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HEARTLAND ENVIRONMENTAL SERVICES, INC.
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July 23, 1991

To: John Williams
Roy F. Weston Inc.
One Weston Way
Lionville, PA

From: Paul B. Humburg
Project Manager
Heartland ESI

Subject: Data Validation Services using EPA Region II guidelines for Inorganic analyses. The samples reviewed consisted of three waters for full TAL metals plus Cyanide plus 1 MS/D and twenty two soils for full TAL metals plus Cyanide plus 2 MS/Ds. The analyses were performed by Roy F. Weston's Gulf Coast Laboratory.

EPA ID	Gulf Coast ID	EPA ID	Gulf Coast ID
	Water Samples (full TAL)		
A24201	03L804-010	226201MS	03L804-017MS
205201	03L804-034	226201D	03L804-017D
226201	03L804-017		
	Soil Samples (full TAL)		
A21001	03L804-001	203001	03L804-030
A22001	03L804-002	204001	03L804-031
A23001	03L804-003	205001	03L804-032
A24001	03L804-004	205001MS	03L804-032MS
A25001	03L804-005	205001D	03L804-032D
A26001	03L804-006	221001	03L804-011
A26101	03L804-007	223001	03L804-013
A27001	03L804-008	224001	03L804-014
A28001	03L804-009	225001	03L804-015
A28001MS	03L804-009MS	226001	03L804-016
A28001D	03L804-009D	227001	03L804-018
201001	03L804-028	228001	03L804-020
202001	03L804-029	229001	03L804-023

Heartland ESI has reviewed the data for the samples listed above for the TAL list for Metals plus Cyanide using EPA Region II CLP Inorganic Data Assessment Protocol, Standard Operating Procedure HW-2, Revision 10, February 1990. Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to the requirements and deliverables of U.S. EPA CLP Region II. This screening assumes that the analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Individual fraction was reviewed as follows:

* Metals plus Cyanide by Paul B. Humburg with secondary review by Christopher D. Scarpellino

Please refer to the Form Is and detailed Data Validation Report for additional information. The Cyanide Data Summary List is included in this report because the laboratory did not submit the Cyanides on the Forms Is in the CLP package. The Form Is included in the Data Validation Report are annotated with the standard validation qualifiers as well as footnotes which refer to the specific findings listed numerically in the Data Assessment Narrative section. Specific comments are provided in the following case narrative.

HEARTLAND ENVIRONMENTAL SERVICES, INC.

INORGANICS DATA ASSESSMENT NARRATIVE

General

The overall package quality was good. The Form Is contained in this data package did not include Cyanide as a target analyte. The laboratory prepared the Cyanide analytical results as a separate package. This reviewer has included the Cyanides in our TAL Metals package.

All holding times were met as required by USEPA Region II. The laboratory failed to distill ~~the~~ a mid-range calibration verification or (ICV) standard for Cyanide as required by EPA Region II protocol.

No field blanks were apparently associated with this set of samples. The Chain-of-Custodies associated with these samples do not indicate that the water samples are equipment or field blanks. Therefore, the soil samples were not qualified based on results from the water samples. The water samples were simply reviewed as additional field samples.
All other contractual requirements were met.

Specific QA/QC deficiency **Findings** are listed numerically in the following categories:

Holding Times

The holding times were met as specified by QA protocol.

Calibration

Samples 204001 and 205001

1. The CRDL Standard for Antimony and Zinc for soils was below the control limit. All positive and non-detect results are flagged "UJ" or "J" , as estimated.

Samples A24201, 226201 and 205201

2. The CRDL Standard for Cadmium for waters was below the lower control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

3. The CRDL Standard for Copper for was above the upper control limit. All positve results are flaged "J", as estimated.

Samples A21001, A22001, A23001, A24001, A25001, A26001, A27001, A28001, 201001, 202001, 203001, 221001, 223001, 224001, 225001, 226001, 227001, 288001 and 229001

4. The CRDL Standard for Antimony was below 50%. All positive and non-detect results are rejected.

Inorganics Data Assessment Narrative (continued - Page 2)

5. The CRDL Standard for Selenium was below the lower control limit. All positive and non-detect results are flagged "UJ" or "J", as estimated.

6. The CRDL Standard for Lead during the MSA run was above the upper control limit. All positive results are flagged "J", as estimated.

Preparation and Field Blanks

No significant interferences were observed.

Interferences

No significant interferences were observed.

Spike Recovery

7. The Matrix Spike Recovery for Antimony for soils was below the lower control limit. All positive and non-detect results are flagged "J" or "UJ" as estimated.

8. The Matrix Spike Recovery for Chromium for soils was above the upper control limit. All positive results are flagged "J", as estimated.

9. The Matrix Spike Recovery for Lead for soils was above 200%. All positive results are rejected.

Duplicate

10. The Duplicate Analysis for Lead for waters was outside the control limits for soils. All positive and non-detect results are flagged "UJ" or "J", as estimated.

LCS

11. The LCS for Mercury was not analyzed as required by the protocol. All positive and non-detect results are flagged "UJ" or "J", as estimated.

Serial Dilution

12. The Serial Dilution Analy~~se~~ses for Aluminum, Barium, Calcium, Chromium, Copper, Iron, Lead(ICP), Magnesium, Manganese Nickel and Zinc were outside the control limits. All positive and non-detect results are flagged "UJ" or "J", as estimated.

MSA

13. For sample A25001 the Lead MSAs were below .990. Therefore, all positive and non-detect results are rejected.

14. The analytical spiking results for the following analytes were outside the control limits on the low side. Therefore, all positive and non-detect results are flagged "J" or "UJ", as estimated.

Analyte	Samples
Thallium	201001 and 205001

15. The analytical spiking results for the following analytes were outside the control limits on the high side. Therefore, all positive results are flagged "J", as estimated.

Analyte	Samples
Selenium	224001, 227001 and 228001.
Thallium	A24001, 228001, A26001, A26101, A27001, 225001, 226001 and 229001.

16. The analytical spiking results for sample 228001 was above 150% for Thallium. All positive results are rejected.

Additional Problems

17. All results for sample 205001 are flagged as estimated due to the fact that the sample was less than 50% solids.

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SUMMARY OF DATA QUALIFICATIONS

SPECIFIC SAMPLE ID	ANALYTE	DL	QL	FINDING
204001 and 205001	Sb and Zn	+	J	1
A24201, 226201 and 205201	Cd	+/U	J/UJ	2
A24201, 226201 and 205201	Cu	+	J	3
A21001, A22001, A23001, A24001. A25001, A26001, A27001, A28001, 201001, 202001, 203001, 221001. 223001, 224001, 225001, 226001 227001, 228001 and 229001.	Sb	+/U	R	4
A21001, A22001, A23001, A24001. A25001, A26001, A27001, A28001, 201001, 202001, 203001, 221001. 223001, 224001, 225001, 226001 227001, 228001 and 229001.	Se	+/U	J/UJ	5
MSAs	Pb	+	J	6
All soils	Sb	+/U	J/UJ	7
All soils	Cr	+	J	8
All soils	Pb	+	R	9
All waters	Pb	+/U	J/UJ	10
All soils	Hg	+/U	J/UJ	11
All soils	Al, Ba, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Ni and Zn	+/U	J/UJ	12

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SUMMARY OF DATA QUALIFICATIONS (Page 2)

A25001	Pb	+/U	R	13
201001 and 205001	Tl	+/U	J/UJ	14
224001, 227001 and 228001. A24001, 228001, A26001, A26101, A27001, 225001, 226001 and 229001.	Se Tl	+	J	15
228001	Tl	+	R	16
205001	All elements	+/U	J/UJ	17

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

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SAMPLE NO.

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INORGANIC ANALYSIS DATA SHEET

A21001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-001

Level (low/med): LOW Date Received: 03/09/91

% Solids: 72.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10300		E	P	J12
7440-36-0	Antimony	~~2.0~~	~~U~~	~~N~~	~~P~~	R 9
7440-38-2	Arsenic	6.3			F	
7440-39-3	Barium	7.5	B	E	P	J12
7440-41-7	Beryllium	1.2	B		P	
7440-43-9	Cadmium	1.2	B		P	
7440-70-2	Calcium	44.5	B	E	P	J12
7440-47-3	Chromium	286		EN	P	J8, 12
7440-48-4	Cobalt	1.4	B		P	
7440-50-8	Copper	12.6		E	P	J12
7439-89-6	Iron	41300		E	P	J12
7439-92-1	Lead	~~27.0~~		~~N~~	~~F~~	R 9
7439-95-4	Magnesium	2150		E	P	J12
7439-96-5	Manganese	10.6		E	P	J12
7439-97-6	Mercury	0.11	U		CV	UJ 11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.96	U	E	P	J12
7440-09-7	Potassium	6560			P	
7782-49-2	Selenium	0.33	U		F	UJ5
7440-22-4	Silver	0.77	U		P	
7440-23-5	Sodium	36.3	B		P	
7440-28-0	Thallium	0.61	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	210			P	
7440-66-6	Zinc	26.6		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A22001

Name: WESTON Gulf Coast Labs Contract:

Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-002

Level (low/med): LOW Date Received: 03/09/91

% Solids: 74.5

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7640		E	P	J12
7440-36-0	Antimony	~~2.0~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	7.5			F	
7440-39-3	Barium	10.1	B	E	P	J12
7440-41-7	Beryllium	1.0	B		P	
7440-43-9	Cadmium	0.89	U		P	
7440-70-2	Calcium	14.5	B	E	P	J12
7440-47-3	Chromium	227		EN	P	J8,12
7440-48-4	Cobalt	1.1	B		P	
7440-50-8	Copper	17.6		E	P	J12
7439-89-6	Iron	30000		E	P	J12
7439-92-1	Lead	~~19.3~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	1490		E	P	J12
7439-96-5	Manganese	6.8		E	P	J12
7439-97-6	Mercury	0.12	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.94	U	E	P	J12
7440-09-7	Potassium	4650			P	
7782-49-2	Selenium	0.34	U		F	UJ5
7440-22-4	Silver	0.76	U		P	
7440-23-5	Sodium	10.3	B		P	
7440-28-0	Thallium	0.63	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	187			P	
7440-66-6	Zinc	21.1		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A23001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-003

Level (low/med): LOW Date Received: 03/09/91

% 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	9650		E	P	J12
7440-36-0	Antimony	~~1.8~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	4.7			F	
7440-39-3	Barium	5.3	B	E	P	J12
7440-41-7	Beryllium	1.1	B		P	
7440-43-9	Cadmium	0.83	U		P	
7440-70-2	Calcium	7.6	B	E	P	J12
7440-47-3	Chromium	208		EN	P	J8,12
7440-48-4	Cobalt	1.1	B		P	
7440-50-8	Copper	4.1	B	E	P	J12
7439-89-6	Iron	32700		E	P	J12
7439-92-1	Lead	~~7.2~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	2160		E	P	J12
7439-96-5	Manganese	8.3		E	P	J12
7439-97-6	Mercury	0.09	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.87	U	E	P	J12
7440-09-7	Potassium	6130			P	
7782-49-2	Selenium	0.33	U		F	UJ5
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	11.2	B		P	
7440-28-0	Thallium	0.60	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	149			P	
7440-66-6	Zinc	21.3		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A24001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-004

