

TO19 DATA VERIFICATION SUMMARY REPORT
for samples collected from
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

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INTRODUCTION

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on February 26, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for semivolatile organic compounds (SVOCs) and metals:

43855

The field quality control (QC) samples collected in association with this SDG included one matrix spike/matrix spike duplicate (MS/MSD), and three field duplicates. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites.

All samples were collected by Parsons and analyzed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by the laboratory at a temperature of 3.0⁰ C which is within the 2-6⁰ C range recommended by the QAPP.

It should be noted that several additional analyses for sample B11-SW02 were included on the chain-of-custody (COC) by mistake. The unnecessary analyses have been crossed off the COC and removed from the report.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, version 1.0. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; and COC forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the CSSA QAPP, version 1.0, were met.

SEMIVOLATILES

General

The SVOC portion of this SDG consisted of eleven (11) samples, including eight (8) environmental soil samples, one MS/MSD pair, and one field duplicate (FD). Only the samples collected from B12 required SVOC analysis. The samples were collected on February 26, 2004 and were analyzed for fluoranthene only. The SVOC analyses were

performed according to the United States Environmental Protection Agency (USEPA) SW846 Method 8270C.

All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) samples, the MS/MSD samples, and the surrogate spikes. Sample B12-SW05 was designated for MS/MSD analysis on the COC.

The LCS recovery for fluoranthene was within acceptance criteria.

The MS/MSD recoveries for fluoranthene were within acceptance criteria.

All surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD samples and field duplicate samples. Sample B12-SW06 was collected in duplicate. The second sample from this location was submitted and analyzed as a field duplicate.

The MS/MSD RPD was within acceptance criteria.

Fluoranthene was below the RL in both the parent and field duplicate sample, so the RPD calculation was not applicable.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All instrument tune criteria were met.
- All initial calibration criteria were met.
- All second source verification criteria were met. The LCS was analyzed using a secondary source.
- All calibration verification criteria were met.
- All internal standard criteria were met.

- All manual integrations were reviewed and approved.

One method blank was analyzed in association with the SVOC analyses in this SDG. The method blank was free of fluoranthene at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All SVOC results for the samples in this SDG were considered usable. The completeness of the SVOC portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

ICP METALS

General

The ICP metals portion of this SDG consisted of twenty (20) samples, including fifteen environmental soil samples, one MS/MSD pair and three field duplicates. The samples were collected on February 26, 2004 and were analyzed for a reduced list of ICP metals. The samples collected from B11 required analysis for barium, chromium, nickel and zinc. The samples collected from B12 required analysis for barium, copper, nickel and zinc.

The ICP metals analyses were performed using USEPA SW846 Method 6010B. The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS and LCS Duplicate (LCSD) samples and the MS/MSD samples. Sample B12-SW05 was designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria, except for the following:

Parent	Metal	MS %R	MSD %R	Criteria
B12-SW05	Barium	134	260	75-125%

All sample results were flagged “M” for barium due to the non-compliant recoveries.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate samples. Samples B11-SW02, B11-SW08 and B12-SW06 were collected in duplicate. The second sample from each location was submitted and analyzed as a field duplicate.

All LCS/LCSD RPDs were within acceptance criteria.

All MS/MSD RPDs were within acceptance criteria, except for the following:

Parent	Metal	RPD	Criteria
B12-SW05	Copper	25.8	RPD ≤ 20

All copper detections above the RL were flagged “J” for all samples due to the variability demonstrated by the MS/MSD.

For the FD pair on B11-SW02, all RPDs met criteria as follows:

Parent	Metal	FD RPD	Criteria
B11-SW02	Barium	2.0	RPD ≤ 20
	Chromium	4.2	
	Nickel	0.08	
	Zinc	4.0	

For the FD pair analyzed on B11-SW08, all RPDs except zinc met criteria as follows:

Parent	Metal	FD RPD	Criteria
B11-SW08	Barium	17.4	RPD ≤ 20
	Chromium	12.0	
	Nickel	18.3	
	Zinc	44.2	

All samples in this SDG were collected on February 26, 2004, so the zinc results for all samples were flagged “J” if detected.

For the FD pair analyzed on B12-SW06, all RPDs failed criteria as follows:

Parent	Metal	FD RPD	Criteria
B12-SW06	Barium	77.0	RPD ≤ 20
	Copper	79.4	
	Nickel	46.8	
	Zinc	48.5	

The data was double checked to ensure the correct concentrations were reported for the parent and field duplicate samples. All samples in this SDG were collected on February 26, 2004, so all results for nickel and zinc were flagged “J” if detected above the RL. No corrective action was necessary for barium because all results for this metal were previously flagged “M” due to the non-compliant MS/MSD recoveries. (The “M” flag supercedes the “J” flag in the CSSA QAPP flag hierarchy.) All copper detections above the RL were previously flagged “J” due to the failing MS/MSD RPD, so no additional corrective action was necessary for this metal.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;

- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- All interference check criteria were met.
- A dilution test (DT) was analyzed on sample B12-SW06. The DT was not applicable for nickel because all sample results were less than 50x the MDL. The DT was applicable for barium, copper and zinc. The %D for these metals failed to meet criteria as follows:

Metal	%D	Criteria
Barium	17.4	%D ≤ 10
Copper	11.1	
Zinc	15.5	

All associated sample results for these metals were previously flagged either “M” or “J” due to the failing MS/MSD recoveries, MS/MSD RPDs and/or field duplicate RPDs, so no additional corrective action was necessary.

