UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
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ORIGINAL (Red)

SDMS DocID 2198337

DATE : October 1, 1992

SUBJECT : Region III Data QA Review

FROM : Cynthia E. Caporale C. Caporale
Region III ESAT RPO (3ES31)

TO : Michael Taurino
Regional Project Manager (3HW73)

Attached is the inorganic data validation report for the Hoffman Landfill Site (Case 18347) 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

cc: Jennifer Woods, MD DOE
Edward Kantor, EMSL-LV
Regional CLP TPO: Stevie Wilding Region: III Lab Code: ITPA

TID File: 03920420 Task 1516

Lockheed
Engineering & Sciences Company

Environmental Services Assistance Teams
Region 3

1419 Forest Drive, Suite 104
Annapolis, Maryland 21403

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DATE: SEPTEMBER 23, 1992

SUBJECT: INORGANIC DATA VALIDATION, CASE 18347
SITE: HOFFMAN LANDFILL

FROM: DAN Q BENEDIKT DQB
SENIOR OVERSIGHT CHEMIST

MAHBOOBEH MECANIC MM
SENIOR OVERSIGHT CHEMIST

TO: CYNTHIA E. CAPORALE
ESAT REGIONAL PROJECT OFFICER

THROUGH: DALE S. BOSHART DSB
ESAT TEAM MANAGER

OVERVIEW

The set of samples for Case 18347 contained twelve (12) unfiltered aqueous samples and eleven (11) solid samples, which were analyzed through the Contract Laboratory Program (CLP) Routine Analytical Services (RAS) for total metals and cyanide. Three (3) field-filtered aqueous samples were analyzed through the CLP RAS for dissolved metals. The sample set included both a filtered and non-filtered field blank, and field duplicate pairs for the aqueous, filtered aqueous and solid matrices.

The 35.3 µg/L concentration for the lead (Pb) analyte in aqueous sample MCJY10 exceeded the Chemical Health Advisory Level (EPA Action Level) of 20.0 µg/L.

SUMMARY

The laboratory divided the samples into two (2) Sample Delivery Groups (SDGs), and performed the analyses according to Statement of Work (SOW) ILM02.1. All analytes were successfully analyzed in all samples with the exception of antimony (Sb) in the solid matrix. Issues relating to data usability are discussed in order of importance in the following paragraphs.

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MAJOR PROBLEM

The recovery for the Sb analyte was very low (< 30%) in the solid matrix spike. Quantitation limits for this analyte may be biased extremely low, and have been qualified unusable, "R", on the Data Summary Form.

MINOR ISSUES

A number of analytes were detected in the laboratory continuing calibration blanks (CCBs), preparation blanks (PBs) or field blanks (FBs) at concentrations greater than (>) the Instrument Detection Limit (IDL). Results in samples that are less than (<) five times (5x) the levels detected in the blanks may be biased high, and have been qualified "B" on the Data Summary Forms. The following table lists the analytes affected by blank contamination and the type of blank used to qualify data.

ANALYTE	MATRIX AFFECTED	TYPE OF BLANK USED
Beryllium (Be)	AQ	CCB
Calcium (Ca)	AQ	PB
Iron (Fe)	AQ, FILT.	PB
Magnesium (Mg)	FILT.	PB
Zinc (Zn)	AQ, FILT. FILT.	PB FB

(AQ = non-filtered aqueous, FILT. = filtered aqueous)

The laboratory duplicate results for the filtered aqueous matrix exceeded the control limit [±Contract Required Detection Limit(CRDL), 20% Relative Percent Difference (RPD)] for the Fe and manganese (Mn) analytes. Results for these analytes have been qualified estimated, "J", except where superseded by the previously mentioned "B" qualifier.

The serial dilution result for the solid matrix exceeded the control limit (10% Difference) for the Zn analyte. Results for this analyte have been qualified estimated, "J", on the Data Summary Form.

The analytical spike recovery for the selenium (Se) and/or thallium (Tl) analytes were low (<85%) in some samples. The result or quantitation limit associated with each of these recoveries has been qualified biased

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low, "L" or "UL", respectively on the Data Summary Forms.

The matrix spike recovery for the Tl analyte in the non-filtered aqueous matrix spike analysis was also low (<75%). Quantitation limits for this analyte in non-filtered samples may be biased low; those results which have not already been qualified "UL" based on the low analytical spike recoveries, have been qualified "UL" on the Data Summary Forms.

NOTES

The laboratory applied the "N" qualifier to the Tl analyte in filtered aqueous samples based on the Tl recovery in the non-filtered matrix spike. The Tl recovery was within control limits in the filtered matrix spike and therefore, they have not been qualified on the Data Summary Forms.

Similarly, the laboratory has applied the "*" qualifier to the Fe and Mn analytes in non-filtered aqueous samples based on the filtered duplicate analysis. The results for these analytes in the non-filtered duplicate analysis were within control limits and therefore they have not been qualified on the Data Summary Forms.

The laboratory has applied the "W" qualifier to the Tl quantitation limits in samples MCJY25, MCJY27 and MCJY29-MCJY31 because the analytical spike recoveries associated with these analyses exceeded the 115% control limit. The results for these analyses, however, were < IDL and high recoveries do not impact detection capability. Therefore, the analytical spikes were not used to qualify data.

The laboratory has applied the "*" qualifier to the Al analyte in solid samples because the laboratory duplicate analysis for the Al analyte in that matrix exceeded the contractual control limits (±CRDL, 20% RPD). The laboratory duplicate results, however, did not exceed the usability limits (±2xCRDL, 35% RPD) established for solid samples in Region 3. Therefore, no data have been qualified based on these duplicate results.

Results for non-filtered field duplicate pair MCJY09/MCJY12 and filtered field duplicate pair MCJY33/MCJY35 agreed within the 20% RPD or ± CRDL control limits established for laboratory duplicate analyses, while the results for solid field duplicate pair MCJY27/MCJY31

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agreed within the laboratory duplicate control limits of 35% RPD or ±2xCRDL. Control limits have not been established for field duplicate analyses and therefore no data have been qualified based on these duplicate results.

The data have been reviewed according to the National Functional Guidelines for Inorganic Data Validation, with modifications for use in Region 3.

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 FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN
TABLE 2	GLOSSARY OF DATA QUALIFIER CODES
TABLE 3	DATA SUMMARY FORMS
APPENDIX A	RESULTS REPORTED BY THE LABORATORY (FORM Is)
APPENDIX B	TPO REPORT
APPENDIX C	SUPPORT DOCUMENTATION

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TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY AFTER DATA VALIDATION

ANALYTE	SAMPLES AFFECTED	DETECTED VALUES	NON-DETECTED RESULTS	BIAS	COMMENTS*
Sb	All solid samples		R	EXTREMELY LOW	A (19.1%)
Be	NCJY09, MCJY12, MCJY16	B		HIGH	B (0.30 µg/L)
Ca	MCJY07	B		HIGH	C (25.8 µg/L)
Fe	MCJY07	B		HIGH	C (9.7 µg/L)
	MCJY32	B		HIGH	C (9.7 µg/L) D (27.6%)
	MCJY33, MCJY35	J			D (27.6%)
Mg	MCJY32	B		HIGH	C (20.4 µg/L)
Mn	MCJY32, MCJY33, MCJY35	J			D (27.4%)
Se	MCJY10, MCJY24-MCJY31	L	UL	LOW	E (66.0%-84.0%)
Tl	MCJY08-MCJY13, MCJY15-MCJY18		UL	LOW	E (60.5%-84.0%) F (71.2%)
	MCJY07, MCJY19		UL	LOW	F (71.2%)
Zn	MCJY07, MCJY08, MCJY17, MCJY18	B		HIGH	C (5.4 µg/L)
	MCJY33, MCJY35	B		HIGH	G (29.3 µg/L)
	All solid samples	J			H (11.5%)

* See explanation of comments in Table 1B.

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TABLE 1B

CODES USED IN COMMENTS COLUMN

A = The matrix spike recovery for this analyte was extremely low. The quantitation limits are biased extremely low and may by unusable.

B = The continuing calibration blank had a result >IDL (the result is in parentheses) and the results in the listed samples were <5x the blank value. The reported results may be biased high.

C = The preparation blank had a result >IDL (the result is in parentheses) and the results in the listed samples were <5x the blank value. The reported results may be biased high.

D = The RPD for the laboratory duplicate results exceeded the control limit (the RPD is in parentheses). The results may be estimated.

E = The analytical spike recovery was low (the range of recoveries is in parentheses). The reported result or quantitation limit may be biased low.

F = The matrix spike recovery was low (the % recovery is in parentheses). The reported quantitation limits may be biased low.

G = The field blank had a result >IDL (the result is in parentheses) and the results in the listed samples were <5x the blank value. The reported results may be biased high.

H = The percent difference in the ICP serial dilution analysis exceeded the control limit (the percent difference is in parentheses). The reported results may be estimated.

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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.

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TABLE 3

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

WATER SAMPLES (µg/L)

Site Name: Hoffman Landfill

Case #: 18347 Sampling Date(s): 6/23/92

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

	Sample No.	MCJY07		MCJY08		MCJY09		MCJY10		MCJY11		MCJY12		MCJY13		MCJY15		MCJY16		MCJY17	
	Dilution factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	Location	BLK-1		GW-1		GW-2		GW-3		GW-4		GW-5		GW-6		SW-1		SW-2		SW-3	
		field blank				Duplicate MCJY12						Duplicate MCJY09									
CRDL	ANALYTE																				
200	Aluminum			[12.1]		[146]		[182]		[112]		[99.8]		[197]		734		206			
60	Antimony																				
10	*Arsenic							[7.0]						[1.4]				[1.1]			
200	Barium			[43.6]		[137]		206		[28.7]		[133]		238		53.2		[17.3]		[37.9]	
5	Beryllium					[0.39]	B	[2.7]				[0.29]	B					[0.24]	B		
5	*Cadmium																				
5000	Calcium	[9.7]	B	24100		70400		83300		139000		69800		21000		22100		117000		11400	
10	*Chromium							[2.8]		[2.2]											
50	Cobalt							[13.2]						[1.9]		[4.2]		[37.8]			
25	Copper					49.7		271		50.0		45.8		[8.5]		[3.9]					
100	Iron	[5.6]	B	[77.6]		1030		172000		1530		931		9300		740		5800		3140	
3	*Lead					6.0		35.3		7.5		5.8		[1.3]		[1.5]					
5000	Magnesium			6220		17300		19400		22100		17000		11300		5980		44600		[4650]	
15	Manganese			[11.1]		78.1		577		31.6		66.8		490		126		3020		429	
0.2	Mercury																				
40	*Nickel							[13.4]								[17.7]		78.7			
5000	Potassium			511		[2460]		[1090]		[1440]		[2320]		[1740]		[1070]		[1870]		[4300]	
5	Selenium								UL												
10	Silver																				
5000	Sodium			[3170]		[3990]		13100		[1640]		[4140]		[4080]		5590		12100		[1960]	
10	Thallium		UL		UL		UL		UL		UL		UL		UL		UL		UL		UL
50	Vanadium																				
20	Zinc	[4.0]	B	[8.8]	B	60.5		561		25.4		56.3		30.8		34.4		32.0		[7.5]	B
10	*Cyanide																				

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

revised 07/90

TABLE 3

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

WATER SAMPLES
(µg/L)

Site Name: Hoffman Landfill

Case #: 18347 Sampling Date(s): 6/23/92

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

RDL	Sample No. / Dilution Factor / Location / ANALYTE	MCJY18		MCJY19		MCJY32		MCJY33		MCJY35									
	Dilution Factor	1.0		1.0		1.0		1.0		1.0									
	Location	SW-4		LT-1		BLK-1 filtered MCJY07 fld blank		GW-6 filtered MCJY13 DUP MCJY35		GW-DUP filtered MCJY13 DUP MCJY33									
200	Aluminum	378		3530						[16.7]									
60	Antimony																		
10	*Arsenic			[2.7]															
200	Barium	[49.1]		[78.6]		[1.5]		222		222									
5	Beryllium																		
5	*Cadmium																		
5000	Calcium	21800		16400		[319]		20800		20200									
10	*Chromium			[5.3]															
50	Cobalt	[2.7]		[8.2]						[3.2]									
25	Copper			[15.2]															
100	Iron	195		12000		[12.1]	B	8170	J	8150	J								
3	*Lead	[0.40]		10.7															
5000	Magnesium	6950		[2490]		[47.6]	B	11200		10900									
15	Manganese	77.9		327		[4.3]	J	484	J	476	J								
0.2	Mercury																		
40	*Nickel	[11.9]		[9.9]															
5000	Potassium	[1090]		[2520]				[1690]		[1600]									
5	Selenium																		
10	Silver																		
5000	Sodium	6040		[3330]		[181]		[3960]		[3880]									
10	Thallium		UL		UL														
50	Vanadium																		
20	Zinc	25.5	B	68.0		29.3		35.2	B	[18.1]	B								
10	*Cyanide						Q		Q		Q								

RDL = Contract Required Detection Limit

*Action Level Exists

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TABLE 3

DATA SUMMARY FORM: INORGANICS

SOIL SAMPLES
(mg/Kg)

Site Name: Hoffman Landfill

Case #: 18347 Sampling Date(s): 6/23/92

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

CRDL	ANALYTE	MCJY21		MCJY22		MCJY23		MCJY24		MCJY25		MCJY26		MCJY27		MCJY28		MCJY29		MCJY30	
	Dilution Factor	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
	% Solids	66.3		61.8		70.0		78.8		80.9		88.2		87.9		97.5		87.4		91.2	
	Location	SED-1		SED-2		SED-3		SED-4		S-1		S-2		S-3		S-4		S-5		S-6	
														Duplicate MCJY31							
40	Aluminum	3750		3950		3660		4260		8270		4270		9470		4670		7900		12000	
12	Antimony		R		R		R		R		R		R		R		R		R		R
2	*Arsenic	5.2		10.6		[2.3]		3.6		7.9		3.3		4.5		3.4		3.8		3.6	
40	Barium	145		[54.5]		68.9		86.5		142		56.6		126		105		71.4		56.8	
1	Beryllium	[1.4]		1.6		[0.93]		1.7		[1.1]		[0.99]		1.3		1.2		[0.84]		[0.94]	
1	*Cadmium							[0.65]		[0.42]											
1000	Calcium	10000		10400		[874]		1290		2640		1200		2290		2940		5610		[739]	
2	*Chromium	10		332		9.0		12.2		12.0		8.9		13.8		10.9		9.6		14.6	
10	Cobalt	48.1		180		[12.8]		54.1		19.3		14.6		17.4		22.1		[11.3]		13.1	
5	Copper	21.0		13.7		25.7		16.1		28.7		21.1		21.3		21.3		14.1		15.6	
20	Iron	47100		49700		25100		27900		33900		24000		35900		54700		21900		33800	
0.6	*Lead	19.9		21.5		18.1		15.7		35.0		17.5		21.2		14.9		21.1		9.7	
1000	Magnesium	[582]		[1140]		[580]		[785]		[1030]		[784]		[1030]		[764]		1330		1200	
3	Manganese	2590		13500		160		1480		1170		311		819		781		620		316	
0.2	Mercury													0.19							
8	*Nickel	57.7		169		20.9		89.1		22.2		14.6		16.5		22.0		9.6		12.9	
1000	Potassium	[794]		[632]		[1370]		[577]		1240		1240		1120		1130		[904]		[949]	
1	Selenium	[0.44]		1.8		[0.41]		[0.34]	L	[0.35]	L		UL	[0.31]	L		UL	[0.37]	L	[0.30]	L
2	Silver																				
1000	Sodium	[83.0]		[101]		[61.7]		[44.4]		[119]		[46.3]		[52.0]		[80.5]		[134]		[39.9]	
2	Thallium																				
10	Vanadium	14.7		[13.4]		18.4		[11.7]		18.3		17.2		21.0		15.0		17.6		21.0	
4	Zinc	140	J	119	J	76.5	J	188	J	78.0	J	79.9	J	110	J	130	J	64.2	J	64.5	J
1	*Cyanide													[0.45]		[0.23]					

CRDL = Contract Required Detection Limit

*Action Level Exists

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TABLE 3

DATA SUMMARY FORM: INORGANICS

Site Name: Hoffman Landfill

SOIL SAMPLES (mg/Kg)

Case #: 18347 Sampling Date(s): 6/23/92

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

CRDL	ANALYTE	MCJY31		Duplicate MCJY27	
	Sample No.	MCJY31		Duplicate MCJY27	
	Dilution Factor	1.0			
	% Solids	88.5			
	Location	S-7			
40	Aluminum	7390			
12	Antimony		R		
2	Arsenic	4.4			
40	Barium	108			
1	Beryllium	[0.83]			
1	Cadmium				
1000	Calcium	2430			
2	Chromium	9.3			
10	Cobalt	12.1			
5	Copper	16.1			
20	Iron	21000			
0.6	*Lead	36.0			
1000	Magnesium	[832]			
3	Manganese	691			
0.1	Mercury	0.16			
8	Nickel	11.3			
1000	Potassium	[866]			
1	Selenium	[0.24]	L		
2	Silver				
1000	Sodium	[49.2]			
2	Thallium				
10	Vanadium	16.3			
4	Zinc	79.6	J		
1	Cyanide	0.71			

CRDL = Contract Required Detection Limit

*Action Level Exists

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CASE 18347

APPENDIX A

RESULTS REPORTED BY LABORATORY

FORM Is

SDG MCJY07

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET 0000003

EPA SAMPLE NO.

MCJY07

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY07____

Level (low/med): LOW__ Date Received: 06/24/92

% 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	11.8	U		P
7440-36-0	Antimony	16.2	U		P
7440-38-2	Arsenic	1.1	U		F
7440-39-3	Barium	0.50	U		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.7	U		P
7440-70-2	Calcium	9.7	B		P
7440-47-3	Chromium	1.8	U		P
7440-48-4	Cobalt	1.7	U		P
7440-50-8	Copper	1.7	U		P
7439-89-6	Iron	5.6	B	*	P
7439-92-1	Lead	0.40	U		F
7439-95-4	Magnesium	19.3	U		P
7439-96-5	Manganese	0.60	U	*	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	6.5	U		P
7440-09-7	Potassium	369	U		P
7782-49-2	Selenium	0.70	U		F
7440-22-4	Silver	3.7	U		P
7440-23-5	Sodium	8.4	U		P
7440-28-0	Thallium	0.60	U	N	F
7440-62-2	Vanadium	9.0	U		P
7440-66-6	Zinc	4.0	B		P
	Cyanide	2.0	U		AS

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

ILM02.1

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0000004

MCJY08

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY08____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	12.1	B		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.1	U		F_
7440-39-3	Barium___	43.6	B		P_
7440-41-7	Beryllium	0.20	U		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	24100	_		P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	1.7	U		P_
7440-50-8	Copper___	1.7	U		P_
7439-89-6	Iron____	77.6	B	*	P_
7439-92-1	Lead____	0.40	U		F_
7439-95-4	Magnesium	6220	_		P_
7439-96-5	Manganese	11.1	B	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	6.5	U		P_
7440-09-7	Potassium	511	B		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	3170	B		P_
7440-28-0	Thallium_	0.60	U	WN	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc____	8.8	B		P_
	Cyanide__	2.0	U		AS

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0000005 (Red)

MCJY09

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY09____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	146	B		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.1	U		F_
7440-39-3	Barium___	137	B		P_
7440-41-7	Beryllium	0.39	B		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	70400	_		P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	1.7	U		P_
7440-50-8	Copper___	49.7	_		P_
7439-89-6	Iron_____	1030	_	*	P_
7439-92-1	Lead_____	6.0	_		F_
7439-95-4	Magnesium	17300	_		P_
7439-96-5	Manganese	78.1	_	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	6.5	U		P_
7440-09-7	Potassium	2460	B		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	3990	B		P_
7440-28-0	Thallium_	0.60	U	WN	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc_____	60.5	_		P_
	Cyanide__	2.0	U		AS
			_		__

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLOUDY Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Original (Red)

0000006

MCJY10

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY10____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	182	B		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	7.0	B		F_
7440-39-3	Barium___	206	_		P_
7440-41-7	Beryllium	2.7	B		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	83300	_		P_
7440-47-3	Chromium_	2.8	B		P_
7440-48-4	Cobalt___	13.2	B		P_
7440-50-8	Copper___	271	_		P_
7439-89-6	Iron_____	172000	_	*	P_
7439-92-1	Lead_____	35.3	_		F_
7439-95-4	Magnesium	19400	_		P_
7439-96-5	Manganese	577	_	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	13.4	B		P_
7440-09-7	Potassium	1090	B		P_
7782-49-2	Selenium_	0.70	U	W	F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	13100	_		P_
7440-28-0	Thallium_	0.60	U	WN	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc_____	561	_		P_
	Cyanide__	2.0	U		AS
			_		

Color Before: BROWN____ Clarity Before: OPAQUE Texture: _____

Color After: BROWN____ Clarity After: OPAQUE Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0000007 (ORIGINAL)

MCJY11

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY11____

Level (low/med): LOW__ Date Received: 06/24/92

% 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	112	B		P
7440-36-0	Antimony	16.2	U		P
7440-38-2	Arsenic	1.1	U		F
7440-39-3	Barium	28.7	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.7	U		P
7440-70-2	Calcium	139000			P
7440-47-3	Chromium	2.2	B		P
7440-48-4	Cobalt	1.7	U		P
7440-50-8	Copper	50.0			P
7439-89-6	Iron	1530		*	P
7439-92-1	Lead	7.5			F
7439-95-4	Magnesium	22100			P
7439-96-5	Manganese	31.6		*	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	6.5	U		P
7440-09-7	Potassium	1440	B		P
7782-49-2	Selenium	0.70	U		F
7440-22-4	Silver	3.7	U		P
7440-23-5	Sodium	1640	B		P
7440-28-0	Thallium	0.60	U	WN	F
7440-62-2	Vanadium	9.0	U		P
7440-66-6	Zinc	25.4			P
	Cyanide	2.0	U		AS

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

ORIGINAL (Red)

EPA SAMPLE NO.

