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DATA VALIDATION REVIEW REPORT – USEPA STAGE 2A

Project:	Kenmore Area Sediment and Water Characterization
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This report summarizes the review of analytical results for 28 sediment, three surface water, nine porewater samples, as well as two sediment, one surface water, and one porewater field duplicates, collected November 6 - 8, 2012. The samples were collected by Anchor QEA, LLC, and submitted to Analytical Resources, Inc. (ARI) in Tukwila, Washington. The porewaters were extracted from the sediments by ARI on November 13, 2012. The samples were analyzed for the following parameters:

- Dioxins/Furans (D/F) by USEPA method 1613B
- Total and dissolved metals by U.S Environmental Protection Agency (USEPA) methods 200.8, 6010C, 6020A, 7470A and 7471A
- Semi-volatile organic compounds (SVOCs) by USEPA method 8270D and polycyclic aromatic hydrocarbons (PAHs) by USEPA method 8270D – selective ion monitoring (SIM)
- Tributyltin (TBT) by Krone (1988)
- Organochlorine pesticides by USEPA method 8081B
- Polychlorinated biphenyls (PCBs) by USEPA method 8082A
- Pentachlorophenol (PCP) by USEPA method 8041
- Total solids (TS) by Standard Method (SM) 2540B
- Total volatile solids (TVS) by SM 2540E
- Total organic carbon (TOC) by Plumb (1981)
- Grain size (GS) by the Puget Sound Estuary Protocol (PSEP) methodology
- Total dissolved solids (TDS) by SM 2540C
- Total suspended solids (TSS) by SM 2540D

ARI sample data group (SDG) numbers VR38, VR58, VR80, VR82, and VS50 were reviewed in this report. Samples reviewed in this report are presented in Table 1. Dioxin/Furan data were reviewed separately (USEPA Stage 4) by Laboratory Data Consultants, Inc. in Carlsbad, California.

Table 1
Samples Reviewed

Sample ID	Lab ID	Matrix	Analyses Requested
HT-01-S-C-121106	VR38A	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
HT-01-W-C-121107	VR80A	Surface Water	Total and dissolved metals, PAHs, PCP, pesticides, SVOCs, TDS, TSS
HT-02-S-C-121106	VR38B	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
HT-03-S-C-121106	VR38C	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
HT-04-S-C-121106	VR38D	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
HT-04-W-C-121107	VR80B	Surface Water	Total and dissolved metals, PAHs, PCP, pesticides, SVOCs, TDS, TSS
HT-04-W-C-DUP-121107	VR80C	Surface Water	Total and dissolved metals, PAHs, PCP, pesticides, SVOCs, TDS, TSS
HT-05-S-C-121106	VR38E	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
HT-06-S-E-121106	VR38J	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT (bulk), TOC, TS, TVS
HT-07-S-E-121106	VR38K	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT (bulk), TOC, TS, TVS
HT-08-S-C-121106	VR38F	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
HT-09-S-C-121106	VR38G	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
HT-10-S-LFP-121106	VR38H	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
HT-11-S-LFP-121106	VR38I	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
SG-01-S-C-121107	VR58J	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
SG-02-S-C-121108	VR82A/VS50B	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-03-S-C-121108	VR82B/VS50C	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-04-S-C-121108	VR82C/VS50D	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-05-S-C-121108	VR82D/VS50E	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-06-S-C-121108	VR82E//VS50F	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-07-S-C-121108	VR82F/VS50G	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-07-S-C-DUP-121108	VR82G/VS50H	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-08-S-C-121108	VR82H/VS50I	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-09-S-C-121108	VR82I/VS50J	Sediment	D/F, total metals, PCBs, pesticides, TBT (porewater), GS, SVOCs, TOC, TS, TVS
SG-10-S-E-121107	VR58A	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT (bulk), TOC, TS, TVS
SG-11-S-E-121107	VR58B	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT (bulk), TOC, TS, TVS
SG-12-S-E-121107	VR58C	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT

Sample ID	Lab ID	Matrix	Analyses Requested
			(bulk), TOC, TS, TVS
SG-13-S-E-121107	VR58D	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT (bulk), TOC, TS, TVS
SG-13-S-E-DUP-121107	VR58E	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT (bulk), TOC, TS, TVS
SG-14-S-E-121107	VR58F/VS50A	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT (porewater), TOC, TS, TVS
SG-15-S-E-121107	VR58G	Sediment	D/F, total metals, PAHs, PCBs, pesticides, GS, SVOCs, TBT (bulk), TOC, TS, TVS
SG-16-S-E-121107	VR58H	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
SG-17-S-E-121107	VR58I	Sediment	D/F, total metals, PAHs, PCBs, GS, SVOCs, TOC, TS, TVS
WS-10-W-C-121107	VR80D	Surface Water	Total and dissolved metals, PAHs, PCP, pesticides, SVOCs, TDS, TSS

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the analytical procedures and data quality objective sections of the Sampling and Analysis Plan (SAP) (Anchor QEA 2012). Laboratory results were reviewed using the following guidelines:

- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA 1999)
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA 2008)

Laboratory and method QC criteria were also used as stated in USEPA 1986 (SW-846, Third Edition), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, update 1, August 1993; update II, January 1995; update IIA, February 1994; update IIB, August 1995; update III, June 1997; update IIIA, May 1999; update IIIB, June 2008; update IVA and IVB, January 2008. Unless noted in this report, laboratory results for the samples listed above were within QC criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ARI at the time of sample receipt; the samples were received cold and in good condition.

Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within holding times.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes with the exception of bis(2-ethylhexyl)phthalate in the method blank associated with SDG VR82. The compound was detected in the method blank at a concentration between the method detection limit (MDL) and the method reporting limit (MRL). The concentration of sample SG-04-S-C-121108 was not significantly greater than (greater than 10x) the level detected in the method blank and was qualified as non-detect.

Field Quality Control

Rinse Blanks

Rinse blanks were not required in association with these sample sets.

Field Duplicates

One surface water and two sediment field duplicates were collected in association with these sample sets. Detected results are summarized in Table 2.

Table 2
Field Duplicate Summary

Parameter	HT-04-W-C-121107	HT-04-W-C-DUP-121107	RPD
Dissolved Arsenic	1 µg/L	1 µg/L	0%
Total Arsenic	2 µg/L	1.2 µg/L	50%
Dissolved Barium	7.8 µg/L	7.7 µg/L	1%
Total Barium	9 µg/L	8.7 µg/L	3%
Dissolved Copper	2.1 µg/L	2 µg/L	5%
Total Copper	2.6 µg/L	3.2 µg/L	21%
Dissolved Iron	150 µg/L	150 µg/L	0%
Total Iron	330 µg/L	330 µg/L	0%
Dissolved Lead	0.1 µg/L	0.1U µg/L	0%
Total Lead	0.5U µg/L	0.3 µg/L	50%
Dissolved Manganese	4.6 µg/L	5.1 µg/L	10%
Total Manganese	32 µg/L	12.4 µg/L	88%
Dissolved Nickel	1.1 µg/L	1 µg/L	10%
Total Nickel	1 µg/L	1.2 µg/L	18%
Total dissolved solids	78 mg/L	74 mg/L	5%
Total suspended solids	3.7 mg/L	3.4 mg/L	8%
Calcium	11500 µg/L	11400 µg/L	1%

Parameter	HT-04-W-C-121107	HT-04-W-C-DUP-121107	RPD
Hardness as CaCO3	50 mg/L	49 mg/L	2%
Magnesium	5060 µg/L	4970 µg/L	2%
Pentachlorophenol	0.022J µg/L	0.02J µg/L	10%

Parameter	SG-07-S-C-121108	SG-07-S-C-DUP-121108	RPD
Total organic carbon	4.95 pct	7.07 pct	35%
Clay, Coarse	3.8 pct	3.9 pct	3%
Clay, Fine	0.9 pct	0.9 pct	0%
Clay, Medium	2.5 pct	2.1 pct	17%
Fines (silt + clay)	44.1 pct	45.4 pct	3%
Gravel	0.5 pct	2.6 pct	135%
Sand, Coarse	3.1 pct	2.8 pct	10%
Sand, Fine	24.4 pct	21.9 pct	11%
Sand, Medium	6.3 pct	6 pct	5%
Sand, Very Coarse	2.7 pct	2.7 pct	0%
Sand, Very Fine	18.9 pct	18.6 pct	2%
Silt, Coarse	11 pct	13.7 pct	22%
Silt, Fine	7.9 pct	7.6 pct	4%
Silt, Medium	12.1 pct	11 pct	10%
Silt, Very Fine	5.9 pct	6.1 pct	3%
Total solids	33.7 pct	34.3 pct	2%
Total volatile solids	13.4 pct	14.11 pct	5%
Cadmium	0.6 mg/kg	0.6 mg/kg	0%
Chromium	41 mg/kg	44 mg/kg	7%
Copper	30 mg/kg	28.7 mg/kg	4%
Lead	21 mg/kg	21 mg/kg	0%
Nickel	41 mg/kg	42 mg/kg	2%
Zinc	126 mg/kg	123 mg/kg	2%
Mercury	0.11 mg/kg	0.08 mg/kg	32%
Aroclor 1254	19U µg/kg	22 µg/kg	15%
4-Methylphenol (p-Cresol)	54Q µg/kg	31J µg/kg	54%
Anthracene	18J µg/kg	19U µg/kg	5%
Benzo(a)anthracene	110 µg/kg	52 µg/kg	72%
Benzo(a)pyrene	63 µg/kg	55 µg/kg	14%
Benzo(b,j,k)fluoranthenes	170 µg/kg	140 µg/kg	19%
Benzo(g,h,i)perylene	36 µg/kg	41 µg/kg	13%
Benzoic acid	430 µg/kg	480 µg/kg	11%
Benzyl alcohol	120 µg/kg	100 µg/kg	18%
Bis(2-ethylhexyl)phthalate	330B µg/kg	300B µg/kg	10%
Butylbenzyl phthalate	28 µg/kg	19U µg/kg	38%
Chrysene	140 µg/kg	82 µg/kg	52%
Dibenzo(a,h)anthracene	17J µg/kg	12J µg/kg	34%
Di-n-butyl phthalate	20U µg/kg	12J µg/kg	50%
Di-n-octyl phthalate	22M µg/kg	19U µg/kg	15%
Fluoranthene	150 µg/kg	140 µg/kg	7%
Fluorene	12J µg/kg	9.7J µg/kg	21%

Parameter	SG-07-S-C-121108	SG-07-S-C-DUP-121108	RPD
Indeno(1,2,3-c,d)pyrene	33 µg/kg	38 µg/kg	14%
Naphthalene	18J µg/kg	25 µg/kg	33%
Phenanthrene	72 µg/kg	68 µg/kg	6%
Phenol	42Q µg/kg	42Q µg/kg	0%
Pyrene	140 µg/kg	130 µg/kg	7%

Parameter	SG-13-S-E-121107	SG-13-S-E-DUP-121107	RPD
Tributyltin (ion)	12 µg/kg	12 µg/kg	0%
Total organic carbon	5.45 pct	3.82 pct	35%
Clay, Coarse	6.4 pct	6.1 pct	5%
Clay, Fine	1.9 pct	2.5 pct	27%
Clay, Medium	3.3 pct	3 pct	10%
Fines (silt + clay)	74.6 pct	76.7 pct	3%
Sand, Coarse	3.2 pct	3 pct	6%
Sand, Fine	5.1 pct	4.6 pct	10%
Sand, Medium	2.8 pct	2.9 pct	4%
Sand, Very Coarse	4.3 pct	3.4 pct	23%
Sand, Very Fine	10.1 pct	9.3 pct	8%
Silt, Coarse	11.5 pct	11.6 pct	1%
Silt, Fine	16.9 pct	17.4 pct	3%
Silt, Medium	21.2 pct	22.4 pct	6%
Silt, Very Fine	13.3 pct	13.7 pct	3%
Total solids	23.2 pct	22.7 pct	2%
Total volatile solids	15.02 pct	14.56 pct	3%
Chromium	54 mg/kg	55 mg/kg	2%
Copper	62.1 mg/kg	62.8 mg/kg	1%
Lead	32 mg/kg	32 mg/kg	0%
Nickel	46 mg/kg	45 mg/kg	2%
Zinc	205 mg/kg	205 mg/kg	0%
Mercury	0.1 mg/kg	0.1 mg/kg	0%
4,4'-DDE (p,p'-DDE)	9.8U µg/kg	4.4J µg/kg	76%
Nonachlor, trans-	4.1J µg/kg	9.8U µg/kg	82%
Aroclor 1232	25Y µg/kg	35Y µg/kg	33%
Aroclor 1254	50Y µg/kg	25Y µg/kg	67%
2-Methylphenol (o-Cresol)	12J µg/kg	14J µg/kg	15%
4-Methylphenol (p-Cresol)	110Q µg/kg	110Q µg/kg	0%
Benzoic acid	1600 µg/kg	1700 µg/kg	6%
Benzyl alcohol	360 µg/kg	380 µg/kg	5%
Bis(2-ethylhexyl)phthalate	560 µg/kg	430 µg/kg	26%
Butylbenzyl phthalate	82 µg/kg	56 µg/kg	38%
Diethyl phthalate	55 µg/kg	50U µg/kg	10%
Di-n-octyl phthalate	73M µg/kg	42 µg/kg	54%
Pentachlorophenol	52J µg/kg	200U µg/kg	117%
Phenol	200Q µg/kg	350Q µg/kg	55%
1-Methylnaphthalene	5.6 µg/kg	7.2 µg/kg	25%
2-Methylnaphthalene	14 µg/kg	19 µg/kg	30%

Parameter	SG-13-S-E-121107	SG-13-S-E-DUP-121107	RPD
Acenaphthene	12 µg/kg	16 µg/kg	29%
Acenaphthylene	6.3 µg/kg	7.5 µg/kg	17%
Anthracene	21 µg/kg	27 µg/kg	25%
Benzo(a)anthracene	110 µg/kg	100 µg/kg	10%
Benzo(a)pyrene	120 µg/kg	100 µg/kg	18%
Benzo(b)fluoranthene	160 µg/kg	140 µg/kg	13%
Benzo(b,j,k)fluoranthenes	340 µg/kg	300 µg/kg	13%
Benzo(g,h,i)perylene	67 µg/kg	56 µg/kg	18%
Benzo(k)fluoranthene	100 µg/kg	88 µg/kg	13%
Chrysene	180 µg/kg	170 µg/kg	6%
Dibenzo(a,h)anthracene	18 µg/kg	16 µg/kg	12%
Dibenzofuran	12 µg/kg	17 µg/kg	34%
Fluoranthene	140 µg/kg	160 µg/kg	13%
Fluorene	17 µg/kg	21 µg/kg	21%
Indeno(1,2,3-c,d)pyrene	54 µg/kg	49 µg/kg	10%
Naphthalene	18 µg/kg	21 µg/kg	15%
Phenanthrene	96 µg/kg	110 µg/kg	14%
Pyrene	230 µg/kg	230 µg/kg	0%

Results at or near the reporting limit (RL) may have exaggerated relative percent difference (RPD) values. No criteria were identified in the SAP, and no data were qualified based on field duplicate results.

Surrogate Recoveries

All surrogate recoveries were within the laboratory control limits.

Column Confirmation Results

All detected pesticide and PCB results were within method criteria with the exception of Aroclor 1254 in sample HT-04-S-C-121106 and Aroclor 1260 in sample SG-11-S-E-121107. The associated sample results have been qualified "J" to indicate they are estimated. See Table 3 for qualified data.

Laboratory Control Sample and Laboratory Control Sample Duplicate

Laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) were analyzed at the required frequencies. All LCS/LCSD analyses yielded percent recovery (%R) and/or RPD values within laboratory control limits with the following exceptions:

- SDG VR58, VR82 SVOCs: The percent recovery (%R) value for 2,4-dimethylphenol was below the project control limit in the LCS. Associated results were qualified "UJ" to indicate a potentially low bias.

See Table 3 for qualified data.

Standard Reference Material

The Puget Sound sediment reference material (SRM) was analyzed for PCBs and NIST 1941B was analyzed for TOC. All SRM results were within acceptable limits.

