HEARTLAND ENVIRONMENTAL SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Three (3) water samples and no (0) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
02-M03	911258001
02-M23	911258002
02-M63	911258003

Heartland ESI has reviewed the data for the samples listed above TAL Metals (under the limited scope requirements) using Region II Data Validation Protocol, February 1990 revision. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

TAl Metals reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112580,** the analysis of three (3) field water sample and no (0) matrix spike and duplicate pair. Overall, the inorganic data quality was fair. The Quality Assurance samples were found in SDG 581 for this data group.

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

Holding Times

The holding times were met as specified in Region II Protocol.

Calibration

1. The CRDL Standards for Arsenic, Cadmium and Lead were above 150%. All positive results are rejected if within the concentration range applied by the Region II Protocol.

2. The CRDL Standards for Copper and Zinc were above the upper control limit. All positive results are qualified as estimated, "J" if within the concentration range as applied by the Region II Protocol.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recovery for Silver was below 30%. All positive and non-detect results are rejected.

4. The Matrix Spike recoveries for Lead and Arsenic were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

No deficeicnies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

5. The following analytes exhibited low recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

Analyte	Samples
Lead	02-M23 and 02-M03.
Selenium	02-M23

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	Pb and As	+	R	1
All water samples	Cu and Zn	+	J	2
All water samples	Ag	+/U	R	3
All water samples	Pb and As	+/U	J/UJ	4
02-M03 and 02-M23 02-M23.	Pb Se	+/U	J/UJ	5

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

QL - denotes data validation qualifier

U.S. EPA - CLP

EPA SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

02-M03

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-05

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP580

Matrix (soil/water): WATER Lab Sample ID: 911258001

Level (low/med): LOW Date Received: 12/02/91

% 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				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic	2.00	U		F	UJ4
7440-39-3	Barium	16.10	B		P	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	15.40			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	10.00	U		P	
7439-89-6	Iron	3260.00			P	
7439-92-1	Lead	~~3.30~~		W	~~F~~	R1
7439-95-4	Magnesium				NR	
7439-96-5	Manganese	5.50	B		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	~~10.00~~	~~U~~		~~P~~	R3
7440-23-5	Sodium	3060.00	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	21.40			P	J2
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

02-M23

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-05

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP580

Matrix (soil/water): WATER Lab Sample ID: 911258002

Level (low/med): LOW Date Received: 12/02/91

% 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				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic	2.00	U		F	UJ4
7440-39-3	Barium	16.00	U		P	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	10.00	U		P	
7439-89-6	Iron	77.60	B		P	
7439-92-1	Lead	2.00	U	W	F	UJ4,5
7439-95-4	Magnesium				NR	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium	2.00	U	W	F	UJ5
7440-22-4	Silver	~~10.00~~	U		~~P~~	R3
7440-23-5	Sodium	436.00	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	15.20	B		P	J2
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

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Comments:

U.S. EPA - CLP

EPA SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

02-M63

Lab Name: ROY F. WESTON, INC - L372 Contract: 1771-15-05

Lab Code: WESTON Case No.: NWS SAS No.: SDG No.: CLP580

Matrix (soil/water): WATER Lab Sample ID: 911258003

Level (low/med): LOW Date Received: 12/02/91

% 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				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic	2.00	U		F	UJ4
7440-39-3	Barium	82.70	B		P	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	419.00			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	24.60	B		P	J2
7439-89-6	Iron	59800.00			P	
7439-92-1	Lead	25.80		S	F	J4
7439-95-4	Magnesium				NR	
7439-96-5	Manganese	409.00			P	
7439-97-6	Mercury	.92			CV	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	~~10.00~~	U		~~P~~	R3
7440-23-5	Sodium	2600.00	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	132.00			P	
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.1: Data Assessment - Contract Compliance (Total Review - Inorganics)

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

	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.			

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.1: Data Assessment - Contract Compliance (Total Review - Inorganics)

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

	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

A.1.8.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]	___	___
	Digestion Log for furnace AA Form XIII present?	[✓]	___	___
	Distillation Log for mercury Form XIII present?	[✓]	___	___
	Distillation Log for cyanides Form XIII present?	[___]	___	✓
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[✓]	___	___
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[___]	___	✓
	Are preparation dates present on Digestion Log?	[✓]	___	___
A.1.8.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	___	✓
	Furnace AA	[✓]	___	___
	Mercury	[✓]	___	___
	Cyanides	[___]	___	✓

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

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

A.1.9 Data Validation and Verification

A.1.9.1 Calibration

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.)			
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:

(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:

(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 Mg/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 DRO 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	Furnace Atomic Absorption (AA) QC Analysis			
A.1.9.12.1	Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]	__	__
	ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
.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# NW3 Site Naval Weapons Station Matrix: Soil ____

SDG# CLP 580 Lab Roy F. Weston Water ✓

Contractor Roy F. Weston Reviewer Paul B. Hunsby 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.

1. The CRDL standards for Arsenic and Lead were greater than 150%. All positive data is rejected.

2. The CRDL Standards for Copper and Zinc were above the upper control limit. All positive data is qualified as estimated.

3. The Matrix Spike recovery for Silver was below 30%. All data is rejected.

4. The Matrix Spike recoveries for Lead and Arsenic was below the lower control limit. All data is qualified as estimated.