Level (low/med): LOW Date Received: 03/09/91

% Solids: 83.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3860		E	P	J12
7440-36-0	Antimony	~~1.7~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	1.7	B		F	
7440-39-3	Barium	1.3	B	E	P	J12
7440-41-7	Beryllium	0.43	B		P	
7440-43-9	Cadmium	0.76	U		P	
7440-70-2	Calcium	15.0	B	E	P	J12
7440-47-3	Chromium	92.0		EN	P	J8,12
7440-48-4	Cobalt	0.76	U		P	
7440-50-8	Copper	3.4	B	E	P	J12
7439-89-6	Iron	13800		E	P	J12
7439-92-1	Lead	~~7.5~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	686	B	E	P	J12
7439-96-5	Manganese	6.5		E	P	J12
7439-97-6	Mercury	0.08	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.81	U	E	P	J12
7440-09-7	Potassium	2040			P	
7782-49-2	Selenium	0.31	U		F	UJ5
7440-22-4	Silver	0.65	U		P	
7440-23-5	Sodium	32.2	B		P	
7440-28-0	Thallium	0.57	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	81.6			P	
7440-66-6	Zinc	10.2		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A24201

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): WATER Lab Sample ID: 03L804-010

Level (low/med): LOW Date Received: 03/09/91

% 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	21.0	B		P	
7440-36-0	Antimony	7.5	U		P	
7440-38-2	Arsenic	1.8	U		F	
7440-39-3	Barium	4.0	U		P	
7440-41-7	Beryllium	0.50	U		P	
7440-43-9	Cadmium	3.4	U		P	UJ 2
7440-70-2	Calcium	167	B		P	
7440-47-3	Chromium	6.3	U		P	
7440-48-4	Cobalt	3.4	U		P	
7440-50-8	Copper	21.4	B		P	J3
7439-89-6	Iron	67.5	B		P	
7439-92-1	Lead	1.6	U	*	F	UJ10
7439-95-4	Magnesium	51.6	U		P	
7439-96-5	Manganese	1.1	B		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.6	U		P	
7440-09-7	Potassium	142	U		P	
7782-49-2	Selenium	1.3	U		F	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	195	B		P	
7440-28-0	Thallium	2.4	U	W	F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.6	U		P	
7440-66-6	Zinc	5.3	B		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A25001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-005

Level (low/med): LOW Date Received: 03/09/91

% Solids: 78.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3030		E	P	J12
7440-36-0	Antimony	~~1.7~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	3.0			F	
7440-39-3	Barium	2.0	B	E	P	J12
7440-41-7	Beryllium	0.28	B		P	
7440-43-9	Cadmium	0.79	U		P	
7440-70-2	Calcium	4.2	B	E	P	J12
7440-47-3	Chromium	71.1		EN	P	J8,12
7440-48-4	Cobalt	0.79	U		P	
7440-50-8	Copper	2.8	B	E	P	J12
7439-89-6	Iron	12800		E	P	J12
7439-92-1	Lead	~~10.8~~		~~N+~~	~~F~~	R9,13
7439-95-4	Magnesium	502	B	E	P	J12
7439-96-5	Manganese	3.9		E	P	J12
7439-97-6	Mercury	0.11	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.84	U	E	P	J12
7440-09-7	Potassium	1400			P	
7782-49-2	Selenium	0.31	U		F	UJ5
7440-22-4	Silver	0.67	U		P	
7440-23-5	Sodium	5.0	B		P	
7440-28-0	Thallium	0.57	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	66.6			P	
7440-66-6	Zinc	6.2		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A26001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-006

Level (low/med): LOW Date Received: 03/09/91

% Solids: 84.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3650		E	P	J12
7440-36-0	Antimony	~~1.6~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	3.8			F	
7440-39-3	Barium	1.3	B	E	P	J12
7440-41-7	Beryllium	0.41	B		P	
7440-43-9	Cadmium	0.73	U		P	
7440-70-2	Calcium	12.0	B	E	P	J12
7440-47-3	Chromium	93.5		EN	P	J8, 12
7440-48-4	Cobalt	0.73	U		P	
7440-50-8	Copper	1.6	B	E	P	J12
7439-89-6	Iron	12400		E	P	J12
7439-92-1	Lead	~~4.0~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	727	B	E	P	J12
7439-96-5	Manganese	3.8		E	P	J12
7439-97-6	Mercury	0.09	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	2.1	B	E	P	J12
7440-09-7	Potassium	2110			P	
7782-49-2	Selenium	0.31	U		F	UJ5
7440-22-4	Silver	0.63	U		P	
7440-23-5	Sodium	50.4	B		P	
7440-28-0	Thallium	0.56	U	W	F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	61.4			P	
7440-66-6	Zinc	12.4		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

ENVIROFORMS/CLP 788

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A26101

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-007

Level (low/med): LOW Date Received: 03/09/91

% Solids: 85.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3710		E	P	J12
7440-36-0	Antimony	1.7	U	N	P	UJ7
7440-38-2	Arsenic	4.6			F	
7440-39-3	Barium	1.4	B	E	P	J12
7440-41-7	Beryllium	0.44	B		P	
7440-43-9	Cadmium	0.79	U		P	
7440-70-2	Calcium	9.9	B	E	P	J12
7440-47-3	Chromium	81.8		EN	P	J8,12
7440-48-4	Cobalt	0.79	U		P	
7440-50-8	Copper	1.6	B	E	P	J12
7439-89-6	Iron	12900		E	P	J12
7439-92-1	Lead	~~3.8~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	787	B	E	P	J12
7439-96-5	Manganese	3.5		E	P	J12
7439-97-6	Mercury	0.08	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.84	U	E	P	J12
7440-09-7	Potassium	2240			P	
7782-49-2	Selenium	0.34	B		F	~~J15~~ PBH 7/22/91
7440-22-4	Silver	0.67	U		P	
7440-23-5	Sodium	21.6	B		P	
7440-28-0	Thallium	0.52	U	W	F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	61.5			P	
7440-66-6	Zinc	7.4		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A27001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-008

Level (low/med): LOW Date Received: 03/09/91

% Solids: 85.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	8490		E	P	J12
7440-36-0	Antimony	~~1.8~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	7.5			F	
7440-39-3	Barium	2.0	B	E	P	J12
7440-41-7	Beryllium	1.1	B		P	
7440-43-9	Cadmium	0.79	U		P	
7440-70-2	Calcium	15.4	B	E	P	J12
7440-47-3	Chromium	265		EN	P	J8, 12
7440-48-4	Cobalt	1.4	B		P	
7440-50-8	Copper	4.2	B	E	P	J12
7439-89-6	Iron	33900		E	P	J12
7439-92-1	Lead	~~5.5~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	2060		E	P	J12
7439-96-5	Manganese	6.1		E	P	J12
7439-97-6	Mercury	0.12	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.84	U	E	P	J12 PBH 7/22/91
7440-09-7	Potassium	6480			P	
7782-49-2	Selenium	0.65	B		F	J5, ~~R15~~
7440-22-4	Silver	0.68	U		P	
7440-23-5	Sodium	17.7	B		P	
7440-28-0	Thallium	0.56	U	W	F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	168			P	
7440-66-6	Zinc	21.1		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

78

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

A28001

STON Gulf Coast Labs Contract:

SGCL Case No.: SAS No.: SDG No.: CLP804

/water): SOIL Lab Sample ID: 03L804-009

ied): LOW Date Received: 03/09/91

84.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4970		E	P	J12
7440-36-0	Antimony	~~1.8~~	U	N	~~P~~	R4
7440-38-2	Arsenic	6.1			F	
7440-39-3	Barium	1.5	B	E	P	J12
7440-41-7	Beryllium	0.66	B		P	
7440-43-9	Cadmium	0.80	U		P	
7440-70-2	Calcium	4.9	B	E	P	J12
7440-47-3	Chromium	183		EN	P	J8,12
7440-48-4	Cobalt	0.80	U		P	
7440-50-8	Copper	1.1	B	E	P	J12
7439-89-6	Iron	19000		E	P	J12
7439-92-1	Lead	~~4.7~~		N	~~F~~	R9
7439-95-4	Magnesium	847	B	E	P	J12
7439-96-5	Manganese	4.6		E	P	J12
7439-97-6	Mercury	0.11	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.85	U	E	P	J12
7440-09-7	Potassium	2630			P	
7782-49-2	Selenium	0.30	U		F	UJ5
7440-22-4	Silver	0.68	U		P	
7440-23-5	Sodium	8.4	B		P	
7440-28-0	Thallium	0.56	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	117			P	
7440-66-6	Zinc	9.5		E	P	J12

re: BROWN Clarity Before: Texture: MEDIUM

r: YELLOW Clarity After: Artifacts:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

201001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-028

Level (low/med): LOW Date Received: 03/09/91

% Solids: 80.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7720		E	P	J12
7440-36-0	Antimony	~~1.7~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	3.5			F	
7440-39-3	Barium	146		E	P	J12
7440-41-7	Beryllium	5.1			P	
7440-43-9	Cadmium	1.3			P	
7440-70-2	Calcium	5220		E	P	J12
7440-47-3	Chromium	83.5		EN	P	J8,12
7440-48-4	Cobalt	64.9			P	
7440-50-8	Copper	1320		E	P	J12
7439-89-6	Iron	35500		E	P	J12
7439-92-1	Lead	~~710~~		~~E~~	~~P~~	R9
7439-95-4	Magnesium	1250		E	P	J12
7439-96-5	Manganese	299		E	P	J12
7439-97-6	Mercury	0.10	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	711		E	P	J12
7440-09-7	Potassium	553	B		P	
7782-49-2	Selenium	1.9			F	J5
7440-22-4	Silver	0.67	U		P	
7440-23-5	Sodium	387	B		P	
7440-28-0	Thallium	0.60	U	W	F	J14
7440-31-5	Tin				NR	
7440-62-2	Vanadium	12.7			P	
7440-66-6	Zinc	2720		E	P	J12

Color Before: BLACK Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

80

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

202001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-029

Level (low/med): LOW Date Received: 03/09/91

% Solids: 80.8

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4700		E	P	J12
7440-36-0	Antimony	~~1.8~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	2.8			F	
7440-39-3	Barium	48.6		E	P	J12
7440-41-7	Beryllium	2.5			P	
7440-43-9	Cadmium	0.81	U		P	
7440-70-2	Calcium	1220		E	P	J12
7440-47-3	Chromium	94.7		EN	P	J8, 12
7440-48-4	Cobalt	13.4			P	
7440-50-8	Copper	261		E	P	J12
7439-89-6	Iron	16800		E	P	J12
7439-92-1	Lead	~~305~~		~~E~~	~~P~~	R9
7439-95-4	Magnesium	871	B	E	P	J12
7439-96-5	Manganese	107		E	P	J12
7439-97-6	Mercury	0.08	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	117		E	P	J12
7440-09-7	Potassium	973	B		P	
7782-49-2	Selenium	0.61	B		F	J5
7440-22-4	Silver	0.69	U		P	
7440-23-5	Sodium	181	B		P	
7440-28-0	Thallium	0.56	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	30.5			P	
7440-66-6	Zinc	980		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

203001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-030

Level (low/med): LOW Date Received: 03/09/91

% Solids: 68.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17300		E	P	J12
7440-36-0	Antimony	~~2.1~~	U	N	~~P~~	R4
7440-38-2	Arsenic	2.7	B		F	
7440-39-3	Barium	325		E	P	J12
7440-41-7	Beryllium	9.9			P	
7440-43-9	Cadmium	1.9			P	
7440-70-2	Calcium	6750		E	P	J12
7440-47-3	Chromium	204		EN	P	J8,12
7440-48-4	Cobalt	62.6			P	
7440-50-8	Copper	859		E	P	J12
7439-89-6	Iron	54100		E	P	J12
7439-92-1	Lead	~~780~~		~~E~~	~~P~~	R9
7439-95-4	Magnesium	2280		E	P	J12
7439-96-5	Manganese	329		E	P	J12
7439-97-6	Mercury	0.11	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	425		E	P	J12
7440-09-7	Potassium	1930			P	
7782-49-2	Selenium	1.8			F	J5
7440-22-4	Silver	0.81	U		P	
7440-23-5	Sodium	766	B		P	
7440-28-0	Thallium	0.65	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	42.3			P	
7440-66-6	Zinc	2890		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

