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CDM FEDERAL PROGRAMS CORPORATION

March 27, 1991

Jack Jojokian (0S 5-W)
Project Officer
U.S. Environmental Protection Agency
401 M. Street, SW
Washington, DC 20460

PROJECT: EPA CONTRACT NO: 68-W9-0002
DOCUMENT NO: TESV-C01077-EP-BYSC
SUBJECT: Work Assignment Number C01077
Draft Data Validation Letter Report
for Inorganic Case 13968, SDG MAM120
Newport Naval Education and Training Center, RI/FS
Newport, Rhode Island
Doc. No: TES5-C01077-DR-BYSD

Dear Mr. Jojokian:

Please find enclosed the Draft Data Validation Letter Report for Inorganic Case 13968, SDG MAM120 for the Newport Naval Training and Education Center RI/FS as partial fulfillment of the reporting requirements for this work assignment.

If you have any comments regarding this submittal, please contact Anita Rigassio of CDM Federal Programs Corporation at (617) 742-2659 within two weeks of receipt of this letter.

Very truly yours,

CDM FEDERAL PROGRAMS CORPORATION

Joseph J. Tarantino

Joseph J. Tarantino
TES V Regional Manager

AR/chc

cc: Carol Keating, EPA Work Assignment Manager, CERCLA, Region I
Richard Leighton, EPA Regional Project Officer, CERCLA, Region I
Jill Robbins, EPA Contracting Officer (letter only)
Deborah Szaro, EPA Technical Project Officer, Region I
J. Steven Paquette, CDM Federal Programs Corporation Deputy Program Manager
Linda Boynton, Viar and Company, Program Manager (letter only)

98 North Washington Street, Suite 200 Boston, MA 02114 617 742-2659

Work Assignment No.	: C01079
EPA Region	: I
Site No.	: 1PZZ
Contract No.	: 68-W9-0002
Document No.	: TES5-C01077-DR-BYSD
Prepared By	: CDM FEDERAL PROGRAMS CORPORATION
Contractor Project Manager	: Michael Kulbersh
Telephone No.	: (617) 742-2659
EPA Work Assignment Manager	: Carol Keating
Telephone No.	: (617) 573-5764
Date Prepared	: March 22, 1991

FOR EPA TES V

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Draft Data Validation Letter Report
Inorganic Case 13968, SDG MAM120

Newport Naval Education and Training Center, RI/FS
Newport, Rhode Island

March 22, 1991

Mr. Dennis Gagne
Regional Sample Control Custodian
U.S. Environmental Protection Agency
JFK Federal Building
Boston, Massachusetts 02203

RE: Contract No. 68-W9-0002/Work Assignment No. C01077
Case No. 13968, SDG No. MAM120
Lab Name: Skinner and Sherman Labs.
Site Name: Newport Naval
Metals/Cyanide: 3 Soil/TR#s MAM120, MAM121, MAM122

Dear Mr. Gagne:

A validation was performed on the inorganic analytical data for three (3) low level soil samples collected from Newport Naval by CDM Federal Programs Corporation (FPC) and submitted to Skinner and Sherman Labs. for total metal and cyanide analyses. The data were evaluated based on the following parameters:

* - data completeness
* - holding times
- calibration verification
- laboratory blank analyses
- ICP interference check sample results
- matrix spike recoveries
- laboratory and field duplicates
* - laboratory control sample results
- furnace atomic absorption results
* - serial dilution results
* - detection limit results
* - sample results

* All criteria were met for these parameters.

INSTRUMENT CALIBRATION VERIFICATION

The initial and final 2X CRDL standards for Lead and Beryllium are not within 20% of their true values. Non-detected Beryllium results in all samples are estimated (UJ) due to poor linearity near the CRDL. Positive Lead results in all samples are reported unqualified since the sample results are greater than 3X CRDL.

The calibration curve correlation coefficients for Selenium are less than 0.995. The relationship between absorbance and concentration is quadratic not linear; therefore the data are reported unqualified.

LABORATORY BLANK ANALYSES

Blank contaminants are summarized in the following table:

Analyte	Maximum Concentration (mg/kg)	Action Level (mg/kg)
Aluminum	4.430	22.15
Beryllium	0.280	1.40
Cadmium	0.480	2.40
Calcium	20.178	100.89
Chromium	1.156	5.78
Cobalt	1.002	5.01
Copper	2.580	12.90
Iron	9.420	47.10
Magnesium	11.198	55.99
Manganese	0.200	1.00
Potassium	23.600	118.00

Values greater than the IDL and less than the Action Level are reported non-detected (U) with the detection limit raised to each quantitated value.