0000008

MCJY12

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY12____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	99.8	B		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.1	U		F_
7440-39-3	Barium___	133	B		P_
7440-41-7	Beryllium	0.29	B		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	69800			P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	1.7	U		P_
7440-50-8	Copper___	45.8			P_
7439-89-6	Iron_____	931		*	P_
7439-92-1	Lead_____	5.8			F_
7439-95-4	Magnesium	17000			P_
7439-96-5	Manganese	66.8		*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	6.5	U		P_
7440-09-7	Potassium	2320	B		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	4140	B		P_
7440-28-0	Thallium_	0.60	U	WN	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc_____	58.3			P_
	Cyanide__	2.0	U		AS

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. 0000009 ORIGINAL (Red)

MCJY13

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY13____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	197	B		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.4	B		F_
7440-39-3	Barium___	238	_		P_
7440-41-7	Beryllium	0.20	U		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	21000	_		P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	1.9	B		P_
7440-50-8	Copper___	8.5	B		P_
7439-89-6	Iron_____	9300	_	*	P_
7439-92-1	Lead_____	1.3	B		F_
7439-95-4	Magnesium	11300	_		P_
7439-96-5	Manganese	490	_	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	6.5	U		P_
7440-09-7	Potassium	1740	B		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	4080	B		P_
7440-28-0	Thallium_	0.60	U	WN	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc_____	30.8	_		P_
	Cyanide__	2.0	U		AS
			_		__

Color Before: COLORLESS Clarity Before: CLOUDY Texture: _____

Color After: COLORLESS Clarity After: CLOUDY Artifacts: _____

Comments:

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ORIGINAL (Red)

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0000010

MCJY15

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY15____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	734	_		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.1	U		F_
7440-39-3	Barium___	53.2	B		P_
7440-41-7	Beryllium	0.20	U		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	22100	_		P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	4.2	B		P_
7440-50-8	Copper___	3.9	B		P_
7439-89-6	Iron____	740	_	*	P_
7439-92-1	Lead____	1.5	B		F_
7439-95-4	Magnesium	5980	_		P_
7439-96-5	Manganese	126	_	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	17.7	B		P_
7440-09-7	Potassium	1070	B		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	5590	_		P_
7440-28-0	Thallium_	0.60	U	WN	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc____	34.4	_		P_
	Cyanide__	2.0	U		AS

Color Before: COLORLESS Clarity Before: CLOUDY Texture: _____

Color After: COLORLESS Clarity After: CLOUDY Artifacts: _____

Comments:

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ORIGINAL (Red)

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0000011

MCJY16

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY16____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	206	_		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.1	B		F_
7440-39-3	Barium___	17.3	B		P_
7440-41-7	Beryllium	0.24	B		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	117000	_		P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	37.8	B		P_
7440-50-8	Copper___	1.7	U		P_
7439-89-6	Iron_____	5800	_	*	P_
7439-92-1	Lead_____	0.40	U		F_
7439-95-4	Magnesium	44600	_		P_
7439-96-5	Manganese	3020	_	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	78.7	_		P_
7440-09-7	Potassium	1870	B		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	12100	_		P_
7440-28-0	Thallium_	0.60	U	WN	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc_____	32.0	_		P_
	Cyanide__	2.0	U		AS
			_		

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

ORIGINAL (Red)

EPA SAMPLE NO.

0000012

MCJY17

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY17____

Level (low/med): LOW__ Date Received: 06/24/92

% 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	11.8	U		P
7440-36-0	Antimony	16.2	U		P
7440-38-2	Arsenic	1.1	U		F
7440-39-3	Barium	37.9	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.7	U		P
7440-70-2	Calcium	11400			P
7440-47-3	Chromium	1.8	U		P
7440-48-4	Cobalt	1.7	U		P
7440-50-8	Copper	1.7	U		P
7439-89-6	Iron	3140		*	P
7439-92-1	Lead	0.40	U		F
7439-95-4	Magnesium	4650	B		P
7439-96-5	Manganese	429		*	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	6.5	U		P
7440-09-7	Potassium	4300	B		P
7782-49-2	Selenium	0.70	U		F
7440-22-4	Silver	3.7	U		P
7440-23-5	Sodium	1960	B		P
7440-28-0	Thallium	0.60	U	WN	F
7440-62-2	Vanadium	9.0	U		P
7440-66-6	Zinc	7.5	B		P
	Cyanide	2.0	U		AS

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ORIGINAL (Red)

0000013

MCJY18

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY18____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	378			P
7440-36-0	Antimony_	16.2	U		P
7440-38-2	Arsenic__	1.1	U		F
7440-39-3	Barium___	49.1	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium__	1.7	U		P
7440-70-2	Calcium__	21800			P
7440-47-3	Chromium_	1.8	U		P
7440-48-4	Cobalt___	2.7	B		P
7440-50-8	Copper___	1.7	U		P
7439-89-6	Iron_____	195		*	P
7439-92-1	Lead_____	0.40	B		F
7439-95-4	Magnesium	5950			P
7439-96-5	Manganese	77.9		*	P
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	11.9	B		P
7440-09-7	Potassium	1090	B		P
7782-49-2	Selenium_	0.70	U		F
7440-22-4	Silver___	3.7	U		P
7440-23-5	Sodium___	5040			P
7440-28-0	Thallium_	0.60	U	WN	F
7440-62-2	Vanadium_	9.0	U		P
7440-66-6	Zinc_____	25.5			P
	Cyanide__	2.0	U		AS

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0000014

MCJY19

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY19____

Level (low/med): LOW__ Date Received: 06/24/92

% 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	3530			P
7440-36-0	Antimony	16.2	U		P
7440-38-2	Arsenic	2.7	B		F
7440-39-3	Barium	78.6	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.7	U		P
7440-70-2	Calcium	16400			P
7440-47-3	Chromium	5.3	B		P
7440-48-4	Cobalt	8.2	B		P
7440-50-8	Copper	15.2	B		P
7439-89-6	Iron	12000		*	P
7439-92-1	Lead	10.7			F
7439-95-4	Magnesium	2490	B		P
7439-96-5	Manganese	327		*	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	9.9	B		P
7440-09-7	Potassium	2520	B		P
7782-49-2	Selenium	0.70	U		F
7440-22-4	Silver	3.7	U		P
7440-23-5	Sodium	3330	B		P
7440-28-0	Thallium	0.60	U	N	F
7440-62-2	Vanadium	9.0	U		P
7440-66-6	Zinc	68.0			P
	Cyanide	2.0	U		AS

Color Before: BROWN____ Clarity Before: OPAQUE Texture: _____

Color After: BROWN____ Clarity After: OPAQUE Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0000015

MCJY32

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0048

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY32____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	11.8	U		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.1	U		F_
7440-39-3	Barium___	1.5	B		P_
7440-41-7	Beryllium	0.20	U		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	319	B		P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	1.7	U		P_
7440-50-8	Copper___	1.7	U		P_
7439-89-6	Iron_____	12.1	B	*	P_
7439-92-1	Lead_____	0.40	U		F_
7439-95-4	Magnesium	47.6	B		P_
7439-96-5	Manganese	4.3	B	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	6.5	U		P_
7440-09-7	Potassium	369	U		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	181	B		P_
7440-28-0	Thallium_	0.60	U	N	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc_____	29.3			P_
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0000016 (Red)

MCJY33

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY33____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	11.8	U		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.1	U		F_
7440-39-3	Barium___	222	_		P_
7440-41-7	Beryllium	0.20	U		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	20800	_		P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	1.7	U		P_
7440-50-8	Copper___	1.7	U		P_
7439-89-6	Iron_____	8170	_	*	P_
7439-92-1	Lead_____	0.40	U		F_
7439-95-4	Magnesium	11200	_		P_
7439-96-5	Manganese	484	_	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	6.5	U		P_
7440-09-7	Potassium	1690	B		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	3960	B		P_
7440-28-0	Thallium_	0.60	U	N	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc_____	35.2	_		P_
_____	Cyanide__		_		NR
			_		__

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

ORIGINAL

EPA SAMPLE NO.

0000017

MCJY35

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Lab Sample ID: MCJY35____

Level (low/med): LOW__ Date Received: 06/24/92

% 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_	16.7	B		P_
7440-36-0	Antimony_	16.2	U		P_
7440-38-2	Arsenic__	1.1	U		F_
7440-39-3	Barium___	222	_		P_
7440-41-7	Beryllium	0.20	U		P_
7440-43-9	Cadmium__	1.7	U		P_
7440-70-2	Calcium__	20200	_		P_
7440-47-3	Chromium_	1.8	U		P_
7440-48-4	Cobalt___	3.2	B		P_
7440-50-8	Copper___	1.7	U		P_
7439-89-6	Iron_____	8150	_	*	P_
7439-92-1	Lead_____	0.40	U		F_
7439-95-4	Magnesium	10900	_		P_
7439-96-5	Manganese	476	_	*	P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___	6.5	U		P_
7440-09-7	Potassium	1600	B		P_
7782-49-2	Selenium_	0.70	U		F_
7440-22-4	Silver___	3.7	U		P_
7440-23-5	Sodium___	3880	B		P_
7440-28-0	Thallium_	0.60	U	N	F_
7440-62-2	Vanadium_	9.0	U		P_
7440-66-6	Zinc_____	18.1	B		P_
	Cyanide__		_		NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

ILM02.1

ORIGINAL
(Red)

CASE 18347

APPENDIX A

RESULTS REPORTED BY LABORATORY

FORM Is

SDG MCJY21

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ORIGINAL (Red) 000003.1

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. 0000

MCJY21

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY21____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _66.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	3750	_	*	P_
7440-36-0	Antimony_	4.7	U	N	P_
7440-38-2	Arsenic__	5.2	_		F_
7440-39-3	Barium___	145	_		P_
7440-41-7	Beryllium	1.4	B		P_
7440-43-9	Cadmium__	0.49	U		P_
7440-70-2	Calcium__	10000	_		P_
7440-47-3	Chromium_	10	_		P_
7440-48-4	Cobalt___	48.1	_		P_
7440-50-8	Copper___	21.0	_		P_
7439-89-6	Iron_____	47100	_		P_
7439-92-1	Lead_____	19.9	_	S	F_
7439-95-4	Magnesium	582	B		P_
7439-96-5	Manganese	2590	_		P_
7439-97-6	Mercury__	0.15	U		CV
7440-02-0	Nickel___	57.7	_		P_
7440-09-7	Potassium	794	B		P_
7782-49-2	Selenium_	0.44	B		F_
7440-22-4	Silver___	1.1	U		P_
7440-23-5	Sodium___	83.0	B		P_
7440-28-0	Thallium_	0.24	U		F_
7440-62-2	Vanadium_	14.7	_		P_
7440-66-6	Zinc_____	140	_	E	P_
	Cyanide__	0.30	U		AS
			_		__

Color Before: BROWN____ Clarity Before: _____ Texture: COARSE

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS:__STONES_AND_FREE_WATER_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ORIGINAL (Red)

MCJY22

~~0001~~ 0004

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY22____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _61.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3950		*	P
7440-36-0	Antimony	5.2	U	N	P
7440-38-2	Arsenic	10.6			F
7440-39-3	Barium	34.5	B		P
7440-41-7	Beryllium	1.6			P
7440-43-9	Cadmium	0.54	U		P
7440-70-2	Calcium	10400			P
7440-47-3	Chromium	332			P
7440-48-4	Cobalt	180			P
7440-50-8	Copper	13.7			P
7439-89-6	Iron	49700			P
7439-92-1	Lead	21.5			F
7439-95-4	Magnesium	1140	B		P
7439-96-5	Manganese	13500			P
7439-97-6	Mercury	0.14	U		CV
7440-02-0	Nickel	169			P
7440-09-7	Potassium	632	B		P
7782-49-2	Selenium	1.8		S	F
7440-22-4	Silver	1.2	U		P
7440-23-5	Sodium	101	B		P
7440-28-0	Thallium	0.25	U		F
7440-62-2	Vanadium	13.4	B		P
7440-66-6	Zinc	119		E	P
	Cyanide	0.32	U		AS

Color Before: BROWN____ Clarity Before: _____ Texture: COARSE

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:
ARTIFACTS: STONES AND FREE WATER

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ORIGINAL (Red)

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MCJY23

~~0001~~ 0005

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY23____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _70.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3660		*	P
7440-36-0	Antimony	4.5	U	N	P
7440-38-2	Arsenic	2.3	B		F
7440-39-3	Barium	68.9			P
7440-41-7	Beryllium	0.93	B		P
7440-43-9	Cadmium	0.47	U		P
7440-70-2	Calcium	274	B		P
7440-47-3	Chromium	9.0			P
7440-48-4	Cobalt	12.8	B		P
7440-50-8	Copper	25.7			P
7439-89-6	Iron	25100			P
7439-92-1	Lead	18.1			F
7439-95-4	Magnesium	380	B		P
7439-96-5	Manganese	160			P
7439-97-6	Mercury	0.14	U		CV
7440-02-0	Nickel	20.9			P
7440-09-7	Potassium	1370	B		P
7782-49-2	Selenium	0.41	B		F
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	61.7	B		P
7440-28-0	Thallium	0.22	U		F
7440-62-2	Vanadium	18.4			P
7440-66-6	Zinc	76.5		E	P
	Cyanide	0.29	U		AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS: ROOTS

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INORGANIC ANALYSES DATA SHEET

ORIGINAL (Red)

EPA SAMPLE NO.

MCJY24

~~0007~~ 0006

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY24____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _78.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4260		*	P
7440-36-0	Antimony	4.0	U	N	P
7440-38-2	Arsenic	3.6			F
7440-39-3	Barium	86.5			P
7440-41-7	Beryllium	1.7			P
7440-43-9	Cadmium	0.55	B		P
7440-70-2	Calcium	1890			P
7440-47-3	Chromium	12.2			P
7440-48-4	Cobalt	54.1			P
7440-50-8	Copper	16.1			P
7439-89-6	Iron	27900			P
7439-92-1	Lead	15.7			F
7439-95-4	Magnesium	785	B		P
7439-96-5	Manganese	1480			P
7439-97-6	Mercury	0.13	U		CV
7440-02-0	Nickel	89.1			P
7440-09-7	Potassium	577	B		P
7782-49-2	Selenium	0.34	B	W	F
7440-22-4	Silver	0.92	U		P
7440-23-5	Sodium	44.4	B		P
7440-28-0	Thallium	0.20	U		F
7440-62-2	Vanadium	11.7	B		P
7440-66-6	Zinc	188		E	P
	Cyanide	0.25	U		AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS: __STONES_AND_FREE_WATER

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MCJY25

0004067

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY25____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _80.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8270		*	P
7440-36-0	Antimony	4.0	U	N	P
7440-38-2	Arsenic	7.9			F
7440-39-3	Barium	142			P
7440-41-7	Beryllium	1.1	B		P
7440-43-9	Cadmium	0.42	B		P
7440-70-2	Calcium	2640			P
7440-47-3	Chromium	12.0			P
7440-48-4	Cobalt	19.3			P
7440-50-8	Copper	28.7			P
7439-89-6	Iron	33900			P
7439-92-1	Lead	35.0			F
7439-95-4	Magnesium	1030	B		P
7439-96-5	Manganese	1170			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	22.2			P
7440-09-7	Potassium	1240			P
7782-49-2	Selenium	0.35	B	W	F
7440-22-4	Silver	0.91	U		P
7440-23-5	Sodium	119	B		P
7440-28-0	Thallium	0.20	U	W	F
7440-62-2	Vanadium	18.3			P
7440-66-6	Zinc	78.0		E	P
	Cyanide	0.25	U		AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS: ROOTS_AND_STONES

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INORGANIC ANALYSES DATA SHEET

ORIGINAL

EPA SAMPLE NO.

MCJY26

0002008

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY26____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _88.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4270		*	P
7440-36-0	Antimony	3.6	U	N	P
7440-38-2	Arsenic	3.3			F
7440-39-3	Barium	56.6			P
7440-41-7	Beryllium	0.99	B		P
7440-43-9	Cadmium	0.38	U		P
7440-70-2	Calcium	1200			P
7440-47-3	Chromium	8.9			P
7440-48-4	Cobalt	14.6			P
7440-50-8	Copper	21.1			P
7439-89-6	Iron	24000			P
7439-92-1	Lead	17.5			F
7439-95-4	Magnesium	784	B		P
7439-96-5	Manganese	311			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	14.6			P
7440-09-7	Potassium	1240			P
7782-49-2	Selenium	0.20	U	W	F
7440-22-4	Silver	0.83	U		P
7440-23-5	Sodium	46.3	B		P
7440-28-0	Thallium	0.18	U		F
7440-62-2	Vanadium	17.2			P
7440-66-6	Zinc	79.9		E	P
	Cyanide	0.23	U		AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS: ROOTS AND STONES

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INORGANIC ANALYSES DATA SHEET

ORIGINAL

EPA SAMPLE NO.

MCJY27

~~0001~~0009

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY27____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _87.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9470		*	P
7440-36-0	Antimony	3.6	U	N	P
7440-38-2	Arsenic	4.5			F
7440-39-3	Barium	126			P
7440-41-7	Beryllium	1.3			P
7440-43-9	Cadmium	0.38	U		P
7440-70-2	Calcium	2290			P
7440-47-3	Chromium	13.8			P
7440-48-4	Cobalt	17.4			P
7440-50-8	Copper	21.3			P
7439-89-6	Iron	35900			P
7439-92-1	Lead	21.2			F
7439-95-4	Magnesium	1030	B		P
7439-96-5	Manganese	819			P
7439-97-6	Mercury	0.19			CV
7440-02-0	Nickel	16.5			P
7440-09-7	Potassium	1120			P
7782-49-2	Selenium	0.31	B	W	F
7440-22-4	Silver	0.83	U		P
7440-23-5	Sodium	52.0	B		P
7440-28-0	Thallium	0.18	U	W	F
7440-62-2	Vanadium	21.0			P
7440-66-6	Zinc	110		E	P
	Cyanide	0.45	B		AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS: ROOTS AND STONES

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

ORIGINAL

EPA SAMPLE NO.