204001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-031

Level (low/med): LOW Date Received: 03/09/91

% Solids: 83.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6650		E	P	J12, 7
7440-36-0	Antimony	~~3.4~~	~~B~~	~~N~~	~~P~~	~~R4~~ J10 k PB 14 7/22/91
7440-38-2	Arsenic	0.79	B		F	
7440-39-3	Barium	142		E	P	J12
7440-41-7	Beryllium	6.5			P	
7440-43-9	Cadmium	0.80	U		P	
7440-70-2	Calcium	3240		E	P	J12
7440-47-3	Chromium	120		EN	P	J8, 12
7440-48-4	Cobalt	33.0			P	
7440-50-8	Copper	461		E	P	J12
7439-89-6	Iron	26000		E	P	J12
7439-92-1	Lead	~~429~~		~~E~~	~~P~~	R9
7439-95-4	Magnesium	1100	B	E	P	J12
7439-96-5	Manganese	214		E	P	J12
7439-97-6	Mercury	0.09	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	220		E	P	J12
7440-09-7	Potassium	604	B		P	
7782-49-2	Selenium	1.8			F	
7440-22-4	Silver	0.68	U		P	
7440-23-5	Sodium	376	B		P	
7440-28-0	Thallium	0.54	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	15.7			P	
7440-66-6	Zinc	1760		E	P	J1, 12

Color Before: BLACK Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

205001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-032

Level (low/med): LOW Date Received: 03/09/91

% Solids: 43.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9710		E	P	J12 J17
7440-36-0	Antimony	4.6	B	N	P	J1,7
7440-38-2	Arsenic	4.6			F	
7440-39-3	Barium	99.8		E	P	J12
7440-41-7	Beryllium	2.5			P	
7440-43-9	Cadmium	1.5	U		P	
7440-70-2	Calcium	2750		E	P	J12
7440-47-3	Chromium	171		EN	P	J8,12
7440-48-4	Cobalt	13.6	B		P	
7440-50-8	Copper	333		E	P	J12
7439-89-6	Iron	23500		E	P	J12
7439-92-1	Lead	~~383~~		~~E~~	~~P~~	R9
7439-95-4	Magnesium	1580	B	E	P	J12
7439-96-5	Manganese	160		E	P	J12
7439-97-6	Mercury	0.16	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	80.1		E	P	J12
7440-09-7	Potassium	834	B		P	
7782-49-2	Selenium	2.9			F	
7440-22-4	Silver	1.3	U		P	
7440-23-5	Sodium	273	B		P	
7440-28-0	Thallium	1.1	U	W	F	J14
7440-31-5	Tin				NR	
7440-62-2	Vanadium	47.4			P	
7440-66-6	Zinc	700		E	P	J1,12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

205201

WESTON Gulf Coast Labs Contract:

WESGCL Case No.: SAS No.: SDG No.: CLP804

Soil/water): WATER Lab Sample ID: 03L804-034

Low/med): LOW Date Received: 03/09/91

: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17.8	U		P	
7440-36-0	Antimony	7.5	U		P	
7440-38-2	Arsenic	1.8	U		F	
7440-39-3	Barium	4.0	U		P	
7440-41-7	Beryllium	0.50	U		P	
7440-43-9	Cadmium	3.4	U		P	UJ2
7440-70-2	Calcium	106	B		P	
7440-47-3	Chromium	6.3	U		P	
7440-48-4	Cobalt	3.4	U		P	
7440-50-8	Copper	11.9	B		P	J3
7439-89-6	Iron	45.2	B		P	
7439-92-1	Lead	1.7	B	*	F	J10
7439-95-4	Magnesium	51.6	U		P	
7439-96-5	Manganese	0.90	U		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.6	U		P	
7440-09-7	Potassium	142	U		P	
7782-49-2	Selenium	1.3	U		F	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	272	B		P	
7440-28-0	Thallium	2.4	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.6	U		P	
7440-66-6	Zinc	12.4	B		P	

efore: COLORLESS Clarity Before: CLEAR Texture:

fter: COLORLESS Clarity After: CLEAR Artifacts:

s:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

221001

ab Name: WESTON Gulf Coast Labs Contract:

ab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

atrix (soil/water): SOIL Lab Sample ID: 03L804-011

evel (low/med): LOW Date Received: 03/09/91

Solids: 67.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3930		E	P	J12
7440-36-0	Antimony	~~2.2~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	2.9			F	
7440-39-3	Barium	16.5	B	E	P	J12
7440-41-7	Beryllium	0.26	B		P	
7440-43-9	Cadmium	2.7			P	
7440-70-2	Calcium	1260	B	E	P	J12
7440-47-3	Chromium	14.3		EN	P	J8, 12
7440-48-4	Cobalt	5.2	B		P	
7440-50-8	Copper	18.3		E	P	J12
7439-89-6	Iron	13400		E	P	J12
7439-92-1	Lead	~~42.9~~		~~E~~	~~P~~	R9
7439-95-4	Magnesium	641	B	E	P	J12
7439-96-5	Manganese	155		E	P	J12
7439-97-6	Mercury	0.11	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	8.6	B	E	P	J12
7440-09-7	Potassium	342	B		P	
7782-49-2	Selenium	0.38	B		F	J5
7440-22-4	Silver	0.84	U		P	
7440-23-5	Sodium	67.1	B		P	
7440-28-0	Thallium	0.70	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	21.4			P	
7440-66-6	Zinc	119		E	P	J12

Color Before: GREY Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

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ENVIROFORMS/CLP 788

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

223001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-013

Level (low/med): LOW Date Received: 03/09/91

% Solids: 73.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2220		E	P	J12
7440-36-0	Antimony	~~2.0~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	2.5	B		F	
7440-39-3	Barium	8.0	B	E	P	J12
7440-41-7	Beryllium	0.27	B		P	
7440-43-9	Cadmium	0.90	U		P	
7440-70-2	Calcium	422	B	E	P	J12
7440-47-3	Chromium	31.8		EN	P	J8, 12
7440-48-4	Cobalt	1.1	B		P	
7440-50-8	Copper	4.6	B	E	P	J12
7439-89-6	Iron	7090		E	P	J12
7439-92-1	Lead	~~106~~		~~E~~	~~P~~	R9
7439-95-4	Magnesium	558	B	E	P	J12
7439-96-5	Manganese	23.7		E	P	J12
7439-97-6	Mercury	0.10	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.95	U	E	P	J12
7440-09-7	Potassium	1440			P	
7782-49-2	Selenium	0.34	U		F	UJ5
7440-22-4	Silver	0.77	U		P	
7440-23-5	Sodium	36.6	B		P	
7440-28-0	Thallium	0.62	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	29.0			P	
7440-66-6	Zinc	20.9		E	P	J12

Color Before: GREY Clarity Before: Texture: COARSE

Color After: COLORLESS Clarity After: Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

224001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-014

Level (low/med): LOW Date Received: 03/09/91

% Solids: 54.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3010		E	P	J12
7440-36-0	Antimony	~~2.0~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	2.8			F	
7440-39-3	Barium	9.2	B	E	P	J12
7440-41-7	Beryllium	0.16	B		P	
7440-43-9	Cadmium	1.8			P	
7440-70-2	Calcium	671	B	E	P	J12
7440-47-3	Chromium	24.0		EN	P	J8, 12
7440-48-4	Cobalt	0.93	U		P	
7440-50-8	Copper	5.3	B	E	P	J12
7439-89-6	Iron	3970		E	P	J12
7439-92-1	Lead	~~26.9~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	318	B	E	P	J12
7439-96-5	Manganese	9.5		E	P	J12
7439-97-6	Mercury	0.17	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.98	U	E	P	J12
7440-09-7	Potassium	678	B		P	
7782-49-2	Selenium	0.37	B	W	F	J5, 15
7440-22-4	Silver	0.79	U		P	
7440-23-5	Sodium	57.6	B		P	
7440-28-0	Thallium	0.56	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	12.5	B		P	
7440-66-6	Zinc	35.6		E	P	J12

Color Before: GREY Clarity Before: Texture: COARSE

Color After: COLORLESS Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

225001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-015

Level (low/med): LOW Date Received: 03/09/91

% Solids: 78.6

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1300		E	P	J12
7440-36-0	Antimony	~~1.7~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	1.2	B		F	
7440-39-3	Barium	1.1	B	E	P	J12
7440-41-7	Beryllium	0.13	B		P	
7440-43-9	Cadmium	0.75	U		P	
7440-70-2	Calcium	56.6	B	E	P	J12
7440-47-3	Chromium	11.6		EN	P	J8, J2
7440-48-4	Cobalt	0.75	U		P	
7440-50-8	Copper	0.77	B	E	P	J12
7439-89-6	Iron	2550		E	P	J12
7439-92-1	Lead	~~6.4~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	171	B	E	P	J12
7439-96-5	Manganese	2.4	B	E	P	J12
7439-97-6	Mercury	0.10	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.79	U	E	P	J12
7440-09-7	Potassium	450	B		P	
7782-49-2	Selenium	0.31	U		F	UJ5
7440-22-4	Silver	0.64	U		P	
7440-23-5	Sodium	10.3	B		P	
7440-28-0	Thallium	0.58	U	W	F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	9.5	B		P	
7440-66-6	Zinc	4.0	B	E	P	J12

Color Before: GREY Clarity Before: Texture: COARSE

Color After: COLORLESS Clarity After: Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

226001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-016

Level (low/med): LOW Date Received: 03/09/91

% Solids: 72.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2360		E	P	J12
7440-36-0	Antimony	~~2.1~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	0.94	B		F	
7440-39-3	Barium	6.6	B	E	P	J12
7440-41-7	Beryllium	0.22	B		P	
7440-43-9	Cadmium	0.93	B		P	
7440-70-2	Calcium	944	B	E	P	J12
7440-47-3	Chromium	13.6		EN	P	J8, 12
7440-48-4	Cobalt	0.93	U		P	
7440-50-8	Copper	4.0	B	E	P	J12
7439-89-6	Iron	3010		E	P	J12
7439-92-1	Lead	~~11.9~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	405	B	E	P	J12
7439-96-5	Manganese	8.3		E	P	J12
7439-97-6	Mercury	0.13	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.99	U	E	P	J12
7440-09-7	Potassium	465	B		P	
7782-49-2	Selenium	0.35	U		F	UJ5
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	42.9	B		P	
7440-28-0	Thallium	0.65	U	W	F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	10.1	B		P	J
7440-66-6	Zinc	36.8		E	P	J12

Color Before: GREY Clarity Before: Texture: COARSE

Color After: COLORLESS Clarity After: Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

226201

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): WATER Lab Sample ID: 03L804-017