- Beryllium in MAM122 and Cadmium in MAM120 and MAM121 are reported non-detected (U) due to blank contamination.

Values less than the IDL are reported unqualified.

- o Beryllium in MAM120 and MAM121, and Cadmium in MAM122 are reported unqualified.

Values greater than the IDL and greater than the Action Level are reported unqualified.

- o Aluminum, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, and Potassium in all samples are reported unqualified.

ICP INTERFERENCE CHECK SAMPLE

Positive results greater than 2X IDL are found for Barium, Sodium, and Vanadium in the ICSA solutions. These analytes should not be found in the ICSA solutions.

Sample data however are reported unqualified because the concentrations of the interferents Aluminum, Calcium, Iron, and Magnesium are less than 50% of their respective concentrations in the ICSA solutions.

Negative Copper, Silver, and Zinc results greater than 2X negative IDL are found in the ICSA solutions. Copper, Silver, and Zinc results are reported unqualified since the concentrations of the interferents Aluminum, Calcium, Iron, and Magnesium are less than 50% of their respective concentrations in the ICSA solutions.

MATRIX SPIKE RECOVERIES

TR #'s	Analyte	Percent Recovery
MAM120S	Arsenic	6.3
	Mercury	139.6
	Selenium	70.3

Non-dected Selenium results in all samples are estimated (UJ) due to the possibility that the detection limit for Selenium may be biased low.

Positive Arsenic results in all samples are estimated (J) due to the possibility of low biased results.

Positive Mercury results in MAM121 and MAM122 are estimated (J) due to the possibility of high biased results.

Non-detected Mercury result in MAM120 is accepted due to high matrix spike recovery (%R > 125).

LABORATORY DUPLICATES

The laboratory duplicate does not meet the required criteria for Arsenic and Nickel. Positive Nickel results in all samples are estimated (J) due to poor laboratory precision.

Positive Arsenic results in all samples are already estimated (J) due to low matrix spike recovery. Therefore, no further action is recommended.

FIELD DUPLICATE

The field duplicate does not meet the required criteria for Antimony, Chromium, Copper, Iron, Lead, Manganese, Nickel, Vanadium, and Zinc.

Positive Chromium, Copper, Iron, Lead, Manganese, and Zinc in all samples are estimated (J) due to poor field duplicate precision (RPD > 50%).

Positive Antimony results in MAM120 and MAM121 and positive Vanadium results in all samples are estimated (J) and non-detected Antimony result in MAM122 is estimated (UJ) due to poor laboratory precision (duplicate difference > 4X CRDL).

Positive Nickel results are already estimated (J) due to poor laboratory precision; therefore, no further action is recommended.

FURNACE ATOMIC ABSORPTION ANALYSIS

Selenium and Thallium post digestion spike recoveries do not meet 85-115% criteria for the following samples:

Analyte	Samples Affected
Selenium	MAM120, MAM121, MAM122
Thallium	MAM122

Non-detected Selenium results in all samples are already estimated (UJ) due to low matrix spike recovery. Therefore, no further action is recommended.

March 22, 1991

Non-detected Thallium result in MAM122 is reported unqualified since post digestion spike recovery is greater than 115.

Duplicate injections do not agree within 20% RSD for Selenium in MAM122A. Non-detected Selenium result in MAM122 is already estimated (UJ) due to low matrix spike recovery. Therefore, no further action is recommended.

SUMMARY

The field duplicate does not have a good precision, and several analytes are estimated. Arsenic, Mercury and Selenium are estimated due to matrix spike results. Overall, the data quality is acceptable. No other problems were encountered with this case.

Sincerely,

Claudia Spita

Claudia Spita
Inorganic Data Validator

Muhannad Kanaan
Work Assignment Manager

Anita Rigassio
CDM Federal Programs Corporation

Attachment

cc: Linda Boynton, Viar
Leah Reed, Viar
Deborah Szaro, Region I Technical Project Officer

CASE 13968
TABLE 1
RECOMMENDATION SUMMARY

Aluminum		Magnesium	
Antimony	UJ^3, J^3	Manganese	J^3
Arsenic	J^1	Mercury	J^1
Barium		Nickel	J^2
Beryllium	A^1, UJ^1	Potassium	
Cadmium	A^1	Selenium	UJ^2
Calcium		Silver	
Chromium	J^3	Sodium	
Cobalt		Thallium	
Copper	J^3	Vanadium	J^3
Iron	J^3	Zinc	J^3
Lead	J^3	Cyanide	

If the field is left blank the qualifier is "A" for accept all data.

A^1 - Accept data, consider non-detected (U), but raise the detection limits due to blank contamination for Beryllium in MAM122 and for Cadmium in MAM120 and MAM121.

