HEARTLAND ENVIRONMENTAL SERVICES, INC.

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NWS EARLE
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June 17, 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 five waters for full TAL metals plus Cyanide plus 1 MS/D. 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)			
01M001	03L902-001	02M001	03L902-002
03M001	03L902-003	03M001MS	03L902-003MS
03M001D	03L902-003D	04M001	03L902-004
04M201	03L902-005		

Site 26

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 Target and Non Target Analyte Summary List and detailed Data Validation Report for additional information. The Target and Non Target list contains all positive and non-detect results that are flagged as estimated or rejected as well as all positive results. 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. Specific comments are provided in the following case narrative.

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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 Target List Summary.

All holding times were met as required by USEPA Region II. The laboratory failed to distill the a mid-range calibration verification (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.

The Mercury results on Form 2A were wrong due to incorrect decimal placement by the operator of the software. The reviewer verified all results to make ensure compliance with the protocol.

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

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

1. The Matrix Spike Recovery for Aluminum was above 150%. All positive results are rejected.

Inorganics Data Assessment Narrative (continued - Page 2)

2. The Matrix Spike Recovery for Thallium was below the lower control limit. All positive and non-detect results are flaged "J" or "UJ", as estimated.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

3. The serial dilution for Aluminum was above 100%. All positive and non-detect results are rejected.

MSA

4. The Correlation Coefficient obtained from the Method of Standard Additions for Lead for sample 03L902-004 was below 0.990. All positive and non-detect results are rejected.

5. 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
Lead	03L902-005

6. 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
Selenium	03L902-004, -005
Thallium	03L902-001, -002, -003, -004 and 005.

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SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	Al	+/U	R	1
All water samples	Tl	+/U	J/UJ	2
All water samples	Al	+/U	R	3
03L902-004	Pb	+/U	R	4
03L902-005	Pb	+	J	5
03L904-004 and -005	Se	+/U	J/UJ	6
03L904-001, -002, -003, -004 and -005	Tl	+/U	J/UJ	6

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

QL - denotes data validation qualifier

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TARGET AND NON TARGET ANALYTE SUMMARY LIST

Site Name: Naval Weapons Station, New Jersey

Sample No. Analyte	Blank Conc. ug/l	Lab Report Conc. ug/l	QAS Report Conc. ug/l	QAS Decision	Footnotes
Sample 03L902-001 (01M001)					
Aluminum	84B	4170EN	---	reject	1,3
Antimony	U	15.1B	15.1B		
Barium	U	22.1B	22.1B		
Calcium	125B	9450	9450		
Copper	U	5.1B	5.1B		
Iron	44.5B	20300	20300		
Lead	U	4.5	4.5		
Magnesium	71.7B	1670B	1670B		
Manganese	U	80.8	80.8		
Potassium	U	1810B	1810B		
Sodium	37.5B	2730B	2730B		
Thallium	U	2.4UWN	2.4UJ	qualify	2,6
Vanadium	-3.1B	12.4B	12.4B		
Zinc	3.1B	11.1B	11.1B		
Sample 03L902-002 (02M001)					
Aluminum	84B	6120EN	---	reject	1,3
Barium	U	10.9B	10.9B		
Calcium	125B	1180B	1180B		
Chromium	U	9.9B	9.9B		
Copper	U	6.3B	6.3B		
Iron	44.5B	10100	10100		
Lead	U	2.9B	2.9B		
Magnesium	71.7B	706B	706B		
Manganese	U	10.7B	10.7B		
Potassium	U	5260	5260		
Sodium	37.5B	4200B	4200B		
Thallium	U	2.4UWN	2.4UJ	qualify	2,6
Vanadium	-3.1B	13.0B	13.0B		
Zinc	3.1B	34.6	34.6		
Sample 03L902-003 (03M001)					
Aluminum	84B	1220EN	---	reject	1,3
Barium	U	5.8B	5.8B		
Calcium	125B	2460B	2460B		
Iron	44.5B	2630	2630		
Lead	U	3.5	3.5		
Magnesium	71.7B	865B	865B		
Manganese	U	4.0B	4.0B		
Potassium	U	794B	794B		

HEARTLAND ENVIRONMENTAL SERVICES, INC.

TARGET AND NON TARGET ANALYTE SUMMARY LIST

Site Name: Naval Weapons Station, New Jersey

Sample No. Analyte	Blank Conc. ug/l	Lab Report Conc. ug/l	QAS Report Conc. ug/l	QAS Decision	Footnotes
Sample 03L902-003 cont.					
Sodium	37.5B	2580B	2580B		
Thallium	U	2.4UWN	2.4UJ	qualify	2,6
Vanadium	-3.1B	3.6B	3.6B		
Zinc	3.1B	6.7B	6.7B		
Sample 03L902-004 (04M001)					
Aluminum	84B	22800EN	---	reject	1,3
Antimony	U	38.0B	38.0B		
Barium	U	88.8B	88.8B		
Beryllium	U	1.1B	1.1B		
Calcium	125B	13100	13100		
Chromium	U	52.6	52.6		
Cobalt	U	4.5B	4.5B		
Copper	U	22.8B	22.8B		
Iron	44.5B	60700	60700		
Lead	U	24.0+	---	reject	4
Magnesium	71.7B	1880B	1880B		
Manganese	U	76.5	76.5		
Potassium	U	3560B	3560B		
Selenium	U	1.1UW	1.1UJ	qualify	6
Sodium	37.5B	2210B	2210B		
Thallium	U	2.4UWN	2.4UJ	qualify	2,6
Vanadium	-3.1B	61.3	61.3		
Zinc	3.1B	55.9	55.9		
Sample 03L902-005 (04M201)					
Aluminum	84B	25.5BEN	---	reject	1,3
Barium	U	28.6B	28.6B		
Calcium	125B	111B	111B		
Iron	44.5B	53.1B	53.1B		
Selenium	U	1.1UW	1.1UJ	qualify	6
Sodium	37.5B	270B	270B		
Thallium	U	2.4UN	2.4UJ	qualify	2
Zinc	3.1B	9.7B	9.7B		

ENVIROFORMS/CLP 788

Site 26

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

01M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP902

Matrix (soil/water): WATER Lab Sample ID: 03L902-001

Level (low/med): LOW Date Received: 03/14/91

% 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	~~4170~~		~~EN~~	~~P~~ R 1,3
7440-36-0	Antimony	15.1	B		P
7440-38-2	Arsenic	1.8	U		F
7440-39-3	Barium	22.1	B		P
7440-41-7	Beryllium	0.50	U		P
7440-43-9	Cadmium	3.4	U		P
7440-70-2	Calcium	9450			P
7440-47-3	Chromium	6.3	U		P
7440-48-4	Cobalt	3.4	U		P
7440-50-8	Copper	5.1	B		P
7439-89-6	Iron	20300			P
7439-92-1	Lead	4.5			F
7439-95-4	Magnesium	1670	B		P
7439-96-5	Manganese	80.8			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	1810	B		P
7782-49-2	Selenium	1.1	U		F
7440-22-4	Silver	2.9	U		P
7440-23-5	Sodium	2730	B		P
7440-28-0	Thallium	2.4	U	NW	F UJ 2,6
7440-31-5	Tin				NR
7440-62-2	Vanadium	12.4	B		P
7440-66-6	Zinc	11.1	B		P

Color Before: Yellow Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Opaque Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

02M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP902

Matrix (soil/water): WATER Lab Sample ID: 03L902-002

Level (low/med): LOW Date Received: 03/14/91

% 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	~~6120~~		~~EN~~	~~P~~ R 1,3
7440-36-0	Antimony	7.5	U		P
7440-38-2	Arsenic	1.8	U		F
7440-39-3	Barium	10.9	B		P
7440-41-7	Beryllium	0.50	U		P
7440-43-9	Cadmium	3.4	U		P
7440-70-2	Calcium	1180	B		P
7440-47-3	Chromium	9.9	B		P
7440-48-4	Cobalt	3.4	U		P
7440-50-8	Copper	6.3	B		P
7439-89-6	Iron	10100			P
7439-92-1	Lead	2.9	B		F
7439-95-4	Magnesium	706	B		P
7439-96-5	Manganese	10.7	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	5260			P
7782-49-2	Selenium	1.1	U		F
7440-22-4	Silver	2.9	U		P
7440-23-5	Sodium	4200	B		P
7440-28-0	Thallium	2.4	U	NW	F UJ 2,6
7440-31-5	Tin				NR
7440-62-2	Vanadium	13.0	B		P
7440-66-6	Zinc	34.6			P

