16953

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

DATE : January 30, 1989

SUBJECT: Inorganic Data Validation for the Eastern Diversified Metals Site
Case 10699

FROM : Theresa A. Simpson TAS
Region III Acting ESAT DPO (3ES23)

TO : Suzanne Billings
Regional Project Manager (3HW12)

THRU : Pat Krantz
Chief, QA Section (3ES23)

Attached is the inorganic data review for the Eastern Diversified Metals Site (Case 10699) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

If you have questions regarding this review, please call me.

Attachment

cc: Mark diFeliciantonio, CDM (w/attachments)
Virginia Nicholas, GCL (w/attachments)
Elaine Spiewak (3HW10) (w/o attachments)
File: TID 03881211 Task #1440

WESTON
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DATE: January 18, 1989

SUBJECT: INORGANIC DATA VALIDATION, CASE 10699
SITE: EASTERN DIVERSIFIED METALS SITE

FROM: MAHBOOBEH MECANIC MM
ESAT SENIOR INORGANIC DATA REVIEWER

TO: TERRY SIMPSON
ACTING ESAT DEPUTY PROJECT OFFICER

THRU: CHARLES MATKOVICH
ESAT TEAM MANAGER CM

OVERVIEW

The set of samples for Case 10699 contained five (5) soil samples, which were analyzed through the Contract Laboratory Program (CLP) Routine Analytical Services. The sample set contained one (1) field duplicate pair.

The action level (10-day health advisory limit) was exceeded for the Pb analyte in samples MCX952 and MCX961.

SUMMARY

All analytes were successfully analyzed in all samples. Areas of concern with respect to data usability are listed according to the seriousness of the problem. These include:

MINOR ISSUES

The preparation blank had a reported result that was > IDL for the Na analyte. The reported results for the Na analyte which are < 5X the blank concentration may be biased high and, therefore, have been qualified "B".

The field duplicate had a result outside of the control limit (±2X CRDL) for the Cr analyte. Therefore, the reported results for the Cr analyte in the samples have been qualified estimated, "J".

The laboratory duplicate had results outside of the control limits (RPD >35% or ±2X CRDL) for the Cu and Ni analytes. Therefore, the reported results for the Cu and Ni analytes in the samples have been qualified estimated, "J".

The percent difference (%D) of the serial dilution was greater than the 10% limit for the Cu analyte. Therefore, the reported results for the Cu analyte in the samples have been qualified estimated, "J".

The matrix spike recovery was low for the Sb analyte. The quantitation limits and reported results for the Sb analyte in the samples may be biased low and, therefore, have been qualified "UL" and "L", respectively.

Duplicate method of standared addition (MSA) analyses were performed for the As analyte in sample MCX952. Both correlation coefficients of the MSAs were <.995. Therefore, the reported result for As in sample MCX952 has been qualified estimated, "J".

The analytical spike recovery was high for the Se analyte in the sample MCX953. The reported result for Se in sample MCX953 may be biased high and, therefore, has been qualified "K".

NOTES

The data was reviewed according to the National Functional Guidelines for Evaluating Inorganic Analyses.

INFORMATION REGARDING REPORT CONTEN

Table 1A is a summary of qualifiers added to the laboratory's results during evaluation.

ATTACHMENTS

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN
TABLE 2	GLOSSARY OF DATA QUALIFIER CODES
TABLE 3	DATA SUMMARY FORM
APPENDIX A	RESULTS REPORTED BY LABORATORY FORM I
APPENDIX B	DPO REPORT

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TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY
AFTER DATA VALIDATION

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
Sb	All samples	L	UL	Low	A (44%)
As	MCX952	J			B
Cr	All samples	J			C (±4.0 ppm)
Cu	All samples	J			D (40%) E (14%)
Ni	All samples	J			D (±18.4 ppm)
Se	MCX953	K		High	F (117%)
Na	All samples	B		High	G (44 ppm)

* See explanation of comments in Table 1B

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TABLE 1B

CODES USED IN COMMENTS COLUMN

A = Due to a low matrix spike recovery (% recovery in parentheses), the quantitation limits and reported results may be biased low.

B = Both MSA correlation coefficients were <.995, therefore, the reported result is estimated.

C = The field duplicate result was outside the control limit, ±2X CRDL, (2X CRDL in parentheses). Therefore, the reported results are estimated.

D = The laboratory duplicate result was outside the control limits, RPD >35% or ±2X CRDL, (relative percent difference or 2X CRDL in parentheses). Therefore, the reported results are estimated.

E = The percent difference (%D) of the serial dilution was greater than the 10% limit (%D in parentheses). Therefore, the reported results are estimated.

F = Due to a high analytical spike recovery (% recovery in parentheses), the reported result may be biased high.

G = The preparation blank had a result > IDL (the result is in parentheses) and the reported results were < 5X the blank. The reported results may be biased high.

