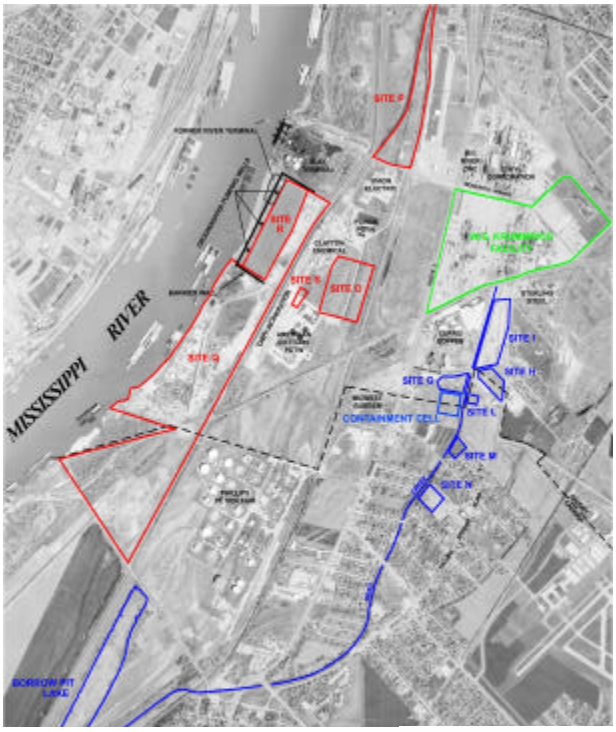
RCRA CORRECTIVE MEASURES STUDY(CMS)

SOLUTIA INC.
W.G. KRUMMRICH FACILITY
SAUGET, ILLINOIS

VOLUME III – DATA VALIDATION REPORT



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VOLUME III - DATA VALIDATION REPORT

Section 1.0 Air
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1.0 AIR SAMPLES DATA VALIDATION

Air samples were taken using EPA Method TO-15 for volatiles and EPA Method TO-13A for semi-volatiles. These same two methods were used for indoor air samples, air intakes to building samples, soil vapor samples and ambient air samples. The sample results, laboratory reports and detailed laboratory backup were sent to an independent auditor at a different office of TRC Environmental Corporation who had not been involved in the data collection, chemical analyses or data evaluation. The auditor independently retrieved additional information from the analysis performing laboratory. A "limited validation" was performed, i.e., not all sample results were audited.

Attached in Appendix A is a memo describing the impact of the validation findings on the results of the investigation. Also attached (in Appendix B) are two separate reports; one on the TO-15 sample results and one on the TO-13A sample results. It should be kept in mind that the two methods screen a wide variety of compounds and are not specific to any given compounds.

APPENDIX A

MEMO

TO: Richard Williams
Solutia, Inc.

FROM: Gale F. Hoffnagle

DATE: January 28, 2004

SUBJECT: Data Validation
TRC Project No. 38182

We have received the data validation reports (attached). There is one for the TO-15 data and one for the TO-13A data. They both conclude: "in general, the data appear to be valid as reported and may be used for decision-making purposes". As a result, the conclusions of the study will remain unchanged.

To address the specific points of the data validation, I have summarized the effort on the conclusions of the study.

TO-15 Data Validation Results:

1. Alpha-chlorotoluene and bromoform were not detected in any samples and were not expected. If the calibration was non-conforming it did not affect the results.

2. The contamination in a field blank appears to be exposure to ambient air since the contaminants which effected quantitative limits were also discovered in the ambient air. The samples that were affected, all had positive, above threshold values, and thus, the quantitative limit is not a concern.

3. The quantitative results of the indoor air samples in the basement of BK (Administration Building) in September may be uncertain, but they are consistent with those on the first floor and the March basement samples. They are also well below OSHA PELs.

4. All results for samples with tracer gas leakage should be considered "estimated values". The leakage of ambient air into soil gas samples should be divided into two categories:
    a. High ppbv leakage (samples at locations SVP-3 and SVP-9) rendered these samples unable to meaningfully detect soil gas concentrations (only few compounds were quantifiable). Since these two locations are not within 100 feet of the buildings, which were the subject of the study, they were not influential in the vapor pathway assessment.
    b. Low ppbv leakage (less than 250 ppbv) was experienced at SVP-7A, SVP-17 and SVP-23 (SVP-17 was not involved in the pathway analyses). SVP-7A (next

to the CCB Building) contained many contaminants not in the ambient air, but did not detect methylene chloride which was found in the indoor ambient air samples and is the only subject of further pathway analysis. SVP-23 (next to BBG Building) had only 10 ppbv of tracer gas and the acetone and chlorobenzene which are at issue, were not found in the ground water nearby.

5. Quantitative limits for some results will change, and some data will be qualified.

TO-13A Data Validation Results:

1. We continue to disagree about the need to keep TO-13A samples cool (not in TO-13A Method) because it is unlikely that SVOCs will desorb from the sampling media due to the high boiling points of the target SVOCs. Since no SVOCs were found indoors (samples at 16°C), their presence in soil vapor is moot.

2. There may have been more SVOCs (both compounds identified and higher concentrations) in the soil vapor samples, which is not important to the pathway analysis.

3. There may be quantitative uncertainty in the aniline and nitrobenzene results found in soil vapor samples. This is not important to the pathway analysis.

In summary, the issues which arose in data validation, did not compromise the data itself and did not compromise the conclusions of the pathway analysis which was the objective of the study. Methods TO-15 and TO-13A were used because they can identify a large range of compounds which might be present. This ability to precisely quantify the individual compounds that were detected is not as great as other methods, but for this survey, their application was suitable.

APPENDIX B

TRC Environmental Corporation

Memo

To: Gale Hoffnagle

From: Elizabeth Denly

CC: Diane Stallings

Date: 1/19/04

Re: TO-15 Data Validation Review: Soil Gas and Indoor Air Samples: Solutia, Inc.: Lab Report #s 0304003A, 0304003B, 0304034, 0304090, 0308373, 0308398, 0308439, and 0309124

SUMMARY

Full and/or limited validation was performed on the data for 35 soil gas samples, 20 indoor air samples, four field blanks, and six trip blanks collected at Solutia, Inc. in Sauget, Illinois. The samples were collected on March 29, March 31, April 1, April 2, August 19, August 20, August 21, and September 6, 2003 and submitted to Air Toxics Limited (Air Toxics) in Folsom, California for analysis. The samples were analyzed for select volatile organic compounds (VOCs) using EPA method TO-15. Air Toxics reported the results under job numbers 0304003A, 0304003B, 0304034, 0304090, 0308373, 0308398, 0308439, and 0309124.

The sample results were assessed using the "USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review" (10/99). Modification of the Functional Guidelines was done to accommodate the non-CLP methodology.

In general, the data appear to be valid as reported and may be used for decision-making purposes.

X Potential uncertainty exists for the alpha-chlorotoluene and bromoform results in select indoor air and soil gas samples due to calibration nonconformances.

X Quantitation limits for trichloroethene, chlorobenzene, acetone, and 1,4-dichlorobenzene were elevated in select soil gas samples due to field blank contamination.

X Potential low bias exists for the alpha-chlorotoluene results in select indoor air and soil gas samples due to low recovery in the laboratory control sample (LCS).

X Potential uncertainty exists for the methylene chloride and chlorobenzene results in indoor air samples BK-Dist-34000 and BK-Dist-Duplicate-4175 due to high relative percent differences (RPDs) in the evaluation of the field duplicate pair.

X Potential uncertainty exists for all compounds in soil gas samples SVP-17-SG-040103, SVP-23-SG-040203, SVP-18-SG-040203, SVP-7A-SG-082003, SVP-9-SG-033103, SVP-3-SG-040103, SVP-9-SG-081903, and SVP-10-SG-082003 due to a leak at the surface seal during sampling. The presence or absence of contaminants due to soil gas or ambient air cannot be determined in these samples.

SAMPLES

Samples included in this review are listed below:

SOIL GAS SAMPLES			
SVP-16-SG-033103	SVP-5-SG-040103	SVP-18-SG-040203	SVP-7A-SG-082003[4]
SVP-12-SG-033103	SVP-14-SG-040103	SVP-19-SG-040203	SVP-13A-SG-082003[4]
SVP-15-SG-033103	SVP-140-SG-040103[2]	SVP-20-SG-040203	SVP-10-SG-082003
SVP-8-SG-033103	SVP-17-SG-040103	SVP-21-SG-040203	SVP-100-SG-082003[3,4]
SVP-10-SG-033103	SVP-1-SG-040103	SVP-22-SG-040203	SVP-23-SG-082003
SVP-100-SG-033103[1]	SVP-2-SG-040103	SVP-23-SG-040203	FB082003 AM
SVP-11-SG-033103	SVP-3-SG-040103	SVP-3-SG-081903	FB082003 PM
SVP-9-SG-033103	SVP-4-SG-040103	SVP-9-SG-081903	Trip Blank 082003
SVP-6-SG-033103	Background Air Sample-040103-AM	SVP-14-SG-081903	SVP-17A-SG-082103
SVP-Background Sample-033103	Background Air Sample-040103-PM	FB081903	FB082103 AM
Trip Blank 033103	Trip Blank 040103	Trip Blank 081903	Trip Blank 082103

[1] Field duplicate of SVP-10-SG-033103
[2] Field duplicate of SVP-14-SG-040103
[3] Field duplicate of SVP-10-SG-082003
[4] Subjected to full validation

INDOOR AIR SAMPLES			
March 29, 2003		September 6, 2003	
BBZ-Office-9910[3]	BK-1st Fl. Office-24489	BBZ-Office-34363	BK-1st Fl. Office-4286
BBZ-Intake-9584	BK-Intake-33584	BBZ-Intake-20947	BK-Intake-439
BBG-Office-9571	BK-Dist-TO1627	BBG-Office-94610	BK-Dist-34000
BBG-Intake-96105	BK-Dist-Duplicate-1584[1]	BBG-Intake-25313	BK-Dist-Duplicate-4175[2]
CCB-Office-TO1560[3]		CCB-Office-4098	Trip Blank
CCB-Intake-14883		CCB-Intake-4247	

[1] Field duplicate of BK-Dist-TO1627
[2] Field duplicate of BK-Dist-34000
[3] Subjected to full validation

REVIEW ELEMENTS

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with TRC requests
- Holding times and sample integrity
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks, field blanks, and trip blanks
- Surrogate spike recoveries
- Laboratory duplicate results
- Laboratory control sample (LCS) results
- Internal standard performance
- Field duplicate results
- Quantitation limits and sample results

- Tentatively identified compounds (TICs)

DISCUSSION

Agreement of Analyses Conducted with TRC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the chain-of-custody and any correspondence between TRC and the laboratory. There were no discrepancies noted.

Holding Times and Sample Integrity

Sample CCB-Office-TO1560 was analyzed 19 minutes outside the EPA-required 72-hour holding time. Based on the opinion of the validator, qualification of the data was not required due to this slight exceedance.

Samples CCB-Intake-4247, BK-Intake-439, BK-Dist-34000, and BK-Dist-Duplicate-4175 were analyzed between 11 minutes and 152 minutes outside the EPA-required 72-hour holding time due to the date and time samples were received by the laboratory. Based on the opinion of the validator, qualification of the data was not required due to these slight exceedances.

The SUMMA canister for sample BK-Dist-Duplicate-1584 was found to be leaking at the time of screening. Since this sample was a field duplicate sample and the results of this sample compared well with the original sample, the leak did not adversely affect the results. Qualification of the data was not required.

GC/MS Tunes

The frequency and abundance of all bromofluorobenzene (BFB) tunes were within the acceptance criteria. The samples were analyzed within 24 hours from the BFB tunes.

Initial and Continuing Calibrations

The following table summarizes the initial calibration (IC) and continuing calibration (CC) results that failed to meet the calibration criteria of percent relative standard deviation (%RSD) <30, percent difference (%D) <30, and relative response factors >0.050.

Instrument	GC/MS "B"	GC/MS "B"	GC/MS "D"	GC/MS "D"
Calibration Date	CC 4/1/03	CC 4/2/03	CC 8/20/03	IC 8/25/03
Compound	%D	%D	%D	%RSD
alpha-chlorotoluene	38.6	37.4	-	-
bromoform	-	-	38.6	-
Freon 134a	-	-	-	33.7

Instrument	GC/MS "B"	GC/MS "B"	GC/MS "D"	GC/MS "D"
Calibration Date	CC 4/1/03	CC 4/2/03	CC 8/20/03	IC 8/25/03
Compound	%D	%D	%D	%RSD
Associated Samples	Indoor Air: BBZ-Office-9910, BBZ-Intake-9584, BBG-Office-9571, BBG-Intake-96105 Soil Gas: SVP-6-SG-033103, SVP-9-SG-033103, SVP-10-SG-033103, SVP-100-SG-033103, SVP-11-SG-033103, SVP-Background Sample-033103, Trip Blank 033103	Soil Gas: SVP-14-SG-040103 (784x), SVP-140-SG-040103 (764x), Background Air Sample-040103-AM, Background Air Sample-040103-PM, Trip Blank 040103	Soil Gas: FB081903, SVP-3-SG-081903, SVP-9-SG-081903 (1.68x and 48x), SVP-14-SG-081903, Trip Blank 081903	Indoor Air: BBZ-Office-34363, BBZ-Intake-20947, BBG-Office-94610, BBG-Intake-25313, CCB-Office-4098, CCB-Intake-4247, BK-1st Fl. Office-4286, BK-Intake-439, BK-Dist-34000, BK-Dist-Duplicate-4175, Trip Blank 090603

- met criteria

Alpha-chlorotoluene and bromoform were not detected in the associated samples; these nondetect results were qualified as estimated (UJ) in the associated samples. Freon-134a was not detected in any of the associated samples; qualification of these nondetects was not required on the basis of the initial calibration nonconformance.

It should be noted that only three to four calibration standards were used for the initial calibration of tertbutylbenzene, naphthalene, and Freon 134a. EPA Method TO-15 requires five calibration standards in the initial calibration. Since these compounds are not routine compounds under this method, the use of three to four calibration standards was deemed acceptable and did not adversely affect the data quality. No validation action was required on this basis.

Method Blanks, Field Blanks, and Trip Blanks

Target VOCs were not detected in the method blanks or trip blanks associated with the samples. Select VOCs were detected in the field blanks. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action Levels (ALs) were established for the common contaminants (methylene chloride and acetone) at 10x the concentration detected. Action Levels (ALs) were established for the remaining contaminants at 5x the concentration detected. The following tables summarize the ALs.

FB081903		
Compound	Concentration	Action Level
Acetone	8.9 ppbV (21 µg/m^3)	89 ppbV (210 µg/m^3)
Associated Samples: SVP-3-SG-089103, SVP-9-SG-081903, SVP-14-SG-081903		

The positive result for acetone in sample SVP-9-SG-081903 was qualified as a nondetect at the reported

concentration due to the blank contamination.

FB082003 AM		
Compound	Concentration	Action Level
Trichloroethene	3.3 ppbV (18 µg/m^3)	16.5 ppbV (90 µg/m^3)
Chlorobenzene	17 ppbV (82 µg/m^3)	85 ppbV (410 µg/m^3)
Acetone	7.7 ppbV (18 µg/m^3)	77 ppbV (180 µg/m^3)
Associated Samples: SVP-7A-SG-082003, SVP-10-SG-082003, SVP-100-SG-082003, SVP-13A-SG-082003, SVP-23-SG-082003		

The positive results for trichloroethene in sample SVP-13A-SG-082003, chlorobenzene in samples SVP-7A-SG-082003, SVP-13A-SG-082003, and SVP-23-SG-082003 and acetone in samples SVP-7A-SG-082003, SVP-10-SG-082003 (1.61x), SVP-13A-SG-082003, and SVP-23-SG-082003 were qualified as nondetects (U) at the reported concentrations due to the blank contamination.

FB082003 PM		
Compound	Concentration	Action Level
Methylene chloride	3.9 ppbV (14 µg/m^3)	39 ppbV (140 µg/m^3)
Acetone	7.7 ppbV (18 µg/m^3)	77 ppbV (180 µg/m^3)
1,4-Dichlorobenzene	3.2 ppbV (20 µg/m^3)	16 ppbV (100 µg/m^3)
Associated Samples: SVP-7A-SG-082003, SVP-10-SG-082003, SVP-100-SG-082003, SVP-13A-SG-082003, SVP-23-SG-082003		

The positive results for 1,4-dichlorobenzene in samples SVP-10-SG-082003 (1.61x) and SVP-13A-SG-082003 were qualified as nondetects at the reported concentrations due to the blank contamination. Methylene chloride was not detected in the associated samples. Qualification of the data on the basis of the methylene chloride contamination was therefore not required. Positive results for acetone in the associated samples were already qualified on the basis of the contamination in FB082003 AM; further qualification on the basis of the acetone contamination in FB082003 PM was not required.

FB082103 AM		
Compound	Concentration	Action Level
Acetone	13 ppbV (32 µg/m^3)	130 ppbV (320 µg/m^3)
Associated Samples: SVP-17A-SG-082103		

The positive result for acetone in sample SVP-17A-SG-082103 was qualified as a nondetect at the reported concentration due to the blank contamination.

Sample results were qualified as follows:

- Sample results > the quantitation limit (QL) but ≤ AL were qualified as nondetect (U) at the reported concentration.
- Sample results ≤ the QL and ≤ AL were qualified as nondetect (U) at the QL.
- Sample results > AL were not qualified.

The frequency of blank collection was compared to the frequency specified in the field sampling plan. Trip blanks were required to be shipped with each set of samples but were not submitted with indoor air samples collected on 3/29/03 or soil gas samples collected on 4/2/03. No validation action was taken on this basis. Field blank samples were collected at the required frequency.

Surrogate Spike Recoveries

The recoveries of the surrogates were within the acceptance criteria in all sample analyses.

Laboratory Duplicate Results

Laboratory duplicate analyses were performed on the following samples:

SVP-8-SG-033103
SVP-12-SG-033103
SVP-4-SG-040103
SVP-23-SG-040203
FB081903
FB082003 PM
BK-Dist-Duplicate-4175

In all cases, the RPDs of the detected analytes were within the acceptance criteria. The results of the initial analyses were reported in all cases.

LCS Results

An LCS was analyzed on each day of sample analysis. The following table summarizes recoveries which were outside of the acceptance criteria.

LCS Date Analyzed	Compound	Percent Recovery	Associated Samples	Validation Action
4/1/03	alpha-chlorotoluene	68	BBZ-Office-9910, BBZ-Intake-9584, BBG-Office-9571, BBG-Intake-96105, SVP-10-SG-033103, SVP-100-SG-033103, SVP-11-SG-033103, SVP-9-SG-033103, SVP-6-SG-033103, SVP-Background Sample-033103, Trip Blank 033103	Estimate (UJ) nondetect results for alpha-chlorotoluene in the associated samples.
4/2/03	tetrachloroethene	131	SVP-14-SG-040103 (784x), SVP-140-SG-040103 (764x), Background Air Sample-040103-AM, Background Air Sample-040103-PM,	No validation action required; tetrachloroethene was not detected in any of the associated samples.

			Trip Blank 040103	

It should be noted that tertbutylbenzene, naphthalene, and Freon-134a were not included in the LCSs. Since the method has no specific requirements for the LCS and the majority of target compounds were included in the LCS, it was the opinion of the validator that data quality was not adversely affected. No validation action was taken on this basis.

Internal Standard Performance

Internal standards were within the acceptance criteria in all sample analyses.

Field Duplicate Results

The following field duplicate pairs were collected:

BK-Dist-TO1627/BK-Dist-Duplicate-1584
SVP-10-SG-033103/SVP-100-SG-033103
SVP-14-SG-040103/SVP-140-SG-040103
SVP-10-SG-082003/SVP-100-SG-082003
BK-Dist-34000/BK-Dist-Duplicate-4175

The following tables summarize the RPDs of the detected compounds in the field duplicate pairs. In the absence of established field duplicate acceptance criteria for soil gas and indoor air matrices, an RPD criterion of 50 was used to evaluate these field duplicate pairs.

Compound	BK-Dist-TO1627 (ppbV)	BK-Dist-Duplicate-1584 (ppbV)	RPD (%)
Methylene chloride	24	18	29
Acetone	4.0	4.1	2.5

Compound	SVP-10-SG-033103 (ppbV)	SVP-100-SG-033103 (ppbV)	RPD (%)
Benzene	680	660	3.0
Chlorobenzene	31,000	32,000	3.2
1,2-Dichlorobenzene	870	810	7.1
1,4-Dichlorobenzene	4500	4400	2.2

Compound	SVP-14-SG-040103 (ppbV)	SVP-140-SG-040103 (ppbV)	RPD (%)
Benzene	1100	1100	0
Chlorobenzene	2200	2300	4.4
4-Methyl-2-pentanone	72,000	75,000	4.1

Compound	SVP-10-SG-082003 (ppbV)	SVP-100-SG-082003 (ppbV)	RPD (%)
Freon 134a	25,000	850 U	NC
Benzene	110 U	1600	NC
Chlorobenzene	110 U	61,000	NC
1,2-Dichlorobenzene	110 U	2600	NC
1,4-Dichlorobenzene	110 U	14,000	NC

Compound	BK-Dist-34000 (ppbV)	BK-Dist-Duplicate-4175 (ppbV)	RPD (%)
Methylene chloride	6.2	12	64
Chlorobenzene	3.1	1.7	58
Acetone	6.2	4.1	41

The RPDs were within the acceptance criteria in field duplicate pairs BK-Dist-TO1627/BK-Dist-Duplicate-1584, SVP-10-SG-033103/SVP-100-SG-033103, and SVP-14-SG-040103/SVP-140-SG-040103. RPDs were not calculable (NC) in the field duplicate pair SVP-10-SG-082003/SVP-100-SG-082003 due to detected compounds in only one of the two samples. As discussed in the TIC section, potential uncertainty exists for the nondetect results for the original sample in this pair. Therefore, a true measure of precision in this field duplicate pair could not be ascertained. Qualification of the data on the basis of this field duplicate pair was therefore not performed. The RPDs of methylene chloride and chlorobenzene were outside the acceptance criteria in the field duplicate pair BK-Dist-34000/BK-Dist-Duplicate-4175. Positive results for methylene chloride and chlorobenzene in samples BK-Dist-34000 and BK-Dist-Duplicate-4175 were qualified as estimated (J).

It should be noted that field duplicates were collected at the frequency specified in the field sampling plan.

Quantitation Limits and Sample Results

All samples were received at a partial vacuum and were pressurized to 5 psi with nitrogen prior to analysis. This pressurization resulted in slight dilution factors for each sample. Quantitation limits for each sample were elevated accordingly by the laboratory.

Several samples were analyzed on dilution due to the concentrations of target compounds or TICs which would have exceeded the calibration range if analyzed undiluted. The following table summarizes the dilutions performed.

Sample ID	Dilution Factor	Reason for Dilution
CCB-Office-TO1560	2.74	Target compounds
SVP-10-SG-033103	366	Target compounds
SVP-100-SG-033103	179	Target compounds
SVP-9-SG-033103	74.8	TIC (tetrafluoroethane)
SVP-14-SG-040103	392/784	Target compounds
SVP-140-SG-040103	382/764	Target compounds
SVP-9-SG-081903	48	Freon 134a (tetrafluoroethane)
SVP-14-SG-081903	183	Target compounds
SVP-7A-SG-082003	19.6	Target compounds
SVP-13A-SG-082003	2.49	Non-target compounds
SVP-10-SG-082003	215	Freon 134a (tetrafluoroethane)
SVP-100-SG-082003	424	Target compounds

Samples CCB-Office-TO1560, SVP-9-SG-081903, and SVP-10-SG-082003 were initially analyzed undiluted but due to calibration range exceedances were further diluted. Samples SVP-14-SG-040103 and SVP-140-SG-040103 were initially analyzed at lower dilution factors (392x and 382x, respectively). The laboratory did not initially report the results of these undiluted or less diluted analyses. Upon request during validation, these data were received. The results of the diluted and undiluted (or less diluted) analyses of these samples were combined during validation in order to report the lowest possible quantitation limits and all results within the calibration range. The quantitation limits of the remaining samples listed in the above table were elevated accordingly by the laboratory due to the dilutions performed.

Tentatively Identified Compounds (TICs)

In order to evaluate potential leakage around the surface seal during sample collection, a tracer gas (tetrafluoroethane) was used at each location during sampling. The laboratory performed a library search on each sample to determine if this tracer gas was present and then calculated an estimated concentration. However, it should be noted for samples collected in August and September 2003, the laboratory calibrated the instrument for one of the tetrafluoroethane isomers (1,1,1,2-tetrafluoroethane; Freon 134a) and performed the library search for the other isomer (1,1,2,2-tetrafluoroethane; Freon 134). Therefore, concentrations of 1,1,1,2-tetrafluoroethane reported in August and September 2003 samples were not estimated concentrations.

Various concentrations of tetrafluoroethane were detected in samples SVP-18-SG-040203 (9.6 ppbV), SVP-23-SG-040203 (10 ppbV), SVP-17-SG-040103 (150 ppbV), SVP-7A-SG-082003 (250 ppbV), SVP-9-SG-033103 (1800 ppbV), SVP-3-SG-040103 (2100 ppbV), SVP-9-SG-081903 (6000 ppbV), and SVP-10-SG-082003 (25,000 ppbV). The presence or absence of contaminants in these samples may or may not be attributable to the soil gas and may be due to the ambient air due to the likelihood of a leak. Both positive and nondetect results in these samples were qualified as estimated (J and UJ, respectively).

TRC Environmental Corporation

Memo

To: Gale Hoffnagle

From: Elizabeth Denly

CC: Diane Stallings

Date: 1/19/04

Re: TO-13A Data Validation Review: Soil Gas and Indoor Air Samples: Solutia, Inc.: Lab Report #s 0304006, 0304039, 0308375, 0308403, 0308437, and 0309121

SUMMARY

Limited validation was performed on the data for 29 soil gas samples, 20 indoor air samples, five field blanks, and six trip blanks collected at Solutia, Inc. in Sauget, Illinois. The samples were collected on March 29, March 31, April 1, August 19, August 20, August 21, and September 6, 2003 and submitted to Air Toxics Limited (Air Toxics) in Folsom, California for analysis. The samples were analyzed for select semivolatile organic compounds (SVOCs) using EPA method TO-13A. Air Toxics reported the results under job numbers 0304006, 0304039, 0308375, 0308403, 0308437, and 0309121.

The sample results were assessed using the "USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review" (10/99). Modification of the Functional Guidelines was done to accommodate the non-CLP methodology.

In general, the data appear to be valid as reported and may be used for decision-making purposes.

X Potential low bias exists for the results of all compounds in select soil gas and all indoor air samples due to cooler temperatures outside the method criteria.

X Potential low bias exists for the nondetect results for phenol, 2-chlorophenol, 2,4-dichlorophenol, 2,4,5-trichlorophenol, and pentachlorophenol in sample SVP-100-SG-082003 due to low surrogate recoveries.

X Potential uncertainty exists for the nitrobenzene, 2,4-dichlorophenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 4-chloroaniline, and aniline results in all samples due to lack of laboratory control sample (LCS) data demonstrating the efficiency of the method for these compounds.

SAMPLES

Samples included in this review are listed below:

SOIL GAS SAMPLES			
SVP-16-SG-033103	SVP-5-SG-040103	SVP-3-SG-081903	SVP-7A-SG-082003
SVP-12-SG-033103	SVP-14-SG-040103	SVP-9-SG-081903	SVP-13A-SG-082003
SVP-15-SG-033103	SVP-140-SG-040103[2]	SVP-14-SG-081903	SVP-10-SG-082003
SVP-8-SG-033103	SVP-17-SG-040103	FB081903	SVP-100-SG-082003[3]
SVP-10-SG-033103	SVP-1-SG-040103	Trip Blank 081903	SVP-23-SG-082003
SVP-100-SG-033103[1]	SVP-2-SG-040103		FB082003 AM
SVP-11-SG-033103	SVP-3-SG-040103		FB082003 PM
SVP-9-SG-033103	SVP-4-SG-040103		Trip Blank 082003
SVP-6-SG-033103	Background Air Sample-040103-AM		SVP-17A-SG-082103
Background Sample-033103	Background Air Sample-040103-PM		FB082103 AM
Trip Blank 033103	Trip Blank 040103		Trip Blank 082103

[1] Field duplicate of SVP-10-SG-033103
[2] Field duplicate of SVP-14-SG-040103
[3] Field duplicate of SVP-10-SG-082003

INDOOR AIR SAMPLES			
March 29, 2003		September 6, 2003	
BBZ-Office-01	BK-1st Fl. Office-07	BBZ-Office-20	BK-1st Fl. Office-26
BBZ-Intake-02	BK-Intake-08	BBZ-Intake-21	BK-Intake-27
BBG-Office-03	BK-Dist-09	BBG-Office-22	BK-Dist-28
BBG-Intake-04	BK-Dist-Duplicate-10[1]	BBG-Intake-23	BK-Dist-Duplicate-29[2]
CCB-Office-05	Blank-11	CCB-Office-24	Trip Blank
CCB-Intake-06		CCB-Intake-25	

[1] Field duplicate of BK-Dist-09
[2] Field duplicate of BK-Dist-28

REVIEW ELEMENTS

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with TRC requests
- Holding times and sample integrity
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks, field blanks, and trip blanks
- Surrogate spike recoveries
- Laboratory duplicate results
- Laboratory control sample (LCS) results
- Internal standard performance
- Field duplicate results
- Quantitation limits and sample results
- Tentatively identified compounds (TICs)

DISCUSSION

Agreement of Analyses Conducted with TRC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the chain-of-custody and any correspondence between TRC and the laboratory. There were no discrepancies noted.

Holding Times and Sample Integrity

All samples were extracted and analyzed within the method-specified holding time.

The XAD tubes for the soil gas samples collected on 3/31/03 and 4/1/03 and the indoor air samples collected on 3/29/03 were placed in a plastic bag and not wrapped in aluminum foil prior to shipping to the laboratory. Potential contaminants from contact with the plastic bag did not interfere with the analyses; no validation action was required on this basis.

The soil gas samples collected on 3/31/03 and the indoor air samples collected on 3/29/03 were shipped to the laboratory without ice and therefore arrived at ambient temperature, which was outside the method criteria. The positive and nondetect results for all compounds in these samples were qualified as estimated (J and UJ, respectively) due to the temperature exceedance.

The indoor air samples collected on 9/6/03 were shipped to the laboratory with blue ice but the cooler temperature upon arrival at the laboratory was 16.0°C, which is outside the method acceptance criteria. The positive and nondetect results for all compounds in these samples were qualified as estimated (J and UJ, respectively) due to the temperature exceedance.

Sample BK-Dist-Duplicate-10 was noted to be broken by the extraction laboratory just prior to the extraction. The XAD for this sample remained within the confine of the wrapper and therefore none of the sorbent was lost. No validation action was required on this basis.

GC/MS Tunes

The frequency and abundance of all decafluorotriphenylphosphine (DFTPP) tunes were within the acceptance criteria. The samples were analyzed within 12 hours from the DFTPP tunes.

Initial and Continuing Calibrations

All criteria were met in the initial and continuing calibrations.

Method Blanks, Field Blanks, and Trip Blanks

Target SVOCs were not detected in the method blanks, field blanks, or trip blanks associated with the samples.

It should be noted that trip blanks and field blanks were collected at the frequency specified in the field sampling plan.

Surrogate Spike Recoveries

Sample SVP-100-SG-082003 yielded low recoveries of the acid surrogates, phenol-d5 (48%) and 2-fluorophenol (46%). The nondetect results for phenol, 2-chlorophenol, 2,4-dichlorophenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, and pentachlorophenol were qualified as estimated (UJ) in sample SVP-100-SG-082003 due to the low surrogate recoveries.

The undiluted analyses of sample SVP-10-SG-033103 (49%) and SVP-100-SG-033103 (47%) yielded low recoveries of the acid surrogate, 2-fluorophenol. Qualification of the data was not required since only one of the acid surrogates fell below the acceptance criteria.

Laboratory Duplicate Results

Laboratory duplicate analyses were performed on the following samples:

SVP-9-SG-033103
BK-Intake-08
SVP-1-SG-040103
SVP-7A-SG-082003
BBZ-Office-20
BBZ-Intake-21

In all cases, the relative percent differences (RPDs) of the detected analytes were within the acceptance criteria or target compounds were not detected in either analysis. The results of the initial analyses were reported in all cases.

It should be noted that duplicate extractions cannot be performed on XAD samples since the entire sample is consumed during the initial extraction. Therefore, the laboratory performed duplicate analyses on the extracts of the samples listed above.

LCS Results

An LCS was extracted with each batch of samples. It should be noted that only select target compounds were included in the LCS (phenol, 2-chlorophenol, and pentachlorophenol). This is not in conformance with Section 13.3.7.1 of the method which states that the LCS should consist of the target compounds with no option for a subset of target compounds. Due to the uncertainty of method efficiency for the remaining compounds not spiked in the LCS, the associated positive and nondetect results were qualified as estimated (J and UJ, respectively) in all samples. Affected compounds include nitrobenzene, 2,4-dichlorophenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 4-chloroaniline, and aniline.

Internal Standard Performance

Internal standards were within the acceptance criteria in all sample analyses.

Field Duplicate Results

The following field duplicate pairs were collected:

BK-Dist-09/BK-Dist-Duplicate-10
SVP-10-SG-033103/SVP-100-SG-033103
SVP-14-SG-040103/SVP-140-SG-040103
SVP-10-SG-082003/SVP-100-SG-082003
BK-Dist-28/BK-Dist-Duplicate-29

The following table summarizes the RPD of the detected compound in the field duplicate pair SVP-14-SG-040103/SVP-140-SG-040103. Target compounds were not detected in the remaining field duplicate pairs. In the absence of established field duplicate acceptance criteria for soil gas and indoor air matrices, an RPD criterion of 50 was used to evaluate this field duplicate pair.

Compound	SVP-14-SG-040103 (µg)	SVP-140-SG-040103 (µg)	RPD (%)
Aniline	8.6	6.4	29

It should be noted that field duplicates were collected at the frequency specified in the field sampling plan.

Quantitation Limits and Sample Results

Samples SVP-10-SG-033103 and SVP-100-SG-033103 were analyzed at two-fold dilutions due to surrogate nonconformances in the undiluted analysis. The laboratory did not initially report the results of the undiluted analyses. Upon request during validation, these data were received. The results of the diluted and undiluted analyses of these samples were combined during validation in order to report the lowest possible quantitation limits and all results within the calibration range.

Tentatively Identified Compounds (TICs)

In order to evaluate potential leakage around the surface seal during sample collection, a tracer gas (4-nitrochlorobenzene) was used at each location during sampling. The laboratory performed a library search on each sample to determine if this tracer gas was present. This compound was not detected in any samples in this data set.

QUALITY ASSURANCE REPORT

Solutia Inc.
W.G. Krummrich Plant
Sauget, Illinois

Phase I CMS Soil Samples

Prepared for

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August 2004

URS

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Project #21561197

Phase I Soil

Sample ID	SDG
S0101(0-2)	KRM01
S0101(13-15)	KRM01
S0102(0-2)	KRM01
S0102(4-6)	KRM01
S0103(0-2)	KRM01
S0103(13-15)	KRM02
S0103(13-15)	KRM05
S0103(13-15)D	KRM02
S0104(0-2)	KRM01
S0104(0-2)	KRM05
S0104(13-15)	KRM01
S0105(0-2)	KRM01
S0105(4-6)	KRM01
S0106(0-2)	KRM01
S0106(8-10)	KRM01
S0106(8-10)	KRM05
S0107(0-2)	KRM01
S0107(13-15)	KRM01
S0108(0-2)	KRM03
S0108(13-15)	KRM03
S0109(0-2)	KRM02
S0109(13-15)	KRM02
S0110(0-2)	KRM02
S0110(13-15)	KRM02
S0111(0-2)	KRM03
S0111(13-15)	KRM03
S0112(0-2)	KRM03
S0112(7-9)	KRM03
S0112(7-9)	KRM07
S0113(0-2)	KRM03
S0113(13-15)	KRM03
S0113(13-15)D	KRM03
S0114(0-2)	KRM02
S0114(13-15)	KRM02
S0201(0-2)	KRM02
S0201(13-15)	KRM02
S0202(0-2)	KRM02
S0202(13-15)	KRM02
S0202(13-15)D	KRM02
S0203(0-2)	KRM03
S0203(13-15)	KRM03
S0204(0-2)	KRM13
S0204(14-16)	KRM13
S0204(14-16)D	KRM13

Phase I Soil

Sample ID	SDG
S0205(0-2)	KRM13
S0205(0-2)	KRM15
S0205(13-15)	KRM13
S0206(0-2)	KRM13
S0206(0-2)	KRM15
S0206(13-15)	KRM13
S0207(0-2)	KRM03
S0207(13-15)	KRM03
S0208(0-2)	KRM13
S0208(0-2)	KRM15
S0208(9-11)	KRM13
S0209(0-2)	KRM13
S0209(13-15)	KRM13
S0210(0-2)	KRM13
S0210(13-15)	KRM13
S0211(0-2)	KRM14
S0211(13-15)	KRM14
S0211(13-15)	KRM15
S0212(0-2)	KRM14
S0212(13-15)	KRM14
S0212(13-15)	KRM15
S0213(0-2)	KRM13
S0213(13-15)	KRM13
S0301(0-2)	KRM01
S0301(13-15)	KRM01
S0301(13-15)D	KRM01
S0302(0-2)	KRM01
S0302(13-15)	KRM01
S0303(0-2)	KRM01
S0303(13-15)	KRM01
S0401(13-15)	KRM13
S0402(13-15)	KRM03
S0403(2-4)	KRM03
S0404(13-15)	KRM04
S0405(2-4)	KRM04
S0406(10-12)	KRM04
S0406(10-12)	KRM07
S0407(12-14)	KRM04
S0408(6-8)	KRM04
S0408(6-8)	KRM07
S0409(10-12)	KRM04
S0410(13-15)	KRM04
S0410(13-15)D	KRM04
S0411(14-16)	KRM03

Phase I Soil

Sample ID	SDG
S0411(14-16)	KRM07
S0411(14-16)D	KRM03
S0412(13-15)	KRM11
S0412(13-15)	KRM12
S0413(10-12)	KRM11
S0413(10-12)D	KRM11
S0414(4-6)	KRM08
S0415(12-14)	KRM08
S0415(12-14)	KRM10
S0416(3-5)	KRM08
S0501(11-13)	KRM11
S0502(6-8)	KRM11
S0502(6-8)	KRM12
S0503(8-10)	KRM13
S0503(8-10)D	KRM13
S0504(13-15)	KRM11
S0505(10-12)	KRM11
S0505(10-12)	KRM15
S0506(13-15)	KRM11
S0507(10-12)	KRM11
S0508(13-15)	KRM11
S0509(3-5)	KRM08
S0510(6-8)	KRM11
S0511(8-10)	KRM08
S0511(8-10)	KRM12
S0601(8-10)	KRM11
S0601(8-10)D	KRM11
S0602(6-8)	KRM11
S0602(6-8)	KRM12
S0603(6-8)	KRM11
S0603(6-8)	KRM12
S0604(14-16)	KRM11
S0604(14-16)D	KRM11
S0605(13-15)	KRM08
S0701(6-8)	KRM08
S0701(6-8)	KRM12
S0702(3-5)	KRM08
S0703(5-7)	KRM08
S0704(14-16)	KRM08
S0704(14-16)	KRM10
S0705(2-4)	KRM08
S0705(2-4)	KRM12
S0706(13-15)	KRM11
S0707(2-4)	KRM13

Phase I Soil

Sample ID	SDG
S0708(4-6)	KRM08
S0709(2-4)	KRM08
S0709(2-4)	KRM10
S0710(13-15)	KRM08
S0710(13-15)	KRM12
S0711(12-14)	KRM08
S0711(12-14)	KRM10
S0712(3-5)	KRM06
S0712(3-5)	KRM07
S0713(6-8)	KRM06
S0801(14-16)	KRM06
S0801(14-16)	KRM07
S0801(4-6)	KRM06
S0801(4-6)	KRM10
S0802(2-4)	KRM06
S0802(2-4)	KRM07
S0802(2-4)D	KRM06
S0803(1-3)	KRM06
S0803(1-3)	KRM07
S0901(1-3)	KRM06
S0902(9-11)	KRM06
S0903(10-12)	KRM04
S0904(6-8)	KRM06
S0904(6-8)	KRM10
S0905(1-3)	KRM04
S0905(1-3)	KRM07
S0906(2-4)	KRM04
S0907(13-15)	KRM04
S0908(6-8)	KRM06
S1001(2-4)	KRM06
S1002(3-5)	KRM06
S1003(12-14)	KRM06
S1003(5-7)	KRM06
S1004(6-8)	KRM04
S1101(10-12)	KRM04
S1102(13-15)	KRM03
S1103(13-15)	KRM04
S1103(13-15)	KRM07
S1201(4-6)	KRM06
S1202(7-9)	KRM06
S1203(3-5)	KRM08
S1204(6-8)	KRM08
S1204(6-8)D	KRM08

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This Quality Assurance Report and the attached Independent Full Validation Report presents the findings of a review of analytical data for soil samples collected as part of Phase I of the Solutia W.G. Krummrich Plant RCRA Corrective Measures Study. Samples were collected in March 2003 from the Solutia Facility located in the Village of Sauget, Illinois. URS Corporation conducted the sampling effort. Analytical testing was provided by Severn Trent Laboratories located in Savannah, Georgia (STL-Savannah). Samples sent to Severn Trent were analyzed using the USEPA SW-846 methodologies referenced in the Quality Assurance Project Plan (QAPP) for various combinations of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals.

One hundred percent of the data were subjected to a data quality review; fourteen percent of these data were subjected to a full validation. The review and validation were performed in order to confirm that the analytical data provided by Severn Trent were acceptable in quality for characterizing the site.

A total of 182 samples (129 investigative samples, 13 field duplicates, 13 equipment blanks, 13 trip blanks, and 7 matrix spike and 7 matrix spike duplicates) were analyzed by STL-Savannah. These samples were submitted in 14 Sample Delivery Groups (SDGs). SDGs 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, and 15 were subjected to a data quality review. SDGs 10 and 11 were subjected to an independent validation. The validation report is presented at the end of this Appendix. The samples were analyzed according to the following USEPA SW-846 Methods: Method 8260B for VOCs, Method 8270C for SVOCs, Method 8082 for PCBs, and Methods 6010B and 7471A for metals and mercury, respectively.

The procedures for review of the data followed guidance from the following documents:

1. Quality Assurance Project Plan, March 2003. Prepared by URS Corporation.
2. U.S EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999.
3. U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, July 2002.

The above "Guidelines" provided the criteria to review the data. Additional quantitative criteria are given in the analytical methods. Qualifiers assigned by the data reviewer have been transcribed onto the laboratory reporting forms (Form-1s). The qualifiers are accompanied by codes which indicate the reason for assignment of the qualifier(s). The various codes are explained in **Table 1** of this Report.

TABLE 1

Lab Qualifier	Definition
NC	No criteria at this time
NA	Not applicable
J	Estimated Value (Organics only)
D	Diluted
U	Non-Detect
B	Analyte found in the blank (Organics only)
B	Value greater than IDL but less than CRDL (Metals only)
E	Exceeds calibration (Organics only)
E	Serial dilution result for samples with concentrations greater than 50 times the IDL are not within 10% of the original sample result (Metals only).
N	Matrix Spike or matrix spike duplicate is outside expected recovery limits. (Metals Only)

URS Qualifier	Definition
U	The analyte was analyzed for but was not detected.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
D	If the sample or extract is reanalyzed at a higher dilution factor, all concentrations are reported with a D.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy, precision, and representativeness (based on MS/MSD, LCS/LCSD, and field duplicate results) were achieved for this data set, except where noted in this appendix. In addition, analytical completeness, defined to be the percentage of analytical results which are judged to be valid, including estimated (J) or estimated non-detect (UJ) values was 100 percent, which exceeds the completeness goal of greater than 95 percent.

The data review included evaluation of the following criteria:

Organics

- Sample holding times
- Laboratory method blank, equipment blank and trip blank samples
- Surrogate spike recoveries
- Laboratory control sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample recoveries and Relative Percent Difference (RPD) values
- Field duplicate results
- Results reported from dilutions
- Internal Standard responses

Inorganics

- Sample holding times
- Equipment blank and laboratory method blank samples
- LCS recoveries
- MS/MSD sample recoveries and RPD values
- Field duplicate results
- Results reported from dilutions
- ICP serial dilutions

The following sections present the results of the data review.

2.1 SAMPLE HOLDING TIMES

Sample holding time requirements for the analyses performed are presented in the QAPP and/or in the "Guidelines." Review of the sample collection and analysis dates involved comparing the chain-of-custody and the summary forms for accuracy, consistency, and holding time compliance.

All extractions and/or analyses for VOCs, SVOCs, PCBs, and metals were completed within the

recommended holding time requirements with the exception of the sample mentioned on the table below.

SDG #	Sample	Analysis	Time Out of Hold	Qualification
KRM04	S0405(0-2)	VOCs	9 days	J/UJ

2.2 EQUIPMENT BLANK AND LABORATORY METHOD BLANK SAMPLES

Equipment blank samples are used to evaluate sampling equipment decontamination procedures. The QAPP requires equipment blank samples to be collected at a frequency of one per 10 investigative samples. Thirteen equipment blank samples were collected for 129 investigative samples which complied with the frequency requirements outlined in the QAPP of 10%.

The equipment blanks had no detections with the exception of the samples mentioned below. The compounds detected in the equipment blanks were either not detected in the related samples or were detected at a concentration > 10xs the equipment blank concentrations. Therefore, no qualifications were required.

SDG #	Sample ID	Compound and Concentration
KRM02	S0201(0-2)EB	Iron (72 ug/l)
KRM03	S0108(0-2)EB	Iron (190 ug/l)
KRM03	S0207(13-15)EB	Iron (130 ug/l)
KRM04	S0407(12-14)EB	Iron (95 ug/l)
KRM06	S0904(6-8)EB	Iron (240 ug/l)
KRM08	S0415(12-14)EB	Iron (220 ug/l)
KRM013	S0206(13-15)EB	Iron (290 ug/l)
KRM014	S0211(0-2)EB	Iron (580 ug/l) and Zinc (39 ug/l)
KRM14	S0211(0-2)EB	bis(2-ethylhexyl)phthalate (21 ug/l)

Laboratory method blank samples evaluate the existence and magnitude of contamination problems resulting from laboratory activities. All laboratory method blank samples were analyzed at the method prescribed frequencies. The laboratory method blank samples had no detections with the exception of the sample mentioned below. However, no qualifications were required since the related samples had concentrations >10xs the preparation blank concentration.

SDG #	Sample ID	Compound and Concentration
KRM03	Preparation Blank	Iron (12.437 mg/kg)

2.3 TRIP BLANKS

Trip blanks samples are used to assess VOC cross contamination of soil samples during shipment to the laboratory. One trip blank was submitted with each shipment containing samples for VOC analyses for a total of 13 trip blank samples. All trip blank samples were VOC-free, indicating the potential for cross contamination of samples during shipping and storage was minimal.

2.4 SURROGATE SPIKE RECOVERIES

Surrogate compounds are used to evaluate overall laboratory performance for sample preparation efficiency on a per sample basis. All samples analyzed for VOCs, SVOCs, and PCBs are spiked with surrogate compounds prior to sample preparation. The "Guidelines" require that all VOC, and PCB surrogate spike recoveries meet acceptance criteria, and allow one SVOC surrogate recovery per fraction (base/neutral or acid fraction) to be outside acceptance criteria, provided that recoveries are greater than or equal to 10 percent.

Surrogate recoveries were within range with the exception of the samples presented below.

SDG #	Sample ID	Analysis	Surrogate	Recovery	Range	Qualification
KRM01	0320C-MBLCS	SVOCs	2,4,6-tribromophenol	130%	26-127	QA/QC sample, no qualifications
KRM02	0320C-LCS	SVOCs	2,4,6-tribromophenol	130%	26-127	QA/QC sample, no qualifications
KRM03	S0411(14-16)	VOCs	bromofluorobenzene	310%	68-121	All detected results "J"
KRM03	S0411(14-16)DRE	VOCs	bromofluorobenzene	341%	68-121	All detected results "J"
KRM03	S0403(2-4)	VOCs	dibromofluoromethane bromofluorobenzene	63% 151%	66-127 68-121	All results Sample "J/UJ"
KRM04	S0410(13-15)	VOCs	bromofluorobenzene	412 %	68-121	All detected results "J"
KRM04	S0410(13-15)D	VOCs	bromofluorobenzene	318 %	68-121	All detected results "J"
KRM04	S0906(2-4)RE	VOCs	bromofluorobenzene	60 %	68-121	All non-detect results "UJ"
KRM04	S0406(10-12)	VOCs	dibromofluoromethane toluene bromofluorobenzene	58 % 361% 36%	66-127 65-128 68-121	All results "J/UJ"
KRM04	S0407(12-14)	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM04	S0408(6-8)	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM04	S0410(13-15)D	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM05	S0104(0-2)	PCBs	DCB1 & DCB2	1526% 1579%	30-150	All detected results "J"

SDG #	Sample ID	Analysis	Surrogate	Recovery	Range	Qualification
KRM05	S0207(13-15)EB	PCBs	DCB1 & DCB2	23% both	30-150	QA/QC sample, no qualifications
KRM06	S1001(2-4)RE	VOCs	bromofluorobenzene	66%	68-141	Sample "J/UJ"
KRM06	S0802(2-4)DL	VOCs	dibromofluoromethane	150D%	66-127	All detected results "J"
KRM06	S0901(1-3)RE	VOCs	bromofluorobenzene	62%	68-121	Sample "J/UJ"
KRM06	S0802(2-4)	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM06	S0802(2-4)D	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM07	S0905(1-3) S0802(2-4) S0803(1-3)	PCBs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM07	S0408(6-8)	PCBs	TCX1	500%	30-150	No action since all results are ND
KRM08	S0710(13-15)	VOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM08	S0703(5-7)	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM08	S0710(13-15)	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM12	S0603(6-8) S0710(13-15) diluted S0705(2-4) S0511(8-10)	PCBs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM12	S0710(13-15) S0705(2-4) S0511(8-10) S0502(6-8)	PCBs	DCB1 & DCB2	Too high for the system to quantify	30-150	All detected results "J"
KRM13	S0707(2-4)MS	VOCs	bromofluorobenzene	67%	68-121	No qualifications, QA/QC sample
KRM13	S0503(8-10)D	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM13	S0205(0-2)	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM15	S0208(0-2)	PCBs	DCB1 & DCB2	326% 310%	30-150	All detected results "J"

2.5 LABORATORY CONTROL SAMPLES RECOVERIES

Laboratory control samples (LCS) serve to monitor the overall performance of the steps in an analysis, including sample preparation. Laboratory control samples were prepared with each batch of samples. All LCS recoveries were within analytical accuracy limits with the exception of the LCSs mentioned below.

SDG #	Batch ID	Method	Analyte	Recovery	Range	Qualifications
KRM01	0320C	SVOCs	hexachlorobutadiene	103%	35-98	None, compound not detected in affected samples.
KRM02	0320C	SVOCs	hexachlorobutadiene	103%	35-98	None, compound not detected in affected samples.
KRM03	410B	SVOCs	1,3-dichlorobenzene bis(2-chloroisopropyl)ether	85% 103%	33-81 30-94	None, compound not detected in affected samples.
KRM04	1M0325	VOCs	1,1-dichloroethane	220%	34-166	None, compound not detected in affected samples.
KRM06	1M0326	VOCs	1,1-dichloroethane	190%	34-166	None, compound not detected in affected samples.
KRM08	100403	VOCs	chloroform 1,1,1-trichloroethane	133% 125%	70-124 70-123	None, compounds not detected in affected samples.
KRM08	200402	VOCs	4-methyl-2-pentanone 2-Hexanone	40% 44%	47-160 46-163	These compounds in sample S0705(2-4) qualified as UJ.
KRM13	2P0407	VOCs	1,1,2,2-tetrachloroethane	58%	59-138	Compound qualified as UJ in S0503(8-10) & S0503(8-10)D

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples are analyzed to assess potential matrix effects upon the data. MS/MSD samples were required to be collected at a frequency of one per 20 investigative samples in accordance with the QAPP. URS Corporation submitted 7 MS/MSD sample sets for 129 investigative samples meeting the QAPP frequency requirement. On occasions where SDGs were closed without a field MS/MSD; the laboratory created a batch MS/MSD sample, using either one of our samples or another clients' samples.

The MS/MSD recoveries and RPDs not within the evaluation criteria are mentioned below and are bolded. Generally, no qualifications were made to the data if the MS/MSD % recoveries were zero due to dilution or if the %RPD was the only factor out of criteria.

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qual.
KRM01	S0105(0-2)	VOCs	2-butanone acetone	**189** / 138 100 / **25**	30-185 30-195	43 34	50 100	Parent "J/UJ" in parent
KRM01	S0105(0-2)	SVOCs	2,4-dinitrophenol	50 / **0**	19-126	**200**	50	Parent UJ in parent
KRM01	S0105(0-2)	Metals	Aluminum Calcium Iron Magnesium Manganese	**1034/-521** **210/-63** **437/-2854** **180/-28** **231**/114	NA NA NA NA NA	NA NA NA NA NA	NA NA NA NA NA	None since the sample conc. are >4xs the spike conc. added.
	S0105(0-2)		Antimony Cadmium Copper Lead Potassium Zinc	**43/48** 106/**170** 113/**233** 96/**178** 110/**13** **151/603**	75-125 75-125 75-125 75-125 75-125 75-125	NA NA NA NA NA NA	NA NA NA NA NA NA	"UJ" parent "J" parent "J" parent "J" parent "J" parent "J" parent
	S0303(13-15)		Aluminum Calcium Iron Magnesium	**1141/1018** **479/400** **1759/1589** **272/248**	NA NA NA NA	NA NA NA NA	NA NA NA NA	None since the sample conc. are >4xs the spike conc. added.
	S0303(13-15)		Antimony Potassium Zinc	**57/56** **149/139** **127**/121	75-125 75-125 75-125	NA NA NA	NA NA NA	"UJ" "J" "J"
KRM02	S0109(0-2)	VOCs	Acetone 2-hexanone dibromochloromethane	**0**/52 136/**165** 111/**125**	30-195 46-163 70-124	23 28 20	100 50 50	Parent sample "J/UJ" in parent sample
KRM02	S0109(0-2)	Metals	Aluminum Calcium Copper Iron Magnesium Zinc	**622/573** **224/252** **40**/80 **303/325** **186/187** **5/32**	NA NA NA NA NA NA	NA NA NA NA NA NA	NA NA NA NA NA NA	None since the sample conc. are >4xs the spike conc. added.
			Antimony Lead	**56/57** **73**/78	75-125 75-125	NA NA	NA NA	"UJ" parent "J" parent
KRM03	S0108(0-2)	SVOCs	2,4-dimethylphenol benzo(g,h,i)perylene	**44 / 41** 33/**31**	45-99 33-122	6.1 8.0	50 50	Parent sample in UJ
KRM03	S0108(0-2)	Metals	Antimony Copper Magnesium Manganese Potassium Zinc	**58/62** **71**/112 **54**/99 **18/60** **63**/83 **21/65**	75-125 75-125 75-125 75-125 75-125 75-125	NA NA NA NA NA NA	NA NA NA NA NA NA	Parent sample "J/UJ"
KRM04	S1103(13-15)	SVOCs	2,4-dinitrophenol 4-nitrophenol 4,6-dinitro-2-methylphenol	21/66 39/73 36/77	19-126 13-133 24-128	**104** **61** **72**	50 50 50	No quals – %RPD only

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qual.
KRM04	S1103(13-15)	Metals	Antimony	**42/41**	75-125	NA	NA	"UJ" parent
			Aluminum	**958/772**	NA	NA	NA	None since the sample conc. are >4xs the spike conc. added.
			Calcium	**24/-44**	NA	NA	NA	
			Iron	**788/294**	NA	NA	NA	
			Magnesium	**146**/93	NA	NA	NA	
			Manganese	**1033/651**	NA	NA	NA	
KRM06	S1202(7-9)	SVOCs	1,3-dichlorobenzene	**30/32**	33-81	8	50	Parent sample "UJ"
			1,2-dichlorobenzene	**28/30**	31-86	21	50	
			2-methylphenol	**32**/40	34-108	21	50	
			bis(2-chlroroisopropyl)ether	**28**/30	30-94	9	50	
			3&4-methylphenol	**30**/38	35-102	22	50	
			hexachloroethane	**28**/30	29-84	9	50	
			2,4-dimethylphenol	**40**/45	45-99	12	50	
			2,4-dichlorophenol	**35**/40	37-103	13	50	
			naphthalene	**35**/38	36-94	7	50	
			2-methylnaphthalene	**32**/38	37-108	14	50	
			2,4,6-trichlorophenol	**38**/45	43-110	18	50	
			2,4,5-trichlorophenol	**40**/48	44-110	17	50	
			2-chloronaphthalene	**35**/42	42-96	19	50	
			dimethylphthalate	**35**/42	40-106	19	50	
			2,6-dinitrotoluene	**35**/42	42-109	19	50	
			acenaphthene	**35**/40	39-104	13	50	
			4-chlorophenyl-phenylether	**35**/40	38-101	13	50	
			4-bromophenyl-phenylether	**32**/40	33-94	21	50	
			di-n-butylphthalate	**38**/48	39-116	24	50	
			butylbenzylphthalate	**42**/52	44-121	21	50	
			benzo(g,h,i)perylene	**30**/42	33-122	34	50	
KRM06	S1202(7-9)	Metals	Antimony	**61/59**	75-125	NA	NA	Parent sample "J/UJ"
			Chromium	103/**163**	75-125	NA	NA	
			Lead	**137**/96	75-125	NA	NA	
			Magnesium	**205/334**	75-125	NA	NA	
			Manganese	**132/582**	75-125	NA	NA	
			Sodium	**164**/117	75-125	NA	NA	
			Vanadium	104/**140**	75-125	NA	NA	
			Zinc	**253**/86	75-125	NA	NA	
	S1003(5-7)		Aluminum	**849/8063**	NA	NA	NA	None since the sample conc. are >4xs the spike conc. added
			Calcium	**1178/6243**	NA	NA	NA	
			Iron	**6507/6001**	NA	NA	NA	
			Potassium	**230/774**	NA	NA	NA	
			Mercury	94.7/**137**	75-125	NA	NA	Parent sample "J/UJ"
KRM08	S0509(3-5)	SVOCs	hexachlorocyclopentadiene	**0/0**	19-107	**0**	50	J/UJ in parent sample
			2-chloronaphthalene	**40**/43	42-96	6	50	
			benzo(k)fluoroanthene	**22**/30	25-127	13	50	
			benzo(g,h,i)perylene	**32**/35	33-122	4	50	
KRM08	S0509(3-5)	Metals	Calcium	**140/60**	75-125	NA	NA	J in parent sample
			Copper	**33**/104	75-125	NA	NA	
			Lead	**3/-3**	75-125	NA	NA	
			Sodium	**65/67**	75-125	NA	NA	
			Zinc	**-30/-60**	75-125	NA	NA	

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qual.
			Mercury	**226.5/125.7**	NA	NA	NA	None since the sample conc. are >4xs the spike conc. added
KRM12	S0710(13-15)	PCBs	Aroclor 1060 Aroclor 1260	**0/0** 93/**23**	24-132 28-153	0 22	50 50	Parent sample "J/UJ"
KRM13	S0707(2-4)	VOCs	styrene tetrachloroethane trans-1,2-dichloroethene	**71** / 78 87 / **135** 39 / 93	73-121 64-135 23-159	6 11 **53**	50 50 50	Parent sample "UJ"
KRM13	S0401(13-15)	VOCs	1,2-dichloropropane MIBK 1,1,2-trichloroethane 2-hexanone bromoform 1,1,2,2-tetrachloroethane	115 / **120** **175 / 182** **132 / 134** **175 / 182** **135** / 132 **145 / 146**	72-118 46-160 66-127 46-163 58-134 59-138	37 35 34 35 31 34	50 50 50 50 50 50	Parent sample "UJ"
KRM13	S0401(13-15)	SVOCs	2,4-dinitrophenol	23 / **0**	19-126	200	50	Parent sample "UJ"
KRM13	S0707(2-4)	SVOCs	1,3-dichlorobenzene 1,2-dichlorobenzene 2-methylphenol bis(2-chloroisopropyl)ether 3&4-methylphenol hexachloroethane isophorone 2,4-dimethylphenol bis(2-chlorethoxy)methane 2,4-dichlorophenol naphthalene 2-methylnaphthalene hexachlorocyclopentadiene 2,4,6-trichlorophenol 2,4,5-trichlorophenol 2-chloronaphthalene dimethylphthalate 2,6-dinitrotoluene acenaphthalene diethylphthalate 4-chlorophenyl-phenylether 4-nitroaniline phenanthrene di-n-butylphthalate pyrene butylbenzylphthalate chrysene	**26 / 28** **26** / 31 **31** / 36 **28** / 33 **31** / 36 **24 / 28** **33** / 38 **36** / 38 **33** / 38 **31** / 38 **31** / 36 **31 / 36** **15 / 17** **38** / 45 **38** / 45 **38** / 43 **38** / 45 **36 / 40** **36** / 43 **36** / 43 **33** / 38 **28** / 36 **26 / 31** **38** / 45 **28** / 36 **43** / 50 **32** / 37	33-81 31-86 34-108 30-94 35-102 29-84 34-103 37-103 34-102 37-103 36-94 37-108 19-107 43-110 44-110 42-96 40-106 42-109 39-104 37-112 38-101 32-111 34-123 39-116 36-132 44-121 35-130	9 17 14 15 14 18 13 21 13 21 14 14 16 17 17 12 17 12 18 18 13 22 8 17 12 15 10	50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50	Parent Sample « J/UJ »
KRM13	S0401(13-15) S0401(13-15)	Metals	Antimony Potassium Aluminum Cadmium Calcium Copper Iron Lead Magnesium	**65/66** 121/**126** **408/273** **-93/-32** **-185/4427** **-79/1** **-457/-663** **-94**/89 **-694/2561**	75-125 75-125 NA NA NA NA NA NA NA	NA NA NA NA NA NA NA NA NA	NA NA NA NA NA NA NA NA NA	Parent Sample "J/UJ" None since the sample conc. are >4xs the spike conc. added

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qual.
			Manganese	**-46/-54**	NA	NA	NA	
			Zinc	**-1539/-632**	NA	NA	NA	
	S0707(2-4)		Antimony	**61/69**	75-125	NA	NA	UJ Parent
			Barium	103/**138**	75-125	NA	NA	J Parent
			Chromium	117/**191**	75-125	NA	NA	J Parent
			Manganese	125/**144**	75-125	NA	NA	J Parent
			Potassium	**148/175**	75-125	NA	NA	J Parent
			Silver	112/**127**	75-125	NA	NA	J Parent
			Vanadium	106/**146**	75-125	NA	NA	J Parent
	S0707(2-4)		Aluminum	**881/688**	NA	NA	NA	None since the sample conc. are >4xs the spike conc. added
			Cadmium	**206/152**	NA	NA	NA	
			Calcium	**-36/-591**	NA	NA	NA	
			Copper	**283/539**	NA	NA	NA	
			Iron	**3613/30058**	NA	NA	NA	
			Lead	**760/874**	NA	NA	NA	
			Zinc	**4826/2504**	NA	NA	NA	

2.7 FIELD DUPLICATE RESULTS

Field duplicate results are used to evaluate representativeness. When results for both duplicate and sample values are greater than five times the practical quantitation limit (PQL), satisfactory representativeness is indicated by an RPD less than or equal to 100 percent for soil samples and less than or equal to 50 percent for aqueous samples. Where one or both of the results of a field duplicate pair are reported at less than five times the PQL, satisfactory representativeness is indicated if the field duplicate results agree within 3.5 times the quantitation limit. Field duplicate results that do not meet these criteria may indicate unsatisfactory representativeness of the results.

Thirteen field duplicate samples were collected for 129 investigative samples, which satisfies the requirement in the QAPP (1 per 10 investigative samples or 10 percent). The reported results for field duplicate sample pairs were in agreement with the above acceptance criteria.

2.8 RESULTS REPORTED FROM DILUTIONS

VOC, SVOC, and PCB results were reported at different dilutions for the samples and analytes mentioned below.

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
KRM03	S0403(2-4)	SVOCs	10	Matrix Interference
KRM04	S0410(13-15)D	SVOCs	4	Matrix Interference

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
KRM04	S0407(12-14)	SVOCs	5	Matrix Interference
KRM04	S0408(6-8)	SVOCs	10	Matrix Interference
KRM06	S0802(2-4)DL	VOCs	40	Matrix Interference
KRM06	S0802(2-4)DDL	VOCs	40	Matrix Interference
KRM06	S0802(2-4)	SVOCs	10	Matrix Interference
KRM06	S0802(2-4)D	SVOCs	10	Matrix Interference
KRM08	S0704(14-16)	VOCs	200	Matrix Interference
KRM08	S0710(13-15)	VOCs	100,000	Matrix Interference
KRM08	S0705(2-4)	VOCs	40	Matrix Interference
KRM08	S0703(5-7)	SVOCs	10	Matrix Interference
KRM08	S0710(13-15)	SVOCs	5	Matrix Interference
KRM05	S0905(1-3) S0408(6-8) S0802(2-4) S0803(1-3)	PCBs	10 5 100 & 10,000 10	Abundance of target analytes
KRM12	S0710(13-15) S0705(2-4) S0511(8-10) S0701(6-8) S0603(6-8) S0602(6-8) S0412(13-15)	PCBs	20 10 10 4 20 4 4	Abundance of target analytes
KRM13	S0205(0-2)DL	VOCs	40	Matrix Interference
KRM13	S0503(8-10)	VOCs	40	Matrix Interference
KRM13	S0503(8-10)D	VOCs	40	Matrix Interference
KRM13	S0503(8-10)D	SVOCs	10	Matrix Interference
KRM13	S0205(0-2)	SVOCs	5	Matrix Interference
KRM015	S0205(0-2)	PCBs	5	Abundance of Target Analytes

Metal results were reported at different dilutions for the samples and analytes mentioned below.

SDG	Sample ID	Analyte	Dilution	Reason for Dilution
KRM01	S0102(4-6)	Thallium	2	Abundance of analyte
KRM02	S0110(0-2)	Mercury	5	Abundance of analyte
KRM04	S0905(1-3)	Calcium	10	Abundance of analyte
KRM06	S1001(2-4)	Calcium	10	Abundance of analyte
	S0802(2-4)	Calcium	10	
	S0802(2-4)D	Calcium	10	
	S1003(5-7)	Mercury	5	Abundance of analyte
	S1002(3-5)	Mercury	5	
	S0712(3-5)	Mercury	5	
	S0803(1-3)	Mercury	5	
	S0901(1-3)	Mercury	5	
	S1001(2-4)	Mercury	10	
	S0802(2-4)	Mercury	10	
	S0802(2-4)D	Mercury	10	
	S0904(6-8)	Mercury	10,000	Abundance of analyte
KRM08	S0711(12-14)	Potassium	2	Abundance of analyte
	S0509(3-5)	Mercury	5	
	S0511(8-10)	Mercury	5	
	S0703(5-7)	Mercury	10	
	S0709(2-4)	Mercury	50	
KMR013	S0707(2-4)	Zinc	5	Abundance of analyte
	S0707(2-4)	Mercury	10	Abundance of analyte
	S0707(2-4)	Cadmium	5	High negative result in initial sample
	S0205(0-2)	Barium	50	Abundance of analyte
	S0205(0-2)	Lead	50	Abundance of analyte
	S0205(0-2)	Nickel	50	Abundance of analyte
	S0205(0-2)	Mercury	5	Abundance of analyte

There were no qualifiers assigned due to dilutions.

2.9 INTERNAL STANDARD RESPONSES

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent. The internal standards area responses were looked at for the data review. Qualifications were made when the responses were greater than or less than the required criteria. The following IS responses were out of range.

SDG #	Sample ID	Analysis	IS Compound	IS Response / Range	Qualifications
KRM01	S0303(0-2)	VOCs	chlorobenzene	77,972 83,682-334,728	IS surrogates qualified as UJ in sample
KRM03	S0111(0-2)	VOCs	chlorobenzene	88,600 104,202-416,806	IS surrogates qualified as UJ in sample
KRM03	S0411(14-16)D	VOCs	chlorobenzene	1,586,935 104,202-416,806	None, sample already qualified
KRM03	S0403(2-4)	VOCs	chlorobenzene	1,803,733 104,202-416,806	None, sample already qualified
KRM04	S0406(10-12)	VOCs	chlorobenzene	3,626,899 76,168-304,674	None, IS surrogates not detected
KRM04	S0906(2-4)RE	VOCs	chlorobenzene	60,107 70,043-280,172	None, sample already qualified
KRM06	S0901(1-3)RE	VOCs	chlorobenzene	81,980 84,043-336,172	None, IS surrogates not detected
KRM08	S0509(3-5)MS S0509(3-5)MSD	VOCs	chlorobenzene chlorobenzene	76,179 89,622-358,468 84,406 89,622-358,486	None, IS response OK for parent.
KRM13	S0401(13-15)MSD	SVOCs	chrysene perylene	313,994 356,776-1,427,106 239,750 271,472-1,085,890	None, IS response OK for parent
KRM14	S0212(0-2)	SVOCs	1,4-dichlorobenzene naphthalene acenaphthene	269,771 51,618-206,472 962,668 183,544-734,178 432,843 96,998-387,992	None, IS surrogates not detected

2.10 ICP SERIAL DILUTIONS

The % differences (D) between the original sample results and the results obtained from the serial dilutions should agree within a 10% difference. However if the analyte concentration is less than a factor of 50 above the IDL, the serial dilution does not need to agree within 10 %. The reported results were in agreement with the acceptance criteria with the exception of the samples mentioned below:

SDG	Sample ID	Analyte	Difference %	Qualified Data
KMR01	S0105(0-2)	Zinc	10.9	Already qualified
		Nickel	13.6	J
	S0303(13-15)	Copper	25.2	J
		Sodium	16.6	J
		Zinc	18.2	Already qualified
KMR04	S1101(10-12)	Cobalt	11.1	J
		Zinc	24.9	J
KMR06	S1003(5-7)	Chromium	16.8	Already qualified
		Beryllium	13	J
KMR13	S0503(8-10)	Zinc	15.7	J
KMR14	S0211(0-2)	Zinc	11.2	J

No additional data qualification was necessary based on serial dilution results.

2.11 SAMPLES NOT INCLUDED IN DATA REVIEW

In some instances multiple analyses of a sample were provided by the laboratory, either due to dilution or reanalysis. In these cases using professional judgment the reviewer chose a single sample to be reported. Samples that were not included in the review are summarized in the table below.

SDG #	Sample ID	Analysis	Reason Removed from Database
KRM01	S0303(0-2)RE	VOCs	Both have same surrogate out, chose original
KRM02	S0202(13-15)	SVOCs	ISs out in original, OK in reanalysis
KRM03	S0411(14-16)RE	VOCs	Better surrogate recovery in original
	S0411(14-16)D	VOCs	ISs out of criteria in original
	S0403(2-4)RE	VOCs	Better surrogate & IS results in original
	S0203(0-2)RE	SVOCs	RE analyzed out of hold time
KRM04	S0405(2-4)DL	VOCs	Similar results, used undiluted sample
	S0410(13-15)RE	VOCs	IS out in reanalysis, IS in for original
	S0410(13-15)DRE	VOCs	LCS out in reanalysis, IS in for original
	S0406(10-12)RE	VOCs	2 ISs out in RE, only 1 IS out in original
	S1004(6-8)DL	VOCs	No detections in DL due to dilution
	S0906(2-4)	VOCs	LCS out in original, OK in RE
	S0903(10-12)DL	VOCs	No detections in DL due to dilution
KRM06	S1001(2-4)	VOCs	IS out in original, OK in RE
	S0802(2-4)	VOCs	2 ISs out in original, 1 out in DL
	S0802(2-4)D	VOCs	Surrogates & IS out in original, OK in DL
	S0901(1-3)	VOCs	2 ISs out in original, 1 out in RE
	S1002(3-5)DL	VOCs	Similar results, used undiluted sample
	S0713(6-8)DL	VOCs	Similar results, used undiluted sample
	S0802(2-4)DL	SVOCs	Surrogates recoveries 0 in both, similar results

SDG #	Sample ID	Analysis	Reason Removed from Database
	S0802(2-4)D-DL	SVOCs	Surrogates recoveries 0 in both, similar results
KRM08	S1203(3-5)DL S0711(12-14)DL S0709(2-4)DL S0710(13-15)DL	VOCs VOCs SVOCs SVOCs	LCSs out high in DL, OK in original LCSs out high in DL, OK in original Surrogates out in DL sample, OK in original No surrogate recovery in DL, OK in original
KRM11	S0507(10-12) S0508(13-15) S0604(14-16) S0604(14-16)D S0502(6-8)RE S0602(6-8)DL	VOCs VOCs VOCs VOCs SVOCs SVOCs	Surrogates, ISs & LCS out in original Surrogates, ISs & LCSs out in original Calibration, duplicate & LCS out in original Calibration, duplicate & LCS out in original More ISs out in Reanalysis Same results in original and DL
KRM13	S0205(0-2)	VOCs	QA/QC results better in reanalysis
KRM14	S0212(0-2)RE	SVOCs	IS out high in both, same results – used original

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.000002
LABORATORY STL-Savannah
LABORATORY NO. S381648, S381681
NO. OF SAMPLES/
MATRIX 24 samples/20 soil, 1 aqueous, & 3 trip blanks (VOCs only)

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME A. Pinnell
COMPLETION DATE 8/11/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	✓	(3)
4. SCS (LCS)	✓	(4)
5. DCS (LCSD)	N/A	N/A
6. MATRIX SPIKE/DUP	(1)	(5)
7. DUPLICATES	✓	✓
8. DILUTIONS	✓	✓
9. INTERNAL STANDARDS	(2)	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) The MS% recovery was out high for 2-butanone and the MSD% recovery was out low for acetone. Therefore, these compounds were qualified as estimated and estimated non-detect (J/UJ) in the parent sample S0105(0-2).
(2) The internal standard area response for chlorobenzene was out low for sample S0303(0-2)[1]. Therefore, the compounds quantified using chlorobenzene were qualified as estimated non-detect (UJ) in this sample.
(5) The MSD% recovery and % RPD for 2,4-dinitrophenol were outside criteria affecting the parent sample S0105(0-2). Therefore, this compound was qualified as estimated non-detect (UJ) in the parent sample.

[1] Used original sample S0303(0-2) for report (VOCs only) since original and reanalyzed samples both had IS3 out of criteria.