PBH 4/24/92

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

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

PBH 4/24/92

...2.2 Contract-Problems/Non-Compliance

QC is found in different data packages, samples were flagged properly.

PBH 4/24/92

MS Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B Hanly Date: 4/24/92
Signature

Verified By: Christopher D. Langdon Date: 4/28/92

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Roy F. Weston CASE NO. NWS SOW NO. 390 SAMPLE TYPE/SDG: CLP 580

SITE/STUDY DESCRIPTION: Naval Weapons Station SAMPLE NOS: 02-M003, 02-M203 and 02-M603

FIELD DUP. #'S: _____ LAB DUP. #'S: 02-M003 Field Blank MATRIX SPIKE #: 6-M003

SERIAL DILUTION SAMPLE NO. 6-M003 COMPLETION DATE: 4/24/92 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				PBL EAP N	ICP ICS %R		Mtpr ix	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	91	NA																		
Sb	60	20																			
As	10	2		99	103	101	102	(211)		U	U	U	U	U			(35)	22	96	92	F
Ba	200	16		98	100	99	99			U	U	U	U	U	85	87	91	58	98	100	P
Be	5	1																			
Cd	5	2		99	105	103	99	116	103	U	U	U	U	U	98	104	97	0	100	103	P
Ca	5000	47																			
	10	4		99	104	106	110	112	113	U	U	U	U	U	100	106	102	9.5	99	4.8	P
Co	50	11																			
Cu	25	6		102	105	104	103	(125)	117	U	U	U	U	U	100	101	91	27	96	100	P
Fe	100	46		100	105	107	109			U	U	U	U	U	95	101	203	5	100	2.2	P
Pb	3	2		107	94	94	98	(293)		U	U	U	U	U			(45)	8	97		F
Mg	5000	29																			
Mn	15	2		100	105	106	106	107	111	U	U	U	U	U	93	95	98	9	100	32	P
Hg	0.2	0.04		102	102	101	102			U	U	U	U	U			85	1	99		CV
Ni	40	11																			
K	5000	694																			
Se	5	2		103	100	103	101	90		U	U	U	U	U			102	0	102		F
Ag	10	3		108	110	110	107	110	104	U	U	U	U	U	100	104	(7.8)	200	82	100	P
	5000	110		97	98	97	98			U	U	163	196	U				4	96	20.5	P
Tl	10																				
V	50	8																			
Zn	20	6		100	105	107	109	(139)	(130)	U	U	U	U	8	95	101	100	14.1	103	0.7	P

000033

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.6: CLP Data Assessment Summary Form (Inorganics)

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

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals (limited scope) Date: 4/27/92 Case #: NWS

Site: Naval Weapons Station Lab Name: Roy Weston

Reviewer's Initials: PBL Number of Samples: 3

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		2											2	
Mercury														
Total		3				1							4	
Other														

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

ICP		2											2	
Flame AA														
Furnace AA						2							2	
Mercury														
Total		2				2							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. NWS
SITE Naval Weapons Station
LABORATORY Roy F. Weston
NO. OF SAMPLES/ MATRIX 3 waters
SDG# CLP 580
REVIEWER (IF NOT ESD) Heartland EST
SOW# 390
REVIEWER'S NAME Paul B. Humby
DPO: ACTION: FYI
COMPLETION DATE 4/27/92

DATA ASSESSMENT SUMMARY

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

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Three (3) water samples and no (0) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
05-M003	911258701
06-M003	911258702
06-M203	911258703

Heartland ESI has reviewed the data for the samples listed above TAL Metals (under the limited scope requirements) using Region II Data Validation Protocol, February 1990 revision. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

TAl Metals reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112587**, the analysis of three (3) field water sample and no (0) matrix spike and duplicate pair. Overall, the inorganic data quality was fair. The Quality Assurance samples were found in SDG 581 for this data group.

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

Holding Times

The holding times were met as specified in Region II Protocol.

Calibration

1. The CRDL Standards for Arsenic, Cadmium and Lead were above 150%. All positive results are rejected if within the concentration range applied by the Region II Protocol.

2. The CRDL Standards for Copper and Zinc were above the upper control limit. All positive results are qualified as estimated, "J" if within the concentration range as applied by the Region II Protocol.

Preparation and Field Blanks

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recovery for Silver was below 30%. All positive and non-detect results are rejected.

4. The Matrix Spike recoveries for Lead and Arsenic were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

No deficeicnies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

MSA

5. The following analytes exhibited low recovery during the GFAA spiking procedures. All data is qualified as estimated, "J" or "UJ".

Analyte	Samples
Arsenic	05-M003.
Lead	06-M003 and 06-M203.
Selenium	06-M003.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	Pb and As	+	R	1
All water samples	Cu and Zn	+	J	2
All water samples	Ag	+/U	R	3
All water samples	Pb and As	+/U	J/UJ	4
05-M003. 06-M003 and 06-M203 06-M003	As Pb Se	+/U	J/UJ	5