MCJY28

~~0001~~010

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY28____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _97.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4670		*	P
7440-36-0	Antimony	3.2	U	N	P
7440-38-2	Arsenic	3.4			F
7440-39-3	Barium	105			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium	0.34	U		P
7440-70-2	Calcium	2940			P
7440-47-3	Chromium	10.9			P
7440-48-4	Cobalt	22.1			P
7440-50-8	Copper	21.3			P
7439-89-6	Iron	54700			P
7439-92-1	Lead	14.9			F
7439-95-4	Magnesium	764	B		P
7439-96-5	Manganese	781			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	22.0			P
7440-09-7	Potassium	1130			P
7782-49-2	Selenium	0.18	U	W	F
7440-22-4	Silver	0.73	U		P
7440-23-5	Sodium	80.5	B		P
7440-28-0	Thallium	0.16	U		F
7440-62-2	Vanadium	15.0			P
7440-66-6	Zinc	130		E	P
	Cyanide	0.23	B		AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS: STONES

FORM I - IN

ILM02.1

U.S. EPA - CLP

ORIGINAL (Red)

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MCJY29

~~0002011~~

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY29____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _87.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7900		*	P
7440-36-0	Antimony	3.7	U	N	P
7440-38-2	Arsenic	3.8			F
7440-39-3	Barium	71.9			P
7440-41-7	Beryllium	0.84	B		P
7440-43-9	Cadmium	0.39	U		P
7440-70-2	Calcium	5610			P
7440-47-3	Chromium	9.6			P
7440-48-4	Cobalt	11.3	B		P
7440-50-8	Copper	14.1			P
7439-89-6	Iron	21900			P
7439-92-1	Lead	21.1			F
7439-95-4	Magnesium	1330			P
7439-96-5	Manganese	620			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	9.8			P
7440-09-7	Potassium	904	B		P
7782-49-2	Selenium	0.37	B	W	F
7440-22-4	Silver	0.85	U		P
7440-23-5	Sodium	174	B		P
7440-28-0	Thallium	0.18	U	W	F
7440-62-2	Vanadium	17.6			P
7440-66-6	Zinc	64.2		E	P
	Cyanide	0.23	U		AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:
ARTIFACTS:__ROOTS_AND_STONES

FORM I - IN

ILM02.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

ORIGINAL

EPA SAMPLE NO.

MCJY30

0000012

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY30____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _91.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12000		*	P
7440-36-0	Antimony	3.5	U	N	P
7440-38-2	Arsenic	3.6			F
7440-39-3	Barium	56.8			P
7440-41-7	Beryllium	0.94	B		P
7440-43-9	Cadmium	0.37	U		P
7440-70-2	Calcium	739	B		P
7440-47-3	Chromium	14.6			P
7440-48-4	Cobalt	13.1			P
7440-50-8	Copper	15.6			P
7439-89-6	Iron	33800			P
7439-92-1	Lead	9.7			F
7439-95-4	Magnesium	1200			P
7439-96-5	Manganese	316			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	12.9			P
7440-09-7	Potassium	949	B		P
7782-49-2	Selenium	0.30	B	W	F
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	39.9	B		P
7440-28-0	Thallium	0.17	U	W	F
7440-62-2	Vanadium	21.0			P
7440-66-6	Zinc	64.5		E	P
	Cyanide	0.22	U		AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS: STONES

FORM I - IN

ILM02.1

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO. (Red)

MCJY31

0000013

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Lab Sample ID: MCJY31____

Level (low/med): LOW__ Date Received: 06/24/92

% Solids: _88.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7390		*	P
7440-36-0	Antimony	3.6	U	N	P
7440-38-2	Arsenic	4.4			F
7440-39-3	Barium	108			P
7440-41-7	Beryllium	0.83	B		P
7440-43-9	Cadmium	0.38	U		P
7440-70-2	Calcium	2430			P
7440-47-3	Chromium	9.3			P
7440-48-4	Cobalt	12.1			P
7440-50-8	Copper	16.1			P
7439-89-6	Iron	21000			P
7439-92-1	Lead	36.0		S	F
7439-95-4	Magnesium	832	B		P
7439-96-5	Manganese	691			P
7439-97-6	Mercury	0.16			CV
7440-02-0	Nickel	11.3			P
7440-09-7	Potassium	866	B		P
7782-49-2	Selenium	0.24	B	W	F
7440-22-4	Silver	0.82	U		P
7440-23-5	Sodium	49.2	B		P
7440-28-0	Thallium	0.17	U	W	F
7440-62-2	Vanadium	15.3			P
7440-66-6	Zinc	79.6		E	P
	Cyanide	0.71			AS

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM

Color After: BROWN____ Clarity After: _____ Artifacts: YES___

Comments:

ARTIFACTS: ROOTS AND STONES

FORM I - IN

ILM02.1

ORIGINAL
(Red)

CASE 18347

APPENDIX B

TPO REPORT

SDG MCJY07

ORIGINAL

TPO: [ ] ACTION [X] FYI

Region III

INORGANIC REGIONAL DATA ASSESSMENT SUMMARY

CASE NO: 18347
SDG NO: MCJY07
SOW: ILM02.1
NO. OF SAMPLES: twelve (12)

LABORATORY: ITPA
DATA USER: Stevie Wilding
REVIEW COMPLETION DATE: 9/23/92
MATRIX: aqueous

REVIEWER: ESAT

	ICP	AA	HG	CN
1. HOLDING TIMES	O	O	O	O
2. INITIAL CALIBRATIONS	O	O	O	O
3. CONTINUING CALIBRATIONS	O	O	O	O
4. FIELD BLANKS(F=NOT APPLICABLE)	o	O	O	O
5. LABORATORY BLANKS	X	O	O	O
6. ICS	O			
7. LCS	O	O		
8. DUPLICATE ANALYSIS	O	O	O	O
9. MATRIX SPIKE	O	M	O	O
10. MSA		O		
11. SERIAL DILUTION	O			
12. SAMPLE VERIFICATION	O	O	O	O
13. REGIONAL QC(F-NOT APPLICABLE)	F	F	F	F
14. OVERALL ASSESSMENT	X	M	O	O

O = No problems or minor problems that do not affect data usability
X = No more than about 5% of the data points are qualified as either estimated or unusable.
M = More than about 5% of the data points are qualified as estimated.
Z = More than about 5% of the data points are qualified as unusable.
A = TPO action requested; use in conjunction with one of the above codes.

TPO ACTION ITEMS:

AREAS OF CONCERN: Documentation attached (see Appendix C)

ORIGINAL (Red)

TPO: [ ] ACTION [X] FYI

Region III

INORGANIC REGIONAL DATA ASSESSMENT SUMMARY

CASE NO: 18347
SDG NO: MCJY07
SOW: ILM02.1
NO. OF SAMPLES: three (3)

LABORATORY: ITPA
DATA USER: Stevie Wilding
REVIEW COMPLETION DATE: 9/23/92
MATRIX: filtered aqueous

REVIEWER: ESAT

	ICP	AA	HG
1. HOLDING TIMES	_O_	_O_	_O_
3. CONTINUING CALIBRATIONS	_O_	_O_	_O_
4. FIELD BLANKS(F=NOT APPLICABLE)	_M_	_O_	_O_
5. LABORATORY BLANKS	_X_	_O_	_O_
6. ICS	_O_		
7. LCS	_O_	_O_	
8. DUPLICATE ANALYSIS	_M_	_O_	_O_
9. MATRIX SPIKE	_O_	_O_	_O_
10. MSA		_O_	
11. SERIAL DILUTION	_O_		
12. SAMPLE VERIFICATION	_O_	_O_	_O_
13. REGIONAL QC(F-NOT APPLICABLE)	_F_	_F_	_F_
14. OVERALL ASSESSMENT	_M_	_O_	_O_

O = No problems or minor problems that do not affect data usability
X = No more than about 5% of the data points are qualified as either estimated or unusable.
M = More than about 5% of the data points are qualified as estimated.
Z = More than about 5% of the data points are qualified as unusable.
A = TPO action requested; use in conjunction with one of the above codes.

TPO ACTION ITEMS: _____

AREAS OF CONCERN: Documentation attached (see Appendix C)

ORIGINAL
(Red)

CASE 18347

APPENDIX B

TPO REPORT

SDG MCJY21

TPO: [X] ACTION [ ] FYI

Region III

INORGANIC REGIONAL DATA ASSESSMENT SUMMARY

CASE NO: 18347
SDG NO: MCJY21
SOW: ILM02.1
NO. OF SAMPLES: nine (9)

LABORATORY: ITPA
DATA USER: Stevie Wilding
REVIEW COMPLETION DATE: 9/23/92
MATRIX: solid

REVIEWER: ESAT

	ICP	AA	HG	CN
1. HOLDING TIMES	O	O	O	O
2. INITIAL CALIBRATIONS	O	O	O	O
3. CONTINUING CALIBRATIONS	O	O	O	O
4. FIELD BLANKS(F=NOT APPLICABLE)	O	O	O	O
5. LABORATORY BLANKS	O	O	O	O
6. ICS	O			
7. LCS	O	O		
8. DUPLICATE ANALYSIS	O	O	O	O
9. MATRIX SPIKE	MA	O	O	O
10. MSA		O		
11. SERIAL DILUTION	M			
12. SAMPLE VERIFICATION	O	O	O	O
13. REGIONAL QC(F-NOT APPLICABLE)	F	F	F	O
14. OVERALL ASSESSMENT	MA	O	O	O

O = No problems or minor problems that do not affect data usability
X = No more than about 5% of the data points are qualified as either estimated or unusable.
M = More than about 5% of the data points are qualified as estimated.
Z = More than about 5% of the data points are qualified as unusable.
A = TPO action requested; use in conjunction with one of the above codes.

TPO ACTION ITEMS: (9) Matrix spike recovery for the Sb analyte was less than 30% (19.1%)

AREAS OF CONCERN: Documentation attached (see Appendix C)

ORIGINAL
(Red)

CASE 18347

APPENDIX C

SUPPORT DOCUMENTATION

SDG MCJY07

July 16, 1992

INTERNATIONAL TECHNOLOGY CORPORATION

000001

CASE NARRATIVE

JUL 1992 RECEIVED

Laboratory Name:	ITAS Pittsburgh, Pennsylvania
Laboratory Code:	ITPA
Project Name:	USEPA/CLP
Inorganic SOW:	ILM02.1
Project Number:	662004
Work Order Number:	Q206156
Contract Number:	68-D2-0044
Case Number:	18347
SDG Number:	MCJY07

Sample Number:				
	MCJY07	MCJY11	MCJY16	MCJY32
	MCJY08	MCJY12	MCJY17	MCJY33
	MCJY09	MCJY13	MCJY18	MCJY35
	MCJY10	MCJY15	MCJY19	

Shipment

Fifteen water samples were received at the ITAS Pittsburgh Laboratory on June 24, 1992; twelve for metals and cyanide analysis and three for metals analysis only.

Metals

A duplicate digestion and a matrix spike were performed on samples MCJY11 and MCJY33. A serial dilution was performed on sample MCJY08.

- The matrix spike for thallium on sample MCJY11 exceeded the 75-125 percent control limits and all associated results were flagged with the "N" qualifier.
- The duplicate digestion for iron and manganese on sample MCJY33 exceeded the 20 percent control limit and all associated results were flagged with the "*" qualifier.

Cyanide Analysis

A duplicate and matrix spike were performed on sample MCJY11.

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3
BLANKS

0000029 ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	11.8	U	11.8	U	11.8	U	11.8	U	11.800	U	P
Antimony	16.2	U	16.2	U	16.2	U	16.2	U	16.200	U	P
Arsenic	1.1	U	1.1	U	1.1	U	1.1	U	1.100	U	F
Barium	0.5	U	0.5	U	0.5	U	0.7	B	0.500	U	P
Beryllium	0.2	U	0.2	U	0.3	B	0.2	U	0.200	U	P
Cadmium	1.7	U	1.7	U	1.7	U	1.7	U	1.700	U	P
Calcium	-7.0	B	-6.4	B	-7.5	B	-5.2	B	25.800	B	P
Chromium	1.8	U	1.8	U	1.8	U	1.8	U	1.800	U	P
Cobalt	1.7	U	1.7	U	1.7	U	1.7	U	1.700	U	P
Copper	1.7	U	1.7	U	1.7	U	1.7	U	1.700	U	P
Iron	2.3	U	-2.4	B	2.3	U	2.3	U	9.680	B	P
Lead	0.4	U	0.4	U	0.4	U	0.4	U	0.400	U	F
Magnesium	19.3	U	19.3	U	19.3	U	19.3	U	20.400	B	P
Manganese	-0.7	B	0.6	U	0.6	U	0.6	U	0.660	B	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.200	U	CV
Nickel	6.5	U	6.5	U	6.5	U	6.5	U	6.500	U	P
Potassium	369.0	U	369.0	U	369.0	U	369.0	U	369.000	U	P
Selenium	0.7	U	0.7	U	0.7	U	0.7	U	0.700	U	F
Silver	3.7	U	3.7	U	3.7	U	3.7	U	3.700	U	P
Sodium	-32.0	B	-22.2	B	-19.7	B	-26.7	B	8.400	U	P
Thallium	0.6	U	0.6	U	0.6	U	0.6	U	0.600	U	F
Vanadium	9.0	U	9.0	U	9.0	U	9.0	U	9.000	U	P
Zinc	2.0	U	2.0	U	2.0	U	2.0	U	5.360	B	P
Cyanide	4.0	U	4.0	U	4.0	U			-2.482	B	AS

MCJY07 08

MCJY09-13 MCJY15-17

MCJY18 MCJY19 MCJY32 MCJY33 MCJY35

next CCB has no hits

FORM III - IN

ILM02.1

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ANALYSIS RUN LOG

0000056

ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: JA61E_____ Method: P_

Start Date: 06/30/92 End Date: 06/30/92

EPA Sample No.	D/F	Time	% R	AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	1423		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
S	1.00	1426																				X					
S	1.00	1428		X	X			X						X					X				X				
S	1.00	1431																									
S	1.00	1433					X		X	X		X	X			X	X			X						X	
S	1.00	1436									X																
S	1.00	1438																							X		
ICV	1.00	1446		X			X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICV	1.00	1449			X																						
ICB	1.00	1451		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICSA	1.00	1454		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICSAB	1.00	1457		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
CRI	1.00	1459			X			X	X		X	X	X				X		X			X			X	X	
ZZZZZZ	1.00	1502																									
ZZZZZZ	1.00	1505																									
ZZZZZZ	1.00	1507																									
ZZZZZZ	1.00	1510																									
ZZZZZZ	1.00	1513																									
ZZZZZZ	1.00	1516																									
ZZZZZZ	1.00	1518																									
CCV	1.00	1521																				X					
CCV	1.00	1523		X	X		X	X	X	X	X	X	X	X		X	X		X	X			X		X	X	
CCB	1.00	1526		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ZZZZZZ	1.00	1529																									
ZZZZZZ	1.00	1531																									
ZZZZZZ	1.00	1534																									
ZZZZZZ	1.00	1537																									
PBW → Ca	25.6mg/L 1.00	1539		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
LCSW Fe	9.7mg/L 1.00	1542		X			X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
LCSW Mg	20.4mg/L 1.00	1545			X																						
MCJY07 Zn	5.4mg/L 1.00	1547		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
MCJY07L	5.00	1550																									

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ANALYSIS RUN LOG

0000057

ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: JA61E_____ Method: P_

Start Date: 06/30/92 End Date: 06/30/92

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
MCJY08	1.00	1553		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
CCV	1.00	1555		_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	X	_	_	_	_	_
CCV	1.00	1558		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	_	X	_	X	X	_
CCB	1.00	1601		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY09	1.00	1603		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY10	1.00	1606		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY11	1.00	1608		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY11D	1.00	1611		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY11S	1.00	1614		X	X	_	X	X	X	_	X	X	X	X	_	_	X	_	X	_	_	X	_	_	X	X	_
MCJY12	1.00	1616		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY13	1.00	1619		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY15	1.00	1622		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY16	1.00	1624		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY17	1.00	1627		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
CCV	1.00	1630		_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	X	_	_	_	_	_
CCV	1.00	1632		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	_	X	_	X	X	_
CCB	1.00	1635		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY18	1.00	1638		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY19	1.00	1640		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY32	1.00	1643		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY33	1.00	1646		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY33D	1.00	1648		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY33S	1.00	1651		X	X	_	X	X	X	_	X	X	X	X	_	_	X	_	X	_	_	X	_	_	X	X	_
MCJY35	1.00	1653		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
ICSA	1.00	1656		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
ICSAB	1.00	1659		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
CRI	1.00	1701		_	X	_	_	X	X	_	X	X	X	_	_	_	X	_	X	_	_	X	_	_	X	X	_
CCV	1.00	1704		_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	X	_	_	_	_	_
CCV	1.00	1707		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	_	X	_	X	X	_
CCB	1.00	1709		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_

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DUPLICATES

EPA SAMPLE NO.
0000040 ORIGINAL (Red)
MCJY33D
Filtered

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		11.8000	U	11.8000	U			P
Antimony		16.2000	U	16.2000	U			P
Arsenic		1.1000	U	1.1000	U			F
Barium	200.0	221.9400		167.3300	B	28.1		P
Beryllium		0.2000	U	0.2000	U			P
Cadmium		1.7000	U	1.7000	U			P
Calcium	5000.0	20773.7700		15776.6300		27.3		P
Chromium		1.8000	U	1.8000	U			P
Cobalt		1.7000	U	2.4200	B	200.0		P
Copper		1.7000	U	1.7000	U			P
Iron		8166.6300		6184.5300		27.6	*	P
Lead		0.4000	U	0.4000	U			F
Magnesium	5000.0	11165.4000		8214.8500		30.4		P
Manganese		483.7800		367.3600		27.4	*	P
Mercury		0.2000	U	0.2000	U			CV
Nickel		6.5000	U	6.5000	U			P
Potassium		1692.0800	B	2441.0200	B	36.2		P
Selenium		0.7000	U	0.7000	U			F
Silver		3.7000	U	3.7000	U			P
Sodium		3964.7300	B	3016.2000	B	27.2		P
Thallium		0.6000	U	0.6000	U			F
Vanadium		9.0000	U	9.0000	U			P
Zinc	20.0	35.1600		26.9000		26.6		P
Cyanide								NR

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6
DUPLICATES

EPA SAMPLE NO.
0000039

MCJY11D
non-filtered

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		111.8900	B	116.4700	B	4.0		P
Antimony		16.2000	U	16.2000	U			P
Arsenic		1.1000	U	1.1000	U			F
Barium		28.7400	B	29.1500	B	1.4		P
Beryllium		0.2000	U	0.2000	U			P
Cadmium		1.7000	U	1.7000	U			P
Calcium		139246.6090		142632.6500		2.4		P
Chromium		2.1900	B	2.1900	B	0.0		P
Cobalt		1.7000	U	1.7000	U			P
Copper	25.0	50.0400		53.2200		6.2		P
Iron		1525.8400		1536.8500		0.7		P
Lead	3.0	7.5000		7.5000		0.0		F
Magnesium	5000.0	22141.2400		22717.6100		2.6		P
Manganese	15.0	31.6000		31.7700		0.5		P
Mercury		0.2000	U	0.2000	U			CV
Nickel		6.5000	U	6.5000	U			P
Potassium		1440.3500	B	1503.7700	B	4.3		P
Selenium		0.7000	U	0.7000	U			F
Silver		3.7000	U	3.7000	U			P
Sodium		1636.0800	B	1841.2200	B	11.8		P
Thallium		0.6000	U	0.6000	U			F
Vanadium		9.0000	U	9.0000	U			P
Zinc	20.0	25.4300		26.2600		3.2		P
Cyanide		2.0000	U	2.0000	U			AS

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14

ANALYSIS RUN LOG

0000074

ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: PC5100_____ Method: F_

Start Date: 07/06/92 End Date: 07/06/92

EPA Sample No.	D/F	Time	% R	Analytes																											
				ALB	SBS	ABA	BEB	CDA	CAR	CRO	CUM	CEN	FEE	PBB	MIG	MIN	HGI	NIK	SEL	AGE	NIA	TIL	VIN	ZIN	CIN
ZZZZZZ	1.00	1029																							
ZZZZZZ	1.00	1034																							
ZZZZZZ	1.00	1039																							
CCV	1.00	1043																				X			
CCB	1.00	1048																				X			
ZZZZZZ	1.00	1053																							
ZZZZZZ	1.00	1057																							
ZZZZZZ	1.00	1102																							
ZZZZZZ	1.00	1107																							
ZZZZZZ	1.00	1111																							
ZZZZZZ	1.00	1116																							
ZZZZZZ	1.00	1121																							
ZZZZZZ	1.00	1125																							
CCV	1.00	1130																				X			
CCB	1.00	1135																				X			
ZZZZZZ	1.00	1139																							
ZZZZZZ	1.00	1144																							
ZZZZZZ	1.00	1149																							
ZZZZZZ	1.00	1153																							
ZZZZZZ	1.00	1158																							
ZZZZZZ	1.00	1203																							
ZZZZZZ	1.00	1208																							
ZZZZZZ	1.00	1213																							
CCV	1.00	1217																				X			
CCB	1.00	1222																				X			
PBW	1.00	1226																				X			
PBWA	1.00	1231	104.0																			X			
LCSW	4.00	1236																				X			
LCSWA	4.00	1240	89.0																			X			
MCJY08	1.00	1245																				X			
MCJY08A	1.00	1250	78.0																			X			
MCJY09	1.00	1254																				X			