Level (low/med): LOW Date Received: 03/09/91

% 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	17.8	U		P	
7440-36-0	Antimony	7.5	U		P	
7440-38-2	Arsenic	1.8	U		F	
7440-39-3	Barium	4.0	U		P	
7440-41-7	Beryllium	0.50	U		P	
7440-43-9	Cadmium	3.4	U		P	UJ2
7440-70-2	Calcium	97.1	B		P	
7440-47-3	Chromium	6.3	U		P	
7440-48-4	Cobalt	3.4	U		P	
7440-50-8	Copper	21.0	B		P	J3
7439-89-6	Iron	44.6	B		P	
7439-92-1	Lead	2.0	B	*	F	J10
7439-95-4	Magnesium	51.6	U		P	
7439-96-5	Manganese	0.90	U		P	
7439-97-6	Mercury	0.20	U		CV	
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.6	U		P	
7440-09-7	Potassium	142	U		P	
7782-49-2	Selenium	1.3	U		F	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	263	B		P	
7440-28-0	Thallium	2.4	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.6	U		P	
7440-66-6	Zinc	4.5	B		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

227001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-018

Level (low/med): LOW Date Received: 03/09/91

% Solids: 83.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1370		E	P	J12
7440-36-0	Antimony	~~1.7~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	3.3			F	
7440-39-3	Barium	7.2	B	E	P	J12
7440-41-7	Beryllium	0.22	B		P	
7440-43-9	Cadmium	0.75	U		P	
7440-70-2	Calcium	55.2	B	E	P	J12
7440-47-3	Chromium	17.1		EN	P	J8, 12
7440-48-4	Cobalt	0.75	U		P	
7440-50-8	Copper	4.7	B	E	P	J12
7439-89-6	Iron	8340		E	P	J12
7439-92-1	Lead	~~29.8~~		~~E~~	~~P~~	R9
7439-95-4	Magnesium	131	B	E	P	J12
7439-96-5	Manganese	11.2		E	P	J12
7439-97-6	Mercury	0.11	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.80	U	E	P	J12
7440-09-7	Potassium	530	B		P	
7782-49-2	Selenium	0.31	U	W	F	UJ5
7440-22-4	Silver	0.64	U		P	
7440-23-5	Sodium	97.4	B		P	
7440-28-0	Thallium	0.57	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	12.6			P	
7440-66-6	Zinc	5.6		E	P	J12

Color Before: BLACK Clarity Before: Texture: COARSE

Color After: COLORLESS Clarity After: Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

228001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-020

Level (low/med): LOW Date Received: 03/09/91

% Solids: 81.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3070		E	P	J12
7440-36-0	Antimony	~~1.8~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	2.7			F	
7440-39-3	Barium	5.3	B	E	P	J12
7440-41-7	Beryllium	0.45	B		P	
7440-43-9	Cadmium	0.81	U		P	
7440-70-2	Calcium	39.4	B	E	P	J12
7440-47-3	Chromium	48.2		EN	P	J8, 12
7440-48-4	Cobalt	0.81	U		P	
7440-50-8	Copper	17.2		E	P	J12
7439-89-6	Iron	9480		E	P	J12
7439-92-1	Lead	~~6.3~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	661	B	E	P	J12
7439-96-5	Manganese	6.0		E	P	J12
7439-97-6	Mercury	0.12	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	2.8	B	E	P	J12
7440-09-7	Potassium	2270			P	
7782-49-2	Selenium	0.30	U	W	F	UJ5
7440-22-4	Silver	0.69	U		P	
7440-23-5	Sodium	31.8	B		P	
7440-28-0	Thallium	0.55	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	36.1			P	
7440-66-6	Zinc	33.3		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

229001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP804

Matrix (soil/water): SOIL Lab Sample ID: 03L804-023

Level (low/med): LOW Date Received: 03/09/91

% Solids: 79.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4350		E	P	J12
7440-36-0	Antimony	~~1.9~~	~~U~~	~~N~~	~~P~~	R4
7440-38-2	Arsenic	1.9	B		F	
7440-39-3	Barium	9.6	B	E	P	J12
7440-41-7	Beryllium	0.30	B		P	
7440-43-9	Cadmium	0.84	U		P	
7440-70-2	Calcium	9.7	B	E	P	J12
7440-47-3	Chromium	46.8		EN	P	J8, 12
7440-48-4	Cobalt	0.84	U		P	
7440-50-8	Copper	2.5	B	E	P	J12
7439-89-6	Iron	5520		E	P	J12
7439-92-1	Lead	~~8.0~~		~~N~~	~~F~~	R9
7439-95-4	Magnesium	452	B	E	P	J12
7439-96-5	Manganese	5.0		E	P	J12
7439-97-6	Mercury	0.09	U		CV	UJ11
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	0.89	U	E	P	J12
7440-09-7	Potassium	1710			P	
7782-49-2	Selenium	0.35	B		F	J5
7440-22-4	Silver	0.72	U		P	
7440-23-5	Sodium	21.7	B		P	
7440-28-0	Thallium	0.56	U	W	F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	25.8			P	
7440-66-6	Zinc	5.3		E	P	J12

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: Artifacts:

Comments:

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 04/01/91

CLIENT: Naval Weapons Station
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9103L804

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	02-001-D001	% Solids	72.6	%	0.10
		Cyanide, Total	0.56 u	MG/KG	0.56
-002	02-002-D001	% Solids	74.5	%	0.10
		Cyanide, Total	0.52 u	MG/KG	0.52
-003	02-003-D001	% Solids	78.8	%	0.10
		Cyanide, Total	0.62 u	MG/KG	0.62
-004	02-004-S001	% Solids	83.6	%	0.10
		Cyanide, Total	0.40 u	MG/KG	0.40
-005	02-005-S001	% Solids	78.7	%	0.10
		Cyanide, Total	0.57 u	MG/KG	0.57
-006	02-006-S001	% Solids	84.6	%	0.10
		Cyanide, Total	0.58 u	MG/KG	0.58
-007	02-006-S101	% Solids	85.6	%	0.10
		Cyanide, Total	0.55 u	MG/KG	0.55
-008	02-007-S001	% Solids	85.2	%	0.10
		Cyanide, Total	0.54 u	MG/KG	0.54
-009	02-008-S001	% Solids	84.6	%	0.10
		Cyanide, Total	0.57 u	MG/KG	0.57
-010	02-004-S201	Cyanide, Total	0.020 u	MG/L	0.020
-011	22-001-D001	% Solids	67.9	%	0.10
		Cyanide, Total	0.47 u	MG/KG	0.47
-013	22-003-D001	% Solids	73.6	%	0.10
		Cyanide, Total	0.54 u	MG/KG	0.54
-014	22-004-D001	% Solids	54.6	%	0.10
		Cyanide, Total	0.90 u	MG/KG	0.90
-015	22-005-D001	% Solids	78.6	%	0.10
		Cyanide, Total	0.61 u	MG/KG	0.61

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 04/01/91

CLIENT: Naval Weapons Station
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9103L804

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-016	22-006-D001	% Solids	72.3		%	0.10
		Cyanide, Total	0.53	u	MG/KG	0.53
-017	22-006-D201	Cyanide, Total	0.020	u	MG/L	0.020
-018	22-007-S001	% Solids	83.7		%	0.10
		Cyanide, Total	0.56	u	MG/KG	0.56
-020	22-008-S001	% Solids	81.2		%	0.10
		Cyanide, Total	0.61	u	MG/KG	0.61
-023	22-009-S001	% Solids	79.7		%	0.10
		Cyanide, Total	0.59	u	MG/KG	0.59
-028	20-001-D001	% Solids	80.0		%	0.10
		Cyanide, Total	0.58	u	MG/KG	0.58
-029	20-002-D001	% Solids	80.8		%	0.10
		Cyanide, Total	2.0		MG/KG	0.58
-030	20-003-D001	% Solids	68.4		%	0.10
		Cyanide, Total	0.68	u	MG/KG	0.68
-031	20-004-D001	% Solids	83.7		%	0.10
		Cyanide, Total	0.59	u	MG/KG	0.59
-032	20-005-D001	% Solids	43.7		%	0.10
		Cyanide, Total	1.1	u	MG/KG	1.1
-034	20-005-D201	Cyanide, Total	0.020	u	MG/L	0.020

	YES	NO	N.A.
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		✓
ACTION: If no, contact RSCC.			
A.1.2 Record of Communication (from RSCC) - Present?	[ ]		✓
ACTION: If no, request from RSCC.			
A.1.3 Trip Report - Present and complete?	[ ]		✓
ACTION: If no, contact RSCC for trip report.			
A.1.4 Sample Traffic Report - Present or on file?	[ ]		✓
Legible?	[ ]		✓
ACTION: If no, request from Regional Sample Control Center (RSCC).			
A.1.5 Cover Page - Present?	[✓]		
Is cover page properly filled in and signed by the lab manager or the manager's designee?	[✓]		
ACTION: If no, prepare Telephone Record Log, and contact laboratory.			
Do numbers of samples correspond to numbers on Record of Communication?	[ ]		✓
Do sample numbers on cover page agree with sample numbers on:			
(a) Traffic Report Sheet?	[ ]		✓
(b) Form I's?	[✓]		
ACTION: If no for any of the above, contact RSCC for clarification.			

	YES	NO	N/A
A.1.6 Form I (Final Data) - Are all Form I's present and complete?	[✓]		
ACTION: If no, prepare telephone record log and contact laboratory for submittal.			
Are correct units (ug/l for waters and mg/kg for soils) indicated on Form I's?	[✓]		
Are soil sample results for each parameter corrected for percent solids?	[✓]		
Are EPA sample # s and corresponding laboratory sample ID # s the same as on the Cover Page, Form I's and in the raw data?	[✓]		
Are computation/transcription errors less than 10% of reported values?	[✓]		
Are all "less than IDL" values properly coded with "U"?	[✓]		
Was a brief physical description of samples given on Form I's?	[✓]		
Were the result qualifiers used correctly with final data?	[✓]		
ACTION: If no for any of the above, prepare Telephone Record Log, and contract laboratory for corrected data.			
Were any samples diluted beyond requirements of contract?		[✓]	
If yes, were dilutions noted on Form I's?	[✓]		
ACTION: If no, note under Contract-Problem/Non-Compliance of the"Data Assessment Narrative".			
A.1.7 Holding Times - (aqueous and soil samples)			
(Examine sample traffic reports and digestion/distillation logs.)			
Mercury analysis (28 days). . . . . exceeded?		[✓]	
Cyanide distillation (14 days). . . . . exceeded?		[✓]	

	YES	NO	N/A
Other Metals analysis (6 months). . . . exceeded?	___	[✓]	___

NOTE: Prepare a list of all samples and analytes for which holding times have been exceeded. Specify the number of days from date of collection to the date of preparation (from raw data). Attach to checklist.

ACTION: If yes, reject (red-line) values less than Instrument Detection Limit (IDL) and flag as estimated (J) the values above IDL even though sample(s) was preserved properly.

A.1.8 Raw Data

		YES	NO	N/A
A.1.8.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]	___	___
	Digestion Log for furnace AA Form XIII present?	[✓]	___	___
	Distillation Log for mercury Form XIII present?	[✓]	___	___
	Distillation Log for cyanides Form XIII present?	[✓]	___	___
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[✓]	___	___
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[✓]	___	___
	Are preparation dates present on Digestion Log?	[✓]	___	___
A.1.8.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	___	✓
	Furnace AA	[✓]	___	___
	Mercury	[✓]	___	___
	Cyanides	[✓]	___	___

	YES	NO	N/A
A.1.8.3 Are all raw data to support all sample analyses and QC operations present?	[✓]	__	__
Legible?	[✓]	__	__
Properly Labeled?	[✓]	__	__

ACTION: If no for any of the above, write Telephone Record Log and contact laboratory. Flag metal data as estimated if pH of sample is greater than 2. Flag cyanide data as estimated if pH sample is less than 12.

