6-Tribromophenol	0.142	0.166	70.000	60.0	17
Terphenyl-d14	0.732	0.757	61.990	60.0	3

Average %Drift:	5

7C cont

Lab Name: Lancaster Laboratories Contract:

Lab Code: LANCAS Case No.: SAS No.: SDG No.:

Instrument ID: HP11165 Calibration Date: 07/07/16 Time: 07:44

Lab File ID: qq0341.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
Methyl parathion	0.258	0.260	30.160	30.0	1
Di-n-butylphthalate	1.246	1.234	29.710	30.0	-1
Parathion	0.162	0.165	30.540	30.0	2
4-Nitroquinoline-1-oxide	0.117	0.082	20.940	30.0	-30
Octachlorostyrene	0.061	0.073	36.150	30.0	20
Isodrin	0.117	0.122	31.320	30.0	4
Fluoranthene	1.189	1.214	30.620	30.0	2
Benzidine	0.809	0.738	82.120	90.0	-9
Pyrene	1.184	1.108	28.080	30.0	-6
p-Dimethylaminoazobenzene	0.202	0.218	32.460	30.0	8
Chlorobenzilate	0.325	0.302	27.950	30.0	-7
3,3'-Dimethylbenzidine	0.651	0.658	30.330	30.0	1
Butylbenzylphthalate	0.518	0.473	27.410	30.0	-9
2-Acetylaminofluorene	0.478	0.456	28.630	30.0	-5
3,3'-Dichlorobenzidine	0.376	0.395	31.490	30.0	5
4,4'-Methylenebis(2-chloroanil	0.197	0.200	30.430	30.0	1
Benzo(a)anthracene	1.013	1.030	30.500	30.0	2
Chrysene	1.014	0.962	28.470	30.0	-5
bis(2-Ethylhexyl)phthalate	0.715	0.664	27.850	30.0	-7
6-Methylchrysene	0.701	0.736	31.530	30.0	5
Di-n-octylphthalate	1.589	1.439	27.180	30.0	-9
Benzo(b)fluoranthene	1.262	1.278	30.380	30.0	1
7,12-Dimethylbenz[a]anthracene	0.589	0.594	30.260	30.0	1
Benzo(k)fluoranthene	1.244	1.163	28.040	30.0	-7
Benzo(a)pyrene	1.181	1.206	30.640	30.0	2
3-Methylcholanthrene	0.520	0.536	30.910	30.0	3
Dibenz(a,h)acridine	0.898	0.925	30.920	30.0	3
Dibenz(a,j)acridine	0.951	1.000	31.540	30.0	5
Indeno(1,2,3-cd)pyrene	1.207	1.274	31.670	30.0	6
Dibenz(a,h)anthracene	1.037	1.076	31.130	30.0	4
Benzo(g,h,i)perylene	1.030	1.081	31.510	30.0	5
Total PAHs	1.127	1.096	535.060	540.0	-1
2-Fluorophenol	1.496	1.532	61.440	60.0	2
Phenol-d6	2.214	2.125	57.610	60.0	-4
Nitrobenzene-d5	0.472	0.464	58.950	60.0	-2

7C cont

Lab Name: Lancaster Laboratories Contract:

Lab Code: LANCAS Case No.: SAS No.: SDG No.:

Instrument ID: HP11165 Calibration Date: 07/07/16 Time: 07:44

Lab File ID: qq0341.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
4-Nitrophenol	0.217	0.186	25.690	30.0	-14
Pentachlorobenzene	0.420	0.467	33.370	30.0	11
2,4-Dinitrotoluene	0.454	0.434	28.690	30.0	-4
2,4,2,6-Dinitrotoluenes	0.394	0.378	58.650	60.0	-2
Dibenzofuran	1.734	1.675	28.990	30.0	-3
1-Naphthylamine	1.385	1.272	27.550	30.0	-8
2,3,4,6-Tetrachlorophenol	0.311	0.319	30.850	30.0	3
2-Naphthylamine	1.365	1.256	27.610	30.0	-8
Diethylphthalate	1.367	1.290	28.300	30.0	-6
Thionazin	0.280	0.279	29.870	30.0	0
Fluorene	1.413	1.391	29.540	30.0	-2
4-Chlorophenyl-phenylether	0.663	0.668	30.240	30.0	1
5-Nitro-o-toluidine	0.436	0.410	28.180	30.0	-6
4-Nitroaniline	0.419	0.366	26.170	30.0	-13
4,6-Dinitro-2-methylphenol	0.147	0.148	30.180	30.0	1
N-Nitrosodiphenylamine (1)	0.658	0.669	30.520	30.0	2
NDPA as diphenylamine	0.658	0.669	30.520	30.0	2
1,2-Diphenylhydrazine	0.900	0.875	29.170	30.0	-3
Tetraethyldithiopyrophosphate	0.123	0.125	30.450	30.0	1
1,3,5-Trinitrobenzene	0.087	0.092	31.740	30.0	6
Diallate (peak 1)	0.405	0.396	24.360	24.9	-2
Phorate	0.536	0.771	43.130	30.0	44
Phenacetin	0.428	0.394	27.630	30.0	-8
4-Bromophenyl-phenylether	0.175	0.207	35.470	30.0	18
Diallate (peak 2)	0.394	0.373	4.830	5.1	-5
Diallate trans/cis	0.403	0.392	29.180	30.0	-3
Hexachlorobenzene	0.176	0.206	35.150	30.0	17
Dimethoate	0.364	0.368	30.360	30.0	1
Pentachlorophenol	0.130	0.125	28.890	30.0	-4
4-Aminobiphenyl	0.580	0.530	27.410	30.0	-9
Pentachloronitrobenzene	0.073	0.079	32.170	30.0	7
Pronamide	0.315	0.310	29.560	30.0	-1
Dinoseb	0.189	0.210	33.380	30.0	11
Phenanthrene	1.138	1.123	29.600	30.0	-1
Anthracene	1.109	1.131	30.570	30.0	2
Carbazole	1.092	1.046	28.740	30.0	-4

(1) Cannot be Separated from Diphenylamine

7C

Contract:

Lab Code: LANCAS Case No.: SAS No.: SDG No.:

Instrument ID: HP11165 Calibration Date: 07/07/16 Time: 07:44

Lab File ID: gg0341.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	0.585	30.280	30.0	1
2,4-Dichlorophenol	0.308	0.318	30.980	30.0	3
1,2,4-Trichlorobenzene	0.315	0.334	31.780	30.0	6
Naphthalene	1.088	1.077	29.690	30.0	-1
4-Chloroaniline	0.475	0.473	29.840	30.0	-1
2,6-Dichlorophenol	0.308	0.311	30.370	30.0	1
Hexachloropropene	0.156	0.177	34.160	30.0	14
Hexachlorobutadiene	0.153	0.171	33.670	30.0	12
Quinoline	0.766	0.743	29.110	30.0	-3
Caprolactam	0.168	0.159	28.320	30.0	-6
N-Nitrosodi-n-butylamine	0.433	0.331	22.980	30.0	-23
4-Chloro-3-methylphenol	0.387	0.382	29.660	30.0	-1
Safrole	0.296	0.313	31.710	30.0	6
2-Methylnaphthalene	0.797	0.768	28.920	30.0	-4
1-Methylnaphthalene	0.736	0.704	28.680	30.0	-4
Hexachlorocyclopentadiene	0.216	0.217	30.070	30.0	0
1,2,4,5-Tetrachlorobenzene	0.470	0.522	33.320	30.0	11
cis-Isosafrole	0.479	0.510	5.430	5.1	6
2,4,6-Trichlorophenol	0.358	0.377	31.590	30.0	5
2,4,5-Trichlorophenol	0.393	0.415	31.690	30.0	6
trans-Isosafrole	0.530	0.586	27.520	24.9	11
Isosafrole	0.522	0.573	32.950	30.0	10
1,1'-Biphenyl	1.504	1.473	29.390	30.0	-2
2-Chloronaphthalene	1.149	0.975	25.460	30.0	-15
1-Chloronaphthalene	1.107	1.199	32.490	30.0	8
Diphenyl ether	0.801	0.808	30.280	30.0	1
2-Nitroaniline	0.400	0.409	30.630	30.0	2
1,4-Naphthoquinone	0.512	0.461	27.000	30.0	-10
1,4-Dinitrobenzene	0.221	0.217	29.450	30.0	-2
Dimethylphthalate	1.389	1.346	29.070	30.0	-3
1,3-Dinitrobenzene	0.250	0.248	29.720	30.0	-1
2,6-Dinitrotoluene	0.323	0.322	29.960	30.0	0
Acenaphthylene	1.831	1.768	28.970	30.0	-3
3-Nitroaniline	0.359	0.355	29.670	30.0	-1
Acenaphthene	1.231	1.151	28.040	30.0	-7
2,4-Dinitrophenol	0.234	0.213	36.520	40.0	-9

7B

Init. Calib. Times(s): 09:32 12:39

Max %Drift for CCC(*) = 20%

COMPOUND	RRF	RRF30	ACTUAL CONC.	TRUE CONC.	% DRIFT
N-Nitrosodimethylamine	0.969	1.107	34.270	30.0	14
Pyridine	1.689	1.752	31.110	30.0	4
2-Picoline	1.731	1.957	33.930	30.0	13
N-Nitrosomethylethylamine	0.893	0.792	26.600	30.0	-11
Methyl methanesulfonate	0.896	0.894	29.910	30.0	0
N-Nitrosodiethylamine	0.858	0.876	30.640	30.0	2
Ethyl methanesulfonate	0.847	0.807	28.580	30.0	-5
Phenol	2.564	2.387	27.930	30.0	-7
Aniline	2.898	2.855	29.550	30.0	-2
a-methylstyrene	1.627	1.696	31.270	30.0	4
bis(2-Chloroethyl) ether	1.825	1.777	29.220	30.0	-3
2-Chlorophenol	1.532	1.566	30.680	30.0	2
1,3-Dichlorobenzene	1.566	1.606	30.780	30.0	3
1,4-Dichlorobenzene	1.638	1.628	29.810	30.0	-1
Benzyl alcohol	1.188	1.244	31.430	30.0	5
1,2-Dichlorobenzene	1.590	1.579	29.790	30.0	-1
Indene	2.798	2.691	28.860	30.0	-4
2-Methylphenol	1.592	1.675	31.560	30.0	5
2,2'-oxybis(1-Chloropropane)	2.032	2.079	30.690	30.0	2
bis(2-Chloroisopropyl) ether	2.032	2.079	30.690	30.0	2
N-Nitrosopyrrolidine	0.949	0.986	31.170	30.0	4
Acetophenone	2.437	2.425	29.860	30.0	0
4-Methylphenol	1.896	1.823	28.840	30.0	-4
Total Cresols	1.742	1.749	60.400	60.0	1
N-Nitroso-di-n-propylamine	1.586	1.556	29.420	30.0	-2
N-Nitrosomorpholine	1.128	1.040	27.660	30.0	-8
o-Toluidine	2.780	2.741	29.580	30.0	-1
Hexachloroethane	0.600	0.610	30.510	30.0	2
Nitrobenzene	0.492	0.486	29.670	30.0	-1
N-Nitrosopiperidine	0.204	0.212	31.210	30.0	4
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	0.412	30.170	30.0	1
O,O,O-Triethylphosphorothioate	0.186	0.199	32.100	30.0	7
bis(2-Chloroethoxy)methane	0.513	0.498	29.120	30.0	-3
Benzoic acid	0.411	0.303	29.480	40.0	-26

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page 1 of 5

138 10208
7/7/16

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: 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

Init. Calib. Times(s): 07:48 09:58

Max %Drift for CCC(*) = 20%

Average %Drift:	0

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 7/6/16

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

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7C cont

Lab Code: LANCAS Case No.: SAS No.: SDG No.:

Lab File ID: gg0291.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

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

7C cont

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: qq0291.d Init. Calib. Date(s): 06/07/16 06/07/16

Init. Calib. Times(s): 09:32 12:39

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

7C

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

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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

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

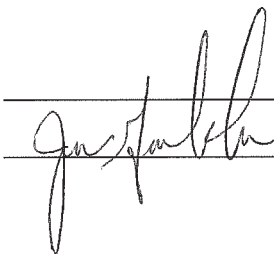
%RSD of internal standard area is flagged out of spec if greater than 30.

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

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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: HP11165 Calibration Date(s): 07/05/16 07/05/16
 Calibration Times: 07:13 09:20

LAB FILE ID:		RRF30 = gg0166.d		RRF50 = gg0165.d		RRF5 = gg0168.d		RRF15 = gg0167.d		RRF80 = gg0164.d		RRF120 = gg0163.d	
COMPOUND	RRF	RRF	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	RRF	%	CAL.		
2-Chlorobenzaldehyde			0.224	0.263	0.256	0.265	0.267	0.270	0.257	7	AVG		
Average %RSD										4			

Janet A. La
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/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: _____

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				CAL. METHOD
RRF30 = gf1005.d		RRF50 = gf1004.d		RRF80 = gf1003.d		RRF120 = gf1002.d						
COMPOUND	RRF	RRF'	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	RRF	% RSD	AVG	
2-Chlorobenzalmalononitrile			0.373	0.369	0.378	0.374	0.376	0.382	0.375	1		
Average %RSD										1		

Jim Fahlke
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.

Lancaster Laboratories, Inc.
Semi Volatile Initial Calibration Verification

LAB NAME: LANCASTER LABS

LAB CODE: LANCAS

INSTRUMENT: HP11165

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:

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: HP11165

Method: SW-846 8270D

File ID: gf0211.d

ICV SAMPLE ID: ICV1376

BATCH: 16JUN07026

Sample Name: SST050

COMPOUND NAME	TRUE CONC.	ACTUAL CONC.	% DRIFT	%D window	INSPEC
2,4,6-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
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
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:

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:

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	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-chloroanil			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.

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											
RRF30 = gf0201.d											
RRF1 = gf0207.d											
RRF50 = gf0204.d											
RRF5 = gf0206.d											
RRF80 = gf0203.d											
RRF15 = gf0205.d											
RRF120 = gf0202.d											
COMPOUND	RRF0.5	RRF1	RRF5	RRF15	RRF30	RRF50	RRF80	RRF120	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.

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											
RRF30 = gf0201.d											
RRF1 = gf0207.d											
RRF50 = gf0204.d											
RRF5 = gf0206.d											
RRF80 = gf0203.d											
RRF15 = gf0205.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.

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

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 - SST7.5	lg0231.d	07/08/16	17:15
02	RVCLB1836 - SST30	lg0232.d	07/08/16	17:44
03	rvCLB1836 - SST20	lg0233.d	07/08/16	18:16
04	rvCLB1836 - SST12.5	lg0234.d	07/08/16	18:44
05	rvCLB1836 - SST7.5	lg0235.d	07/08/16	19:13
06	rvCLB1836 - SST3.75	lg0236.d	07/08/16	19:41
07	rvCLB1836 - SST1.25	lg0237.d	07/08/16	20:10
08	rvCLB1836 - SST0.25	lg0238.d	07/08/16	20:38
09	SBKWD178	lg0239.d	07/08/16	21:06
10	178WDLCS	lg0240.d	07/08/16	21:35
11	178WDLCS	lg0241.d	07/08/16	22:03
12	178WDLCS1	lg0242.d	07/08/16	22:31
13	178WDLCS1	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: 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: 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

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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: gg0340.d DFTPP Injection Date: 07/07/16

Instrument ID: HP11165 DFTPP Injection Time: 07:26

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	40.7
68	Less than 2.0% of mass 69	0.81 (1.58)1
69	Mass 69 relative abundance	51.3
70	Less than 2.0% of mass 69	0.38 (0.74)1
127	10.0 - 80.00% of mass 198	46.3
197	Less than 2.0% of mass 198	0.48
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.73
275	10.0 - 60.0% of mass 198	23.7
365	Greater than 1.00% of mass 198	2.33
441	Present, and less than mass 443	9.87
442	Greater than 50.00% of mass 198	60.6
443	15.00 - 24.00% of mass 442	11.3 (18.6)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	8454741	gg0353.d	07/07/16	15:46

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: gg0340.d DFTPP Injection Date: 07/07/16

Instrument ID: HP11165 DFTPP Injection Time: 07:26

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.00% of mass 198	40.7
68	Less than 2.0% of mass 69	0.81 (1.58)1
69	Mass 69 relative abundance	51.3
70	Less than 2.0% of mass 69	0.38 (0.74)1
127	10.0 - 80.00% of mass 198	46.3
197	Less than 2.0% of mass 198	0.48
198	Base peak, 100% relative abundance	100.0
199	5.00 to 9.00% of mass 198	6.73
275	10.0 - 60.0% of mass 198	23.7
365	Greater than 1.00% of mass 198	2.33
441	Present, and less than mass 443	9.87
442	Greater than 50.00% of mass 198	60.6
443	15.00 - 24.00% of mass 442	11.3 (18.6)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	gg0341.d	07/07/16	07:44
02	TRG1566 - SSTD30	gg0342.d	07/07/16	08:18
03	CBZ1876 - SSTD30	gg0343.d	07/07/16	08:45
04	8449094	gg0344.d	07/07/16	09:23
05	8450969	gg0345.d	07/07/16	09:49
06	8450973	gg0346.d	07/07/16	10:15
07	BAS1166 - SSTD30	gg0341a.d	07/07/16	10:40
08	SBLKLF187	gg0354.d	07/07/16	11:06
09	187LFLCS	gg0355.d	07/07/16	11:31
10	8455582	gg0356.d	07/07/16	11:57
11	8455582MS	gg0357.d	07/07/16	12:22
12	8455582MSD	gg0358.d	07/07/16	12:47
13	8450977	gg0347.d	07/07/16	13:13
14	8454721	gg0348.d	07/07/16	13:38
15	8454725	gg0349.d	07/07/16	14:04
16	8454729	gg0350.d	07/07/16	14:29
17	8454733	gg0351.d	07/07/16	14:55
18	8454737	gg0352.d	07/07/16	15:21

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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: 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

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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: 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	SBKLE187	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	187LELCS2	gg0297.d	07/06/16	21:45
08	187LELCS3	gg0298.d	07/06/16	22:10
09	187LELCS3	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

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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: 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: 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 - SST30	gg0161.d	07/05/16	06:21
02	TRG1566 - SST30	gg0162.d	07/05/16	06:47
03	CBZ1876 - SST120	gg0163.d	07/05/16	07:13
04	CBZ1876 - SST80	gg0164.d	07/05/16	07:38
05	CBZ1876 - SST50	gg0165.d	07/05/16	08:04
06	CBZ1876 - SST30	gg0166.d	07/05/16	08:29
07	CBZ1876 - SST15	gg0167.d	07/05/16	08:55
08	CBZ1876 - SST5	gg0168.d	07/05/16	09:20
09	CBZMDL1876 - SST001	gg0169.d	07/05/16	09:46
10	SBKLF182	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: 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: 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 - SST30	gf1001.d	06/28/16	07:22
02	TRG1586 - SST120	gf1002.d	06/28/16	07:48
03	TRG1586 - SST80	gf1003.d	06/28/16	08:14
04	TRG1586 - SST50	gf1004.d	06/28/16	08:40
05	TRG1586 - SST30	gf1005.d	06/28/16	09:07
06	TRG1586 - SST15	gf1006.d	06/28/16	09:32
07	TRG1586 - SST5	gf1007.d	06/28/16	09:58
08	TRGMDL1586 - SST001	gf1008.d	06/28/16	10:25
09	SBKWA178	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: 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 - SST30	gf0201.d	06/07/16	09:32
02	STD1526 - SST120	gf0202.d	06/07/16	09:59
03	STD1526 - SST80	gf0203.d	06/07/16	10:25
04	STD1526 - SST50	gf0204.d	06/07/16	10:51
05	STD1526 - SST15	gf0205.d	06/07/16	11:20
06	STD1526 - SST5	gf0206.d	06/07/16	11:47
07	STD1526 - SST1	gf0207.d	06/07/16	12:13
08	STD1526 - SST.5	gf0208.d	06/07/16	12:39
09	MDL1526 - SST00.5	gf0209.d	06/07/16	13:06
10	MDLPAH1526 - SST00.1	gf0210.d	06/07/16	13:32
11	ICV1376 - SST050	gf0211.d	06/07/16	14:00
12	ICVBAS0716 - SST050	gf0212.d	06/07/16	14:28

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

UNSPK: P444096 MS: P444097 MSD: P444098 Analyte	Batch: 16187SLE026 (Sample number(s): 8445669, 8445673, 8445677)								
	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.

SDG: DWD89
Matrix: SOLID

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

LCS: 187LELCS	Batch: 16187SLE026 (Sample number(s): 8445669, 8445673, 8445677)							
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): 8445669, 8445673, 8445677)							
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): 8445669, 8445673, 8445677)							
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

SDG: DWD89
Matrix: LIQUID

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

LCS: 178WDLCS LCSD: 178WDLCS1	Batch: 16178WAD026 (Sample number(s): 8445666-8445667)							
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: 178WDLCS2	Batch: 16178WAD026 (Sample number(s): 8445666-8445667)							
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

Fraction: Semivolatiles by GC/MS

Sample	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
	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits	% Recovery	Limits
16187SLE026	130	35 - 136	96	63 - 117	103	57 - 126	91	54 - 123	95	58 - 122	104	59 - 129
SBLKLE187	122	35 - 136	90	63 - 117	101	57 - 126	89	54 - 123	97	58 - 122	100	59 - 129
187LELCS	118	35 - 136	89	63 - 117	94	57 - 126	85	54 - 123	87	58 - 122	97	59 - 129
187LELCSD2	101	35 - 136	84	63 - 117	89	57 - 126	83	54 - 123	88	58 - 122	91	59 - 129
8445669	91	35 - 136	76	63 - 117	82	57 - 126	73	54 - 123	81	58 - 122	83	59 - 129
8445673	103	35 - 136	87	63 - 117	92	57 - 126	84	54 - 123	90	58 - 122	93	59 - 129
8445677	100	35 - 136	82	63 - 117	89	57 - 126	81	54 - 123	85	58 - 122	87	59 - 129
P444096 UNSPK	93	35 - 136	77	63 - 117	87	57 - 126	81	54 - 123	85	58 - 122	83	59 - 129
P444097 MS	99	35 - 136	80	63 - 117	88	57 - 126	81	54 - 123	87	58 - 122	89	59 - 129
P444098 MSD												

Fraction: Semivolatiles by GC/MS

16178WAD026 Sample	2-Fluorobiphenyl		Nitrobenzene-d5		Terphenyl-d14	
	Spike Added	100 ug/l	Spike Added	100 ug/l	Spike Added	100 ug/l
	% 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
178WDLCS	100	61 - 112	107	46 - 128	105	41 - 125
8445666	99	61 - 112	103	46 - 128	96	41 - 125
8445667	97	61 - 112	102	46 - 128	67	41 - 125

Fraction: Semivolatiles by GC/MS

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-Chlorobenzalmononitrile	07/06/16	N.D.	ug/kg	170	500

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

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 Reference List GC/MS Semivolatiles

CLIENT: CH2M Hill, Inc.
SDG: DWD89

Fraction: Semivolatiles by GC/MS

Analysis	Batch Number	Sample Number	Analysis Date
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
		8445669	07/07/2016 04:11:00
		8445673	07/07/2016 04:36:00
		8445677	07/07/2016 05:02:00
		P444096 UNSPK	07/07/2016 02:54:00
		P444097 MS	07/07/2016 03:20:00
		P444098 MSD	07/07/2016 03:45:00
SVOA 8270D (water)	16178WAD026	SBLKWD178	07/08/2016 21:06:00
		178WDLCS	07/08/2016 21:35:00
		178WDLCS2	07/08/2016 22:03:00
		178WDLCS1	07/08/2016 22:31:00
		178WDLCS1	07/08/2016 23:00:00
		8445666	07/09/2016 03:15:00
		8445667	07/09/2016 03:44:00

Quality Control and Calibration Summary Forms

Semivolatiles by GC/MS

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD89

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

Refer to the QC Summary forms for more information.

SAMPLE ANALYSIS:

(Sample number(s): 8445669, 8445673, 8445677: 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

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD89

GC/MS Semivolatiles

Fraction: Semivolatiles by GC/MS

SVOA 8270D (microwave)

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
8445666	BGA-1-FB	X		1	Field Blank
8445667	DU-3-1-FB	X		1	Field Blank
8445669	DU-1-7-A		X	5	
8445673	DU-1-7-B		X	5	
8445677	DU-1-7-C		X	5	

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#: 16187SLE026 (Sample number(s): 8445669, 8445673, 8445677, UNSPK: P444097)
The recovery(ies) for the following analyte(s) in the LCS is below the acceptance window:
2-Chlorobenzalmalononitrile

(Sample number(s): 8445669, 8445673, 8445677: Analysis: 10726)
The stated QC limits for 2-Chlorobenzalmalononitrile are advisory only.

MS/MSD

Batch#: 16187SLE026 (Sample number(s): 8445669, 8445673, 8445677, UNSPK: P444097)
The recovery(ies) for the following analyte(s) in the MS and MSD is outside the acceptance window: Quinoline

Case Narrative/Conformance Summary

Semivolatiles by GC/MS

Semivolatiles by GC/MS Data



Lancaster Laboratories
Environmental

VOA Prep Summary by SDG: DWD89
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 requirements?	Preserv. lot #	Preservative (volume)	Final Extraction Vol (mL)	Problem Codes
8445672	150A	07320	16685074	Y	06/24/16 09:45	06/25/16 17:13	32.54 g	36.57 g	4.03 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8445672	150B	07320	16685076	N	06/24/16 09:45	06/25/16 17:13	32.10 g	35.77 g	3.67 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8445672	169A	07578	16688864	N	06/24/16 09:45	06/25/16 17:12	29.58 g	33.75 g	4.17 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8445676	150A	07320	16685078	N	06/24/16 11:30	06/25/16 17:13	32.09 g	34.75 g	2.66 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8445676	150B	07320	16685077	Y	06/24/16 11:30	06/25/16 17:13	32.11 g	35.27 g	3.16 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A,D
8445676	169A	07578	16688863	N	06/24/16 11:30	06/25/16 17:10	29.73 g	33.57 g	3.84 g	4.50 g - 5.50 g	N	16158	MeOH w/surrogate (5 mL)	5.000	A
8445680	150A	07320	16685084	N	06/24/16 14:20	06/25/16 17:13	32.59 g	36.12 g	3.53 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8445680	150B	07320	16685083	Y	06/24/16 14:20	06/25/16 17:13	32.40 g	36.38 g	3.98 g	4.50 g - 5.50 g	N	9-08-15	DI Water (5 mL)	5.000	A
8445680	169A	07578	16688865	N	06/24/16 14:20	06/25/16 17:09	29.50 g	33.12 g	3.62 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

Final Extraction Vol (mL) = Preservative Vol + Added MeOH (if applicable)

KEY to problem codes:

A = wt. does not meet requirements
D = sampler not full

B = vial leaked

C# where # = volume of MeOH added in mL due to sample not covered/matrix (lot #)

E = effervescence observed

F = pH >= 2

G = headspace in container

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	VLKLL14	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	VLKLL14	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	

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 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	VLKA31	06/27/2016	08:12	A161791AA	
jkh09052	AU27C01.D	VSTD050	06/27/2016	08:37	A161791AA	
jkh09052	AU27X01.D	VLKA31	06/27/2016	09:00	A161791AA	
jkh09052	AU27B01.D	VLKA31	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\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	VLKA26	06/20/2016	15:21	A161721AA	
jkh09052	AU20S09.D	8416938	06/20/2016	15:58	A161721AA	
jkh09052	AU20X02.D	VLKA26	06/20/2016	16:25	A161721AA	
jkh09052	AU20X03.D	VLKA26	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	

Preparation and Run Logs

Volatiles by GC/MS

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract: _____

Lab Code: LANCAS Case No.: _____ SAS No.: _____ SDG No.: _DWD89_

Lab File ID (Standard): 1105c05.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)		IS2(FBZ)		IS3(CBZ)		IS4(DCB)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #	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.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Lancaster Laboratories Contract: _____
 Lab Code: LANCAS Case No.: _____ SAS No.: _____ SDG No.: _DWD89_
 Lab File ID (Standard): 1105c05.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)		IS2(FBZ)		IS3(CBZ)		IS4(DCB)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #	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 LC SL14	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.:_DWD89_

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)		IS2(FBZ)		IS3(CBZ)		IS4(DCB)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #	AREA #	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

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 * 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.: _DWD89_
 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)		IS2(FBZ)		IS3(CBZ)		IS4(DCB)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #	AREA #	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.

