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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III
CENTRAL REGIONAL LABORATORY
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ANNAPOLIS, MARYLAND 21401
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DATE : November 15, 1989

SUBJECT: Inorganic Data Validation for the Delta Quarries Site
Case 12544

FROM : Theresa A. Simpson CEK for
Region III ESAT DPO (3ES23)

TO : Donna McCartney
Regional Project Manager (3HW21)

THRU : Patricia J. Krantz, Chief CEK for
Quality Assurance Branch (3ES23)

Attached is the inorganic data review for the Delta Quarries Site (Case 12544) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

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

Attachment

TID File: 03890816 Task 1114

copies - Connie
PADER

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WESTON
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DATE: 10 NOVEMBER 1989

SUBJECT: INORGANIC DATA VALIDATION, Case 12544
SITE: DELTA QUARRIES

FROM: MARSHA BURRELL MB — MAHBOOBEH MECANIC DJM for M.M.
INORGANIC DATA REVIEWER — SENIOR INORGANIC DATA REVIEWER

TO: TERRY SIMPSON
ESAT DEPUTY PROJECT OFFICER

THRU: RICHARD D. DRESSER RDD
ESAT ACTING TEAM MANAGER

OVERVIEW

The set of samples for Case 12544 contained nine (9) unfiltered and two (2) filtered aqueous samples which were analyzed through the Contract Laboratory Program (CLP) Routine Analytical Services. Included in the sample set were two (2) unfiltered equipment blanks and one (1) unfiltered field duplicate pair.

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

Several blanks had reported results for analytes that were >IDL. The reported results for the analytes in the affected samples which are <5X the blank concentration may be biased high and, therefore, have been qualified "B" as summarized in the following table:

Analyte	Sample Type	Type of Blank
Fe	filtered aqueous	preparation
Pb	filtered and unfiltered aqueous-sampled 8/14/89	equipment
Fe,Zn	filtered aqueous-sampled 8/24/89	equipment
Pb	filtered and unfiltered aqueous-sampled 8/24/89	equipment

The unfiltered laboratory duplicate results were outside of the control limits for the Cr and Pb analytes. Therefore, the quantitation limits and reported results for these analytes in the unfiltered aqueous samples have been qualified estimated, "UJ" and "J", respectively; excluding the reported results for the Pb analyte which have been qualified "B" as previously mentioned.

The filtered laboratory duplicate results were outside of the control limits for the Cr and Fe analytes. Therefore, the quantitation limits and reported results for these analytes in the filtered aqueous samples have been qualified estimated, "UJ" and "J", respectively; excluding the reported result for Fe in sample MCX673 which has been qualified "B" as previously mentioned.

The filtered matrix spike recovery was low for the Pb analyte. The reported result for the Pb analyte in sample MCX667 may be biased low; however, it has been qualified "B" as previously mentioned. The quantitation limit for Pb in sample MCX673 may be biased low and has been qualified "UL".

The analytical spike recoveries were low for the Pb, Se, and Tl analytes in several filtered and unfiltered samples. The quantitation limits for these analytes in the affected samples may be biased low and, therefore, have been qualified "UL". The reported result for Pb in samples MCX667 may be biased low; however, it has been qualified "B" as previously mentioned.

NOTE:

The data was reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses.

INFORMATION REGARDING REPORT CONTENT

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's
APPENDIX B	DPO REPORT
APPENDIX C	SUPPORT DOCUMENTATION

DCN - MB911A05.DEL

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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*
Cr	All unfiltered aqueous	J	UJ		A (±10 ppb)
	Both filtered aqueous		UJ		A (±10 ppb)
Fe	MCX665;MCX671	B		High	B (46.1 ppb)
	MCX667	J			A (35.7%)
	MCX673	B		High	C (47.3 ppb) A (35.7%)
Pb	MCX663;MCX664; MCX666	B		High	C (1.1 ppb) A (±3 ppb)
	MCX665;MCX668; MCX669;MCX671; MCX672	J	UJ		A (±3 ppb)
	MCX670	B		High	C (1.0 ppb) A (±3 ppb)
	MCX667	B		High	C (1.1 ppb) D (74.8%) E (75.3%)
	MCX673		UL	Low	D (74.8%) E (80.0%)
Se	MCX663;MCX669; MCX670		UL	Low	E (78.7-81.6%)
Tl	MCX663;MCX668; MCX669;MCX670; MCX673		UL	Low	E (51.4-74.6%)
Zn	MCX670;MCX673	B		High	C (8.2 ppb)

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TABLE 1B

CODES USED IN COMMENTS COLUMN

A = The laboratory duplicate results were outside of the control limits ± CRDL or RPD >20% (CRDL or relative percent difference is in parentheses). Therefore, the quantitation limits and/or reported results are estimated.