COMMENTS: (3) Surrogate recovery of 2,4,6-tribromophenol was out high affecting the LCS sample for batch 0320C. However, since the surrogate recoveries for this compound were within criteria for the other samples in this batch, no action is necessary.
(4) The LCS% recovery for hexachlorobutadiene was out high in batch 0320C. However, all samples in this batch were non-detect for this compound, so no action is necessary.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL - Savannah
LABORATORY NO. S381648
NO. OF SAMPLES/
MATRIX 21/ 20 soil + 1 aqueous

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME K. Hoskins
COMPLETION DATE 7/03/03

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010	Mercury Meth # 7471A & 7470A
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. DUPLICATES	(1)	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(2+3)	✓
7. DILUTIONS	(4+5+6)	(7)
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (3) MS/MSD % recoveries were outside control limits in sample S0105(0-2) for antimony and zinc. Also, the MSD % recoveries were outside control limits for cadmium, copper, lead and potassium. MS/MSD % recoveries were also out in sample S0303(13-15) for antimony and potassium. The MSD % recovery was out for zinc. Therefore, related constituents in the parent samples were qualified as estimated (J) and estimated non-detect (UJ).
(4) The ICP serial dilution % D for zinc and nickel in sample S0105(0-2) was >10%. Therefore, nickel was qualified as estimated (J). Zinc was already qualified due to action (3). The ICP serial dilution % D for copper, sodium, and zinc in sample S0303(13-15) was > 10%; therefore, the related compounds for the sample were qualified as estimated (J) or estimated non-detect(UJ) with the exception of zinc that was already qualified due to action (3).

COMMENTS: (1) The laboratory duplicate for sample S0105(0-2) was >20% for aluminum, cadmium, calcium, copper, iron, lead, magnesium, manganese and potassium. However, no action is necessary because the duplicate was run on the spiked MS/MSD sample.
(2) MS/MSD % recoveries were out in sample S0105(0-2) for aluminum, calcium, iron, magnesium, and manganese. MS/MSD % recoveries in sample S0303(13-15) were also out for aluminum, calcium, iron, and magnesium but since the sample results are >4xs the spike added, no action is necessary.
(5) The ICP serial dilution for sample S0105(0-2) had %D >10 for antimony, arsenic, and beryllium, but the sample results were not >50xs the MDL; therefore, no action is necessary. Sample S0303(13-15) had % D>10 for antimony, arsenic, and beryllium but the sample results were not >50xs the MDL; therefore, no action is necessary.
(6) Sample S0102 (4-6) was diluted by a factor of 2 for thallium analysis. However, no action is necessary.
(7) The mercury ICP serial dilution for sample S0105(0-2) and S0303(13-15) had % D>10. The sample results were not >50xs the MDL; therefore, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
SITE Solutia Krummrich
LABORATORY STL-Savannah
LABORATORY NO. S381681A, S381740
REVIEWER URS Corporation
NO. OF SAMPLES/
REVIEWER'S NAME A. Turnell
MATRIX 15 samples / 13 soil & 2 aqueous
COMPLETION DATE 8/25/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	✓	(2)
4. SCS (LCS)	✓	(3)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(1)	✓
7. DUPLICATES	✓	✓
8. DILUTIONS	✓	✓
9. INTERNAL STANDARDS	✓	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Acetone was not recovered in the MS sample and 2-hexanone and dibromochloromethane were slightly high in the MSD. Therefore, the parent sample S0109(0-2) related results were qualified as estimated and estimated non-detect (J/UJ).

COMMENTS: (2) Surrogate 2,4,6-tribromophenol was slightly high for the LCS from batch 0320C. However, all the surrogates for all the investigative samples were acceptable and 2,4,6-tribromophenol was not reported in our samples. Therefore, no action is necessary.
(3) Hexachlorobutadiene recovery in the LCS for batch 0320C-MB was slightly high. However, no action is necessary since the compound in the related samples was non-detect.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL - Savannah
LABORATORY NO. S381681A, S3381740
NO. OF SAMPLES/
MATRIX 14 samples / 13 soil & 1 aqueous

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME K. Hoskins
COMPLETION DATE 8/25/2003

DATA ASSESSMENT WORKSHEET

	Metals/ Mercury Meth # 6010/7471
1. HOLDING TIMES	✓
2. BLANKS	(1)
3. DUPLICATES	(2)
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	(3+4)
7. DILUTIONS	(5+6)
8. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (4) The MS/MSD % recoveries for antimony were low and the MS% recovery for lead was low in sample S0109(0-2). Therefore, the associated sample results were qualified as estimated and as estimated non-detect (J/UJ).

COMMENTS: (1) Iron was detected in the equipment blank S0201(0-2)EB. However, no action is necessary because the related sample result was >10xs the equipment blank result.
(2) Even though the %RPDs are <20%, the samples used to assess reproducibility were the spiked MS and MSD samples instead of one of our unspiked samples. However, no qualifications are needed.
(3) The MS/MSD sample % recovery for aluminum, calcium, copper, iron, magnesium, and zinc were outside criteria but the sample results were >4xs the spikes added. Therefore, no action is necessary.
(5) The serial dilutions for calcium, chromium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc had %RPD >10% in the equipment blank S0201(0-2)EB. However, no action is necessary because the sample concentrations were not >50xs the IDL and the related sample is a QA/QC sample. Also, the serial dilutions for antimony, arsenic, silver, and mercury in sample S0109(0-2) and mercury in sample S0202(13-15) had %RPD >10%. However, no action is necessary because the sample concentrations were not > 50xs the IDL.
(6) Sample S0110(0-2) was diluted by a factor of 5 for mercury. However, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.000002 SITE Solutia Krummrich
LABORATORY STL-Savannah
LABORATORY NO. S381740, S381785 REVIEWER URS Corporation
NO. OF SAMPLES/ REVIEWER'S NAME A. Turnell
MATRIX 20 samples / 18 soil & 2 aqueous COMPLETION DATE 5/20/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	(1)	(3)
4. SCS (LCS)	✓	(4)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	✓	(5)
7. DUPLICATES	✓	✓
8. DILUTIONS	✓	(6)
9. INTERNAL STANDARDS	(2)	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples S0411(14-16)[1] and S0411(14-16)D[2] had high BFB surrogate recoveries. Therefore, detected compounds in these samples were qualified as estimated (J). In addition, sample S0403(2-4)[3] had low BFB and DFM surrogate recoveries. Therefore, this sample was qualified as estimated and estimated non-detect (J/UJ).
(2) The internal standard response for chlorobenzene was low for sample S0111(0-2). Therefore, the results quantitated using this standard were qualified as estimated non-detect (UJ). The internal standard response for chlorobenzene was high for sample S0403(2-4)[3]. However, no action is necessary since this sample was already qualified due to Action #1.

[1] Used original sample S0411(14-16) for report (VOCs only) due to better surrogate recovery in original than reanalysis.
[2] Used reanalysis of sample S0411(14-16)D for report (VOCs only) due to ISs being out of criteria in original analysis.
[3] Used original sample S0403(2-4) for report (VOCs only) due to better surrogate and IS results in original than reanalysis.

ACTIONS (CONTINUED):
(5) MS/MSD % recoveries were low for 2,4-dimethylphenol and benzo(g,h,i)perylene. Therefore, these compounds were qualified as estimated non-detect (UJ) in the parent sample S0108(0-2).

COMMENTS: (3) Surrogates were not recovered in sample S0403(2-4) due to sample dilution. However, no action is necessary. Surrogates phenol and nitrobenzene had slightly low recoveries for sample S0203(0-2)[4]. However, no action is necessary since both surrogates are not from the same fraction.
(4) LCS % recoveries for 1,3–dichlorobenzene and bis(2-chloroisopropyl)ether were high in LCS 410B-MB. However, no action is necessary because the LCS was performed on a method blank.
(6) Sample S0403(2-4) was diluted by a factor of 10. However, no action is necessary.

[4] Used original sample S0203(0-2) for report (SVOCs only) due to reanalysis being analyzed out of hold time.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL-Savannah
LABORATORY NO. S381740A, S381785
NO. OF SAMPLES/
MATRIX 20 / 18 soils + 2 aqueous

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 5/15/2003

DATA ASSESSMENT WORKSHEET

	Metals / Mercury Meth # 6010 / 7471
1. HOLDING TIMES	✓
2. BLANKS	(1)
3. DUPLICATES	✓
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	(2)
7. DILUTIONS	✓
8. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (2) The spike % recoveries for antimony, copper, magnesium, manganese, potassium, and zinc in sample S0108(0-2) were below criteria. Therefore, the associated sample results were qualified as estimated (J) and estimated non-detect (UJ).

COMMENTS: (1) Iron was detected in the preparation blank. However, no action is necessary because the related sample result was >10xs the preparation blank result. Iron was also detected in EB S0108(0-2) and EB S0207(13-15). However, no action is necessary because the related sample concentrations were >10xs the EB results.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.000002
LABORATORY STL-Savannah
LABORATORY NO. S381785A, S381823
NO. OF SAMPLES/
MATRIX 18 samples/15 soil, 2 aqueous, & 1 trip blank (VOCs only)

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME A. Pinnell
COMPLETION DATE 7/14/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	(1)	✓
2. BLANKS	✓	✓
3. SURROGATES	(2)	(5)
4. SCS (LCS)	(3)	✓
5. DCS (LCSD)	N/A	N/A
6. MATRIX SPIKE/DUP	✓	(6)
7. DUPLICATES	✓	✓
8. DILUTIONS	✓	(7)
9. INTERNAL STANDARDS	(4)	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Sample S0405(2-4)[1] was analyzed out of hold time. Therefore, the sample results were qualified as estimated non-detect (UJ).
(2) Surrogate recoveries for S0410(13-15)[2] and S0410(13-15)D[3] were high outside criteria for bromofluorobenzene. Therefore, the detected compounds were qualified as estimated (J). All surrogate recoveries were outside criteria for sample S0406(10-12)[4]. Therefore, the sample was qualified estimated and

[1] Used original sample S0405(2-4) for report (VOCs only) due to similar results in original as in diluted sample.
[2] Used original sample S0410(13-15) for report (VOCs only) due to IS being within criteria for original and not in reanalysis.
[3] Used original sample S0410(13-15)D for report (VOCs only) due to LCS out of criteria in reanalysis.
[4] Used original sample S0406(10-12) for report (VOCs only) due to more ISs out of criteria in reanalyzed sample.

ACTION ITEMS (CONTINUED):
estimated non-detect (J/UJ). Surrogate recovery of bromofluorobenzene was low outside criteria for sample S0906(2-4)[5]. Therefore, the sample was qualified as estimated non-detect (UJ).

COMMENTS: (3) LCS recovery for 1,1-dichloroethane was out high for batch 1M0325 affecting sample S0907(13-15). However, the result in this sample was non-detect for 1,1-dichloroethane and therefore, no action is necessary.
(4) The internal standard (IS) response for sample S0406(10-12)[4] exceeded the 100% criteria (low bias) for chlorobenzene. However, no compounds quantitated using this IS were detected and so no action is necessary. The chlorobenzene IS response for sample S0906(2-4)[5] was low outside criteria. However, this sample was already qualified due to Action #1.
(5) Surrogates were not recovered for samples S0407(12-14), S0408(6-8), and S0410(13-15)D[3] due to sample dilutions. However, no action is necessary.
(6) Matrix spike %RPD recoveries were out high for 2,4-dinitrophenol, 4-nitrophenol, and 4,6-dinitro-2-methylphenol for sample S1103(13-15). However, since the MS/MSD percent recoveries were within range, no action is necessary.
(7) Samples S0410(13-15)D[3], S0407(12-14), and S0408(6-8) were diluted ranging from 1:4 to 1:10 times. However, no action is necessary.

[5] Used reanalysis of sample S0906(2-4) for report (VOCs only) due to LCS out of criteria in original and not in RE.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL - Savannah
LABORATORY NO. S381785A, S381823
NO. OF SAMPLES/
MATRIX 17 / 15 soils + 2 aqueous

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE June 2, 2003

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010B	Mercury Meth # 7471A & 7470A
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. DUPLICATES	(2)	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3+4)	✓
7. DILUTIONS	(5+6+7)	(8)
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (3) The spike % recovery for antimony in sample S1103(13-15) was below criteria. Therefore, the antimony parent sample result was qualified as estimated non-detect (UJ).
(5) The serial dilution for cobalt and zinc had %RPD >10% in sample S1101(10-12). Therefore, the associated sample results were qualified as estimated (J).

COMMENTS: (1) Iron was detected in EB S0407(12-14). However, no action is necessary because the related sample result was >10xs the EB result.
(2) The duplicate RPD for manganese in sample S1103(13-15) was high. However, no action is necessary because the duplicate was run on the spiked MS/MSD sample.
(4) Aluminum, calcium, iron, magnesium, and manganese spike recoveries were below and above criteria. However, no action is necessary because the sample concentrations were >4xs the spikes added.
(6) The serial dilution for calcium, chromium, copper, iron, magnesium, manganese, and zinc had %RPD >10% in sample S0407(12-14)EB. However, no action is necessary because the sample concentrations were not >

COMMENTS (CONTINUED):

COMMENTS (CONTINUED):
50xs the MDL and the related sample is an equipment blank. The serial dilution for antimony and sodium had %RPD >10% in sample S1101(10-12). However, no action is necessary because the sample concentrations were not >50xs the MDL.
(7) Sample S0905(1-3) was diluted by a factor of 10 for calcium. However, no action is necessary.
(8) The serial dilution for mercury had a %RPD >10% in sample S1103(13-15). However, no action is necessary because the sample concentration was not >50xs the MDL.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL-Savannah
LABORATORY NO. S381681B, S381648A, S381740B
NO. OF SAMPLES/ MATRIX 4 / 3 soil and 1 aqueous

SITE Solutia Krummrich
REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 8/28/2003

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	(1 & 2)
4. SCS (LCS)	✓
5. DCS (LSCD)	✓
6. MATRIX SPIKE/DUP	✓
7. DILUTIONS	✓
8. INTERNAL STANDARDS	(3)
9. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Sample S0104(0-2) had high DCBI and DCB2 surrogate recoveries. Therefore, detected analytes were qualified as estimated (J).

COMMENTS: (2) Surrogate recoveries DCB1 and DCB2 were low for the equipment blank S0207(13-15)EB; however, no action is necessary because it is a QA/QC sample.
(3) The internal standard area responses were recovered slightly high on the first channel (ECD1) for the LCS and LCSD of batch 0318R; however, no action is necessary because data was reported from the second channel (ECD2).

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.000002
LABORATORY STL-Savannah
LABORATORY NO. S381863, S381921
NO. OF SAMPLES/
MATRIX 20 samples/17 soil, 1 aqueous, & 2 trip blanks (VOCs only)

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME A. Pinnell
COMPLETION DATE 7/18/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	(1)	(5)
4. SCS (LCS)	(2)	✓
5. DCS (LCSD)	✓	N/A
6. MATRIX SPIKE/DUP	N/A	(6 & 7)
7. DUPLICATES	✓	✓
8. DILUTIONS	(3)	(8)
9. INTERNAL STANDARDS	(4)	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Surrogate recovery of bromofluorobenzene was out low for sample S1001(2-4)[1]. Therefore, this sample was qualified as estimated and estimated non-detect (J/UJ). Surrogate recovery for dibromofluoromethane was out high for sample S0802(2-4)[2]. Therefore, detected compounds in this sample were qualified as estimated (J). Surrogate recovery of bromofluorobenzene was out low for sample S0901(1-3)[3]. Therefore, this sample was qualified as estimated and estimated non-detect (J/UJ).

[1] Used reanalysis of sample S1001(2-4) for report (VOCs only) due to IS out in addition to surrogate in original sample.
[2] Used diluted results of sample S0802(2-4) for report (VOCs only) due to ISs out in addition to surrogates in original sample.
[3] Used reanalysis of sample S0901(1-3) for report (VOCs only) due to more ISs out in original and detections in reanalysis.

ACTIONS (CONTINUED):
(6) MS and MSD % recoveries for several compounds were out low for batch 0325D. Therefore, the related compounds in the parent sample S1202(7-9) were qualified as estimated non-detect (UJ).

COMMENTS: (2) LCS % recovery for batch 1M0326 of 1,1-Dichloroethane was high outside criteria indicating a high bias. However, since the compound is non-detect in affected samples, no action is necessary.
(3) Samples S0802(2-4)[2] and S0802(2-4)D[4] were diluted by a secondary dilution of 1:40. However, no action is necessary.
(4) The IS chlorobenzene response for sample S0901(1-3)[3] was out low. However, no analytes were detected that were quantitated using this IS and so no action is necessary.
(5) Surrogate recoveries for samples S0802(2-4)[5] and S0802(2-4)D[6] were zero due to dilutions. However, no action is necessary.
(7) An MS/MSD was not performed for the water matrix due to lack of sample volume. However, since the aqueous samples are QA/QC samples, no action is necessary.
(8) Samples S0802(2-4)[5] and S0802(2-4)D[6] were diluted by a factor of 10. However, no action is necessary.

[4] Used dilution for sample S0802(2-4)D for report (VOCs only) due to QA/QC results in for diluted and not in original sample.
[5] Used original for sample S0802(2-4) for report (SVOCs only) due to surrogates out and similar results in both samples.
[6] Used original for sample S0802(2-4)D for report (SVOCs only) due to surrogates out and similar results in both samples.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL - Savannah
LABORATORY NO. S381863, S381921
NO. OF SAMPLES/
MATRIX 18 / 17 soil +1 aqueous

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME K. Hoskins
COMPLETION DATE 05/29/03

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010	Mercury Meth # 7471
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. DUPLICATES	(2)	(8)
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3+4)	(9)
7. DILUTIONS	(5+6+7)	(10+11)
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (3) The MS/MSD spike % recoveries for antimony, chromium, lead, magnesium, manganese, sodium, vanadium, and zinc in sample S1003(5-7) were outside of criteria. Therefore, the parent sample result for antimony was qualified as estimated non-detect (UJ) and all other constituents were qualified as estimated (J).
(5) The serial dilution for chromium and beryllium had a RPD >10% in sample S1003(5-7). Therefore, beryllium was qualified as estimated (J). Chromium was already qualified due to action (3).
(9) The mercury MSD spike % recovery in sample S0713(6-8) was high. Therefore, mercury was qualified as estimated (J) in the parent sample.

COMMENTS: (1) Iron was detected in equipment blank S0904(6-8). However, no action is necessary because the related sample result was >10xs times the equipment blank result.

COMMENTS (CONTINUED):

(2) The laboratory duplicate RPDs for aluminum, calcium, chromium, lead, magnesium, manganese, potassium, vanadium, and zinc in sample S1003(5-7) were high. However, no action is necessary because the duplicate was performed on the spiked samples (MS & MSD).

(4) Aluminum, calcium, iron, and potassium spike recoveries were outside of criteria for sample S1003(5-7). However, no action is necessary because the sample results were >4xs the spikes added.

(6) The serial dilution for antimony, arsenic, cadmium, and selenium had RPD >10% in sample S1003(5-7). However, no action is necessary because the sample concentrations were not >50xs the MDL. Also, the serial dilution for barium, calcium, copper, magnesium, manganese, sodium, and zinc had a RPD >10% in sample S0904(6 -8)EB. However, no action is necessary because the sample concentrations are not >50xs the MDL and the associated sample is an equipment blank.

(7) Samples S1001(2-4), S0802(2-4), and S0802(2-4)D were diluted by a factor of 10 for calcium. However, no action is necessary.

(8) The laboratory duplicate RPD for mercury in sample S0713(6-8) was high. However, no action is necessary because the sample result was not >50xs the MDL.

(10) The serial dilution for mercury had a RPD >10% in sample S0713(6-8). However, no action is necessary because the sample concentration was not >50xs the MDL.

(11) Samples S1003(5-7), S1002(3-5), S0712(3-5), S0803(1-3), and S0901(1-3) were diluted by a factor of 5. Samples S1001(2-4), S0802(2-4), and S0802(2-4) were diluted by a factor of 10. Sample S0904(6-8) was diluted by a factor of 10,000. However, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL-Savannah
LABORATORY NO. S381740, S381785, S381823, S381863
NO. OF SAMPLES/ MATRIX 10 / soil

SITE Solutia Krummrich
REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 9/15/2003

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	(1)
4. SCS (LCS)	✓
5. DCS (LSCD)	NA
6. MATRIX SPIKE/DUP	✓
7. DILUTIONS	(2)
8. INTERNAL STANDARDS	✓
9. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS:

COMMENTS: (1) Surrogates were not recovered for samples S0905(1-3), S0802(2-4) and S0803(1-3) due to dilutions; however, no action is necessary. Sample S0408(6-8) had a high TCX 1 surrogate recovery. However, no action is needed since all the sample results were non-detect.
(2) Samples S0905(1-3), S0408(6-8), S0802(2-4) and S0803(1-3) were diluted by 5 to 10,000 times; however no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.000002
LABORATORY STL-Savannah
LABORATORY NO. S381958, S382020
NO. OF SAMPLES/
MATRIX 21 samples/18 soil, 1 aqueous, & 2 trip blanks (VOCs only)

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME A. Pinnell
COMPLETION DATE 7/21/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	(1)	(6)
4. SCS (LCS)	(2)	✓
5. DCS (LCSD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3)	(7)
7. DUPLICATES	✓	✓
8. DILUTIONS	(4)	(8)
9. INTERNAL STANDARDS	(5)	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (2) LCS recoveries for 4-methyl-2-pentanone and 2-hexanone were low affecting sample S0705(2-4). Therefore, these compounds were qualified as estimated non-detect (UJ) in this sample. LCS recoveries were out high for chloroform and 1,1,1-trichloroethane affecting samples S0704(14-16) and S0710(13-15). However, since these results were non-detect, no action is necessary.
(7) MS/MSD % recoveries for hexachlorocyclopentadiene, 2-chloronaphthalene, benzo(k)fluoranthene, and benzo(g,h,i)perylene were low outside criteria. Therefore, these results were qualified as estimated and estimated non-detect (J/UJ) in the parent sample S0509(3-5). An MS/MSD was not supplied for the water matrix. However, since the aqueous sample is a QA/QC sample, no action is necessary.

COMMENTS: (1) Surrogate recoveries for sample S0710(13-15) were zero due to dilution. However, no action is necessary.
(3) The full MS/MSD compound list was not performed as requested. However, since the limited list of compounds reported were within criteria, no action is necessary.
(4) Samples S0704(14-16), S0710(13-15) and S0705(2-4) were diluted between 40 and 100,000 times. However, no action is necessary.
(5) The internal standard recovery for chlorobenzene was low outside criteria for the MS and MSD samples. However, since the IS was within range for the MS/MSD parent sample S0509(3-5), no action is necessary.
(6) Surrogate recoveries for samples S0703(5-7) and S0710(13-15)[1] were zero due to dilution. However, no action is necessary.
(8) Samples S0703(5-7) and S0710(13-15)[1] were diluted by a factor of 5 and 10 times. However, no action is necessary.

[1] Used original results for sample S0710(13-15) for report (SVOCs only) due to similar QA/QC results and original less diluted than the diluted sample.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL - Savannah
LABORATORY NO. S381958, S382020
NO. OF SAMPLES/
MATRIX 19 / 18 soils + 1 aqueous

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 5/26/2003

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010B	Mercury Meth # 7471A & 7470A
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. DUPLICATES	(2)	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3)	(6)
7. DILUTIONS	(4+5)	(7)
8. OTHER	✓	(8)
9. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (3) The spike % recoveries for calcium, coppper, lead, sodium, and zinc in sample S0509(3-5) were outside of criteria. Therefore, the associated sample results were qualified as estimated (J).
(8) Samples S0414(4-6), S0416(3-5), and S0711(12-14) exceeded the upper calibration range for mercury; therefore, the mercury results in these samples were qualified as estimated (J).

COMMENTS: (1) Iron was detected in EB S0415(12-14). However, no action is necessary because the related sample result was >10xs the EB result.
(2) The duplicate RPD for calcium in sample S0509(3-5) was high. However, no action is necessary because the duplicate was run on the spiked MSD sample.

COMMENTS (continued):

COMMENTS (continued):
(4) The serial dilutions for barium, cadmium, calcium, copper, chromium, magnesium, nickel, potassium, sodium, and zinc had %RPD >10% in sample S0415(12-14). However, no action is necessary because the sample concentrations are not >50xs the MDL and the related sample is an EB.
(5) Sample S0711(12-14) was diluted by a factor of 2 for potassium. However, no action is necessary.
(6) Spike recoveries were outside of criteria high. However, no action is necessary due to the sample result being >4xs the spike added.
(7) Sample S0509(3-5) and S0511(8-10) were diluted by a factor of 5, sample S0703(5-7) was diluted by a factor of 10, and sample S0709(2-4) was diluted by a factor of 50. However, no action is necessary.

KRM12

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL-Savannah
LABORATORY NO. S382020B, S382052A

NO. OF SAMPLES/
MATRIX 8 / 8 soil

SITE Solutia Krummrich

REVIEWER URS Corporation

REVIEWER'S NAME A. Turnell
COMPLETION DATE 09/05/03

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	(1+2)
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	(3)
7. DILUTIONS	(4)
8. INTERNAL STANDARDS	✓
9. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Surrogates DCB1 and DCB2 were high for samples S0710(13-15), S0705(2-4), S0511(8-10) and S0502(6-8). Some of the high recoveries were shown as 0% due to recoveries being greater than 3xs the upper-limit. Therefore, detected compounds in these samples were qualified as estimated (J).

COMMENTS: (2) Surrogates were not recovered in samples S0603(6-8), S0710(13-15), S0705(2-4), S0511(8-10) due to dilutions; however, no action is necessary.
(3) Samples S0710(13-15), S0705(2-4), S0511(8-10), S0701(6-8), S0603(6-8), S0602(6-8) and S0412(13-15) were diluted from 4 to 20xs; however, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.000002
LABORATORY STL-Savannah
LABORATORY NO. S382139, S382203
NO. OF SAMPLES/
MATRIX 22 samples/19 soil, 1 aqueous, & 2 trip blanks (VOCs only)

SITE Solutia Krummrich

EVIEWER URS Corporation
REVIEWER'S NAME A. Pinnell
COMPLETION DATE 7/28/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	(1)	(5)
4. SCS (LCS)	(2)	✓
5. DCS (LCSD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3)	(6)
7. DUPLICATES	✓	✓
8. DILUTIONS	(4)	(7)
9. INTERNAL STANDARDS	✓	(8)
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (2) LCS % recovery for 1,1,2,2-tetrachlorethane was slightly low affecting samples S0503(8-10) and S0503(8-10)D. Therefore, the 1,1,2,2-tetrachlorethane results in these samples were qualified as estimated non-detect (UJ).
(3) MS, MSD, and %RPD recoveries were outside criteria for styrene, tetrachlorethene, and trans-1,2-dichloroethene affecting sample S0707(2-4). Therefore, these compounds were qualified in the parent sample as estimated non-detect (UJ). Several compounds had MS and MSD % recoveries out of criteria affecting sample S0401(13-15). Therefore, these compounds were qualified as estimated non-detect (UJ) in the parent sample S0401(13-15).

ACTION ITEMS (CONTINUED):
(6) % RPD and MSD % recoveries for 2,4-dinitrophenol were outside criteria. Therefore, 2,4-dinitrophenol in the parent sample S0401(13-15) was qualified as estimated non-detect (UJ). MS/MSD % recoveries for several compounds were out low affecting sample S0707(2-4). Therefore, the related compounds were qualified as estimated and estimated non-detect (J/UJ) in the parent sample S0707(2-4).

COMMENTS: (1) Surrogate recovery of bromofluorobenzene for sample S0707(2-4)MS was out slightly low. However, since this is a QA/QC sample, no action is necessary.
(4) Samples S0205(0-2)[1], S0503(8-10), and S0503(8-10)D were diluted by a factor of 1:40. However, no action is necessary.
(5) Surrogate recoveries for samples S0503(8-10)D and S0205(0-2) were zero due to dilution. However, no action is necessary.
(7) Samples S0503(8-10)D and S0205(0-2) were diluted between 5 and 10 times. However, no action is necessary.
(8) The IS response for chrysene and perylene were out low for the QA/QC sample S0401(13-15)MSD. However, since all results for the parent sample S0401(13-15) were non-detect, no action is necessary.

[1] Used results from diluted sample S0205(0-2) due to QA/QC better in the diluted sample than in the original.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL - Savannah
LABORATORY NO. S382139, S382203
NO. OF SAMPLES/
MATRIX 20/ 19 soil + 1 aqueous

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher/A.Turnell
COMPLETION DATE 5/29/03, 9/04/03

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010	Mercury Meth # 7471A & 7470A
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. DUPLICATES	(2)	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3+4)	(8+9)
7. DILUTIONS	(5+ 6+7)	(10+11)
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (3) Antimony MS/MSD percent recovery was low and potassium MSD recovery was high in the spike sample S0401(13-15). Therefore, antimony was qualified as estimated non-detect (UJ) and potassium was qualified as estimated (J) in the parent sample. In spike sample S0707(2-4) the MS/MSD antimony percent recovery was low. Barium, chromium, manganese, silver and vanadium % recoveries were high in the MSD sample. Potassium MS/MSD % recoveries were also high. Therefore, antimony was qualified as an estimated non-detect (UJ) while the other constituents were qualified as estimated (J) in the parent sample S0707(2-4).
(5) The zinc percent difference was >10% in the serial dilution for sample S0503(8-10). Therefore, zinc was qualified as estimated (J) in this sample.
(8) Mercury MS percent recovery was slightly low. Therefore, mercury in the parent sample S0401(13-15) was qualified as estimated (J).

COMMENTS: (1) Iron was detected in the equipment blank S0206(13-15)EB. The iron concentration detected in the related sample, S0206 (13-15), was >10xs the equipment blank concentration. Therefore, no action is needed.
(2) Even though some of the analytes had >20% RPD, no action is necessary because the laboratory duplicates were performed on the spiked samples.
(4) Sample S0401(13-15) MS/MSD % recoveries for aluminum, cadmium, calcium, copper, iron, lead, magnesium, manganese, and zinc were higher/lower than criteria. Sample S0707(2-4) MS/MSD recoveries for aluminum, cadmium, calcium, copper, iron, lead and zinc were higher or lower than criteria. However, no action is necessary because the sample concentrations were >4xs the spikes added.
(6) Sample S0206(13-15)EB serial dilution had >10% difference for aluminum, barium, iron, manganese, potassium, sodium and zinc. Sample S0503(8-10) serial dilution for arsenic and sodium had >10% difference. However, no action is necessary because in both cases the sample concentrations are not >50xs the MDL.
(7) Sample S0707(2-4) was diluted by a factor of 5 for zinc and sample S0205 (0-2) was diluted by a factor of 5 for cadmium and by a factor of 50 for barium, lead, and nickel. However, no action is necessary.
(9) Sample S0707(2-4) MS/MSD % recoveries for mercury were lower than the criteria. However, no action is necessary because the sample concentrations were >4xs the spike added.
(10) Sample S0401(13-15) serial dilution had >10% RPD for mercury. However, no action is necessary because the initial sample concentration is not >50xs the MDL.
(11) Sample S0707 (2-4) was diluted by a factor of 10. Sample S0205(0-2) was diluted by a factor of 5. However, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.000002
LABORATORY STL-Savannah
LABORATORY NO. S382244 (KRM14)
NO. OF SAMPLES/
MATRIX 6 samples/ 4 soil, 1 aqueous, & 1 trip blank (VOCs only)

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME A. Pinnell
COMPLETION DATE 8/8/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	(1)
3. SURROGATES	✓	✓
4. SCS (LCS)	✓	✓
5. DCS (LCSD)	✓	N/A
6. MATRIX SPIKE/DUP	N/A	✓
7. DUPLICATES	N/A	N/A
8. DILUTIONS	✓	✓
9. INTERNAL STANDARDS	✓	(2)
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS:

COMMENTS: (1) Bis(2-ethylhexyl)phthalate was detected in the QA/QC sample S0211(0-2)EB. However, since the compound was not detected in the related sample, no action is necessary.
(2) Several internal standard area responses were out high for sample S0212(0-2)[1]. However, since all results in this sample are non-detect, no action is necessary.

[1] Used original results for sample S0212(0-2) since original and reanalysis have similar ISs out of criteria and results.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL - Savannah
LABORATORY NO. S382244
NO. OF SAMPLES/
MATRIX 5 / 4 soils + 1 aqueous

SITE Solutia Krummrich

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher/A. Turnell
COMPLETION DATE 05/03 & 08/03

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010B	Mercury Meth # 7471A & 7470A
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. DUPLICATES	(2)	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	NA	NA
6. MATRIX SPIKE/DUP	(3)	✓
7. DILUTIONS	(4+5)	(6)
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (4) Zinc serial dilution in sample S0211(0-2) had >10 % difference; therefore, zinc in this sample was qualified as estimated (J).

COMMENTS: (1) Iron and zinc were detected in the equipment blank S0211(0-2)EB. However, no action is needed because iron and zinc concentrations in the related sample (S0211(0-2)) were greater than 10xs the EB results.
(2) Calcium RPD was >10% in the duplicate sample, ZZZZZ. However since this sample is not one of our samples, no action is necessary.
(3) Aluminum, calcium, iron, magnesium and zinc had high and low spike recoveries in spiked sample ZZZZZ MS/MSD; however, no action is needed because the sample concentrations were > 4xs the spike added and this sample has no corresponding sample in this sample delivery group. Antimony, chromium, copper and nickel had high and low percent spike recoveries in spiked sample ZZZZZ. However, no action is needed because this sample has no corresponding sample in this sample delivery group.

(5) Antimony, arsenic, silver and sodium serial dilutions in sample S0211(0-2) had >10 % difference. However, no action is necessary because the sample concentrations are not >50xs the MDL.
(6) Mercury serial dilution in sample ZZZZZ was >10%; however, no action is necessary because the sample concentration was <50xs the MDL, and it has no corresponding sample in this sample delivery group.

KRM15

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL-Savannah
LABORATORY NO. S382091, S382139, S382244, S382203
NO. OF SAMPLES/ MATRIX 6 / 6 soil

SITE Solutia Krummrich
REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 06/02/2003

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	(1)
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	✓
7. DILUTIONS	(2)
8. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Sample S0208(0-2) had high DCBI and DCB2 surrogate recoveries. Therefore, detected analytes were qualified as estimated (J). Sample S0206(0-2) had high DCB1 and DCB2 recoveries. Since the recoveries were greater than 3xs the upper-limit, they are shown as 0% in the surrogate sheet. Therefore, detected compounds were qualified as estimated (J) .

COMMENTS: (2) Sample S0205(0-2) was diluted by a factor of 5. However, no action is necessary.

VALIDATION REPORT

Solutia Inc.
W.G. Krummrich Plant
Sauget, Illinois

Prepared for
W.G. Krummrich Plant
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August 2004

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Project #21561197

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1.1 INTRODUCTION

This section summarizes the full validation reports for the chemical data produced by STL of Savannah, Georgia. The validation was completed in accordance with USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001) and Inorganic Data Review (USEPA 2002), where applicable to SW-846 Methods.

1.2 FULL VALIDATION OF VOC DATA - SDG KRM11

This section describes the full validation for 18 soil samples, three water samples and two trip blank samples which were prepared by USEPA SW-846 Method 5030 and analyzed for volatile organic compounds (VOCs) by USEPA SW-846 Method 8260B. The samples were analyzed by STL Laboratories, Inc. of Savannah, Georgia and submitted as part of the sample delivery group (SDG) KRM11. The samples included as part of this validation are listed below:

Sample Identification	Sample Identification	Sample Identification	Sample Identification
S0601(8-10)	S0510(6-8)	S0507(10-12)	S0506(13-15)
S0601(8-10)D	S0502(6-8)	S0501(11-13)	S0505(10-12)
S0413(10-12)	S0604(14-16)	S0601(8-10)EB	S0706(13-15)
S0413(10-12)D	S0604(14-16)D	S0507(10-12)EB	S0504(13-15)EB
S0603(6-8)	S0602(6-8)	TB-13	TB-13
S0508(13-15)	S0412(13-15)	S0504(13-15)	

Evaluation of the analytical data followed procedures outlined in USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The evaluation criteria used during the validation were a combination of those criteria presented in the respective methods and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data Package Completeness
- Laboratory Case Narrative\Cooler Receipt Form
- Holding Times and Sample Preservation
- Instrument Performance
- Initial Calibration

- Calibration Verification
- Field Duplicate Samples
- Blank Samples
- Surrogate Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples
- Internal Standards and Retention Times
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
- Target Compound Identification and Quantification
- Overall Data Assessment.

1.2.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective method. The data package was complete for SDG KRM11.

1.2.2 Laboratory Case Narrative\Cooler Receipt Form

The laboratory case narrative indicated surrogate, LCS and internal standards recoveries were outside evaluation criteria. Samples S0504(13-15)EB and TB-13 were analyzed outside holding time. Several samples were analyzed at a dilution due to matrix interference and/or high target compound concentrations. These issues are addressed in the appropriate sections below. The laboratory did not mention initial calibration and calibration verification percent relative standard deviations (%RSDs) outside evaluation criteria.

1.2.3 Holding Times and Sample Preservation

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. All samples were received and maintained at 4 $\pm$ 2 ^{o}C. Samples were analyzed within 14 days, as required by the method, with the exception of S0504(13-15)EB and TB-13 (15 days). Trip blanks are QC samples used to assess potential contamination emanating from sample shipment and are therefore not qualified as field samples. Qualification of field sample data are listed in the table below:

Field ID	Analysis	Qualification
S0504(13-15)EB	All VOCs	J/UJ

1.2.4 Instrument Performance

GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against criteria established in USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001).

Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no calculation or transcription errors were noted. No qualifications to the data were required.

1.2.5 Initial Calibration

Initial calibration (ICAL) criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for volatiles analysis. Samples included in this SDG were analyzed using instruments MSO5973, MSP5973, MSL5972 and MSM5972. The ICALs for these instruments were performed on the following dates: 2/25/03, 3/24/03, 3/26/03 and 4/2/03 respectively. At least five standard concentrations were used to establish the ICAL curve as required by USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001).

For the ICAL curve, the response factors (RFs) were reviewed following USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The ICAL RFs were greater than 0.05 for all analytes. Additionally, review of the ICAL summary forms indicated that the RF percent relative standard deviations (%RSDs) were $\leq$ 30 percent for all target analytes with the exception of those listed in the following table:

Instrument	Analyte	%RSD
MSP5973	Chloromethane	38
MSP5973	Bromomethane	77

Qualifications of data based on the ICAL data are listed in the table below:

Field ID	Analyte	Qualification
S0601(8-10)	Chloromethane	UJ
S0601(8-10)	Bromomethane	UJ
S0601(8-10)D	Chloromethane	UJ
S0601(8-10)D	Bromomethane	UJ
S0413(10-12)	Chloromethane	UJ
S0413(10-12)	Bromomethane	UJ
S0413(10-12)D	Chloromethane	UJ
S0413(10-12)D	Bromomethane	UJ
S0502(6-8)	Chloromethane	J
S0502(6-8)	Bromomethane	UJ
S0604(14-16)	Chloromethane	UJ
S0604(14-16)	Bromomethane	UJ
S0504(13-15)	Chloromethane	UJ
S0504(13-15)	Bromomethane	UJ
S0505(10-12)	Chloromethane	J
S0505(10-12)	Bromomethane	UJ
S0706(13-15)	Chloromethane	UJ
S0706(13-15)	Bromomethane	UJ

Recalculations of the RFs and %RSDs for one compound per internal standard were performed, and no errors in calculation were noted.

1.2.6 Calibration Verification

Review of the analysis run log indicated the calibration verifications (CVs) were performed at the required frequency of every 12 hours. Review of the continuing calibration summary form indicated all RFs met the evaluation criteria of greater than 0.05 for all analytes. In addition, %Ds met the evaluation criteria of < 25 percent for all analytes with the exceptions noted below:

CV	Analyte	%D
MSO5973_oq474	Acetone	**33**
MSP5973_pq002	Chloromethane	**42**
MSP5973_pq002	Bromomethane	**26**
MSP5973_pq002	Chloroethane	**46**

CV	Analyte	%D
MSP5973_pq002	1,2-Dichloroethane	**25**
MSP5973_pq002	4-Methyl-2-Pentanone	**27**
MSP5973_pq002	1,1,2,2-Tetrachloroethane	**53**
MSP5973_pq017	4-Methyl-2-Pentanone	**33**
MSL5972_lq641	Acetone	**32**

Qualifications based on CV data are listed in the table below. Chloromethane and bromomethane were previously qualified due to initial calibration %RSDs; therefore, no further qualification of chloromethane or bromomethane data was required.

Field ID	Analyte	Qualification
S0601(8-10)	Chloroethane	**J/UJ**
S0601(8-10)D	Chloroethane	**J/UJ**
S0413(10-12)	Chloroethane	**J/UJ**
S0413(10-12)D	Chloroethane	**J/UJ**
S0502(6-8)	Chloroethane	**J/UJ**
S0604(14-16)	Chloroethane	**J/UJ**
S0504(13-15)	Chloroethane	**J/UJ**
S0505(10-12)	Chloroethane	**J/UJ**
S0706(13-15)	Chloroethane	**J/UJ**
S0601(8-10)	1,2-Dichloroethane	**J/UJ**
S0601(8-10)D	1,2-Dichloroethane	**J/UJ**
S0413(10-12)	1,2-Dichloroethane	**J/UJ**
S0413(10-12)D	1,2-Dichloroethane	**J/UJ**
S0502(6-8)	1,2-Dichloroethane	**J/UJ**
S0604(14-16)	1,2-Dichloroethane	**J/UJ**
S0504(13-15)	1,2-Dichloroethane	**J/UJ**
S0505(10-12)	1,2-Dichloroethane	**J/UJ**
S0706(13-15)	1,2-Dichloroethane	**J/UJ**
S0601(8-10)	4-Methyl-2-Pentanone	**J/UJ**
S0601(8-10)D	4-Methyl-2-Pentanone	**J/UJ**
S0413(10-12)	4-Methyl-2-Pentanone	**J/UJ**
S0413(10-12)D	4-Methyl-2-Pentanone	**J/UJ**
S0502(6-8)	4-Methyl-2-Pentanone	**J/UJ**
S0604(14-16)	4-Methyl-2-Pentanone	**J/UJ**

Field ID	Analyte	Qualification
S0504(13-15)	4-Methyl-2-Pentanone	J/UJ
S0505(10-12)	4-Methyl-2-Pentanone	J/UJ
S0706(13-15)	4-Methyl-2-Pentanone	J/UJ
S0601(8-10)	1,1,2,2-Tetrachloroethane	J/UJ
S0601(8-10)D	1,1,2,2-Tetrachloroethane	J/UJ
S0413(10-12)	1,1,2,2-Tetrachloroethane	J/UJ
S0413(10-12)D	1,1,2,2-Tetrachloroethane	J/UJ
S0502(6-8)	1,1,2,2-Tetrachloroethane	J/UJ
S0604(14-16)	1,1,2,2-Tetrachloroethane	J/UJ
S0504(13-15)	1,1,2,2-Tetrachloroethane	J/UJ
S0505(10-12)	1,1,2,2-Tetrachloroethane	J/UJ
S0706(13-15)	1,1,2,2-Tetrachloroethane	J/UJ
S0506(13-15)	4-Methyl-2-Pentanone	J/UJ
S0504(13-15)EB	Acetone	J/UJ

1.2.7 Field Duplicate Samples

Field duplicate samples were analyzed to assess method precision. Samples that were duplicated in the field are listed in the following table:

Field ID	Field Duplicate ID
S0413(10-12)	S0413(10-12)D
S0604(14-16)	S0604(14-16)D
S0601(8-10)	S0601(8-10)D

The field duplicate sample pairs relative percent difference (RPD) were within evaluation criteria (50%) for all compounds with the exception of those listed in the following table:

Field ID	Field Duplicate ID	Analyte	Qualification
S0601(8-10)	S0601(8-10)D	Benzene	J
S0413(10-12)	S0413(10-12)D	Acetone	J/UJ
S0604(14-16)	S0604(14-16)D	Chlorobenzene	J
S0604(14-16)	S0604(14-16)D	2-Butanone	J/UJ

1.2.8 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). Trip blank and equipment blank samples were also evaluated to assess contamination problems emanating from sampling, decontamination and shipping procedures. All method, trip and equipment blanks were reported as non-detect. No qualification of the data was required.

1.2.9 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. Surrogate recoveries were within acceptance criteria for the validated samples with the exception of the following:

Field ID	Surrogate	Recovery	Criteria
S0508(13-15)	p-bromofluorobenzene	**195**	68-121
S0507(10-12)	p-bromofluorobenzene	**379**	68-121
S0508(13-15)RE	p-bromofluorobenzene	**300**	68-121
S0507(10-12)RE	p-bromofluorobenzene	**306**	68-121

Qualifications based on surrogate recovery data are listed in the following table:

Field ID	Analyte	Qualification
S0508(13-15)	All detected VOCs	J
S0507(10-12)	All detected VOCs	J
S0508(13-15)RE	All detected VOCs	J
S0507(10-12)RE	All detected VOCs	J

A minimum of 10 percent of the surrogate recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.2.10 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

MS/MSD spike samples were not requested or analyzed in this SDG. No qualification of the data was required.

1.2.11 Internal Standards and Retention Times

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the samples in this SDG were within evaluation criteria with the exception of the following listed in the table below.

Field ID	IS	Area	Criteria
S0508(13-15)	Chlorobenzene-d5	370571	89622-358486
S0507(10-12)	1,2-Dichloroethane-d4	50704	57659-230636
S0507(10-12)	1,4-Difluorobenzene	142698	226124-904496
S0507(10-12)	Chlorobenzene-d5	39205	89622-358486
S0507(10-12)RE	Chlorobenzene-d5	78645	90400-361600

Qualifications of data based on internal stand areas are listed in the following table. Sample S0508(13-15) was previously qualified due to surrogate recoveries; therefore, no further qualification of the data was required.

Field ID	Analyte	Qualification
S0507(10-12)	All VOCs	**J/UJ**
S0507(10-12)RE	All VOCs	**J/UJ**

The summary forms were verified to the raw data, and no transcription errors were noted.

1.2.12 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

LCS/LCSD samples were analyzed to assess the accuracy of the analytical process. All LCS/LCSD data was within evaluation criteria with the exception of those listed in the following table:

LCS ID	LCS Compound	LCS/LCSD Recovery	RPD	LCS/LCSD/RPD Criteria
1M0403MB	Carbon disulfide	38/102	91	43-143/50
1M0403MB	1,1-Dichloroethane	220/100	75	34-166/50
2O0406MB	o-xylene	125	-	74-122
2P0408MB	1,1,2,2-Tetrachloroethane	58	-	59-138

Qualifications based on LCS recoveries data are listed in the following table. A minimum of 10 percent of the LCS recoveries were recalculated and verified. No calculation or transcription errors were noted.

Field ID	Analyte	Qualification
S0601(8-10)EB	Carbon disulfide	UJ
S0507(10-12)EB	Carbon disulfide	UJ
S0603(6-8)	Carbon disulfide	J
S0508(13-15)	Carbon disulfide	UJ
S0510(6-8)	Carbon disulfide	UJ
S0604(14-16)	Carbon disulfide	UJ
S0604(14-16)D	Carbon disulfide	UJ
S0412(13-15)	Carbon disulfide	UJ
S0507(10-12)	Carbon disulfide	J
S0501(11-13)	Carbon disulfide	J
S0506(13-15)	1,1,2,2-Tetrachloroethane	UJ

1.2.13 Target Compound Identification and Quantification

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 different from the associated continuing calibration retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantification, a minimum of 10 percent of the detected results were recalculated from the raw data, and no calculation errors were noted. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. No qualification of data was required.

1.2.14 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision, based on LCS, LCSD and surrogate data were achieved for this SDG. In addition, completeness defined to be the percentage of analytical results, which are judged to be valid, including, estimated (J) data, was 100 percent for this SDG.

1.3 FULL VALIDATION OF SVOC DATA - SDG KRM11

This section describes the full validation for eighteen soil samples and three water samples, which were extracted by USEPA Methods 3550B/3520C (soil/water) and analyzed for semi-volatile organic compounds (SVOCs) following USEPA SW846 Method 8270C. The samples were analyzed by Severn Trent Laboratories, Inc. of Savannah, Georgia and submitted as part of the sample delivery group (SDG) KRM11. Samples validated for SVOCs in this SDG include:

Sample Identification	Sample Identification	Sample Identification
S0601(8-10)	S0502(6-8)	S0601(8-10)EB
S0601(8-10)D	S0604(14-16)	S0507(10-12)EB
S0413(10-12)	S0604(14-16)D	S0504(13-15)
S0413(10-12)D	S0602(6-8)	S0506(13-15)
S0603(6-8)	S0402(13-15)	S0505(10-12)
S0508(13-15)	S0507(10-12)	S0706(13-15)
S0510(6-8)	S0501(11-13)	S0504(13-15)EB

Evaluation of the analytical data followed procedures outlined in the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The evaluation criteria used during the validation were a combination of those criteria presented in the respective method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data Package Completeness
- Laboratory Case Narrative/Cooler Receipt Form
- Holding times and Sample Preservation
- Instrument Performance

- Initial Calibration
- Calibration Verification
- Blank Samples
- Surrogate Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples
- Internal Standards
- Laboratory Control Samples (LCS)
- Field Duplicate Samples
- Target Compound Identification and quantification
- Overall Data Assessment.

1.3.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package SDG KRM11 was considered complete.

1.3.2 Laboratory Case Narrative/Cooler Receipt Form

The laboratory case narrative indicated that a different client sample was used as batch MS/MSD. Some batches did not have MS/MSD samples due to insufficient sample volumes. Several samples were analyzed at a dilution due to matrix interference or high native concentrations of target analytes. No qualification of data was required. No additional problems were noted in the laboratory case narrative or cooler receipt form.

1.3.3 Holding Times and Sample Preservation

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved, extracted within 14 days of sample collection for soil, 7 days fro water, and analyzed within 40 days of the extraction. No qualifications to the data were required.

1.3.4 Instrument Performance

GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no calculation or transcription errors were noted.

1.3.5 Initial Calibration

Initial calibration (ICAL) criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for semi-volatile analysis. An ICAL was analyzed at the beginning of the run sequence. The laboratory used six standard concentrations to establish the calibration curve, meeting the minimum required. For the ICAL, the response factors (RFs) were reviewed and were greater than 0.05, and the percent relative standard deviations (%RSDs) were $\leq$ 30 percent for all target compounds quantitated using internal standards. Some target analytes were quantitated using linear regression and all correlation coefficients (r^2) were greater than 0.995.

A recalculation of the RFs and %RSD for one compound per internal standard was performed, and no errors in calculations were noted.

1.3.6 Calibration Verification

Review of the laboratory instrument run logs indicated the calibration verifications (CVs) were performed at the required frequency of every 12 hours or batch of 20 samples. Review of CV summary forms indicated all target compounds quantitated using internal standards had RFs that met the evaluation criteria of greater than 0.05 for all target analytes and percent differences (%Ds) of $\leq$ 25 percent. Target compounds quantitated using liner regression had a percent drift $\leq$ 20 percent. Recalculation of the RF and %D for one compound per internal standard was completed, and no errors in calculation were noted.

1.3.7 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by the method and all target compounds were reported as non-detect. The blank sample chromatograms were reviewed and all peaks present were surrogate compounds, internal standards, unidentified compounds, or target compounds below the MDL.

1.3.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. Surrogates were not recovered for 8 of 21 samples during SVOC analysis due to sample dilutions between a factor of 5 and 20. Sample chromatograms and mass spectra were reviewed to determine that the surrogate was diluted out of each sample in question. No errors were noted and no qualifications to the data were required. All other surrogate recoveries for undiluted samples were within the acceptance criteria for the validated samples. Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.3.9 MS/MSD Samples

MS/MSD samples were analyzed to assess accuracy and precision for the analyses. One batch had a URS sample (S0413(10-12)) spiked. All MS/MSD recoveries and RPDs were within the evaluation criteria (19-107/50) with the exception of hexachlorocyclopentadiene (12/18/50). USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001) state that organic data should not be qualified based on MS/MSD criteria alone. LCS and surrogate recoveries were within evaluation criteria; therefore, no qualifications to the data were required. Ten percent of the MS/MSD recoveries and RPD values were recalculated from the raw data and no calculation errors were noted.

1.3.10 Internal Standards

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the validated samples in this SDG were within evaluation criteria with the exception of those listed in the following table:

Field ID	Internal Standard	Area	Criteria
S0502(6-8)	Acenaphthene-d10	740632	176879-707516
S0502(6-8)	Phenanthrene-d10	1358913	272022-1088090
S0502(6-8)	Chrysene-d12	1851518	388894-1555578
S0502(6-8)	Perylene-d12	1572371	313886-1255542
S0502(6-8)RE	1,4-Dichlorobenzene-d4	381613	88885-355540
S0502(6-8)RE	Naphthalene-d8	1502538	332673-1330692
S0502(6-8)RE	Acenaphthene-d10	1065087	228155-912620
S0502(6-8)RE	Phenanthrene-d10	2080731	474117-1896468
S0502(6-8)RE	Chrysene-d12	3607578	687400-2749598
S0502(6-8)RE	Perylene-d12	3656116	619828-2479310

USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001) state that non-detect compounds with an area greater than 100 percent should not be qualified. All analytes in samples S0502(6-8) and S0502(6-8) were reported non-detect. No qualification of data was required. The summary forms were verified to the raw data, and no transcription errors were noted.

1.3.11 Laboratory Control Samples (LCS)

LCS samples were analyzed to assess the accuracy of the analytical process. All LCS data were within QC evaluation criteria. Ten percent of the reported values were calculated using the raw data. No calculation or transcription errors were noted.

1.3.12 Field Duplicate Samples

Field duplicate samples were analyzed to assess method precision. Samples that were duplicated in the field are listed in the following table.

Field ID	Field Duplicate ID
S0413(10-12)	S0413(10-12)D
S0604(14-16)	S0604(14-16)D
S0601(8-10)	S0601(8-10)D

The field duplicate sample pairs relative percent difference (RPD) were within evaluation criteria (50%) for all compounds. No qualification of data was required.

1.3.13 Target Compound Identification and Quantification

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 different from the associated ICAL retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantification, approximately 10 percent of the detected results were recalculated from the raw data, and no calculation errors were noted. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. No transcription or calculation errors were noted and reporting limits were properly adjusted for dilutions.

1.3.14 Overall Data Assessment

Based on the criteria outlined it is recommended that the results reported for these analyses, be accepted for their intended use. Acceptable levels of accuracy and precision, based on LCS, MS/MSD, and surrogate data were achieved for this SDG. In addition completeness, defined to be the percentage of analytical results judged to be valid including estimated (**J/UJ**) data, was 100 percent for this SDG.

1.4 FULL VALIDATION OF PCB DATA - SDG KRM10

This section describes the full validation for six soil samples and one water sample which were analyzed for polychlorinated biphenyls (PCBs) by EPA SW-846 Method 8082. The samples were analyzed by Severn Trent Laboratories (STL), Inc., of Savannah, Georgia, and submitted as part of sample delivery group (SDG) KRM10. Samples included as part of this validation are listed below:

Sample Identification	Sample Identification	Sample Identification	Sample Identification
S0801(4-6)	S0904(6-8)	S0904(6-8)EB	S0415(12-14)
S0709(2-4)	S0711(12-14)	S0704(14-16)	

The validation followed USEPA National Functional Guidelines for Low Concentration Organic Data Review (June 2001) where applicable to USEPA Method 8082. The evaluation criteria used during the validation were a combination of those criteria presented in the analytical method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data Package Completeness
- Problems Identified in the Laboratory Case Narrative
- Sample Preservation and Holding Times
- Initial Calibration
- Calibration Verification
- Blank Samples
- Surrogate Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples
- Laboratory Control Samples (LCS)
- Target Compound Identification and Quantification
- Overall Assessment of Data.

1.4.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was considered complete for SDG KRM10.

1.4.2 Problems Identified in the Laboratory Case Narrative

The case narrative indicated a spiking compound (PCB 1016) was outside advisory limits in the MS/MSD, surrogate recoveries were outside advisory limits due to matrix interference, and that PCB 1260 exceeded the maximum recovery criteria in a calibration verification. These issues are discussed below in the appropriate sections. No additional problems were noted in laboratory the case narrative.

1.4.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the chains-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were received and maintained at 4°C ± 2°C. All samples were extracted within 14 days of collection for soil and 7 days for water, and all samples were analyzed within 40 days of

sample extraction. No qualifications of data were required based on sample preservation and holding time requirements.

1.4.4 Initial Calibration

Initial calibration (ICAL) criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for PCB analyses. The ICAL for PCBs was done using a mixture of Aroclors 1016 and 1260 at six concentrations, and Aroclors 1221, 1232, 1242, 1248, 1254, and 1268 at a single concentration as outlined in Method 8082. The correlation coefficient (r^2) for of each of the major Aroclor 1016 and 1260 peaks greater than the method criteria of 0.995. No qualifications to the PCB data were necessary.

The correlation coefficients (r^2) for one representative peak from Aroclors 1016 and 1260 were recalculated, for both columns, and no transcription or calculation errors were noted.

1.4.5 Calibration Verification

Continuing calibration verifications (CV) were performed at the required frequency of every 12 hours for PCB analysis. All peaks eluted within the specified retention time windows and the CFs average percent difference (%D) was within the evaluation criteria (15%) for Aroclors 1016 and 1260 for each CV. One peak for Aroclor 1260 was above evaluation criteria for CV 2k0407; however, the average %D for all the peaks was within evaluation criteria. No qualifications to the data were required.

The %Ds for two major peaks from Aroclors 1016 and 1260, from each applicable CV, were recalculated from the raw data, for both columns, and no transcription or calculation errors were noted.

1.4.6 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Equipment blanks are used to evaluate the existence and magnitude of contamination problems from sampling activities. Method blank samples were analyzed with each analytical batch as required by Method 8082, and one equipment blank, collected in the field, was analyzed with the SDG. All target compounds were reported as non-detect in each method blank and the equipment blank. Review of chromatograms indicated that no peaks were present. No data qualifications were required based on blank samples.

1.4.7 Duplicate Samples

Field duplicates are collected to assess sample precision based on field collection techniques and laboratory duplicates are analyzed to assess the laboratory and analytical method precision. Field duplicates were not collected and laboratory duplicates were not analyzed with this SDG. No qualifications to the data were required.

1.4.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. All surrogate recoveries were within evaluation criteria with the exception of the following:

Field ID	Surrogate	Column	Recovery	Criteria
S0904(6-8)	decachlorobiphenyl	CLP	0	30-150
S0904(6-8)	decachlorobiphenyl	CLP2	0	30-150
S0904(6-8)EB	decachlorobiphenyl	CLP	28	30-150
S0904(6-8)EB	decachlorobiphenyl	CLP2	28	30-150
S0709(2-4)	tetrachloro-m-xylene	CLP	0	30-150
S0709(2-4)	tetrachloro-m-xylene	CLP2	0	30-150
S0709(2-4)	decachlorobiphenyl	CLP	0	30-150
S0709(2-4)	decachlorobiphenyl	CLP2	0	30-150
S0711(12-14)	decachlorobiphenyl	CLP	0	30-150
S0711(12-14)	decachlorobiphenyl	CLP2	0	30-150
S0704(14-16)	decachlorobiphenyl	CLP	230	30-150
S0704(14-16)	decachlorobiphenyl	CLP2	230	30-150

Non-detect data associated with a high surrogate recoveries required no qualifications. Although there were several surrogate recoveries with 0%, no data were rejected based on matrix interferences and sample dilutions noted in the case narrative, the chromatograms, and the extraction logs. All data that required qualifications based on surrogate recoveries are identified in the following table.

Field ID	Analyte	Qualification
S0904(6-8)	All PCBs	**J/UJ**
S0904(6-8)EB	All PCBs	**UJ**
S0709(2-4)	All PCBs	**J/UJ**

Field ID	Analyte	Qualification
S0711(12-14)	All PCBs	**J/UJ**
S0704(14-16)	PCB 1248	**J**

Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.4.9 MS/MSD Samples

Sample S0711(12-14) was analyzed as a MS/MSD sample to assess accuracy and precision for the analyses. The MS/MSD recoveries and relative percent difference (RPD) were above evaluation criteria for PCB 1016. Sample S0711(12-14) was previously qualified **J/UJ** due to surrogate recoveries; therefore, no additional qualifications to the data were required. Approximately 20% of the MS/MSD recoveries and RPDs were recalculated from the raw data and verified against the values presented on the QC summary form. No calculation or transcription errors were noted.

1.4.10 LCS

A laboratory control sample (LCS) was analyzed with the analytical batch as required by Method 8082. Review of the LCS summary forms indicated all LCS recoveries were within evaluation criteria. No qualifications to the data were required. Twenty percent of the LCS recoveries were recalculated, and no calculation or transcription errors were noted.

1.4.11 Target Compound Identification and Quantification

For the validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified properly and the spectra of the identified compounds were verified against the retention time of the associated standard curve or CV. The retention times of identified compounds and surrogates were within the calculated retention time windows on both columns. Approximately 10 percent of the sample results were recalculated and no calculations or transcription errors were noted.

1.4.12 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. MS/MSD, LCS and surrogate recoveries demonstrated that acceptable levels of

accuracy and precision were achieved, with the noted exceptions. In addition completeness defined to be the percentage of analytical results that are judged to be valid, including estimated values (**J**), was 100 percent for this SDG.

1.5 FULL VALIDATION OF METALS DATA – SDG KRM11

This section describes the full data validation for 18 soil and three water samples, which were analyzed for the target analyte list (TAL) metals. The samples were prepared using USEPA Methods 3050B/7471A (soil) and 3005A/7470A (water) and analyzed following USEPA Methods 6010B/7470A/7471A. Samples were analyzed by Severn Trent Laboratories, Inc. (STL) of Savannah, Georgia and submitted as part sample delivery group (SDG) KRM11. The samples included as part of this validation are listed below:

Sample Identification	Sample Identification	Sample Identification
S0601(8-10)	S0502(6-8)	S0601(8-10)EB
S0601(8-10)D	S0604(14-16)	S0507(10-12)EB
S0413(10-12)	S0604(14-16)D	S0504(13-15)
S0413(10-12)D	S0602(6-8)	S0506(13-15)
S0603(6-8)	S0402(13-15)	S0505(10-12)
S0508(13-15)	S0507(10-12)	S0706(13-15)
S0510(6-8)	S0501(11-13)	S0504(13-15)EB

The data validation followed USEPA National Functional Guidelines for Inorganic Data Review (USEPA 2002), where applicable to the respective USEPA methods. The evaluation criteria used during the validation were a combination of those criteria presented in the respective methods and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data Package Completeness
- Laboratory Case Narrative
- Sample Preservation and Holding Times
- Blank Contamination
- Initial Calibration
- Calibration Verification

- Laboratory Control Sample (LCS)
- Laboratory Duplicate Analysis
- Field Duplicate Analysis
- Matrix Spike/Matrix Spike Duplicate (MS/MSD Samples
- ICP Serial Dilution
- ICP Interference Check Samples (ICS)
- Sample Result Verification
- Overall Data Assessment

1.5.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package did not contain raw instrument data for mercury. The laboratory was contacted and the raw instrument data was submitted as an addendum. Subsequently SDG KRM11 was considered complete.

1.5.2 Laboratory Case Narrative

The laboratory case narrative indicated that there were matrix spike/matrix spike duplicate, and laboratory duplicate recoveries outside laboratory control limits. These issues are addressed in the appropriate sections below. Some samples were reported at a dilution due to matrix interference or high levels of target metals; however, no qualifications to the data were required.

1.5.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the sample chain-of-custody, the sample preparation logs, the analysis run logs, and the raw data forms for holding time compliance. The samples were received by the laboratory at 4 $\pm$ 2 °C, properly preserved, and analyzed within the evaluation criteria of 6 months (28 days for mercury). No qualification of the data was required based on holding time criteria or sample preservation.

1.5.4 Blank Contamination

The purpose of blank samples was to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Initial calibration, continuing calibration preparation blanks and equipment blanks were reported non-detect for metals with the exception of the following:

Blank ID	Analyte	Concentration	Units
S0601(8-10)EB	Iron	420	ug/L
S0601(8-10)EB	Sodium	530	ug/L

Analytical data associated with equipment blank S0601(8-10)EB were reported non-detect or at concentrations greater than five times (5X) the associated blank concentration and did not require qualification. Ten percent of the blank sample results were compared to the raw data; no transcription errors were noted.

1.5.5 Initial Calibration

Initial calibration (ICAL) criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for metals analysis. An ICAL curve consisting of a blank and two standards was used to establish the ICAL for metals as specified in Method 6010B. Review of the ICAL and initial calibration verification (ICV) data indicated that all analytes were within evaluation criteria. No qualification of data was required based on ICAL criteria or ICV recoveries. A minimum of 10 percent of the ICV recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

Additionally an ICAL curve, consisting of a blank and five standards, was used to establish the ICAL for mercury as specified in Methods 7470A/7471A. Review of the ICAL data indicated the correlation coefficient (r^2) value was greater than 0.995 for mercury. No qualification of the mercury or cyanide data was required based on the ICAL. The initial calibration curve and the ICV recovery was recalculated for mercury and no calculation or transcription errors were noted.

1.5.6 Calibration Verification

Calibration verification (CV) criteria were established to assess whether the instrument was capable of reproducing acceptable qualitative and quantitative data established by the ICAL. The laboratory analyzed CV samples at a frequency of 10 percent as specified by the methodologies. CV samples

associated with the validated samples had recoveries within the evaluation criteria. No qualifications to the data were required. A minimum of 10 percent of the CV sample recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.5.7 Laboratory Control Sample

Laboratory control samples (LCS) were analyzed to assess the accuracy of the analytical method and to demonstrate laboratory method performance. LCS recoveries were within evaluation criteria for all analytes. No qualification of data was required based on LCS recoveries. A minimum of 10 percent of LCS recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.5.8 Laboratory Duplicate Analysis

Laboratory duplicate samples were analyzed to assess method precision by the laboratory at the time of analysis. The laboratory duplicated and analyzed the matrix spike samples of S0601(8-10) and S0504(13-15) for all target compounds. The laboratory was instructed to duplicate the unspiked parent sample. The spike duplicate sample pair relative percent difference (RPD) was within evaluation criteria (20%) for all compounds with the exception of calcium (36%) in sample S0504(13-15). The calcium result for sample S0504(13-15) was not qualified because the spike sample was duplicated and this was not a true measure of the laboratories precision. A minimum of 10 percent of the duplicate sample pair RPDs were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.5.9 Field Duplicate Analysis

Field duplicate samples were analyzed to assess method precision. Samples that were duplicated in the field are listed in the following table:

Field ID	Field Duplicate ID
S0413(10-12)	S0413(10-12)D
S0604(14-16)	S0604(14-16)D
S0601(8-10)	S0601(8-10)D

The field duplicate sample pairs RPD were within evaluation criteria (50%) for all compounds with the exception of those listed in the following table:

Field ID	Field Duplicate ID	Analyte	Qualification
S0601(8-10)	S0601(8-10)D	Manganese	J
S0604(14-16)	S0604(14-16)D	Aluminum	J
S0604(14-16)	S0604(14-16)D	Manganese	J
S0604(14-16)	S0604(14-16)D	Potassium	J

A minimum of 10 percent of the duplicate sample pair RPDs were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.5.10 MS/MSD Samples

Matrix spike/matrix spike duplicate (MS/MSD) samples were analyzed to assess accuracy and precision and the effects of matrix interference during analysis. The laboratory spiked and analyzed samples S0601(8-10) and S0504(13-15) for this SDG. MS/MSD recoveries were all within the evaluation criteria (75-125%) with the exception of those listed in the following table:

MS/MSD ID	Analyte	MS/MSD Recovery	RPD	MS/MSD/RPD Criteria
S0601(8-10)	Antimony	45/45	0	75-125/20
S0601(8-10)	Copper	127/141	7	75-125/20
S0601(8-10)	Lead	130/156	15	75-125/20
S0601(8-10)	Zinc	133/187	19	75-125/20
S0504(13-15)	Antimony	66/59	12	75-125/20
S0504(13-15)	Chromium	7/6	1	75-125/20
S0504(13-15)	Copper	290/219	19	75-125/20
S0504(13-15)	Nickel	71/71	0	75-125/20

Qualifications of data based on MS/MSD recoveries are listed in the following table:

Field ID	Analyte	Qualification
S0601(8-10)	Antimony	UJ
S0601(8-10)	Copper	J
S0601(8-10)	Lead	J
S0601(8-10)	Zinc	J
S0504(13-15)	Antimony	UJ

Field ID	Analyte	Qualification
S0504(13-15)	Chromium	J
S0504(13-15)	Copper	J
S0504(13-15)	Nickel	J

A minimum of 10 percent of the MS/MSD recoveries were recalculated and compared to the raw data and no transcription and calculation errors were noted.

1.5.11 ICP Serial Dilutions

The serial dilution of samples S0601(8-10) and S0504(13-15) were analyzed to determine whether or not significant physical or chemical interferences exist due to sample matrix. The percent difference (%D) for each compound of the serial dilution sample was within evaluation criteria (10%) with the exception of arsenic for samples S0601(8-10) (11%) and S0504(13-15) (36%). Both samples had the arsenic result qualified estimated (**J**). A minimum of 10 percent of the serial dilution sample %Ds were recalculated and compared to the raw data and no transcription and calculation errors were noted.

1.5.12 ICP Interference Check Samples

Interference check samples (ICS) were analyzed to verify the laboratory's interelement and background correction factors for ICP analysis. The laboratory analyzed the ICS at the beginning and end of the analytical run (or a minimum or twice per eight hour analytical run) as required by the methodology. The ICS recoveries were within evaluation criteria. No qualification of data was required based on interelement interferences. One hundred percent of the ICS recoveries were recalculated and compared to the raw data and no transcription and calculation errors were noted.

1.5.13 Sample Result Verification

A minimum of 10 percent of the data summary forms were reviewed and compared to the raw data package and no transcription errors were noted.

1.5.14 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Completeness is defined to be the percentage of analytical results that are judged to be valid, including estimated (J) data, which was 100 percent for this SDG.