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: 1105c05.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.

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: 1105c05.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.

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: 1105c05.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: 1105c05.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.

report generated on 07/05/2016 at 17:34

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/l105c05.d

RT Summary

File ID:

=====

Internal Standard Name	l105c05.d	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

File ID:

=====

Internal Standard Name	l105c05.d	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: _____

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.

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
# 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
# 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.

report generated on 06/27/2016 at 09:06

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

File ID:

=====

Internal Standard Name	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

File ID:

=====

Internal Standard Name	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.

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	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 %

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	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	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 %

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

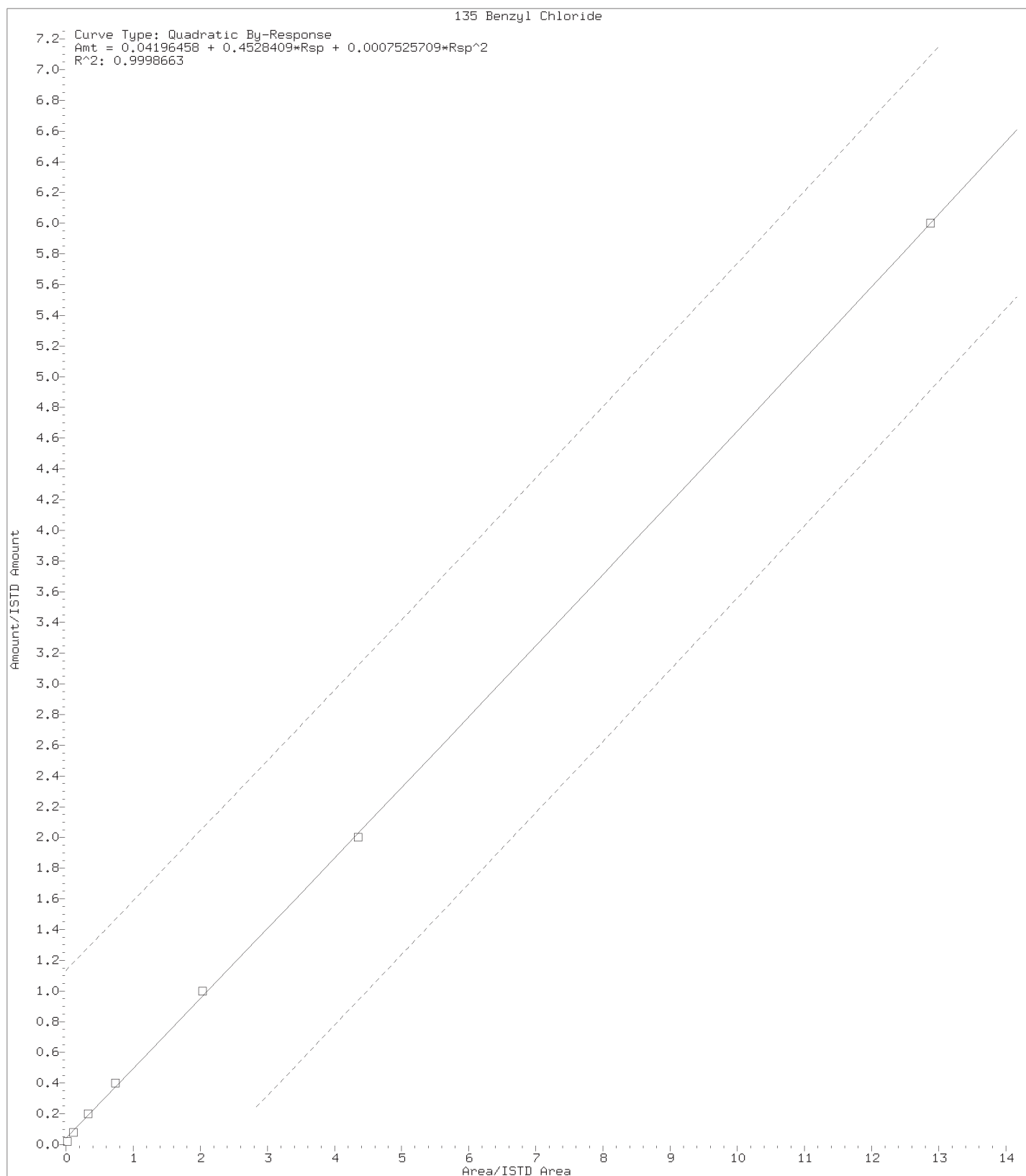
File ID:

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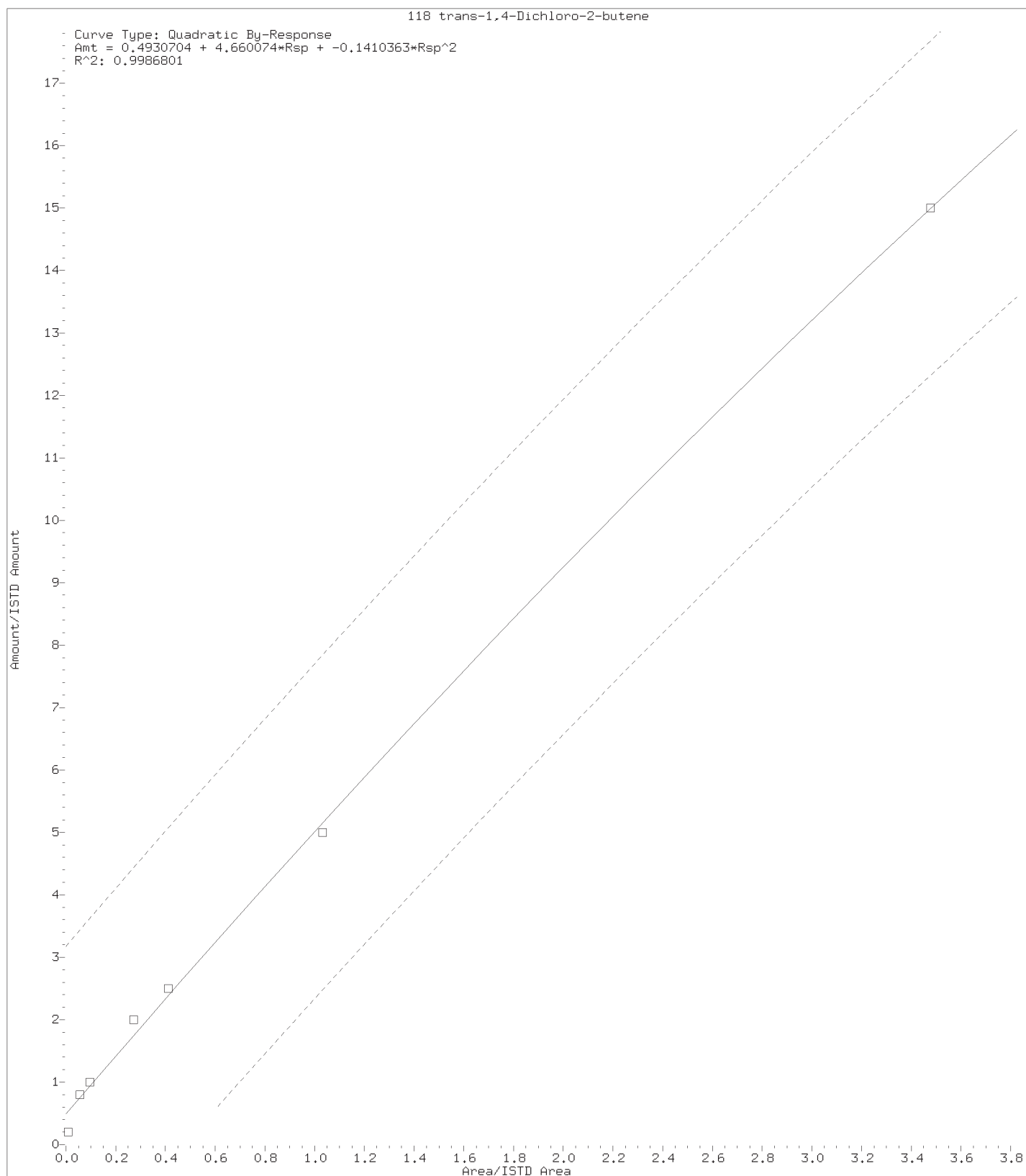
Internal Standard Name	la22i01.d	la22i02.d	la22i03.d	la22i04.d	la22i05.d	la22i06.d	la22i07.d	Avg. RT
t-Butyl alcohol-d10	4.012	3.993	3.990	3.996	3.993	3.993	4.009	3.998
Fluorobenzene	7.510	7.504	7.504	7.507	7.507	7.507	7.510	7.507
Chlorobenzene-d5	11.041	11.041	11.041	11.041	11.041	11.041	11.041	11.041
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.



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

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 = 1a22i07.d RRF 4 = 1a22i06.d RRF 10= 1a22i05.d										
RRF 20= 1a22i04.d RRF 50= 1a22i03.d RRF100= 1a22i02.d RRF300= 1a22i01.d										

Average %RSD 9

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 = 1a22i07.d	RRF 4 = 1a22i06.d	RRF 10 = 1a22i05.d	RRF 20 = 1a22i04.d	RRF 50 = 1a22i03.d	RRF100 = 1a22i02.d	RRF300 = 1a22i01.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 = 1a22i07.d	RRF 4 = 1a22i06.d	RRF 10 = 1a22i05.d	RRF 20 = 1a22i04.d	RRF 50 = 1a22i03.d	RRF100 = 1a22i02.d	RRF300 = 1a22i01.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.

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 %

page 3 of 3

FORM VII VOA

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
# 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
# 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 %

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

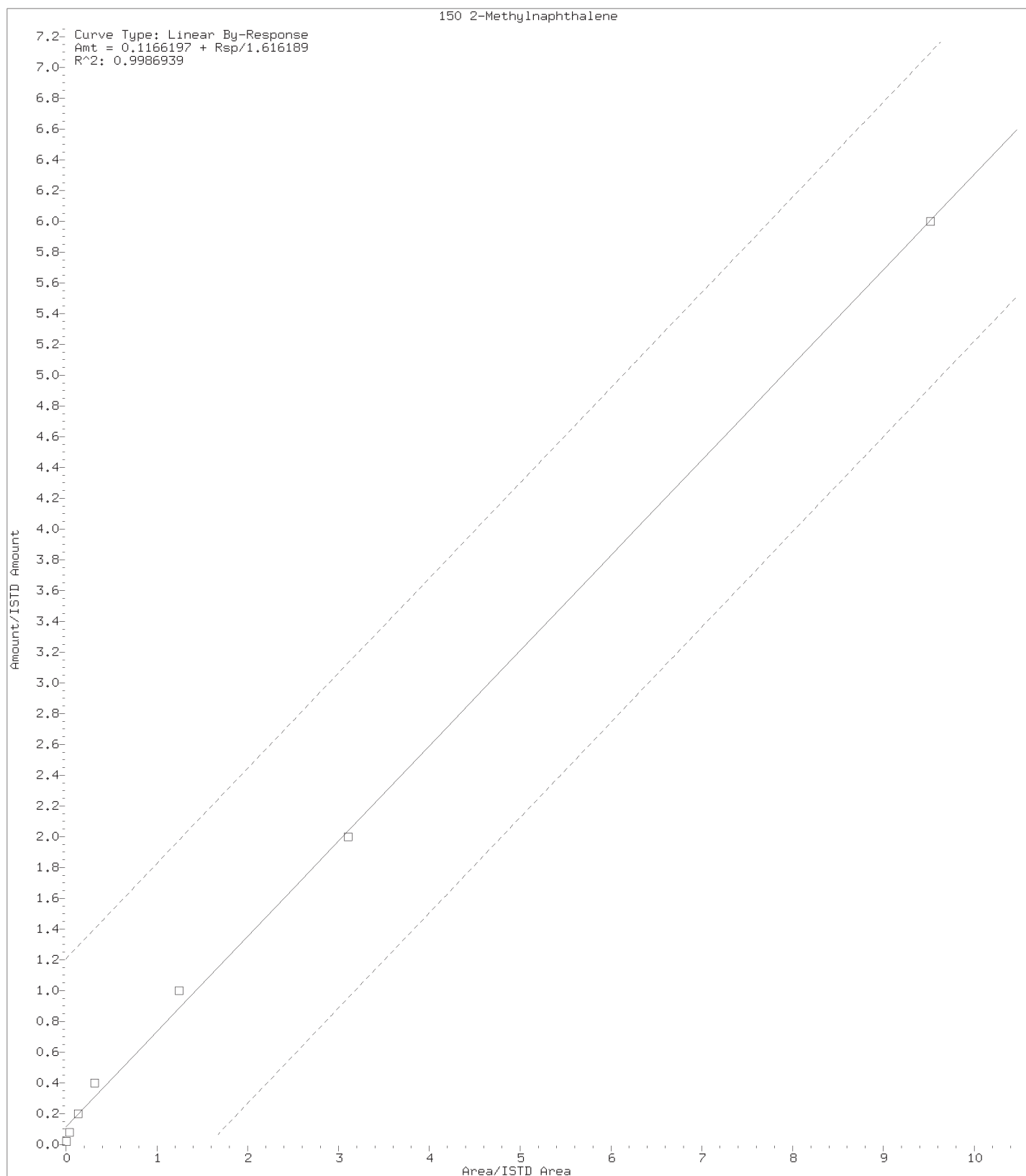
File ID:

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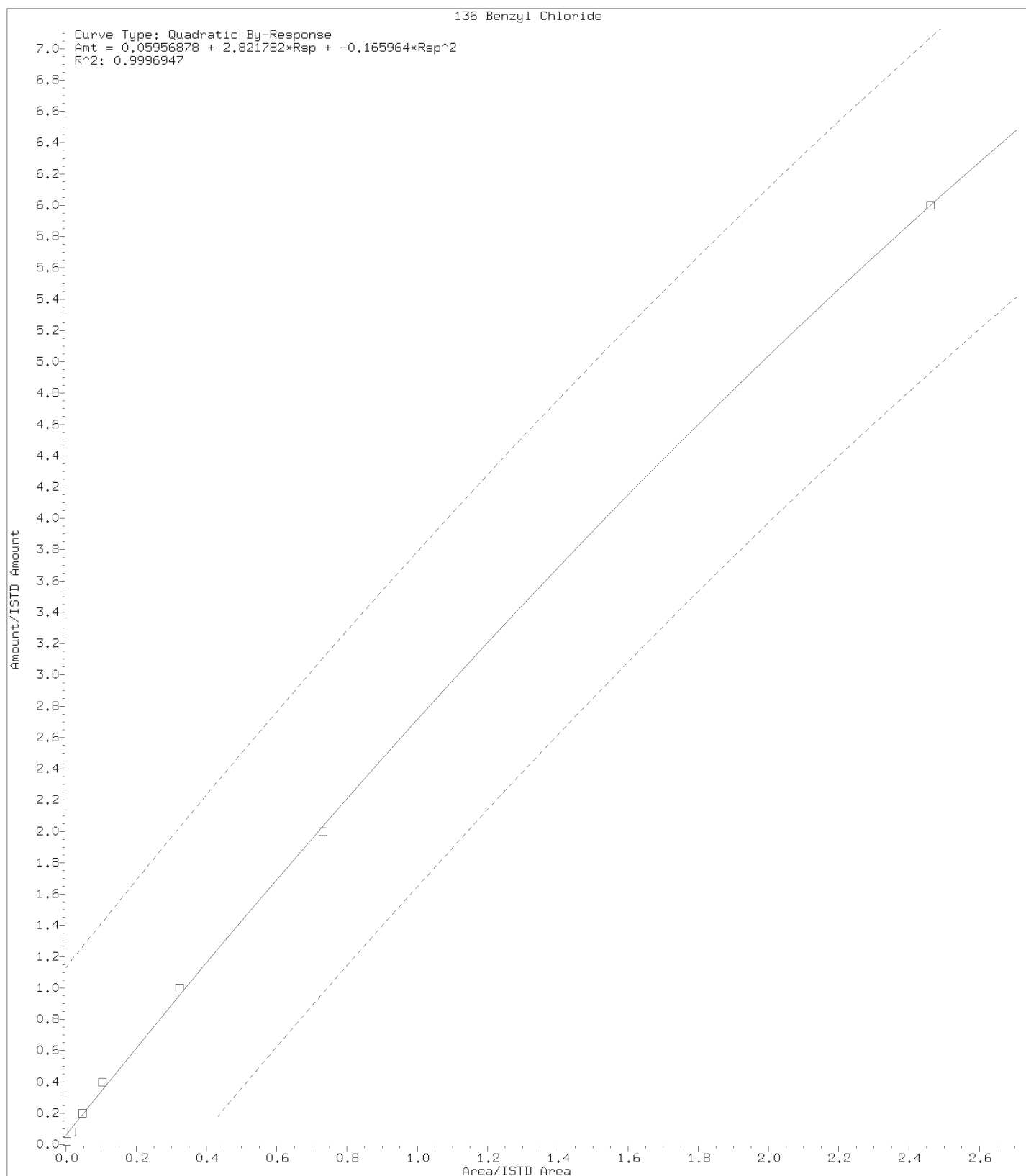
Internal Standard Name	au20i01.d	au20i02.d	au20i03.d	au20i04.d	au20i05.d	au20i06.d	au20i07.d	Avg. RT
t-Butyl alcohol-d10	3.951	3.964	3.958	3.964	3.970	3.958	3.957	3.960
Fluorobenzene	7.456	7.449	7.449	7.456	7.456	7.449	7.455	7.453
Chlorobenzene-d5	11.015	11.008	11.008	11.015	11.015	11.008	11.008	11.011
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.

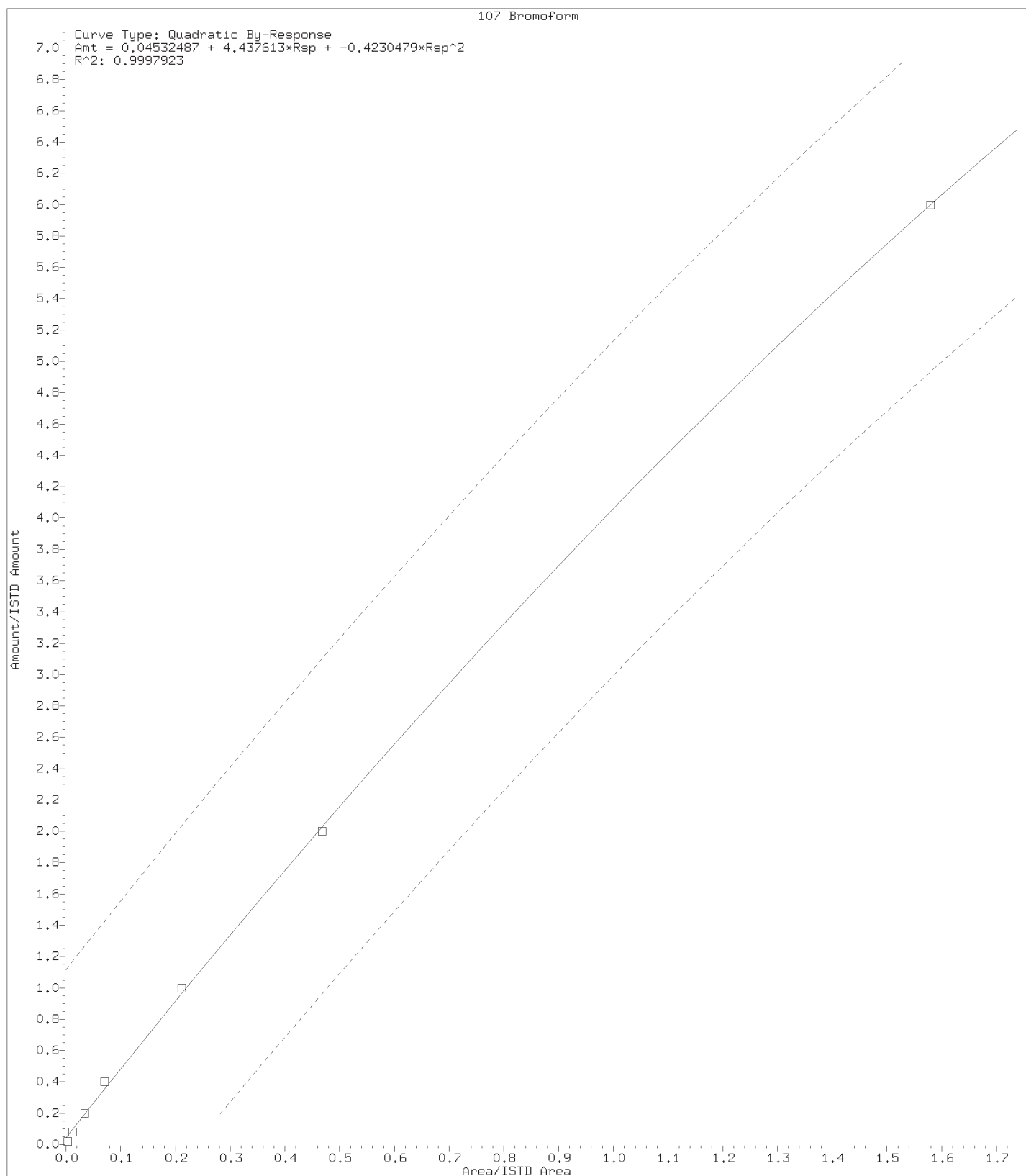
Report generated on 06/20/2016 at 13:53.



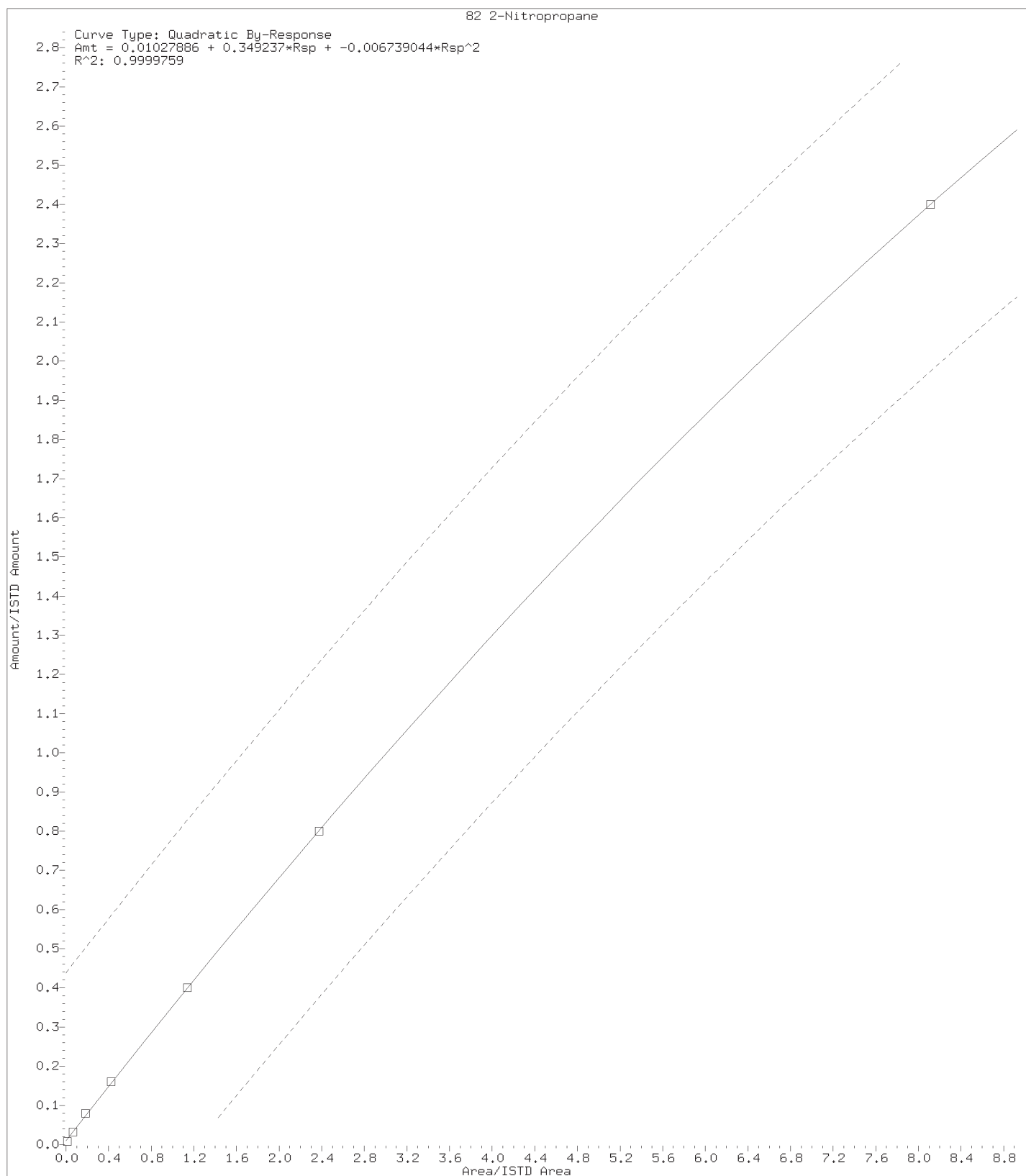
Digitally signed by Sara E. Johnson on 06/21/2016 at 16:45.
Target 3.5 esignature user ID: sej02002



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

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.

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		%	CAL.
									RSD	METHOD
COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF		
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	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	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	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	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	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	2.9367	8	AVG
sec-Butylbenzene	3.6375	3.0055	3.4821	3.7111	3.9143	3.4622	3.5355	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	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	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	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		%	CAL.
COMPOUND	RRF 1	RRF 4	RRF 10	RRF 20	RRF 50	RRF100	RRF300	RRF	RSD	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.