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ANALYSIS RUN LOG

ORIGINAL (Red)

0000075

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: PC5100_____ Method: F_

Start Date: 07/06/92 End Date: 07/06/92

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
MCJY09A	1.00	1259	72.0																					X			
CCV	1.00	1303																						X			
CCB	1.00	1308																						X			
MCJY10	1.00	1313																						X			
MCJY10A	1.00	1317	60.5																					X			
MCJY11	1.00	1322																						X			
MCJY11A	1.00	1327	77.5																					X			
MCJY11D	1.00	1331																						X			
MCJY11DA	1.00	1336	80.5																					X			
MCJY11S	1.00	1341																						X			
MCJY12	1.00	1345																						X			
MCJY12A	1.00	1350	73.5																					X			
CCV	1.00	1355																						X			
[illegible]B	1.00	1359																						X			
MCJY07	1.00	1418																						X			
MCJY07A	1.00	1422	102.0																					X			
MCJY13	1.00	1427																						X			
MCJY13A	1.00	1431	80.0																					X			
MCJY15	1.00	1436																						X			
MCJY15A	1.00	1441	82.0																					X			
MCJY16	1.00	1445																						X			
MCJY16A	1.00	1450	84.0																					X			
CCV	1.00	1455																						X			
CCB	1.00	1459																						X			
MCJY17	1.00	1504																						X			
MCJY17A	1.00	1509	84.0																					X			
MCJY18	1.00	1513																						X			
MCJY18A	1.00	1518	82.0																					X			
MCJY19	1.00	1522																						X			
MCJY19A	1.00	1527	89.0																					X			
MCJY32	1.00	1532																						X			
MCJY32A	1.00	1536	101.0																					X			

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ANALYSIS RUN LOG

ORIGINAL (Red)

0000076

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: PC5100_____ Method: F_

Start Date: 07/06/92 End Date: 07/06/92

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	C N
CCV	1.00	1541																						X			
CCB	1.00	1546																						X			
MCJY33	1.00	1550																						X			
MCJY33A	1.00	1555	85.0																					X			
MCJY33D	1.00	1600																						X			
MCJY33DA	1.00	1604	84.0																					X			
MCJY33S	1.00	1609																						X			
MCJY35	1.00	1614																						X			
MCJY35A	1.00	1618	86.0																					X			
CCV	1.00	1623																						X			
CCB	1.00	1628																						X			

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5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

0000037

MCJY11S

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044 non-Gilvey

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER_ Level (low/med): LOW___

% Solids for Sample: __0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	2120.0500		111.8900	B	2000.00	100.4		P
Antimony	75-125	493.7900		16.2000	U	500.00	98.8		P
Arsenic	75-125	35.9000		1.1000	U	40.00	89.8		F
Barium	75-125	1985.0500		28.7400	B	2000.00	97.8		P
Beryllium	75-125	47.4000		0.2000	U	50.00	94.8		P
Cadmium	75-125	49.4000		1.7000	U	50.00	98.8		P
Calcium									NR
Chromium	75-125	189.6600		2.1900	B	200.00	93.7		P
Cobalt	75-125	485.8300		1.7000	U	500.00	97.2		P
Copper	75-125	296.2500		50.0400		250.00	98.5		P
Iron	75-125	2521.9400		1525.8400		1000.00	99.6		P
Lead	75-125	28.2000		7.5000		20.00	103.5		F
Magnesium									NR
Manganese	75-125	502.7000		31.6000		500.00	94.2		P
Mercury	75-125	0.9270		0.2000	U	1.00	92.7		CV
Nickel	75-125	498.9400		6.5000	U	500.00	99.8		P
Potassium									NR
Selenium	75-125	8.9000		0.7000	U	10.00	89.0		F
Silver	75-125	42.4700		3.7000	U	50.00	84.9		P
Sodium									NR
Thallium	75-125	35.6000		0.6000	U	50.00	71.2	N	F
Vanadium	75-125	497.0100		9.0000	U	500.00	99.4		P
Zinc	75-125	516.7700		25.4300		500.00	98.3		P
Cyanide	75-125	92.1780		2.0000	U	100.00	92.2		AS

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

0000038

MCJY33S
Filtered

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER_ Level (low/med): LOW___

% Solids for Sample: __0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	2007.5200		11.8000	U	2000.00	100.4		P
Antimony	75-125	494.3400		16.2000	U	500.00	98.9		P
Arsenic	75-125	37.0000		1.1000	U	40.00	92.5		F
Barium	75-125	2185.3300		221.9400		2000.00	98.2		P
Beryllium	75-125	48.4800		0.2000	U	50.00	97.0		P
Cadmium	75-125	49.8000		1.7000	U	50.00	99.6		P
Calcium									NR
Chromium	75-125	189.0300		1.8000	U	200.00	94.5		P
Cobalt	75-125	497.1000		1.7000	U	500.00	99.4		P
Copper	75-125	245.6600		1.7000	U	250.00	98.3		P
Iron		9046.4600		8166.6300		1000.00	88.0		P
Lead	75-125	20.0000		0.4000	U	20.00	100.0		F
Magnesium									NR
Manganese	75-125	955.1700		483.7800		500.00	94.3		P
Mercury	75-125	0.9370		0.2000	U	1.00	93.7		CV
Nickel	75-125	507.5400		6.5000	U	500.00	101.5		P
Potassium									NR
Selenium	75-125	9.4000		0.7000	U	10.00	94.0		F
Silver	75-125	45.4500		3.7000	U	50.00	90.9		P
Sodium									NR
Thallium	75-125	40.0000		0.6000	U	50.00	80.0		F
Vanadium	75-125	500.0800		9.0000	U	500.00	100.0		P
Zinc	75-125	529.8100		35.1600		500.00	98.9		P
Cyanide									NR

Comments:

ORIGINAL
(Red)

CASE 18347

APPENDIX B

TPO REPORT

SDG MCJY07

ORIGINAL
(Red)

CASE 18347

APPENDIX B

TPO REPORT

SDG MCJY07

TPO: [ ] ACTION [X] FYI

Region III

ORIGINAL (Red)

INORGANIC REGIONAL DATA ASSESSMENT SUMMARY

CASE NO: 18347
SDG NO: MCJY07
SOW: ILM02.1
NO. OF SAMPLES: twelve (12)

LABORATORY: ITPA
DATA USER: Stevie Wilding
REVIEW COMPLETION DATE: 9/23/92
MATRIX: aqueous

REVIEWER: ESAT

	ICP	AA	HG	CN
1. HOLDING TIMES	O	O	O	O
2. INITIAL CALIBRATIONS	O	O	O	O
3. CONTINUING CALIBRATIONS	O	O	O	O
4. FIELD BLANKS(F=NOT APPLICABLE)	O	O	O	O
5. LABORATORY BLANKS	X	O	O	O
6. ICS	O			
7. LCS	O	O		
8. DUPLICATE ANALYSIS	O	O	O	O
9. MATRIX SPIKE	O	M	O	O
10. MSA		O		
11. SERIAL DILUTION	O			
12. SAMPLE VERIFICATION	O	O	O	O
13. REGIONAL QC(F-NOT APPLICABLE)	F	F	F	F
14. OVERALL ASSESSMENT	X	M	O	O

O = No problems or minor problems that do not affect data usability
X = No more than about 5% of the data points are qualified as either estimated or unusable.
M = More than about 5% of the data points are qualified as estimated.
Z = More than about 5% of the data points are qualified as unusable.
A = TPO action requested; use in conjunction with one of the above codes.

TPO ACTION ITEMS: _____

AREAS OF CONCERN: Documentation attached (see Appendix C)

ORIGINAL (Red)

TPO: [ ] ACTION [X] FYI

Region III

INORGANIC REGIONAL DATA ASSESSMENT SUMMARY

CASE NO: 18347
SDG NO: MCJY07
SOW: ILM02.1
NO. OF SAMPLES: three (3)

LABORATORY: ITPA
DATA USER: Stevie Wilding
REVIEW COMPLETION DATE: 9/23/92
MATRIX: filtered aqueous

REVIEWER: ESAT

	ICP	AA	HG
1. HOLDING TIMES	O	O	O
3. CONTINUING CALIBRATIONS	O	O	O
4. FIELD BLANKS(F=NOT APPLICABLE)	M	O	O
5. LABORATORY BLANKS	X	O	O
6. ICS	O		
7. LCS	O	O	
8. DUPLICATE ANALYSIS	M	O	O
9. MATRIX SPIKE	O	O	O
10. MSA		O	
11. SERIAL DILUTION	O		
12. SAMPLE VERIFICATION	O	O	O
13. REGIONAL QC(F-NOT APPLICABLE)	F	F	F
14. OVERALL ASSESSMENT	M	O	O

O = No problems or minor problems that do not affect data usability
X = No more than about 5% of the data points are qualified as either estimated or unusable.
M = More than about 5% of the data points are qualified as estimated.
Z = More than about 5% of the data points are qualified as unusable.
A = TPO action requested; use in conjunction with one of the above codes.

TPO ACTION ITEMS: _____

AREAS OF CONCERN: Documentation attached (see Appendix C)

ORIGINAL
Red.

CASE 18347

APPENDIX B

TPO REPORT

SDG MCJY21

TPO: [X] ACTION [ ] FYI

Region III

INORGANIC REGIONAL DATA ASSESSMENT SUMMARY

CASE NO: 18347
SDG NO: MCJY21
SOW: ILM02.1
NO. OF SAMPLES: nine (9)

LABORATORY: ITPA
DATA USER: Stevie Wilding
REVIEW COMPLETION DATE: 9/23/92
MATRIX: solid

REVIEWER: ESAT

	ICP	AA	HG	CN
1. HOLDING TIMES	_O_	_O_	_O_	_O_
2. INITIAL CALIBRATIONS	_O_	_O_	_O_	_O_
3. CONTINUING CALIBRATIONS	_O_	_O_	_O_	_O_
4. FIELD BLANKS(F=NOT APPLICABLE)	_O_	_O_	_O_	_O_
5. LABORATORY BLANKS	_O_	_O_	_O_	_O_
6. ICS	_O_			
7. LCS	_O_	_O_		
8. DUPLICATE ANALYSIS	_O_	_O_	_O_	_O_
9. MATRIX SPIKE	_MA_	_O_	_O_	_O_
10. MSA		_O_		
11. SERIAL DILUTION	_M_			
12. SAMPLE VERIFICATION	_O_	_O_	_O_	_O_
13. REGIONAL QC(F-NOT APPLICABLE)	_F_	_F_	_F_	_O_
14. OVERALL ASSESSMENT	_MA_	_O_	_O_	_O_

O = No problems or minor problems that do not affect data usability
X = No more than about 5% of the data points are qualified as either estimated or unusable.
M = More than about 5% of the data points are qualified as estimated.
Z = More than about 5% of the data points are qualified as unusable.
A = TPO action requested; use in conjunction with one of the above codes.

TPO ACTION ITEMS: (9) Matrix spike recovery for the Sb analyte was less than 30% (19.1%)

AREAS OF CONCERN: Documentation attached (see Appendix C)

ORIGINAL
(Red)

CASE 18347

APPENDIX C

SUPPORT DOCUMENTATION

SDG MCJY07

July 16, 1992

INTERNATIONAL TECHNOLOGY CORPORATION

00000 ORIGINAL (Red)

CASE NARRATIVE

JUL 1992 RECEIVED

Laboratory Name:	ITAS Pittsburgh, Pennsylvania
Laboratory Code:	ITPA
Project Name:	USEPA/CLP
Inorganic SOW:	ILM02.1
Project Number:	662004
Work Order Number:	Q206156
Contract Number:	68-D2-0044
Case Number:	18347
SDG Number:	MCJY07

Sample Number:				
	MCJY07	MCJY11	MCJY16	MCJY32
	MCJY08	MCJY12	MCJY17	MCJY33
	MCJY09	MCJY13	MCJY18	MCJY35
	MCJY10	MCJY15	MCJY19	

Shipment

Fifteen water samples were received at the ITAS Pittsburgh Laboratory on June 24, 1992; twelve for metals and cyanide analysis and three for metals analysis only.

Metals

A duplicate digestion and a matrix spike were performed on samples MCJY11 and MCJY33. A serial dilution was performed on sample MCJY08.

- The matrix spike for thallium on sample MCJY11 exceeded the 75-125 percent control limits and all associated results were flagged with the "N" qualifier.
- The duplicate digestion for iron and manganese on sample MCJY33 exceeded the 20 percent control limit and all associated results were flagged with the "*" qualifier.

Cyanide Analysis

A duplicate and matrix spike were performed on sample MCJY11.

U.S. EPA - CLP

3
BLANKS

0000029

ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	11.8	U	11.8	U	11.8	U	11.8	U	11.800	U	P
Antimony	16.2	U	16.2	U	16.2	U	16.2	U	16.200	U	P
Arsenic	1.1	U	1.1	U	1.1	U	1.1	U	1.100	U	F
Barium	0.5	U	0.5	U	0.5	U	0.7	B	0.500	U	P
Beryllium	0.2	U	0.2	U	0.3	B	0.2	U	0.200	U	P
Cadmium	1.7	U	1.7	U	1.7	U	1.7	U	1.700	U	P
Calcium	-7.0	B	-6.4	B	-7.5	B	-5.2	B	25.800	B	P
Chromium	1.8	U	1.8	U	1.8	U	1.8	U	1.800	U	P
Cobalt	1.7	U	1.7	U	1.7	U	1.7	U	1.700	U	P
Copper	1.7	U	1.7	U	1.7	U	1.7	U	1.700	U	P
Iron	2.3	U	-2.4	B	2.3	U	2.3	U	9.680	B	P
Lead	0.4	U	0.4	U	0.4	U	0.4	U	0.400	U	F
Magnesium	19.3	U	19.3	U	19.3	U	19.3	U	20.400	B	P
Manganese	-0.7	B	0.6	U	0.6	U	0.6	U	0.660	B	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	0.200	U	CV
Nickel	6.5	U	6.5	U	6.5	U	6.5	U	6.500	U	P
Potassium	369.0	U	369.0	U	369.0	U	369.0	U	369.000	U	P
Selenium	0.7	U	0.7	U	0.7	U	0.7	U	0.700	U	F
Silver	3.7	U	3.7	U	3.7	U	3.7	U	3.700	U	P
Sodium	-32.0	B	-22.2	B	-19.7	B	-26.7	B	8.400	U	P
Thallium	0.6	U	0.6	U	0.6	U	0.6	U	0.600	U	F
Vanadium	9.0	U	9.0	U	9.0	U	9.0	U	9.000	U	P
Zinc	2.0	U	2.0	U	2.0	U	2.0	U	5.360	B	P
Cyanide	4.0	U	4.0	U	4.0	U			-2.482	B	AS

MCJY07 08

MCJY09-13 MCJY15-17

MCJY18 MCJY19 MCJY32 MCJY33 MCJY35

next CCB has no hits

FORM III - IN

ILM02.1

U.S. EPA - CLP

14

ANALYSIS RUN LOG

ORIGINAL (Red)

0000056

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: JA61E_____ Method: P_

Start Date: 06/30/92 End Date: 06/30/92

EPA Sample No.	D/F	Time	% R	Analytes																										
				ALK	BS	ASA	BAE	BED	CAR	CIO	CU	CE	FB	PBG	MGN	MNG	HGI	NI	KE	SEG	AGA	NAL	TL	VIN	ZIN	CN
S0	1.00	1423		X	X		X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
S	1.00	1426																			X					
S	1.00	1428		X	X			X					X					X				X				
S	1.00	1431																								
S	1.00	1433					X		X	X		X	X			X	X			X					X	
S	1.00	1436									X															
S	1.00	1438																						X		
ICV	1.00	1446		X			X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICV	1.00	1449			X																					
ICB	1.00	1451		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICSA	1.00	1454		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICSAB	1.00	1457		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
CRI	1.00	1459			X			X	X		X	X	X				X		X			X			X	X	
ZZZZZZ	1.00	1502																								
ZZZZZZ	1.00	1505																								
ZZZZZZ	1.00	1507																								
ZZZZZZ	1.00	1510																								
ZZZZZZ	1.00	1513																								
ZZZZZZ	1.00	1516																								
ZZZZZZ	1.00	1518																								
CCV	1.00	1521																			X					
CCV	1.00	1523		X	X		X	X	X	X	X	X	X	X		X	X		X	X			X		X	X	
CCB	1.00	1526		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ZZZZZZ	1.00	1529																								
ZZZZZZ	1.00	1531																								
ZZZZZZ	1.00	1534																								
ZZZZZZ	1.00	1537																								
PBW → Ca	25.6mg/L 1.00	1539		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
LCSW Fe	9.7mg/L 1.00	1542		X			X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
LCSW Mg	20.4mg/L 1.00	1545			X																					
MCJY07 Zn	5.4mg/L 1.00	1547		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
MCJY07L	5.00	1550																								

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ANALYSIS RUN LOG

0000057

ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: JA61E_____ Method: P_

Start Date: 06/30/92 End Date: 06/30/92

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
MCJY08	1.00	1553		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
CCV	1.00	1555		_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	X	_	_	_	_	_
CCV	1.00	1558		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	_	X	_	X	X	_
CCB	1.00	1601		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY09	1.00	1603		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY10	1.00	1606		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY11	1.00	1608		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY11D	1.00	1611		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY11S	1.00	1614		X	X	_	X	X	X	_	X	X	X	X	_	_	X	_	X	_	_	X	_	_	X	X	_
MCJY12	1.00	1616		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY13	1.00	1619		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY15	1.00	1622		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY16	1.00	1624		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY17	1.00	1627		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
CCV	1.00	1630		_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	X	_	_	_	_	_
CCV	1.00	1632		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	_	X	_	X	X	_
CCB	1.00	1635		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY18	1.00	1638		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY19	1.00	1640		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY32	1.00	1643		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY33	1.00	1646		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY33D	1.00	1648		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
MCJY33S	1.00	1651		X	X	_	X	X	X	_	X	X	X	X	_	_	X	_	X	_	_	X	_	_	X	X	_
MCJY35	1.00	1653		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
ICSA	1.00	1656		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
ICSAB	1.00	1659		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_
CRI	1.00	1701		_	X	_	_	X	X	_	X	X	X	_	_	_	X	_	X	_	_	X	_	_	X	X	_
CCV	1.00	1704		_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	X	_	_	_	_	_
CCV	1.00	1707		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	_	X	_	X	X	_
CCB	1.00	1709		X	X	_	X	X	X	X	X	X	X	X	_	X	X	_	X	X	_	X	X	_	X	X	_

FORM XIV - IN

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6
DUPLICATES

EPA SAMPLE NO.
0000040 (Red)
MCJY33D
Filtered

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		11.8000	U	11.8000	U			P
Antimony		16.2000	U	16.2000	U			P
Arsenic		1.1000	U	1.1000	U			F
Barium	200.0	221.9400		167.3300	B	28.1		P
Beryllium		0.2000	U	0.2000	U			P
Cadmium		1.7000	U	1.7000	U			P
Calcium	5000.0	20773.7700		15776.6300		27.3		P
Chromium		1.8000	U	1.8000	U			P
Cobalt		1.7000	U	2.4200	B	200.0		P
Copper		1.7000	U	1.7000	U			P
Iron		8166.6300		6184.5300		27.6	*	P
Lead		0.4000	U	0.4000	U			F
Magnesium	5000.0	11165.4000		8214.8500		30.4		P
Manganese		483.7800		367.3600		27.4	*	P
Mercury		0.2000	U	0.2000	U			CV
Nickel		6.5000	U	6.5000	U			P
Potassium		1692.0800	B	2441.0200	B	36.2		P
Selenium		0.7000	U	0.7000	U			F
Silver		3.7000	U	3.7000	U			P
Sodium		3964.7300	B	3016.2000	B	27.2		P
Thallium		0.6000	U	0.6000	U			F
Vanadium		9.0000	U	9.0000	U			P
Zinc	20.0	35.1600		26.9000		26.6		P
Cyanide								NR

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6
DUPLICATES

ORIGINAL (Red)

EPA SAMPLE NO.