Matrix Spike and Matrix Spike Duplicate

Matrix spike (MS) and matrix spike duplicate (MSD) samples were analyzed at required frequencies with the exception of all organic analyses (SVOC, PAH, pesticides and PCP) in SDG VR80. The LCS/LCSD %R values were used to evaluate accuracy for the surface water samples. All MS/MSD %R values were within control limits with the following exceptions:

- SDG VR38 and VR58 metals: The %R values for antimony in the MS analyses were below the project control limit. All sample results have been qualified "UJ" to indicate a potentially low bias.
- SDG VR58
    - SVOCs: The MSD %R values for 2-methylphenol and hexachlorobutadiene were below the control limit for sample SG-01-S-C-121107. Parent sample results have been qualified "UJ" to indicate a potentially low bias.
    - PAHs: The MS and/or MSD %R values for naphthalene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene were below the control limit for sample SG-16-S-E-121107. Parent sample results have been qualified "UJ" to indicate a potentially low bias.
    - Pesticides: The MSD %R value for 4,4'-DDT was below the control limit, and the MS/MSD RPD value was above the control limit for sample SG-15-S-E-121107. The parent sample result has been qualified "UJ" to indicate a potentially low bias.
- SDG VR82
    - SVOCs: The MSD %R values for 2-methylphenol and 2,4-dimethylphenol were below the control limit, and the MS/MSD RPD value was above the control limit for 2,4-dimethylphenol for sample SG-04-S-C-121108.

Parent sample results have been qualified "UJ" to indicate a potentially low bias.

  - Pesticides: The MSD %R value for heptachlor was below the control limit for sample SG-08-S-C-121108. The parent sample result has been qualified "UJ" to indicate a potentially low bias. 4,4'-DDT did not recover in the MSD, however, the spike level was below the reporting limit and the MS recovered within control limits so no data were qualified.

- VS50 TBT: The MSD did not recover. The sample concentration was significantly greater than (>4x) the spike concentration, so no data were qualified.

See Table 3 for qualified data.

Laboratory Replicates

Laboratory replicates were analyzed at the required frequencies. All duplicate RPD results were within required limits with the following exceptions:

- SDG VR38 metals: The duplicate RPD value for chromium was above the project control limit. Associated sample results have been qualified "J" to indicate they are estimated.
- SDG VR58 metals: The duplicate RPD values for antimony, arsenic, copper, lead and zinc were above the project control limit. Antimony sample and duplicate results were less than five times (<5x) the method reporting limit (MRL) and within two times (± 2x) the MRL of each other so those data were not qualified. Associated arsenic, copper, lead and zinc results have been qualified "J" or "UJ" to indicate that they are estimated.

See Table 3 for qualified data.

Sample Analyses

The laboratory flagged four dibenzofuran and five di-n-octyl phthalate results as estimated due to a low spectral match. These results have been qualified "J" to indicate they are estimated.

Method Reporting Limits

All reporting limits were deemed acceptable as reported. All values were reported using the laboratory reporting limits. Values were reported as undiluted, or when reported as diluted, the reporting limit accurately reflects the dilution factor. Some pesticide and PCB reporting limits were elevated due to chromatographic interference.

Overall Assessment

This evaluation determined that the laboratory followed the specified analytical methods and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the surrogate, LCS/LCSD, and MS/MSD %R values, with the exceptions noted above. Precision was also acceptable as demonstrated by the laboratory duplicates, MS/MSD, and LCS/LCSD RPD values, with the exceptions noted above. Most data were deemed acceptable as reported; all other data are acceptable as qualified. Table 3 summarizes the qualifiers applied to samples reviewed in this report.

Data Qualifier Definitions

U Indicates the compound or analyte was analyzed for but not detected at or above the specified limit.

J Indicates an estimated value.

UJ Indicates the compound or analyte was analyzed for but not detected and the specified limit reported is estimated

DNR Do not report

Table 3
Data Qualification Summary

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
HT-01-S-C-121106	Metals	Chromium	17.8 mg/kg	17.8J mg/kg	High duplicate RPD value
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	19U µg/kg	DNR	Report from other/undiluted analysis
		2-Methylnaphthalene	19U µg/kg		
		Acenaphthene	19U µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	19U µg/kg		
		Benzo(a)anthracene	19U µg/kg		
		Benzo(a)pyrene	19U µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Benzo(b,j,k)fluoranthenes	38 µg/kg		
		Benzo(g,h,i)perylene	19U µg/kg		
		Chrysene	19U µg/kg		
		Dibenzo(a,h)anthracene	19U µg/kg		
		Dibenzofuran	19U µg/kg		
		Fluoranthene	19U µg/kg		
		Fluorene	19U µg/kg		
		Indeno(1,2,3-c,d)pyrene	19U µg/kg		
		Naphthalene	19U µg/kg		
		Phenanthrene	19U µg/kg		
		Pyrene	19U µg/kg		
HT-02-S-C-121106	Metals	Chromium	23.3 mg/kg	23.3J mg/kg	High duplicate RPD value
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	20U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	20U µg/kg		
		Acenaphthene	20U µg/kg		
		Acenaphthylene	20U µg/kg		
		Anthracene	20U µg/kg		
		Benzo(a)anthracene	20U µg/kg		
		Benzo(a)pyrene	20U µg/kg		
		Benzo(b,j,k)fluoranthenes	39U µg/kg		
		Benzo(g,h,i)perylene	20U µg/kg		
		Chrysene	20U µg/kg		
		Dibenzo(a,h)anthracene	20U µg/kg		
		Dibenzofuran	20U µg/kg		
		Fluoranthene	23 µg/kg		
		Fluorene	20U µg/kg		
		Indeno(1,2,3-c,d)pyrene	20U µg/kg		
		Naphthalene	12 µg/kg		
		Phenanthrene	20 µg/kg		
		Pyrene	16J µg/kg		
HT-03-S-C-121106	Metals	Chromium	23 mg/kg	23J mg/kg	High duplicate RPD value
		Antimony	7U mg/kg	7UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	25 µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	42 µg/kg		
		Acenaphthene	49 µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	53 µg/kg		
		Benzo(a)anthracene	60 µg/kg		
		Benzo(a)pyrene	45 µg/kg		
		Benzo(b,j,k)fluoranthenes	120 µg/kg		
		Benzo(g,h,i)perylene	26 µg/kg		
		Chrysene	89 µg/kg		
		Dibenzo(a,h)anthracene	14 µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Dibenzofuran	56 µg/kg		
		Fluoranthene	210 µg/kg		
		Fluorene	69 µg/kg		
		Indeno(1,2,3-c,d)pyrene	23 µg/kg		
		Naphthalene	76 µg/kg		
		Phenanthrene	210 µg/kg		
		Pyrene	160 µg/kg		
HT-04-S-C-121106	Metals	Chromium	27 mg/kg	27J mg/kg	High duplicate RPD value
		Antimony	10U mg/kg	10UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	73 µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	180 µg/kg		
		Acenaphthene	110 µg/kg		
		Acenaphthylene	17J µg/kg		
		Anthracene	180 µg/kg		
		Benzo(a)anthracene	240 µg/kg		
		Benzo(a)pyrene	140 µg/kg		
		Benzo(b,j,k)fluoranthenes	420 µg/kg		
		Benzo(g,h,i)perylene	20U µg/kg		
		Chrysene	360 µg/kg		
		Dibenzo(a,h)anthracene	20U µg/kg		
		Dibenzofuran	200 µg/kg		
		Fluoranthene	990 µg/kg		
		Fluorene	200 µg/kg		
		Indeno(1,2,3-c,d)pyrene	20U µg/kg		
		Naphthalene	290 µg/kg		
		Phenanthrene	810 µg/kg		
		Pyrene	620 µg/kg		
	PCBs	Aroclor 1254	28P µg/kg	28J µg/kg	Column confirmation RPD above control limit
HT-04-W-C-121107	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	1U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	1U µg/kg		
		Acenaphthene	1U µg/kg		
		Acenaphthylene	1U µg/kg		
		Anthracene	1U µg/kg		
		Benzo(a)anthracene	1U µg/kg		
		Benzo(a)pyrene	1U µg/kg		
		Benzo(b,j,k)fluoranthenes	5U µg/kg		
		Benzo(g,h,i)perylene	1U µg/kg		
		Chrysene	1U µg/kg		
		Dibenzo(a,h)anthracene	1U µg/kg		
		Dibenzofuran	1U µg/kg		
		Fluoranthene	1U µg/kg		
		Fluorene	1U µg/kg		
		Hexachlorobutadiene	3U µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		(Hexachloro-1,3-butadiene)			
		Indeno(1,2,3-c,d)pyrene	1U µg/kg		
		Naphthalene	1U µg/kg		
		Pentachlorophenol	10U µg/kg		
		Phenanthrene	1U µg/kg		
		Pyrene	1U µg/kg		
HT-04-W-C-DUP-121107	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	1U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	1U µg/kg		
		Acenaphthene	1U µg/kg		
		Acenaphthylene	1U µg/kg		
		Anthracene	1U µg/kg		
		Benzo(a)anthracene	1U µg/kg		
		Benzo(a)pyrene	1U µg/kg		
		Benzo(b,j,k)fluoranthenes	5U µg/kg		
		Benzo(g,h,i)perylene	1U µg/kg		
		Chrysene	1U µg/kg		
		Dibenzo(a,h)anthracene	1U µg/kg		
		Dibenzofuran	1U µg/kg		
		Fluoranthene	1U µg/kg		
		Fluorene	1U µg/kg		
		Hexachlorobutadiene (Hexachloro-1,3-butadiene)	3U µg/kg		
		Indeno(1,2,3-c,d)pyrene	1U µg/kg		
		Naphthalene	1U µg/kg		
		Pentachlorophenol	10U µg/kg		
		Phenanthrene	1U µg/kg		
		Pyrene	1U µg/kg		
HT-05-S-C-121106	Metals	Chromium	20.3 mg/kg	20.3J mg/kg	High duplicate RPD value
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	18U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	18U µg/kg		
		Acenaphthene	18U µg/kg		
		Acenaphthylene	18U µg/kg		
		Anthracene	18U µg/kg		
		Benzo(a)anthracene	18U µg/kg		
		Benzo(a)pyrene	18U µg/kg		
		Benzo(b,j,k)fluoranthenes	10J µg/kg		
		Benzo(g,h,i)perylene	18U µg/kg		
		Chrysene	12J µg/kg		
		Dibenzo(a,h)anthracene	18U µg/kg		
		Dibenzofuran	18U µg/kg		
		Fluoranthene	20 µg/kg		
		Fluorene	18U µg/kg		
		Indeno(1,2,3-c,d)pyrene	18U µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Naphthalene	18U µg/kg		
		Phenanthrene	18U µg/kg		
		Pyrene	12J µg/kg		
HT-06-S-E-121106	Metals	Chromium	25.5 mg/kg	25.5J mg/kg	High duplicate RPD value
		Antimony	7U mg/kg	7UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	19U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	19U µg/kg		
		Acenaphthene	19U µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	19U µg/kg		
		Benzo(a)anthracene	15J µg/kg		
		Benzo(a)pyrene	18J µg/kg		
		Benzo(b,j,k)fluoranthenes	48 µg/kg		
		Benzo(g,h,i)perylene	18J µg/kg		
		Chrysene	24 µg/kg		
		Dibenzo(a,h)anthracene	19U µg/kg		
		Dibenzofuran	19U µg/kg		
		Fluoranthene	48 µg/kg		
		Fluorene	19U µg/kg		
		Hexachlorobenzene	19U µg/kg		
		Hexachlorobutadiene	10UJ µg/kg		
		Indeno(1,2,3-c,d)pyrene	14J µg/kg		
		Naphthalene	19U µg/kg		
		Phenanthrene	20 µg/kg		
		Pyrene	34 µg/kg		
HT-07-S-E-121106	Metals	Chromium	30.1 mg/kg	30.1J mg/kg	High duplicate RPD value
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	20U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	20U µg/kg		
		Acenaphthene	20U µg/kg		
		Acenaphthylene	20U µg/kg		
		Anthracene	20U µg/kg		
		Benzo(a)anthracene	12 µg/kg		
		Benzo(a)pyrene	17 µg/kg		
		Benzo(b,j,k)fluoranthenes	41 µg/kg		
		Benzo(g,h,i)perylene	12 µg/kg		
		Chrysene	21 µg/kg		
		Dibenzo(a,h)anthracene	20U µg/kg		
		Dibenzofuran	20U µg/kg		
		Fluoranthene	35 µg/kg		
		Fluorene	20U µg/kg		
		Hexachlorobenzene	20U µg/kg		
		Hexachlorobutadiene	10UJ µg/kg		
		Indeno(1,2,3-c,d)pyrene	8.5 µg/kg		
		Naphthalene	20U µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Phenanthrene	17 µg/kg		
		Pyrene	32 µg/kg		
HT-08-S-C-121106	Metals	Chromium	29.6 mg/kg	29.6J mg/kg	High duplicate RPD value
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	18U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	18U µg/kg		
		Acenaphthene	18U µg/kg		
		Acenaphthylene	18U µg/kg		
		Anthracene	18U µg/kg		
		Benzo(a)anthracene	18U µg/kg		
		Benzo(a)pyrene	18U µg/kg		
		Benzo(b,j,k)fluoranthenes	15J µg/kg		
		Benzo(g,h,i)perylene	18U µg/kg		
		Chrysene	10J µg/kg		
		Dibenzo(a,h)anthracene	18U µg/kg		
		Dibenzofuran	18U µg/kg		
		Fluoranthene	19 µg/kg		
		Fluorene	18U µg/kg		
		Indeno(1,2,3-c,d)pyrene	18U µg/kg		
		Naphthalene	18U µg/kg		
		Phenanthrene	9.2J µg/kg		
		Pyrene	17J µg/kg		
HT-09-S-C-121106	Metals	Chromium	28.8 mg/kg	28.8J mg/kg	High duplicate RPD value
		Antimony	7U mg/kg	7UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	19U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	19U µg/kg		
		Acenaphthene	19U µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	19U µg/kg		
		Benzo(a)anthracene	20 µg/kg		
		Benzo(a)pyrene	24 µg/kg		
		Benzo(b,j,k)fluoranthenes	56 µg/kg		
		Benzo(g,h,i)perylene	16 µg/kg		
		Chrysene	32 µg/kg		
		Dibenzo(a,h)anthracene	19U µg/kg		
		Dibenzofuran	19U µg/kg		
		Fluoranthene	60 µg/kg		
		Fluorene	19U µg/kg		
		Indeno(1,2,3-c,d)pyrene	14 µg/kg		
		Naphthalene	19U µg/kg		
		Phenanthrene	34 µg/kg		
		Pyrene	46 µg/kg		
HT-10-S-LFP-121106	Metals	Chromium	24.3 mg/kg	24.3J mg/kg	High duplicate RPD value
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	19U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	19U µg/kg		
		Acenaphthene	19U µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	19U µg/kg		
		Benzo(a)anthracene	4.7J µg/kg		
		Benzo(a)pyrene	6.6 µg/kg		
		Benzo(b,j,k)fluoranthenes	14 µg/kg		
		Benzo(g,h,i)perylene	4.7J µg/kg		
		Chrysene	8.6 µg/kg		
		Dibenzo(a,h)anthracene	19U µg/kg		
		Dibenzofuran	19U µg/kg		
		Fluoranthene	14 µg/kg		
		Fluorene	19U µg/kg		
		Indeno(1,2,3-c,d)pyrene	3.8J µg/kg		
		Naphthalene	19U µg/kg		
		Phenanthrene	6.6 µg/kg		
		Pyrene	14 µg/kg		
HT-11-S-LFP-121106	Metals	Chromium	22.6 mg/kg	22.6J mg/kg	High duplicate RPD value
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	20U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	20U µg/kg		
		Acenaphthene	20U µg/kg		
		Acenaphthylene	20U µg/kg		
		Anthracene	20U µg/kg		
		Benzo(a)anthracene	20U µg/kg		
		Benzo(a)pyrene	20U µg/kg		
		Benzo(b,j,k)fluoranthenes	39U µg/kg		
		Benzo(g,h,i)perylene	20U µg/kg		
		Chrysene	20U µg/kg		
		Dibenzo(a,h)anthracene	20U µg/kg		
		Dibenzofuran	20U µg/kg		
		Fluoranthene	20U µg/kg		
		Fluorene	20U µg/kg		
		Indeno(1,2,3-c,d)pyrene	20U µg/kg		
		Naphthalene	20U µg/kg		
		Phenanthrene	20U µg/kg		
		Pyrene	3.2J µg/kg		
SG-01-S-C-121107	Metals	Copper	5.9 mg/kg	5.9J mg/kg	High duplicate RPD value
		Lead	4 mg/kg	4J mg/kg	
		Zinc	43 mg/kg	43J mg/kg	
		Arsenic	6U mg/kg	6UJ mg/kg	
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	19UJ µg/kg	19UJ µg/kg	Low LCS %R value
		2-Methylphenol (o-Cresol)	19U µg/kg	19UJ µg/kg	Low MSD %R value
		Hexachlorobutadiene	10UJ µg/kg	10UJ µg/kg	