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD89__

Lab File ID: 1105t05.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	1105s51.d	07/06/16	01:15
24	8451651	1105s52.d	07/06/16	01:37
25	8454720	1105s53.d	07/06/16	01:59
26	8457188	1105s54.d	07/06/16	02:20

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Lancaster Laboratories Contract:_____

Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_DWD89_

Lab File ID: 1105t05.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	1105c05.d	07/05/16	17:13
02	LCSL14	1105s31.d	07/05/16	17:35
03	LCDL14	1105s32.d	07/05/16	17:57
04	VBLKL14	1105b05.d	07/05/16	18:19
05	8442828	1105s33.d	07/05/16	18:41
06	8442829	1105s34.d	07/05/16	19:03
07	8442830	1105s35.d	07/05/16	19:25
08	8442831	1105s36.d	07/05/16	19:47
09	8444113	1105s37.d	07/05/16	20:09
10	8444114	1105s38.d	07/05/16	20:31
11	8444115	1105s39.d	07/05/16	20:52
12	8444116	1105s40.d	07/05/16	21:14
13	8445666	1105s41.d	07/05/16	21:36
14	8445667	1105s42.d	07/05/16	21:58
15	8445668	1105s43.d	07/05/16	22:20
16	8449085	1105s44.d	07/05/16	22:42
17	8450968	1105s45.d	07/05/16	23:04
18	8451646	1105s46.d	07/05/16	23:26
19	8451647	1105s47.d	07/05/16	23:47
20	8451647DL	1105s48.d	07/06/16	00:09
21	8451648	1105s49.d	07/06/16	00:31
22	8451649	1105s50.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.:_DWD89_

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.:_DWD89__

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.:_DWD89_

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.:_DWD89_

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

GC/MS Volatiles

Fraction: Volatiles by GC/MS

LCS: LCSL14 LCSD: LCDL14	Batch: L161872AA (Sample number(s): 8445666-8445668)							
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

SDG: DWD89
Matrix: SOLID

GC/MS Volatiles

Fraction: Volatiles by GC/MS

LCS: LCSA32 LCSD: LCDA32	Batch: A161792AA (Sample number(s): 8445672, 8445676, 8445680)							
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

Fraction: Volatiles by GC/MS

L161872AA Sample	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
	% 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
8445666	106	77 - 113	98	78 - 113	106	80 - 116	95	80 - 113
8445667	103	77 - 113	97	78 - 113	105	80 - 116	94	80 - 113
8445668	104	77 - 113	97	78 - 113	105	80 - 116	95	80 - 113

Fraction: Volatiles by GC/MS

A161792AA Sample	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
	% 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
8445672	103	54 - 135	80	50 - 131	104	50 - 141	111	52 - 141
8445676	101	54 - 135	81	50 - 131	103	50 - 141	110	52 - 141
8445680	102	54 - 135	75	50 - 131	106	50 - 141	118	52 - 141

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

A161792AA / VBLKA32 Analyte	Analysis Date	Blank Results	Units	MDL	LOQ
4-Methyl-2-pentanone	06/27/16	N.D.	ug/kg	3	10

Quality Control Reference List GC/MS Volatiles

CLIENT: CH2M Hill, Inc.
SDG: DWD89

Fraction: Volatiles by GC/MS

Analysis	Batch Number	Sample Number	Analysis Date
4-Methyl-2-pentanone 8260C	A161792AA	VLKA32	06/27/2016 09:22:00
		LCSA32	06/27/2016 09:50:00
		LCDA32	06/27/2016 10:15:00
		8445672	06/27/2016 17:11:00
		8445676	06/27/2016 17:34:00
		8445680	06/27/2016 17:56:00
4-Methyl-2-pentanone 8260C	L161872AA	VLKL14	07/05/2016 18:19:00
		LCSL14	07/05/2016 17:35:00
		LCDL14	07/05/2016 17:57:00
		8445666	07/05/2016 21:36:00
		8445667	07/05/2016 21:58:00
		8445668	07/05/2016 22:20:00

Quality Control and Calibration Summary Forms

Volatiles by GC/MS

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD89

GC/MS Volatiles

Fraction: Volatiles by GC/MS

SAMPLE ANALYSIS:

(Sample number(s): 8445672, 8445676, 8445680: 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

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD89

GC/MS Volatiles

Fraction: Volatiles by GC/MS

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
8445666	BGA-1-FB	X		1	Field Blank
8445667	DU-3-1-FB	X		1	Field Blank
8445668	TB-4	X		1	Trip Blank
8445672	DU-1-7-A		X	1.24	
8445676	DU-1-7-B		X	1.58	
8445680	DU-1-7-C		X	1.26	

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

(Sample number(s): 8445672, 8445676, 8445680: 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.

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.

Case Narrative/Conformance Summary

Volatiles by GC/MS

Volatiles by GC/MS Data

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 $\geq$ 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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Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:23

Group Number: 1677906

Laboratory Duplicate continued

Background B G the sample used in conjunction with the duplicate

Analysis Name	B G Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Vanadium	1.71	1.37	22 1	20
Zinc	2.92	3.27	11 1	20
Batch number: 161950637002A Sample number s : 8455250 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: 161890022A

	3,4-Dinitrotoluene
8455251	116
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.

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:23

Group Number: 1677906

MS/MSD continued

Unspiked UNSP the sample used in conjunction 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
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 : 8455250 UNSP : P444103									
Thallium	0.0287 U	0.400	0.377	0.400	0.386	94	97	75-125	2	20

Laboratory Duplicate

Background B G the sample used in conjunction 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 : 8455250 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

*- 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 SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:23

Group Number: 1677906

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 : 8455250								
Thallium	0.200	0.214			107		80-120		

MS/MSD

Unspiked UNSP the sample used in conjunction 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: 161890022A	Sample number s : 8455251 UNSP : P444107									
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
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: 161890045A	Sample number s : 8455251 UNSP : P444107									
Perchlorate in Soil LC/MS/MS	2.1 U	100	88.41	100	79.56	88	80	80-120	11	15
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161950637002	Sample number s : 8455250 UNSP : P444103									
Aluminum	1322.61	200	1614.79	200	1921.26	146	299	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

*- 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 SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:23

Group Number: 1677906

Method Blank continued

Analysis Name	Result	MDL**	LOQ
	mg/kg	mg/kg	mg/kg
Batch number: 161950637002A	Sample number	s : 8455250	
Thallium	0.0290 U	0.0290	0.200

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 161890022A	Sample number	s : 8455251							
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		
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/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161890045A	Sample number	s : 8455251							
Perchlorate in Soil LC/MS/MS	100	58.6			59		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161950637002	Sample number	s : 8455250							
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.
Reported: 08/29/2016 09:23

Group Number: 1677906

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: 161890022A	Sample number	s : 8455251	
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: 161890045A	Sample number	s : 8455251	
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 : 8455250	
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.

Sample Description: Explosives/Perchlorate Blank Grab Sand
Woodbine Phase III MEC RFI

LL Sample # SW 8455251
LL Group # 1677906
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:23

D89B2 SDG#: DWD89-17BL

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	39 U	39	120	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	39 U	39	120	1
13413	1,3-Dinitrobenzene	99-65-0	38 U	38	120	1
13413	2,4-Dinitrotoluene	121-14-2	38 U	38	120	1
13413	2,6-Dinitrotoluene	606-20-2	110 U	110	120	1
13413	HM	2691-41-0	200 U	200	290	1
13413	Nitrobenzene	98-95-3	96 U	96	290	1
13413	Nitroglycerin	55-63-0	770 U	770	2,300	1
13413	2-Nitrotoluene	88-72-2	72 U	72	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	770 U	770	2,300	1
13413	RD	121-82-4	38 U	38	120	1
13413	Tetryl	479-45-8	96 U	96	290	1
13413	1,3,5-Trinitrobenzene	99-35-4	38 U	38	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	42 U	42	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	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	161890022A	08/17/2016 21:15	James H Place	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 16:20	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

*=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 8455250
LL Group # 1677906
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:23

D89B1 SDG#: DWD89-16BL

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 03:52	Matthew R Machtinger	1
01650	Calcium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06951	Chromium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06952	Cobalt	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06953	Copper	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
01654	Iron	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06955	Lead	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
01657	Magnesium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06958	Manganese	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06961	Nickel	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
01662	Potassium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06936	Selenium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06966	Silver	SW-846 6010C	1	161950637002	07/15/2016 15:17	Cindy M Gehman	1
01667	Sodium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06971	Vanadium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06972	Zinc	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06145	Thallium	SW-846 6020A	1	161950637002A	07/15/2016 05:43	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: Metals Blank Grab Sand
Woodbine Phase III MEC RFI

LL Sample # SW 8455250
LL Group # 1677906
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: n.a.

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:23

D89B1 SDG#: DWD89-16BL

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	0.607 J	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	0.150 J	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	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06944	Antimony	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06935	Arsenic	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06946	Barium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1
06947	Beryllium	SW-846 6010C	1	161950637002	07/15/2016 03:52	Matthew R Machtinger	1

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

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 RFISubmittal Date: 06/25/2016
Group Number: 1677906
SDG: DWD89
PO Number: 10381-7-113967
Release Number: DWD89
State of Sample Origin: GAClient Sample DescriptionMetals Blank Grab Sand
Explosives/Perchlorate Blank Grab Sand

Lancaster Labs

(LL) #
8455250
8455251

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

Respectfully Submitted,

Natalie R. Luciano
Senior Specialist

(717) 556-7258

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 $\geq$ 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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Client: CH2M

Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>06/25/2016 9:30</u>
Number of Packages:	<u>3</u>	Number of Projects:	<u>1</u>

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 $\geq$ 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:	Yes		

Unpacked by Krista Abel (3058) at 10:37 on 06/25/2016

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	Loose/Bag	N
2	DT146	0.4	DT	Wet	Y	Loose/Bag	N
3	DT146	0.9	DT	Wet	Y	Loose/Bag	N

Container Quantity Discrepancy Details

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
DU-3-1-FB	12	7	

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 11372

Group # 1676208

8445666-80

COC # 503222

Client Information				Matrix				Analysis Requested												For Lab Use Only			
Client: CHZM HILL		Acct. #:		☐ Tissue ☐ Ground ☐ Surface ☐ Sediment ☐ Potable ☐ Water ☐ NPDES ☐ Other:		Preservation Codes - - - - - VOC SVOC Hex Chromium Cyanide Mercury/Metals Perchlorate Explosives Moisture pH/ORP												FSC: _____ SCR#: _____ Preservation Codes H=HCl T=Thiosulfate N=HNO ₃ B=NaOH S=H ₂ SO ₄ O=Other					
Project Name/ #: DOW WOODBINE		PWSID #:																Remarks 					
Project Manager: Mark Sherrill		P.O. #:																					
Sampler: J. Crostic M. Burlington		Quote #:		State where samples were collected: Georgia For Compliance: Yes ☐ No ☐		Grab Composite Soil ☒ Sediment																	
Sample Identification		Collected																					
		Date	Time	Grab	Composite																		
DU-1-7-A		6-24-16	0945	X	X																		
DU-1-7-B		↓	1130	X	X																		
DU-1-7-C		↓	1420	X	X																		
Turnaround Time (TAT) Requested (please circle) Standard Rush (Rush TAT is subject to laboratory approval and surcharge.)				Relinquished by J. Crostic		Date	Time	Received by		Date	Time												
				Relinquished by		Date	Time	Received by		Date	Time												
Date results are needed: _____ E-mail address: _____				Relinquished by		Date	Time	Received by		Date	Time												
				Relinquished by		Date	Time	Received by		Date	Time												
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												
				Relinquished by		Date	Time	Received by		Date	Time												
				EDD Required? Yes No If yes, format: _____				Relinquished by Commercial Carrier: UPS FedEx ☒ Other _____															
				Site-Specific QC (MS/MSD/Dup)? Yes ☒ No (If yes, indicate QC sample and submit triplicate sample volume.)				Temperature upon receipt 0.4 °C															

2 of 2

For Eurofins Lancaster Laboratories Environmental use only

8445666-80

COC #503221

[illegible]

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

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.

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
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: Nitroaromatics/Amines 8330B w
Batch number: 161780001A

3,4-Dinitrotoluene

8445666	110
8445667	110
Blank	109
LCS	107
LCSD	109

Limits: 85-115

Analysis Name: Nitroaromatics/Amines 8330B s
Batch number: 161890022A

3,4-Dinitrotoluene

8445671	120
8445675	126
8445679	128
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.

Quality Control SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

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
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: L161872AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8445666	106	106	95	98
8445667	105	103	94	97
8445668	105	104	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: CS Compound
Batch number: 16178WAA026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8445666	66	66	73
8445667	75	74	83
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
8445666	103	99	96
8445667	102	97	67
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: 16187SLE026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8445669	88	89	101	83	84	91
8445673	81	82	91	73	76	83
8445677	90	92	103	84	87	93
Blank	95	103	130	91	96	104
LCS	97	101	122	89	90	100

*- 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 SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

Laboratory Duplicate continued

Background B G the sample used in conjunction with the duplicate

Analysis Name	B G Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Mercury	0.000127	0.000130	2 1	20
	mg/kg	mg/kg		
Batch number: 16187102201A	Sample number s : 8445669,8445673 B G: P444071			
Total Cyanide solid	0.17 U	0.18 U	0 1	20
Batch number: 16187102201B	Sample number s : 8445677 B G: P444096			
Total Cyanide solid	0.18 U	0.18 U	0 1	20
	mg/l	mg/l		
Batch number: 16180117101B	Sample number s : 8445666-8445667 B G: P445372			
Total Cyanide water	0.0050 U	0.0050 U	0 1	20
	mg/kg	mg/kg		
Batch number: 16189042502A	Sample number s : 8445669,8445673,8445677 B G: P444096			
Hexavalent Chromium SOLIDS	0.50 U	0.50 U	0 1	20
	mg/l	mg/l		
Batch number: 16177027601A	Sample number s : 8445666-8445667 B G: 8445666			
Hexavalent Chromium	0.0070 U	0.0070 U	0 1	5
	m	m		
Batch number: 16189182101A	Sample number s : 8445669,8445673,8445677 B G: P444096			
Oxidation Reduction Potential	656	673.5	3	5
	Std. Units	Std. Units		
Batch number: 16189039401A	Sample number s : 8445669,8445673,8445677 B G: P444096			
pH	4.77	4.75	0	3
	%	%		
Batch number: 16232820001A	Sample number s : 8445669-8445680 B G: P444096			
Moisture	6.73	6.93	3	5
Moisture	6.73	6.93	3	5

Surrogate Quality ControlSurrogate 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

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8445672	104	103	111	80
8445676	103	101	110	81
8445680	106	102	118	75
Blank	102	100	101	96

*- 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.
Reported: 08/29/2016 09:17

Group Number: 1676208

Laboratory Duplicate continued

Background B G the sample used in conjunction with the duplicate

Analysis Name	B G Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
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 : 8445670,8445674,8445678 B G: P444078
Thallium 0.0290 U 0.0279 U 0 1 20

	mg/l	mg/l		
Batch number: 161790635001	Sample number s : 8445666-8445667 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 : 8445666-8445667 B G: P441460
Thallium 0.00016 U 0.00016 U 0 1 20

Batch number: 161795713002 Sample number s : 8445666-8445667 B G: P444555

*- 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.
Reported: 08/29/2016 09:17

Group Number: 1676208

MS/MSD continued

Unspiked UNSP the sample used in conjunction 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
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	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 Thallium	Sample number 0.00016 U	s : 8445666-8445667 UNSP : P441460 0.00200 0.00204 0.00200 0.00198				102	99	75-125	3	20
Batch number: 161795713002 Mercury	Sample number 0.000127	s : 8445666-8445667 UNSP : P444555 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: 16187102201A Total Cyanide solid	Sample number 0.17 U	s : 8445669,8445673 UNSP : P444071 4.98 4.98				100		41-145		
Batch number: 16187102201B Total Cyanide solid	Sample number 0.18 U	s : 8445677 UNSP : P444096 5.03 4.03				80		41-145		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16180117101B Total Cyanide water	Sample number 0.0050 U	s : 8445666-8445667 UNSP : P445372 0.200 0.190				95		72-114		
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16189042502A Hexavalent Chromium SOLIDS	Sample number 0.50 U	s : 8445669,8445673,8445677 UNSP : P444096 40.3 0.50 U				0		75-125		

Laboratory Duplicate

Background B G the sample used in conjunction with the duplicate

Analysis Name	B G Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 161820638002 Mercury	Sample number 0.0416	s : 8445669,8445673,8445677 B G: P444071 0.0377	10 1	20
Batch number: 161940637001 Aluminum	608.74	s : 8445670,8445674,8445678 B G: P444078 594.43	2	20
Antimony	0.700 U	0.673 U	0 1	20
Arsenic	0.970 U	0.933 U	0 1	20

*- Outside of specification

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Quality Control SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

MS/MSD continued

Unspiked UNSP the sample used in conjunction 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
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 161800005A Perchlorate in Water LC/MS/MS	Sample number 5.77	s : 8445666-8445667 5.00	10.68	UNSP : P437254 5.00	9.48	98	74	80-120	12	15
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 161820638002 Mercury	Sample number 0.0416	s : 8445669,8445673,8445677 0.167	0.202	UNSP : P444071 0.156	0.191	96	95	80-120	6	20
Batch number: 161940637001 Aluminum	Sample number 608.74	s : 8445670,8445674,8445678 198.02	1059.35	UNSP : P444078 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 Thallium	Sample number 0.0290 U	s : 8445670,8445674,8445678 0.396	0.584	UNSP : P444078 0.374	0.512	148	137	75-125	13	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 161790635001 Aluminum	Sample number 0.0872	s : 8445666-8445667 2.00	2.02	UNSP : P444144 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

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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 SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

LCS/LCSD continued

Analysis Name	LCS Spike Added m	LCS Conc m	LCSD Spike Added m	LCSD Conc m	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	Std. Units	Std. Units	Std. Units	Std. Units					
Batch number: 16189039401A pH	Sample number s : 8445669,8445673,8445677 7.00	7.00			100		95-105		
	%	%	%	%					
Batch number: 16232820001A Moisture	Sample number s : 8445669-8445680 89.5	89.46			100		99-101		
Moisture	89.5	89.46			100		99-101		

MS/MSD

Unspiked UNSP the sample used in conjunction 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: A161792AA 4-Methyl-2-pentanone	Sample number s : 8445672,8445676,8445680 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: 16187SLE026 Quinoline	Sample number s : 8445669,8445673,8445677 170 U	1656.73	773.6	1661.13	932.37	47	56	80-119	19	30
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 161890022A 4-Amino-2,6-Dinitrotoluene	Sample number s : 8445671,8445675,8445679 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
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: 161890045A Perchlorate in Soil LC/MS/MS	Sample number s : 8445671,8445675,8445679 2.1 U	100	88.41	100	79.56	88	80	80-120	11	15

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Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

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
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	8445666-8445667						
Thallium	0.00200	0.00200			100		80-120		
Batch number: 161795713002	Sample number	s	8445666-8445667						
Mercury	0.00100	0.000956			96		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16187102201A	Sample number	s	8445669,8445673						
Total Cyanide solid	10	9.97			100		90-110		
Batch number: 16187102201B	Sample number	s	8445677						
Total Cyanide solid	10	9.97			100		90-110		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16180117101B	Sample number	s	8445666-8445667						
Total Cyanide water	0.200	0.194			97		90-110		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16189042502A	Sample number	s	8445669,8445673,8445677						
Hexavalent Chromium SOLIDS	5.00	4.63			93		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16177027601A	Sample number	s	8445666-8445667						
Hexavalent Chromium	0.200	0.209	0.200	0.206	104	103	90-110	1	4
	m	m	m	m					
Batch number: 16189182101A	Sample number	s	8445669,8445673,8445677						
Oxidation Reduction Potential	427	426			100		98-102		

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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 SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

LCS/LCSD continued

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
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: 161890045A	Sample number s : 8445671,8445675,8445679								
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 : 8445666-8445667								
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 : 8445669,8445673,8445677								
Mercury	0.100	0.0943			94		80-120		
Batch number: 161940637001	Sample number s : 8445670,8445674,8445678								
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		
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 : 8445670,8445674,8445678								
Thallium	0.200	0.179			90		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 161790635001	Sample number s : 8445666-8445667								

*- 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 SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

LCS/LCSD

Analysis Name	LCS Spike Added ug/kg	LCS Conc ug/kg	LCSD Spike Added ug/kg	LCSD Conc ug/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: A161792AA 4-Methyl-2-pentanone	Sample number 100	s : 8445672, 8445676, 8445680 114.38	100	109.22	114	109	50-120	5	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: L161872AA 4-Methyl-2-pentanone	Sample number 100	s : 8445666-8445668 108.79	100	109.11	109	109	47-133	0	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16187SLE026 2-Chlorobenzaldehyde	Sample number 1666.67	s : 8445669, 8445673, 8445677 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		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16178WAA026 2-Chlorobenzalmalononitrile	Sample number 50	s : 8445666-8445667 24.68	50	28.7	49	57	25-125	15	30
	ug/kg	ug/kg	ug/kg	ug/kg					
Batch number: 16178WAD026 2-Chlorobenzaldehyde	Sample number 50	s : 8445666-8445667 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: 161890022A 4-Amino-2,6-Dinitrotoluene	Sample number 1972	s : 8445671, 8445675, 8445679 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		
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 4-Amino-2,6-Dinitrotoluene	Sample number 10	s : 8445666-8445667 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

*- 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: 08/29/2016 09:17

Group Number: 1676208

Method Blank continued

Analysis Name	Result mg/l	MDL** mg/l	LOQ mg/l
Batch number: 161790635001	Sample number s : 8445666-8445667		
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 : 8445666-8445667		
Thallium	0.00016 U	0.00016	0.0010
Batch number: 161795713002	Sample number s : 8445666-8445667		
Mercury	0.000050 U	0.000050	0.00020
	mg/kg	mg/kg	mg/kg
Batch number: 16187102201A	Sample number s : 8445669,8445673		
Total Cyanide solid	0.18 U	0.18	0.50
Batch number: 16187102201B	Sample number s : 8445677		
Total Cyanide solid	0.18 U	0.18	0.50
	mg/l	mg/l	mg/l
Batch number: 16180117101B	Sample number s : 8445666-8445667		
Total Cyanide water	0.0050 U	0.0050	0.010
	mg/kg	mg/kg	mg/kg
Batch number: 16189042502A	Sample number s : 8445669,8445673,8445677		
Hexavalent Chromium SOLIDS	0.50 U	0.50	1.5
	mg/l	mg/l	mg/l
Batch number: 16177027601A	Sample number s : 8445666-8445667		
Hexavalent Chromium	0.0070 U	0.0070	0.020

LCS/LCSD

*- 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.

Quality Control Summary

Client Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

Method Blank continued

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
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: 161890045A	Sample number	s : 8445671, 8445675, 8445679	
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 : 8445666-8445667	
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 : 8445669, 8445673, 8445677	
Mercury	0.0100 U	0.0100	0.100
Batch number: 161940637001	Sample number	s : 8445670, 8445674, 8445678	
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 : 8445670, 8445674, 8445678	
Thallium	0.0290 U	0.0290	0.200

*- 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.

Quality Control SummaryClient Name: CH2M Hill, Inc.
Reported: 08/29/2016 09:17

Group Number: 1676208

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 : 8445672, 8445676, 8445680	
4-Methyl-2-pentanone	3 U	3	10
	ug/l	ug/l	ug/l
Batch number: L161872AA	Sample number	s : 8445666-8445668	
4-Methyl-2-pentanone	3 U	3	10
	ug/kg	ug/kg	ug/kg
Batch number: 16187SLE026	Sample number	s : 8445669, 8445673, 8445677	
2-Chlorobenzaldehyde	33 U	33	170
2-Chlorobenzalmononitrile	170 U	170	500
Quinoline	33 U	33	170
	ug/l	ug/l	ug/l
Batch number: 16178WAA026	Sample number	s : 8445666-8445667	
2-Chlorobenzalmononitrile	5 U	5	15
Batch number: 16178WAD026	Sample number	s : 8445666-8445667	
2-Chlorobenzaldehyde	1 U	1	5
Quinoline	1 U	1	5
	ug/kg	ug/kg	ug/kg
Batch number: 161890022A	Sample number	s : 8445671, 8445675, 8445679	
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 : 8445666-8445667	
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

*- 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.

Sample Description: DU-1-7-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445680
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 14:20 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8915 SDG#: DWD89-15

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	1.26
Wet Chemistry	SM 2540 G-1997	%	%	%	%	
00118	Moisture	n.a.	5.6	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	SW-846 8260C	1	A161792AA	06/27/2016 17:56	Jennifer Howe	1.26
07320	GC/MS - LL DIH20 Encore Prep	SW-846 5035A	1	201617741635	06/25/2016 17:13	atelyn C Shober	n.a.
07320	GC/MS - LL DIH20 Encore Prep	SW-846 5035A	2	201617741635	06/25/2016 17:13	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617741635	06/25/2016 17:09	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-1-7-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445679
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 14:20 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8914 SDG#: DWD89-14

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	43 U		43	130	1
13413	2-Amino-4,6-Dinitrotoluene	35572-78-2	43 U		43	130	1
13413	1,3-Dinitrobenzene	99-65-0	42 U		42	130	1
13413	2,4-Dinitrotoluene	121-14-2	42 U		42	130	1
13413	2,6-Dinitrotoluene	606-20-2	120 U		120	130	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	840 U		840	2,500	1
13413	2-Nitrotoluene	88-72-2	78 U		78	130	1
13413	3-Nitrotoluene	99-08-1	110 U		110	130	1
13413	4-Nitrotoluene	99-99-0	110 U		110	130	1
13413	PETN	78-11-5	840 U		840	2,500	1
13413	RD	121-82-4	42 U		42	130	1
13413	Tetryl	479-45-8	100 U		100	310	1
13413	1,3,5-Trinitrobenzene	99-35-4	42 U		42	130	1
13413	2,4,6-Trinitrotoluene	118-96-7	46 U		46	130	1
Perchlorate		SW-846 6850 1/2007	ug/kg		ug/kg	ug/kg	
06557	Perchlorate in Soil LC/MS/MS	14797-73-0	2.2 U		2.2	5.3	1
		The stated QC limits are advisory.					
Wet Chemistry		SM 2540 G-1997	%		%	%	
00118	Moisture	n.a.	5.6		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	161890022A	08/17/2016 16:18	James H Place	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 15:54	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: DU-1-7-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445678
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 14:20 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8913 SDG#: DWD89-13

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 09:24	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:30	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	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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

Sample Description: DU-1-7-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445678
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 14:20 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8913 SDG#: DWD89-13

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	688	7.79	35.9	1
06944	Antimony	7440-36-0	0.628 U	0.628	3.59	1
06935	Arsenic	7440-38-2	0.871 U	0.871	3.59	1
06946	Barium	7440-39-3	3.04	0.0296	0.898	1
06947	Beryllium	7440-41-7	0.0601 U	0.0601	0.898	1
06949	Cadmium	7440-43-9	0.0440 U	0.0440	0.898	1
01650	Calcium	7440-70-2	209	5.08	35.9	1
06951	Chromium	7440-47-3	1.47 J	0.126	2.69	1
06952	Cobalt	7440-48-4	0.108 U	0.108	0.898	1
06953	Copper	7440-50-8	5.30	0.206	1.80	1
01654	Iron	7439-89-6	361	3.70	35.9	1
06955	Lead	7439-92-1	6.16	0.494	2.69	1
01657	Magnesium	7439-95-4	58.1	1.71	18.0	1
06958	Manganese	7439-96-5	17.6	0.0745	0.898	1
06961	Nickel	7440-02-0	0.269 U	0.269	1.80	1
01662	Potassium	7440-09-7	39.3 J	21.5	89.8	1
06936	Selenium	7782-49-2	0.808 U	0.808	3.59	1
06966	Silver	7440-22-4	0.135 U	0.135	0.898	1
01667	Sodium	7440-23-5	21.5 U	21.5	180	1
06971	Vanadium	7440-62-2	2.18	0.126	0.898	1
06972	Zinc	7440-66-6	1.63 J	0.610	3.59	1
		SW-846 6020A	mg/kg	mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0260 U	0.0260	0.180	2
Wet Chemistry						
		SM 2540 G-1997	%	%	%	
00118	Moisture	n.a.	5.6	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 09:24	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 09:24	Joanne M Gates	1

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

Sample Description: DU-1-7-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445677
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 14:20 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8912 SDG#: DWD89-12

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 10:00	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	16187102201B	07/06/2016 12:10	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	10
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

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

Sample Description: DU-1-7-C Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445677
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 14:20 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8912 SDG#: DWD89-12

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	870	5
10726	2-Chlorobenzalmononitrile	2698-41-1	870 U	870	2,600	5
10726	Quinoline	91-22-5	170 U	170	870	5
The stated QC limits for 2-Chlorobenzalmononitrile 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	0.0204 J	0.0099	0.0993	1
Wet Chemistry	SW-846 9012B		mg/kg	mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.19 U	0.19	0.51	1
	ASTM D1498		m	m	m	
01821	Oxidation Reduction Potential	n.a.	640	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	15.9	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.	4.92	0.0100	0.0100	1
The pH was measured in water at 21 C.						
Wet Chemistry	SM 2540 G-1997		%	%	%	
00111	Moisture	n.a.	5.6	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	SV0A 8270D microwave	SW-846 8270D	1	16187SLE026	07/07/2016 05:02	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16187SLE026	07/06/2016 08:00	Bradley W VanLeuven	1

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

Sample Description: DU-1-7-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445676
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 11:30 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8911 SDG#: DWD89-11

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	1.58
Wet Chemistry	SM 2540 G-1997	%	%	%	%	
00118	Moisture	n.a.	1.9	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	SW-846 8260C	1	A161792AA	06/27/2016 17:34	Jennifer Howe	1.58
07320	GC/MS - LL DIH20 Encore Prep	SW-846 5035A	1	201617741635	06/25/2016 17:13	atelyn C Shober	n.a.
07320	GC/MS - LL DIH20 Encore Prep	SW-846 5035A	2	201617741635	06/25/2016 17:13	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617741635	06/25/2016 17:10	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-1-7-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445675
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 11:30 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8910 SDG#: DWD89-10