QUALITY ASSURANCE REPORT

Solutia Inc.
W.G. Krummrich Plant
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Phase II CMS Soil Samples

Prepared for

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August 2004

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Phase II Soil

Sample ID	SDG
CT-1-1-13-15	KRM44
CT-1-1-13-15	KRM44A
CT-1-1-13-15-DUP	KRM44
CT-1-1-13-15-DUP	KRM44A
CT-1-2-0-2	KRM44
CT-1-2-0-2	KRM44A
CT-26-1-13-15	KRM33
CT-26-1-13-15	KRM33A
CT-2a-1-13-15	KRM33
CT-2a-1-13-15	KRM33A
LF-1-1-18-20	KRM33
LF-1-1-18-20	KRM33A
LF-2-1-18-20	KRM33
LF-2-1-18-20	KRM33A
LF-3-1-18-20	KRM33
LF-3-1-18-20	KRM33A
LF-4-1-18-20	KRM33
LF-4-1-18-20	KRM33A
LF-4-2-18-20	KRM33
LF-4-2-18-20	KRM33A
S-04-17-10-12	KRM28
S-04-17-1-2	KRM28
S-04-17-14-16	KRM28
S-04-18-1-2	KRM28
S-04-18-14-16	KRM28
S-04-18-9-11	KRM28
S-04-19-0-2	KRM28
S-04-19-10-12	KRM28
S-04-19-14-16	KRM28
S-04-20-0-2	KRM28
S-04-20-0-2-DUP	KRM28
S-04-20-14-16	KRM28
S-04-20-6-8	KRM28
S-04-21-1-2	KRM28
S-04-21-1-2-DUP	KRM28
S-04-21-14-16	KRM28
S-04-21-6-8	KRM28
S-04-22-0-2	KRM31
S-04-22-10-12	KRM31
S-04-22-14-16	KRM31
S-04-23-0-2	KRM28
S-04-23-10-12	KRM28
S-04-24-0-2	KRM31
S-04-24-14-16	KRM31

Phase II Soil

Sample ID	SDG
S-04-24-6-8	KRM31
S-04-25-0-2	KRM31
S-04-25-14-16	KRM31
S-04-25-6-8	KRM31
S-04-25-6-8-DUP	KRM31
S-04-26-10-12	KRM32
S-04-26-1-3	KRM32
S-04-26-14-16	KRM32
S-04-26-14-16-DUP	KRM32
S-04-27-0-2	KRM32
S-04-27-14-16	KRM32
S-04-27-14-16-DUP	KRM32
S-04-27-4-6	KRM32
S-04-28-1-3	KRM38
S-04-28-14-16	KRM38
S-04-28-6-8	KRM38
S-04-29-1-3	KRM34
S-04-29-14-16	KRM34
S-04-29-6-8	KRM34
S-05-12-10-12	KRM39
S-05-12-1-3	KRM39
S-05-12-1-3-DUP	KRM39
S-05-12-14-16	KRM39
S-05-13-1-3	KRM31
S-05-13-14-16	KRM31
S-05-13-8-10	KRM31
S-05-14-0-4	KRM31
S-05-14-14-16	KRM31
S-05-14-4-8	KRM31
S-05-15-10-12	KRM32
S-05-15-1-3	KRM32
S-05-15-14-16	KRM32
S-05-16-1-3	KRM32
S-05-16-14-16	KRM32
S-05-16-7-8	KRM32
S-05-SMP277-01-1-3	KRM45
S-05-SMP277-01-14-16	KRM45
S-05-SMP277-01-9-11	KRM45
S-06-06-1-3	KRM38
S-06-06-14-16	KRM38
S-06-06-14-16-DUP	KRM38
S-06-06-6-8	KRM38
S-06-07-1-3	KRM38
S-06-07-1-3	KRM41

Phase II Soil

Sample ID	SDG
S-06-07-14-16	KRM38
S-06-07-9-11	KRM38
S-06-08-1-3	KRM38
S-06-08-1-3	KRM41
S-06-08-14-16	KRM38
S-06-08-8-10	KRM38
S-06-08-8-10-DUP	KRM38
S-06-09-1-3	KRM38
S-06-09-1-3	KRM41
S-06-09-14-16	KRM38
S-06-09-14-16	KRM41
S-06-09-6-8	KRM38
S-06-10-10-12	KRM38
S-06-10-1-3	KRM38
S-06-10-1-3	KRM41
S-06-10-14-16	KRM38
S-07-14-10-12	KRM34
S-07-14-1-3	KRM34
S-07-14-1-3	KRM43
S-07-14-1-3-DUP	KRM34
S-07-14-1-3-DUP	KRM43
S-07-14-14-16	KRM34
S-07-15-1-3	KRM37
S-07-15-1-3	KRM41
S-07-15-14-16	KRM37
S-07-15-6-8	KRM37
S-07-15-6-8	KRM41
S-07-16-1-3	KRM34
S-07-16-1-3	KRM43
S-07-16-14-16	KRM34
S-07-16-6-8	KRM34
S-07-17-1-3	KRM34
S-07-17-14-16	KRM34
S-07-17-14-16-DUP	KRM34
S-07-17-6-8	KRM34
S-07-18-10-12	KRM37
S-07-18-10-12	KRM41
S-07-18-1-3	KRM37
S-07-18-14-16	KRM37
S-07-18-14-16	KRM41
S-07-19-10-12	KRM37
S-07-19-10-12	KRM41
S-07-19-10-12-DUP	KRM37
S-07-19-10-12-DUP	KRM41

Phase II Soil

Sample ID	SDG
S-07-19-1-3	KRM37
S-07-19-14-16	KRM37
S-07-20-1-3	KRM34
S-07-20-1-3	KRM43
S-07-20-14-16	KRM34
S-07-20-6-8	KRM34
S-08-04-1-2	KRM35
S-08-06-3-4	KRM35
S-08-06-3-4-DUP	KRM35
S-08-08-3-4	KRM35
S-08-10-1-2	KRM35
S-08-10-1-2-DUP	KRM35
S-08-13-1-2	KRM35
S-08-19-5-6	KRM42
S-08-19-5-6-DUP	KRM42
S-08-19-9-10	KRM42
S-08-22-9-10	KRM42
S-08-23-5-6	KRM42
S-08-25-1-2	KRM42
S-08-25-1-2-DUP	KRM42
S-08-25-5-6	KRM42
S-08-25-9-10	KRM42
S-08-26-9-10	KRM42
S-08-26-9-10-DUP	KRM42
S-08-27-1-2	KRM42
S-08-27-5-6	KRM42
S-08-30-5-6	KRM42
S-08-31-13-14	KRM43
S-08-34-13-14	KRM46
S-08-35-13-14	KRM46
S-08-36-9-10	KRM46
S-09-09-2-3	KRM29
S-09-09B-4-5	KRM29
S-09-10-0-2	KRM29
S-09-10-0-2-DUP	KRM29
S-09-11-0-2	KRM29
S-09-11-9-10	KRM29
S-09-12-2-3	KRM29
S-09-12-5-6	KRM29
S-09-13-1-2	KRM29
S-09-13-6-7	KRM29
S-09-13-6-7-DUP	KRM29
S-09-14-2-3	KRM29
S-09-14-6-8	KRM29

Phase II Soil

Sample ID	SDG
S-09-15-2-3	KRM29
S-09-15-9-10	KRM29
S-09-16-2-3	KRM29
S-09-16-9-10	KRM29
S-09-17-2-3	KRM29
S-09-17-7-8	KRM29
S-09-17-7-8-DUP	KRM29
S-09-18-0-2	KRM30
S-09-18-6-7	KRM30
S-09-18-9-10	KRM36
S-09-19-0-2	KRM30
S-09-19-6-7	KRM30
S-09-19-9-10	KRM36
S-09-20-2-3	KRM30
S-09-20-2-3-DUP	KRM30
S-09-20-6-7	KRM30
S-09-21-13-14	KRM40
S-09-22-13-14	KRM40
S-09-22-7-8	KRM40
S-09-23-13-14	KRM40
S-09-23-7-8	KRM40
S-09-24-13-14	KRM40
S-09-24-7-8	KRM40
S-12-05-12-16	KRM32
S-12-05-1-3	KRM32
S-12-05-6-8	KRM32
S-12-06-1-3	KRM45
S-12-06-1-3	KRM45A
S-12-06-14-16	KRM45
S-12-06-14-16	KRM45A
S-12-06-6-8	KRM45
S-12-06-6-8	KRM45A
S-12-07-1-3	KRM39
S-12-07-1-3	KRM39A
S-12-07-1-3	KRM42
S-12-07-14-16	KRM39
S-12-07-14-16	KRM39A
S-12-07-14-16	KRM42
S-12-07-8-10	KRM39
S-12-07-8-10	KRM39A
S-12-07-8-10	KRM42
S-12-08-10-12	KRM39
S-12-08-10-12	KRM39A
S-12-08-1-3	KRM39

Phase II Soil

Sample ID	SDG
S-12-08-1-3	KRM39A
S-12-08-14-16	KRM39
S-12-08-14-16	KRM39A
S-12-10-1-3	KRM39
S-12-10-1-3	KRM39A
S-12-10-14-16	KRM39
S-12-10-14-16	KRM39A
S-12-10-14-16-DUP	KRM39
S-12-10-14-16-DUP	KRM39A
S-12-10-6-8	KRM39
S-12-10-6-8	KRM39A
S-12-11-1-3	KRM39
S-12-11-1-3	KRM39A
S-12-11-14-16	KRM39
S-12-11-14-16	KRM39A
S-12-11-14-16	KRM42
S-12-11-8-10	KRM39
S-12-11-8-10	KRM39A
S-12-12-0-2	KRM37
S-12-12-14-16	KRM37
S-12-12-6-8	KRM37
S-12-9-1-3	KRM45
S-12-9-1-3	KRM45A
S-12-9-1-3	KRM46
S-12-9-14-16	KRM45
S-12-9-14-16	KRM45A
S-12-9-8-10	KRM45
S-12-9-8-10	KRM45A

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This Quality Assurance Report presents the findings of a review of analytical data for soil samples collected as part of the CMS Phase II Investigation for the Solutia W.G. Krummrich facility. Samples were collected from October to November 2003. URS Corporation (URS) conducted the sampling effort on behalf of Solutia. Analytical testing was provided by Severn Trent Laboratories located in Savannah, Georgia (STL). Samples sent to Severn Trent were analyzed using the USEPA SW-846 methodologies referenced in the Quality Assurance Project Plan (QAPP). Samples were primarily tested for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals and mercury. In addition, selected samples were also tested for polychlorinated biphenyls (PCBs), pesticides, herbicides, dioxins and furans.

One hundred percent of the data were subjected to a Level III data quality review; twenty four percent of these data were subjected to a Level IV full validation. The review and validation were performed in order to confirm that the analytical data provided by STL were acceptable in quality for characterizing the site.

A total of 235 samples (177 investigative samples, 22 field duplicates, 22 trip blanks, and 14 matrix spike and 14 matrix spike duplicates) were analyzed by STL. These samples were submitted in 23 Sample Delivery Groups (SDGs), SDG 28 through SDG 46. SDGs 28, 36, 39A, 39, and 44A were subjected to a full data validation which includes a data quality review. In addition, portions of SDGs 33 and 44 were also subjected to an independent data validation. All the other SDGs were subjected to a data quality review. The samples were analyzed according to the following USEPA SW-846 Methods: Method 8260B for VOCs, Method 8270C for SVOCs, Method 6010B for Metals, Method 7471A for Mercury, Method 8082 for PCBs, Method 8081A for Pesticides, Method 8151 for Herbicides, and Method 8280 for Dioxins and Furans.

The procedures for review of the data followed guidance from the following documents:

1. Quality Assurance Project Plan, March 2003. Prepared by URS Corporation.
2. U.S EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999.
3. U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, July 2002.

The above "Guidelines" provided the criteria to review the data. Additional quantitative criteria are provided in the analytical methods. Qualifiers assigned by the data reviewer have been transcribed onto the laboratory reporting forms (Form-1s). The qualifiers are accompanied by codes which indicate the reason for assignment of the qualifier(s). The various codes are explained in **Table 1** of this Report.

TABLE 1

Lab Qualifier	Definition
NC	No criteria at this time
NA	Not applicable
J	Estimated Value (Organics only)
D	Diluted
U	Non-Detect
B	Analyte found in the blank (Organics only)
B	Value greater than IDL but less than CRDL (Metals only)
E	Exceeds calibration (Organics only)
E	Serial dilution result for samples with concentrations greater than 50 times the IDL are not within 10% of the original sample result (Metals only).
N	Matrix Spike or matrix spike duplicate is outside expected recovery limits. (Metals Only)

URS Qualifier	Definition
U	The analyte was analyzed for but was not detected.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
D	If the sample or extract is reanalyzed at a higher dilution factor, all concentrations are reported with a D.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy, precision, and representativeness (based on MS/MSD, LCS/LCSD, and field duplicate results) were achieved for this data set, except where noted. In addition, analytical completeness, defined to be the percentage of analytical results which are judged to be valid, including estimated (J) or estimated non-detect (UJ) values was 97 percent, which exceeds the completeness goal of greater than 95 percent.

The data review included evaluation of the following criteria:

Organics

- Sample holding times
- Laboratory method blank and trip blank samples
- Surrogate spike recoveries
- Laboratory control sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample recoveries and Relative Percent Difference (RPD) values
- Field duplicate results
- Results reported from dilutions
- Internal standard responses.

Inorganics

- Sample holding times
- Equipment blank and laboratory method blank samples
- LCS recoveries
- MS/MSD sample recoveries and RPD values
- Field duplicate results
- Results reported from dilutions
- ICP serial dilutions.

The following sections present the results of the data review.

1.1 SAMPLE HOLDING TIMES

Sample holding time requirements for the analyses performed are presented in the QAPP and/or in the "Guidelines." Review of the sample collection and analysis dates involved comparing the chain-of-custody and the summary forms for accuracy, consistency, and holding time compliance.

Extractions and/or analyses for VOCs, SVOCs, metals, mercury, PCBs, pesticides, herbicides, dioxins and furans were completed within the recommended holding time requirements with the exception of the samples mentioned on the table below.

SDG #	Sample	Analysis	Time Out of Hold	Qualification
KRM033	LF-3-1-18-20 LF-4-2-18-20 LF-2-1-18-20	8260	3 days 1 day 2 days	"J" for detections and "UJ" for non-detects.
KRM035	S-4-29-14-16 (second RE)	8270	> 28 days	"R" for all analytes
KRM037	S-07-15-1-3 S-07-15-6-8DL S-07-19-14-16 S-07-19-14-16RE	8260 8270	1 day 1 day 1 day > 28 days	"J" for detections and "UJ" for non-detects. "J" for detections and "R" for non-detects.
KRM038	S-06-10-1-3RE	8260	2 days	"J" for detections and "UJ" for non-detects.
KRM043	S-07-20-1-3 S-07-14-1-3 & DL S-07-14-10-12 S-07-16-1-3 S-07-14-1-3-D S-12-11-8-10 S-08-31-13-14 & DL & RE S-07-14-1-3RE S-07-14-10-12RE S-07-16-1-3RE S-07-14-1-3DRE S-12-11-8-10RE S-07-14-1-3DLRE	8082	>14 days >28 days	"J" for detections and "UJ" for non-detects. "J" for detections and "R" for non-detects.
KRM045	S-12-9-8-10DL S-12-9-1-3RE	8260 8270	1 day 29 days	"J" for detections and "UJ" for non-detects. "R" for all analytes

1.2 EQUIPMENT BLANK AND LABORATORY METHOD BLANK SAMPLES

Equipment blank samples are used to evaluate sampling equipment decontamination procedures. The QAPP requires equipment blank samples to be collected at a frequency of one per 10 investigative samples for reusable sampling equipment. Seventeen equipment blank samples were collected for 177 investigative samples which complied with the frequency requirements outlined in the QAPP of 10%. The equipment blanks had no detections with the exception of the samples mentioned below. Qualification of only one sample was required.

SDG #	Sample ID	Compound and Concentration	Qualifier
KRM038	S-06-07-1-3-EB	Barium (92 µg/l)	Barium (53 mg/kg) was qualified "U" in related sample S-06-07-1-3
KRM034	S-4-29-EB	Aluminum (380 µg/l) Iron (550 µg/l) Zinc (42 µg/l)	No qualifiers needed since the concentrations of these analytes in the associated sample, S-4-29-1-3, were greater than 10 times the equipment blank concentrations.
KRM037	S-07-18-1-3-EB	Iron (90 µg/l)	No qualifier needed since the iron concentration in the associated sample, S-07-18-1-3, was greater than 10 times the equipment blank concentration.
KRM038	S-06-07-1-3-EB S-06-09-1-3-EB	Iron (55 µg/l) Barium (100 µg/l) Iron (77 µg/l) Sodium (580 µg/l)	No qualifiers needed since the concentrations of these analytes in the associated samples, S-06-07-1-3 and S-06-09-1-3, were greater than 10 times the equipment blank concentrations.
KRM045	S-12-9-1-3-EB	Iron (240 µg/l)	No qualifier needed since the iron concentration in the associated sample, S-12-9-1-3, was greater than 10 times the equipment blank concentration

Laboratory method blank samples were used to evaluate the presence and magnitude of contamination problems resulting from laboratory activities. Laboratory method blank samples were analyzed at the method prescribed frequencies. The laboratory method blank samples had no detections with the exception of the samples mentioned on the table below.

SDG #	Sample ID	Compound and Concentration	Qualifier
KRM037	Preparation blank	Iron (5.11 mg/kg)	No qualifier needed since all sample results were greater than 10 times the preparation blank result.
KRM038	KRM38-29	Chloromethane (270 ug/kg)	Chloromethane result in sample S-06-10-1-3 (190 ug/kg) was elevated to "U"

1.3 TRIP BLANKS

Trip blanks samples are used to assess the potential for VOC cross contamination of soil samples during shipment to the laboratory. One trip blank was submitted with each shipment containing samples for VOC analyses for a total of 22 trip blank samples. Trip blank samples were VOC-free, indicating the potential for cross contamination of samples during shipping and storage was minimal.

1.4 SURROGATE SPIKE RECOVERIES

Surrogate compounds are used to evaluate overall laboratory performance for sample preparation efficiency on a per sample basis. Samples analyzed for VOCs and SVOCs were spiked with surrogate compounds prior to sample preparation. The "Guidelines" require that all VOC surrogate spike recoveries meet acceptance criteria, and allow one SVOC surrogate recovery per fraction (base/neutral or acid fraction) to be outside acceptance criteria, provided that recoveries are greater than or equal to 10 percent.

Surrogate recoveries were within range with the exception of the samples presented below.

SDG #	Sample ID	Analysis	Surrogate	Recov.	Range	Qualification
KRM031	S-04-22-14-16	VOCs	BFB	133%	68-121	"J" for detections.
	S-05-13-14-16		DFM & BFB	141% & 124%	66-127	
	S-04-22-10-12		BFB	132%	68-121	
	S-05-13-1-3DL		DFM	132%	66-127	
	S-05-14-0-4		All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
	S-05-14-4-8		All surrogates	0%	NA	
	S-05-14-14-16	SVOCs	All surrogates	0%	NA	
	S-04-22-10-12		All surrogates	0%	NA	
	S-05-13-1-3		All surrogates	0%	NA	
	S-05-13-8-10		All surrogates	0%	NA	
	S-05-13-14-16		All surrogates	0%	NA	
KRM032	S-04-26-1-3	VOCs	BFB	59%	68-121	"J" for detections and "UJ" for non-detects.
	S-04-26-1-3RE		BFB	47%	68-121	
	S-04-26-10-12		BFB	141%	68-121	"J" for detections.
	S-05-16-7-8		All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
	S-05-16-7-8DL		All surrogates	0%	NA	
	S-05-16-1-3	SVOCs	All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
	S-05-16-7-8		All surrogates	0%	NA	
	S-05-16-14-16		All surrogates	0%	NA	
KRM033	LF-4-1-18-20	SVOCs	All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
	LF-4-2-18-20	Herbicides	2,4-DCAA	180%	34-127	No action. No analytes detected.
KRM034	S-07-16-1-3	VOCs	BFB	59%	68-121	"J" for detections and "UJ" for non-detects.
	S-4-29-14-16	SVOCs	NBZ & FBP	29% & 34%	31-99 37-106	All compounds qualified as "UJ".
	S-4-29-14-16RE		FBP & TPH	34% & 34%	37-106 38-120	
	S-07-14-14-16		All but TPH	0%	NA	No action. No surrogate recoveries due to dilutions.
	S-4-29-14-16 (second RE)		NBZ	29%	31-99	No action. Only one base surrogate out.

SDG #	Sample ID	Analysis	Surrogate	Recov.	Range	Qualification
KRM035	S-08-04-1-2 & the secondary DL S-08-06-3-4 S-08-06-3-4-D S-08-08-3-4 S-08-10-1-2 S-08-10-1-2-D & the secondary DL	PCBs	All surrogates	0 %	NA	No action. No surrogate recoveries due to dilutions.
	S-08-13-1-2 S-08-13-1-2-EB		TCX 1	208%	30-150	QA/QC sample, no qualifications
KRM037	S-07-18-10-12 S-07-19-10-12 S-07-19-10-12-D	VOCs	All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
	S-07-19-14-16	SVOCs	FBP	36%	37-106	No action. Only one base surrogate out.
	S-07-15-6-8 S-07-19-1-3 S-07-19-10-12 & DL S-07-19-10-12-D & DL S-12-12-6-8DL S-12-12-0-2DL S-07-18-10-12	SVOCs	All or some surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
KRM038	S-04-28-6-8 S-04-28-14-16 S-06-07-1-3DL S-06-07-9-11DL S-06-07-14-16DL S-04-28-14-16DL S-06-10-14-16DL	VOCs	All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
	S-04-28-1-3		DFM	183%	66-127	"J" for detections
	S-06-10-14-16		TOL & BFB	131% & 223%	65-128 & 68-121	"J" for detections
	S-06-06-14-16-DDL	SVOCs	NBZ, FBP & TPH	0%	NA	
	S-06-08-8-10DL		All surrogates except FBP	0%	NA	No action. No surrogate recoveries due to dilutions.
	S-06-08-1-3DL		All surrogates except TBP	0%	NA	
KRM041	S-07-15-1-3	PCBs	DCB	X	30-150	"J" for detections
	S-07-15-6-8 S-07-18-10-12 S-07-18-14-16 S-06-07-1-3 S-06-09-1-3 S-06-08-1-3 S-06-10-1-3 S-07-19-10-12 S-07-19-10-12-D		All surrogates	0 %	NA	No action. No surrogate recoveries due to dilutions.

SDG #	Sample ID	Analysis	Surrogate	Recov.	Range	Qualification
KRM042	S-08-19-5-6-D	PCBs	DCB1&DCB2	323% & 291%	30-150	"J" for detections
	S-08-19-5-6		DCB1&DCB2	X	30-150	"J" for detections
	S-08-27-5-6		DCB1&DCB2	317% & 435%	30-150	"J" for detections
	S-12-11-14-16 S-08-19-9-10 S-08-23-5-6 S-08-25-1-2 S-08-25-5-6 S-08-25-9-10 S-08-26-9-10 S-08-26-9-10-D S-08-27-1-2 S-08-30-5-6 S-12-07-1-3 S-12-07-8-10 S-12-07-14-16 S-08-25-1-2-D S-08-22-9-10		All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
KRM043	S-07-14-1-3	PCBs	TCXs & DCB1,2	0% & X	30-150	"J" for detections and "R" for non-detects.
	S-07-16-1-3		TCXs & DCB1,2	0% & X	30-150	
	S-07-20-1-3		TCXs & DCB1,2	0%, 21%,19%	30-150	
	S-07-14-10-12		TCXs & DCB1,2	0%, 10%, 10%	30-150	
	S-12-11-8-10		TCXs & DCB2	0% & 20%	30-150	
	S-07-14-1-3-D		TCXs & DCB1	0% & 179%	30-150	
	S-08-31-13-14 & DL & RE		All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
	S-07-14-1-3DL		TCX & DCB1,2	0% & X	NA	
	S-07-14-1-3DLRE		DCB1,2	X	NA	
	S-07-14-1-3RE		DCB1,2	X	30-150	No action. Samples already qualified due to hold times.
	S-07-14-1-3-DRE		DCB1,2	X	30-150	
	S-12-11-8-10RE		DCB1,2	X	30-150	
KRM045	S-12-9-14-16	VOCs	BFB	128%	68-121	"J" for detections.
	S-12-9-1-3	SVOCs	NBZ & FBP	28% & 33%	31-99 37-106	All base/neutral analytes "UJ"
	S-05-SMP277-01-9-11 S-05-SMP277-01-14-16		All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.
KRM046	S-08-34-13-14 S-08-36-9-10 S-08-35-13-14	PCBs	All surrogates	0%	NA	No action. No surrogate recoveries due to dilutions.

X: Recovery outside control limits.
Samples ending with D – means a duplicate sample
Samples ending in RE – means a reanalyzed sample
Samples ending in DL – means a diluted sample.

1.5 LABORATORY CONTROL SAMPLES RECOVERIES

Laboratory control samples (LCS) serve to monitor the overall performance of the steps in an analysis, including sample preparation. Laboratory control samples were prepared with each batch of samples. LCS recoveries were within analytical accuracy limits with the exception of the LCS' mentioned below. Qualifications were made to related samples as appropriate.

SDG #	Sample ID	Analysis	LCS compound	Recov.	Range	Qualification
KRM031	Batch KRM31-20	VOCs	1,2-dichloropropane	120%	72-118	None, neither compound was detected in related samples.
	Batch KRM31-23		Chloromethane	184%	42-143	
			Vinyl chloride	164%	38-151	
			1,1-dichloroethane	248%	34-166	
	Batch KRM31-14	SVOCs	Benzoic acid	0%	10-160	
			Benzidine	0%	10-63	
	Batch KRM31-1		Benzidine	100%	10-95	
KRM032	Batch KRM32-1		Chloromethane	184%	42-143	None, neither compound was detected in related samples.
			Vinyl chloride	164%	38-151	
			1,1-dichloroethane	248%	34-166	
	Batch KRM32-26		1,1-dichloroethane	220%	34-166	Related samples already qualified.
	Batch KRM32-29	VOCs	Chloromethane	192%	42-143	None, neither compound was detected in related samples.
			Vinyl chloride	164%	37-151	
			1,2-dichloropropane	120%	72-118	
	Batch KRM32-32		Chloromethane	216%	42-143	None, neither compound was detected in related samples.
			Vinyl chloride	188%	38-151	
			1,1-dichloroethane	280%	34-166	
	Batch KRM32-14	SVOCs	Aniline	6%	10-92	None, these compounds were not analyzed for in our samples.
			Benzidine	0%	10-63	
	Batch KRM32-26		Benzidine	100%	10-95	
KRM033	Batch KRM33-23		1,1-dichloroethene	38%	46-142	Compound qualified "UJ" in sample LF-1-1-18-20.
	Batch KRM33-26	VOCs	4-methyl-2-pentanone	39%	47-160	Compounds qualified "UJ" in samples LF-4-2-18-20 & CT-2a-1-13-15.
			2-hexanone	44%	46-163	
	Batch KRM33-38		4-methyl-2-pentanone	44%	47-160	Compound qualified "UJ" in sample CT-26-1-13-15.
	Batch KRM33-1	SVOCs	Benzidine	100%	10-95	None, compound was not analyzed for in our samples.
	Batch KRM33-26		Benzidine	124%	10-95	
	Batch KRM33-29		Benzidine	127%	10-95	
KRM034	Batch KRM34-1	SVOCs	Benzidine	115%	10-95	None, these compounds were not analyzed for in our samples.
	Batch KRM34-23		Benzidine	115%	10-95	
	Batch KRM34-18		Aniline	6%	10-92	
			Benzidine	0%	10-63	
KRM037	Batch KRM37-23	VOCs	4-methyl-2-pentanone	44%	47-160	Compounds qualified "UJ" in all related samples.
	Batch KRM37-29		4-methyl-2-pentanone	39%	47-160	
			2-hexanone	44%	46-163	
	Batch KRM37-18	SVOCs	Benzidine	0%	10-63	None, this compound was not analyzed for in our samples.
KRM038	Batch KRM38-23		4-methyl-2-pentanone	39%	47-160	Compounds qualified "UJ" in all related samples.
			2-hexanone	44%	46-163	
	Batch KRM38-29		Bromomethane	19%	22-184	Compounds qualified "UJ" in all related samples.
		VOCs	4-methyl-2-pentanone	40%	47-160	

SDG #	Sample ID	Analysis	LCS compound	Recov.	Range	Qualification
	Batch KRM38-32		1,1-dichloroethene	38%	46-142	Compound qualified "UJ" in sample S-06-06-14-16.
	Batch KRM38-1		Chloromethane Chloroform	146% 126%	42-143 70-124	None, compounds were not detected in related sample.
	Batch KRM38-1 Batch KRM38-18	SVOCs	Benzidine Benzidine	109% 0%	10-95 10-63	None, this compound was not analyzed for in our samples.
KRM044	Batch KRM44-1	VOCs	Chloroethane	200%	46-152	None, chloroethane was not detected in related samples.
KRM045	Batch KRM45-11	VOCs	4-methyl-2-pentanone	44%	47-160	Compound qualified "UJ" in samples S-05-SMP277-01-14-16 & S-05-SMP277-01-9-11.
	Batch KRM45-6	SVOCs	Aniline Benzidine	7% 0%	10-92 10-63	None, related samples are QA/QC samples.

1.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples are analyzed to assess potential matrix effects upon the data. MS/MSD samples were required to be collected at a frequency of one per 20 investigative samples in accordance with the QAPP. URS submitted 14 MS/MSD sample sets for 177 investigative samples meeting the QAPP frequency requirement.

The MS/MSD recoveries and Relative Percent Differences (RPDs) not within the evaluation criteria are mentioned below and are bolded. No qualifications were made to the data if the MS/MSD % recoveries were zero due to dilutions or if the %RPD was the only factor out of criteria. USEPA National Functional Guidelines for Organic Data Review (October 1999) state that organic data should not be qualified based on MS/MSD criteria alone. However, using informed professional judgment the data reviewer may determine the need for qualification of the data.

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qualifier
KRM029	S-09-16-2-3	Metals	Mercury	91 / **74**	80-120	NA	NA	"UJ" in parent sample
	S-09-09-2-3		Mercury	**1368/1672**	80-120	NA	NA	None, since the sample result was > 4xs the spike added.
KRM030	S-09-18-0-2	Metals	Mercury	**574/17**	80-120	NA	NA	None, since the sample result was > 4xs the spike added.

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qualifier
KRM031	S-05-13-1-3	VOCs	o-Xylene	**0/0**	74-122	0	50	"UJ" and "J" qualifiers were assigned to the low and 0% recoveries. No action is necessary for the high recoveries since all these compounds were non-detect in the parent sample.
			Chloroethane	**197/186**	46-152	8.8	50	
			Acetone	**0**/101	30-195	60	100	
			Carbon disulfide	**39**/88	43-143	**76**	50	
			1,1-dichloroethane	**225**/91	34-166	**87**	50	
			2-butanone	**0/0**	30-185	0	50	
			Benzene	74/**40**	65-130	21	50	
			1,2-dichloropropane	**119/123**	72-118	0	50	
			4-methyl-2-pentanone	**0/0**	47-160	0	50	
			2-hexanone	**194/174**	46-163	15	50	
			Chlorobenzene	**0/0**	69-128	0	50	
			Xylene (total)	**54/39**	74-122	15	50	
			1,1,2,2 tetrachloroethane	**144**/131	59-138	12	50	
			Hexachlorocyclopentadiene	**0/0**	19-107	0	50	"UJ" qualifiers for both compounds in the parent sample.
			2,4-Dinitrophenol	**0/0**	19-126	0	50	
		SVOCs	Benzoic acid	**0/0**	10-94	0	100	None, compounds were not analyzed for.
			Benzidine	**0/0**	10-95	0	100	
	S-05-13-1-3		4,6-dinitro-2-methylphe	**23**/24	24-128	1.1	50	None, since all other criteria were in for these compounds.
			1,4-dichlorobenzene	**188/172**	25-93	7	50	
			1,2-dichlorobenzene	**1050/1000**	31-86	3.9	50	
			1,2,4-trichlorobenzene	**105**/98	26-102	7.4	50	
			4-chloroaniline	**100**/88	18-94	13	50	
			1,2-diphenylhydrazine	**135**/120	22-129	12	50	
KRM032	S-05-16-1-3	VOCs	Benzene	**0/0**	65-130	0	50	"J" in parent sample
			o-Xylene	**72**/76	74-122	3.5	50	None, since all other criteria were in for these compounds.
			Chloroethane	**44**/49	46-152	3.7	100	
			1,1-dichloroethane	**189**/82	34-166	**83**	50	
			1,1,1-trichloroethane	**67**/70	70-123	0	50	
			Dibromochloromethane	**61/65**	70-124	0	50	
			Styrene	**72**/76	73-121	0	50	
			Bromoform	**54/56**	58-134	3.1	50	
			Bromodichloromethane	72/**70**	71-120	8	50	
	S-05-16-1-3	SVOCs	2-chlorophenol	**16**/42	22-109	**86**	50	None, since all other criteria were in for these compounds.
			2-methylphenol	**29**/48	34-108	45	50	
			bis(2-chloroisopropyl)e	**11**/45	30-94	**120**	50	
			3,4 methylphenol	**34**/50	35-102	35	50	
			Hexachloroethane	**7**/35	29-84	**133**	50	
			Nitrobezene	**13**/42	24-110	**106**	50	
			Isophorone	**29**/50	34-103	50	50	
			2-nitrophenol	**18**/45	33-102	**83**	50	
			2,4-dimethylphenol	**39**/55	45-99	32	50	
		SVOCs	Bis(2-chloroethoxy)meth	**27**/50	34-102	**58**	50	None, since all other criteria were in for these compounds.
			2,4-dichlorophenol	**36**/50	37-103	28	50	
			1,2,4-trichlorobenzene	**22**/45	26-102	68	50	
			Naphthalene	**23**/50	36-94	**70**	50	
			Hexachlorobutadiene	**23**/55	35-98	**80**	50	
			2-methylnaphthalene	**36**/52	37-108	33	50	
			4,6-dinitro-2-methylphe	**10/16**	24-128	**51**	50	
			Benzo(a)pyrene	**14**/70	30-128	**133**	50	
			4-nitrophenol	51/90	13-133	**53**	50	
			Phenol	24/45	20-108	**59**	50	

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qualifier
			N-nitroso-di-n-prop.	22/50	17-110	**74**	50	
	S-05-16-1-3		Bis(2-chloroethyl)ether	**0**/42	27-96	**200**	50	"UJ" qualifiers assigned to these compounds in the parent sample.
			1,3-dichlorobenzene	**0**/35	33-81	**200**	50	
			1,4-dichlorobenzene	**0**/38	25-93	**200**	50	
			1,2-dichlorobenzene	**0**/40	31-86	**200**	50	
			Hexachlorocyclopentadiene	**0/0**	19-107	0	50	
			2,4-dinitrophenol	**0/0**	19-126	0	50	
			Benzidine	**0/0**	10-95	0	100	None, compounds were not analyzed for.
			Benzoic Acid	**0/0**	10-94	0	50	
	S-04-26-1-3	SVOCs	Hexachlorocyclopentadiene	**14/18**	19-107	23	50	None, since all other criteria were in for these compounds.
			Phenanthrene	**263**/84	34-123	**89**	50	
			Fluoranthene	**382**/118	18-137	**83**	50	
			Pyrene	**442/137**	36-132	**88**	50	
			Benzo(a)anthracene	**287**/103	28-134	**82**	50	
			Chrysene	**258**/95	35-130	**78**	50	
			Benzo(b)fluoranthene	**368/134**	29-128	**84**	50	
			Benzo(k)fluoranthene	**165**/68	25-127	**70**	50	
			Benzo(a)pyrene	**287**/95	30-128	**87**	50	
			Indeno(1,2,3-cd)pyrene	**165**/68	24-136	**73**	50	
			Benzo(g,h,i)perylene	**167**/64	33-122	**76**	50	
			Bis(2-chloroethyl)ether	50/**19**	27-96	**90**	50	
			1,3-dichlorobenzene	45/**10**	33-81	**125**	50	
			1,4-dichlorobenzene	45/**11**	25-93	**121**	50	
			1,2-dichlorobenzene	47/**13**	31-86	**112**	50	
			bis(2-chloroisopropyl)e	50/**23**	30-94	**74**	50	
			Hexachloroethane	45/**11**	29-84	**119**	50	
			Isophorone	**55**/32	34-103	**54**	50	
			2-nitrophenol	53/**26**	33-102	**67**	50	
			2,4-dimethylphenol	60/**37**	45-99	**49**	50	
			Bis(2-chloroethoxy)meth	55/**32**	34-102	**54**	50	
			1,2,4-trichlorobenzene	53/**23**	26-102	**79**	50	
			Naphthalene	55/**26**	36-94	**71**	50	
			Hexachlorobutadiene	55/**21**	35-98	**90**	50	
			2-methylnaphthalene	63/**34**	37-108	**59**	50	
			2,4,6-trichlorophenol	58/**42**	43-110	32	50	
			2-chloronaphthalene	53/**34**	42-96	42	50	
			Pyrene	**442/137**	36-132	**88**	50	
KRM033	LF-1-1-18-20	VOCs	Acetone	**1/0**	30-195	3.4	100	"J" in parent sample
		SVOCs	Benzoic Acid	**7/7**	10-94	0	100	None, benzoic acid was not analyzed for and all other QA/QC criteria were in for 2,4-dinitrophenol.
			2,4-dinitrophenol	28/**16**	19-126	**53**	50	
	LF-1-1-18-20	Herbicide	Dichlorprop	**141**/56	11-125	**86**	50	None, since data are not qualified
			MCPA	119/42	30-144	**95**	50	

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qualifier
	LF-1-1-18-20		2,4-D	118/55	29-161	**72**	50	based on RPDs only, and all other criteria were in.
			2,4,5-T	120/59	33-165	**68**	50	
			2,4-DB	85/50	20-182	**51**	50	
		Metals	Antimony	**33/34**	75-125	NA	NA	"UJ" in parent sample
			Potassium	113/**127**	75-125	NA	NA	"J" in parent sample
KRM034	S-07-20-1-3	VOCs	2-hexanone	136/174	46-163	9	50	None, all other QA/QC criteria within limits.
			Dibromochloromethane	120/126	70-124	9	50	
		SVOCs	Benzidine	**0/0**	10-95	0	100	None, compound was not analyzed for.
		Metals	Antimony	125/**41**	75-125	NA	NA	"J" qualifiers assigned to these compounds in the parent sample.
			Magnesium	121/**135**	75-125	NA	NA	
			Potassium	**176**/92	75-125	NA	NA	
			Sodium	**178/68**	75-125	NA	NA	
KRM035	S-08-04-1-2	PCBs	Aroclor-1016	**0/0**	24-132	0	50	None, spiking compounds were diluted out.
			Aroclor-1260	**0/0**	28-153	0	50	
KRM037	S-12-12-0-2	VOCs	Chloroethane	**32/14**	46-152	72	100	None, since all other criteria were in for these compounds.
			Chlorobenzene	**133/150**	69-128	11	50	
			Dibromochloromethane	**125**/123	70-124	6.4	50	
			Benzene	112/**58**	65-130	23	50	
			Tetrachloroethene	112/**138**	64-134	12	50	
			Bromoform	133/**135**	58-134	9	50	
	S-12-12-0-2	SVOCs	1,4-dichlorobenzene	**0/0**	25-93	30	50	"J" and "UJ" qualifiers assigned to these compounds in the parent sample.
			1,2-dichlorobenzene	**0/0**	31-86	30	50	
			Hexachlorocyclopentadiene	**0/0**	19-107	30	50	
			1,2,4-trichlorobenzene	**14/11**	26-102	4.6	50	None, since all other criteria were in for these compounds.
			Pyrene	**30/30**	36-132	0	50	
	S-12-12-0-2	Metals	Antimony	**58/47**	75-125	NA	NA	"J" and "UJ" qualifiers assigned to these compounds in the parent sample.
			Cadmium	**73/70**	75-125	NA	NA	
			Copper	**65/61**	75-125	NA	NA	
			Lead	**62/53**	75-125	NA	NA	
			Manganese	**39/158**	75-125	NA	NA	
			Potassium	112/**127**	75-125	NA	NA	
			Vanadium	**70/72**	75-125	NA	NA	
			Zinc	**48/55**	75-125	NA	NA	
			Mercury	**-304/456**	80-120	NA	NA	None, since the sample result was > 4xs the spike added.

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qualifier
KRM038	S-06-10-1-3	VOCs	Benzene	65/**49**	65-130	27	50	None, since all other criteria were in for benzene.
		SVOCs	Hexachlorocyclopentadiene	**8/16**	19-107	**67**	50	None, since all other criteria were in for hexachlorocyclopen-tadiene & benzidine was not analyzed for.
			Benzidine	10/**0**	10-95	**200**	100	
		Metals	Antimony	**48/49**	75-125	NA	NA	"J" qualifiers assigned to these compounds in the parent sample.
			Cadmium	104/**135**	75-125	NA	NA	
			Silver	113/**66**	75-125	NA	NA	
			Sodium	110/**128**	75-125	NA	NA	
			Potassium	**129/162**	75-125	NA	NA	
	S-06-10-1-3		Aluminum	**571/381**	75-125	NA	NA	None, since the sample result were > 4xs the spikes added.
			Calcium	**5583/9197**	75-125	NA	NA	
			Copper	**61/1836**	75-125	NA	NA	
			Iron	**6909/786**	75-125	NA	NA	
			Lead	**35/187**	75-125	NA	NA	
			Magnesium	**315/125**	75-125	NA	NA	
			Manganese	120/**134**	75-125	NA	NA	
			Zinc	**102/201**	75-125	NA	NA	
KRM041	S-06-10-1-3	PCBs	Aroclor-1016	**0/0**	24-132	0	50	None, spiking compounds were diluted out.
			Aroclor-1260	**0/0**	28-153	0	50	
KRM042	S-08-25-1-2	PCBs	Aroclor-1016	**0/0**	24-132	0	50	None, spiking compounds were diluted out.
			Aroclor-1260	**0/0**	28-153	0	50	
KRM045	S-12-06-14-16	SVOCs	Benzoic acid	**0/0**	10-94	0	100	None, compound was not analyzed for.
KRM045 A	S-12-06-14-16	Dioxins	HCDF	**60**/64	63-164	5.1	46	None, since all other criteria were in for HCDF.
KRM046	S-08-34-13-14	PCBs	Aroclor-1016	**0/0**	24-132	0	50	None, spiking compounds were diluted out.
			Aroclor-1260	**0/0**	28-153	0	50	

1.7 FIELD DUPLICATE RESULTS

Field duplicate results are used to evaluate representativeness. When results for both duplicate and sample values are greater than five times the practical quantitation limit (PQL), satisfactory representativeness is indicated by an RPD less than or equal to 100 percent for soil samples and less than or equal to 50 percent for aqueous samples. Where one or both of the results of a field duplicate pair are reported at less than five times the PQL, satisfactory representativeness is indicated if the field duplicate results agree within 3.5 times the quantitation limit. Field duplicate results that do not meet these criteria may indicate unsatisfact ory representativeness of the results.

Twenty-two field duplicate samples were collected for 177 investigative samples. This is 12 percent which satisfies the requirement in the QAPP (1 per 10 investigative samples or 10 percent). The reported results for field duplicate sample pairs were in agreement with the above acceptance criteria with the exception of the samples mentioned below:

SDG #	Sample ID	Compound and Concentration	Qualifier	Reason
KRM029	S-09-17-7-8 S-09-17-7-8-D	Mecury (28 mg/kg) Mercury (15 mg/kg)	J J	The difference was >3.5 times the RL.
KRM030	S-09-20-2-3 S-09-20-2-3-D	Mecury (0.049mg/kg) Mercury (5.6 mg/kg)	J J	The difference was >3.5 times the RL.
KRM034	S-07-17-14-16 S-07-17-14-16-D	Arsenic (3.5 mg/kg) Arsenic (13 mg/kg)	J J	The difference was >3.5 times the RL.
	S-07-14-1-3 S-07-14-1-3-D	Flouoranthene (1,400 ug/kg) Fluoranthene (2,800 ug/kg)	J J	The difference was >3.5 times the RL.
KRM035	S-08-10-1-2 S-08-10-1-2-D	Aroclor 1248 (52000 ug/kg) Aroclor 1248 (2100000 ug/kg)	J J	The difference in results was > 100 %
	S-08-10-1-2 S-08-10-1-2-D	Aroclor 1254 (91000 ug/kg) Aroclor 1254 (830000 ug/kg)	J J	The difference in results was > 100 %
KRM037	S-07-19-10-12 S-07-19-10-12-D	Aluminum (1,900 mg/kg) Aluminum (6,700 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Arsenic (1.9 mg/kg) Arsenic (8.6 mg/kg)	J J	The difference was >3.5 times the RL.
	S-07-19-10-12 S-07-19-10-12-D	Barium (53 mg/kg) Barium (190 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Cadmiun (0.44 U mg/kg) Cadmium (3.3 mg/kg)	UJ J	The difference was >3.5 times the RL.
	S-07-19-10-12 S-07-19-10-12-D	Calcium (2,500 mg/kg) Calcium (32,000 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Chromium (3.8 mg/kg) Chromium (17 mg/kg)	J J	The difference was >3.5 times the RL.
	S-07-19-10-12 S-07-19-10-12-D	Copper (18 U mg/kg) Copper (88 mg/kg)	UJ J	The difference was >3.5 times the RL.

SDG #	Sample ID	Compound and Concentration	Qualifier	Reason
	S-07-19-10-12 S-07-19-10-12-D	Iron (5,100 mg/kg) Iron (25,000 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Lead (3.6 mg/kg) Lead (5,600 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Magnesium (1,500 mg/kg) Magnesium (5,900 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Manganese (52 mg/kg) Manganese (170 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Nickel (7.5 mg/kg) Nickel (31 mg/kg)	J J	The difference was >3.5 times the RL.
	S-07-19-10-12 S-07-19-10-12-D	Potassium (380 mg/kg) Potassium (12,000 mg/kg)	J J	The difference was >3.5 times the RL.
	S-07-19-10-12 S-07-19-10-12-D	Vanadium (7.4 mg/kg) Vanadium (23 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Zinc (15 mg/kg) Zinc (350 mg/kg)	J J	The difference in results was > 100 %
	S-07-19-10-12 S-07-19-10-12-D	Mercury (0.042 mg/kg) Mercury (0.57 mg/kg)	J J	The difference was >3.5 times the RL.
KRM042	S-08-25-1-2 S-08-25-1-2-D	Aroclor 1248 (370,000 U mg/kg) Aroclor 1248 (5,200,000 mg/kg)	UJ J	The difference was >3.5 times the RL.
	S-08-25-1-2 S-08-25-1-2-D	Aroclor 1254 (620,000 mg/kg) Aroclor 1254 (8,700,000 mg/kg)	J J	The difference in results was > 100 %

1.8 RESULTS REPORTED FROM DILUTIONS

VOCs, SVOCs, metals, PCBs and dioxins results were reported at different dilutions for the samples mentioned below. There were no qualifiers assigned due to dilutions.

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
KRM029	S-09-11-9-10	Mercury	5	Abundance of target analyte
	S-09-14-2-3	Mercury	5	Abundance of target analyte
	S-09-14-6-8	Mercury	5	Abundance of target analyte
	S-09-15-9-10	Mercury	10	Abundance of target analyte
	S-09-09-2-3	Mercury	20	Abundance of target analyte
	S-09-09B-4-5	Mercury	20	Abundance of target analyte
	S-09-10-0-2-D	Mercury	50	Abundance of target analyte
	S-09-17-7-8-D	Mercury	50	Abundance of target analyte
	S-09-12-5-6	Mercury	100	Abundance of target analyte
	S-09-11-0-2	Mercury	100	Abundance of target analyte
	S-09-10-0-2	Mercury	100	Abundance of target analyte
	S-09-13-6-7	Mercury	100	Abundance of target analyte
	S-09-13-6-7-D	Mercury	100	Abundance of target analyte
	S-09-17-7-8	Mercury	500	Abundance of target analyte
	S-09-16-9-10	Mercury	2000	Abundance of target analyte
	S-09-17-2-3	Mercury	2000	Abundance of target analyte

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
KRM030	S-09-18-0-2	Mercury	5	Abundance of target analyte
	S-09-19-0-2	Mercury	5	Abundance of target analyte
	S-09-20-2-3-D	Mercury	100	Abundance of target analyte
	S-09-18-6-7	Mercury	200	Abundance of target analyte
	S-09-19-6-7	Mercury	1000	Abundance of target analyte
	S-09-20-6-7	Mercury	5000	Abundance of target analyte
KRM031	S-05-14-0-4	VOCs	40	Matrix Interference and
	S-04-22-10-12		40	abundance of target analytes.
	S-04-22-14-16		40	Matrix Interference and
	S-05-13-1-3		40	abundance of target analytes.
	S-05-13-8-10		40 & 80	Matrix Interference and
	S-05-13-14-16		40	abundance of target analytes.
	S-05-14-0-4	SVOCs	10	Matrix Interference
	S-05-14-4-8		10	Matrix Interference
	S-05-14-14-16		10	Matrix Interference
	S-04-22-10-12		10	Matrix Interference
	S-05-13-1-3		10	Matrix Interference
	S-05-13-8-10		10	Matrix Interference
	S-05-13-14-16		10	Matrix Interference
KRM032	S-05-16-14-16	VOCs	40	Matrix Interference and
	S-05-16-1-3		40	abundance of target analytes.
	S-05-15-14-16		40	Matrix Interference and
	S-05-15-10-12		40	abundance of target analytes.
	S-04-26-14-16-DDL		40	Matrix Interference and
	S-04-26-14-16DL		40	abundance of target analytes.
	S-04-26-10-12DL		80	Matrix Interference and
	S-05-16-7-8		2000	abundance of target analytes.
	S-05-16-7-8DL		10,000	Matrix Interference and abundance of target analytes.
	S-05-16-1-3	SVOCs	10	Matrix Interference
	S-05-16-7-8		10	Matrix Interference
	S-05-16-14-16		10	Matrix Interference
KRM033	LF-4-2-18-20	VOCs	40	Abundance of target analytes
	CT-2a-1-13-15		40	Abundance of target analytes
	CT-26-1-13-15		40	Abundance of target analytes
	LF-4-1-18-20	SVOCs	5 (Secondary)	Abundance of target analytes
KRM034	S-07-16-14-16	VOCs	40	Abundance of chlorobenzene
	S-07-14-14-16	SVOCs	5	Matrix Interference
	S-07-16-1-3	Metals (antimony, arsenic, cadmium, calcium, copper, iron, lead, thallium, and vanadium)		Abundance of target analytes
	S-07-17-1-3	Metals (lead)	2	Abundance of target analyte
	S-07-17-1-3	Metals (zinc)	5	Abundance of target analyte
	S-07-17-1-3	Mercury	5	Abundance of target analyte
KRM035	S-08-06-3-4	PCBs	100	Matrix Interference
	S-08-06-3-4-D		100	Matrix Interference
	S-08-08-3-4		500	Matrix Interference
	S-08-10-1-2		500	Matrix Interference
	S-08-04-1-2		500	Matrix Interference
	S-08-10-1-2-D		1,000	Matrix Interference
	S-08-04-1-2		1,000	Matrix Interference

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
			(secondary)	
	S-08-10-1-2-D		4,000	Matrix Interference
			(secondary)	
	S-08-13-1-2		10,000	Matrix Interference
KRM037	S-07-15-1-3	VOCs	40	Abundance of target analytes
	S-07-19-1-3		40	Abundance of target analytes
	S-07-15-6-8		40 & 100	Abundance of target analytes
	S-07-19-14-16		100	Abundance of target analytes
	S-12-12-0-2		100	Abundance of target analytes
	S-07-18-14-16		1,000	Abundance of target analytes
	S-12-12-6-8		1,000	Abundance of target analytes
	S-12-12-14-16		1,000	Abundance of target analytes
	S-07-19-10-12		2,000	Abundance of target analytes
	S-07-19-10-12-D		2,000	Abundance of target analytes
	S-07-18-10-12		10,000	Abundance of target analytes
	S-12-12-0-2	SVOCs	2	Abundance of target analytes
	S-07-18-10-12		4	Abundance of target analytes
	S-07-19-1-3		4	Abundance of target analytes
	S-07-15-6-8		5	Abundance of target analytes
	S-12-12-6-8		100	Abundance of target analytes
	S-07-19-10-12		200 & 1,000	Abundance of target analytes
	S-07-19-10-12-D		200 & 1,000	Abundance of target analytes
		Metals		
	S-12-12-0-2	Calcium	5	Abundance of target analyte
	S-07-19-10-12-D	Lead	5	Abundance of target analyte
	S-07-15-1-3	Mercury	10	Abundance of target analyte
	S-12-12-0-2	Mercury	10	Abundance of target analyte
	S-07-19-1-3	Mercury	10	Abundance of target analyte
	S-07-19-10-12-D	Mercury	10	Abundance of target analyte
KRM038	S-04-28-1-3	VOCs	40	Abundance of target analytes
			(secondary)	
	S-06-06-1-3		40	Abundance of target analytes
	S-06-06-6-8		40	Abundance of target analytes
	S-06-06-14-16-D		40	Abundance of target analytes
	S-06-09-6-8		40	Abundance of target analytes
	S-06-09-14-16		40	Abundance of target analytes
	S-06-08-1-3		40	Abundance of target analytes
	S-06-08-8-10		40	Abundance of target analytes
	S-06-08-8-10-D		40	Abundance of target analytes
	S-06-08-14-16		40	Abundance of target analytes
	S-06-10-1-3		40	Abundance of target analytes
	S-06-10-10-12		40 & 100	Abundance of target analytes
	S-06-10-14-16		40 & 200,000	Abundance of target analytes
	S-06-09-1-3		100 & 10,000	Abundance of target analytes
	S-06-07-1-3		200 & 10,000	Abundance of target analytes
	S-06-07-9-11		200 & 4,000	Abundance of target analytes
	S-06-07-14-16		200 & 4,000	Abundance of target analytes
	S-04-28-14-16		1,000 & 2,000	Abundance of target analytes
	S-04-28-6-8		10,000	Abundance of target analytes
	S-06-06-14-16-D	SVOCs	4	Abundance of target analytes
	S-06-08-1-3		4	Abundance of target analytes
	S-06-08-8-10		50	Abundance of target analytes
	S-06-08-8-10-D		50	Abundance of target analytes

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
	S-06-07-9-11	Metals	5	Abundance of target analyte
	S-06-08-1-3	Calcium	5	Abundance of target analyte
	S-06-10-1-3	Calcium	5	Abundance of target analyte
	S-06-06-1-3	Calcium & Lead	5	Abundance of target analyte
	S-06-10-1-3	Mercury	5	Abundance of target analyte
	S-06-09-1-3	Mercury	20	Abundance of target analyte
	S-06-08-1-3	Mercury	20	Abundance of target analyte
KRM040	S-09-21-13-14	Mercury	5	Abundance of target analyte
	S-09-22-7-8	Mercury	5	Abundance of target analyte
	S-09-23-13-14	Mercury	10	Abundance of target analyte
	S-09-24-7-8	Mercury	100	Abundance of target analyte
	S-09-23-7-8	Mercury	500	Abundance of target analyte
	S-09-24-13-14	Mercury	500	Abundance of target analyte
KRM041	S-07-18-14-16	PCBs	10	Matrix Interference
	S-06-10-1-3		20	Matrix Interference
	S-07-18-10-12		25	Matrix Interference
	S-06-08-1-3		40	Matrix Interference
	S-07-15-6-8		50	Matrix Interference
	S-06-07-1-3		50	Matrix Interference
	S-07-19-10-12		200	Matrix Interference
	S-07-19-10-12-D		200	Matrix Interference
	S-06-09-1-3		1,000	Matrix Interference
KRM042	S-08-22-9-10	PCBs	2,000	Matrix Interference
	S-12-11-14-16		100	Matrix Interference
	S-08-19-9-10		400	Matrix Interference
	S-08-23-5-6		2,000	Matrix Interference
	S-08-25-1-2		10,000	Matrix Interference
	S-08-25-5-6		10	Matrix Interference
	S-08-25-5-6RE		40	Matrix Interference
	S-08-25-9-10		50	Matrix Interference
	S-08-25-9-10RE		200	Matrix Interference
	S-08-25-1-2-D		1000 & 10000	Matrix Interference
	S-08-26-9-10		2,000	Matrix Interference
	S-08-26-9-10-D		2,000	Matrix Interference
	S-08-27-1-2		200	Matrix Interference
	S-08-30-5-6		2,000	Matrix Interference
	S-12-07-1-3		50	Matrix Interference
	S-12-07-8-10		50	Matrix Interference
	S-12-07-14-16		50	Matrix Interference
KRM043	S-07-14-1-3DL	PCBs	4 (secondary)	Abundance of target analytes
	S-08-31-13-14		500 & 1000	Abundance of target analytes
KRM045	S-12-9-8-10	VOCs	40 (secondary)	Abundance of target analytes
	S-12-9-14-16		40 (secondary)	Abundance of chlorobenzene
	S-05-SMP277-01-9-11		40	Abundance of target analytes
	S-05-SMP277-01-14-16		40	Abundance of target analytes
	S-05-SMP277-01-9-11	SVOCs	5	Matrix Interference
	S-05-SMP277-01-14-16		10	Matrix Interference
	S-12-9-1-3	Metals Calcium	10	Abundance of calcium

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
KRM045 A	S-12-06-6-8	Dioxins	2	Abundance of target analytes
KRM046	S-08-36-9-10 S-08-34-13-14 S-08-35-13-14	PCBs	40 50 10,000	Matrix Interference Matrix Interference Matrix Interference

1.9 INTERNAL STANDARD RESPONSES

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent. The internal standards area responses were checked for the data review. Qualifications were made when the responses were greater than or less than the required criteria as required by the Guidelines. The following IS responses were out of range.

SDG #	Sample ID	Analysis	IS Compound	IS Response / Range	Qualifications
KRM031	S-04-25-0-2	SVOCs	1,4-dichlorobenzene Naphthalene Acenaphthene Phenanthrene	569,383 78,176– 312,702 2,155,236 316,442–1,265,766 893,868 151,212– 604,848 1,066,666 242,068–968,270	All detected analytes in sample S-04-25-0-2 were qualified "J".
	S-04-25-6-8-D		1,4-dichlorobenzene Naphthalene Acenaphthene Phenanthrene	439,809 78,176– 312,702 1,688,594 316,442–1,265,766 794,281 151,212– 604,848 1,127,999 242,068–968,270	All detected analytes in sample S-04-25-6-8-D were qualified "J".
	S-04-25-14-16		1,4-dichlorobenzene Naphthalene Acenaphthene Phenanthrene	435,116 78,176– 312,702 1,688,012 316,442–1,265,766 779,867 151,212– 604,848 1,123,317 242,068–968,270	All detected analytes in sample S-04-25-14-16 were qualified "J".
	S-04-24-0-2		1,4-dichlorobenzene Naphthalene	346,518 74,496–297,982 1,169,143 272,834–1,091,334	No qualifications necessary since the sample only had non-detects.
	S-04-22-0-2RE		1,4-dichlorobenzene	846,287	No qualifications necessary
	S-04-22-0-2				

SDG #	Sample ID	Analysis	IS Compound	IS Response / Range	Qualifications
				169,878–679,510	since the sample only had non-detects.
	S-04-25-0-2-RE		Naphthalene	3,251,059 674,868–2,699,474	
			Acenaphthene	1,460,351 326,596–1,306,386	
	S-04-25-14-16RE		1,4-dichlorobenzene	334,224 74,496-297,982	No qualifications necessary since the sample only had non-detects.
			Naphthalene	1,225,401 272,834–1,091,334	
			Acenaphthene	556,742 124,668–498,670	
			Phenanthrene	804,744 200,710–802,842	
			1,4-dichlorobenzene	940,788 169,878–679,510	No qualifications necessary since the sample only had non-detects.
			Naphthalene	3,494,978 674,868–2,699,474	
			Acenaphthene	1,502,903 326,596–1,306,386	
			1,4-dichlorobenzene	766,454 169,878–679,510	
			Naphthalene	3,002,408 674,868–2,699,474	
			Acenaphthene	1,448,945 326,596–1,306,386	
KRM032	S-04-26-1-3	VOCs	Chlorobenzene	26,523 54,178–216,710	Sample already qualified due to surrogates.
	S-12-05-1-3		Chlorobenzene	52,649 54,178–216,710	Sample was qualified as "J" and "UJ".
	S-04-26-1-3RE		Chlorobenzene	21,311 54,178–216,710	Sample already qualified due to surrogates.
			1,4-difluorobenzene	107,751 126,570–506,280	
	S-12-05-1-3RE		Chlorobenzene	46,933 54,178–216,710	Sample was qualified as "J" and "UJ".
KRM033	LF-4-2-18-20	SVOCs	1,4-dichlorobenzene	66,658 80,260–321,040	
			Naphthalene	204,572 331,892–1,327,566	Sample was qualified as "J" and "UJ".
			Acenaphthene	185,756 195,423–781,692	
	LF-4-2-18-20RE		1,4-dichlorobenzene	167,243 177,526–710,106	Sample was qualified as "J" and "UJ".
			Naphthalene	717,681 745,248–2,980,992	

SDG #	Sample ID	Analysis	IS Compound	IS Response / Range	Qualifications
KRM034	S-07-16-1-3	VOCs	1,4-difluorobenzene	112,631 157,928–631,710	Sample was qualified as "J" and "UJ".
			Chlorobenzene	31,754 87,960–351,838	
	S-07-14-1-3-D		1,4-difluorobenzene	130,932 157,928–631,710	Sample was qualified as "J" and "UJ".
			Chlorobenzene	49,052 87,960–351,838	
	S-07-16-1-3RE		1,2-dichloroethane	14,100 57,218–228,872	
			1,4-difluorobenzene	16,361 102,980–411,918	Sample was qualified as "J" and "UJ".
			Chlorobenzene	9,724 59,137–236,548	
	S-07-14-1-3-DRE		Chlorobenzene	49,724 59,137–236,548	Sample was qualified as "J" and "UJ".
	S-07-20-14-16	SVOCs	1,4-dichlorobenzene	200,390 207,688–830,750	
			Naphthalene	815,782 896,907–3,587,628	Sample was qualified as "J" and "UJ".
			Acenaphthene	488,089 549,828–2,199,314	
			Phenanthrene	845,565 1,016,076–4,064,306	
			Chrysene	716,798 893,020–3,572,082	
			Perylene	742,932 807,662–3,230,648	
	S-07-20-14-16RE		Phenanthrene	954,939 967,594–3,870,376	Sample was qualified as "J" and "UJ".
	S-07-14-1-3		Naphthalene	856,066 896,907–3,587,628	
			Acenaphthene	502,775 549,828–2,199,314	Sample was qualified as "J" and "UJ".
			Phenanthrene	889,024 1,016,076–4,064,306	
			Chrysene	882,252 893,020–3,572,082	
	S-07-14-1-3RE		1,4-dichlorobenzene	173,003 191,696–766,782	
			Naphthalene	674,253 831,779–3,327,116	Sample was qualified as "J" and "UJ".
			Acenaphthene	394,138 504,616–2,018,466	
KRM034		SVOCs	Phenanthrene	791,296 967,594–3,870,376	

SDG #	Sample ID	Analysis	IS Compound	IS Response / Range	Qualifications
	S-07-14-10-12		Naphthalene	858,370 896,907–3,587,628	Sample was qualified as "J" and "UJ".
			Acenaphthene	511,174 549,828–2,199,314	
			Phenanthrene	920,081 1,016,076–4,064,306	
	S-07-14-10-12RE		Acenaphthene	448,964 504,616–2,018,466	Sample was qualified as "J" and "UJ".
			Phenanthrene	810,413 967,594–3,870,376	
	S-4-29-1-3		1,4-dichlorobenzene	203,538 207,688–830,750	Sample was qualified as "J" and "UJ".
			Naphthalene	796,376 896,907–3,587,628	
			Acenaphthene	487,995 549,828–2,199,314	
	S-4-29-1-3RE		1,4-dichlorobenzene	186,088 191,696–766,782	Sample was qualified as "J" and "UJ".
			Naphthalene	726,921 831,779–3,327,116	
			Acenaphthene	440,250 504,616–2,018,466	
	S-4-29-6-8		Naphthalene	879,625 896,907–3,587,628	Sample was qualified as "J" and "UJ".
			Acenaphthene	515,569 549,828–2,199,314	
			Phenanthrene	913,325 1,016,076–4,064,306	
	S-4-29-6-8RE		Phenanthrene	899,917 967,594–3,870,376	Sample was qualified as "J" and "UJ".
	S-4-29-14-16		1,4-dichlorobenzene	204,317 207,688–830,750	
			Naphthalene	813,244 896,907–3,587,628	
			Acenaphthene	483,519 549,828–2,199,314	Sample was qualified as "J" and "UJ".
			Phenanthrene	861,868 1,016,076–4,064,306	
			Chrysene	759,637 893,020–3,572,082	
			Perylene	695,912 807,662–3,230,648	
KRM034	S-4-29-14-16RE	SVOCs	Phenanthrene	924,360 967,594–3,870,376	
	S-07-16-6-8		Acenaphthene	549,284 549,828–2,199,314	Sample was qualified as "J" and "UJ".
			Phenanthrene	963,533 1,016,076–4,064,306	
			Chrysene	829,756 893,020–3,572,082	Sample was qualified as "J" and "UJ".

SDG #	Sample ID	Analysis	IS Compound	IS Response / Range	Qualifications
KRM034	S-07-16-6-8RE	SVOCs	Perylene	772,360 807,662–3,230,648	Sample was qualified as "J" and "UJ".
			Naphthalene	830,792 831,779–3,327,116	
			Acenaphthene	468,216 504,616–2,018,466	
			Phenanthrene	862,307 967,594–3,870,376	
	S-07-17-1-3		1,4-dichlorobenzene	198,460 207,688–830,750	Sample was qualified as "J" and "UJ".
			Naphthalene	786,128 896,907–3,587,628	
			Acenaphthene	473,244 549,828–2,199,314	
			Phenanthrene	915,101 1,016,076–4,064,306	
			Chrysene	890,745 893,020–3,572,082	
	S-07-17-1-3RE		1,4-dichlorobenzene	167,460 191,696–766,782	Sample was qualified as "J" and "UJ".
			Naphthalene	660,804 831,779–3,327,116	
			Acenaphthene	412,275 504,616–2,018,466	
			Phenanthrene	938,057 967,594–3,870,376	
KRM035	S-08-06-3-4	PCBs	Bromonitrobenzene	700,935 135,436–406,306	No qualifiers assigned since results were reported from the second channel and the ranges out of criteria were reported from the first channel.
	S-08-06-3-4-D		Bromonitrobenzene	799,096 135,436–406,306	
	S-08-10-1-2-D		Bromonitrobenzene	667,690 92,694–278,080	No qualifiers assigned since results were reported from the first channel and the ranges out of criteria were reported from the second channel.
	S-08-10-1-2		Bromonitrobenzene	1,445,689 92,694–278,080	
	S-08-10-1-2-DDL		Bromonitrobenzene	292,957 92,694-278,080	
KRM037	S-07-15-14-16	SVOCs	Naphthalene	232,258 255,922–1,023,690	Sample was qualified as "J" and "UJ".
			Acenaphthene	153,539 173,978–695,912	
	S-07-15-14-16RE		Acenaphthene	194,814 195,423–781,692	Sample was qualified as "J" and "UJ".
			Phenanthrene	326,542 374,818–1499,274	
	S-07-19-14-16		Chrysene	357,468 391,736–1,566,942	Sample was qualified as "J" and "UJ".
			Perylene	342,630 393,026–1,572,104	
KRM038	S-06-10-14-16	VOCs	Chlorobenzene	78,552 105,541–422,164	Sample was qualified as "J" and "UJ".

SDG #	Sample ID	Analysis	IS Compound	IS Response / Range	Qualifications
KRM041	S-07-19-10-12 S-07-19-10-12-D	PCBs	Bromonitrobenzene Bromonitrobenzene	1,136,570 92,694–278,080 1,483,211 92,694–278,080	No qualifiers assigned since results were reported from the first channel and the ranges out of criteria were reported from the second channel.
KRM042	S-08-25-5-6	PCBs	Bromonitrobenzene	289,215 92,694–278,080	No qualifiers assigned since results were reported from the first channel and the ranges out of criteria were reported from the second channel.
KRM046	S-08-34-13-14	PCBs	Bromonitrobenzene	451,620 135,436–406,306	No qualifiers assigned since results were reported from the second channel and the ranges out of criteria were reported from the first channel.

1.10 ICP SERIAL DILUTIONS

The percent differences (D) between the original sample results and the results obtained from the serial dilutions should agree within a 10% difference. However if the analyte concentration is less than a factor of 50 above the IDL, the serial dilution does not need to agree within 10 %. The reported results were in agreement with the acceptance criteria with the exception of the samples mentioned below:

SDG	Sample ID	Analyte	Difference %	Qualifiers
KRM033	LF-3-1-18-20	Chromium Copper Nickel Zinc	14.8 14.3 10.6 12.8	"J" "J" "J" "J"
KRM034	S-4-29-EB	Aluminum	37.2	None since this is a QA/QC sample.
KRM037	S-07-18-1-3	Aluminum Barium Copper Lead Vanadium	19.6 67.6 12.5 42.5 11.5	"J" "J" "J" "J" "J"
KRM038	S-04-28-1-3	Chromium Cobalt Zinc	10.3 14.5 12.4	"J" "J" "J"
KRM045	S-12-6-1-3	Zinc	13.4	"J"

No additional data qualification was necessary based on serial dilution results.

1.11 CONTINUING CALIBRATION VERIFICATIONS

The continuing calibration (CCAL) criteria are not checked as part of a Data Quality Review. However, when continuing calibrations are mentioned in the Case Narrative as being out of control limits, a review of the continuing calibration summary forms is conducted to determine if data have been affected. The Continuing Calibrations average percent difference (%Ds) met the evaluation criteria of less than 25 percent for VOCs with the exceptions noted below:

Identifier	Analyte	%D	Related Samples	Qualifiers
KRM032 VOCs MQ562, 11-06-03, 1m1106.b	Bromomethane Carbon disulfide Methylene chloride 1,1-dichloroethane	26.2 59.8 51.5 90.6	S-05-16-1-3 S-05-16-7-8 S-04-26-1-3 S-04-26-10-12 S-04-26-14-16 S-04-26-14-16-D S-12-05-1-3 S-12-05-6-8 S-12-05-12-16 S-04-27-0-2 S-04-27-4-6 S-04-27-14-16 S-04-27-14-16-D S-05-16-7-8-DL S-05-16-14-16 S-04-26-1-3RE S-04-26-14-16DL S-12-05-1-3RE S-05-15-1-3 S-04-26-14-16DDL	Bromomethane results in all the samples were qualified "UJ". Carbon disulfide non-detect results in all samples were qualified "R". Carbon disulfide detected results were qualified "J". Methylene chloride results in all the samples were qualified "R" since all results were non-detect. 1,1-dichloroethane results in all the samples were qualified "R" since all results were non-detect.
KRM032 VOCs BQ761, 11-01-03, 1b1101.b	Chloroethane	157.6	TB7102403 S-05-15-14-16EB	None since related samples are QA/QC samples.
KRM032 VOCs BQ770, 11-02-03, 1b1102.b	Chloroethane Bromomethane	104.2 47.4	TB8102703	None since related sample is a QA/QC sample.
KRM032 VOCs MQ557, 11-05-03, 1m1105.b	Acetone	25.9	S-05-15-10-12 S-05-15-14-16	Acetone results in both samples were "UJ".
KRM044 VOCs BQ687, 10-24-03, 2b1024A.b	Acetone	44.3	Calibrations 1-7	None since related samples are calibrations.
KRM044 VOCs BQ838, 11-10-03, 1b1110.b	Bromomethane Vinyl acetate	66.1 61.1	Trip Blank # 6	None since related sample is a QA/QC sample.

Some PCBs %Ds were above evaluation criteria (15%) for several continuing calibration verifications; however, the average % D for all the peaks were within evaluation criteria (25% D). No qualifications to the data were necessary.

KRM29

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388437
NO. OF SAMPLES/
MATRIX 22/20 soils + 2 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Hoskins
COMPLETION DATE 01/13/04

DATA ASSESSMENT WORKSHEET

	Mercury Meth # 7470/747 1
1. HOLDING TIMES	✓
2. BLANKS	✓
3. DUPLICATES	(1+2)
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	(3+4)
7. DILUTIONS	(5+6)
8. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples S-09-17-7-8 and S-09-17-7-8-D did not meet the duplicate criteria for mercury (the difference was greater than 3.5 times the RL). Therefore, mercury was qualified as estimated (J) in both samples. (3) The mercury MSD % recovery for sample S-09-16-2-3 was slightly low. Therefore, the parent sample was qualified as estimated (J).

COMMENTS: (2) The laboratory duplicates were performed on the spiked samples. However, no action is necessary. In addition, one duplicate RPD was greater than 20 %. However, no action is necessary because the duplicate was not performed in any of our samples.
(4) The mercury MS/MSD % recoveries for sample S-09-09-2-3 were outside criteria. Since the sample results were greater than 4 times the spikes added, no action is necessary.
(5) The serial dilution % difference was >10 % for sample S-09-16-2-3. However, no action is necessary since the initial sample result was less than 50 times the MDL.
(6) Samples S-09-11-9-10, S-09-14-2-3, S-09-14-6-8 were diluted by 5 times. Samples S-09-10-0-2-D and S-09-17-7-8D were diluted by 50 times. Samples S-09-12-5-6, S-09-11-0-2, S-09-10-0-2, S-09-13-6-7 and S-09-13-6-7D were diluted by 100 times. Sample S-09-15-9-10 was diluted by 10 times. Samples S-09-09-2-3 and S-09-

COMMENTS (CONTINUED):
09B-4-5 were diluted by 20 times. Sample S-09-17-7-8 was diluted by 500 times. Samples S-09-16-9-10 and S-09-17-2-3 were diluted by 2,000 times. However, no action is necessary.

KRM30

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388498
NO. OF SAMPLES/
MATRIX 9/7 soils + 2 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Hoskins
COMPLETION DATE 01/19/04

DATA ASSESSMENT WORKSHEET

	Mercury Meth # 7470/74 71
1. HOLDING TIMES	✓
2. BLANKS	✓
3. DUPLICATES	(1+2)
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	(3)
7. DILUTIONS	(4+5)
8. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples S-09-20-2-3 and S-09-20-2-3D did not comply with the duplicate criteria (the difference was greater than 3.5 times the RL). Therefore, mercury was qualified as estimated (J) in both samples.

COMMENTS: (2) The laboratory duplicate for mercury had a % RPD greater than 20%. However, no action is necessary because the laboratory duplicate was run on the spiked MS/MSD sample.
(3) The MS/MSD sample S-09-18-0-2 for mercury had recoveries outside of criteria. However, no action is necessary because the sample concentrations were greater than 4 times the spikes added.
(4) The ICP serial dilutions for samples S-09-18-0-2 and S-09-20-2-3 for mercury had a % D greater than 10%. However, the sample results were not greater than 50 times the MDL and no action is necessary.
(5) Samples S-09-18-0-2 and S-09-19-0-2 were diluted by 5 times. Sample S-09-20-2-3-D was diluted by 100 times. Sample S-09-18-6-7 was diluted by 200 times. Sample S-09-19-6-7 was diluted by 1,000 times. Sample S-09-20-6-7 was diluted by 5,000 times. However, no action is necessary.

KRM 31

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388553
NO. OF SAMPLES/
MATRIX 21/16 soil & 5 aqueous includes 3 trip blanks for VOCs

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 2/3/04 & 4/21/04

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	(1)	(5)
4. SCS (LCS)	(2)	(6)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3)	(7+8)
7. DILUTIONS	(4)	(9)
8. DUPLICATES	✓	✓
9. INTERNAL STANDARDS	✓	(10+11)
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples S-04-22-14-16, S-05-13-14-16, S-04-22-10-12 and S-05-13-1-3DL surrogate recoveries were high. Therefore, detected results for samples S-05-13-14-16 and S-05-13-1-3DL were qualified as estimated "J".
(3) The MS/MSD % recoveries were low (including 0 recoveries) and high for several compounds including o-xylene, chloroethane, acetone, carbon disulfide, 1,1-dichloroethane, 2-butanone, benzene, 1,2-dichloropropane, 4-methyl-2-pentanone, 2-hexanone, chlorobenzene, xylene and 1,1,2,2 tetrachloroethane. In addition, carbon disulfide and 1,1 dichloroethane RPDs were greater than the criteria. Therefore, all the compounds with low % recoveries were qualified as estimated "J" and estimated non-detect "UJ" in the parent sample S-05-13-1-3. No action is necessary for the high % recoveries since all these compounds were non-detect in the parent sample.

ACTIONS (CONTINUED):
(7) The MS/MSD sample S-05-13-1-3 had 0% recoveries for hexachlorocyclopentadiene and 2,4-dinitrophenol. Therefore, in the parent sample hexachlorocyclopentadiene and 2,4-dinitrophenol were qualified as estimated non-detect "UJ".
(10) 1,4-dichlorobenzene, naphthalene, acenaphthene and phenanthrene internal standards were high for samples S-04-25-0-2*, S-04-25-6-88-D* and S-04-25-14-16*. Therefore, detected analytes in these samples were qualified as estimated "J". Samples S-04-25-6-8-DRE and S-04-24-0-2RE were qualified (UJ) due to internal standards being out; however, these samples were not used and the original samples were chosen for the report due to better QA/QC.

* Originals were chosen instead of the reanalysis due to better QA/QC.

COMMENTS: (2) The LCS KRM 31-20 had a slightly high recovery for 1,2-dichloropropane. The LCS KRM31-23 had high recoveries for chloromethane, vinyl chloride and 1,1-dichloroethane. However, none of these compounds were detected in any of the related samples, and no action is necessary.
(4) Samples S-05-14-0-4, S-04-22-10-12, S-04-22-14-16*, S-05-13-1-3, S-05-13-8-10, S-05-13-14-16 were diluted by 40 to 80 times due to matrix interference and abundance of target analytes. However, no action is necessary.
(5) Surrogates for samples S-05-14-0-4, S-05-14-4-8, S- 05-14-14-16, S-04-22-10-12, S-05-13-1-3, S-05-13-8-10, S-05-13-14-16 were not recovered due to dilutions. However, no action is necessary.
(6)Benzoic acid and benzidine were not recovered in the LCS KRM31-14 and benzidine recovery was slightly high for LCS KRM 31-1. However, these analytes were not reported in any of our samples and no action is necessary.
(8) The MS/MSD sample S-05-13-1-3 had low recoveries for benzoic acid and benzidine. However, no action is necessary because these compounds were not reported in the sample. The same MS also had a slightly low recovery for 4,6-dinitro-2-methylphe; however, no action is necessary because all other QC criteria were in for this analyte. The same sample had high recoveries for 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, 4-chloroaniline and 1,2-diphenylhydrazine. In addition, a batch MS/MSD recoveries were out for aniline, benzoic acid and benzidine. However, no action is necessary since the MS/MSD sample is not one of our samples.
(9) Samples S-05-14-0-4, S-05-14-4-8, S-05-14-14-16, S-04-22-10-12, S-05-13-1-3, S-05-13-8-10 and S-05-13-14-16 were diluted by 10 times; however, no action is necessary.
(11) Sample S-04-24-0-2* had high internal standards for 1,4-dichlorobenzene and naphthalene. However, no qualifications were necessary because the sample had only non-detects. Sample S-04-22-0-2RE* had also high internal standards for 1,4-dichlorobenzene, naphthalene and acenaphthene. However, no qualifications were necessary because the sample had only non-detects. Sample S-04-22-0-2 also had high internal standards for 1,4-dichlorobenzene, naphthalene and acenaphthene. However, this sample was not used and the reanalysis sample was chosen for the report due to better QA/QC. Samples S-04-25-0-2RE and S-04-25-14-16RE had high internal standards for 1,4-dichlorobenzene, naphthalene and acenaphthene. No qualifications were required because the samples were non-detect. These samples were not used and the original results were chosen for the report.