0000039

MCJY11D
non-filtered

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		111.8900	B	116.4700	B	4.0		P
Antimony		16.2000	U	16.2000	U			P
Arsenic		1.1000	U	1.1000	U			F
Barium		28.7400	B	29.1500	B	1.4		P
Beryllium		0.2000	U	0.2000	U			P
Cadmium		1.7000	U	1.7000	U			P
Calcium		139246.6090		142632.6500		2.4		P
Chromium		2.1900	B	2.1900	B	0.0		P
Cobalt		1.7000	U	1.7000	U			P
Copper	25.0	50.0400		53.2200		6.2		P
Iron		1525.8400		1536.8500		0.7		P
Lead	3.0	7.5000		7.5000		0.0		F
Magnesium	5000.0	22141.2400		22717.6100		2.6		P
Manganese	15.0	31.6000		31.7700		0.5		P
Mercury		0.2000	U	0.2000	U			CV
Nickel		6.5000	U	6.5000	U			P
Potassium		1440.3500	B	1503.7700	B	4.3		P
Selenium		0.7000	U	0.7000	U			F
Silver		3.7000	U	3.7000	U			P
Sodium		1636.0800	B	1841.2200	B	11.8		P
Thallium		0.6000	U	0.6000	U			F
Vanadium		9.0000	U	9.0000	U			P
Zinc	20.0	25.4300		26.2600		3.2		P
Cyanide		2.0000	U	2.0000	U			AS

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ANALYSIS RUN LOG

0000074 ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: PC5100_____ Method: F_

Start Date: 07/06/92 End Date: 07/06/92

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	1029																									
ZZZZZZ	1.00	1034																									
ZZZZZZ	1.00	1039																									
CCV	1.00	1043																						X			
CCB	1.00	1048																						X			
ZZZZZZ	1.00	1053																									
ZZZZZZ	1.00	1057																									
ZZZZZZ	1.00	1102																									
ZZZZZZ	1.00	1107																									
ZZZZZZ	1.00	1111																									
ZZZZZZ	1.00	1116																									
ZZZZZZ	1.00	1121																									
ZZZZZZ	1.00	1125																									
CCV	1.00	1130																						X			
CCB	1.00	1135																						X			
ZZZZZZ	1.00	1139																									
ZZZZZZ	1.00	1144																									
ZZZZZZ	1.00	1149																									
ZZZZZZ	1.00	1153																									
ZZZZZZ	1.00	1158																									
ZZZZZZ	1.00	1203																									
ZZZZZZ	1.00	1208																									
ZZZZZZ	1.00	1213																									
CCV	1.00	1217																						X			
CCB	1.00	1222																						X			
PBW	1.00	1226																						X			
PBWA	1.00	1231	104.0																					X			
LCSW	4.00	1236																						X			
LCSWA	4.00	1240	89.0																					X			
MCJY08	1.00	1245																						X			
MCJY08A	1.00	1250	78.0																					X			
MCJY09	1.00	1254																						X			

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ANALYSIS RUN LOG

ORIGINAL (Red)

0000075

Lab Name: ITAS_PITTSBURGH

Contract: 68-D2-0044

Lab Code: ITPA Case No.: 18347

SAS No.: SDG No.: MCJY07

Instrument ID Number: PC5100

Method: F

Start Date: 07/06/92

End Date: 07/06/92

EPA Sample No.	D/F	Time	% R	Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Hg	Ni	K	Se	Ag	Na	Tl	V	Zn	CN
MCJY09A	1.00	1259	72.0																					X			
CCV	1.00	1303																						X			
CCB	1.00	1308																						X			
MCJY10	1.00	1313																						X			
MCJY10A	1.00	1317	60.5																					X			
MCJY11	1.00	1322																						X			
MCJY11A	1.00	1327	77.5																					X			
MCJY11D	1.00	1331																						X			
MCJY11DA	1.00	1336	80.5																					X			
MCJY11S	1.00	1341																						X			
MCJY12	1.00	1345																						X			
MCJY12A	1.00	1350	73.5																					X			
CCV	1.00	1355																						X			
[illegible]B	1.00	1359																						X			
MCJY07	1.00	1418																						X			
MCJY07A	1.00	1422	102.0																					X			
MCJY13	1.00	1427																						X			
MCJY13A	1.00	1431	80.0																					X			
MCJY15	1.00	1436																						X			
MCJY15A	1.00	1441	82.0																					X			
MCJY16	1.00	1445																						X			
MCJY16A	1.00	1450	84.0																					X			
CCV	1.00	1455																						X			
CCB	1.00	1459																						X			
MCJY17	1.00	1504																						X			
MCJY17A	1.00	1509	84.0																					X			
MCJY18	1.00	1513																						X			
MCJY18A	1.00	1518	82.0																					X			
MCJY19	1.00	1522																						X			
MCJY19A	1.00	1527	89.0																					X			
MCJY32	1.00	1532																						X			
MCJY32A	1.00	1536	101.0																					X			

ORIGINAL (Red)

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ANALYSIS RUN LOG

0000076

Lab Name: ITAS_PITTSBURGH__________ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _______ SDG No.:MCJY07

Instrument ID Number: PC5100_______ Method: F_

Start Date: 07/06/92 End Date: 07/06/92

EPA Sample No.	D/F	Time	% R	Analytes: A L	S B	A S	B A	B E	C D	C A	C R	C O	C U	F E	P B	M G	M N	H G	N I	K	S E	A G	N A	T L	V	Z N	C N
CCV	1.00	1541																						X			
CCB	1.00	1546																						X			
MCJY33	1.00	1550																						X			
MCJY33A	1.00	1555	85.0																					X			
MCJY33D	1.00	1600																						X			
MCJY33DA	1.00	1604	84.0																					X			
MCJY33S	1.00	1609																						X			
MCJY35	1.00	1614																						X			
MCJY35A	1.00	1618	86.0																					X			
CCV	1.00	1623																						X			
CCB	1.00	1628																						X			

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5A
SPIKE SAMPLE RECOVERY

ORIGINAL (Red)

EPA SAMPLE NO.

0000037

MCJY11S

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044 non-filtered

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER_ Level (low/med): LOW___

% Solids for Sample: __0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	2120.0500		111.8900	B	2000.00	100.4		P
Antimony	75-125	493.7900		16.2000	U	500.00	98.8		P
Arsenic	75-125	35.9000		1.1000	U	40.00	89.8		F
Barium	75-125	1985.0500		28.7400	B	2000.00	97.8		P
Beryllium	75-125	47.4000		0.2000	U	50.00	94.8		P
Cadmium	75-125	49.4000		1.7000	U	50.00	98.8		P
Calcium									NR
Chromium	75-125	189.6600		2.1900	B	200.00	93.7		P
Cobalt	75-125	485.8300		1.7000	U	500.00	97.2		P
Copper	75-125	296.2500		50.0400		250.00	98.5		P
Iron	75-125	2521.9400		1525.8400		1000.00	99.6		P
Lead	75-125	28.2000		7.5000		20.00	103.5		F
Magnesium									NR
Manganese	75-125	502.7000		31.6000		500.00	94.2		P
Mercury	75-125	0.9270		0.2000	U	1.00	92.7		CV
Nickel	75-125	498.9400		6.5000	U	500.00	99.8		P
Potassium									NR
Selenium	75-125	8.9000		0.7000	U	10.00	89.0		F
Silver	75-125	42.4700		3.7000	U	50.00	84.9		P
Sodium									NR
Thallium	75-125	35.6000		0.6000	U	50.00	71.2	N	F
Vanadium	75-125	497.0100		9.0000	U	500.00	99.4		P
Zinc	75-125	516.7700		25.4300		500.00	98.3		P
Cyanide	75-125	92.1780		2.0000	U	100.00	92.2		AS

Comments:

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

ORIGINAL (Red)

EPA SAMPLE NO.

0000038

MCJY33S

Filtered

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY07

Matrix (soil/water): WATER_ Level (low/med): LOW___

% Solids for Sample: __0.0

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	2007.5200		11.8000	U	2000.00	100.4		P
Antimony	75-125	494.3400		16.2000	U	500.00	98.9		P
Arsenic	75-125	37.0000		1.1000	U	40.00	92.5		F
Barium	75-125	2185.3300		221.9400		2000.00	98.2		P
Beryllium	75-125	48.4800		0.2000	U	50.00	97.0		P
Cadmium	75-125	49.8000		1.7000	U	50.00	99.6		P
Calcium									NR
Chromium	75-125	189.0300		1.8000	U	200.00	94.5		P
Cobalt	75-125	497.1000		1.7000	U	500.00	99.4		P
Copper	75-125	245.6600		1.7000	U	250.00	98.3		P
Iron		9046.4600		8166.6300		1000.00	88.0		P
Lead	75-125	20.0000		0.4000	U	20.00	100.0		F
Magnesium									NR
Manganese	75-125	955.1700		483.7800		500.00	94.3		P
Mercury	75-125	0.9370		0.2000	U	1.00	93.7		CV
Nickel	75-125	507.5400		6.5000	U	500.00	101.5		P
Potassium									NR
Selenium	75-125	9.4000		0.7000	U	10.00	94.0		F
Silver	75-125	45.4500		3.7000	U	50.00	90.9		P
Sodium									NR
Thallium	75-125	40.0000		0.6000	U	50.00	80.0		F
Vanadium	75-125	500.0800		9.0000	U	500.00	100.0		P
Zinc	75-125	529.8100		35.1600		500.00	98.9		P
Cyanide									NR

Comments:

U.S. EPA - CLP

14
ANALYSIS RUN LOG

0000069 ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY07

Instrument ID Number: PC5100_____ Method: F_

Start Date: 07/07/92 End Date: 07/07/92

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
MCJY08	1.00	0241																			X						
MCJY08A	1.00	0245	104.0																		X						
MCJY09	1.00	0248																			X						
MCJY09A	1.00	0252	96.0																		X						
CCV	1.00	0255																			X						
CCB	1.00	0259																			X						
MCJY10	1.00	0302																			X						
MCJY10A	1.00	0306	66.0																		X						
MCJY11	1.00	0309																			X						
MCJY11A	1.00	0313	96.0																		X						
MCJY11D	1.00	0317																			X						
MCJY11DA	1.00	0320	105.0																		X						
MCJY11S	1.00	0324																			X						
CC[illegible]	1.00	0327																			X						
CCB	1.00	0331																			X						
MCJY12	1.00	0337																			X						
MCJY12A	1.00	0340	103.0																		X						
MCJY13	1.00	0344																			X						
MCJY13A	1.00	0347	94.0																		X						
MCJY15	1.00	0351																			X						
MCJY15A	1.00	0354	95.0																		X						
MCJY16	1.00	0358																			X						
MCJY16A	1.00	0401	88.0																		X						
CCV	1.00	0404																			X						
CCB	1.00	0408																			X						
MCJY17	1.00	0411																			X						
MCJY17A	1.00	0415	106.0																		X						
MCJY18	1.00	0418																			X						
MCJY18A	1.00	0422	95.0																		X						
MCJY19	1.00	0425																			X						
MCJY19A	1.00	0429	108.0																		X						
MCJY32	1.00	0432																			X						

ORIGINAL
(Red)

CASE 18347

APPENDIX C

SUPPORT DOCUMENTATION

SDG MCJY21

July 16, 1992

INTERNATIONAL TECHNOLOGY CORPORATION

000001

ORIGINAL (Red)

CASE NARRATIVE

JUL 1992 RECEIVED

Laboratory Name:	ITAS Pittsburgh, Pennsylvania
Laboratory Code:	ITPA
Project Name:	USEPA/CLP
Inorganic SOW:	ILM02.1
Project Number:	662004
Work Order Number:	Q206155
Contract Number:	68-D2-0044
Case Number:	18347
SDG Number:	MCJY21

Sample Number:	MCJY21	MCJY24	MCJY27	MCJY30
	MCJY22	MCJY25	MCJY28	MCJY31
	MCJY23	MCJY26	MCJY29	

Shipment

Eleven soil samples were received at the ITAS Pittsburgh Laboratory on June 24, 1992, for metals and cyanide analysis.

Metals

A duplicate digestion and a matrix spike were performed on sample MCJY25. A serial dilution was performed on sample MCJY21.

- The matrix spike for antimony exceeded the 75-125 percent control limits and all associated results were flagged with the "N" qualifier.
- The duplicate digestion for aluminum exceeded the 20 percent control limit and all associated results were flagged with the "*" qualifier.
- The serial dilution for zinc was beyond the 10 percent control limit and all associated results were flagged with the "E" qualifier.
- A dilution was reported for iron on sample MCJY28, due to a concentration greater than the linear range.
- The ICP analysis was used to determine the initial GFAA dilutions for lead.

000002

ORIGINAL (Red)

Metals (Continued)

- Dilutions were reported for lead on samples MCJY25, MCJY25D, MCJY25S, MCJY26, MCJY27, MCJY28, MCJY29, and MCJY31, due to concentrations greater than the calibration range.

- Sample MCJY22 for selenium and samples MCJY21 and MCJY31 for lead were analyzed by method of standard additions. The correlation coefficients were greater than 0.995 and these results were flagged with the "S" qualifier

Cyanide Analysis

A duplicate and matrix spike were performed on sample MCJY25.

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MCJY25S
0000032

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

ORIGINAL (Red)

Matrix (soil/water): SOIL__ Level (low/med): LOW___

% Solids for Sample: _80.9

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	23.5649		4.0049	U	123.61	19.1	N	P
Arsenic	75-125	15.8962		7.8863		9.89	81.0		F
Barium	75-125	615.1743		142.4104		494.44	95.6		P
Beryllium	75-125	12.7268		1.0902	B	12.36	94.1		P
Cadmium	75-125	11.1347		0.4203	B	12.36	86.7		P
Calcium									NR
Chromium	75-125	58.2274		11.9778		49.44	93.5		P
Cobalt	75-125	140.4648		19.3127		123.61	98.0		P
Copper	75-125	87.8690		28.6650		61.80	95.8		P
Iron									NR
Lead		41.9283		34.9567		4.94	141.1		F
Magnesium									NR
Manganese		1512.5983		1174.6156		123.61	273.4		P
Mercury	75-125	0.7275		0.1177	U	0.59	123.3		CV
Nickel	75-125	141.5130		22.1681		123.61	96.5		P
Potassium									NR
Selenium	75-125	2.2002		0.3461	B	2.47	75.1		F
Silver	75-125	10.0692		0.9147	U	12.36	81.5		P
Sodium									NR
Thallium	75-125	11.5698		0.1978	U	12.36	93.6		F
Vanadium	75-125	139.3424		18.2843		123.61	97.9		P
Zinc	75-125	201.1471		77.9629		123.61	99.7		P
Cyanide	75-125	5.3359		0.2468	U	6.18	86.3		AS

Placed extremely out

Comments:

U.S. EPA - CLP

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MCJY25A
0000033
ORIGINAL (Med)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY24

Matrix (soil/water) : SOIL__ Level (low/med): LOW___

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
Aluminum									NR
Antimony		106.53		16.20	U	120.0	88.8		P
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

Comments:

U.S. EPA - CLP

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ICP SERIAL DILUTION

EPA SAMPLE NO.

MCJY21 ORIGINAL 0000037

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Level (low/med): LOW__

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	12930.63		13852.50		7.1		P
Antimony	16.20	U	81.00	U			P
Arsenic							
Barium	500.23		529.10	B	5.8		P
Beryllium	4.82	B	6.40	B	32.8		P
Cadmium	1.70	U	8.50	U			P
Calcium	34619.89		37743.80		9.0		P
Chromium	34.41		42.75	B	24.2		P
Cobalt	165.99		182.55	B	10.0		P
Copper	72.30		77.00	B	6.5		P
Iron	162241.48		177149.65		9.2		P
Lead							
Magnesium	2007.66	B	2194.80	B	9.3		P
Manganese	8932.72		9622.85		7.7		P
Mercury							
Nickel	198.82		206.70		4.0		P
Potassium	2737.77	B	4386.55	B	60.2		P
Selenium							
Silver	3.70	U	19.50	U			P
Sodium	286.14	B	360.25	B	25.9		P
Thallium							
Vanadium	50.53		52.80	B	4.5		P
Zinc	482.23		537.60		11.5	E	P

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6
DUPLICATES

EPA SAMPLE NO.

MCJY25D

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.: MCJY21

Matrix (soil/water): SOIL_ Level (low/med): _LOW__

% Solids for Sample: _80.9 % Solids for Duplicate: __81.1

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		8269.2089		10305.3597		21.9	*	P
Antimony		4.0049	U	4.0049	U			P
Arsenic	2.5	7.8863		8.4549		7.0		F
Barium	49.4	142.4104		164.9839		14.7		P
Beryllium	1.2	1.0902	B	1.2485		13.5		P
Cadmium		0.4203	B	0.4203	U	200.0		P
Calcium	1236.1	2642.7713		2661.2361		0.7		P
Chromium	2.5	11.9778		14.3263		17.9		P
Cobalt	12.4	19.3127		20.2225		4.6		P
Copper	6.2	28.6650		29.7824		3.8		P
Iron		33916.1182		35482.3782		4.5		P
Lead		34.9567		34.0667		2.6		F
Magnesium		1031.1125	B	1169.3622	B	12.6		P
Manganese		1174.6156		1274.5637		8.2		P
Mercury		0.1177	U	0.1212	U			CV
Nickel	9.9	22.1681		25.7454		14.9		P
Potassium	1236.1	1236.5043		1597.1669		25.5		P
Selenium		0.3461	B	0.4450	B	25.0		F
Silver		0.9147	U	0.9147	U			P
Sodium		118.6749	B	118.4598	B	0.2		P
Thallium		0.1978	U	0.1978	U			F
Vanadium	12.4	18.2843		22.4549		20.5		P
Zinc		77.9629		86.7392		10.7		P
Cyanide		0.2468	U	0.2746	B	200.0		AS

9k doesn't exceed usability limits

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14

ANALYSIS RUN LOG

ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044 0000070

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY21

Instrument ID Number: PC5100_____ Method: F_

Start Date: 07/07/92 End Date: 07/07/92

EPA Sample No.	D/F	Time	% R	Analytes																								
				ALK	SB	ASA	BA	BE	CD	CA	CR	CO	CU	CE	FE	PB	MG	MN	HG	NI	K	SE	AG	AL	TL	VI	ZN	CN
ZZZZZZ	1.00	0436																										
CCV	1.00	0439																				X						
CCB	1.00	0443																				X						
ZZZZZZ	1.00	0446																										
ZZZZZZ	1.00	0450																										
ZZZZZZ	1.00	0454																										
ZZZZZZ	1.00	0457																										
ZZZZZZ	1.00	0501																										
ZZZZZZ	1.00	0505																										
ZZZZZZ	1.00	0508																										
PBS	1.00	0512																				X						
PBSA	1.00	0515	107.0																			X						
CCV	1.00	0519																				X						
CCB	1.00	0522																				X						
ZZZZZZ	1.00	0527																										
ZZZZZZ	1.00	0531																										
LCSS	10.00	0534																				X						
LCSSA	10.00	0537	102.0																			X						
MCJY21	1.00	0541																				X						
MCJY21A	1.00	0544	93.0																			X						
MCJY22	1.00	0548																										
MCJY22A	1.00	0551	82.0																									
MCJY23	1.00	0555																				X						
MCJY23A	1.00	0558	105.0																			X						
CCV	1.00	0602																				X						
CCB	1.00	0605																				X						
MCJY24	1.00	0609																				X						
MCJY24A	1.00	0612	69.0																			X						
MCJY25	1.00	0616																				X						
MCJY25A	1.00	0619	82.0																			X						
MCJY25D	1.00	0623																				X						
MCJY25DA	1.00	0626	84.0																			X						