UJ^1 - Non-detected Beryllium results in all samples are estimated (UJ) due to poor linearity near the CRDL.

UJ^2,J^1 - Non-detected Selenium results in all samples are estimated (UJ) and positive Arsenic results in all samples are estimated (J) due to low matrix spike recoveries. Positive Mercury results in MAM121 and MAM122 are estimated (J) due to high matrix spike recovery.

J^2 - Positive Nickel results in all samples are estimated (J) due to poor laboratory precision.

UJ^3,J^3 - Non-detected Antimony result in MAM122 is estimated (UJ), positive Antimony results in MAM120 and MAM121, and positive Chromium, Copper, Iron, Lead, Manganese, Vanadium, and Zinc in all samples are estimated (J) due to poor field duplicate precision.

TEMPL2-8

TABLE 2 PAGE 1 of 1

APRIL 25, 1990
CLP INORGANIC ANALYSIS
CASE NO. 13968, SDG NO. MAM120
SOIL ANALYTICAL RESULTS
(mg/Kg)

Sample Location			SS2		TP#1		TP#11							
Sample Number														
Traffic Report Number			MAM120		MAM121		MAM122							
Remarks		CRDL (mg/kg)					DUPLICATE OF MAM121							
Inorganic Elements														
Aluminum	P	40.0	13500.00		13400.00		9760.00							
Antimony	P	12.0	53.40	J	67.10	J	2.80	UJ						
Arsenic	F	2.0	20.90	J	11.40	J	6.20	J						
Barium	P	40.0	152.00		152.00		25.20							
Beryllium	P	1.0	0.20	UJ	0.20	UJ	0.64	UJ						
Cadmium	P	1.0	1.70	U	1.70	U								
Calcium	P	1000.0	3740.00	J	4170.00	J	771.00	J						
Chromium	P	2.0	108.00	J	108.00	J	15.00	J						
Cobalt	P	10.0	23.40		24.40		6.10							
Copper	P	5.0	813.00	J	7740.00	J	32.50	J						
Iron	P	20.0	57500.00	J	60100.00	J	18800.00	J						
Lead	P	0.6	648.00	J	947.00	J	24.00	J						
Magnesium	P	1000.0	4510.00		4570.00		1890.00							
Manganese	P	3.0	731.00	J	787.00	J	255.00	J						
Mercury	CV	0.1	0.10	UJ	1.00	J	0.81	J						
Nickel	P	8.0	119.00	J	118.00	J	13.30	J						
Potassium	P	1000.0	403.00		414.00		308.00							
Selenium	F	1.0	0.70	UJ	0.70	UJ	0.70	UJ						
Silver	P	2.0	2.30		3.20									
Sodium	P	1000.0	131.00		140.00		22.10							
Thallium	F	2.0												
Vanadium	P	10.0	141.00	J	152.00	J	19.80	J						
Zinc	P	4.0	2210.00	J	2690.00	J	50.10	J						
Cyanide	AS	5.0					1.60							

Analytical Method
F Furnace
P ICP/Flame AA
CV Cold Vapor
AS Semi-Automated Spectrophometric

NOTE:
A blank space indicates the element was not detected.
CRDL for samples is obtained by dividing contract CRDL by % solids and weights
J Quantitation is approximate due to limititations identified in the quality control review.
U Revised Sample Quantitation Limit.
UJ Quantitation is approximate due to limitations identified in the quality control review.
Instrument Detection Limits for the elements listed above are reported in Table 3 .

TABLE 3 PAGE 1 OF 1
APRIL 25, 1990
CLP INORGANIC ANALYSIS
CASE NO. 13968, SDG NO. MAM120
SOIL AND SEDIMENT SAMPLE DETECTION LIMITS (mg/Kg)