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		1-Methylnaphthalene	19U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	19U µg/kg		
		Acenaphthene	19U µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	19U µg/kg		
		Benzo(a)anthracene	6.1 µg/kg		
		Benzo(a)pyrene	7.2 µg/kg		
		Benzo(b,j,k)fluoranthenes	18 µg/kg		
		Benzo(g,h,i)perylene	19U µg/kg		
		Chrysene	9.1		
		Dibenzo(a,h)anthracene	19U µg/kg		
		Dibenzofuran	19U µg/kg		
		Fluoranthene	18 µg/kg		
		Fluorene	19U µg/kg		
		Indeno(1,2,3-c,d)pyrene	19U µg/kg		
		Naphthalene	19U µg/kg		
		Phenanthrene	6.7 µg/kg		
		Pyrene	16 µg/kg		
SG-02-S-C-121108	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	19UJ µg/kg	19UJ µg/kg	Low LCS %R value
		Hexachlorobenzene	19U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
SG-03-S-C-121108	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		Hexachlorobenzene	20U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
		Di-n-octyl phthalate	58M µg/kg	58J µg/kg	Estimated value
SG-04-S-C-121108	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS/MSD %R value; high MS/MSD RPD
		2-Methylphenol (o-Cresol)	20U µg/kg	20UJ µg/kg	Low MSD %R value
		Bis(2-ethylhexyl)phthalate	62 µg/kg	62U µg/kg	Method blank contamination
		Hexachlorobenzene	20U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
SG-05-S-C-121108	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		Hexachlorobenzene	20U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
		Di-n-octyl phthalate	22M µg/kg	22J µg/kg	Estimated value
SG-06-S-C-121108	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		Hexachlorobenzene	20U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
		Di-n-octyl phthalate	41M µg/kg	41J µg/kg	Estimated value
SG-07-S-C-121108	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		Hexachlorobenzene	20U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
		Di-n-octyl phthalate	22M µg/kg	22J µg/kg	Estimated value

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
SG-07-S-C-DUP-121108	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	19UJ µg/kg	19UJ µg/kg	Low LCS %R value
		Hexachlorobenzene	20U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
SG-08-S-C-121108	SVOCs / PAHs / Pesticides	Heptachlor	4.8U µg/kg	4.8UJ µg/kg	Low MSD %R value
		2,4-Dimethylphenol	19UJ µg/kg	19UJ µg/kg	Low LCS %R value
		Hexachlorobenzene	20U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
SG-09-S-C-121108	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		Hexachlorobenzene	20U µg/kg	DNR	Report from other analysis
		Hexachlorobutadiene	10UJ µg/kg		
SG-10-S-E-121107	Metals	Copper	18.8 mg/kg	18.8J mg/kg	High duplicate RPD value
		Lead	19 mg/kg	19J mg/kg	
		Zinc	97 mg/kg	97J mg/kg	
		Arsenic	9U mg/kg	9UJ mg/kg	
		Antimony	9U mg/kg	9UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		1-Methylnaphthalene	20U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	20U µg/kg		
		Acenaphthene	16 µg/kg		
		Acenaphthylene	20U µg/kg		
		Anthracene	48 µg/kg		
		Benzo(a)anthracene	150 µg/kg		
		Benzo(a)pyrene	150 µg/kg		
		Benzo(g,h,i)perylene	89 µg/kg		
		Benzo(b,j,k)fluoranthenes	330 µg/kg		
		Chrysene	240 µg/kg		
		Dibenzo(a,h)anthracene	28 µg/kg		
		Dibenzofuran	40Y µg/kg		
		Fluoranthene	320 µg/kg		
		Fluorene	28 µg/kg		
		Hexachlorobenzene	20U µg/kg		
		Hexachlorobutadiene	10UJ µg/kg		
		Indeno(1,2,3-c,d)pyrene	84 µg/kg		
		Naphthalene	18 µg/kg		
		Phenanthrene	250 µg/kg		
		Pyrene	350 µg/kg		
SG-11-S-E-121107	Metals	Copper	97 mg/kg	97J mg/kg	High duplicate RPD value
		Lead	50 mg/kg	50J mg/kg	
		Zinc	377 mg/kg	377J mg/kg	
		Arsenic	30U mg/kg	30UJ mg/kg	
		Antimony	30U mg/kg	30UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		1-Methylnaphthalene	12J µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	19J µg/kg		
		Acenaphthene	18J µg/kg		
		Acenaphthylene	13J µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Anthracene	64 µg/kg		
		Benzo(a)anthracene	150 µg/kg		
		Benzo(a)pyrene	150 µg/kg		
		Benzo(b,j,k)fluoranthenes	390 µg/kg		
		Benzo(g,h,i)perylene	100 µg/kg		
		Chrysene	280 µg/kg		
		Dibenzo(a,h)anthracene	29 µg/kg		
		Dibenzofuran	59 µg/kg		
		Fluoranthene	420 µg/kg		
		Fluorene	34 µg/kg		
		Hexachlorobenzene	20U µg/kg		
		Hexachlorobutadiene (Hexachloro-1,3-butadiene)	10UJ µg/kg		
		Indeno(1,2,3-c,d)pyrene	83 µg/kg		
		Naphthalene	38 µg/kg		
		Phenanthrene	190 µg/kg		
		Pyrene	280 µg/kg		
		Dibenzofuran	38M µg/kg	38J µg/kg	Estimated result
	PCBs	Aroclor 1260	29P µg/kg	29J µg/kg	Column confirmation RPD above control limit
SG-12-S-E-121107	Metals	Copper	47.5 mg/kg	47.5J mg/kg	High duplicate RPD value
		Lead	27 mg/kg	27J mg/kg	
		Zinc	185 mg/kg	185J mg/kg	
		Arsenic	20U mg/kg	20UJ mg/kg	
		Antimony	20U mg/kg	20UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		1-Methylnaphthalene	20U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	12J µg/kg		
		Acenaphthene	17 µg/kg		
		Acenaphthylene	20U µg/kg		
		Anthracene	30 µg/kg		
		Benzo(a)anthracene	110 µg/kg		
		Benzo(a)pyrene	100 µg/kg		
		Benzo(b,j,k)fluoranthenes	280 µg/kg		
		Benzo(g,h,i)perylene	51 µg/kg		
		Chrysene	190 µg/kg		
		Dibenzo(a,h)anthracene	14 µg/kg		
		Dibenzofuran	35 µg/kg		
		Fluoranthene	150 µg/kg		
		Fluorene	22 µg/kg		
		Hexachlorobenzene	20U µg/kg		
		Hexachlorobutadiene	10UJ µg/kg		
		Indeno(1,2,3-c,d)pyrene	43 µg/kg		
		Naphthalene	18 µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Phenanthrene	120 µg/kg		
		Pyrene	180 µg/kg		
		Dibenzofuran	35M µg/kg	35J µg/kg	Estimated result
SG-13-S-E-121107	Metals	Copper	62.1 mg/kg	62.1J mg/kg	High duplicate RPD value
		Lead	32 mg/kg	32J mg/kg	
		Zinc	205 mg/kg	205J mg/kg	
		Arsenic	20U mg/kg	20UJ mg/kg	
		Antimony	20U mg/kg	20UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		1-Methylnaphthalene	5.6 µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	14 µg/kg		
		Acenaphthene	12 µg/kg		
		Acenaphthylene	6.3 µg/kg		
		Anthracene	21 µg/kg		
		Benzo(a)anthracene	110 µg/kg		
		Benzo(a)pyrene	120 µg/kg		
		Benzo(b,j,k)fluoranthenes	340 µg/kg		
		Benzo(g,h,i)perylene	67 µg/kg		
		Chrysene	180 µg/kg		
		Dibenzo(a,h)anthracene	18 µg/kg		
		Dibenzofuran	41M µg/kg		
		Fluoranthene	140 µg/kg		
		Fluorene	17 µg/kg		
		Hexachlorobenzene	20U µg/kg		
		Hexachlorobutadiene	10UJ µg/kg		
		Indeno(1,2,3-c,d)pyrene	54 µg/kg		
		Naphthalene	18 µg/kg		
		Phenanthrene	96 µg/kg		
		Pyrene	230 µg/kg		
		Di-n-octyl phthalate	73M µg/kg	73J µg/kg	Estimated value
		Dibenzofuran	41M µg/kg	41J µg/kg	
SG-13-S-E-DUP-121107	Metals	Copper	62.8 mg/kg	62.8J mg/kg	High duplicate RPD value
		Lead	32 mg/kg	32J mg/kg	
		Zinc	205 mg/kg	205J mg/kg	
		Arsenic	20U mg/kg	20UJ mg/kg	
		Antimony	20U mg/kg	20UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	20UJ µg/kg	20UJ µg/kg	Low LCS %R value
		1-Methylnaphthalene	20U µg/kg	DNR	High duplicate RPD value
		2-Methylnaphthalene	15J µg/kg		Report from other analysis
		Acenaphthene	16 µg/kg		
		Acenaphthylene	20U µg/kg		
		Anthracene	27 µg/kg		
		Benzo(a)anthracene	100 µg/kg		
		Benzo(a)pyrene	100 µg/kg		
		Benzo(b,j,k)fluoranthenes	300 µg/kg		
		Benzo(g,h,i)perylene	56 µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Chrysene	170 µg/kg		
		Dibenzo(a,h)anthracene	16 µg/kg		
		Dibenzofuran	17 µg/kg		
		Fluoranthene	160 µg/kg		
		Fluorene	21 µg/kg		
		Hexachlorobenzene	20U µg/kg		
		Hexachlorobutadiene (Hexachloro-1,3-butadiene)	10UJ µg/kg		
		Indeno(1,2,3-c,d)pyrene	49 µg/kg		
		Naphthalene	21 µg/kg		
		Phenanthrene	110 µg/kg		
		Pyrene	200 µg/kg		
		Dibenzofuran	24M µg/kg	24J µg/kg	Estimated value
SG-14-S-E-121107	Metals	Copper	111 mg/kg	111J mg/kg	High duplicate RPD value
		Lead	26 mg/kg	26J mg/kg	
		Zinc	182 mg/kg	182J mg/kg	
		Arsenic	10U mg/kg	10UJ mg/kg	
		Antimony	10U mg/kg	10UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	19UJ µg/kg	19UJ µg/kg	Low LCS %R value
		1-Methylnaphthalene	28 µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	51 µg/kg		
		Acenaphthene	120 µg/kg		
		Acenaphthylene	16 µg/kg		
		Anthracene	140 µg/kg		
		Benzo(a)anthracene	350 µg/kg		
		Benzo(a)pyrene	210 µg/kg		
		Benzo(b,j,k)fluoranthenes	600 µg/kg		
		Benzo(g,h,i)perylene	84 µg/kg		
		Chrysene	440 µg/kg		
		Dibenzo(a,h)anthracene	28 µg/kg		
		Dibenzofuran	77 µg/kg		
		Fluoranthene	1000 µg/kg		
		Fluorene	150 µg/kg		
		Hexachlorobenzene	19U µg/kg		
		Hexachlorobutadiene (Hexachloro-1,3-butadiene)	10UJ µg/kg		
		Indeno(1,2,3-c,d)pyrene	77 µg/kg		
		Naphthalene	110 µg/kg		
		Phenanthrene	680 µg/kg		
		Pyrene	850 µg/kg		
SG-15-S-E-121107	Metals	Copper	5.5 mg/kg	5.5J mg/kg	High duplicate RPD value
		Lead	7 mg/kg	7J mg/kg	
		Zinc	57 mg/kg	57J mg/kg	

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Arsenic	6U mg/kg	6UJ mg/kg	
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	4,4'-DDT (p,p'-DDT)	1.9U µg/kg	1.9UJ µg/kg	Low MSD %R value, high MS/MSD RPD value
		2,4-Dimethylphenol	19UJ µg/kg	19UJ µg/kg	Low LCS %R value
		1-Methylnaphthalene	19U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	19U µg/kg		
		Acenaphthene	19U µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	19U µg/kg		
		Benzo(a)anthracene	19U µg/kg		
		Benzo(a)pyrene	19U µg/kg		
		Benzo(b,j,k)fluoranthenes	37 µg/kg		
		Benzo(g,h,i)perylene	19U µg/kg		
		Chrysene	19U µg/kg		
		Dibenzo(a,h)anthracene	19U µg/kg		
		Dibenzofuran	19U µg/kg		
		Fluoranthene	11 µg/kg		
		Fluorene	19U µg/kg		
		Hexachlorobenzene	19U µg/kg		
		Hexachlorobutadiene (Hexachloro-1,3-butadiene)	10 µg/kg		
		Indeno(1,2,3-c,d)pyrene	19U µg/kg		
		Naphthalene	19U µg/kg		
		Phenanthrene	6.8 µg/kg		
		Pyrene	10 µg/kg		
SG-16-S-E-121107	Metals	Copper	5.4 mg/kg	5.4J mg/kg	High duplicate RPD value
		Lead	4 mg/kg	4J mg/kg	
		Zinc	43 mg/kg	43J mg/kg	
		Arsenic	6U mg/kg	6UJ mg/kg	
		Antimony	6U mg/kg	6UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	19UJ µg/kg	19UJ µg/kg	Low LCS %R value
		Benzo(g,h,i)perylene	4.8U µg/kg	4.8UJ µg/kg	Low MS/MSD %R value
		Dibenzo(a,h)anthracene	4.8U µg/kg	4.8UJ µg/kg	
		Indeno(1,2,3-c,d)pyrene	4.8U µg/kg	4.8UJ µg/kg	
		Naphthalene	4.8U µg/kg	4.8UJ µg/kg	Low MS %R value
		1-Methylnaphthalene	19U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	19U µg/kg		
		Acenaphthene	19U µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	19U µg/kg		
		Benzo(a)anthracene	19U µg/kg		
		Benzo(a)pyrene	19U µg/kg		
		Benzo(b,j,k)fluoranthenes	39 µg/kg		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Benzo(g,h,i)perylene	19U µg/kg		
		Chrysene	19U µg/kg		
		Dibenzo(a,h)anthracene	19U µg/kg		
		Dibenzofuran	19U µg/kg		
		Fluoranthene	5.1 µg/kg		
		Fluorene	19U µg/kg		
		Indeno(1,2,3-c,d)pyrene	19U µg/kg		
		Naphthalene	19U µg/kg		
		Phenanthrene	19U µg/kg		
		Pyrene	4.5J µg/kg		
SG-17-S-E-121107	Metals	Copper	13.5 mg/kg	13.5J mg/kg	High duplicate RPD value
		Lead	7 mg/kg	7J mg/kg	
		Zinc	64 mg/kg	64J mg/kg	
		Arsenic	10U mg/kg	10UJ mg/kg	
		Antimony	10U mg/kg	10UJ mg/kg	Low MS %R value
	SVOCs / PAHs / Pesticides	2,4-Dimethylphenol	19UJ µg/kg	19UJ µg/kg	Low LCS %R value
		1-Methylnaphthalene	19U µg/kg	DNR	Report from other analysis
		2-Methylnaphthalene	19U µg/kg		
		Acenaphthene	19U µg/kg		
		Acenaphthylene	19U µg/kg		
		Anthracene	2.8J µg/kg		
		Benzo(a)anthracene	12 µg/kg		
		Benzo(a)pyrene	4.9U µg/kg		
		Benzo(b,j,k)fluoranthenes	45 µg/kg		
		Benzo(g,h,i)perylene	9 µg/kg		
		Chrysene	25 µg/kg		
		Dibenzo(a,h)anthracene	19U µg/kg		
		Dibenzofuran	19U µg/kg		
		Fluoranthene	37 µg/kg		
		Fluorene	19U µg/kg		
		Indeno(1,2,3-c,d)pyrene	7.4 µg/kg		
		Naphthalene	19U µg/kg		
		Phenanthrene	19 µg/kg		
		Pyrene	39 µg/kg		
WS-10-W-C-121107	SVOCs / PAHs / Pesticides	1-Methylnaphthalene	1U ug/L	DNR	Report from other analysis
		2-Methylnaphthalene	1U ug/L		
		Acenaphthene	1U ug/L		
		Acenaphthylene	1U ug/L		
		Anthracene	1U ug/L		
		Benzo(a)anthracene	1U ug/L		
		Benzo(a)pyrene	1U ug/L		
		Benzo(b,j,k)fluoranthenes	5U ug/L		
		Benzo(g,h,i)perylene	1U ug/L		
		Chrysene	1U ug/L		
		Dibenzo(a,h)anthracene	1U ug/L		
		Dibenzofuran	1U ug/L		
		Fluoranthene	1U ug/L		

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
		Fluorene	1U ug/L		
		Hexachlorobutadiene (Hexachloro-1,3-butadiene)	3U ug/L		
		Indeno(1,2,3-c,d)pyrene	1U ug/L		
		Naphthalene	1U ug/L		
		Phenanthrene	1U ug/L		
		Pyrene	1U ug/L		

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Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437 **Web** www.lab-data.com **Fax** 760.634.0439

Anchor QEA, LLC
720 Olive Way, Suite 900
Seattle, WA 98101
ATTN: Ms. Cindy Fields

January 8, 2013

SUBJECT: City of Kenmore, Data Validation

Dear Ms. Fields,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received December 17, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 28943:

SDG #	Fraction
VR38	Dioxins/Dibenzofurans
VR58	
VR82	

The data validation was performed under Stage 4 guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review, September 2005

Please feel free to contact us if you have any questions.