Color Before: Yellow Clarity Before: Opaque Texture:

Color After: White Clarity After: Opaque Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

03M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP902

Matrix (soil/water): WATER Lab Sample ID: 03L902-003

Level (low/med): LOW Date Received: 03/14/91

% 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	~~1220~~		EN	~~P~~ R 1,3
7440-36-0	Antimony	7.5	U		P
7440-38-2	Arsenic	1.8	U		F
7440-39-3	Barium	5.8	B		P
7440-41-7	Beryllium	0.50	U		P
7440-43-9	Cadmium	3.4	U		P
7440-70-2	Calcium	2460	B		P
7440-47-3	Chromium	6.3	U		P
7440-48-4	Cobalt	3.4	U		P
7440-50-8	Copper	2.9	U		P
7439-89-6	Iron	2630			P
7439-92-1	Lead	3.5			F
7439-95-4	Magnesium	865	B		P
7439-96-5	Manganese	4.0	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	794	B		P
7782-49-2	Selenium	1.1	U		F
7440-22-4	Silver	2.9	U		P
7440-23-5	Sodium	2580	B		P
7440-28-0	Thallium	2.4	U	NW	F UJ 2,6
7440-31-5	Tin				NR
7440-62-2	Vanadium	3.6	B		P
7440-66-6	Zinc	6.7	B		P

Color Before: Colorless Clarity Before: Cloudy Texture:

Color After: Colorless Clarity After: Cloudy Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

04M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP902

Matrix (soil/water): WATER Lab Sample ID: 03L902-004

Level (low/med): LOW Date Received: 03/14/91

% 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	~~22800~~		~~EN~~	~~P~~	R 1,3
7440-36-0	Antimony	38.0	B		P	
7440-38-2	Arsenic	1.8	U		F	
7440-39-3	Barium	88.8	B		P	
7440-41-7	Beryllium	1.1	B		P	
7440-43-9	Cadmium	3.4	U		P	
7440-70-2	Calcium	13100			P	
7440-47-3	Chromium	52.6			P	
7440-48-4	Cobalt	4.5	B		P	
7440-50-8	Copper	22.8	B		P	
7439-89-6	Iron	60700			P	
7439-92-1	Lead	~~24.0~~		~~+~~	~~P~~	R 4
7439-95-4	Magnesium	1880	B		P	
7439-96-5	Manganese	76.5			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	3560	B		P	
7782-49-2	Selenium	1.1	U	W	F	UJ 6
7440-22-4	Silver	17.1			P	
7440-23-5	Sodium	2210	B		P	
7440-28-0	Thallium	2.4	U	NW	F	UJ 2,6
7440-31-5	Tin				NR	
7440-62-2	Vanadium	61.3			P	
7440-66-6	Zinc	55.9			P	

Color Before: Brown Clarity Before: Opaque Texture:

Color After: Yellow Clarity After: Cloudy Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

04M201

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP902

Matrix (soil/water): WATER Lab Sample ID: 03L902-005

Level (low/med): LOW Date Received: 03/14/91

% 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	~~25.5~~	~~B~~	~~EN~~	~~P~~	R 1,3
7440-36-0	Antimony	7.5	U		P	
7440-38-2	Arsenic	1.8	U		F	
7440-39-3	Barium	28.6	B		P	
7440-41-7	Beryllium	0.50	U		P	
7440-43-9	Cadmium	3.4	U		P	
7440-70-2	Calcium	111	B		P	
7440-47-3	Chromium	6.3	U		P	
7440-48-4	Cobalt	3.4	U		P	
7440-50-8	Copper	2.9	U		P	
7439-89-6	Iron	53.1	B		P	
7439-92-1	Lead	1.6	U	W	F	
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	1.1	U	W	F	UJ6
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	270	B		P	
7440-28-0	Thallium	2.4	U	N	F	UJ2
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.6	U		P	
7440-66-6	Zinc	9.7	B		P	

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

	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 perations 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 Narrativ ".

	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) -			
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.)

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).

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:

	YES	NO	N/A
(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".

NOTE: If pre-digestion spike result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, disregard spike recovery on Form V. Flag the associated data as estimated(J).

A.1.9.7.5 Soil/Sediment

Are any spike recoveries:

	YES	NO	N/A
(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%?	✓	[✓]	PBH 6/18/91

	YES	NO	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 <u>Furnace Atomic Absorbtion (AA) QC Analysis</u>			
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 when predigestion spike recovery is within control limits of 75-125% or when SR>4xSA.

		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?	PBH 6/17/91 [✓]	___	✓
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 Colts Neck N.J. Matrix: Soil ____

SDG# 03L402 Lab Gulf Coast Water ✓

Contractor Roy F. Weston Reviewer Paul B. Humburg 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 Form 2A results for Mercury were incorrectly entered with a decimal error. The Reviewer went back and checked the raw data to verify correctness on Summary Forms.

The Matrix Spike Recovery for Aluminum was greater than 150%. All positive data is rejected for this analyte.

The Matrix Spike Recovery for Thallium was below the control limit. All positive and non-detect data is qualified as estimated.

The Method of Standard Additions for Lead for Sample 04M001 was below 0.990. All positive and non-detect results are rejected.

The Serial Dilution for Aluminum was

A.2.1 (continuation)

greater than 100%. All positive and non-detect results are rejected.

The Analytical spike for Lead on sample 03L902-005 was high. All positive results are flagged as estimated.

The Analytical spike for Selenium on sample 03L902-004 and -005 were low. All positive and non-detect results are flagged as estimated.

The Analytical spike for thallium for all samples were low. All positive and non-detect results are estimated.

PBH 6/17/91

PBH 6/17/91

..2.2 Contract-Problems/Non-Compliance

The laboratory failed to distill the ICV and mid-range standard for Cyanide as required by contract.

PBH 6/17/91

MMB Reviewer: _____ Date: _____
Signature

ontractor Reviewer: Paul B. Hanley Date: 6/17/91
Signature

Verified by: [illegible] Date: 6/18/91

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 786 SAMPLE TYPE/SDG: CLP 902

SITE/STUDY DESCRIPTION: Colts Neck N.J. SAMPLE NOS: 03L902-001-005

FIELD DUP. #'S: _____ LAB DUP. #'S: 03M001 Field Blank _____ MATRIX SPIKE #: 03M001

SERIAL DILUTION SAMPLE NO. 03M001 COMPLETION DATE: 6/17/91 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				PBRLEAPN	ICP ICS % R		MStprix %	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
					Continued						Continued										
	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3		Init	Fin					
Al	200	17.8		95	95	97	97			U	U	U	U	84	93	94	267	9.0	92		P
Sb	60	7.5		96	96	97	96	111	109	25.6	29.3	38.4	44.1	U			91		83		P
As	10	1.8		104	105	106	106	107		U	U	U	U	U			85		103		F
Ba	200	4.0		96	96	98	99			U	U	U	U	U	93	94	92	8.3	92		P
Be	5	0.5		97	97	97	95	92	94	U	U	U	U	U	93	89	88		93		P
Cd	5	3.4		96	96	99	99 ~~100~~	119	89	U	U	4.1	U	U	97	98	103		102		P
Ca	5000	7.0		95	94	96	95			10.9	19.1	12.7	7.2	12.5	93	91		1.8	92		P
Cr	10	6.3		104	103	106	106	84	111	U	U	U	U	U	90	90	101		101		P
Co	50	3.4		100	100	102	102	94	94	U	U	U	U	U	88	88	97		97		P
Cu	25	2.9		98	98	99	100	89	90	-2.9	U	U	U	U	93	92	96		94		P
Fe	100	2.2		99	99	101	101			U	3.0	8.5	14.5	44.5	90	90	120	6.0	96		P
Pb	3	1.6 / 15.9		98	92	101	102	117		1.6	U	U	U	U			90	41.4	97		F/P
Mg	5000	51.6		96	96	97	97			U	U	U	U	71.7	97	96		6.7	93		P
Mn	15	0.9		99	99	100	100	94	92	U	U	U	U	U	92	91	96	83.2	95		P
Hg	0.2	0.2		107	96	101	95			U	U	U	U	U			88				CV
Ni	40	3.6		97	98	99	99	95	100	U	U	U	U	U	85	84	95	200	94		P
K	5000	14.2		104	104	106	107			U	U	U	U	U		PBH 6/17/91	~~45~~	8.7	92		P
Se	5	1.1		96	100	94	95	90		U	U	U	U	U			94		86		F
Ag	10	2.9		99	99	99	99	96	107	U	U	U	U	U	94	94	101		97		P
Na	5000	20.2		95	95	96	96			U	U	U	U	37.5				4.4	92		P
Tl	10	2.4		106	93	106	104	92		U	U	U	U	U			60		105		F
V	50	2.6		100	100	101	102	91	94	U	U	U	U	-3.1	92	91	95	2.7	96		P
Zn	20	2.7		97	97	99	99	94	90	U	U	U	U	3.1	89	88	95	7.2	94		P
CN	10	10.		105	105	97				U	U	U		U			96		103		A