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

QL - denotes data validation qualifier

10-005-M003

Lab Name:Roy F. Weston, Inc. Contract:1771-15-03

Lab Code:WESTON Case No:NWS SAS No.: SDG No.:CLP587

Matrix (soil/water):WATER Lab Sample ID:9112587001

Level (low/med): LOW Date Received:12/03/91

% 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				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic	~~-5.30~~	~~B~~	~~W~~	~~P~~	R1
7440-39-3	Barium	16.00	U		P	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	209.00			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	18.90	B		P	J2
7439-89-6	Iron	35700.00			P	
7439-92-1	Lead	50.00		S	F	J4
7439-95-4	Magnesium				NR	
7439-96-5	Manganese	41.80			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	~~10.00~~	~~U~~		~~P~~	R3
7440-23-5	Sodium	4340.00	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	86.50			P	
	Cyanide				NR	

Color Before:COLORLESS Clarity Before:CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

15A

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

10-006-M003

Lab Name:Roy F. Weston, Inc. Contract:1771-15-03

Lab Code:WESTON Case No:NWS SAS No.: SDG No.:CLP587

Matrix (soil/water):WATER Lab Sample ID:9112587002

Level (low/med): LOW Date Received:12/03/91

% 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				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic	2.00	U		F	UJ4
7440-39-3	Barium	113.00	B		P	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	4.20	B		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	32.50			P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	10.00	U		P	
7439-89-6	Iron	7650.00			P	
7439-92-1	Lead	~~2.60~~	~~B~~	~~W~~	~~F~~	R1
7439-95-4	Magnesium				NR	
7439-96-5	Manganese	37.30			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium	2.00	U	W	F	UJ5
7440-22-4	Silver	~~10.00~~	~~U~~		~~P~~	R3
7440-23-5	Sodium	7120.00			P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	248.00			P	
	Cyanide				NR	

Color Before:COLORLESS Clarity Before:CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

10-006-M203

Lab Name:Roy F. Weston, Inc. Contract:1771-15-03

Lab Code:WESTON Case No:NWS SAS No.: SDG No.:CLP587

Matrix (soil/water):WATER Lab Sample ID:9112587003

Level (low/med): LOW Date Received:12/03/91

% 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				NR	
7440-36-0	Antimony				NR	
7440-38-2	Arsenic	2.00	U		F	UJ4
7440-39-3	Barium	16.00	U		P	
7440-41-7	Beryllium				NR	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium				NR	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt				NR	
7440-50-8	Copper	10.00	U		P	
7439-89-6	Iron	56.70	B		P	
7439-92-1	Lead	2.00	U	W	F	UJ4,5
7439-95-4	Magnesium				NR	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel				NR	
7440-09-7	Potassium				NR	
7782-49-2	Selenium	2.00	U		F	
7440-22-4	Silver	~~10.00~~	~~U~~		~~P~~	R3
7440-23-5	Sodium	219.00	B		P	
7440-28-0	Thallium				NR	
7440-62-2	Vanadium				NR	
7440-66-6	Zinc	17.10	B		P	J2
	Cyanide				NR	

Color Before:COLORLESS Clarity Before:CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.1: Data Assessment - Contract Compliance (Total Review - Inorganics)

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

	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.			

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.1: Data Assessment - Contract Compliance (Total Review - Inorganics)

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

	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

A.1.8.1	Digestion Log* for flame AA/ICP (Form XIII) present?	[✓]	___	___
	Digestion Log for furnace AA Form XIII present?	[✓]	___	___
	Distillation Log for mercury Form XIII present?	[✓]	___	___
	Distillation Log for cyanides Form XIII present?	[___]	___	✓
	Are pH values (pH<2 for all metals, pH>12 for cyanide) present?	[✓]	___	___
	*Weights, dilutions and volumes used to obtain values.			
	Percent solids calculation present for soils/sediments?	[___]	___	✓
	Are preparation dates present on Digestion Log?	[✓]	___	___
A.1.8.2	Measurement read out record present? ICP	[✓]	___	___
	Flame AA	[___]	___	✓
	Furnace AA	[✓]	___	___
	Mercury	[✓]	___	___
	Cyanides	[___]	___	✓

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

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

A.1.9 Data Validation and Verification

A.1.9.1 Calibration

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.)			
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:

(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:

(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 Ug/L on wet weight basis and calculate RPD or Difference for each analyte.

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

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

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

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

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

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

* Substitute IDL for CRDL when IDL > CRDL.

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

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

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

* Substitute IDL for CRDL when IDL > CRDL.

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

	YES	NO	N/A

A.1.9.9.4 Soil/Sediment

Circle all values on Form VI for field duplicates that are:

RPD >100%, or

Difference > 2 x CRDL*

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

>100%? ___ [ ] ✓

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

>2x *CRDL? ___ [ ] ✓

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

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

A.1.9.10.1 Was one LCS prepared and analyzed for:

every 20 water samples? [✓] ___ ___

every 20 solid samples? [___] ___ ✓

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

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

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

* Substitute IDL for CRDL when IDL > CRDL.

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

	YES	NO	N/A

A.1.9.10.2 Aqueous LCS

Circle all LCS values outside control limits (80 - 120%- except aqueous Ag and Sb).

Is any LCS recovery:			
less than 50%?	___	[✓]	___
between 50% and 79%?	___	[✓]	___
between 121% and 150%?	___	[✓]	___
greater than 150%?	___	[✓]	___

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

A.1.9.10.3 Solid LCS

NOTE: 1. If "Found" value of LCS is rejectable due to duplicate injections or analytical spike recovery criteria, regardless of LCS recovery, flag the associated data as estimated (J).