Sincerely,

Ming-Hwa Hwang
Project Manager/Senior Chemist

1,846 pages-EX

Attachment 1

EDD

LDC #28943 (Anchor Environmental-Seattle WA / City of Kenmore)

Project #120891-01.01

LDC	SDG#	DATE REC'D	(3) DATE DUE	Dioxins (1613B)																															
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	VR38	12/17/12	01/10/13	0	11																														
B	VR58	12/17/12	01/10/13	0	10																														
C	VR82	12/17/12	01/10/13	0	9																														
Total	T/MH			0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: City of Kenmore

Collection Date: November 6, 2012

LDC Report Date: January 3, 2013

Matrix: Sediment

Parameters: Dioxins/Dibenzofurans

Validation Level: Stage 4

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): VR38

Sample Identification

HT-01-S-C-121106
HT-02-S-C-121106
HT-03-S-C-121106
HT-04-S-C-121106
HT-05-S-C-121106
HT-08-S-C-121106
HT-09-S-C-121106
HT-10-S-LFP-121106
HT-11-S-LFP-121106
HT-06-S-E-121106
HT-07-S-E-121106
HT-07-S-E-121106DUP

Introduction

This data review covers 12 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1613B for Polychlorinated Dioxins/Dibenzofurans.

This review follows USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

The chromatographic resolution between 2,3,7,8-TCDD and the peaks representing any other unlabeled TCDD isomers was resolved with a valley of less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compound and labeled compound.

IV. Continuing Calibration (Continuing)

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for unlabeled compounds and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB-111612	11/16/12	2,3,7,8-TCDF 1,2,3,7,8-PeCDF 1,2,3,7,8-PeCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD Total TCDF Total HpCDD	0.0240 pg/g 0.0320 pg/g 0.0200 pg/g 0.0540 pg/g 0.144 pg/g 0.772 pg/g 0.0600 pg/g 0.230 pg/g	All samples in SDG VR38

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
HT-01-S-C-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF 1,2,3,7,8-PeCDD	0.0355 pg/g 0.0611 pg/g 0.0671 pg/g	0.0355U pg/g 0.0611U pg/g 0.0671U pg/g
HT-02-S-C-121106	1,2,3,7,8-PeCDF	0.0990 pg/g	0.0990U pg/g
HT-05-S-C-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF	0.0860 pg/g 0.115 pg/g	0.0860U pg/g 0.115U pg/g
HT-08-S-C-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF	0.0818 pg/g 0.0818 pg/g	0.0818U pg/g 0.0818U pg/g
HT-10-S-LFP-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF	0.0751 pg/g 0.0909 pg/g	0.0751U pg/g 0.0909U pg/g
HT-11-S-LFP-121106	1,2,3,7,8-PeCDF 1,2,3,7,8-PeCDD	0.0563 pg/g 0.0660 pg/g	0.0563U pg/g 0.0660U pg/g
HT-07-S-E-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF	0.116 pg/g 0.142 pg/g	0.116U pg/g 0.142U pg/g

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Ongoing Precision & Recovery Samples (OPR)

Ongoing precision and recovery (OPR) control samples were reviewed for each matrix as applicable. The percent recoveries (%R) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits.

X. Target Compound Identifications

All target compound identifications were within validation criteria.

XI. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
All samples in SDG VR38	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A
HT-03-S-C-121106 HT-04-S-C-121106 HT-08-S-C-121106 HT-06-S-E-121106	All compounds flagged "X" by the laboratory indicates results coeluted with Polychlorinated Diphenyl Ether (PDBE).	J (all detects)	A

XII. System Performance

The system performance was acceptable.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to compound quantitation problems, data were qualified as estimated in eleven samples.

Due to method blank contamination problems, data were qualified as not detected in seven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the Stage 4 data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

City of Kenmore
Dioxins/Dibenzofurans - Data Qualification Summary - SDG VR38

SDG	Sample	Compound	Flag	A or P	Reason
VR38	HT-01-S-C-121106 HT-02-S-C-121106 HT-03-S-C-121106 HT-04-S-C-121106 HT-05-S-C-121106 HT-08-S-C-121106 HT-09-S-C-121106 HT-10-S-LFP-121106 HT-11-S-LFP-121106 HT-06-S-E-121106 HT-07-S-E-121106	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A	Compound quantitation and RLs
VR38	HT-03-S-C-121106 HT-04-S-C-121106 HT-08-S-C-121106 HT-06-S-E-121106	All compounds flagged "X" by the laboratory indicates results coeluted with Polychlorinated Diphenyl Ether (PDBE).	J (all detects)	A	Compound quantitation and RLs

City of Kenmore
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG VR38

SDG	Sample	Compound	Modified Final Concentration	A or P
VR38	HT-01-S-C-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF 1,2,3,7,8-PeCDD	0.0355U pg/g 0.0611U pg/g 0.0671U pg/g	A
VR38	HT-02-S-C-121106	1,2,3,7,8-PeCDF	0.0990U pg/g	A
VR38	HT-05-S-C-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF	0.0860U pg/g 0.115U pg/g	A
VR38	HT-08-S-C-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF	0.0818U pg/g 0.0818U pg/g	A
VR38	HT-10-S-LFP-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF	0.0751U pg/g 0.0909U pg/g	A
VR38	HT-11-S-LFP-121106	1,2,3,7,8-PeCDF 1,2,3,7,8-PeCDD	0.0563U pg/g 0.0660U pg/g	A
VR38	HT-07-S-E-121106	2,3,7,8-TCDF 1,2,3,7,8-PeCDF	0.116U pg/g 0.142U pg/g	A

LDC #: 28943A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/02/13
SDG #: VR38 Stage 4 Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: SVG
2nd Reviewer: ✓

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/06/12
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	%RSD ≤ 20/35%
IV.	Continuing calibration/~~ICV~~	A	QC limits
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates /Lab Dup	N/A	
VII.	Laboratory control samples	A	~~LCS~~ OPR
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	QC limits
X.	Target compound identifications	A	
XI.	Compound quantitation/RL/LOQ/LODs	SW	EMPC = Jdets /A
XII.	System performance	A	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Sediment

1	HT-01-S-C-121106	11	HT-07-S-E-121106	21	MB-111612	31	
2	HT-02-S-C-121106	12	HT-07-S-E-121106DUP	22		32	
3	HT-03-S-C-121106	13		23		33	
4	HT-04-S-C-121106	14		24		34	
5	HT-05-S-C-121106	15		25		35	
6	HT-08-S-C-121106	16		26		36	
7	HT-09-S-C-121106	17		27		37	
8	HT-10-S-LFP-121106	18		28		38	
9	HT-11-S-LFP-121106	19		29		39	
10	HT-06-S-E-121106	20		30		40	

Notes: _____

LDC #: 38942A21

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: V

Method: Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
III. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and ≤ 35% for labeled compounds ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?				
IV. Continuing calibration	✓			
Was a routine calibration performed at the beginning and end of each 12 hour period?	✓			
Were all the concentrations for the unlabeled compounds and labeled compounds within the QC limits (Method 1613B, Table 6)?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?		✓		
VI. Matrix spike/Matrix spike duplicates	✓			
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
IX. Internal standards				
Were internal standard recoveries within the 25-150% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
X. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XI. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:

LDC #: 28943A21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 11/16/12 **Blank analysis date:** 11/27/12 **Associated samples:** All

Conc. units: pg/g

Compound	Blank ID		Sample Identification							
	MB-111612	5X	1	2	5	6	8	9	11	
H	0.0240	0.12	0.0355*/U		0.0860/U	0.0818/U	0.0751/U		0.116*/U	
I	0.0320*	0.16	0.0611/U	0.0990/U	0.115*/U	0.0818*/U	0.0909/U	0.0563/U	0.142/U	
B	0.0200*	0.10	0.0671*/U					0.0660*/U		
O	0.0540*	0.27								
F	0.144	0.72								
G	0.772	3.86								
V	0.0600	0.30								
U	0.230	1.15								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 28943 A21

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JVG
2nd Reviewer: [illegible]

1613B
METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method ~~8290~~)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	EMPC results		J dets /A
		3, 4, ~~5~~, 6, 10	X flag indicates coelution with polychlorinated diphenyl ethers (PCDE)		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 28943C21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of Compound
C_x = Concentration of compound,
S= Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF	Recalculated RRF	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL Autospec1	11/23/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.03	1.03	1.05	1.05	4.5	4.4
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.86	0.86	0.88	0.88	2.5	6.3
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.92	0.92	0.92	2.0	2.3
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.00	1.00	1.02	1.02	3.4	3.6
			OCDF (13C-OCDD)	1.15	1.15	1.14	1.14	2.7	2.8

Cis/Cx	Ax	Ais
100/10	386426	3749939
100/40	504023	5846599
100/200	1240430	2706025
100/200	1145559	2296332
200/400	2230571	3880000

STD	2,3,7,8-TCDD	2,3,7,8-TCDF	1,2,3,6,7,8-HxCDD	1,2,3,4,6,7,8-HpCDD	OCDF
CSL	1.140	0.970	0.890	1.080	1.110
CS1	1.030	0.800	0.920	0.980	1.100
CS2	1.010	0.860	0.900	0.990	1.120
CS3	1.030	0.860	0.920	1.000	1.150
CS4	1.040	0.880	0.920	1.020	1.160
CS5	1.050	0.890	0.950	1.030	1.180
x =	1.050	0.877	0.917	1.017	1.137
s =	0.04604	0.05538	0.02066	0.03615	0.03141

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC # 28943A1

VALIDATION FINDINGS WORKSHEET
Routine Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer: ✓

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Ref IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1	12112702 Autospec1	11/27/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.00	1.00	4.2	4.3
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.87	0.87	1.2	1.2
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.92	0.92	0.3	0.3
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	1.02	1.02	0.3	0.3
			OCDF (13C-OCDD)	1.14	1.16	1.16	1.6	1.6
2	12112711 Autospec1	11/27/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.03	1.03	2.0	2.1
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.86	0.86	2.2	2.2
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.91	0.91	1.7	0.5
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	1.01	1.01	0.4	0.4
			OCDF (13C-OCDD)	1.14	1.12	1.12	1.2	1.4

		OpeningCCV		Closing CCV	
Cis/Cx	Compound (Ref IS)	Ax	Ais	Ax	Ais
100/10	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	362610	3609079	428520	4168462
100/10	2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	491819	5677448	559406	6525539
100/50	1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	1251751	2719057	1565539	3433390
100/50	1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1128153	2212376	1404939	2773687
200/100	OCDF (13C-OCDD)	2198010	3805239	2660239	4733220

LDC #: 28943 A21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: OPR-1116 IV

Compound	Spike Added (pg/g)		Spiked Sample Concentration (pg/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20	NA	21.7	NA	108	108				
1,2,3,7,8-PeCDD	100		109		109	109				
1,2,3,4,7,8-HxCDD	↓		110		110	110				
1,2,3,4,7,8,9-HpCDF			109		109	109				
OCDF	200	↓	215	↓	108	108				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 28993A21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer: [signature]

METHOD: GC/MS Dioxins/Dibenzofurans (Method 1613B)

Compound results reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #1, 1234678-HpCDD

$$\text{Conc.} = \frac{(43947)(100)(20)}{(2250492)(1.017)(10.1)(\quad)}$$

$$= 3.80 \text{ pg/g}$$

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

City of Kenmore - LDC 28943

SDG: VR38

Analytical Method	E1613B											
Sample ID	**Lab Sample ID**	**Chemical Name**	**Anal Date**	**Result**	**Mod Res Report**	**Detect**	**Lab Qual**	**Val Qual**	**Reason**	**RL**	**MDL**	**Units**
HT-01-S-C-121106	12-22267-VR38A	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.0375	Yes	Y	JEMPC	J	23	1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.134	Yes	Y	JEMPC	J	23	0.986		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.0335	Yes	Y	JEMPC	J	23	1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.643	Yes	Y	J			1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.0572	Yes	Y	J			1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.193	Yes	Y	J			1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.0493	Yes	Y	JEMPC	J	23	1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.0611	Yes	N	BJ	U	7	1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.0454	Yes	Y	JEMPC	J	23	0.986		pg/g
HT-01-S-C-121106	12-22267-VR38A	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	1.18	Yes	Y	EMPC	J	23	1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.414	Yes	N	U			1.97	0.414	pg/g
HT-01-S-C-121106	12-22267-VR38A	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.0355	Yes	N	BJEMPC	U	7	0.986		pg/g
HT-01-S-C-121106	12-22267-VR38A	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.132	Yes	Y	UEMPC	J	23	0.986		pg/g
HT-01-S-C-121106	12-22267-VR38A	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	1.2	Yes	Y	EMPC	J	23	1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.103	Yes	Y	J			1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.0671	Yes	N	BJEMPC	U	7	0.986		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	31.4	Yes	Y				4.93		pg/g
HT-01-S-C-121106	12-22267-VR38A	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.444	Yes	Y	EMPC	J	23	0.986		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-01-S-C-121106	12-22267-VR38A	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	3.79		Yes	Y				1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.17		Yes	Y	UEMPC	J	23	0.986		pg/g
HT-01-S-C-121106	12-22267-VR38A	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	7.37		Yes	Y				1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	1.88		Yes	Y				1.97		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	1.91		Yes	Y	J			4.93		pg/g
HT-01-S-C-121106	12-22267-VR38A	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.209		Yes	N	U			1.97	0.209	pg/g
HT-01-S-C-121106	12-22267-VR38A	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.876		Yes	Y	EMPC	J	23	1.97		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	3.44		Yes	Y	J			4.95		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.137		Yes	Y	JEMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.158		Yes	Y	BJ			0.990		pg/g
HT-02-S-C-121106	12-22268-VR38B	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.362		Yes	Y	EMPC	J	23	0.990		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.0495		Yes	Y	JEMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	2.42		Yes	Y	EMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.0812		Yes	Y	J			0.990		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.115		Yes	Y	JEMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	3.61		Yes	Y	EMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	1.21		Yes	Y	JEMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.434		Yes	Y	J			1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	21.4		Yes	Y				1.98		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-02-S-C-121106	12-22268-VR38B	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.78		Yes	Y	EMPC	J	23	0.990		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	9.3		Yes	Y				1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	3.17		Yes	Y	EMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.099		Yes	N	BJ	U	7	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	1.84		Yes	Y	EMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	1.46		Yes	Y	EMPC	J	23	0.990		pg/g
HT-02-S-C-121106	12-22268-VR38B	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.135		Yes	Y	BJ			0.990		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.275		Yes	Y	J			1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.168		Yes	Y	JEMPC	J	23	0.990		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.145		Yes	N	U			1.98	0.145	pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.105		Yes	Y	JEMPC	J	23	1.98		pg/g
HT-02-S-C-121106	12-22268-VR38B	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	101		Yes	Y				4.95		pg/g
HT-02-S-C-121106	12-22268-VR38B	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.129		Yes	Y	J			1.98		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.654		Yes	Y	J			1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.459		Yes	Y	J			1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	5.68		Yes	Y				1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.754		Yes	Y	J			1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	2.25		Yes	Y				1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.518		Yes	Y	JEMPC	J	23	1.99		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-03-S-C-121106	12-22269-VR38C	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.303		Yes	Y	BJX	J	24	1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.317		Yes	Y	J			0.997		pg/g
HT-03-S-C-121106	12-22269-VR38C	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	13.6		Yes	Y	EMPC	J	23	1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.349		Yes	Y	JEMPC	J	23	1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.397		Yes	Y	J			0.997		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.185		Yes	Y	JEMPC	J	23	1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.64		Yes	Y	JEMPC	J	23	0.997		pg/g
HT-03-S-C-121106	12-22269-VR38C	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	83.9		Yes	Y				1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	11.8		Yes	Y				4.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	18.4		Yes	Y	EMPC	J	23	1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	4.21		Yes	Y	EMPC	J	23	0.997		pg/g
HT-03-S-C-121106	12-22269-VR38C	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	16.3		Yes	Y	EMPC	J	23	1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	272		Yes	Y				4.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	9.79		Yes	Y	EMPC	J	23	1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	6.63		Yes	Y	EMPC	J	23	0.997		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	1.29		Yes	Y	J			1.99		pg/g
HT-03-S-C-121106	12-22269-VR38C	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.239		Yes	Y	JEMPC	J	23	0.997		pg/g
HT-03-S-C-121106	12-22269-VR38C	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	2.56		Yes	Y	EMPC	J	23	0.997		pg/g
HT-03-S-C-121106	12-22269-VR38C	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	38.7		Yes	Y				1.99		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-04-S-C-121106	12-22270-VR38D	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	71.5		Yes	Y				4.98		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	26.8		Yes	Y				1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	2.65		Yes	Y				1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	8.69		Yes	Y				1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	65.1		Yes	Y	EMPC	J	23	1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.871		Yes	Y	JX	J	24	1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.546		Yes	Y	JEMPC	J	23	0.996		pg/g
HT-04-S-C-121106	12-22270-VR38D	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	50.5		Yes	Y	EMPC	J	23	1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	1.77		Yes	Y	JEMPC	J	23	1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	1.41		Yes	Y				0.996		pg/g
HT-04-S-C-121106	12-22270-VR38D	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	7.22		Yes	Y	EMPC	J	23	0.996		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	1.79		Yes	Y	J			1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	2.18		Yes	Y				1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	1.78		Yes	Y	J			1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	79.5		Yes	Y	EMPC	J	23	1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	423		Yes	Y				1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	14.3		Yes	Y	EMPC	J	23	0.996		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	178		Yes	Y				1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.618		Yes	Y	J			1.99		pg/g