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	41 U		41	120	1
13413	2,4,6-Trinitrotoluene	118-96-7	45 U		45	120	1
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	5.1	1
		The stated QC limits are advisory.					
Wet Chemistry		SM 2540 G-1997	%		%	%	
00118	Moisture	n.a.	1.9		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 08:30	James H Place	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 15:29	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: DU-1-7-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445674
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 11:30 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8909 SDG#: DWD89-09

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 09:21	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:28	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	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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

Sample Description: DU-1-7-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445674
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 11:30 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8909 SDG#: DWD89-09

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	7.31	33.7	1
06944	Antimony	7440-36-0	0.590 U	0.590	3.37	1
06935	Arsenic	7440-38-2	1.03 J	0.817	3.37	1
06946	Barium	7440-39-3	4.07	0.0278	0.842	1
06947	Beryllium	7440-41-7	0.0564 U	0.0564	0.842	1
06949	Cadmium	7440-43-9	0.0413 U	0.0413	0.842	1
01650	Calcium	7440-70-2	218	4.77	33.7	1
06951	Chromium	7440-47-3	1.84 J	0.118	2.53	1
06952	Cobalt	7440-48-4	0.101 U	0.101	0.842	1
06953	Copper	7440-50-8	3.83	0.194	1.68	1
01654	Iron	7439-89-6	688	3.47	33.7	1
06955	Lead	7439-92-1	5.91	0.463	2.53	1
01657	Magnesium	7439-95-4	80.8	1.60	16.8	1
06958	Manganese	7439-96-5	24.1	0.0699	0.842	1
06961	Nickel	7440-02-0	0.392 J	0.253	1.68	1
01662	Potassium	7440-09-7	46.0 J	20.1	84.2	1
06936	Selenium	7782-49-2	0.758 U	0.758	3.37	1
06966	Silver	7440-22-4	0.126 U	0.126	0.842	1
01667	Sodium	7440-23-5	20.1 U	20.1	168	1
06971	Vanadium	7440-62-2	2.72	0.118	0.842	1
06972	Zinc	7440-66-6	1.92 J	0.573	3.37	1
		SW-846 6020A	mg/kg	mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0244 U	0.0244	0.168	2
Wet Chemistry						
		SM 2540 G-1997	%	%	%	
00118	Moisture	n.a.	1.9	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 09:21	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 09:21	Joanne M Gates	1

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

Sample Description: DU-1-7-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445673
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 11:30 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8908 SDG#: DWD89-08

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 09:58	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 12:09	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	16189042502A	07/11/2016 20:20	Daniel S Smith	10
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

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

Sample Description: DU-1-7-B Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445673
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 11:30 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8908 SDG#: DWD89-08

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-Chlorobenzalmononitrile	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-Chlorobenzalmononitrile 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	0.0171 J	0.0099	0.0986	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.	606	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	5.1 U	5.1	15.3	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.	5.65	0.0100	0.0100	1
The pH was measured in water at 21.1 C.						
Wet Chemistry	SM 2540 G-1997		%	%	%	
00111	Moisture	n.a.	1.9	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	SV0A 8270D microwave	SW-846 8270D	1	16187SLE026	07/07/2016 04:36	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16187SLE026	07/06/2016 08:00	Bradley W VanLeuven	1

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

Sample Description: DU-1-7-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445672
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 09:45 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8907 SDG#: DWD89-07

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	1.24
Wet Chemistry	SM 2540 G-1997	%	%	%	%	
00118	Moisture	n.a.	1.8	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	SW-846 8260C	1	A161792AA	06/27/2016 17:11	Jennifer Howe	1.24
07320	GC/MS - LL DIH20 Encore Prep	SW-846 5035A	1	201617741635	06/25/2016 17:13	atelyn C Shober	n.a.
07320	GC/MS - LL DIH20 Encore Prep	SW-846 5035A	2	201617741635	06/25/2016 17:13	atelyn C Shober	n.a.
07578	GC/MS-HL Encore Prep-NC	SW-846 5035A	1	201617741635	06/25/2016 17:12	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-1-7-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445671
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 09:45 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8906 SDG#: DWD89-06

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	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	5.1	1
The stated QC limits are advisory.							
Wet Chemistry		SM 2540 G-1997	%		%	%	
00118	Moisture	n.a.	1.8		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 05:40	James H Place	1
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	161890045A	07/11/2016 15:16	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: DU-1-7-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445670
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 09:45 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8905 SDG#: DWD89-05

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 09:18	Joanne M Gates	1
06955	Lead	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
01657	Magnesium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06958	Manganese	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06961	Nickel	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
01662	Potassium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06936	Selenium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06966	Silver	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
01667	Sodium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06971	Vanadium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06972	Zinc	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06145	Thallium	SW-846 6020A	1	161940637001A	07/14/2016 08:27	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	16232820001A	08/19/2016 20:37	Scott W Freisher	1

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

Sample Description: DU-1-7-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445670
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 09:45 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8905 SDG#: DWD89-05

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	1,130	8.26	38.1	1
06944	Antimony	7440-36-0	0.666 U	0.666	3.81	1
06935	Arsenic	7440-38-2	0.923 U	0.923	3.81	1
06946	Barium	7440-39-3	3.52	0.0314	0.952	1
06947	Beryllium	7440-41-7	0.0638 U	0.0638	0.952	1
06949	Cadmium	7440-43-9	0.0466 U	0.0466	0.952	1
01650	Calcium	7440-70-2	168	5.39	38.1	1
06951	Chromium	7440-47-3	1.68 J	0.133	2.86	1
06952	Cobalt	7440-48-4	0.114 U	0.114	0.952	1
06953	Copper	7440-50-8	4.11	0.219	1.90	1
01654	Iron	7439-89-6	585	3.92	38.1	1
06955	Lead	7439-92-1	4.99	0.523	2.86	1
01657	Magnesium	7439-95-4	69.8	1.81	19.0	1
06958	Manganese	7439-96-5	19.2	0.0790	0.952	1
06961	Nickel	7440-02-0	0.329 J	0.286	1.90	1
01662	Potassium	7440-09-7	45.2 J	22.7	95.2	1
06936	Selenium	7782-49-2	0.857 U	0.857	3.81	1
06966	Silver	7440-22-4	0.143 U	0.143	0.952	1
01667	Sodium	7440-23-5	22.7 U	22.7	190	1
06971	Vanadium	7440-62-2	2.42	0.133	0.952	1
06972	Zinc	7440-66-6	1.83 J	0.647	3.81	1
		SW-846 6020A	mg/kg	mg/kg	mg/kg	
06145	Thallium	7440-28-0	0.0276 U	0.0276	0.190	2
Wet Chemistry						
		SM 2540 G-1997	%	%	%	
00118	Moisture	n.a.	1.8	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 09:18	Joanne M Gates	1
06944	Antimony	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06935	Arsenic	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06946	Barium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06947	Beryllium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06949	Cadmium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
01650	Calcium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06951	Chromium	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06952	Cobalt	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1
06953	Copper	SW-846 6010C	1	161940637001	07/14/2016 09:18	Joanne M Gates	1

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

Sample Description: DU-1-7-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445669
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 09:45 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8904 SDG#: DWD89-04

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 09:56	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 12:05	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	16189042502A	07/11/2016 20:20	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	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

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

Sample Description: DU-1-7-A Composite Soil
Woodbine Phase III MEC RFI

LL Sample # SW 8445669
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 09:45 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8904 SDG#: DWD89-04

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	840	5
10726	2-Chlorobenzalmononitrile	2698-41-1	840 U	840	2,500	5
10726	Quinoline	91-22-5	170 U	170	840	5
The stated QC limits for 2-Chlorobenzalmononitrile 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	0.0158 J	0.0095	0.0955	1
Wet Chemistry	SW-846 9012B		mg/kg	mg/kg	mg/kg	
05895	Total Cyanide solid	57-12-5	0.18 U	0.18	0.50	1
	ASTM D1498		m	m	m	
01821	Oxidation Reduction Potential	n.a.	642	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	2.5 U	2.5	7.6	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.	5.20	0.0100	0.0100	1
The pH was measured in water at 21 C.						
Wet Chemistry	SM 2540 G-1997		%	%	%	
00111	Moisture	n.a.	1.8	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	SV0A 8270D microwave	SW-846 8270D	1	16187SLE026	07/07/2016 04:11	William H Saadeh	5
10813	BNA Soil Microwave APP I	SW-846 3546	1	16187SLE026	07/06/2016 08:00	Bradley W VanLeuven	1

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

Sample Description: TB-4 Water
Woodbine Phase III MEC RFI

LL Sample # WW 8445668
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 08:00

CH2M Hill, Inc.

Submitted: 06/25/2016 09:30

PO Box 241329

Reported: 08/29/2016 09:17

Denver CO 80224

D8903 SDG#: DWD89-03TB

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 22:20	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 22:20	Matthew S rause	1

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

Sample Description: DU-3-1-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8445667
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 12:40 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8902 SDG#: DWD89-02FB

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 21:58	Suzanne M Will	1
07049	Cadmium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
01750	Calcium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07051	Chromium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07052	Cobalt	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07053	Copper	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
01754	Iron	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07055	Lead	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07058	Manganese	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07061	Nickel	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07036	Selenium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07066	Silver	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07071	Vanadium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07072	Zinc	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
06045	Thallium	SW-846 6020A	1	161790639001A	06/29/2016 00:05	Tara L Snyder	1
00259	Mercury	SW-846 7470A	1	161795713002	06/29/2016 09:23	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	16180117101B	06/28/2016 14:14	Dein Bernot	1
08256	Cyanide Water Distillation	SW-846 9012B	1	16180117101B	06/28/2016 09:30	Nancy J Shoop	1
00276	Hexavalent Chromium	SW-846 7196A	1	16177027601A	06/25/2016 11:40	Daniel S Smith	1

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

Sample Description: DU-3-1-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8445667
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 12:40 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8902 SDG#: DWD89-02FB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals						
07036	Selenium	SW-846 6010C 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						
06045	Thallium	7440-28-0	0.00016 U	0.00016	0.0010	1
SW-846 7470A						
00259	Mercury	7439-97-6	0.000050 U	0.000050	0.00020	1
Wet Chemistry						
08255	Total Cyanide water	SW-846 9012B 57-12-5	0.0050 U	0.0050	0.010	1
SW-846 7196A						
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 21:58	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 21:58	Matthew S rause	1
02395	CS Compound	SW-846 8270D	1	16178WAA026	06/28/2016 16:07	Joseph M Gambler	1
10461	SVOA 8270D water	SW-846 8270D	1	16178WAD026	07/09/2016 03:44	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 05:30	James H Place	1
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	161800005A	06/28/2016 17:38	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 21:58	Suzanne M Will	1
07044	Antimony	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07035	Arsenic	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1
07046	Barium	SW-846 6010C	1	161790635001	06/28/2016 21:58	Suzanne M Will	1

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

Sample Description: DU-3-1-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8445667
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 12:40 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8902 SDG#: DWD89-02FB

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	ug/l	ug/l	ug/l		
	Oct. 2006					
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	0.121 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	0.0465 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	0.0045 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-1-FB Grab Water
Woodbine Phase III MEC RFI

LL Sample # WW 8445666
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 12:15 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8901 SDG#: DWD89-01FB

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 21:55	Suzanne M Will	1
07049	Cadmium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
01750	Calcium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07051	Chromium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07052	Cobalt	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07053	Copper	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
01754	Iron	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07055	Lead	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07058	Manganese	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07061	Nickel	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07036	Selenium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07066	Silver	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07071	Vanadium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07072	Zinc	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
06045	Thallium	SW-846 6020A	1	161790639001A	06/29/2016 00:04	Tara L Snyder	1
00259	Mercury	SW-846 7470A	1	161795713002	06/29/2016 09:21	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	16180117101B	06/28/2016 14:13	Dein Bernot	1
08256	Cyanide Water Distillation	SW-846 9012B	1	16180117101B	06/28/2016 09:30	Nancy J Shoop	1
00276	Hexavalent Chromium	SW-846 7196A	1	16177027601A	06/25/2016 11:40	Daniel S Smith	1

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

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

LL Sample # WW 8445666
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 12:15 by JC

CH2M Hill, Inc.

PO Box 241329

Denver CO 80224

Submitted: 06/25/2016 09:30

Reported: 08/29/2016 09:17

D8901 SDG#: DWD89-01FB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals						
07036	Selenium	SW-846 6010C 7782-49-2	0.0097 U	mg/l 0.0097	mg/l 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						
06045	Thallium	7440-28-0	0.00016 U	mg/l 0.00016	mg/l 0.0010	1
SW-846 7470A						
00259	Mercury	7439-97-6	0.000050 U	mg/l 0.000050	mg/l 0.00020	1
Wet Chemistry						
08255	Total Cyanide water	SW-846 9012B 57-12-5	0.0050 U	mg/l 0.0050	mg/l 0.010	1
SW-846 7196A						
00276	Hexavalent Chromium	18540-29-9	0.0070 U	mg/l 0.0070	mg/l 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 21:36	Matthew S rause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	L161872AA	07/05/2016 21:36	Matthew S rause	1
02395	CS Compound	SW-846 8270D	1	16178WAA026	06/28/2016 15:41	Joseph M Gambler	1
10461	SVOA 8270D water	SW-846 8270D	1	16178WAD026	07/09/2016 03:15	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 04:48	James H Place	1
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	161800005A	06/28/2016 17:25	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 21:55	Suzanne M Will	1
07044	Antimony	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07035	Arsenic	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1
07046	Barium	SW-846 6010C	1	161790635001	06/28/2016 21:55	Suzanne M Will	1

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

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

LL Sample # WW 8445666
LL Group # 1676208
Account # 11372

Project Name: Woodbine Phase III MEC RFI

Collected: 06/24/2016 12:15 by JC

CH2M Hill, Inc.

Submitted: 06/25/2016 09:30

PO Box 241329

Reported: 08/29/2016 09:17

Denver CO 80224

D8901 SDG#: DWD89-01FB

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	ug/l	ug/l	ug/l	ug/l	
	Oct. 2006					
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	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	mg/l	
01743	Aluminum	7429-90-5	0.129 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	0.109 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	0.0018 U	0.0018	0.0100	1
07061	Nickel	7440-02-0	0.0053 J	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

Respectfully Submitted,



Natalie R. Luciano
Senior Specialist

(717) 556-7258

ANALYTICAL RESULTS

Prepared by:

Prepared for:

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

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

Report Date: August 29, 2016

Project: Woodbine Phase III MEC RFI

Submittal Date: 06/25/2016

Group Number: 1676208

SDG: DWD89

PO Number: 10381-7-113967

Release Number: DWD89

State of Sample Origin: GA

Client Sample Description

BGA-1-FB Grab Water

DU-3-1-FB Grab Water

TB-4 Water

DU-1-7-A Composite Soil

DU-1-7-A Composite Soil

DU-1-7-A Composite Soil

DU-1-7-A Composite Soil

DU-1-7-B Composite Soil

DU-1-7-B Composite Soil

DU-1-7-B Composite Soil

DU-1-7-B Composite Soil

DU-1-7-C Composite Soil

DU-1-7-C Composite Soil

DU-1-7-C Composite Soil

DU-1-7-C Composite Soil

Lancaster Labs

(LL) #

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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.
Electronic Copy To CH2M Hill, Inc.
Electronic Copy To CH2M Hill, Inc.

Attn: Mark Sherrill
Attn: Chemistry Mailbox
Attn: Mark Stinnett

Analysis Reports / Field Chain of Custody

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

09825 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**

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

09320 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.

09598 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.

10495 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

02375 Specials in water by GC/MS**10926 SVOA 8290D (microwave)****10461 SVOAs by 8290D 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.

05875 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.

05876 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.

00296 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.

00374 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.

10639 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.

13375 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.

06559 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 8290D BNA Extraction

01643	Aluminum
01943	Aluminum
06744	Antimony
09044	Antimony
09035	Arsenic
06735	Arsenic
09046	Barium
06746	Barium
09049	Beryllium
06749	Beryllium
06747	Cadmium
09047	Cadmium
01650	Calcium
01950	Calcium
09051	Chromium
06751	Chromium
06752	Cobalt
09052	Cobalt
09053	Copper
06753	Copper
01954	Iron
01654	Iron
09055	Lead
06755	Lead
01659	Magnesium
01959	Magnesium
09058	Manganese
06758	Manganese
06761	Nickel
09061	Nickel
01962	Potassium
01662	Potassium
09036	Selenium
06736	Selenium
06766	Silver
09066	Silver
01969	Sodium
01669	Sodium
06791	Vanadium
09091	Vanadium
06792	Zinc
09092	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.

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.

11779 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.

11775 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.

00257 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, 9491B - U4**00157 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

10637 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

05913 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

Sample pH Log

SDG: DWD89

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
8445666	002A	>12	>12	PK	NA	NA	NA	NA	NA	Y	N	NA	NA	N	NA	NA	6/25/2016 8:21:09PM	1201
8445666	008A	<2	<2	PK	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	6/25/2016 8:35:57PM	1201
8445666	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731
8445667	002A	>12	>12	PK	NA	NA	NA	NA	NA	Y	N	NA	NA	N	NA	NA	6/25/2016 8:21:10PM	1201
8445667	008A	<2	<2	PK	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	6/25/2016 8:33:41PM	1201
8445667	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA	7/6/2016 10:37:23AM	1731
8445668	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

**Sample Reference List for SDG Number DWD89
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
8445666	BGA-1-FB	06/24/2016 12:15	06/25/2016 09:30
8445667	DU-3-1-FB	06/24/2016 12:40	06/25/2016 09:30
8445668	TB-4	06/24/2016 08:00	06/25/2016 09:30
8445669	DU-1-7-A	06/24/2016 09:45	06/25/2016 09:30
8445670	DU-1-7-A	06/24/2016 09:45	06/25/2016 09:30
8445671	DU-1-7-A	06/24/2016 09:45	06/25/2016 09:30
8445672	DU-1-7-A	06/24/2016 09:45	06/25/2016 09:30
8445673	DU-1-7-B	06/24/2016 11:30	06/25/2016 09:30
8445674	DU-1-7-B	06/24/2016 11:30	06/25/2016 09:30
8445675	DU-1-7-B	06/24/2016 11:30	06/25/2016 09:30
8445676	DU-1-7-B	06/24/2016 11:30	06/25/2016 09:30
8445677	DU-1-7-C	06/24/2016 14:20	06/25/2016 09:30
8445678	DU-1-7-C	06/24/2016 14:20	06/25/2016 09:30
8445679	DU-1-7-C	06/24/2016 14:20	06/25/2016 09:30
8445680	DU-1-7-C	06/24/2016 14:20	06/25/2016 09:30
8455250	Metals Blank		06/25/2016 09:30
8455251	Explosives/Perchlorate Blank		06/25/2016 09:30

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Type I (No Raw Data) Data Package

Prepared for:

CH2M Hill, Inc.
PO Box 241329
Denver CO 80224

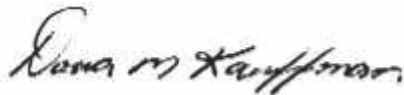
Project: Woodbine Phase III MEC RFI
Sand, Soil and Water Samples
Collected on 06/24/16

SDG# DWD89

GROUP	SAMPLE NUMBERS
1656208	844- 6667844- 680
1655906	84- - 2- 0784- - 2- 1

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:



Date: 09/07/2016

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.

MOISTURE

8444097MS	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444098MSD	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444099SS	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444100IS	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444101PDS	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444102DUP	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444102DUP	A	00121	1.0617	7.9974	8.5052	6.93	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444103BKG	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444104MS	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444105MSD	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444106DUP	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444107BKG	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444108MS	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444109MSD	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444110BKG	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444111MS	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
8444112MSD	A	00118				6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)
LCS 89.5% Std.		00111	1.0742	5.0196	1.6033	89.46	8/19/16 (1201/SWF)	8/22/16 (236/CW)

MOISTURE

Moisture Data Report

Batch #: 16231820011

Sample ID	Batch ID	Analysis#	Sample		Dry Wt	%Moisture	Analysis	Verified
			Tare Wt	Wt			Date (Emp#)	Date (Emp#)
8444051	A	00111	1.0747	7.5239	7.7974	10.65	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444052	A	00118				10.65	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444053	A	00118				10.65	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444054	A	00118				10.65	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444055	A	00111	1.0856	9.3373	9.6139	8.66	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444056	A	00118				8.66	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444057	A	00118				8.66	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444058	A	00118				8.66	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444059	A	00111	1.0923	8.4255	8.9533	6.70	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444060	A	00118				6.70	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444061	A	00118				6.70	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444062	A	00118				6.70	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444063	A	00111	1.0899	6.3592	6.1367	20.64	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444064	A	00118				20.64	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444065	A	00118				20.64	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444066	A	00118				20.64	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444067	A	00111	1.1042	5.6821	5.7231	18.71	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444068	A	00118				18.71	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444069	A	00118				18.71	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444070	A	00118				18.71	8/18/16 (1201/SWF)	8/23/16 (236/CW)
P442807BKG	A	00111	1.0473	7.3365	8.3345	0.67	8/18/16 (1201/SWF)	8/23/16 (236/CW)
P442807DUP	A	00111	1.0665	7.8208	8.8341	0.68	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444071BKG	B	00111	1.0767	6.2737	6.2071	18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444072MS	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444073MSD	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444074SS	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444075IS	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444076PDS	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444077DUP	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444077DUP	B	00121	1.0507	6.5979	6.5762	16.25	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444078BKG	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444079MS	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444080MSD	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444081DUP	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444082BKG	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444083MS	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444084MSD	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444085BKG	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444086MS	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444087MSD	B	00118				18.22	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444088	B	00111	1.0608	8.4273	7.0221	29.26	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444089	B	00118				29.26	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444090	B	00118				29.26	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444091	B	00118				29.26	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444092	B	00111	1.0739	7.8129	8.1782	9.07	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444093	B	00118				9.07	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444094	B	00118				9.07	8/18/16 (1201/SWF)	8/23/16 (236/CW)
8444095	B	00118				9.07	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 #: 16232820001

Sample ID	Batch ID	Analysis#	Sample		Dry Wt	%Moisture	Analysis	Verified
			Tare Wt	Wt			Date (Emp#)	Date (Emp#)
8444096BKG	A	00111	1.0658	7.2932	7.8680	6.73	8/19/16 (1201/SWF)	8/22/16 (236/CW)

MOISTURE

Sample Matrix Quality Control

<u>Analysis Name</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 16231820011A	Sample number(s): 8444051-8444070, 8444051-8444070			
Moisture	0.67	0.68	1 (1)	5
Moisture	0.67	0.68	1 (1)	5
Batch number: 16231820011B	Sample number(s): 8444071-8444095, 8444071-8444095			
Moisture	18.2	16.3	11*	5
Moisture	18.2	16.3	11*	5
Moisture Duplicate	18.2	16.3	11*	5
Batch number: 16232820001A	Sample number(s): 8444096-8444112, 8444096-8444112			
Moisture	6.7	6.9	3	5
Moisture	6.7	6.9	3	5
Moisture Duplicate	6.7	6.9	3	5

* - Outside of specification

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

MOISTURE

8444102	BGA31DUP
8444103	BGA32BKG
8444104	BGA32MS
8444105	BGA32MSD
8444106	BGA32DUP
8444107	BGA33BKG
8444108	BGA33MS
8444109	BGA33MSD
8444110	BGA34BKG
8444111	BGA34MS
8444112	BGA34MSD

COMMENTS:

Method defined actions are taken for any failed matrix QC.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>LCS</u> <u>%REC</u>	<u>LCSD</u> <u>%REC</u>	<u>LCS/LCSD</u> <u>Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 16231820011A	Sample number(s):	8444051-8444070, 8444051-8444070			
Moisture	100	99-101			
Moisture	100	99-101			
Batch number: 16231820011B	Sample number(s):	8444071-8444095, 8444071-8444095			
Moisture	100	99-101			
Moisture	100	99-101			
Moisture Duplicate	100	99-101			
Batch number: 16232820001A	Sample number(s):	8444096-8444112, 8444096-8444112			
Moisture	100	99-101			
Moisture	100	99-101			
Moisture Duplicate	100	99-101			

MOISTURE

SAMPLE NUMBERS:

<u>Sample #</u>	<u>Sample Code</u>
8444051	D25A1
8444052	D25A2
8444053	D25A3
8444054	D25A4
8444055	D25B1
8444056	D25B2
8444057	D25B3
8444058	D25B4
8444059	D25C1
8444060	D25C2
8444061	D25C3
8444062	D25C4
8444063	D22A1
8444064	D22A2
8444065	D22A3
8444066	D22A4
8444067	D22B1
8444068	D22B2
8444069	D22B3
8444070	D22B4
8444071	D22C1BKG
8444072	D22C1MS
8444073	D22C1MSD
8444074	D22C1SS
8444075	D22C1IS
8444076	D22C1PDS
8444077	D22C1DUP
8444078	D22C2BKG
8444079	D22C2MS
8444080	D22C2MSD
8444081	D22C2DUP
8444082	D22C3BKG
8444083	D22C3MS
8444084	D22C3MSD
8444085	D22C3BKG
8444086	D22C3MS
8444087	D22C3MSD
8444088	BGA11
8444089	BGA12
8444090	BGA13
8444091	BGA14
8444092	BGA21
8444093	BGA22
8444094	BGA23
8444095	BGA24
8444096	BGA31BKG
8444097	BGA31MS
8444098	BGA31MSD
8444099	BGA31SS
8444100	BGA31IS
8444101	BGA31PDS

Moisture Data

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

SDG: DWD88
Matrix: SOLID

Water Quality
Fraction: Wet Chemistry

LCS: P189182Q	Batch: 16189182101A (Sample number(s): 8444088, 8444092, 8444096, 8444102)								
	Batch: 16189182101B (Sample number(s): 8444071, 8444077)								
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	426	NA	100	NA	98-102	NA	NA

SDG: DWD88
Matrix: SOLID

Water Quality
Fraction: Wet Chemistry

LCS: P187042Q	Batch: 16187042501A (Sample number(s): 8444051, 8444055, 8444059, 8444063)								
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): 8444051, 8444055, 8444059, 8444063, 8444067)								
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: 16188182101B (Sample number(s): 8444051, 8444055, 8444059, 8444063, 8444067)								
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: P189039Q	Batch: 16189039401A (Sample number(s): 8444088, 8444092, 8444096, 8444102) Batch: 16189039401B (Sample number(s): 8444071, 8444077)								
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	7.00	NA	100	NA	95-105	NA	NA

LCS: P189042Q	Batch: 16189042501A (Sample number(s): 8444067, 8444071, 8444074-8444077, 8444088, 8444092)								
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

LCS: P189042Q	Batch: 16189042502A (Sample number(s): 8444096, 8444099-8444102)								
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	4.63	NA	93	NA	80-120	NA	NA

Water Quality
Fraction: Wet Chemistry

LCS: P176027Q LCSD: P176027Y	Batch: 16176027601A (Sample number(s): 8444113, 8444115-8444116)								
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

Water Quality

Fraction: Wet Chemistry

BKG: 8444096 DUP: 8444102	Batch: 16189039401A (Sample number(s): 8444088, 8444092, 8444096, 8444102)				
Parameter	ME	Unspiked Conc Std. Units	DUP Conc Std. Units	%RPD	%RPD Limits
pH	MTR	4.77	4.75	0	3

BKG: 8444071 DUP: 8444077	Batch: 16189039401B (Sample number(s): 8444071, 8444077)				
Parameter	ME	Unspiked Conc Std. Units	DUP Conc Std. Units	%RPD	%RPD Limits
pH	MTR	4.57	4.55	0	3

BKG: 8444096 DUP: 8444102	Batch: 16189042502A (Sample number(s): 8444096, 8444099-8444102)				
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: 8444096 DUP: 8444102	Batch: 16189182101A (Sample number(s): 8444088, 8444092, 8444096, 8444102)				
Parameter	ME	Unspiked Conc mV	DUP Conc mV	%RPD	%RPD Limits
Oxidation Reduction Potential	TI	656.	673.5	3	5

BKG: 8444071 DUP: 8444077	Batch: 16189182101B (Sample number(s): 8444071, 8444077)				
Parameter	ME	Unspiked Conc mV	DUP Conc mV	%RPD	%RPD Limits
Oxidation Reduction Potential	TI	625.5	621.	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

UNSPK: 8444096 MS: 8444096	Batch: 16189042502A (Sample number(s): 8444096, 8444099-8444102)									
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.	N.D.	NA	0 *	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.