2. If IDL of an analyte is equal to or greater than true value of LCS, disregard the "Action" below even though LCS is out of control limits.

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

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

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

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

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

	YES	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 Furnace Atomic Absorption (AA) QC Analysis			
A.1.9.12.1 Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	[✓]	__	__
ACTION: If no, reject the data on Form I's for which duplicate injections were not performed.			
.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# NWS Site Naval Weapons Station Matrix: Soil ____

SDG# CLP 587 Lab Roy F. Weston Water ✓

Contractor Roy F. Weston Reviewer 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.

1. The CRDL Standards for Arsenic and lead was below above 150%. All data positive reje data is rejected. PBH 4/24/92

2. The CRDL Standards for Copper and Zinc were above the upper control limit. All positive results are qualified as estimated.

3. The Matrix Spike Recovery for Silver was below 30%. All data rejected.

4. The Matrix Spike recoveries for Lead and Arsenic were below the lower control limit. All data is qualified as estimated.

PBH 4/24/92

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

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

PBH 4/24/92

...2.2 Contract-Problems/Non-Compliance

QC appears in a different data package.
Form 1s were not flagged properly.

PBH 4/24/92

MS Reviewer: _____ Date: _____
Signature

Contractor Reviewer: Paul B. Hamly Date: 4/24/92
Signature

Verifier: Kathleen D. Scapellino Date: 4/28/92

APPENDIX A.5 SUMMARY OF INORGANICS QUALITY CONTROL DATA

LABORATORY: Roy F. Weston CASE NO. NWS SOW NO. 390 SAMPLE TYPE/SDG: CLP 587

SITE/STUDY DESCRIPTION: Naval Weapons Station SAMPLE NOS: 105-M003, 106-M003, 106-M203

FIELD DUP. #'S: Field Blank LAB DUP. #'S: 6-M003 MATRIX SPIKE #: 6-M003

SERIAL DILUTION SAMPLE NO. 6-M003 COMPLETION DATE: 4/24/92 REVIEWERS INITIALS: PBH

	X	I	IIA				IIB		III					IV		V	VI	VII	IX	
Parameter	Detection Limits UG/L		Field Blank	Calib. Ver. %R	Continued			CRDL Std Ver. %R		Calibration Blanks	Continued			PB PREP	ICP %R		MS %rec	Lab Dup RPD/Diff	LCS %R	Ser Dil %D	Meth
	CRDL	IDL		Init	1	2	3	Init	Fin	Init	1	2	3		Init	Fin					
Al	200	91	NA																		
Sb	60	20																			
As	10	2		99	103	101	102	(211)		U	U	U	U	U			(35)	22	96		F
Ba	200	16		98	100	99	99			U	U	U	U	U	85	87	94	58	98	100	P
Be	5	1																			
Cd	5	2		99	105	103	94	116	103	U	U	U	U	U	98	104	97	0	100	100	P
Ca	5000	47																			
	10	4		99	104	106	110	112	113	U	U	U	U	U	100	106	102	9.5	99	4.8	P
Co	50	11																			
Cu	25	6		102	105	104	103	(123)	112	U	U	U	U	U	100	101	91	27	96	100	P
Fe	100	46		100	105	107	104			U	U	U	U	U	95	101	233	5	100	2.2	P
Pb	3	2		107	94	94	98	(283)		U	U	U	U	U			(45)	8	97		F
Mg	5000	29																			
Mn	15	2		100	105	106	106	107	111	U	U	U	U	U	93	95	98	9	102	32	P
Hg	0.2	0.04		103	103	102	100			U	U	U	U	U			85	1	102		CV
Ni	40	11															PBH 4/24/92	4			
K	5000	694																0			~~P~~
Se	5	2		103	100	103	101	90		U	U	U	U	U			102	0 ~~200~~	102	100	~~P~~ F
Ag	10	3		108	110	110	107	110	108	U	U	U	U	U	100	104	(7.8)	200 4	82	20.5	~~P~~ P
	5000	110		97	98	97	98			U	U	163	196	U				4	96		P
Tl	10																				
V	50	8																			
Zn	20	6		100	105	107	104	(39)	(130)	U	U	U	U	8	95	101	100	14.1	103	0.7	P

000033

Title: Evaluation of Metals Data for the Contract Laboratory Program Appendix A.6: CLP Data Assessment Summary Form (Inorganics)

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

CLP DATA ASSESSMENT SUMMARY FORM (INORGANICS)

Type of Review: TAL Metals (limited scope) Date: 4/27/92 Case #: NWS

Site: Naval Weapons Station Lab Name: Roy Weston

Reviewer's Initials: PBL Number of Samples: 3

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		2											2	
Mercury														
Total		3				1							4	
Other														

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

ICP		2											2	
Flame AA														
Furnace AA						2							2	
Mercury														
Total		2				2							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. NWS

SITE Naval Weapons Station

LABORATORY Roy F. Weston

NO. OF SAMPLES/ MATRIX 3 waters

SDG# CLP 587

REVIEWER (IF NOT ESD) Heartland EST

SOW# 390

REVIEWER'S NAME Paul B. Humby

EPO: ACTION _____ FYI _____

COMPLETION DATE 4/27/92

DATA ASSESSMENT SUMMARY

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

HEARTLAND ENVIRONMENTAL SERVICES, INC.