SDG: VR38

Analytical Method	E1613B											
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-04-S-C-121106	12-22270-VR38D	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	1460	Yes	Y				4.98		pg/g
HT-04-S-C-121106	12-22270-VR38D	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	31.3	Yes	Y	EMPC	J	23	1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	25.6	Yes	Y	EMPC	J	23	0.996		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	4.33	Yes	Y				1.99		pg/g
HT-04-S-C-121106	12-22270-VR38D	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	2.14	Yes	Y				0.996		pg/g
HT-04-S-C-121106	12-22270-VR38D	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	1.05	Yes	Y				0.996		pg/g
HT-05-S-C-121106	12-22271-VR38E	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	3.87	Yes	Y	EMPC	J	23	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.127	Yes	Y	JEMPC	J	23	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.205	Yes	Y	JEMPC	J	23	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	2.44	Yes	Y				1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.27	Yes	Y	JEMPC	J	23	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.884	Yes	Y	J			1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	40	Yes	Y				1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	2.79	Yes	Y	EMPC	J	23	0.978		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	18.4	Yes	Y				1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	8.55	Yes	Y	EMPC	J	23	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	136	Yes	Y				4.89		pg/g
HT-05-S-C-121106	12-22271-VR38E	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.117	Yes	Y	J			0.978		pg/g
HT-05-S-C-121106	12-22271-VR38E	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	1.25	Yes	Y	EMPC	J	23	0.978		pg/g

SDG: VR38

Analytical Method	E1613B											
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-05-S-C-121106	12-22271-VR38E	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	4.6	Yes	Y	EMPC	J	23	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.667	Yes	Y	EMPC	J	23	0.978		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.42	Yes	Y	JEMPC	J	23	0.978		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.34	Yes	Y	J			1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	7.39	Yes	Y				4.89		pg/g
HT-05-S-C-121106	12-22271-VR38E	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	6.91	Yes	Y	EMPC	J	23	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.086	Yes	N	BJ	U	7	0.978		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.115	Yes	N	BJEMPC	U	7	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.79	Yes	Y	J			1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.233	Yes	Y	JEMPC	J	23	1.96		pg/g
HT-05-S-C-121106	12-22271-VR38E	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.151	Yes	Y	JEMPC	J	23	0.978		pg/g
HT-05-S-C-121106	12-22271-VR38E	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.219	Yes	Y	J			1.96		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	25.4	Yes	Y				2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.176	Yes	Y	JEMPC	J	23	0.999		pg/g
HT-06-S-E-121106	12-22276-VR38J	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	9.16	Yes	Y	EMPC	J	23	2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	188	Yes	Y				5.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	8.8	Yes	Y				5.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	6.1	Yes	Y	EMPC	J	23	2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	11.6	Yes	Y				2.00		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-06-S-E-121106	12-22276-VR38J	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	1.77	Yes	Y	EMPC	J	23	0.999		pg/g
HT-06-S-E-121106	12-22276-VR38J	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	4.09	Yes	Y	EMPC	J	23	0.999		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.785	Yes	Y	J			2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	47.3	Yes	Y				2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	8.75	Yes	Y	EMPC	J	23	2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.374	Yes	Y	JEMPC	J	23	2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	0.302	Yes	Y	J			2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.252	Yes	Y	JEMPC	J	23	0.999		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.204	Yes	Y	BJX	J	24	2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.18	Yes	Y	J			2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.559	Yes	Y	J			2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.503	Yes	Y	J			2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	1.5	Yes	Y	J			2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.32	Yes	Y	JEMPC	J	23	2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.274	Yes	Y	JEMPC	J	23	0.999		pg/g
HT-06-S-E-121106	12-22276-VR38J	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.252	Yes	Y	J			0.999		pg/g
HT-06-S-E-121106	12-22276-VR38J	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	3.93	Yes	Y				2.00		pg/g
HT-06-S-E-121106	12-22276-VR38J	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	1.26	Yes	Y	EMPC	J	23	0.999		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.261	Yes	Y	J			1.99		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-07-S-E-121106	12-22277-VR38K	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.911	Yes	Y	J			1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.355	Yes	Y	J			1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	1.27	Yes	Y	EMPC	J	23	0.997		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	0.215	Yes	Y	J			1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.116	Yes	N	BJEMPC	U	7	0.997		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	3.43	Yes	Y				1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0917	Yes	Y	J			1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.221	Yes	Y	J			1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	30.4	Yes	Y				1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	6.85	Yes	Y	EMPC	J	23	1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.142	Yes	N	BJ	U	7	1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.243	Yes	Y	JEMPC	J	23	0.997		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.347	Yes	Y	J			1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.156	Yes	Y	J			0.997		pg/g
HT-07-S-E-121106	12-22277-VR38K	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	10.2	Yes	Y				1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.156	Yes	Y	JEMPC	J	23	0.997		pg/g
HT-07-S-E-121106	12-22277-VR38K	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	1.68	Yes	Y	EMPC	J	23	0.997		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	17.1	Yes	Y				1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	6.05	Yes	Y				1.99		pg/g

SDG: VR38

Analytical Method	E1613B											
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-07-S-E-121106	12-22277-VR38K	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.66	Yes	Y	J			1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	4.03	Yes	Y	EMPC	J	23	0.997		pg/g
HT-07-S-E-121106	12-22277-VR38K	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	5.7	Yes	Y	EMPC	J	23	1.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	136	Yes	Y				4.99		pg/g
HT-07-S-E-121106	12-22277-VR38K	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	9.54	Yes	Y				4.99		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	3.89	Yes	Y	J			4.99		pg/g
HT-08-S-C-121106	12-22272-VR38F	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.0758	Yes	Y	J			0.998		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.0818	Yes	N	BJXEMP	UJ	7,24	2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.13	Yes	Y	JEMPC	J	23	2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.387	Yes	Y	J			2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.0858	Yes	Y	JEMPC	J	23	2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	1.59	Yes	Y	J			2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.0818	Yes	N	BJ	U	7	0.998		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.0539	Yes	Y	JEMPC	J	23	2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.124	Yes	Y	JEMPC	J	23	2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	59.8	Yes	Y				4.99		pg/g
HT-08-S-C-121106	12-22272-VR38F	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	2.41	Yes	Y	EMPC	J	23	2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.735	Yes	Y	EMPC	J	23	0.998		pg/g
HT-08-S-C-121106	12-22272-VR38F	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	2.53	Yes	Y	EMPC	J	23	2.00		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-08-S-C-121106	12-22272-VR38F	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	1.56		Yes	Y	EMPC	J	23	2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	1.15		Yes	Y	EMPC	J	23	0.998		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.289		Yes	Y	JEMPC	J	23	2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.144		Yes	Y	BJ			0.998		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	8.06		Yes	Y				2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.12		Yes	Y	J			2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.134		Yes	Y	J			2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	4.22		Yes	Y				2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	14.5		Yes	Y				2.00		pg/g
HT-08-S-C-121106	12-22272-VR38F	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.601		Yes	Y	EMPC	J	23	0.998		pg/g
HT-08-S-C-121106	12-22272-VR38F	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.148		Yes	Y	JEMPC	J	23	0.998		pg/g
HT-09-S-C-121106	12-22273-VR38G	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	11.2		Yes	Y	EMPC	J	23	1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.574		Yes	Y	J			1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.556		Yes	Y	J			1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	6.28		Yes	Y				1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.534		Yes	Y	J			1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	1.25		Yes	Y	J			1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.373		Yes	Y	JEMPC	J	23	1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.165		Yes	Y	JEMPC	J	23	0.996		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-09-S-C-121106	12-22273-VR38G	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.265	Yes	Y	J			1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	169	Yes	Y				4.98		pg/g
HT-09-S-C-121106	12-22273-VR38G	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.183	Yes	Y	JEMPC	J	23	0.996		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.825	Yes	Y	J			1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	2.79	Yes	Y	EMPC	J	23	0.996		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.159	Yes	Y	BJ			1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	4.39	Yes	Y	EMPC	J	23	1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.175	Yes	Y	BJ			0.996		pg/g
HT-09-S-C-121106	12-22273-VR38G	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	8.76	Yes	Y				1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	24.8	Yes	Y				1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	2.15	Yes	Y	EMPC	J	23	0.996		pg/g
HT-09-S-C-121106	12-22273-VR38G	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	19.5	Yes	Y				1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	14	Yes	Y				4.98		pg/g
HT-09-S-C-121106	12-22273-VR38G	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	1.7	Yes	Y	EMPC	J	23	0.996		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.414	Yes	Y	J			1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	47.3	Yes	Y				1.99		pg/g
HT-09-S-C-121106	12-22273-VR38G	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.305	Yes	Y	J			0.996		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	6.32	Yes	Y				1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.14	Yes	N	U			1.98	0.140	pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-10-S-LFP-121106	12-22274-VR38H	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	11		Yes	Y				1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.168		Yes	Y	JEMPC	J	23	0.988		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.245		Yes	Y	J			1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	2.82		Yes	Y	EMPC	J	23	0.988		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	2.74		Yes	Y	EMPC	J	23	1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.303		Yes	N	U			1.98	0.303	pg/g
HT-10-S-LFP-121106	12-22274-VR38H	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	2.3		Yes	Y	EMPC	J	23	1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.617		Yes	Y	EMPC	J	23	0.988		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	2.73		Yes	Y	EMPC	J	23	1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.136		Yes	Y	JEMPC	J	23	1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.0909		Yes	N	BJ	U	7	1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.0751		Yes	N	BJ	U	7	0.988		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	40.1		Yes	Y				4.94		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.146		Yes	Y	J			0.988		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	2.38		Yes	Y	J			4.94		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.117		Yes	Y	BJEMPC	J	23	0.988		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.338		Yes	Y	UEMPC	J	23	0.988		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	2.46		Yes	Y	EMPC	J	23	1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.119		Yes	Y	J			1.98		pg/g

SDG: VR38

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.377	Yes	Y	J			1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.128	Yes	Y	J			1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	1.05	Yes	Y	J			1.98		pg/g
HT-10-S-LFP-121106	12-22274-VR38H	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.0652	Yes	Y	JEMPC	J	23	1.98		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.341	Yes	Y	EMPC	J	23	0.970		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.066	Yes	N	BJEMPC	U	7	0.970		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.0466	Yes	Y	J			0.970		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.066	Yes	Y	JEMPC	J	23	1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.312	Yes	Y	J			1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.134	Yes	Y	JEMPC	J	23	1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.0272	Yes	Y	JEMPC	J	23	1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.0834	Yes	Y	J			1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/27/2012	0.293	Yes	Y	EMPC	J	23	0.970		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/27/2012	0.162	Yes	N	U			1.94	0.162	pg/g
HT-11-S-LFP-121106	12-22275-VR38I	Total Hexachlorodibenzofuran (HxCDF)	11/27/2012	2.49	Yes	Y	EMPC	J	23	1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/27/2012	0.0563	Yes	N	BJ	U	7	1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/27/2012	0.153	Yes	Y	JEMPC	J	23	0.970		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	Total Pentachlorodibenzofuran (PeCDF)	11/27/2012	2.97	Yes	Y	EMPC	J	23	1.94		pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/27/2012	44.9	Yes	Y				4.85		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	1.76	Yes	Y	EMPC	J	23	1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.153	Yes	N	U			0.970	0.153	pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.103	Yes	Y	JEMPC	J	23	1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	Total Tetrachlorodibenzofuran (TCDF)	11/27/2012	0.72	Yes	Y	EMPC	J	23	0.970	0.153	pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	5.45	Yes	Y				1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/27/2012	0.84	Yes	Y	J			1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/27/2012	14	Yes	Y				1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	Total Heptachlorodibenzofuran (HpCDF)	11/27/2012	2.23	Yes	Y	EMPC	J	23	1.94		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/27/2012	1.61	Yes	Y	J			4.85		pg/g
HT-11-S-LFP-121106	12-22275-VR38I	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/27/2012	0.0718	Yes	Y	JEMPC	J	23	1.94		pg/g

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: City of Kenmore

Collection Date: November 7, 2012

LDC Report Date: January 15, 2013

Matrix: Sediment

Parameters: Dioxins/Dibenzofurans

Validation Level: Stage 4

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): VR58

Sample Identification

SG-10-S-E-121107
SG-11-S-E-121107
SG-12-S-E-121107
SG-13-S-E-121107
SG-13-S-E-dup-121107
SG-14-S-E-121107
SG-15-S-E-121107
SG-16-S-E-121107
SG-17-S-E-121107
SG-01-S-C-121107

Introduction

This data review covers 10 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1613B for Polychlorinated Dioxins/Dibenzofurans.

This review follows USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

The chromatographic resolution between 2,3,7,8-TCDD and the peaks representing any other unlabeled TCDD isomers was resolved with a valley of less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compound and labeled compound.

IV. Continuing Calibration (Continuing)

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for unlabeled compounds and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB-111412	11/14/12	2,3,7,8-TCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total TCDF Total HxCDF Total HxCDD Total HpCDD	0.0320 pg/g 0.0260 pg/g 0.0640 pg/g 0.248 pg/g 0.0560 pg/g 1.50 pg/g 0.0440 pg/g 0.0260 pg/g 0.0880 pg/g 0.550 pg/g	All samples in SDG VR58

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
SG-15-S-E-121107	2,3,7,8-TCDF 1,2,3,7,8,9-HxCDF	0.103 pg/g 0.0653 pg/g	0.103U pg/g 0.0653U pg/g
SG-16-S-E-121107	1,2,3,7,8,9-HxCDF	0.0259 pg/g	0.0259U pg/g
SG-17-S-E-121107	2,3,7,8-TCDF 1,2,3,7,8,9-HxCDF	0.136 pg/g 0.110 pg/g	0.136U pg/g 0.110U pg/g
SG-01-S-C-121107	2,3,7,8-TCDF 1,2,3,7,8,9-HxCDF	0.0691 pg/g 0.0573 pg/g	0.0691U pg/g 0.0573U pg/g

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Ongoing Precision & Recovery Samples (OPR)

Ongoing precision and recovery (OPR) control samples were reviewed for each matrix as applicable. The percent recoveries (%R) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits.

X. Target Compound Identifications

All target compound identifications were within validation criteria.

XI. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
All samples in SDG VR58	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A
SG-10-S-E-121107 SG-11-S-E-121107 SG-13-S-E-121107 SG-13-S-E-dup-121107 SG-14-S-E-121107	All compounds flagged "X" by the laboratory indicates results coeluted with Polychlorinated Diphenyl Ether (PDBE).	J (all detects)	A

XII. System Performance

The system performance was acceptable.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to compound quantitation problems, data were qualified as estimated in ten samples.

Due to method blank contamination problems, data were qualified as not detected in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the Stage 4 data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples SG-13-S-E-121107 and SG-13-S-E-dup-121107 were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD
	SG-13-S-E-121107	SG-13-S-E-dup-121107	
2,3,7,8-TCDF	2.84	1.22	80
2,3,7,8-TCDD	0.719	0.521	32
1,2,3,7,8-PeCDF	5.30	2.06	88
2,3,4,7,8-PeCDF	4.71	1.82	89
1,2,3,7,8-PeCDD	5.66	2.51	77
1,2,3,4,7,8-HxCDF	13.2	4.94	91
1,2,3,6,7,8-HxCDF	8.24	3.39	83
2,3,4,6,7,8-HxCDF	15.4	5.77	91
1,2,3,7,8,9-HxCDF	7.63	2.82	92
1,2,3,4,7,8-HxCDD	11.8	5.28	76
1,2,3,6,7,8-HxCDD	97.4	32.5	100
1,2,3,7,8,9-HxCDD	25.6	10.8	81
1,2,3,4,6,7,8-HpCDF	230	93.1	85
1,2,3,4,7,8,9-HpCDF	10.6	4.97	72
1,2,3,4,6,7,8-HpCDD	1730	600	97
OCDF	837	379	75
OCDD	14400	4830	100
Total TCDF	32.4	15.9	68
Total TCDD	10.5	4.89	73
Total PeCDF	129	51.6	86
Total PeCDD	31.5	13.1	83
Total HxCDF	438	161	92

Compound	Concentration (pg/g)		RPD
	SG-13-S-E-121107	SG-13-S-E-dup-121107	
Total HxCDD	353	136	89
Total HpCDF	809	314	88
Total HpCDD	3200	1120	96

XV. Field Blanks

No field blanks were identified in this SDG.