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

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

16189042502A / 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

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 Reference List Water Quality

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Fraction: Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
pH	16188039401A	P188039Q	07/06/2016 20:00:00
pH	16188039401B	8444051	07/06/2016 20:00:00
		8444055	07/06/2016 20:00:00
		8444059	07/06/2016 20:00:00
		8444063	07/06/2016 20:00:00
		8444067	07/06/2016 20:00:00
pH	16189039401A	P189039Q	07/07/2016 12:30:00
		8444088	07/07/2016 12:30:00
		8444092	07/07/2016 12:30:00
		8444096 BKG	07/07/2016 12:30:00
		8444102 DUP	07/07/2016 12:30:00
pH	16189039401B	8444071 BKG	07/07/2016 12:30:00
		8444077 DUP	07/07/2016 12:30:00

Quality Control Reference List Water Quality

CLIENT: CH2M Hill, Inc.
SDG: DWD88

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
		8444113	06/24/2016 11:50:00
		8444115	06/24/2016 11:50:00
		8444116	06/24/2016 11:50:00
Hexavalent Chromium (SOLIDS)	16187042501A	P187042B	07/05/2016 20:45:00
		P187042Q	07/05/2016 20:45:00
		8444051	07/05/2016 20:45:00
		8444055	07/05/2016 20:45:00
		8444059	07/05/2016 20:45:00
		8444063	07/05/2016 20:45:00
Hexavalent Chromium (SOLIDS)	16189042501A	P189042B	07/11/2016 19:30:00
		P189042Q	07/11/2016 19:30:00
		8444074 SS	07/11/2016 19:30:00
		8444076 PDS	07/11/2016 19:30:00
		8444067	07/11/2016 19:30:00
		8444071 UNSPK	07/11/2016 19:30:00
		8444075 IS	07/11/2016 19:30:00
		8444077 DUP	07/11/2016 19:30:00
		8444088	07/11/2016 19:30:00
		8444092	07/11/2016 19:30:00
Hexavalent Chromium (SOLIDS)	16189042502A	P189042B	07/11/2016 20:20:00
		P189042Q	07/11/2016 20:20:00
		8444099 SS	07/11/2016 20:20:00
		8444101 PDS	07/11/2016 20:20:00
		8444096 UNSPK/BKG	07/11/2016 20:20:00
		8444100 IS	07/11/2016 20:20:00
		8444102 DUP	07/11/2016 20:20:00
Oxidation Reduction Potential	16188182101A	P188182Q	07/06/2016 20:00:00
Oxidation Reduction Potential	16188182101B	8444051	07/06/2016 20:00:00
		8444055	07/06/2016 20:00:00
		8444059	07/06/2016 20:00:00
		8444063	07/06/2016 20:00:00
		8444067	07/06/2016 20:00:00
Oxidation Reduction Potential	16189182101A	P189182Q	07/07/2016 12:30:00
		8444088	07/07/2016 12:30:00
		8444092	07/07/2016 12:30:00
		8444096 BKG	07/07/2016 12:30:00
		8444102 DUP	07/07/2016 12:30:00
Oxidation Reduction Potential	16189182101B	8444071 BKG	07/07/2016 12:30:00
		8444077 DUP	07/07/2016 12:30:00

QC Summary

Wet Chemistry

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.

SDG: DWD88

Water Quality

Fraction: Wet Chemistry

(Sample number(s): 8444088: Analysis: 00394)

The pH was measured in water at 20.8 C.

(Sample number(s): 8444071, 8444077: Analysis: 00394)

The pH was measured in water at 20.7 C.

(Sample number(s): 8444096, 8444102: Analysis: 00394)

The pH was measured in water at 20.6 C.

(Sample number(s): 8444051: Analysis: 00394)

The pH was measured in water at 19.9 C.

(Sample number(s): 8444055, 8444059, 8444063: Analysis: 00394)

The pH was measured in water at 19.8 C.

(Sample number(s): 8444067: Analysis: 00394)

The pH was measured in water at 19.7 C.

(Sample number(s): 8444067, 8444071, 8444074-8444077, 8444088, 8444092, 8444096, 8444099-8444102: Analysis: 00425)

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

(Sample number(s): 8444051, 8444055, 8444063: 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

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.

SDG: DWD88

Water Quality

Fraction: Wet Chemistry

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Method defined actions are taken for any failed matrix QC.

Batch#: 16189042502A (Sample number(s): 8444096, 8444099-8444102, UNSPK: 8444099-8444096, BKG: 8444096)

The recovery(ies) for the following analyte(s) in the MS is outside the acceptance window: Hexavalent Chromium (SOLIDS)

SAMPLE ANALYSIS:

Samples	Hexavalent Chromium	Hexavalent Chromium (SOLIDS)	Oxidation Reduction Potential	pH
8444051		DF10	DF1	DF1
8444055		DF10	DF1	DF1
8444059		DF1	DF1	DF1
8444063		DF20	DF1	DF1
8444067		DF20	DF1	DF1
8444071		UNSPK/ DF20	UNSPK/ DF1	UNSPK/ DF1
8444074		SS/ DF20		
8444075		IS/ DF20		
8444076		PDS/ DF20		
8444077		D/ DF20	D/ DF1	D/ DF1
8444088		DF20	DF1	DF1
8444092		DF5	DF1	DF1
8444096		UNSPK/ DF20; DF1	UNSPK/ DF1	UNSPK/ DF1
8444099		SS/ DF20		
8444100		IS/ DF20		
8444101		PDS/ DF20		
8444102		D/ DF20	D/ DF1	D/ DF1
8444113	DF1			
8444115	DF1			
8444116	DF1			

No problems were encountered with the analysis of the samples.

(Sample number(s): 8444092: Analysis: 00394)

The pH was measured in water at 20.9 C.

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Water Quality

Fraction: Wet Chemistry

Sample #	Client ID	Matrix		Comments
		Liquid	Solid	
8444051	DU-2-5-A		X	
8444055	DU-2-5-B		X	
8444059	DU-2-5-C		X	
8444063	DU-2-2-A		X	
8444067	DU-2-2-B		X	
8444071	DU-2-2-C		X	Background/Unspiked
8444074	DU-2-2-C SS		X	Soluble Spike
8444075	DU-2-2-C IS		X	Insoluble Spike
8444076	DU-2-2-C PDS		X	Post Digestion Spike
8444077	DU-2-2-C DUP		X	Duplicate
8444088	BGA-1		X	
8444092	BGA-2		X	
8444096	BGA-3		X	Background/
8444099	BGA-3 SS		X	Soluble Spike
8444100	BGA-3 IS		X	Insoluble Spike
8444101	BGA-3 PDS		X	Post Digestion Spike
8444102	BGA-3 DUP		X	Duplicate
8444113	DU-2-5-FB	X		Field Blank
8444115	DU-2-2-EB	X		Equipment Blank
8444116	BGA-3-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.

Case Narrative/Conformance Summary

Wet Chemistry

Wet Chemistry Data

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

Start Time: 14:45
Cool Time: 16:30
Finish: 16:45

Batch No. _____

1	6	1	8	1

1	1	7

1	0	1

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

Analysis: 08256 Date: 6-29-16 Analyst: BW/9263

Std. Ref. (Book/Page/Line): 220405 / P. 63 / 2-7,8

[illegible]

Please Note: Final extraction volume is 50 mL

Verified: Sm/347 Signing Son EP/065 Date: 7/8/16

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

Start Time: 0915
Cool Time: 1100
Finish: 1115

Batch No.

1 6 1 8 7

1 0 2

2 0 1

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

Analysis: 5896 Date: 7-5-16 Analyst: MJS 123

Std. Ref. (Book/Page/Line): 220405 p. 65 J. 8.9

Bottle Code	Sample Number	Initial		Comments/True Values	SDG
		Volume (mL)	Weight (g)		
	LCSS		1.00	+ 5ml 20mg/L KCN	
	PBS		2.00		
20A	8444059		2.00		A DWD88
20A	8444063		2.01		
20A	8444067		2.04		
20A	8444071 (u)		2.06		
20A	8444072 (u)		2.01	+ 5ml 20mg/L KCN	
20A	8444077 (u)		2.03		
20A	8444088		2.00		
20A	8444092		2.10		
36A	8445366		2.09		GPA02
36A	8445367		2.09		
20A	8445669		2.03		DWD89
20A	8445673		2.00		
20A	8445677		2.06		B
20A	8449086		2.04		DWD90
36A	8455582		2.10		
20A	8444096 (u)		2.01		DWD88
20A	8444097 (u)		1.99	+ 5ml 20mg/L KCN	
20A	8444102 (u)		2.00		

Please Note: Final extraction volume is 50 mL

Verified: sm/347 Signature EF/665
DWD88 Page 95 of 974

Date: 7/8/16

230285 6

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

Start Time: 0930

Cool Time: 1115^{min}

Finish: 1130

Batch No.

1	6	1	8	0

1	1	7

1	0	1

11

Enter 102 for Analysis 492, 5896

Enter 117 for Analysis 8256

Analysis: 8256

Date: 6-28-16

Analyst: 7451263

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

[illegible]

Please Note: Final extraction volume is 50 mL

Verified:

Sm/347

Date:

6/29/16

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

Start Time: 0925

Cool Time: 1110

Finish: 1125

Batch No.

1 6 1 8 3

1 0 2

2 0 1

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

Analysis: 5896

Date: 7-1-16

Analyst: NYS1213

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

Bottle Code	Sample Number	Initial Volume (mL)	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 (u)		2.08		
20A	8438337 (u)		2.00	+5ml 20 mg/L KCN	
20A	8438342 (u)		2.07		
20A	8438350		2.10		
20A	8438370		2.06		
20A	8438374		2.00		
20A	8444051		2.03		DWD88
20A	8444055		2.02		
(u) 8438353	8438336 (u)		2.05		B DWD86
(A) 8438354	8438337 (u)		2.07	+5ml 20 mg/L KCN	
(D) 8438359	8438342 (u)		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

Extraction/Distillation/Digestion Logs

Instrumental Wet Chemistry

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



Lancaster Laboratories
Environmental

Quality Control Summary
Initial And Continuing Calibration
Instrumental Analysis/SCN

SDG: DWD88

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

Sample	Total Cyanide		
	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



Lancaster Laboratories
Environmental

Quality Control Summary
Initial And Continuing Calibration
Instrumental Analysis/TCN

SDG: DWD88

Instrument ID: 09037
Calibration Date: 07/06/2016

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	AUTO CAL6	AUTO CAL7	CC
Total Cyanide	0.3285	0.3956	0.4566	0.6268	0.9382	1.5425	2.4490	1.0000

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

Concentration units: mg/L

Batch Numbers: 16187102201A, 16187102201B
Run Start Dates: 07/06/2016
Run Names: 1618801C01

Sample	Total Cyanide		
	True	Result	%Rec
ICV	0.15	0.14840	99
ICB	0	ND	NA
CCV2	0.15	0.14540	97
CCB 1	0	ND	NA
CCV2	0.15	0.14870	99
CCB 2	0	ND	NA
CCV2	0.15	0.14660	98
CCB 3	0	ND	NA
CCV2	0.15	0.14440	96
CCB 4	0	ND	NA
CCV2	0.15	0.14600	97
CCB 6	0	ND	NA
CCV2	0.15	0.14780	99
CCB 7	0	ND	NA

* = Out of Specifications



Lancaster Laboratories
Environmental

Quality Control Summary
Initial And Continuing Calibration
Instrumental Analysis/SCN

SDG: DWD88

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

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	AUTO CAL6	CC
Total Cyanide	0.3874	0.4491	0.6233	0.9107	1.4941	2.3611	1.0000

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

Concentration units: mg/L

Batch Numbers: 16181117101A
Run Start Dates: 07/02/2016
Run Names: 1618402C01

Sample	Total Cyanide		
	True	Result	%Rec
ICV	0.15	0.14610	97
ICB	0	ND	NA
CCV2	0.15	0.14050	94
CCB 1	0	ND	NA

* = Out of Specifications



Lancaster Laboratories
Environmental

Quality Control Summary
Initial And Continuing Calibration
Instrumental Analysis/TCN

SDG: DWD88

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
Run Start Dates: 07/02/2016
Run Names: 1618401C01

Sample	Total Cyanide		
	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

* = Out of Specifications

SDG: DWD88
Matrix: LIQUID

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

LCS: P18017AQ	Batch: 16180117101A (Sample number(s): 8444113, 8444115)								
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

LCS: P18117AQ	Batch: 16181117101A (Sample number(s): 8444116)								
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	0.215	NA	108	NA	90-110	NA	NA

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

LCS: P18302AQ	Batch: 16183102201A (Sample number(s): 8444051, 8444055)								
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

LCS: P18702AQ	Batch: 16187102201A (Sample number(s): 8444059, 8444063, 8444067, 8444071-8444072, 8444077, 8444088, 8444092) Batch: 16187102201B (Sample number(s): 8444096-8444097, 8444102)								
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	9.97	NA	100	NA	90-110	NA	NA

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

BKG: P445371 DUP: P445371	Batch: 16180117101A (Sample number(s): 8444113, 8444115)				
Parameter	ME	Unspiked Conc mg/l	DUP Conc mg/l	%RPD	%RPD Limits
Total Cyanide (water)	AK	N.D.	N.D.	0 (1)	20

BKG: P450506 DUP: P450506	Batch: 16181117101A (Sample number(s): 8444116)				
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.

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

UNSPK: P445371 MS: P445371	Batch: 16180117101A (Sample number(s): 8444113, 8444115)									
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

UNSPK: P450506 MS: P450506	Batch: 16181117101A (Sample number(s): 8444116)									
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.	0.205	NA	102	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.

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

BKG: P438336 DUP: P438342	Batch: 16183102201A (Sample number(s): 8444051, 8444055)				
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: 8444071 DUP: 8444077	Batch: 16187102201A (Sample number(s): 8444059, 8444063, 8444067, 8444071-8444072, 8444077, 8444088, 8444092)				
Parameter	ME	Unspiked Conc mg/kg	DUP Conc mg/kg	%RPD	%RPD Limits
Total Cyanide (solid)	AK	N.D.	N.D.	0 (1)	20

BKG: 8444096 DUP: 8444102	Batch: 16187102201B (Sample number(s): 8444096-8444097, 8444102)				
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: P438336 MS: P438337	Batch: 16183102201A (Sample number(s): 8444051, 8444055)									
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: 8444071 MS: 8444072	Batch: 16187102201A (Sample number(s): 8444059, 8444063, 8444067, 8444071-8444072, 8444077, 8444088, 8444092)									
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	4.98	N.D.	4.98	NA	100	NA	41-145	NA	NA

UNSPK: 8444096 MS: 8444097	Batch: 16187102201B (Sample number(s): 8444096-8444097, 8444102)									
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	5.03	N.D.	4.03	NA	80	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.

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

16181117101A / P18117AB Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Total Cyanide (water)	AK	07/02/16	N.D.	mg/l	0.0050	0.010

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

16187102201A / P18702AB Parameter	ME	Analysis Date	Blank Results	Units	MDL	LOQ
Total Cyanide (solid)	AK	07/06/16	N.D.	mg/kg	0.18	0.50

Quality Control Reference List Instrumental Water Quality

CLIENT: CH2M Hill, Inc.
SDG: DWD88

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
		8444051	07/02/2016 13:21:00
		8444055	07/02/2016 13:22:00
		P438336 UNSPK/BKG	07/02/2016 13:12:00
		P438337 MS	07/02/2016 13:13:00
		P438342 DUP	07/02/2016 13:14:00
Total Cyanide (solid)	16187102201A	P18702AB	07/06/2016 11:50:00
		P18702AQ	07/06/2016 11:49:00
		8444059	07/06/2016 11:52:00
		8444063	07/06/2016 11:55:00
		8444067	07/06/2016 11:56:00
		8444071 UNSPK/BKG	07/06/2016 11:57:00
		8444072 MS	07/06/2016 11:59:00
		8444077 DUP	07/06/2016 12:00:00
		8444088	07/06/2016 12:01:00
Total Cyanide (solid)	16187102201B	8444092	07/06/2016 12:02:00
		8444096 UNSPK/BKG	07/06/2016 12:14:00
		8444097 MS	07/06/2016 12:15:00
Total Cyanide (solid)	16187102201B	8444102 DUP	07/06/2016 12:57:00
Total Cyanide (water)	16180117101A	P18017AB	06/28/2016 13:51:00
		P18017AQ	06/28/2016 13:50:00
		8444113	06/28/2016 13:59:00
		8444115	06/28/2016 14:00:00
		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
Total Cyanide (water)	16181117101A	P18117AB	07/02/2016 15:25:00
		P18117AQ	07/02/2016 15:24:00
		8444116	07/02/2016 15:32:00
		P450506 UNSPK/BKG	07/02/2016 15:33:00
		P450506 MS	07/02/2016 15:34:00
		P450506 DUP	07/02/2016 15:38:00

Quality Control and Calibration Summary Forms

Instrumental Wet Chemistry

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

Sample Duplicate

Method defined actions are taken for any failed matrix QC.

Batch#: 16183102201A (Sample number(s): 8444051, 8444055, UNSPK: P438337, BKG: P438342)
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

Case Narrative/Conformance Summary

CLIENT: CH2M Hill, Inc.
SDG: DWD88

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
8444051	DU-2-5-A		X	1	
8444055	DU-2-5-B		X	1	
8444059	DU-2-5-C		X	1	
8444063	DU-2-2-A		X	1	
8444067	DU-2-2-B		X	1	
8444071	DU-2-2-C		X	1	Background/Unspiked
8444072	DU-2-2-C MS		X	1	Matrix Spike
8444077	DU-2-2-C DUP		X	1	Duplicate
8444088	BGA-1		X	1	
8444092	BGA-2		X	1	
8444096	BGA-3		X	1	Background/
8444097	BGA-3 MS		X	1	Matrix Spike
8444102	BGA-3 DUP		X	1	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

Instrumental Wet Chemistry

Instrumental Wet Chemistry Data



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD88

Method: CV
Instrument ID: 19302
Run Name: 1619703M08

Run Start Date: 07/15/2016
Run End Date: 07/15/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
S0	1.00	11:49															X											
S0.2	1.00	11:51															X											
S0.5	1.00	11:53															X											
S1.0	1.00	11:55															X											
S2.5	1.00	11:57															X											
S5.0	1.00	11:59															X											
ICV	1.00	12:01															X											
ICB	1.00	12:03															X											
CRA	1.00	12:05															X											
CCV	1.00	12:07															X											
CCB	1.00	12:09															X											
P19538BB	1.00	12:21															X											
P19538BQ	1.00	12:23															X											
8444096BKG	1.00	12:25															X											
8444096A	1.00	12:27																										
8444102DUP	1.00	12:29															X											
8444097MS	1.00	12:31															X											
8444098MSD	1.00	12:33															X											
8444088	1.00	12:35															X											
8444092	1.00	12:37															X											
ZZZZZZ	1.00	12:39																										
CCV	1.00	12:41															X											
CCB	1.00	12:43															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



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																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K S	S E	A G	N A	T L	V N	Z N			
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											
8444071BKG	1.00	09:26															X											
8444071A	1.00	09:28																										
8444077DUP	1.00	09:30															X											
8444072MS	1.00	09:32															X											
8444073MSD	1.00	09:34															X											
8444051	1.00	09:36															X											
8444055	1.00	09:38															X											
CCV	1.00	09:40															X											
CCB	1.00	09:42															X											
8444059	1.00	09:44															X											
8444063	1.00	09:46															X											
8444067	1.00	09:48															X											
ZZZZZZ	1.00	09:50																										
ZZZZZZ	1.00	09:52																										
ZZZZZZ	1.00	09:54																										
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



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																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
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
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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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD88

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																														
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N								
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



Method: MS
Instrument ID: 19204
Run Name: 1619701E05

Run Start Date: 07/15/2016
Run End Date: 07/15/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
ZZZZZZ	1.00	06:07																										
CCV	1.00	06:08																					X					
CCB	1.00	06:10																					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



Method: MS
Instrument ID: 19204
Run Name: 1619701E05

Run Start Date: 07/15/2016
Run End Date: 07/15/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
S0	1.00	04:58																					X					
S	1.00	05:00																					X					
CCS	1.00	05:01																					X					
CCS	1.00	05:03																					X					
ICV	1.00	05:05																					X					
ICB	1.00	05:07																					X					
LLC	1.00	05:09																					X					
ICSA	1.00	05:11																					X					
ICSAB	1.00	05:12																					X					
ZZZZZZ	1.00	05:14																										
CCV	1.00	05:16																					X					
CCB	1.00	05:18																					X					
P19537BB	2.00	05:20																					X					
P19537BQ	2.00	05:21																					X					
8444103BKG	2.00	05:23																					X					
8444103A	2.00	05:25																										
8444106DUP	2.00	05:27																					X					
8444104MS	2.00	05:29																					X					
8444105MSD	2.00	05:30																					X					
8444103L	10.00	05:32																					X					
8444089	2.00	05:34																					X					
8444093	2.00	05:36																					X					
CCV	1.00	05:38																					X					
CCB	1.00	05:39																					X					
8455248	2.00	05:41																					X					
ZZZZZZ	2.00	05:43																										
ZZZZZZ	2.00	05:45																										
ZZZZZZ	2.00	05:47																										
ZZZZZZ	2.00	05:49																										
ZZZZZZ	2.00	05:50																										
ZZZZZZ	2.00	05:52																										
ZZZZZZ	2.00	05:54																										
ZZZZZZ	2.00	05:56																										
CCV	1.00	05:58																					X					
CCB	1.00	05:59																					X					
LLC	1.00	06:01																					X					
ICSA	1.00	06:03																					X					
ICSAB	1.00	06:05																					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



Method: MS
Instrument ID: 19204
Run Name: 1619603E05

Run Start Date: 07/14/2016
Run End Date: 07/14/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
ZZZZZZ	10.00	08:47																										
LLC	1.00	08:48																					X					
ICSA	1.00	08:50																					X					
ICSAB	1.00	08:52																					X					
ZZZZZZ	1.00	08:54																										
CCV	1.00	08:56																					X					
CCB	1.00	08:57																					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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD88

Method: MS
Instrument ID: 19204
Run Name: 1619603E05

Run Start Date: 07/14/2016
Run End Date: 07/14/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
S0	1.00	07:38																					X					
S	1.00	07:40																					X					
CCS	1.00	07:41																					X					
CCS	1.00	07:43																					X					
ICV	1.00	07:45																					X					
ICB	1.00	07:47																					X					
LLC	1.00	07:49																					X					
ICSA	1.00	07:50																					X					
ICSAB	1.00	07:52																					X					
ZZZZZZ	1.00	07:54																										
CCV	1.00	07:56																					X					
CCB	1.00	07:58																					X					
P19437AB	2.00	08:00																					X					
P19437AQ	2.00	08:01																					X					
8444078BKG	2.00	08:03																					X					
8444078A	2.00	08:05																					X					
8444081DUP	2.00	08:07																					X					
8444079MS	2.00	08:09																					X					
8444080MSD	2.00	08:10																					X					
8444078L	10.00	08:12																					X					
8444052	2.00	08:14																					X					
8444056	2.00	08:16																					X					
CCV	1.00	08:18																					X					
CCB	1.00	08:19																					X					
8444060	2.00	08:21																					X					
8444064	2.00	08:23																					X					
8444068	2.00	08:25																					X					
ZZZZZZ	2.00	08:27																										
ZZZZZZ	2.00	08:28																										
ZZZZZZ	2.00	08:30																										
ZZZZZZ	2.00	08:32																										
ZZZZZZ	2.00	08:34																										
ZZZZZZ	2.00	08:36																										
ZZZZZZ	2.00	08:37																										
CCV	1.00	08:39																					X					
CCB	1.00	08:41																					X					
ZZZZZZ	2.00	08:43																										
ZZZZZZ	2.00	08:45																										

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD88

Method: P
Instrument ID: 11016
Run Name: 1620007T70

Run Start Date: 07/18/2016
Run End Date: 07/18/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
S0	1.00	19:16																			X							
S	1.00	19:19																										
S	1.00	19:22																			X							
S	1.00	19:26																										
ICV	1.00	19:29																			X							
ICB	1.00	19:32																			X							
LLC	1.00	19:35																			X							
ICSA	1.00	19:38																			X							
ICSAB	1.00	19:41																			X							
CCV	1.00	19:44																			X							
CCB	1.00	19:47																			X							
ZZZZZZ	1.00	19:50																										
ZZZZZZ	1.00	19:54																										
ZZZZZZ	1.00	19:57																										
ZZZZZZ	1.00	20:00																										
ZZZZZZ	1.00	20:03																										
ZZZZZZ	1.00	20:06																										
ZZZZZZ	1.00	20:09																										
ZZZZZZ	5.00	20:12																										
ZZZZZZ	1.00	20:15																										
ZZZZZZ	1.00	20:18																										
CCV	1.00	20:21																			X							
CCB	1.00	20:24																			X							
ZZZZZZ	1.00	20:27																										
8444103BKG	1.00	20:31																			X							
8444103A	1.00	20:34																										
8444103L	5.00	20:37																			X							
LLC	1.00	20:40																			X							
ICSA	1.00	20:43																			X							
ICSAB	1.00	20:47																			X							
CCV	1.00	20:50																			X							
CCB	1.00	20:53																			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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD88

Method: P
Instrument ID: 23745
Run Name: 1619706T74

Run Start Date: 07/15/2016
Run End Date: 07/15/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
S0	1.00	14:13																			X							
S	1.00	14:16																										
S	1.00	14:20																			X							
S	1.00	14:23																										
ICV	1.00	14:27																			X							
ICB	1.00	14:30																			X							
LLC	1.00	14:33																			X							
ICSA	1.00	14:36																			X							
ICSAB	1.00	14:40																			X							
CCV	1.00	14:44																			X							
CCB	1.00	14:47																			X							
P19537BB	1.00	14:50																			X							
P19537BQ	1.00	14:54																										
ZZZZZZ	1.00	14:57																										
8444106DUP	1.00	15:00																			X							
ZZZZZZ	5.00	15:03																										
8444089	1.00	15:07																			X							
8444093	1.00	15:10																			X							
8455248	1.00	15:13																			X							
ZZZZZZ	1.00	15:17																										
ZZZZZZ	1.00	15:20																										
CCV	1.00	15:23																			X							
CCB	1.00	15:26																			X							
ZZZZZZ	1.00	15:30																										
ZZZZZZ	1.00	15:33																										
ZZZZZZ	1.00	15:36																										
ZZZZZZ	1.00	15:40																										
ZZZZZZ	1.00	15:43																										
ZZZZZZ	1.00	15:46																										
LLC	1.00	15:49																			X							
ICSA	1.00	15:53																			X							
ICSAB	1.00	15:56																			X							
CCV	1.00	16:00																			X							
CCB	1.00	16:03																			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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD88

Method: P
Instrument ID: 18255
Run Name: 1619702T73

Run Start Date: 07/15/2016
Run End Date: 07/15/2016

			Analytes																																
Lab Sample ID	D/F	Time	A	S	A	B	B	C	C	C	C	C	F	P	M	M	H	N	K	S	A	N	T	V	Z										
			L	B	S	A	E	D	A	R	O	U	E	B	G	N	G	I			E	G	A	L		N									
CCB	1.00	04:38	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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD88