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

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Seven (7) water samples and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
01-M003	911262301
02-M003	911262302
03-M003	911262303
04-M003	911262304
04-M203	911262305
07-M003	911262306
07-M103	911262307

Heartland ESI has reviewed the data for the samples listed above for Ground Water parameters using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Ground water Parameters reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112623**, the analysis of seven (7) field water samples and one (1) matrix spike and duplicate pair. Overall, the groundwater parameter data quality was good. The USEPA analytical protocol was followed as required.

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

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

1. The Matris Spike recovery for CODs was below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All Water Samples	COD	+/U	J/UJ	1

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/20/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9112L623

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	10-001-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	40.9	MG/L	5.0
		Chemical Oxygen Demand	31.0	MG/L J1	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.056	MG/L	0.040
		Sulfate	59.7	MG/L	10.0
		Turbidity	228	NTU	0.050
-002	10-002-M003	BOD 5 Day	1.1	MG/L	1.0
		Chloride	5.8	MG/L	5.0
		Chemical Oxygen Demand	10.5	MG/L J1	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.020u	MG/L	0.020
		Sulfate	18.0	MG/L	5.0
		Turbidity	36.6	NTU	0.050
-003	10-003-M003	BOD 5 Day	1.2	MG/L	1.0
		Chloride	8.0	MG/L	5.0
		Chemical Oxygen Demand	14.9	MG/L J1	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.26	MG-N/L	0.10
		Phosphate, as P	0.040u	MG/L	0.040
		Sulfate	18.3	MG/L	5.0
		Turbidity	81.9	NTU	0.050
-004	10-004-M003	BOD 5 Day	3.3	MG/L	1.0
		Chloride	8.8	MG/L	5.0
		Chemical Oxygen Demand	91.5	MG/L J1	10.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.38	MG/L	0.040
		Sulfate	20.3	MG/L	5.0
		Turbidity	560	NTU	0.050

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/20/91

NAVAL WEAPONS/COLTSNECK
ORDER: 1771-15-03-0000

WESTON BATCH #: 9112L623

SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	
10-004-M203	BOD 5 Day	1.0 u	MG/L	1.0	
	Chloride	5.0 u	MG/L	5.0	
	Chemical Oxygen Demand	14.9	MG/L	5.0	J1
	Ammonia, as N	0.10 u	MG/L	0.10	
	Nitrite, as N	0.10 u	MG-N/L	0.10	
	Nitrate, as N	0.10 u	MG-N/L	0.10	
	Phosphate, as P	0.020u	MG/L	0.020	
	Sulfate	5.0 u	MG/L	5.0	
	Turbidity	0.070	NTU	0.050	
10-007-M003	BOD 5 Day	1.0 u	MG/L	1.0	
	Chloride	6.5	MG/L	5.0	
	Chemical Oxygen Demand	44.3	MG/L	5.0	J1
	Ammonia, as N	0.33	MG/L	0.10	
	Nitrite, as N	0.10 u	MG-N/L	0.10	
	Nitrate, as N	0.10 u	MG-N/L	0.10	
	Phosphate, as P	0.066	MG/L	0.040	
	Sulfate	108	MG/L	20.0	
	Turbidity	132	NTU	0.050	
10-007-M103	BOD 5 Day	1.0 u	MG/L	1.0	
	Chloride	6.1	MG/L	5.0	
	Chemical Oxygen Demand	79.7	MG/L	10.0	J1
	Ammonia, as N	0.32	MG/L	0.10	
	Nitrite, as N	0.10 u	MG-N/L	0.10	
	Nitrate, as N	0.10 u	MG-N/L	0.10	
	Phosphate, as P	0.040u	MG/L	0.040	
	Sulfate	105	MG/L	20.0	
	Turbidity	131	NTU	0.050	

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Two (2) water samples and no (0) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
05-007-	911260701
05-008-	911260702

Heartland ESI has reviewed the data for the samples listed above for Ground Water parameters using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Ground water Parameters reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112607,** the analysis of two (2) field water samples and no (0) matrix spike and duplicate pair. Overall, the groundwater parameter data quality was good. The USEPA analytical protocol was followed as required.

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

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

No deficiencies in this section.

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING

All Water Samples data stands as reported with no qualification.

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/16/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9112L607

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	05-007-M003	BOD 5 Day	1.2	MG/L	1.0
		Chloride	7.0	MG/L	5.0
		Chemical Oxygen Demand	22.2	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.27	MG-N/L	0.10
		Phosphate, as P	0.051	MG/L	0.040
		Sulfate	59.9	MG/L	10.0
		Turbidity	398	NTU	0.050
-002	05-008-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	7.7	MG/L	5.0
		Chemical Oxygen Demand	14.9	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.040u	MG/L	0.040
		Sulfate	13.5	MG/L	5.0
		Turbidity	195	NTU	0.050

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. One (1) water sample and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
05-M03	911260802

Heartland ESI has reviewed the data for the samples listed above for Ground Water parameters using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Ground water Parameters reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112608,** the analysis of one (1) field water samples and one (1) matrix spike and duplicate pair. Overall, the groundwater parameter data quality was good. The USEPA analytical protocol was followed as required.