City of Kenmore
Dioxins/Dibenzofurans - Data Qualification Summary - SDG VR58

SDG	Sample	Compound	Flag	A or P	Reason
VR58	SG-10-S-E-121107 SG-11-S-E-121107 SG-12-S-E-121107 SG-13-S-E-121107 SG-13-S-E-dup-121107 SG-14-S-E-121107 SG-15-S-E-121107 SG-16-S-E-121107 SG-17-S-E-121107 SG-01-S-C-121107	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A	Compound quantitation and RLs
VR58	SG-10-S-E-121107 SG-11-S-E-121107 SG-13-S-E-121107 SG-13-S-E-dup-121107 SG-14-S-E-121107	All compounds flagged "X" by the laboratory indicates results coeluted with Polychlorinated Diphenyl Ether (PDBE).	J (all detects)	A	Compound quantitation and RLs

City of Kenmore
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG VR58

SDG	Sample	Compound	Modified Final Concentration	A or P
VR58	SG-15-S-E-121107	2,3,7,8-TCDF 1,2,3,7,8,9-HxCDF	0.103U pg/g 0.0653U pg/g	A
VR58	SG-16-S-E-121107	1,2,3,7,8,9-HxCDF	0.0259U pg/g	A
VR58	SG-17-S-E-121107	2,3,7,8-TCDF 1,2,3,7,8,9-HxCDF	0.136U pg/g 0.110U pg/g	A
VR58	SG-01-S-C-121107	2,3,7,8-TCDF 1,2,3,7,8,9-HxCDF	0.0691U pg/g 0.0573U pg/g	A

LDC #: 28943B21 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/02/13
SDG #: VR58 Stage 4 Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: JV6
2nd Reviewer: 1

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/07/12
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	%RSD ≤ 20/35%
IV.	Continuing calibration/~~ICV~~	A	QC Limits
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	A	~~LCS~~ OPR
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	QC limits
X.	Target compound identifications	A	
XI.	Compound quantitation/RL/LOQ/LODs	A	EMPC = J dets /A
XII.	System performance	A	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 6, 8
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	SG-10-S-E-121107	11	SG-16-S-E-121107	21	MB-111412	31	
2	SG-11-S-E-121107	12	SG-17-S-E-121107	22		32	
3	~~SG-11-S-E-121107DL~~	13	SG-01-S-C-121107	23		33	
4	SG-12-S-E-121107	14		24		34	
5	~~SG-12-S-E-121107DL~~	15		25		35	
6	SG-13-S-E-121107 D	16		26		36	
7	~~SG-13-S-E-121107DL~~	17		27		37	
8	SG-13-S-E-dup-121107 D	18		28		38	
9	SG-14-S-E-121107	19		29		39	
10	SG-15-S-E-121107	20		30		40	

Notes:

LDC #: 28943 B24

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: ✓

Method: Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
III. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and ≤ 35% for labeled compounds ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IV. Continuing calibration				
Was a routine calibration performed at the beginning and end of each 12 hour period?	✓			
Were all the concentrations for the unlabeled compounds and labeled compounds within the QC limits (Method 1613B, Table 6)?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

LDC #: 28943 B21

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
IX. Internal standards				
Were internal standard recoveries within the 25-150% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
X. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XI. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:

LDC #: 28943B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 11/14/12 **Blank analysis date:** 11/28/12 **Associated samples:** All

Conc. units: pg/g (All others either ND or > 5X MB)

Compound	Blank ID		Sample Identification							
	MB-111412	5X	10	11	12	13				
H	0.0320	0.16	0.103*/U		0.136/U	0.0691/U				
N	0.0260	0.13	0.0653*/U	0.0259/U	0.110*/U	0.0573*/U				
O	0.0640*	0.32								
F	0.248	1.24								
Q	0.0560*	0.28								
G	1.50	7.5								
V	0.0440*	0.22								
X	0.0260	0.13								
T	0.0880*	0.44								
U	0.550	2.75								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 28943 B21

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	~~Associated Samples~~	Qualifications
		All	EMPC results		J dets / A
					↓
		1, 2, 6, 8, 9	X flag indicates coelution with polychlorinated diphenyl ethers		

Comments: See sample calculation verification worksheet for recalculations

LDC#: 28943B21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Y N NA Were field duplicate pairs identified in this SDG?

Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g)		RPD
	6	8	
H	2.84*	1.22	80
A	0.719*	0.521*	32
I	5.30	2.06	88
J	4.71	1.82	89
B	5.66	2.51	77
K	13.2	4.94	91
L	8.24	3.39	83
M	15.4	5.77	91
N	7.63	2.82	92
C	11.8	5.28	76
D	97.4	32.5	100
E	25.6	10.8	81
O	230	93.1	85
P	10.6	4.97	72
F	1730	600	97
Q	837	379	75
G	14400	4830	100
V	32.4*	15.9*	68
R	10.5*	4.89*	73
W	129*	51.6*	86
S	31.5	13.1*	83
X	438*	161	92
T	353	136	89
Y	809	314*	88
U	3200	1120	96

*EMPC

LDC #: 28943B21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of Compound
C_x = Concentration of compound,
S= Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF	Recalculated RRF	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL Autospec1	11/23/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.03	1.03	1.05	1.05	4.5	4.4
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.86	0.86	0.88	0.88	2.5	6.3
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.92	0.92	0.92	2.0	2.3
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.00	1.00	1.02	1.02	3.4	3.6
			OCDF (13C-OCDD)	1.15	1.15	1.14	1.14	2.7	2.8

Cis/Cx	Ax	Ais
100/10	386426	3749939
100/40	504023	5846599
100/200	1240430	2706025
100/200	1145559	2296332
200/400	2230571	3880000

STD	2,3,7,8-TCDD	2,3,7,8-TCDF	1,2,3,6,7,8-HxCDD	1,2,3,4,6,7,8-HpCDD	OCDF
CSL	1.140	0.970	0.890	1.080	1.110
CS1	1.030	0.800	0.920	0.980	1.100
CS2	1.010	0.860	0.900	0.990	1.120
CS3	1.030	0.860	0.920	1.000	1.150
CS4	1.040	0.880	0.920	1.020	1.160
CS5	1.050	0.890	0.950	1.030	1.180
x =	1.050	0.877	0.917	1.017	1.137
s =	0.04604	0.05538	0.02066	0.03615	0.03141

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC # 28943B21

VALIDATION FINDINGS WORKSHEET
Routine Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Ref IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1	12112802 Autospec1	11/28/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.00	1.00	4.9	5.0
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.86	0.86	1.8	1.8
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.93	0.93	1.1	1.1
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	1.01	1.01	0.7	0.7
			OCDF (13C-OCDD)	1.14	1.15	1.15	0.9	0.9
2	12112811 Autospec1	11/28/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.01	1.01	4.1	3.8
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.86	0.86	1.6	1.6
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.93	0.93	1.7	1.8
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	1.01	1.01	1.1	1.1
			OCDF (13C-OCDD)	1.14	1.12	1.12	1.8	1.8

		OpeningCCV		Closing CCV	
Cis/Cx	Compound (Ref IS)	Ax	Ais	Ax	Ais
100/10	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	387000	3880000	489000	4870000
100/10	2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	525000	6100000	652000	7560000
100/50	1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	1369000	2950000	1960000	4200000
100/50	1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1265000	2500000	1862000	3700000
200/100	OCDF (13C-OCDD)	2470000	4300000	3480000	6200000

LDC # 28943B21

VALIDATION FINDINGS WORKSHEET
Routine Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer: [signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Ref IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1	12112820 Autospec1	11/29/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.03	1.03	1.5	1.7
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.86	0.86	2.1	2.2
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.91	0.91	0.5	0.5
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	0.99	0.99	2.3	2.3
			OCDF (13C-OCDD)	1.14	1.12	1.12	1.3	1.3
2	12112829 Autospec1	11/29/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.03	1.03	1.8	1.7
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.85	0.85	2.7	2.8
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.92	0.92	0.3	0.4
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	1.05	1.05	0.1	3.0
			OCDF (13C-OCDD)	1.14	1.12	1.13	1.2	1.8

		OpeningCCV		Closing CCV	
Cis/Cx	Compound (Ref IS)	Ax	Ais	Ax	Ais
100/10	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	448000	4340000	414000	4010000
100/10	2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	597000	6940000	547000	6420000
100/50	1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	1671000	3660000	1385000	3010000
100/50	1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1502000	3030000	2459376	4696774
200/100	OCDF (13C-OCDD)	2850000	5088000	2260000	4010000

LDC #: 28943 B21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: OPR-111d1v

Compound	Spike Added (pg/g)		Spiked Sample Concentration (pg/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20	NA	21.2	NA	106	106				
1,2,3,7,8-PeCDD	100		107		107	107				
1,2,3,4,7,8-HxCDD			111		111	111				
1,2,3,4,7,8,9-HpCDF			110		110	110				
OCDF	200		209		104	104				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 28943 B21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: GC/MS Dioxins/Dibenzofurans (Method 1613B)

Compound results reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #1, 2,3,7,8-TCDF

Conc. = $\frac{[5.94\text{e}3 + 8.76\text{e}3](1\text{ng})}{[1.90\text{e}6 + 2.43\text{e}6](0.877)}$

= 0.387

final conc. = $\frac{(0.387)(20)}{10.2\text{g}}$ = 0.7588 pg/g

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

SDG: VR58

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-01-S-C-121107	12-22338-VR58J	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.395	Yes	Y	EMPC	J	23	0.987		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.31	Yes	Y	J			1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0573	Yes	Y	JEMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.077	Yes	Y	J			1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.0592	Yes	Y	JEMPC	J	23	0.987		pg/g
SG-01-S-C-121107	12-22338-VR58J	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	2.43	Yes	Y	EMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	2.67	Yes	Y	J			4.94		pg/g
SG-01-S-C-121107	12-22338-VR58J	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.0691	Yes	N	BJ	U	7	0.987		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.107	Yes	Y	J			0.987		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.0809	Yes	Y	JEMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0553	Yes	Y	JEMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	0.0454	Yes	Y	JEMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	1.19	Yes	Y	J			1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.154	Yes	Y	JEMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0573	Yes	N	BJEMPC	U	7	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	10.9	Yes	Y				1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.391	Yes	Y	EMPC	J	23	0.987		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	5.7	Yes	Y				1.97		pg/g

SDG: VR58

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-01-S-C-121107	12-22338-VR58J	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	2.07	Yes	Y	EMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	40.5	Yes	Y				4.94		pg/g
SG-01-S-C-121107	12-22338-VR58J	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	1.28	Yes	Y	EMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	3.28	Yes	Y	EMPC	J	23	1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.219	Yes	Y	J			1.97		pg/g
SG-01-S-C-121107	12-22338-VR58J	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.164	Yes	Y	JEMPC	J	23	0.987		pg/g
SG-01-S-C-121107	12-22338-VR58J	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.679	Yes	Y	EMPC	J	23	0.987		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	1.59	Yes	Y	J			1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.692	Yes	Y	J			1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	168	Yes	Y				1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.388	Yes	Y	JEMPC	J	23	0.980		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	4.73	Yes	Y				1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	11.3	Yes	Y	EMPC	J	23	0.980		pg/g
SG-10-S-E-121107	12-22329-VR58A	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	19.7	Yes	Y	EMPC	J	23	1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.725	Yes	Y	J			0.980		pg/g
SG-10-S-E-121107	12-22329-VR58A	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	50.6	Yes	Y	EMPC	J	23	1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	1.49	Yes	Y	J			1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	8.56	Yes	Y	EMPC	J	23	0.980		pg/g
SG-10-S-E-121107	12-22329-VR58A	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	332	Yes	Y				1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	73.3	Yes	Y				1.96		pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-10-S-E-121107	12-22329-VR58A	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	77.5		Yes	Y				4.90		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	2.26		Yes	Y				1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	1.47		Yes	Y				0.980		pg/g
SG-10-S-E-121107	12-22329-VR58A	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	39.1		Yes	Y				1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	1290		Yes	Y				4.90		pg/g
SG-10-S-E-121107	12-22329-VR58A	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	1.96		Yes	Y				1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	8.32		Yes	Y				1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	1.26		Yes	Y	J			1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.675		Yes	Y	JX	J	24	1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	22.3		Yes	Y				1.96		pg/g
SG-10-S-E-121107	12-22329-VR58A	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.759		Yes	Y	J			0.980		pg/g
SG-10-S-E-121107	12-22329-VR58A	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	3.27		Yes	Y	EMPC	J	23	0.980		pg/g
SG-11-S-E-121107	12-22330-VR58B	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	3.38		Yes	Y				0.999		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	15.3		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	879		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	472		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	5.19		Yes	Y				0.999		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	5.37		Yes	Y	X	J	24	2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	12.8		Yes	Y				0.999		pg/g

SDG: VR58

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-11-S-E-121107	12-22330-VR58B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	25.8		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	871		Yes	Y				5.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	13.6		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	14.7		Yes	Y	EMPC	J	23	0.999		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	15.3		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	119		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	51.2		Yes	Y	EMPC	J	23	0.999		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	7.11		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	282		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	4150		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	60.3		Yes	Y				0.999		pg/g
SG-11-S-E-121107	12-22330-VR58B	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	563		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	157		Yes	Y	EMPC	J	23	2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	1.32		Yes	Y				0.999		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	52.3		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	21.1		Yes	Y				2.00		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	2120		Yes	Y				9.99		pg/g
SG-11-S-E-121107	12-22330-VR58B	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	16500		Yes	Y				25.0		pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-12-S-E-121107	12-22331-VR58C	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	6		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	2.96		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	6.4		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	104		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	8.02		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	38.8		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	5.15		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	2.87		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.804		Yes	Y	J			0.997		pg/g
SG-12-S-E-121107	12-22331-VR58C	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	193		Yes	Y	EMPC	J	23	1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	2.15		Yes	Y				0.997		pg/g
SG-12-S-E-121107	12-22331-VR58C	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	9.33		Yes	Y	EMPC	J	23	0.997		pg/g
SG-12-S-E-121107	12-22331-VR58C	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	75.2		Yes	Y	EMPC	J	23	1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	18		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	2.57		Yes	Y	EMPC	J	23	0.997		pg/g
SG-12-S-E-121107	12-22331-VR58C	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	29.7		Yes	Y	EMPC	J	23	0.997		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	5.1		Yes	Y				0.997		pg/g
SG-12-S-E-121107	12-22331-VR58C	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	199		Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	769		Yes	Y				1.99		pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-12-S-E-121107	12-22331-VR58C	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	27.8	Yes	Y				0.997		pg/g
SG-12-S-E-121107	12-22331-VR58C	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	1470	Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	347	Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	356	Yes	Y				4.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	8.29	Yes	Y				1.99		pg/g
SG-12-S-E-121107	12-22331-VR58C	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	6410	Yes	Y				24.9		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	1730	Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.719	Yes	Y	JEMPC	J	23	0.998		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	25.6	Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	32.4	Yes	Y	EMPC	J	23	0.998		pg/g
SG-13-S-E-121107	12-22332-VR58D	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	129	Yes	Y	EMPC	J	23	2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	353	Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	2.84	Yes	Y	EMPC	J	23	0.998		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	7.63	Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	10.6	Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	438	Yes	Y	EMPC	J	23	2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	4.71	Yes	Y				0.998		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	5.3	Yes	Y	X	J	24	2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	8.24	Yes	Y				2.00		pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-13-S-E-121107	12-22332-VR58D	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	97.4		Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	15.4		Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	230		Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	13.2		Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	31.5		Yes	Y				0.998		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	5.66		Yes	Y				0.998		pg/g
SG-13-S-E-121107	12-22332-VR58D	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	10.5		Yes	Y	EMPC	J	23	0.998		pg/g
SG-13-S-E-121107	12-22332-VR58D	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	3200		Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	809		Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	837		Yes	Y				4.99		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	11.8		Yes	Y				2.00		pg/g
SG-13-S-E-121107	12-22332-VR58D	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	14400		Yes	Y				25.0		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	161		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	2.06		Yes	Y	X	J	24	2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	3.39		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	32.5		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	2.82		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	4.94		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	15.9		Yes	Y	EMPC	J	23	0.999		pg/g