- The laboratory also analyzed a post digestion spike (PDS) on sample B12-SW06. All PDS recoveries were within acceptance criteria.

One method blank and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of target metals at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP metals results for the samples in this SDG were considered usable. The completeness for the ICP metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

ARSENIC

General

The arsenic portion of this SDG consisted of nine (9) samples, including seven environmental soil samples and two field duplicates. The samples were collected on

February 26, 2004 and were analyzed for arsenic using USEPA SW846 Method 7060A. Only the samples collected from B11 required analysis for arsenic.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted that all but two of the samples were analyzed at a dilution due to the high level of arsenic present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples. No sample from B11 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples and the field duplicate analyte results. Samples B11-SW02 and B11-SW08 were collected in duplicate. The second sample from this location was submitted and analyzed as a field duplicate.

The LCS/LCSD RPD was within acceptance criteria.

The field duplicate RPD's met criteria as follows:

Sample ID	Metal	FD RPD	Criteria
B11-SW02	Arsenic	14.0	RPD \leq 25
B11-SW08	Arsenic	8.8	RPD \leq 25

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met. There were three ICALs associated with the arsenic results in this SDG.
- All initial and continuing calibration verification criteria were met.

- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- The dilution test was analyzed on the field duplicate of sample B11-SW08. Arsenic failed criteria as follows:

Metal	%D	Criteria
Arsenic	23.4	%D ≤ 10

No MS/MSD was analyzed, so the arsenic results in all samples from B11 were flagged “M” in accordance with the CSSA QAPP.

- The laboratory also analyzed a PDS on sample B11-SW08. Arsenic failed to meet criteria in the PDS, as follows:

Metal	%R	Criteria
Arsenic	83.4	85-115%

No corrective action was necessary since all associated sample results were previously flagged “M” due to the failing DT.

One method blank and several calibration blanks were analyzed in association with the arsenic analyses in this SDG. All blanks were free of arsenic at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All arsenic results for the samples in this SDG were considered usable. The completeness for the arsenic portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

CADMIUM

General

The cadmium portion of this SDG consisted of nine (9) samples, including seven environmental soil samples and two field duplicates. The samples were collected on February 26, 2004 and were analyzed for cadmium using USEPA SW846 Method 7131A. Only the samples collected from B11 required analysis for cadmium.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted four samples required a dilution due to the high levels of cadmium present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples. No sample was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples and the field duplicate analyte concentrations. Samples B11-SW02 and B11-SW08 were collected in duplicate. The second sample from each location was submitted and analyzed as a field duplicate.

The LCS/LCSD RPD was within acceptance criteria.

For the FD pair on B11-SW02, the RPD failed as follows:

Parent	Metal	FD RPD	Criteria
B11-SW02	Cadmium	56.5	RPD ≤ 25

All samples in this SDG were collected on February 26, 2004, so the cadmium results for all samples were flagged “J” if detected

For the FD pair analyzed on B11-SW08, the RPD met criteria as follows:

Parent	Metal	FD RPD	Criteria
B11-SW08	Cadmium	12.2	RPD ≤ 25

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.

- The dilution test was analyzed on sample B11-SW05. The DT met criteria with a %D of 8.3.
- The laboratory also analyzed a PDS on sample B11-SW05. Cadmium met criteria in the PDS with a recovery of 100.5%.

One method blank and several calibration blanks were analyzed in association with the cadmium analyses in this SDG. All blanks were free of cadmium at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All cadmium results for the samples in this SDG were considered usable. The completeness for the cadmium portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

LEAD

General

The lead portion of this SDG consisted of eleven (11) samples, including eight environmental soil samples, one MS/MSD pair and one field duplicate. The samples were collected on February 26, 2004 and were analyzed for lead using USEPA SW846 Method 7421. Only the samples collected from B12 required analysis for lead.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted six of the samples required a dilution due to the high levels of lead present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples and MS/MSD samples. Sample B12-SW05 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

The MS/MSD recoveries failed to meet acceptance criteria as follows:

Parent	Metal	MS %R	MSD %R	Criteria
B12-SW05	Lead	2771	-8168	75-125%

The anomalous recoveries were due to the low spike amount relative to the parent sample concentration. The parent sample concentration was 309.6 mg/kg and the spike amount was less than one percent of that (2.5 mg/kg). All sample results for lead were flagged “M” in accordance with the CSSA QAPP.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte concentrations. Sample B12-SW06 was collected in duplicate. The second sample from this location was submitted and analyzed as a field duplicate.