* These samples were chosen for the report due to better QA/QC.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
SITE WG Krummrich – Sauget, IL
LABORATORY STL- Savannah
LABORATORY NO. S388600, S388626
REVIEWER URS Corporation
NO. OF SAMPLES/
REVIEWER'S NAME A. Turnell
MATRIX 20/17 soils & 3 aqueous including 2 trip blanks
COMPLETION DATE 04/29/04

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	(1+2)	(10)
4. SCS (LCS)	(3)	(11)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(4+5)	(12+13)
7. DILUTIONS	(6)	(14)
8. DUPLICATES	✓	✓
9. INTERNAL STANDARDS	(7)	✓
10. OTHER	(8+9)	✓
11. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Sample S-04-26-1-3* p-bromofluorobenzene surrogate % recovery was low. This sample was reanalyzed and p-bromofluorobenzene surrogate % recovery was also low. Therefore, detected and non-detect compounds in these two samples were qualified as estimated "J" and estimated non-detect "UJ". Sample S-04-26-10-12 p-bromofluorobenzene % surrogate recovery was high. Therefore, the detected compound chlorobenzene was qualified as estimated "J".
(5) MS and MSD % recoveries were 0 % for benzene in sample S-05-16-1-3. Due to benzene not being recovered, this analyte was qualified as estimated "J" in the parent sample.

ACTIONS (CONTINUED):
(7) Samples S-04-26-1-3, S-12-05-1-3, S-04-26-1-3RE, S-12-05-1-3RE* internal standards were low. Therefore, samples S-12-05-1-3 and S-12-05-1-3RE were qualified as estimated "J" and estimated non-detect "UJ". Samples S-04-26-1-3 and S-04-26-1-3RE were already qualified due to action (1).
(8) The % D for bromomethane, carbon disulfide, methylene chloride and 1,1-dichloroethane exceeded the established criteria for CCAL MQ562. The related samples are S-05-16-1-3, S-05-16-7-8, S-04-26-1-3, S-04-26-10-12, S-04-26-14-16, S-04-26-14-16D, S-12-05-1-3, S-12-05-6-8, S-12-05-12-16, S-04-27-0-2, S-04-27-4-6, S-04-27-14-16, S-04-27-14-16-D, S-05-16-7-8DL, S-05-16-14-16, S-04-26-1-3RE, S-04-26-14-16DL, S-12-05-1-3RE, S-05-15-1-3, S-04-26-14-16DDL. Therefore, all bromomethane results were estimated non-detect "UJ", detected carbon disulfide results were estimated "J", non-detect carbon disulfide results were rejected "R", and all methylene chloride and 1,1-dichloroethane results were rejected "R" since all of them were non-detect. The % D for acetone exceeded the established criteria for CCAL MQ557. Therefore, related samples S-05-15-10-12 and S-05-15-14-16 were qualified as estimated non-detect "UJ".
(13) MS/MSD recoveries were 0 % for bis(2-chloroethyl)ether, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, benzoic acid, hexachlorocyclopentadiene, 2,4-dinitrophenol and benzidine for sample S-05-16-1-3. Due to the complete lack of recovery for these analytes, the parent sample was qualified as estimated non-detect "UJ" for these compounds with the exception of benzoic acid and benzidine since these two were not reported in our sample. MS and MSD recovery was also 0 % for benzidine in sample S-04-26-1-3. However, since this analyte was not reported in the sample, no action is necessary.

* The reanalyzed sample was kept for the report.

COMMENTS: (2) Samples S-05-16-7-8 and S-05-16-7-8 had no surrogates recovered due to dilutions. However, no action is necessary.
(3) Chloromethane, vinyl chloride and 1,1-dichloroethane LCS % recoveries were high for LCS KRM 32-1. However, all related samples were non-detect for these analytes and no action is necessary. 1,1-dichloroethane LCS % recovery was high for LCS KRM 32-26; however, all related 1,1-dichloroethane results were already qualified due to action (9). Chloromethane, vinyl chloride, and 1,2-dichloropropane LCS % recoveries were high in LCS KRM 32-29. However, all related samples were non-detect for these analytes, and no action is necessary. Chloromethane, vinyl chloride and 1,1-dichloroethane LCS recoveries were high for KRM 32-32. However, the related sample was non-detect for these analytes and no action is necessary.
(4) MS and MSD % recoveries were out for o-xylene, chloroethane, 1-1-dichloroethane, 1,1,1-trichloroethane, dibromochloromethane, styrene, bromoform and bromodichloromethane in sample S-05-16-1-3. However, since the other QA/QC parameters were in, no action is necessary.
(6) Samples S-04-26-10-12DL, S-04-26-14-16DL, S-04-26-14-16-DDL, S-05-15-10-12, S-05-15-14-16, S-05-16-1-3, S-05-16-7-8, S-05-16-7-8DL and S-05-16-14-16 were diluted by 40 to 10,000 times due to the abundance of target compounds and matrix interference. However, no action is necessary.
(9) The % D for chloroethane exceeded the established criteria for CCAL BQ761. However, no action is necessary because the related samples are QA/QC. The % D for chloroethane and bromomethane exceeded the established criteria for CCAL BQ770. However, no action is necessary because the related samples are QA/QC.
(10) Samples S-05-16-1-3, S-05-16-7-8 and S-05-16-14-16 surrogates were not recovered due to dilutions; however, no action is necessary.
(11) LCS KRM32-14 aniline and benzidine recoveries were low. LCS KRM32-26 benzidine recovery was high. However, no action is necessary because these analytes were not reported in the related samples.
(12) MS and MSD recoveries were out for the sample S-05-16-1-3 for 2-chlorophenol, 2-methylphenol, bis(2-chloroisopropyl)e, 3 & 4 methylphenol, hexachloroethane, nitrobenzene, isophorone, 2-nitrophenol, 2,4-dimethylphenol, bis(2-chloroethoxy)meth, 2,4-dichlorophenol, 1,2,4-trichlorobenzene, naphthalene, hexachlorobutadiene, 2-methylnaphthalene, 4,6-dinitro-2-methylphe, benzo(a)pyrene, 4-nitrophenol, phenol, and n-nitroso-di-n-prop. due to matrix interference and no action is necessary. MS and MSD recoveries were out for the sample S-04-26-1-3 for hexachlorocyclopentadiene, phenanthrene, flouranthene, pyrene, benzo(a)anthracene,

COMMENT 12 (CONTINUED):
chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd) pyrene, benzo(g,h,i)perylene, bis(2-chloroethyl)ether, 1,3-dichlorobenzene, 1-4 dichlorobenzene, 1,2-dichlorobenzene, bis(2-chloroisopropyl)e, hexachloroethane, isophorone, 2-nitrophenol, 2,4-dimethylphenol, bis(2-chloroethoxy)meth, 1,2,4-trichlorobenzene, naphthalene, hexachlorobutadiene, 2-methylnaphthalene, 2,4,6-trichlorophenol, 2-chloronaphthalene and pyrene. However, no action is necessary because all other QA/QC criteria were in.
(14) Samples S-05-16-1-3, S-05-16-7-8 and S-05-16-14-16 were diluted by 10 times. However, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388697, S388732, S388784, S388818, S388861 & S388687
NO. OF SAMPLES/
MATRIX 12/7 soil & 5 aqueous (including 5 trip blanks)

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/15/04

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270	Herbicides Meth # 8151
1. HOLDING TIMES	(1)	✓	✓
2. BLANKS	✓	✓	✓
3. SURROGATES	✓	(6)	(11)
4. SCS (LCS)	(2)	(7)	✓
5. DCS (LSCD)	N/A	N/A	N/A
6. MATRIX SPIKE/DUP	(3)	(8)	(12)
7. DILUTIONS	(4)	(9)	✓
8. DUPLICATES	N/A	N/A	N/A
9. INTERNAL STANDARDS	✓	(10)	N/A
10. OTHER	(5)	N/A	N/A
11. OVERALL ASSESSMENT	O	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples LF-3-1-18-20, LF-4-2-18-20, and LF-2-1-18-20 were extracted outside of holdtime. Therefore, these samples were qualified as estimated "J" and estimated non-detect "UJ".
(2) LCS KRM33-23 had low % recovery for 1,1-dichloroethene. Therefore, 1,1-dichloroethene in the associated sample LF-1-1-18-20 was qualified as estimated non-detect "UJ". LCS KRM33-26 had low % recovery for 4-methyl-2-pentanone and 2-hexanone. Therefore, these analytes in the associated samples LF-4-2-18-20 and CT-2a-1-13-15 were qualified as estimated non-detect "UJ". LCS KRM33-38 had low % recovery for 4-methyl-2-pentanone. Therefore, this analyte was qualified as estimated non-detect "UJ" in the associated sample CT-26-1-13-15.

ACTIONS (CONTINUED):
(3) The MS and MSD samples had low % recovery for acetone. Therefore, the parent sample LF-1-1-18-20 was qualified as estimated "J" for this analyte.
(10) Sample LF-4-2-18-20* had low internal standard results for 1,4-dichlorobenzene-d4, naphthalene-d8, and acenaphthene-d10. The reanalysis of this sample had low internal standards for 1,4-dichlorobenzene-d4 and naphthalene-d8. Therefore, all analytes in these samples were qualified as estimated "J" or estimated non-detect "UJ".

* Data from this sample has not been used.

COMMENTS: (4) Samples LF-4-2-18-20, CT-2a-1-13-15, and CT-26-1-13-15 were diluted by 40 times. However, no action is necessary.
(5) Samples LF-3-1-18-20, LF-4-1-18-20, and LF-2-1-18-20 were reanalyzed from their Encore B vials after poor initial purging. Because reanalyses were also not acceptable, these samples were analyzed from their bulk containers. However, no action is necessary.
(6) The diluted analysis of sample LF-4-1-18-20 had 0 % recoveries of all surrogates due to dilution. However, no action is necessary because this was a diluted sample.
(7) LCSs KRM33-1, KRM33-26 and KRM33-29 had high % recoveries of benzidine. However, no action is necessary because this analyte was not analyzed for in submitted samples.
(8) The MS sample with parent sample LF-1-1-18-20 had low % recovery of benzoic acid. The MSD sample had low % recovery of benzoic acid and 2,4-dinitrophenol. The RPD for 2,4-dinitrophenol was also high. However, no action is necessary because benzoic acid was not analyzed for and no action is taken on MS/MSD data alone. Results from three other MS/MSD analyses were included. In these samples % recoveries were outside limits for a number of analytes and some RPDs were also high. However, no action is needed because these samples do not relate to any submitted samples.
(9) Sample LF-4-1-18-20 was analyzed at a secondary dilution of 5 times.
(11) Recovery of surrogate 2,4-DCAA in sample LF-4-2-18-20 was high. However, no action is needed because no analytes were detected in this sample.
(12) The MS sample with parent sample LF-1-1-18-20 had a high % recovery for dichloroprop and high RPDs for MCPA, dichloroprop, 2,4-D, 2,4,5-T, and 2,4-DB. However, no action is necessary because dichloroprop was not detected in the parent sample, data is not qualified based only on RPDs, and data is not qualified based on MS/MSD results alone.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000 SITE WG Krummrich – Sauget, IL
LABORATORY STL- Savannah
LABORATORY NO. S388697, S388732, S388784 REVIEWER URS Corporation
S388818 & S388861
NO. OF SAMPLES/ REVIEWER'S NAME K. Fletcher
MATRIX 7/7 soil COMPLETION DATE 04/15/04

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010	Mercury Meth # 7471
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. DUPLICATES	✓	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(1+2)	(5)
7. DILUTIONS	(3+4)	(6)
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) The MS/MSD samples with parent sample LF-1-1-18-20 had low % recoveries for antimony and the MSD sample had a high % recovery for potassium. Therefore, in the parent sample these analytes were qualified as estimated non-detect "UJ" and estimated "J".
(3) In the serial dilution for sample LF-3-1-18-20 chromium, copper, nickel, and zinc had % differences greater than 10%. Therefore, these analytes were qualified in this sample as "J".

COMMENTS:
(2) The % recoveries from two MS/MSD samples unrelated to analyzed samples were outside of limits for a number of analytes including antimony, sodium, manganese, potassium, copper, and chromium. However, no action is necessary because these samples were unrelated to submitted samples. Some % recoveries for MS/MSD sample LF-1-1-18-20 were out. However, no action is necessary since sample results were 4 times greater than the spikes added.
(4) Several serial dilutions % D were greater than 10%; however, no action is necessary because the initial sample results were not greater than 50 times the MDL.

COMMENTS (CONTINUED):
(5) The % recoveries from MS/MSD sample ZZZZZ-2S were out. However, no action is needed because the sample result was 4 times greater than the spike added and the MS/MSD is unrelated to our samples.
(6) Mercury serial dilutions % D were greater than 10%; however no action is necessary because the initial sample results were not greater than 50 times the MDLs.

KRM 33A

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388697A, S388732A, S388784A, S388818A & S388861A
NO. OF SAMPLES/
MATRIX 7/7 soil

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/25/04

DATA ASSESSMENT WORKSHEET

	Dioxins Meth # 8280
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	✓
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	✓
7. DILUTIONS	✓
8. DUPLICATES	N/A
9. INTERNAL STANDARDS	N/A
10. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS:

COMMENTS:

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
SITE WG Krummrich – Sauget, IL
LABORATORY STL- Savannah
LABORATORY NO. S388696
REVIEWER URS Corporation
NO. OF SAMPLES/
REVIEWER'S NAME K. Fletcher
MATRIX 19/17 soils + 2 aqueous including 1 trip blank
COMPLETION DATE 03/08/04

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	(5)
2. BLANKS	✓	✓
3. SURROGATES	(1)	(6+7)
4. SCS (LCS)	✓	(8)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(2)	(9)
7. DILUTIONS	(3)	(10)
8. DUPLICATES	✓	(11)
9. INTERNAL STANDARDS	(4)	(12)
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Surrogate recovery of p-bromofluorobenzene in sample S-07-16-1-3 was low. Therefore, all analytes in this sample were qualified as estimated (J) or estimated non-detect (UJ).
(4) In samples S-07-16-1-3 and S-07-14-1-3-D* internal standards of 1,4-difluorobenzene and chlorobenzene – d5 were low. In the reanalyzed sample of S-07-16-1-3* internal standards of 1,2-dichloroethane-d4 as well as the other two internal standard compounds were low. In the reanalyzed sample of S-07-14-1-3-D the internal standard of chlorobenzene-d5 was also low. Therefore, all analytes in these samples were qualified as estimated (J) or estimated non-detect (UJ).
(5) The second reanalysis of S-4-29-14-16* was extracted grossly outside of holdtime (more than 28 days after sample collection). Therefore, all analytes in this sample were rejected (R).
(6) Surrogate recoveries of S-4-29-14-16* were low for bases nitrobenzene-d5 and fluorobiphenyl. In the reanalysis of S-4-29-14-16, recoveries were low for 2-fluorobiphenyl and terphenyl-d14. Therefore, all the base/neutral compounds in these samples were qualified as estimated non-detect (UJ).

ACTIONS (CONTINUED):
(11) The difference between results of fluoranthene in samples S-07-14-1-3 and its field duplicate S-07-14-1-3-D was greater than 3.5 times the reporting limit. Therefore these analytes were qualified as estimated (J) in both samples.
(12) Sample S-07-20-14-16* had low internal standards for 1,4-dichlorobenzene-d4, naphthalene-d8, acenaphthene-d10, phenanthrene-d10, chrysene-d12 and perylene-d12. The reanalysis of this sample had low internal standards for phenanthrene-d10. Sample S-07-14-1-3 had low internal standards for all analytes except 1,4-dichlorobenzene-d4 and perylene-d12. The reanalysis of this sample* had low internal standards for all analytes except chrysene-d12 and perylene-d12. Sample S-07-14-10-12 had low internal standards for naphthalene-d8, acenaphthene-d10, and phenanthrene-d10. The reanalysis of this sample* had low internal standards for the same analytes excluding naphthalene-d8. Sample S-4-29-1-3 had low internal standards for 1,4-dichlorobenzene-d4, naphthalene-d8, and acenaphthene-d10. The reanalysis of this sample* had matching results. Sample S-4-29-6-8* had low internal standards for naphthalene-d8, acenaphthene-d10, and phenanthrene-d10. The reanalysis of this sample had a low internal standard for phenanthrene-d10. Sample S-4-29-14-16* had low internal standards for all compounds. The reanalysis of this sample had a low internal standard for phenanthrene. Sample S-07-16-6-8* had low internal standards for all compounds except 1,4-dichlorobenzene and naphthalene. The reanalysis of this sample had low internal standards for naphthalene-d8, acenaphthene-d10, and phenanthrene-d10. Sample S-07-17-1-3 had low internal standards for all compounds except perylene-d12. The reanalysis of this sample* had low internal standards for all compounds except chrysene-d12 and perylene-d12. Therefore, for all of these samples, all analytes were qualified as estimated (J) or estimated non-detect (UJ).

COMMENTS: (2) The MSD sample had high % recoveries of 2-hexanone and dibromochloromethane. However, these compounds were not detected in the associated sample (S-07-20-1-3), and no action is necessary.
(3) Sample S-07-16-14-16 was diluted by 40 times due to the abundance of chlorobenzene. However, no action is necessary.
(7) Sample S-07-14-14-16 had 0% surrogate recoveries for 2-fluorophenol, phenol-d5, nitrobenzene-d5, 2-fluorobiphenyl, and tribromophenol. However, no action is necessary because this sample was diluted. In the second reanalysis of S-4-29-14-16,* surrogate recovery of nitrobenzene-d5 was low. However, no action is necessary because this was the only base surrogate outside of recovery limits.
(8) The LCSs relating to method blanks KRM34-1 and KRM34-23 had high % benzidine recoveries. The LCS relating to method blank KRM34-18 had low aniline and benzidine % recoveries. However, no action is necessary because these compounds were not analyzed in the related samples.
(9) The MS and MSD samples relating to parent sample S-07-20-1-3 had low % recoveries of benzidine. However, no action is necessary because this compound was not analyzed in the parent sample. The other MS sample presented in this SDG had a low recovery of benzoic acid. The MSD sample had a low recovery of benzoic acid and 2,4-dinitrophenol. However, no action is necessary because this sample has no parent sample within this SDG.
(10) Sample S-07-14-14-16 was diluted by 5 times. However, no action is necessary.

* Data from this sample has not been used.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388696
NO. OF SAMPLES/
MATRIX 18/17 soils + 1 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 03/08/04

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010	Mercury Meth # 7471
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. DUPLICATES	(2+3)	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(4)	✓
7. DILUTIONS	(5)	(6)
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (2) Field duplicate results for arsenic in samples S-07-17-14-16 and S-07-17-14-16D had a difference greater than 3.5 times the reporting limit. Therefore in these samples, arsenic was qualified as estimated (J).
(3) The laboratory duplicate analysis of sample S-07-20-1-3SD had high RPDs for antimony, iron, lead and sodium. However, no action is necessary because the duplicate analysis was run on a spiked sample.
(4) In the MS sample, potassium and sodium % recoveries were greater than 125%. In the MSD sample, antimony and sodium % recoveries were below 75% and magnesium % recovery was greater than 125%. Therefore, all of these analytes were qualified as estimated (J) in the parent sample, S-07-20-1-3. For the same MS/MSD sample there were other % recoveries that were out. However, no action is necessary since the initial sample concentrations were greater than 4 times the spikes added.

COMMENTS: (1) Aluminum, iron, and zinc were detected in equipment blank S-4-29-EB. However, no action is needed because the concentrations of these analytes in the associated sample (S-4-29-1-3) were greater than 10 times the equipment blank concentrations.

COMMENTS (CONTINUED):
(5) Sample S-07-16-1-3 analysis was diluted by 5 times for the antimony, arsenic, cadmium, calcium, copper, iron, lead, thallium, and vanadium analysis. Sample S-07-17-1-3 was diluted by 2 times for the analysis of lead and diluted by 5 times for the analysis of zinc. However, no action is needed. In the serial dilution of S-4-29-EB, the % D of aluminum was greater than 10% and the sample concentration was greater than 50 times the MDL. However, no action is needed because this is a QA/QC sample. Also, in the serial dilution of S-07-20-1-3, the % Ds of antimony, arsenic, beryllium, cobalt, silver and sodium were greater than 10%. However, no action is needed because the sample concentrations were not greater than 50 times the MDLs.
(6) Sample S-07-17-1-3 was diluted by 5 times; however, no action is needed. In addition, the mercury serial dilution % D was greater than 10%. However, no action is necessary because the initial sample result was not greater than 50 times the MDL.

KRM 35

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388698
NO. OF SAMPLES/
MATRIX 8/7 soil & 1 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 4/16/04

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	(1)
4. SCS (LCS)	✓
5. DCS (LSCD)	✓
6. MATRIX SPIKE/DUP	(2)
7. DILUTIONS	(3)
8. DUPLICATES	(4)
9. INTERNAL STANDARDS	(5)
10. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (4) The field duplicate of sample S-08-10-1-2, S-08-10-1-2-D, had high % RPDs of arochlor-1248 and arochlor-1254. Therefore, these analytes were qualified as estimated "J" in these samples.

COMMENTS: (1) Samples S-08-04-1-2, S-08-06-3-4, S-08-06-3-4-D, S-08-08-3-4, S-08-10-1-2, S-08-10-1-2-D, S-08-13-1-2, and the secondary dilutions of S-08-04-1-2 and S-08-10-1-2-D had 0 % recovery of all surrogates. However, no action is necessary because these samples were diluted. Sample S-08-13-1-2-EB had high % recovery of tetrachloro-m-xylene. However, no action is necessary because no analytes were detected and this is a QA/QC sample.
(2) The MS/MSD was performed with parent sample S-08-04-1-2 and all spiking compounds were diluted out. However, no action is necessary because action is not taken on MS/MSD data alone.

COMMENTS (CONTINUED):
(3) Samples S-08-06-3-4 and S-08-06-3-4-D were diluted by 100 times. Samples S-08-08-3-4, S-08-10-1-2, and S-08-04-1-2 were diluted by 500 times. Samples S-08-10-1-2-D and the secondary dilution of S-08-04-1-2 were diluted by 1,000 times. The secondary dilution of S-08-10-1-2-D was diluted by 4,000 times and sample S-08-13-1-2 was diluted by 10,000 times. However, no action is necessary.
(5) Samples S-08-06-3-4 and S-08-06-3-4-D had high internal standard results for bromonitrobenzene in the first channel. Results were reported from the second channel; therefore, no action is necessary. Samples S-08-10-1-2-D, S-08-10-1-2 and the secondary dilution of S-08-10-1-2-D had high internal standards results for bromonitrobenzene in the second channel. Results were reported from the first channel; therefore, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388734
NO. OF SAMPLES/
MATRIX 15/13 soils + 2 aqueous includes 1 trip blank and 1 equipment blank

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 03/16/04

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	(1)	(7)
2. BLANKS	✓	✓
3. SURROGATES	(2)	(8)
4. SCS (LCS)	(3)	(9)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(4)	(10+11)
7. DILUTIONS	(5)	(12)
8. DUPLICATES	✓	✓
9. INTERNAL STANDARDS	✓	(13)
10. OTHER	(6)	✓
11. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples S-07-15-1-3, S-07-15-6-8DL*, S-07-19-14-16 were extracted 1 day past hold time. Therefore, all detected compounds were qualified as estimated (J) and non-detects were qualified as estimated non-detect (UJ).
(3) The LCS relating to method blank KRM37-23 had a low recovery of 4-methyl-2-pentanone (MIBK). The LCS relating to m.b. KRM 37-29 had low recoveries of MIBK and 2-hexanone. The method blank KRM37-23 relates to samples S-07-15-6-8, S-07-18-10-12, S-07-18-14-16, S-12-12-0-2, S-12-12-6-8, S-12-12-14-16, S-07-19-1-3, S-07-19-10-12, S-07-19-10-12-D and the MS and MSD samples. The method blank KRM37-29 relates to samples S-07-15-1-3, the 100 times dilution of S-07-15-6-8 and S-07-19-14-16. Therefore, related samples except QA/QC samples had MIBK and 2-hexanone qualified as estimated non-detect (UJ).
(7) The reanalysis of S-07-19-14-16* was extracted grossly outside of holdtime (more than 28 days after sample collection). Therefore, all analytes in this sample were qualified as estimated (J) or rejected (R).

ACTIONS (CONTINUED):
(10) The MS and MSD samples relating to parent sample S-12-12-0-2 had 0% recovery for 1,4-dichlorobenzene, 1,2-dichlorobenzene, and hexachlorocyclopentadiene. Therefore in sample S-12-12-0-2 (and its diluted sample*) these compounds were qualified as estimated (J) or estimated non-detect (UJ).
(13) Sample S-07-15-14-16* had low internal standards for naphthalene-d8 and acenaphthene-d10. The reanalysis of this sample had low internal standards for acenaphthene-d10 and phenanthrene-d10. Sample S-07-19-14-16 had low internal standards for chrysene-d12 and perylene-d12. Therefore, all compounds in these samples were qualified as estimated (J) or estimated non-detect (UJ).

COMMENTS: (2) In samples S-07-18-10-12, S-07-19-10-12, and S-07-19-10-12-D surrogates were not recovered due to dilutions. However, no action is needed.
(4) In the MS and MSD samples chloroethane % recoveries were low and chlorobenzene % recoveries were high. In the MS sample dibromochloromethane % recovery was high. In the MSD sample benzene % recovery was low and tetrachloroethene and bromoform recoveries were high. However, no action is necessary because these analytes were not flagged in other QA/QC criteria.
(5) Samples S-07-15-1-3 and S-07-19-1-3 were diluted by 40 times. Samples S-07-19-14-16 and S-12-12-0-2 were diluted by 100 times. Samples S-07-18-14-16, S-12-12-6-8 and S-12-12-14-16 were diluted by 1000 times. Samples S-07-19-10-12 and S-07-19-10-12-D were diluted by 2000 times. Sample S-07-18-10-12 was diluted by 10,000 times. Sample S-07-15-6-8 was diluted by 40 and 100 times. However, no action is necessary.
(6) The % RSD in the initial calibration for total xylenes in batch 2B1024A was high. However, no action is necessary because the RSD % is less than 30% and the average % RSD of all compounds was less than 15%.
(8) In sample S-07-19-14-16 surrogate recovery of 2-fluorobiphenyl was low; however no action is needed because this is the only base surrogate outside of criteria. In samples S-07-15-6-8, S-07-19-1-3, S-07-19-10-12 (and its dilution*), S-07-19-10-12-D (and its dilution*), S-12-12-6-8 (diluted*), S-12-12-0-2 (diluted*), and S-07-18-10-12 all or some surrogates had 0% recovery; however, no action is needed because these samples were diluted.
(9) The LCS sample relating to m.b. KRM37-18 had a low % recovery for benzidine. However, no action is necessary because this compound was not analyzed for in related samples.
(11) The MS and MSD samples (not related to our samples) had low % recoveries for bis(2-chloroethyl)ether, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 2-methylphenol, bis(2-chloroisopropyl)ether, 3&4-methylphenol, hexachloroethane, isophorone, 2-nitrophenol, 2,4-dimethylphenol, bis(2-chloroethoxy)methane, naphthalene, hexachlorobutadiene, 2-methyl-naphthalene, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, 2-chloronaphthalene, and acenaphthene. The MS sample had low % recoveries for nitrobenzene, 2,4-dichlorophenol, 1,2,4-trichlorobenzene, 2,6-dinitrotoluene, acenaphthylene, and 4-chlorophenyl-phenylet. However, no action is needed because these samples do not relate to our samples. The MS and MSD samples related to sample S-12-12-0-2 had low % recoveries of 1,2,4-trichlorobenzene and pyrene; however, no action is needed.
(12) Sample S-12-12-0-2 was diluted by 2 times. Samples S-07-18-10-12 and S-07-19-1-3 were diluted by 4 times. Sample S-07-15-6-8 was diluted by 5 times. Sample S-12-12-6-8 was diluted by 100 times. Samples S-07-19-10-12 and S-07-19-10-12-D were diluted by 200 and 1,000 times respectively; however, no action is needed.

* Data from this sample has not been used.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388734
NO. OF SAMPLES/
MATRIX 14/13 soils and 1 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 03/16/04

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010	Mercury Meth # 7471
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. DUPLICATES	(2+3)	(7+8)
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(4)	(9)
7. DILUTIONS	(5+6)	(10)
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (2) The RPDs of aluminum, barium, calcium, iron, lead, magnesium, manganese, vanadium, and zinc between samples S-07-19-10-12 and S-07-19-10-12-D were greater than 100% and all the results were 5 times greater than the RL. Arsenic, cadmium, chromium, copper, nickel, and potassium results had a difference greater than 3.5 times the RL and results in at least one sample for each analyte were below 5 times the RL. Therefore, all of these analytes were qualified as estimated (J) or estimated non-detect (UJ) in samples S-07-19-10-12 and S-07-19-10-12-D.
(4) In MS and MSD samples, with parent sample S-12-12-0-2, % recoveries were outside of limits for antimony, cadmium, copper, lead, manganese, vanadium, and zinc. In the MSD sample, the % recovery for potassium was outside of criteria. Therefore in sample S-12-12-0-2, these analytes were qualified as estimated (J) or estimated non-detect (UJ). Other MS/MSD % recoveries were out. However, no action is necessary because the initial sample concentrations were greater than 4 times the spikes added.
(5) In the serial dilution of sample S-07-18-1-3, aluminum, barium, copper, lead and vanadium % Ds were high. Therefore, these analytes were qualified as estimated (J) in sample S-07-18-1-3.
(7) In the field sample and duplicate S-07-19-10-12 and S-07-19-10-12-D the difference between the sample results was greater than 3.5 times the RL and the sample concentration was less than 5 times the RL. Therefore, mercury was qualified as estimated (J) in both samples.

COMMENTS: (1) Iron was detected in equipment blank S-07-18-1-3-EB. However, no action is necessary because in the associated sample, S-07-18-1-3, iron was detected at a concentration greater than 10 times the equipment blank result. Iron was also detected in a preparation blank. However, no action is necessary because all sample results were 10 times greater than the preparation blank result.
(3) Laboratory duplicate analysis of sample S-12-12-0-2SD had high RPDs for aluminum, antimony, iron, magnesium, and manganese. However, no action is necessary because the duplicate analysis was run on a spiked sample.
(6) Sample S-12-12-0-2 was diluted by 5 times for the analysis of calcium and sample S-07-19-10-12-D was diluted by 5 times for the analysis of lead. However, no action is necessary. In addition, several serial dilutions % Ds were >10 %. However, no action is necessary because the initial sample results were not greater than 50 times the MDL.
(8) Laboratory duplicate analysis of sample S-12-12-0-2SD had a high RPD for mercury; however, no action is necessary because the duplicate analysis was run on a spike sample.
(9) In MS and MSD samples with parent sample S-12-12-02 % recoveries were out; however, no action is necessary because the sample concentrations were greater than 4 times the spikes added.
(10) Samples S-07-15-1-3, S-12-12-0-2, S-07-19-1-3, and S-07-19-10-12-D were diluted by 10 times for the analysis of mercury; however, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388785
NO. OF SAMPLES/
MATRIX 23/20 soils + 3 aqueous including 1 trip blank

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/06/04

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	(1)	✓
2. BLANKS	(2)	✓
3. SURROGATES	(3+4)	(10)
4. SCS (LCS)	(5+6)	(11)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(7)	(12)
7. DILUTIONS	(8)	(13)
8. DUPLICATES	✓	✓
9. INTERNAL STANDARDS	(9)	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) The reanalysis of sample S-06-10-1-3* was analyzed two days outside of hold time; therefore, all analytes in this sample were qualified as estimated (J) or estimated non-detect (UJ).
(2) Chloromethane was detected in method blank KRM38-29. Therefore, the associated chloromethane result in sample S-06-10-1-3 less than 5 times the method blank result was qualified as non-detect (U).
(4) In sample S-04-28-1-3, surrogate recovery of dibromofluoromethane was high. In sample S-06-10-14-16, surrogate recoveries of toluene-d8 and p-bromofluorobenzene were high. Therefore, all detected analytes in these samples were qualified as estimated (J).
(5) LCS sample KRM38-23 had low % recoveries for 4-methyl-2-pentanone and 2-hexanone. The related samples, S-06-07-1-3, S-06-07-9-11, S-06-07-14-16, S-06-06-14-16-D, S-04-28-1-3DL*, S-06-09-6-8, S-06-09-14-16, S-06-08-1-3, and S-06-08-8-10 were qualified as estimated non-detect (UJ) for these analytes. LCS sample KRM38-29 had low % recoveries for bromomethane and 4-methyl-2-pentanone. The related samples, S-

ACTIONS (CONTINUED):
04-28-6-8, S-04-28-14-16, S-06-09-1-3, S-06-10-10-12DL*, S-04-28-14-16DL*, and S-06-10-1-3 were qualified as estimated non-detect (UJ) for these analytes. LCS sample KRM38-32 had low % recovery for 1,1-dichloroethene. The related compound in sample S-06-06-14-16 was qualified as estimated non-detect (UJ).
(9) Sample S-06-10-14-16* had low internal standards for chlorobenzene-d5. Therefore, all non-detect results were qualified as estimated non-detect (UJ). (All detected analytes were qualified in action 4.)

COMMENTS:
(3) Samples S-04-28-6-8 and S-04-28-14-16 and diluted analyses of samples S-06-07-1-3*, S-06-07-9-11*, S-06-07-14-16*, S-04-28-14-16*, and S-06-10-14-16 had 0% recovery for all 3 surrogates due to dilutions, dibromofluoromethane, toluene-d8, and p-bromofluorobenzene. However, no action is necessary because these samples were diluted.
(6) LCS sample KRM38-1 had high % recoveries for chloromethane and chloroform. However, no action is needed because the associated sample, S-04-28-1-3, was non-detect for these analytes.
(7) The MSD % recovery for benzene was low. However, no action is necessary because the MS % recovery was within limits.
(8) Samples S-06-06-1-3, S-06-06-6-8, S-06-06-14-16-D, S-06-09-6-8, S-06-09-14-16, S-06-08-1-3, S-06-08-8-10, S-06-08-8-10-D, S-06-08-14-16, S-06-10-1-3, S-06-10-10-12, and S-06-10-14-16* were diluted by 40 times in the original sample. Sample S-06-10-10-12 was then diluted by 100 times* and sample S-06-10-14-16 was diluted by 200,000 times. Sample S-04-28-1-3* was diluted by 40 times after original analysis. The original sample of S-06-09-1-3 was diluted by 100 times. The original samples of S-06-07-1-3, S-06-07-9-11, and S-06-07-14-16 were diluted by 200 times. Samples S-06-07-9-11* and S-06-07-14-16* were then diluted by 4,000 times. Sample S-06-07-1-3DL* was then diluted by 10,000 times. The original sample S-04-28-14-16 was diluted by 1,000 times and then 2,000* times. The original sample S-04-28-6-8 was diluted by 10,000 times. However, no action is necessary.
(10) The diluted analysis of S-06-06-14-16-D* had 0% surrogate recoveries for nitrobenzene-d5, 2-fluorobiphenyl, and terphenyl-d14. The diluted analysis of S-06-08-8-10* had 0% surrogate recoveries for all surrogates except 2-fluorobiphenyl. The diluted analysis of S-06-08-1-3* had 0% recoveries for all surrogates except 2,4,6-tribromophenol. The diluted analysis of S-06-08-8-10-D* had 0% recoveries for all surrogates. However, no action is needed because these samples were diluted. Therefore, surrogates were not recovered.
(11) LCS KRM38-1 had high % recovery of benzidine. LCS KRM38-18 had low % recovery of benzidine. However, no action is necessary because this analyte was not analyzed for in any of our samples.
(12) MS and MSD % recoveries of hexachlorocyclopentadiene were low and the RPD was high. MSD % recovery of benzidine was low and the RPD was high. However, no action is needed because no action is taken on MS/MSD data alone and benzidine was not analyzed for in our samples.
(13) Samples S-06-06-14-16-D and S-06-08-1-3 were diluted by 4 times*. Samples S-06-08-8-10 and S-06-08-8-10-D were diluted by 50 times*. However, no action is necessary.

*Data from this sample has not been used.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388785
NO. OF SAMPLES/
MATRIX 22/20 soils + 2 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/06/04

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010	Mercury Meth # 7471
1. HOLDING TIMES	✓	✓
2. BLANKS	(1+2)	✓
3. DUPLICATES	(3)	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(4+5)	✓
7. DILUTIONS	(6+7)	(9)
8. OTHER	(8)	✓
9. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Barium was detected in equipment blank S-06-07-1-3-EB with a concentration of 92 µg/l. Therefore, the related barium concentration of 53 mg/kg in sample S-06-07-1-3 was qualified non-detect (U) since this concentration is not 10 times greater than the equipment blank barium detection.
(4) MS and MSD % recoveries were low for antimony and high for potassium. MSD % recovery was high for cadmium and sodium and low for silver. Therefore, antimony, cadmium, potassium, silver, and sodium were qualified as estimated (J) in the parent sample S-06-10-1-3.
(6) In the serial dilution of S-04-28-1-3, chromium, cobalt, and zinc had high % differences. Therefore, these analytes were qualified as estimated (J) in sample S-04-28-1-3.

COMMENTS: (2) Iron was detected in equipment blank S-06-07-1-3-EB and barium, iron, and sodium were detected in equipment blank S-06-09-1-3-EB; however, no action is needed because the associated sample concentrations were greater than 10 times these results.

COMMENTS (CONTINUED):
(3) Laboratory duplicate analysis of sample S-06-10-1-3SD had high RPDs for calcium and iron; however, no action is necessary because the duplicate analysis was run on a spiked sample.
(5) MS and MSD % recoveries were out for aluminum, calcium, copper, iron, lead, magnesium, and zinc. MSD % recovery was also out for manganese. However, no action is necessary because the sample concentrations were 4 times greater than the spikes added.
(7) Samples S-06-07-9-11, S-06-08-1-3, and S-06-10-1-3 were diluted by 5 times for the analysis of calcium. Sample S-06-10-1-3 was also diluted by 5 times for the analysis of lead. However, no action is needed. Several ICP serial dilutions % D were greater than 10% for samples S-06-07-1-3-EB and S-04-28-1-3. However, no action is necessary because the initial sample concentrations were not 50 times the MDL.
(8) The continuing calibration verification % recovery for potassium was high associated with sample S-06-07-1-3EB. However, no action is needed because the associated sample result was non-detect and this is a QA/QC sample. In the continuing calibration verification associated with the first analysis of samples, the lead % recovery was outside of limits. However, no action is necessary because all samples were reanalyzed.
(9) Samples S-06-06-1-3 and S-06-10-1-3 were diluted by 5 times and samples S-06-09-1-3 and S-06-08-1-3 were diluted by 20 times for the analysis of mercury. However, no action is needed. The ICP serial dilution % D was greater than 10%. However, no action is necessary because the initial sample concentration was not 50 times the MDL.

KRM40

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388820
NO. OF SAMPLES/
MATRIX 7/7 soils

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/06/04

DATA ASSESSMENT WORKSHEET

	Mercury Meth # 7471
1. HOLDING TIMES	✓
2. BLANKS	✓
3. DUPLICATES	✓
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	(1)
7. DILUTIONS	(2+3)
8. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS:

COMMENTS: (1) The MSD % recovery was high; however, no action is necessary because the related sample is not included in this SDG.
(2) Samples S-09-21-13-14 and S-09-22-7-8 were diluted by 5 times. Sample S-09-23-13-14 was diluted by 10 times. Sample S-09-24-7-8 was diluted by 100 times. Samples S-09-23-7-8 and S-09-24-13-14 were diluted by 500 times. However, no action is necessary.
(3) Sample S-09-22-13-14 serial dilution % difference (D) was greater than 10%; however, no action is necessary because the initial sample result was not greater than 50 times the MDL.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388911, S388911A, S388862B, S388976B
NO. OF SAMPLES/ MATRIX 18/18 soils

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 4/29/04

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	(1+2)
4. SCS (LCS)	✓
5. DCS (LSCD)	NA
6. MATRIX SPIKE/DUP	(3)
7. DILUTIONS	(4)
8. DUPLICATES	(5)
9. INTERNAL STANDARDS	(6)
10. OTHER	(7)
11. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples S-08-19-5-6-D, S-08-19-5-6 and S-08-27-5-6 had high surrogate recoveries. Therefore, detected compounds were qualified as estimated (J).
(5) Samples S-08-25-1-2 and S-08-25-1-2-D did not comply with the duplicate criteria for aroclor-1248 (the difference was greater than 3.5 times the RL) and aroclor -1254 (173 % difference between the original and the duplicate sample). Therefore, these analytes were qualified in both samples as estimated (J) and estimated non-detect (UJ).

COMMENTS: (2) Samples S-12-11-14-16, S-08-19-9-10, S-08-23-5-6, S-08-25-1-2, S-08-25-5-6, S-08-25-9-10, S-08-26-9-10, S-08-26-9-10-D, S-08-27-1-2, S-08-30-5-6, S-12-07-1-3, S-12-07-8-10, S-12-07-14-16, S-08-25-1-2-D, S-08-22-9-10 surrogates were not recovered due to dilutions. However, no action is necessary.
(3) MS/MSD % recoveries were not recovered in sample S-08-25-1-2 due to dilutions; however, no action is necessary.
(4) Samples S-08-22-9-10, S-12-11-14-16, S-08-19-9-10, S-08-23-5-6, S-08-25-1-2, S-08-25-5-6, S-08-25-5-6RE, S-08-25-9-10, S-08-25-9-10RE, S-08-25-1-2-D, S-08-25-1-2-DRE, S-08-26-9-10, S-08-26-9-10-D, S-08-27-1-2, S-08-30-5-6, S-12-07-1-3, S-12-07-8-10 and S-12-07-14-16 were diluted by 10 to 10,000 times; however, no action is necessary.
(6) The internal standard IS1 bromonitrobenzene was out for sample S-08-25-5-6 for the second channel. However, the data was reported from the first channel and no action is necessary.
(7) Several individual % Ds were higher than 15%; however, the average % D for all peaks was within evaluation criteria and no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388911, S388911A, S388862B, S388976B
NO. OF SAMPLES/ MATRIX 18/18 soils

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 4/29/04

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	(1+2)
4. SCS (LCS)	✓
5. DCS (LSCD)	NA
6. MATRIX SPIKE/DUP	(3)
7. DILUTIONS	(4)
8. DUPLICATES	(5)
9. INTERNAL STANDARDS	(6)
10. OTHER	(7)
11. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples S-08-19-5-6-D, S-08-19-5-6 and S-08-27-5-6 had high surrogate recoveries. Therefore, detected compounds were qualified as estimated (J).
(5) Samples S-08-25-1-2 and S-08-25-1-2-D did not comply with the duplicate criteria for aroclor-1248 (the difference was greater than 3.5 times the RL) and aroclor -1254 (173 % difference between the original and the duplicate sample). Therefore, these analytes were qualified in both samples as estimated (J) and estimated non-detect (UJ).

COMMENTS: (2) Samples S-12-11-14-16, S-08-19-9-10, S-08-23-5-6, S-08-25-1-2, S-08-25-5-6, S-08-25-9-10, S-08-26-9-10, S-08-26-9-10-D, S-08-27-1-2, S-08-30-5-6, S-12-07-1-3, S-12-07-8-10, S-12-07-14-16, S-08-25-1-2-D, S-08-22-9-10 surrogates were not recovered due to dilutions. However, no action is necessary.
(3) MS/MSD % recoveries were not recovered in sample S-08-25-1-2 due to dilutions; however, no action is necessary.
(4) Samples S-08-22-9-10, S-12-11-14-16, S-08-19-9-10, S-08-23-5-6, S-08-25-1-2, S-08-25-5-6, S-08-25-5-6RE, S-08-25-9-10, S-08-25-9-10RE, S-08-25-1-2-D, S-08-25-1-2-DRE, S-08-26-9-10, S-08-26-9-10-D, S-08-27-1-2, S-08-30-5-6, S-12-07-1-3, S-12-07-8-10 and S-12-07-14-16 were diluted by 10 to 10,000 times; however, no action is necessary.
(6) The internal standard IS1 bromonitrobenzene was out for sample S-08-25-5-6 for the second channel. However, the data was reported from the first channel and no action is necessary.
(7) Several individual % Ds were higher than 15%; however, the average % D for all peaks was within evaluation criteria and no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388696A, S388862C, S388862C
NO. OF SAMPLES/ MATRIX 7/7 soils

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/20/04

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	(1)
2. BLANKS	✓
3. SURROGATES	(2+3)
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	✓
7. DILUTIONS	(4)
8. DUPLICATES	(5)
9. INTERNAL STANDARDS	✓
10. OTHER	(6)
11. OVERALL ASSESSMENT	M

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples S-07-20-1-3*, S-07-14-1-3*, S-07-14-10-12*, S-07-16-1-3, S-07-14-1-3-D*, S-12-11-8-10*, S-08-31-13-14, the diluted analyses of S-07-14-1-3 and S-08-31-13-14 and the reanalysis of S-08-31-13-14* exceeded extraction times by less than 2 times. Therefore, all analytes in these samples were qualified as estimated (J) or estimated non-detect (UJ). The reanalyses of samples S-07-14-1-3*, S-07-14-10-12*, S-07-16-1-3*, S-07-20-1-3, S-07-14-1-3-D, S-08-31-13-14* and S-12-11-8-10* and the diluted reanalysis of sample S-07-14-1-3* grossly exceeded extraction hold times. Therefore, all non-detect analytes in these samples were qualified as rejected (R) and all detected analytes were qualified as estimated (J).

ACTIONS (CONTINUED):
(2) Samples S-07-14-1-3* and S-07-16-1-3 had 0% recovery of surrogate tetrachloro-m-xylene and recovery outside of control limits of decachlorobiphenyl. Samples S-07-20-1-3*, S-07-14-10-12*, and S-12-11-8-10* had 0% recovery of surrogate tetrachloro-m-xylene and low % recovery of decachlorobiphenyl. Sample S-07-14-1-3-D* had 0% recovery of surrogate tetrachloro-m-xylene and high % recovery of decachlorobiphenyl. Therefore, all detected analytes in all of these samples were qualified as estimated (J) and all non-detect analytes were qualified as rejected (R).

COMMENTS: (3) Samples S-08-31-13-14 and the diluted* and reanalyzed* S-08-31-13-14 had 0% recovery for both surrogates in both analyses. The diluted analysis of sample S-07-14-1-3 had 0% surrogate recovery of tetrachloro-m-xylene and recovery outside control limits of decachlorobiphenyl. The diluted reanalysis of sample S-07-14-1-3* had % recovery outside of control limits for decachlorobiphenyl. However, no action is needed because these samples were diluted. The reanalyses of samples S-07-14-1-3, S-07-14-1-3-D, and S-12-11-8-10* had % recoveries outside of control limits for decachlorobiphenyl. However, no action is necessary because all analytes in these samples were already qualified as estimated (J) or estimated non-detect (UJ) in item 1.
(4) Sample S-07-14-1-3DL was analyzed at a secondary dilution of 4 times. Sample S-08-31-13-14 was analyzed at a primary dilution of 500 times and a secondary dilution of 1000 times*. The reanalysis of this sample* was analyzed at a dilution of 1000 times. However, no action is necessary.
(5) The absolute difference between the undiluted original sample S-07-14-1-3* and its field duplicate S-07-14-1-3-D* was greater than 3.5 times the RL for Aroclor-1268 and Aroclor 1260 results. However, no action is necessary because these analytes were already qualified as estimated (J) and rejected (R) in these samples (see action 1).
(6) In batches 1K1201 and 2K1205, the % drift in Aroclor 1260 was high in two analyses. However, because the grand mean exception rule was applied and the average % difference of all the analytes in these continuing calibration verifications was <15%, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S388944
NO. OF SAMPLES/
MATRIX 4/3 soil & 1 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/16/04

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	✓
4. SCS (LCS)	(1)
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	(2)
7. DILUTIONS	✓
8. DUPLICATES	✓
9. INTERNAL STANDARDS	✓
10. OTHER	(3+4)
11. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (4) In continuing calibration lab file MQ709, chloroethane and acetone % D were outside of limits. Therefore, all affected samples CT-1-2-0-2, CT-1-1-13-15, and CT-1-1-13-15DUP were qualified as estimated non detect (UJ) for chloroethane and rejected for acetone (R).

COMMENTS: (1) LCS KRM44-1 recovery of chloroethane was high. However, no action is needed because this analyte was not detected in any of the associated samples.
(2) No MS/MSD was performed; however, no action is necessary.

COMMENTS (CONTINUED):
(3) In continuing calibration lab file BQ687, acetone % D was high and in lab file BQ838 bromomethane and vinyl acetate were high. However, no action is needed because these continuing calibration verifications either do not affect analyzed samples or affect only the QA/QC trip blank # 6.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S389080, S389143
NO. OF SAMPLES/
MATRIX 13/9 soils and 4 aqueous (including 2 trip blanks)

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/14/04

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	(1)	(5)
2. BLANKS	✓	✓
3. SURROGATES	(2)	(6+7)
4. SCS (LCS)	(3)	(8)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	N/A	(9)
7. DILUTIONS	(4)	(10)
8. DUPLICATES	N/A	N/A
9. INTERNAL STANDARDS	✓	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Sample S-12-9-8-10 (diluted by 40) was analyzed one day outside of hold time. Therefore, all analytes were qualified as estimated (J) or estimated non-detect (UJ).
(2) Sample S-12-9-14-16 had high surrogate recovery for p-bromofluorobenzene. Therefore, all detected compounds in this sample were qualified as estimated (J).
(3) LCS KRM 45-11 % recovery of 4-methyl-2-pentanone was low. Therefore, this compound was qualified as estimated non-detect (UJ) in the associated samples S-05-SMP277-01-9-11 and S-05-SMP277-01-14-16.
(5) The reanalysis of sample S-12-9-1-3* was extracted 29 days after sample collection. Therefore, all compounds in this sample were qualified as rejected (R).
(6) Sample S-12-9-1-3 had low surrogate recoveries for base/neutrals nitrobenzene-d5 and 2-fluorobiphenyl. Therefore, all base/neutral analytes in S-12-9-1-3 were qualified as estimated non-detect (UJ).

COMMENTS: (4) Samples S-12-9-8-10(DL)*, S-12-9-14-16 (DL)*, S-05-SMP277-01-9-11 and S-05-SMP277-01-14-16 were diluted by 40 times. However, no action is necessary.
(7) Samples S-05-SMP277-01-9-11 and S-05-SMP277-01-14-16 had 0 % recovery for all surrogates due to dilutions. However, no action is necessary because these samples were diluted.
(8) LCS KRM45-6 had low % recovery for aniline and benzidine. However, no action is necessary because this LCS only relates to QA/QC samples S-12-06-1-3-EB and S-12-9-1-3-EB.
(9) MS and MSD samples related to parent sample S-12-06-14-16 had 0 % recovery for benzoic acid and MS and MSD samples with no related parent sample had low % recovery for hexachlorocyclopentadiene. However, no action is necessary because benzoic acid was not analyzed for and the MS/MSD samples with low hexachlorocyclopentadiene recovery had no related parent sample.
(10) Samples S-05-SMP277-01-9-11 was initially diluted by 5 times and sample S-05-SMP277-01-14-16 was initially diluted by 10 times; however, no action is necessary.

* Data from this sample has not been used.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S389080, S389143
NO. OF SAMPLES/
MATRIX 8/6 soils + 2 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/14/04

DATA ASSESSMENT WORKSHEET

	Metals Meth # 6010	Mercury Meth # 7470
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. DUPLICATES	(2)	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3)	(6)
7. DILUTIONS	(4+5)	✓
8. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (4) The % D of zinc was high in the serial dilution of sample S-12-6-1-3. Therefore, zinc was qualified as estimated (J) in sample S-12-6-1-3.

COMMENTS: (1) Iron was detected in the equipment blank S-12-9-1-3-EB. However, no action is necessary because iron was detected in the associated sample at greater than 10 times the equipment blank concentration.
(2) The laboratory duplicate sample had high % RPDs for calcium, copper, magnesium, manganese, and zinc. However, no action is necessary because this sample was not related to analyzed samples and was a spiked sample.
(3) The MS % recoveries were outside limits for antimony, barium, copper, and potassium. The MSD % recoveries were outside limits for antimony, potassium, chromium, and lead. However, no action is necessary because spiked samples were not related to our samples.
(5) Sample S-12-9-1-3 was diluted by 10 times for the analysis of calcium; however, no action is necessary. Arsenic, cadmium and sodium %Ds for the serial dilution for sample S-12-6-1-3 were greater than 10 %. However, no action is necessary because the initial sample results were not greater than 50 times the MDL.
(6) The MS and MSD samples had high % recoveries for mercury. However, no action is necessary because these samples were not related to our samples.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561388.00000
LABORATORY STL- Savannah
LABORATORY NO. S389080B, S389143B
NO. OF SAMPLES/
MATRIX 4/4 soil

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 04/25/04

DATA ASSESSMENT WORKSHEET

	PCBs Meth # 8082
1. HOLDING TIMES	✓
2. BLANKS	✓
3. SURROGATES	(1)
4. SCS (LCS)	✓
5. DCS (LSCD)	N/A
6. MATRIX SPIKE/DUP	(2)
7. DILUTIONS	(3)
8. DUPLICATES	N/A
9. INTERNAL STANDARDS	(4)
10. OTHER	(5)
11. OVERALL ASSESSMENT	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS:

COMMENTS: (1) In samples S-08-34-13-14, S-08-36-9-10, and S-08-35-13-14 all surrogate % recoveries were 0 % due to dilutions; therefore, no action is necessary. The recovery of surrogate decachlorobiphenyl in sample S-12-9-1-3 was high; however, no action is needed because all analytes were non-detect.

COMMENTS (CONTINUED):
(2) A MS/MSD sample was analyzed with parent sample S-08-34-13-14 and spiking compounds were diluted out; however, no action is necessary.
(3) Sample S-08-36-9-10 was diluted by 40 times, sample S-08-34-13-14 was diluted by 50 times, and S-08-35-13-14 was diluted by 10,000 times; however, no action is necessary.
(4) The internal standard result for bromonitrobenzene in sample S-08-34-13-14 was high in the first channel. However, no action is necessary because sample results were reported from the second channel.
(5) In batch 1K1205 the continuing calibration % D results were high in 5 analyses for aroclor -1260. However, no action is needed because the grand mean exception rule was applied and the average % D of all of the compounds was less than 15 %.

VALIDATION REPORT

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Sauget, Illinois

Prepared for
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August 2004

URS

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1.1 INTRODUCTION

This section summarizes the full validation reports for the chemical data produced by STL of Savannah, Georgia. The validations were completed in accordance with USEPA National Functional Guidelines for organic and inorganic data, where applicable to SW-846 Methods.

1.2 FULL VALIDATION OF VOC DATA - SDG KRM28

This section describes the full validation for 19 soil and five aqueous samples. The aqueous samples were prepared following USEPA SW-846 Method 5030 and the soil samples were prepared following SW-846 Method 5035. Both aqueous and soil samples were analyzed for VOCs following SW-846 Method 8260B. All samples were analyzed by STL of Savannah, Georgia, and submitted as part of the SDG KRM28. The following table identifies the samples included as part of the data validation:

Sample Identification	Sample Identification	Sample Identification	Sample Identification
S-04-018-9-11	S-04-021-1-2	S-04-19-0-2	S-04-20-14-16
S-04-08-14-16	S-04-021-S-2-DUP	S-04-19-10-12	S-04-23-0-2-EB
TB-102003	S-04-021-6-8	S-04-19-14-16	S-04-23-0-2
S0417(1-2)	S-04-021-14-16	S-04-20-0-2	S-04-23-10-12
S04-017-10-12	S-04-018-1-2	S-04-20-0-2-D	TB3102203
S-04-017-14-16	S-04-19-0-2-EB	S-04-20-6-8	TB2102203

The validation followed USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (EPA, 2001) where applicable to SW-846 Method 8260B. The evaluation criteria used during the validation were a combination of those criteria presented in the analytical method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Problems identified in the laboratory case narrative
- Holding times and sample preservation
- GC/MS instrument performance
- Initial calibration
- Calibration verification
- Blank samples

- Surrogate spike recoveries
- MS/MSD samples
- Internal standard areas and retention times
- Laboratory control samples
- Field duplicate evaluation
- Target compound identification and quantitation
- Overall data assessment

1.2.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete.

1.2.2 Problems Identified in the Laboratory Case Narrative

The laboratory case narrative indicated that LCS, MS/MSD, internal standard and surrogate recoveries were outside evaluation criteria. These issues are addressed in the respective sections below. No additional problems were noted in the laboratory case narrative or the cooler receipt form.

1.2.3 Holding Times and Sample Preservation

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved (4±2 °C) and analyzed within 14 days of sample collection. However, the sample preparation log misidentified several samples. The laboratory was notified and corrections made to the laboratory log.

1.2.4 Instrument Performance

The GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated

against the laboratory criteria, which followed CLP criteria. This was an acceptable deviation from the method.

Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no qualifications to the data were required. Approximately 10% of the mass abundance percentages were recalculated from the raw data and no calculation or transcription errors were noted.

1.2.5 Initial Calibration

Calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for volatiles analyses. A total of five ICAL curves were analyzed as part of SDG KRM28. At least five concentration standards were used to establish each ICAL as required by the method. For each ICAL, the summary forms were reviewed and the RFs were greater than 0.10 for chloromethane, 1,1-dichloroethane, bromoform, greater than 0.30 for chlorobenzene, and 1,1,2,2-tetrachloroethane and greater than 0.05 for all other analytes.

Additionally, review of the ICAL summary forms indicated the %RSDs were $\leq$ 15 percent for calibration check compounds (CCC) and ≤ 30 percent for all other target compounds. In some cases, the laboratory determined linearity using linear regression. All r-values were greater than 0.990. No qualifications to the data were required based on the ICALs. Recalculation of the RFs and %RSD for one compound per internal standard was performed, and no errors in calculations were noted.

1.2.6 Calibration Verification

Review of the laboratory instrument run logs indicated the CVs were performed at the required frequency of every 12 hours or batch of 20 samples. Review of CV summary forms indicated all RFs were greater than 0.10 for chloromethane, 1,1-dichloroethane, bromoform, greater than 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane, and greater than 0.05 for all other analytes with the following exceptions:

CV	Instrument	Analyte	RF	Criteria
MQ536	MSM5972	Acetone	**0.0434**	0.05
MW543	MSM5972	Acetone	**0.0443**	0.05

In addition, %Ds met the evaluation criteria of $\leq$ 20 percent for CCCs and ≤ 50 percent for all other target analytes with the following exceptions:

CV	Instrument	Analyte	%D	Criteria (%)
MQ529	MSM5972	1,1-Dichloroethane	**95**	50

Qualifications to VOC data, due to associated outlying RF or %D values, are identified in the table below:

Field ID	Analyte	Qualification
S0417(1-2)	1,1-Dichloroethane	**UJ**
S04-017-10-12	1,1-Dichloroethane	**UJ**
S-04-017-14-16	1,1-Dichloroethane	**UJ**
S-04-017-14-16RE	1,1-Dichloroethane	**UJ**
S-04-021-1-2	1,1-Dichloroethane	**UJ**
S-04-021-1-2-DUP	1,1-Dichloroethane	**UJ**
S-04-021-6-8	1,1-Dichloroethane	**UJ**
S-04-021-14-16	1,1-Dichloroethane	**UJ**
S-04-018-1-2	1,1-Dichloroethane	**UJ**
S-04-018-9-11	1,1-Dichloroethane	**UJ**
S-04-018-9-11RE	1,1-Dichloroethane	**UJ**
S-04-018-14-16	1,1-Dichloroethane	**UJ**
S-04-19-0-2	Acetone	**J**
S-04-19-10-12	Acetone	**R**
S-04-19-10-12RE	Acetone	**R**
S-04-19-14-16	Acetone	**R**
S-04-19-14-16RE	Acetone	**R**
S-04-20-0-2	Acetone	**J**
S-04-20-0-2-D	Acetone	**J**
S-04-20-6-8	Acetone	**J**
S-04-20-14-16	Acetone	**J**
S-04-23-0-2	Acetone	**R**
S-04-23-0-2RE	Acetone	**R**
S-04-23-10-12	Acetone	**J**

Recalculation of the RF and %D for one compound per internal standard was completed, and no errors in calculation were noted.

1.2.7 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by the method. Additionally, two equipment blank and three trip blank samples were collected to assess potential cross-contamination. All target compounds were reported as non-detect. The blank sample chromatograms were reviewed and all peaks present were surrogate compounds, internal standards, non-target compounds, or target compounds below the MDL.

1.2.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. All surrogate recoveries were within the method acceptance criteria for the validated samples with the exception of the following:

Field ID	Surrogate Compound	% Recovery	Criteria
S-04-23-0-2	Dibromofluoromethane	**155**	58-142
S-04-23-0-2	Bromofluorobenzene	**55**	63-135
S-04-23-10-12	Bromofluorobenzene	**545**	63-135
S-04-23-0-2-RE	Bromofluorobenzene	**62**	63-135
S-04-017-14-16	Dibromofluoromethane	**147**	66-127
S-04-017-14-16	Bromofluorobenzene	**180**	68-121
S-04-018-9-11	Bromofluorobenzene	**143**	68-121
S-04-017-14-16RE	Bromofluorobenzene	**137**	68-121
S-04-19-10-12	Dibromofluoromethane	**53**	66-127
S-04-19-10-12	Toluene-d8	**47**	65-128
S-04-19-10-12RE	Dibromofluoromethane	**50**	66-127
S-04-19-10-12RE	Toluene-d8	**47**	65-128
S-04-19-14-16	Toluene-d8	**54**	65-128
S-04-19-14-16RE	Toluene-d8	**52**	65-128

The following table identifies qualifications due to outlying surrogate recoveries:

Field ID	Analyte	Qualifier
S-04-23-0-2	All VOCs	**J** (detects)/**UJ** (non-detects)
S-04-23-10-12	All VOCs	**J** (detects)
S-04-23-0-2RE	All VOCs	**J** (detects)/**UJ** (non-detects)
S-04-017-14-16	All VOCs	**J** (detects)
S-04-018-9-11	All VOCs	**J** (detects)
S-04-017-14-16RE	All VOCs	**J** (detects)
S-04-19-10-12	All VOCs	**J** (detects)/**UJ** (non-detects)
S-04-19-10-12RE	All VOCs	**J** (detects)/**UJ** (non-detects)
S-04-19-14-16	All VOCs	**J** (detects)/**UJ** (non-detects)
S-04-19-14-16RE	All VOCs	**J** (detects)/**UJ** (non-detects)

Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.2.9 Matrix Spike/Matrix Spike Duplicate Samples

An MS/MSD sample was analyzed to assess accuracy and precision for the analyses. The MS/MSD spike was performed on sample S0417 (1-2). All MS/MSD recoveries and RPDs were within the evaluation criteria with the exceptions listed below:

Field ID	Analyte	MS/MSD/RPD	Criteria
S0417 (1-2)	m,p-xylene	**162/148**/18	74-121/50
S0417 (1-2)	o-xylene	**135/135**/8.3	74-122/50
S0417 (1-2)	Vinyl chloride	**154**/141/17	38-151/100
S0417 (1-2)	Chloroethane	**262/244**/16	46-152/100
S0417 (1-2)	1,1,1-Trichloroethane	**143/138**/12	70-123/50
S0417 (1-2)	Carbon tetrachloride	**135/129**/13	66-128/50
S0417 (1-2)	Benzene	**132/135**	65-130/50
S0417 (1-2)	1,2-Dichloropropane	**154/162**/3.6	72-118/50
S0417 (1-2)	Bromodichloromethane	119/**132**/2.2	71-120/50
S0417 (1-2)	4-Methyl-2-pentanone	**162/191**/8	47-160/50
S0417 (1-2)	1,1,2-Trichloroethane	**130/144**/2.1	66-127/50
S0417 (1-2)	Tetrachloroethane	**197/170**/23	64-134/50
S0417 (1-2)	2-Hexanone	**189/206**/0	46-163/50

Field ID	Analyte	MS/MSD/RPD	Criteria
S0417 (1-2)	Dibromochloromethane	**165/162**/10	70-124/50
S0417 (1-2)	Ethylbenzene	**151/147**/11	71-120/50
S0417 (1-2)	Styrene	**54/68**/14	73-121/50
S0417 (1-2)	1,1,2,2,-PCA	**159/168**/3.4	59-138/50
S0417 (1-2)	Xylenes (total)	**154/150**/12	74-122/50

USEPA CLP National Functional Guidelines indicates organic data should not be qualified using MS/MSD data alone. Based on professional judgment, and associated surrogate recoveries were within criteria in the associated samples, no qualification of the data was required.

Ten percent of the MS/MSD recoveries and RPD values were recalculated from the raw data. The laboratory calculated the RPD values incorrectly. The RPDs were determined by using the RPD between the MS and MSD concentration as required by SW-846; however, they used different spiking concentrations for the MS and MSD. Therefore, using concentrations to determine RPDs is incorrect. The RPDs were recalculated using percent recoveries and no qualification of data was required.

1.2.10 Internal Standards

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS retention times for the validated samples in this SDG were within evaluation criteria, with the exception of sample S-04-23-0-2. Associated data were previously qualified due to surrogate recoveries and no additional qualifications were necessary. The summary forms were verified to the raw data, and no transcription errors were noted.

1.2.11 Laboratory Control Samples

The LCS was analyzed to assess the accuracy of the analytical process. All LCS data were within QC evaluation criteria with the exceptions noted below.

LCS	Analyte	% Recovery	Criteria
KRM28-24	m,p-xylenes	**130**	74-121
KRM28-24	4-methyl-2-pentanone	**40**	47-160
KRM28-24	Xylenes (Total)	**124**	74-122

LCS	Analyte	% Recovery	Criteria
KRM28-30	m,p-Xylene	**140**	74-121
KRM28-30	Chloromethane	**168**	42-143
KRM28-30	Vinyl chloride	**160**	38-151
KRM28-30	1,2-Dichloropropane	**128**	72-118
KRM28-30	Ethylbenzene	**124**	71-120
KRM28-30	Xylenes (total)	**133**	74-122

The following table identifies qualifications due to outlying LCS recoveries.

Field ID	Analyte	Qualification
S-04-017-14-16	4-methyl-2-pentanone	**UJ**
S-04-018-9-11	4-methyl-2-pentanone	**UJ**
S-04-017-14-16RE	4-methyl-2-pentanone	**UJ**
S-04-018-9-11RE	4-methyl-2-pentanone	**UJ**

Ten percent of the reported values were calculated using the raw data. No calculation or transcription errors were noted.

1.2.12 Field Duplicate Evaluation

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at a 5% frequency. The field duplicates for this SDG are listed in the table below. All recoveries were with in evaluation criteria, therefore, no qualifications of data were necessary.

Sample Identification	Duplicate Identification
S-04-021-S-2	S-04-021-S-2-DUP
S-04-20-0-2	S-04-20-0-2-D

1.2.13 Target Compound Identification and Quantitation

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 minutes different from the associated continuing calibration retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantitation, ten percent of the detected results were recalculated from the raw data, and no calculation errors were noted. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. Review of the raw data indicated that not all compounds were quantified using the closest internal standard as recommended in the method; however, the laboratory did select an internal standard that was close to the target analyte. No qualification of data was required.

1.2.14 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use, with the exception of rejected data (**R**). Acceptable levels of accuracy and precision, based on LCS, MS/MSD, and surrogate data were achieved for this SDG. In addition, completeness defined to be the percentage of analytical results judged to be valid, including estimated (**J**) data, was 99 percent for this SDG.

1.3 FULL VALIDATION OF VOC DATA - SDG KRM39

This section describes the full validation for 15 soil, 3 trip blank, one equipment blank and 3 field duplicates. The aqueous samples were prepared following Method 5030B and analyzed for VOCs following the SW-846 Method 8260B. The soil samples were prepared following Method 5035 and analyzed for VOCs following the SW-846 Method 8260B. Samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM39. The following identifies the samples included as part of the data validation:

Sample Identification	Sample Identification	Sample Identification	Sample Identification
S-12-08-1-3	TB1211030	S-05-12-1-3	S-12-10-14-16
S-12-08-12	S-12-08-1-3-EB	S-05-12-1-3-D	S-12-10-14-16-D
S-12-08-14-16	S-12-07-1-3	S-05-12-10-12	TB13110603
S-12-11-1-3	S-12-07-8-10	S-05-12-14-16	
S-12-11-8-10	S-12-07-14-16	S-12-10-1-3	
S-12-11-14-16	TB12110503	S-12-10-6-8	

The validation followed USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (EPA 2001) where applicable to SW-846 Method 8260B. The evaluation criteria used during the validation were a combination of those criteria presented in the analytical method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Problems identified in the laboratory case narrative
- Holding times and sample preservation
- GC/MS instrument performance
- Initial calibration
- Calibration verification
- Blank samples
- Surrogate recoveries
- MS/MSD samples
- Internal standard areas and retention times
- Laboratory control samples
- Field duplicate evaluation
- Target compound identification and quantitation
- Overall data assessment

1.3.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete.

1.3.2 Problems Identified in the Laboratory Case Narrative

The laboratory case narrative indicated internal standard responses were outside evaluation criteria. LCS, MS/MSD and surrogate recoveries were outside evaluation. These issues are addressed in the respective sections below. No additional problems were noted in the laboratory case narrative or the cooler receipt form.

1.3.3 Holding Times and Sample Preservation

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time

compliance. Soil samples were extracted within 48 hours of sampling and analyzed within 14 days of sample collection. Water samples were properly preserved and analyzed within 14 days of sample collection. No qualifications to the data were required.

1.3.4 Instrument Performance

The GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against the laboratory criteria, which was different that those criteria presented in SW-846 Method 8260B. However, the mass-to-charge ratio (m/z) were within both criteria. Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no calculation or transcription errors were noted.

1.3.5 Initial Calibration

Calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for volatile analyses. A total of five ICAL curves were analyzed as part of SDG KRM39. At least five standard concentrations were used to establish the ICAL curve as required by the method. For the ICAL, the RFs were reviewed and were greater than 0.10 for chloromethane, 1,1-dichloroethane, and bromoform, greater than 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane and greater than 0.05 for all other analytes.

Review of the initial calibration summary forms indicated the %RSDs were $\leq$ 15 percent for CCCs, and $\leq$ 30 percent for all other target compounds. In some cases, the laboratory determined linearity using linear regression. All correlation coefficients values were greater than 0.99, as required by the method. Therefore, no qualifications of the data were required. Recalculation of the RFs and %RSD for one compound per internal standard was performed, and no errors in calculations were noted.

1.3.6 Continuing Verification

Review of the laboratory instrument run logs indicated the CVs were performed at the required frequency of every 12 hours or batch of 20 samples. Review of CV summary forms indicated all RFs were greater than 0.10 for chloromethane, 1,1-dichloroethane, and bromoform, greater than 0.30 for chlorobenzene

and 1,1,2,2-tetrachloroethane, and greater than 0.05 for all other analytes with the exceptions noted below:

CV	Instrument	Analyte	RF	Criteria
BQ465	MSB5973	Bromomethane	**0.0329**	0.05

In addition, %Ds met the evaluation criteria of ≤ 20 percent for CCCs and ≤ 50 percent for all other target analytes with the following exceptions:

CVV	Instrument	Analyte	%D	Criteria (%)
BQ465	MSB5973	Bromomethane	**84**	50
BQ885	MSB5973	Bromomethane	**70**	50

Bromomethane was not qualified since the effected samples were equipment blanks and trip blanks, which do not require qualification. Recalculation of the RF and %D for one compound per internal standard was completed, and no errors in calculation were noted.

1.3.7 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by the method. Additionally, one equipment blank and three trip blank samples were collected to assess potential cross-contamination. All target compounds were reported as non-detect and no qualifications were required. The blank sample chromatograms were reviewed and all peaks present were surrogate compounds, internal standards, or target compounds below the MDL.

1.3.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. All surrogate recoveries were within the method acceptance criteria for the validated samples with the exception of the following:

Field ID	Surrogate Compound	% Recovery	Criteria
S-12-08-1-3	p-Bromofluorobenzene	**60**	68-121
S-05-12-1-3	Dibromofluoromethane	**152**	66-127
S-05-12-1-3	p-Bromofluorobenzene	**47**	68-121

Field ID	Surrogate Compound	% Recovery	Criteria
S-12-10-14-16	Dibromofluoromethane	**172**	66-127
S-12-10-14-16	Toluene-d8	**164**	65-128
S-12-10-14-16	p-Bromofluorobenzene	**156**	68-121

The following table identifies qualifications due to outlying surrogate recoveries:

Field ID	Analyte	Qualifier
S-12-08-1-3	All VOCs (detect/non-detect)	**J/UJ**
S-05-12-1-3	All VOCs (detect/non-detect)	**J/UJ**
S-12-10-14-16	All Detected VOCs	**J**

Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.3.9 Matrix Spike/Matrix Spike Duplicate Samples

An MS/MSD sample was analyzed to assess accuracy and precision for the analyses. The MS/MSD spike was performed on sample S-12-11-1-3. All MS/MSD recoveries and RPDs were within the evaluation criteria with the exception of benzene and dibromochloromethane. The benzene MS/MSD recoveries of 180 and 154 percent exceeded the evaluation criteria of 65 to 135 percent. The dibromochloromethane MS recovery of 130 percent exceeded the evaluation criteria of 70-124 percent. USEPA CLP National Functional Guidelines indicates data should not be qualified based on MS/MSD data alone. Since the other associated QC parameters were within criteria, no qualification of data was required. Ten percent of the MS/MSD recoveries and RPD values were recalculated from the raw data and no calculation errors were noted.

1.3.10 Internal Standards

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS retention times for the validated samples in this SDG were within evaluation criteria and no qualification to the data was required. The summary forms were verified to the raw data, and no transcription errors were noted.

1.3.11 Laboratory Control Samples

The LCS was analyzed to assess the accuracy of the analytical process. All LCS data were within QC evaluation criteria with the exceptions noted below:

LCS	Analyte	% Recovery	Criteria
KRM39-33	4-Methyl-2-Pentanone	**40**	47-160
KRM39-36	4-Methyl-2-Pentanone	**44**	47-160
KRM39-24	Chloromethane	**136**	40-123

The following table identifies qualifications due to outlying LCS recoveries.