A.1.9 Data Validation and Verification

A.1.9.1 Calibration

	YES	NO	N/A
A.1.9.1.1 Is record of at least 2 point calibration present for ICP analysis?	[✓]	__	__
Is record of 5 point calibration present for Hg analysis?	[✓]	__	__

ACTION: If no for any of the above, write in the Contract Problem/Non-Compliance section of the "Data Assessment Narrative".

	YES	NO	N/A
A.1.9.1.2 Is record of 4 point calibration present for:			
Flame AA?	[__]	__	✓
Furnace AA?	[✓]	__	__
Cyanides?	[✓]	__	__

NOTE:
1. If less than 4 standards are measured in absorbance mode, then the remaining standards in concentration mode must be run immediately after calibration and be within ±10% of true value.
2. For all AA (except Hg) and Cyanide analyses, one calibration standard is at CRDL level. If not, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".

	YES	NO	N/A
ACTION: Flag associated data as estimated if standards are not within ±10% of true values (except CRDL calibration standard). Do not flag the data as estimated in linear range indicated by good recovery of standard.			
A.1.9.1.3 Is correlation *coefficient less than 0.995 for:			
Mercury Analysis?	___	[✓]	___
Cyanide Analysis?	___	[✓]	___
Atomic Absorption Analysis?	___	[✓]	___
ACTION: If yes, flag the associated data as estimated.			
A.1.9.2 Form II A (Initial and Continuing Calibration Verification)-			
A.1.9.2.1 Present and complete for every metal and cyanide?	[✓]	___	___
Present and complete for AA and ICP when both are used for same analyte?	[✓]	___	___
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
A.1.9.2.2 Circle all values on data summary sheet that are outside contract windows. Are all calibration standards (initial and continuing) within control limits?			
Metals 90-110%	[✓]	___	___
Hg - 80-120%	[✓]	___	___
Cyanides 85-115%	[✓]	___	___

* The reviewer will calculate correlation coefficient.

	YES	NO	N/A
ACTION: Flag as estimated (J) all positive data (not flagged with a "U") analyzed between a calibration standard with %R between 75-89% (65-79% for Hg; 70-84% for CN) or 111-125% (121-135% for Hg; 116-130% for CN) recovery and nearest good calibration standard. Qualify results <IDL as estimated (UJ), if the ICV or CCV %R is 75-89% (CN, 70-84% ; HG, 65-79%). Reject (red-line) as unacceptable data if recovery of the ICV or CCV is outside the range 75-125% (CN, 70-130%; Hg, 65-135%). Qualify five samples on either side of verification standard out of control limits.			
Was continuing calibration performed every 10 samples or every 2 hours?	[✓]		
ACTION: If no, flag the excess samples (eleventh and up) data as estimated (J).			
Was ICV for cyanides distilled?	[ ]		✓
ACTION: If no, write in the Contract-Problem/Non-Compliance section of the "Data Assessment Narrative".			

A.1.9.3 Form II B (CRDL Standards for AA and ICP) -

	YES	NO	N/A
A.1.9.3.1 Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?	[✓]		
*Was a mid-range calib. verification standard distilled and analyzed for cyanide analysis?	[ ]		✓
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run? (Note: CRI for AL,Ba,Ca,Fe,Mg,Na,or K is not required.)	[✓]		

ACTION: If no for any of the above, flag as estimated all data falling within the affected ranges. The affected ranges are:

AA Analysis - **True Value ± CRDL
ICP Analysis - **True Value ± 2CRDL
CN Analysis - **True Value ± 0.5 x True Value.

* Find the results of mid-range standard in the raw data.
**True value of CRA, CRI or mid-range standard. Substitute IDL for CRDL when IDL > CRDL.

		YES	NO	N.A.
A.1.9.3.2	Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and for every four hours of ICP run?	[✓]		
	ACTION: If no, write in Contract Problem/Non-Compliance Section of the "Data Assessment Narrative".			
A.1.9.3.3	Circle all values on summary sheet that are outside acceptance windows.			
	Are CRA and CRI standards within control limits: Metals 80 - 120%R?	[ ]	✓	
	Is mid-range standard within control limits: Cyanide 80 - 120%R?	[✓]		
	ACTION: Flag as estimated all data within the affected ranges if the recovery of the standard is between 50-79%; flag only positive data if the recovery is between 121-150%; reject (red line) all data if the recovery is less than 50%; reject only positive data if the recovery is greater than 150%.			
A.1.9.4	Form III (Initial and Continuing Calibration Blanks)			
A.1.9.4.1	Present and complete?	[✓]		
	For both AA and ICP when both are used for same analyte?	[✓]		
	Was an initial calibration blank analyzed?	[✓]		
	Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (whichever is more frequent)?	[✓]		
	ACTION: If no, prepare Telephone Record Log, contact laboratory and write in the contract-problems/non-compliance section of the Data Assessment Narrative.			

		YES	NO	N/A
A.1.9.4.2	Circle all calibration blank values on Data Summary Sheet that are above CRDL (or 2 x IDL when IDL > CRDL). Are all calibration blanks (when IDL<CRDL) less than or equal to Contract Required Detection Limits (CRDL)?	[✓]		
	Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?	[✓]		

ACTION: If no for any of the above, flag as estimated (J) all positive data less than or equal to calibration blank values analyzed between calibration blank with value over CRDL (or 2xIDL) and nearest good calibration blank. Flag five samples on either side of the calibration blank.

A.1.9.5 FORM III (Preparation Blank) -

(Note: The preparation blank for mercury is the same as the calibration blank.)

		YES	NO	N/A
A.1.9.5.1	Was one prep. blank analyzed for: each 20 samples?	[✓]		
	each batch?	[✓]		
	each matrix type?	[✓]		
	both AA and ICP when both are used for same analyte?	[✓]		

ACTION: If no for any of the above, flag as estimated (J) all associated positive data <10 x IDLs for which prep. blank was not analyzed.

NOTE: If only one blank was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).

		YES	NO	N/A
A.1.9.5.2	Is concentration of prep. blank greater than CRDL when IDL is less than or equal to CRDL?		[✓]	
	If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank value?		[✓]	

		YES	NO	N/A
	ACTION: If yes, reject (red-line) all associated data greater than CRDL concentration but less than ten times the prep. blank value found in the raw data.			
A.1.9.5.3	Do concentrations of prep. blank fall below two times IDL when IDL is greater than CRDL?	[✓]		
	ACTION: If no, reject (red-line) all positive data that has a concentration less than 10 times the prep. blank value in the raw data.			
A.1.9.5.4	Is concentration of prep. blank below the negative CRDL?		[✓]	
	ACTION: If yes, reject (red-line) all associated data that has a concentration less than 10xCRDL.			
A.1.9.6	Form IV (ICP Interference Check Sample)			
A.1.9.6.1	Present and complete?	[✓]		
	(NOTE: Not required for furnace AA, flame AA, mercury, cyanide and Ca, Mg, K and Na.)			
	Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	[✓]		
	ACTION: If no, flag as estimated (J) all samples for which AL, Ca, Fe, or Mg is higher than in ICS.			
A.1.8.6.2	Circle all values on Data Summary Sheet that are more than + 20% of true or established mean value. Are all Interference Check Sample results inside of control limits (+ 20%)?	[✓]		
	If no, is concentration of Al, Ca, Fe, or Mg lower than in ICS?	[ ]		✓
	ACTION: If no, flag as estimated (J) those positive results for which ICS recovery is between 121-150%; flag all sample results as estimated if ICS recovery falls within 50-79%; reject (red-line) those sample results for which ICS recovery is less than 50%; if ICS recovery is above 150%, reject positive results only (not flagged with a "U").			

		YES	NO	N/A
A.1.9.7	Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)- (Note: Not required for Ca, Mg, K, and Na (both matrices), Al, and Fe (soil only.)			
A.1.9.7.1	Present and complete for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each conc. range (i.e. low, med., high)?	[✓]	__	__
	For both AA and ICP when both are used for same analyte?	[__]	__	✓
	ACTION: If no for any of the above, flag as estimated (J) all positive data less than four times spiking level for which spiked sample was not analyzed.			
	NOTE: If one spiked sample was analyzed for more than 20 samples, then first 20 samples analyzed do not have to be flagged as estimated (J).			
A.1.9.7.2	Was field blank used for spiked sample?	__	[✓]	__
	ACTION: If yes, flag all positive data less than 4 x spike added as estimated (J) for which field blank was used as spiked sample.			
	NOTE: Matrix spike analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.7.3	Circle all values on Data Summary Sheet that are outside control limits (75% to 125%). Are all recoveries within control limits?	[__]	✓	__
	If no, is sample concentration greater than or equal to four times spike concentration?	[__]	✓	__
	ACTION: If yes, disregard spike recoveries for analytes whose concentrations are greater than or equal to four times spike added. If no, circle those analytes on Form V for which sample concentration is less than four times the spike concentration.			

	YES	NO	N/A
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	[✓]	__	__

ACTION: If no, write in the Contract - Problem/Non - Compliance section of "Data Assessment Narrative".

A.1.9.7.4 Aqueous

Are any spike recoveries:

(a) less than 30%?	__	[✓]	__
(b) between 30-74%?	__	[✓]	__
(c) between 126-150%?	__	[✓]	__
(d) greater than 150%?	__	[✓]	__

ACTION: If less than 30%, reject all associated aqueous data; if between 30-74%, flag all associated aqueous data as estimated (J); if between 126-150%, flag as estimated (J) all associated aqueous data not flagged with a "U"; if greater than 150%, reject (red-line) all associated aqueous data not flagged with a "U".

A.1.9.7.5 Soil/Sediment

Are any spike recoveries:

(a) less than 10%?	__	[✓]	__
(b) between 10-74%?	✓	[__]	__
(c) between 126-200%?	✓	[__]	__
(d) greater than 200%?	✓	[__]	__

ACTION: If less than 10%, reject all associated data; if between 10-74%, flag all associated data as estimated; if between 126-200%, flag as estimated all associated data was not flagged with a "U"; if greater than 200%, reject all associated data not flagged with a "U".

		YES	NO	N/A
A.1.9.8	Form VI (Lab Duplicates)			
A.1.9.8.1	Present and complete for: each 20 samples?	[✓]	___	___
	each matrix type?	[✓]	___	___
	each concentration range (i.e. low, med., high)?	[✓]	___	___
	both AA and ICP when both are used for same analyte?	[✓]	___	___

ACTION: If no for any the above, flag as estimated (J) all data >CRDL* for which duplicate sample was not analyzed.

Note: 1. If one duplicate sample was analyzed for more than 20 samples, then first 20 samples do not have to be flagged as estimated.
2. If percent solids for soil sample and its duplicate differ by more than 1%, prepare a Form VI for each duplicate pair, report concentrations in Hg/L on wet weight basis and calculate RPD or Difference for each analyte.

A.1.9.8.2	Was field blank used for duplicate analysis?	___	[✓]	___

ACTION: If yes, flag all data >CRDL* as estimated (J) for which field blank was used as duplicate.

NOTE: Duplicate analysis should be performed on a field blank when it is the only aqueous sample in SDG.

A.1.9.8.3	Are all values within control limits (RPD 20% or difference < ±CRDL)?	[___]	[✓]	___
	If no, are all results outside the control limits flagged with an * on Form I's and VI?	[✓]	___	___

ACTION: If no, write in the Contract - Problems/Non-Compliance section of "Data Assessment Narrative".

NOTE: 1. RPD is not calculable for an analyte of the sample - duplicate pair when both values are less than IDL.

* Substitute IDL for CRDL when IDL > CRDL.