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TABLE 2

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION
(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Table 3

DATA SUMMARY FORM: I N O R G A N I C S

Site Name: Eastern Diversified Metals Site

SOIL SAMPLES (mg/Kg)

Case #: 10699 Sampling Date(s): 10/27/88

+Due to dilution, sample quanitation limit is affected. See dilution table for specifics.

AR300598

CRDL	ANALYTE	MCX952		MCX953		MCX960		MCX961		MCX962	
	Dilution Factor	1		1		1		1		1	
	% Solids	82.5		79.6		80.8		87.2		83.7	
	Location	SS-8		SS26 Duplicate of MCX960		SS33 Duplicate of MCX953		SS14		SS18	
40	Aluminum	14200		8730		7880		13000		11700	
12	Antimony	20.8	L		UL		UL	22.9	L		UL
2	Arsenic	3.8	J	4.4		4.1		4.5		3.6	
40	Barium	[47.6]		[33.4]		[33.4]		81.5		[40.0]	
1	Beryllium	[0.34]		[0.23]		[0.25]		[0.32]		[0.33]	
1	Cadmium	1.6						6.8			
1000	Calcium	1780		[73.8]		[71.6]		1180		[697]	
2	Chromium	9.7	J	22.4	J	5.4	J	9.9	J	13.0	J
10	Cobalt	[11.9]		[5.0]		[4.0]		[8.1]		12.8	
5	Copper	14000	J	49.5	J	35.0	J	11000	J	98.6	J
20	Iron	6850		8100		7590		15400		16500	
1	*Lead	557		27.4		33.5		2160		20.1	
1000	Magnesium	[1020]		[378]		[284]		1210		1740	
3	Manganese	558		1190		1080		371		359	
0.2	Mercury										
8	Nickel	10.4	J	28.6	J	[4.9]	J	26.1	J	51.1	J
1000	Potassium	[359]		[416]		[321]		[417]		[387]	
1	Selenium			[0.35]	K	[0.59]		[0.32]			
2	Silver	[1.3]						2.9			
1000	Sodium	[57.3]	B	[48.4]	B	[49.8]	B	[51.9]	B	[49.1]	B
2	Thallium										
10	Vanadium	[10.4]		15.5		14.5		14.2		18.3	
4	Zinc	459		28.0		25.0		1240		120	
2	Cyanide										

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 12/88

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APPENDIX A

RESULTS REPORTED BY LABORATORY

FORM I'S

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX952

Lab Name: KEYSTONE-MONROEVILLE Contract: 68-W8-0025

Lab Code: KEYPA Case No.: 10699 SAS No.: SDG No.: MCX952

Matrix (soil/water): SOIL Lab Sample ID: MCX952

Level (low/med): LOW Date Received: 10/29/88

% Solids: 82.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14200.00		*	P
7440-36-0	Antimony	20.80		N	P
7440-38-2	Arsenic	3.80		+	F
7440-39-3	Barium	47.60	B		P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	1.60			P
7440-70-2	Calcium	1780.00			P
7440-47-3	Chromium	9.70		*	P
7440-48-4	Cobalt	11.90	B		P
7440-50-8	Copper	14000.00		*E	P
7439-89-6	Iron	6850.00			P
7439-92-1	Lead	557.00			P
7439-95-4	Magnesium	1020.00	B		P
7439-96-5	Manganese	558.00			P
7439-97-6	Mercury	0.12	U		CV
7439-02-0	Nickel	10.40		*	P
7440-09-7	Potassium	359.00	B		P
7782-49-2	Selenium	0.32	U		F
7440-22-4	Silver	1.30	B		P
7440-23-5	Sodium	57.30	B		P
7440-28-0	Thallium	0.48	U		F
7440-62-2	Vanadium	10.40	B		P
7440-66-6	Zinc	459.00			P
	Cyanide	0.61	U		AS

Color Before: RED/BROWN Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: Artifacts: YES

Comments:
SAMPLE CONTAINS SOME ROCKS

AR301600

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX953

Lab Name: KEYSTONE-MONROEVILLE Contract: 68-W8-0025

Lab Code: KEYPA Case No.: 10699 SAS No.: SDG No.: MCX952

Matrix (soil/water): SOIL Lab Sample ID: MCX953

Level (low/med): LOW Date Received: 10/29/88

% Solids: 79.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8730.00		*	P
7440-36-0	Antimony	5.30	U	N	P
7440-38-2	Arsenic	4.40			F
7440-39-3	Barium	33.40	B		P
7440-41-7	Beryllium	0.23	B		P
7440-43-9	Cadmium	0.73	U		P
7440-70-2	Calcium	73.80	B		P
7440-47-3	Chromium	22.40		*	P
7440-48-4	Cobalt	5.00	B		P
7440-50-8	Copper	49.50		*E	P
7439-89-6	Iron	8100.00			P
7439-92-1	Lead	27.40			F
7439-95-4	Magnesium	378.00	B		P
7439-96-5	Manganese	1190.00			P
7439-97-6	Mercury	0.13	U		CV
7439-02-0	Nickel	28.60		*	P
7440-09-7	Potassium	416.00	B		P
7782-49-2	Selenium	0.35	B	W	F
7440-22-4	Silver	1.20	U		P
7440-23-5	Sodium	48.40	B		P
7440-28-0	Thallium	0.50	U	W	F
7440-62-2	Vanadium	15.50			P
7440-66-6	Zinc	28.00			P
	Cyanide	0.63	U		AS