B = The unfiltered 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.

C = The equipment 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.

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

E = Due to a low analytical spike recovery (% recovery is in parentheses), the quantitation limits and/or reported results may be biased low.

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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: Delta Quarries SDG# MCX663 SDG# MCX667 WATER SAMPLES (ug/L)

Case #: 12544 Sampling Date(s): 8/14 → 8/24, 1987

*Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

CRDL	ANALYTE	MCX663		MCX664		MCX665		MCX666		MCX667		MCX668		MCX669		MCX670		MCX671		MCX672	
	Dilution Factor	1.0		1.0		10		10		10		1.0		10		1.0		1.0		1.0	
	Location	RW-3		RW-12		MWEB1 Equip BLK		MW17		MW17 Filtered		MWM1		MWM2 DUP OF MCX668		MW9-88		MW-3 Equip BLK		MW20-88	
200	Aluminum	[37.5]						[85.1]				612		856		730					
60	Antimony																				
10	*Arsenic	[8.8]										[4.6]		[3.8]							
200	Barium	464		[58.9]				[30.9]		[28.3]		380		388		[126]				[117]	
5	Beryllium							[1.0]													
5	*Cadmium																				
5000	Calcium	106000		[4740]		[103]		[2700]		[2630]		186000		187000		66600		[85.1]		25400	
10	*Chromium		UJ		UJ		UJ		UJ		UJ	15.6	J		UJ		UJ		UJ		UJ
50	Cobalt	[13.4]						[8.6]				[7.7]		[13.4]		[12.5]				[16.3]	
25	Copper	[8.0]																			
100	Iron	2540		5480		[46.7]	B	37200		725	J	7880		8200		1420		[47.3]	B	295	
3	*Lead	[2.1]	B	[2.0]	B	[1.1]	J	[2.9]	B	[1.3]	B	4.8	J	3.9	J	4.8	B	[1.0]	J		UJ
5000	Magnesium	12500		[915]				[1020]		[1170]		19000		19100		[2020]				[1570]	
15	Manganese	1090		261				350		229		1640		1650		86.8				70.3	
0.2	Mercury																				
40	*Nickel	[14.4]						[9.8]				[16.7]		[20.2]		[26.5]				[39.7]	
5000	Potassium	[588]		[635]				[529]		[471]		[1110]		[1260]		[3650]				[1400]	
5	Selenium		UL												UL		UL			[3.2]	
10	Silver																				
5000	Sodium	[2220]		[907]		[139]		[2210]		[2150]		14100		14300		71200				[1160]	
10	Thallium		UL										UL		UL		UL				
50	Vanadium																				
20	Zinc	23.8		45.3				30.6				35.7		41.1		40.6	B	[8.2]		90.0	
10	*Cyanide																				

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

Table 3

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

Site Name: Delta Quarries SDG# MCX6603, MCX6601 WATER SAMPLES (ug/L)

Case #: 12544 Sampling Date(s): 8/14 → 8/24/89

*Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

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CRDL	ANALYTE																						
	Sample No.	MCX6673																					
	Dilution Factor	1.0																					
	Location	MW9-88-2																					
		Filtered																					
200	Aluminum																						
60	Antimony																						
10	*Arsenic																						
200	Barium	[96.6]																					
5	Beryllium																						
5	*Cadmium																						
5000	Calcium	75300																					
10	*Chromium		UJ																				
50	Cobalt	[9.0]																					
25	Copper																						
100	Iron	[41.6]	B																				
5	*Lead		UL																				
5000	Magnesium	[2310]																					
15	Manganese	75.3																					
0.2	Mercury																						
40	*Nickel	[21.6]																					
5000	Potassium	[3460]																					
5	Selenium																						
10	Silver																						
5000	Sodium	17680																					
10	Thallium		UL																				
50	Vanadium																						
20	Zinc	26.9	B																				
10	*Cyanide		CQ																				

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

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX663

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-01S

Level (low/med): LOW Date Received: 08/18/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	37.50	B		P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	8.80	B		F
7440-39-3	Barium	464.00			P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	106000.00			P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	13.40	B		P
7440-50-8	Copper	8.00	B		P
7439-89-6	Iron	2540.00			P
7439-92-1	Lead	2.10	B	*	F
7439-95-4	Magnesium	12500.00			P
7439-96-5	Manganese	1090.00			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	14.40	B		P
7440-09-7	Potassium	588.00	B		P
7782-49-2	Selenium	3.00	U	W	F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	2220.00	B		P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	23.80			P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX664