Sample Location			SS2	TP#1	TP#11							
Traffic Report Number			MAM120	MAM121	MAM122							
Remarks					DUPLICATE of MAM121							
Percent Solids			80.8%	75.0%	81.1%							
Inorganic Elements		IDL (ug/L)										
Aluminum	P	13.0	3.09	3.18	3.08							
Antimony	P	12.0	2.86	2.94	2.85							
Arsenic	F	2.0	0.47	0.49	0.47							
Barium	P	2.0	0.48	0.49	0.47							
Beryllium	P	1.0	0.24	0.24	0.24							
Cadmium	P	1.0	0.24	0.24	0.24							
Calcium	P	25.0	5.95	6.12	5.93							
Chromium	P	4.0	0.95	0.98	0.95							
Cobalt	P	4.0	0.95	0.98	0.95							
Copper	P	5.0	1.19	1.22	1.19							
Iron	P	6.0	1.43	1.47	1.42							
Lead	P	15.0	3.57	3.67	3.56							
Magnesium	P	54.0	12.85	13.21	12.80							
Manganese	P	1.0	0.24	0.24	0.24							
Mercury	CV	0.2	0.11	0.13	0.10							
Nickel	P	5.0	1.19	1.22	1.19							
Potassium	P	89.0	21.18	21.77	21.10							
Selenium	F	3.0	0.71	0.73	0.71							
Silver	P	3.0	0.71	0.73	0.71							
Sodium	P	41.0	9.76	10.03	9.54							
Thallium	F	1.0	0.24	0.24	0.24							
Vanadium	P	3.0	0.71	0.73	0.71							
Zinc	P	5.0	1.19	1.22	1.19							
Cyanide	AS	20.0	1.2	1.3	1.2							

Analytical Method :
F Furnace AA
P ICP/Flame AA
CV Cold Vapor
AS Semi Automated Spectrophotometric

Sample's wet weight (gms)											
for Hg analysis		0.23	0.21	0.24							
for ICP analysis		1.04	1.09	1.04							
for furnace AA analysis		1.06	1.09	1.06							
for Cyanide analysis		4.96	4.97	5.03							

Volumes used in preparing sample for analysis:
for Hg analysis 100 mls
for ICP and AA analysis 200 mls
for Cyanide analysis 250 mls

Newport Naval

REGION I
Data Review Worksheets

Site Name 13968
Reference Number CO1077

REGION I REVIEW OF INORGANIC
CONTRACT LABORATORY DATA PACKAGE

The hardcopied (laboratory name) SKINNER & SHERMAN LABS data package received at Region I has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No.	13968	SAS No.	NA	Sampling Date(s)	4/25/90
SDG. No.	MAM120	Matrix	Soil	Shipping Date(s)	4/26/90
No. of Samples	3			Date Rec'd by Lab	4/27/90

Traffic Report Nos: MAM 120, MAM 121, MAM 122.

Trip Blank No.: None
Equipment Blank No.: NONE
Field Dup Nos: MAM 121, MAM 122

SOW No. 7/88 requires that specific analytical work be done and that associated reports be provided by the laboratory to the Regions, EMSL-LV, and SMO. The general criteria used to determine the performance were based on an examination of:

- -Data Completeness
- -Holding Times
- -Calibrations
- -Blanks
- -ICP Interference Check Results
- -Matrix Spike Recoveries
- -Laboratory Duplicates
- -Field Duplicates
- -Lab Control Sample Results
- -Furnace AA Results
- -ICP Serial Dilution Results
- -Detection Limit Results
- -Sample Quantitation

Overall Comments: The data quality is acceptable.

Definitions and Qualifiers:

A - Acceptable data.
J - Approximate data due to quality control criteria.
R - Reject data due to quality control criteria.
U - Analyte not detected.

Reviewer: Mei Ching Tse Date: 6/7/90

REGION I
Data Review Worksheets

All criteria were met

I. DATA COMPLETENESS

MISSING INFORMATION	DATE LAB CONTACTED	DATE REC'D

REGION I
Data Review Worksheets

All criteria were met

II. HOLDING TIMES

Complete table for all samples and circle the analysis date for samples not within criteria.

SAMPLE ID	DATE SAMPLED	HG DATE ANALYSIS	CYANIDE DATE ANALYSIS	OTHERS DATE ANALYSIS ICP	pH	ACTION
MAM 120	4/25/90	28 5/23/90	14 5/09/90	23 5/18/90	NA	
MAM 121	4/25/90	28 5/23/90	14 5/09/90	23 5/18/90	NA	
MAM 122	4/25/90	28 5/23/90	14 5/09/90	23 5/18/90	NA	

METALS - 180 DAYS FROM SAMPLE COLLECTION
MERCURY - 28 DAYS FROM SAMPLE COLLECTION
CYANIDE - 14 DAYS FROM SAMPLE COLLECTION

ACTION:

1. If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).

2. If holding times are grossly exceeded, the reviewer may determine that non-detects are unusable (R).

I A. INSTRUMENT CALIBRATION (Section 1) All criteria met.

1. Recovery Criteria

List the analytes which did not meet the percent recovery (%R) criteria for Initial or Continuing Calibration.