U.S. EPA - CLP

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ANALYSIS RUN LOG

ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044 0000071

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY21

Instrument ID Number: PC5100_____ Method: F_

Start Date: 07/07/92 End Date: 07/07/92

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
MCJY25S	1.00	0630																									
MCJY26	1.00	0633																			X						
MCJY26A	1.00	0637	84.0																		X						
CCV	1.00	0640																			X						
CCB	1.00	0644																			X						
MCJY27	1.00	0647																			X						
MCJY27A	1.00	0651	74.0																		X						
MCJY28	1.00	0654																			X						
MCJY28A	1.00	0658	82.0																		X						
MCJY29	1.00	0701																			X						
MCJY29A	1.00	0705	77.0																		X						
MCJY30	1.00	0708																			X						
MCJY30A	1.00	0712	82.0																		X						
MCJY31	1.00	0715																			X						
MCJY31A	1.00	0719	83.0																		X						
CCV	1.00	0723																			X						
CCB	1.00	0726																			X						
MCJY25S	1.00	0738																			X						
ZZZZZZ	1.00	0741																									
ZZZZZZ	1.00	0745																									
ZZZZZZ	1.00	0748																									
ZZZZZZ	1.00	0752																									
ZZZZZZ	1.00	0755																									
ZZZZZZ	1.00	0759																									
ZZZZZZ	1.00	0802																									
ZZZZZZ	1.00	0806																									
CCV	1.00	0809																			X						
CCB	1.00	0813																			X						

U.S. EPA - CLP

14

ANALYSIS RUN LOG

ORIGINAL (Red)

Lab Name: ITAS_PITTSBURGH_____ Contract: 68-D2-0044 0000060

Lab Code: ITPA__ Case No.: 18347_ SAS No.: _____ SDG No.:MCJY21

Instrument ID Number: PE5100_____ Method: F_

Start Date: 07/07/92 End Date: 07/07/92

EPA Sample No.	D/F	Time	% R	Analytes: AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
MCJY21A	1.00	1615	112.0																					X			
MCJY22	1.00	1619																						X			
MCJY22A	1.00	1624	114.5																					X			
CCV	1.00	1628																						X			
CCB	1.00	1633																						X			
MCJY23	1.00	1637																						X			
MCJY23A	1.00	1642	111.5																					X			
MCJY24	1.00	1647																						X			
MCJY24A	1.00	1651	89.0																					X			
MCJY25	1.00	1656																						X			
MCJY25A	1.00	1700	115.5																					X			
MCJY25D	1.00	1705																						X			
MCJY25DA	1.00	1710	116.0																					X			
CCV	1.00	1714																						X			
[illegible]B	1.00	1719																						X			
MCJY25S	1.00	1723																						X			
MCJY26	1.00	1728																						X			
MCJY26A	1.00	1733	112.5																					X			
MCJY27	1.00	1737																						X			
MCJY27A	1.00	1742	115.5																					X			
CCV	1.00	1747																						X			
CCB	1.00	1751																						X			
MCJY28	1.00	1756																						X			
MCJY28A	1.00	1801	108.0																					X			
MCJY29	1.00	1805																						X			
MCJY29A	1.00	1810	122.0																					X			
MCJY30	1.00	1815																						X			
MCJY30A	1.00	1819	119.0																					X			
MCJY31	1.00	1824																						X			
MCJY31A	1.00	1829	117.0																					X			
CCV	1.00	1833																						X			
CCB	1.00	1838																						X			

U.S. EPA - CLP

8

STANDARD ADDITION RESULTS

ORIGINAL 0000036

Lab Name: ITAS_PITTSBURGH_____ Contract:68-D2-0044

Lab Code: ITPA__ Case No.: 18347_ SAS No.:_____ SDG No.:MCJY21

Concentration Units: ug/L

EPA Sample No.	An	0 ADD ABS	1 ADD CON	1 ADD ABS	2 ADD CON	2 ADD ABS	3 ADD CON	3 ADD ABS	Final Conc.	r	Q
MCJY21	PB	0.068	5.00	0.093	10.00	0.122	15.00	0.143	13.5	0.9983	
MCJY31	PB	0.041	5.00	0.068	10.00	0.092	15.00	0.117	8.3	0.9997	
MCJY22	SE	0.018	5.00	0.037	10.00	0.050	15.00	0.068	5.8	0.9976	

ORIGINAL
(Red)

CASE 18347

APPENDIX C

SUPPORT DOCUMENTATION

ALL SDGs

ORIGINAL (Red)

EPA SAMPLE SHIPPING LOG FOR ALL SAMPLES SENT THROUGH THE CONTRACT LAB PROGRAM (12/85 version)

RECEIVED JUL 1992

CASE# 18347 SAS# _____ SITE NAME: HOFFMAN LF (MD 04)

Site Leader: JENNIFER WOODS
Phone: (914) 631 3455

EPA Project Officer: MELISSA WHITTINGTON
(215) 597 - 3437

SAS REQUEST: (details remarks)

QC SAMPLE INFO AND/OR COMMENTS	CONC. (low/ med/ high)	SAMPLE PHASE (aq/ sol)	TYPE OF REQUEST org, dio inor, SAS	SAMPLE TRAFFIC REPORT NUMBER	ORGANICS OR INORGANICS: LAB NAME	DATE SHIPPED	DATA RECEIVED XX out items not requested: VOA	BNA	PEST	TCDD	METALS	CN	LAB NAME	SAS REQUEST (itemize)	DATE SHIPPED	DATA REC'D
Field Blank	L	AQ	INORG	MCSY 07	IT Analytical Services	6/23/92					✓	✓				
				MCSY 08							✓	✓				
Dup of MCSY12				MCSY 09							✓	✓				
				MCSY 10							✓	✓				
Spike				MCSY 11							✓	✓				
Dup of MCSY09				MCSY 12							✓	✓				
				MCSY 13							✓	✓				
				MCSY 15							✓	✓				
				MCSY 16							✓	✓				
				MCSY 17							✓	✓				
				MCSY 18							✓	✓				
				MCSY 19							✓	✓	rec'd	7/17/92		
											DISSOLVED					
Field Blank	L	AQ	INORG	MCSY 32	IT	6/23/92					✓					
Spike				MCSY 33							✓					
Dup of MCSY35				MCSY 35							✓		rec'd	7/17/92		

ORIGINAL (Red)

MDTE51

page 4 of 4

EPA SAMPLE SHIPPING LOG FOR ALL SAMPLES SENT THROUGH THE CONTRACT LAB PROGRAM (12/85 version)

CASE# 18347 SAS# _____ SITE NAME: Hoffman (MD 04)

Site Leader: Jennifer Woods EPA Project Officer: Melissa Whittington

Phone: (410) 631-3455 (215) 597-3437

SAS REQUEST: (details required)

RECEIVED JUL 1992

QC SAMPLE INFO AND/OR COMMENTS	CONC. (low/med/high)	SAMPLE PHASE (aq/sol)	TYPE OF REQUEST org, dio inor, SAS	SAMPLE TRAFFIC REPORT NUMBER	ORGANICS OR INORGANICS: LAB NAME	DATE SHIPPED	DATA RECEIVED XX out items not requested: VOA	BNA	PEST	TCDD	METALS	CN	LAB NAME	SAS REQUEST (itemize)	DATE SHIPPED	DATA REC'D
	L	Solid	INORG	MCSY 21	IT Analytical Export PA	6/23/92					✓	✓				
				MCSY 22							✓	✓				
				MCSY 23							✓	✓				
				MCSY 24							✓	✓				
Spike				MCSY 25							✓	✓				
				MCSY 26							✓	✓				
p of MCSY 31				MCSY 27							✓	✓				
				MCSY 28							✓	✓				
				MCSY 29							✓	✓				
				MCSY 30							✓	✓				
p of MCSY 27				MCSY 31							✓	✓	rec'd	7/17/92	gg	

EPA Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

& Chain of Custody Record
(For Inorganic CLP Analysis)

18347

1. Sample Description (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (SAS)
7. Waste (SAS)
8. Other (SAS) (Specify)

2. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (SAS) (Specify)
N. Not preserved

3. Region No.: III
Sampling Co.: MDE / HSWMA
Sampler (Name): JENNIFER WOOD
Sampler Signature: [signature]

4. Type of Activity
Lead: SF [ ] PRP [ ] ST [X] FED [ ]
Pre-Remedial: PA [ ] SSI [X] LSI [ ]
Remedial: RIFS [ ] RD [ ] RA [ ] O&M [ ] NPLD [ ]
Removal: CLEM [ ] REMA [ ] REM [ ] OIL [ ] UST [ ]

5. Date Shipped: 6/23/92
Carrier: FEDEX
Airbill Number: 4209458030

6. Ship To
IT ANALYTICAL SERVICES - EXPORT
5103 OLD WILLIAM PENN HWY
EXPORT, PA 15632
ATTN: ROBERT FINLAY
(412) 731 ~~866~~ 0006

7. Date Received -- Received by: 6-24-92 J. Smith
Laboratory Contract Number: 68-D2-0044

8. Transfer to
Date Received
Received by
Contract Number
Price

CLP Sample Numbers (from labels)	A Enter # from Box 1	B Conc. Low Med High	C Sample Type: Comp./Grab	D Preservative from Box 6	E - RAS Analysis: Metals Total	Metals Dissolved	Cyanide	Low Conc. Nitrate/Nitrite	Low Conc. Fluoride	High pH	High Conductivity	F Regional Specific Tracking Number or Tag Numbers	G Station Location Number	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Corresp. CLP Org. Samp. No.	K Sample Condition on Receipt	L High Conc. Phases (Check below): Solids	Water - MIS Liq.	Non Water - MIS Liq.
MCTY 07	3	L	G	2,3	X		X					3-1185901 3-1185962	BLK 1	6/23/92 830	[illegible]	CKY 14	ok			
MCTY 08	2	L	G	2,3	X		X					3-1185903 3-1185904	GW 1	6/23/92 830	[illegible]	CKY 15				
MCTY 09	2	L	G	2,3	X		X					3-1185905 3-1185906	GW 2	6/23/92 1045	[illegible]	CKY 16				
MCTY 10	2	L	G	2,3	X		X					3-1185907 3-1185908	GW 3	6/23/92 1200	[illegible]	CKY 17				
MCTY 11	2	L	G	2,3	X		X					3-1185909 3-1185912	GW 4	6/23/92 1015	[illegible]	CKY 18				
MCTY 12	2	L	G	2,3	X		X					3-1185913 3-1185914	GW 5	6/23/92 1045	[illegible]	CKY 19				
MCTY 13	2	L	G	2,3	X		X					3-1185915 3-1185916	GW 6	6/23/92 1345	[illegible]	CKY 20				
~~MCTY 14~~	~~2~~	~~L~~	~~G~~	~~2,3~~	~~X~~		~~X~~					~~3-1185917 3-1185918~~ NO	~~GW 7~~			~~CKY 21~~				
MCTY 15	1	L	G	2,3	X		X					3-1185919 3-1185920	SW 1	6/23/92 945	[illegible]	CKY 22				
MCTY 16	1	L	G	2,3	X		X					3-1185921 3-1185922	SW 2	6/23/92 930	[illegible]	CKY 23	✓			

Shipment for Case complete? (Y/N): Y
Page 1 of 3
Sample used for a spike and/or duplicate: DO QC ON MCTY 11
Additional Sampler Signatures: [signature] Michele A. Hoover
Chain of Custody Seal Number

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	6/23/92 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Received by: (Signature)	Date / Time	Received for Laboratory by: (Signature) J. Smith	Date / Time 6-24-92 0930	Remarks Is custody seal intact? Y/N/none	

EPA Form 9110-1 (Rev. 5-91) Replaces EPA Form (2075-6), previous edition which may be used.
DISTRIBUTION:
Green - Region Copy Pink - SMO Copy White - Lab Copy Yellow - Lab Copy for Return to SMO

Split Samples [ ] Accepted (Signature)
[ ] Declined

000098

1 020257

ORIGINAL (Red)

EPA

United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

Inorganic Traffic Report & Chain of Custody Record

(For Inorganic CLP Analysis)

SAS No. (if applicable):

Case No.: 18347

1. Sample Description (Enter in Column A)
   1. Surface Water
   2. Ground Water
   3. Leachate
   4. Rinsate
   5. Soil/Sediment
   6. Oil (SAS)
   7. Waste (SAS)
   8. Other (SAS) (Specify)

2. Preservative (Enter in Column D)
   1. HCl
   2. HNO_3
   3. NaOH
   4. H_2SO_4
   5. $K_2CR_2O_7$
   6. Ice only
   7. Other (SAS) (Specify)
   N. Not preserved

3. Region No.: III

Sampling Co.: MDE/ASWMA

Sampler (Name): Jennifer Woods

Sampler Signature: [signature]

4. Type of Activity

	Lead	Pre-Remedial	Remedial	Removal
SF			RIFS	CLEM
PRP		PA	RD	REMA
ST	X	SSI	RA	REM
FED		LSI	O&M	OIL
			NPLD	UST

5. Date Shipped: 6/23/92

Carrier: FED EX

Airbill Number: 4208458030

6. Ship To: IT ANALYTICAL SERVICES-EXPORT
5103 OLD WILLIAM PENN HWY
EXPORT, PA 15632
ATTN: ROBERT FINLAY
(412) 731-8806

7. Date Received -- Received by: 6-24-92 [signature]

Laboratory Contract Number: 68-D2-0044

8. Transfer to:

Date Received:

Received by:

Contract Number:

Price:

CLP Sample Numbers (from labels)	A Enter # from Box 1	B Conc. Low Med High	C Sample Type: Comp./Grab	D Preservative from Box 6	E - RAS Analysis: Metals Total	Metals Dissolved	Cyanide	Low Conc. Nitrate/Nitrite	Low Conc. Fluoride	High pH	High Conductivity	F Regional Specific Tracking Number or Tag Numbers	G Station Location Number	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Corresp. CLP Org. Samp. No.	K Sample Condition on Receipt	L High Conc. Phases (Check below): Solids	Water - MS Liq.	Non Water - MS Liq.
MCSY 17	1	L	G	2,3	X		X					3-1185923 / 3-1185924	SW3	6/23/92 1050	[illegible]	CKY 24	OK			
MCSY 18	1	L	G	2,3	X		X					3-1185925 / 3-1185926	SW4	6/23/92 1215	[illegible]	CKY 25				
MCSY 19	3	L	G	2,3	X		X					3-1185927 / 3-1185928	LT1	6/23/92 0915	[illegible]	CKY 26				
~~MCSY 20~~	~~3~~	~~L~~	~~G~~	~~2,3~~	~~X~~		~~X~~					~~3-1185929 / 3-1185930~~	~~LT2~~			~~CKY 27~~				
MCSY 21	5	L	G	6	X		X					3-1185931	SED1	6/23/92 945	[illegible]	CKY 28				
MCSY 22	5	L	G	6	X		X					3-1185932	SED2	6/23/92 930	[illegible]	CKY 29				
MCSY 23	5	L	G	6	X		X					3-1185933	SED3	6/23/92 1050	[illegible]	CKY 30				
MCSY 24	5	L	G	6	X		X					3-1185934	SED4	6/23/92 1215	[illegible]	CKY 31				
MCSY 25	5	L	G	6	X		X					3-1185935	S1	6/23/92 1200	[illegible]	CKY 32				
MCSY 26	5	L	G	6	X		X					3-1185936	S2	6/23/92 1000	[illegible]	CKY 33				

Shipment for Case complete? (Y/N): Y

Page 1 of 3

Sample used for a spike and/or duplicate: DO QC on MCSY 25

Additional Sampler Signatures: [signatures]

Chain of Custody Seal Number:

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	6/23/92 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Received by: (Signature)	Date / Time	Received for Laboratory by:			

000389

EPA United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490, FTS 557-2490

Inorganic Traffic Report & Chain of Custody Record

(For Inorganic CLP Analysis)

1. Sample Description (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (SAS)
7. Waste (SAS)
8. Other (SAS) (Specify)

2. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (SAS) (Specify)
N. Not preserved

3. Region No.: III
Sampling Co.: MDE/HSWMA
Sampler (Name): Jennifer Woods
Sampler Signature: [signature]

4. Type of Activity: Lead: SF, PRP, ST, FED [X]; Pre-Remedial: PA, SSI [X], LSI; Remedial: RIFS, RD, RA, O&M, NPLD; Removal: CLEM, REMA, REM, OIL, UST

5. Date Shipped: 6/23/92
Carrier: FED EX
Airbill Number: 4208458030

6. Ship To: IT ANALYTICAL SERVICES - EXPORT
(5103 OLD WILLIAM PENN HWY
EXPORT, PA 15632
ATTN: ROBERT FINLAY
(412) 731-8806

SAS No. (if applicable):
Case No.: 18347
7. Date Received -- Received by: 6-24-92 [signature]
Laboratory Contract Number: 68-D2-0044
8. Transfer to:
Date Received:
Received by:
Contract Number:
Price:

CLP Sample Numbers (from labels)	A Enter # from Box 1	B Conc. Low Med High	C Sample Type: Comp./Grab	D Preservative from Box 6	E - RAS Analysis: Metals Total	Metals Dissolved	Cyanide	Low Conc. Nitrate/Nitrite	Low Conc. Fluoride	High pH	High Conductivity	F Regional Specific Tracking Number or Tag Numbers	G Station Location Number	H Mo/Day/Year/Time Sample Collection	I Sampler Initials	J Corresp. CLP Org. Samp. No.	K Sample Condition on Receipt	L High Conc. Phases (Check below): Solids	Water - MIS Liq.	Non Water - MIS Liq.
MCJY 27	5	L	G	6	X		X					3-1185937	S3	6/23/92 930	[illegible]	CKY 34	OK			
MCJY 28	5	L	G	6	X		X					3-1185938	S4	6/23/92 900	[illegible]	CKY 35				
MCJY 29	5	L	G	6	X		X					3-1185939	S5	6/23/92 850	[illegible]	CKY 36				
MCJY 30	5	L	G	6	X		X					3-1185940	S6	6/23/92 1035	[illegible]	CKY 37				
MCJY 31	5	L	G	6	X		X					3-1185941	S7	6/23/92 930	[illegible]	CKY 38				
* MCJY 32	2	L	G	2		X						3-1185942	BLK1	6/23/92 830	[illegible]	CKY 19				
* MCJY 33	2	L	G	2		X						3-1185943	GW6	6/23/92 1341	RAD	CKY 20				
~~* MCJY 34~~	~~2~~	~~L~~	~~G~~	~~2~~		~~X~~						~~3-1185944~~	~~GW7~~			~~CKY 21~~				
* MCJY 35	2	L	G	2		X						~~3-1185946~~								
												3-1225237	GW DUP	6/23/92 1343	RAD	NA				

Shipment for Case complete? (Y/N): Y
Page 1 of 3
Sample used for a spike and/or duplicate: Do QC on MCJY 33
Additional Sampler Signatures: [signature]
Chain of Custody Seal Number: * DIGESTION REQUIRED

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	6/23/92 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Received by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	Is custody seal intact? Y/N/none
		[signature]	6 24 92 0930		

Split Samples

A Form 9110-1 (Rev. 5-91) Replaces EPA Form (2075-6), previous edition which may be used
TRIBUTION:
en - Region Copy Pink - SMO Copy White - Lab Copy

0000400

RECEIVED
OCT 6 1992
SITE ASSESSMENT
SECTION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401- 3013
(410) 573 - 2799

ORIGINAL (Red)

DATE : August 18, 1992

SUBJECT : Region III Data QA Review

FROM : Cynthia E. Caporale C. Caporale
Region III ESAT RPO (3ES31)

TO : Melissa Whittington
Regional Project Manager (3HW13)

Attached is the inorganic data validation report for the Bishop Processing Site (SAS 7190C-01) 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

cc: Bob Dover, MD DOE
Edward Kantor, EMSL-LV
Regional CLP TPO: Larry Marchin

Region: VII Lab Code: IOWA

TID File: 03920420 Task 1432

INORGANIC
DATA VALIDATION
RECEIVED - 8/25/92
BISHOP PROCESSING

Lockheed
Engineering & Sciences Company

Environmental Services Assistance Teams
Region 3

1419 Forest Drive, Suite 104
Annapolis, Maryland 21403

ORIGINAL (Red)

DATE: AUGUST 14, 1992

SUBJECT: INORGANIC DATA VALIDATION, SAS 7190C-01
SITE: BISHOP PROCESSING

FROM: DAN Q BENEDIKT DQB
SENIOR OVERSIGHT CHEMIST

MAHBOOBEH MECANIC MM
SENIOR OVERSIGHT CHEMIST

TO: CYNTHIA E. CAPORALE
ESAT REGIONAL PROJECT OFFICER

THROUGH: DALE S. BOSHART DSB
ESAT TEAM MANAGER

OVERVIEW

The set of samples for SAS 7190C-01 consisted of seven (7) solid samples which were analyzed through the Contract Laboratory Program (CLP) Special Analytical Services (SAS) for asbestos.