Color Before: DRK [illegible] arity Before: Texture: FINE

Color After: GRAY [illegible] arity After: Artifacts:

Comments:
LEAD NEEDED 2x DILUTION

AR301601

FORM I - IN 7/87

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX960

Lab Name: KEYSTONE-MONROEVILLE Contract: 68-W8-0025

Lab Code: KEYPA Case No.: 10699 SAS No.: SDG No.: MCX952

Matrix (soil/water): SOIL Lab Sample ID: MCX960

Level (low/med): LOW Date Received: 10/29/88

% Solids: 80.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7880.00		*	P
7440-36-0	Antimony	5.20	U	N	P
7440-38-2	Arsenic	4.10			F
7440-39-3	Barium	33.40	B		P
7440-41-7	Beryllium	0.25	B		P
7440-43-9	Cadmium	0.72	U		P
7440-70-2	Calcium	71.60	B		P
7440-47-3	Chromium	5.40		*	P
7440-48-4	Cobalt	4.00	B		P
7440-50-8	Copper	35.00		*E	P
7439-89-6	Iron	7590.00			P
7439-92-1	Lead	33.50			P
7439-95-4	Magnesium	284.00	B		P
7439-96-5	Manganese	1080.00			P
7439-97-6	Mercury	0.12	U		CV
7439-02-0	Nickel	4.90	B	*	P
7440-09-7	Potassium	321.00	B		P
7782-49-2	Selenium	0.59	B		F
7440-22-4	Silver	1.20	U		P
7440-23-5	Sodium	49.80	B		P
7440-28-0	Thallium	0.50	U		F
7440-62-2	Vanadium	14.50			P
7440-66-6	Zinc	25.00			P
	Cyanide	0.62	U		AS

Color Before: DRK BROWN Clarity Before: Texture: FINE

Color After: DRK BROWN Clarity After: Artifacts:

Comments:

AR301602

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX961

Lab Name: KEYSTONE-MONROEVILLE Contract: 68-W8-0025

Lab Code: KEYPA Case No.: 10699 SAS No.: SDG No.: MCX952

Matrix (soil/water): SOIL Lab Sample ID: MCX961

Level (low/med): LOW Date Received: 10/29/88

% Solids: 87.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13000.00		*	P
7440-36-0	Antimony	22.90		N	P
7440-38-2	Arsenic	4.50			F
7440-39-3	Barium	81.50			P
7440-41-7	Beryllium	0.32	B		P
7440-43-9	Cadmium	6.80			P
7440-70-2	Calcium	1180.00			P
7440-47-3	Chromium	9.90		*	P
7440-48-4	Cobalt	8.10	B		P
7440-50-8	Copper	19000.00		*E	P
7439-89-6	Iron	15400.00			P
7439-92-1	Lead	2160.00			P
7439-95-4	Magnesium	1210.00			P
7439-96-5	Manganese	371.00			P
7439-97-6	Mercury	0.11	U		CV
7439-02-0	Nickel	26.10		*	P
7440-09-7	Potassium	419.00	B		P
7782-49-2	Selenium	0.32	B		F
7440-22-4	Silver	2.90			P
7440-23-5	Sodium	51.90	B		P
7440-28-0	Thallium	0.46	U		F
7440-62-2	Vanadium	14.20			P
7440-66-6	Zinc	1240.00			P
	Cyanide	0.57	U		AS