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 900

SITE/STUDY DESCRIPTION: Colts Neck NJ SAMPLE NOS: 036902 -001-005

FIELD DUP. #'S: _____ LAB DUP. #'S: 003 Field Blank _____ MATRIX SPIKE #: 002

SERIAL DILUTION SAMPLE NO. 003 COMPLETION DATE: 6/12/91 REVIEWERS INITIALS: PBH

X		I	IIA				IIB		III						IV		V	VI	VII	IX	
Parameter	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 BLANK	ICP ICS %R Init	Fin	MS Matrix	Lab Dup RPD Diff.	LCS %R	Ser Dil %D	Meth
Al	200	17.8			96						37								92		P
Sb	60	7.5			94	105					33.6								87		P
As	10	1.8			105						U	U							102		F
Ba	200	4.0			96						U								92		P
Be	5	0.5			92						U								93		P
Cd	5	3.5			99						U								104		P
Ca	5000	7.0			93						45.6								91		P
Cr	10	6.3			103						U								100		P
Co	50	3.4			99						U								96		P
Cu	25	2.9			97						U								94		P
Fe	100	2.2			98						17.8								95		P
Pb	3	1.6/15.9			104	100	108	107			U	U	U						100		F/P
Mg	5000	51.6			95						U								92		P
Mn	15	0.9			97						U								95		P
Hg	0.2	0.2			94	92	90				U	U	U								CV
Ni	40	3.6			96						U								93		P
K	5000	14.2			105						U								91		P
Se	5	1.1			94	97	99	86			U								84		F
Ag	10	2.9			96						U								99		P
Na	5000	20.2			94						U								91		P
Tl	10	2.4			108			84			U								96		F
V	50	2.6			99						U								95		P
Zn	20	2.7			96						U								93		P
CN	10	10																			A

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 902

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 03L902 - 001 - 005

Field Blank _____

FIELD DUP. #'S: Colts Neck, NJ LAB DUP. #'S: 003 MATRIX SPIKE #: 003

SERIAL DILUTION SAMPLE NO. 003 COMPLETION DATE: 6/17/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	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	PBLANK	ICP ICS % R Init	Fin	Matrix Spike	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
Al	200																				
Sb	60																				
As	10																				
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3	1.6			102	106	101				U	U	U								F
Mg	5000																				
Mn	15																				
Hg	0.2	0.2			92	87					U	U	U								CV
Ni	40																				
K	5000																				
Se	5	1.1			96	100	96				U	U	U								F
Ag	10																				
Na	5000																				
Tl	10	2.9		98	98	103	102			U	U	U	U								F
V	50																				
Zn	20																				
CN	10																				

00040

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 7/87 SAMPLE TYPE/SDG: CLP 03L902

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 03L902-001 — 005

Field Blank _____

FIELD DUP. #'S: ~~003~~ PBH 6/17/91 LAB DUP. #'S: 003 MATRIX SPIKE #: 003

SERIAL DILUTION SAMPLE NO. 003 COMPLETION DATE: 6/17/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	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	PBLANK PN	ICP ICS %R Init	Fin	Matrix Spik	Lab Dup RPD/Diff	LCS %R	Ser Dil %D	Meth
Al	200																				
Sb	60																				
As	10																				
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3	1.6			96	101	108				U	U	U								F
Mg	5000																				
Mn	15																				
Hg	0.2										U										
Ni	40																				
K	5000																				
Se	5	1.1			98	100	97				U	U	U								F
Ag	10																				
Na	5000																				
Tl	10	2.4			103						U	U	U								F
V	50																				
Zn	20																				
CN	10																				

00041

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 902

SITE/STUDY DESCRIPTION: _____ SAMPLE NOS: 03L902-004-005

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: 003 MATRIX SPIKE #: 003

SERIAL DILUTION SAMPLE NO. 003 COMPLETION DATE: 6/17/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III					IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBLANK	ICP ICS % R		MSpike	Lab Dup RPD/Diff	LCS	Ser Dil	Meth
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin			% R	% D	
Al	200																				
Sb	60																				
As	10																				
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3	1.6		104	98	100	98			U	U	U	U								F
Mg	5000																				
Mn	15																				
Hg	0.2																				
Ni	40																				
K	5000																				
Se	5	1.1		97	90	98	101			U	U	U	U								F
Ag	10																				
Na	5000																				
Tl	10																				
V	50																				
Zn	20																				
CN	10																				

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 288 SAMPLE TYPE/SDG: CLP 902

SITE/STUDY DESCRIPTION: Colts Neck NJ SAMPLE NOS: 03L902-001-005

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: 003 MATRIX SPIKE #: 003

SERIAL DILUTION SAMPLE NO. 003 COMPLETION DATE: 6/17/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBR EP	BLAN	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3			Init	Fin					
Al	200																					
Sb	60																					
As	10																					
Ba	200																					
Be	5																					
Cd	5																					
Ca	5000																					
Cr	10																					
Co	50																					
Cu	25																					
Fe	100																					
Pb	3	1.6			94	92	92				U	U	U									F
Mg	5000																					
Mn	15																					
Hg	0.2																					
Ni	40																					
K	5000																					
Se	5																					
Ag	10																					
Na	5000																					
Tl	10																					
V	50																					
Zn	20																					
CN	10																					

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 288 SAMPLE TYPE/SDG: CLP 902

SITE/STUDY DESCRIPTION: Colts Neck NJ SAMPLE NOS: 03L902-001-005

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: 003 MATRIX SPIKE #: 003

SERIAL DILUTION SAMPLE NO. 003 COMPLETION DATE: 6/17/90 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L CRDL	IDL	Field Blank	Calib. Ver. XR Init	Continued 1	2	3	CRDL Std Ver. % R Init	Fin	Calibration Blanks Init	Continued 1	2	3	PREP	BLANK	ICP ICS % R Init	Fin	Matrix Spike	Lab Dup RPD Diff	LCS % R	Ser Dil % D	Meth
Al	200																					
Sb	60																					
As	10																					
Ba	200																					
Be	5																					
Cd	5																					
Ca	5000																					
Cr	10																					
Co	50																					
Cu	25																					
Fe	100																					
Pb	3	1.6			92	92	95				U	U	U									F
Mg	5000																					
Mn	15																					
Hg	0.2																					
Ni	40																					
K	5000																					
Se	5																					
Ag	10																					
Na	5000																					
Tl	10																					
V	50																					
Zn	20																					
CN	10																					

00044

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 7/3 SAMPLE TYPE/SDG: CLP 902

SITE/STUDY DESCRIPTION: Colts Neck NJ SAMPLE NOS: 03L902 001 - 005

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: 003 MATRIX SPIKE #: 003

SERIAL DILUTION SAMPLE NO. 003 COMPLETION DATE: 6/17/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III						IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB RL EP AN		ICP ICS % R		MS Matrix	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3			Init	Fin					
Al	200																					
Sb	60																					
As	10																					
Ba	200																					
Be	5																					
Cd	5																					
Ca	5000																					
Co	10																					
Cr	50																					
Cu	25																					
Fe	100																					
Pb	3	1.6			96						U											F
Mg	5000																					
Mn	15																					
Hg	0.2																					
Ni	40																					
K	5000																					
Se	5																					
Ag	10																					
Na	5000																					
Tl	10																					
V	50																					
Zn	20																					
CN	10																					

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals + Cyanide Date: 6/17/91 Case #:

Site: Colts Neck Naval Base N.J. Lab Name: Gulf Coast

Reviewer's Initials: PBH Number of Samples: 5

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					1		2	
Flame AA														
Furnace AA												1	1	
Mercury														
Total						1					1	1	3	
Other														

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

ICP														
Flame AA														
Furnace AA						1						3	4	
Mercury														
Total						1						3	4	
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: Feb. 1990
Number: HW-2
Revision: 10

INORGANIC REGIONAL DATA ASSESSMENT

Region II

CASE NO. _____

SITE Colts Neck N.J.