SDG: VR58

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-13-S-E-DUP-121107	12-22333-VR58E	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	13.1		Yes	Y	EMPC	J	23	0.999		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	51.6		Yes	Y	EMPC	J	23	2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	5.77		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	93.1		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	1.22		Yes	Y				0.999		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	4830		Yes	Y				5.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	4.97		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	136		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	1120		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	600		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	10.8		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	2.51		Yes	Y				0.999		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	1.82		Yes	Y				0.999		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	5.28		Yes	Y				2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	379		Yes	Y				5.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	314		Yes	Y	EMPC	J	23	2.00		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.521		Yes	Y	JEMPC	J	23	0.999		pg/g
SG-13-S-E-DUP-121107	12-22333-VR58E	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	4.89		Yes	Y	EMPC	J	23	0.999		pg/g
SG-14-S-E-121107	12-22334-VR58F	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	5.27		Yes	Y	EMPC	J	23	0.995		pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-14-S-E-121107	12-22334-VR58F	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	2.9	Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	2.08	Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.796	Yes	Y	JX	J	24	1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.957	Yes	Y	J			0.995		pg/g
SG-14-S-E-121107	12-22334-VR58F	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	64.1	Yes	Y	EMPC	J	23	1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	3.06	Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	1.09	Yes	Y				0.995		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	36.2	Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	1.99	Yes	Y				0.995		pg/g
SG-14-S-E-121107	12-22334-VR58F	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	115	Yes	Y	EMPC	J	23	1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	106	Yes	Y				4.98		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	2.54	Yes	Y	EMPC	J	23	1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	6.86	Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	12.5	Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.404	Yes	Y	JEMPC	J	23	0.995		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	2.26	Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	15.4	Yes	Y	EMPC	J	23	0.995		pg/g
SG-14-S-E-121107	12-22334-VR58F	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	28.9	Yes	Y	EMPC	J	23	1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	2490	Yes	Y				4.98		pg/g

SDG: VR58

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-14-S-E-121107	12-22334-VR58F	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	102		Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	304		Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	13.5		Yes	Y	EMPC	J	23	0.995		pg/g
SG-14-S-E-121107	12-22334-VR58F	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	877		Yes	Y				1.99		pg/g
SG-14-S-E-121107	12-22334-VR58F	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.816		Yes	Y	J			1.99		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	105		Yes	Y				4.95		pg/g
SG-15-S-E-121107	12-22335-VR58G	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.154		Yes	Y	JEMPC	J	23	0.990		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.35		Yes	Y	JEMPC	J	23	1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	3.73		Yes	Y	EMPC	J	23	1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	4.11		Yes	Y	EMPC	J	23	1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	13.9		Yes	Y				1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.632		Yes	Y	EMPC	J	23	0.990		pg/g
SG-15-S-E-121107	12-22335-VR58G	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	27.3		Yes	Y				1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	6.17		Yes	Y	EMPC	J	23	1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	3.85		Yes	Y	EMPC	J	23	1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.176		Yes	Y	J			1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0653		Yes	N	BJEMPC	U	7	1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.19		Yes	Y	J			1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	1.06		Yes	Y	EMPC	J	23	0.990		pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-15-S-E-121107	12-22335-VR58G	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.818	Yes	Y	J			1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.103	Yes	Y	J			1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	2.05	Yes	Y				1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	5.88	Yes	Y				4.95		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.0911	Yes	Y	J			1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	0.0713	Yes	Y	JEMPC	J	23	1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.103	Yes	N	JEMPC	U	7	0.990		pg/g
SG-15-S-E-121107	12-22335-VR58G	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.446	Yes	Y	EMPC	J	23	0.990		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.0891	Yes	Y	JEMPC	J	23	0.990		pg/g
SG-15-S-E-121107	12-22335-VR58G	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.143	Yes	Y	J			1.98		pg/g
SG-15-S-E-121107	12-22335-VR58G	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.0752	Yes	Y	JEMPC	J	23	0.990		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.0679	Yes	Y	JEMPC	J	23	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	2.41	Yes	Y	EMPC	J	23	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.441	Yes	Y	EMPC	J	23	0.998		pg/g
SG-16-S-E-121107	12-22336-VR58H	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.144	Yes	Y	JEMPC	J	23	0.998		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	4.24	Yes	Y				2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	1.86	Yes	Y	EMPC	J	23	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	8.18	Yes	Y				2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.681	Yes	Y	EMPC	J	23	0.998	0.0220	pg/g

SDG: VR58

Analytical Method	E1613B											
Sample ID	**Lab Sample ID**	**Chemical Name**	**Anal Date**	**Result**	**Mod Res Report**	**Detect**	**Lab Qual**	**Val Qual**	**Reason**	**RL**	**MDL**	**Units**
SG-16-S-E-121107	12-22336-VR58H	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.0758	Yes	Y	J			2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0739	Yes	Y	JEMPC	J	23	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.202	Yes	Y	JEMPC	J	23	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0559	Yes	Y	JEMPC	J	23	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	0.888	Yes	Y	J			2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	0.0639	Yes	Y	J			2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0259	Yes	N	BJ	U	7	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.0758	Yes	Y	JEMPC	J	23	0.998		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	0.168	Yes	Y	J			2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	1.75	Yes	Y	J			4.99		pg/g
SG-16-S-E-121107	12-22336-VR58H	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	1.56	Yes	Y	EMPC	J	23	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	32	Yes	Y				4.99		pg/g
SG-16-S-E-121107	12-22336-VR58H	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.022	Yes	N	U			0.998	0.0220	pg/g
SG-16-S-E-121107	12-22336-VR58H	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.481	Yes	Y	EMPC	J	23	0.998		pg/g
SG-16-S-E-121107	12-22336-VR58H	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.0918	Yes	Y	JEMPC	J	23	2.00		pg/g
SG-16-S-E-121107	12-22336-VR58H	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.0439	Yes	N	U			0.998	0.0439	pg/g
SG-16-S-E-121107	12-22336-VR58H	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.95	Yes	Y	EMPC	J	23	2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.11	Yes	N	BJEMPC	U	7	2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.136	Yes	Y	J			0.998		pg/g

SDG: VR58

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-17-S-E-121107	12-22337-VR58I	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/28/2012	0.126	Yes	Y	JEMPC	J	23	2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.725	Yes	Y	JEMPC	J	23	2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	2.12	Yes	Y				2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	1.06	Yes	Y	J			2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	Total Hexachlorodibenzofuran (HxCDF)	11/28/2012	17.8	Yes	Y	EMPC	J	23	2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/28/2012	0.625	Yes	Y	J			2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/28/2012	252	Yes	Y				4.99		pg/g
SG-17-S-E-121107	12-22337-VR58I	Total Pentachlorodibenzofuran (PeCDF)	11/28/2012	5.21	Yes	Y	EMPC	J	23	2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	82	Yes	Y				2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	2.33	Yes	Y				2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	0.226	Yes	Y	JEMPC	J	23	0.998		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/28/2012	14.4	Yes	Y				2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	14.9	Yes	Y	EMPC	J	23	2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/28/2012	0.95	Yes	Y	J			2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	Total Tetrachlorodibenzofuran (TCDF)	11/28/2012	2.5	Yes	Y	EMPC	J	23	0.998		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/28/2012	50.3	Yes	Y				2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	Total Heptachlorodibenzofuran (HpCDF)	11/28/2012	31.5	Yes	Y				2.00		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/28/2012	24.5	Yes	Y				4.99		pg/g
SG-17-S-E-121107	12-22337-VR58I	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/28/2012	1.03	Yes	Y	JEMPC	J	23	2.00		pg/g

SDG: VR58

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-17-S-E-121107	12-22337-VR58I	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	0.491		Yes	Y	J			0.998		pg/g
SG-17-S-E-121107	12-22337-VR58I	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/28/2012	1.11		Yes	Y	EMPC	J	23	0.998		pg/g
SG-17-S-E-121107	12-22337-VR58I	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/28/2012	0.136		Yes	N	BJ	U	7	0.998		pg/g
SG-17-S-E-121107	12-22337-VR58I	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/28/2012	2.03		Yes	Y	EMPC	J	23	0.998		pg/g

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: City of Kenmore

Collection Date: November 8, 2012

LDC Report Date: January 3, 2013

Matrix: Sediment

Parameters: Dioxins/Dibenzofurans

Validation Level: Stage 4

Laboratory: Analytical Resources, Inc.

Sample Delivery Group (SDG): VR82

Sample Identification

SG-02-S-C-121108
SG-03-S-C-121108
SG-04-S-C-121108
SG-05-S-C-121108
SG-06-S-C-121108
SG-07-S-C-121108
SG-07-S-C-dup-121108
SG-08-S-C-121108
SG-09-S-C-121108
SG-04-S-C-121108DUP

Introduction

This data review covers 10 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1613B for Polychlorinated Dioxins/Dibenzofurans.

This review follows USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

The chromatographic resolution between 2,3,7,8-TCDD and the peaks representing any other unlabeled TCDD isomers was resolved with a valley of less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 35.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compound and labeled compound.

IV. Continuing Calibration (Continuing)

Continuing calibration was performed at the required frequencies.

All of the continuing calibration results were within the QC limits for unlabeled compounds and labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB-111412	11/14/12	2,3,7,8-TCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDD OCDF OCDD Total TCDF Total HxCDF Total HxCDD Total HpCDD	0.0320 pg/g 0.0260 pg/g 0.0640 pg/g 0.248 pg/g 0.0560 pg/g 1.50 pg/g 0.0440 pg/g 0.0260 pg/g 0.0880 pg/g 0.550 pg/g	All samples in SDG VR82

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Ongoing Precision & Recovery Samples (OPR)

Ongoing precision and recovery (OPR) control samples were reviewed for each matrix as applicable. The percent recoveries (%R) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits.

X. Target Compound Identifications

All target compound identifications were within validation criteria.

XI. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria with the following exceptions:

Sample	Compound	Flag	A or P
All samples in SDG VR82	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A
SG-05-S-C-121108	All compounds flagged "X" by the laboratory indicates results coeluted with Polychlorinated Diphenyl Ether (PDBE).	J (all detects)	A

XII. System Performance

The system performance was acceptable.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to compound quantitation problems, data were qualified as estimated in nine samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the Stage 4 data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples SG-07-S-C-121108 and SG-07-S-C-dup-121108 were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD
	SG-07-S-C-121108	SG-07-S-C-dup-121108	
2,3,7,8-TCDF	0.643	0.579	10
2,3,7,8-TCDD	0.306	0.341	11
1,2,3,7,8-PeCDF	0.442	0.466	5
2,3,4,7,8-PeCDF	0.452	0.556	21
1,2,3,7,8-PeCDD	1.18	1.03	14

Compound	Concentration (pg/g)		RPD
	SG-07-S-C-121108	SG-07-S-C-dup-121108	
1,2,3,4,7,8-HxCDF	1.20	1.05	13
1,2,3,6,7,8-HxCDF	0.989	0.958	3
2,3,4,6,7,8-HxCDF	1.40	1.34	4
1,2,3,7,8,9-HxCDF	0.386	0.411	6
1,2,3,4,7,8-HxCDD	1.42	1.38	3
1,2,3,6,7,8-HxCDD	4.38	4.21	4
1,2,3,7,8,9-HxCDD	2.85	2.95	3
1,2,3,4,6,7,8-HpCDF	14.6	14.6	0
1,2,3,4,7,8,9-HpCDF	1.06	1.14	7
1,2,3,4,6,7,8-HpCDD	85.5	82.7	3
OCDF	40.9	39.5	3
OCDD	652	613	6
Total TCDF	11.1	10.3	7
Total TCDD	4.25	3.82	11
Total PeCDF	14.8	14.2	4
Total PeCDD	8.33	7.29	13
Total HxCDF	25.8	25.6	1
Total HxCDD	31.4	30.2	4
Total HpCDF	43.8	43.3	1
Total HpCDD	167	155	7

XV. Field Blanks

No field blanks were identified in this SDG.

City of Kenmore
Dioxins/Dibenzofurans - Data Qualification Summary - SDG VR82

SDG	Sample	Compound	Flag	A or P	Reason
VR82	SG-02-S-C-121108 SG-03-S-C-121108 SG-04-S-C-121108 SG-05-S-C-121108 SG-06-S-C-121108 SG-07-S-C-121108 SG-07-S-C-dup-121108 SG-08-S-C-121108 SG-09-S-C-121108	All compounds reported as estimated maximum possible concentration (EMPC)	J (all detects)	A	Compound quantitation and RLs
VR82	SG-05-S-C-121108	All compounds flagged "X" by the laboratory indicates results coeluted with Polychlorinated Diphenyl Ether (PDBE).	J (all detects)	A	Compound quantitation and RLs

City of Kenmore
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG VR82

No Sample Data Qualified in this SDG

LDC #: 28943C21 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/02/13
SDG #: VR82 Stage 4 Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: SW
2nd Reviewer: V

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/08/12
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	%RSD ≤ 20/35 %
IV.	Continuing calibration/~~ICV~~	A	QC Limits
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates /Lab Dup	N/A	
VII.	Laboratory control samples	A	~~LCS~~ OPR
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	QC Limits
X.	Target compound identifications	A	
XI.	Compound quantitation/RL/LOQ/LODs	A	EMPC = Jdets /A
XII.	System performance	A	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	J = 7, 8
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	SG-02-S-C-121108	11	SG-04-S-C-121108DUP	21	MB-111412	31	
2	~~SG-02-S-C-121108DL~~	12		22		32	
3	SG-03-S-C-121108	13		23		33	
4	SG-04-S-C-121108	14		24		34	
5	SG-05-S-C-121108	15		25		35	
6	SG-06-S-C-121108	16		26		36	
7	SG-07-S-C-121108	17		27		37	
8	SG-07-S-C-dup-121108	18		28		38	
9	SG-08-S-C-121108	19		29		39	
10	SG-09-S-C-121108	20		30		40	

Notes:

LDC #: 28943C21

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: ✓

Method: Dioxins/Dibenzofurans (EPA SW 846 Method 1613B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
III. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and ≤ 35% for labeled compounds ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IV. Continuing calibration				
Was a routine calibration performed at the beginning and end of each 12 hour period?	✓			
Were all the concentrations for the unlabeled compounds and labeled compounds within the QC limits (Method 1613B, Table 6)?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
IX. Internal standards				
Were internal standard recoveries within the 25-150% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
X. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XI. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:

LDC #: 28943C21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 11/14/12 **Blank analysis date:** 11/28/12 **Associated samples:** All

Conc. units: pg/g (> 5X MB)

Compound	Blank ID		Sample Identification							
	MB-111412	5X								
H	0.0320	0.16								
N	0.0260	0.13								
O	0.0640*	0.32								
F	0.248	1.24								
Q	0.0560*	0.28								
G	1.50	7.5								
V	0.0440*	0.22								
X	0.0260	0.13								
T	0.0880*	0.44								
U	0.550	2.75								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 28943C21

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JVG
2nd Reviewer: LW

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		All	EMPC results		J dets / A
		4	X flag indicates coelution with polychlorinated diphenyl ethers		

Comments: See sample calculation verification worksheet for recalculations

LDC#: 28943C21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g)		RPD
	7	8	
H	0.643	0.579*	10
A	0.306*	0.341*	11
I	0.442	0.466	5
J	0.452*	0.556	21
B	1.18	1.03	14
K	1.20	1.05	13
L	0.989	0.958	3
M	1.40	1.34	4
N	0.386	0.411	6
C	1.42	1.38	3
D	4.38	4.21	4
E	2.85	2.95	3
O	14.6	14.6	0
P	1.06	1.14	7
F	85.5	82.7	3
Q	40.9	39.5	3
G	652	613	6
V	11.1*	10.3*	7
R	4.25*	3.82*	11
W	14.8*	14.2*	4
S	8.33*	7.29*	13
X	25.8*	25.6	1
T	31.4*	30.2*	4
Y	43.8	43.3	1
U	167	155	7

*EMPC

LDC #: 28943C21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of Compound
C_x = Concentration of compound,
S= Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF	Recalculated RRF	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL Autospec1	11/23/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.03	1.03	1.05	1.05	4.5	4.4
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.86	0.86	0.88	0.88	2.5	6.3
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.92	0.92	0.92	2.0	2.3
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.00	1.00	1.02	1.02	3.4	3.6
			OCDF (13C-OCDD)	1.15	1.15	1.14	1.14	2.7	2.8

Cis/Cx	Ax	Ais
100/10	386426	3749939
100/40	504023	5846599
100/200	1240430	2706025
100/200	1145559	2296332
200/400	2230571	3880000

STD	2,3,7,8-TCDD	2,3,7,8-TCDF	1,2,3,6,7,8-HxCDD	1,2,3,4,6,7,8-HpCDD	OCDF
CSL	1.140	0.970	0.890	1.080	1.110
CS1	1.030	0.800	0.920	0.980	1.100
CS2	1.010	0.860	0.900	0.990	1.120
CS3	1.030	0.860	0.920	1.000	1.150
CS4	1.040	0.880	0.920	1.020	1.160
CS5	1.050	0.890	0.950	1.030	1.180
x =	1.050	0.877	0.917	1.017	1.137
s =	0.04604	0.05538	0.02066	0.03615	0.03141

