

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 and rock samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on December 29, 2003. The samples in the following Sample Delivery Group (SDG) were analyzed for volatile organic compounds (VOCs) and metals:

43447

The only field quality control (QC) sample collected in association with this SDG was 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.

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 6.0° C which is within the 2-6° C range recommended by the QAPP.

The Demo Dud samples (designated by the sample IDs starting with "DD") are not applicable for site closure. The demo dud site was over-excavated after this sampling event and all soil was disposed of off-site. However, because all the samples were submitted and analyzed together as a group, all data in this SDG was reviewed and included for submittal, regardless of sampling location.

The samples in this SDG consisted of two matrices, rock and soil, as follows:

ROCK	SOIL
DD-BOT1	AOC54-BOT01
DD-BOT2	AOC54-SW01
DD-BOT3	AOC54-SW02
DD-SW02	AOC54-SW03
DD-SW03	AOC54-SW04
DD-SW04	DD-SW01
DD-SW07	DD-SW05
DD-SW08	DD-SW06
DD-SW10	DD-SW09
DD-SW11	

The samples were divided into these two matrix groups for the purposes of flagging.

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; 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.

VOLATILES

General

The VOC portion of this SDG consisted of fifteen (15) environmental soil and rock samples. The samples were collected on December 29, 2003 and were analyzed for Toluene only according to the United States Environmental Protection Agency (USEPA) SW846 Method 8260B. Only samples from the DD area required analysis for Toluene.

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 samples in this SDG were run in three analytical batches (two for soil and one for water) on two different instruments.

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 sample was designated for MS/MSD analysis on the COC.

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

All surrogate spike recoveries were within acceptance criteria, except for the following:

Sample ID	Surrogate	%R	Criteria
DD-SW11	1,2-Dichloroethane-D4	152	52-149%

The high surrogate recovery was due to the low internal standard response for this sample. Since the surrogate was recovered high and toluene was non-detect in this sample, no corrective action was necessary.

Precision

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

All three 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 field and laboratory blanks for cross contamination of samples during shipment or 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. There were two ICALs for this SDG, one for soils and one for waters.
- All second source verification criteria were met. The ICV samples were analyzed using a secondary source.
- All calibration verification criteria were met. No CCV data was reported for waters because the ICAL was analyzed in the same batch as the samples.
- All internal standard criteria were met, except for the following:

Sample ID	Internal Standard	Area	Lower Limit
DD-SW01	1,4-Dichlorobenzene-D4	197380	205708
DD-SW04	1,4-Dichlorobenzene-D4	197402	205708
DD-SW11	Fluorobenzene	576252	605725
	Chlorobenzene-D5	405787	429430
	1,4-Dichlorobenzene-D4	183019	205708

A low internal standard response results in a high bias for analyte results. Toluene is quantitated against the internal standard Fluorobenzene, so the low response for the other internal standards did not affect the data. Only sample DD-SW11 had a low response for Fluorobenzene and toluene was non-detect in this sample, so no corrective action was necessary. It should be noted that the lab reanalyzed the samples with failing internal standards and similar results were obtained.

- All manual integrations were verified and approved.

Three method blanks (two soils and one water) and one trip blank were analyzed in association with the VOC analyses in this SDG. Toluene was not detected at or above the RL in any of the blanks.

Completeness

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

All Toluene results for the samples in this SDG were considered usable. The completeness of the VOC 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 five (5) environmental soil samples. The samples were collected on December 29, 2003 and were analyzed for a reduced list of ICP metals, which included barium, chromium copper and nickel. Only the samples from AOC54 required 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. The 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. 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 was prepared using a secondary source.
- All interference check criteria were met.
- A dilution test (DT) was analyzed on sample AOC54-SW04. All metals except Nickel met tolerance in the DT as follows:

Metal	%D	Criteria
Barium	2.3	%D ≤ 10
Chromium	5.3	
Copper	0.7	
Nickel	13.8	

No MS/MSD was available for this SDG, so all nickel results were flagged “M” in accordance with the CSSA QAPP.

- The laboratory also analyzed a post digestion spike (PDS) on sample AOC54-SW04. 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 five (5) environmental soil samples. The samples were collected on December 29, 2003 and were analyzed for arsenic using USEPA SW846 Method 7060A. Only the samples collected from AOC54 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.

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.

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 was prepared using a secondary source.
- The dilution test (DT) was analyzed on sample AOC54-SW04. Arsenic met criteria with a %D of 3.0.
- 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.