LABORATORY Gulf Coast

NO. OF SAMPLES/ MATRIX 5 waters

SDG# 03L902

REVIEWER (IF NOT ESD) _____

SOW# 788

REVIEWER'S NAME Paul B. Humbury
Heartland ESF

DPO: ACTION _____ FYI _____

COMPLETION DATE 6/12/91

DATA ASSESSMENT SUMMARY

		ICP	AA	Hg	CYANIDE
1.	HOLDING TIMES	0	0	0	0
2.	CALIBRATIONS	0	0	0	0
3.	BLANKS	0	0	0	0
4.	ICS	0			
5.	LCS	0	0		
6.	DUPLICATE ANALYSIS	0	0	0	0
7.	MATRIX SPIKE	2	0	0	0
8.	MSA		2		
9.	SERIAL DILUTION	2			
10.	SAMPLE VERIFICATION	0	0	0	0
11.	OTHER QC	0	0	0	0
12.	OVERALL ASSESSMENT	0	0	0	0

0 = 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: _____

HEARTLAND ENVIRONMENTAL SERVICES, INC.

P.O. BOX 163 ST. PETERS MO 63376
(314) 278-8232

June 17, 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 seven waters for full TAL metals plus Cyanide plus 1 MS/D. 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)		
01M001	03L904-001	02M001	03L904-002
03M001	03L904-003	04M001	03L904-004
05M001	03L904-005	07M001	03L904-006
07M201	03L904-007	07M201MS	03L904-007MS
07M201D	03L904-007D		

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 Target and Non Target Analyte Summary List and detailed Data Validation Report for additional information. The Target and Non Target list contains all positive and non-detect results that are flagged as estimated or rejected as well as all positive results. 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 Target List Summary.

All holding times were met as required by USEPA Region II. The laboratory failed to distill the a mid-range calibration verification (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.

The Mercury results were not flagged with a "N" for the Matrix Spike Recovery as required by protocol.

Sample 9103L904-006 showed a significant negative bias for Silver. The reported laboratory detection limit has been adjusted to reflect this apparent matrix problem with this sample.

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

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Inorganics Data Assessment Narrative (continued - Page 2)

Spike Recovery

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

Duplicate

2. The duplicate analysis for Iron was outside the control limits. All positive and non-detect results are flagged as "J" or "UJ" estimated.

LCS

No deficiencies in this section.

Serial Dilution

3. The serial dilution for Iron was outside the control limits. All positive and non-detect results are flagged as "J" or "UJ", estimated.

MSA

4. The Correlation Coefficient for the Method of Standard Additions for Lead for sample 03L904-005 was below 0.990. All positive and non-detect results are rejected.

5. 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
Lead	03L904-002 and -003
Thallium	03L904-007

6. 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
Lead	03L904-004
Selenium	03L904-004, -005
Thallium	03L904-001, -002, -003, -004, -005 and -007

HEARTLAND ENVIRONMENTAL SERVICES, INC.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	Hg	+/U	J/UJ	1
All water samples	Fe	+/U	J/UJ	2
All water samples	Fe	+/U	J/UJ	3
03L904-005	Pb	+/U	R	4
03L904-002 and 003	Pb	+	J	5
03L904-007	Tl	+	J	5
03L904-004	Pb	+/U	J/UJ	6
03L904-004 and -005	Se	+/U	J/UJ	6
03L904-001, -002, -003, -004 -005 and -007	Tl	+/U	J/UJ	6

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

QL - denotes data validation qualifier

HEARTLAND ENVIRONMENTAL SERVICES, INC.

TARGET AND NON TARGET ANALYTE SUMMARY LIST

Site Name: Naval Weapons Station, New Jersey

Sample No. Analyte	Blank Conc. ug/l	Lab Report Conc. ug/l	QAS Report Conc. ug/l	QAS Decision	Footnotes
Sample 03L904-001 (01M001)					
Aluminum	84B	3900	3900		
Arsenic	U	1.9B	1.9B		
Barium	U	65.1B	65.1B		
Cadmium	U	4.2B	4.2B		
Calcium	125B	5400	5400		
Chromium	U	80.1	80.1		
Cobalt	U	3.6B	3.6B		
Iron	44.5B	12300E*	12300J	qualify	2,3
Lead	U	3.8	3.8		
Magnesium	71.7B	2790B	2790B		
Manganese	U	156	156		
Mercury	U	0.2U	0.2UJ	qualify	1
Nickel	U	12.7B	12.7B		
Potassium	U	3050B	3050B		
Sodium	37.5B	20600	20600		
Thallium	U	2.4UW	2.4UJ	qualify	6
Vanadium	-3.1B	44.7B	44.7B		
Zinc	3.1B	44.0	44.0		
Sample 03L904-002 (02M001)					
Aluminum	84B	2890	2890		
Antimony	U	9.7B	9.7B		
Barium	U	61.2B	61.2B		
Calcium	125B	541B	541B		
Chromium	U	28.1	28.1		
Copper	U	18.6B	18.6B		
Iron	44.5B	3120E*	3120J	qualify	2,3
Magnesium	71.7B	412B	412B		
Manganese	U	23.2	23.2		
Mercury	U	0.2U	0.2UJ	qualify	1
Nickel	U	7.5B	7.5B		
Potassium	U	925B	925B		
Sodium	37.5B	1570B	1570B		
Thallium	U	2.4UW	2.4UJ	qualify	6
Vanadium	-3.1B	20.1B	20.1B		
Zinc	3.1B	307	307		
Sample 03L904-003 (03M001)					
Aluminum	84B	728	728		
Antimony	U	12.4B	12.4B		

HEARTLAND ENVIRONMENTAL SERVICES, INC.

TARGET AND NON TARGET ANALYTE SUMMARY LIST

Site Name: Naval Weapons Station, New Jersey

Sample No. Analyte	Blank Conc. ug/l	Lab Report Conc. ug/l	QAS Report Conc. ug/l	QAS Decision	Footnotes
Sample 03L904-003 cont.					
Calcium	125B	2860B	2860B		
Chromium	U	22.6	22.6		
Copper	U	2.9B	2.9B		
Iron	44.5B	4940E*	4940J	qualify	2,3
Lead	U	2.1BW	2.1J	qualify	5
Magnesium	71.7B	1470B	1470B		
Manganese	U	3.3B	3.3B		
Mercury	U	0.2U	0.2UJ	qualify	1
Potassium	U	847B	847B		
Sodium	37.5B	10200	10200		
Thallium	U	2.4UW	2.4UJ	qualify	6
Vanadium	-3.1B	27.8B	27.8B		
Zinc	3.1B	17.6B	17.6B		
Sample 03L904-004 (04M001)					
Aluminum	84B	14300	14300		
Antimony	U	13.4B	13.4B		
Arsenic	U	19.3	19.3		
Barium	U	34.4B	34.4B		
Beryllium	U	2.0B	2.0B		
Calcium	125B	2850B	2850B		
Chromium	U	454	454		
Cobalt	U	10.0B	10.0B		
Iron	44.5B	73900E*	73900J	qualify	2,3
Lead	U	30.5W	30.5J	qualify	6
Magnesium	71.7B	4130B	4130B		
Manganese	U	54.9	54.9		
Mercury	U	0.2U	0.2UJ	qualify	1
Nickel	U	27.3B	27.3B		
Potassium	U	10300	10300		
Selenium	U	1.1UW	1.1UJ	qualify	6
Sodium	37.5B	3640B	3640B		
Thallium	U	2.4UW	2.4UJ	qualify	6
Vanadium	-3.1B	361	361		
Zinc	3.1B	117	117		
Sample 03L904-005 (05M001)					
Aluminum	84B	31900	31900		
Antimony	U	16.8B	16.8B		

HEARTLAND ENVIRONMENTAL SERVICES, INC.