Field ID	Analyte	Qualification
S-12-07-1-3	4-Methyl-2-Pentanone	**UJ**
S-12-07-8-10	4-Methyl-2-Pentanone	**UJ**
S-12-07-14-16	4-Methyl-2-Pentanone	**UJ**
S-05-12-10-12	4-Methyl-2-Pentanone	**UJ**
S-05-12-14-16	4-Methyl-2-Pentanone	**UJ**
S-12-10-14-16	4-Methyl-2-Pentanone	**UJ**
S-12-10-14-16-D	4-Methyl-2-Pentanone	**UJ**
S-12-07-14-16DL	4-Methyl-2-Pentanone	**UJ**
S-12-10-14-16RE	4-Methyl-2-Pentanone	**UJ**

All chloromethane results associated with the LCS recoveries above evaluation criteria, indicating a possible high bias, were reported as non-detect and did not require qualification. Ten percent of the LCS values were calculated using the raw data. No calculation or transcription errors were noted.

1.3.12 Field Duplicate Evaluation

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at a 5% frequency. The field duplicates for this SDG are listed in the table below. All duplicate RPDs were with in evaluation criteria; therefore, no qualification of data were necessary.

Field ID	Field Duplicate ID
S-12-10-14-16	S-12-10-14-16-D

1.3.13 Target Compound Identification and Quantitation

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 minutes different from the associated continuing calibration retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantitation, ten percent of the detected results were recalculated from the raw data, and no calculation errors were noted. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. Review of the raw data indicated that not all compounds were quantified using the closest internal standard as recommended in the method; however, the laboratory did select an internal standard that was close to the target analyte. No qualification of data was required.

1.3.14 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision, based on LCS, MS/MSD, and surrogate data were achieved for this SDG. In addition, completeness defined to be the percentage of analytical results judged to be valid, including estimated (J) data, was 100 percent for this SDG.

1.4 FULL VALIDATION OF SVOC DATA - SDG KRM28

This section describes the full validation for nineteen soil samples and two aqueous samples. The samples were extracted by USEPA SW-846 Method 3550B/3520C (solid/aqueous) and analyzed for SVOCs following SW-846 Method 8270C. The samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM28. Samples validated for SVOCs in this SDG include:

Sample Identification	Sample Identification	Sample Identification
S0417 (1-2)	S04-017-10-12	S-04-017-14-16
S-04-021-1-2	S-04-021-1-2Dup	S-04-021-6-8
S-04-021-14-16	S-04-018-1-2	S-04-018-9-11
S-04-018-14-16	S-04-19-0-2	S-04-19-10-12
S-04-19-14-16	S-04-20-0-2	S-04-20-0-2-Dup

Sample Identification	Sample Identification	Sample Identification
S-04-20-6-8	S-04-20-14-16	S-04-23-0-2
S-04-23-10-12	S-04-19-0-2-EB	S-04-23-0-2-EB

Evaluation of the analytical data followed procedures outlined in the USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001), where applicable to SW-846 Method 8270C. The evaluation criteria used during the validation was a combination of those criteria presented in the respective method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data package completeness
- Problems identified in the laboratory case narrative
- Holding times and sample preservation
- GC/MS instrument performance
- Initial calibration
- Calibration verification
- Blank samples
- Surrogate spike recoveries
- MS/MSD samples
- Internal standards
- Laboratory control samples
- Field duplicate evaluation
- Target compound identification and quantitation
- Overall data assessment

1.4.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was considered complete.

1.4.2 Problems Identified in the Laboratory Case Narrative

The laboratory case narrative indicated internal standards associated with several samples, a MS/MSD, a method blank, and a LCS had area responses that were outside QC limits. Additionally, the batch MS/MSD associated with batches 1027B and 1105B were outside evaluation criteria and surrogates were diluted out of one sample. These issues are addressed below in the appropriate sections. No additional problems were noted in the laboratory case narrative or on the cooler receipt form.

1.4.3 Holding Times and Sample Preservation

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved (4±2 °C), extracted within 14 days of sample collection, and analyzed within 40 days of the extraction. No qualifications to the data were required.

1.4.4 GC/MS Instrument Performance

The GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against CLP criteria.

Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no qualifications to the data were required. Ion abundance percentages were recalculated for four check samples and no calculation or transcription errors were noted.

1.4.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for SVOC analysis. An ICAL was analyzed at the beginning of the run sequence. The laboratory used between five and seven standard concentrations to establish the calibration curve, meeting the minimum required by the method. The ICAL for each analyte was established using the RF, a first order linear calibration or a second order calibration. RFs were reviewed and were greater than 0.05, and the %RSDs were $\leq$ 30 percent for all target compounds calibrated using

response factors. Correlation coefficients for first and second order calibrations for all target compounds were greater than 0.99. The following exceptions were noted:

ICAL Ref.	Analyte	Mean RF	RF Criteria	%RSD	%Criteria
11/11/03 1321	2-Nitrobiphenyl	**0.0401**	.05	7.8	30.0
11/11/03 1321	Ethyl Parathion	0.1664	.05	**52**	30.0

Qualifications to the data due to RFs and %RSDs outside criteria are identified in the following table:

Sample Identification	Analyte	Qualification	Comment
S-04-19-0-2	2-Nitrobiphenyl	**R**	RF below criteria
S-04-19-10-12	2-Nitrobiphenyl	**R**	RF below criteria
S-04-19-14-16	2-Nitrobiphenyl	**R**	RF below criteria
S-04-20-0-2	2-Nitrobiphenyl	**R**	RF below criteria
S-04-20-0-2-D	2-Nitrobiphenyl	**R**	RF below criteria
S-04-20-6-8	2-Nitrobiphenyl	**R**	RF below criteria
S-04-20-14-16	2-Nitrobiphenyl	**R**	RF below criteria
S-04-23-0-2	2-Nitrobiphenyl	**R**	RF below criteria
S-04-23-10-12	2-Nitrobiphenyl	**R**	RF below criteria

Based on professional judgment, no qualifications were required for ethyl parathion data because all associated samples were nondetect. A recalculation of the RFs and %RSD for one compound per internal standard was performed, for two ICALs, and no errors in calculations were noted.

1.4.6 Calibration Verification

Review of the laboratory instrument run logs indicated the CVs were performed at the required frequency of every 12 hours or batch of 20 samples. Review of CV summary forms indicated all RFs met the evaluation criteria of greater than 0.05 for all target analytes. Additionally, the %D met the evaluation criteria of $\leq$ 25 percent for target analytes calibrated using RFs, and percent drift met evaluation criteria of $\leq$ 20 percent for target compounds calibrated using first or second order calibrations, with the exception of the following:

CCAL	Analyte	RF	RF Criteria	%RSD	%Criteria
JQ847	2,4-Dinitrophenol	0.2495	0.05	**53.1**	20.0
JQ847	4,6-Dinitro-2-methylphenol	0.1937	0.05	**33.4**	20.0
TQ079	Benzo(k)fluoranthene	1.03139	0.05	**25.0**	20.0
TQ080	2-Nitrobiphenyl	**0.04011**	0.05	10.7	25.0
TQ080	3,4-Dichloronitrobenzene	0.56551	0.05	**30.3**	25.0
TQ081	2-Nitrobiphenyl	**0.04438**	0.05	10.7	25.0
TQ081	Ethyl Parathion	---	0.05	**100**	25.0
JQ870	3,4-Dichloronitrobenzene	0.43054	0.05	**28.7**	25.0
JQ870	Ethyl Parathion	0.16958	0.05	**62.2**	25.0
JQ896	3,4-Dichloronitrobenzene	0.4672	0.05	**39.7**	25.0
JQ896	Ethyl Parathion	0.2426	0.05	**45.9**	25.0

Qualifications to the data due to RFs were made based on the ICAL. Additional qualifications due to outlying %D or percent drift values are identified in the following table:

Field ID	Analyte	Qualification
S0417 (1-2)	2,4-Dinitrophenol	UJ
S0417 (1-2)	4,6-Dinitro-2-methylphenol	UJ
S04-017-10-12	2,4-Dinitrophenol	UJ
S04-017-10-12	4,6-Dinitro-2-methylphenol	UJ
S04-017-14-16	2,4-Dinitrophenol	UJ
S04-017-14-16	4,6-Dinitro-2-methylphenol	UJ
S04-021-1-2	2,4-Dinitrophenol	UJ
S04-021-1-2	4,6-Dinitro-2-methylphenol	UJ
S04-021-1-2-DUP	2,4-Dinitrophenol	UJ
S04-021-1-2-DUP	4,6-Dinitro-2-methylphenol	UJ
S04-021-1-2-DUP (RE)	3,4-Dichloronitrobenzene	UJ
S04-021-1-2-DUP (RE)	Ethyl Parathion	UJ
S-04-021-6-8	2,4-Dinitrophenol	UJ
S-04-021-6-8	4,6-Dinitro-2-methylphenol	UJ
S-04-021-6-8 (RE)	3,4-Dichloronitrobenzene	UJ
S-04-021-6-8 (RE)	Ethyl Parathion	UJ
S-04-021-14-16	2,4-Dinitrophenol	UJ
S-04-021-14-16	4,6-Dinitro-2-methylphenol	UJ
S-04-021-14-16 (RE)	3,4-Dichloronitrobenzene	UJ
S-04-021-14-16 (RE)	Ethyl Parathion	UJ
S-04-018-1-2	2,4-Dinitrophenol	UJ

Field ID	Analyte	Qualification
S-04-018-1-2	4,6-Dinitro-2-methylphenol	UJ
S-04-018-1-2 (RE)	3,4-Dichloronitrobenzene	UJ
S-04-018-1-2 (RE)	Ethyl Parathion	UJ
S-04-018-9-11	2,4-Dinitrophenol	UJ
S-04-018-9-11	4,6-Dinitro-2-methylphenol	UJ
S-04-018-14-16	2,4-Dinitrophenol	UJ
S-04-018-14-16	4,6-Dinitro-2-methylphenol	UJ
S-04-018-14-16 (RE)	3,4-Dichloronitrobenzene	UJ
S-04-018-14-16 (RE)	Ethyl Parathion	UJ
S-04-19-0-2	Benzo(k)fluoranthene	UJ
S-04-19-0-2	3,4-Dichloronitrobenzene	UJ
S-04-19-0-2	Ethyl Parathion	UJ
S-04-19-10-12	Benzo(k)fluoranthene	UJ
S-04-19-10-12	3,4-Dichloronitrobenzene	UJ
S-04-19-10-12	Ethyl Parathion	UJ
S-04-19-14-16	Benzo(k)fluoranthene	UJ
S-04-19-14-16	3,4-Dichloronitrobenzene	UJ
S-04-19-14-16	Ethyl Parathion	UJ
S-04-20-0-2	Benzo(k)fluoranthene	UJ
S-04-20-0-2	3,4-Dichloronitrobenzene	UJ
S-04-20-0-2	Ethyl Parathion	UJ
S-04-20-0-2-D	Benzo(k)fluoranthene	UJ
S-04-20-0-2-D	3,4-Dichloronitrobenzene	UJ
S-04-20-0-2-D	Ethyl Parathion	UJ
S-04-20-6-8	3,4-Dichloronitrobenzene	UJ
S-04-20-6-8	Ethyl Parathion	UJ
S-04-20-14-16	Benzo(k)fluoranthene	UJ
S-04-20-14-16	3,4-Dichloronitrobenzene	UJ
S-04-20-14-16	Ethyl Parathion	UJ
S-04-23-0-2	Benzo(k)fluoranthene	UJ
S-04-23-0-2	3,4-Dichloronitrobenzene	UJ
S-04-23-0-2	Ethyl Parathion	UJ
S-04-23-10-12	Benzo(k)fluoranthene	UJ
S-04-23-10-12	3,4-Dichloronitrobenzene	UJ
S-04-23-10-12	Ethyl Parathion	UJ

A recalculation of select RFs and %Ds were completed, for three CVs, and no errors in calculations were noted.

1.4.7 Blank Samples

Method blanks and equipment blanks were analyzed with this SDG. The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. The purpose of equipment blanks is to evaluate contamination problems resulting from field sampling activities.

Method blank samples were analyzed with each analytical batch, as required by SW-846 Method 8270C, and all target compounds were reported as non-detect. Additionally, two equipment blanks were analyzed with the SDG, and all target compounds were also reported non-detect. The blank sample chromatograms were reviewed and all peaks present were determined to be one of the following: surrogate compounds, internal standards, unidentified compounds, or target compounds below the MDL.

1.4.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. Surrogates were not recovered for one sample in this SDG, which was due to a sample dilution factor of 20. The sample chromatogram and mass spectra were reviewed to determine that each surrogate was diluted out of the sample in question. No errors were noted and no qualifications to the data were required. All other surrogate recoveries were within the method acceptance criteria for the validated samples. Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.4.9 Matrix Spike/Matrix Spike Duplicate Samples

The MS/MSD samples were analyzed to assess accuracy and precision for the analyses. The MS/MSD spike was performed on sample S0417 (1-2). All MS/MSD recoveries and RPD percentages were within QC criteria. The MS/MSD and RPD values were re-calculated for approximately 10% of the data and no calculation or transcription errors were noted. No qualifications to the sample data were necessary.

1.4.10 Internal Standards

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the validated samples in this SDG were within evaluation criteria with the exception of samples S0417 (1-2), S-04-021-1-2-DUP, S-04-021-6-8, S-04-021-14-16, S-04-018-1-2, and S-04-018-14-16, which had several IS recoveries above the +100% limit. Several of these samples were reanalyzed and the IS recoveries were still outside criteria. There were no qualifications of the data required since associated data were non-detect. The IS summary forms were verified against the raw data, and no transcription errors were noted.

1.4.11 Laboratory Control Samples

The LCS was analyzed to assess the accuracy of the analytical process. All target analyte recoveries were within evaluation criteria and no qualifications to the data were required. A select number of the reported values were calculated using the raw data. No calculation or transcription errors were noted.

1.4.12 Field Duplicate Evaluation

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at an approximate frequency of 10%. The field duplicates for this SDG are listed in the table below:

Field ID	Field Duplicate ID
S-04-021-1-2	S-04-021-1-2Dup

All duplicate RPDs were with in evaluation criteria; therefore, no qualifications of the data were required.

1.4.13 Target Compound Identification and Quantitation

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 different from the associated ICAL retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantification, a surrogate compound result was recalculated from the raw data since all results were reported as non-detect. No qualifications to the data were required. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. No transcription or calculation errors were noted and reporting limits were properly adjusted for dilutions.

1.4.14 Overall Data Assessment

Based on the criteria outlined it is recommended that the results reported for these analyses, with the exception of rejected (**R**) data, be accepted for their intended use. Acceptable levels of accuracy and precision, based on LCS, MS/MSD, and surrogate data were achieved for this SDG. In addition completeness, defined to be the percentage of analytical results judged to be valid including estimated (**J/UJ**) data, was 96 percent for this SDG.

1.5 FULL VALIDATION OF SVOC DATA - SDG KRM 39

This section describes the full validation for seventeen soil samples which were extracted by USEPA SW846 Method 3550B and analyzed for SVOCs following USEPA SW846 Method 8270C. The samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM39. Samples validated for SVOCs in this SDG include:

Sample Identification	Sample Identification	Sample Identification
S-12-08-1-3	S-12-07-1-3	S-05-12-14-16
S-12-08-10-12	S-12-07-8-10	S-12-10-1-3
S-12-08-14-16	S-12-07-14-16	S-12-10-6-8
S-12-11-1-3	S-05-12-1-3	S-12-10-14-16
S-12-11-8-10	S-05-12-1-3-D	S-12-10-14-16-D
S-12-11-14-16	S-05-12-10-12	

Evaluation of the analytical data followed procedures outlined in the USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001), where applicable to SW-846 Method 8270C. The evaluation criteria used during the validation were a combination of those criteria presented in the respective method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Problems identified in the laboratory case narrative
- Holding times and sample preservation
- GC/MS instrument performance
- Initial calibration
- Calibration verification
- Blank samples
- Surrogate spike recoveries
- MS/MSD samples
- Internal standards
- Laboratory control samples
- Field duplicate evaluation
- Target compound identification and quantitation
- Overall data assessment.

1.5.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete.

1.5.2 Problems Identified in the Laboratory Case Narrative

The laboratory case narrative indicated that the MS/MSD sample S-12-11-1-3 was analyzed at a 50X dilution due to matrix interference. Subsequently several of the spiked target analytes were not recoverable. Additionally, internal standard recoveries were outside evaluation criteria for several samples and surrogate recoveries were not recoverable for several samples due to dilution of the sample. Several samples were diluted and reanalyzed due to matrix interference and/or high levels of target compounds. These issues are addressed below in the appropriate sections. No additional problems were noted in the case narrative.

1.5.3 Holding Times and Sample Preservation

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved (4±2 °C), extracted within 14 days of sample collection, and analyzed within 40 days of the extraction. No qualifications to the data were required.

1.5.4 GC/MS Instrument Performance

The GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against CLP criteria.

Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no qualifications to the data were required. Ion abundance percentages were recalculated for two check samples and no calculation or transcription errors were noted.

1.5.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for semi-volatile analysis. An ICAL was analyzed at the beginning of the run sequence. The laboratory used between five and seven standard concentrations to establish the calibration curve, meeting the minimum required by the method. An ICAL for each analyte was established using the RF, a first order linear calibration or a second order calibration. RFs were reviewed and were greater than 0.05, and the %RSDs were $\leq$ 30 percent for all target compounds calibrated using response factors. Correlation coefficients for first and second order calibrations for all target compounds were greater than 0.99. No qualification of the data was required.

Recalculation of select the RFs and %RSDs were performed and no errors in calculations were noted.

1.5.6 Calibration Verification

Review of the laboratory instrument run logs indicated the CVs were performed at the required frequency of every 12 hours or batch of 20 samples. Review of CV summary forms indicated all RFs met the evaluation criteria of greater than 0.05 for all target analytes. Additionally, the %D met the evaluation criteria of ≤ 25 percent for target analytes calibrated using RFs, and percent drift met evaluation criteria of ≤ 20 percent for target compounds calibrated using first or second order calibrations, with the exception of the following:

CVV	Instrument	Analyte	%D or % drift	Criteria (%)
GQ021	MSG5973	Hexachlorocyclopentadiene	30	25
GQ071	MSG5973	2,4-Dinitropohenol	26	20
GQ071	MSG5973	4-Nitroaniline	30	25

Qualifications due to outlying %D or percent drift values are identified in the table below.

Field ID	Analyte	Qualification
S-12-08-10-12	Hexachlorocyclopentadiene	**UJ**
S-12-08-14-16	Hexachlorocyclopentadiene	**UJ**
S-12-10-1-3	2,4-Dinitropohenol	**UJ**
S-12-10-1-3	4-Nitroaniline	**UJ**

A recalculation of select RFs and %Ds were completed, for three CVs, and no errors in calculation were noted.

1.5.7 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by the method and all target compounds were reported as non-detect. The blank sample chromatograms were reviewed and all peaks present were surrogate compounds, internal standards, unidentified compounds, or target compounds below the MDL.

1.5.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. Surrogates were not recovered for 9 of 17 samples during SVOC analysis due to sample dilutions between a factor of 10 and 100. Sample chromatograms and mass spectra were reviewed to determine that the surrogate was diluted out of each sample in question. No errors were noted and no qualifications to the data were required. All other surrogate recoveries for undiluted samples were within the method acceptance criteria for the validated samples. Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.5.9 Matrix Spike/Matrix Spike Duplicate Samples

The MS/MSD samples were analyzed to assess accuracy and precision for the analyses. The MS/MSD spike was performed on sample S-12-11-1-3. This sample was analyzed at a 50X dilution due to matrix interference. As a result of the 50X dilution, the majority of the spiking compounds were diluted of the MS/MSD. Sample chromatograms and mass spectra were reviewed to determine that the spiking compounds were diluted out of the MS/MSD. No errors were noted and no qualifications to the data were required.

1.5.10 Internal Standards

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the validated samples in this SDG were within evaluation criteria, except for samples S-12-10-6-8 and S-12-10-14-16-D, which had several IS recoveries below the lower limit. The samples were reanalyzed and the IS recoveries were still below the lower limit. Qualifications due to IS recoveries are listed in the following table.

Field ID	Analyte	Qualification
S-12-10-6-8	All SVOCs (detect/non-detect)	J/R
S-12-10-14-16-D	All SVOCs (detect/non-detect)	J/R
S-12-10-6-8RE	All SVOCs (detect/non-detect)	J/R
S-12-10-14-16-DRE	All SVOCs (detect/non-detect)	J/R

The IS summary forms were verified against the raw data, and no transcription errors were noted.

1.5.11 Laboratory Control Samples

The LCS was analyzed to assess the accuracy of the analytical process. All target analyte recoveries were within evaluation criteria and no qualifications to the data were required. A select number of the reported values were calculated using the raw data. No calculation or transcription errors were noted.

1.5.12 Field Duplicate Evaluation

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at an approximate frequency of 10%. The field duplicates for this SDG are listed in the table below:

Field ID	Field Duplicate ID
S-12-10-14-16	S-12-10-14-16-D
S-05-12-1-3	S-05-12-1-3-D

All RPDs were within evaluation criteria with the exception of those listed in the following table.

Field ID	Field Duplicate ID	Analyte	RPD	Qualification
S-12-10-14-16	S-12-10-14-16-D	3-Nitrochlorobenzene	200	UJ/J
S-12-10-14-16	S-12-10-14-16-D	4-Nitrochlorobenzene	200	J/J
S-12-10-14-16	S-12-10-14-16-D	2-Nitrochlorobenzene	200	J/J
S-12-10-14-16 DL	S-12-10-14-16-D DL	4-Nitrochlorobenzene	183	J/J
S-12-10-14-16 DL	S-12-10-14-16-D DL	2-Nitrochlorobenzene	190	J/J

1.5.13 Target Compound Identification and Quantitation

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 minutes different from the associated ICAL retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantification, a select number of detected results were recalculated from the raw data. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. No transcription or calculation errors were noted and reporting limits were properly adjusted for dilutions.

1.5.14 Overall Data Assessment

Based on the criteria outlined it is recommended that the results reported for these analyses be accepted for their intended use, with the exception of rejected (**R**) data. Acceptable levels of accuracy and precision, based on LCS, MS/MSD, and surrogate data were achieved for this SDG. In addition completeness, defined to be the percentage of analytical results judged to be valid including estimated (**J/UJ**) data, was approximately 97 percent for this SDG.

1.6 FULL VALIDATION OF SVOC DATA - SDG KRM44

This section describes the full validation for three soil samples, which were extracted by USEPA SW846 Method 3550B and analyzed for SVOCs following USEPA SW846 Method 8270C. The soil samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM44. Samples validated for SVOCs in this SDG include:

Sample Identification	Sample Identification	Sample Identification
CT-1-2-0'-2'	CT-1-1-13'-15'	CT-1-1-13'-15'DUP

Evaluation of the analytical data followed procedures outlined in the USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001), where applicable to SW-846 Method 8270C. The evaluation criteria used during the validation were a combination of those criteria presented in the respective method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Problems identified in the laboratory case narrative
- Holding times and sample preservation
- GC/MS instrument performance
- Initial calibration
- Calibration verification
- Blank samples
- Surrogate spike recoveries
- MS/MSD samples
- Internal Standards

- Laboratory control samples
- Field duplicate evaluation
- Target compound identification and quantitation
- Overall data assessment.

1.6.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was missing the reporting form for the batch MS/MSD. The reasoning for not providing the MS/MSD form was matrix interferences and poor recoveries. The laboratory was contacted and a request for the missing form was submitted; however, since the batch MS/MSD was a part of a different data set and matrix, the missing MS/MSD was not considered essential for SDG KRM44 and the package was otherwise considered complete.

1.6.2 Problems Identified in the Laboratory Case Narrative

The laboratory case narrative indicated that the results for the batch MS/MSD analysis were not reported due to dilutions and matrix interferences. Additionally, the MS/MSD results were not actually provided with the package (see Section 3.6.1). No additional problems were noted in laboratory the case narrative.

1.6.3 Holding Times and Sample Preservation

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved (4±2 °C), extracted within 14 days of sample collection, and analyzed within 40 days of the extraction. No qualifications to the data were required.

1.6.4 GC/MS Instrument Performance

The GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass

assignments, and ion abundance criteria. Instrument performance check samples were evaluated against CLP criteria.

Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no qualifications to the data were required. Ion abundance percentages were recalculated for three check samples and no calculation or transcription errors were noted.

1.6.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for semi-volatile analysis. An ICAL was analyzed at the beginning of the run sequence. The laboratory used between five and seven standard concentrations for each target compound to establish the ICAL, meeting the minimum required by the method. The RFs were reviewed for each ICAL and were greater than 0.05, and the %RSDs were $\leq$ 30 percent for all target compounds. A recalculation of the RFs and %RSD for four target compounds was performed, and no transcription or calculation errors were noted. No qualifications to the data were required based on the ICAL.

1.6.6 Calibration Verification

Review of the laboratory instrument run logs indicated the CVs were performed at the required frequency of every 12 hours or with each analytical batch of 20 or fewer samples. Review of CV summary forms indicated all RFs met the evaluation criteria of greater than 0.05 for all target analytes. Additionally, the RF %Ds met the evaluation criteria of $\leq$ 25 percent between the CV and ICAL for all target compounds. Recalculation of the RFs and %Ds for four target compounds in one CV was completed, and no errors in calculation were noted. No qualifications to the data were required based on the CVs.

1.6.7 Blank Samples

The purpose of the method blank sample is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by the method, and all target compounds were reported as non-detect. The blank sample chromatograms were reviewed and all peaks present were surrogate compounds, internal standards, unidentified compounds, or target compounds below the MDL. No qualifications to the data were required.

1.6.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. All surrogate recoveries were within evaluation criteria for the validated samples. Therefore, no qualifications to the data were required. Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.6.9 Matrix Spike/Matrix Spike Duplicate Samples

The MS/MSD samples are analyzed to assess accuracy and precision for the analyses and the effects of matrix interference during the analysis of a particular sample. No MS/MSD was requested for the samples in this SDG, and the standard batch MS/MSD was not reported due to matrix interferences (see Section 3.6.1). Qualifications for organic data are not based on MS/MSD results alone, and since surrogate recoveries were within evaluation criteria, no qualifications to the SVOC data were made.

1.6.10 Internal Standards

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the validated samples in this SDG were within evaluation criteria; therefore, no qualifications to the data were required. The summary forms were verified against the raw data, and no transcription errors were noted.

1.6.11 Laboratory Control Samples

The LCS was analyzed to assess the accuracy of the analytical process. All target analyte recoveries were within evaluation criteria; therefore, no qualifications to the data were required. A select number of the reported values were calculated using the raw data. No calculation or transcription errors were noted.

1.6.12 Field Duplicate Evaluation

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at a 5% frequency. The field duplicates for this SDG are listed in the table below. All

target compounds were reported as non-detect for the parent sample and duplicate; therefore, no qualifications to the data were necessary.

Sample Identification	Sample Identification
CT-1-1-13'-15'	CT-1-1-13'-15'DUP

1.6.13 Target Compound Identification and Quantitation

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 minutes different from the associated ICAL retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantification, a surrogate compound result was recalculated from the raw data since all results were reported as non-detect. No calculation or transcription errors were noted and no qualifications to the data were required.

1.6.14 Overall Data Assessment

Based on the criteria outlined it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision, based on LCS, duplicate and surrogate data were achieved for this SDG. In addition completeness, defined to be the percentage of analytical results judged to be valid, including estimated (**J/UJ**) data, was 100 percent for this SDG.

1.7 FULL VALIDATION OF PESTICIDE/PCB DATA – SDG KRM33

This section describes the full validation for six soil samples which were prepared by USEPA SW-846 Method 3550B and analyzed for organochlorine pesticides and PCBs by SW-846 Methods 8081A and 8082, respectively. The samples were analyzed by STL, of Savannah, Georgia, and submitted as part of SDG KRM33. The samples included as part of this validation are listed below:

Sample Identification	Sample Identification
LF-3-1-18'-20'	LF-4-1-18'-20'
LF-4-2-18'-20'	LF-2-1-18'-20'
LF-1-1-18'-20'	CT-2a-1-13'-15'

Evaluation of the analytical data followed procedures outlined in the USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (USEPA, 2001) where applicable to USEPA SW-846 Methods 8081A and 8082. The evaluation criteria used during the validation were a combination of those criteria presented in the analytical method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data package completeness
- Laboratory case narrative
- Sample preservation and holding times
- GC/ECD instrument performance check
- Initial calibration
- Calibration verification
- Blank samples
- Duplicate samples
- Surrogate spike recoveries
- Matrix spike/matrix spike duplicate samples
- Laboratory control samples
- Target compound identification and quantification
- Overall assessment of data.

1.7.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete for the validated samples.

1.7.2 Laboratory Case Narrative

The laboratory case narrative indicated there were MS/MSD RPDs, surrogate recoveries, and CV recoveries outside evaluation criteria. These issues are discussed below in the appropriate sections. No additional problems were noted in the laboratory case narrative.

1.7.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The validated samples were received and maintained at 4°C ± 2°C. The samples were extracted within 14 days of collection and analyzed within 40 days of sample extraction. No qualifications of data were required based on sample preservation and holding time requirements.

1.7.4 GC/ECD Instrument Performance Check

Upon review of the raw data, the performance evaluation mixture (PEM) was analyzed following the guidance outlined in the method. All peaks had a minimum of 90 percent resolution, and all chromatographic peaks for the PEM samples eluted within the specified retention time windows of the associated calibration verification samples. Additionally, all endrin and 4,4'-DDT breakdown percentages were within the control limits. The percent breakdown for one PEM sample from each analytical column, on each of the GCs utilized for pesticide analysis, was recalculated and no transcription or calculation errors were noted.

1.7.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for pesticide and PCB analyses. The ICAL for pesticides was done using two individual calibration mixtures (Mix A and B) containing all of the single component pesticides and surrogates. ICALs were performed using six standard concentrations on two GCs using dual analytical columns. The %RSD for the CFs were below the method criteria of 20 percent; therefore, no qualifications to the pesticide data were necessary.

The ICAL for PCBs was done using a mixture of Aroclors 1016 and 1260 at six concentrations, and Aroclors 1221, 1232, 1242, 1248, 1254 and 1268 at a single concentration as outlined in Method 8082. The %RSD for the CFs of each of the five major Aroclor 1016 and 1260 peaks was less than the method criteria of 20 percent. No qualifications to the PCB data were necessary.

The CFs and %RSD for three single component pesticides and two of the five major peaks from Aroclors 1016 and 1260 were recalculated, for one column on each GC, and no transcription or calculation errors were noted.

1.7.6 Calibration Verification

The CVs were performed following the method required frequency of at least once every 20 samples analyzed. Peak resolution and retention time window criteria were met for both pesticides and PCBs on each analytical column. The CFs average %D was within the evaluation criteria (15%) for Aroclors 1016 and 1260, and for each pesticide compound, except those identified in the following table:

CV Identification	Column ID	Compound	% D	% D Limits
JNV10005	RTX CLPI	4,4-DDT	16.1	15
JNV10005	RTX CLPI	endrin aldehyde	15.4	15
JNV10005	RTX CLPI	methoxychlor	16.4	15
MNV12005	RTX CLPI	methoxychlor	23.9	15
MNV13018	RTX CLPI	heptachlor	16.4	15
MNV13018	RTX CLPI	methoxychlor	24.8	15
MNV13019	RTX CLPII	aroclor-1260	16.4	15
MNV14005	RTX CLPI	endrin	15.7	15
MNV14005	RTX CLPI	4,4-DDD	21.9	15
MNV14005	RTX CLPI	4,4-DDT	15.3	15
MNV14005	RTX CLPI	endrin aldehyde	20.0	15
MNV14005	RTX CLPI	methoxychlor	34.6	15
MNV14005	RTX CLPII	methoxychlor	24.0	15

Qualifications of data based on CV recoveries outside of evaluation criteria are identified in the following table:

Sample ID	Column ID	Compound	Qualification
LF-2-1-18'-20'	RTX CLP I	4,4-DDT	UJ
LF-2-1-18'-20'	RTX CLP I	endrin aldehyde	UJ
LF-2-1-18'-20'	RTX CLP I	methoxychlor	UJ
LF-1-1-18'-20'	RTX CLP I	4,4-DDT	UJ
LF-1-1-18'-20'	RTX CLP I	endrin aldehyde	UJ
LF-1-1-18'-20'	RTX CLP I	methoxychlor	UJ
LF-3-1-18'-20'	RTX CLP I	methoxychlor	UJ
CT-2a-1-13'-15'	RTX CLP I	heptachlor	UJ
CT-2a-1-13'-15'	RTX CLP I	methoxychlor	UJ
LF-4-1-18'-20'	RTX CLP I	endrin	UJ
LF-4-1-18'-20'	RTX CLP I	4,4-DDD	UJ

Sample ID	Column ID	Compound	Qualification
LF-4-1-18'-20'	RTX CLP I	4,4-DDT	UJ
LF-4-1-18'-20'	RTX CLP I	endrin aldehyde	UJ
LF-4-1-18'-20'	RTX CLP I	methoxychlor	UJ

The %Ds and CFs were recalculated from the raw data of both columns for two CVs, for three pesticide compounds and two of the five major peaks from Aroclors 1016 and 1260, and no transcription or calculation errors were noted.

1.7.7 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by Methods 8081A and 8082. All target compounds were reported as non-detect. Review of chromatograms indicated that no peaks were present other than surrogate compounds. No data qualifications were required based on blank samples.

1.7.8 Duplicate Samples

Field duplicates are collected to assess sample precision based on field collection techniques and laboratory duplicates are analyzed to assess the laboratory and analytical method precision. Field duplicates were not collected and laboratory duplicates were not analyzed with this SDG. No qualifications to the data were required.

1.7.9 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. All surrogate recoveries were within evaluation criteria, with the exception of those listed in the following table:

Sample ID	Column ID	Surrogate	%R	%R Limits
LF-4-2-18'-20'	RTX CLP I	tetrachloro-m-xylene	**12**	30-150
LF-1-1-18'-20'	RTX CLP I	decachlorobiphenyl	**483**	30-150
LF-1-1-18'-20'	RTX CLP II	decachlorobiphenyl	**539**	30-150
LF-4-1-18'-20'	RTX CLP I	tetrachloro-m-xylene	**200**	30-150
LF-4-1-18'-20'	RTX CLP I	decachlorobiphenyl	**156**	30-150

Sample ID	Column ID	Surrogate	%R	%R Limits
LF-4-1-18'-20'	RTX CLP II	decachlorobiphenyl	**233**	30-150

Qualifications were not required for non-detect data associated with surrogate recoveries reported above evaluation criteria, which indicates a high bias. Also, data qualifications were not required for sample LF-4-2-18'-20' since the data was reported from the alternate column. Data qualifications based on surrogate recoveries are identified in the following table:

Sample ID	Column ID	Analyte	Qualification
LF-1-1-18'-20'	RTX CLP I	Aroclor 1248	J
LF-1-1-18'-20'	RTX CLP I	Aroclor 1260	J

Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.7.10 Matrix Spike/Matrix Spike Duplicate Samples

The MS/MSD samples were analyzed to assess accuracy and precision for the analyses and the effects of matrix interference during the analysis of a particular sample. The MS/MSD spike was performed on sample LF-1-1-18'-20' for both pesticides and PCBs and on LF-3-1-18'-20' for pesticides only.

All MS/MSD recoveries and RPDs were within the evaluation criteria for both pesticides and PCBs in both samples, with one exception. Sample LF-1-1-18'-20' had a RPD of 49% for Aroclor 1260, which exceeded the 40% criteria. However, no qualifications to the data were required since the spike recoveries were within criteria, and the data was previously qualified due to surrogate spike recoveries. Approximately five percent of the MS/MSD recoveries and RPD values were recalculated from the raw data and no calculation errors were noted.

1.7.11 Laboratory Control Samples

A LCS was analyzed with the analytical batch as required by Methods 8081A and 8082. Review of the LCS summary forms indicated all recoveries were within evaluation criteria for both pesticides and PCBs. Therefore, no qualifications to the data were required. Five percent of the LCS recoveries were recalculated, and no calculation or transcription errors were noted.

1.7.12 Target Compound Identification and Quantification

For the validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified properly and the spectra of the identified compounds were verified against the retention time of the associated standard curve or CV. The retention times of identified compounds and surrogates were within the calculated retention time windows on both columns for pesticides and PCBs. Approximately ten percent of the detected concentrations were recalculated for verification. There were no calculation or transcription errors noted.

1.7.13 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. The LCS, MS/MSD and surrogate recoveries demonstrated that acceptable levels of accuracy and precision were achieved. In addition completeness defined to be the percentage of analytical results that are judged to be valid, including estimated values (**J/UJ**), was 100 percent for this SDG.

1.8 FULL VALIDATION OF PCB DATA - SDG KRM44

This section describes the full validation for three soil samples, which were prepared by USEPA SW-846 Method 3520C and analyzed for PCBs by USEPA SW-846 Method 8082. The samples were analyzed by STL, of Savannah, Georgia, and submitted as part of SDG KRM44. Samples included as part of this validation are listed below:

Sample Identification	Sample Identification	Sample Identification
CT-1-2-0'-2'	CT-1-1-13'-15'	CT-1-1-13'-15' DUP

The validation followed USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (June 2001) where applicable to USEPA Method 8082. The evaluation criteria used during the validation were a combination of those criteria presented in the analytical method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data package completeness
- Problems identified in the laboratory case narrative
- Sample preservation and holding times
- Initial calibration
- Calibration verification
- Blank samples
- Duplicate samples
- Surrogate spike recoveries
- Matrix spike/matrix spike duplicate samples
- Laboratory control samples
- Target compound identification and quantification
- Overall assessment of data.

1.8.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of the analytes requested for each field sample submitted in the analytical batch, along with requested QC documentation for the method. The data package was missing the reporting form for the batch MS/MSD. The reasoning for not providing the MS/MSD form was matrix interferences and poor recoveries. The laboratory was contacted and a request for the missing form was submitted; however, since the batch MS/MSD was a part of a different data set and matrix, the missing MS/MSD was not considered essential for SDG KRM44 and the package was otherwise considered complete.

1.8.2 Problems Identified in the Laboratory Case Narrative

The case narrative indicated surrogate recoveries were outside advisory limits due to matrix interferences and sample dilutions as a result of the matrix interferences. Additionally, MS/MSD results were outside evaluation criteria due to matrix interferences and dilutions, although these results were not actually provided with the package (see Section 3.8.1). These issues are discussed below in the appropriate sections. No additional problems were noted in laboratory the case narrative.

1.8.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were received and maintained at 4°C ± 2°C. All samples were extracted within 14 days of collection and all samples were analyzed within 40 days of sample extraction. No qualifications of data were required based on sample preservation and holding time requirements.

1.8.4 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for PCB analyses. External calibration procedures are common to Aroclor analysis using dual analytical columns; however, in this case STL Savannah established the ICAL using internal standard procedures common in PCB congener analysis. Although USEPA Method 8082 suggests external calibration for Aroclor analysis, internal calibration procedures are considered an acceptable alternative by USEPA methodology.

The ICAL for PCBs was performed on both analytical columns using a mixture of Aroclors 1016 and 1260 at six concentrations, and Aroclors 1221, 1232, 1242, 1248, 1254, and 1268 at a single concentration as outlined in Method 8082. The RFs were determined for of each of the major Aroclor 1016 and 1260 peaks, and the %RSDs were less than the method criteria of 20%. No qualifications to the PCB data were necessary.

The RFs and %RSDs for two representative peaks of Aroclors 1016 and 1260 were recalculated, for both columns, and no transcription or calculation errors were noted.

1.8.5 Calibration Verification

The CVs were performed at the required frequency of every 12 hours or every batch of 20 or fewer samples. All peaks eluted within the specified retention time windows and the CFs average %D was within the evaluation criteria (15%) for Aroclors 1016 and 1260. No qualifications to the data were required.

The %Ds for two major peaks from Aroclors 1016 and 1260, from two applicable CVs, were recalculated from the raw data, for both columns, and no transcription or calculation errors were noted.

1.8.6 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by Method 8082. All target compounds were reported as non-detect in each method blank. Review of chromatograms indicated that no significant peaks were present, other than internal standards and surrogates. No data qualifications were required based on blank samples.

1.8.7 Duplicate Samples

Field duplicates are collected to assess sample precision based on field collection techniques and laboratory duplicates are analyzed to assess the laboratory and analytical method precision. The field duplicate sample %D were outside evaluation criteria for soil samples (%D < 50); therefore the results for samples CT-1-1-13'-15' and CT-1-1-13'-15'DUP were qualified as estimated (**J/UJ**) for Aroclor 1254 and Aroclor 1260.

1.8.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. All surrogate recoveries were within evaluation criteria with the exception of the following:

Field ID	Surrogate	Column	Recovery	Criteria
CT-1-2-0'-2'	decachlorobiphenyl	RTX CLPI	0	30-150
CT-1-2-0'-2'	decachlorobiphenyl	RTX CLPII	0	30-150
CT-1-2-0'-2'DL	tetrachloro-m-xylene	RTX CLPI	0	30-150
CT-1-2-0'-2'DL	tetrachloro-m-xylene	RTX CLPII	0	30-150
CT-1-2-0'-2'DL	decachlorobiphenyl	RTX CLPI	0	30-150
CT-1-2-0'-2'DL	decachlorobiphenyl	RTX CLPII	0	30-150
CT-1-1-13'-15'	tetrachloro-m-xylene	RTX CLPI	330	30-150
CT-1-1-13'-15'	decachlorobiphenyl	RTX CLPI	0	30-150
CT-1-1-13'-15'	decachlorobiphenyl	RTX CLPII	0	30-150

Non-detect data associated with high surrogate recoveries required no qualifications. Although there were several surrogate recoveries with 0%, no data were rejected based on matrix interferences and

sample dilutions noted in the case narrative, the chromatograms, and the extraction logs. All data that required qualifications based on surrogate recoveries are identified in the following table.

Field ID	Analyte	Qualification
CT-1-2-0'-2'	All PCBs	**J/UJ**
CT-1-2-0'-2'DL	All PCBs	**J/UJ**
CT-1-1-13'-15'	All PCBs	**J/UJ**

Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.8.9 Matrix Spike/Matrix Spike Duplicate Samples

The MS/MSD samples were analyzed to assess accuracy and precision for the analyses and the effects of matrix interference during the analysis of a particular sample. No MS/MSD was requested for the samples in this SDG, and the standard batch MS/MSD was not reported due to matrix interferences (see Section 3.8.1). No data qualifications are required for organic data based on MS/MSD results alone, and the data were previously qualified due to surrogate recoveries. Therefore, no additional qualifications to the data were made based on the MS/MSD analysis.

1.8.10 Laboratory Control Samples

A LCS was analyzed with each analytical batch as required by Method 8082. Review of the LCS summary forms indicated all LCS recoveries were within evaluation criteria; therefore, no qualifications to the data were required. Ten percent of the LCS recoveries were recalculated, and no calculation or transcription errors were noted.

1.8.11 Target Compound Identification and Quantification

For the validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified properly and the spectra of the identified compounds were verified against the retention time of the associated standard curve or CV. The retention times of identified compounds and surrogates were within the calculated retention time windows on both columns. Approximately 10 percent of the sample results were recalculated and no calculations or transcription errors were noted.

1.8.12 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. LCS and surrogate recoveries and field duplicates demonstrated that acceptable levels of accuracy and precision were achieved, with the noted exceptions. In addition completeness defined to be the percentage of analytical results that are judged to be valid, including estimated values (**J/UJ**), was 100 percent for this SDG.

1.9 FULL VALIDATION OF DIOXIN/FURAN DATA - SDG KRM39

This section describes the full validation for 12 soil samples, one field duplicate, and one equipment blank that were extracted and analyzed for chlorinated dioxins and furans following USEPA SW846 Method 8280. The samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM39A. Samples validated in this SDG included:

Sample Identification	Sample Identification
S-12-08-1-3	S-12-07-1-3
S-12-08-10-12	S-12-07-8-10
S-12-08-14-16	S-12-07-14-16
S-12-11-1-3	S-12-10-1-3
S-12-11-8-10	S-12-10-6-8
S-12-11-14-16	S-12-10-14-16
S-12-08-1-3-EB	S-12-10-14-16-D

Evaluation of the analytical data followed procedures outlined in the USEPA AOC National Functional Guidelines for Chlorinated Dioxin/Furan Data Review (August 2002), where applicable to SW-846 Method 8280. The evaluation criteria used during the validation were a combination of those criteria presented in the respective method and the laboratory criteria based on historical data.

The following method performance criteria were evaluated:

- Completeness of data package
- Significant problems identified in the laboratory case narrative
- Holding times and sample preservation
- Window defining mix
- Initial calibration

- Calibration verification
- Blank samples
- Internal standard recovery and isotopic ratios
- MS/MSD samples
- Laboratory control sample
- Target homologue identification and quantitation
- Field duplicate
- System performance and overall assessment of data.

1.9.1 Data Package Completeness

The data package was reviewed to ensure that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted on the chain-of-custody, along with requested quality control documentation for the method. The data package SDG KRM39A contained all necessary quality control parameters for review.

1.9.2 Problems Identified in the Laboratory Case Narrative

The laboratory case narrative indicated the matrix spike pair for sample S-12-11-1-3 was extracted with the soil batch 1115A. Due to high concentrations of positive results within certain homologous series, this matrix spike pair was analyzed at a dilution of fifty. Since the concentration of the spike solution was 2.5 µg /kg, and a dilution of fifty would make this concentration less than the low point of 0.5 µg/kg from the initial calibration, spiking compounds were not recovered. Additionally, due to insufficient sample volume, a batch specific matrix spike pair was not extracted with the aqueous batch 1105G that included only the equipment blank.

The case narrative also indicated that due to the abundance of target constituents, samples S-12-11-1-3 (initial dilution factor 50) and S-12-11-8-10 (initial dilution factor 500) were also analyzed at a secondary dilution factor of 250 and 2500, respectively, so that all results could be reported within the linear range of the instrument. Samples S-12-07-1-3 and S-12-07-8-10 were analyzed neat, and at a dilution factor of four and two, respectively, to report all results within the linear range of the instrument.

1.9.3 Holding Times and Sample Preservation

Sample collection and analysis dates were reviewed, which included comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved, extracted within 30 days of sample collection and analyzed within 45 days of sample collection. The aqueous batch method blank and the laboratory control spike were analyzed on the 56th day after extraction. No qualifications to the field sample data were required.

1.9.4 Window Defining Mix

A window defining mix was performed to check the retention time windows for each of the homologues and the gas chromatograph resolution of 2,3,7,8-TCDD and 1,2,3,4-TCDD. Criteria for evaluation of instrument performance included assessing the valley height between 2,3,7,8-TCDD and 1,2,3,4-TCDD to the peak height of 2,3,7,8-TCDD, and ensuring that the selected ion scanning started and ended to bracket the homologue elution windows. This valley percent was evaluated against method criteria. Based on the raw data, the valley percent was within evaluation criteria of 0 to 25 percent and no qualifications to the data were required.

1.9.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for dioxin and furan analysis. An ICAL was analyzed prior to sample analyses. The laboratory used five standard concentrations to establish the calibration curve, meeting the minimum required by the method. For the ICAL, the ion abundance ratios were reviewed and found to be within the method required ranges and the percent relative standard deviations were $\leq$ 15 percent for all components. No qualifications to the data were required.

A recalculation of RFs and the %RSD for three of the four ICALs was performed, and no errors in calculations were noted.

1.9.6 Calibration Verification

Review of the raw data indicated that a CV was performed at the required frequency beginning a 12-hour shift. Review of CV raw data indicated all ion mass ratios met method criteria for all homologues.

Additionally, the %Ds met the evaluation criteria of ≤ 30 percent for all homologues. Therefore, no qualification of the data was required. Recalculation of the RF and %D for each representative homologue within each series was completed, and no errors in calculation were noted.

1.9.7 Blank Samples

The purpose of the method blank sample is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. A method blank was analyzed with each analytical batch as required by the method and all target compounds were reported as non-detect. The method blank raw data were reviewed and positive detections less than the reporting limit were found. The laboratory provided enlarged pictures that displayed integration of baselines instead of peaks that validated the results as non-detect.

1.9.8 Internal Standard Recovery and Isotopic Ratios

Internal standards were added prior to extraction and cleanup procedures. The internal standards were used to quantitate all homologues unless any internal standard in a diluted sample was less than 10 percent of the area of the same internal standard in the initial calibration. Sample results for S-12-11-1-3 (dilution factors 50 and 250) and S-12-11-8-10 (dilution factors 500 and 2500) were quantitated using the recovery standard. The use of the recovery standard for this purpose is outlined in SW8280 while the laboratory provided SW8280A analysis. A recovery standard was added to the extracts prior to analysis that was used to evaluate internal standard recovery. All internal standard recoveries were within the method required criteria of 40 to 120 percent, except for two, or when diluted out. Review of the raw data indicated all ion mass ratios met method criteria for all homologues. All of the recoveries were recalculated, and the summary forms versus the raw data were reviewed. Several minor calculation disparities, possibly due to software rounding limitations, were noted as follows:

Laboratory ID	Sample ID	DF	Laboratory Calculated		Validator Calculated	
			TCDD %R	OCDD %R	TCDD %R	OCDD %R
S388862A*1	S-12-08-1-3	1	100%	117%	93%	114%
S388862A*2	S-12-08-10-12	1	100%	127%	95%	119%
S388862A*3	S-12-08-14-16	1	97%	120%	94%	111%
S388862A*4	S-12-11-1-3	50	0%	0%	194%	262%
S388862A*4	S-12-11-1-3	250	0%	0%	511%	not recovered

Laboratory ID	Sample ID	DF	Laboratory Calculated		Validator Calculated	
			TCDD % R	OCDD %R	TCDD %R	OCDD %R
S388862A*5	S-12-11-8-10	500	0%	0%	645%	not recovered
S388862A*5	S-12-11-8-10	2500	0%	0%	not recovered	not recovered
S388862A*6	S-12-11-14-16	1	92%	115%	88%	115%
S388862A*7	S-12-08-1-3-EB	1	100%	not reported	106%	75%
S388876A*1	S-12-07-1-3	1	118%	84%	116%	81%
S388876A*1	S-12-07-1-3	4	**136%**	100%	**130%**	99%
S388876A*2	S-12-07-8-10	1	108%	85%	106%	87%
S388876A*2	S-12-07-8-10	2	114%	110%	115%	112%
S388876A*3	S-12-07-14-16	1	107%	87%	106%	87%
S389060*1	S-12-10-1-3	1	100%	85%	103%	87%
S389060*2	S-12-10-6-8	1	100%	85%	99%	87%
S389060*3	S-12-10-14-16	1	76%	**34%**	79%	**35%**
S389060*4	S-12-10-14-16-D	1	100%	85%	102%	88%

Sample S-12-07-1-3 displayed an internal standard recovery greater than the upper control limit (i.e., 120%) for $^{13}C_{12}$-TCDD at 136%. Sample S-12-10-14-16 displayed an internal standard recovery less than the lower control limit (i.e., 40%) for $^{13}C_{12}$-OCDD at 34%. The following qualifications were made:

Sample Identification	Analyte	Qualification
S-12-07-1-3 DL	Tetra CDD	**UJ**
S-12-07-1-3 DL	Tetra CDF	**UJ**
S-12-07-1-3 DL	Penta CDD	**UJ**
S-12-07-1-3 DL	Penta CDF	**UJ**
S-12-07-1-3 DL	Hexa CDD	**UJ**
S-12-07-1-3 DL	Hexa CDF	**J**
S-12-10-14-16	Hepta CDD	**UJ**
S-12-10-14-16	Hepta CDF	**UJ**
S-12-10-14-16	Octa CDD	**J**
S-12-10-14-16	Octa CDF	**UJ**

1.9.9 Matrix Spike/Matrix Spike Duplicate Samples

A MS/MSD was analyzed to assess accuracy and precision of the analysis. The MS/MSD for sample S-12-11-1-3 was extracted with the soil batch 1115A. Due to high concentrations of positive results within certain homologous series, this MS/MSD was analyzed at a dilution of fifty. Since the concentration of the spike solution was 2.5 µg/kg, and a dilution of fifty would make this concentration less than the low point of 0.5 µg/kg from the initial calibration, spiking compounds were not recovered. No qualifications to the data were required.

1.9.10 Laboratory Control Sample

A LCS was analyzed to assess the accuracy of the analytical process. All LCS data were within laboratory generated control limits. Two thirds of the reported values were recalculated using the raw data. Minor calculation disparities were corrected for by rounding the concentration to two significant figures prior to calculating the percent recovery. No transcription errors were noted and no qualifications to the data were required.

1.9.11 Target Homologue Identification and Quantitation

For validation of the homologue identification, chromatograms were reviewed to verify that the selected ion ratios were within method required limits. No anomalies were noted with the identification of the target homologues in the samples. During the review of the method blank raw data, it was revealed that several positive results less than the reporting limit were not reported by the laboratory. The laboratory provided revised method blank integrations that proved the detections were not valid. To ensure the field sample results were not also improperly integrated, the laboratory re-evaluated the integrations of the associated positive field sample results with concentrations less than five times that displayed for the method blank within the raw data. Two OCDD detections were found to have been false positives. The laboratory provided corrected result forms for samples S-12-08-10-12 and S-12-08-14-16.

For the validation of homologue quantification, approximately ten percent of the results were recalculated from the raw data. When an internal standard was diluted out to less than 10 percent of the area of that internal standard in the initial calibration, the laboratory calculated target concentrations based on the recovery standard response and average relative response factors from the initial calibration relative to this recovery standard. Sample results for S-12-11-1-3 (dilution factors 50 and 250) and S-12-11-8-10

(dilution factors 500 and 2500) were quantitated using the recovery standard. The use of the recovery standard for this purpose is outlined in SW8280A while the laboratory provided SW8280 analyses. This quantitation negates the inherent correction for extraction efficiency and creates biased reported concentrations, typically low. The associated results were qualified as follows:

Sample Identification	Homologue	Units	Dilution Factor	Qualifier
S-12-11-1-3	Tetra CDD	µg/kg	50	UJ
S-12-11-1-3	Tetra CDF	µg/kg	50	UJ
S-12-11-1-3	Penta CDD	µg/kg	50	UJ
S-12-11-1-3	Penta CDF	µg/kg	50	UJ
S-12-11-1-3	Hexa CDD	µg/kg	50	J
S-12-11-1-3	Hexa CDF	µg/kg	50	UJ
S-12-11-1-3	Hepta CDD	µg/kg	50	J
S-12-11-1-3	Hepta CDF	µg/kg	50	UJ
S-12-11-1-3	Octa CDD	µg/kg	50	J
S-12-11-1-3	Octa CDF	µg/kg	50	UJ
S-12-11-1-3 DL	Tetra CDD	µg/kg	250	UJ
S-12-11-1-3 DL	Tetra CDF	µg/kg	250	UJ
S-12-11-1-3 DL	Penta CDD	µg/kg	250	UJ
S-12-11-1-3 DL	Penta CDF	µg/kg	250	UJ
S-12-11-1-3 DL	Hexa CDD	µg/kg	250	UJ
S-12-11-1-3 DL	Hexa CDF	µg/kg	250	UJ
S-12-11-1-3DL	Hepta CDD	µg/kg	250	UJ
S-12-11-1-3 DL	Hepta CDF	µg/kg	250	UJ
S-12-11-1-3 DL	Octa CDD	µg/kg	250	J
S-12-11-1-3 DL	Octa CDF	µg/kg	250	UJ
S-12-11-8-10	Tetra CDD	µg/kg	500	UJ
S-12-11-8-10	Tetra CDF	µg/kg	500	UJ
S-12-11-8-10	Penta CDD	µg/kg	500	UJ
S-12-11-8-10	Penta CDF	µg/kg	500	UJ
S-12-11-8-10	Hexa CDD	µg/kg	500	J
S-12-11-8-10	Hexa CDF	µg/kg	500	J
S-12-11-8-10	Hepta CDD	µg/kg	500	J
S-12-11-8-10	Hepta CDF	µg/kg	500	J
S-12-11-8-10	Octa CDD	µg/kg	500	J
S-12-11-8-10	Octa CDF	µg/kg	500	J
S-12-11-8-10 DL	Tetra CDD	µg/kg	2500	UJ

Sample Identification	Homologue	Units	Dilution Factor	Qualifier
S-12-11-8-10 DL	Tetra CDF	µg/kg	2500	UJ
S-12-11-8-10 DL	Penta CDD	µg/kg	2500	UJ
S-12-11-8-10 DL	Penta CDF	µg/kg	2500	UJ
S-12-11-8-10 DL	Hexa CDD	µg/kg	2500	UJ
S-12-11-8-10 DL	Hexa CDF	µg/kg	2500	UJ
S-12-11-8-10 DL	Hepta CDD	µg/kg	2500	J
S-12-11-8-10 DL	Hepta CDF	µg/kg	2500	J
S-12-11-8-10 DL	Octa CDD	µg/kg	2500	J
S-12-11-8-10 DL	Octa CDF	µg/kg	2500	UJ

No transcription errors were noted and reporting limits were properly adjusted for dilutions. Minor computational disparities were observed that might be attributable from rounding differences due to software limitations. Several initial analytical results exceeded the initial calibration range. These results and qualifications are tabulated below. In all cases, the laboratory performed secondary analyses at dilutions that displayed acceptable results for data use.

Sample Identification	Homologue	Units	Initial Dilution Factor	Initial Result	Qualifier	Secondary Dilution Factor	Secondary Result for Use
S-12-11-1-3	Octa CDD	ug/kg	50	510	J	250	160
S-12-11-8-10	Hepta CDD	ug/kg	500	4300	J	2500	810
S-12-11-8-10	Octa CDD	ug/kg	500	5200	J	2500	2500
S-12-07-1-3	Octa CDD	ug/kg	1	7.6	J	4	10
S-12-07-8-10	Octa CDD	ug/kg	1	4.3	J	2	5.1

1.9.12 Field Duplicate

A field duplicate pair (S-12-10-14-16) was collected and included for analysis with this SDG. The results for both samples were either non-detect or positive detections less than the reporting limit. No qualifications to the data were required.

1.9.13 Overall Data Assessment

Based on the data reviewed it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision based on LCS and surrogate data

were achieved for this SDG. Completeness, defined to be the percentage of analytical results judged to be valid including estimated (**J/UJ**) data, was 100 percent for this SDG.

1.10 FULL VALIDATION OF DIOXIN/FURAN DATA - SDG KRM44

This section describes the full validation for two soil samples and one field duplicate, which were extracted and analyzed for chlorinated dioxins and furans following USEPA SW846 Method 8280. The samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM44A. Samples validated in this SDG included:

Sample Identification
CT-1-2-0'-2'
CT-1-1-13'-15'
CT-1-1-13'-15' DUP

Evaluation of the analytical data followed procedures outlined in the USEPA AOC National Functional Guidelines for Chlorinated Dioxin/Furan Data Review (August 2002), where applicable to SW-846 Method 8280. The evaluation criteria used during the validation were a combination of those criteria presented in the respective method and the laboratory criteria based on historical data.

The following method performance criteria were evaluated:

- Completeness of data package
- Problems identified in the laboratory case narrative
- Holding times and sample preservation
- Window defining mix
- Initial calibration
- Calibration verification
- Blank samples
- Internal standard recovery and isotopic ratios
- MS/MSD samples
- Laboratory control sample
- Target homologue identification and quantitation
- Field duplicate
- System performance and overall assessment of data.

1.10.1 Data Package Completeness

The data package was reviewed to ensure that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted on the chain-of-custody, along with requested quality control documentation for the method. The data package SDG KRM44A contained all select quality control parameters for review.

1.10.2 Problems Identified in the Laboratory Case Narrative

No problems were identified in the laboratory case narrative.

1.10.3 Holding Times and Sample Preservation

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved, extracted within 30 days of sample collection and analyzed within 45 days of sample collection. No qualifications to the data were required.

1.10.4 Window Defining Mix

A window defining mix was performed to check the retention time windows for each of the homologues and the gas chromatograph resolution of 2,3,7,8-TCDD and 1,2,3,4-TCDD. Criteria for evaluation of instrument performance included assessing the valley height between 2,3,7,8-TCDD and 1,2,3,4-TCDD to the peak height of 2,3,7,8-TCDD and that the selected ion scanning started and ended to bracket the homologue elution windows. This valley percent was evaluated against method criteria. Based on the raw data, the valley percent was within evaluation criteria.

1.10.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for dioxin and furan analysis. An ICAL was analyzed prior to sample analyses. The laboratory used five standard concentrations to establish the calibration curve, meeting the minimum required by the method. For the ICAL, the ion abundance ratios were reviewed and found to be within the method required ranges and the percent relative standard deviations were $\leq$ 15 percent for all components. No qualifications to the data were required.

A recalculation of a relative response factor and the percent relative standard deviation for TCDD was performed, and no errors in calculations were noted.

1.10.6 Calibration Verification

Review of the raw data indicated the CVs were performed at the required frequency beginning every 12-hour shift. Review of CV raw data indicated all ion mass ratios met method criteria for all homologues. Additionally, the %Ds met the evaluation criteria of $\leq$ 30 percent for all homologues. No qualifications to the data were required. Recalculation of the RF and %D for TCDD was completed, and no errors in calculation were noted.

1.10.7 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. A method blank was analyzed with each analytical batch as required by the method and all target compounds were reported as non-detect. The method blank sample chromatogram was reviewed and all peaks present were the recovery standard, internal standards, and non-target compounds. No qualification of data was required.

1.10.8 Internal Standard Recovery and Isotopic Ratios

Internal standards were added prior to extraction and cleanup procedures. The internal standards were used to quantitate all homologues. A recovery standard was added to the extracts prior to analyses that was used to evaluate internal standard recovery. All internal standard recoveries were within the method required criteria of 40-120%. Review of the raw data indicated all ion mass ratios met method criteria for all homologues. No errors were noted and no qualifications to the data were required. Ten percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

1.10.9 Matrix Spike/Matrix Spike Duplicate Samples

The MS/MSD samples were analyzed to assess accuracy and precision for the analyses. The MS/MSD spike was performed on a sample from a different SDG. All MS/MSD recoveries and RPDs were within the evaluation criteria. Project requirements of sampling MS/MSDs at a rate of 5% were achieved. No qualifications to the data were required.

1.10.10 Laboratory Control Sample

A LCS was analyzed to assess the accuracy of the analytical process. All LCS recoveries were within laboratory generated control limits. Ten percent of the reported values were calculated using the raw data. No calculation or transcription errors were noted and no qualifications to the data were required.

1.10.11 Target Homologue Identification and Quantitation

For validation of the homologue identification, chromatograms were reviewed to verify that the selected ion ratios were within method required limits. No anomalies were noted with the identification of the target homologues in the samples.

For the validation of homologue quantification, approximately ten percent of the results were recalculated from the raw data, and no calculation errors were noted. No transcription or calculation errors were noted and reporting limits were properly adjusted for dilutions.

1.10.12 Field Duplicate

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at a 5% frequency. The field duplicates for this SDG are listed in the table below. All recoveries were with in evaluation criteria, therefore, no qualifications of data were necessary.

Field ID	Field Duplicate ID
CT-1-1-13'-15'	CT-1-1-13'-15'Dup

1.10.13 Overall Data Assessment

Based on the data reviewed it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision based on LCS, MS/MSD, and surrogate data were achieved for this SDG. Completeness, defined to be the percentage of analytical results judged to be valid including estimated (**J/UJ**) data, was 100 percent for this SDG.

1.11 FULL VALIDATION OF MERCURY DATA – SDG KRM36

This section describes the full data validation for two soil samples, which were prepared and analyzed by USEPA SW-846 Method 7471A. Samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM36. Samples included as part of this validation are listed below:

Sample Identification	Sample Identification
S-09-18-9-10	S-09-19-9-10

The data validation followed USEPA CLP National Functional Guidelines for Inorganic Data Review (USEPA 2002), where applicable to the respective USEPA method. The evaluation criteria used during the validation were a combination of those criteria presented in the respective methods and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Laboratory case narrative
- Sample preservation and holding times
- Blank contamination
- Initial calibration
- Calibration verification
- Laboratory control sample
- Laboratory duplicate analysis
- Matrix spike/matrix spike duplicate samples
- Serial dilution
- Field duplicate evaluation
- Sample result verification
- Overall data assessment.

1.11.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective

methods. The data summary form for both samples were reviewed and compared to the raw data package and no transcription errors were noted. The data package was complete for SDG KRM36.

1.11.2 Laboratory Case Narrative

The laboratory case narrative indicated that the matrix spike/matrix spike duplicate sample was from a different SDG. Both samples were diluted and reanalyzed due to high detections of mercury. No additional items were noted in the case narrative.

1.11.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the sample chain-of-custody, the sample preparation logs, the analysis run logs, and the raw data forms for holding time compliance. The samples were received by the laboratory at 4 $\pm$ 2 °C, properly preserved, and analyzed within the evaluation criteria of 28 days for mercury. No qualification of the data was required based on holding time criteria or sample preservation.

1.11.4 Blank Contamination

The purpose of blank samples was to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Initial calibration, continuing calibration, and preparation blanks were all reported non-detect for mercury. Ten percent of the blank sample results were compared to the raw data and no transcription errors were noted.

1.11.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for mercury. A curve consisting of a blank and five standards, was used to establish the ICAL for mercury as specified in Method 7471A. Review of the ICAL data indicated the correlation coefficient (r) value was greater than 0.995 for mercury. No qualification of the mercury data was required based on the ICAL. The ICAL curve and the ICV recovery were recalculated for mercury and no calculation or transcription errors were noted.

1.11.6 Calibration Verification

The CV criteria were established to assess whether the instrument was capable of reproducing acceptable qualitative and quantitative data established by the ICAL. The laboratory analyzed CV samples at a frequency of 10 percent as specified by the methodologies. CV samples associated with the validated samples had recoveries within the evaluation criteria (80-120%). No qualifications to the data were required. One hundred percent of the CV sample recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.11.7 Laboratory Control Sample

A LCS was analyzed to assess the accuracy of the analytical method and to demonstrate laboratory method performance. The LCS recovery was within evaluation criteria for mercury (80-120%). No qualification of data was required based on the LCS recovery. The LCS recovery was recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.11.8 Laboratory Duplicate Analysis

A laboratory duplicate sample was not in SDG KRM36.

1.11.9 Matrix Spike/Spike Duplicate

A MS/MSD sample pair was analyzed to assess accuracy and the effects of matrix interference during analysis. The laboratory spiked and analyzed a sample from a different SDG. Project requirements of sampling MS/MSDs at a rate of 5% were achieved. No qualification of data was required.

1.11.10 Serial Dilutions

The serial dilution sample was analyzed to determine whether or not significant physical or chemical interferences exist due to sample matrix. The laboratory analyzed a sample from a different SDG. The serial dilution is a batch requirement, not a project requirement. The laboratory performed serial dilutions on URS samples in sufficient quantity in other SDGs. No qualification of data was required.

1.11.11 Field Duplicate Evaluation

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at a 5% frequency. No field duplicates were collected as part of this SDG; therefore, no qualifications of data were necessary.

1.11.12 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Completeness is defined to be the percentage of analytical results that are judged to be valid, including estimated (J) data, which was 100 percent for this SDG.

1.12 FULL VALIDATION OF METALS DATA – SDG KRM39

This section describes the full data validation for 17 soil samples, which were prepared by USEPA SW-846 Methods 3050B (ICP metals) and 7471A (mercury) and analyzed for metals by USEPA SW-846 Methods 6010B (ICP metals) and 7471A (mercury). Samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM39. Samples included as part of this validation are listed below:

Sample Identification	Sample Identification	Sample Identification
S-12-08-1-3	S-12-07-1-3	S-05-12-14-16
S-12-08-10-12	S-12-07-8-10	S-12-10-1-3
S-12-08-14-16	S-12-07-14-16	S-12-10-6-8
S-12-11-1-3	S-05-12-1-3	S-12-10-14-16
S-12-11-8-10	S-05-12-1-3-D	S-12-10-14-16-D
S-12-11-14-16	S-05-12-10-12	

The data validation followed USEPA CLP National Functional Guidelines for Inorganic Data Review (USEPA 2002), where applicable to the respective USEPA methods. The evaluation criteria used during the validation were a combination of those criteria presented in the respective methods and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Laboratory case narrative

- Sample preservation and holding times
- Blank contamination
- Initial calibration
- Calibration verification
- Laboratory control sample
- Laboratory duplicate analysis
- Matrix spike/matrix spike duplicate samples
- ICP serial dilution
- ICP interference check samples
- Field duplicate evaluation
- Sample result verification
- Overall data assessment.

1.12.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete for SDG KRM39.

1.12.2 Laboratory Case Narrative

The laboratory case narrative indicated that several matrix spike/matrix spike duplicate recoveries were outside evaluation criteria. Additionally, several laboratory duplicate RPDs were outside evaluation criteria. These issues are addressed in the appropriate sections below.

1.12.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the sample chain-of-custody, the sample preparation logs, the analysis run logs, and the raw data forms for holding time compliance. The samples were received by the laboratory at 4 $\pm$ 2 °C, properly preserved, and analyzed within the evaluation criteria of 6 months (28 days for mercury). No qualification of the data was required based on holding time criteria or sample preservation.

1.12.4 Blank Contamination

The purpose of blank samples was to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Initial calibration, continuing calibration, and preparation blanks were all reported non-detect for all metals. Ten percent of the blank sample results were compared to the raw data; no transcription errors were noted.

1.12.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for ICP metals and mercury. A curve consisting of a blank and three standards was used to establish the initial calibration curve for metals, meeting and/or exceeding requirements specified in Method 6010B. Review of the ICAL and initial calibration verification (ICV) data indicated that all analytes were within evaluation criteria (90-110%). No qualification of data was required based on ICAL criteria or ICV recoveries. One hundred percent of the ICV recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

Additionally a curve consisting of a blank and five standards, was used to establish the ICAL for mercury as specified in Method 7471A. Review of the ICAL data indicated the correlation coefficient value was greater than 0.995 for mercury. No qualification of the mercury data was required based on the ICAL. The initial calibration curve and the ICV recovery were recalculated for mercury, and no calculation or transcription errors were noted.

1.12.6 Calibration Verification

The CV criteria were established to assess whether the instrument was capable of reproducing acceptable qualitative and quantitative data established by the ICAL. The laboratory analyzed CV samples at a frequency of 10 percent as specified by the methodologies. CV samples associated with the validated samples had recoveries within the evaluation criteria (80-120%). No qualifications to the data were required. One hundred percent of the CV sample recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.12.7 Laboratory Control Sample

The LCS were analyzed to assess the accuracy of the analytical method and to demonstrate laboratory method performance. LCS recoveries were within evaluation criteria (80-120%) for all analytes. No qualification of data was required based on LCS recoveries. One hundred percent of LCS recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.12.8 Laboratory Duplicate Analysis

Laboratory duplicate samples were analyzed to assess method precision by the laboratory at the time of analysis. Samples S-12-11-1-3 and S-12-07-1-3 were submitted and duplicated by the laboratory and analyzed for all target compounds. The duplicate sample pair relative percent difference (RPD) was within evaluation criteria (25%) for all analytes with the exception of calcium (32%) and iron (46%) in sample S-12-07-1-3. Both analytes were qualified **J**. One hundred percent of the duplicate sample pair RPDs were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.12.9 Matrix Spike/Spike Duplicate

The MS/MSD sample pairs were analyzed to assess accuracy and the effects of matrix interference during analysis. The laboratory spiked and analyzed samples S-12-11-1-3 and S-12-07-1-3 for all target ICP metals and mercury. The MS/MSD recoveries were within evaluation criteria with the exception of those listed in the following table:

MS/MSD ID	Analyte	MS/MSD Recovery	RPD	MS/MSD/RPD Criteria
S-12-11-1-3	Antimony	**31/33**	8	75-125/20
S-12-11-1-3	Chromium	107/**129**	11	75-125/20
S-12-11-1-3	Copper	**56**/80	7	75-125/20
S-12-11-1-3	Potassium	**145/136**	2	75-125/20
S-12-07-1-3	Antimony	**58/56**	1	75-125/20
S-12-07-1-3	Magnesium	**64**/80	7	75-125/20
S-12-07-1-3	Mercury	90/**141**	8	75-125/20
S-12-07-1-3	Zinc	**72**/103	20	75-125/20

Qualification of data based on MS/MSD recoveries are listed in the following table.

Field ID	Analyte	Qualification
S-12-11-1-3	Antimony	UJ
S-12-11-1-3	Chromium	J
S-12-11-1-3	Copper	J
S-12-11-1-3	Potassium	J
S-12-07-1-3	Antimony	UJ
S-12-07-1-3	Magnesium	J
S-12-07-1-3	Mercury	J
S-12-07-1-3	Zinc	J

1.12.10 ICP Serial Dilutions

The serial dilution of samples S-12-11-1-3 and S-12-07-1-3 was analyzed to determine whether or not significant physical or chemical interferences exist due to sample matrix. The percent difference (%D) for each compound of the serial dilution sample was within evaluation criteria (10%) with the exception of arsenic (11%) and sodium (13%). The arsenic and sodium results for sample S-12-11-1-3 were qualified **J.** No additional qualifications to the data were required. One hundred percent of the serial dilution sample %Ds were recalculated and compared to the raw data and no transcription and calculation errors were noted.

1.12.11 ICP Interference Check Sample

The ICS were analyzed to verify the laboratory's interelement and background correction factors for ICP analysis. The laboratory analyzed the ICS at the beginning and end of the analytical run (or a minimum or twice per eight hour analytical run) as required by the methodology. The ICS recoveries were within evaluation criteria (80-120%). No qualification of data was required based on interelement interferences. One hundred percent of the ICS recoveries were recalculated and compared to the raw data and no transcription and calculation errors were noted.

1.12.12 Field Duplicate Evaluation

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at a 5% frequency. The field duplicates for this SDG are listed in the table below. All recoveries were with in evaluation criteria, therefore, no qualifications of data were necessary.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Laboratory case narrative
- Sample preservation and holding times
- Blank contamination
- Initial calibration
- Calibration verification
- Laboratory control sample
- Laboratory duplicate analysis
- Matrix spike/matrix spike duplicate samples
- ICP serial dilution
- ICP interference check samples
- Field duplicate evaluation
- Sample result verification
- Overall data assessment.

1.13.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete for SDG KRM44.

1.13.2 Laboratory Case Narrative

The laboratory case narrative indicated that the matrix spike/matrix spike duplicate sample was from a different SDG. No additional items were noted in the case narrative. The laboratory case narrative did not note that the serial dilution %D was outside evaluation criteria for arsenic. This issue is addressed in the appropriate section below.

1.13.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the sample chain-of-custody, the sample preparation logs, the analysis run logs, and the raw data forms for holding time compliance. The

samples were received by the laboratory at 4 ± 2 °C, properly preserved, and analyzed within the evaluation criteria of 6 months (28 days for mercury). No qualification of the data was required based on holding time criteria or sample preservation.

1.13.4 Blank Contamination

The purpose of blank samples was to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Initial calibration, continuing calibration, and preparation blanks were all reported non-detect for all metals. Ten percent of the blank sample results were compared to the raw data and no transcription errors were noted.