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-02S

Level (low/med): LOW Date Received: 08/18/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.00	U		P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	58.90	B		P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	4740.00	B		P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	5.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	5480.00			P
7439-92-1	Lead	2.00	B	*	F
7439-95-4	Magnesium	915.00	B		P
7439-96-5	Manganese	261.00			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	7.00	U		P
7440-09-7	Potassium	635.00	B		P
7782-49-2	Selenium	3.00	U		F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	907.00	B		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	45.30			P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX665

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-03S

Level (low/med): LOW Date Received: 08/18/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.00	U		P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	3.00	U		P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	103.00	B		P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	5.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	46.70	B		P
7439-92-1	Lead	1.10	B	*	F
7439-95-4	Magnesium	40.00	U		P
7439-96-5	Manganese	3.00	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	7.00	U		P
7440-09-7	Potassium	179.00	U		P
7782-49-2	Selenium	3.00	U		F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	139.00	B		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	6.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX666

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-04S

Level (low/med): LOW Date Received: 8/18/89

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	85.10	B		P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	30.90	B		P
7440-41-7	Beryllium	1.00	B		P
7440-43-9	Cadmium	4.00	U		P
7440-70-2	Calcium	2700.00	B		P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	8.60	B		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	37200.00			P
7439-92-1	Lead	2.90	B	*	F
7439-95-4	Magnesium	1020.00	B		P
7439-96-5	Manganese	350.00			P
7439-97-6	Mercury	.20	U		CV
7440-02-0	Nickel	9.80	B		P
7440-09-7	Potassium	529.00	B		P
7782-49-2	Selenium	3.00	U		F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	2210.00	B		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	30.60			P
	Cyanide	10.00	U		AS

Color Before: BROWN Clarity Before: CLOUDY Texture:

Color After: BROWN Clarity After: CLOUDY Artifacts:

Comments:

AR302310

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX667

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX667

Matrix (soil/water): WATER Lab Sample ID: 08203-01S

Level (low/med): LOW Date Received: 08/18/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.00	U		P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	28.30	B		P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	2630.00	B		P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	5.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	725.00		*	P
7439-92-1	Lead	1.30	B	NW	F
7439-95-4	Magnesium	1170.00	B		P
7439-96-5	Manganese	229.00			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	7.00	U		P
7440-09-7	Potassium	471.00	B		P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	2150.00	B		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	6.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX668

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-05S

Level (low/med): LOW Date Received: 08/25/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	612.00			P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	4.60	B		F
7440-39-3	Barium	380.00			P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	186000.00			P
7440-47-3	Chromium	15.60		*	P
7440-48-4	Cobalt	7.70	B		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	7880.00			P
7439-92-1	Lead	4.80		*	F
7439-95-4	Magnesium	19000.00			P
7439-96-5	Manganese	1640.00			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	16.70	B		P
7440-09-7	Potassium	1110.00	B		P
7782-49-2	Selenium	3.00	U	W	F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	14100.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	35.70			P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX669

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-09-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-06S

Level (low/med): LOW Date Received: 08/25/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	856.00			P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	3.80	B		F
7440-39-3	Barium	388.00			P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	187000.00			P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	13.40	B		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	8200.00			P
7439-92-1	Lead	3.90		*	F
7439-95-4	Magnesium	19100.00			P
7439-96-5	Manganese	1650.00			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	20.20	B		P
7440-09-7	Potassium	1260.00	B		P
7782-49-2	Selenium	3.00	U	W	F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	14300.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	41.10			P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX670

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-07S

Level (low/med): LOW Date Received: 08/28/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	730.00			P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	126.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	66600.00			P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	12.50	B		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	1420.00			P
7439-92-1	Lead	4.80		*	F
7439-95-4	Magnesium	2020.00	B		P
7439-96-5	Manganese	86.80			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	26.50	B		P
7440-09-7	Potassium	3650.00	B		P
7782-49-2	Selenium	3.00	U	W	F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	7120.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	40.60			P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX671

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-08S

Level (low/med): LOW Date Received: 08/28/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.00	U		P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	3.00	U		P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	85.10	B		P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	5.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	47.30	B		P
7439-92-1	Lead	1.00	B	*	F
7439-95-4	Magnesium	40.00	U		P
7439-96-5	Manganese	3.00	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	7.00	U		P
7440-09-7	Potassium	179.00	U		P
7782-49-2	Selenium	3.00	U		F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	74.00	U		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	8.20	B		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN 7/88