	YES	NO	N/A
2. If lab duplicate result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, do not apply precision criteria.			
A.1.9.8.4 Is any value for sample duplicate pair less than CRDL* and other value greater than or equal to 10 x *CRDL?	___	[✓]	___
ACTION: If yes, flag the associated data as estimated (J).			
A.1.9.8.5 Aqueous Circle all values on Data Summary Sheet that are: RPD > 50%, or Difference > ± CRDL*			
Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?	✓	[ ]	___
Is any **difference between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?	___	[✓]	___
ACTION: If yes, flag the associated data as estimated.			
A.1.9.8.6 Soil/Sediment Circle all values on Data Summary Sheet that are: RPD > 100%, or Difference > 2 x CRDL*			
Is any RPD (where sample and duplicate are both greater than or equal to 5 times *CRDL) : > 100%?	___	[✓]	___
Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x*CRDL) : > 2x*CRDL?	___	[✓]	___

* Substitute IDL for CRDL when IDL > CRDL.
** Use absolute values of sample and duplicate to calculate the difference.

	YES	NO	N/A
ACTION: If yes, flag the associated data as estimated.			
A.1.9.9 Field Duplicates			
A.1.9.9.1 Were field duplicates analyzed?	[ ]	✓	
ACTION: If yes, prepare a Form VI for each aqueous field duplicate pair. Prepare a Form VI for each soil duplicate pair, if percent solids for sample and its duplicate differ by more than 1%; report concentrations of soils in ug/l on wet weight basis and calculate RPDs or Difference for each analyte.			
NOTE: 1. Do not calculate RPD when both values are less than IDL. 2. Flag all associated data only for field duplicate pair.			
A.1.9.9.2 Is any value for sample duplicate pair less than *CRDL and other value greater than or equal to 10 x *CRDL?		[✓]	
ACTION: If yes, flag the associated data as estimated.			
A.1.9.9.3 Aqueous			
Circle all values on Form VI for field duplicates that are: RPD > 50%, or Difference > ± CRDL*			
Is any RPD greater than 50% where sample and duplicate are both greater than or equal to 5 times *CRDL?		[✓]	
Is any **difference between sample and duplicate greater than *CRDL where sample and/or duplicate is less than 5 times *CRDL?		[✓]	
ACTION: If yes, flag the associated data as estimated.			

* Substitute IDL for CRDL when IDL > CRDL.

** Use absolute values of sample and duplicate to calculate the difference.

	YES	NO	N/A

A.1.9.9.4 Soil/Sediment

Circle all values on Form VI for field duplicates that are:
RPD >100%, or

Difference > 2 x CRDL*

Is any RPD (where sample and duplicate are both greater than 5 times *CRDL) :

>100%? ___ [✓] ___

Is any **difference between sample and duplicate (where sample and/or duplicate is less than 5x *CRDL):

>2x *CRDL? ___ [✓] ___

ACTION: If yes, flag the associated data as estimated.

A.1.9.10 Form VII (Laboratory Control Sample) (Note: LCS - not required for aqueous Hg and cyanide analyses.)

A.1.9.10.1 Was one LCS prepared and analyzed for:

every 20 water samples? [✓] ___ ___

every 20 solid samples? [✓] ___ ___

both AA and ICP when both are used for same analyte? [✓] ___ ___

ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory for submittal of results of LCS. Flag as estimated (J) all data for which LCS was not analyzed.

NOTE: If only one LCS was analyzed for more than 20 samples, then first 20 samples close to LCS do not have to be flagged as estimated.

* Substitute IDL for CRDL when IDL > CRDL.

**Use absolute values of sample and duplicate to calculate the difference.

	YES	NO	N/A
A.1.9.10.2 Aqueous LCS			
Circle all LCS values outside control limits (80 - 120%- except aqueous Ag and Sb).			
Is any LCS recovery: less than 50%?	___	[✓]	___
between 50% and 79%?	___	[✓]	___
between 121% and 150%?	___	[✓]	___
greater than 150%?	___	[✓]	___

ACTION: Less than 50%, reject (red-line) all data; between 50% and 79%, flag all associated data as estimated (J); between 121% and 150%, flag all positive (not flagged with a "U") results as estimated; greater than 150%, reject all positive results.

A.1.9.10.3 Solid LCS

NOTE: 1. If "Found" value of LCS is rejectable due to duplicate injections or analytical spike recovery criteria, regardless of LCS recovery, flag the associated data as estimated (J).
2. If IDL of an analyte is equal to or greater than true value of LCS, disregard the "Action" below even though LCS is out of control limits.

Is LCS "Found" value higher than the control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated positive data as estimated.

Is LCS "Found" value lower than the Control limits on Form VII?	___	[✓]	___

ACTION: If yes, qualify all associated data as estimated.

		YES	NO	N/A
A.1.9.11	Form IX (ICP Serial Dilution) -			
	NOTE: Serial dilution analysis is required only for initial concentrations equal to or greater than 10 x IDL.			
A.1.9.11.1	Was Serial Dilution analysis performed for: each 20 samples?	[✓]	__	__
	each matrix type?	[✓]	__	__
	each concentration range (i.e. low, med.)?	[✓]	__	__
	ACTION: If no for any of the above, flag all positive data greater than or equal to 10xIDLs as estimated (J) for which Serial Dilution Analysis was not performed, and summarize the deficiency on the DPO report.			
A.1.9.11.2	Was field blank(s) used for Serial Dilution Analysis?	__	[✓]	__
	ACTION: If yes, flag all associated data ≥ 10 x IDL as estimated (J).			
	NOTE: Serial dilution analysis should be performed on a field blank when it is the only aqueous sample in SDG.			
A.1.9.11.3	Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.	[✓]	__	__
	ACTION: If no, write in the contract-problem/non-compliance section of the "Data Assessment Narrative".			
A.1.9.11.4	Circle all values on Data Summary Sheet that are outside control limit for initial concentrations equal to or greater than 10 x IDLs only. Are any % difference values: > 10%?	✓	[__]	__
	≥ 100%?	__	[✓]	__

		YES	ND	N/A
	ACTION: Flag as estimated (J) all associated equal to or greater than 10xIDLs for which percent difference is greater than 10% but less than 100%. Reject (red-line) all associated sample results equal to or greater than 10xIDLs for which PD is greater than or equal to 100%.			
A.1.9.12	Furnace Atomic Absorbtion (AA) QC Analysis			
A.1.9.12.1	Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]		
	ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
A.1.9.12.2	Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or Coefficient of Variation (CV) for concentration greater than CRDL?	[✓]		
	Was a dilution analyzed for sample with post digestion spike recovery less than 40%?	[✓]		
	ACTION: If no for any of the above, flag all the associated data as estimated (J).			
A.1.9.12.3	Is *post digestion spike recovery less than 10% or greater than 150% for any result?	✓	[ ]	
	ACTION: If yes, reject (red-line) the affected data if recovery is <10%; reject data not flagged with "U" if spike recovery is >150%.			
	NOTE: Reject the data only if the affected sample was not subsequently analyzed by Method of Standard Addition.			

* Post digestion spike is not required on the pre-digestion spiked sample.

		YES	NO	N/A
A.1.9.13	Form VIII (Method of Standard Addition Results)			
A.1.9.13.1	Present?	[✓]	__	__
	If no, is any Form I result coded with "S" or a "+"?	__	[✓]	__
	ACTION: If yes, write request on Telephone Record Log and contact laboratory for submittal of Form VIII.			
A.1.9.13.2	Is coefficient of correlation for MSA less than 0.990 for any sample?	✓	[ ]	__
	ACTION: If yes, reject (red-line) affected data.			
A.1.9.13.3	Was *MSA required for any sample but not performed?	__	[✓]	__
	Is coefficient of correlation for MSA less than 0.995?	__	[✓]	__
	Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	__	[✓]	__
	ACTION: If yes for any of the above, flag all the associated data as estimated (J).			
A.1.9.13.4	Was proper quantitation procedure followed correctly as outlined in the SOW on page E-16 through E-17?	[✓]	__	__
	ACTION: If no, note exception under contract problem/ non-compliance of data assessment narrative, or prepare a separate list.			
A.1.9.14	Dissolved/Total or Inorganic/Total Analytes -			
A.1.9.14.1	Were any analyses performed for dissolved as well as total analytes on the same sample(s).	__	[✓]	__
	Were any analyses performed for inorganic as well as total (organic + inorganic) analytes on the same sample(s)?	__	[✓]	__

* MSA is not required on LCS and prep. blank.

	YES	NO	N/A

NOTE:
1. If yes, prepare a list comparing differences between all dissolved (or inorganic) and total analytes. Compute the differences as a percent of the total analyte only when dissolved concentration is greater than CRDL as well as total concentration.
2. Apply the following questions only if inorganic (or dissolved) results are (i) above CRDL, and (ii) greater than total constituents.
3. At least one preparation blank, ICS, and LCS should be analyzed in each analytical run.

A.1.9.14.2 Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 10%?		[✓]	
A.1.9.14.3 Is the concentration of any dissolved (or inorganic) analyte greater than its total concentration by more than 50%?		[✓]	

ACTION: If more than 10%, flag both dissolved (or inorganic) and total values as estimated (J); if more than 50%, reject (red-line) the data for both values.

A.1.9.15 Form I to IX

A.1.9.15.1 Are all the Form I through Form IX labeled with:

Laboratory name?	[✓]		
Case/SAS number?	[ ]		✓
EPA sample No.?	[✓]		
SDG No.?	[✓]		
Contract No.?	[ ]		✓
Correct units?	[✓]		
Matrix?	[✓]		

ACTION: If no for any of the above, note under contract problem/non-compliance section of the "Data Assessment Narrative".

	YES	NO	N/A
A.1.9.15.2 Do any computation/transcription errors exceed 10% of reported values on Forms I-IX for:			
(NOTE: Check all forms against raw data.)			
(a) all analytes analyzed by ICP?	___	[✓]	___
(b) all analytes analyzed by GFAA?	___	[✓]	___
(c) all analytes analyzed by AA Flame?	___	[ ]	✓
(d) Mercury?	___	[✓]	___
(e) Cyanide?	___	[✓]	___

ACTION: If yes, prepare Telephone Log, contact laboratory for corrected data and correct errors with red pencil and initial.

A.1.9.16 Form I (Field Blank) -

Circle all field blank values on Data Summary Sheet that are greater than CRDL, 2 x IDL when IDL > CRDL.

Do concentrations of field blank(s) fall below CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	[___]	___	✓
If no, was field blank value already rejected due to other QC criteria?	[___]	___	✓

ACTION: If no, reject (except field blank results) all associated positive sample data less than or equal to five times the field blank value.

	YES	NO	N/A
A.1.9.17 Form X, XI, XII (Verification of Instrumental Parameters).			
A.1.9.17.1 Is verification report present for:			
Instrument Detection Limits (quarterly)?	[✓]	__	__
ICP Interelement Correction Factors (annually)?	[✓]	__	__
ICP Linear Ranges (quarterly)?	[✓]	__	__
ACTION: If no, contact DPO of the lab.			
A.1.9.17.2 Form X (Instrument Detection Limits) - (Note: IDL is not required for Cyanide.)			
Are IDLs present for: all the analytes?	[✓]	__	__
all the instruments used?	[✓]	__	__
For both AA and ICP when both are used for same analyte?	[✓]	__	__
ACTION: If no for any of the above, prepare Telephone Record Log and contact laboratory.			
Is IDL greater than CRDL for any analyte?	__	[✓]	__
If yes, is the concentration on Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL?	[✓]	__	__
ACTION: If no, flag as estimated all values less than five times IDL of the instrument whose IDL exceeds CRDL.			