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 five (5) environmental soil samples. The samples were collected on December 29, 2003 and were analyzed for cadmium using USEPA SW846 Method 7131A. Only samples from AOC54 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.

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.

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 was prepared using a secondary source.
- The dilution test was analyzed on sample AOC54-SW04 and met criteria with a %D of 1.9.
- 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.

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 five (5) environmental soil samples. The samples were collected on December 29, 2003 and were analyzed for lead using USEPA SW846 Method 7421. Only the samples collected from AOC54 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 that all five samples 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.

Both 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 was prepared using a secondary source.

- A dilution test was analyzed on sample AOC54-SW04 and met criteria with a %D of 9.8. It should be noted that although the final dilution for this sample was 10x, the dilution test was evaluated using the 5x and 25x dilutions.
- 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 five (5) environmental soil samples. The samples were collected on December 29, 2003 and were analyzed for mercury using USEPA SW846 Method 7471A. Only the samples collected from AOC54 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. 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.

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. 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%.

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CAMP STANLEY STORAGE ACTIVITY
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Data Verification by: Tammy Chang and Katherine LaPierre
Parsons - Austin

INTRODUCTION

The following data verification summary report covers soil and rock samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on March 18, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for semivolatile organic compounds (SVOCs) and metals:

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The only field quality control (QC) sample collected in association with this SDG were two field duplicate (FD) samples. 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.

The samples in this SDG consisted of two matrices, rock and soil, as follows:

ROCK	SOIL
B29-SW01	AOC54-BOT02
B29-SW02	AOC54-SW05
B29-SW03	DD-SW12
B29-SW04	DD-SW15
B29-SW05	DD-SW17
B29-SW05 (DUP)	
B29-SW06	
DD-BOT04	
DD-BOT05	
DD-SW13	
DD-SW14	
DD-SW16	
DD-SW16 (DUP)	
DD-SW18	
DD-SW19	

The samples were divided into these two matrix groups for the purposes of flagging.

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; 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.

SEMIVOLATILES (SVOCs)

General

The SVOC portion of this SDG consisted of nine (9) samples, including six environmental soil and rock samples, one field duplicate and one MS/MSD pair. The samples were collected on March 18, 2004 and were analyzed for SVOCs 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) sample, the MS/MSD samples and the surrogate spikes. Sample B29-SW06 (rock) was designated for MS/MSD analysis on the COC.

All LCS and surrogates recoveries were within acceptance criteria.

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

Analyte	MS %R	MSD %R	Criteria
Benzoic Acid	6.3	7.4	25-172%

All sample results for benzoic acid were flagged "M" due to the low bias demonstrated by the MS/MSD.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD and field duplicate analyte results. Sample B29-SW05 was collected in duplicate. The second jar for this sample was submitted and analyzed as a field duplicate.

All MS/MSD RPDs were within acceptance criteria.

The RPD could not be evaluated for the field duplicate pair because all analytes were below the RL.

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.
- 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. No target SVOCs were detected at or above the RL in the method blank.

Completeness

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

All SVOCs results for the samples in this SDG were considered usable. The completeness of the SVOCs 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 sixteen (16) samples, including twelve environmental soil and rock samples, two field duplicates and one MS/MSD pair. The samples were collected on March 18, 2004 and were analyzed for a reduced list of ICP metals. The samples were analyzed for one or more of the following metals: chromium, copper, nickel, and zinc. Each sample has its own specific target list for 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. The samples were prepared and analyzed in two batches and within the holding time required by the method.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW06 (rock) was designated for MS/MSD analysis on the COC.

Two LCS/LCSD pair were analyzed for ICP metals. All LCS/LCSD and MS/MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD samples and the field duplicate analyte results. Sample B29-SW05 and sample DD-SW16 were collected in duplicate. The second jar for each sample was submitted and analyzed as a field duplicate.

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

For the field duplicate pair analyzed on sample B29-SW05, the RPDs for chromium and zinc could not be calculated because these metals were below the RL in both the parent and field duplicate. The RPD for nickel met criteria as follows:

Metal	B29-SW05 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Nickel	3.62	3.42	5.7	RPD \leq 20

For the field duplicate pair analyzed on sample DD-SW16, the RPD for copper met criteria, but the RPD for zinc exceeded criteria as follows:

Metal	DD-SW16 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Copper	17.17	15.83	8.1	RPD \leq 20
Zinc	17.36	13.59	24.4	

All zinc results above the RL were flagged "J" due to the high field duplicate 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. All samples were prepared and analyzed within the holding time required by the method.