1.13.5 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for ICP metals and mercury. A curve consisting of a blank and three standards, was used to establish the initial calibration curve for metals, meeting and/or exceeding requirements as specified in Method 6010B. Review of the ICAL and ICV data indicated that all analytes were within evaluation criteria (90-110%). No qualification of data was required based on ICAL criteria or ICV recoveries. One hundred percent of the ICV recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

Additionally a blank and five standards, was used to establish the ICAL curve for mercury as specified in Method 7471A. Review of the ICAL data indicated the correlation coefficient value was greater than 0.995 for mercury. No qualification of the mercury data was required based on the ICAL. The ICAL curve and the ICV recovery were recalculated for mercury and no calculation or transcription errors were noted.

1.13.6 Calibration Verification

The CV criteria were established to assess whether the instrument was capable of reproducing acceptable qualitative and quantitative data established by the ICAL. The laboratory analyzed CV samples at a frequency of 10 percent as specified by the methodologies. CV samples associated with the validated samples had recoveries within the evaluation criteria (80-120%). No qualifications to the data were required. One hundred percent of the CV sample recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.13.7 Laboratory Control Sample

The LCS were analyzed to assess the accuracy of the analytical method and to demonstrate laboratory method performance. LCS recoveries were within evaluation criteria for all analytes (80-120%). No qualification of data was required based on LCS recoveries. One hundred percent of LCS recoveries were recalculated and compared to the raw data and no calculation or transcription errors were noted.

1.13.8 Laboratory Duplicate Analysis

A laboratory duplicate sample was not in SDG KRM44.

1.13.9 Matrix Spike/Spike Duplicate

A MS/MSD sample pair was analyzed to assess accuracy and the effects of matrix interference during analysis. The laboratory spiked and analyzed a sample from a different SDG. Project requirements of sampling MS/MSDs at a rate of 5% were achieved. No qualification of data was required.

1.13.10 ICP Serial Dilutions

The serial dilution of sample CT-1-2-0'-2' was analyzed to determine whether or not significant physical or chemical interferences exist due to sample matrix. The percent difference (%D) for each compound of the serial dilution sample was within evaluation criteria (10%) with the exception of arsenic (29%). The arsenic result for sample CT-1-2-0'-2' was qualified **J.** No additional qualifications to the data were required. One hundred percent of the serial dilution sample %Ds were recalculated and compared to the raw data and no transcription and calculation errors were noted.

1.13.11 ICP Interference Check Sample

The ICS were analyzed to verify the laboratory's interelement and background correction factors for ICP analysis. The laboratory analyzed the ICS at the beginning and end of the analytical run (or a minimum or twice per eight hour analytical run) as required by the methodology. The ICS recoveries were within evaluation criteria (80-120%). No qualification of data was required based on interelement interferences. One hundred percent of the ICS recoveries were recalculated and compared to the raw data and no transcription and calculation errors were noted.

1.13.12 Field Duplicate Evaluation

Overall precision for the sampling event was measured using field duplicate samples. Field duplicates were collected at a 5% frequency. The field duplicates for this SDG are listed in the table below. All recoveries were with in evaluation criteria, therefore, no qualifications of data were necessary.

Field ID	Field Duplicate ID
CT-1-1-13'-15'	CT-1-1-13'-15'Dup

1.13.13 Sample Result Verification

The data summary form for sample CT-1-2-0'-2' was reviewed and compared to the raw data package and no transcription errors were noted.

1.13.14 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Completeness is defined to be the percentage of analytical results that are judged to be valid, including estimated (J) data, which was 100 percent for this SDG.

Sample Identification	Sample Identification
S-05-12-1-3	S-05-12-1-3-D
S-12-10-14-16	S-12-10-14-16-D

1.12.13 Sample Result Verification

A minimum of ten percent of the validated sample results were recalculated to validate that analyte quantitation was derived accurately, and no calculation errors were noted. Data summary forms were reviewed and compared to the raw data package. No transcription errors were noted and the correct reporting limits were used.

1.12.14 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Completeness is defined to be the percentage of analytical results that are judged to be valid, including estimated (J) data, which was 100 percent for this SDG.

1.13 FULL VALIDATION OF METALS DATA – SDG KRM44

This section describes the full data validation for three soil samples, which were prepared by USEPA SW-846 Methods 3050B (ICP metals) and 7471A (mercury) and analyzed for metals by USEPA SW-846 Methods 6010B (ICP metals) and 7471A (mercury). Samples were analyzed by STL of Savannah, Georgia, and submitted as part of SDG KRM44. Samples included as part of this validation are listed below:

Sample Identification	Sample Identification	Sample Identification
CT-1-2-0'-2'	CT-1-1-13'-15'	CT-1-1-13'-15' DUP

The data validation followed USEPA CLP National Functional Guidelines for Inorganic Data Review (USEPA 2002), where applicable to the respective USEPA methods. The evaluation criteria used during the validation were a combination of those criteria presented in the respective methods and the laboratory criteria based on historical data.

DATA VALIDATION REPORT FOR DNAPL CHARACTERIZATION STUDY

March through June 2004

ECS Environmental Chemistry Services

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DATA VALIDATION REPORT

SOLUTIA INC.
KRUMMRICH PLANT
SAUGET, ILLINOIS
SOIL, GROUNDWATER, AND NAPL SAMPLING

MARCH 24 THROUGH JUNE 11, 2004

Prepared for
Solutia, Inc.
Houston, Texas
July 19, 2004

ECS Environmental Chemistry Services

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1.0 INTRODUCTION

One hundred and seventy-six soil, seven aqueous, and two NAPL samples were collected by Groundwater Services, Inc. from the Solutia Inc. Krummrich plant in Sauget, Illinois from March 24 through June 11, 2004. Ten trip blanks, eleven rinsate blanks, and thirteen field duplicates were also collected. The samples were relinquished by GSI under documented chain-of-custody for transport to Severn Trent Services in Savannah, Georgia. All samples were analyzed by the Seven Trent Services laboratory in Savannah Georgia except the dioxin analyses. The dioxin analyses were transported under documented chain of custody for transport and analysis to the Seven Trent Services laboratory in Sacramento, California.

The soil samples, aqueous samples, and one of the NAPL samples were analyzed for volatiles, semivolatiles, and total organic carbon (TOC) by the methods listed below. The other NAPL sample was analyzed for all of the following parameters by the methods shown:

PARAMETER	ANALYTICAL METHOD
Volatiles	8260B
Semivolatiles	8270C
Organochlorine Pesticides	8081A
Polychlorinated Biphenyls	8082
Herbicides	8151A
Total aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, nickel, potassium, selenium, silver, sodium, thallium , vanadium, zinc	6010B
Mercury	7470A
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans	8280A

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Data were qualified using data validation performed on all of the quality control data provided with a particular sample. Each analyte was identified as one of the following:

- Acceptable for use without restriction
- Qualified as an estimated concentration with a "J"
- Qualified as not detected with an estimated detection limit with a "UJ"
- Qualified as undetected with a "U"
- Rejected as unusable for the intended use with an "R"

For volatile organic, semivolatile organic, organochlorine pesticide, PCB, herbicide, and dioxin data, the following items were checked in accordance with the procedures set forth in the USEPA document entitled Contract Laboratory Program National Functional Guidelines for Organic Data Review using the QA/QC criteria presented in the method, if applicable:

- Holding Times
- GC/MS Instrument Performance
- Initial Calibration
- Continuing Calibration
- Blanks
- System Monitoring Compounds (Surrogate Samples)
- Matrix Spike/ Matrix Spike Duplicates
- Laboratory Control Samples
- Internal Standards
- Compound Identification
- Compound Quantitation
- Overall Assessment of Data

For metal and TOC data, the following items were checked in accordance with the procedures set forth in the USEPA document entitled Contract Laboratory Program National Functional Guidelines for Inorganic Data Review using the QA/QC criteria presented in method, if applicable:

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- Holding Times
- Calibration
- Blanks
- ICP Interference Check Sample (ICP metal analytes only)
- Laboratory Control Samples
- Duplicate Sample Analysis
- Spike Sample Analysis
- Overall Assessment of Data

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2.0 DATA REVIEW OF VOLATILE ORGANIC COMPOUNDS

The following samples were analyzed for volatiles:

SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN001	S442500-1	MCB-1	OIL	03/24/04
KDN002	S443269-1	K-9 (8-10 FT)	SOLID	04/13/04
	S443269-2	K-9 (18-20 FT)	SOLID	04/13/04
	S443269-3	K-9 (25-28 FT)	SOLID	04/13/04
	S443269-4	K-9 (30-33 FT)	SOLID	04/13/04
	S443269-5	K-9 (43-45 FT)	SOLID	04/13/04
	S443269-6	K-9 (53-55 FT)	SOLID	04/13/04
	S443269-7	K-9 (63-65 FT)	SOLID	04/13/04
	S443269-8	K-9 (75-78 FT)	SOLID	04/14/04
	S443269-9	K-9 (82-85 FT)	SOLID	04/14/04
	S443269-10	K-9 (95-98 FT)	SOLID	04/14/04
	S443269-11	K-9 (105-106 FT)	SOLID	04/14/04
	S443269-12	K-9 (108-111 FT)	SOLID	04/14/04
KDN003	S443313-1	K-8 (5-8 FT)	SOLID	04/15/04
	S443313-2	Duplicate 1	SOLID	04/15/04
	S443313-3	K-8 (15-18 FT)	SOLID	04/15/04
	S443313-4	K-8 (23-25 FT)	SOLID	04/15/04
	S443313-5	K-8 (30-33 FT)	SOLID	04/15/04
	S443313-6	K-8 (45-48 FT)	SOLID	04/15/04
	S443313-7	K-8 (55-58 FT)	SOLID	04/15/04
	S443313-8	K-8 (63-65 FT)	SOLID	04/15/04
	S443313-9	K-8 (73-75 FT)	SOLID	04/15/04
	S443313-10	K-8 (93-95 FT)	SOLID	04/15/04
	S443313-11	Duplicate 2	SOLID	04/15/04
	S443313-12	K-8 (88-90 FT)	SOLID	04/15/04
	S443313-13	K-8 (105-108 FT)	SOLID	04/15/04
	S443313-14	K-8 (110-113 FT)	SOLID	04/15/04
	S443313-18	Equipment Rinse	LIQUID	04/14/04
KDN004	S443358-1	K-7 (0-3 FT)	SOLID	04/16/04
	S443358-2	K-7 (18-20 FT)	SOLID	04/16/04
	S443358-3	K-7 (28-30 FT)	SOLID	04/16/04
	S443358-4	K-7 (30-33 FT)	SOLID	04/16/04
	S443358-5	K-7 (40-43 FT)	SOLID	04/16/04
	S443358-6	K-7 (58-60 FT)	SOLID	04/16/04
	S443358-7	Duplicate 3	SOLID	04/16/04
	S443358-8	K-7 (73-75 FT)	SOLID	04/16/04
	S443358-9	K-7 (68-70 FT)	SOLID	04/16/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN004	S443358-10	K-7 (83-85 FT)	SOLID	04/16/04
	S443358-11	K-7 (90-93 FT)	SOLID	04/16/04
	S443358-12	K-7 (108-110 FT)	SOLID	04/16/04
	S443358-13	K-7 (110-113 FT)	SOLID	04/16/04
	S443358-14	K-6 (8-10 FT)	SOLID	04/17/04
	S443358-19	Equipment Rinse (K-8)	LIQUID	04/16/04
	S443358-20	Equipment Rinse (K-9)	LIQUID	04/17/04
KDN005	S443358A-1	K-6 (15-18 FT)	SOLID	04/17/04
	S443358A-2	K-6 (25-28 FT)	SOLID	04/17/04
	S443358A-3	K-6 (33-35 FT)	SOLID	04/17/04
	S443358A-4	K-6 (40-43 FT)	SOLID	04/17/04
	S443358A-5	K-6 (50-53 FT)	SOLID	04/17/04
	S443358A-6	K-6 (65-68 FT)	SOLID	04/17/04
	S443358A-7	K-6 (73-75 FT)	SOLID	04/17/04
	S443358A-8	K-6 (85-88 FT)	SOLID	04/19/04
	S443358A-9	K-6 (95-98 FT)	SOLID	04/19/04
	S443358A-10	K-6 (105-110 FT)	SOLID	04/19/04
	S443358A-11	Duplicate 5	SOLID	04/19/04
	S443358A-12	K-6 (110-113 FT)	SOLID	04/19/04
KDN006	S443366-1	K-5 (45-48 FT)	SOLID	04/19/04
	S443366-2	K-5 (55-58 FT)	SOLID	04/20/04
	S443366-3	K-5 (65-68 FT)	SOLID	04/20/04
	S443366-4	K-5 (73-75 FT)	SOLID	04/20/04
	S443366-5	K-5 (83-85 FT)	SOLID	04/20/04
	S443366-6	K-5 (90-93 FT)	SOLID	04/20/04
	S443366-7	K-5 (113-116 FT)	SOLID	04/20/04
	S443366-8	K-5 (3-5 FT)	SOLID	04/19/04
	S443366-9	K-5 (13-15 FT)	SOLID	04/19/04
	S443366-10	K-5 (20-23 FT)	SOLID	04/19/04
	S443366-11	Duplicate 6	SOLID	04/19/04
	S443366-12	K-5 (30-33 FT)	SOLID	04/19/04
	S443366-17	K-5 (105-109 FT)	SOLID	04/20/04
	S443366-18	K-5 (109-111 FT)	SOLID	04/20/04
	S443366-19	Trip Blank	LIQUID	04/20/04
	S443366-20	Equipment Rinse (K-6)	LIQUID	04/19/04
	S443366-21	Trip Blank	LIQUID	04/19/04
	S443366-22	K-9 (109-111 FT)	SOLID	04/20/04
KDN007	S443445-1	K-1 (8-10 FT)	SOLID	04/21/04
	S443445-2	K-1 (15-18 FT)	SOLID	04/21/04
	S443445-3	Duplicate 8	SOLID	04/21/04
	S443445-4	K-1 (30-33 FT)	SOLID	04/21/04
	S443445-5	K-1 (25-28 FT)	SOLID	04/21/04
	S443445-6	K-1 (55-58 FT)	SOLID	04/21/04
	S443445-7	K-1 (60-63 FT)	SOLID	04/21/04
	S443445-8	K-1 (75-78 FT)	SOLID	04/21/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN007	S443445-9	K-1 (80-83 FT)	SOLID	04/21/04
	S443445-10	K-1 (95-98 FT)	SOLID	04/21/04
	S443445-11	K-1 (108-110 FT)	SOLID	04/21/04
	S443445-12	K-1 (113-116 FT)	SOLID	04/21/04
	S443445-16	Equipment Rinse (K-5)	LIQUID	04/20/04
	S443445-17	Equipment Rinse (K-1)	LIQUID	04/21/04
KDN008	S443721-1	K-4 (8-10 FT)	SOLID	04/28/04
	S443721-2	K-4 (15-18 FT)	SOLID	04/28/04
	S443721-3	Duplicate 9	SOLID	04/28/04
	S443721-4	K-4 (28-30 FT)	SOLID	04/28/04
	S443721-5	K-4 (38-40 FT)	SOLID	04/28/04
	S443721-6	K-4 (43-45 FT)	SOLID	04/28/04
	S443721-7	K-4 (58-60 FT)	SOLID	04/28/04
	S443721-8	K-4 (60-63 FT)	SOLID	04/28/04
	S443721-9	K-4 (75-78 FT)	SOLID	04/28/04
	S443721-10	K-4 (80-83 FT)	SOLID	04/28/04
	S443721-11	K-4 (90-93 FT)	SOLID	04/28/04
	S443721-12	K-4 (108-110 FT)	SOLID	04/28/04
	S443721-13	Duplicate 10	SOLID	04/28/04
	S443721-14	K-4 (110-111.5 FT)	SOLID	04/28/04
	S443721-18	Trip Blank	LIQUID	04/28/04
KDN009	S444029-1	K-4	LIQUID	05/06/04
	S443991-1	K-8	LIQUID	05/04/04
	S443991-2	K-1	LIQUID	05/05/04
	S443991-3	K-7	LIQUID	05/05/04
	S443991-4	K-6	LIQUID	05/05/04
	S443991-5	K-9	LIQUID	05/05/04
	S443991-6	K-5	LIQUID	05/05/04
	S443991-7	Trip Blank	LIQUID	05/04/04
KDN010	S443991A-1	K-2 (3-5 FT)	SOLID	05/06/04
	S443991A-2	K-2 (15-18 FT)	SOLID	05/06/04
	S443991A-3	K-2 (25-28 FT)	SOLID	05/06/04
	S443991A-4	K-2 (39-40 FT)	SOLID	05/06/04
	S443991A-5	K-2 (45-48 FT)	SOLID	05/06/04
	S443991A-6	K-2 (55-57 FT)	SOLID	05/06/04
	S443991A-7	K-2 (68-70 FT)	SOLID	05/06/04
	S443991A-8	K-2 (73-75 FT)	SOLID	05/06/04
	S443991A-9	K-2 (83-85 FT)	SOLID	05/06/04
	S443991A-10	K-2 (93-95 FT)	SOLID	05/06/04
	S443991A-11	K-2 (105-108 FT)	SOLID	05/06/04
	S443991A-16	K-2 Equipment Rinse	LIQUID	05/06/04
	S443991A-17	Trip Blank	LIQUID	05/06/04
KDN011	S444029-1	K-3 (8-10 FT)	SOLID	05/07/04
	S444029-2	K-3 (8-10 FT)	SOLID	05/07/04
	S444029-3	K-3 (13-15 FT)	SOLID	05/07/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN011	S444029-4	Duplicate 11	SOLID	05/07/04
	S444029-5	K-3 (23-25 FT)	SOLID	05/07/04
	S444029-6	K-3 (35-39 FT)	SOLID	05/07/04
	S444029-7	K-3 (45-48 FT)	SOLID	05/07/04
	S444029-8	K-3 (57-59 FT)	SOLID	05/07/04
	S444029-9	K-3 (60-63 FT)	SOLID	05/07/04
	S444029-10	Duplicate 12	SOLID	05/07/04
	S444029-11	K-3 (73-75 FT)	SOLID	05/07/04
	S444029-12	K-3 (87-89 FT)	SOLID	05/07/04
	S444029-13	K-3 (95-98 FT)	SOLID	05/07/04
	S444029-14	K-3 (107-109 FT)	SOLID	05/07/04
	S444029-19	K-3 Equipment Rinse	LIQUID	05/07/04
	S444029-20	Trip Blank	LIQUID	05/07/04
KDN012	S444184-1	1DNAPL-K-3	LIQUID	05/15/04
KDN013	S445116-1	K-11 (6-8.5 FT)	SOLID	06/08/04
	S445116-2	K-11 (13.5-16 FT)	SOLID	06/08/04
	S445116-3	K-11 (18.5-21 FT)	SOLID	06/08/04
	S445116-4	K-11 (33-35.5 FT)	SOLID	06/08/04
	S445116-5	K-11 (45.5-48 FT)	SOLID	06/08/04
	S445116-6	K-11 (58.5-61 FT)	SOLID	06/08/04
	S445116-7	K-11 (68-70.5 FT)	SOLID	06/08/04
	S445116-8	K-11 (73-75.5 FT)	SOLID	06/08/04
	S445116-9	K-11 (90.5-93 FT)	SOLID	06/09/04
	S445116-10	K-11 (101-103.5 FT)	SOLID	06/09/04
	S445116-11	K-11 (106-108.5 FT)	SOLID	06/09/04
	S445116-12	K-11 (101-103.5 FT)	SOLID	06/09/04
	S445116-13	EB- (06-09-04) Auger bit	LIQUID	06/09/04
KDN014	S445182-1	K-10 (8.5-11.0 FT)	SOLID	06/09/04
	S445182-2	K-10 (18.5-21.0 FT)	SOLID	06/09/04
	S445182-3	K-10 (21.0-23.5 FT)	SOLID	06/09/04
	S445182-4	K-10 (40.5-43.0 FT)	SOLID	06/09/04
	S445182-5	K-10 (58.0-60.5 FT)	SOLID	06/09/04
	S445182-6	K-10 (66.0-68.5 FT)	SOLID	06/09/04
	S445182-7	K-10 (80.0-82.5 FT)	SOLID	06/10/04
	S445182-8	K-10 (90.5-93.0 FT)	SOLID	06/10/04
	S445182-9	K-10 (106.0-108.5 FT)	SOLID	06/10/04
	S445182-10	K-10A (106.0-108.5 FT)	SOLID	06/10/04
	S445182-11	K-10 (111.0-113.5 FT)	SOLID	06/10/04
	S445182-12	K-10 (45.5-48.0 FT)	SOLID	06/10/04
	S445182-16	Trip Blank	LIQUID	06/10/04
KDN015	S445262-1	K-12 (0-2.5 FT)	SOLID	06/10/04
	S445262-2	K-12 (10-12.5 FT)	SOLID	06/10/04
	S445262-3	K-12 (21-23.5 FT)	SOLID	06/10/04
	S445262-4	K-12 (33.5-36 FT)	SOLID	06/10/04
	S445262-5	K-12 (43.5-46 FT)	SOLID	06/10/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN015	S445262-6	K-12 (53.5-56 FT)	SOLID	06/10/04
	S445262-7	K-12 (63.5-66 FT)	SOLID	06/10/04
	S445262-8	K-12 (66-68,5 FT)	SOLID	06/10/04
	S445262-9	K-12 (81-83.5 FT).	SOLID	06/11/04
	S445262-10	K-12 (93.5-96 FT)	SOLID	06/11/04
	S445262-11	K-12 (101-103.5 FT)	SOLID	06/11/04
	S445262-12	K-12 (106-108.5 FT)	SOLID	06/11/04
	S445262-13	DUP	SOLID	06/11/04
	S445262-17	06/10/04 EB	LIQUID	06/10/04
	S445262-18	06/11-04 EB	LIQUID	06/11/04
	S445262-19	Trip Blank	LIQUID	06/11/04
	S445262-20	Trip Blank	LIQUID	06/11/04
	S445262-21	Trip Blank	LIQUID	06/11/04

2.1 *Holding Times*

The maximum holding time from date of collection to date of analysis for volatiles in organic and solid samples recommended in the method is 14 days. The maximum holding time from date of collection to date of analysis for volatiles in aqueous samples that have been preserved at 4° C to a pH less than 2 recommended in the method is 14 days. These holding times were met for all of the volatile samples in this data set. None of the volatile data were qualified based on holding time.

2.2 *GC/MS Instrument Performance*

All of the mass calibrations for volatiles met the ion abundance criteria specified by SW-846. GC/MS tunes were conducted at the proper frequency (1 every 12 hours) for this data set.

BFB ion abundance criteria were met on the following instrument tunes:

SDG	GC/MS INSTRUMENT	DATE	TIME
KDN001	MSM5972	03/25/04	1722
	MSM5972	03/26/04	0942

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SDG	GC/MS INSTRUMENT	DATE	TIME
KDN002	MSM5972	04/16/04	0900
	MSM5972	04/20/04	0857
	MSM5972	04/21/04	0851
	MSM5972	04/27/04	0854
KDN003	MSB5973	04/08/04	1358
	MSM5972	04/16/04	0900
	MSM5973	04/22/04	0947
	MSM5972	04/24/04	0842
	MSM5972	04/26/04	0904
	MSM5972	04/27/04	0854
KDN004	MSO5973	04/14/04	1140
	MSM5972	04/16/04	0900
	MSM5972	04/23/04	0853
	MSM5972	04/26/04	1929
	MSM5972	04/27/04	1915
	MSM5972	04/28/04	0859
KDN005	MSL5972	04/28/04	0854
	MSL5972	04/28/04	2105
	MSL5972	04/30/04	0931
KDN006	MSB5973	04/08/04	1358
	MSL5972	04/28/04	0854
	MSB5973	04/26/04	0653
	MSL5972	04/28/04	2105
	MSL5972	04/29/04	0844
	MSL5972	04/30/04	0931
KDN007	MSB5973	04/08/04	1358
	MSL5972	04/28/04	0854
	MSB5973	04/28/04	1036
	MSL5972	04/30/04	0931
	MSL5972	04/30/04	2136

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SDG	GC/MS INSTRUMENT	DATE	TIME
KDN008	MSM5972	04/16/04	0900
	MSB5973	05/10/04	1328
	MSM5972	05/07/04	0909
	MSB5973	05/11/04	0711
	MSM5972	05/11/04	0848
	MSM5972	05/12/04	0847
KDN009	MSP5973	05/13/04	0853
	MSP5973	05/17/04	1036
	MSP5973	05/18/04	1005
	MSP5973	05/19/04	1004
KDN010	MSM5972	04/16/04	0900
	MSP5973	05/13/04	0853
	MSP5973	05/17/04	1036
	MSM5972	05/18/04	0845
	MSM5972	05/18/04	2024
	MSM5972	05/19/04	0857
	MSM5972	05/20/04	0852
KDN011	MSB5973	05/10/04	1328
	MSL5972	04/28/04	0854
	MSB5973	05/20/04	0625
	MSL5972	05/20/04	1126
	MSL5972	05/21/04	0931
KDN012	MSO5973	05/24/04	1157
	MSO5973	05/25/04	0910
KDN013	MSL5972	06/09/04	1325
	MSL5972	06/14/04	1052
	MSL5972	06/15/04	0929
	MSL5972	06/16/04	0956
	MSL5972	06/21/04	0837
KDN014	MSM5972	04/16/04	0900

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SDG	GC/MS INSTRUMENT	DATE	TIME
KDN014	MSM5972	06/14/04	0935
	MSM5972	06/15/04	0923
	MSM5972	06/16/04	0953
	MSM5972	06/17/04	0906
	MSO5973	06/15/04	1446
	MSO5973	06/18/04	0944
KDN015	MSM5972	04/16/04	0900
	MSM5972	06/17/04	0906
	MSM5972	06/18/04	0932
	MSP5973	06/18/04	1801
	MSP5973	06/21/04	1011
	MSP5973	06/22/04	1024

None of the volatile data in this report were qualified as estimated or rejected as unusable due to noncompliance instrument tuning.

2.3 *Initial Calibration*

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels as appropriate for these samples. Each calibration standard contained test compounds, surrogates, and internal standards.

The following initial calibrations were performed on the GC/MS instruments used for volatile analysis for this data set:

SDG	GC/MS INST ID	DATE	TIME	ASSOCIATED SAMPLES
KDN001	MSM5972	03/25/04	1854	All samples in this SDG
KDN002	MSM5972	04/16/04	1148	All samples in this SDG
KDN003	MSB5973	04/08/04	1447	S443313-18

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SDG	GC/MS INST ID	DATE	TIME	ASSOCIATED SAMPLES
KDN003	MSM5972	04/16/04	1148	S443313-1-14, 3DL
KDN004	MSO5973	04/14/04	1313	S443358-18, 19
	MSM5972	04/16/04	1148	S443358-1-14
KDN005	MSL5972	04/28/04	0919	S443358A-2-4, 6-8, 10
KDN006	MSB5973	04/08/04	1447	S443366-19, 20, 21
	MSL5972	04/28/04	0919	S443366-1-12, 22
KDN007	MSB5973	04/08/04	1447	S443445-16, 17
	MSL5972	04/28/04	0919	S443445-1-12
KDN008	MSM5972	04/16/04	1148	S443721-18
	MSB5973	05/10/04	1434	S443721-1-13, 1DL, 2DL, 3DL, 4DL, 5DL, 6DL, 7DL, 9DL, 13DL, 14DL
KDN009	MSP5973	05/13/04	0948	All samples in this SDG
KDN010	MSM5972	04/16/04	1148	S443991A-1-11
	MSP5973	05/13/04	0948	S443991A-15, 16, 17
KDN011	MSB5973	05/10/04	1434	S444029-19, 20
	MSL5972	04/28/04	0919	S444029-1-14
KDN012	MSO5973	05/24/04	1047	All samples in this SDG
KDN013	MSL5972	06/09/04	1413	All samples in this SDG
KDN014	MSM5972	04/16/04	1148	S445182-1-12
	MSO5973	06/15/04	1527	S445182-16
KDN015	MSM5972	04/16/04	1148	S445262-1-13, 5DL, 6DL, 7DL, 8DL
	MSP5973	06/18/04	1928	S445262-17-20

The results of the data validation procedure for the initial calibrations are summarized as follows.

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GC/MS Instrument ID MSM5972 – 03/25/04 - 1854

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSM5972 – 04/16/04 - 1148

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

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All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSB5973 – 04/08/04 - 1447

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSO5973 – 04/14/04 - 1313

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSL5972 – 04/28/04 - 0919

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were

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qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSB5973 – 05/10/04 - 1434

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSP5973 – 05/13/04 - 0948

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1

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Compound	RRF Control Limit
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSO5973 – 05/24/04 - 1047

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

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GC/MS Instrument ID MSL5972 – 06/09/04 - 1413

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSO5973 – 06/15/04 - 1148

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

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All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSP5973 – 06/18/04 - 1928

The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this initial calibration.

All percent relative standard deviations (%RSD) for Calibration Check Compounds (CCC) were less than or equal to 30 percent. None of the volatile data in this report were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

2.4 *Continuing Calibration*

Each GC/MS employed for samples or associated quality control samples was calibrated for each 12-hour shift in which samples or associated quality control samples were analyzed. Each calibration standard was performed at one concentration level with a standard that contained all compounds, surrogates and internal standards. The following

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continuing calibrations were performed on the GC/MS instruments used for volatile analysis:

SDG	GC/MS INST.ID	DATE	TIME	ASSOCIATED SAMPLES
KDN001	MSM5972	03/25/04	1722	S442500-1
	MSM5972	03/26/04	1032	S442500-1DL
KDN002	MSM5972	04/20/04	1034	S443269-1-7, 9-11, 2DL, 3DL, 5DL, 6DL
	MSM5972	04/21/04	0944	S443269-7DL, 11DL
	MSM5972	04/27/04	1019	S443269-8, 12
KDN003	MSB5973	04/22/04	1013	S443313-18
	MSM5972	04/24/04	0958	S443313-1, 2, 4, 6-9, 11-14
	MSM5972	04/26/04	0954	S443313-10
	MSM5972	04/27/04	1019	S443313-3, 3DL, 5
KDN004	MSO5973	04/23/04	0950	S443358-18, 19
	MSM5972	04/26/04	2014	S443358-1-4
	MSM5972	04/27/04	1019	S443358-5, 6, 8, 9
	MSM5972	04/27/04	2000	S443358-7, 10-12, 14
	MSM5972	04/28/04	1015	S443358-1RE, 3DL, 45DL, 13, 14DL
KDN005	MSL5972	04/28/04	2123	S443358A-1, 5, 9, 11
	MSL5972	04/30/04	1000	S443358-12
KDN006	MSB5973	04/26/04	0718	S443366-19, 20, 21
	MSL5972	04/28/04	2123	S443366-1, 3, 5
	MSL5972	04/29/04	0912	S443366-1, 2, 4, 6, 8-12, 22
	MSL5972	04/30/04	1000	S443366-4DL, 7
KDN007	MSB5973	04/28/04	1109	S443445-16, 17
	MSL5972	04/30/04	1000	S443445-2, 3, 8, 11, 12
	MSL5972	04/30/04	2152	S443445-1, 2DL, 3DL, 4-7. 8DL, 9, 10
KDN008	MSM5972	05/07/04	0938	S443721-10, 13, 14

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SDG	GC/MS INST.ID	DATE	TIME	ASSOCIATED SAMPLES
KDN008	MSM5972	05/11/04	0940	S443721-1-9, 1DL, 2DL, 3DL, 4DL, 5DL, 12, 13DL
	MSM5972	05/12/04	0938	S443721-6DL, 7DL, 9DL, 11, 14DL
	MSB5973	05/11/04	1044	S-443721-18
KDN009	MSP5973	05/17/04	1131	S4433991-7, S440294-1
	MSP5973	05/18/04	1059	S4433991-1-3, 6, S440294-1DL
	MSP5973	05/19/04	1101	S4433991-4, 5
KDN010	MSP5973	05/17/04	1131	S4433991A-15, 16, 17
	MSM5972	05/18/04	0939	S4433991A-3
	MSM5972	05/18/04	2045	S4433991A-1, 4, 6-9, 11
	MSM5972	05/19/04	1027	S4433991A-1DL, 2, 5, 7DL, 9DL
	MSM5972	05/20/04	0932	S4433991A-4DL, 10
KDN011	MSB5973	05/20/04	0738	S444029-19, 20
	MSL5972	05/20/04	1153	S4440291-4, 6-12, 13DL, 14
	MSL5972	05/21/04	1109	S444029-2DL, 3DL, 5, 6DL, 11RE, 13
KDN012	MSO5973	05/25/04	0935	S444184-1
KDN013	MSL5972	06/14/04	1116	S445116-1, 3-8, 10-12
	MSL5972	06/15/04	0955	S445116-2, 9
	MSL5972	06/16/04	1057	S445116-12D
	MSL5972	06/21/04	0903	S445116-13
KDN014	MSM5972	06/14/04	1053	S445182-1, 2, 6-11
	MSM5972	06/15/04	0948	S445182-5, 12
	MSM5972	06/16/04	1112	S445182-3, 4DL
	MSM5972	06/17/04	0948	S445182-4
	MSO5973	06/18/04	1040	S445182-16
KDN015	MSM5972	06/17/04	0948	S445262-1-8, 12, 13
	MSM5972	06/18/04	1001	S445262-9-11, 5DL, 6DL, 7DL, 8DL
	MSP5973	06/21/04	1038	S445262-17, 18

SDG	GC/MS INST.ID	DATE	TIME	ASSOCIATED SAMPLES
KDN015	MSP5973	06/22/04	1050	S445262-19, 20, 21

The results of the data validation procedure for the continuing calibrations are summarized as follows.

GC/MS Instrument ID MSM5972 – 03/25/04 - 1722

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 03/26/04 - 1032

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/20/04 - 1034

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

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All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/21/04 - 0944

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/27/04 - 1019

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSB5973 – 04/22/04 - 1013

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

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All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/24/04 - 0958

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/26/04 - 0954

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 - 04/27/04 - 1019

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

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All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSO5973 – 04/23/04 - 0950

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/26/04 - 2014

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/27/04 - 1019

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

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All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/27/04 - 2000

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 04/28/04 - 1015

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSL5972 – 04/28/04 - 2123

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

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All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSL5972 – 04/30/04 - 1000

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSB5973 – 04/26/04 - 0718

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent with the following exceptions:

SDG	COMPOUND	%D	ASSOC. SAMPLES
KDN006	1,1-Dichloroethene	48	S443366-19, 20, 21
	Ethyl benzene	21	S443366-19, 20, 21

Detection limits for the non-detects in the associated samples were qualified as estimated with a "UJ" qualifier.

GC/MS Instrument ID MSL5972 – 04/29/04 - 0912

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1

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Compound	RRF Control Limit
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSB5973 – 04/28/04 - 1109

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent with the following exceptions:

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SDG	COMPOUND	%D	ASSOC. SAMPLES
KDN006	1,1-Dichloroethene	43	S443445-16, 17

Detection limits for the non-detects in the associated samples were qualified as estimated with a "UJ" qualifier.

GC/MS Instrument ID MSL5972 – 04/30/04 - 2152

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 05/07/04 - 0938

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 05/11/04 - 0940

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

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All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 05/12/04 - 0938

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSB5973 – 05/11/04 - 1044

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSP5973 – 05/17/04 - 1131

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

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All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSP5973 –05/18/04 - 1059

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSP5973 – 05/19/04 - 1101

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

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Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration.

All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 05/18/04 - 0939

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

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GC/MS Instrument ID MSM5972 – 05/18/04 - 2045

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 5/19/04 - 1027

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

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All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 05/20/04 - 0932

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSB5973 – 05/20/04 - 0738

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1

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Compound	RRF Control Limit
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSL5972 – 05/20/04 - 1153

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

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GC/MS Instrument ID MSL5972 – 05/21/04 - 1109

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSO5973 – 05/25/04 - 0935

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

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All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSL5972 – 06/14/04 - 1116

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSL5972 – 06/15/04 - 0955

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1

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Compound	RRF Control Limit
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSL5972 – 06/16/04 - 1057

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

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GC/MS Instrument ID MSL5972 – 06/21/04 - 0903

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 06/14/04 - 1053

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

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All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 06/15/04 - 0948

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 06/16/04 - 1112

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1

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Compound	RRF Control Limit
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 06/17/04 - 0948

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

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GC/MS Instrument ID MSO5973 – 06/18/04 - 1040

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSM5972 – 06/18/04 - 1001

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

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All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSP5973 – 06/21/04 - 1038

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

GC/MS Instrument ID MSP5973 – 06/22/04 - 1050

This continuing calibration was performed at one concentration level with a standard that contained all test compounds. The relative response factors (RRFs) for System Performance Check Compounds (SPCC) were checked to determine whether the following Control Limits were met:

Compound	RRF Control Limit
Chloromethane	0.1

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Compound	RRF Control Limit
1,1-Dichloroethane	0.1
Bromoform	0.1
Chlorobenzene	0.3
1,1,2,2-Tetrachloroethane	0.3

All RRF met the control limits listed above. None of the volatile data were qualified as estimated or rejected as unusable due to RRFs for this continuing calibration. All percent differences (%D) for Calibration Check Compounds (CCC) were less than or equal to 25 percent. None of the volatile data were qualified based on continuing calibration %D.

2.5 *Blanks*

The following blanks were associated with the volatile analyses in this report:

SDG	BLANK ID	GC/MS INST ID	DATE	TIME	ASSOCIATED SAMPLES
KDN001	KDN001-1	MSM5972	04/07/04	1225	S442500-1
KDN002	KDN002-1	MSM5972	04/20/04	1231	S443269-1, 5-7, 9-11
	KDN002-13	MSM5972	04/20/04	1253	S443269-2-4, 2DL, 3DL, 5DL, 6DL
	KDN002-16	MSM5972	04/21/04	1204	S443269-7DL, 11DL
	KDN002-19	MSM5972	04/27/04	1220	S443269-8, 12
	Equipment Rinse	MSM5972	04/22/04	2001	S443269-8-12
KDN003	KDN003-1	MSM5972	04/24/04	1149	S443313-11-14
	KDN003-33	MSM5972	04/24/04	1209	S443313-1, 2, 4, 6-9
	KDN003-36	MSM5972	04/26/04	1213	S443313-13, 15
	KDN003-39	MSM5972	04/27/04	1241	S443313-3, 3DL, 5
KDN004	KDN004-13	MSO5973	04/23/04	1204	S443358-19, 20
	KDN004-1	MSM5972	04/26/04	2258	S443358-1-4
	KDN004-21	MSM5972	04/27/04	1220	S443358-5, 6, 8, 9
	KDN004-24	MSM5972	04/27/04	2119	S443358-7, 10-12, 14
	KDN004-27	MSM5972	04/28/04	1239	S443358-1RE, 13
	KDN004-30	MSM5972	04/28/04	1300	S443358-3DL, 4DL, 14DL
	Equipment Rinse (K-8)	MSM5972	04/23/04	1301	S443358-1-14

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SDG	BLANK ID	GC/MS INST ID	DATE	TIME	ASSOCIATED SAMPLES
KDN005	KDN005-1	MSM5972	04/28/04	1640	S443358A-2-4, 6-8, 10
	KDN005-20	MSL5972	04/29/04	0026	S443358A-1, 5, 9, 11, 13
	KDN005-23	MSL5972	04/30/04	1323	S443358A-12
	Equipment Rinse (K-9)	MSM5972	04/23/04	1327	S443358A-1-7
KDN006	KDN006-1	MSL5972	04/29/04	0026	S443366-3, 5
	KDN006-13	MSB5973	04/26/04	1008	S443366-19, 20, 21
	KDN006-21	MSL5972	04/29/04	1206	S443366-4, 6, 22
	KDN006-24	MSL5972	04/29/04	1144	S443366-1, 2, 8-12
	KDN006-27	MSL5972	04/30/04	1345	S443366-4DL, 7
	Equipment Rinse (K-6)	MSB5973	04/26/04	1328	S443366-1, 8-12, 16
	Trip Blank(19)	MSB5973	04/26/04	1304	S443366-2-7, 17, 18, 22
	Trip Blank (21)	MSB5973	04/26/04	1352	S443366-1, 8-12, 16
KDN007	KDN007-1	MSL5972	04/30/04	1323	S443445-2, 3, 8, 11, 12
	KDN00-20	MSB5973	04/28/04	1307	S443445-16, 17
	KDN0035	MSL5972	05/01/04	0127	S443445-9, 10
	KDN007-38	MSL5972	05/01/04	0104	S443445-1, 2DL, 3DL, 4-7, 8DL
	KDN007-42	MSL5972	05/01/04	1446	S443445-5RE
	Equipment Rinse (K-1)	MSB5973	04/28/04	1744	S443445-1-12
KDN008	KDN008-1	MSM5972	05/07/04	1136	S443721-10, 13, 14
	KDN008-20	MSB5973	05/11/04	1223	S443721-18
	KDN008-28	MSM5972	05/11/04	1200	S443721-1-9, 1DL, 2DL, 3DL, 4DL, 5DL, 12, 13DL
	KDN008-31	MSM5972	05/12/04	1202	S443721-6DL, 7DL, 9DL, 11, 14DL
	Trip Blank	MSB5973	05/11/04	1901	All samples in this SDG
KDN009	KDN009-1	MSP5973	05/17/04	1350	S443991-7, S440294-1
	KDN009-13	MSP5973	05/18/04	1318	S443991-1-3, 6, S440294-1DL
	KDN009-16	MSP5973	05/19/04	1320	S443991-4, 5
	Trip Blank	MSP5973	05/17/04	1943	All samples in this SDG
KDN010	KDN010-1	MSM5972	05/18/04	1409	S443991A-3
	KDN010-13	MSP5973	05/17/04	1350	S443991A-15, 16, 17
	KDN010-21	MSM5972	05/18/04	2214	S443991A-1, 4
	KDN010-24	MSM5972	05/18/04	2250	S443991A-6-9, 11
	KDN010-27	MSM5972	05/19/04	1302	S443991A-1DL, 2, 5, 7DL. 9DL
	KDN010-30	MSM5972	05/20/04	1207	S443991A-4DL, 10
	K-4 Equipment Rinse	MSP5973	05/17/04	2011	All samples in this SDG

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SDG	BLANK ID	GC/MS INST ID	DATE	TIME	ASSOCIATED SAMPLES
KDN010	K-2 Equipment Rinse	MSP5973	05/17/04	2039	All samples in this SDG
	Trip Blank	MSP5973	05/17/04	2107	All samples in this SDG
KDN011	KDN011-1	MSL5972	05/20/04	1430	S444029-19, 20
	KDN011-20	MSB5973	05/20/04	0926	S444029-1-4, 6-12, 13DL, 14
	KDN011-34	MSL5972	05/21/04	1421	S444029-2DL, 3DL, 5, 6DL, 11RE, 13, 15
	KDN011-37	MSL5972	05/21/04	1359	S444029-13
	K-3 Equipment Rinse	MSL5972	05/20/04	1041	All samples in this SDG
	Trip Blank	MSL5972	05/20/04	1017	All samples in this SDG
KDN012	KDN012-1	MSO5973	05/25/04	1157	All samples in this SDG
KDN013	KDN013-1	MSL5972	06/14/04	1333	S445116-1, 3-8, 10-12
	KDN013-32	MSL5972	06/15/04	1236	S445116-2, 9
	KDN013-35	MSL5972	06/16/04	1409	S445116-12D
	KDN013-38	MSL5972	06/21/04	1141	S445116-13
	EB- (06-09-04) Auger bit	MSO5973	06/18/04	1245	S445116-9-12
KDN014	KDN014-1	MSM5972	06/14/04	1340	S445182-1, 2, 6-11
	KDN014-20	MSO5973	06/18/04	1245	S445182-16
	KDN014-26	MSM5972	06/16/04	1319	S445182-3
	KDN014-29	MSM5972	06/17/04	1206	S445182-4
	KDN014-32	MSM5972	06/15/04	1243	S445182-12, 5
	KDN014-35	MSM5972	06/16/04	1348	S445182-12RE, 4DL
	Trip Blank	MS05973	06/18/04	1331	All samples in this SDG
KDN015	KDN015-1	MSM5972	06/17/04	1206	SS445262-1-8, 12, 13
	KDN015-13	MSP5973	06/21/04	1309	SS445262-17, 18
	KDN015-25	MSM5972	06/18/04	1234	SS445262-5DL, 6DL, 7DL, 8DL
	KDN015-28	MSM5972	06/18/04	1213	S445262-9-11
	KDN015-31	MSP5973	06/22/04	1321	S445262-19-21
	6-10-04 EB	MSP5973	06/21/04	2139	S445262-1-8, 14
	6-11-04 EB	MSP5973	06/21/04	2209	S445262-9-13
	Trip Blank	MSP5973	06/22/04	1402	All samples in this SDG
	Trip Blank	MSP5973	06/22/04	1433	All samples in this SDG
	Trip Blank	MSP5973	06/22/04	1502	All samples in this SDG

The following target volatile compounds were reported in the associated blanks:

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SDG	BLANK ID	COMPOUND	CONC.	ASSOC. SAMPLES QUALIFIED AS NON-DETECT
KDN007	Equipment rinse (K-1)	Carbon Disulfide	0.00092 mg/l	S443445-9, 11, 12
KDN010	K-2 Equipment Rinse	Toluene	0.00061 mg/l	S443991A-4
KDN013	EB- (06-09-04) Auger bit	Acetone	0.0054 mg/l	S445116-10, 11
		Toluene	0.00060 mg/l	S445116-10
KDN015	6-10-04 EB	Toluene	0.00055 mg/l	S445262-6
	6-11-04 EB	Toluene	0,00058 mg/l	None

Any volatile compounds detected in a sample (other than a common laboratory contaminant), that was also detected in any associated blank were qualified as not detected with a "U" qualifier if the sample concentration was less than five times the blank concentration. For common laboratory contaminants (methylene chloride, acetone, 2-butanone, cyclohexane), the results were qualified by elevating the quantitation limit to the concentration found in the sample with a "U" qualifier when the sample concentration is less than 10 times the blank concentration. The quantitation limit was elevated to the concentration in the sample. The compounds and samples listed above were qualified as NOT DETECTED based on the guidance defined here.

2.6 *Surrogate Samples*

All volatile surrogate percent recoveries (%R) for the samples covered by this report were within the specified quality control limits with the following exceptions:

SDG	LAB SAMPLE ID	SURROGATE	%R	CONTROL LIMITS
KDN002	S443269-6	p-Bromofluorbenzene	138	68-121
	S443269-3	Dibromofluoromethane	157	66-127
		Toluene-d8	146	65-128
		p-Bromofluorbenzene	151	68-121
KDN004	S443358-3DL	Dibromofluoromethane	150	66-127
		Toluene-d8	142	65-128

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SDG	LAB SAMPLE ID	SURROGATE	%R	CONTROL LIMITS
KDN004	S443358-3DL	p-Bromofluorbenzene	148	68-121
KDN007	S443445-5	Dibromofluoromethane	139	66-127
	S443445-5RE	Dibromofluoromethane	129	66-127
		Toluene-d8	129	65-128
		p-Bromofluorbenzene	126	68-121
KDN008	S443721-4	Dibromofluoromethane	129	66-127
		p-Bromofluorbenzene	150	68-121
	S443721-6	Dibromofluoromethane	131	66-127
		p-Bromofluorbenzene	131	68-121
	S443721-9	Dibromofluoromethane	143	66-127
		Toluene-d8	148	65-128
		p-Bromofluorbenzene	156	68-121
	S443721-14	p-Bromofluorbenzene	132	68-121
KDN011	S444029-11	Dibromofluoromethane	141	66-127
		Toluene-d8	145	65-128
		p-Bromofluorbenzene	134	68-121
	S444029-13DL	Dibromofluoromethane	130	66-127
		Toluene-d8	130	65-128
	S444029-11RE	Dibromofluoromethane	128	66-127
KDN014	S445182-4	p-Bromofluorbenzene	40	68-121
	S445182-12	p-Bromofluorbenzene	67	68-121
	S445182-12RE	p-Bromofluorbenzene	58	68-121
	S445182-4DL	p-Bromofluorbenzene	65	68-121
KDN015	S445262-6	Dibromofluoromethane	232	66-127

Positive volatile results were qualified as estimated with a "J" qualifier based on low or high surrogate recoveries. Volatile detection limits for non-detect compounds were qualified as estimated with a "UJ" qualifier based on low surrogate recoveries.

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2.7 *Matrix Spike/ Matrix Spike Duplicate*

The MS/MSD percent recoveries and relative percent differences (RPDs) were within specified quality control limits with the following exceptions:

SDG	MS/MSD ID	COMPOUND	MS %R	MSD %R	CONT. LIMITS	RPD	CONT. LIMIT
KDN005	S443358A-10	Chloroethane	**209**	61	46-152	**116**	100
		Bromodichloropropane	**124**	115	71-120	17	50
		cis-1,3-Dichloropropene	**178**	110	71-123	9	50
		2-Hexanone	**167**	**232**	46-163	24	50
		Bromoform	**136**	122	56-134	20	50
		1,1,2,2-Tetrachloroethane	**149**	**141**	59-138	14	50
		2-Butnone	116	**237**	30-185	**58**	50
		4-Methyl-2-pentanone	**178**	**220**	47-160	12	50
KDN007	S443445-6	o-Xylene	**60**	**61**	74-122	1	50
		m,p-Xylene	**73**	**73**	74-121	0	50
		Chloromethane	**27**	**26**	42-143	3	100
		Vinyl chloride	**34**	**34**	38-151	2	100
		Chloroethane	**28**	**24**	46-152	14	100
		1,1,1-Trichloroethane	**60**	**59**	70-124	1	50
KDN007	S443445-6	Carbon Tetrachloride	**62**	**63**	70-123	1	50
		Benzene	**61**	**63**	66-128	2	50
		Trichloroethene	**61**	**64**	64-126	6	50
		1,2-Dichloropropane	**62**	**66**	72-118	7	50
		Bromodichloromethane	**64**	**68**	71-120	9	50
		cis-1,3-Dichloropropene	**59**	**65**	71-123	6	50
		trans-1,3-Dichloropropene	**58**	**62**	66-128	6	50
		1,1,2-Trichlorethane	**64**	**70**	66-127	0	50
		Tetrachloethene	**53**	**53**	64-134	7	50

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SDG	MS/MSD ID	COMPOUND	MS %R	MSD %R	CONT. LIMITS	RPD	CONT. LIMIT
KDN007	S443445-6	Dibromochloromethane	**53**	**56**	70-124	1	50
		Chlorobenzene	**56**	**62**	69-128	10	50
		Ethyl Benzene	**69**	**58**	71-120	1	50
		Styrene	**57**	**54**	73-121	8	50
		Bromoform	**50**	**54**	58-134	8	50
		Xylenes	**68**	**68**	74-122	0	50
KDN008	S443721-2DL	Acetone	**23**	**23**	30-195	0	100
		4-Methyl-2-pentanone	**44**	**41**	47-160	7	50
		2-Hexanone	**43**	**42**	46-163	2	50
KDN009	S443904-1	Styrene	**34**	**33**	75-123	2	30
KDN010	S443991A-2	m,p-Xylene	**160**	**90**	74-121	20	50
		Chloromethane	**212**	**212**	46-154	0	100
		Methylene Chloride	**181**	**185**	29-153	2	100
		Benzene	**54**	**50**	65-130	3	50
		Tot-Xylene	**138**	88	74-122	20	50
KDN011	S444029-2DL	Chloroethane	**182**	**154**	46-152	16	100
		4-Methyl-2-pentanone	**40**	**32**	47-160	22	50
		2-Hexanone	**38**	**32**	46-163	16	50
		Chlorobenzene	73	**45**	69-128	10	50
KDN014	S445182-9	o-Xylene	100	103	74-122	**57**	50
		m,p-Xylene	100	104	74-121	**59**	50
		1,2-Dichoroethene	93	90	33-150	**65**	50
		Chloroethane	**176**	**159**	46-152	68	100
		1,1-Dichloroethene	103	100	46-142	62	100
		Carbon disulfide	90	89	46-142	**60**	50
		trans-1,2-Dichloroethene	94	92	43-143	**61**	50
		1,1-Dichloroethane	69	62	23-159	**68**	50
		cis-1,2-Dichloroethene	91	86	34-166	**64**	50
		Chloroform	97	97	70-123	**59**	50
		1,1,1-Trichloroethane	85	84	70-128	**61**	50
		Carbon tetrachloride	84	81	65-130	**62**	50
		Benzene	101	96	39-158	**62**	50
		1,2-Dichloroethane	96	94	64--126	**60**	50
		Trichloroethene	97	100	72-118	**56**	50

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SDG	MS/MSD ID	COMPOUND	MS %R	MSD %R	CONT. LIMITS	RPD	CONT. LIMIT
KDN014	S445182-9	1,2-Dichloropropane	101	103	71-120	**58**	50
		Bromodichloromethane	88	86	71-123	**61**	50
		cis-1,3-Dichloropropene	93	92	71-123	**60**	50
		4-Methyl-2-Pentanone	143	**164**	47-160	**50**	50
		Toluene	97	92	66-128	**60**	
		trans-1,3-Dichloropropene	93	86	66-127	**65**	50
		1, 1, 2-Tetrachloethane	109	111	64-134	**57**	50
		Tetrachloroethene	97	97	64-134	**57**	50
		Dibromochloromethane	97	97	70-124	**54**	50
		Chlorobenzene	**65**	**65**	69-128	46	50
		Ethyl Benzene	94	94	71-120	**57**	50
		Styrene	94	94	73-121	**64**	50
		Bromoform	108	108	58-134	**54**	50
		Xylenes	100	100	74-122	**58**	50
KDN015	S445262-9	o-Xylene	106	108	74-122	**59**	50
		m,p-Xylene	100	104	74-121	**62**	50
		Chloroethane	**177**	**161**	46-152	49	
		1,1-Dichloroethene	110	103	46-142	49	100
		Carbon disulfide	96	93	46-142	**52**	50
		trans-1,2-Dichloroethene	98	94	43-143	**54**	50
		1,1-Dichloroethane	67	64	23-159	**54**	50
		cis-1,2-Dichloroethene	106	94	34-166	**53**	50
		Chloroform	100	100	70-123	**58**	50
		1,1,1-Trichloroethane	94	90	70-128	**54**	50
		Carbon tetrachloride	90	92	65-130	**60**	50
		Benzene	112	110	39-158	**56**	50
		1,2-Dichloroethane	100	103	64--126	**61**	50
		Trichloroethene	108	107	72-118	**56**	50
		1,2-Dichloropropane	110	109	71-120	**57**	50

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SDG	MS/MSD ID	COMPOUND	MS %R	MSD %R	CONT. LIMITS	RPD	CONT. LIMIT
KDN015	S445262-9	Bromodichloromethane	94	93	71-123	**57**	50
		cis-1,3-Dichloropropene	96	94	71-123	**56**	50
		4-Methyl-2-Pentanone	**167**	**176**	47-160	**61**	50
		Toluene	104	106	66-128	**59**	
		trans-1,3-Dichloropropene	92	93	66-127	**55**	50
		1, 1, 2-Tetrachloethane	119	93	64-134	**55**	50
		Tetrachloroethene	104	100	64-134	**54**	50
		Dibromochloromethane	100	99	70-124	**57**	50
		Chlorobenzene	**188**	126	69-128	15	50
		Ethyl Benzene	100	103	71-120	**61**	50
		Styrene	98	101	73-121	**59**	50
		Bromoform	108	110	58-134	**59**	50
		Xylenes	114	108	74-122	**54**	50

None of the samples were qualified based on MS/MSD percent recoveries or relative percent differences. The Functional Guidelines state that data should never be qualified based on matrix spike data alone.

2.8 *Laboratory Control Samples*

All of the LCS percent recoveries and relative percent differences (RPDs) were within specified quality control limits with the following exceptions:

SDG	LCS ID	COMPOUND	LCS % R	CONT. LIMITS	ASSOC SAMPLES
KDN003	KDN003-33	Chloromethane	40	42-143	S443313-1, 2, 4, 6-9
KDN004	KDN004-1	Chloroethane	162	46-152	S443358-1-4
	KDN004-24	Methylene Chloride	156	29-153	S443358-7, 10-12, 14

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SDG	LCS ID	COMPOUND	LCS % R	CONT. LIMITS	ASSOC SAMPLES
KDN004	KDN004-30	Chloromethane	15	42-143	S443358-3DL, 4DL, 14DL
		Vinyl chloride	25	38-151	S443358-3DL, 4DL, 14DL
		Chloroethane	40	46-152	S443358-3DL, 4DL, 14DL
KDN005	KDN005-1	Chloroethane	40	46-152	S443358A-2-4, 6-8, 10
	KDN005-20	Chloroethane	40	46-152	S443358A-1, 5, 9, 11, 12
KDN006	KDN006-1	Chloroethane	240	46-152	S443366-3, 5
	KDN006-13	Chloroethane	228	46-152	S443366-19, 20, 21
		Tetrachloroethene	132	71-129	S443366-19, 20, 21
		Bromoform	144	69-138	S443366-19, 20, 21
		M,p-Xylene	129	78-119	S443366-19, 20, 21
	KDN006-24	Chloromethane	18	42-143	S443366-1, 2, 8-12
		Vinyl chloride	29	38-151	S443366-1, 2, 8-12
		Chloroethane	28	46-152	S443366-1, 2, 8-12
	KDN006-27	Chloroethane	44	46-152	S443366-4DL, 7
KDN007	KDN007-20	Chloroethane	272	40-158	S443445-16, 17
	KDN007-35	Chloroethane	240	46-152	S443445-9, 10
KDN008	KDN008-28	1,1,1-Trichloroethane	132	70-123	S443721-1-9, 1DL, 2 DL, 3 DL, 4 DL, 5 DL, 12, 13 DL
		Carbon Tetrachloride	136	66-128	S443721-1-9, 1DL, 2 DL, 3 DL, 4 DL, 5 DL, 12, 13 DL
		Bromodichloromethane	132	71-120	S443721-1-9, 1DL, 2 DL, 3 DL, 4 DL, 5 DL, 12, 13 DL
		Dichromochloromethane	128	70-124	S443721-1-9, 1DL, 2 DL, 3 DL, 4 DL, 5 DL, 12, 13 DL

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SDG	LCS ID	COMPOUND	LCS % R	CONT. LIMITS	ASSOC SAMPLES
KDN008	KDN008-31	4-Methyl-2-pentanone	46	47-160	S443721-6DL, 7DL, 9DL, 11, 14DL
KDN010	KDN010-21	Chloromethane	158	46-152	S443991A-1, 4
	KDN010-24	Acetone	28	30-195	S443991A-6-9, 11
	KDN010-27	Methylene Chloride	164	29-153	S443991A-1DL, 2, 5, 7DL. 9DL
	KDN010-30	4-Methyl-2-pentanone	44	47-160	S443991A-4DL, 10
KDN011	KDN011-1	1,2-Dichloropropane	124	74-122	S444029-1-4, 6-12, 13DL, 14
	KDN011-34	4-Methyl-2-pentanone	44	47-160	S444029-2DL, 3DL, 5, 6DL, 11RE, 13
KDN014	KDN014-1	Methylene Chloride	158	29-153	S445182-1, 2, 6-11
	KDN014-32	Methylene Chloride	160	29-153	S445182-5, 12
	KDN014-35	Methylene Chloride	169	29-153	S445182-12RE, 4DL
KDN015	KDN015-28	Methylene Chloride	156	29-153	S445262-9-11
	KDN015-25	Methylene Chloride	156	29-153	S445262-5DL, 6DL, 7DL, 8DL

Positive results for associated samples and compounds listed above were qualified as estimated with a "J" qualifier when the LCS recovery was low or high. Detection limits for non-detects were qualified as estimated with a "UJ" qualifier when the LCS recovery was low.

2.9 *Internal Standards*

All internal standard area counts were less than a factor of + OR- 50% from the associated calibration standard with the following exceptions:

SDG	SAMPLE ID	INTERNAL STANDARD	RESPONSE	ACCEPTABLE RANGE
KDN002	S443269-5	Chlorobenzene-d5	48369	51416-205662
	S443269-6	Chlorobenzene-d5	46575	51416-205662
	S443269-7	Chlorobenzene-d5	44951	51416-205662

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SDG	SAMPLE ID	INTERNAL STANDARD	RESPONSE	ACCEPTABLE RANGE
KDN002	S443269-11	1,4-Difluorobenzene	94509	95408-381634
		Chlorobenzene-d5	41928	51416-205662
KDN004	S443358-1	Chlorobenzene-d5	42887	44192-176770
	S443358-1RE	1,4-Difluorobenzene	78023	84298-337190
		Chlorobenzene-d5	23639	47076-188304
KDN006	S443366-4	1,4-Difluorobenzene	524328	575958-2303832
		Chlorobenzene-d5	241534	263996-1055982
KDN014	S445182-4	Chlorobenzene-d5	448652	88882-355528
KDN015	S445262-6	Chlorobenzene-d5	60299	70935-283740

For samples listed above, where both the original and reanalyzed results were out of control limits, the results for the original samples were qualified as estimated with a "J" qualifier for detected results and a "UJ" qualifier to denote an estimated detection limit for non-detect results based on low internal standard recoveries for the compounds quantitated with the out of control limit internal standards. The data user should note that the actual concentration of the volatiles present in the samples might be higher than those reported for positive results and may be higher than reporting limits for non-detected results.

For samples that had internal standard results out of control limits on the original analysis and had internal standard results on the reanalysis that were in control limits, the data user is directed to use the reanalyzed results.

The internal standard retention times for the selected samples did not vary more than + or- 30 seconds from the retention time of the associated calibration standard.

2.10 Target Compound Identification

All target compound identifications were acceptable with regard to the supporting data.

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2.11 Target Compound Quantitation

All target compound quantitations were acceptable with regard to the supporting data.

2.12 Overall Assessment of Data

All data validation qualifiers applied by ECS are included in Appendix A. The data appears acceptable for its intended use based on the review of the quality control items discussed in this section.

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3.0 DATA REVIEW OF SEMIVOLATILE ORGANIC COMPOUNDS

The following samples were analyzed for semivolatiles:

SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN001	S442500-1	MCB-1	OIL	03/24/04
KDN002	S443269-1	K-9 (8-10 FT)	SOLID	04/13/04
	S443269-2	K-9 (18-20 FT)	SOLID	04/13/04
	S443269-3	K-9 (25-28 FT)	SOLID	04/13/04
	S443269-4	K-9 (30-33 FT)	SOLID	04/13/04
	S443269-5	K-9 (43-45 FT)	SOLID	04/13/04
	S443269-6	K-9 (53-55 FT)	SOLID	04/13/04
	S443269-7	K-9 (63-65 FT)	SOLID	04/13/04
	S443269-8	K-9 (75-78 FT)	SOLID	04/14/04
	S443269-9	K-9 (82-85 FT)	SOLID	04/14/04
	S443269-10	K-9 (95-98 FT)	SOLID	04/14/04
	S443269-11	K-9 (105-106 FT)	SOLID	04/14/04
	S443269-12	K-9 (108-111 FT)	SOLID	04/14/04
KDN003	S443313-1	K-8 (5-8 FT)	SOLID	04/15/04
	S443313-2	Duplicate 1	SOLID	04/15/04
	S443313-3	K-8 (15-18 FT)	SOLID	04/15/04
	S443313-4	K-8 (23-25 FT)	SOLID	04/15/04
	S443313-5	K-8 (30-33 FT)	SOLID	04/15/04
	S443313-6	K-8 (45-48 FT)	SOLID	04/15/04
	S443313-7	K-8 (55-58 FT)	SOLID	04/15/04
	S443313-8	K-8 (63-65 FT)	SOLID	04/15/04
	S443313-9	K-8 (73-75 FT)	SOLID	04/15/04
	S443313-10	K-8 (93-95 FT)	SOLID	04/15/04
	S443313-11	Duplicate 2	SOLID	04/15/04
	S443313-12	K-8 (88-90 FT)	SOLID	04/15/04
	S443313-13	K-8 (105-108 FT)	SOLID	04/15/04
	S443313-14	K-8 (110-113 FT)	SOLID	04/15/04
	S443313-18	Equipment Rinse	LIQUID	04/14/04
KDN004	S443358-1	K-7 (0-3 FT)	SOLID	04/16/04
	S443358-2	K-7 (18-20 FT)	SOLID	04/16/04
	S443358-3	K-7 (28-30 FT)	SOLID	04/16/04
	S443358-4	K-7 (30-33 FT)	SOLID	04/16/04
	S443358-5	K-7 (40-43 FT)	SOLID	04/16/04
	S443358-6	K-7 (58-60 FT)	SOLID	04/16/04
	S443358-7	Duplicate 3	SOLID	04/16/04
	S443358-8	K-7 (73-75 FT)	SOLID	04/16/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN004	S443358-9	K-7 (68-70 FT)	SOLID	04/16/04
	S443358-10	K-7 (83-85 FT)	SOLID	04/16/04
	S443358-11	K-7 (90-93 FT)	SOLID	04/16/04
	S443358-12	K-7 (108-110 FT)	SOLID	04/16/04
	S443358-13	K-7 (110-113 FT)	SOLID	04/16/04
	S443358-14	K-6 (8-10 FT)	SOLID	04/17/04
	S443358-19	Equipment Rinse (K-8)	LIQUID	04/16/04
	S443358-20	Equipment Rinse (K-9)	LIQUID	04/17/04
KDN005	S443358A-1	K-6 (15-18 FT)	SOLID	04/17/04
	S443358A-2	K-6 (25-28 FT)	SOLID	04/17/04
	S443358A-3	K-6 (33-35 FT)	SOLID	04/17/04
	S443358A-4	K-6 (40-43 FT)	SOLID	04/17/04
	S443358A-5	K-6 (50-53 FT)	SOLID	04/17/04
	S443358A-6	K-6 (65-68 FT)	SOLID	04/17/04
	S443358A-7	K-6 (73-75 FT)	SOLID	04/17/04
	S443358A-8	K-6 (85-88 FT)	SOLID	04/19/04
	S443358A-9	K-6 (95-98 FT)	SOLID	04/19/04
	S443358A-10	K-6 (105-110 FT)	SOLID	04/19/04
	S443358A-11	Duplicate 5	SOLID	04/19/04
	S443358A-12	K-6 (110-113 FT)	SOLID	04/19/04
KDN006	S443366-1	K-5 (45-48 FT)	SOLID	04/19/04
	S443366-2	K-5 (55-58 FT)	SOLID	04/20/04
	S443366-3	K-5 (65-68 FT)	SOLID	04/20/04
	S443366-4	K-5 (73-75 FT)	SOLID	04/20/04
	S443366-5	K-5 (83-85 FT)	SOLID	04/20/04
	S443366-6	K-5 (90-93 FT)	SOLID	04/20/04
	S443366-7	K-5 (113-116 FT)	SOLID	04/20/04
	S443366-8	K-5 (3-5 FT)	SOLID	04/19/04
	S443366-9	K-5 (13-15 FT)	SOLID	04/19/04
	S443366-10	K-5 (20-23 FT)	SOLID	04/19/04
	S443366-11	Duplicate 6	SOLID	04/19/04
	S443366-12	K-5 (30-33 FT)	SOLID	04/19/04
	S443366-17	K-5 (105-109 FT)	SOLID	04/20/04
	S443366-22	K-9 (109-111 FT)	SOLID	04/20/04
KDN007	S443445-1	K-1 (8-10 FT)	SOLID	04/21/04
	S443445-2	K-1 (15-18 FT)	SOLID	04/21/04
	S443445-3	Duplicate 8	SOLID	04/21/04
	S443445-4	K-1 (30-33 FT)	SOLID	04/21/04
	S443445-5	K-1 (25-28 FT)	SOLID	04/21/04
	S443445-6	K-1 (55-58 FT)	SOLID	04/21/04
	S443445-7	K-1 (60-63 FT)	SOLID	04/21/04
	S443445-8	K-1 (75-78 FT)	SOLID	04/21/04
	S443445-9	K-1 (80-83 FT)	SOLID	04/21/04
	S443445-10	K-1 (95-98 FT)	SOLID	04/21/04
	S443445-11	K-1 (108-110 FT)	SOLID	04/21/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN007	S443445-12	K-1 (113-116 FT)	SOLID	04/21/04
	S443445-16	Equipment Rinse (K-5)	LIQUID	04/20/04
	S443445-17	Equipment Rinse (K-1)	LIQUID	04/21/04
KDN008	S443721-1	K-4 (8-10 FT)	SOLID	04/28/04
	S443721-2	K-4 (15-18 FT)	SOLID	04/28/04
	S443721-3	Duplicate 9	SOLID	04/28/04
	S443721-4	K-4 (28-30 FT)	SOLID	04/28/04
	S443721-5	K-4 (38-40 FT)	SOLID	04/28/04
	S443721-6	K-4 (43-45 FT)	SOLID	04/28/04
	S443721-7	K-4 (58-60 FT)	SOLID	04/28/04
	S443721-8	K-4 (60-63 FT)	SOLID	04/28/04
	S443721-9	K-4 (75-78 FT)	SOLID	04/28/04
	S443721-10	K-4 (80-83 FT)	SOLID	04/28/04
	S443721-11	K-4 (90-93 FT)	SOLID	04/28/04
	S443721-12	K-4 (108-110 FT)	SOLID	04/28/04
	S443721-13	Duplicate 10	SOLID	04/28/04
	S443721-14	K-4 (110-111.5 FT)	SOLID	04/28/04
KDN009	S444029-1	K-4	LIQUID	05/06/04
	S443991-1	K-8	LIQUID	05/04/04
	S443991-2	K-1	LIQUID	05/05/04
	S443991-3	K-7	LIQUID	05/05/04
	S443991-4	K-6	LIQUID	05/05/04
	S443991-5	K-9	LIQUID	05/05/04
	S443991-6	K-5	LIQUID	05/05/04
KDN010	S443991A-1	K-2 (3-5 FT)	SOLID	05/06/04
	S443991A-2	K-2 (15-18 FT)	SOLID	05/06/04
	S443991A-3	K-2 (25-28 FT)	SOLID	05/06/04
	S443991A-4	K-2 (39-40 FT)	SOLID	05/06/04
	S443991A-5	K-2 (45-48 FT)	SOLID	05/06/04
	S443991A-6	K-2 (55-57 FT)	SOLID	05/06/04
	S443991A-7	K-2 (68-70 FT)	SOLID	05/06/04
	S443991A-8	K-2 (73-75 FT)	SOLID	05/06/04
	S443991A-9	K-2 (83-85 FT)	SOLID	05/06/04
	S443991A-10	K-2 (93-95 FT)	SOLID	05/06/04
	S443991A-11	K-2 (105-108 FT)	SOLID	05/06/04
	S443991A-16	K-2 Equipment Rinse	LIQUID	05/06/04
KDN011	S444029-1	K-3 (8-10 FT)	SOLID	05/07/04
	S444029-2	K-3 (8-10 FT)	SOLID	05/07/04
	S444029-3	K-3 (13-15 FT)	SOLID	05/07/04
	S444029-4	Duplicate 11	SOLID	05/07/04
	S444029-5	K-3 (23-25 FT)	SOLID	05/07/04
	S444029-6	K-3 (35-39 FT)	SOLID	05/07/04
	S444029-7	K-3 (45-48 FT)	SOLID	05/07/04
	S444029-8	K-3 (57-59 FT)	SOLID	05/07/04
	S444029-9	K-3 (60-63 FT)	SOLID	05/07/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN011	S444029-10	Duplicate 12	SOLID	05/07/04
	S444029-11	K-3 (73-75 FT)	SOLID	05/07/04
	S444029-12	K-3 (87-89 FT)	SOLID	05/07/04
	S444029-13	K-3 (95-98 FT)	SOLID	05/07/04
	S444029-14	K-3 (107-109 FT)	SOLID	05/07/04
	S444029-19	K-3 Equipment Rinse	LIQUID	05/07/04
KDN012	S444184-1	1DNAPL-K-3	LIQUID	05/15/04
KDN013	S445116-1	K-11 (6-8.5 FT)	SOLID	06/08/04
	S445116-2	K-11 (13.5-16 FT)	SOLID	06/08/04
	S445116-3	K-11 (18.5-21 FT)	SOLID	06/08/04
	S445116-4	K-11 (33-35.5 FT)	SOLID	06/08/04
	S445116-5	K-11 (45.5-48 FT)	SOLID	06/08/04
	S445116-6	K-11 (58.5-61 FT)	SOLID	06/08/04
	S445116-7	K-11 (68-70.5 FT)	SOLID	06/08/04
	S445116-8	K-11 (73-75.5 FT)	SOLID	06/08/04
	S445116-9	K-11 (90.5-93 FT)	SOLID	06/09/04
	S445116-10	K-11 (101-103.5 FT)	SOLID	06/09/04
	S445116-11	K-11 (106-108.5 FT)	SOLID	06/09/04
	S445116-12	K-11 (101-103.5 FT)	SOLID	06/09/04
	S445116-13	EB- (06-09-04) Auger bit	LIQUID	06/09/04
KDN014	S445182-1	K-10 (8.5-11.0)	SOLID	06/09/04
	S445182-2	K-10 (18.5-21.0)	SOLID	06/09/04
	S445182-3	K-10 (21.0-23.5)	SOLID	06/09/04
	S445182-4	K-10 (40.5-43.0)	SOLID	06/09/04
	S445182-5	K-10 (58.0-60.5)	SOLID	06/09/04
	S445182-6	K-10 (66.0-68.5)	SOLID	06/09/04
	S445182-7	K-10 (80.0-82.5)	SOLID	06/10/04
	S445182-8	K-10 (90.5-93.0)	SOLID	06/10/04
	S445182-9	K-10 (106.0-108.5)	SOLID	06/10/04
	S445182-10	K-10A (106.0-108.5)	SOLID	06/10/04
	S445182-11	K-10 (111.0-113.5)	SOLID	06/10/04
	S445182-12	K-10 (45.5-48.0)	SOLID	06/10/04
KDN015	S445262-1	K-12 (0-2.5)	SOLID	06/10/04
	S445262-2	K-12 (10-12.5)	SOLID	06/10/04
	S445262-3	K-12 (21-23.5)	SOLID	06/10/04
	S445262-4	K-12 (33.5-36)	SOLID	06/10/04
	S445262-5	K-12 (43.5-46)	SOLID	06/10/04
	S445262-6	K-12 (53.5-56)	SOLID	06/10/04
	S445262-7	K-12 (63.5-66)	SOLID	06/10/04
	S445262-8	K-12 (66-68,5)	SOLID	06/10/04
	S445262-9	K-12 (81-83.5).	SOLID	06/11/04
	S445262-10	K-12 (93.5-96)	SOLID	06/11/04
	S445262-11	K-12 (101-103.5)	SOLID	06/11/04
	S445262-12	K-12 (106-108.5)	SOLID	06/11/04
	S445262-13	DUP	SOLID	06/11/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN015	S445262-17	06/10/04 EB	LIQUID	06/10/04
	S445262-18	06/11-04 EB	LIQUID	06/11/04

3.1 *Holding Times*

The maximum holding time from date of collection to date of extraction for semivolatiles in organic and solid samples recommended in the method is 14 days. The maximum holding time from date of collection to date of extraction for semivolatiles in aqueous samples recommended in the method is 7 days. The maximum holding time from date of extraction to date of analysis for semivolatile recommended for all media in the method is 40 days. All of these holding times were met for the samples in this report with the following exceptions:

SDG	SAMPLE ID	HOLDING TIME EXCEEDANCE
KDN006	S443366-9RE	7 DAYS
KDN-007	S443445-1DL	3 DAYS
KDN015	S445262-17	4 DAYS

The positive volatile results for the samples listed above were qualified as estimated with a "J" qualifier based on exceeded holding time. Detection limits for non-detects were qualified as estimated with a "UJ" qualifier based on exceeded holding time.