SUMMARY

The analyses were performed according to EPA method 9002 for analysis of bulk asbestos samples. The asbestos analyses were successfully completed in all samples. Issues affecting data usability are discussed in the following paragraphs.

MINOR ISSUE

EPA method 9002 is a semiquantitative method, which relies on the discretion and experience of the analyst to estimate the volume of asbestos present based on comparison to previously analyzed samples or standards. Standard reference materials as well as previously analyzed environmental samples differ in composition and texture from currently analyzed environmental samples; quantitations based on visual comparisons are inexact, and all reported values have therefore been qualified estimated, "J", on the Data Summary Form.

 ORIGINAL (Red)

NOTES

The laboratory recovery for chrysotile asbestos in a National Institute of Standards and Technology (NIST) Standard Reference Material (SRM) was well within the reported confidence interval.

The data have been reviewed according to the National Functional Guidelines for data validation, with modifications for use in Region 3.

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 FORMS
APPENDIX A	RESULTS REPORTED BY THE LABORATORY (FORM Is)
APPENDIX B	TPO REPORT
APPENDIX C	SUPPORT DOCUMENTATION

DB208A05.bsh

ORIGINAL (Red)

TABLE 1A

SUMMARY OF QUALIFIERS ON DATA SUMMARY
AFTER DATA VALIDATION

ANALYTE	SAMPLES AFFECTED	DETECTED VALUES	NON-DETECTED RESULTS	BIAS	COMMENTS*
amosite	All samples	J			A
glass	All samples	J			A
cellulose	All samples	J			A
soil	All samples	J			A

* See explanation of comments in Table 1B.

ORIGINAL (Red)

TABLE 1B

CODES USED IN COMMENTS COLUMN

A = The quantitation is based on visual comparison with standards or previous environmental samples that differ in composition and density from the current samples. The reported results may be estimated.

ORIGINAL (Red)

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.

ORIGINAL (Red)

TABLE 3

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

Site Name: Bishop Processing

ASBESTOS (Volume %)

Case #: 7190C-01 Sampling Date(s) 4/15/92

Sample No.		7190C01		7190C02		7190C03		7190C04		7190C05		7190C06		7190C07					
Dilution Factor		1.0		1.0		1.0		1.0		1.0		1.0		1.0					
Location		SC3901		SC3902		SC3903		SC3904		SC3905		SC3906		SC3907					
ANALYTE NAME	DL																		
chrysotile*	1.0																		
amosite *	1.0			1.0	J														
glass	1.0			1.0	J														
cellulose	1.0	1.0	J	5.0	J			1.0	J	1.0	J	1.0	J	3	J				
soil	n/a	99	J	92	J	99	J	99	J	99	J	98	J	96	J				

DL = SAS Required Detection Limit

* Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

Revised 03/92

ORIGINAL
(Red)

SAS 7190C-01

APPENDIX A

RESULTS REPORTED BY LABORATORY

FORM Is

Hygienic Laboratory

ORIGINAL (Red)

The University of Iowa

Oakdale Hall
Iowa City, IA 52242
Telephone: (319) 335-4500
FAX: (319) 335-4555

H.A. Wallace Building
900 East Grand, Des Moines, IA 50319
Telephone: (515) 281-5371
FAX: (515) 243-1349

Report Results To	
CLP SAS P.O . BOX 818 ALEXANDRIA, VA 22313	Sample Identification: 9202849 Submitter Reference: 7190-C-01 Location: SC3901 Sample Type: DARK BROWN SOIL Date Collected: 04/15/92 12:27:00 Collected by: GLANTZ JEFFREY
Date Received: 04/16/92 Date Reported: 05/19/92	

— Results of Analyses —

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
NO ASBESTOS DETECTED	
CELLULOSE	1
SOIL	99

Date Analyzed: 05/15/92
Method: NIOSH 9002

Analyst: MCR
Verified: SB

* Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Coordinator of analytical services - Lynn Hudachek @ (319) 335-4500

PPM - Parts/Million	MG/L - Milligrams/Liter	MG/KG - Milligrams/Kilogram
PPB - Parts/Billion	uG/L - Micrograms/Liter	uG/KG - Micrograms/Kilogram
< - Less than	> - Greater than	pCi/L - Pico Curies/Liter
Quantitation Limit - Lowest concentration reliably measured		

ORIGINAL (Red)

Hygienic Laboratory

The University of Iowa

Oakdale Hall
Iowa City, IA 52242
Telephone: (319) 335-4500
FAX: (319) 335-4555

H.A. Wallace Building
900 East Grand, Des Moines, IA 50319
Telephone: (515) 281-5371
FAX: (515) 243-1349

Report Results To	Sample Identification: 9202850
CLP SAS P.O. BOX 818 ALEXANDRIA, VA 22313	Submitter Reference: 7190-C-01 Location: SC3902 Sample Type: DARK BROWN SOIL Date Collected: 04/15/92 11:58:00
Date Received: 04/16/92 Date Reported: 05/19/92	Collected by: GLANTZ JEFFREY

— Results of Analyses —

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
CHRYSOTILE ASBESTOS	<1 (<1 % BY WEIGHT)
AMOSITE ASBESTOS	1 (1.18 % BY WEIGHT)
GLASS	1
CELLULOSE	5
SOIL	92

Date Analyzed: 05/15/92
Method: NIOSH 9002
Analyst: MCR
Verified: SB
* Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
CHRYSOTILE ASBESTOS	<1
AMOSITE	1

Date Analyzed: 05/18/92
Method: NISOH 9002
Analyst: MCR
Verified: SB
* Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Coordinator of analytical services - Lynn Hudachek @ (319) 335-4500

PPM - Parts/Million
PPB - Parts/Billion
< - Less than
Quantitation Limit - Lowest concentration reliably measured
MG/L - Milligrams/Liter
uG/L - Micrograms/Liter
> - Greater than
MG/KG - Milligrams/Kilogram
uG/KG - Micrograms/Kilogram
pCi/L - Pico Curies/Liter

Hygienic Laboratory

ORIGINAL (Red)

The University of Iowa

Oakdale Hall
Iowa City, IA 52242
Telephone: (319) 335-4500
FAX: (319) 335-4555

H.A. Wallace Building
900 East Grand, Des Moines, IA 50319
Telephone: (515) 281-5371
FAX: (515) 243-1349

Report Results To	
CLP SAS P.O. BOX 818 ALEXANDRIA, VA 22313	Sample Identification: 9202851 Submitter Reference: 7190-C-01 Location: SC3903 Sample Type: LIGHT BROWN SOIL Date Collected: 04/15/92 12:00:00 Collected by: GLANTZ JEFFREY
Date Received: 04/16/92 Date Reported: 05/19/92	

— Results of Analyses —

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
CHRYSOTILE ASBESTOS	<1 (<1 % BY WEIGHT)
CELLULOSE	<1
SOIL	99

Date Analyzed: 05/18/92
Method: NIOSH 9002

Analyst: MCR
Verified: SB

* Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Coordinator of analytical services - Lynn Hudachek @ (319) 335-4500

PPM - Parts/Million
PPB - Parts/Billion
< - Less than
Quantitation Limit - Lowest concentration reliably measured

MG/L - Milligrams/Liter
uG/L - Micrograms/Liter
> - Greater than

MG/KG - Milligrams/Kilogram
uG/KG - Micrograms/Kilogram
pCi/L - Pico Curies/Liter

Hygienic Laboratory

ORIGINAL (Red)

The University of Iowa

Oakdale Hall
Iowa City, IA 52242
Telephone: (319) 335-4500
FAX: (319) 335-4555

H.A. Wallace Building
900 East Grand, Des Moines, IA 50319
Telephone: (515) 281-5371
FAX: (515) 243-1349

Report Results To	
CLP SAS P.O. BOX 818 ALEXANDRIA, VA 22313	Sample Identification: 9202852 Submitter Reference: 7190-C-01 Location: SC3904 Sample Type: DARK BROWN SOIL Date Collected: 04/15/92 12:20:00 Collected by: GLANTZ JEFFREY
Date Received: 04/16/92 Date Reported: 05/19/92	

— Results of Analyses —

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
NO ASBESTOS DETECTED	
CELLULOSE	1
SOIL	99

Date Analyzed: 05/18/92
Method: NISOH 9002

Analyst: MCR
Verified: SB

* Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Coordinator of analytical services - Lynn Hudachek @ (319) 335-4500

PPM - Parts/Million
PPB - Parts/Billion
< - Less than
Quantitation Limit - Lowest concentration reliably measured

MG/L - Milligrams/Liter
uG/L - Micrograms/Liter
> - Greater than

MG/KG - Milligrams/Kilogram
uG/KG - Micrograms/Kilogram
pCi/L - Pico Curies/Liter

ORIGINAL (Red)

Hygienic Laboratory

The University of Iowa

Oakdale Hall
Iowa City, IA 52242
Telephone: (319) 335-4500
FAX: (319) 335-4555

H.A. Wallace Building
900 East Grand, Des Moines, IA 50319
Telephone: (515) 281-5371
FAX: (515) 243-1349

Report Results To	
CLP SAS P.O . BOX 818 ALEXANDRIA, VA 22313	Sample Identification: 9202853 Submitter Reference: 7190-C-01 Location: SC3905 Sample Type: LIGHT BROWN SOIL Date Collected: 04/15/92 12:06:00 Collected by: GLANTZ JEFFREY
Date Received: 04/16/92 Date Reported: 05/19/92	

— Results of Analyses —

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
NO ASBESTOS DETECTED	
CELLULOSE	1
SOIL	99

Date Analyzed: 05/18/92
Method: NIOSH 9002

Analyst: MCR
Verified: SB

* Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
NO ASBESTOS DETECTED	

Date Analyzed: 05/18/92
Method: NISOH 9002

Analyst: MCH
Verified: SB

* Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Coordinator of analytical services - Lynn Hudachek @ (319) 335-4500

PPM - Parts/Million
PPB - Parts/Billion
< - Less than
Quantitation Limit - Lowest concentration reliably measured

MG/L - Milligrams/Liter
uG/L - Micrograms/Liter
> - Greater than

MG/KG - Milligrams/Kilogram
uG/KG - Micrograms/Kilogram
pCi/L - Pico Curies/Liter

ORIGINAL (Red)

Hygienic Laboratory

The University of Iowa

Oakdale Hall
Iowa City, IA 52242
Telephone: (319) 335-4500
FAX: (319) 335-4555

H.A. Wallace Building
900 East Grand, Des Moines, IA 50319
Telephone: (515) 281-5371
FAX: (515) 243-1349

Report Results To	Sample Identification: 9202854
CLP SAS P.O. BOX 818 ALEXANDRIA, VA 22313	Submitter Reference: 7190-C-01
	Location: SC3906
	Sample Type: BROWN SOIL
	Date Collected: 04/15/92 11:55:00
Date Received: 04/16/92	Collected by: GLANTZ JEFFREY
Date Reported: 05/19/92	

— Results of Analyses —

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
NO ASBESTOS DETECTED	
GLASS	<1
CELLULOSE	1
SOIL	98

Date Analyzed: 05/18/92
Method: NIOSH 9002

Analyst: MCR
Verified: SB

*Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Coordinator of analytical services - Lynn Hudachek @ (319) 335-4500

PPM - Parts/Million
PPB - Parts/Billion
< - Less than
Quantitation Limit - Lowest concentration reliably measured

MG/L - Milligrams/Liter
uG/L - Micrograms/Liter
> - Greater than

MG/KG - Milligrams/Kilogram
uG/KG - Micrograms/Kilogram
pCi/L - Pico Curies/Liter

ORIGINAL (Red)

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H.A. Wallace Building
900 East Grand, Des Moines, IA 50319
Telephone: (515) 281-5371
FAX: (515) 243-1349

Report Results To	Sample Identification: 9202855
CLP SAS P.O . BOX 818 ALEXANDRIA, VA 22313	Submitter Reference: 7190-C-01 Location: SC3907 Sample Type: BROWN SOIL Date Collected: 04/15/92 11:58:00
Date Received: 04/16/92	Collected by: GLANTZ JEFFREY
Date Reported: 05/19/92	

— Results of Analyses —

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
CHRYSOTILE ASBESTOS	<1 (<1 % BY WEIGHT)
AMOSITE ASBESTOS	<1 (<1.18 % BY WEIGHT)
GLASS	<1
CELLULOSE	3
SOIL	96

Date Analyzed: 05/18/92
Method: NIOSH 9002

Analyst: MCR
Verified: SB

*Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Coordinator of analytical services - Lynn Hudachek @ (319) 335-4500

PPM - Parts/Million
PPB - Parts/Billion
<- Less than
Quantitation Limit - Lowest concentration reliably measured

MG/L - Milligrams/Liter
uG/L - Micrograms/Liter
>- Greater than

MG/KG - Milligrams/Kilogram
uG/KG - Micrograms/Kilogram
pCi/L - Pico Curies/Liter

ORIGINAL
(Red)

SAS 7190C-01

APPENDIX B

TPO REPORT

TPO: [ ] ACTION [X] FYI

Region III

ORIGINAL (Red)

INORGANIC REGIONAL DATA ASSESSMENT SUMMARY

SAS: 7190C-01
SDG NO: N/A
SOW: N/A
NO. OF SAMPLES: seven (7)

LABORATORY: IOWA
DATA USER: Larry Marchin
REVIEW COMPLETION DATE: 8/12/92
MATRIX: solid

REVIEWER: ESAT

	asbestos
1. HOLDING TIMES	_O_
2. INITIAL CALIBRATIONS	_O_
3. CONTINUING CALIBRATIONS	_O_
4. FIELD BLANKS(F=NOT APPLICABLE)	_F_
5. LABORATORY BLANKS	_O_
6. ICS	_ _
7. LCS	_ _
8. DUPLICATE ANALYSIS	_ _
9. MATRIX SPIKE	_ _
10. MSA	
11. SERIAL DILUTION	_ _
12. SAMPLE VERIFICATION	_O_
13. REGIONAL QC(F-NOT APPLICABLE)	_O_
14. OVERALL ASSESSMENT	_O_

O = No problems or minor problems that do not affect data usability
X = No more than about 5% of the data points are qualified as either estimated or unusable.
M = More than about 5% of the data points are qualified as estimated.
Z = More than about 5% of the data points are qualified as unusable.
A = TPO action requested; use in conjunction with one of the above codes.

TPO ACTION ITEMS: _____

AREAS OF CONCERN: Documentation attached (see Appendix C)

ORIGINAL
(Red)

SAS 7190C-01

APPENDIX C

SUPPORT DOCUMENTATION

Hygienic Laboratory

ORIGINAL (Red)

The University of Iowa

Oakdale Hall
Iowa City, IA 52242
Telephone: (319) 335-4500
FAX: (319) 335-4555

H.A. Wallace Building
900 East Grand, Des Moines, IA 50319
Telephone: (515) 281-5371
FAX: (515) 243-1349

Report Results To	Sample Identification: NIST3
UHL UNIVERSITY HYGIENIC LAB IOWA CITY, IA 52242	Submitter Reference: Location: NIST UNKNON 7649 Sample Type: 11% CHRYSOTILE ASB Date Collected: 05/18/92 15:46:36
Date Received: 05/18/92	Collected by:
Date Reported: 05/19/92	

Comments
BLIND KNOWN FOR SAS CASE #7190C-01

— Results of Analyses —

Description: FIBER IDENTIFICATION

Material Identified*	Percent By Volume
CHRYSOTILE ASBESTOS	10

Date Analyzed: 05/18/92
Method: EPA BULK

Analyst: MCR
Verified: SB

* Any material containing more than 1% Asbestos is considered by EPA to be a potential health hazard

Coordinator of analytical services - Lynn Hudachek @ (319) 335-4500

PPM - Parts/Million	MG/L - Milligrams/Liter	MG/KG - Milligrams/Kilogram
PPB - Parts/Billion	uG/L - Micrograms/Liter	uG/KG - Micrograms/Kilogram
< - Less than	> - Greater than	pCi/L - Pico Curies/Liter

Quantitation Limit - Lowest concentration reliably measured

ORIGINAL (Red)

Results from point-counts of the material fall within or slightly below the range stated. The lower values from point-counts may be attributed to the fine-grained matrix reducing the visibility of the fibers. In addition, the point-count data is more variable than the XRD data due to the smaller sample size, and differences in particle identification between analysts. A positive identification of every particle is difficult due to the overlying fine-grained matrix that can hinder the measurement of the optical properties.

Table 2: Quantitative results for Sample 2. (NIST 7649)

Phase	Range (wt%)	Mean (wt%)
Chrysotile	6-16[1]	11
Calcite and gypsum	40-58	49
Vermiculite + mica	26-54	40 (by difference)

"True" concentration for the NIST standard with Confidence Interval

The combined weight percent of calcite and gypsum is determined by dissolving the two components using dilute hydrochloric acid, and determining the weight loss. An independent gravimetric technique for determining the amount of gypsum by conversion to bassanite produces results that are consistent with the acid-dissolution results. The range given in Table 2 for the combined weight of calcite and gypsum is based on the results of 5 randomly selected samples. There is a 95% confidence that 95% of the samples received by the labs will contain calcite and gypsum within the stated range.

The combined weight percent of vermiculite and mica is determined by difference, using the mean values of the other two components.

Summary of laboratory results

Of the 573 laboratories that submitted results, the average value reported for chrysotile is 20.7%, with a range from 0 - 70%. This summary of laboratory data is for information purposes only, and does not indicate the true amount of chrysotile in the sample. There were 5 (1%) false negatives or misidentification of asbestos type for this sample.

SAMPLE 3

Macroscopic description

The material is white to off-white in color and has a fibrous texture. Most

---

[1] The ranges given are calculated 95-95 tolerance intervals, meaning that we have 95% confidence that 95% of the samples received by the labs fall within these limits.

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(Red)

SAS 7190C-01

SAS AND METHOD

ORIGINAL (Red)

data when the material on the slide is homogeneous and has a uniform thickness, which is difficult to obtain [6]. The point-counting technique is, recommended by the EPA to determine the amount of asbestos in bulk [1]; however in the more recent Asbestos Hazard Emergency Response Act (AHERA) regulations, asbestos quantification may be performed by a point-counting or equivalent estimation method [7].

16. Make a quantitative estimate of the asbestos content of the sample from the appropriate combination of the estimates from both the gross and microscopic examinations. If asbestos fibers are identified, report the material as "asbestos-containing". Asbestos content should be reported as a range of percent content. The range reported should be indicative of the analyst's precision in estimating asbestos content. For greater quantities use Figure 1 in arriving at your estimate.

EVALUATION OF METHOD:

The method is compiled from standard techniques used in mineralogy [8-13], and from standard laboratory procedures for bulk asbestos analysis which have been utilized for several years. These techniques have been successfully applied to the analysis of EPA Bulk Sample Analysis Quality Assurance Program samples for more than 8 years [1,5]. However, no formal evaluation of this method, as written, has been performed.

REFERENCES:

[1] U.S. Environmental Protection Agency, "Interim Method for the Determination of Asbestos in Bulk Insulation Samples," EPA-600/M4-82-020, December, 1982.

[2] Criteria for a Recommended Standard...Occupational Exposure to Asbestos (Revised), U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-169 (1976), as amended in NIOSH Statement at OSHA Public Hearing, June 21, 1984.

[3] Jankovic, J. T. Asbestos Bulk Sampling Procedure, Amer. Ind. Hyg. Assoc. J., B-8 to B-10. February, 1985.

[4] U. S. Environmental Protection Agency, "Asbestos Waste Management Guidance" EPA/530-SW-85-007, May, 1985.

[5] National Voluntary Laboratory Accreditation Program, National Institute of Standards and Technology, Bldg 101, Room A-307 Gaithersburg, MD. 20899.

[6] Jankovic, J. T., J. L. Clere, W. Sanderson, and L. Piacitelli. Estimating Quantities of Asbestos in Building Materials. National Asbestos Council Journal, Fall, 1988.

[7] Title 40, Code of Federal Regulations, Part 763. Appendix A to Subpart F. Interim Method of the Determination of Asbestos in Bulk Insulation Samples. April 15, 1988.