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

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

1. The Matris Spike recovery for Phosphate was below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All Water Samples	Phosphate	+/U	J/UJ	1

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/17/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9112L608

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS		REPORTING LIMIT
-002	03-005-M003	BOD 5 Day	3.8	MG/L		1.0
		Chloride	9.1	MG/L		5.0
		Chemical Oxygen Demand	187	MG/L		25.0
		Ammonia, as N	2.6	MG/L		0.10
		Nitrite, as N	0.10 u	MG-N/L		0.10
		Nitrate, as N	0.62	MG-N/L		0.10
		Phosphate, as P	0.17	MG/L	J1	0.040
		Sulfate	69.6	MG/L		10.0
		Turbidity	360	NTU		0.050

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Seven (7) water samples and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
01-M03	911262401
02-M03	911262402
03-M03	911262403
04-M03	911262404
05-M03	911262405
06-M03	911262406
06-M13	911262407

Heartland ESI has reviewed the data for the samples listed above for Ground Water parameters using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Ground water Parameters reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112624**, the analysis of seven (7) field water samples and one (1) matrix spike and duplicate pair. Overall, the groundwater parameter data quality was good. The USEPA analytical protocol was followed as required.

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

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

No deficiencies in this section.

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING

All Water Sample data stands as reported without qualification.

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/31/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9112L624

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	05-001-M003	BOD 5 Day	2.9	MG/L	1.0
		Chloride	7.8	MG/L	5.0
		Chemical Oxygen Demand	19.7	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.046	MG/L	0.040
		Sulfate	12.6	MG/L	5.0
		Turbidity	443	NTU	0.050
-002	05-002-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	8.0	MG/L	5.0
		Chemical Oxygen Demand	15.3	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.040u	MG/L	0.040
		Sulfate	33.3	MG/L	5.0
		Turbidity	418	NTU	0.050
-003	05-003-M003	BOD 5 Day	1.2	MG/L	1.0
		Chloride	8.2	MG/L	5.0
		Chemical Oxygen Demand	19.7	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.14	MG-N/L	0.10
		Phosphate, as P	0.040u	MG/L	0.040
		Sulfate	24.5	MG/L	5.0
		Turbidity	177	NTU	0.050
-004	05-004-M003	BOD 5 Day	3.3	MG/L	1.0
		Chloride	7.8	MG/L	5.0
		Chemical Oxygen Demand	22.7	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.15	MG/L	0.040
		Sulfate	14.9	MG/L	5.0
		Turbidity	433	NTU	0.050

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/31/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9112L624

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-005	05-005-M003	BOD 5 Day	1.7	MG/L	1.0
		Chloride	23.4	MG/L	5.0
		Chemical Oxygen Demand	30.0	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10	MG-N/L	0.10
		Phosphate, as P	0.24	MG/L	0.040
		Sulfate	33.8	MG/L	5.0
		Turbidity	470	NTU	0.050
-006	05-006-M003	BOD 5 Day	7.7	MG/L	1.0
		Chloride	43.5	MG/L	5.0
		Chemical Oxygen Demand	40.3	MG/L	5.0
		Ammonia, as N	0.11	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.16	MG/L	0.040
		Sulfate	110	MG/L	20.0
		Turbidity	629	NTU	0.050
-007	05-006-M103	BOD 5 Day	6.9	MG/L	1.0
		Chloride	45.7	MG/L	5.0
		Chemical Oxygen Demand	10.9	MG/L	5.0
		Ammonia, as N	0.11	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.059	MG/L	0.040
		Sulfate	107	MG/L	20.0
		Turbidity	781	NTU	0.050

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Eight (8) water samples and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
01-M003	911150401
02-M003	911150402
03-M003	911150403
04-M103	911150404
04-M003	911150405
04-M203	911150406
05-M003	911150407
06-M003	911150408

Heartland ESI has reviewed the data for the samples listed above for Ground Water parameters using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Ground water Parameters reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112504,** the analysis of eight (8) field water samples and one (1) matrix spike and duplicate pair. Overall, the groundwater parameter data quality was good. The USEPA analytical protocol was followed as required.

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

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

1. The Matrix Spike recoveries for Phosphate and Nitrate were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

2. The Matrix Spike recovery for Chloride was above the upper control limit. All positive results are qualified as estimated, "J".

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All Water Samples	Phosphate and Nitrate.	+/U	J/UJ	1
All water samples	Chloride	+	J	2

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/14/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9111L504

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	04-001-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	6.0	MG/L J2	5.0
		Chemical Oxygen Demand	2270	MG/L	500
		Nitrate Nitrite	1.0 u	MG-N/L UJ1	1.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Phosphate, as P	0.58	MG/L J1	0.040
		Sulfate	23.2	MG/L	5.0
		Turbidity	242	NTU	0.050
-002	04-002-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	6.9	MG/L J2	5.0
		Chemical Oxygen Demand	50.8	MG/L	5.0
		Nitrate Nitrite	0.33	MG-N/L J1	0.10
		Ammonia, as N	0.39	MG/L	0.10
		Phosphate, as P	0.040u	MG/L UJ1	0.040
		Sulfate	31.8	MG/L	10.0
		Turbidity	509	NTU	0.050
-003	04-003-M003	BOD 5 Day	9.5	MG/L	1.0
		Chloride	5.0 u	MG/L	5.0
		Chemical Oxygen Demand	20.7	MG/L	5.0
		Nitrate Nitrite	0.26	MG-N/L J1	0.10
		Ammonia, as N	0.10 u	MG/L	0.10
		Phosphate, as P	0.048	MG/L J1	0.040
		Sulfate	9.9	MG/L	5.0
		Turbidity	250	NTU	0.050
-004	04-002-M103	BOD 5 Day	1.1	MG/L	1.0
		Chloride	7.2	MG/L J2	5.0
		Chemical Oxygen Demand	30.7	MG/L	5.0
		Nitrate Nitrite	0.20	MG-N/L J1	0.10
		Ammonia, as N	0.41	MG/L	0.10
		Phosphate, as P	0.040u	MG/L UJ1	0.040
		Sulfate	30.9	MG/L	5.0
		Turbidity	463	NTU	0.050