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
SAMPLE CONTAINS MANY ROCKS
COPPER NEEDED 5x DILUTION

AR301603

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX962

Lab Name: KEYSTONE-MONROEVILLE Contract: 68-W8-0025

Lab Code: KEYPA Case No.: 10699 SAS No.: SDG No.: MCX952

Matrix (soil/water): SOIL Lab Sample ID: MCX962

Level (low/med): LOW Date Received: 10/29/88

% Solids: 83.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11700.00		*	P
7440-36-0	Antimony	5.00	U	N	P
7440-38-2	Arsenic	3.60			F
7440-39-3	Barium	40.00	B		P
7440-41-7	Beryllium	0.33	B		P
7440-43-9	Cadmium	0.69	U		P
7440-70-2	Calcium	697.00	B		P
7440-47-3	Chromium	13.00		*	P
7440-48-4	Cobalt	12.80			P
7440-50-8	Copper	98.60		*E	P
7439-89-6	Iron	16500.00			P
7439-92-1	Lead	20.10			F
7439-95-4	Magnesium	1740.00			P
7439-96-5	Manganese	359.00			P
7439-97-6	Mercury	0.12	U		CV
7439-02-0	Nickel	51.10		*	P
7440-09-7	Potassium	387.00	B		P
7782-49-2	Selenium	0.31	U		F
7440-22-4	Silver	1.10	U		P
7440-23-5	Sodium	49.10	B		P
7440-28-0	Thallium	0.48	U		F
7440-62-2	Vanadium	18.30			P
7440-66-6	Zinc	120.00			P
[illegible]	[illegible]de	0.60	U		AS
[illegible]					

Color Before: [illegible]arity Before: Texture: FINE

Color After: [illegible]arity After: Artifacts: YES

Comments:
SAMPLE CONTAINS SOME ROCKS
LEAD NEEDED 2x DILUTION

AR301604

APPENDIX B
DPO REPORT

INORGANIC DATA VALIDATION SUMMARY

Date Review Completed 1/18/88
Case No. 10699 SAS No.
Site Name Eastern Diversified Metals Site
Sample Nos. MCX952, MCX953, MCX960 - MCX962

Contract Lab Keystone Environmental Res. Inc.
Contract No. 68-01-0025
Lab DPO Chuck Sands
Reviewer Mahboobeh McCanic
from Region III Phone (301) 266-9887
FTS

MATRIX	CONCENTRATION low	med	high	MATRIX RELATED COMMENTS
soil/sediment	5			
aqueous				
other				

ICP	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blanks		✓		Al (123 ppb), Ca (106 ppb), Cu (3.1 ppb), Fe (61.8 ppb), +
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank		✓		Ca (137 ppm), Cu (4.02 ppm), Fe (7.8 ppm), Na (44 ppm)
Interference Check Sample	✓			
Lab Control Sample	✓			
Lab Duplicate		✓		Cu (40%), Ni (I 18.4 ppm), Al (20.8%), Cr (±2.3
Matrix Spike		✓		Sb (44%)
Serial Dilution		✓		Cu (14.3%)

FURNACE	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blanks	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank		✓		Pb (0.34 ppm)
Lab Control Sample	✓			
Lab Duplicate	✓			
Matrix Spike	✓			
Duplicate Injections	✓			
Analytical Spike		✓		As (both MSA <0.995), Se (117%), Tl (117%)

MERCURY & CYANIDE	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blank	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank	✓			
Lab Duplicate	✓			
Matrix Spike	✓			

REVIEWER'S COMMENTS:

+ Mg (116.9 ppb), Ag (5.6, 9.0 ppb), Zn (2.5 ppb), Sb (24.2 ppb)

AR301606

*DOCUMENTATION ATTACHED (See following pages).

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APPENDIX B
DPO REPORT

INORGANIC DATA VALIDATION SUMMARY

Date Review Completed 1/16/89
Case No. 10699 SAS No.
Site Name Eastern Diversified Metals Site
Sample Nos. MCX952, MCX953, MCX960 - MCX962

Contract Lab Keystone Environmental Res. Inc
Contract No. 68-01-0025
Lab DPO Chuck Sands
Reviewer Mahboobeh Mecanic
from Region III Phone (301) 266-9887
FTS

MATRIX	CONCENTRATION low	med	high	MATRIX RELATED COMMENTS
soil/sediment	5			
aqueous				
other				

ICP	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blanks		✓		Al (123 ppb), Ca (106 ppb), Cu (3.1 ppb), Fe (61.8 ppb), +
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank		✓		Ca (137 ppm), Cu (4.02 ppm), Fe (7.8 ppm), Na (44 ppm)
Interference Check Sample	✓			
Lab Control Sample	✓			
Lab Duplicate		✓		Cu (40%), Ni (± 18.4 ppm), Al (20.8%), Cr (± 2.3
Matrix Spike		✓		Sb (44%)
Serial Dilution		✓		Cu (14.3%)

FURNACE	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blanks	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank		✓		Pb (0.34 ppm)
Lab Control Sample	✓			
Lab Duplicate	✓			
Matrix Spike	✓			
Duplicate Injections	✓			
Analytical Spike		✓		As (both MSA <0.995), Se (117%), Tl (117%)

MERCURY & CYANIDE	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blank	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank	✓			
Lab Duplicate	✓			
Matrix Spike	✓			

REVIEWER'S COMMENTS:

+ Mg (116.9 ppb), Ag (5.6, 9.0 ppb), Zn (2.5 ppb), Sb (24.2 ppb)

AR301608

*DOCUMENTATION ATTACHED (See following pages).