3.2 *GC/MS Instrument Performance*

All of the mass calibrations for semivolatiles met the ion abundance specified by the Functional Guidelines. GC/MS tunes were conducted at the proper frequency (1 every 12 hours). Ion abundance criteria were met as follows:

SDG	GC/MS INSTR, ID	DATE	TIME
KDN001	MSG5973	04/02/04	0801

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SDG	GC/MS INSTR, ID	DATE	TIME
KDN001	MSG5973	04/08/04	1117
	MSG5973	04/14/04	1322
KDN002	MSG5973	04/22/04	1140
	MSG5973	04/26/04	1114
	MSG5973	04/27/04	1040
KDN003	MST5973	04/20/04	1125
	MSN5973	04/22/04	1140
	MST5973	04/26/04	0949
	MSN5973	04/27/04	1040
	MSJ5971	04/27/04	1410
	MSJ5971	04/28/04	1540
	MSJ5971	04/29/04	0916
KDN004	MSE5972	04/28/04	0924
	MSE5972	05/06/04	0850
	MSG5973	05/06/04	1000
	MSE5973	05/07/04	1615
	MSG5973	05/12/04	0901
KDN005	MSN5973	05/04/04	1227
	MSN5973	05/06/04	1149
KDN006	MSG5973	05/06/04	1000
	MSN5973	05/06/04	1149
	MSN5973	05/07/04	0831
	MSN5973	05/10/04	0751
	MSG5973	05/11/04	1209
	MSE5972	05/12/04	1133
	MSG5973	05/17/04	0954
	MSE5972	05/18/04	0936
KDN007	MST5973	04/30/04	1528
	MST5973	05/10/04	1001

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SDG	GC/MS INSTR, ID	DATE	TIME
KDN007	MST5973	05/11/04	0942
	MST5973	05/14/04	0846
KDN008	MSE5973	05/12/04	1133
	MSE5973	05/17/04	1214
	MSE5973	05/18/04	0936
	MSE5973	05/19/04	1026
	MSE5973	05/20/04	0845
KDN009	MSE5973	05/12/04	1133
	MSG5973	05/19/04	1328
	MST5973	05/18/04	1650
	MSE5973	05/21/04	1123
	MSG5973	05/22/04	0755
	MSE5973	05/22/04	0811
	MST5973	05/24/04	0811
	MSE5973	05/24/04	0824
	MSG5973	05/24/04	0825
KDN010	MST5973	05/13/04	1114
	MSN5973	05/13/04	1244
	MST5973	05/19/04	1650
	MST5973	05/15/04	1236
	MSN5973	05/20/04	1245
	MST5973	05/22/04	0932
	MST5973	05/24/04	0811
KDN011	MSN5973	05/13/04	1244
	MSJ5971	05/21/04	1130
	MSN5973	05/24/04	0828
	MSJ5971	05/24/04	1319
	MSN5973	05/27/04	0830
	MSN5973	05/28/04	0904

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SDG	GC/MS INSTR, ID	DATE	TIME
KDN012	MSJ5971	05/21/04	1130
	MSJ5971	05/26/04	1253
	MSJ5971	05/27/04	0902
KDN013	MSG5973	05/27/04	1033
	MSE5973	06/13/04	0850
	MSE5973	06/16/04	0901
	MSE5973	06/17/04	0825
	MSG5973	06/22/04	0846
KDN014	MST5973	06/22/04	1335
	MST5973	06/23/04	1423
	MST5973	06/24/04	1413
KDN015	MSE5973	06/13/04	0850
	MST5973	06/14/04	0953
	MSE5973	06/20/04	0958
	MST5973	06/20/04	1017
	MSG5973	06/22/04	0846
	MSG5973	06/25/04	0827

None of the semivolatile data was qualified as estimated or rejected as unusable due to non-compliant instrument tuning.

3.3 *Initial Calibration*

The following initial calibrations were performed on the GC/MS instruments used for semivolatile analysis:

SDG	GC/MS INSTRUMENT ID	DATE	TIME	ASSOCIATED SAMPLES
KDN001	MSG5973	04/02/04	0818	S442500-1, 1DL

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SDG	GC/MS INSTRUMENT ID	DATE	TIME	ASSOCIATED SAMPLES
KDN002	MSG5973	04/22/04	1153	All samples in this SDG
KDN003	MST5973	04/20/04	1139	S443313-1-3, 5-11
	MSN5973	04/22/04	1153	S443313-13-18
	MSJ5971	04/27/04	1507	S443313-13, 15, 12RE, 14RE
KDN004	MSE5972	04/28/04	0940	S443358-2-14
	MSG5973	05/06/04	1016	S443358-1
KDN005	MSN5973	05/04/04	1344	All samples in this SDG
KDN006	MSG5973	05/06/04	1016	S443366-6-12, 17, 9DL
	MSN5973	05/06/04	1203	S443366-10DL
	MSE5972	05/12/04	1148	S443366-5, 9RE
KDN007	MST5973	04/30/04	1714	All samples in this SDG
KDN008	MSE5972	05/12/04	1148	All samples in this SDG
KDN009	MSE5972	05/12/04	1148	S443991-1, 2, 5. 6
	MSG5973	05/19/04	1344	S443991-3, 4
	MST5973	05/18/04	1735	S44029A-1, 1DL-
KDN010	MST5973	05/13/04	1132	S443991A-13, 14
	MSN5973	05/13/04	1259	S443991A-15, 16
	MST5973	05/19/04	1735	S443991A-1-11, 10DL
KDN011	MSN5973	05/13/04	1259	S444029-1, 4-11
	MSJ5971	05/21/04	1231	S444029-12-14
	MSN5973	05/27/04	0859	S444029-1DL, 2DL, 3DL, 4DL, 5DL, 6DL, 10DL
KDN012	MSJ5973	05/21/04	1231	All samples in this SDG
KDN013	MSG5973	05/27/04	1049	S444184-1-12, 8RE
	MSE5973	06/13/04	0912	S444184-13
KDN014	MST45973	06/22/04	1353	All samples in this SDG
KDN015	MSE5973	06/13/04	0912	S445262-1-8
	MST5973	06/14/04	1010	S445262-9-13
	MSG5973	06/22/04	0913	S445262-17, 18

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The results of the data validation procedure for the initial calibrations are summarized as follows.

GC/MS Instrument ID MSG5973 – 04/02/04 - 0818

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSG5973 – 04/22/04 - 1153

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MST5973 – 04/20/04 - 1139

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

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All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSJ5971 – 04/27/04 - 1507

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSE5973 – 04/28/04 - 0940

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

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GC/MS Instrument ID MSG5973 – 05/06/04 - 1016

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSN5973 – 05/04/04 - 1344

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSN5973 – 05/06/04 - 1203

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

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All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSE5972 – 5/12/04 - 1148

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MST5973 – 04/30/04 - 1714

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

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GC/MS Instrument ID MSG5973 – 05/19/04 - 1344

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MST5973 – 05/18/04 - 1735

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MST5973 – 05/13/04 - 1132

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

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All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSN5973 – 05/13/04 - 1259

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MST5973 – 05/19/04 - 1735

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

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GC/MS Instrument ID MSJ5971 – 05/21/04 - 1231

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSN5973 – 05/27/04 - 0859

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSG5973 – 05/27/04 - 1049

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

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All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSE5973 – 06/13/04 - 0912

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MST5973 – 06/22/04 - 1353

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

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GC/MS Instrument ID MST5973 – 06/14/04 - 1010

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

GC/MS Instrument ID MSG5973 – 06/22/04 - 0913

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards.

All relative response factors (RRFs) for all SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to RRF for this initial calibration.

All percent relative standard deviations (%RSD) for CCCs were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

3.4 Continuing Calibration

Each GC/MS employed for samples or associated quality control samples was calibrated for each 12-hour shift in which samples or associated quality control samples were analyzed. Each calibration standard was performed at one concentration level with a standard that contained all test compounds, surrogates and internal standards.

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The following continuing calibration were performed on the GC/MS instruments used for semivolatile analysis:

SDG	GC/MS INSTRUMENT ID	DATE	TIME	ASSOCIATED SAMPLES
KDN001	MSG5973	04/08/04	1202	S442500-1
	MSG5973	04/14/04	1339	S442500-1DL
KDN002	MSG5973	04/26/04	1130	S443269-1, 3, 4, 6-9, 11, 12
	MSG5973	04/27/04	1109	S443269-2, 3RE, 5, 8RE, 9RE, 10, 11RE, 12RE
KDN003	MST5973	04/26/04	1451	S443313-1-3, 5-11
	MSN5973	04/27/04	1109	S443313-18
	MSJ5971	04/28/04	1628	S443313-13, 15
	MSJ5971	04/29/04	0931	S443313-4, 12RE, 14RE
KDN004	MSE5973	05/06/04	0940	S443358-2-8, 10, 12, 14
	MSE5973	05/07/04	1905	S443358-5, 9, 11, 13
	MSG5973	05/12/04	0920	S443358-1
KDN005	MSN5973	05/06/04	1451	S443358-3 DL
KDN006	MSN5973	05/07/04	0916	S443366-6, 7, 11, 12, 17
	MSN5973	05/10/04	0814	S443366-8-10, 9DL
	MSG5973	05/11/04	1226	S443366-10DL
	MSG5973	05/17/04	1010	S443366-9RE
	MSE5973	05/18/04	0953	S443366-5
KDN007	MST5973	05/10/04	1048	S443445-1, 7, 816, 17
	MST5973	05/11/04	1000	S4434452-5, 9-11S443445
	MST5973	05/14/04	0857	S443445-1DL, 6, 12
KDN008	MSE5973	05/17/04	1346	S443721-4-8, 10
	MSE5973	05/18/04	0953	S443721-1-3, 4DL, 5DL, 6DL, 9, 10DL, 14
	MSE73	05/19/04	1119	S443721-1DL9DL14DL
	MSE5973	05/20/04	0910	S443721-2DL, 3DL
KDN009	MSE5973	05/21/04	1140	S443991-2

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SDG	GC/MS INSTRUMENT ID	DATE	TIME	ASSOCIATED SAMPLES
KDN009	MSG5973	05/22/04	0755	S443991-3
	MSE5973	05/22/04	0835	S443991-1,5
	MST5973	05/24/04	0829	S444029A-1, 1DL
	MSE5973	05/24/04	0854	S443991-6
	MSG5973	05/24/04	0825	S443991-4
KDN010	MST5973	05/15/04	1327	S443991A-13, 14
	MSN5973	05/20/04	1315	S443991A-15, 16
	MST5973	05/22/04	0950	S443991A-1-11
	MST5973	05/24/04	0829	S443991A-10DL
KDN011	MSN5973	05/24/04	0841	S444029-1, 4-11
	MSJ5971	05/24/04	1335	S444029-12-14
	MSN5973	05/28/04	0919	S444029-1DL, 2, 2DL, 3DL, 4DL, 5DL, 6DL, 10DL
KDN012	MSJ5971	05/26/04	1309	S444184-1
	MSJ5971	05/27/04	0956	S444184-1DL
KDN013	MSE5973	06/16/04	0918	S445116-1-12
	MSE5973	06/17/04	0846	S445116-8RE
	MSG5973	06/22/04	1227	S445116-13
KDN014	MST5973	06/22/04	1805	S445182-1-7, 9-11
	MST5973	06/23/04	1550	S445182-8, 12
KDN015	MSE5973	06/20/04	1014	S445262-1-8
	MST5973	06/20/04	1038	S445262-9-13
	MSG5973	06/25/04	0843	S445262-17, 18

The results of the data validation procedure for the 8270 continuing calibration(s) were summarized as follows.

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GC/MS Instrument ID MSG5973 – 04/08/04 - 1202

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 04/14/04 - 1339

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 04/26/04 - 1130

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 04/27/04 - 1109

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

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All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST5973 – 04/26/04 - 1451

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent with the following exception:

COMPOUND	%D	ASSOCIATED SAMPLES
n-Nitrosodiphenylamine	28	S443313-1-3, 5-11

Positive results for the compound and samples listed above were qualified as estimated with a "J" qualifier. Detection limits for non-detects of the compound and samples listed above were qualified as estimated with a "UJ" qualifier.

GC/MS Instrument ID MSN5973 – 04/27/04 - 1109

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

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GC/MS Instrument ID MSJ5971– 04/28/04 - 1628

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSJ5971 – 04/29/04 - 0931

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE5973 – 05/06/04 - 0940

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE5973 – 05/07/04 - 1905

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

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All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 05/12/04 - 0920

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSN5973 – 05/06/04 – 1451

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent with the following exception:

COMPOUND	%D	ASSOCIATED SAMPLES
n-Nitrosodiphenylamine	23	S443358A-3DL

Qualification of data was not required because the undiluted result was used for this sample and compound.

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GC/MS Instrument ID MSN5973 – 05/07/04 - 0916

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSN5973 – 05/10/04 - 0814

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 05/11/04 - 1226

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 05/17/04 - 1010

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

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All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE5973 – 05/18/04 - 0953

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST5973 – 05/10/04 - 1048

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST5973 – 05/11/04 - 1000

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

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GC/MS Instrument ID MST5973 – 05/14/04 - 0857

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE973 – 05/17/04 - 1346

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE973 – 05/18/04 - 0953

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE973 – 05/19/04 - 1119

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

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All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE973 – 05/20/04 - 0910

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE5973 – 05/21/04 - 1140

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 05/22/04 - 0755

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

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GC/MS Instrument ID MSE5973 – 05/22/04 - 0835

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST5973 – 05/24/04 - 0829

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE5973 – 05/24/04 - 0854

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 05/24/04 - 0825

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

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All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST5973 – 05/15/04 - 1327

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSN5973 – 05/20/04 - 1315

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST973 – 05/22/04 - 0950

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

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GC/MS Instrument ID MSN5973 – 05/24/04 - 0841

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSJ5971 – 05/24/04 - 1335

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSN5973 – 05/28/04 - 0919

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSJ5971 – 05/26/04 - 1309

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

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All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSJ5971 – 05/27/04 - 0956

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE5973 – 06/16/04 - 0918

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE5973 – 06/17/04 - 0846

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

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GC/MS Instrument ID MSG5973 – 06/22/04 - 1227

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST5973 – 06/23/04 - 1805

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST5973 – 06/24/04 - 1550

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSE5973 – 06/20/04 - 1014

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

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All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MST5973 – 06/20/04 - 1038

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

GC/MS Instrument ID MSG5973 – 06/25/04 - 0843

All relative response factors (RRFs) for SPCCs were greater than or equal to 0.05. None of the data were qualified as estimated or rejected as unusable due to the relative response factors for this continuing calibration.

All percent differences (%D) for CCCs were less than or equal to 25 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

3.5 Blanks

The following blanks were associated with the semivolatile analyses:

SDG	BLANK ID	GC/MS INST. ID	DATE	TIME	ASSOC. SAMPLES
KDN001	KDN001-01	MSG5973	04/01/04	1735	S442500-1, 1DL
KDN002	KDN002-2	MSG5973	04/27/04	1424	All samples in this SDG
	Equipment Rinse	MSG5973	04/27/04		S443269-8-12

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SDG	BLANK ID	GC/MS INST. ID	DATE	TIME	ASSOC. SAMPLES
KDN003	KDN003-2	MSG5973	04/26/04	2127	All samples in this SDG
KDN004	KDN004-2	MSE5973	05/08/04	0035	All samples in this SDG
KDN005	KDN005-2	MSE5973	04/26/04	1847	All samples in this SDG
KDN006	KDN006-2	MSE5972	05/18/04	1651	S443366-1-9, 11, 12, 17
	KDN006-30	MSG5973	05/14/04	1632	S443366-9RE
KDN007	KDN007-2	MST5973	05/10/04	1410	S443445-1-12
	KDN007-21	MST5973	04/27/04	1549	S443445-16, 17
	Equipment Rinse (K-1)	MST45973	05/10/04	1667	All samples in this SDG
KDN008	KDN008-2	MST5973	05/11/04	1250	All samples in this SDG
KDN009	KDN009-2	MSG5973	05/13/04	1331	S443991-1-6
	KDN009-19	MSG5073	05/22/04	1546	S444029A-1, 1DL
KDN010	KDN010-2	MST5973	05/22/04	1757	S443991A-1-11, 10DL
	KDN010-13	MST5973	05/15/04	1426	S443991-14, 15, 16
	K-4 Equipment Rinse	MSN5973	05/20/04	2304	All samples in this SDG
	K-2 Equipment Rinse	MSN5973	05/20/04	2332	All samples in this SDG
KDN011	KDN011-2	MSG5973	05/24/04	1523	All samples in this SDG
KDN012	KDN012-2	MSN5973	05/21/04	1406	All samples in this SDG
KDN013	KDN013-2	MSL5972	06/16/04	1023	S445116-1-12, 8RE
	KDN013-21	MSL5972	06/22/04	1416	S445116-13
	EB (06-09-04)	MSG5973	06/22/04	0846	S445116-9-12
KDN014	KDN014-2	MSE5973	06/20/04	1442	All samples in this SDG
KDN015	KDN015-14	MSG5973	06/25/04	1454	S445262-17, 18
	KDN015-2	MSE5973	06/20/04	1625	S445262-1-13
	06-10-04 EB	MSG5973	MSG5973	1612	S445262-1-8
	06-11-04 EB	MSG5073	MSG5073	1638	S445262-9-12

The following target semivolatile compounds were reported in the associated blanks:

SDG	BLANK ID	COMPOUND	CONC.	ASSOC. SAMPLES QUALIFIED AS NON-DETECT
KDN002	Equipment Rinse	Benzo (a) anthracene	0.001 mg/l	None
		Chrysene	0.0012 mg/l	None
		Di-n-octylphthalate	0.0014 mg/l	None
		Benzo(k) fluoranthene	0.0013 mg/l	None
		Benzo (a) pyrene	0.00093 mg/l	None

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SDG	BLANK ID	COMPOUND	CONC.	ASSOC. SAMPLES QUALIFIED AS NON-DETECT
KDN002	Equipment Rinse	Benzo (g,h,i) perylene	0.00065 mg/l	None
KDN006	KDN006-2	Bis (2-Ethylhexyl) phthalate	0.27 mg/kg	S443366-1-9, 11, 12, 17
	KDN006-30	Pyrene	0.022 mg/kg	None
KDN010	KDN010-13	Benzo(k) fluoranthene	0.0012 mg/l	None
		Benzo (a) pyrene	0.0010 mg/l	None
		Indeno(1,2,3-cd) pyrene	0.00093 mg/l	None
		Benzo (g,h,i) perylene	0.00094 mg/l	None
	K-2 Equipment rinse	1,4-Dichlorobenzene	0.0046 mg/l	S443991A-4, 6, 8, 9
		1,2-Dichlorobenzene	0.0027 mg/l	S443991A-3, 8
KDN011	KDN011-2	1,4-Dichlorobenzene	0.075 mg/kg	None
		1,2-Dichlorobenzene	0.074 mg/kg	S444029-12, 13
KDN013	EB (06-09-04)	Anthracene	0.56 mg/l	None
KDN014	KDN014-2	Benzo(k) fluoranthene	0.030 mg/kg	None
		Benzo (a) pyrene	0.036 mg/kg	None
		Indeno(1,2,3-cd) pyrene	0.048 mg/kg	S445182-1
		Dibenzo(a,h)anthracene	0.058 mg/kg	None
		Benzo (g,h,i) perylene	0.060 mg/kg	None

Any semivolatile compounds detected in a sample (other than a common laboratory contaminant), that was also detected in any associated blank were qualified as not detected with a "U" qualifier if the sample concentration was less than five times the blank concentration. For common laboratory contaminants (phthalates), the results were qualified by elevating the quantitation limit to the concentration found in the sample with a "U" qualifier when the sample concentration is less than 10 times the blank concentration. The quantitation limit was elevated to the concentration in the sample. The compounds and samples listed above were qualified as NOT DETECTED based on the guidance defined here.

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3.6 *Surrogate Samples*

Surrogates were not added to the samples analyzed in SDGs KDN001 because these samples were directly injected into the GC/MS. Since the samples were not extracted, there is no need to evaluate surrogates, which measure extraction efficiency. The data user should refer to the internal standard results for information about analytical accuracy for these samples.

All semivolatile surrogate percent recoveries (%R) for the other samples covered by this report were within the specified quality control limits with the following exceptions:

SDG	LAB SAMPLE ID	SURROGATE	%R	CONTROL LIMITS
KDN006	S443366-9	2-Fluorophenol (AC)	8	31-105
	S443366-9RE	Nitrobenzene-d5 (BN)	30	31-99
		2-Fluorobiphenyl (BN)	36	37-106

Positive volatile results were qualified as estimated with a "J" qualifier based on low or high surrogate recoveries. Semivolatile detection limits for non-detect compounds were qualified as estimated with a "UJ" qualifier based on low surrogate recoveries.

For sample 9, the data user should use the data from the original analysis for all base-neutral results that were not analyzed out of the calibration range (designated by a E flag). Two base-neutral surrogates were out of control limits for the reanalyzed data. The data user should use the data from the reanalysis (designated with a "RE" suffix) for the acid extractable results that were not analyzed out of the calibration range. One of the acid extractable surrogates was out of control limits with a recovery less than 10 percent for the original analysis. However, since the reanalysis was analyzed outside of holding time, the reanalyzed acid-extractable results are qualified as estimated and may be biased low. Results reported as out of calibration range and designated with a "E" flag from the original or reanalyzed analyses should be taken from the diluted sample analysis.

3.7 *Matrix Spike/ Matrix Spike Duplicate*

The MS/MSD percent recoveries and percent relative percent differences (RPDs) were within specified quality control limits with the following exceptions:

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SDG	MS/MSD ID	COMPOUND	MS %R	MSD %R	CONT. LIMITS	RPD	CONT. LIMIT
KDN006	S443366-17	Hexachlorocyclopent adiene	**18**	**16**	19-107	10	50
KDN007	S443445-6	Aniline	**0**	36	10-86	200	100
		Benzyl alcohol	**0**	46	21-110	46	200
		Hexachloroethane	**26**	33	29-84	26	50
		Benzoic Acid	**0**	**172**	10-94	200	100
		Naphthalene	**31**	56	36-94	11	50
		1-Methylnaphthalene	**0**	51	12-128	**200**	50
		Hexachlorocyclo-pentadiene	**0**	**0**	19-107	1	50
		2,4-Dinitrophenol	**0**	**0**	19-126	0	50
		1,2-Diphenylhydrazine	**0**	82	22-129	**200**	50
		Pentachlorphenol	**0**	41	17-140	**200**	50
		Benzidine	**0**	**0**	10-95	0	100
		bis (2-Ethylhexyl) phthalate	**156**	**156**	39-122	0	50
KDN011	S444029-2	2-Methylphenol	**0**	**0**	34-108	0	50
		Hexachloroethane	**28**	24	29-84	18	50
		Hexachlorocyclo-pentadiene	**0**	**0**	19-107	6	50
		2,4,6-Trichlorophenol	**40**	**38**	43-110	6	50
		2,4,5-Trichlorophenol	**43**	**40**	43-110	6	50
		2,6-Dinitrophenol	**38**	**33**	42-109	13	50
		2,4-Dinitrophenol	**0**	**0**	19-126	0	50
		Di-n-octylphthalate	**36**	**33**	38-126	7	50
		Dibenzo (a,h) anthracene	**28**	**21**	29-126	**200**	50
KDN014	S445182-9	2-Methylnaophthalene	**36**	40	37-108	6.4	50
KDN015	S445262-9	1,3-Dichlrobenzene	**23**	36	33-81	43	50
		1,2-Dichlrobenzene	**26**	39	31-86	38	50
		Hexachloroethane	**23**	36	29-84	43	50
		Naphthalene	**33**	44	36-94	28	50
		Hexachlorobutadiene	**33**	47	35-98	34	50
		2-Chloronapthalene	**39**	47	42-96	19	50

None of the samples were qualified based on MS/MSD percent recoveries or relative percent differences. The Functional Guidelines state that data should never be qualified based on matrix spike data alone.

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3.8 *Laboratory Control Samples*

All of the LCS percent recoveries and relative percent differences (RPDs) were within specified quality control limits with the following exceptions:

SDG	LCS ID	COMPOUND	LCS % R	CONT. LIMITS	ASSOC SAMPLES
KDN005	KDN005-2	2,6-Dinitro toluene	118	42-109	All samples in this SDG
KDN010	KDN010-2	bis (2-Chloroisopropyl) ether	100	30-94	S443991A-1-11, 1DL
		2,4-Dinitrophenol	7	19-126	S443991A-1-11, 1DL
KDN012	KDN012-2	2,4-Dinitrophenol	180	19-126	S444184-1, 1 DL
		2,4-Dichlorophenol	190	12-172	S444184-1, 1 DL
		4,6-Dinitro-2 methylphenol	170	34-164	S444184-1, 1 DL

Positive results for associated samples and compounds listed above were qualified as estimated with a "J" qualifier when the LCS recovery is low or high. Detection limits for non-detects were rejected with a "R" qualifier when the LCS recovery is low.

3.9 *Internal Standards*

All internal standard area counts were less than a factor of + OR- 50% from the associated calibration standard with the following exceptions:

SDG	SAMPLE ID	INTERNAL STANDARD	RESPONSE	ACCEPTABLE RANGE
KDN002	S443369-3	Chrysene-d12	305984	453371-1813484
		Perylene-d12	346402	470586-1882344
	S443369-8	Chrysene-d12	262852	453371-1813484

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SDG	SAMPLE ID	INTERNAL STANDARD	RESPONSE	ACCEPTABLE RANGE
KDN002	S443369-8	Perylene-d12	339971	470586-1882344
	S443369-9	Chrysene-d12	387026	453371-1813484
		Perylene-d12	425807	470586-1882344
	S443369-11	Chrysene-d12	326214	453371-1813484
		Perylene-d12	369833	470586-1882344
	S443369-12	Chrysene-d12	451199	453371-1813484
	S443369-3RE	1,4-Dichlorobenzene-d4	66256	70828-283310
		Naphthalene-d8	260351	295522-1182090
		Acenapthene-d10	156685	167805-671220
		Phenanthrene-d10	269288	282426-1129702
		Chrysene-d12	251557	311144-1244574
		Perylene-d12	253728	283120-1132480
	S443269-8RE	Chrysene-d12	304959	311144-1244574
		Perylene-d12	340315	283120-1132480
	S443269-9RE	Chrysene-d12	306860	311144-1244574
	S443369-11RE	1,4-Dichlorobenzene-d4	65949	70828-283310
		Naphthalene-d8	286290	295522-1182090
		Acenapthene-d10	166158	167805-671220
		Phenanthrene-d10	280818	282426-1129702
		Chrysene-d12	271818	311144-1244574
		Perylene-d12	275963	283120-1132480
	S443369-12RE	1,4-Dichlorobenzene-d4	57361	70828-283310
		Naphthalene-d8	237957	295522-1182090
		Acenapthene-d10	141609	167805-671220
		Phenanthrene-d10	245945	282426-1129702
		Chrysene-d12	234313	311144-1244574
		Perylene-d12	247776	283120-1132480

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SDG	SAMPLE ID	INTERNAL STANDARD	RESPONSE	ACCEPTABLE RANGE
KDN003	S443313-12	Phenanthrene-d10	329264	367325-1469300
		Perylene-d12	307521	308453-1233812
	S443313-14	1,4-Dichlorobenzene-d4	72058	94464-377856
		Naphthalene-d8	281019	377096-1508382
		Acenapthene-d10	166852	233546-934182
		Phenanthrene-d10	254117	367325-1469300
		Chrysene-d12	285551	368476-1473904
		Perylene-d12	241460	308453-1233812
	S443313-14RE	1,4-Dichlorobenzene-d4	254117	367325-1469300
		Naphthalene-d8	285551	368476-1473904
		Acenapthene-d10	241460	308453-1233812
		Phenanthrene-d10	47672	54222-216886
		Chrysene-d12	190990	288179-1152716
		Perylene-d12	133468	211006-844026
KDN009	S443991-2	1,4-Dichlorobenzene-d4	601738	93399-373596
		Naphthalene-d8	2435786	386904-1547616
		Acenapthene-d10	1351436	213162-852646
		Phenanthrene-d10	2161379	325764-1303054
		Chrysene-d12	1543113	216664-866658
		Perylene-d12	1496637	206663-826652
KDN013	S445116-8	Perylene-d12	215491	246457-985828

The internal standards for the reanalyzed samples had internal standards that were in control limits for samples S443313-12 and S445116-8. The data user is directed to use the reanalyzed results for these samples.

For samples S443369-3, 8, 9, 11, 12; and S443313-14, both the original and reanalyzed results were out of control limits and the data user should use the original results. The original analysis results were reported as estimated with a "J" qualifier for detected results and a "UJ" qualifier to denote an estimated detection limit for non-detected results based on low internal standard recoveries. The data user should note that the actual

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concentration of the volatiles present in the samples might be higher than those reported for positive results and may be higher than reporting limits for non-detected results.

For sample S443991-2 the internal standards were high and the results were non-detect so no qualification was required.

The internal standard retention times for the selected samples did not vary more than + or- 30 seconds from the retention time of the associated calibration standard.

3.10 Target Compound Identification

All target compound identifications were acceptable with regard to the supporting data.

3.11 Target Compound Quantitation

All target compound quantitations were acceptable with regard to the supporting data.

3.12 Overall Assessment of Data

All data validation qualifiers applied by ECS are included in Appendix A. The data appears acceptable for its intended use based on the review of the quality control items discussed in this section.

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4.0 DATA REVIEW OF ORGANOCHLORINE PESTICIDES AND POLYCHLORINATED BIPHENYLS

The following sample was analyzed for organochlorine pesticides and PCBs:

SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN001	S442500-1	MCB-1	OIL	03/24/04

4.1 Holding Times

The maximum holding time from date of collection to date of extraction for pesticides and PCBs in oil samples specified in the method is 30 days. The maximum holding time from date of extraction to date of analysis for pesticides and PCBs specified in the method is 40 days. This holding time was met for the sample covered by this report. None of the data were qualified based on holding times.

4.2 Initial Calibration

The initial calibrations for pesticides and PCBs are summarized as follows:

SDG	GC/ECD INSTRUMENT ID	GC COLUMN	DATE	TIME
KDN001	SGIECD1	1/2	04/12/04	1249

All %RSD standards were less than or equal to 20.0 percent. None of the pesticide or PCB data were qualified based on initial calibration data

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4.3 Continuing Calibration

The pesticides and PCB continuing calibrations were summarized as follows:

SDG	GC/ECD INSTRUMENT ID	GC COLUMN	DATE	TIME
KDN001	SGIECD	1 AND 2	04/20/04	1007
	SGIECD1	1 AND 2	04/20/04	1705

All organochlorine pesticides %D for compounds were less than or equal to 20.0 percent with the following exceptions:

SDG	GC/ECD INST. ID	DATE	TIME	ASSOC. SAMPLES	STANDARD	%D
KDN001	SGIECD1	04/20/04	1007	MB, LCS	4,4'-DDT	26
	SGIECD2	04/20/04	1007	MB, LCS	Methoxychlor	28
					Endrin Ketone	31
					Aroclor 1016	22
	SGIECD2	04/20/04	1705	S442500-1	Heptachlor	24
					Delta-BHC	23
					Methoxychlor	21
	SGIECD1	04/21/04	0258	S442500-1	Methoxychlor	38
					Aroclor 1016	40

The pesticides and PCB results listed above were qualified as estimated with a "J" qualifier for positive results and a "UJ" qualifier for non-detects.

4.4 Blanks

The following method blank was associated with the pesticide and PCB analyses:

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SDG	BLANK ID	GC/ECD INSTRUMENT ID	DATE ANALYZED
KDN001	KDN001-1	GSIECD1	04/20/04

None of the pesticide or PCB compounds were detected above the method detection limit in any of the blank. None of the pesticide or PCB data were qualified based on blank data.

4.5 Surrogates

All pesticide and PCB surrogate percent recoveries (%R) were within the specified quality control limits with the following exception:

SDG	SAMPLE ID	SURROGATE	%R	CONTROL LIMITS %R
KDN001	S442500-1	Tetrachloro-m-xylene	190	30-150

All positive organochlorine pesticide and PCB results in the sample listed above were qualified as estimated with a "J" qualifier based on high surrogate recovery.

4.6 Matrix Spike/ Matrix Spike Duplicate

A project MS/MSD was not analyzed with this SDG.

4.7 Laboratory Control Samples

A pesticide LCS was not analyzed with this SDG. All of the PCB LCS percent recoveries and relative percent differences (RPDs) were within specified quality control limits. None of the pesticide or PCB data were qualified based on LCS data.

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4.8 Compound Identification

All compound identifications were acceptable with regard to the supporting data.

4.9 Compound Quantitation

All compound identifications were acceptable with regard to the supporting data.

4.10 Overall Assessment of Organic Data

All data validation qualifiers applied by ECS are included in Appendix A. The data appears acceptable for its intended use based on the review of the quality control items discussed in this section.

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5.0 DATA REVIEW OF HERBICIDES

The following sample was analyzed for herbicides:

SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN001	S442500-1	MCB-1	OIL	03/24/04

5.1 Holding Times

The maximum holding time from date of collection to date of extraction for herbicides in oil samples specified in the method is 30 days. The maximum holding time from date of extraction to date of analysis for herbicides specified in the method is 40 days. This holding time was met for the sample covered by this report. None of the data were qualified based on holding times.

5.2 Initial Calibration

The initial calibration for herbicide analysis is summarized as follows:

SDG	GC/ECD INSTRUMENT ID	GC COLUMN	DATE	TIME
KDN001	SGSECD1	1 AND 2	03/30/04	0127

All %RSD standards were less than or equal to 20.0 percent. None of the herbicide data were qualified based on initial calibration data

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5.3 Continuing Calibration

The herbicide continuing calibrations were summarized as follows:

SDG	GC/ECD INSTRUMENT ID	GC COLUMN	DATE	TIME
KDN001	SGSECD	1	03/31/04	0211
	SGSECD	2	03/31/04	0211
	SGSECD	1	04/05/04	1856
	SGSECD	2	04/05/04	1856

All herbicide %D for compounds were less than or equal to 20.0 percent with the following exceptions:

SDG	GC/ECD INSTR. ID	DATE	TIME	ASSOC. SAMPLES	STANDARD	%D
KDN001	SGSECD1	03/31/04	0211	MB, LCS	MCPA	25
					2,4-DB	26
	SGSECD2	03/31/04	0211	MB, LCS	MCPA	32
					MCPP	25

The herbicides listed above were qualified as estimated with a "J" qualifier for positive results and a "UJ" qualifier for non-detects.

5.4 Blanks

The following method blank was associated with the herbicide analysis:

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SDG	BLANK ID	GC/ECD INSTRUMENT ID	DATE ANALYZED
KDN001	KDN001-1	SGSECD1	04/04/04

None of the herbicide compounds were detected above the method detection limit in the blank.

5.5 Surrogates

All herbicides surrogate percent recoveries (%R) were diluted out.

5.6 Matrix Spike/ Matrix Spike Duplicate

A project MS/MSD was not analyzed with this SDG.

5.7 Laboratory Control Samples

All of the LCS percent recoveries and relative percent differences (RPDs) were within specified quality control limits.

5.8 Compound Identification

All compound identifications were acceptable with regard to the supporting data.

5.9 Compound Quantitation

All compound identifications were acceptable with regard to the supporting data.

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5.10 Overall Assessment of Data

All data validation qualifiers applied by ECS are included in Appendix A. The data appears acceptable for its intended use based on the review of the quality control items discussed in this section.

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6.0 DATA REVIEW OF ICP METALS ANALYSES

The following sample was analyzed for ICP metals:

SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN001	S442500-1	MCB-1	OIL	03/24/04

6.1 *Holding Times*

The maximum holding time from date of collection to date of analysis for ICP metals in organic and solid samples recommended in SW-846 is 6 months. These holding times were met for the sample in this report. None of the ICP metals data in this report were qualified based on holding times.

6.2 *Calibration*

The following distinct instrument calibrations were performed :

- Initial Calibration (IC)
- Initial Calibration Verification(ICV)
- Continuing Calibration Verification (CCV)

The ICs were performed for every 24-hour period, in which field samples or associated quality control samples were analyzed, or each time the instrument was set up which ever was more frequent. All ICs were performed with the specified number of levels (A blank and 1 standard). None of the data were qualified or rejected as unusable due to the IC data.

All ICVs were performed at a single level immediately following the IC. All analysis results fell within the 90 to 110 percent recovery control limits.

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All CCVs were performed at a single level at a frequency of 10 percent or every two hours whichever was more frequent. Each analytical run sequence was closed with a CCV and a Continuing Calibration Blank (CCB). All calibration verifications were within the 90 to 110 percent recovery control limits. None of the metal data were qualified based on continuing calibration.

6.3 *Blanks*

All blanks were free of analytes at concentrations above the MDLs with the following exceptions:

SDG	BLANK ID	ANALYTE	CONC	SAMPLES QUALIFIED AS NON-DETECT FOR THIS ANALYTE
KDN001	ICB1	Chromium	0.0014	None
		Iron	0.031	None
		Silver	0.0021	None
	CCB3	Chromium	0.0011mg/l	None
		Iron	0.021 mg/l	None
		Zinc	0.0027 mg/l	None
	CCB4	Chromium	0.0015 mg/l	None
		Iron	0.023 mg/l	None
		Lead	0.0038 mg/l	None
		Zinc	0.0022 mg/l	None
	PB1	Chromium	0.23 mg/kg	None
		Iron	4.3 mg/kg	None
		Lead	0.40 mg/kg	None
		Zinc	0.49 mg/kg	None

Any metal detected in a sample, that was also detected in an associated blank were qualified as not detected with a "U" qualifier if the sample concentration was less than

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five times the blank concentration. None of the sample results were below the qualification level so none of the samples were qualified based on blank data.

6.4 *ICP Interference Check Sample (ICS)*

An ICS consisting of Solution A and Solution AB was analyzed at the beginning and end of each sample analysis run or a minimum of twice per 8 hour shift, whichever is more frequent. All ICS results were within 80% to 120% of the true value.

6.5 *Laboratory Control Sample (LCS)*

All LCS analyses were within the specified percent recovery (%R) control limits of 80% to 120%. None of the metal results were qualified based on LCS data.

6.6 *Duplicate Control Sample*

The project sample was not used as the duplicate for this SDG.

6.7 *Spike Sample Analysis*

The project sample was not used as the spike for this SDG.

6.8 *Sample Result Verification*

All ICP metal results were reported accurately based on a review of the raw data.

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6.9 *Overall Assessment of Data*

All data validation qualifiers applied by ECS are included in Appendix A. The data appears acceptable for its intended use based on the review of the quality control items discussed in this section.

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7.0 DATA REVIEW OF MERCURY ANALYSES

The following sample was analyzed for mercury:

SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN001	S442500-1	MCB-1	OIL	03/24/04

7.1 Holding Times

The maximum holding time from date of collection to date of analysis for mercury recommended in the method is 28 days. This holding time was met for the sample in this report. None of mercury data in this report were qualified based on holding times.

7.2 Calibration

The following distinct instrument calibrations were performed:

- Initial Calibration (IC)
- Initial Calibration Verification (ICV)
- Continuing Calibration Verification (CCV)

The ICs were performed for every 24-hour period, in which field samples or associated quality control samples were analyzed, or each time the instrument was set up which ever was more frequent. All ICs were performed with the specified number of levels (A blank and 5 standard). None of the data were qualified or rejected as unusable due to the IC data.

All ICVs were performed at a single level immediately following the IC. All analysis results fell within the 90 to 110 percent recovery control limits.

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All CCVs were performed at a single level at a frequency of 10 percent or every two hours whichever was more frequent. Each analytical run sequence was closed with a CCV and a Continuing Calibration Blank (CCB). All calibration verifications were within the 80 to 120 percent recovery control limits. None of the mercury data were qualified based on CCV data.

7.3 Blanks

Mercury was not reported in the associated method or field blanks. None of mercury data were qualified based on blank data.

7.4 Laboratory Control Sample (LCS)

All LCS analyses were within the specified percent recovery (%R) control limits. None of the mercury data were qualified based on LCS data.

7.5 Duplicate Control Sample

The project sample was not used as the duplicate for this SDG.

7.6 Spike Sample Analysis

The project sample was not used as the spike for this SDG.

7.7 Sample Result Verification

All mercury results were reported accurately based on a review of the raw data.

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7.8 Overall Assessment of Data

All data validation qualifiers applied by ECS are included in Appendix A. The data appears acceptable for its intended use based on the review of the quality control items discussed in this section.

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8.0 DATA REVIEW OF WET CHEMISTRY PARAMETERS

The following samples were analyzed for wet chemistry parameters (TOC):

SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN002	S443269-1	K-9 (8-10 FT)	SOLID	04/13/04
	S443269-2	K-9 (18-20 FT)	SOLID	04/13/04
	S443269-3	K-9 (25-28 FT)	SOLID	04/13/04
	S443269-4	K-9 (30-33 FT)	SOLID	04/13/04
	S443269-5	K-9 (43-45 FT)	SOLID	04/13/04
	S443269-6	K-9 (53-55 FT)	SOLID	04/13/04
	S443269-7	K-9 (63-65 FT)	SOLID	04/13/04
	S443269-8	K-9 (75-78 FT)	SOLID	04/14/04
	S443269-9	K-9 (82-85 FT)	SOLID	04/14/04
	S443269-10	K-9 (95-98 FT)	SOLID	04/14/04
	S443269-11	K-9 (105-106 FT)	SOLID	04/14/04
	S443269-12	K-9 (108-111 FT)	SOLID	04/14/04
	S443269-13	K-9 (12-15 FT)	SOLID	04/13/04
	S443269-14	K-9 (58-60 FT)	SOLID	04/13/04
	S443269-15	K-9 (90-93 FT)	SOLID	04/14/04
KDN003	S443313-1	K-8 (5-8 FT)	SOLID	04/15/04
	S443313-2	Duplicate 1	SOLID	04/15/04
	S443313-3	K-8 (15-18 FT)	SOLID	04/15/04
	S443313-4	K-8 (23-25 FT)	SOLID	04/15/04
	S443313-5	K-8 (30-33 FT)	SOLID	04/15/04
	S443313-6	K-8 (45-48 FT)	SOLID	04/15/04
	S443313-7	K-8 (55-58 FT)	SOLID	04/15/04
	S443313-8	K-8 (63-65 FT)	SOLID	04/15/04
	S443313-9	K-8 (73-75 FT)	SOLID	04/15/04
	S443313-10	K-8 (93-95 FT)	SOLID	04/15/04
	S443313-11	Duplicate 2	SOLID	04/15/04
	S443313-12	K-8 (88-90 FT)	SOLID	04/15/04
	S443313-13	K-8 (105-108 FT)	SOLID	04/15/04
	S443313-14	K-8 (110-113 FT)	SOLID	04/15/04
	S443313-15	K-8 (13-15 FT)	SOLID	04/15/04
	S443313-16	K-8 (33-35 FT)	SOLID	04/15/04
	S443313-17	K-8 (98-100 FT)	SOLID	04/15/04
KDN004	S443358-1	K-7 (0-3 FT)	SOLID	04/16/04
	S443358-2	K-7 (18-20 FT)	SOLID	04/16/04
	S443358-3	K-7 (28-30 FT)	SOLID	04/16/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN004	S443358-4	K-7 (30-33 FT)	SOLID	04/16/04
	S443358-5	K-7 (40-43 FT)	SOLID	04/16/04
	S443358-6	K-7 (58-60 FT)	SOLID	04/16/04
	S443358-7	Duplicate 3	SOLID	04/16/04
	S443358-8	K-7 (73-75 FT)	SOLID	04/16/04
	S443358-9	K-7 (68-70 FT)	SOLID	04/16/04
	S443358-10	K-7 (83-85 FT)	SOLID	04/16/04
	S443358-11	K-7 (90-93 FT)	SOLID	04/16/04
	S443358-12	K-7 (108-110 FT)	SOLID	04/16/04
	S443358-13	K-7 (110-113 FT)	SOLID	04/16/04
	S443358-14	K-6 (8-10 FT)	SOLID	04/17/04
	S443358-15	K-7 (23-25 FT)	SOLID	04/16/04
	S443358-16	K-7 (43-45 FT)	SOLID	04/16/04
	S443358-17	K-7 (75-78 FT)	SOLID	04/16/04
	S443358-18	Duplicate 4	SOLID	04/16/04
KDN005	S443358A-1	K-6 (15-18 FT)	SOLID	04/17/04
	S443358A-2	K-6 (25-28 FT)	SOLID	04/17/04
	S443358A-3	K-6 (33-35 FT)	SOLID	04/17/04
	S443358A-4	K-6 (40-43 FT)	SOLID	04/17/04
	S443358A-5	K-6 (50-53 FT)	SOLID	04/17/04
	S443358A-6	K-6 (65-68 FT)	SOLID	04/17/04
	S443358A-7	K-6 (73-75 FT)	SOLID	04/17/04
	S443358A-8	K-6 (85-88 FT)	SOLID	04/19/04
	S443358A-9	K-6 (95-98 FT)	SOLID	04/19/04
	S443358A-10	K-6 (105-110 FT)	SOLID	04/19/04
	S443358A-11	Duplicate 5	SOLID	04/19/04
	S443358A-12	K-6 (110-113 FT)	SOLID	04/19/04
	S443358A-13	K-6 (13-15 FT)	SOLID	04/17/04
	S443358A-14	K-6 (45-48 FT)	SOLID	04/17/04
	S443358A-15	K-6 (78-80 FT)	SOLID	04/19/04
KDN006	S443366-1	K-5 (45-48 FT)	SOLID	04/19/04
	S443366-2	K-5 (55-58 FT)	SOLID	04/20/04
	S443366-3	K-5 (65-68 FT)	SOLID	04/20/04
	S443366-4	K-5 (73-75 FT)	SOLID	04/20/04
	S443366-5	K-5 (83-85 FT)	SOLID	04/20/04
	S443366-6	K-5 (90-93 FT)	SOLID	04/20/04
	S443366-7	K-5 (113-116 FT)	SOLID	04/20/04
	S443366-8	K-5 (3-5 FT)	SOLID	04/19/04
	S443366-9	K-5 (13-15 FT)	SOLID	04/19/04
	S443366-10	K-5 (20-23 FT)	SOLID	04/19/04
	S443366-11	Duplicate 6	SOLID	04/19/04
	S443366-12	K-5 (30-33 FT)	SOLID	04/19/04
	S443366-13	Duplicate 7	SOLID	04/20/04
	S443366-14	K-5 (58-60 FT)	SOLID	04/20/04
	S443366-15	K-5 (95-98 FT)	SOLID	04/20/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN006	S443366-16	K-5 (8-10 FT)	SOLID	04/19/04
	S443366-17	K-5 (105-109 FT)	SOLID	04/20/04
	S443366-18	K-5 (109-111 FT)	SOLID	04/20/04
KDN007	S443445-1	K-1 (8-10 FT)	SOLID	04/21/04
	S443445-2	K-1 (15-18 FT)	SOLID	04/21/04
	S443445-3	Duplicate 8	SOLID	04/21/04
	S443445-4	K-1 (30-33 FT)	SOLID	04/21/04
	S443445-5	K-1 (25-28 FT)	SOLID	04/21/04
	S443445-6	K-1 (55-58 FT)	SOLID	04/21/04
	S443445-7	K-1 (60-63 FT)	SOLID	04/21/04
	S443445-8	K-1 (75-78 FT)	SOLID	04/21/04
	S443445-9	K-1 (80-83 FT)	SOLID	04/21/04
	S443445-10	K-1 (95-98 FT)	SOLID	04/21/04
	S443445-11	K-1 (108-110 FT)	SOLID	04/21/04
	S443445-12	K-1 (113-116 FT)	SOLID	04/21/04
	S443445-13	K-1 (13-15 FT)	SOLID	04/21/04
	S443445-14	K-1 (43-45 FT)	SOLID	04/21/04
	S443445-15	K-1 (85-88 FT)	SOLID	04/21/04
KDN008	S443721-1	K-4 (8-10 FT)	SOLID	04/28/04
	S443721-2	K-4 (15-18 FT)	SOLID	04/28/04
	S443721-3	Duplicate 9	SOLID	04/28/04
	S443721-4	K-4 (28-30 FT)	SOLID	04/28/04
	S443721-5	K-4 (38-40 FT)	SOLID	04/28/04
	S443721-6	K-4 (43-45 FT)	SOLID	04/28/04
	S443721-7	K-4 (58-60 FT)	SOLID	04/28/04
	S443721-8	K-4 (60-63 FT)	SOLID	04/28/04
	S443721-9	K-4 (75-78 FT)	SOLID	04/28/04
	S443721-10	K-4 (80-83 FT)	SOLID	04/28/04
	S443721-11	K-4 (90-93 FT)	SOLID	04/28/04
	S443721-12	K-4 (108-110 FT)	SOLID	04/28/04
	S443721-13	Duplicate 10	SOLID	04/28/04
	S443721-14	K-4 (110-111.5 FT)	SOLID	04/28/04
	S443721-15	K-4 (23-25 FT)	SOLID	04/28/04
	S443721-16	K-4 (55-58 FT)	SOLID	04/28/04
	S443721-17	K-4 (103-105 FT)	SOLID	04/28/04
KDN009	S444029-1	K-4	LIQUID	05/06/04
	S443991-1	K-8	LIQUID	05/04/04
	S443991-2	K-1	LIQUID	05/05/04
	S443991-3	K-7	LIQUID	05/05/04
	S443991-4	K-6	LIQUID	05/05/04
	S443991-5	K-9	LIQUID	05/05/04
	S443991-6	K-5	LIQUID	05/05/04
KDN010	S443991A-1	K-2 (3-5 FT)	SOLID	05/06/04
	S443991A-2	K-2 (15-18 FT)	SOLID	05/06/04
	S443991A-3	K-2 (25-28 FT)	SOLID	05/06/04

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SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN010	S443991A-4	K-2 (39-40 FT)	SOLID	05/06/04
	S443991A-5	K-2 (45-48 FT)	SOLID	05/06/04
	S443991A-6	K-2 (55-57 FT)	SOLID	05/06/04
	S443991A-7	K-2 (68-70 FT)	SOLID	05/06/04
	S443991A-8	K-2 (73-75 FT)	SOLID	05/06/04
	S443991A-9	K-2 (83-85 FT)	SOLID	05/06/04
	S443991A-10	K-2 (93-95 FT)	SOLID	05/06/04
	S443991A-11	K-2 (105-108 FT)	SOLID	05/06/04
	S443991A-12	K-2 (10-13 FT)	SOLID	05/06/04
	S443991A-13	K-2 (60-63 FT)	SOLID	05/06/04
	S443991A-14	K-2 (88-90 FT)	SOLID	05/06/04
KDN011	S444029-1	K-3 (8-10 FT)	SOLID	05/07/04
	S444029-2	K-3 (8-10 FT)	SOLID	05/07/04
	S444029-3	K-3 (13-15 FT)	SOLID	05/07/04
	S444029-4	Duplicate 11	SOLID	05/07/04
	S444029-5	K-3 (23-25 FT)	SOLID	05/07/04
	S444029-6	K-3 (35-39 FT)	SOLID	05/07/04
	S444029-7	K-3 (45-48 FT)	SOLID	05/07/04
	S444029-8	K-3 (57-59 FT)	SOLID	05/07/04
	S444029-9	K-3 (60-63 FT)	SOLID	05/07/04
	S444029-10	Duplicate 12	SOLID	05/07/04
	S444029-11	K-3 (73-75 FT)	SOLID	05/07/04
	S444029-12	K-3 (87-89 FT)	SOLID	05/07/04
	S444029-13	K-3 (95-98 FT)	SOLID	05/07/04
	S444029-14	K-3 (107-109 FT)	SOLID	05/07/04
	S444029-15	K-3 (113-115 FT)	SOLID	05/07/04
	S444029-16	K-3 (25-28 FT)	SOLID	05/07/04
	S444029-17	K-3 (53-55 FT)	SOLID	05/07/04
	S444029-18	K-3 (93-95 FT)	SOLID	05/07/04
KDN013	S445116-1	K-11 (6-8.5 FT)	SOLID	06/08/04
	S445116-2	K-11 (13.5-16 FT)	SOLID	06/08/04
	S445116-3	K-11 (18.5-21 FT)	SOLID	06/08/04
	S445116-4	K-11 (33-35.5 FT)	SOLID	06/08/04
	S445116-5	K-11 (45.5-48 FT)	SOLID	06/08/04
	S445116-6	K-11 (58.5-61 FT)	SOLID	06/08/04
	S445116-7	K-11 (68-70.5 FT)	SOLID	06/08/04
	S445116-8	K-11 (73-75.5 FT)	SOLID	06/08/04
	S445116-9	K-11 (90.5-93 FT)	SOLID	06/09/04
	S445116-10	K-11 (101-103.5 FT)	SOLID	06/09/04
	S445116-11	K-11 (106-108.5 FT)	SOLID	06/09/04
	S445116-12	K-11 (101-103.5 FT)	SOLID	06/09/04
KDN014	S445182-1	K-10 (8.5-11.0)	SOLID	06/09/04
	S445182-2	K-10 (18.5-21.0)	SOLID	06/09/04
	S445182-3	K-10 (21.0-23.5)	SOLID	06/09/04
	S445182-4	K-10 (40.5-43.0)	SOLID	06/09/04

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KDN014	S445182-5	K-10 (58.0-60.5)	SOLID	06/09/04
	S445182-6	K-10 (66.0-68.5)	SOLID	06/09/04
	S445182-7	K-10 (80.0-82.5)	SOLID	06/10/04
KDN015	S445182-8	K-10 (90.5-93.0)	SOLID	06/10/04
	S445182-9	K-10 (106.0-108.5)	SOLID	06/10/04
	S445182-10	K-10A (106.0-108.5)	SOLID	06/10/04
	S445182-11	K-10 (111.0-113.5)	SOLID	06/10/04
	S445182-12	K-10 (45.5-48.0)	SOLID	06/10/04
	S445182-13	K-10 (11-13.5)	SOLID	06/10/04
	S445182-14	K-10 (71-73.5)	SOLID	06/10/04
	S445182-15	K-10 (98.5-101)	SOLID	06/10/04
	S445262-1	K-12 (0-2.5)	SOLID	06/10/04
	S445262-2	K-12 (10-12.5)	SOLID	06/10/04
	S445262-3	K-12 (21-23.5)	SOLID	06/10/04
	S445262-4	K-12 (33.5-36)	SOLID	06/10/04
	S445262-5	K-12 (43.5-46)	SOLID	06/10/04
	S445262-6	K-12 (53.5-56)	SOLID	06/10/04
	S445262-7	K-12 (63.5-66)	SOLID	06/10/04
	S445262-8	K-12 (66-68,5)	SOLID	06/10/04
	S445262-9	K-12 (81-83.5).	SOLID	06/11/04
	S445262-10	K-12 (93.5-96)	SOLID	06/11/04
	S445262-11	K-12 (101-103.5)	SOLID	06/11/04
	S445262-12	K-12 (106-108.5)	SOLID	06/11/04
	S445262-13	DUP	SOLID	06/11/04
	S445262-14	K-12 (18.5-21)	SOLID	06/10/04
	S445262-15	K-12 (68.5-71)	SOLID	06/11/04
	S445262-16	K-12 (88-88.5)	SOLID	06/11/04

8.1 Holding Times

The maximum holding time from date of collection to date of analysis for total organic carbon (TOC) recommended in SW-846 is 28 days. None of total organic carbon data were qualified based on holding times.

8.2 Blanks

Total organic carbon was not reported in the associated method or field blanks. None of TOC data were qualified based on blank data.

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8.3 *Laboratory Control Sample (LCS)*

All LCS analyses were within the specified percent recovery (%R) control limits. None of the TOC data were qualified based on LCS data.

8.4 *Duplicate Control Sample*

All duplicate analyses were within the specified control limits. None of the TOC data were qualified based on duplicate data.

8.5 *Spike Sample Analysis*

All matrix spike analyses were within 75 to 125 percent recovery. None of the TOC data were qualified based on spike data.

8.6 *Overall Assessment of Data*

All data validation qualifiers applied by ECS are included in Appendix A. The data appears acceptable for its intended use based on the review of the quality control items discussed in this section.

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9.0 DATA REVIEW OF POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD) AND POLYCHLORINATED DIBENZOFURANS (PCDF)

The following sample was analyzed for PCDD and PCDF:

SDG	LAB SAMPLE ID	FIELD SAMPLE ID	MATRIX	DATE COLLECTED
KDN001	S442500-1	MCB-1	OIL	03/24/04

9.1 *Holding Times*

The maximum holding time from date of collection to date of extraction for PCDD and PCDFs in organic and solid samples recommended in the method is 30 days. The maximum holding time from date of extraction to date of analysis for PCDD and PCDF recommended in the method is 45 days. These holding times were met for the sample in this report. None of the PCDD and PCDF data were qualified based on holding times.

9.2 *Initial Calibration*

The following initial calibration was performed on the GC/MS instrument used for PCDD and PCDF analysis:

SDG	GC/MS INSTRUMENT ID	DATE	TIME
KDN001	1DB	04/02/04	1138

The results of the data validation procedure for the initial calibration is summarized as follows.

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GC/MS Instrument ID 1DB – 04/02/04 - 1138

Each GC/MS employed for samples or associated quality control samples was calibrated independently at five concentration levels. Each calibration standard contained all test compounds, surrogates, and internal standards. All signal to noise ratios were greater than or equal to 25:1. None of the data were qualified as estimated or rejected as unusable due to signal to noise ratio for this initial calibration. All percent relative standard deviations (%RSD) were less than or equal to 15 percent. None of the data were qualified as estimated or rejected as unusable due to percent relative standard deviations for this initial calibration.

9.3 *Continuing Calibration*

Each GC/MS employed for samples or associated quality control samples was calibrated for each 12-hour shift in which samples or associated quality control samples were analyzed. Each calibration standard was performed at one concentration level with a standard that contained all test compounds, surrogates and internal standards.

The following continuing calibration were performed on the GC/MS instruments used for PCDD and PCDF analysis:

SDG	GC/MS INSTRUMENT ID	DATE	TIME	ASSOCIATED SAMPLES
GDADQ1AA	1DB	04/05/04	1129	S442500-1

The results of the data validation procedure for the continuing calibration(s) were summarized as follows.

GC/MS Instrument ID 1DB- 04/02/04 - 1129

All percent differences (%D) for reported compounds were less than or equal to 30 percent. None of the data were qualified as estimated or rejected as unusable due to the %D for this continuing calibration.

All signal to noise ratios for native compounds were greater than or equal to 2.5:1. All signal to noise ratios for internal standards compounds were greater than or equal to

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10:1. None of the data were qualified as estimated or rejected as unusable due to signal to noise ratio for this initial calibration.

9.4 *Blanks*

The following method blank was associated with the PCDD and PCDF analyses:

SDG	BLANK ID	GC/MS INSTRUMENT ID	DATE
GDADQ1AA	G4C270134	1DB	04/02/04

None of the PCDD and PCDF compounds were detected in the blank. None of the data were qualified based on blank data.

9.5 *Surrogate Samples*

All surrogate percent recoveries (%R) were within the specified quality control limits. None of the data were qualified based on surrogate recoveries.

9.6 *Matrix Spike/ Matrix Spike Duplicate*

The project sample was not used as the MS/MSD.

9.7 *Internal Standards*

All internal standard area counts were within control limits. None of the data were qualified based on internal standards.

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9.8 *Target Compound Identification*

All target compound identifications were acceptable with regard to the supporting data.

9.9 *Target Compound Quantitation*

All target compound quantitations were acceptable with regard to the supporting data.

9.10 *Overall Assessment of Data*

All data validation qualifiers applied by ECS are included in Appendix A. The data appears acceptable for its intended use based on the review of the quality control items discussed in this section.

QUALITY ASSURANCE REPORT

Solutia Inc.
W.G. Krummrich Plant
Sauget, Illinois

Groundwater CMS Samples

Prepared for

W.G. Krummrich Plant
520 Monsanto Avenue
Sauget, Illinois 62206

August 2004

URS

URS Corporation
1001 Highland Plaza Drive West, Suite 300
St. Louis, MO 63100
(314) 429-0100
Project #21561197

Groundwater

Sample ID	SDG
B-24A	KRM24
B-24C	KRM25
B-25A	KRM24
B-25B	KRM24
B-28A	KRM25
B-28B	KRM24
B-28B-D	KRM24
B-29A	KRM24
B-29B	KRM25
GM-17A	KRM26
GM-17B	KRM23
GM-17C	KRM23
GM-19A	KRM24
GM-19B	KRM24
GM-19C	KRM24
GM-19C-D	KRM24
GM-20A	KRM24
GM-20B	KRM24
GM-4A	KRM23
GM-4B	KRM23
GM-4C	KRM23
GM-6A	KRM23
GM-6B	KRM23
GM-7	KRM27
MW-7B	KRM23
MW-7C	KRM23
TRA1-GPA23	KRM26
TRA1-GPA43	KRM26
TRA1-GPA77	KRM26
TRA1-GPB21	KRM16
TRA1-GPB43	KRM16
TRA1-GPB73	KRM16
TRA1-GPC15	KRM18
TRA1-GPC15-D	KRM18
TRA1-GPC44	KRM18
TRA1-GPC74	KRM18
TRA2-GPA25	KRM27
TRA2-GPA45	KRM27
TRA2-GPA71	KRM27
TRA2-GPB25	KRM27
TRA2-GPB45	KRM27
TRA2-GPB45-D	KRM27
TRA2-GPB70	KRM27
TRA2-GPC25	KRM16

Groundwater

Sample ID	SDG
TRA2-GPC43	KRM16
TRA2-GPC43D	KRM16
TRA2-GPC73	KRM16
TRA2-GPD21	KRM17
TRA2-GPD41	KRM17
TRA2-GPD72	KRM17
TRA2-GPE21'	KRM16
TRA2-GPE42'	KRM16
TRA2-GPE72'	KRM16
TRA2-GPF15	KRM19
TRA2-GPF42	KRM19
TRA2-GPF58	KRM19
TRA2-GPF58D	KRM19
TRA2-GPG15	KRM19
TRA2-GPG43	KRM19
TRA2-GPG73	KRM19
TRA4-GPA105	KRM18
TRA4-GPA15	KRM18
TRA4-GPA36	KRM18
TRA4-GPA66	KRM18
TRA4-GPB119.3	KRM18
TRA4-GPB29	KRM18
TRA4-GPB49	KRM18
TRA4-GPB76	KRM18
TRA4-GPC119	KRM16
TRA4-GPC21	KRM16
TRA4-GPC43	KRM16
TRA4-GPC73	KRM16
TRA4-GPD119	KRM22
TRA4-GPD28	KRM21
TRA4-GPD28D	KRM21
TRA4-GPD48	KRM21
TRA4-GPD78	KRM21
TRA4-GPE114	KRM22
TRA4-GPE27	KRM22
TRA4-GPE49	KRM22
TRA4-GPE79	KRM22
TRA4-GPE79D	KRM22
TRA6-GPC121	KRM20
TRA6-GPC24	KRM20
TRA6-GPC65	KRM20
TRA6-GPC85	KRM20
TRA6-GPD114.5	KRM21
TRA6-GPD55	KRM21
TRA6-GPD85	KRM21

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This Quality Assurance Report and the attached Independent Full Validation Report presents the findings of a review of analytical data for groundwater samples collected as part of the RCRA Corrective Measures Study (CMS) for the Solutia W.G. Krummrich Facility. Samples were collected from June to August 2003 from the Solutia facility and surrounding properties. URS Corporation conducted the sampling effort. Analytical testing was provided by Severn Trent Laboratories located in Savannah, Georgia (STL-Savannah). Samples sent to Severn Trent were analyzed using the USEPA SW-846 methodologies referenced in the Quality Assurance Project Plan (QAPP). All samples were tested for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). In addition, selected samples were also tested for geochemical parameters such as methane, manganese, nitrates, alkalinity, sulfate and carbon dioxide.

One hundred percent of the data were subjected to a data quality review; sixteen percent of these data were subjected to a full validation. The review and validation were performed in order to confirm that the analytical data provided by Severn Trent were acceptable in quality for characterizing the site.

A total of 128 samples (81 investigative samples, 8 field duplicates, 34 trip blanks, and 5 matrix spike and 5 matrix spike duplicates) were analyzed by STL-Savannah. These samples were submitted in 12 Sample Delivery Groups (SDGs), SDG 16 through SDG 27. SDGs 24 and 25 were subjected to an independent data validation which includes a data quality review. All the other SDGs were subjected to a data quality review. The validation report is presented at the end of this report. The samples were analyzed according to the following USEPA SW-846 Methods: Method 8260B for VOCs, Method 8270C for SVOCs, Method AR30 for methane, Method 6010B for manganese, Method 353.2 for nitrates, Method 310.1 for alkalinity, and Method 375.4 for sulfates. Carbon Dioxide was calculated using Method 310.1/4500-CO_2D. The American Public Health Association[1] published this method. The method calculates CO_2 based on bicarbonate, carbonate and hydroxide alkalinity. No QA/QC is associated with this method. Therefore, CO_2 results were not reviewed and are not part of this report.

The procedures for review of the data followed guidance from the following documents:

1. Quality Assurance Project Plan, March 2003. Prepared by URS Corporation.
2. U.S EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999.
3. U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, July 2002.

[1] Published in "The Standard Methods for the Examination of Water and Wastewater."

The above "Guidelines" provided the criteria to review the data. Additional quantitative criteria are given in the analytical methods. Qualifiers assigned by the data reviewer have been transcribed onto the laboratory reporting forms (Form-1s). The qualifiers are accompanied by codes which indicate the reason for assignment of the qualifier(s). The various codes are explained in **Table 1** below.

TABLE 1

Lab Qualifier	Definition
NC	No criteria at this time
NA	Not applicable
J	Estimated Value (Organics only)
D	Diluted
U	Non-Detect
B	Analyte found in the blank (Organics only)
B	Value greater than IDL but less than CRDL (Metals only)
E	Exceeds calibration (Organics only)
E	Serial dilution result for samples with concentrations greater than 50 times the IDL are not within 10% of the original sample result (Metals only).
N	Matrix Spike or matrix spike duplicate is outside expected recovery limits. (Metals Only)

URS Qualifier	Definition
U	The analyte was analyzed for but was not detected.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
D	If the sample or extract is reanalyzed at a higher dilution factor, all concentrations are reported with a D.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy, precision, and representativeness (based on MS/MSD, LCS/LCSD, and field duplicate results) were achieved for this data set, except where noted in this appendix. In addition, analytical completeness, defined to be the percentage of analytical results which are judged to be valid, including estimated (J) or estimated non-detect (UJ) values was 98 percent, which exceeds the completeness goal of 95 percent.

The data review included evaluation of the following criteria:

Organics

- Sample holding times
- Laboratory method blank and trip blank samples
- Surrogate spike recoveries
- Laboratory control sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample recoveries and Relative Percent Difference (RPD) values
- Field duplicate results
- Results reported from dilutions
- Internal Standard responses

Inorganics

- Sample holding times
- Equipment blank and laboratory method blank samples
- LCS recoveries
- MS/MSD sample recoveries and RPD values
- Field duplicate results
- Results reported from dilutions
- ICP serial dilutions

The following sections present the results of the data review.

2.1 SAMPLE HOLDING TIMES

Sample holding time requirements for the analyses performed are presented in the QAPP and/or in the "Guidelines." Review of the sample collection and analysis dates involved comparing the chain-of-custody and the summary forms for accuracy, consistency, and holding time compliance.

All extractions and/or analyses for VOCs, SVOCs, methane, manganese, nitrates, alkalinity and sulfates were completed within the recommended holding time requirements with the exception of the samples mentioned on the table below.

SDG #	Sample	Analysis	Time Out of Hold	Qualification
KRM016	TRA4-GPC73 and TRA4-GPC119	Alkalinity	2 days	"J"
KRM017	TRA2-GPD21, TRA2-GPD41 & TRA2-GPD72	Alkalinity	1 day	"J"
KRM020	TRA6-GPC24	Methane	1 day	"J"
KRM022	TRA4-GPE27MS	VOCs	1 day	None because it is a QA/QC sample
KRM027	TRA2-GPB45 (Reanalysis)	SVOCs	> 2xs extraction time	The reanalysis were rejected "R"

2.2 EQUIPMENT BLANK AND LABORATORY METHOD BLANK SAMPLES

Equipment blank samples are used to evaluate sampling equipment decontamination procedures. The QAPP requires equipment blank samples to be collected at a frequency of one per 10 investigative samples for reusable sampling equipment. No equipment blanks were collected as the tubing used to retrieve the groundwater samples was dedicated to a sample location and depth. For example, tubing was used only once before being discarded.

Laboratory method blank samples evaluate the existence and magnitude of contamination problems resulting from laboratory activities. All laboratory method blank samples were analyzed at the method prescribed frequencies. The laboratory method blank samples had no detections.

2.3 TRIP BLANKS

Trip blanks samples are used to assess VOC cross contamination of soil samples during shipment to the laboratory. One trip blank was submitted with each shipment containing samples for VOC analyses for a total of 34 trip blank samples. The one trip blank sample with VOC detection is mentioned below:

SDG #	Sample ID	Compound and Concentration
KRM019	Trip Blank-12	Styrene 7.4 ug/l

There was no need to qualify data because the associated samples in KRM019 were non-detect for styrene. Overall, there was a minimal potential for cross contamination of samples during shipping and storage.

2.4 SURROGATE SPIKE RECOVERIES

Surrogate compounds are used to evaluate overall laboratory performance for sample preparation efficiency on a per sample basis. All samples analyzed for VOCs and SVOCs were spiked with surrogate compounds prior to sample preparation. The "Guidelines" require that all VOC surrogate spike recoveries meet acceptance criteria, and allow one SVOC surrogate recovery per fraction (base/neutral or acid fraction) to be outside acceptance criteria, provided that recoveries are greater than or equal to 10 percent.

Surrogate recoveries were within range with the exception of the samples presented below.

SDG #	Sample ID	Analysis	Surrogate	Recovery	Range	Qualification
KRM016	TRA4-GPC73	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM016	TRA4-GPC119	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM017	TRA2-GPD41	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM017	TRA2-GPD72	SVOCs	Base surrogates	0%	NA	Due to dilution, therefore no action
KRM018	TRA1-GPC74 MSD	VOCs	Dibromofluoromethane	134 %	68-129	QA/QC sample, no qualifications
KRM018	TRA1-GPC74 MS and MSD	SVOCs	All surrogates	0%	NA	Due to dilutions, therefore no action

SDG #	Sample ID	Analysis	Surrogate	Recovery	Range	Qualification
KRM020	TRA6-GPC65	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM020	TRA6-GPC85	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM020	MW-7B	SVOCs	All surrogates	0%	NA	Due to dilution, therefore no action
KRM026	KRM26-19 (Method Blank)	SVOCs	2-Fluorophenol Phenol-d5 Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromophenol	26% 26% 30% 30% 28%	43 – 114 46 – 112 51 – 115 55 – 116 47 - 133	None since neither of the related samples had recoveries that were out.
KRM027	KRM27-11(LCS)	VOCs	Dibromofluoromethane	140%	68 - 129	QA/QC sample, no qualifications
KRM027	TRA2-GPB45	SVOCs	2-Fluorophenol Phenol-d5	31% 22%	43 – 114 46 – 112	Sample qualified as "UJ"

2.5 LABORATORY CONTROL SAMPLES RECOVERIES

Laboratory control samples (LCS) serve to monitor the overall performance of the steps in an analysis, including sample preparation. Laboratory control samples were prepared with each batch of samples. All LCS recoveries were within analytical accuracy limits with the exception of the LCSs mentioned below. Qualifications were made as appropriate.

SDG #	Sample ID	Analysis	LCS compound	Recovery	Range	Qualification
KRM016	Batch 1A0710	VOCs	Carbon Tetrachloride trans-1-3-Dichloropropene	144 % 136 %	67 - 136 73 - 133	None, neither compound was detected in related samples.
KRM016	Batch 7802	SVOCs	4-Chloroaniline	100%	19 - 95	None, all 4-Chloroaniline associated results were non-detect.
KRM018	Batch 100715 LCS Batch 100717 LCS	VOCs	Bromomethane m,p-Xylene	196 % 120 %	22 - 184 78 - 119	None, related bromomethane results were non-detect. None, related m,p-Xylene results were non-detect or QA/QC samples.
KRM018	Batch 0709C LCS	SVOCs	2-Methylphenol	120 %	48 -113	None, related 2-Methylphenol results were non-detect.
KRM019	Batch 1A0730 LCS	VOCs	Bromomethane	220 %	22 - 184	None, related bromomethane results were non-detect.

SDG #	Sample ID	Analysis	LCS compound	Recovery	Range	Qualification
KRM019	Batch 0721D LCS	SVOCs	Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine 3&4-Methylphenol 4-Chloro-3-methylphenol	120 % 120 % 120 % 120 %	40 - 115 42 - 117 40 - 116 53 - 117	None, neither compound was detected in related samples.
KRM020	Batch 2A0728 Batch 1A0730 Batch 1A0731 Batch 1B0805	VOCs	Bromomethane Bromomethane Bromomethane 1,2-Dichloropropane cis-1,3-Dichloropropene	220% 220% 260% 72% 76%	22 - 184 22 - 184 22 - 184 74 - 122 77 - 127	None, related bromomethane results were non-detect. TRA6-GPC65 (DL) 1,2-Dichloropropane & cis-1,3-Dichloropropene results "UJ".
KRM021	Batch 0731 LCS	VOCs	Bromomethane	260%	22 - 184	None, related bromomethane results were non-detect.
KRM023	Batch 0807B LCS	SVOCs	2,4-Dinitrotoluene	130%	44 - 129	None, related 2,4-Dinitrotoluene results were non-detect.
KRM026	Batch 1A0831 LCS Batch 2A0831 LCS	VOCs	Acetone Acetone Bromomethane Bromoform	0% 0% 188% 68%	32 - 164 32 - 164 22 - 184 69 - 138	TRA1-GPA23 acetone result "R" TRA1-GPA43 & TRA1-GPA77 acetone "R"& bromoform "UJ"
KRM026	Batch 0822B LCS	SVOCs	Butylbenzylphthalate Di-n-octylphthalate	130% 130%	58 - 129 56 -127	None, neither compound was detected in related samples.
KRM027	Batch 0918C LCS	SVOCs	3-Nitroaniline	120%	41 - 117	None, all 3-Nitroaniline associated results were non-detect.