The LCS/LCSD RPD was within acceptance criteria.

The MS/MSD RPD failed to meet criteria as follows:

Parent	Metal	RPD	Criteria
B12-SW05	Lead	113	$RPD \leq 25$

All associated sample results were previously flagged “M” due to the failing MS/MSD recoveries, so no additional corrective action was necessary.

For the FD pair analyzed on B12-SW06, the RPD met criteria as follows:

Parent	Metal	FD RPD	Criteria
B12-SW06	Lead	8.8	$RPD \leq 25$

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- The dilution test was analyzed on sample B12-SW05. The DT failed to meet criteria as follows:

Metal	%D	Criteria
Lead	12.4	$\%D \leq 10$

All associated sample results were previously flagged “M” due to the failing MS/MSD recoveries, so no additional corrective action was necessary.

- The laboratory also analyzed a PDS on sample B12-SW05. Lead failed to meet criteria in the PDS as follows:

Metal	%R	Criteria
Lead	-187.2	85-115%

The anomalous recovery was again due to the low spike concentration (2.6 mg/kg) relative to the parent concentration (290 mg/kg). All associated sample results were previously flagged “M” due to the failing MS/MSD recoveries, so no additional corrective action was necessary.

One method blank and several calibration blanks were analyzed in association with the lead analyses in this SDG. All blanks were free of lead at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All lead results for the samples in this SDG were considered usable. The completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

MERCURY

General

The mercury portion of this SDG consisted of eleven (11) samples, including eight environmental soil samples, one MS/MSD pair and one field duplicate. The samples were collected on February 26, 2004 and were analyzed for mercury using USEPA SW846 Method 7471A. Only the samples collected from B12 required analysis for mercury.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples and MS/MSD samples. Sample B12-SW05 was designated for MS/MSD analysis on the COC.

All LCS/LCSD and MS/MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte concentrations. Sample B12-SW06 was collected in duplicate. The second sample from this location was submitted and analyzed as a field duplicate.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

For the FD pair analyzed on B12-SW06, the RPD failed to meet criteria as follows:

Parent	Metal	FD RPD	Criteria
B12-SW06	Mercury	114.3	RPD ≤ 25

All mercury results above the RL were flagged “J” due to the high FD RPD.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. The samples were prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

One method blank and several calibration blanks were analyzed in association with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All mercury results for the samples in this SDG were considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

TO19 DATA VERIFICATION SUMMARY REPORT
for samples collected from
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

Data Verification by: Katherine LaPierre and Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on May 26, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for metals:

44568

No field quality control (QC) samples were collected in association with this SDG. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites.

All samples were collected by Parsons and analyzed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by the laboratory at a temperature of 4.0° C which is within the 2-6° C range recommended by the QAPP.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, version 1.0. Information reviewed in the data packages included sample results; laboratory quality control results; calibrations; case narratives; raw data; chain-of-custody (COC) forms and cooler receipt checklists. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the CSSA QAPP, version 1.0, were met.

ICP METALS

General

The ICP metals portion of this SDG consisted of three (3) environmental soil samples. The samples were collected on May 26, 2004 and were analyzed for a reduced list of ICP metals. Sample B12-BOT03 was analyzed for copper only. Samples B12-SW07 and B12-SW09 were analyzed for zinc only.

The ICP metals analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 6010B. The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP and within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the LCS/LCSD samples. No sample was designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD.

All LCS/LCSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- All interference check criteria were met.
- A dilution test was not applicable because all sample results were below 50 times the MDL.
- No PDS was required as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of the target metals at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP metals results for the samples in this SDG were considered usable. The completeness for the ICP metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

LEAD

General

The lead portion of this SDG consisted of four (4) environmental soil samples. The samples were collected on May 26, 2004 and were analyzed for lead using USEPA SW846 Method 7421.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted that all required dilution due to the high levels of lead present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples. No sample was designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples.

The LCS/LCSD RPD was within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV sample was prepared using a secondary source.
- A dilution test (DT) was analyzed on sample B12-SW09. The DT was evaluated using the 10x dilution and the 50x dilution of this sample. The DT met criteria for lead with a percent difference of 1.0.
- No PDS was required as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the lead analyses in this SDG. All blanks were free of lead at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All lead results for the samples in this SDG were considered usable. The completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

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BOERNE, TEXAS

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Parsons - Austin

INTRODUCTION

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on February 2, 2005. The samples in the following Sample Delivery Group (SDG) were analyzed for metals:

46489

The field quality control (QC) samples collected in association with this SDG included two field duplicates and two matrix spike/matrix spike duplicate (MS/MSD) pairs. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites. The QC samples were analyzed for the same parameters as the associated parent sample.