Method: P
Instrument ID: 18255
Run Name: 1619702T73

Run Start Date: 07/15/2016
Run End Date: 07/15/2016

Lab Sample ID	D/F	Time	Analytes																									
			A	S	A	B	B	C	C	C	C	F	P	M	M	H	N	K	S	A	N	T	V	Z				
S0	1.00	02:31	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
S	1.00	02:34	X						X			X		X				X		X								
S	1.00	02:38			X	X	X	X			X	X		X		X		X	X				X					
S	1.00	02:41		X					X														X					
ICV	1.00	02:45	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
ICB	1.00	02:48	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
LLC	1.00	02:51	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
ICSA	1.00	02:55	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
ICSAB	1.00	02:58	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
CCV	1.00	03:02	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
CCB	1.00	03:05	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
P19537BB	1.00	03:08	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X				
P19537BQ	1.00	03:12	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
8444103BKG	1.00	03:15	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X				
8444103A	1.00	03:18										X																
8444106DUP	1.00	03:22	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X				
8444104MS	1.00	03:25	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
8444105MSD	1.00	03:28	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
8444103L	5.00	03:32	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X				
8444089	1.00	03:35	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X				
8444093	1.00	03:38	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X				
CCV	1.00	03:42	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
CCB	1.00	03:45	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
8455248	1.00	03:48	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X				
ZZZZZZ	1.00	03:52																										
ZZZZZZ	1.00	03:55																										
ZZZZZZ	1.00	03:58																										
ZZZZZZ	1.00	04:02																										
ZZZZZZ	1.00	04:05																										
ZZZZZZ	1.00	04:08																										
ZZZZZZ	1.00	04:11																										
ZZZZZZ	1.00	04:15																										
CCV	1.00	04:18	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
CCB	1.00	04:21	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
LLC	1.00	04:25	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
ICSA	1.00	04:28	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
ICSAB	1.00	04:32	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X				
CCV	1.00	04:35	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

Method: P
Instrument ID: 16417
Run Name: 1619604T72

Run Start Date: 07/14/2016
Run End Date: 07/14/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N			
ICSA	1.00	09:55	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
ICSAB	1.00	09:58	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
CCV	1.00	10:02	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
CCB	1.00	10:05	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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 14
ANALYSIS RUN LOG
SDG No.: DWD88

Method: P
Instrument ID: 16417
Run Name: 1619604T72

Run Start Date: 07/14/2016
Run End Date: 07/14/2016

Lab Sample ID	D/F	Time	Analytes																									
			A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K I	S E	A G	N A	T L	V L	Z N			
S0	1.00	07:56	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
S	1.00	07:59	X						X				X		X				X		X							
S	1.00	08:02			X	X	X	X			X	X		X		X		X		X	X				X			
S	1.00	08:06		X						X														X				
ICV	1.00	08:09	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
ICB	1.00	08:12	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
LLC	1.00	08:15	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
ICSA	1.00	08:18	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
ICSAB	1.00	08:22	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
CCV	1.00	08:25	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
CCB	1.00	08:28	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
P19437AB	1.00	08:31	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
P19437AQ	1.00	08:34	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444078BKG	1.00	08:38	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444078A	1.00	08:41	X						X				X															
8444081DUP	1.00	08:44	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444079MS	1.00	08:47	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444080MSD	1.00	08:50	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444078L	5.00	08:53	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444052	1.00	08:57	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444056	1.00	09:00	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
CCV	1.00	09:03	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
CCB	1.00	09:06	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444060	1.00	09:09	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444064	1.00	09:12	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
8444068	1.00	09:15	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
ZZZZZZ	1.00	09:18																										
ZZZZZZ	1.00	09:21																										
ZZZZZZ	1.00	09:24																										
ZZZZZZ	1.00	09:27																										
ZZZZZZ	1.00	09:30																										
ZZZZZZ	1.00	09:33																										
ZZZZZZ	1.00	09:37																										
CCV	1.00	09:40	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
CCB	1.00	09:43	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X			
ZZZZZZ	1.00	09:46																										
ZZZZZZ	1.00	09:49																										
LLC	1.00	09:52	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

Method: CV
Batch Number: 161950638002

Lab Sample ID	Date	Sample Weight(gram)	Final Volume(ml)
8444088	07/14/2016	0.60	100
8444092	07/14/2016	0.62	100
8444096BKG	07/14/2016	0.61	100
8444102DUP	07/14/2016	0.61	100
8444098MSD	07/14/2016	0.65	100
8444097MS	07/14/2016	0.60	100
P19538BB	07/14/2016	0.60	100
P19538BQ	07/14/2016	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)
8444051	07/01/2016	0.62	100
8444055	07/01/2016	0.64	100
8444059	07/01/2016	0.65	100
8444063	07/01/2016	0.60	100
8444067	07/01/2016	0.61	100
8444071BKG	07/01/2016	0.64	100
8444077DUP	07/01/2016	0.63	100
8444073MSD	07/01/2016	0.64	100
8444072MS	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

Method: MS
Batch Number: 161950637002

Lab Sample ID	Date	Sample Weight(gram)	Final Volume(ml)
8444089	07/14/2016	1.01	100
8444093	07/14/2016	1.01	100
8455248	07/14/2016	1.11	100
8444103BKG	07/14/2016	1.01	100
8444106DUP	07/14/2016	1.02	100
8444105MSD	07/14/2016	1.00	100
8444104MS	07/14/2016	1.00	100
P19537BB	07/14/2016	1.00	100
P19537BQ	07/14/2016	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: 161940637001

Lab Sample ID	Date	Sample Weight(gram)	Final Volume(ml)
8444052	07/13/2016	1.05	100
8444056	07/13/2016	1.48	100
8444060	07/13/2016	1.13	100
8444064	07/13/2016	1.05	100
8444068	07/13/2016	1.06	100
8444078BKG	07/13/2016	1.00	100
8444081DUP	07/13/2016	1.04	100
8444080MSD	07/13/2016	1.07	100
8444079MS	07/13/2016	1.01	100
P19437AB	07/13/2016	1.00	100
P19437AQ	07/13/2016	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: P

Batch Number: 161950637002

Lab Sample ID	Date	Sample Weight(gram)	Final Volume(ml)
8444089	07/14/2016	1.01	100
8444093	07/14/2016	1.01	100
8455248	07/14/2016	1.11	100
8444103BKG	07/14/2016	1.01	100
8444106DUP	07/14/2016	1.02	100
8444105MSD	07/14/2016	1.00	100
8444104MS	07/14/2016	1.00	100
P19537BB	07/14/2016	1.00	100
P19537BQ	07/14/2016	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: P

Batch Number: 161940637001

Lab Sample ID	Date	Sample Weight(gram)	Final Volume(ml)
8444052	07/13/2016	1.05	100
8444056	07/13/2016	1.48	100
8444060	07/13/2016	1.13	100
8444064	07/13/2016	1.05	100
8444068	07/13/2016	1.06	100
8444078BKG	07/13/2016	1.00	100
8444081DUP	07/13/2016	1.04	100
8444080MSD	07/13/2016	1.07	100
8444079MS	07/13/2016	1.01	100
P19437AB	07/13/2016	1.00	100
P19437AQ	07/13/2016	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

Preparation and Run Logs

Metals in Solid

Instrument ID: 19204

Start Date: 07/15/2016

Run Name: 1619701E05

End Date: 07/15/2016

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
CCV	05:58	106											
CCB	05:59	106											
LLC	06:01	108											
ICSA	06:03	91											
ICSAB	06:05	91											
ZZZZZZ	06:07												
CCV	06:08	105											
CCB	06:10	103											

LEGEND: BKG = Background MS = Matrix Spike DUP = Duplicate MSD = Matrix Spike Duplicate L = Serial Dilution A = Post Digest Spike B = Blank Q = Laboratory Control Sample Y = Laboratory Control Sample Duplicate FLAG: R = Internal Standard Relative Intensity OOS	INTERNAL STANDARD ELEMENTS: BE = Beryllium LI = Lithium BI = Bismuth SC = Scandium GE = Germanium TB = Terbium HO = Holmium Y = Yttrium IN = Indium

Instrument ID: 19204

Start Date: 07/15/2016

Run Name: 1619701E05

End Date: 07/15/2016

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
S0	04:58	100											
S	05:00	97											
CCS	05:01	99											
CCS	05:03	101											
ICV	05:05	100											
ICB	05:07	102											
LLC	05:09	105											
ICSA	05:11	89											
ICSAB	05:12	90											
ZZZZZZ	05:14												
CCV	05:16	103											
CCB	05:18	102											
P19537BB	05:20	112											
P19537BQ	05:21	108											
8444103BKG	05:23	94											
8444103A	05:25	87											
8444106DUP	05:27	88											
8444104MS	05:29	92											
8444105MSD	05:30	90											
8444103L	05:32	90											
8444089	05:34	113											
8444093	05:36	112											
CCV	05:38	104											
CCB	05:39	103											
8455248	05:41	109											
ZZZZZZ	05:43												
ZZZZZZ	05:45												
ZZZZZZ	05:47												
ZZZZZZ	05:49												
ZZZZZZ	05:50												
ZZZZZZ	05:52												
ZZZZZZ	05:54												
ZZZZZZ	05:56												

LEGEND:

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

FLAG:

R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:

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

Instrument ID: 19204

Start Date: 07/14/2016

Run Name: 1619603E05

End Date: 07/14/2016

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
ZZZZZZ	08:37												
CCV	08:39	88											
CCB	08:41	85											
ZZZZZZ	08:43												
ZZZZZZ	08:45												
ZZZZZZ	08:47												
LLC	08:48	85											
ICSA	08:50	74											
ICSAB	08:52	73											
ZZZZZZ	08:54												
CCV	08:56	85											
CCB	08:57	82											

LEGEND:

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

FLAG:

R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:

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

Instrument ID: 19204

Run Name: 1619603E05

Start Date: 07/14/2016

End Date: 07/14/2016

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
S0	07:38	100											
S	07:40	93											
CCS	07:41	99											
CCS	07:43	98											
ICV	07:45	97											
ICB	07:47	97											
LLC	07:49	100											
ICSA	07:50	86											
ICSAB	07:52	82											
ZZZZZZ	07:54												
CCV	07:56	92											
CCB	07:58	92											
P19437AB	08:00	104											
P19437AQ	08:01	105											
8444078BKG	08:03	104											
8444078A	08:05	104											
8444081DUP	08:07	102											
8444079MS	08:09	98											
8444080MSD	08:10	98											
8444078L	08:12	97											
8444052	08:14	99											
8444056	08:16	100											
CCV	08:18	96											
CCB	08:19	93											
8444060	08:21	96											
8444064	08:23	92											
8444068	08:25	93											
ZZZZZZ	08:27												
ZZZZZZ	08:28												
ZZZZZZ	08:30												
ZZZZZZ	08:32												
ZZZZZZ	08:34												
ZZZZZZ	08:36												

LEGEND:

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

FLAG:

R = Internal Standard Relative Intensity OOS

INTERNAL STANDARD ELEMENTS:

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

Tune Report

Extract 1	0.0 V	Omega Lens	6.1 V	Deflect	16.8 V
Extract 2	-160.0 V	Cell Entrance	-30 V	Plate Bias	-40 V
Mass	Peak	Axis	Axis	Axis	Axis
	Height	(Actual)	(Required)	(Flag)	
Omega Bias	-75 V	Cell Exit	-50 V		
 ## Cell Parameters ##					
OctP Bias	-6.0 V	He Flow	0.0 mL/min	Energy Discrimination	5.0 V
OctP RF	200 V	H2 Flow	0.0 mL/min		
Use Gas	false	3rd Gas Flow	0 %		

Tune Report

Batch Folder D:\Agilent\ICPMH\1\DATA\~EPATUNE.b
Report Comment ICP-MS #19204 (E05) Daily Tune Check
Instrument Name G3281A JP12071581

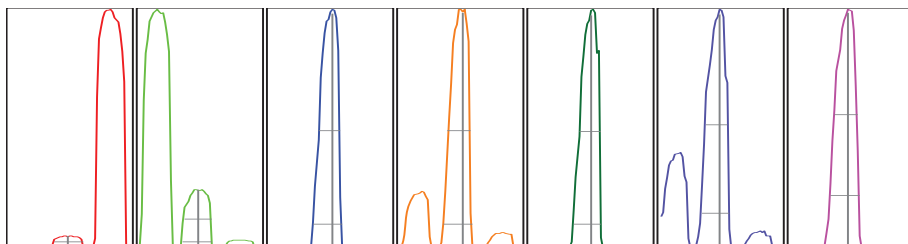
[No Gas]

Mass	Range	Count (Actual)	Response (Actual) [cps/ug/l]	Response (Required) [cps/ug/l]	Response (Flag)	Resp Ratio (Actual)	Resp Ratio (Required)	Resp Ratio (Flag)
6		9253	9253.02			NaN	-	
24		20585	20585.38			NaN	-	
103		41440	41440.22			NaN	-	
115		43240	43239.53			NaN	-	
140		45071	45070.56			NaN	-	
208		24557	24557.07			NaN	-	
238		52357	52356.73			NaN	-	

Mass	RSD% (Actual)	RSD% (Required)	RSD% (Flag)	Background (Actual)	Background (Required)	Background (Flag)
6	0.96	5.00				
24	0.84	5.00				
103	1.05	5.00				
115	1.17	5.00				
140	0.74	5.00				
208	0.91	5.00				
238	0.93	5.00				

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
6	9126	9200	9279	9344	9316
24	20367	20518	20548	20661	20833
103	40951	41229	41251	41737	42034
115	42471	43152	43185	43648	43741
140	44592	44968	45024	45402	45367
208	24332	24376	24503	24730	24845
238	51656	52058	52539	52743	52788

Integration Time [sec] 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	W-50%	W-X% (Actual)	W-X% (Required)	W-X% (Flag)
6	1396.01	5.95	5.9 - 6.1		0.69	0.772	0.900	
24	3312.17	23.95	23.9 - 24.1		0.66	0.736	0.900	
103	8019.04	103.05	102.9 - 103.1		0.52	0.680	0.900	
115	8313.39	115.05	114.9 - 115.1		0.53	0.668	0.900	
140	8862.35	140.00	139.9 - 140.1		0.52	0.668	0.900	
208	4681.43	207.95	207.9 - 208.1		0.55	0.682	0.900	
238	9826.67	237.90	237.9 - 238.1		0.53	0.693	0.900	

X = 10 Integration Time [sec] 0.1 Acquisition Time [sec] 260.8 Y Axis Linear

Tune Parameters

Plasma Paramters

RF Power	1600 W	Carrier Gas	0.25 L/min	S/C Temp	20 °C
RF Matching	0.80 V	Option Gas	0.0 %	Makeup/Dilution Gas	0.80 L/min
Smpl Depth	8.0 mm	Nebulizer Pump	0.10 rps	Gas Switch	Dilution Gas

Lenses Parameters

Tune Report

Extract 1	0.0 V	Omega Lens	6.1 V	Deflect	16.8 V
Extract 2	-160.0 V	Cell Entrance	-30 V	Plate Bias	-40 V
Mass	Peak	Axis	Axis	W-50%	W-X%
	Height	(Actual)	(Required)	(Flag)	(Actual)
					(Required)
					(Flag)
Omega Bias	-75 V	Cell Exit	-50 V		
 ## Cell Parameters ##					
OctP Bias	-6.0 V	He Flow	0.0 mL/min	Energy Discrimination	5.0 V
OctP RF	200 V	H2 Flow	0.0 mL/min		
Use Gas	false	3rd Gas Flow	0 %		

Tune Report

Batch Folder D:\Agilent\ICPMH\1\DATA\~EPATUNE.b
 Report Comment ICP-MS #19204 (E05) Daily Tune Check
 Instrument Name G3281A JP12071581

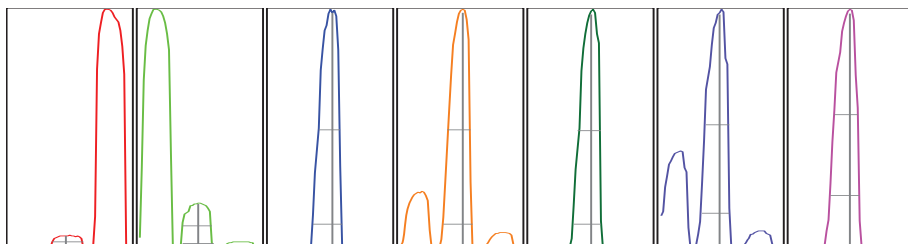
[No Gas]

Mass	Range	Count (Actual)	Response (Actual) [cps/ug/l]	Response (Required) [cps/ug/l]	Response (Flag)	Resp Ratio (Actual)	Resp Ratio (Required)	Resp Ratio (Flag)
6		11922	11921.94			NaN	-	
24		26325	26324.68			NaN	-	
103		47889	47888.82			NaN	-	
115		49696	49696.02			NaN	-	
140		51754	51754.29			NaN	-	
208		28112	28112.47			NaN	-	
238		60261	60261.11			NaN	-	

Mass	RSD% (Actual)	RSD% (Required)	RSD% (Flag)	Background (Actual)	Background (Required)	Background (Flag)
6	1.37	5.00				
24	2.06	5.00				
103	2.50	5.00				
115	2.89	5.00				
140	3.15	5.00				
208	2.46	5.00				
238	2.79	5.00				

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
6	11700	11865	12061	12102	11883
24	25514	26046	26690	26530	26843
103	46028	47541	48117	48613	49145
115	47519	49073	50237	50471	51180
140	49203	51111	52714	52475	53269
208	27155	27720	28367	28365	28955
238	57797	59897	60341	60826	62444

Integration Time [sec] 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	W-50%	W-X% (Actual)	W-X% (Required)	W-X% (Flag)
6	1745.87	5.90	5.9 - 6.1		0.72	0.785	0.900	
24	4100.47	23.95	23.9 - 24.1		0.68	0.752	0.900	
103	9002.28	103.05	102.9 - 103.1		0.54	0.701	0.900	
115	9319.64	115.05	114.9 - 115.1		0.55	0.698	0.900	
140	9855.23	140.00	139.9 - 140.1		0.53	0.683	0.900	
208	5213.44	207.95	207.9 - 208.1		0.56	0.694	0.900	
238	11004.70	237.95	237.9 - 238.1		0.56	0.705	0.900	

X = 10 Integration Time [sec] 0.1 Acquisition Time [sec] 260.8 Y Axis Linear

Tune Parameters

Plasma Paramters

RF Power	1600 W	Carrier Gas	0.25 L/min	S/C Temp	20 °C
RF Matching	0.80 V	Option Gas	0.0 %	Makeup/Dilution Gas	0.80 L/min
Smpl Depth	8.0 mm	Nebulizer Pump	0.10 rps	Gas Switch	Dilution Gas

Lenses Parameters

Method: P
Instrument ID: 18255
Date: 07/2016

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:

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)	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

Method: P
Instrument ID: 11016
Date: 07/2016

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			
Silver	328.06	10.00	10000.0
Sodium			
Vanadium			
Zinc			

Comments:

METHODS:

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

Instrument ID: 18255
Date: 03/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for:				
		TH	TI	V	W	ZR
Aluminum	308.21	0.0000000	0.0000000	0.0297620	0.0000000	0.0000000
Antimony	206.83	0.0000000	0.0000000	-0.0042860	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	455.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0008740
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	0.0021110	0.0000000	0.0000000	0.0000000
Copper	327.40	0.0000000	-0.0028080	0.0000000	0.0000000	-0.0011050
Lead	220.35	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
Selenium	196.09	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.06	0.0000000	0.0000000	0.0000000	0.0000000	0.0022630
Vanadium	292.40	0.0000000	0.0007000	0.0000000	0.0000000	0.0000000
Zinc	213.86	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

Instrument ID: 18255
Date: 03/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for:				
		CO	CR	MO	NI	SN
Aluminum	308.21	0.0000000	0.0000000	0.0222270	0.0000000	0.0000000
Antimony	206.83	0.0000000	0.0091000	0.0000000	0.0000000	-0.0210000
Arsenic	189.04	0.0000000	0.0000000	0.0009090	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	0.0000000
Copper	327.40	0.0000000	0.0000000	-0.0012910	0.0000000	0.0000000
Lead	220.35	0.0000000	0.0000000	-0.0025910	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
Selenium	196.09	0.0000000	0.0021000	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	-0.0181760	0.0000000	0.0000000
Zinc	213.86	0.0000000	0.0000000	0.0000000	0.0074210	0.0000000

Comments:

Instrument ID: 18255
Date: 03/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for:				
		AL	CA	FE	MG	AG
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.83	0.0000000	0.0000000	0.0000650	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	-0.0001890	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	0.0000500	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	0.0000300	0.0000000	0.0000000	0.0000000
Lead	220.35	0.0003320	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
Selenium	196.09	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.06	0.0000000	0.0000000	-0.0003830	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	213.86	0.0000000	0.0000000	0.0000980	0.0000000	0.0000000

Comments:

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:

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:

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:

Instrument ID: 11016

Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for:				
		TI	ZR	--	--	--
Silver	328.06	-0.0002270	0.0065740			

Comments:

Instrument ID: 11016

Date: 02/2016

Analyte	Wavelength (nm)	Interelement Correction Factor for:				
		AL	CA	FE	MG	TH
Silver	328.06	0.0000000	0.0000000	-0.0001830	0.0000000	-0.0133000

Comments:



Lancaster Laboratories
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QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD88
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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 10 MDL
METHOD DETECTION LIMITS (ANNUALLY)
SDG No.: DWD88
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



Method: P
Date: 06/2016

Analyte	Wavelength (nm)	Background	LOQ (UG/L)	MDL (UG/L)
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Nickel				
Potassium				
Selenium				
Silver	328.06		10.0	1.5
Sodium				
Vanadium				
Zinc				

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



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			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

Method: CV
Instrument ID: 19302
Date: 07/2016

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

Method: MS
Instrument ID: 19204
Date: 07/2016

Analyte	MASS (amu)	Background	IDL (UG/L)
Thallium	203		0.049

Comments:

METHODS:

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

Method: P
Instrument ID: 23745
Date: 07/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Magnesium			
Manganese			
Nickel			
Potassium			
Selenium			
Silver			0.70
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: 18255
Date: 07/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Aluminum	308.21		33.4
Antimony	206.83		6.4
Arsenic	189.04		7.2
Barium	455.40		0.33
Beryllium	313.04		0.67
Cadmium	226.50		0.36
Calcium	317.93		33.4
Chromium	267.72		0.94
Cobalt	228.62		0.75
Copper	327.40		1.7
Iron	261.19		33.4
Lead	220.35		5.4
Magnesium	285.21		16.7
Manganese	257.61		0.83
Nickel	231.60		1.5
Potassium	766.49		83.4
Selenium	196.09		8.6
Silver	328.06		0.83
Sodium	589.59		167
Vanadium	292.40		0.58
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: 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: P
Instrument ID: 11016
Date: 07/2016

Analyte	Wavelength (nm)	Background	IDL (UG/L)
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Magnesium			
Manganese			
Nickel			
Potassium			
Selenium			
Silver	328.06		0.73
Sodium			
Vanadium			
Zinc			

Comments:

METHODS:

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

QUALITY ASSURANCE SUMMARY

FORM 9

SERIAL DILUTIONS

SDG No.: DWD88

Matrix: SOIL

Level (low/med): LOW

Background Lab Sample ID: 8444103BKG

Serial Dilution Lab Sample ID: 8444103L

Batch Number(s): 161950637002

Concentration Units: UG/L

Analyte	Mass	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Diff.	Q	M
Aluminum		13358.3400		13541.1500		1		P
Antimony		7.0000	U	35.0000	U			P
Arsenic		9.7000	U	48.5000	U			P
Barium		40.4700		41.1500	B	2		P
Beryllium		0.6700	U	3.3500	U			P
Cadmium		0.4900	U	2.4500	U			P
Calcium		734.4600		729.7500	B	1		P
Chromium		15.9100	B	19.3000	B	21		P
Cobalt		1.2000	U	6.0000	U			P
Copper		7.8700	B	11.5000	U	100		P
Iron		3515.7800		3552.3000		1		P
Lead		58.8000		84.3500	B	43		P
Magnesium		504.4300		492.6500	B	2		P
Manganese		36.9600		36.8000	B	0		P
Nickel		3.9000	B	15.0000	U	100		P
Potassium		421.6900	B	1195.0000	U	100		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		17.2300		13.8000	B	20		P
Zinc		29.5000	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

QUALITY ASSURANCE SUMMARY

FORM 9

SERIAL DILUTIONS

SDG No.: DWD88

Matrix: SOIL

Level (low/med): LOW

Background Lab Sample ID: 8444078BKG

Serial Dilution Lab Sample ID: 8444078L

Batch Number(s): 161940637001

Concentration Units: UG/L

Analyte	Mass	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Diff.	Q	M
Aluminum		6087.3800		5902.0000		3		P
Antimony		7.0000	U	35.0000	U			P
Arsenic		9.7000	U	48.5000	U			P
Barium		31.1800		31.9000	B	2		P
Beryllium		0.6700	U	3.3500	U			P
Cadmium		0.4900	U	2.4500	U			P
Calcium		9348.8800		9310.7000		0		P
Chromium		11.1200	B	12.3500	B	11		P
Cobalt		1.2000	U	6.0000	U			P
Copper		32.1000		31.2000	B	3		P
Iron		3063.7700		3053.8500		0		P
Lead		31.7300		27.5000	U	100		P
Magnesium		1265.8700		1287.6500		2		P
Manganese		260.6200		263.1500		1		P
Nickel		3.0000	U	15.0000	U			P
Potassium		878.1100	B	1195.0000	U	100		P
Selenium		9.0000	U	45.0000	U			P
Silver		1.5000	U	7.5000	U			P
Sodium		257.5200	B	1195.0000	U	100		P
Thallium	203	0.1450	U	0.7250	U			MS
Vanadium		16.8300		13.0000	B	23		P
Zinc		33.1200	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

Analyte	Mass	Batch Number	Units	True	Found	C	Control Limits (%)	%R	M	In Spec
Aluminum		161950637002	MG/KG	200.000	194.302		80 - 120	97	P	Yes
Antimony		161950637002	MG/KG	50.000	46.503		80 - 120	93	P	Yes
Arsenic		161950637002	MG/KG	15.000	13.535		80 - 120	90	P	Yes
Barium		161950637002	MG/KG	200.000	196.879		80 - 120	98	P	Yes
Beryllium		161950637002	MG/KG	5.000	4.848		80 - 120	97	P	Yes
Cadmium		161950637002	MG/KG	5.000	4.828		80 - 120	97	P	Yes
Calcium		161950637002	MG/KG	400.000	389.673		80 - 120	97	P	Yes
Chromium		161950637002	MG/KG	20.000	18.939		80 - 120	95	P	Yes
Cobalt		161950637002	MG/KG	50.000	49.132		80 - 120	98	P	Yes
Copper		161950637002	MG/KG	25.000	25.059		80 - 120	100	P	Yes
Iron		161950637002	MG/KG	100.000	97.738		80 - 120	98	P	Yes
Lead		161950637002	MG/KG	15.000	14.813		80 - 120	99	P	Yes
Magnesium		161950637002	MG/KG	200.000	197.496		80 - 120	99	P	Yes
Manganese		161950637002	MG/KG	50.000	49.550		80 - 120	99	P	Yes
Mercury		161950638002	MG/KG	0.100	0.095		80 - 120	95	CV	Yes
Nickel		161950637002	MG/KG	50.000	49.286		80 - 120	99	P	Yes
Potassium		161950637002	MG/KG	1000.000	987.073		80 - 120	99	P	Yes
Selenium		161950637002	MG/KG	15.000	13.467		80 - 120	90	P	Yes
Silver		161950637002	MG/KG	5.000	5.259		80 - 120	105	P	Yes
Sodium		161950637002	MG/KG	1000.000	994.964		80 - 120	99	P	Yes
Thallium	203	161950637002	MG/KG	0.200	0.214		80 - 120	107	MS	Yes
Vanadium		161950637002	MG/KG	50.000	48.025		80 - 120	96	P	Yes
Zinc		161950637002	MG/KG	50.000	47.295		80 - 120	95	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