2.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples are analyzed to assess potential matrix effects upon the data. MS/MSD samples were required to be collected at a frequency of one per 20 investigative samples in accordance with the QAPP. URS Corporation submitted 5 MS/MSD sample sets for 81 investigative samples meeting the QAPP frequency requirement. On occasions where SDGs were closed without a field MS/MSD, the laboratory created a batch MS/MSD sample, using either one of our samples or another clients' samples.

The MS/MSD recoveries and RPDs not within the evaluation criteria are mentioned below and are bolded. No qualifications were made to the data if the MS/MSD % recoveries were zero due to dilutions or if the %RPD was the only factor out of criteria. USEPA National Functional Guidelines for Organic Data Review (October 1999) state that organic data should not be qualified based on MS/MSD criteria alone. However, using informed professional judgment the data reviewer may determine the need for qualification of the data.

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qualifier
KRM016	TRA1-GPB21	VOCs	Bromomethane	112 / 42	22 - 184	**91**	50	None, because all other QA/QC criteria within limits.
			Carbon Tetrachloride	**142 / 146**	67 - 136	2.8	30	
			Benzene	**140 / 140**	69 - 128	0	30	
			Trans-1,3-dichloropropene	**134 / 136**	73 - 133	1.5	30	
	52543-1	Methane	Methane	108/**0**	75 - 125	**198**	30	None. The parent sample is not one of our samples.
KRM017	TRA1-GPB21	VOCs	Bromomethane	112 / 42	22 - 184	**91**	50	None. The MS/MSD sample provided belongs to KRM 016.
			Carbon Tetrachloride	**142 / 146**	67 - 136	2.8	30	
			Benzene	**140 / 140**	69 - 128	0	30	
			Trans-1,3-dichloropropene	**134 / 136**	73 - 133	1.5	30	
KRM018	TRA1-GPC74	VOCs	Benzene	**68** / 80	69 - 128	9.1	30	"J" parent
			Ethyl benzene	**0 / 0**	76 - 120	0	30	"J" parent
			m, p –Xylene	**40 / 60**	78 - 119	11	30	"J" parent
			o-Xylene	**62** / 82	77 - 121	12	30	"J" parent
			Xylene (total)	**47 / 67**	77 - 121	11	30	"J" parent
			Bromomethane	146 **/ 200**	22 - 184	31	50	None, because all other QA/QC criteria within limits.
			cis-1 2-Dichloroethene	110 **/ 136**	57 - 132	21	30	
			Chloroform	110 **/140**	72 - 124	24	30	
			Chlorobenzene	108 **/ 146**	72 - 126	30	30	
			Styrene	118 **/128**	75 - 123	8.1	30	
		SVOCs	4-Chloroaniline	39 **/ 0**	41 - 111	**200**	40	"J" parent
			Naphthalene	100 **/ 0**	10 - 95	4.3	40	"UJ" parent
KRM019	85581-6	SVOCs	bis(2-Chloroisopropyl)e	**140 / 150**	40 - 115	6.9	40	None. The parent sample is not one of our samples.
			bis(2-chloroethyl)ether	110 **/ 120**	43 - 111	8.7	40	
			N-Nitroso-di-n-propylamine	**120 /120**	42 -117	0	40	
			Nitrobenzene	96 **/ 110**	49 - 107	14	40	
KRM020	TRA6-GPC24	VOCs	Bromomethane	**220 / 260**	22 - 184	17	50	None, bromomethane result in the parent sample was non-detect.
	85743-1	Methane	Methane	**68 / 72**	75 - 125	6.2	30	None. The parent sample is not one of our samples.
	TRA6-GPC24 TRA6-GPC65	Sulfate Sulfate	Sulfate	**-23 / -71**	75 - 125	NA	NA	None since the sample conc. is 4xs the spike conc. added.
			Sulfate	**-13 / -13**	75 - 125	NA	NA	
KRM021	TRA6-GPD85	VOCs	Bromomethane	**190** / 182	22 - 184	4.3	50	None, because all other QA/QC criteria within limits.
			Chlorobenzene	72 / **66**	72 - 126	5.0	30	
	86103-9		m, p – Xylene	**120** / 110	78 -119	3.6	30	None. The parent sample is not one of our samples.
			o-Xylene	**146** / 126	77 - 121	6.1	30	
KRM022	TRA4-GPE27	VOCs	Bromomethane	**240 / 220**	22 - 184	8.7	50	None, because all other QA/QC criteria within limits.
			Chloroethane	**196 / 174**	40 - 158	12	50	

SDG #	Parent Sample	Method	Analyte	MS/MSD %Recov.	Criteria %	RPD %	RPD Limit	Qualifier
KRM026	86522-1	SVOCs	3,3-Dichlorobenzidine	**17 / 26**	10 - 109	**42**	40	None. The parent sample is not one of our samples.

2.7 FIELD DUPLICATE RESULTS

Field duplicate results are used to evaluate representativeness. When results for both duplicate and sample values are greater than five times the practical quantitation limit (PQL), satisfactory representativeness is indicated by an RPD less than or equal to 100 percent for soil samples and less than or equal to 50 percent for aqueous samples. Where one or both of the results of a field duplicate pair are reported at less than five times the PQL, satisfactory representativeness is indicated if the field duplicate results agree within 3.5 times the quantitation limit. Field duplicate results that do not meet these criteria may indicate unsatisfactory representativeness of the results.

Eight field duplicate samples were collected for 81 investigative samples. This is 9.9 percent that satisfies the requirement in the QAPP (1 per 10 investigative samples or 10 percent). The reported results for field duplicate sample pairs were in agreement with the above acceptance criteria with the exception of the sample mentioned below:

SDG #	Sample ID	Compound and Concentration	Qualifier
KRM018	TRA1-GPC15	Chlorobenzene 88 µg/l	"J"
(VOCs)	TRA1-GPC15-D	Chlorobenzene 33 µg/l	"J"

2.8 RESULTS REPORTED FROM DILUTIONS

VOC, SVOC and geochemical parameters results such as alkalinity and sulfate were reported at different dilutions for the samples mentioned below.

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
KRM016	TRA2-GPE42 TRA2-GPC73 TRA4-GPC73 TRA4-GPC119 TRA1-GPB43 TRA1-GPB73	VOCs	2 & 5 25 100 & 1000 10 & 20 25 & 500 25 & 100	Abundance of target analytes
KRM016	TRA4-GPC73 TRA4-GPC119 TRA1-GPB43	SVOCs	5 5 2	Abundance of target analytes

SDG #	Sample ID	Analyte	Dilution	Reason for Dilution
KRM016	TRA4-GPC43 TRA4-GPC119	Sulfate	2 10	Abundance of target analyte
KRM017	TRA2-GPD41 TRA2-GPD72	VOCs	5 & 20 10	Abundance of target analytes
KRM017	TRA2-GPD41 TRA2-GPD72	SVOCs	10 5	Abundance of target analytes
KRM017	TRA2-GPD21 TRA2-GPD41 TRA2-GPD72	Sulfate	5 5 5	Abundance of target analyte
KRM018	TRA1-GPC44 TRA1-GPC74 TRA4-CPA105 TRA4-GPB76 TRA4-GPB119.3	VOCs	2 2 2 & 10 5 25 & 100	Abundance of target analytes
KRM018	TRA1-GPC44 TRA1-GPC74	SVOCs	5 & 50 5 & 50	Abundance of target analytes
KRM020	TRA6-GPC65 TRA6-GPC85 TRA6-GPC121	VOCs	100 100 5	Abundance of target analytes
KRM020	TRA6-GPC65 TRA6-GPC85	SVOCs	50 200	Abundance of 4-chloroaniline
KRM020	TRA6-GPC65 TRA6-GPC85 TRA6-GPC121 TRA6-GPC24 TRA6-GPC121	Alkalinity Sulfate	5 5 5 50 20	Abundance of target analyte Abundance of target analyte
KRM023	GM-17B GM-17C GM-6B GM-6A GM-4C GM-4B MW-7B MW-7C	VOCs	25 10 50 & 250 100 & 200 100 & 200 20 100 100	Abundance of chlorobenzene and/ or benzene.
KRM023	GM-17C MW-7B MW-7C	SVOCs	2 10 5	Abundance of 1,4-dichlorobenzene.
KRM026	GM-17A	VOCs	500 & 10,000	Abundance of benzene and chlorobenzene.

There were no qualifiers assigned due to dilutions.

2.9 INTERNAL STANDARD RESPONSES

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent. The internal standards area responses were checked for the data review. Qualifications were made when the responses were greater than or less than the required criteria. The following IS responses were out of range.

SDG #	Sample ID	Analysis	IS Compound	IS Response / Range	Qualifications
KRM027	TRA2-GPB45RE1	SVOCs	Acenaphthene	111,213 112,198 - 448,790	No additional qualifiers needed since the sample was rejected "R" due to hold time exceedance.
			Phenanthrene	185,481 189,866 - 759,464	
			Chrysene	144,505 163,578 - 654,310	
			Perylene	120,839 155,619 - 622,476	
	TRA2-GPB45RE2		1,4-Dichlorobenzene	430,250 85,204 - 340,818	No additional qualifiers needed since the sample was rejected "R" due to hold time exceedance.
			Naphthalene	1,753,961 357,913 - 1,431,652	
			Acenaphthene	1,018,888 197,671 - 790,684	
			Phenanthrene	1,793,577 329,643 - 1,318,572	
			Chrysene	1,500,260 244,774 - 979,098	
			Perylene	1,448,283 239,228 - 956,912	
KRM018	TRA1-GPC44DL	SVOCs	1,4-Dichlorobenzene	153,668 166,756 - 667,022	IS surrogates qualified as J and UJ in sample.
			Naphthalene	666,398 744,116 - 2,976,462	
			Acenaphthene	322,751 370,486 - 1,481,946	
			Phenanthrene	572,615 651,368 - 2,605,470	
			Chrysene	385,394 409,352 - 1,637,410	
			Perylene	335,360 392,490 - 1,569,958	
	TRA1-GPC44DLRE	SVOCs	1,4-Dichlorobenzene	155,137 166,756 - 667,022	IS surrogates qualified as J and UJ in sample
			Naphthalene	672,565 744,116 - 2,976,462	
			Acenaphthene	322,919 370,486 - 1,481,946	
			Phenanthrene	571,595 651,368 - 2,605,470	
			Chrysene	384,721 409,352 - 1,637,410	
			Perylene	333,525 392,490 - 1,569,958	

2.10 ICP SERIAL DILUTIONS

The % differences (D) between the original sample results and the results obtained from the serial dilutions should agree within a 10% difference. However if the analyte concentration is less than a factor of 50 above the IDL, the serial dilution does not need to agree within 10 %. All the reported results were in agreement with the acceptance criteria.

2.11 SAMPLES WITH MULTIPLE RUNS

In some instances multiple analyses of a sample were provided by the laboratory, either due to dilution and/or reanalysis. In these cases, the reviewer chose a single sample to be reported using professional judgment.

SDG #	Sample ID	Analysis	Rationale
KRM016	TRA1-GPB43 DL & TRA1-GPB73 DL	VOCs	Only used diluted benzene result. Original benzene result exceeded the calibration range.
	TRA2-GPE42 DL, TRA4-GPC119 DL & TRA4-GPC73 DL		Only used diluted chlorobenzene result. Original chlorobenzene result exceeded the calibration range.
	TRA1-GPB43 DL	SVOCs	Only used diluted naphthalene result. Original naphthalene result exceeded the calibration range.
	TRA4-GPC119 DL		Only used diluted 1,4-dichlorobenzene result. Original 1,4-dichlorobenzene result exceeded the calibration range.
	TRA4-GPC73 DL		Only used diluted phenol result. Original phenol result exceeded the calibration range.
KRM017	TRA2-GPD41 DL	VOCs	Only used diluted chlorobenzene result. Original chlorobenzene result exceeded the calibration range.
	TRA2-GPD41 DL	SVOCs	Only used diluted 1,4-dichlorobenzene result. Original 1,4-dichlorobenzene result exceeded the calibration range.
	TRA2-GPD72 DL		Only used diluted 1,4-dichlorobenzene and 1,2-dichlorobenzene results. Original 1,4-dichlorobenzene and 1,2-dichlorobenzene results exceeded the calibration range.

SDG #	Sample ID	Analysis	Rationale
KRM018	TRA4-CPA105 DL, TRA4-GPB119.3 DL & TRA4-GPB76 DL	VOCs	Only used diluted chlorobenzene result. Original chlorobenzene result exceeded the calibration range.
	TRA1-GPC74 DL	SVOCs	Only used diluted naphthalene result. Original naphthalene result exceeded the calibration range.
	TRA1-GPC44 DL	SVOCs	Only used the first diluted naphthalene result. Original naphthalene result exceeded the calibration range.
KRM020	TRA6-GPC65 DL, TRA6-GPC85 DL	VOCs	Only used diluted benzene and chlorobenzene results. Original benzene and chlorobenzene results exceeded the calibration range.
	TRA6-GPC121 DL	VOCs	Only used diluted chlorobenzene result. Original chlorobenzene result exceeded the calibration range.
	TRA6-GPC65 DL & TRA6-GPC85 DL	SVOCs	Only used diluted 4-chloroaniline result. Original 4-chloroaniline result exceeded the calibration range.
KRM023	GM-4C DL	VOCs	Only used diluted benzene result. Original benzene result exceeded the calibration range.
	GM-6A DL & GM-6B DL	SVOCs	Only used diluted chlorobenzene result. Original chlorobenzene result exceeded the calibration range.
	GM-17C DL, MW-7B DL & MW-7C DL	SVOCs	Only used diluted 1,4-dichlorobenzene result. Original 1,4-dichlorobenzene result exceeded the calibration range.
KRM026	GM-17A DL	VOCs	Only used diluted benzene and chlorobenzene results. Original benzene and chlorobenzene results exceeded the calibration range.
KRM027	TRA2-GPB45 RE	SVOCs	Both reanalyzes significantly exceeded hold time and were rejected, chose original.

KRM16

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002 SITE WG Krummrich – Sauget, IL
LABORATORY STL- Savannah
LABORATORY NO. S384901, S384952, S384998 S385028, S385093 REVIEWER URS Corporation
NO. OF SAMPLES/ REVIEWER'S NAME K. Fletcher
MATRIX 19/19 aqueous including 5 trip blanks 4/4 aqueous for methods # AR30 COMPLETION DATE 11/17/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270	Methane Meth # AR30
1. HOLDING TIMES	✓	✓	✓
2. BLANKS	✓	✓	✓
3. SURROGATES	✓	(4)	N/A
4. SCS (LCS)	(1)	(5)	✓
5. DCS (LSCD)	N/A	N/A	N/A
6. MATRIX SPIKE/DUP	(2)	✓	(7)
7. DILUTIONS	(3)	(6)	✓
8. DUPLICATES	✓	✓	N/A
9. INTERNAL STANDARDS	✓	✓	N/A
10. OTHER	✓	✓	(8)
11. OVERALL ASSESSMENT	O	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

COMMENTS: (1) The LCS % recoveries for batch 1A0710 for carbon tetrachloride and trans-1,3-dichloropropene were high; however, because all of the associated samples were non-detects for these analytes, no action is necessary.
(2) MS/MSD % recoveries for carbon tetrachloride, benzene, and trans-1-,3-dichloropropene were slightly high. The bromomethane % RPD was also high. However, no action is necessary.
(3) Samples TRA2-GPE42, TRA2-GPC73, TRA4-GPC73, TRA4-GPC119, TRA1-GPB43, and TRA1-GPB73 were diluted by 2 to 1000 times due to abundance of target compounds; however, no action is necessary.
(4) Surrogates were not recovered in diluted samples TRA4-GPC73 and TRA4-GPC119 as the surrogate was diluted out; however, no action is necessary.

KRM16

(5) The LCS % recovery for batch 7802 was above control limits for 4-chloroaniline; however, because all associated samples are non-detects for this analyte, no action is necessary.

(6) TRA4-GPC73, TRA4-GPC119, and TRA1-GPB43 were diluted by 2 to 5 times due to abundance of target compounds; however, no action is necessary.

(7) The methane % recovery for the MS/MSD sample was low and the % RPD was high; however, because the MS/MSD sample was not performed on one of our samples, no action is necessary.

(8) TRA4-GPC73 and TRA4-GPC119 exceeded the upper calibration limit for the FID detector; therefore, the results used for the report are from the TCD detector. There is no action necessary.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO.S385028, S384998
NO. OF SAMPLES/
MATRIX 4/4 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 11/17/2003

DATA ASSESSMENT WORKSHEET

	Manganese Meth # 6010	Nitrate-N Meth # 353.2	Alkalinity Meth # 310.1	SO_4 Meth # 375.4
1. HOLDING TIMES	✓	✓	(2)	✓
2. BLANKS	✓	✓	✓	✓
3. DUPLICATES	(1)	N/A	N/A	N/A
4. SCS (LCS)	✓	✓	✓	✓
5. DCS (LSCD)	N/A	N/A	N/A	N/A
6. MATRIX SPIKE/DUP	✓	N/A	N/A	N/A
7. DILUTIONS	✓	✓	✓	(3)
8. OVERALL ASSESSMENT	O	O	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION: (2) The hold time of 14 days was exceeded by 2 days in samples TRA4-GPC73 and TRA4-GPC119; therefore, these samples were qualified as estimated (J).

COMMENTS: (1) The duplicate was run on a spiked sample instead of one of our regular samples; however, no action is necessary.
(3) TRA4-GPC43 and TRA4-GPC119 were diluted by 2 to 10 times due to abundance of the analyte; however, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S385126
NO. OF SAMPLES/
MATRIX 4/4 aqueous including 1 trip blank

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 10/28/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270	Methane Meth # AR30
1. HOLDING TIMES	✓	✓	✓
2. BLANKS	✓	✓	✓
3. SURROGATES	✓	(3)	N/A
4. SCS (LCS)	✓	✓	✓
5. DCS (LSCD)	N/A	N/A	N/A
6. MATRIX SPIKE/DUP	(1)	N/A	✓
7. DILUTIONS	(2)	(4)	✓
8. DUPLICATES	N/A	N/A	N/A
9. INTERNAL STANDARDS	✓	✓	N/A
10. OTHER	N/A	N/A	(5)
11. OVERALL ASSESSMENT	O	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

COMMENTS: (1) MS/MSD % recoveries were high for carbon tetrachloride, benzene, trans-1,3-dichloropropene and the RPD was high for bromomethane. However, no action is necessary because the MS/MSD parent sample provided is from SDG 16.
(2) Due to abundance of constituents sample TRA2-GPD41 was diluted by 5 and 20 times. Also sample TRA2-GPD72 was diluted by 10 times; however, no action is necessary.
(3) All surrogates were not recovered for sample TRA2-GPD41 and the base surrogates were not recovered for sample TRA2-GPD72 due to dilutions. However, no action is necessary.
(4) Samples TRA2-GPD41 and TRA2-GPD72 were diluted by 10 and 5 times respectively. No action is necessary.

(5) TRA2-GPD41 and TRA2-GPD72 exceeded the upper calibration limit for the FID detector; therefore, the results used for the report are from the TCD detector. No action is necessary.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S385126
NO. OF SAMPLES/
MATRIX 4/4 aqueous

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 10/28/2003

DATA ASSESSMENT WORKSHEET

	Manganese Meth # 6010	Nitrate-N Meth # 353.2	Alkalinity Meth #310.1	SO_4 Meth # 375.4
1. HOLDING TIMES	✓	✓	(2)	✓
2. BLANKS	✓	✓	✓	✓
3. DUPLICATES	(1)	N/A	N/A	N/A
4. SCS (LCS)	✓	✓	✓	✓
5. DCS (LSCD)	N/A	N/A	N/A	N/A
6. MATRIX SPIKE/DUP	✓	N/A	N/A	N/A
7. DILUTIONS	✓	✓	(3)	(4)
8. OVERALL ASSESSMENT	O	O	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTIONS: (2) The alkalinity analysis for samples TRA2-GPD21, TRA2-GPD41 and TRA2-GPD72 was run outside of holdtime (15 days instead of 14 days). Therefore, alkalinity results were qualified as estimated (J).

COMMENTS: (1) The duplicate was run on a spiked sample instead of one of our regular samples; however, no action is necessary.
(3) Samples TRA2-GPD21, TRA2-GPD41 and TRA2-GPD72 were diluted by a factor of 5. However, no action is necessary.
(4) Samples TRA2-GPD21 and TRA2-GPD41 were diluted by a factor of 10; however, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S385240, S385323, S385362, S385390
NO. OF SAMPLES/
MATRIX 16/16 aqueous including 4 trip blanks

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 11/17/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 3260	SVOCs Meth # 3270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	(1)	(6)
4. SCS (LCS)	(2)	(7)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(3)	(8)
7. DILUTIONS	(4)	(9)
8. DUPLICATES	(5)	✓
9. INTERNAL STANDARDS	✓	(10)
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (3) The MS sample had low % recoveries of benzene, ethylbenzene, m,p-xylene, o-xylene, and total xylenes. The MSD sample had high % recoveries for bromomethane, cis-1,2-dichloroethene, chloroform, chlorobenzene, and styrene and low % recoveries for ethylbenzene, m,p-xylene, and total xylenes. Therefore, these analytes were qualified in the parent sample, TRA1-GPC74, as estimated (J), with the exception of the analytes that had high MSD % recoveries because they were non-detects in this sample.
(5) Duplicate % RPD for chlorobenzene in samples TRA1-GPC15 and TRA1-GPC15-D was > 50%; therefore, this analyte was qualified as estimated (J).
(8) The MSD sample had 0% recoveries for napthalene and 4-chloroaniline. In addition, the % RPD for 4-chloroaniline was high. Therefore, these analytes were qualified in the parent sample, TRA1-GPC74, as estimated and estimated non-detects (J, UJ).

(10) Sample TRA1-GPC44 (diluted not original one) and the LCS relating to batch 0709C had low internal standards. These samples were reanalyzed with the same results. Therefore, sample TRA1-GPC44 (diluted) and this reanalysis were qualified as estimated and estimated non-detect (U and UJ).

COMMENTS: (1) Surrogate recovery of dibromofluoromethane was high in the MSD sample; however, no action is necessary because surrogate recovery in the parent sample was within limits.
(2) Recovery of bromomethane was high for the LCS relating to m.b. KRM18-1; however, because all of the associated samples were non-detects for this analyte, no action is necessary. Recovery of m,p-xylene was slightly high for the LCS relating to m.b. KRM18-14; however, because all of the associated samples were QA/QC samples or non-detects for this analyte, no action is necessary.
(4) Samples TRA1-GPC44, TRA1-GPC74, TRA4-CPA105, TRA4-GPB76, and TRA4-GPB119.3 were diluted by 2 to 100 times due to abundance of target compounds.
(6) Surrogates were not recovered for samples TRA1-GPC44 and TRA1-GPC74 (parent) and MS/MSD samples due to dilutions. However, no action is necessary.
(7) Recovery of 2-methylphenol was high for the LCS relating to m.b. KRM18-1; however, because all of the associated 2-methylphenol results were non-detects, no action is necessary.
(9) Samples TRA1-GPC44 and TRA1-GPC74 were diluted by 5 to 50 times due to abundance of target compounds. However, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S385505, S385584
NO. OF SAMPLES/
MATRIX 9/9 aqueous including 2 trip blanks

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 11/17/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	(1)	✓
3. SURROGATES	✓	✓
4. SCS (LCS)	(2)	(3)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	✓	(4)
7. DILUTIONS	✓	✓
8. DUPLICATES	✓	✓
9. INTERNAL STANDARDS	✓	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

COMMENTS: (1) Styrene was detected in trip blank-12; however, because all associated styrene results were non-detect, no action is necessary.
(2) Bromomethane had a high % recovery in the LCS relating to m.b. KRM19-7; however, because this analyte was not detected in any of the associated samples, no action is necessary.
(3) Bis(2-chloroisopropyl)ether, n-nitroso-di-n-propylamine, 3 & 4-methylphenol, and 4-chloro-3-methylphenol had high % recoveries in the LCS relating to m.b. KRM19-1; however, because these analytes were not detected in any of the associated samples, no action is necessary.
(4) The MS and MSD % recoveries were high for bis(2-chloroisopropyl)ether and n-nitroso-di-n-propylamine. The MSD % recoveries were also high for nitrobenzene and bis(2-chloroethyl)ether. However, no action is necessary because the MS/MSD was not run on any of our samples.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002 SITE WG Krummrich – Sauget, IL
LABORATORY STL- Savannah
LABORATORY NO. S385634, S385682, S385701 REVIEWER URS Corporation
NO. OF SAMPLES/ REVIEWER'S NAME K. Fletcher
MATRIX 7/7 aqueous including 3 trip blanks COMPLETION DATE 11/20/03
4/4 aqueous for method AR30

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270	Methane Meth # AR30
1. HOLDING TIMES	✓	✓	(6)
2. BLANKS	✓	✓	✓
3. SURROGATES	✓	(4)	N/A
4. SCS (LCS)	(1)	✓	✓
5. DCS (LSCD)	N/A	N/A	N/A
6. MATRIX SPIKE/DUP	(2)	N/A	(7)
7. DILUTIONS	(3)	(5)	✓
8. DUPLICATES	N/A	N/A	N/A
9. INTERNAL STANDARDS	✓	✓	✓
10. OTHER	N/A	N/A	(8)
11. OVERALL ASSESSMENT	O	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) The LCS relating to m.b. KRM20-1 had a high % recovery for bromomethane as did the LCSs relating to m.b.s KRM20-7 and KRM20-10. However, no action is necessary because all of the associated samples are non-detects for this analyte. The LCS relating to KRM20-13 had low % recoveries for 1,2-dichloropropane and cis-1,3-dichloropropene. The only non-QA/QC sample associated with this LCS, the 100 times diluted TRA6-GPC65, is therefore qualified for these analytes as estimated non-detect (UJ).*
(6) Sample TRA6-GPC24 was analyzed 1 day after the 14 day hold time; therefore this sample was qualified as estimated "J".

* Used original report for the report with the exception of benzene and chlorobenzene diluted results.

COMMENTS: (2) MS/MSD % recovery for bromomethane was high, but because the parent sample was non-detect for this analyte, no action is necessary.
(3) Samples TRA6-GPC65, TRA6-GPC85, and TRA6-GPC121 were diluted by 5 to 100 times due to abundance of target analytes.
(4) Diluted samples TRA6-GPC65 and TRA6-GPC85 surrogates were not recovered due to dilutions. However, no action is necessary
(5) Sample TRA6-GPC65 and TRA6-GPC85 were diluted by 50 to 200 times due to abundance of 4-chloroaniline.
(7) MS/MSD % recovery was low for methane; however, no action is necessary because the MS/MSD was not performed on one of our samples.
(8) Results exceeded the upper calibration range for the FID detector in samples TRA6-GPC65, TRA6-GPC85 and TRA6-GPC121; therefore, methane results were reported from the TCD detector.

INORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002 SITE WG Krummrich – Sauget, IL
LABORATORY STL- Savannah
LABORATORY NO. S385634, S385682, S385701 REVIEWER URS Corporation
NO. OF SAMPLES/ REVIEWER'S NAME K. Fletcher
MATRIX 4/4 aqueous COMPLETION DATE 11/21/03

DATA ASSESSMENT WORKSHEET

	Manganese Meth # 6010	Nitrate –N Meth # 353.2	Alkalinity Meth # 310.1	SO_4 Meth # 375.4
1. HOLDING TIMES	✓	✓	✓	✓
2. BLANKS	✓	✓	✓	✓
3. DUPLICATES	(1)	N/A	N/A	N/A
4. SCS (LCS)	✓	✓	✓	✓
5. DCS (LSCD)	N/A	N/A	N/A	N/A
6. MATRIX SPIKE/DUP	✓	N/A	N/A	(4)
7. DILUTIONS	✓	✓	(3)	(5)
8. OTHER	N/A	(2)	N/A	N/A
9. OVERALL ASSESSMENT	O	O	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

COMMENTS: (1) The duplicate sample was performed on our spiked sample and not on one of our regular samples; however, no action is necessary.
(2) Sample TRA6-GPC65 was reported with a raised detection limit due to suspected interference in the Nitrite analysis; however, no action is necessary.
(3) Samples TRA6-GPC65, TRA6-GPC85, and TRA6-GPC121 were diluted by 5 due to abundance.
(4) Sample TRA6-GPC24 was used as the MS/MSD sample. The MS/MSD recovery was negative; however, no action is necessary because the spike added was less than 4 times the sample concentration.
(5) Samples TRA6-GPC24 and TRA6-GPC121 were diluted by 20 to 50 times due to abundance; however, no action is necessary.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S385810, S385847, S385883
NO. OF SAMPLES/
MATRIX 10/10 aqueous including 3 trip blanks

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 11/17/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	✓	✓
4. SCS (LCS)	(1)	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(2)	(3)
7. DILUTIONS	✓	✓
8. DUPLICATES	✓	✓
9. INTERNAL STANDARDS	✓	(4)
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

COMMENTS: (1) Bromomethane had a high % recovery in the LCS for batch 0731; however, because all of the associated bromomethane results were non-detects, no action is necessary.
(2) The MS sample for batch 0731 had a high % recovery for bromomethane while the MSD had a low % recovery for chlorobenzene. However, since all other QA/QC criteria are within limits, no action is necessary. The MS for batch 0807 had high % recoveries for m,p-xylene and o-xylene. However, no action is necessary because this MS/MSD was not run on any of our samples.
(3) No MS/MSD sample was analyzed with batch 0730 due to insufficient sample volume; however, no action is necessary.
(4) IS4 for the m.b. for batch 0730 was high; therefore, this m.b. was reanalyzed and all of the internal standards were low. However, no action is necessary because all the internal standards for our investigative samples were within limits.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S385931, S385981
NO. OF SAMPLES/
MATRIX 8/8 aqueous including 2 trip blanks

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 11/14/03

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	(1)	✓
2. BLANKS	✓	✓
3. SURROGATES	✓	✓
4. SCS (LCS)	✓	✓
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	(2)	✓
7. DILUTIONS	✓	✓
8. DUPLICATES	✓	✓
9. INTERNAL STANDARDS	✓	✓
10. OTHER	(3)	✓
11. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

COMMENTS: (1) The MS/MSD sample (TRA4-GPE27) was extracted 1 day outside of hold time. However, since these are QA/QC samples no action is necessary.
(2) MS and MSD % recoveries were high for bromomethane and chloroethane. However, no action is necessary because these analytes were not detected in the parent sample and all other QA/QC criteria are in.
(3) The continuing calibration criterion was slightly exceeded for vinyl chloride in batch 100810. Vinyl chloride related results were checked to make sure no rejections were needed and there is no further action.

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S386056, S386102, S386124
NO. OF SAMPLES/
MATRIX 12/12 aqueous including 3 trip blanks

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 11/17/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8260
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	✓	(2)
4. SCS (LCS)	✓	(3)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	✓	✓
7. DILUTIONS	(1)	(4)
8. DUPLICATES	N/A	N/A
9. INTERNAL STANDARDS	✓	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

COMMENTS: (1) Samples GM-17B, GM-17C, GM-6B, GM-6A, GM-4C, GM-4B, MW-7B, and MW-7C were diluted by 10 to 250 times due to chlorobenzene and/or benzene abundance; however, no action is necessary.
(2) Surrogates for sample MW-7B were not recovered due to dilutions; however, no action is necessary.
(3) 2,4-dinitrotoluene had a slightly high % recovery in the LCS relating to m.b. KRM23-1; however, the 2,4-dinitrotoluene results in all associated samples were non-detect. Therefore, no action is necessary.
(4) Samples GM-17C, MW-7B, and MW-7C were diluted by 2 to 10 times due to an abundance of 1,4-dichlorobenzene; however, no action is necessary.

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ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S386470, S386568
NO. OF SAMPLES/
MATRIX 7/7 aqueous including 3 trip blanks

SITE WG Krummrich – Sauget, IL

REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE 11/17/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	✓
2. BLANKS	✓	✓
3. SURROGATES	✓	(3)
4. SCS (LCS)	(1)	(4)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	✓	(5)
7. DILUTIONS	(2)	✓
8. DUPLICATES	NA	N/A
9. INTERNAL STANDARDS	✓	✓
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION: (1) LCS % recovery associated with batch 1A0831 was 0 for acetone. LCS % recoveries associated with batch 2A0831 were out high for bromomethane, low for bromoform and had a 0 % recovery for acetone. Therefore, associated acetone results were rejected, associated bromomethane results were not qualified because they were non-detect, and associated bromoform results were qualified as estimated non-detect (UJ).

COMMENTS: (2) Sample GM-17A was run at a primary dilution of 500 and a secondary dilution of 10,000 due to the abundance of benzene and chlorobenzene. However, no action is necessary.
(3) Five out of six surrogates were low for the method blank of batch 0825D; however, no action is necessary because none of the related samples had any surrogate recoveries out.
(4) Butylbenzylphthalate and di-n-octylphthalate LCS recoveries were high for batch 0822B. However, no action is necessary because none of these compounds were detected in any of the related samples.
(5) RPD % recovery for the MS/MSD was slightly high for 3-3'-dichlorobenzidine. However, no action is necessary because the MS/MSD was not performed on any of our samples.

KRM27

ORGANIC DATA ASSESSMENT

PROJECT NO. 21561197.00002
LABORATORY STL- Savannah
LABORATORY NO. S386645, S386666, S386790
NO. OF SAMPLES/
MATRIX 11/11 aqueous including 3 trip blanks

SITE WG Krummrich – Sauget, IL
REVIEWER URS Corporation
REVIEWER'S NAME K. Fletcher
COMPLETION DATE 11/17/2003

DATA ASSESSMENT WORKSHEET

	VOCs Meth # 8260	SVOCs Meth # 8270
1. HOLDING TIMES	✓	(2)
2. BLANKS	✓	✓
3. SURROGATES	(1)	(3)
4. SCS (LCS)	✓	(4)
5. DCS (LSCD)	N/A	N/A
6. MATRIX SPIKE/DUP	✓	N/A
7. DILUTIONS	✓	✓
8. DUPLICATES	✓	✓
9. INTERNAL STANDARDS	✓	(5)
10. OVERALL ASSESSMENT	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION: (2) The hold time was exceeded (>2xs the extraction time) in both of the reanalyses of sample TRA2-GPB45; therefore, all results for both of these analyses were rejected (R)*.
(3) Recoveries of 2-fluorophenol and phenol-d5 were low in sample TRA2-GPB45; therefore, all results for this sample were qualified as estimated non-detect (UJ).

COMMENTS: (1) The LCS for batch 1B0911 had a high % recovery for dibromofluoromethane; however, no action is necessary because this is a QA/QC sample and all related sample recoveries are within limits.
(4) The LCS for batch 0918C had a high recovery for 3-nitroaniline; however, because all of the 3-nitroaniline results in associated samples were non-detect, no action is necessary.
(5) Internal standard results were low for the first reanalysis of TRA2-GPB45 and internal standard results were high for the second reanalysis of TRA2-GPB45. However, since these samples have been rejected, no further action is necessary.

* The original sample has been the one chosen to be reported.

VALIDATION REPORT

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Prepared for

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August 2004

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This section describes the full validation for sixteen aqueous samples, including four trip blank samples which were prepared by USEPA SW-846 Method 5030 and analyzed for volatile organic compounds (VOCs) by USEPA SW-846 Method 8260B. The samples were analyzed by STL Laboratories, Inc. of Savannah, Georgia and submitted as part of the sample delivery group (SDG) KRM24. The samples included as part of this validation are listed below:

Sample Identification	Sample Identification	Sample Identification
GM-19B	GM-20A	B-25A
GM-19C	TB-081103	B-29A
GM-19C-D	B-25B	B-24A
GM-19A	TB-081203-BH	TB-081303
TB-08-08-KB	B-28B	
GM-20B	B-28B-D	

Evaluation of the analytical data followed procedures outlined in USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The evaluation criteria used during the validation were a combination of those criteria presented in the respective methods and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data Package Completeness
- Laboratory Case Narrative\Cooler Receipt Form
- Holding Times and Sample Preservation
- Instrument Performance
- Initial Calibration
- Calibration Verification
- Field Duplicate Samples
- Blank Samples
- Surrogate Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples
- Internal Standards and Retention Times

- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
- Target Compound Identification and Quantification
- Overall Data Assessment.

1.1 DATA PACKAGE COMPLETENESS

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective method. The data package was complete for SDG KRM24.

1.2 LABORATORY CASE NARRATIVE\COOLER RECEIPT FORM

The laboratory case narrative indicated LCS recoveries were outside evaluation criteria. The narrative also indicated several samples were received without proper preservation and some samples were analyzed outside of holding time criteria. Several samples were analyzed at a dilution due to high target compound concentrations. These issues are addressed in the appropriate sections below.

1.3 HOLDING TIMES AND SAMPLE PRESERVATION

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. All samples were received and maintained at 4 ± 2°C; however, six samples were received with inadequate acid preservative (pH > 2) and were not adjusted to provide a pH of ≤ 2. The table below identifies the samples outside preservation criteria and the holding time adjustments required by the method:

Field ID	pH upon Receipt	New HT
B-25B	> 2	7 days
B-28B	> 2	7 days
B-28B-D	> 2	7 days
B-25A	> 2	7 days
B-29A	> 2	7 days
B-24A	> 2	7 days

Samples were analyzed within 14 days, as required by the method, with the exception of the samples with adjusted holding times due to sample preservation. Qualification of field sample data due to holding times are listed in the table below (Note: Qualifications also apply to any diluted or re-analyzed samples):

Field ID	Holding Time	Days Outside Holding Time	Qualification
B-25B	7 days	8 days	**Detects – J** **Non-detect - R**
B-28B	7 days	8 days	**Detects – J** **Non-detect - R**
B-28B-D	7 days	8 days	**Detects – J** **Non-detect - R**
B-25A	7 days	8 days	**Detects – J** **Non-detect - R**
B-29A	7 days	8 days	**Detects – J** **Non-detect - R**
B-24A	7 days	8 days	**Detects – J** **Non-detect - R**
TB-081303	14 days	1 day	**J/UJ**

1.4 INSTRUMENT PERFORMANCE

GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against criteria established in USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001).

Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no calculation or transcription errors were noted. No qualifications to the data were required.

1.5 INITIAL CALIBRATION

Initial calibration (ICAL) criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for volatiles analysis. Samples included in this SDG were analyzed using instruments MSO5973 and MSA5973. The ICALs for both instruments were performed on 8-12-03. At least five standard concentrations were used to establish the ICAL curve as required by USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001).

For the ICAL curve, the response factors (RFs) were reviewed following USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The ICAL RFs were greater than 0.05 for all analytes. Additionally, review of the ICAL summary forms indicated that the RF percent relative standard deviations (%RSDs) were ≤ 15 percent for target compounds and ≤ 30 percent for calibration check compounds (CCC). In some instances, linearity was determined using linear regression. All correlation coefficients were greater than 0.99 when linear regression was used to establish the ICAL. Recalculations of the RFs and %RSDs for two compounds per standard curve were performed, and no systematic errors in calculation or transcription were noted.

1.6 CALIBRATION VERIFICATION

Review of the analysis run log indicated the initial calibration verification (ICV) was analyzed following the ICAL and calibration verifications (CVs) were performed at the required frequency of every 12 hours. Review of the continuing calibration summary form indicated all RFs met the evaluation criteria of greater than 0.05 for all analytes. In addition, %Ds met the evaluation criteria of less than 20 percent for CCCs and less than 25 percent for all other analytes with the exceptions noted below:

Identifier	Verification	Analyte	%D
MSO5973, 8-22-03. OQ668	**CV**	Bromomethane	**31.3**
MSO5973, 8-25-03, OQ688	**CV**	2-Hexanone	**25.8**
MSO5973, 8-27-03, OQ710	**CV**	m,p,-Xylene	**38.6**
MSO5973, 8-27-03, OQ710	**CV**	Xylene	**32.4**
MSA5973, 8-12-03, AQ342	**ICV**	Vinyl chloride	**27.2**
MSA5973, 8-12-03, AQ342	**ICV**	Bromomethane	**55.5**
MSA5973, 8-12-03, AQ342	**ICV**	Acetone	**39.4**
MSA5973, 8-12-03, AQ342	**ICV**	2-Butanone	**27.5**
MSA5973, 8-12-03, AQ342	**ICV**	2-Hexanone	**30.0**
MSA5973, 8-19-03, AQ431	**ICV**	Chloromethane	**32.1**
MSA5973, 8-19-03, AQ431	**ICV**	Bromomethane	**53.7**
MSA5973, 8-19-03, AQ431	**ICV**	Acetone	**38.9**
MSA5973, 8-19-03, AQ431	**ICV**	2-Butanone	**25.6**
MSA5973, 8-19-03, AQ431	**ICV**	2-Hexanone	**32.0**
MSA5973, 8-19-03, AQ431	**ICV**	Bromoform	**26.1**

Qualifications based on CV data are listed in the table below. Data were not qualified based on outlying ICV recoveries when the CV recoveries preceding the samples were acceptable.

Field ID	Analyte	Qualification
B-28B	m,p-Xylenes	J/UJ
B-28B	Total xylenes	J/UJ
B-28B-D	m,p-Xylenes	J/UJ
B-28B-D	Total xylenes	J/UJ
B-25A	m,p-Xylenes	J/UJ
B-25A	Total xylenes	J/UJ
B-24A	m,p-Xylenes	J/UJ
B-24A	Total xylenes	J/UJ
TB-081303	m,p-Xylenes	J/UJ
TB-081303	Total xylenes	J/UJ
B-25B	2-Hexanone	J/UJ

1.7 FIELD DUPLICATE SAMPLES

Field duplicate samples were analyzed to assess method precision. Samples that were duplicated in the field are listed in the following table:

Field ID	Field Duplicate ID
GM-19C	GM-19C-D
B-28B	B-28B-D

The field duplicate sample pair's relative percent difference (RPD) were within evaluation criteria (50%) for all compounds.

1.8 BLANK SAMPLES

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). Trip blank and equipment blank samples were also evaluated to assess contamination problems emanating from sampling, decontamination and shipping procedures. All method, trip and equipment blanks were reported as non-detect. No qualification of the data was required.

1.9 SURROGATE SPIKE RECOVERIES

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. Surrogate recoveries were within acceptance criteria for the validated samples.

Approximately five percent of the surrogate recoveries were recalculated, and the summary forms versus the raw data were verified. No systematic calculation or transcription errors were noted.

1.10 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples were analyzed to assess accuracy and precision for the analyses. Sample GM-20B was spiked for the analytical batch and all MS/MSD recoveries and RPDs were within the evaluation criteria. Ten percent of the MS/MSD recoveries and RPD values were recalculated from the raw data and no calculation errors were noted.

1.11 INTERNAL STANDARDS AND RETENTION TIMES

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the samples in this SDG were within evaluation criteria. The summary forms were verified to the raw data, and no transcription errors were noted.

1.12 LABORATORY CONTROL SAMPLE (LCS)

LCS samples were analyzed to assess the accuracy of the analytical process. All LCS data was within evaluation criteria with the exception of those listed in the following table:

LCS ID	LCS Compound	LCS Recovery	LCS Criteria
KRM24-18	Chloromethane	128	40-123
KRM24-18	Acetone	0	32-165

Qualifications based on LCS recoveries data are listed in the following table. Chloromethane results associated with the outlying LCS recovery were reported as non-detect; therefore, no qualification of data was required. Approximately five percent of the LCS recoveries were recalculated and verified, and no systematic calculation or transcription errors were noted.

Field ID	Analyte	Qualification
B-25B	Acetone	R

1.13 TARGET COMPOUND IDENTIFICATION AND QUANTIFICATION

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 different from the associated continuing calibration retention times. No anomalies were noted with the identification of the target compounds in the samples. For the validation of compound quantification, four of the detected results were recalculated from the raw data, and no systematic calculation errors were noted. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. No qualification of data was required.

1.14 OVERALL DATA ASSESSMENT

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use, with the exception of the rejected data noted. Acceptable levels of accuracy and precision, based on LCS, MS/MSD and surrogate data were achieved for this SDG. In addition, completeness defined to be the percentage of analytical results, which are judged to be valid, including, estimated (J) data, was 70 percent for this SDG. Some samples required dilutions due concentrations detected above the linear range of the calibration curve. The following identifies which analytical result should be used when multiple results are available due to dilutions.

Field ID	Analyte	Analytical Run
GM-19C	All compounds except chlorobenzene	Original (undiluted)
GM-19C (DL)	Chlorobenzene (400 ug/L)	10x Dilution
GM-19C-D	All compounds except chlorobenzene	Original (undiluted)
GM-19C-D (DL)	Chlorobenzene (1200 ug/L)	10x Dilution
B-25B	All compounds except 1,2-dichloroethane and chlorobenzene	Original (100x)
B-25B (DL)	1,2-dichloroethane (9400 ug/L) and chlorobenzene (14000 ug/L)	500x Dilution
B-24A	All compounds except acetone	Original (100x)
B-24A (DL)	Acetone (48000 ug/L)	200x Dilution

This section describes the full validation for twelve aqueous samples, which were extracted by USEPA Method 3520C and analyzed for semi-volatile organic compounds (SVOCs) following USEPA SW846 Method 8270C. The samples were analyzed by Severn Trent Laboratories, Inc. of Savannah, Georgia and submitted as part of the sample delivery group (SDG) KRM24. Samples validated for SVOCs in this SDG include:

Sample Identification	Sample Identification	Sample Identification
GM-198	GM-19C	GM-19C-D
GM-19A	GM-20B	GM-20A
B-25B	B-28B	B-28B-D
B-25A	B-29A	B-24A

Evaluation of the analytical data followed procedures outlined in the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The evaluation criteria used during the validation were a combination of those criteria presented in the respective method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data Package Completeness
- Laboratory Case Narrative/Cooler Receipt Form
- Holding times and Sample Preservation
- Instrument Performance
- Initial Calibration
- Calibration Verification
- Blank Samples
- Surrogate Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples
- Internal Standards
- Laboratory Control Samples (LCS)
- Field Duplicate Samples
- Target Compound Identification and quantification
- Overall Data Assessment

2.1 DATA PACKAGE COMPLETENESS

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package SDG KRM24 was considered complete.

2.2 LABORATORY CASE NARRATIVE/COOLER RECEIPT FORM

The laboratory case narrative indicated MS/MSD recoveries were outside control limits, and several samples had zero percent surrogate recoveries due to sample dilutions resulting from matrix interference or high native concentrations of target analytes. Additionally, the case narrative indicated two samples had low internal standard area recoveries. These issues are addressed subsequently in the appropriate sections. No additional problems were noted in the laboratory case narrative or on the laboratory cooler receipt form.

2.3 HOLDING TIMES AND SAMPLE PRESERVATION

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the sample summary forms, the raw data forms, extraction logs, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved, extracted within 7 days, and analyzed within 40 days of the extraction. No qualifications to the data were required.

2.4 INSTRUMENT PERFORMANCE

GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no calculation or transcription errors were noted.

2.5 INITIAL CALIBRATION

Initial calibration (ICAL) criteria were established to assess whether the GC/MS instrument was capable of producing acceptable qualitative and quantitative data for semi-volatiles analysis. ICALs were analyzed for each instrument used in the analysis of SVOCs prior to the beginning of the analytical run sequence. The laboratory used six standard concentrations to establish the ICAL for each instrument, meeting the minimum required by the method. For each ICAL, the response factors (RFs) were reviewed and were greater than 0.05 for all target compounds. Additionally, the percent relative standard deviations (%RSDs) were ≤ 30 percent for calibration check compounds (CCCs), and ≤ 15 percent for all target compounds quantitated using internal standards. Some target analytes were quantitated using linear regression and all correlation coefficients (r) were greater than 0.990. The following table identifies the exceptions to the ICAL criteria:

Instrument ID	ICAL Date	Analyte	%RSD or R
MSJ5971	8/13/03	2,4-Dinitrophenol	**46.5**

Sample qualifications due to ICAL %RSD or correlation coefficients outside evaluation criteria are identified in the following table:

Sample ID	Analyte	Qualification
GM-19C-D (DL)	2,4-Dinitrophenol	**UJ**

A recalculation of the RFs and %RSDs was performed for three target analytes in the ICALs prepared for the primary samples, and no systematic calculation or transcription errors were noted.

2.6 CALIBRATION VERIFICATION

Review of the laboratory instrument run logs indicated the calibration verifications (CVs) were performed at the required frequency of every 12 hours or batch of 20 samples. Review of CV summary forms indicated all target compounds quantitated using internal standards had RFs that met the evaluation criteria of greater than 0.05 for all target analytes and percent differences (%Ds) of ≤ 20 percent. Target compounds quantitated using linear regression also had a percent drift ≤ 20 percent. The following table identifies the exceptions to the CV criteria:

CV ID	Analyte	%D
GQ388	2-Nitroaniline	**29.5**
GQ388	2,6-Dinitrotoluene	**25.1**
GQ388	4-Nitrophenol	**32.8**
GQ388	2,4-Dinitrotoluene	**38.9**
GQ388	4,6-Dinitro-2-methylphenol	**31.2**
GQ388	Benzo(b)fluoranthene	**39.3**
GQ388	Benzo(k)fluoranthene	**24.5**
KQ671	2,4-Dinitrophenol	**25.5**
GQ567	Benzo(k)fluoranthene	**30.3**
GQ573	Hexachlorocyclopentadiene	**22.6**
GQ573	3,3'-Dichlorobenzidine	**21.6**
GQ573	Indeno(1,2,3-cd)pyrene	**22.9**

Sample qualifications due to CV %D outside evaluation criteria are identified in the following table:

Sample ID	Analyte	Qualification
GM-20B	2-Nitroaniline	**UJ**
GM-20B	2,6-Dinitrotoluene	**UJ**
GM-20B	4-Nitrophenol	**UJ**
GM-20B	2,4-Dinitrotoluene	**UJ**
GM-20B	4,6-Dinitro-2-methylphenol	**UJ**
GM-20B	Benzo(b)fluoranthene	**UJ**
GM-20B	Benzo(k)fluoranthene	**UJ**
B-25B (DL)	2,4-Dinitrophenol	**UJ**
B-28B-D	Benzo(k)fluoranthene	**UJ**
B-25A	Benzo(k)fluoranthene	**UJ**
B-28B	Hexachlorocyclopentadiene	**UJ**
B-28B	3,3'-Dichlorobenzidine	**UJ**
B-28B	Indeno(1,2,3-cd)pyrene	**UJ**
B-28B (DL)	Hexachlorocyclopentadiene	**UJ**
B-28B (DL)	3,3'-Dichlorobenzidine	**UJ**
B-28B (DL)	Indeno(1,2,3-cd)pyrene	**UJ**
B-28B-D	Hexachlorocyclopentadiene	**UJ**
B-28B-D	3,3'-Dichlorobenzidine	**UJ**
B-28B-D	Indeno(1,2,3-cd)pyrene	**UJ**

Sample ID	Analyte	Qualification
B-29A	Hexachlorocyclopentadiene	UJ
B-29A	3,3'-Dichlorobenzidine	UJ
B-29A	Indeno(1,2,3-cd)pyrene	UJ
B-24A	Hexachlorocyclopentadiene	UJ
B-24A	3,3'-Dichlorobenzidine	UJ
B-24A	Indeno(1,2,3-cd)pyrene	UJ
B-24A (DL)	Hexachlorocyclopentadiene	UJ
B-24A (DL)	3,3'-Dichlorobenzidine	UJ
B-24A (DL)	Indeno(1,2,3-cd)pyrene	UJ
B-25A (RE)	Hexachlorocyclopentadiene	UJ
B-25A (RE)	3,3'-Dichlorobenzidine	UJ
B-25A (RE)	Indeno(1,2,3-cd)pyrene	UJ

Recalculation of the RF and %D for two compounds in five CVs was completed, and no systematic calculation or transcription errors were noted.

2.7 BLANK SAMPLES

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by the method and all target compounds were reported as non-detect. The blank sample chromatograms were reviewed and all peaks present were surrogate compounds, internal standards, unidentified compounds, or target compounds below the MDL.

2.8 SURROGATE SPIKE RECOVERIES

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. Surrogates were not recovered for 5 of 12 primary samples during SVOC analysis due to sample dilutions by a factor of 50. Additionally, surrogates were not recovered in the majority of diluted re-analyses (dilution factor of 4-1000). Sample chromatograms and mass spectra were reviewed to determine that the surrogate was diluted out of each sample in question. No errors were noted and no qualifications to the data were required. All other surrogate recoveries for undiluted samples were within the acceptance criteria for the validated samples with the exception of sample B-25B, in which 5 of 6 surrogates were not recovered. Therefore, sample **B-25B** was qualified as estimated (**J**) for detected

compounds and rejected (**R**) for all non-detect compounds. Two surrogate recoveries were recalculated for three primary samples with surrogates available, and the summary forms versus the raw data were verified. No systematic calculation or transcription errors were noted.

2.9 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples were analyzed to assess accuracy and precision for the analyses. Sample GM-20B was spiked with the analytical batch KRM24. All MS/MSD recoveries and RPDs were within the evaluation criteria with the exception of the following:

Sample ID	Analyte	MS/MSD %R (RPD)	Criteria
GM-20B	1,4-Dichlorobenzene	**100**/60 (4.1)	36-91 / 40
GM-20B	2,4-Dimethylphenol	85/**3** (**187**)	38-114 / 40
GM-20B	Bis(2-chloroethoxy)methane	**120/120** (0)	57-110 / 40
GM-20B	4-Chloroaniline	**0/0** (0)	10-95 / 40

USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001) state that organic data should not be qualified based on MS/MSD criteria alone. LCS and surrogate recoveries were within evaluation criteria; therefore, no qualifications to the data were required. However, 4-Chloroaniline was qualified estimated (**J**) due to the zero recovery in both the MS and MSD. Ten percent of the MS/MSD recoveries and RPD values were recalculated from the raw data and no calculation errors were noted.

2.10 INTERNAL STANDARDS AND RETENTION TIMES

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the validated samples in this SDG were within evaluation criteria with the exception of those listed in the following table:

Field ID	Internal Standard	Area	Criteria
B-25A	1,4-Dichlorobenzene	127994	135552-542208
B-24A	Perylene-d12	325411	345679-1382716
B-25A (RE)	Chrysene-d12	320086	353372-1413488
B-25A (RE)	Perylene-d12	334268	345679-1382716
B-24A (RE)	1,4-Dichlorobenzene-d4	87177	116515-466060
B-24A (RE)	Naphthalene-d8	329620	462793-1851172
B-24A (RE)	Acenaphthene-d10	203011	264424-1057698
B-24A (RE)	Phenanthrene-d10	375840	455681-1822724
B-24A (RE)	Chrysene-d12	293200	334046-1336182
B-24A (RE)	Perylene-d12	280036	346311-1385244

The summary forms were verified to the raw data, and no transcription errors were noted. Qualifications due to low internal standard recoveries, following USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001), are identified in the following table:

Field ID	Analyte	Qualification
B-25A	Phenol	J
B-25A	bis(2-Chloroethyl)ether	UJ
B-25A	2-Chlorophenol	J
B-25A	1,2-; 1,3-; 1,4-Dichlorobenzene	UJ
B-25A	2-Methylphenol	UJ
B-25A	2,2'-Oxybis(1-chloropropane)	UJ
B-25A	N-nitroso-di-n-propylamine	UJ
B-25A	3-; 4-Methylphenol	J
B-25A	Hexachloroethane	UJ
B-25A (RE)	Pyrene	UJ
B-25A (RE)	Butylbenzylphthalate	UJ
B-25A (RE)	3,3'-Dichlorobenzidine	UJ
B-25A (RE)	Benzo(a)anthracene	UJ
B-25A (RE)	bis(2-Ethylhexyl)phthalate	UJ
B-25A (RE)	Chrysene	UJ
B-25A (RE)	Di-n-octylphthalate	UJ
B-25A (RE)	Benzo(b)fluoranthene	UJ
B-25A (RE)	Benzo(k)fluoranthene	UJ

Field ID	Analyte	Qualification
B-25A (RE)	Benzo(a)pyrene	UJ
B-25A (RE)	Indeno(1,2,3-cd)pyrene	UJ
B-25A (RE)	Dibenzo(a,h)anthracene	UJ
B-25A (RE)	Benzo(g,h,i)perylene	UJ
B-24A	Di-n-octylphthalate	UJ
B-24A	Benzo(b)fluoranthene	UJ
B-24A	Benzo(k)fluoranthene	UJ
B-24A	Benzo(a)pyrene	UJ
B-24A	Indeno(1,2,3-cd)pyrene	UJ
B-24A	Dibenzo(a,h)anthracene	UJ
B-24A	Benzo(g,h,i)perylene	UJ
B-24A (RE)	All detected compounds	J
B-24A (RE)	All non-detects	UJ

2.11 LABORATORY CONTROL SAMPLES (LCS)

LCS samples were analyzed to assess the accuracy of the analytical process. All LCS data were within QC evaluation criteria. Ten percent of the reported values from two LCS were calculated using the raw data. No systematic calculation or transcription errors were noted.

2.12 FIELD DUPLICATE SAMPLES

Field duplicate samples were analyzed to assess method precision. Samples that were duplicated in the field are listed in the following table.

Field ID	Field Duplicate ID
GM-19C	GM-19C-D
B-28B	B-28B-D

The field duplicate sample pairs relative percent difference (RPD) were within evaluation criteria (50%) for all compounds, with the exception of 4-Chloroaniline for duplicate pair B-28B / B-28B-D and their respective dilutions. Therefore, 4-Chloroaniline was qualified as estimated (**J/UJ**).

2.13 TARGET COMPOUND IDENTIFICATION AND QUANTIFICATION

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 different from the associated ICAL retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantification, four of the detected results were recalculated from the raw data, and no systematic calculation errors were noted. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. No transcription or calculation errors were noted and reporting limits were properly adjusted for dilutions.

2.14 OVERALL DATA ASSESSMENT

Based on the criteria outlined it is recommended that the results reported for these analyses, be accepted for their intended use. Acceptable levels of accuracy and precision, based on LCS, MS/MSD, and surrogate data were achieved for this SDG, with the exception of rejected data noted in Section 1.8. In addition completeness, defined to be the percentage of analytical results judged to be valid including estimated (**J/UJ**) data, was 98 percent for this SDG. Some samples required dilutions due to concentrations detected above the linear range of the calibration curve. The following identifies which analytical result should be used when multiple results are available due to dilutions or re-analyses:

Field ID	Analyte	Analytical Run
GM-19C	All compounds except 1,4-Dichlorobenzene	Original (undiluted)
GM-19C (DL)	1,4-Dichlorobenzene	4x dilution
GM-19C-D	All compounds except 1,4-Dichlorobenzene	Original (undiluted)
GM-19C-D (DL)	1,4-Dichlorobenzene	5x Dilution
GM-19A	All compounds except Pentachlorophenol	Original (undiluted)
GM-19A (DL)	Pentachlorophenol	4x dilution
GM-20B	All compounds except 1,4-Dichlorobenzene	Original (undiluted)
GM-20B (DL)	1,4-Dichlorobenzene	5x dilution
B-25B (DL)	All compounds	200x dilution
B-28B	All compounds except Phenol, 2-Chlorophenol, 3&4-Methylphenol, 2,4-Dichlorophenol, and 2,4,6-Trichlorophenol	Original (50x dilution)
B-28B (DL)	Phenol, 2-Chlorophenol, 3&4-Methylphenol, 2,4-Dichlorophenol, and 2,4,6-Trichlorophenol	1000x dilution
B-28B-D	All compounds except Phenol, 2-Chlorophenol, 3&4-Methylphenol, 2,4-Dichlorophenol, 4-Chloroaniline and 2,4,6-Trichlorophenol	Original (50x dilution)
B-28B-D (DL)	Phenol, 2-Chlorophenol, 3&4-Methylphenol, 2,4-	1000x dilution

Field ID	Analyte	Analytical Run
	Dichlorophenol, 4-Chloroaniline and 2,4,6-Trichlorophenol	
B-25A	All compounds except Phenol, bis(2-Chloroethyl)ether, 2-Chlorophenol, 1,2- 1,3- and 1,4-Dichlorobenzene, 2-Methylphenol, 2,2'-Oxybis(1-Chloropropane), N-nitroso-di-n-propylamine, 3&4-Methylphenol, Hexachloroethane and 2,4-Dichlorophenol	Original (50x dilution)
B-25A (DL)	Phenol and 2,4-Dichlorophenol	250x dilution
B-25A (RE)	bis(2-Chloroethyl)ether, 2-Chlorophenol, 1,2- 1,3- and 1,4-Dichlorobenzene, 2-Methylphenol, 2,2'-Oxybis(1-Chloropropane), N-nitroso-di-n-propylamine, 3&4-Methylphenol, Hexachloroethane	50x dilution
B-29A	All compounds except Phenol, 2-Chlorophenol, and 3&4-Methylphenol	Original (50x dilution)
B-29A (DL)	Phenol, 2-Chlorophenol and 3&4-Methylphenol	250x dilution
B-24A	All compounds except Phenol and 2-Chlorophenol	Original (50x dilution)
B-24A (DL)	Phenol and 2-Chlorophenol	250x dilution

This section describes the full validation for four aqueous samples, including one trip blank sample, which were prepared by USEPA SW-846 Method 5030 and analyzed for volatile organic compounds (VOCs) by USEPA SW-846 Method 8260B. The samples were analyzed by STL Laboratories, Inc. of Savannah, Georgia and submitted as part of the sample delivery group (SDG) KRM25. The samples included as part of this validation are listed below:

Sample Identification
B-28A
B-24C
B-29B
TB-081403

Evaluation of the analytical data followed procedures outlined in USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The evaluation criteria used during the validation were a combination of those criteria presented in the respective methods and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data Package Completeness
- Laboratory Case Narrative\Cooler Receipt Form
- Holding Times and Sample Preservation
- Instrument Performance
- Initial Calibration
- Calibration Verification
- Field Duplicate Samples
- Blank Samples
- Surrogate Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples
- Internal Standards and Retention Times
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)
- Target Compound Identification and Quantification
- Overall Data Assessment.

3.1 DATA PACKAGE COMPLETENESS

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective method. Additional volume was not provided for MS/MSD analysis; therefore, the laboratory analyzed the LCS in duplicate. The data package was considered complete for SDG KRM25.

3.2 LABORATORY CASE NARRATIVE\COOLER RECEIPT FORM

The laboratory case narrative indicated LCS recoveries were outside evaluation criteria. This issue is addressed in the LCS sections below. The narrative also indicated an MS/MSD was not analyzed as part of the analytical batch due to insufficient sample volume. No qualification of data was required.

3.3 HOLDING TIMES AND SAMPLE PRESERVATION

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. All samples were received and maintained at 4 ± 2°C; with adequate acid preservative to provide a pH of 2. Samples were analyzed within 14 days as required by Method 8260B.

3.4 INSTRUMENT PERFORMANCE

GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against criteria established in USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001).

Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no calculation or transcription errors were noted. No qualifications to the data were required.

3.5 INITIAL CALIBRATION

Initial calibration (ICAL) criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for volatiles analysis. Samples included in this SDG were analyzed using instrument and MSO5973. The ICALs was completed on 8-12-03. At least five standard concentrations were used to establish the ICAL curve as required by USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001).

For the ICAL curve, the response factors (RFs) were reviewed following USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The ICAL RFs were greater than 0.05 for all analytes with the exception of acetone (0.038). Acetone results for the validated samples were qualified as summarized below.

Field ID	Analyte	Qualification
B-28A	Acetone	**UJ**
B-24C	Acetone	**J**
B-29B	Acetone	**UJ**

Additionally, review of the ICAL summary forms indicated that the RF percent relative standard deviations (%RSDs) were $\leq$ 15 percent for target compounds and $\leq$ 30 percent for calibration check compounds (CCC). In some instances, linearity was determined using linear regression. All correlation coefficients were greater than 0.99 when linear regression was used to establish the ICAL.

Recalculations of the RFs and %RSDs for two compounds per standard curve were performed, and no systematic errors in calculation or transcription were noted.

3.6 CALIBRATION VERIFICATION

Review of the analysis run log indicated the initial calibration verification (ICV) were analyzed following the ICAL and calibration verifications (CVs) were performed at the required frequency of every 12 hours. Review of the continuing calibration summary form indicated all RFs met the evaluation criteria of greater than 0.05 for all analytes except acetone (0.034 and 0.033) for CVs OQ710 and OQ727, respectively. Acetone results were previously qualified due to ICAL RF values. No additional qualification of the data was required. In addition, %Ds met the evaluation criteria of less than 20 percent for CCCs, and less than 25 percent for all target analytes, with the exceptions noted below:

Identifier	Verification	Analyte	%D
MSO5973, 8-27-03, OQ710	**CV**	m,p,-Xylene	**38.6**
MSO5973, 8-27-03, OQ710	**CV**	Xylene	**32.4**

Qualifications based on CV data are listed in the table below.

Field ID	Analyte	Qualification
B-24C (10x dil)	m,p-Xylenes	**J/UJ**
B-24C (10x dil)	Total xylenes	**J/UJ**

3.7 FIELD DUPLICATE SAMPLES

Field duplicate samples were analyzed to assess method precision. Field duplicate samples were not submitted as part of the validated SDG.

3.8 BLANK SAMPLES

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). Trip blank samples were also evaluated to assess contamination problems emanating from sampling, decontamination and shipping procedures. All method, trip and equipment blanks were reported as non-detect. No qualification of the data was required.

3.9 SURROGATE SPIKE RECOVERIES

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. Surrogate recoveries were within acceptance criteria for the validated samples. Approximately five percent of the surrogate recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

3.10 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples were analyzed to assess accuracy and precision for the analyses. Sufficient volume was not submitted to complete MS/MSD analysis. The laboratory analyzed the LCS sample in duplicate to provide precision assessment. Refer to the LCS section for further details.

3.11 INTERNAL STANDARDS AND RETENTION TIMES

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the samples in this SDG were within evaluation criteria. The summary forms were verified to the raw data, and no transcription errors were noted.

3.12 LABORATORY CONTROL SAMPLE (LCS)

LCS samples were analyzed to assess the accuracy of the analytical process. Sufficient volume was not available to complete MS/MSD analysis; therefore, the laboratory analyzed the LCS in duplicate.
All LCS and LCSD data were within evaluation criteria with the exception of those listed in the following table:

LCS ID	LCS Compound	LCS/LCSD/RPD Recovery	LCS Criteria
KRM25-8	Chloroform	100/**132**/9.5	72-124/30
KRM25-8	m,p-xylene	110/**120**/8.7	78-119/30

Associated data were reported as nondetect; therefore, no qualification of data was required. Approximately five percent of the LCS recoveries were recalculated and no systematic calculation errors were noted.

3.13 TARGET COMPOUND IDENTIFICATION AND QUANTIFICATION

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the

relative retention time was no greater than 0.06 different from the associated continuing calibration retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantification, four of the detected results were recalculated from the raw data, and no systematic calculation errors were noted. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. No qualification of data was required.

3.14 OVERALL DATA ASSESSMENT

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision, based on LCS, LCSD and surrogate data were achieved for this SDG. In addition, completeness defined to be the percentage of analytical results, which are judged to be valid, including, estimated (J) data, was 100 percent for this SDG. Some samples required dilutions due concentrations detected above the linear range of the calibration curve. The following identifies which analytical result should be used when multiple results are available due to dilutions.

Field ID	Analyte	Analytical Run
B-24C	All analytes except chlorobenzene and 1,2-dichloroethane	Original (10x dilution)
B-24C	Chlorobenzene (7300 ug/L) and 1,2-dichloroethane (13,000 ug/L)	200x dilution

This section describes the full validation for three aqueous samples, which were extracted by USEPA Method 3520C and analyzed for semi-volatile organic compounds (SVOCs) following USEPA SW846 Method 8270C. The samples were analyzed by Severn Trent Laboratories, Inc. of Savannah, Georgia and submitted as part of the sample delivery group (SDG) KRM25. Samples validated for SVOCs in this SDG include:

Sample Identification
B-28A
B-24C
B-29B

Evaluation of the analytical data followed procedures outlined in the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). The evaluation criteria used during the validation were a combination of those criteria presented in the respective method and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Data package completeness
- Laboratory case narrative/cooler receipt form
- Holding times and sample preservation
- Instrument performance
- Initial calibration
- Calibration verification
- Blank samples
- Surrogate spike recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) samples
- Internal standards
- Laboratory control samples (LCS)
- Field duplicate samples
- Target compound identification and quantification
- Overall data assessment.

4.1 DATA PACKAGE COMPLETENESS

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package SDG KRM25 was considered complete.

4.2 LABORATORY CASE NARRATIVE/COOLER RECEIPT FORM

The laboratory case narrative indicated batch specific MS/MSD samples were not analyzed due to insufficient sample volume. Some samples required dilution and subsequent surrogate recoveries were unrecoverable. No qualification of data was required. No additional problems were noted in the laboratory case narrative or on the laboratory cooler receipt form.

4.3 HOLDING TIMES AND SAMPLE PRESERVATION

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the sample summary forms, the raw data forms, extraction logs, and the chromatograms for accuracy, consistency, and holding time compliance. The samples were properly preserved, extracted within 7 days, and analyzed within 40 days of the extraction. No qualifications to the data were required.

4.4 INSTRUMENT PERFORMANCE

GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against USEPA National Functional Guidelines for Low Concentration Organic Data Review (USEPA 2001). Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no calculation or transcription errors were noted.

4.5 INITIAL CALIBRATION

Initial calibration (ICAL) criteria were established to assess whether the GC/MS instrument was capable of producing acceptable qualitative and quantitative data for semi-volatiles analysis. ICALs were analyzed for each instrument used in the analysis of SVOCs prior to the beginning of the analytical run sequence. The laboratory used six standard concentrations to establish the ICAL for each instrument, meeting the minimum required by the method. For each ICAL, the response factors (RFs) were reviewed and were greater than 0.05 for all target compounds. Additionally, the percent relative standard deviations (%RSDs) were $\leq$ 30 percent for calibration check compounds (CCCs), and $\leq$ 15 percent for all target compounds quantitated using internal standards. Some target analytes were quantitated using linear regression and all correlation coefficients (r) were greater than 0.99. All target compounds were within evaluation criteria. No qualification of data was required. A recalculation of the RFs and %RSDs was performed for three target analytes in the ICALs prepared for the primary samples, and no systematic calculation or transcription errors were noted.

4.6 CALIBRATION VERIFICATION

Review of the laboratory instrument run logs indicated the calibration verifications (CVs) were performed at the required frequency of every 12 hours or batch of 20 samples. Review of CV summary forms indicated all target compounds quantitated using internal standards had RFs that met the evaluation criteria of greater than 0.05 for all target analytes and percent differences (%Ds) of $\leq$ 20 percent. Target compounds quantitated using linear regression also had a percent drift $\leq$ 20 percent. The following table identifies the exceptions to the CV criteria:

CV ID	Analyte	%D
KQ672	2,4-Dinitrophenol	**22**
JQ472	4-Nitrophenol	**22**
JQ472	2,4-Dinitrotoluene	**21**
JQ472	3,3'-Dichlorobenzidine	**21**
GQ567	Benzo(k)fluoranthene	**30**
EQ443	Benzo(g,h,i)perylene	**22**

Sample qualifications due to %D outside evaluation criteria are identified in the following table:

Sample ID	Analyte	Qualification
B-28A	2,4-Dinitrophenol	UJ
B-24C DL	4-Nitrophenol	UJ
B-24C DL	2,4-Dinitrotoluene	UJ
B-24C DL	3,3'-Dichlorobenzidine	UJ
B-24C	Benzo(k)fluoranthene	UJ
B-29B	Benzo(k)fluoranthene	UJ
B-29B DL	Benzo(g,h,i)perylene	UJ

Recalculation of the RF and %D for two compounds in five CVs was completed, and no systematic calculation or transcription errors were noted.

4.7 BLANK SAMPLES

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by the method and all target compounds were reported as non-detect. The blank sample chromatograms were reviewed and all peaks present were surrogate compounds, internal standards, unidentified compounds, or target compounds below the MDL.

4.8 SURROGATE SPIKE RECOVERIES

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per sample basis. Surrogates were not recovered for 2 of 3 primary samples during SVOC analysis due to sample dilutions by a factor of 50. Additionally, surrogates were not recovered in the diluted re-analyses (dilution factor of 400). Sample chromatograms and mass spectra were reviewed to determine that the surrogate was diluted out of each sample in question. No errors were noted and no qualifications to the data were required. All surrogate recoveries for undiluted samples were within the acceptance criteria for the validated samples. Two surrogate recoveries were recalculated for primary samples with surrogates available, and the summary forms versus the raw data were verified. No systematic calculation or transcription errors were noted.

4.9 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) SAMPLES

MS/MSD samples were not analyzed due to insufficient sample volume. No qualification of data was required

4.10 INTERNAL STANDARDS

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent, and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas and retention times for the validated samples in this SDG were within evaluation criteria. No qualification of data was required.

4.11 LABORATORY CONTROL SAMPLES (LCS)

LCS samples were analyzed to assess the accuracy of the analytical process. All LCS data were within QC evaluation criteria. Ten percent of the reported values were calculated using the raw data. No calculation or transcription errors were noted.

4.12 FIELD DUPLICATE SAMPLES

No field duplicate samples were analyzed in this SDG.

4.13 TARGET COMPOUND IDENTIFICATION AND QUANTIFICATION

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 different from the associated ICAL retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantification, four of the detected results were recalculated from the raw data, and no systematic calculation errors were noted. Additionally, the reporting limits were verified to determine if reporting limits were adjusted for dilutions. No transcription or calculation errors were noted and reporting limits were properly adjusted for dilutions.

4.14 OVERALL DATA ASSESSMENT

Based on the criteria outlined it is recommended that the results reported for these analyses, be accepted for their intended use. Acceptable levels of accuracy and precision, based on LCS, MS/MSD, and surrogate data were achieved for this SDG. In addition completeness, defined to be the percentage of analytical results judged to be valid including estimated (**J/UJ**) data, was 100 percent for this SDG. Some samples required dilutions due concentrations detected above the linear range of the calibration curve. The following identifies which analytical result should be used when multiple results are available due to dilutions:

Field ID	Analyte	Analytical Run
B-24C	All compounds except Phenol, 2-Chlorophenol, 2,4-Dichlorophenol, 4-Chloroaniline, 3&4-Methylphenol, Naphthalene, and 2,4,6-Trichlorophenol	Original (50X dilution)
B-24C (DL)	Phenol, 2-Chlorophenol, 2,4-Dichlorophenol, 4-Chloroaniline, 3&4-Methylphenol, Naphthalene, and 2,4,6-Trichlorophenol	Dilution (400X Dilution)
B-29B	All compounds except Phenol, 2-Chlorophenol, m&p-Cresol, 2,4-Dichlorophenol and Naphthalene	Original (50X dilution)
B-29B (DL)	Phenol, 2-Chlorophenol, m&p-Cresol, 2,4-Dichlorophenol and Naphthalene	Dilution (400X Dilution)