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC # 26943C21

VALIDATION FINDINGS WORKSHEET
Routine Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Ref IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1	12112802 Autospec1	11/28/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.00	1.00	4.9	5.0
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.86	0.86	1.8	1.8
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.93	0.93	1.1	1.1
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	1.01	1.01	0.7	0.7
			OCDF (13C-OCDD)	1.14	1.15	1.15	0.9	0.9
2	12112811 Autospec1	11/28/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.01	1.01	4.1	3.8
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.86	0.86	1.6	1.6
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.93	0.93	1.7	1.8
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	1.01	1.01	1.1	1.1
			OCDF (13C-OCDD)	1.14	1.12	1.12	1.8	1.8

		OpeningCCV		Closing CCV	
Cis/Cx	Compound (Ref IS)	Ax	Ais	Ax	Ais
100/10	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	387000	3880000	489000	4870000
100/10	2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	525000	6100000	652000	7560000
100/50	1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	1369000	2950000	1960000	4200000
100/50	1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1265000	2500000	1862000	3700000
200/100	OCDF (13C-OCDD)	2470000	4300000	3480000	6200000

LDC # 28993C2/

VALIDATION FINDINGS WORKSHEET
Routine Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound,
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Ref IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1,	12112820 Autospec1	11/29/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.03	1.03	1.5	1.7
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.86	0.86	2.1	2.2
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.91	0.91	0.5	0.5
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	0.99	0.99	2.3	2.3
			OCDF (13C-OCDD)	1.14	1.12	1.12	1.3	1.3
2	12112829 Autospec1	11/29/2012	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.05	1.03	1.03	1.8	1.7
			2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	0.88	0.85	0.85	2.7	2.8
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	0.92	0.92	0.92	0.3	0.4
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.02	1.05	1.05	0.1	3.0
			OCDF (13C-OCDD)	1.14	1.12	1.13	1.2	1.8

		OpeningCCV		Closing CCV	
Cis/Cx	Compound (Ref IS)	Ax	Ais	Ax	Ais
100/10	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	448000	4340000	414000	4010000
100/10	2,3,7,8-TCDF (13C-2,3,7,8-TCDF)	597000	6940000	547000	6420000
100/50	1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	1671000	3660000	1385000	3010000
100/50	1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1502000	3030000	2459376	4696774
200/100	OCDF (13C-OCDD)	2850000	5088000	2260000	4010000

LDC #: 29432C21

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS Dioxins/Dibenzofurans (EPA Method 1613B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: OPR-11141

Compound	Spike Added (pg/g)		Spiked Sample Concentration (pg/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
2,3,7,8-TCDD	20	NA	21.2	NA	106	106				
1,2,3,7,8-PeCDD	100		107		107	107				
1,2,3,4,7,8-HxCDD	↓		111		111	111				
1,2,3,4,7,8,9-HpCDF	↓		110		110	110				
OCDF	200	↓	209	↓	104	104				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 28943C21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer:

METHOD: GC/MS Dioxins/Dibenzofurans (Method 1613B)

Compound results reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #1, 2,3,7,8-TCDF

Conc. = $\frac{[2.71e4 + 3.36e4)](100)}{[1.78e6 + 3.62e6](0.887)}$

= 1.688

final conc. = $\frac{(1.658)(20\,ml)}{(10\,g)}$ = 3376 pg/g

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

SDG: VR82

Analytical Method	E1613B											
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-02-S-C-121108	12-22479-VR82A	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.975	Yes	Y	JEMPC	J	23	0.999		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	3.12	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	11.7	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	137	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	8.04	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	366	Yes	Y				5.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	404	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	2260	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	53.1	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	1020	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	3.37	Yes	Y				0.999		pg/g
SG-02-S-C-121108	12-22479-VR82A	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	43.9	Yes	Y				0.999		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	8.28	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	3.04	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	3.27	Yes	Y				0.999		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	7.34	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	14.5	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	7.83	Yes	Y				0.999		pg/g

SDG: VR82

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-02-S-C-121108	12-22479-VR82A	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	14.9	Yes	Y	EMPC	J	23	0.999		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	29.5	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	55.5	Yes	Y	EMPC	J	23	0.999		pg/g
SG-02-S-C-121108	12-22479-VR82A	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	119	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	334	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	240	Yes	Y				2.00		pg/g
SG-02-S-C-121108	12-22479-VR82A	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	7420	Yes	Y				25.0		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	4760	Yes	Y				5.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	26.5	Yes	Y				0.999		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	610	Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.8	Yes	Y	JEMPC	J	23	2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.599	Yes	Y	JEMPC	J	23	0.999		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	14.5	Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	32.2	Yes	Y	EMPC	J	23	0.999		pg/g
SG-03-S-C-121108	12-22480-VR82B	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	59.4	Yes	Y	EMPC	J	23	2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	206	Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	1620	Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	273	Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	272	Yes	Y				5.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	6.97	Yes	Y				2.00		pg/g

SDG: VR82

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-03-S-C-121108	12-22480-VR82B	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	6.21		Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	4.83		Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	84.1		Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	3.75		Yes	Y				0.999		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	28		Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	4.02		Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	1.71		Yes	Y	J			2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	1.86		Yes	Y				0.999		pg/g
SG-03-S-C-121108	12-22480-VR82B	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	136		Yes	Y	EMPC	J	23	2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	4.63		Yes	Y				2.00		pg/g
SG-03-S-C-121108	12-22480-VR82B	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	2.13		Yes	Y				0.999		pg/g
SG-03-S-C-121108	12-22480-VR82B	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	9.77		Yes	Y	EMPC	J	23	0.999		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	4.39		Yes	Y				1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	0.173		Yes	Y	BJEMPC	J	23	0.997		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	0.315		Yes	Y	J			1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	7.38		Yes	Y	EMPC	J	23	1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.128		Yes	Y	JEMPC	J	23	0.997		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.164		Yes	Y	JX	J	24	1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.261		Yes	Y	J			1.99		pg/g

SDG: VR82

Analytical Method	E1613B											
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-04-S-C-121108	12-22481-VR82C	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.289	Yes	Y	J			1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.361	Yes	Y	JEMPC	J	23	1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	1.13	Yes	Y	EMPC	J	23	0.997		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.185	Yes	Y	BJEMPC	J	23	1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.15	Yes	Y	JEMPC	J	23	0.997		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	1.62	Yes	Y	J			1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	0.381	Yes	Y	J			0.997		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	0.491	Yes	Y	J			1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	10.8	Yes	Y				4.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	13.1	Yes	Y	EMPC	J	23	1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	134	Yes	Y				1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	2.51	Yes	Y	EMPC	J	23	0.997		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	40.5	Yes	Y				1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	16.1	Yes	Y				1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	307	Yes	Y				4.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	3.51	Yes	Y	EMPC	J	23	1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	0.897	Yes	Y	J			1.99		pg/g
SG-04-S-C-121108	12-22481-VR82C	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	2.12	Yes	Y	EMPC	J	23	0.997		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	1.63	Yes	Y	J			1.99		pg/g

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-05-S-C-121108	12-22482-VR82D	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	473	Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.74	Yes	Y	J			1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	25.4	Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	2.14	Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	8.58	Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.45	Yes	Y	J			1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.684	Yes	Y	J			1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	45.2	Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	0.841	Yes	Y	J			0.994		pg/g
SG-05-S-C-121108	12-22482-VR82D	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	4.22	Yes	Y	EMPC	J	23	0.994		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.751	Yes	Y	J			1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	71.9	Yes	Y				4.97		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	2.18	Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	9.38	Yes	Y	EMPC	J	23	0.994		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	184	Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	60.4	Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	1540	Yes	Y				4.97		pg/g
SG-05-S-C-121108	12-22482-VR82D	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	22.5	Yes	Y	EMPC	J	23	1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	13.8	Yes	Y	EMPC	J	23	0.994		pg/g

SDG: VR82

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-05-S-C-121108	12-22482-VR82D	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	4.84		Yes	Y				1.99		pg/g
SG-05-S-C-121108	12-22482-VR82D	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.322		Yes	Y	JEMPC	J	23	0.994		pg/g
SG-05-S-C-121108	12-22482-VR82D	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.785		Yes	Y	JEMPC	J	23	0.994		pg/g
SG-05-S-C-121108	12-22482-VR82D	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	1.33		Yes	Y				0.994		pg/g
SG-05-S-C-121108	12-22482-VR82D	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	79.2		Yes	Y				1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	237		Yes	Y				1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.846		Yes	Y	J			1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.478		Yes	Y	JEMPC	J	23	0.995		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	5.68		Yes	Y				1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	15.5		Yes	Y	EMPC	J	23	0.995		pg/g
SG-06-S-C-121108	12-22483-VR82E	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	24.5		Yes	Y	EMPC	J	23	1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	70.1		Yes	Y				1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	9.24		Yes	Y	EMPC	J	23	0.995		pg/g
SG-06-S-C-121108	12-22483-VR82E	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	803		Yes	Y				1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	104		Yes	Y				1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	108		Yes	Y				4.98		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	2.65		Yes	Y				1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.746		Yes	Y	J			1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	31.3		Yes	Y				1.99		pg/g

SDG: VR82

Analytical Method	E1613B											
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-06-S-C-121108	12-22483-VR82E	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	2520		Yes	Y				4.98		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	1.58		Yes	Y				0.995		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.64		Yes	Y	J			1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	2.55		Yes	Y				1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.9		Yes	Y	J			1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.826		Yes	Y	JEMPC	J	23	0.995		pg/g
SG-06-S-C-121108	12-22483-VR82E	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	51.1		Yes	Y	EMPC	J	23	1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	1.98		Yes	Y	J			1.99		pg/g
SG-06-S-C-121108	12-22483-VR82E	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	0.967		Yes	Y	J			0.995		pg/g
SG-06-S-C-121108	12-22483-VR82E	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	4.89		Yes	Y	EMPC	J	23	0.995		pg/g
SG-06-S-C-121108	12-22483-VR82E	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	9.51		Yes	Y				1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	4.25		Yes	Y	EMPC	J	23	0.995		pg/g
SG-07-S-C-121108	12-22484-VR82F	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.452		Yes	Y	JEMPC	J	23	0.995		pg/g
SG-07-S-C-121108	12-22484-VR82F	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	0.643		Yes	Y	J			0.995		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	1.06		Yes	Y	J			1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	25.8		Yes	Y	EMPC	J	23	1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.442		Yes	Y	J			1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.989		Yes	Y	J			1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	4.38		Yes	Y				1.99		pg/g

SDG: VR82

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-07-S-C-121108	12-22484-VR82F	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	14.6	Yes	Y				1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.386	Yes	Y	J			1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.306	Yes	Y	JEMPC	J	23	0.995		pg/g
SG-07-S-C-121108	12-22484-VR82F	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.4	Yes	Y	J			1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	1.18	Yes	Y				0.995		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	1.42	Yes	Y	J			1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	40.9	Yes	Y				4.98		pg/g
SG-07-S-C-121108	12-22484-VR82F	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	43.8	Yes	Y				1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	167	Yes	Y				1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	8.33	Yes	Y	EMPC	J	23	0.995		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	85.5	Yes	Y				1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	31.4	Yes	Y	EMPC	J	23	1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	652	Yes	Y				4.98		pg/g
SG-07-S-C-121108	12-22484-VR82F	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	14.8	Yes	Y	EMPC	J	23	1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	2.85	Yes	Y				1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.2	Yes	Y	J			1.99		pg/g
SG-07-S-C-121108	12-22484-VR82F	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	11.1	Yes	Y	EMPC	J	23	0.995		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	0.579	Yes	Y	JEMPC	J	23	0.992		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	82.7	Yes	Y				1.98		pg/g

SDG: VR82

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-07-S-C-DUP-121108	12-22485-VR82G	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	3.82		Yes	Y	EMPC	J	23	0.992		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	1.14		Yes	Y	J			1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.341		Yes	Y	JEMPC	J	23	0.992		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	10.3		Yes	Y	EMPC	J	23	0.992		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	14.2		Yes	Y	EMPC	J	23	1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	30.2		Yes	Y	EMPC	J	23	1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	7.29		Yes	Y	EMPC	J	23	0.992		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	155		Yes	Y				1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	43.3		Yes	Y				1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	39.5		Yes	Y				4.96		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	1.38		Yes	Y	J			1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	25.6		Yes	Y				1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	613		Yes	Y				4.96		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	2.95		Yes	Y				1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	1.03		Yes	Y				0.992		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.556		Yes	Y	J			0.992		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.466		Yes	Y	J			1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.958		Yes	Y	J			1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	4.21		Yes	Y				1.98		pg/g

SDG: VR82

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res	Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-07-S-C-DUP-121108	12-22485-VR82G	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.34		Yes	Y	J			1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	14.6		Yes	Y				1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.05		Yes	Y	J			1.98		pg/g
SG-07-S-C-DUP-121108	12-22485-VR82G	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.411		Yes	Y	J			1.98		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	2.99		Yes	Y				1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	57.2		Yes	Y	EMPC	J	23	1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	160		Yes	Y				1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	6.12		Yes	Y	EMPC	J	23	0.978		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	88.5		Yes	Y				1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	27.2		Yes	Y	EMPC	J	23	1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	684		Yes	Y				4.89		pg/g
SG-08-S-C-121108	12-22486-VR82H	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.293		Yes	Y	JEMPC	J	23	0.978		pg/g
SG-08-S-C-121108	12-22486-VR82H	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	9.21		Yes	Y	EMPC	J	23	0.978		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	66		Yes	Y				4.89		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.366		Yes	Y	JEMPC	J	23	1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	12.8		Yes	Y	EMPC	J	23	1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	1.36		Yes	Y	J			1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	0.87		Yes	Y	J			0.978		pg/g
SG-08-S-C-121108	12-22486-VR82H	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	3.33		Yes	Y	EMPC	J	23	0.978		pg/g

SDG: VR82

Analytical Method E1613B

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-08-S-C-121108	12-22486-VR82H	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	0.553	Yes	Y	J			0.978		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	1.83	Yes	Y	JEMPC	J	23	1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	25.7	Yes	Y	EMPC	J	23	1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.54	Yes	Y	J			0.978		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.409	Yes	Y	JEMPC	J	23	1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.964	Yes	Y	J			1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	3.85	Yes	Y				1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.37	Yes	Y	J			1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.3	Yes	Y	J			1.96		pg/g
SG-08-S-C-121108	12-22486-VR82H	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	18.7	Yes	Y				1.96		pg/g
SG-09-S-C-121108	12-22487-VR82I	Total Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	4.12	Yes	Y	EMPC	J	23	0.985		pg/g
SG-09-S-C-121108	12-22487-VR82I	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	11/29/2012	0.372	Yes	Y	JEMPC	J	23	0.985		pg/g
SG-09-S-C-121108	12-22487-VR82I	Total Tetrachlorodibenzofuran (TCDF)	11/29/2012	12.2	Yes	Y	EMPC	J	23	0.985		pg/g
SG-09-S-C-121108	12-22487-VR82I	Total Pentachlorodibenzofuran (PeCDF)	11/29/2012	17.1	Yes	Y	EMPC	J	23	1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	11/29/2012	798	Yes	Y				4.93		pg/g
SG-09-S-C-121108	12-22487-VR82I	Total Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	35	Yes	Y	EMPC	J	23	1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	103	Yes	Y				1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	Total Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	7.92	Yes	Y	EMPC	J	23	0.985		pg/g
SG-09-S-C-121108	12-22487-VR82I	Total Heptachlorodibenzo-p-dioxin (HpCDD)	11/29/2012	191	Yes	Y				1.97		pg/g

SDG: VR82

Analytical Method	E1613B											
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Mod Res Report	Detect	Lab Qual	Val Qual	Reason	RL	MDL	Units
SG-09-S-C-121108	12-22487-VR82I	Total Heptachlorodibenzofuran (HpCDF)	11/29/2012	52.8	Yes	Y	EMPC	J	23	1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	11/29/2012	46.6	Yes	Y				4.93		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	3.54	Yes	Y				1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	11/29/2012	1.24	Yes	Y				0.985		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	11/29/2012	0.497	Yes	Y	J			1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11/29/2012	0.784	Yes	Y	J			0.985		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	11/29/2012	1.33	Yes	Y	JEMPC	J	23	1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	Total Hexachlorodibenzofuran (HxCDF)	11/29/2012	30.6	Yes	Y	EMPC	J	23	1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.573	Yes	Y	J			0.985		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	11/29/2012	0.577	Yes	Y	JEMPC	J	23	1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.23	Yes	Y	J			1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	5.03	Yes	Y				1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.74	Yes	Y	J			1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	11/29/2012	17.7	Yes	Y				1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	11/29/2012	1.43	Yes	Y	J			1.97		pg/g
SG-09-S-C-121108	12-22487-VR82I	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	11/29/2012	1.71	Yes	Y	J			1.97		pg/g