DATE	ICV/CCV#	ANALYTE	%R	ACTION	SAMPLES AFFECTED

ACTIONS:

If any analyte does not meet the %R criteria follow the actions stated below:

For Positive Results:

	Accept	Estimate (J)	Reject (R)
Metals	90-110%R	75-89%R, 111-125%R	<75%R, >125%R
Mercury	80-120%R	65-79%R, 121-135%R	<65%R, >135%R
Cyanide	85-115%R	70-84%R, 116-130%R	<70%R, >130%R

For Non-detected Results:

	Accept	Estimate (UJ)	Reject (R)
Metals	90-125%R	75-89%R	<75%R, >125%R
Mercury	80-135%R	65-79%R	<65%R, >135%R
Cyanide	85-130%R	70-84%R	<70%R, >130%R

REGION I
Data Review Worksheets

III B. INSTRUMENT CALIBRATION (Section 2)

2. Analytical Sequence

A. Did the laboratory use the proper number of standards for calibration as described in the SOW? (Yes) or No

B. Were calibrations performed at the beginning of each analysis? (Yes) or No

C. Were calibration standards analyzed at the beginning of sample analysis and at a minimum frequency of ten percent or every two hours during analysis, whichever is more frequent? (Yes) or No

D. Were the correlation coefficients for the calibration curves for AA, Hg, and CN ≥ 0.995? Yes or (No)

E. Was a standard at 2xCRDL analyzed for all ICP analyses? (Yes) or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below and list the samples affected.

The initial and final 2xCRDL standards are not within 20% of their true values for Beryllium and Lead. Non-detected Beryllium results in all samples are estimated (UJ) due to poor linearity near the CRDL. Positive Lead results in all samples are reported unqualified since the results are greater than 3xCRDL.

The calibration curve correlation coefficients for Selenium are less than 0.995. The relationship between absorbance and concentration is quadratic not linear; therefore, the data are reported unqualified.

REGION I
Data Review Worksheet

IV A. BLANK ANALYSIS RESULTS (Sections 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water blanks.

1. Laboratory Blanks MATRIX: Soil

DATE	ICB/CCB#	PREP BL	ANALYTE	CONC./UNITS
5-18-90	CCB#1		Al	17.2 ug/L
-"-	CCB#1		Be	1.4 ug/L
-"-	CCB#1		Cd	1.6 ug/L
-"-	CCB#1		Fe	8.8 ug/L
-"-	CCB#2		Cd	1.8 ug/L

2. Equipment/Trip Blanks

DATE	EQUIP BL#	ANALYTE	CONC./UNITS

None

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples and for each digestion batch? Yes or No

B. Was a calibration blank run every 10 samples or every 2 hours whichever is more frequent? Yes or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

REGION I
Data Review Worksheet

IV A. BLANK ANALYSIS RESULTS (Sections 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water blanks.

1. Laboratory Blanks MATRIX: SOIL

DATE	ICB/CCB#	PREP BL	ANALYTE	CONC./UNITS
5/18/90	CCB#2		Co	4.4 ug/L
-"-	CCB#2		Cu	12.9 ug/L
-"-	CCB#2		Fe	47.1 ug/L
-"-	CCB#2		Mn	1.0 ug/L
-"-	CCB#2		K	1180 ug/L

2. Equipment/Trip Blanks

DATE	EQUIP BL#	ANALYTE	CONC./UNITS
		NONE	

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples and for each digestion batch? (Yes) or No

B. Was a calibration blank run every 10 samples or every 2 hours whichever is more frequent? (Yes) or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

REGION I
Data Review Worksheet

IV A. BLANK ANALYSIS RESULTS (Sections 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water blanks.

1. Laboratory Blanks MATRIX: Soil

DATE	ICB/CCB#	PREP BL	ANALYTE	CONC./UNITS
5/18/90	CCB#3		Al	20.3 ug/L
-"-	CCB#3		Cd	2.4 ug/L
-"-	CCB#3		Co	8.8 ug/L
-"-	CCB#3		Fe	22.1 ug/L
-"-		PBS	Al	4.430 mg/kg

2. Equipment/Trip Blanks

DATE	EQUIP BL#	ANALYTE	CONC./UNITS
		None	

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples and for each digestion batch? Yes or No

B. Was a calibration blank run every 10 samples or every 2 hours whichever is more frequent? Yes or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

REGION I
Data Review Worksheet

IV A. BLANK ANALYSIS RESULTS (Sections 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water blanks.