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/14/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9111L504

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-005	04-004-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	5.0 u	MG/L	5.0
		Chemical Oxygen Demand	23.6	MG/L	5.0
		Nitrate Nitrite	0.19	MG-N/L J1	0.10
		Ammonia, as N	0.10 u	MG/L	0.10
		Phosphate, as P	0.12	MG/L J1	0.040
		Sulfate	11.1	MG/L	5.0
		Turbidity	2550	NTU	0.050
-006	04-004-M203	BOD 5 Day	2.6	MG/L	1.0
		Chloride	5.0 u	MG/L	5.0
		Chemical Oxygen Demand	16.4	MG/L	5.0
		Nitrate Nitrite	0.40	MG-N/L J1	0.10
		Ammonia, as N	0.10 u	MG/L	0.10
		Phosphate, as P	0.040	MG/L J1	0.020
		Sulfate	5.0 u	MG/L	5.0
		Turbidity	5.3	NTU	0.050
-007	04-005-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	5.5	MG/L J2	5.0
		Chemical Oxygen Demand	42.5	MG/L	20.0
		Nitrate Nitrite	0.32	MG-N/L J1	0.10
		Ammonia, as N	0.10 u	MG/L	0.10
		Phosphate, as P	0.63	MG/L J1	0.040
		Sulfate	13.3	MG/L	5.0
		Turbidity	840	NTU	0.050
-008	04-006-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	5.6	MG/L J2	5.0
		Chemical Oxygen Demand	13.5	MG/L	5.0
		Nitrate Nitrite	0.29	MG-N/L J1	0.10
		Ammonia, as N	0.10 u	MG/L	0.10
		Phosphate, as P	0.045	MG/L J1	0.040
		Sulfate	9.9	MG/L	5.0
		Turbidity	0.46	NTU	0.050

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Seven (7) water samples and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
01-M003	911154401
02-M003	911154402
03-M003	911154403
03-M203	911154404
04-M003	911154405
04-M103	911154406
05-M003	911154407

Heartland ESI has reviewed the data for the samples listed above for Ground Water parameters using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Ground water Parameters reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General
The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112544**, the analysis of seven (7) field water samples and one (1) matrix spike and duplicate pair. Overall, the groundwater parameter data quality was good. The USEPA analytical protocol was followed as required.

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

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

1. The Matrix Spike recoveries for Phosphate and Nitrate were below the lower control limit. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All Water Samples	Phosphate and Nitrate.	+/U	J/UJ	1

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/17/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9111L544

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	07-001-M003	BOD 5 Day	8.1	MG/L	1.0
		Chloride	11.8	MG/L	5.0
		Chemical Oxygen Demand	170	MG/L	25.0
		Nitrate Nitrite	0.52	MG-N/L J	0.10
		Ammonia, as N	0.10 u	MG/L	0.10
		Phosphate, as P	0.61	MG/L J	0.067
		Sulfate	10.0	MG/L	5.0
		Turbidity	505	NTU	0.050
-002	07-002-M003	BOD 5 Day	1.2	MG/L	1.0
		Chloride	27.8	MG/L	5.0
		Chemical Oxygen Demand	58.1	MG/L	10.0
		Nitrate Nitrite	2.2	MG-N/L J	0.20
		Ammonia, as N	2.1	MG/L	0.10
		Phosphate, as P	0.21	MG/L J	0.040
		Sulfate	38.7	MG/L	5.0
		Turbidity	1160	NTU	0.050
-003	07-003-M003	BOD 5 Day	8.1	MG/L	1.0
		Chloride	9.7	MG/L	5.0
		Chemical Oxygen Demand	103	MG/L	10.0
		Nitrate Nitrite	0.19	MG-N/L J	0.10
		Ammonia, as N	0.13	MG/L	0.10
		Phosphate, as P	1.0	MG/L J	0.080
		Sulfate	33.9	MG/L	5.0
		Turbidity	1160	NTU	0.050
-004	07-003-M203	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	5.0 u	MG/L	5.0
		Chemical Oxygen Demand	12.8	MG/L	10.0
		Nitrate Nitrite	1.9	MG-N/L J	0.20
		Ammonia, as N	0.10 u	MG/L	0.10
		Phosphate, as P	0.058	MG/L J	0.020
		Sulfate	5.0 u	MG/L	5.0
		Turbidity	1.6	NTU	0.050

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/17/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9111L544