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX672

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX663

Matrix (soil/water): WATER Lab Sample ID: 08202-09S

Level (low/med): LOW Date Received: 08/28/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.00	U		P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	117.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	25400.00			P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	16.30	B		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	295.00			P
7439-92-1	Lead	1.00	U	*	F
7439-95-4	Magnesium	1570.00	B		P
7439-96-5	Manganese	70.30			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	39.70	B		P
7440-09-7	Potassium	1400.00	B		P
7782-49-2	Selenium	3.20	B		F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	1160.00	B		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	90.00			P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCX673

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D9-0088

Lab Code: SKINER Case No.: 12544 SAS No.: SDG No.: MCX667

Matrix (soil/water): WATER Lab Sample ID: 08203-02S

Level (low/med): LOW Date Received: 08/28/89

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.00	U		P
7440-36-0	Antimony	17.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	96.60	B		P
7440-41-7	Beryllium	1.00	U		P
7440-41-7	Cadmium	4.00	U		P
7440-70-2	Calcium	75300.00			P
7440-47-3	Chromium	10.00	U	*	P
7440-48-4	Cobalt	9.00	B		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	41.60	B	*	P
7439-92-1	Lead	1.00	U	NW	F
7439-95-4	Magnesium	2310.00	B		P
7439-96-5	Manganese	75.30			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	21.60	B		P
7440-09-7	Potassium	3640.00	B		P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	8.00	U		P
7440-23-5	Sodium	7680.00			P
7440-28-0	Thallium	2.00	U	W	F
7440-62-2	Vanadium	6.00	U		P
7440-66-6	Zinc	26.90			P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTON

APPENDIX B

DPO REPORT

WESTON INORGANIC DATA VALIDATION SUMMARY

Date Review Completed: November 3, 1989
Case No.: 12544
Site Name: Delta Quarries
Sample Nos.: SDG # MCX663
SDG # MCX667

Contract Lab.: Skinner & Sherman
Contract No.: –
Lab DPO: Deborah Sgaro
Reviewer: Marsha Burrell
From Region III/ESAT
Phone: (301) 266-9887

MATRIX	CONCENTRATION low	med	high	MATRIX RELATED COMMENTS
soil/solid				
aqueous	11			9 unfiltered; 2 filtered
other				

ICP	OK	FYI	Action	COMMENTS
Holding Time	X			
Calibration Blanks	X			
Initial Calibration	X			
Continuing Calibration	X			
Preparation Blank		X		Fe 46.1 ppb
Interference Check Sample	X			
Lab Control Sample	X			
Lab Duplicate		X		Cr (f,u) ±10 ppb Fe (f) 35.7%
Matrix Spike	X			
Serial Dilution	X			

FURNACE	OK	FYI	Action	COMMENTS
Holding Time	X			
Calibration Blanks	X			
Initial Calibration	X			
Continuing Calibration	X			
Preparation Blank	X			
Lab Control Sample	X			
Lab Duplicate		X		Pb (u) ±3 ppb
Matrix Spike		X		Pb (f) 74.8%
Duplicate Injections	X			
Analytical Spike		X		Pb (f) 75.3–80.0% +

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

REVIEWER'S COMMENTS: (u) = unfiltered (f) = filtered

+ Se (u) 78.7–81.6% Tl (u,f) 51.4–74.6%

AR302319

DPO ISSUES

1. The correlation coefficient of the standard curves used to generate some of the As, Se and Tl data was <0.995. (See Appendix C, pages 4-6).

APPENDIX C

SUPPORT DOCUMENTATION

Normal Calibration

RINSE

		As-E	Se-E
Standard Z STD1 0/0			
Abs	1	0.000	0.000
Mean		0.000	0.000
P/H		-0.001	-0.004
Abs	2	-0.002	-0.003
Mean		-0.001	-0.002
P/H		-0.002	-0.004