1. Laboratory Blanks MATRIX: Soil

DATE	ICB/CCB#	PREP BL	ANALYTE	CONC./UNITS
5/18/90		PBS	Cd	0.232 mg/kg
-"-		PBS	Ca	20.178 mg/kg
-"-		PBS	Cr	1.156 mg/kg
-"-		PBS	Co	1.002 mg/kg
-"-		PBS	Fe	8.506 mg/kg
-"-		PBS	Mg	11.198 mg/kg

2. Equipment/Trip Blanks

DATE	EQUIP BL#	ANALYTE	CONC./UNITS
		None	

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples and for each digestion batch? Yes or No

B. Was a calibration blank run every 10 samples or every 2 hours whichever is more frequent? Yes or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

REGION I
Data Review Worksheets

IV B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Levels for any analyte is equal to five times the highest concentration of that element's contamination in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL). Specific actions are as follows:

1. When the concentration is greater than the IDL, but less than the Action Level, report the sample concentration detected with a U.

2. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

MATRIX: Soil

ELEMENT	MAX. CONC./ UNITS	AL/ UNITS
Al	4.430 mg/kg	22.15 mg/kg
Be	0.280 mg/kg	1.40 mg/kg
Cd	0.480 mg/kg	2.40 mg/kg
Ca	20.178 mg/kg	100.89 mg/kg
Cr	1.156 mg/kg	5.78 mg/kg
Co	1.002 mg/kg	5.01 mg/kg
Fe	9.420 mg/kg	47.10 mg/kg

MATRIX: Soil

ELEMENT	MAX. CONC./ UNITS	AL/ UNITS
Mg	11.198 mg/kg	55.99 mg/kg
Cu	2.580 mg/kg	12.90 mg/kg
Mn	0.200 mg/kg	1.00 mg/kg
K	23.600 mg/kg	118.00 mg/kg

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

$$\text{Conc. in ug/L} \times \frac{\text{Volume diluted to (200ml)}}{\text{Weight digested (1gram)}} \times \frac{1\text{L}}{1000\text{ml}} \times \frac{1000\text{gm}}{1\text{kg}} \times \frac{1\text{mg}}{1000\text{ug}} = \text{mg/kg}$$

Multiplying this result by 5 to arrive at the action level gives a final result in mg/kg which can then be compared to sample results.

REGION I
Data Review Worksheets

V A. ICP INTERFERENCE CHECK SAMPLE (Sections 1 & 2) all criteria met.

1. Recovery Criteria

List any elements in the ICS AB solution which did not meet the criteria for %R.

DATE	ELEMENT	%R	ACTION	SAMPLES AFFECTED

ACTIONS:

If an element does not meet the %R criteria , follow the actions stated below:

	PERCENT RECOVERY		
	<50%	50-79%	>120%
Positive Sample Results	R	J	J
Non-detected Sample Results	R	UJ	A

2. Frequency Requirements

Were Interference QC samples run at the beginning and end of each sample analysis run or a minimum of twice per 8 hour working shift, whichever is more frequent? Yes or No

If no,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below and list the samples affected.

_____

_____

_____

REGION I
Data Review Worksheets

V B. ICP INTERFERENCE CHECK SAMPLE (Section 3)

3. Report the concentration of any elements detected in the ICS A solution > 2xIDL that should not be present.

ELEMENT	CONC. DETECTED IN THE ICS	IDL	CONC. OF INTERFERENTS IN THE ICS AL	CA	FE	MG
Ba	6	2.0	469700	445800	178650	445200
Cu	-31	5.0				
Ag	-11	3.0				
Na	218	41				
Vn	11	3.0				
Zn	-11	5.0				

Estimate the concentration produced by the interfering element in all affected samples. See guidelines for examples. List the samples affected by interferences below:

SAMPLE AFFECTED	ELEMENT AFFECTED	SAMPLE CONC. (ug/L)	SAMPLE INTERFERENT CONC. AL	CA	FE	MG	ESTIMATED INTERF. (ug/L)

ACTIONS:

1. In general, the sample data can be accepted without qualification if the sample concentrations of Al, Ca, Fe, and Mg are less than 50% of their respective levels in the ICS solution.

2. Estimate (J) positive results for affected elements for samples with levels of interferents 50% or more of that in the ICS solution.

3. Reject (R) positive results if the reported concentration is due entirely to the interfering element.

4. Estimate (UJ) non-detected results for which false negatives are suspect.

Give explanations for any actions taken below:
Concentrations of Al, Ca, Fe, Mg are below 50% of the ICSAB solution concentration in all samples.

VI. MATRIX SPIKE

TR # MAM120S MATRIX: Soil

1. Recovery Criteria

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added
SSR - spikes sample result
SR - sample result

Analyte	SSR	SR	S	%R	Action
As	21.4634	20.8762	9.34	6.3	(J)
Hg	0.7820	0.1076	0.56	139.6	A ; J
Se	1.6439	0.7005	2.34	70.3	(UJ)

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.