Analyte	Mass	Batch Number	Units	True	Found	C	Control Limits (%)	%R	M	In Spec
Aluminum		161940637001	MG/KG	200.000	209.062		80 - 120	105	P	Yes
Antimony		161940637001	MG/KG	50.000	49.595		80 - 120	99	P	Yes
Arsenic		161940637001	MG/KG	15.000	16.108		80 - 120	107	P	Yes
Barium		161940637001	MG/KG	200.000	203.204		80 - 120	102	P	Yes
Beryllium		161940637001	MG/KG	5.000	5.117		80 - 120	102	P	Yes
Cadmium		161940637001	MG/KG	5.000	5.068		80 - 120	101	P	Yes
Calcium		161940637001	MG/KG	400.000	431.203		80 - 120	108	P	Yes
Chromium		161940637001	MG/KG	20.000	19.925		80 - 120	100	P	Yes
Cobalt		161940637001	MG/KG	50.000	50.681		80 - 120	101	P	Yes
Copper		161940637001	MG/KG	25.000	27.108		80 - 120	108	P	Yes
Iron		161940637001	MG/KG	100.000	100.000		80 - 120	100	P	Yes
Lead		161940637001	MG/KG	15.000	14.823		80 - 120	99	P	Yes
Magnesium		161940637001	MG/KG	200.000	208.649		80 - 120	104	P	Yes
Manganese		161940637001	MG/KG	50.000	51.526		80 - 120	103	P	Yes
Mercury		161820638002	MG/KG	0.100	0.094		80 - 120	94	CV	Yes
Nickel		161940637001	MG/KG	50.000	51.411		80 - 120	103	P	Yes
Potassium		161940637001	MG/KG	1000.000	1046.008		80 - 120	105	P	Yes
Selenium		161940637001	MG/KG	15.000	15.579		80 - 120	104	P	Yes
Silver		161940637001	MG/KG	5.000	5.061		80 - 120	101	P	Yes
Sodium		161940637001	MG/KG	1000.000	1032.677		80 - 120	103	P	Yes
Thallium	203	161940637001	MG/KG	0.200	0.179	B	80 - 120	90	MS	Yes
Vanadium		161940637001	MG/KG	50.000	50.699		80 - 120	101	P	Yes
Zinc		161940637001	MG/KG	50.000	50.740		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



Lancaster Laboratories
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QUALITY ASSURANCE SUMMARY

FORM 6

DUPLICATES

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444103BKG

Duplicate Lab Sample ID: 8444106DUP

Batch Number(s): 161950637002

Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum			1322.6079		1244.0314		6		P
Antimony			0.6931	U	0.6863	U			P
Arsenic			0.9604	U	0.9510	U			P
Barium		1.0	4.0069		3.6686		9		P
Beryllium			0.0663	U	0.0657	U			P
Cadmium			0.0485	U	0.0480	U			P
Calcium		39.6	72.7188		74.7461		3		P
Chromium			1.5752	B	1.4520	B	8		P
Cobalt			0.1188	U	0.1176	U			P
Copper			0.7792	B	0.7294	B	7		P
Iron			348.0970		328.3020		6		P
Lead		3.0	5.8218		5.0873		13		P
Magnesium		19.8	49.9436		46.5402		7		P
Manganese		1.0	3.6594		2.6304		33	*	P
Nickel			0.3861	B	0.3451	B	11		P
Potassium			41.7515	B	40.6814	B	3		P
Selenium			0.8911	U	0.8824	U			P
Silver			0.1485	U	0.1510	B	200		P
Sodium			23.6634	U	23.4314	U			P
Thallium	203		0.0287	U	0.0284	U			MS
Vanadium		1.0	1.7059		1.3716		22		P
Zinc			2.9208	B	3.2657	B	11		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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 6

DUPLICATES

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444096BKG

Duplicate Lab Sample ID: 8444102DUP

Batch Number(s): 161950638002

Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Mercury			0.0305	B	0.0305	B	0		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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 6

DUPLICATES

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444078BKG

Duplicate Lab Sample ID: 8444081DUP

Batch Number(s): 161940637001

Concentration Units: MG/KG

Analyte	Mass	Control Limit	Samples (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum			608.7380		594.4260		2		P
Antimony			0.7000	U	0.6731	U			P
Arsenic			0.9700	U	0.9327	U			P
Barium		1.0	3.1180		2.9971		4		P
Beryllium			0.0670	U	0.0644	U			P
Cadmium			0.0490	U	0.0471	U			P
Calcium			934.8880		860.9452		8		P
Chromium			1.1120	B	1.0587	B	5		P
Cobalt			0.1200	U	0.1154	U			P
Copper		2.0	3.2100		3.2298		1		P
Iron			306.3770		298.8760		2		P
Lead		3.0	3.1730		2.9750		6		P
Magnesium			126.5870		119.5144		6		P
Manganese			26.0620		23.3231		11		P
Nickel			0.3000	U	0.2885	U			P
Potassium			87.8110	B	84.6798	B	4		P
Selenium			0.9000	U	0.8654	U			P
Silver			0.1500	U	0.1442	U			P
Sodium			25.7520	B	24.2288	B	6		P
Thallium	203		0.0290	U	0.0279	U			MS
Vanadium		1.0	1.6830		1.6231		4		P
Zinc			3.3120	B	2.8558	B	15		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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 6

DUPLICATES

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444071BKG

Duplicate Lab Sample ID: 8444077DUP

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 5B

POST DIGEST SPIKE SAMPLE RECOVERY

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444103BKG

Post Digest Spike Lab Sample ID: 8444103A

Batch Number(s): 161950637002

Concentration Units: UG/L

Analyte	Mass	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	Q	M
Iron			3989.4800	3515.7800	500.0000	95		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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 5B

POST DIGEST SPIKE SAMPLE RECOVERY

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444078BKG

Post Digest Spike Lab Sample ID: 8444078A

Batch Number(s): 161940637001

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			6982.5400	6087.3800	1000.0000	90		P
Calcium			10153.2900	9348.8800	1000.0000	80		P
Iron			3501.9900	3063.7700	500.0000	88		P
Thallium	203		1.0460	0.1450 U	1.0000	105		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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 5A (MS/MSD)

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444103BKG Matrix Spike Lab Sample ID: 8444104MS Matrix Spike Duplicate Lab Sample ID: 8444105MSD
Batch Number(s): 161950637002

Analyte	Mass	BKG Sample		MS Sample		MSD Sample		MS Spike Added	MSD Spike Added	Units	MS		MSD		RPD	Control Limit		M
		Result	C	Result	C	Result	C				%R	Q	%R	Q		%R	RPD	
Aluminum		1322.6079		1614.7920		1921.2620		200.0000	200.0000	MG/KG	146		299		17			20P
Antimony		0.6931	U	44.2830		43.7040		50.0000	50.0000	MG/KG	89		87		1	75 - 125		20P
Arsenic		0.9604	U	13.3400		13.0480		15.0000	15.0000	MG/KG	89		87		2	75 - 125		20P
Barium		4.0069		198.2530		202.1180		200.0000	200.0000	MG/KG	97		99		2	75 - 125		20P
Beryllium		0.0663	U	4.9040		5.0240		5.0000	5.0000	MG/KG	98		100		2	75 - 125		20P
Cadmium		0.0485	U	4.7850		4.7520		5.0000	5.0000	MG/KG	96		95		1	75 - 125		20P
Calcium		72.7188		445.5300		456.4100		400.0000	400.0000	MG/KG	93		96		2	75 - 125		20P
Chromium		1.5752	B	19.9880		20.5280		20.0000	20.0000	MG/KG	92		95		3	75 - 125		20P
Cobalt		0.1188	U	48.3990		48.0910		50.0000	50.0000	MG/KG	97		96		1	75 - 125		20P
Copper		0.7792	B	25.4400		26.4080		25.0000	25.0000	MG/KG	99		103		4	75 - 125		20P
Iron		348.0970		415.6920		478.1320		100.0000	100.0000	MG/KG	68	N	130	N	14	75 - 125		20P
Lead		5.8218		18.9950		19.2900		15.0000	15.0000	MG/KG	88		90		2	75 - 125		20P
Magnesium		49.9436		249.7490		261.4470		200.0000	200.0000	MG/KG	100		106		5	75 - 125		20P
Manganese		3.6594		51.9790		52.7310		50.0000	50.0000	MG/KG	97		98		1	75 - 125		20P
Nickel		0.3861	B	48.8980		48.7880		50.0000	50.0000	MG/KG	97		97		0	75 - 125		20P
Potassium		41.7515	B	1041.0240		1039.7430		1000.0000	1000.0000	MG/KG	100		100		0	75 - 125		20P
Selenium		0.8911	U	12.7110		13.4180		15.0000	15.0000	MG/KG	85		89		5	75 - 125		20P
Silver		0.1485	U	5.2650		5.2050		5.0000	5.0000	MG/KG	105		104		1	75 - 125		20P
Sodium		23.6634	U	997.4900		993.5450		1000.0000	1000.0000	MG/KG	100		99		0	75 - 125		20P
Thallium	203	0.0287	U	0.3774		0.3862		0.4000	0.4000	MG/KG	94		97		2	75 - 125		20MS
Vanadium		1.7059		49.1040		50.0720		50.0000	50.0000	MG/KG	95		97		2	75 - 125		20P
Zinc		2.9208	B	49.2560		49.9280		50.0000	50.0000	MG/KG	93		94		1	75 - 125		20P

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

METHODS:		CONCENTRATION QUALIFIERS:	
P = ICP Atomic Emission Spectrometer	CV = Cold Vapor	U = Below MDL, B= Below LOQ	
MS = ICP Mass Spectrometry	AF = Cold Vapor Atomic Fluorescence	FLAGS:	
DWD88 Page 868 of 974		N = Matrix Spike OOS, * = Duplicate OOS	



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 5A (MS/MSD)

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444096BKG Matrix Spike Lab Sample ID: 8444097MS Matrix Spike Duplicate Lab Sample ID: 8444098MSD
Batch Number(s): 161950638002

Analyte	Mass	BKG Sample		MS Sample		MSD Sample		MS Spike Added	MSD Spike Added	Units	MS		MSD		RPD	Q	Control Limit		M
		Result	C	Result	C	Result	C				%R	Q	%R	Q			%R	RPD	
Mercury		0.0305	B	0.1994		0.1765		0.1667	0.1538	MG/KG	101		95		12		80 - 120	20	CV

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

METHODS:		CONCENTRATION QUALIFIERS:	
P = ICP Atomic Emission Spectrometer	CV = Cold Vapor	U= Below MDL, B= Below LOQ	
MS = ICP Mass Spectrometry	AF = Cold Vapor Atomic Fluorescence	FLAGS:	
DWD88 Page 867 of 974		N = Matrix Spike OOS, * = Duplicate OOS	



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 5A (MS/MSD)

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444078BKG Matrix Spike Lab Sample ID: 8444079MS Matrix Spike Duplicate Lab Sample ID: 8444080MSD
Batch Number(s): 161940637001

Analyte	Mass	BKG Sample		MS Sample		MSD Sample		MS Spike Added	MSD Spike Added	Units	MS		MSD		RPD	Control Limit		M
		Result	C	Result	C	Result	C				%R	Q	%R	Q		%R	RPD	
Aluminum		608.7380		1059.3495		973.4879		198.0198	186.9159	MG/KG	228	N	195	N	8	75 - 125	20	P
Antimony		0.7000	U	45.6832		44.3486		49.5050	46.7290	MG/KG	92		95		3	75 - 125	20	P
Arsenic		0.9700	U	14.4465		14.3364		14.8515	14.0187	MG/KG	97		102		1	75 - 125	20	P
Barium		3.1180		204.7317		196.7019		198.0198	186.9159	MG/KG	102		104		4	75 - 125	20	P
Beryllium		0.0670	U	5.1079		4.9206		4.9505	4.6729	MG/KG	103		105		4	75 - 125	20	P
Cadmium		0.0490	U	5.0812		4.8729		4.9505	4.6729	MG/KG	103		104		4	75 - 125	20	P
Calcium		934.8880		1280.1950		1137.8645		396.0396	373.8318	MG/KG	87		54	N	12	75 - 125	20	P
Chromium		1.1120	B	20.9683		19.9813		19.8020	18.6916	MG/KG	100		101		5	75 - 125	20	P
Cobalt		0.1200	U	50.2950		48.4224		49.5050	46.7290	MG/KG	102		104		4	75 - 125	20	P
Copper		3.2100		29.1139		27.7720		24.7525	23.3645	MG/KG	105		105		5	75 - 125	20	P
Iron		306.3770		393.5158		351.2187		99.0099	93.4579	MG/KG	88		48	N	11	75 - 125	20	P
Lead		3.1730		18.6574		17.0168		14.8515	14.0187	MG/KG	104		99		9	75 - 125	20	P
Magnesium		126.5870		332.7812		309.5252		198.0198	186.9159	MG/KG	104		98		7	75 - 125	20	P
Manganese		26.0620		74.6703		71.0935		49.5050	46.7290	MG/KG	98		96		5	75 - 125	20	P
Nickel		0.3000	U	50.9871		49.1028		49.5050	46.7290	MG/KG	103		105		4	75 - 125	20	P
Potassium		87.8110	B	1127.2396		1079.4692		990.0990	934.5794	MG/KG	105		106		4	75 - 125	20	P
Selenium		0.9000	U	14.0059		13.3084		14.8515	14.0187	MG/KG	94		95		5	75 - 125	20	P
Silver		0.1500	U	4.9802		4.7355		4.9505	4.6729	MG/KG	101		101		5	75 - 125	20	P
Sodium		25.7520	B	1053.3683		1007.3215		990.0990	934.5794	MG/KG	104		105		4	75 - 125	20	P
Thallium	203	0.0290	U	0.5842		0.5121		0.3960	0.3738	MG/KG	148	N	137	N	13	75 - 125	20	MS
Vanadium		1.6830		51.8010		49.5393		49.5050	46.7290	MG/KG	101		102		4	75 - 125	20	P
Zinc		3.3120	B	52.6158		50.4411		49.5050	46.7290	MG/KG	100		101		4	75 - 125	20	P

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

METHODS:		CONCENTRATION QUALIFIERS:	
P = ICP Atomic Emission Spectrometer	CV = Cold Vapor	U = Below MDL, B= Below LOQ	
MS = ICP Mass Spectrometry	AF = Cold Vapor Atomic Fluorescence	FLAGS:	
DWD88 Page 866 of 974		N = Matrix Spike OOS, * = Duplicate OOS	



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 5A (MS/MSD)

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Background Lab Sample ID: 8444071BKG Matrix Spike Lab Sample ID: 8444072MS Matrix Spike Duplicate Lab Sample ID: 8444073MSD
Batch Number(s): 161820638002

Analyte	Mass	BKG Sample		MS Sample		MSD Sample		MS Spike Added	MSD Spike Added	Units	MS		MSD		RPD	Q	Control Limit		M
		Result	C	Result	C	Result	C				%R	Q	%R	Q			%R	RPD	
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:		CONCENTRATION QUALIFIERS:	
P = ICP Atomic Emission Spectrometer	CV = Cold Vapor	U= Below MDL, B= Below LOQ	
MS = ICP Mass Spectrometry	AF = Cold Vapor Atomic Fluorescence	FLAGS:	
DWD88 Page 865 of 974		N = Matrix Spike OOS, * = Duplicate OOS	

Instrument ID: 19204
Run Name: 1619701E05
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	99903	99.9	101993.5	102.0
Calcium	44	300000	300000	277677	92.6	279842.1	93.3
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	235961	94.4	240808.7	96.3
Magnesium	24	100000	100000	91449	91.4	93366.7	93.4
Molybdenum	98	2000	2000	2023	101.2	1971.6	98.6
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	100357	100.4	102071.7	102.1
Sodium	23	250000	250000	231281	92.5	237218.4	94.9
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2253	112.7	2284.1	114.2

Control Limits: All Metals 80%-120%

Instrument ID: 19204
Run Name: 1619701E05
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	101562	101.6	101396.7	101.4
Calcium	44	300000	300000	278812	92.9	277271.6	92.4
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	240672	96.3	241051.9	96.4
Magnesium	24	100000	100000	92682	92.7	93724.0	93.7
Molybdenum	98	2000	2000	2025	101.3	2003.0	100.2
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	101663	101.7	101462.0	101.5
Sodium	23	250000	250000	238853	95.5	237252.8	94.9
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.0	
Titanium	47	2000	2000	2229	111.5	2254.5	112.7

Control Limits: All Metals 80%-120%

Instrument ID: 19204
Run Name: 1619603E05
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	110174	110.2	110898.9	110.9
Calcium	44	300000	300000	325327	108.4	322762.9	107.6
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	264082	105.6	264113.3	105.6
Magnesium	24	100000	100000	106761	106.8	106650.9	106.7
Molybdenum	98	2000	2000	2147	107.4	2113.5	105.7
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	110739	110.7	110270.4	110.3
Sodium	23	250000	250000	263481	105.4	263881.2	105.6
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.5	
Titanium	47	2000	2000	2338	116.9	2240.7	112.0

Control Limits: All Metals 80%-120%

Instrument ID: 19204
Run Name: 1619603E05
Concentration Units: ug/L

Analyte	Mass	True		Found			
		Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum	27	100000	100000	102104	102.1	105735.3	105.7
Calcium	44	300000	300000	301003	100.3	309239.0	103.1
Carbon	13	20000	20000	NA		NA	
Chloride	37	100000	100000	NA		NA	
Iron	57	250000	250000	242604	97.0	252365.4	100.9
Magnesium	24	100000	100000	96422	96.4	101243.1	101.2
Molybdenum	98	2000	2000	2122	106.1	2102.6	105.1
Phosphorus	31	10000	10000	NA		NA	
Potassium	39	100000	100000	103600	103.6	106963.5	107.0
Sodium	23	250000	250000	240923	96.4	249424.7	99.8
Sulfur	34	10000	10000	NA		NA	
Thallium	203	0	0	0		0.3	
Titanium	47	2000	2000	2135	106.8	2224.5	111.2

Control Limits: All Metals 80%-120%



Instrument ID: 11016
Run Name: 1620007T70
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	522689	104.5	520554.6	104.1	526305	105.3	521712.7	104.3
Antimony										
Arsenic										
Barium										
Beryllium										
Cadmium										
Calcium	500000	500000	512344	102.5	512204.5	102.4	512919	102.6	512439.1	102.5
Chromium										
Cobalt										
Copper										
Iron	200000	200000	207477	103.7	206589.0	103.3	206733	103.4	205391.4	102.7
Lead										
Magnesium	500000	500000	507383	101.5	503545.5	100.7	504898	101.0	499307.1	99.9
Manganese										
Nickel										
Potassium										
Selenium										
Silver	0	200	7		223.6	111.8	8		227.3	113.7
Sodium										
Vanadium										
Zinc										

Control Limits: All Metals 80%-120%

Instrument ID: 23745
Run Name: 1619706T74
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	471843	94.4	474418.8	94.9	476944	95.4	471436.4	94.3
Antimony										
Arsenic										
Barium										
Beryllium										
Cadmium										
Calcium	500000	500000	477720	95.5	482862.6	96.6	481725	96.3	474875.5	95.0
Chromium										
Cobalt										
Copper										
Iron	200000	200000	192042	96.0	193681.5	96.8	192611	96.3	189984.5	95.0
Lead										
Magnesium	500000	500000	516019	103.2	517845.7	103.6	517204	103.4	505628.7	101.1
Manganese										
Nickel										
Potassium										
Selenium										
Silver	0	200	5		228.9	114.5	4		225.9	113.0
Sodium										
Vanadium										
Zinc										

Control Limits: All Metals 80%-120%

Instrument ID: 18255
Run Name: 1619702T73
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	512299	102.5	517838.2	103.6	517209	103.4	524113.0	104.8
Antimony	0	600	19		640.0	106.7	17		644.4	107.4
Arsenic	0	100	3		98.6	98.6	13		113.9	113.9
Barium	0	500	4		521.0	104.2	4		529.9	106.0
Beryllium	0	500	0		515.0	103.0	0		527.5	105.5
Cadmium	0	1000	-2		948.1	94.8	-2		954.9	95.5
Calcium	500000	500000	506614	101.3	511835.4	102.4	507744	101.5	520170.9	104.0
Chromium	0	500	3		482.6	96.5	4		485.4	97.1
Cobalt	0	500	1		469.4	93.9	1		474.3	94.9
Copper	0	500	-6		533.5	106.7	-6		547.6	109.5
Iron	200000	200000	203001	101.5	205709.7	102.9	203760	101.9	207289.9	103.6
Lead	0	50	2		52.6	105.2	2		53.1	106.2
Magnesium	500000	500000	487503	97.5	493787.8	98.8	502682	100.5	509593.7	101.9
Manganese	0	500	1		494.4	98.9	1		505.2	101.0
Nickel	0	1000	4		923.0	92.3	4		926.7	92.7
Potassium	0	0	15		4.7		48		8.4	
Selenium	0	550	-7		596.5	108.5	6		572.2	104.0
Silver	0	200	0		222.7	111.4	-1		224.1	112.1
Sodium	0	0	326		336.5		292		316.2	
Vanadium	0	500	0		502.7	100.5	0		511.6	102.3
Zinc	0	1000	5		1033.8	103.4	5		1038.0	103.8

Control Limits: All Metals 80%-120%

Instrument ID: 16417
Run Name: 1619604T72
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	528627	105.7	531536.7	106.3	538359	107.7	538771.0	107.8
Antimony	0	600	-5		631.5	105.3	-3		632.1	105.4
Arsenic	0	100	-6		96.9	96.9	11		108.9	108.9
Barium	0	500	4		504.9	101.0	4		513.0	102.6
Beryllium	0	500	0		505.2	101.0	0		507.7	101.5
Cadmium	0	1000	-1		933.7	93.4	-1		935.2	93.5
Calcium	500000	500000	530550	106.1	533143.0	106.6	529961	106.0	533325.1	106.7
Chromium	0	500	8		487.9	97.6	8		492.9	98.6
Cobalt	0	500	0		456.0	91.2	0		459.3	91.9
Copper	0	500	2		528.2	105.6	2		535.5	107.1
Iron	200000	200000	212866	106.4	215167.2	107.6	213810	106.9	215662.8	107.8
Lead	0	50	-5		47.4	94.8	-2		48.4	96.8
Magnesium	500000	500000	530669	106.1	533304.1	106.7	533048	106.6	540296.9	108.1
Manganese	0	500	2		482.6	96.5	1		489.4	97.9
Nickel	0	1000	-3		897.4	89.7	-2		901.0	90.1
Potassium	0	0	19		95.4		-25		77.6	
Selenium	0	550	-8		565.0	102.7	-24		553.6	100.7
Silver	0	200	-5		216.9	108.5	-9		217.6	108.8
Sodium	0	0	227		250.2		250		256.6	
Vanadium	0	500	-1		512.8	102.6	-1		518.2	103.6
Zinc	0	1000	0		1013.5	101.4	0		1020.0	102.0

Control Limits: All Metals 80%-120%



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: CV

Run Name: 1619703M08

Calibration Date(s): 07/15/2016

Preparation Blank Matrix: SOIL

Analyte	Mass	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L)			C	Preparation Blank (MG/KG)			C	Batch Number
				1	C	2	C	3	C	Mass		
Mercury		0.050	U	0.050	U	0.050	U			0.010	U	161950638002

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: CV

Run Name: 1618401M08

Calibration Date(s): 07/02/2016

Preparation Blank Matrix: SOIL

Analyte	Mass	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L)			C	Preparation Blank (MG/KG)			C	Batch Number
				1	C	2	C	3	C	Mass		
Mercury		0.050	U	0.050	U	0.050	U	0.050	U	0.010	U	161820638002

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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Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: MS
Run Name: 1619701E05
Calibration Date(s): 07/15/2016

Analyte	Mass	Initial Calibration Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)		
			C	1	C	2	C	3	C	Mass	Batch Number
Thallium	203			0.049	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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: MS

Run Name: 1619701E05

Calibration Date(s): 07/15/2016

Preparation Blank Matrix: SOIL

Analyte	Mass	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L)			C	Preparation Blank (MG/KG)			C	Batch Number
				1	C	2	C	3	C	Mass		
Thallium	203	0.059	B	0.049	U	0.049	U	0.049	U	203	0.029	U161950637002A

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: MS
Run Name: 1619603E05
Calibration Date(s): 07/14/2016

Analyte	Mass	Initial Calibration Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)		
			C	1	C	2	C	3	C	Mass	Batch Number
Thallium	203			0.049	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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Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: MS

Run Name: 1619603E05

Calibration Date(s): 07/14/2016

Preparation Blank Matrix: SOIL

Analyte	Mass	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L)			C	Preparation Blank (MG/KG)			C	Batch Number
				1	C	2	C	3	C	Mass		
Thallium	203	0.074	B	0.054	B	0.049	U	0.049	U	203	0.029	U161940637001A

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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Environmental

QUALITY ASSURANCE SUMMARY

FORM 3

BLANKS

SDG No.: DWD88

Method: P

Run Name: 1620007T70

Calibration Date(s): 07/18/2016

Analyte	Mass	Initial Calibration Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)		
			C	1	C	2	C	3	C	Mass	Batch Number
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Nickel											
Potassium											
Selenium											
Silver		0.83 U		0.83 U		0.83 U		0.83 U			
Sodium											
Vanadium											
Zinc											

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY
FORM 3
BLANKS
SDG No.: DWD88

Method: P

Run Name: 1619706T74

Calibration Date(s): 07/15/2016

Preparation Blank Matrix: SOIL

Analyte	Mass	Initial Calibration Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)		
		C	1	C	2	C	3	C	Mass	C	Batch Number
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Nickel											
Potassium											
Selenium											
Silver		2.0B	1.7B	2.0B	1.7B		0.191B	161950637002			
Sodium											
Vanadium											
Zinc											

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



Method: P
Run Name: 1619702T73
Calibration Date(s): 07/15/2016

Analyte	Mass	Initial Calibration Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)				
			C	1	C	2	C	3	C	Mass		C	Batch Number
Aluminum				45.0	U								
Antimony				6.4	U								
Arsenic				7.2	U								
Barium				0.33	U								
Beryllium				0.67	U								
Cadmium				0.36	U								
Calcium				33.4	U								
Chromium				2.6	B								
Cobalt				0.75	U								
Copper				1.7	U								
Iron				33.4	U								
Lead				5.4	U								
Magnesium				16.7	U								
Manganese				0.83	U								
Nickel				1.5	U								
Potassium				83.4	U								
Selenium				8.6	U								
Silver				2.6	B								
Sodium				167	U								
Vanadium				-0.76	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

Method: P
Run Name: 1619702T73
Calibration Date(s): 07/15/2016
Preparation Blank Matrix: SOIL

Analyte	Mass	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)			
			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	161950637002
Antimony		6.4	U	6.4	U	6.4	U	6.4	U		0.700	U	161950637002
Arsenic		7.2	U	7.2	U	7.2	U	7.2	U		0.970	U	161950637002
Barium		0.33	U	0.33	U	0.33	U	0.33	U		0.033	U	161950637002
Beryllium		0.67	U	0.67	U	0.67	U	0.67	U		0.067	U	161950637002
Cadmium		0.36	U	0.36	U	0.36	U	0.36	U		0.049	U	161950637002
Calcium		33.4	U	33.4	U	33.4	U	33.4	U		5.700	U	161950637002
Chromium		2.2	B	2.6	B	2.6	B	2.6	B		0.140	U	161950637002
Cobalt		0.75	U	-1.0	B	-0.79	B	-0.87	B		0.120	U	161950637002
Copper		1.7	U	1.7	U	1.7	U	1.7	U		0.230	U	161950637002
Iron		33.4	U	33.4	U	33.4	U	33.4	U		4.100	U	161950637002
Lead		7.1	B	7.6	B	5.4	U	5.8	B		0.631	B	161950637002
Magnesium		16.7	U	16.7	U	16.7	U	16.7	U		1.900	U	161950637002
Manganese		0.83	U	0.83	U	0.83	U	0.83	U		0.083	U	161950637002
Nickel		1.5	U	1.5	U	1.5	U	1.5	U		0.300	U	161950637002
Potassium		83.4	U	83.4	U	83.4	U	83.4	U		23.900	U	161950637002
Selenium		-11.0	B	-8.6	B	8.6	U	8.6	U		0.900	U	161950637002
Silver		2.6	B	3.0	B	2.9	B	3.0	B				
Sodium		167	U	167	U	167	U	167	U		23.900	U	161950637002
Vanadium		-1.0	B	-0.86	B	-0.89	B	0.75	U		0.140	U	161950637002
Zinc		2.0	U	2.0	U	2.0	U	2.0	U		0.680	U	161950637002