	YES	NO	N/A
A.1.9.17.3 Form XI (Linear Ranges)			
Was any sample result higher than high linear range of ICP.	___	[✓]	___
Was any sample result higher than the highest calibration standard for non-ICP parameters?	___	[✓]	___
If yes for any of the above, was the sample diluted to obtain the result on Form I?	[✓]	___	___
ACTION: If no, flag the result reported on Form I as estimated(J).			
A.1.9.18 Percent Solids of Sediments			
Is soil content in sediment(s) less than 50%?	✓	[__]	___
ACTION: If yes, qualify as estimated all data not previously rejected or flagged due to other QC criteria.			

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.2: Data Assessment Narrative

Date: Feb. 1990
Number: HW-2
Revision: 10

Case# _____ Site: Naval Weapons Sta. Matrix: Soil ✓

SDG# CLP 804 Lab: Gulf Coast Water ✓

Contractor: Roy F. Weston Reviewer: Paul B. Humbury, Heartland ESI. Other _____

A.2.1 The case description and exceptions, if any, are noted below with reason(s) for rejection or qualification as estimated value(s) J.

The CRDL Standard for samples 031 and 032 for Antimony and Zinc were above the control limit. Flag all positive results are estimated.

The CRDL Standard for samples 010, 017 and 34 for Cadmium was below the control limit. Flag all positive and non-detect results as estimated.

The CRDL Standard for samples 010, 17 and 34 for copper was above the upper control limit. All positive results are estimated.

The CRDL Standard for samples 001-18, 20, 23, 28 thru 30 for Antimony was below 50%. All data is rejected.

The CRDL Standard for samples 1-9, 11, 13-16, 18, 20, 23, 28, 29 and 30 for Selenium was below the control limit. Flag all positive and non-detect results as estimated.

The CRDL standard for the MSAs by lead

A.2.1 (continuation)

was below the control limit. Flag all positive and non-detect results as estimated.
The Matrix Spike Recovery for Antimony for samples 1-18, 20, 23, 28 thru 30 was below control limits. All positive and non-detect results as estimated.
The Matrix Spike Recovery for Chromium for samples 1-18, 20, 23, 28 thru 30 was above the upper control limit. All positive results are estimated.
The Matrix Spike Recovery for Pb for was above 200%. All data that is positive is rejected.
The Duplicate result for Lead was outside the control limit. All positive and non-detect results are estimated.
The laboratory failed to analyze a soil LCS for Mercury. All positive and non-detect results are flagged as estimated.
The Serial Dilution were outside the control limits for Al, Ba, Ca, Cu, Cr, Fe, Pb ICP, Mg, Mn, Ni and Zn.
The two MSAs run on sample A25001 for Lead were below .990. All data is rejected.

A.2.1 (continuation)

The following samples had low recoveries for post-digestion spikes. All positive and non-detect results are estimated.

Lead 005

Thallium 032 and 028.

The following sample had high recoveries for post-digestion spikes. All positive results are estimated.

Selenium 014, 018 and 020.

Thallium 010, 006, 007, 008, 015, 016 and 023.

The following sample had a recovery above 150%, All data is rejected.

The following sample had less than 50% solids, All data is as estimated. Sample 205001.

PBH 7/23/91

PBH 7/23/91

A.2.2 Contract-Problems/Non-Compliance

Laboratory failed to distill the ICV or the midrange verification standard as required by contract.

MMB Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hunley Date: 7/23/91
Signature

Verified by: [illegible] D. [illegible] Date: 7/23/91

APPENDIX A.3 SUMMARY OF INORGANICS QUALITY CONTROL DATA Soil

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: SDG 804

SITE/STUDY DESCRIPTION: Naval Weapons Sta SAMPLE NOS: A21001-A28001, 201001-05201, 221001-229001

FIELD DUP. #'S: NA LAB DUP. #'S: 205001 Field Blank NA MATRIX SPIKE #: 205001

SERIAL DILUTION SAMPLE NO. 205001 COMPLETION DATE: 7/22/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
	Detection Limits UG/L			Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBL EAN	ICP ICS % R					
					Continued						Continued									
rater	CRDL	IDL	Field Blank	Init	1	2	3	Init	Fin	Init	1	2	3	EP	Init	Fin	Mtrix	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
1	200	12.8	NA	95	97	98	96			U	U	U	U	13.6	92	93	463	7.6	91	44	P
b	60	7.5		99	103	103	101	123	93	31	29	29	9	U			50	49.7	87	100	P
s	10	1.8		99	97	102		89		U	U	U		U			78	25.5	96		F
a	200	4		97	98	99	96	~~98~~ ~~94~~		5	6	5	5	U	93	93	94	12.8	92	34	P
e	5	0.5		97	101	102	100	~~83~~ 98	94	U	U	U	U	U	94	96	94	13.9	92	100	P
d	5	3.4		96	97	96	95	83	93	U	U	U	U	U	92	93	110		94		P
a	5000	7.0		96	99	100	97			8	13	7	11	22	94	95		5.4	91	42	P
	10	6.3		105	108	108	107	99	104	U	U	U	U	U	92	93	91	3.1	100	42	P
o	50	3.4		101	103	104	101	103	96	U	U	U	U	U	89	89	98	20.4	95	100	P
u	25	2.9		98	101	102	98	100	98	U	-5	-6	-6	U	93	93	94	11.1	93	53	P
e	100	2.2		100	102	104	101			U	U	U	U	U	91	91		8.6	95	45	P
b	5	16		98	101	102	100	103		U	U	U	U	U	89	90	79	9.6	96	45	P
g	5000	91.6		97	99	101	98			U	U	U	U	17.4	97	98		4.5	92	44	P
n	15	0.9		100	102	103	101	103	100	2	1	1	1	U	93	94	94	9.2	94	45	P
g	0.2	0.2		107	96	101	95			U	U	U	U	U			122				CV
i	40	3.6		99	101	102	100	104	104	U	U	U	U	U	87	87	97	12.4	93	33	P
	5000	142		96	97	98	96			U	U	U	U	U				11.6	90	44	P
e	5	1.3		102	100	100		98		U	U	U		U			112	8.8	100		F
g	10	2.9		99	100	101	100	107	107	3	U	U	U	U	95	95	95		97		P
a	5000	20.2		96	97	98	97	7/23/91 PBH		25	U	U	U	6.5				24.8	91	82	P
	10	~~25.5~~ 2.4	PBH 7/23/91	99	103	102	~~97~~	95		U	U	U		U			85		94		F
r	50	20.7		101	103	104	101	98	95	U	U	U	U	U	93	93	97	6.9	96	40	P
n	20	2.6		98	100	101	99	121	100	U	U	U	U	U	90	91	76	9.0	91	43	P
N	10	~~2.7~~ 10		102	105	102				U	U	U	U	U			108		90		G

PBH 7/23/91

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: _____ CASE NO. _____ SOW NO. _____ SAMPLE TYPE/SDG: _____

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: _____

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: _____ REVIEWERS INITIALS: _____

X		I	IIA					IIB		III						IV		V	VI	VII	IX	
rater	Detection Limits UG/L CRDL	Detection Limits UG/L IDL	Field Blank	Calib. Ver. %R Init	Continued 1	Continued 2	Continued 3	CRDL Std Ver. % R Init	CRDL Std Ver. % R Fin	Calibration Blanks Init	Continued 1	Continued 2	Continued 3	PREP BLAN		ICP ICS % R Init	ICP ICS % R Fin	Matrix Spik	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
1	200	17.8			97						U	34										P
b	60	7.5			103						35	32										P
s	10	1.8		100	102	102	103			U	U	U	U									F
a	200	4			97						6	6										P
e	5	0.5			102						U	U										P
d	5	3.4			94						U	U										P
a	5000	7.0			99						11	38										P
	10	6.3			108						U	U										P
o	50	3.4			103						-4	U										P
u	25	2.9			100						-6	-6										P
e	100	2.2			102						U	11										P
b	5	16			101						U	U										P
g	5000	51.6			99						U	U										P
n	15	0.9			102						1	1.5										P
g	0.2	0.2			92	90					U	U	U									CV
i	40	3.6			101						U	U										P
	5000	142			95						U	U										P
e	5	1.3		108	98					U	U											F
g	10	2.9			101						3	U										P
a	5000	20.2			97						U	U										P
	10	2.4		103	97	101	98			U	U	U	U									F
	50	20.7			102						U	U										P
n	20	2.6			100						U	U										P
N	10	10			103					U	U	U	U					97		103		C

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: _____ CASE NO. _____ SOW NO. _____ SAMPLE TYPE/SDG: _____

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: _____

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: _____ REVIEWERS INITIALS: _____

	X		I	IIA				IIB		III					IV		V	VI	VII	IX	
	Detection Limits UG/L			Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks					ICP % R	ICS	M S	Lab Dup		Ser	M
ra- ter	CRDL	IDL	Field Blank	Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3	P B R L E A P N	Init	Fin	t p r i x k	RPD/ Diff.	LCS % R	Dil % D	e t h
l	200																				
b	60																				
s	10				104																F
a	200																				
e	5																				
d	5																				
a	5000																				
	10																				
o	50																				
u	25																				
e	100																				
b	5	1.6																			
g	5000				90																CV
In	15																				
g	0.2																				
i	40																				
	5000																				
e	5			102	103																F
g	10																				
a	5000																				
	10				98	97															F
	50																				
n	20																				
N	10			107	105			PBH 7/23/91	U	U	U	U	U	U			112	103			C

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA water

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: SPG-804

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: A21001-A28001, 201001-205201, 221001-229001

FIELD DUP. #'S: NA LAB DUP. #'S: 226201 Field Blank NA MATRIX SPIKE #: 226201

SERIAL DILUTION SAMPLE NO. 226201 COMPLETION DATE: 7/23/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
	Detection Limits UG/L			Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				ICP ICS % R						
					Continued						Continued									
rater	CRDL	IDL	Field Blank	Init	1	2	3	Init	Fin	Init	1	2	3	PREP	PBLAN	Init	Fin	Mtrx Spik	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
l	200	17.8		97	94	95	96			U	U	U	U	99		97	95	95	200	95		P
b	60	7.5		102	98	97	98	100	103	21	27	23	22	-8				92		91		P
s	10	1.8			105	108		101			U	U	U	U				95		99		F
a	200	4		98	95	95	96			4	6	4	6	U		96	94	93		94		P
e	5	0.5		99	96	96	96	104	101	U	U	U	U	U		96	93	94		96		P
d	5	3.4		99	98	97	101	102	76	U	U	U	U	U		97	96	106		102		P
a	5000	7.0		97	95	94	95			12	15	U	12	148		96	94		0.5	94	11	P
	10	6.3		108	105	105	106	83	82	U	U	U	U	U		95	93	103		104		P
o	50	3.4		103	101	100	101	101	101	U	U	U	U	U		91	90	100		99		P
u	25	2.9		101	98	99	99	128	127	U	18	U	11	U		98	97	96	200	98	164	P
e	100	2.2		102	98	99	100			3	U	U	U	65		94	92	123	13	100	12	P
b	5	1.6 ~~1.6~~	PBH 7/23/91	~~99~~	~~96~~			103										99	151	101		F
g	5000	516		99	96	96	97			U	U	U	U	105		100	98		200	95		P
n	15	0.6		102	99	99	100	102	102	U	1	1	1	U		95	93	98		98		P
g	0.2	0.2			92	87	83				U	U	U	U								CV
i	40	3.6		101	98	98	99	101	106	U	U	U	U	U		89	87	99		97		P
:	5000	140		97	94	95	96			U	U	U	U	U						94		P
e	5	1.3		103	106	104	104	112		U	U			U				97		85		F
g	10	2.9		102	99	99	100	99	100	U	U	U	U	U		98	97	102		103		P
a	5000	20.2		97	94	94	95			U	U	U	U	271					2.3	94	28	P
	10	2.4			109	98	105	93			U	U	U	U				89		81		F
,	50	20.7		102	100	100	100	99	98	U	U	U	U	U		95	94	98		99		P
n	20	2.6		100	98	98	100	102	100	U	U	U	U	4		92	91	97	6.5	97	100	P
N	10	10		107	105	105				U	U	U	U	U				107		108		C