TARGET AND NON TARGET ANALYTE SUMMARY LIST

Site Name: Naval Weapons Station, New Jersey

Sample No. Analyte	Blank Conc. ug/l	Lab Report Conc. ug/l	QAS Report Conc. ug/l	QAS Decision	Footnotes
Sample 03L904-005 cont.					
Arsenic	U	8.9B	8.9B		
Barium	U	27.4B	27.4B		
Beryllium	U	4.8B	4.8B		
Calcium	125B	3180B	3180B		
Chromium	U	760	760		
Cobalt	U	12.2B	12.2B		
Copper	U	13.1B	13.1B		
Iron	44.5B	98900E*	98900J	qualify	2,3
Lead	U	62.5+	---	reject	4
Magnesium	71.7B	8170	8170		
Manganese	U	46.9	46.9		
Mercury	U	0.2U	0.2UJ	qualify	1
Nickel	U	19.1B	19.1B		
Potassium	U	23700	23700		
Selenium	U	1.6BW	1.6J	qualify	6
Sodium	37.5B	4470B	4470B		
Thallium	U	2.4UW	2.4UJ	qualify	6
Vanadium	-3.1B	590	590		
Zinc	3.1B	163	163		
Sample 03L904-006 (07M001)					
Aluminum	84B	122000	122000		
Antimony	U	51.1B	51.1B		
Arsenic	U	96.0S	96.0		
Barium	U	129B	129B		
Beryllium	U	17.1	17.1		
Cadmium	U	14.9	14.9		
Calcium	125B	4470B	4470B		
Chromium	U	3630	3630		
Cobalt	U	146	146		
Copper	U	44.3	44.3		
Iron	44.5B	452000E*	452000J	qualify	2,3
Lead	U	196	196		
Magnesium	71.7B	19700	19700		
Manganese	U	431	431		
Mercury	U	0.2U	0.2UJ	qualify	1
Nickel	U	381	381		
Potassium	U	63800	63800		
Selenium	U	5.5UW	5.5UJ	qualify	6
Silver	U	2.9U	34U		
Sodium	37.5B	9640	9640		
Vanadium	-3.1B	2980	2980		

HEARTLAND ENVIRONMENTAL SERVICES, INC.

TARGET AND NON TARGET ANALYTE SUMMARY LIST

Site Name: Naval Weapons Station, New Jersey

Sample No. Analyte	Blank Conc. ug/l	Lab Report Conc. ug/l	QAS Report Conc. ug/l	QAS Decision	Footnotes
Sample 03L904-006 cont.					
Zinc	3.1B	1160	1160		
Sample 03L904-007 (07M201)					
Aluminum	84B	87.6B	87.6B		
Calcium	125B	104B	104B		
Iron	44.5B	187E*	187J	qualify	2,3
Mercury	U	0.2U	0.2UJ	qualify	1
Selenium	U	1.1UW	1.1UJ	qualify	6
Sodium	37.5B	245B	245B		
Thallium	U	2.4UW	2.4UJ	qualify	6
Zinc	3.1B	7.8B	7.8B		

ENVIROFORMS/CLP 788 Site 10

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

01M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP904

Matrix (soil/water): WATER Lab Sample ID: 03L904-001

Level (low/med): LOW Date Received: 03/14/91

% 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	3900			P	
7440-36-0	Antimony	7.5	U		P	
7440-38-2	Arsenic	1.9	B		F	
7440-39-3	Barium	65.1	B		P	
7440-41-7	Beryllium	0.50	U		P	
7440-43-9	Cadmium	4.2	B		P	
7440-70-2	Calcium	5400			P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	80.1			P	
7440-48-4	Cobalt	3.6	B		P	
7440-50-8	Copper	2.9	U		P	
7439-89-6	Iron	12300		E*	P	J 2,3
7439-92-1	Lead	3.8			F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	2790	B		P	
7439-96-5	Manganese	156			P	
7439-97-6	Mercury	0.20	U		CV	UJ 1
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	12.7	B		P	
7440-09-7	Potassium	3050	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	20600			P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	2.4	U	W	F	J6
7440-31-5	Tin				NR	
7440-62-2	Vanadium	44.7	B		P	
7440-66-6	Zinc	44.0			P	

Colorless Clarity Before: Cloudy Texture:

Colorless Clarity After: Clear Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

02M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CI 04

Matrix (soil/water): WATER Lab Sample ID: 03L904 002

Level (low/med): LOW Date Received: 03/14/91

% 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	2890			P	
7440-36-0	Antimony	9.7	B		P	
7440-38-2	Arsenic	1.8	U		F	
7440-39-3	Barium	61.2	B		P	
7440-41-7	Beryllium	0.50	U		P	
7440-43-9	Cadmium	3.4	U		P	
7440-70-2	Calcium	541	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	28.1			P	
7440-48-4	Cobalt	3.4	U		P	
7440-50-8	Copper	18.6	B		P	J 2,3
7439-89-6	Iron	3120		E*	P	
7439-92-1	Lead	1.6	U		F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	412	B		P	
7439-96-5	Manganese	23.2			P	
7439-97-6	Mercury	0.20	U		CV	UJ 1
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	7.5	B		P	
7440-09-7	Potassium	925	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	1570	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	2.4	U	W	F	J 6
7440-31-5	Tin				NR	
7440-62-2	Vanadium	20.1	B		P	
7440-66-6	Zinc	307			P	

Colorless Clarity Before: Cloudy Texture:

Colorless Clarity After: Clear Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

03M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP904

Matrix (soil/water): WATER Lab Sample ID: 03L904-003

Level (low/med): LOW Date Received: 03/14/91

% 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	728			P	
7440-36-0	Antimony	12.4	B		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	
7440-70-2	Calcium	2860	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	22.6			P	
7440-48-4	Cobalt	3.4	U		P	
7440-50-8	Copper	2.9	B		P	
7439-89-6	Iron	4940		E*	P	J 2,3
7439-92-1	Lead	2.1	B	W	F	J5
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	1470	B		P	
7439-96-5	Manganese	3.3	B		P	
7439-97-6	Mercury	0.20	U		CV	J1
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.6	U		P	
7440-09-7	Potassium	847	B		P	
7782-49-2	Selenium	1.1	U		F	
7440-21-3	Silicon				NR	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	10200			P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	2.4	U	W	F	J6
7440-31-5	Tin				NR	
7440-62-2	Vanadium	27.8	B		P	
7440-66-6	Zinc	17.6	B		P	

Colorless Clarity Before: Cloudy Texture:

Colorless Clarity After: Clear Artifacts:

Comments:

00011 27

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

04M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP904

Matrix (soil/water): WATER Lab Sample ID: 03L904-004

Level (low/med): LOW Date Received: 03/14/91

% 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	14300			P	
7440-36-0	Antimony	13.4	B		P	
7440-38-2	Arsenic	19.3			F	
7440-39-3	Barium	34.4	B		P	
7440-41-7	Beryllium	2.0	B		P	
7440-43-9	Cadmium	3.4	U		P	
7440-70-2	Calcium	2850	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	454			P	
7440-48-4	Cobalt	10.0	B		P	
7440-50-8	Copper	2.9	U		P	
7439-89-6	Iron	73900		E*	P	J 2,3
7439-92-1	Lead	30.5		W	F	J 6
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	4130	B		P	
7439-96-5	Manganese	54.9			P	
7439-97-6	Mercury	0.20	U		CV	UJ 1
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	27.3	B		P	
7440-09-7	Potassium	10300			P	
7782-49-2	Selenium	1.1	U	W	F	J 6
7440-21-3	Silicon				NR	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	3640	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	2.4	U	W	F	J 6
7440-31-5	Tin				NR	
7440-62-2	Vanadium	361			P	
7440-66-6	Zinc	117			P	