2. If any analyte does not meet the %R criteria follow the actions stated below:

	PERCENT RECOVERY		
	<30%	30%-74%	>125%
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

2. Frequency Criteria

A. Was a matrix spike prepared at the required frequency? Yes or No

B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? Yes or No

separate worksheet should be used for each matrix spike pair.

REGION I
Data Review Worksheets

VII. LABORATORY DUPLICATES

List the concentrations of any analyte not meeting the criteria for duplicate precision. For soil duplicates, calculate the CRDL in mg/kg using the sample weight, volume and percent solids data for the sample. Indicate what criteria was used to evaluate precision by circling either the RPD or CRDL for each element.

MATRIX: Soil

Element	CRDL water ug/L	CRDL soil mg/kg	Sample # MAM120 mg/Kg	Duplicate# MAM120D mg/Kg	RPD	Action
Aluminum	200					
Antimony	60					
Arsenic	10		20.8762	12.2606	52.0	(J) all samples
Barium	200					
Beryllium	5					
Cadmium	5					
Calcium	5000					
Chromium	10					
Cobalt	50					
Copper	25					
Iron	100					
Lead	3 ~~5~~					
Magnesium	5000					
Manganese	15					
Mercury	0.2					
Nickel	40		118.9025	169.4491	35.0	(J) all samples.
Potassium	5000					
Selenium	5					
Silver	10					
Sodium	5000					
Thallium	10					
Vanadium	50					
Zinc	20					
Cyanide	10					

Laboratory Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:

1. Estimate (J) positive results for elements which have an RPD >20% for waters and >35% for soils.

2. If sample results are less than 5x the CRDL, estimate (J) positive results for elements whose absolute difference is >CRDL, (2xCRDL for soils). If both samples are non-detected, the RPD is not calculated (NC).

REGION I
Data Review Worksheets

VIII. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair. For soil duplicates, calculate the CRDL in mg/kg using the sample weight, volume and percent solids data for the sample. Indicate what criteria was used to evalute the precision by circling either the RPD or CRDL for each element.

MATRIX: SOIL

Element	CRDL water ug/L	CRDL soil mg/kg	Sample # MAM121	Duplicate# MAM122	RPD	Action
Aluminum	200	48.9	13400.00	9760.00	31.4	
Antimony	60	(14.7)	67.10	2.80U	200.0	UJ, J
Arsenic	10	2.4	11.40	6.20	59.1	
Barium	200	48.9	152.00	25.20	143.1	
Beryllium	5	1.2	0.24U	0.64U	NC	
Cadmium	5	1.2	1.70	0.24U	200.0	
Calcium	5000	1223.2	4170.00	771.00	137.6	
Chromium	10	2.4	108.00	15.00	(151.2)	J
Cobalt	50	12.2	24.40	6.10	120.0	
Copper	25	6.1	7740.00	32.50	(198.3)	J
Iron	100	24.5	60100.00	18800.00	(104.7)	J
Lead	3 ~~5~~	0.73	947.00	24.00	(190.1)	J
Magnesium	5000	1223.2	4570.00	1890.00	82.0	
Manganese	15	3.7	787.00	255.00	(102.0)	J
Mercury	0.2	0.13	1.00	0.81	21.0	
Nickel	40	(9.8)	118.00	13.30	159.5	
Potassium	5000	1223.2	414.00	308.00	29.4	
Selenium	5	1.2	0.73U	0.70U	NC	
Silver	10	2.4	3.20	0.71U	200.0	
Sodium	5000	1223.2	140.00	22.10	145.5	
Thallium	10	2.4	0.24U	0.23U	NC	
Vanadium	50	(12.2)	152.00	19.80	153.9	
Zinc	20	4.9	2690.00	50.10	(192.7)	
Cyanide	20 ~~10~~	1.3	1.30U	1.60	2000	

Field Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:

1. Estimate (J) positive results for elements which have an RPD >30% for waters and >50% for soils.

2. If sample results are less than 5x the CRDL, estimate (J) positive results and (UJ) nondetected results for elements whose absolute difference is >2xCRDL, (4xCRDL for soils). If both samples are non-detected, the RPD is not calculated (NC).

IX. LABORATORY CONTROL SAMPLE

1. Aqueous LCS

List any LCS recoveries not within the 80-120% criteria and the samples affected.

DATE	ELEMENT	%R	ACTION	SAMPLES AFFECTED
			NA	

2. Solid LCS All criteria met.

List any analytes that were not within the control windows set by the EPA for the solid LCS sample. The 80-120% criteria is not used to evaluate solid LCS results.