[8] Bloss, F. Donald, Introduction to the Methods of Optical Crystallography, Holt, Rinehart, & Winston, 1961.

[9] Kerr, Paul F., Optical Mineralogy, 4th Ed., New York, McGraw-Hill, 1977.

[10] Shelley, David, Optical Mineralogy, 2nd Ed., New York, Elsevier, 1985.

[11] Phillips, W. R. and D. T. Griffen, Optical Mineralogy, W. H. Freeman and Co., 1981.

[12] McCrone, Walter, The Asbestos Particle Atlas, Ann Arbor Science, Michigan, 1980.

[13] "Selected Silicate Minerals and their Asbestiform Varieties," Bureau of Mines Information Circular IC 8751, 1977.

METHOD WRITTEN BY: Patricia A. Klinger, CIHT, and Keith R. Nicholson, CIH, DataChem, Inc., Salt Lake City, Utah, under NIOSH Contract 200-84-2508, and Frank J. Hearl, PE and John T. Jankovic, CIH, NIOSH/DBDS.

Site File
~~1426~~ JAZ 4/6/92 3-25-92
1526

SMO # 7190-C-01

U.S. Environmental Protection Agency
HWI Sample Management Office
P.O. Box 818 Alexandria, VA 22313
PHONE (703) 557-2490 or FTS 557-2490

SAS Number

ORIGINAL (Red)

SPECIAL ANALYTICAL SERVICES
Regional Request

☐ Regional Transmittal ☐ Telephone Request

A. EPA Region and Client: EPA Region III

B. Regional Representative: Stevie Wilding

C. Telephone Number: (410) 266-9180

D. Date of Request: 5/17/92

E. Site Name: Bishop Processing (MD-083)

MAR 1992 RECEIVED

Please provide below a description of your request for Special Analytical Services under the Contract Laboratory Program. In order to most efficiently obtain laboratory capability for your request, please address the following considerations, if applicable. Incomplete or erroneous information may result in delay in the processing of your request. Please continue response on additional sheets, or attach supplementary information as needed.

1. General description of analytical service requested:

   Analysis of up to seven (7) soil samples for asbestos. Samples will be collected and analyzed according to EPA Method 9002 (Asbestos [bulk]), method attached.

2. Definition and number of work units involved (specify whether whole samples or fractions; whether organics or inorganics; whether aqueous or soil and sediments; and whether low, medium, or high concentration):

   Seven (7) unknown concentration soil samples by EPA Method 9002 (Asbestos [bulk]).

3. Program (specify whether Superfund (Remedial or Enforcement), RCRA, NPDES, etc.), and justification for analysis and Site Account Number:

   Superfund (Pre-Remedial) 2TFR03N9ZZ.

   SAS Approved by:

4. Estimated date(s) of collection: April 15-16, 1992

ORIGINAL (Red)

5. Estimated date(s) and method of shipment:

All samples will be shipped at the same time via overnight carrier sometime during the period of April 15-16, 1992.

6. Approximate number of days results required after receipt of lab samples:

Completed data packages are due within 95 days from receipt of last sample.

7. Analytical protocol required (attach copy if other than a protocol currently used in this program):

EPA Method 9002 (Asbestos [bulk]), method attached.

8. Special technical instructions (if outside protocol requirements, specify compound names, CAS numbers, detection limits, etc.):

None.

9. Analytical results required (if known, specify format for date sheets, QA/AC reports, Chain-of-Custody documentation, etc.). If not completed, format of results will be left to program discretion.

Report in units of percent area. Types of asbestos fibers must be differentiated and quantitated individually. No minimum requirements are stipulated. Report all fibers, aspect ration $\geq$ 3:1 which are detectable. Also report in units of percent weight. Submit a copy of the chain-of-custody forms, SAS packing list, and airbill. Submit all deliverables as per the BOA.

10. Other (use additional sheets or attachment supplementary information, as needed):

None.

11. Name of sampling/shipping contact:

Phone:

ORIGINAL (Red)

12. Data Requirements

Parameter	Detection Limit	Precision (+ or - Conc)
Chrysotile	<1%	not determined
amosite	<1%	
crocidolite	<1%	
anthophyllite	<1%	
tremolite	<1%	
actinolite	<1%	

13. QC Requirements

Refer to method.

14. Action required if limits are exceeded:

Repeat analysis and submit data from all repetitions. Contact SMO for additional information as required.

15. Request prepared by:

16. Request reviewed by: Kenneth L. Kelly ESAT 3-25-92. EPA T. Thomas 3/25/92

Please return this request to the Sample Management Office as soon as possible to expedite processing of your request for Special Analytical Services. Should you have any questions or need any assistance, please contact your local Regional representative at the Sample Management Office.

M.W.: various

EPA Standard (Bulk): 1%

PROPERTIES: solid, fibrous, crystalline, anisotropic

ORIGINAL (Red)

SYNONYMS: actinolite [CAS #13768-00-8], or ferroactinolite; cummingtonite-grunerite (amosite) [CAS #12172-73-5]; anthophyllite [CAS #17068-78-9]; chrysotile [CAS #12001-29-5] or serpentine; crocidolite [CAS #12001-28-4] or riebeckite; tremolite [CAS #14567-73-8]; amphibole asbestos.

SAMPLING

BULK SAMPLE: 1 to 10 grams

SHIPMENT: seal securely to prevent escape of asbestos

SAMPLE STABILITY: stable

BLANKS: none required

ACCURACY

RANGE STUDIED: <1% to 100% asbestos

BIAS: not determined

PRECISION: not determined

MEASUREMENT

TECHNIQUE: MICROSCOPY, STEREO AND POLARIZED LIGHT, WITH DISPERSION STAINING

ANALYTE: actinolite asbestos, amosite, anthophyllite asbestos, chrysotile, crocidolite, tremolite asbestos

EQUIPMENT: microscope, polarized light: 100-400X dispersion staining objective, stereo microscope: 10-45X

RANGE: 1% to 100% asbestos

ESTIMATED LOD: <1% asbestos [1]

PRECISION: not determined

APPLICABILITY: This method is useful for the qualitative identification of asbestos and the semi-quantitative determination of asbestos content of bulk samples, expressed as a percent of projected area. The method measures percent asbestos as perceived by the analyst in comparison to standard area projections, photos, and drawings, or trained experience. The method is not applicable to samples containing large amounts of fine fibers below the resolution of the light microscope.

INTERFERENCES: Other fibers with optical properties similar to the asbestos minerals may give positive interferences. Optical properties of asbestos may be obscured by coating on the fibers. Fibers finer than the resolving power of the microscope (ca. 0.3 µm) will not be detected. Heat and acid treatment may alter the index of refraction of asbestos and change its color.

OTHER METHODS: This method (originally designated as method 7403) is designed for use with NIOSH Methods 7400 (phase contrast microscopy) and 7402 (electron microscopy/EDS). The method is similar to the EPA bulk asbestos method [1].

REAGENTS:

1. Refractive index (RI) liquids for Dispersion Staining: high-dispersion (HD) series, 1.550, 1.605, 1.620.
2. Refractive index liquids: 1.670, 1.680, and 1.700.
3. Asbestos reference samples such as SRM #1866, available from the National Institute of Standards and Technology.*
4. Distilled Water (optional).
5. Concentrated HCl: ACS reagent grade (optional).

*See SPECIAL PRECAUTIONS

EQUIPMENT:

1. Sample containers: screw-top plastic vials of 10- to 50-mL capacity.
2. Microscope, polarized light, with polarizer, analyzer, port for retardation plate, 360° graduated rotating stage, substage condenser with iris, lamp, lamp iris, and:
   a. Objective lenses: 10X, 20x, and 40X or near equivalent.
   b. Ocular lense: 10X minimum.
   c. Eyepiece reticle: crosshair.
   d. Dispersion staining objective lens or equivalent.
   e. Compensator plate: ca. 550 nm ± 20 nm, retardation: "first order red" compensator.
3. Microscope slides: 75 mm x 25 mm.
4. Cover slips: 22 mm x 22 mm.
5. Ventilated hood or negative pressure glove box.
6. Mortar and pestle: agate or porcelain.
7. Stereomicroscope, ca. 10 to 45X.
8. Light source: incandescent or fluorescent.
9. Tweezers, dissecting needles, spatulas, probes, and scalpels.
10. Glassine paper or clean glass plate.
11. Low-speed hand drill with coarse burr bit (optional).

ORIGINAL (Red)

SPECIAL PRECAUTIONS: Asbestos, a human carcinogen, should be handled only in an exhaust hood (equipped with a HEPA filter). [2] Precautions should be taken when collecting unknown samples, which may be asbestos, to preclude exposure to the person collecting the sample and minimize the disruption to the parent material [3]. Disposal of asbestos-containing materials should follow EPA Guidelines [4].

SAMPLING:

1. Place 1 to 10 g of the material to be analyzed in a sample container.
   NOTE: For large samples (i.e., whole ceiling tiles) that are fairly homogenous, a representative small portion should be submitted for analysis. Sample size should be adjusted to ensure that it is representative of the parent material.
2. Make sure that sample containers are taped so they will not open in transit.
3. Ship the samples in a rigid container with sufficient packing material to prevent damage or sample loss.

SAMPLE PREPARATION:

4. Visually examine samples in the container and with a low-magnification stereomicroscope in a hood. (If necessary, a sample may be carefully removed from the container and placed on glassine transfer paper or clean glass plate for examination). Break off a portion of the sample and examine the edges for emergent fibers. Note the homogeneity of the sample. Some hard tiles can be broken, and the edges examined for emergent fibers. If fibers are found, make an estimate of the amount and type of fibers present, confirm fiber type (steps 6 through 13) and quantify (steps 14 through 16).

5. In a hood, open sample container and with tweezers remove small, representative portions of the sample.
   a. If there are obvious separable layers, sample and analyze each layer separately.
   b. If the sample appears to be slightly inhomogeneous, mix it in the sample container with tweezers or a spatula before taking the portion for analysis. Alternatively, take small representative portions of each type of material and place on a glass slide.
   c. On hard tiles that may have thin, inseparable layers, use a scalpel to cut through all the layers for a representative sample. Then cut it into smaller pieces after placing RI liquid on it before trying to reduce the thickness. Alternatively, use a low-speed hand drill equipped with a burr bit to remove material from hard tiles. Avoid excessive heating of the sample which may alter the optical properties of the material.
   NOTE: This type of sample often requires ashing or other specialized preparation.
   d. If the sample has large, hard particles, grind it in a mortar. Do not grind so fine that fiber characteristics are destroyed.
   e. If necessary, treat a portion of the sample in a hood with an appropriate solvent to remove binders, tars, and other interfering materials which may be present in the sample. Make corrections for the non-asbestos material removed by this process.
   NOTE: Other methods of sample preparation such as acid and sodium metaphosphate treatment and ashing are not normally necessary. However, if needed, use as described in Reference [1].
6. After placing a few drops of RI liquid on the slide, put a small portion of sample in the liquid. Tease apart with a needle or smash small clumps with the flat end of a spatula or probe, producing a uniform thickness of particles so that better estimates of projected area percentages can be made. Mix the fibers and particles on the slide so that they are as homogeneous as possible.
   NOTE: An even dispersion of sample should cover the entire area under the cover slip. Some practice will be necessary to judge the right amount of material to place on the slide. Too little sample may not give sufficient information and too much sample cannot be easily analyzed.

CALIBRATION AND QUALITY CONTROL:

7. Check for contamination of microscope slides, cover slips and refractive index liquids once per day of operation. Record results in a separate logbook.
8. Verify the refractive indices of the refractive index liquids used once per week of operation. Record these checks in a separate logbook.
9. Follow the manufacturer's instructions for illumination, condenser alignment and other microscope adjustments. Perform these adjustments prior to each sample set.
10. Determine precent of each identified asbestos species by comparision to standard projections (Figure 1) [1]. If no fibers are detected in a homogeneous sample, examine at least two additional preparations before concluding that no asbestos is present.
11. If it appears that the preparation technique might not be able to produce a homogeneous or representative sample on the slide, prepare a duplicate slide and average the results. Occasionally, when the duplicate results vary greatly, it will be necessary to prepare additional replicate slides and average all the replicate results. Prepare duplicate slides of at least 10% of the samples analyzed. Average the results for reporting.
12. Analyze about 5% blind samples of known asbestos content.
13. Laboratories performing this analytical method should participate in the National Voluntary Labortory Accreditation Program [5] or a similar interlaboratory quality control program. Each analyst should have completed formal training in polarized light microscopy and its application to crystalline materials. In lieu of formal training, laboratory training in asbestos bulk analysis under the direction of a trained asbestos bulk analyst may be substituted. Due to the subjective nature of the method, frequent practice is essential in order to remain proficient in estimating projected area percentages.

QUALITATIVE ASSESSMENT:

14. Scan the slide to identify any asbestos minerals using the optical properties of morphology, refractive indices, color, pleochroism, birefringence, extinction characteristics, sign of elongation, and dispersion staining characteristics.

NOTE: Identification of asbestos using polarized light microscopy is unlike most other analytical methods. The quality of the results is dependent on the skill and judgment of the analyst. This method does not lend itself easily to a step-wise approach. Various procedures devised by different analysts may yield equivalent results. The following step-wise procedure repeatedly utilizes the sample preparation procedure previously outlined.

ORIGINAL (Red)

a. Prepare a slide using 1.550 HD RI liquid. Adjust the polarizing filter such that the polars are partially crossed, with ca. 15° offset. Scan the preparation, examining the morphology for the presence of fibers. If no fibers are found, scan the additional preparations. If no fibers are found in any of the preparations, report that the sample does not contain asbestos, and stop the analysis at this point.

b. If fibers are found, adjust the polarizing filter such that the polars are fully crossed. If all of the fibers are isotropic (disappear at all angles of rotation) then those fibers are not asbestos. Fibrous glass and mineral wool, which are common components of suspect samples, are isotropic. If only isotropic fibers are found in the additional preparations, report no asbestos fibers detected, and stop the analysis.

c. If anisotropic fibers are found, rotate the stage to determine the angle of extinction. Except for tremolite-actinolite asbestos which has oblique extinction at 10-20°, the other forms of asbestos exhibit parallel extinction. Tremolite may show both parallel and oblique extinction.

d. Insert the first-order red compensator plate in the microscope and determine the sign of elongation. All forms of asbestos have a postive sign of elongation except for crocidolite. If the sign of elongation observed is negative, go to step "g".

NOTE: To determine the direction of the sign of elongation on a particular microscope configuration, examine a known chrysotile sample and note the direction (NE-SW or NW-SE) of the blue coloration. Chrysotile has a positive sign of elongation.

e. Remove the first-order red compensator and uncross the polarizer. Examine under plane polarized light for blue and gold-brown Becke colors at the fiber-oil interface (i.e., index of refraction match). Becke colors are not always evident. Examine fiber morphology for twisted, wavy bundles of fibers which are characteristic of chrysotile. Twisted, ribbon-like morphology with cellular internal features may indicate cellulose fibers. It may be necessary to cross the polars partially in order to see the fibers if the index of refraction is an exact match at 1.550. If the fibers appear to have higher index of refraction, go to step "h", otherwise continue.

f. Identification of chrysotile. Insert the dispersion staining objective. Observing dispersion staining colors of blue and blue-magenta confirms chrysotile. Cellulose, which is a common interfering fiber at the 1.550 index of refraction, will not exhibit these dispersion staining colors. If chrysotile is found, go to step 15 for quantitative estimation.

g. Identification of crocidolite. Prepare a slide in 1.700 RI liquid. Examine under plane-polarized light (uncrossed polars); check for morphology of crocidolite. Fibers will be straight, with rigid appearance, and may appear blue or purple-blue. Crocidolite is pleochroic, i.e., it will appear to change its color (blue or gray) as it is rotated through plane polarized light. Insert the dispersion staining objective. The central stop dispersion staining colors are red magenta and blue magenta, however these colors are sometimes difficult to impossible to see because of the opacity of the dark blue fibers. If observations above indicate crocidolite, go to step 15 for quantitative estimation.

h. Identification of amosite. Prepare a slide in 1.680 RI liquid. Observe the fiber morphology for amosite characteristics: straight fibers and fiber bundles with broom-like or splayed ends. If the morphology matches amosite, examine the fibers using the dispersion staining objective. Blue and pale blue colors indicate the cummingtonite form of amosite, and gold and blue colors indicate the grunerite form of amosite. If amosite is confirmed by this test, go to step 15 for quantitative estimation, otherwise continue.

ORIGINAL (Red)

i. Identification of anthophyllite-tremolite-actinolite. Prepare a slide in 1.605 HD RI liquid. Examine morphology for comparision to anthophyllite-tremolite-actinolite asbestos. The refractive indices for these forms of asbestos vary naturally within the species. Anthophyllite can be distinguished from actinolite and tremolite by its nearly parallel extinction. Actinolite has a light to dark green color under plane-polarized light and exhibits some pleochroism. For all three, fibers will be straight, single fibers possibly with some larger composite fibers. Cleavage fragments may also be present. Examine using the central stop dispersion staining objective. Anthophyllite will exhibit central stop colors of blue and gold/gold-magenta; tremolite will exhibit pale blue and yellow; and actinolite will exhibit magenta and golden-yellow colors.

NOTE: In this refractive index range, wollastonite is a common interfering mineral with similiar morphology including the presence of cleavage fragments. It has both positive and negative sign of elongation, parallel extinction, and central stop dispersion staining colors of pale yellow and pale yellow to magenta. If further confirmation of wollastonite versus anthophyllite is needed, go to step "j". If any of the above forms of asbestos was confirmed above, go to step 15 for quantitative estimation. If none of the tests above confirmed asbestos fibers, examine the additional preparations and if the same result occurs, report the absence of asbestos in this sample.

j. Wash a small portion of the sample in a drop of concentrated hydrochloric acid on a slide. Place the slide, with cover slip in place, on a warm hot plate until dry. By capillary action, place 1.620 RI liquid under the cover slip and examine the slide. Wollastonite fibers will have a "cross-hatched" appearance across the length of the fibers and will not show central stop dispersion colors. Anthophyllite and tremolite will still show their original dispersion colors.

NOTE: There are alternative analysis procedures to the step-wise approach outlined above which will yield equivalent results. Some of these alternatives are:

i. Perform the initial scan for the presence of asbestos using crossed polars as well as the first-order red compensator. This allows for simultaneous viewing of birefringent and amorphous materials as well as determining their sign of elongation. Some fibers which are covered with mortar may best be observed using this configuration.

ii. Some analysts prefer to mount their first preparation in a RI liquid different than any asbestos materials and conduct their initial examination under plane-polarized light.

iii. If alternative RI liquids are used from those specified, dispersion staining colors observed will also change. Refer to an appropriate reference for the specific colors associated with asbestos in the RI liquids actually used.

QUANTITATIVE ASSESSMENT:

15. Estimate the content of the asbestos type present in the sample using the 1.550 RI preparation. Express the estimate as an area percent of all material present, taking into account the loading and distribution of all sample material on the slide. Use Figure 1 as an aid in arriving at your estimate. If additional unidentified fibers are present in the sample, continue with the qualitative measurement (step 14).

NOTE: Point-counting techniques to determine percentages of the asbestos minerals are not generally recommended. The point-counting method only produces accurate quantitative

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data when the material on the slide is homogeneous and has a uniform thickness, which is difficult to obtain [6]. The point-counting technique is, recommended by the EPA to determine the amount of asbestos in bulk [1]; however in the more recent Asbestos Hazard Emergency Response Act (AHERA) regulations, asbestos quantification may be performed by a point-counting or equivalent estimation method [7].

16. Make a quantitative estimate of the asbestos content of the sample from the appropriate combination of the estimates from both the gross and microscopic examinations. If asbestos fibers are identified, report the material as "asbestos-containing". Asbestos content should be reported as a range of percent content. The range reported should be indicative of the analyst's precision in estimating asbestos content. For greater quantities use Figure 1 in arriving at your estimate.

EVALUATION OF METHOD:

The method is compiled from standard techniques used in mineralogy [8-13], and from standard laboratory procedures for bulk asbestos analysis which have been utilized for several years. These techniques have been successfully applied to the analysis of EPA Bulk Sample Analysis Quality Assurance Program samples for more than 8 years [1,5]. However, no formal evaluation of this method, as written, has been performed.

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