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



Method: P
Run Name: 1619604T72
Calibration Date(s): 07/14/2016

Analyte	Mass	Initial Calibration Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank (MG/KG)		
			C	1	C	2	C	3	C	Mass	Batch Number
Aluminum				45.0	U						
Antimony				6.4	U						
Arsenic				7.2	U						
Barium				0.33	U						
Beryllium				0.67	U						
Cadmium				-0.37	B						
Calcium				33.4	U						
Chromium				0.94	U						
Cobalt				0.75	U						
Copper				1.7	U						
Iron				33.4	U						
Lead				5.4	U						
Magnesium				21.0	B						
Manganese				0.83	U						
Nickel				1.5	U						
Potassium				83.4	U						
Selenium				8.6	U						
Silver				0.83	U						
Sodium				167	U						
Vanadium				0.75	U						
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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 3

BLANKS

SDG No.: DWD88

Method: P

Run Name: 1619604T72

Calibration Date(s): 07/14/2016

Preparation Blank Matrix: SOIL

Analyte	Mass	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)				Preparation Blank (MG/KG)		
			C	1	C	2	C	3	C	Batch Number
Aluminum		45.0	U	45.0	U	45.0	U	45.0	U	8.943B161940637001
Antimony		6.4	U	6.4	U	6.4	U	6.4	U	0.700U161940637001
Arsenic		7.2	U	7.2	U	7.2	U	7.2	U	0.970U161940637001
Barium		0.33	U	0.33	U	0.33	U	0.33	U	0.082B161940637001
Beryllium		0.67	U	0.67	U	0.67	U	0.67	U	0.067U161940637001
Cadmium		0.36	U	0.36	U	-0.39	B	0.36	U	0.049U161940637001
Calcium		33.4	U	33.4	U	33.4	U	33.4	U	22.050B161940637001
Chromium		0.94	U	0.94	U	0.94	U	0.94	U	0.140U161940637001
Cobalt		0.75	U	0.75	U	0.75	U	0.75	U	0.120U161940637001
Copper		1.7	U	1.7	U	1.7	U	1.7	U	0.230U161940637001
Iron		33.4	U	33.4	U	33.4	U	33.4	U	4.100U161940637001
Lead		5.4	U	5.4	U	5.4	U	5.4	U	0.550U161940637001
Magnesium		16.7	U	21.2	B	16.7	U	16.7	U	2.813B161940637001
Manganese		0.83	U	0.83	U	0.83	U	0.83	U	0.083U161940637001
Nickel		1.5	U	1.5	U	1.5	U	1.5	U	0.300U161940637001
Potassium		83.4	U	83.4	U	83.4	U	83.4	U	23.900U161940637001
Selenium		8.6	U	8.6	U	8.6	U	8.6	U	0.900U161940637001
Silver		0.83	U	0.83	U	0.83	U	0.83	U	0.150U161940637001
Sodium		167	U	167	U	167	U	167	U	23.900U161940637001
Vanadium		0.75	U	0.75	U	0.75	U	0.75	U	0.140U161940637001
Zinc		2.0	U	2.0	U	2.0	U	2.0	U	0.680U161940637001

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

Method: CV

Run Name: 1619703M08

Calibration Date(s): 07/15/2016

Concentration Units: UG/L

Analyte	Mass	Initial			Final	
		True	Found	%R	Found	%R
Mercury		0.2	0.24	120.0		

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

Method: CV

Run Name: 1618401M08

Calibration Date(s): 07/02/2016

Concentration Units: UG/L

Analyte	Mass	Initial			Final	
		True	Found	%R	Found	%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

Method: MS

Run Name: 1619701E05

Calibration Date(s): 07/15/2016

Concentration Units: UG/L

Analyte	Mass	Initial			Final	
		True	Found	%R	Found	%R
Thallium	203	1.0	1.28	128.0	1.20	120.0

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

Method: MS

Run Name: 1619603E05

Calibration Date(s): 07/14/2016

Concentration Units: UG/L

Analyte	Mass	Initial			Final	
		True	Found	%R	Found	%R
Thallium	203	1.0	1.07	107.0	1.24	124.0

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

Method: P

Run Name: 1620007T70

Calibration Date(s): 07/18/2016

Concentration Units: UG/L

Analyte	Mass	Initial			Final	
		True	Found	%R	Found	%R
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Selenium						
Silver		10.0	9.53	95.3	9.51	95.1
Sodium						
Vanadium						
Zinc						

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

Method: P

Run Name: 1619706T74

Calibration Date(s): 07/15/2016

Concentration Units: UG/L

Analyte	Mass	Initial			Final	
		True	Found	%R	Found	%R
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Selenium						
Silver		10.0	11.95	119.5	11.80	118.0
Sodium						
Vanadium						
Zinc						

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

Method: P

Run Name: 1619702T73

Calibration Date(s): 07/15/2016

Concentration Units: UG/L

Analyte	Mass	Initial			Final	
		True	Found	%R	Found	%R
Aluminum		400.0	419.20	104.8	389.93	97.5
Antimony		40.0	41.03	102.6	40.28	100.7
Arsenic		40.0	33.81	84.5	34.18	85.5
Barium		10.0	10.09	100.9	10.22	102.2
Beryllium		10.0	9.86	98.6	10.02	100.2
Cadmium		10.0	10.07	100.7	10.20	102.0
Calcium		400.0	390.52	97.6	386.29	96.6
Chromium		30.0	30.22	100.7	29.58	98.6
Cobalt		10.0	9.23	92.3	9.47	94.7
Copper		20.0	20.13	100.7	20.74	103.7
Iron		400.0	396.57	99.1	397.79	99.4
Lead		30.0	36.64	122.1	34.75	115.8
Magnesium		200.0	194.11	97.1	200.55	100.3
Manganese		10.0	10.09	100.9	10.22	102.2
Nickel		20.0	20.51	102.6	20.76	103.8
Potassium		1000.0	1038.90	103.9	998.10	99.8
Selenium		40.0	34.89	87.2	32.64	81.6
Silver		10.0	12.81	128.1	12.71	127.1
Sodium		2000.0	2113.79	105.7	2114.91	105.7
Vanadium		10.0	8.72	87.2	9.01	90.1
Zinc		40.0	38.78	97.0	38.50	96.3

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

Method: P
Run Name: 1619604T72
Calibration Date(s): 07/14/2016
Concentration Units: UG/L

Analyte	Mass	Initial			Final	
		True	Found	%R	Found	%R
Aluminum		400.0	398.00	99.5	370.73	92.7
Antimony		40.0	39.18	98.0	37.91	94.8
Arsenic		40.0	37.13	92.8	41.64	104.1
Barium		10.0	10.41	104.1	10.42	104.2
Beryllium		10.0	9.95	99.5	9.84	98.4
Cadmium		10.0	9.86	98.6	9.89	98.9
Calcium		400.0	403.33	100.8	402.18	100.5
Chromium		30.0	31.17	103.9	30.44	101.5
Cobalt		10.0	9.86	98.6	9.60	96.0
Copper		20.0	19.52	97.6	20.53	102.7
Iron		400.0	392.45	98.1	388.06	97.0
Lead		30.0	29.02	96.7	27.10	90.3
Magnesium		200.0	205.71	102.9	199.90	100.0
Manganese		10.0	10.32	103.2	10.24	102.4
Nickel		20.0	20.49	102.5	20.90	104.5
Potassium		1000.0	1050.09	105.0	966.88	96.7
Selenium		40.0	41.18	103.0	41.28	103.2
Silver		10.0	10.16	101.6	10.18	101.8
Sodium		2000.0	2073.81	103.7	2081.04	104.1
Vanadium		10.0	9.91	99.1	9.67	96.7
Zinc		40.0	38.99	97.5	38.83	97.1

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

Method: CV
Run Name: 1619703M08
Calibration Date(s): 07/15/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Mercury		2.5	2.42	96.8	1.0	0.99	99.0	1.0	1.01	101.0

(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			Continuing Calibration					
		True	Found	%R(1)	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



Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	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

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		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

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	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

Method: CV
Run Name: 1618401M08
Calibration Date(s): 07/02/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	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: MS
Run Name: 1619701E05
Calibration Date(s): 07/15/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Thallium	203				25.0	26.05	104.2	25.0	25.17	100.7

(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: 1619701E05
Calibration Date(s): 07/15/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Thallium	203	50.0	48.84	97.7	25.0	25.32	101.3	25.0	24.78	99.1

(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



Method: MS
Run Name: 1619603E05
Calibration Date(s): 07/14/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Thallium	203				25.0	25.40	101.6	25.0	25.74	103.0

(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: 1619603E05
Calibration Date(s): 07/14/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Thallium	203	50.0	49.16	98.3	25.0	24.75	99.0	25.0	25.69	102.8

(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: P
Run Name: 1620007T70
Calibration Date(s): 07/18/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Magnesium										
Manganese										
Nickel										
Potassium										
Selenium										
Silver					500.0	500.35	100.1			
Sodium										
Vanadium										
Zinc										

(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: P
Run Name: 1620007T70
Calibration Date(s): 07/18/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Magnesium										
Manganese										
Nickel										
Potassium										
Selenium										
Silver		600.0	606.23	101.0	500.0	493.11	98.6	500.0	504.62	100.9
Sodium										
Vanadium										
Zinc										

(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: P
Run Name: 1619706T74
Calibration Date(s): 07/15/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Magnesium										
Manganese										
Nickel										
Potassium										
Selenium										
Silver					500.0	509.70	101.9			
Sodium										
Vanadium										
Zinc										

(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: P
Run Name: 1619706T74
Calibration Date(s): 07/15/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Magnesium										
Manganese										
Nickel										
Potassium										
Selenium										
Silver		600.0	618.58	103.1	500.0	509.36	101.9	500.0	510.13	102.0
Sodium										
Vanadium										
Zinc										

(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: P
Run Name: 1619702T73
Calibration Date(s): 07/15/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Aluminum					25000.0	25780.60	103.1	25000.0	25791.17	103.2
Antimony					500.0	506.52	101.3	500.0	509.10	101.8
Arsenic					500.0	500.68	100.1	500.0	507.13	101.4
Barium					500.0	512.66	102.5	500.0	516.56	103.3
Beryllium					500.0	499.50	99.9	500.0	504.20	100.8
Cadmium					500.0	501.29	100.3	500.0	503.36	100.7
Calcium					25000.0	25292.07	101.2	25000.0	25476.02	101.9
Chromium					500.0	490.49	98.1	500.0	490.80	98.2
Cobalt					500.0	502.04	100.4	500.0	505.91	101.2
Copper					500.0	515.57	103.1	500.0	521.43	104.3
Iron					25000.0	25523.84	102.1	25000.0	25540.80	102.2
Lead					500.0	508.27	101.7	500.0	506.91	101.4
Magnesium					25000.0	25991.79	104.0	25000.0	26003.03	104.0
Manganese					500.0	512.38	102.5	500.0	516.69	103.3
Nickel					500.0	502.28	100.5	500.0	504.15	100.8
Potassium					25000.0	25916.16	103.7	25000.0	26055.87	104.2
Selenium					500.0	498.77	99.8	500.0	485.34	97.1
Silver					500.0	506.01	101.2	500.0	507.57	101.5
Sodium					25000.0	25785.21	103.1	25000.0	25894.05	103.6
Vanadium					500.0	504.10	100.8	500.0	508.12	101.6
Zinc					500.0	501.60	100.3	500.0	501.64	100.3

(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: P
Run Name: 1619702T73
Calibration Date(s): 07/15/2016
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	30563.76	101.9	25000.0	25545.73	102.2	25000.0	25671.98	102.7
Antimony		600.0	615.11	102.5	500.0	501.37	100.3	500.0	496.78	99.4
Arsenic		600.0	599.78	100.0	500.0	495.24	99.0	500.0	506.03	101.2
Barium		600.0	619.35	103.2	500.0	509.05	101.8	500.0	506.89	101.4
Beryllium		600.0	601.42	100.2	500.0	495.37	99.1	500.0	494.04	98.8
Cadmium		600.0	600.37	100.1	500.0	497.79	99.6	500.0	497.89	99.6
Calcium		30000.0	30439.03	101.5	25000.0	25314.11	101.3	25000.0	25036.64	100.1
Chromium		600.0	591.47	98.6	500.0	488.73	97.7	500.0	486.20	97.2
Cobalt		600.0	594.10	99.0	500.0	499.45	99.9	500.0	498.43	99.7
Copper		600.0	609.69	101.6	500.0	508.96	101.8	500.0	509.53	101.9
Iron		30000.0	30427.41	101.4	25000.0	25352.11	101.4	25000.0	25328.44	101.3
Lead		600.0	599.10	99.9	500.0	502.09	100.4	500.0	503.47	100.7
Magnesium		30000.0	30792.95	102.6	25000.0	25594.84	102.4	25000.0	25862.38	103.4
Manganese		600.0	616.16	102.7	500.0	508.34	101.7	500.0	506.15	101.2
Nickel		600.0	597.25	99.5	500.0	498.44	99.7	500.0	498.86	99.8
Potassium		30000.0	30849.81	102.8	25000.0	25671.04	102.7	25000.0	25780.79	103.1
Selenium		600.0	604.89	100.8	500.0	496.74	99.3	500.0	508.04	101.6
Silver		600.0	615.23	102.5	500.0	504.32	100.9	500.0	501.27	100.3
Sodium		30000.0	30890.01	103.0	25000.0	25659.08	102.6	25000.0	25541.82	102.2
Vanadium		600.0	605.74	101.0	500.0	499.91	100.0	500.0	498.89	99.8
Zinc		600.0	598.08	99.7	500.0	498.05	99.6	500.0	499.47	99.9

(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: P
Run Name: 1619604T72
Calibration Date(s): 07/14/2016
Concentration Units: UG/L

Analyte	Mass	Initial Calibration			Continuing Calibration					
		True	Found	%R(1)	True	Found	%R(2)	True	Found	%R(2)
Aluminum					25000.0	25325.74	101.3	25000.0	25267.68	101.1
Antimony					500.0	505.44	101.1	500.0	500.58	100.1
Arsenic					500.0	510.77	102.2	500.0	514.31	102.9
Barium					500.0	504.00	100.8	500.0	505.97	101.2
Beryllium					500.0	488.10	97.6	500.0	487.73	97.5
Cadmium					500.0	502.45	100.5	500.0	501.95	100.4
Calcium					25000.0	25320.75	101.3	25000.0	25279.32	101.1
Chromium					500.0	494.49	98.9	500.0	494.32	98.9
Cobalt					500.0	498.01	99.6	500.0	497.54	99.5
Copper					500.0	513.03	102.6	500.0	515.46	103.1
Iron					25000.0	25060.68	100.2	25000.0	24992.88	100.0
Lead					500.0	483.30	96.7	500.0	487.99	97.6
Magnesium					25000.0	25376.38	101.5	25000.0	25209.18	100.8
Manganese					500.0	503.69	100.7	500.0	503.29	100.7
Nickel					500.0	498.17	99.6	500.0	498.58	99.7
Potassium					25000.0	25756.88	103.0	25000.0	25731.66	102.9
Selenium					500.0	504.15	100.8	500.0	499.62	99.9
Silver					500.0	501.44	100.3	500.0	502.21	100.4
Sodium					25000.0	25401.50	101.6	25000.0	25329.62	101.3
Vanadium					500.0	511.21	102.2	500.0	513.15	102.6
Zinc					500.0	498.47	99.7	500.0	496.75	99.4

(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: P
Run Name: 1619604T72
Calibration Date(s): 07/14/2016
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	30357.81	101.2	25000.0	25425.74	101.7	25000.0	25349.96	101.4
Antimony		600.0	615.28	102.5	500.0	504.76	101.0	500.0	501.73	100.3
Arsenic		600.0	602.40	100.4	500.0	503.99	100.8	500.0	506.05	101.2
Barium		600.0	602.75	100.5	500.0	500.50	100.1	500.0	513.76	102.8
Beryllium		600.0	588.82	98.1	500.0	485.26	97.1	500.0	498.51	99.7
Cadmium		600.0	602.08	100.3	500.0	499.63	99.9	500.0	504.28	100.9
Calcium		30000.0	30263.35	100.9	25000.0	25349.24	101.4	25000.0	25411.23	101.6
Chromium		600.0	591.08	98.5	500.0	494.75	99.0	500.0	514.24	102.8
Cobalt		600.0	589.54	98.3	500.0	494.38	98.9	500.0	500.54	100.1
Copper		600.0	610.69	101.8	500.0	510.67	102.1	500.0	523.58	104.7
Iron		30000.0	30186.61	100.6	25000.0	25051.61	100.2	25000.0	25139.80	100.6
Lead		600.0	579.79	96.6	500.0	485.25	97.1	500.0	486.85	97.4
Magnesium		30000.0	30427.34	101.4	25000.0	25245.20	101.0	25000.0	25134.18	100.5
Manganese		600.0	604.46	100.7	500.0	499.47	99.9	500.0	515.57	103.1
Nickel		600.0	591.56	98.6	500.0	495.93	99.2	500.0	497.91	99.6
Potassium		30000.0	30907.85	103.0	25000.0	25695.58	102.8	25000.0	25465.66	101.9
Selenium		600.0	592.79	98.8	500.0	485.28	97.1	500.0	504.41	100.9
Silver		600.0	607.53	101.3	500.0	498.53	99.7	500.0	515.11	103.0
Sodium		30000.0	30337.58	101.1	25000.0	25363.43	101.5	25000.0	25616.52	102.5
Vanadium		600.0	615.93	102.7	500.0	509.64	101.9	500.0	523.97	104.8
Zinc		600.0	596.27	99.4	500.0	494.97	99.0	500.0	498.05	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

QUALITY CONTROL REFERENCE LIST

SDG No.: DWD88

Matrix: SOIL

<u>Analyte</u>	<u>Batch Number</u>	<u>Lab Sample ID</u>
Mercury	161950638002	8444088
		8444092
		8444096BKG
		8444097MS
		8444098MSD
		8444102DUP
		P19538BB
		P19538BQ

LEGEND:

BKG = Background	B = Blank
DUP = Duplicate	Q = Laboratory Control Sample
MS = Matrix Spike	Y = Laboratory Control Sample Duplicate
MSD = Matrix Spike Duplicate	

QUALITY CONTROL REFERENCE LIST

SDG No.: DWD88

Matrix: SOIL

<u>Analyte</u>	<u>Batch Number</u>	<u>Lab Sample ID</u>
Mercury	161820638002	8444051
		8444055
		8444059
		8444063
		8444067
		8444071BKG
		8444072MS
		8444073MSD
		8444077DUP
		P18238BB
		P18238BQ

LEGEND:

BKG = Background

DUP = Duplicate

MS = Matrix Spike

MSD = Matrix Spike Duplicate

B = Blank

Q = Laboratory Control Sample

Y = Laboratory Control Sample Duplicate

SDG No.: DWD88

Matrix: SOIL

<u>Analyte</u>	<u>Batch Number</u>	<u>Lab Sample ID</u>
Thallium	161950637002	8444089
		8444093
		8444103BKG
		8444104MS
		8444105MSD
		8444106DUP
		8455248
		P19537BB
		P19537BQ

LEGEND:

BKG = Background

DUP = Duplicate

MS = Matrix Spike

MSD = Matrix Spike Duplicate

B = Blank

Q = Laboratory Control Sample

Y = Laboratory Control Sample Duplicate

QUALITY CONTROL REFERENCE LIST

SDG No.: DWD88

Matrix: SOIL

<u>Analyte</u>	<u>Batch Number</u>	<u>Lab Sample ID</u>
Thallium	161940637001	8444052
		8444056
		8444060
		8444064
		8444068
		8444078BKG
		8444079MS
		8444080MSD
		8444081DUP
		P19437AB
		P19437AQ

LEGEND:

BKG = Background

DUP = Duplicate

MS = Matrix Spike

MSD = Matrix Spike Duplicate

B = Blank

Q = Laboratory Control Sample

Y = Laboratory Control Sample Duplicate

QUALITY CONTROL REFERENCE LIST

SDG No.: DWD88

Matrix: SOIL

<u>Analyte</u>	<u>Batch Number</u>	<u>Lab Sample ID</u>
Aluminum	161950637002	8444089
Antimony		8444093
Arsenic		8444103BKG
Barium		8444104MS
Beryllium		8444105MSD
Cadmium		8444106DUP
Calcium		8455248
Chromium		P19537BB
Cobalt		P19537BQ
Copper		
Iron		
Lead		
Magnesium		
Manganese		
Nickel		
Potassium		
Selenium		
Silver		
Sodium		
Vanadium		
Zinc		

LEGEND:

BKG = Background

DUP = Duplicate

MS = Matrix Spike

MSD = Matrix Spike Duplicate

B = Blank

Q = Laboratory Control Sample

Y = Laboratory Control Sample Duplicate

QUALITY CONTROL REFERENCE LIST

SDG No.: DWD88
Matrix: SOIL

<u>Analyte</u>	<u>Batch Number</u>	<u>Lab Sample ID</u>
Aluminum	161940637001	8444052
Antimony		8444056
Arsenic		8444060
Barium		8444064
Beryllium		8444068
Cadmium		8444078BKG
Calcium		8444079MS
Chromium		8444080MSD
Cobalt		8444081DUP
Copper		P19437AB
Iron		P19437AQ
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	

Quality Control and Calibration Summary Forms

Metals in Solid



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8455248

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7.8	U		P
7440-36-0	Antimony	0.63	U		P
7440-38-2	Arsenic	0.87	U		P
7440-39-3	Barium	0.030	U		P
7440-41-7	Beryllium	0.060	U		P
7440-43-9	Cadmium	0.044	U		P
7440-70-2	Calcium	5.1	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	3.7	U		P
7439-92-1	Lead	0.50	U		P
7439-95-4	Magnesium	1.7	U		P
7439-96-5	Manganese	0.075	U		P
7440-02-0	Nickel	0.27	U		P
7440-09-7	Potassium	21.5	U		P
7782-49-2	Selenium	0.81	U		P
7440-22-4	Silver	0.14	B		P
7440-23-5	Sodium	21.5	U		P
7440-28-0	Thallium	0.026	U		MS
7440-62-2	Vanadium	0.13	U		P
7440-66-6	Zinc	0.61	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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444106DUP

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1240			P
7440-36-0	Antimony	0.69	U		P
7440-38-2	Arsenic	0.95	U		P
7440-39-3	Barium	3.7			P
7440-41-7	Beryllium	0.066	U		P
7440-43-9	Cadmium	0.048	U		P
7440-70-2	Calcium	74.7			P
7440-47-3	Chromium	1.5	B		P
7440-48-4	Cobalt	0.12	U		P
7440-50-8	Copper	0.73	B		P
7439-89-6	Iron	328			P
7439-92-1	Lead	5.1			P
7439-95-4	Magnesium	46.5			P
7439-96-5	Manganese	2.6			P
7440-02-0	Nickel	0.35	B		P
7440-09-7	Potassium	40.7	B		P
7782-49-2	Selenium	0.88	U		P
7440-22-4	Silver	0.15	B		P
7440-23-5	Sodium	23.4	U		P
7440-28-0	Thallium	0.028	U		MS
7440-62-2	Vanadium	1.4			P
7440-66-6	Zinc	3.3	B		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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444105MSD

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1920			P
7440-36-0	Antimony	43.7			P
7440-38-2	Arsenic	13.0			P
7440-39-3	Barium	202			P
7440-41-7	Beryllium	5.0			P
7440-43-9	Cadmium	4.8			P
7440-70-2	Calcium	456			P
7440-47-3	Chromium	20.5			P
7440-48-4	Cobalt	48.1			P
7440-50-8	Copper	26.4			P
7439-89-6	Iron	478			P
7439-92-1	Lead	19.3			P
7439-95-4	Magnesium	261			P
7439-96-5	Manganese	52.7			P
7440-02-0	Nickel	48.8			P
7440-09-7	Potassium	1040			P
7782-49-2	Selenium	13.4			P
7440-22-4	Silver	5.2			P
7440-23-5	Sodium	994			P
7440-28-0	Thallium	0.39			MS
7440-62-2	Vanadium	50.1			P
7440-66-6	Zinc	49.9			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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444104MS
Concentration Units: MG/KG

% Solids: 100.0
Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1610			P
7440-36-0	Antimony	44.3			P
7440-38-2	Arsenic	13.3			P
7440-39-3	Barium	198			P
7440-41-7	Beryllium	4.9			P
7440-43-9	Cadmium	4.8			P
7440-70-2	Calcium	446			P
7440-47-3	Chromium	20.0			P
7440-48-4	Cobalt	48.4			P
7440-50-8	Copper	25.4			P
7439-89-6	Iron	416			P
7439-92-1	Lead	19.0			P
7439-95-4	Magnesium	250			P
7439-96-5	Manganese	52.0			P
7440-02-0	Nickel	48.9			P
7440-09-7	Potassium	1040			P
7782-49-2	Selenium	12.7			P
7440-22-4	Silver	5.3			P
7440-23-5	Sodium	997			P
7440-28-0	Thallium	0.38			MS
7440-62-2	Vanadium	49.1			P
7440-66-6	Zinc	49.3			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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444103BKG

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1320			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	72.7			P
7440-47-3	Chromium	1.6	B		P
7440-48-4	Cobalt	0.12	U		P
7440-50-8	Copper	0.78	B		P
7439-89-6	Iron	348			P
7439-92-1	Lead	5.8			P
7439-95-4	Magnesium	49.9			P
7439-96-5	Manganese	3.7			P
7440-02-0	Nickel	0.39	B		P
7440-09-7	Potassium	41.8	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	1.7			P
7440-66-6	Zinc	2.9	B		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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444102DUP

% 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:

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444098MSD

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.18			CV

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444097MS
Concentration Units: MG/KG

% Solids: 100.0
Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.20			CV

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444096BKG

% 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:

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444093

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	401			P
7440-36-0	Antimony	0.69	U		P
7440-38-2	Arsenic	0.96	U		P
7440-39-3	Barium	1.5			P
7440-41-7	Beryllium	0.066	U		P
7440-43-9	Cadmium	0.049	U		P
7440-70-2	Calcium	35.6	B		P
7440-47-3	Chromium	0.49	B		P
7440-48-4	Cobalt	0.12	U		P
7440-50-8	Copper	0.33	B		P
7439-89-6	Iron	371			P
7439-92-1	Lead	2.5	B		P
7439-95-4	Magnesium	15.4	B		P
7439-96-5	Manganese	0.92	B		P
7440-02-0	Nickel	0.30	U		P
7440-09-7	Potassium	23.7	U		P
7782-49-2	Selenium	0.89	U		P
7440-22-4	Silver	0.15	B		P
7440-23-5	Sodium	23.7	U		P
7440-28-0	Thallium	0.029	U		MS
7440-62-2	Vanadium	0.86	B		P
7440-66-6	Zinc	0.67	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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444092

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.016	B		CV

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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444089

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	288			P
7440-36-0	Antimony	0.69	U		P
7440-38-2	Arsenic	0.96	U		P
7440-39-3	Barium	4.6			P
7440-41-7	Beryllium	0.066	U		P
7440-43-9	Cadmium	0.049	U		P
7440-70-2	Calcium	76.4			P
7440-47-3	Chromium	0.52	B		P
7440-48-4	Cobalt	0.12	U		P
7440-50-8	Copper	0.46	B		P
7439-89-6	Iron	373			P
7439-92-1	Lead	3.5			P
7439-95-4	Magnesium	34.1			P
7439-96-5	Manganese	0.82	B		P
7440-02-0	Nickel	0.30	U		P
7440-09-7	Potassium	31.6	B		P
7782-49-2	Selenium	0.89	U		P
7440-22-4	Silver	0.15	U		P
7440-23-5	Sodium	32.9	B		P
7440-28-0	Thallium	0.029	U		MS
7440-62-2	Vanadium	0.95	B		P
7440-66-6	Zinc	0.68	B		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



Lancaster Laboratories
Environmental

QUALITY ASSURANCE SUMMARY

FORM 1

INORGANIC ANALYSIS DATA SHEET

SDG No.: DWD88

Matrix: SOIL Level (low/med): LOW

Lab Sample ID: 8444088

% Solids: 100.0

Concentration Units: MG/KG

Date Received: 06/24/2016

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.022	B		CV

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