All samples were collected by Parsons. All analyses were performed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by APPL at a temperature of 3.5°C which is within the 2-6°C range recommended by the QAPP.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, version 1.0. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt form and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the CSSA QAPP, version 1.0, were met.

ICP METALS

General

The ICP metals portion of this SDG consisted of eighteen (18) samples, including thirteen (13) environmental soil samples, two MS/MSD pair, and one field duplicate. The samples were collected on February 2, 2005 and were analyzed for barium, chromium, copper, nickel and zinc. The samples from site B2 did not require analysis for ICP metals.

The ICP metals analyses were performed using USEPA SW846 Method 6010B. The samples in this SDG were analyzed following the procedures outlined in the CSSA

QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) and laboratory control spike duplicate (LCSD) samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria, with the following exceptions:

Parent Sample	Metal	MS %R	MSD %R	Criteria
AOC46-SS05	Barium	68.8	69.3	75-125
	Copper	62.9	57.6	75-125
	Nickel	(75.9)	74.3	75-125
	Zinc	69.0	63.9	75-125
AOC53-SW11	Barium	8.7	-20.0	75-125
	Nickel	73.1	70.4	75-125
	Zinc	48.9	31.4	75-125

() indicates the recovery met criteria.

All sample results for barium, copper, nickel and zinc were flagged “M” due to the low bias demonstrated by the MS/MSD samples.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Sample AOC53-BOT03 was collected in duplicate and the second jar from this location was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

The field duplicate RPD was not applicable for chromium since both the parent sample and the field duplicate sample concentrations for chromium were below the RL. The field duplicate RPDs for all other target metals were within acceptance criteria as follows:

Metal	Parent Conc. (mg/kg)	FD Conc. (mg/kg)	RPD	Criteria
Barium	36.36	37.14	2.1	RPD ≤ 20
Copper	11.91	11.02	7.8	
Nickel	5.93	6.68	11.9	
Zinc	28.43	27.02	5.1	

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- All interference check criteria were met.
- The initial calibration was analyzed using multiple points and the low point was below the RL for all metals, so no RL check standard was necessary.
- A dilution test (DT) was analyzed on sample AOC46-SS05. The dilution test was not applicable for nickel because the parent sample concentration for this metal was less than 50 times the MDL. The DT met criteria for chromium and copper, but both barium and zinc failed as follows:

Sample ID	Metal	%D	Criteria
AOC46-SS05	Barium	11.4	%D ≤ 10
	Chromium	3.5	
	Copper	6.5	
	Zinc	11.3	

No corrective action was necessary since all barium and zinc results were previously flagged “M” due to the failing MS/MSD recoveries.

- No post digestion spike was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of target metals at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP metals results for the samples in this SDG were considered usable. The completeness for the ICP metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

ARSENIC

General

The arsenic portion of this SDG consisted of eighteen (18) samples, including thirteen (13) environmental soil samples, two MS/MSD pair, and one field duplicate. The samples were collected on February 2, 2005 and were analyzed for arsenic using USEPA SW846 Method 7060A. The samples from site B2 did not require analysis for arsenic.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

The samples in this SDG were digested in two different batches and analyzed in a single batch under one initial calibration.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

Two sets of LCS/LCSD samples were analyzed for arsenic, one LCS/LCSD pair for each digestion batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria, with the following exception:

Parent Sample	Metal	MS %R	MSD %R	Criteria
AOC53-SW11	Arsenic	(90.0)	70.8	74-120%

() indicates the recovery met criteria.

Since two MS/MSD pair were analyzed and three of the four spikes met criteria, it is the professional opinion of the data verifier that the results do not illustrate a matrix effect was present and thus "M" flagging the data was not warranted. Discussions were held with Dr. Joe Fernando and Mr. Willie Sekula, both of Portage Environmental, Inc., and they agreed that because the failing MSD showed only a marginal exceedance and all other spike recoveries for arsenic were well within the acceptance criteria, no "M" flags should be applied.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Sample AOC53-BOT03 was collected in duplicate and the second jar from this location was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

The field duplicate RPD was within acceptance criteria as follows:

Metal	Parent Conc. (mg/kg)	FD Conc. (mg/kg)	RPD	Criteria
Arsenic	4.38	3.95	10.3	RPD ≤ 25

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP within the holding time required by the method.

- There was one four-point initial calibration established for arsenic. All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV sample was prepared using a secondary source.
- A dilution test (DT) was performed on samples AOC46-SS05 and on sample AOC53-SW11. Arsenic failed to meet criteria in both dilution tests as follows:

Sample ID	Metal	%D	Criteria
AOC46-SS05	Arsenic	12.1	%D ≤ 10
AOC53-SW11	Arsenic	12.9	%D ≤ 10

All arsenic results were flagged “J” due to the failing dilution test results.