- The instrument was calibrated twice on March 24, 2004 due to instrument drift. All initial calibration criteria were met for both initial calibration curves (ICALs).

- 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 ICV was injected after the first ICAL only since both calibrations were analyzed on the same day.
- All interference check criteria were met.
- No dilution test (DT) was required for analytical batch 040323A-74363 since no target metals were detected at a level greater than 50 times MDLs.
- A DT was required for analytical batch 040323A-74364 since both copper and zinc were detected above 50 times the MDL in one or more samples in this analytical batch. The DT was performed with sample DD-SW18. Both copper and zinc had non-compliant recoveries, as follows:

Metal	%D	Criteria
Copper	32.5	%D ≤ 10
Zinc	15.2	

No MS/MSD was available for this analytical batch, so all copper and zinc results were flagged “M” for the samples in this batch in accordance with the CSSA QAPP.

- No PDS was required as per the CSSA QAPP.

Two 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 nine (9) samples, including six (6) environmental rock samples, one field duplicate and one MS/MSD pair. The samples were collected on March 18, 2004 and were analyzed for arsenic using USEPA SW846 Method 7060A.

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 sample B29-SW05 required a 2x dilution due to the high level of arsenic present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW06 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 and MS/MSD samples, and the field duplicate analyte results. Sample B29-SW05 was collected in duplicate. The second jar for this sample was submitted and analyzed as a field duplicate.

All LCS/LCSD, MS/MSD and field duplicate 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.
- The DT was analyzed on sample B29-SW06. Arsenic failed to meet the criteria ($\%D \leq 10$) with a %D of 13.2. Because the MS/MSD met criteria for this metal, all arsenic results were flagged “J” in accordance with the CSSA QAPP.
- 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.

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%.

LEAD

General

The lead portion of this SDG consisted of twenty-two (22) samples, including eighteen (18) environmental soil and rock samples, two field duplicates and one MS/MSD pair. The samples were collected on March 18, 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 in two analytical batches and within the holding time required by the method.

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

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD and MS/MSD samples. Sample B29-SW06 (rock) was designated for MS/MSD analysis on the COC.

Two LCS/LCSD pair were analyzed for lead. All LCS/LCSD recoveries were within acceptance criteria.

The lead recovery was slightly above tolerance in the MS, but met criteria in the MSD as follows:

Analyte	MS %R	MSD %R	Criteria
Lead	126	88.4	74-124%

All lead results for the rock samples in this SDG were flagged “M” in accordance with the CSSA QAPP.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD and MS/MSD samples, and the field duplicate analyte results. Samples B29-SW05 and DD-SW16 were both collected in duplicate. The second jar for each sample was submitted and analyzed as a field duplicate.

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

For the field duplicate pair analyzed on sample B29-SW05, the RPD for lead met criteria as follows:

Metal	B29-SW05 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Lead	3.76	4.08	8.2	RPD ≤ 25

For the field duplicate pair analyzed on sample DD-SW16, the RPD for lead exceeded criteria as follows:

Metal	DD-SW16 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Lead	370.18	104.10	112.2	RPD ≤ 25

All lead results above the RL were flagged “J” due to the high field duplicate RPD, unless previously flagged “M” (since the “M” flag supercedes the “J” flag in the CSSA QAPP flag hierarchy).

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.

- There were two initial calibration curves analyzed for lead. Both curves met all initial calibration criteria.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The two ICV samples (one for each ICAL) were prepared using a secondary source.
- Two dilution tests were analyzed. The DT run on sample B29-SW06 was evaluated using the 2x and 10x dilutions. The DT run on sample DD-SW19 was evaluated using the undiluted result and the 5x dilution. Both DTs met criteria for lead.
- 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 seven (7) samples, including six (6) environmental soil and rock samples and one filed duplicate. The samples were collected on March 18, 2004 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.

It should be noted that sample DD-SW17 required a 5x dilution due to the high level of mercury 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 results. Sample DD-SW16 was collected in duplicate. The second jar for this sample was submitted and analyzed as a field duplicate.

The LCS/LCSD RPD was within acceptance criteria.

The field duplicate RPD for sample DD-SW16 exceeded criteria as follows:

Analyte	DD-SW16 Result (mg/kg)	FD Result (mg/kg)	RPD	Criteria
Mercury	0.56	0.76	30	RPD \leq 25

All mercury results above the RL were flagged "J" due to the high 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%.