Green Clarity Before: Opaque Texture:

Yellow Clarity After: Cloudy Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

05M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP904

Matrix (soil/water): WATER Lab Sample ID: 03L904-005

Level (low/med): LOW Date Received: 03/14/91

% 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	31900			P	
7440-36-0	Antimony	16.8	B		P	
7440-38-2	Arsenic	8.9	B		F	
7440-39-3	Barium	27.4	B		P	
7440-41-7	Beryllium	4.8	B		P	
7440-43-9	Cadmium	3.4	U		P	
7440-70-2	Calcium	3180	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	760			P	
7440-48-4	Cobalt	12.2	B		P	
7440-50-8	Copper	13.1	B		P	
7439-89-6	Iron	98900		E*	P	J 2,3
7439-92-1	Lead	~~62.5~~		+	~~F~~	R 4
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	8170			P	
7439-96-5	Manganese	46.9			P	
7439-97-6	Mercury	0.20	U		CV	UJ 1
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	19.1	B		P	
7440-09-7	Potassium	23700			P	
7782-49-2	Selenium	1.6	B	W	F	J 6
7440-21-3	Silicon				NR	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	4470	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	2.4	U	W	F	J 6
7440-31-5	Tin				NR	
7440-62-2	Vanadium	590			P	
7440-66-6	Zinc	163			P	

Green Clarity Before: Opaque Texture:

Yellow Clarity After: Clear Artifacts:

Comments:

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

07M001

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP904

Matrix (soil/water): WATER Lab Sample ID: 03L904-006

Level (low/med): LOW Date Received: 03/14/91

% 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	122000			P	
7440-36-0	Antimony	51.1	B		P	
7440-38-2	Arsenic	96.0		S	F	
7440-39-3	Barium	129	B		P	
7440-41-7	Beryllium	17.1			P	
7440-43-9	Cadmium	14.9			P	
7440-70-2	Calcium	4470	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	3630			P	
7440-48-4	Cobalt	146			P	
7440-50-8	Copper	44.3			P	
7439-89-6	Iron	452000		E*	P	J 2,3
7439-92-1	Lead	196			P	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	19700			P	
7439-96-5	Manganese	431			P	
7439-97-6	Mercury	0.20	U		CV	J 1
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	381			P	
7440-09-7	Potassium	63800			P	
7782-49-2	Selenium	5.5	U	W	F	J 6
1440-21-3	Silicon				NR	
7440-22-4	Silver	~~2.9~~	~~U~~		~~P~~	34 U See Narrative
7440-23-5	Sodium	9640			P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	2.4	U		F	
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2980			P	
7440-66-6	Zinc	1160			P	

Green Clarity Before: Opaque Texture:

Yellow Clarity After: Clear Artifacts:

Comments:
Elevated detection limit for Selenium due to matrix interferences

ENVIROFORMS/CLP 788

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

07M201

Lab Name: WESTON Gulf Coast Labs Contract:

Lab Code: WESGCL Case No.: SAS No.: SDG No.: CLP904

Matrix (soil/water): WATER Lab Sample ID: 03L904-007

Level (low/med): LOW Date Received: 03/14/91

% 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	87.6	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	
7440-70-2	Calcium	104	B		P	
7440-46-2	Cesium				NR	
7440-47-3	Chromium	6.3	U		P	
7440-48-4	Cobalt	3.4	U		P	
7440-50-8	Copper	2.9	U		P	
7439-89-6	Iron	187		E*	P	J 2,3
7439-92-1	Lead	1.6	U		F	
7439-93-2	Lithium				NR	
7439-95-4	Magnesium	51.6	U		P	
7439-96-5	Manganese	0.90	U		P	
7439-97-6	Mercury	0.20	U		CV	VJ 1
7439-98-7	Molybdenum				NR	
7440-02-0	Nickel	3.6	U		P	
7440-09-7	Potassium	142	U		P	
7782-49-2	Selenium	1.1	U	W	F	J 6
7440-21-3	Silicon				NR	
7440-22-4	Silver	2.9	U		P	
7440-23-5	Sodium	245	B		P	
7440-24-6	Strontium				NR	
7440-28-0	Thallium	2.4	U	W	F	J 6
7440-31-5	Tin				NR	
7440-62-2	Vanadium	2.6	U		P	
7440-66-6	Zinc	7.8	B		P	

Colorless Clarity Before: Clear Texture:

Colorless Clarity After: Clear Artifacts:

Comments:

	YES	NO	N/A
A.1.1 Contract Compliance Screening Report (CCS) - Present?	[ ]		X
ACTION: If no, contact RSCC.			
A.1.2 Record of Communication (from RSCC) - Present?	[ ]		X
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.			
Ar 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.

		YES	NO	N/A
	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

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".

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) -			
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.			

HEARTLAND ENVIRONMENTAL SERVICES, INC.

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(314) 278-8232

HEARTLAND ESI INVOICE FOR CONTRACTED SERVICES

PRESENTED TO ROY F. WESTON, INC.

DATE OF ISSUE 11/08/91 INVOICE NUMBER 110891A

PROJECT NAME Colts Neck, NJ - Naval Weapons Station

QA/QC LEVEL Region II

CASE# 9108L518

SAMPLE #	MATRIX	VOA	BNA	P/PCB	M+CN
08-T001-S001	SOIL	X	X	X	X
08-T002-S001	SOIL	X	X	X	X
08-T004-S001	SOIL	X	X	X	X
08-T004-S101	SOIL	X	X	X	X
08-T005-S001	SOIL	X	X	X	X
08-T006-S001	SOIL	X	X	X	X
08-T006-S001MS	SOIL	X	X	X	X
08-T006-S001MSD	SOIL	X	X	X	
08-T006-S001D	SOIL				X
08-T007-S001	SOIL	X	X	X	X
08-T007-W201	WATER	X	X	X	X
08-T007-W201MS	WATER				X
08-T007-W201D	WATER				X
TRIP BLANK	WATER	X			
08-T004-S001	TCLP	X	X	X	
08-T004-S001MS	TCLP	X	X	X	
08-T004-S001MSD	TCLP	X	X		

VOA = VOLATILES
BNA = SEMIVOLATILES
M+CN= METALS+CYANIDE
PEST= PESTICIDES/PCBS

Volatiles/Semivolatiles/ Pesticide/PCBs	(12 samples @ $110.00)	=	$1320.00
Metals plus Cyanide Soil	(9 samples @ $ 40.00)	=	$ 360.00
Metals plus Cyanide Water	(3 samples @ $ 50.00)	=	$ 150.00
Volatiles Water	(2 samples @ $ 50.00)	=	$ 100.00
Semivolatiles Water	(1 sample @ $ 40.00)	=	$ 40.00
	TOTAL	=	$1970.00

If Roy F. Weston pays within 30 days of date of Invoice a 5% discount of $98.50 may be subtracted from total.

Authorized by: Paul B. Hinely Date: 11/8/91

	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%?	✓	[~~✓~~]	PBH 6/14/91
(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".

NOTE: If pre-digestion spike result is rejectable due to coefficient of correlation of MSA, analytical spike recovery, or duplicate injections criteria, disregard spike recovery on Form V. Flag the associated data as estimated(J).

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?	✓	[✓]	PBH 6/14/91
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.)

	YES	NO	N/A
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.

	YES	NO	N/A
Is LCS "Found" value higher than the control limits on Form VII?	___	[ ]	✓

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

	YES	NO	N/A
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	NO	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 <u>Furnace Atomic Absorbtion (AA) QC Analysis</u>			
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 when predigestion spike recovery is within control limits of 75-125% or when SR>4xSA.