- No PDS was required as per the CSSA QAPP.

Two method blanks and several calibration blanks were analyzed in association with the arsenic analyses in this SDG. All blanks were free of arsenic at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All arsenic result for the samples in this SDG was considered usable. The completeness for the arsenic portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

CADMIUM

General

The cadmium portion of this SDG consisted of eighteen (18) samples, including thirteen (13) environmental soil samples, two MS/MSD pair, and one field duplicate. The samples were collected on February 2, 2005 and were analyzed for cadmium using USEPA SW846 Method 7421. The samples from site B2 did not require analysis for cadmium.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

The samples in this SDG were digested in two different batches and analyzed in a single batch under one initial calibration.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

Two sets of LCS/LCSD samples were analyzed for cadmium, one LCS/LCSD pair for each digestion batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Sample AOC53-BOT03 was collected in duplicate and the second jar from this location was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

The field duplicate RPD was within acceptance criteria as follows:

Metal	Parent Conc. (mg/kg)	FD Conc. (mg/kg)	RPD	Criteria
Cadmium	0.26	0.23	12.2	RPD \leq 25

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- A dilution test (DT) was not required since all sample results were less than 25 times the MDL in the raw data. It should be noted that several samples had concentrations above 25 times the MDL after the calculation was performed to take the percent moisture into account. However, the bench analyst did not have the percent moisture data and thus, no DT was analyzed.
- No PDS was required, as per the CSSA QAPP.

Two method blanks and several calibration blanks were analyzed in association with the cadmium analyses in this SDG. All blanks were free of cadmium at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All cadmium results for the samples in this SDG were considered usable. The completeness for the cadmium portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

LEAD

General

The lead portion of this SDG consisted of twenty-five (25) samples, including nineteen (19) environmental soil samples, two MS/MSD pair, and two field duplicates. The samples were collected on February 2, 2005 and were analyzed for lead using USEPA SW846 Method 7421. The samples from site B2 required analysis for lead only.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted that all of the samples required a dilution due to the high levels of lead present. The samples in this SDG were digested in two different batches and analyzed in a two batches under two different initial calibrations.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

Two sets of LCS/LCSD samples were analyzed for cadmium, one LCS/LCSD pair for each digestion batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries failed to meet acceptance criteria due to the high concentration of lead present in the parent sample. The amount of lead in the parent sample was greater than ten times the concentration spiked in the MS/MSD samples. All lead results were flagged “M” due to the non-compliant MS/MSD recoveries.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte results. Samples AOC53-BOT03 and B2-SS12 were collected in duplicate. The second jar from each of these locations was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD RPDs were within acceptance criteria.

The RPD for the MS/MSD analyzed on sample AOC46-SS05 was within acceptance criteria. However, the RPD for the MS/MSD analyzed on sample AOC53-SW11 exceeded the acceptance criteria ($RPD \leq 25$) at 25.6. All lead results were previously flagged “M” due to the anomalous MS/MSD recoveries, so no corrective action was necessary.

All field duplicate RPDs were within acceptance criteria as follows:

Parent Sample	Metal	Parent Conc. (mg/kg)	FD Conc. (mg/kg)	RPD	Criteria
AOC53-BOT03	Lead	31.83	34.40	7.8	$RPD \leq 25$
B2-SS12	Lead	141.83	139.02	2.0	$RPD \leq 25$

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration (ICAL) criteria were met. There were two ICALs associated with the data. Both ICALs met all criteria.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met for both ICALs. The ICV samples were prepared using a secondary source.

- A dilution test was analyzed on samples AOC46-SS05 and AOC53-SW11. The DT analyzed on sample AOC46-SS05 was assessed using the 25x dilution and the 125x dilution. The DT analyzed on sample AOC53-SW11 was assessed using the 50x dilution and the 250x dilution. Both dilution tests met criteria as follows:

Parent Sample	Metal	%D	Criteria
AOC46-SS05	Lead	0.9	%D ≤ 10
AOC53-SW11	Lead	5.3	%D ≤ 10

- No PDS was required, as per the CSSA QAPP.

Two method blanks and several calibration blanks were analyzed in association with the lead analyses in this SDG. All blanks were free of lead at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All lead results for the samples in this SDG were considered usable. The completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

MERCURY

General

The mercury portion of this SDG consisted of eighteen (18) samples, including thirteen environmental soil samples, two MS/MSD pair, and one field duplicate. The samples were collected on February 2, 2005 and were analyzed for mercury using USEPA SW846 Method 7471A. The samples from site B2 did not require analysis for mercury.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples, and the MS/MSD samples. Samples AOC46-SS05 and AOC53-SW11 were both designated for MS/MSD analysis on the COC.