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS		REPORTING LIMIT
-005	07-004-M003	BOD 5 Day	2.9	MG/L		1.0
		Chloride	14.0	MG/L		5.0
		Chemical Oxygen Demand	59.5	MG/L		10.0
		Nitrate Nitrite	0.32	MG-N/L	J	0.10
		Ammonia, as N	0.10 u	MG/L		0.10
		Phosphate, as P	0.12	MG/L	J	0.040
		Sulfate	21.4	MG/L		5.0
		Turbidity	1130	NTU		0.050
-006	07-004-M103	BOD 5 Day	2.9	MG/L		1.0
		Chloride	13.8	MG/L		5.0
		Chemical Oxygen Demand	70.9	MG/L		10.0
		Nitrate Nitrite	0.27	MG-N/L	J	0.10
		Ammonia, as N	0.10 u	MG/L		0.10
		Phosphate, as P	0.12	MG/L	J	0.040
		Sulfate	22.2	MG/L		5.0
		Turbidity	1110	NTU		0.050
007	07-005-M003	BOD 5 Day	2.9	MG/L		1.0
		Chloride	26.7	MG/L		5.0
		Chemical Oxygen Demand	170	MG/L		25.0
		Nitrate Nitrite	0.27	MG-N/L	J	0.10
		Ammonia, as N	0.10 u	MG/L		0.10
		Phosphate, as P	0.44	MG/L	J	0.040
		Sulfate	44.0	MG/L		10.0
		Turbidity	455	NTU		0.050

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Two (2) water samples and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
06-M003	911258101
06-M203	911258102

Heartland ESI has reviewed the data for the samples listed above for Ground Water parameters using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Ground water Parameters reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General
The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112581**, the analysis of two (2) field water samples and one (1) matrix spike and duplicate pair. Overall, the groundwater parameter data quality was good. The USEPA analytical protocol was followed as required.

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

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

No deficiencies in this section.

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING

All water data stands as reported without qualification.

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/17/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9112L581

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	03-006-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	5.7	MG/L	5.0
		Chemical Oxygen Demand	87.9	MG/L	20.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.52	MG-N/L	0.10
		Phosphate, as P	0.19	MG/L	0.040
		Sulfate	14.6	MG/L	5.0
		Turbidity	7.4	NTU	0.050
-002	03-006-M203	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	5.0 u	MG/L	5.0
		Chemical Oxygen Demand	11.3	MG/L	10.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.020u	MG/L	0.020
		Sulfate	5.0 u	MG/L	5.0
		Turbidity	0.070	NTU	0.050

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

April 26, 1992

TO: John Williams Jr.
Project Manager
Roy F. Weston Inc.

FROM: Paul Humburg
Project Manager
Heartland ESI.

SUBJECT: Submittal of Data Validation results for Naval Weapons Station, New Jersey. Three (3) water samples and one (1) Matrix Spike and Duplicate pair were analysed by the Roy F. Weston Lionville Laboratory.

Navy No.	RFW No.
05-M003	911258701
06-M003	911258702
06-M203	911258703

Heartland ESI has reviewed the data for the samples listed above for Ground Water parameters using good professional judgement in context with the methods from the USEPA Method for Chemical Analysis of Water and Wastes and the Standard Methods for the Examination of Water and Waterwater 16 ed. Analytical data in this report were screened to determine usability of the results and also to determine contractual compliance relative to the requirements and deliverables of the Region II Protocol. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results.

Inorganic fraction was reviewed as follows:

Ground water Parameters reviewed by Paul B. Humburg

Please refer to the Annotated From 1s and the detailed data validation report for additional information. Specific comments are provided on the following pages.

DATA ASSESSMENT NARRATIVE
Groundwater Parameters

General
The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations and reported results are reviewed utilizing the raw instrument data. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Naval Weapons Station,N.J., SDG# 9112587,** the analysis of three (3) field water samples and one (1) matrix spike and duplicate pair. Overall, the groundwater parameter data quality was good. The USEPA analytical protocol was followed as required.

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

Holding Times

The holding times were met as specified in by USEPA. Protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blanks

No deficiencies in this section.

Spike Recovery

No deficiencies in this section.

Matrix Spike Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING

All water data stands as reported without qualification.

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

QL - denotes data validation qualifier

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/19/91

CLIENT: NAVAL WEAPONS/COLTSNECK
WORK ORDER: 1771-15-03-0000

WESTON BATCH #: 9112L587

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	10-005-M003	BOD 5 Day	3.6	MG/L	1.0
		Chloride	9.1	MG/L	5.0
		Chemical Oxygen Demand	56.0	MG/L	5.0
		Ammonia, as N	0.38	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.30	MG/L	0.040
		Sulfate	5.0 u	MG/L	5.0
		Turbidity	427	NTU	0.050
-002	10-006-M003	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	12.4	MG/L	5.0
		Chemical Oxygen Demand	51.6	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	1.6	MG-N/L	0.10
		Phosphate, as P	0.044	MG/L	0.040
		Sulfate	36.8	MG/L	5.0
		Turbidity	32.2	NTU	0.050
-003	10-006-M203	BOD 5 Day	1.0 u	MG/L	1.0
		Chloride	5.0 u	MG/L	5.0
		Chemical Oxygen Demand	7.5	MG/L	5.0
		Ammonia, as N	0.10 u	MG/L	0.10
		Nitrite, as N	0.10 u	MG-N/L	0.10
		Nitrate, as N	0.10 u	MG-N/L	0.10
		Phosphate, as P	0.020u	MG/L	0.020
		Sulfate	5.0 u	MG/L	5.0
		Turbidity	0.11	NTU	0.050