		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 Colts Neck N.J. Matrix: Soil ____

SDG# CLP 904 Lab Gulf Coast Water ✓

Contractor Roy F. Weston Reviewer Paul B. Humburg 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 Matrix Spike Recovery for Mercury was below the control limits. All positive and non-detect results are flagged as estimated.

The Duplicate Analysis for Iron was outside the control limit. All positive and non-detect results are estimated.

The Method of Standard Additions for Sample 03L904-005 for Lead was below .995 on both analyses and below .990. Reject all positive and nondetect results for this sample for Lead.

The Serial Dilution for Iron was outside the control limits. All positive and non-detect results are flagged as estimated.

The Analytical Spike for Lead on samples

A.2.1 (continuation)

03L904-002 and 003 was out of control high. All positive results are estimated.
The analytical spike for Selenium on sample 03L904-005 was out low. Flag positive and non-detect results as estimated.
The analytical spike for Thallium for samples 03L904-001, -002, -003, -004 and -005 were out low. Flag all positive and nondetect results as estimated.
The analytical spike for Thallium for sample 03L904-007 was out high. The positive results will be flagged as estimated.
The ICP raw data for Silver for sample 03L904-006 showed a value of (-33.7 µg/L). The nondetect reported should be higher than 2.9 µg/L and should be flagged as estimated.

RBH 6/14/91

PBH 6/14/91

.2.2 Contract-Problems/Non-Compliance

The ICV Cyanide standard was not distilled as required by contract. The mid-range standard for Cyanide was not distilled as required by contract, but has no impact on the data. Mercury was not flagged with a "N" even though the recovery was outside the control limits for the Matrix Spike.

M-B Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hamby Date: 6/14/91
Signature

Verified by: Kristyn D. Scarpellino Date: 6/18/91

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck N.J. SAMPLE NOS: 034904 001-007

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: 07M201D MATRIX SPIKE #: 07M201

SERIAL DILUTION SAMPLE NO. 07M201 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	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	PBLEAN	ICP ICS % R Init	Fin	MS Spike %	Lab Dup RPD Diff.	LCS % R	Ser Dil % D	Meth
[redacted]	200	18		95	95	97	97			U	U	U	U	84	93	94	88	114	92	100	P
Sb	60	7.5		96	96	97	96	111	109	26	29	38	44	U			88	200	83		P
[redacted]	10	1.8		104	105	106	106	107		U	U	U	U	U			102		103		F
[redacted]	200	4		96	96	98	99			U	U	U	U	U	93	94	93		92		P
Be	5	0.5		97	97	97	95	92	94	U	U	U	U	U	93	89	88		95		P
[redacted]	5	3.4		96	96	99	99	119	89	U	U	U	U	U	97	98	104		102		P
Ca	5000	7.0		95	94	96	95			11	19	13	7	125	93	91		6.6	92	50.4	P
[redacted]	10	6.3		104	103	106	106	84	111	U	U	U	U	U	90	90	96		101		P
Co	50	3.4		100	100	102	102	94	94	U	U	U	U	U	88	88	97		97		P
Cu	25	2.9		98	98	99	100	89	90	-2.9	U	U	U	U	93	92	95		94		P
[redacted]	100	2.2		99	98	101	101			U	3	9	15	46	90	90	81	142	96	24	P
Pb	3	15.9/1.6		98	98	100	100	100	104	U	U	U	U	U	88	86	99		95		P/E
[redacted]	5000	51.6		96	96	97	97			U	U	U	U	72	97	96	PBH ~~95~~		93		P
Mn	15	0.9		99	99	100	100	94	92	U	U	U	U	U	92	91	95		95		P
Hg	0.2	0.2		107	96	106	95			PBH U	-.16 ~~-0.2~~	U	U	U			73				CU
[redacted]	40	3.6		97	98	99	99	95	100	U	U	U	U	U	85	84	94		94		P
K	5000	142		104	104	106	107			U	U	U	U	U					92		P
[redacted]	5	1.1		96	100	94	95	90		U	U	U	U	U			82		86		F
Ag	10	2.9 ~~70~~	PBH 6/14/91	99	99	99	99	96	107	U	U	U	U	U	94	94	95		97		P
[redacted]	5000	20.2 ~~29~~	PBH 6/14/91	95	95	96	96			U	U	U	U	38				9.9	92	9.0	P
[redacted]	10	2.4		106	93	106	104	92		U	U	U	U	U			84		105		F
V	50	2.6		100	100	101	102	91	94	U	U	U	U	-3.1	9.2	91	95		96		P
[redacted]	20	2.7		97	97	99	99	94	90	U	U	U	U	3.1	89	89	93	53.7	94	92.	P
CN	10	10		105	105	97	105			U	U	U	U	U			100		103		

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck N.J. SAMPLE NOS: 03L904 001-007

PBH 6/14/91

FIELD DUP. #'S: ~~007~~ LAB DUP. #'S: 007 Field Blank _____ MATRIX SPIKE #: 007

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PBH

Parameter	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	PBLEAN P	N	ICP ICS % R Init	Fin	MStrix	Spik	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
[redacted]	200	18			96						37										92		P
Sb	60	7.5			94						34										87		P
[redacted]	10	1.8			105	105	108	95			U	U	U								102		F
[redacted]	200	4			96						U										92		P
Be	5	0.5			92						U										93		P
[redacted]	5	3.4			99						U										104		P
Ca	5000	7.0			93						46										91		P
[redacted]	10	6.3			103						U										100		P
Co	50	3.4			99						U										96		P
Cu	25	2.9			97						U										94		P
[redacted]	100	2.2			98						18										95		P
Pb	3	16/1.6			97			117			U										93		P/F
[redacted]	5000	51.6			95						U										92		P
Mn	15	0.9			97						U										95		P
Hg	0.2	0.2			94	92	90				U	U	U										CV
[redacted]	40	3.6			96						U										93		P
K	5000	142			105						U										91		P
[redacted]	5	1.1			94	97	99	86			U	U	-1.2								84		F
Ag	10	2.9			96						U										99		P
[redacted]	5000	20.2			94						U										91		P
[redacted]	10	2.4			108	105	102	84			U	U	U								96		F
V	50	2.6			99						U										95		P
[redacted]	20	2.7			96						U										93		P
CN	10	10									U												A

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck N.J. SAMPLE NOS: 03L904 001-007

FIELD DUP. #'S: _____ Field Blank _____ LAB DUP. #'S: 007D MATRIX SPIKE #: 007 MS

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 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									
Parameter	CRDL	IDL	Field Blank	Init	1	2	3	Init	Fin	Init	1	2	3	PB REPN	Init	Fin	Matrix	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
[redacted]	200																				
Sb	60																				
[redacted]	10	1.8			105						U										F
Ba	200																				
Be	5																				
[redacted]	5																				
Ca	5000																				
[redacted]	10																				
Co	50																				
[redacted]	25																				
[redacted]	100																				
Pb	3	1.6		98	92	101	102	107		~~U~~ 1.6	U	U	U	U					100		F
[redacted]	5000																				
Mn	15																				
[redacted]	0.2				92	87	83				U	U	U								CU
[redacted]	40																				
K	5000																				
[redacted]	5	1.1			96	100	96				U	U	U								F
Ag	10																				
[redacted]	5000																				
Tl	10	2.4			101						U										F
V	50																				
[redacted]	20																				
CN	10																				

00044

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck NJ SAMPLE NOS: 03L904 001-007

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: 007D MATRIX SPIKE #: 007S

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III						IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBLEAN		ICP ICS % R		Matrix Spike	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3			Init	Fin					
[redacted]	200																					
Sb	60																					
[redacted]	10	1.8		101	101	103	104			U	U	U	U									F
Ba	200																					
Be	5																					
[redacted]	5																					
Ca	5000																					
[redacted]	10																					
Co	50																					
Cu	25																					
[redacted]	100																					
Pb	3	1.6			104	100	108				U	U	U							97		F
[redacted]	5000																					
Mn	15																					
[redacted]	0.2																					
[redacted]	40																					
K	5000																					
[redacted]	5	11			98	100	97				U	U	U									F
Ag	10																					
[redacted]	5000																					
[redacted]	10	2.4		98	98	103	102			U	U	U	U									F
V	50																					
[redacted]	20																					
CN	10																					