All LCS/LCSD and MS/MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples. The field duplicate analyte results were also reviewed for precision. Sample AOC53-BOT03 was collected in duplicate and the second jar from this location was submitted and analyzed as a field duplicate (FD).

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Both the parent and field duplicate results were non-detect for mercury, so the RPD calculation was not applicable.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. The samples were prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

One method blank and several calibration blanks were analyzed in association with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

The mercury results for all samples in this SDG were considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

TO19 DATA VERIFICATION SUMMARY REPORT
for samples collected from
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

Data Verification by: Katherine LaPierre and Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers soil samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on February 16, 2005. The samples in the following Sample Delivery Group (SDG) were analyzed for volatile organic compounds (VOCS), semivolatile organic compounds (SVOCs), pesticides and metals:

46616

The field quality control (QC) samples collected in association with this SDG included one matrix spike/matrix spike duplicate (MS/MSD) pair and one trip blank. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites. The trip blank was analyzed for volatiles only. The MS/MSD was analyzed for the same parameters as the parent sample.

All samples were collected by Parsons. All analyses were performed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by APPL at a temperature of 2.5°C which is within the 2-6°C range recommended by the QAPP.

This data verification report does not cover the waste characterization sample (AOC46-WC01) included on the chain of custody. Samples for waste characterization do not require data verification per the client's instructions. In addition, one sample (AOC53-BOT04) was analyzed for polychlorinated biphenyls (PCBs) because the analyst thought he recognized a PCB pattern for this sample when he reviewed the pesticide data. The sample was found not to contain any PCBs above the RL, so the PCB data was used as screening only and a detailed verification of the PCB analyses was not performed.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, version 1.0. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; cooler receipt form and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the CSSA QAPP, version 1.0, were met.

VOLATILES

General

The VOC portion of this SDG consisted of six (6) samples, including five soil samples and one trip blank. The samples were collected on February 16, 2005 and were analyzed for the full list of VOCs as specified in the CSSA QAPP. It should be noted that several analytes failed to meet criteria in the second source standard, requiring the data to be rejected (flagged "R"). The affected samples were recollected on March 10, 2005 and analyzed for the affected target analytes at no cost to the client. The recollected samples were reported in SDG 46805.

The VOC analyses were performed according to USEPA SW846 Method 8260B. All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The VOC analyses were performed in four analytical batches, three for soils and one for the water trip blank. The analyses were performed on four different instruments and each analytical batch was run using a separate ICAL.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) and LCS duplicate (LCSD) samples and the surrogate spikes. No VOC sample was designated for MS/MSD analysis on the COC.

Two batches contained an LCS only and two batches contained an LCS/LCSD pair. All analytes met criteria in the LCS/LCSD samples analyzed for soils except for the following:

AAB #	Analyte	%R	Criteria
050218AM-84348	1,3,5-Trimethylbenzene	250	62-135%
	2-Chlorotoluene	169	63-135%
	4-Chlorotoluene	220	64-135%

This LCS was only associated with sample AOC53-BOT05. All non-compliant analytes were recovered high and were non-detect in the sample, so no corrective action was necessary.

All analytes met criteria in the LCS/LCSD analyzed for the water batch, except for the following:

AAB #	Analyte	LCS %R	LCSD %R	Criteria
050302AS-84351	Bromomethane	131	130	72-125%

This LCS/LCSD pair was only associated with the trip blank. This compound was recovered slightly high in the LCS/LCSD and was not detected in the trip blank, so no corrective action was required.

All surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD concentrations.

All LCS/LCSD RPDs were within acceptance criteria, except for the following:

AAB #	Analyte	RPD	Criteria
050302AS-84351	Dichlorodifluoromethane	26.5	RPD \leq 20

This LCS/LCSD pair was only associated with the trip blank. This compound was not detected in the trip blank, so no corrective action was required

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during sample transit and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All instrument tune criteria were met.
- There were four initial calibrations (ICALs) associated with this SDG, three for soils and one for waters. All initial calibration criteria were met, except for the following: For AAB number 0502318AM-84348, the average response factor (RF) for bromoform did not meet the minimum requirement of 0.10. The RF for bromoform was 0.0638. For AAB number 050301AC-84359, the relative standard deviation (RSD) for methylene chloride exceeded the maximum criteria of 15% at 79%. All bromoform and methylene chloride results were flagged "R" as rejected in the associated samples.
- The LCS samples were prepared using a secondary source. All secondary source verification (SSV) criteria were met, except for the following:

AAB #	Analyte	%D	Criteria	Assoc. Samples
050226AC-84347	1,2,4-Trichlorobenzene	33	%D ≤ 25	AOC53-BOT04
050218AM-84348	1,3,5-Trimethylbenzene	150	%D ≤ 25	AOC53-BOT05
	2-Chlorotoluene	69		
	4-Chlorotoluene	120		
	Bromoform	26		
	Naphthalene	29		
	Vinyl chloride	39		
050301AC-74359	Methylene chloride	29	%D ≤ 25	AOC53-SW15
	trans-1,2-Dichloroethene	27		AOC53-SW16 AOC53-SW17
050302AS-84351	Bromomethane	31	%D ≤ 25	TB-1

All non-compliant analytes were flagged “R” as rejected in the associated samples in accordance with the CSSA QAPP. These samples (except the TB-1) were recollected and reanalyzed for the failing analytes.