AUTO ZERO
12:14:39
Thu 28 SEP 1989

		As-E	Se-E
Standard C STD2 10/5			
Abs	1	0.066	0.036
Mean		0.066	0.036
P/H		0.136	0.056
Abs	2	0.062	0.041
Mean		0.064	0.038
P/H		0.114	0.049
		As-E	Se-E
Mean		0.064	0.035
SD		0.003	0.004
RSD		04.27	09.47
		As-S	Se-S
Standard 1 STD3 50/50			
Abs	1	0.274	0.230
Mean		0.274	0.230
P/H		0.497	0.368
Abs	2	0.273	0.232
Mean		0.273	0.231
P/H		0.431	0.389
		As-S	Se-S
Mean		0.273	0.231
SD		0.001	0.001
RSD		00.36	00.60
		As-S	Se-S
Standard 2 STD4 100/100			
Abs	1	0.435	0.350
Mean		0.435	0.350
P/H		0.601	0.438
Abs	2	0.447	0.337
Mean		0.441	0.343
P/H		0.606	0.429
		As-S	Se-S
Mean		0.441	0.343
SD		0.008	0.009
RSD		01.90	02.68

CALIBRATE A

Pb r = .992
Se r = .984

STD	CONC	MEAN
Z	00.00	0.000
C	10.00	0.064
1	50.00	0.273
2	99.99	0.441

APP CONC
STD Z 00.00
STD C 10.14

Normal Calibration

RINSE

		As-S	Se-S
Standard Z STD1 0/0			
Abs	1	0.002	0.002
Mean		0.002	0.002
P/H		-0.002	-0.004
Abs	2	0.000	0.000
Mean		0.001	0.001
P/H		-0.002	-0.007

AUTO ZERO
12:01:13
Thu 28 SEP 1989

		As-S	Se-S
Standard C STD2 10/5			
Abs	1	0.066	0.031
Mean		0.066	0.031
P/H		0.129	0.043
Abs	2	0.065	0.026
Mean		0.065	0.028
P/H		0.087	0.038
		As-S	Se-S
Mean		0.065	0.028
SD		0.001	0.004
RSD		01.53	12.85

		As-S	Se-S
Standard 1 STD3 50/50			
Abs	1	0.286	0.218
Mean		0.286	0.218
P/H		0.500	0.314
Abs	2	0.284	0.220
Mean		0.285	0.219
P/H		0.439	0.293
		As-S	Se-S
Mean		0.285	0.219
SD		0.001	0.001
RSD		00.49	00.63

		As-S	Se-S
Standard 2 STD4 100/100			
Abs	1	0.468	0.322
Mean		0.468	0.322
P/H		0.664	0.393
Abs	2	0.501	0.344
Mean		0.484	0.333
P/H		0.600	0.382
		As-S	Se-S
Mean		0.484	0.333
SD		0.023	0.016
RSD		04.81	04.65

Se r= .988

CALIBRATE A

STD	CONC	MEAN
Z	00.00	0.000
C	03.00	0.065
1	50.00	0.285
2	100.00	0.484

APP CONC

STD Z	00.00
STD C	09.97
STD 1	49.26
STD 2	DIG HI

Normal Calibration

Page 6 of 6

RINSE

		Pb-S	Tl-S
Standard Z STD1 0/0			
Abs	1	0.002	-0.002
Mean		0.002	-0.002
P/H		-0.005	0.001
Abs	2	0.000	-0.001
Mean		0.001	-0.002
P/H		-0.004	-0.005

AUTO ZERO
16:08:53
Fri 29 SEP 1989

		Pb-S	Tl-S
Standard C STD2 3/10			
Abs	1	0.025	0.027
Mean		0.025	0.027
P/H		0.035	0.035
Abs	2	0.022	0.027
Mean		0.023	0.027
P/H		0.039	0.046
		Pb-S	Tl-S
Mean		0.023	0.027
SD		0.002	0.000
RSD		09.56	00.00
		Pb-S	Tl-S
Standard 1 STD3 50/50			
Abs	1	0.320	0.150
Mean		0.320	0.150
P/H		0.462	0.201
Abs	2	0.301	0.141
Mean		0.310	0.145
P/H		0.475	0.201
		Pb-S	Tl-S
Mean		0.310	0.145
SD		0.013	0.006
RSD		04.32	04.41
		Pb-S	Tl-S
Standard 2 STD4 100/100			
Abs	1	0.554	0.247
Mean		0.554	0.247
P/H		0.724	0.292
Abs	2	0.532	0.234
Mean		0.543	0.240
P/H		0.760	0.308
		Pb-S	Tl-S
Mean		0.543	0.240
SD		0.016	0.009
RSD		02.85	03.83

CALIBRATE A

STD	CONC	MEAN
Z	00.00	0.000
C	03.00	0.023
1	50.00	0.310
2	99.99	0.543

Tl r = .994

000109

	CONC
STD Z	00.00
STD C	03.32
STD 1	49.97
STD 2	DIG HI

AR302324