00045

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck NJ. SAMPLE NOS: 03L904 001-007

FIELD DUP. #'S: _____ LAB DUP. #'S: 007D Field Blank _____ MATRIX SPIKE #: 007S

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/90 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L CRDL	Detection Limits UG/L IDL	Field Blank	Calib. Ver. %R Init	Calib. Ver. %R Continued 1	Calib. Ver. %R Continued 2	Calib. Ver. %R Continued 3	CRDL Std Ver. %R Init	CRDL Std Ver. %R Fin	Calibration Blanks Init	Calibration Blanks Continued 1	Calibration Blanks Continued 2	Calibration Blanks Continued 3	PREP BLANK	ICP ICS %R Init	ICP ICS %R Fin	MS Matrix	Lab Dup RPD Diff.	LCS %R	Ser Dil %D	Meth
Al	200																				
Sb	60																				
As	10	1.8			101	103	103				U	U	U								F
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3	1.6			102	106	101				U	U	U								F
Mg	5000																				
Mn	15																				
Hg	0.2																				
Ni	40																				
K	5000																				
Se	5	1.1			97	101					U	-1.1									F
Ag	10																				
Na	5000																				
Tl	10	2.4			94						U										F
V	50																				
Zn	20																				
CN	10																				

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck N.J. SAMPLE NOS: 03L904 001-007

FIELD DUP. #'S: _____ LAB DUP. #'S: 007D Field Blank _____ MATRIX SPIKE #: 007S

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	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 BLANK	ICP ICS % R Init	Fin	MS Matrix	Lab Dup RPD Diff	LCS % R	Ser Dil % D	Meth
Al	200																				
Sb	60																				
As	10	1.8			104	104	103				U	U	U								F
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3	1.6			96	101	108				U	U	U								F
Mg	5000																				
Mn	15																				
Hg	0.2																				
Ni	40																				
K	5000																				
Se	5	1.1		97	90	98	101			U	U	U	U								F
Ag	10																				
Na	5000																				
Tl	10																				
V	50																				
Zn	20																				
CN	10																				

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck, N.J. SAMPLE NOS: 03L904 001-007

Field Blank _____

FIELD DUP. #'S: _____ LAB DUP. #'S: 007D MATRIX SPIKE #: 007S

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PBM

	X		I	IIA				IIB		III					IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBLANK	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin					
[redacted]	200																				
Sb	60																				
[redacted]	10	1.8			100	102	104				U	U	U								F
Ba	200																				
Be	5																				
[redacted]	5																				
Ca	5000																				
[redacted]	10																				
Co	50																				
Cu	25																				
[redacted]	100																				
Pb	3	1.6			104	109					U	U									F
[redacted]	5000																				
Mn	15																				
Hg	0.2																				
[redacted]	40																				
K	5000																				
[redacted]	5																				
Ag	10																				
[redacted]	5000																				
[redacted]	10																				
V	50																				
[redacted]	20																				
CN	10																				

00048

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP904

SITE/STUDY DESCRIPTION: Colts Neck NJ. SAMPLE NOS: 03L904 001-007

FIELD DUP. #'S: _____ LAB DUP. #'S: 007D Field Blank _____ MATRIX SPIKE #: 007S

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PBH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	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	BLANK	ICP ICS %R Init	Fin	Matrix Spike	Lab Dup RPD/Diff	LCS %R	Ser Dil %D	Meth
Al	200																					
Sb	60																					
As	10																					
Ba	200																					
Be	5																					
Cd	5																					
Ca	5000																					
Cr	10																					
Co	50																					
Cu	25																					
Fe	100																					
Pb	3	1.6		104	98	100	98			U	U	U	U									F
Mg	5000																					
Mn	15																					
Hg	0.2																					
Ni	40																					
K	5000																					
Se	5																					
Ag	10																					
Na	5000																					
Tl	10																					
V	50																					
Zn	20																					
CN	10																					

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 288 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck N.J. SAMPLE NOS: 03L904 001-007

FIELD DUP. #'S: _____ LAB DUP. #'S: 0070 Field Blank _____ MATRIX SPIKE #: 0025

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PBK

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PB RL EP AN	ICP ICS % R		Matrix Spike	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin					
Al	200																				
Sb	60																				
As	10																				
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3	1.6			94	92	92				U	U	U								F
Mg	5000																				
Mn	15																				
Hg	0.2																				
Ni	40																				
K	5000																				
Se	5																				
Ag	10																				
Na	5000																				
Tl	10																				
V	50																				
Zn	20																				
CN	10																				

00050

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck NJ. SAMPLE NOS: 034904 001-007

FIELD DUP. #'S: _____ LAB DUP. #'S: 007D Field Blank _____ MATRIX SPIKE #: 007S

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	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	PBLANK	ICP ICS % R Init	Fin	MS Matrix	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Meth
Al	200																				
Sb	60																				
As	10																				
Ba	200																				
Be	5																				
Cd	5																				
Ca	5000																				
Cr	10																				
Co	50																				
Cu	25																				
Fe	100																				
Pb	3	1.6			92	92	95				U	U	U								F
Mg	5000																				
Mn	15																				
Hg	0.2																				
Ni	40																				
K	5000																				
Se	5																				
Ag	10																				
Na	5000																				
Tl	10																				
V	50																				
Zn	20																				
CN	10																				

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Gulf Coast CASE NO. _____ SOW NO. 788 SAMPLE TYPE/SDG: CLP 904

SITE/STUDY DESCRIPTION: Colts Neck N.J. SAMPLE NOS: 03L904 001-007

FIELD DUP. #'S: _____ LAB DUP. #'S: 007D Field Blank _____ MATRIX SPIKE #: 007S

SERIAL DILUTION SAMPLE NO. 007 COMPLETION DATE: 6/14/91 REVIEWERS INITIALS: PDH

	X		I	IIA				IIB		III				IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R				CRDL Std Ver. % R		Calibration Blanks				PBLEAN	ICP ICS % R		MS Matrix	Lab Dup RPD/Diff	LCS % R	Ser Dil % D	Method
	CRDL	IDL		Init	Continued 1	2	3	Init	Fin	Init	Continued 1	2	3		Init	Fin					
[redacted]	200																				
Sb	60																				
[redacted]	10																				
Ba	200																				
Be	5																				
[redacted]	5																				
Ca	5000																				
[redacted]	10																				
Co	50																				
[redacted]	25																				
[redacted]	100																				
Pb	3	1.6			102						U										F
[redacted]	5000																				
Mn	15																				
[redacted]	0.2																				
[redacted]	40																				
[redacted]	5000																				
[redacted]	5																				
Ag	10																				
[redacted]	5000																				
[redacted]	10																				
[redacted]	50																				
[redacted]	20																				
CN	10																				

00052

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals + Cyanide Date: 6/14/91 Case #:

Site: Colts Neck N.J. Lab Name: Gulf Coast

Reviewer's Initials: PBH Number of Samples: 2 waters

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														
Flame AA														
Furnace AA												1	1	
Mercury														
Total												1	1	
Other														

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

PBH 6/14/91

ICP						~~1~~	1				1		2	
Flame AA														
Furnace AA												3	3	
Mercury						1							1	
Total						1	1				1	3	6	
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: Feb. 1990
Number: HW-2
Revision: 10

INORGANIC REGIONAL DATA ASSESSMENT

Region II

CASE NO. _____

SITE Colts Neck N.J.

LABORATORY Gulf Coast

NO. OF SAMPLES/ MATRIX 7 waters

SDG# CLP 904

REVIEWER (IF NOT ESD) _____

SOW# 788

REVIEWER'S NAME Paul B. Humburg Heartland ESI

DPO: ACTION _____ FYI _____

COMPLETION DATE 6/14/91

DATA ASSESSMENT SUMMARY

		ICP	AA	Hg	CYANIDE
1.	HOLDING TIMES	O	O	O	O
2.	CALIBRATIONS	O	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	O	O	O
8.	MSA		Z		
9.	SERIAL DILUTION	O			
10.	SAMPLE VERIFICATION	O	O	O	O
11.	OTHER QC	O	O	O	O
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: _____