- All continuing calibration verification criteria were met.
- All internal standard criteria were met.

Four method blanks and one Trip Blank were analyzed in association with the VOC analyses in this SDG. All blanks were free of target VOCs at or above the reporting limit (RL), with the following exceptions:

AAB #	Analyte	Conc.	RL
050302AS-84351	1,2,3-Trichlorobenzene	0.47 µg/L	0.3 µg/L
	Naphthalene	0.41 µg/L	0.4 µg/L

This method blank was associated with the Trip Blank only. The trip blank was non-detect for both analytes, so no corrective action was necessary.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All VOC results for the samples in this SDG were considered usable, with the exception of 14 data points rejected due to analytes that failed ICAL and/or SSV criteria. Therefore, the completeness of the VOC portion of this SDG is 96.1%, which meets the minimum acceptance criteria of 90%.

SEMIVOLATILES

General

The SVOC portion of this SDG consisted of five (5) soil samples. These samples were collected on February 16, 2005 and were analyzed for the full list of SVOCs as listed in the CSSA QAPP.

The SVOC analyses were performed according to USEPA SW846 Method 8270C. All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS sample and the surrogate spikes. No SVOC sample was designated for MS/MSD analysis on the COC.

All LCS and surrogate spike recoveries were within acceptance criteria.

Precision

Precision could not be evaluated for the SVOC portion of this SDG since no duplicate analyses were performed.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All instrument tune criteria were met.
- All initial calibration criteria were met.
- All secondary source criteria were met.
- All continuing calibration verification criteria were met.
- All internal standard criteria were met.

One method blank was analyzed in association with the SVOC analyses in this SDG. The blank was free of target SVOCs at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All SVOC results for the samples in this SDG were considered usable. Therefore, the completeness of the SVOC portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

PESTICIDES

General

The pesticide portion of this SDG consisted of five (5) environmental soil samples. The samples were collected on February 16, 2005 and were analyzed for the full list of pesticides as specified in the CSSA QAPP.

The pesticide analyses were performed according to USEPA SW846 Method 8081A. All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS sample and the surrogate spikes.

All LCS and surrogate percent recoveries were within acceptance criteria.

Precision

Precision could not be evaluated for the pesticide portion of this SDG since no duplicate analyses were performed.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blank for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All breakdown check criteria were met.
- All initial calibration criteria were met. The laboratory provided information for both columns.
- All second source verification criteria were met. The standards analyzed immediately following the ICALs were prepared using a secondary source.
- All calibration verification criteria were met.

One method blank was analyzed in association with the pesticide analyses in this SDG. The blank was free of target pesticides at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All pesticide results for the samples in this SDG were considered usable. The completeness of the pesticide portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

ICP METALS

General

The ICP metals portion of this SDG consisted of twenty-one (21) samples, including nineteen environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for barium, chromium, copper, nickel, and zinc. Not all samples were analyzed for all metals.

The ICP metals analyses were performed using USEPA SW846 Method 6010B. The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The samples in this SDG were analyzed in three different batches.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD samples and the MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

There were three LCS/LCSD pair analyzed, one for each batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPDs obtained from the LCS/LCSD and the MS/MSD concentrations.

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- Three ICALs were analyzed for ICP metals. All initial calibration criteria were met.
- All second source verification criteria were met. The initial calibration verification was prepared using a secondary source.
- All continuing calibration verification criteria were met, except for the following:

CCV Date & Time	Metal	%D	Criteria
21-Feb-05 21:35	Zinc	13.0	%D ≤ 10
21-Feb-05 22:38	Zinc	18.2	%D ≤ 10

All samples associated with the CCV analyzed at 22:38 were reanalyzed with passing CCVs for zinc. Several samples were associated with the CCV analyzed at 21:35 and were not reanalyzed. All samples associated with this CCV had detections of zinc above the RL. However, because this CCV was only slightly outside criteria (3% low) and the CCV analyzed immediately prior to these samples met criteria, rejection of the data was deemed unnecessary. Conversations were held with Dr. Joe Fernando of Portage Environmental, Inc. and, based on the professional opinions of Portage and Parsons, the zinc results for the samples associated with the CCV of 21-Feb-05 21:35 were flagged “J” as estimated. The zinc results for these samples may exhibit a slight low bias, but the data is considered usable.