APPENDIX A.3 SUMMARY OF INORGANICS QUALITY CONTROL DATA Soil

LABORATORY: _____ CASE NO. _____ SOW NO. _____ SAMPLE TYPE/SDG: _____

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: _____

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: _____ REVIEWERS INITIALS: _____

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
ra-ter	Detection Limits UG/L CRDL	IDL	Field Blank	Calib. Ver. %R Init	Continued 1	2	3	CRDL Std Ver. % R Init	Fin	Calibration Blanks Init	Continued 1	2	3	PREP	BLAN	ICP ICS % R Init	Fin	Matrix Spik	Lab Dup RPD Diff.	LCS % R	Ser Dil % D	Meth
l	200	17.8			95	94	96				U	U	20									P
b	60	7.5			98	95	96			U	19	U	22									P
s	10	1.8		101	105	103	100			U	U	U	U									F
a	200	4			96	94	95				4	U	5									P
e	5	0.5			96	93	~~100~~ 95				U	U	U									P
d	5	3.4			99	98	~~94~~ 100				U	U	U									P
a	5000	7.0	PBH 7/23/91		95	93	~~105~~ 94				U	10	36									P
	10	6.3			106	104	~~100~~ 105				U	U	U									P
o	50	3.4			101	99	~~48~~ 100				U	U	U									P
u	25	2.9			99	97	98				5	5	5									P
e	100	2.2			99	98	99				U	U	15									P
b	5	1.6																				F
g	5000	51.6			96	95	95				U	U	U									P
n	15	0.6			99	97	98				U	U	1									P
g	0.2	0.2			87	92	109				U	U	U	U								CV
i	40	3.6			99	96	97				U	U	5									P
:	5000	142			95	94	95				U	U	U									P
e	5	1.3			107					U	U	U	U									F
g	10	2.9			99	97	99				U	U	U									P
a	5000	20.2			94	93	94				U	U	32									P
	10	2.4			97						U	U	U									F
	50	20.7			100	98	99				U	U	U									P
n	20	2.6			99	97	98				U	U	U									P
N	10	10			105					U	U	U		U						92		C

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: _____ CASE NO. _____ SOW NO. _____ SAMPLE TYPE/SDG: _____

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: _____

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: _____ REVIEWERS INITIALS: _____

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
ra-ter	Detection Limits UG/L CRDL	IDL	Field Blank	Calib. Ver. %R Init	Continued 1	2	3	CRDL Std Ver. % R Init	Fin	Calibration Blanks Init	Continued 1	2	3	PREP	BLAN	ICP ICS % R Init	Fin	Matrix Spik	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
l	200	17.8									U											P
b	60	7.5									21											P
s	10	1.8			98	101					U	U	U									F
a	200	4									4											P
e	5	0.5									U											P
d	5	3.4									U											P
a	5000	7.0									34											P
	10	6.3									U											P
o	50	3.4									U											P
u	25	2.9									U											P
e	100	2.2									14											P
b	5	1.6		109	103	95		130						U								F
g	5000	51.6									U											P
n	15	0.6									1											P
g	0.2	0.2									U	U										CV
i	40	3.6									4											P
	5000	142									U											P
e	5	1.3		102	107	110		108			U	U										F
g	10	2.9									U											P
a	5000	20.2									U											P
	10	2.4		92	99	101				U	U	U	U									F
	50	20.7									U											P
n	20	2.6									U											P
N	10	10		103	105	104																C

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: SDG 804

SITE/STUDY DESCRIPTION: Naval Weapons Sta SAMPLE NOS: A21001-A28001, 201001-205201, 221001-229001

FIELD DUP. #'S: NA LAB DUP. #'S: A28001 Field Blank NA MATRIX SPIKE #: A28001

SERIAL DILUTION SAMPLE NO. A28001 COMPLETION DATE: 7/23/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV			V	VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBLANK		ICP ICS % R		Matrix Spk	Lab Dup RPD/Diff	LCS	Ser Dil	Meth
					Continued						Continued											
rater	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3			Init	Fin			% R	% D	
l	200	17.8		96	97	96	93			U	U	U	U	19		94	92	498	3	93	6.3	P
b	60	7.5		99	99	96	93	61	45	-22	-20	-28	-24	-10				20		86		P
s	10	1.8			101			101			U			U				96	11	100		F
a	200	4		97	97	97	93			U	U	U	U	-1.52		91	90	93	19	94	100	P
e	5	0.5		100	99	99	96	98	96	U	U	U	U	U		92	92	94	9	93	43	P
d	5	3.4		98	98	95	94	112	81	U	U	U	U	U		100	98	106		108		P
a	5000	7.0		96	95	95	92			U	-25	-23	-21	18.5		91	90	~~128~~	8	91	100	P
	10	6.3		105	106	104	101	116	115	U	U	U	U	U		90	86	128 ~~97~~	0.3	101	7.6	P
o	50	3.4		101	101	100	96	98	96	U	U	U	U	U		87	85	97 ~~93~~		96		P
u	25	2.9		99	99	97	94	93	91	-3	U	U	U	U		91	89	93	38	95	100	P
e	100	2.2		100	101	101	96			-4	-3	10	U	10.4		90	88		5	97	6.6	P
b	5	1.5		99	99	98	95	93		U	U	U	U	U		81	80	96	14	92		P
g	5000	51.6		98	98	98	95			U	U	U	U	20.9		97	96		9	93	7.2	P
n	15	0.6		101	101	100	96	97	94	U	U	U	U	-0.2		92	90	96	3	96	5.6	P
g	0.2	0.2		116	115	104	~~94~~			U	U	U		U				103				CV
i	40	3.6	PBH	99	99	98	94 ~~92~~	86	88	-5	-6	-7	-5	-1.7		83	81	92		94		P
	5000	142	7/23/91	96	97	96	92 ~~106~~			U	U	U	U	U					9	92	6.6	P
e	5	1.3			107	104	106 ~~97~~	82		U	U	-1.3	U	-0.4				118		95		F
g	10	2.9		100	100	100	97 ~~94~~	85	86	U	U	U	U	U		94	93	76		99		P
a	5000	20.2		96	97	97	94 ~~97~~			U	U	U	U	U					14	93	6.3	P
	10	2.4			101	104	97	117			U	U	U	U				111		116		F
	50	20.7		101	101	100	97	96	92	U	U	U	U	-0.6		91	89	104	1	97	3.8	P
n	20	2.6		99	98	98	94	90	91	U	U	U	U	U		88	86	94	7	91	65.4	P
N	10	10		106	106																	C

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: _____ CASE NO. _____ SOW NO. _____ SAMPLE TYPE/SDG: _____

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: _____

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: _____ REVIEWERS INITIALS: _____

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
ra-ter	Detection Limits UG/L CRDL	IDL	Field Blank	Calib. Ver. %R Init	Continued 1	2	3	CRDL Std Ver. % R Init	Fin	Calibration Blanks Init	Continued 1	2	3	PREP	BLAN	ICP ICS % R Init	Fin	Matrix Spik	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
l	200	12.8			95						29											P
b	60	2.5			95						-15											P
s	10	1.8		104	105	102	107	107		U	U	U	U									F
a	200	4			94						U											P
e	5	0.5			99						U											P
d	5	3.4			92						U											P
a	5000	7.0			94						15											P
	10	6.3			102						U											P
o	50	3.4			97						U											P
u	25	2.9			94						U											P
e	100	2.2			98						9											P
b	5	15			95			116			U											P
g	5000	51.6			96						U											P
n	15	0.6			97						U											P
g	0.2	0.2																				
i	40	3.6			95						-7											P
	5000	142			92						U											P
e	5	1.3			103			92			U											F
g	10	2.9			99						U											P
a	5000	20.2			95						U											P
	10	2.4			97	98	99				U	U	U									F
	50	20.7			97						U											P
n	20	2.6			94						U											P
N	10																					

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: _____ CASE NO. _____ SOW NO. _____ SAMPLE TYPE/SDG: _____

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: _____

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: _____ MATRIX SPIKE #: _____

SERIAL DILUTION SAMPLE NO. _____ COMPLETION DATE: _____ REVIEWERS INITIALS: _____

	X		I	IIA				IIB		III					IV		V	VI	VII	IX	
	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB RE P	PB LA N	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff	LCS	Ser Dil	Meth
					Continued						Continued											
rater	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3			Init	Fin			% R	% D	
l	200																					
b	60																					
s	10																					
a	200																					
e	5																					
d	5																					
a	5000																					
	10																					
o	50																					
u	25																					
e	100																					
b	5	1.6		105	103	95		107		U	U	U	U	U								F
g	5000																					
n	15																					
g	0.2																					
i	40																					
	5000																					
e	5	1.1		105	103	101		74		U	U	U	U									F
g	10																					
a	5000																					
	10																					
	50																					
n	20																					
N	10																					

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals + Cyanide Date: 7/23/91 Case #:

Site: Colts Neck Naval Weapons Station NJ Lab Name: Gulf Coast

Reviewer's Initials: PBH Number of Samples: 25

Analytes Rejected Due to Exceeding Review Criteria:*

	Holding Times	Calibration	Prep Blank	Field Blank	Inter-ferences	Spike Recovery	Duplicates Lab	Duplicates Field	Detection Limits	LCS	Serial Dilution	MSA	Total Analytes	Rejection
ICP		1				PBH 7/23/91							1	
Flame AA														
Furnace AA						1	~~1~~	PBH 7/23/91				1	2	
Mercury														
Total		1				1						1	3	
Other														

Analytes Flagged as Estimated (J) Due to Exceeding Criteria For:*

ICP		4				2					11		17	
Flame AA														
Furnace AA		2					1					3	6	
Mercury										1			1	
Total		6				2	1			1	11	3	24	
Other														

Note:
Asterisk (*) Indicates additional exceedances of review criteria.

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.7: CLP Data Assessment Checklist
Inorganic Analysis

Date: Dec. 1988
Number: HW-2
Revision: 8

INORGANIC REGIONAL DATA ASSESSMENT

Region II

CASE NO. _____

SITE Naval Weapons Station

LABORATORY Gulf Coast

NO. OF SAMPLES/ MATRIX 3 waters / 22 soils

SDG# CLP 804

REVIEWER (IF NOT ESD) _____

SOW# 788

REVIEWER'S NAME Paul B. Humburg
Heartland ESI

DPO: ACTION _____ FYI _____

COMPLETION DATE 7/23/91

DATA ASSESSMENT SUMMARY

	ICP	AA	Hg	CYANIDE
1. HOLDING TIMES	O	O	O	O
2. CALIBRATIONS	Z	O	O	O
3. BLANKS	O	O	O	O
4. ICS	O			
5. LCS	O	O		
6. DUPLICATE ANALYSIS	O	O	O	O
7. MATRIX SPIKE	O	Z	O	O
8. MSA		O		
9. SERIAL DILUTION	O			
10. SAMPLE VERIFICATION	O	O	O	O
11. OTHER QC				
12. OVERALL ASSESSMENT	O	O	O	O

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

ACTION ITEMS: _____

AREAS OF CONCERN: _____

NOTABLE PERFORMANCE: _____