- All interference check criteria were met.
- The initial calibrations were analyzed using multiple points and the low point was below the RL for all metals, so no RL check standard was necessary.
- A dilution test (DT) was analyzed on samples AOC46-BOT01 and BLDG43-SW08 for all metals. A DT was analyzed on sample BLDG43-SW10 for copper only. All metals met DT criteria, except for the following:

AAB #	Sample ID	Metal	%D	Criteria
050218A-83966	AOC46-BOT01	Barium	13.0	%D ≤ 10
050223A-84060	BLDG43-SW08	Barium	12.0	%D ≤ 10
		Nickel	18.8	
		Zinc	10.9	

Barium met criteria in the MS/MSD analyzed for AAB number 050218A-83966, so the barium results for all samples analyzed in this AAB were flagged “J” as estimated due to the failing DT. The only sample analyzed in AAB 050223A-84060 was the parent sample for the DT. The results for the non-compliant metals were flagged “M” in sample BLDG43-SW08 in accordance with the CSSA QAPP.

- No post digestion spike was required, as per the CSSA QAPP.

Three method blanks and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of target metals at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP metals results for the samples in this SDG were considered usable. The completeness for the ICP metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

ARSENIC

General

The arsenic portion of this SDG consisted of seventeen (17) samples, including fifteen environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for arsenic using USEPA SW846 Method 7060A.

The samples were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted that sample BLDG43-SW07 required a 2x dilution due to the high concentration of arsenic present.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD and MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

The MS met criteria, but the MSD failed to meet criteria as follows:

Metal	MS %R	MSD %R	Criteria
Arsenic	79.6	72.4	74-120%

All sample results for arsenic were flagged “M” due to the low bias demonstrated by the MSD recovery.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD concentrations.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The sample in this SDG was analyzed following the COC and the analytical procedures described in the CSSA QAPP. The sample was prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met.
- A DT was performed on sample AOC46-BOT01. The DT met criteria for arsenic with a %D of 4.6.
- No PDS was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the arsenic analyses in this SDG. All blanks were free of arsenic at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

The arsenic result for the sample in this SDG was considered usable. The completeness for the arsenic portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

CADMIUM

General

The cadmium portion of this SDG consisted of seventeen (17) samples, including fifteen environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for cadmium using USEPA SW846 Method 7131A.

The samples were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted that several samples required dilution due to the high concentration of cadmium present.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD and MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

The MS/MSD recoveries failed to meet criteria as follows:

Metal	MS %R	MSD %R	Criteria
Cadmium	73.3	60.0	80-122%

All sample results for cadmium were flagged “M” due to the low bias demonstrated by the MS/MSD recoveries.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD concentrations.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The sample in this SDG was analyzed following the COC and the analytical procedures described in the CSSA QAPP. The sample was prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met.
- A DT was performed on sample AOC46-BOT01 but was not applicable because this sample did not contain cadmium at a concentration greater than 25x the MDL.
- No PDS was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the cadmium analyses in this SDG. All blanks were free of cadmium at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

The cadmium result for the sample in this SDG was considered usable. The completeness for the cadmium portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

LEAD

General

The lead portion of this SDG consisted of nineteen (19) samples, including seventeen (17) environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for lead using USEPA SW846 Method 7421.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted that all but two of the samples required a dilution due to the high levels of lead present.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD and MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

The MS/MSD recoveries failed to meet criteria as follows:

Metal	MS %R	MSD %R	Criteria
Lead	-369	-381	74-124%

The anomalous recoveries were due to the low spike amount (2.5 mg/kg) relative to the parent sample concentration (107 mg/kg). All sample results for lead were flagged "M" in accordance with the CSSA QAPP.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD concentrations.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blank for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met. Two ICALs were analyzed for lead.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met.
- A dilution test was analyzed on sample AOC46-BOT01. The %D for lead exceeded criteria ($\%D \leq 10$) at 12.1%. All sample results for lead were previously flagged “M” due to the non-compliant MS/MSD recoveries, so no additional corrective action was necessary.
- No PDS was required, as per the CSSA QAPP.

One method blank and several calibration blanks were analyzed in association with the lead analyses in this SDG. All blanks were free of lead at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All lead results for the samples in this SDG were considered usable. The completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

MERCURY

General

The mercury portion of this SDG consisted of eighteen (18) samples, including sixteen (16) environmental soil samples and one MS/MSD pair. The samples were collected on February 16, 2005 and were analyzed for mercury using USEPA SW846 Method 7471A.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The samples in this SDG were analyzed in two batches.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS/LCSD and MS/MSD samples. Sample AOC46-BOT01 was designated for MS/MSD analysis on the COC.

Two LCS/LCSD pair were analyzed for mercury, one for each batch. All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD concentrations.

All LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. The samples were prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

Two method blanks and several calibration blanks were analyzed in association with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All mercury results for the samples in this SDG were considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.