ELEMENT	LCS CONC.	CONTROL WINDOWS	ACTION	SAMPLES AFFECTED

ACTIONS:

AQUEOUS LCS	Percent Recovery <50%	51-79%	>120%
Positive Results	R	J	J
Non-detected Results	R	UJ	A

SOLID LCS	<EPA Control Windows	>EPA Control Windows
Positive Results	J	J
Non-detected Results	UJ	A

3. Frequency Criteria

A. Was an LCS analyzed for every matrix, every digestion batch, and every 20 samples? Yes or No

REGION I
Data Review Worksheets

X A. FURNACE ATOMIC ABSORPTION ANALYSIS

1. Duplicate Precision

-------- Duplicate injections and one-point analytical spikes were performed for all samples: duplicate injections agreed within ± 20%.

-------- Duplicate injections and/or spikes were not performed for the following samples/elements:_____

--✓------ Duplicate injections did not agree within ± 20% for samples/elements: Se: MAM122A (31.9%)-reran.

2. Post Digestion Spike Recoveries

-------- Spike recoveries met the 85-115% recovery criteria for all samples.

---✓---- Spike recoveries did not meet the 85-115% criteria but did not require MSA for the following samples/elements: MAM120/Se; MAM121/Se; MAM122/Se, TL.

---✓--- MSA was used to quantitate analytical results when contractually required.

✓ Correlation coefficients ≥0.995, accept results.

____ Correlation coefficients <0.995 for sample numbers/elements:_____

-------- Method of Standard Addition (MSA) was not performed as required for samples/elements:_____

ACTIONS:

1. Estimate (J) positive results if duplicate injections are outside ± 20 % RSD or CV.

2. If the sample absorbance is <50% of post digestion spike absorbance the following actions should be applied:

	PERCENT RECOVERY		
	<10%	11%-84%	>115%
Positive Sample Results	J or R	J	J
Non-detected Results	R	UJ	A

3. Estimate (J) sample results if MSA was required and not performed.

4. Estimate (J) sample results if correlation coefficient was <0.995.

All criteria were met.

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Data Review Worksheets

XI. INDUCTIVELY COUPLED PLASMA (ICP) SERIAL DILUTION ANALYSIS

✓ Serial Dilutions were performed for each matrix and results of the diluted sample analysis agreed within ten percent of the original undiluted analysis.

_____ Serial Dilutions were not performed for the following:

_____

_____ Serial Dilutions were performed, but analytical results did not agree within 10% for analyte concentrations greater than 50x the IDL before dilution.

Report all results below that do not meet the required laboratory criteria for ICP serial dilution analysis.

MATRIX: Soil

ELEMENT	IDL	50xIDL	SAMPLE RESULT	SERIAL DILUTION	%D	ACTION
Aluminum						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Silver						
Sodium						
Vanadium						
Zinc						

Actions apply to all samples of the same matrix.

ACTIONS:

1. Estimate (J) positive results if %D >15.

XII. DETECTION LIMIT RESULTS

1. Instrument Detection Limits

_____ Instrument Detection Limit results were present and found to be less than the Contract Required Detection Limits.

_____ IDLs were not included in the data package on Form XI.

✓ IDLs were present, but the criteria was not met for the following elements: LEAD IDL = 15 ug/L ; CRDL = 3 ug/L.
ALL SAMPLE RESULTS ARE > 5x IDL.

2. Reporting Requirements

✓ Were sample results on Form I reported down to the IDL not the CRDL for all analytes? (Yes) or No

✓ Were sample results that were analyzed by ICP for Se, Tl, As, or Pb at least 5x IDL. (Yes) or No

✓ Were sample weights, volumes, and dilutions taken into account when reporting detection limits on Form I. (Yes) or No

If No,

The reported results may be inaccurate. Make the necessary changes on the data summary tables and request that the laboratory resubmit the corrected data.

REGION I
Data Review Worksheets

All criteria were met

XIII. SAMPLE QUANTITATION

Yes — Sample results fall within the linear range for ICP and within the calibrated range for all other parameters.

_____ Sample results were beyond the linear range/ calibration range of the instrument for the following samples/elements:

_____

In the space below, please show a minimum of one sample calculation per method:

ICP

Al: MAM120 (13500.00 mg/Kg)

Calc: $56.830\ mg/L \times \frac{200ml}{1.04g} \times \frac{1L}{1000ml} \times \frac{1000g}{1Kg} \times \frac{1}{0.808} = 13525.00\ mg/Kg$ dry weight

FURNACE

As: MAM120 (20.90 mg/Kg)

Calc: $17.9\ \mu g/L \times 5 \times \frac{200ml}{1.06g} \times \frac{1L}{1000ml} \times \frac{1000g}{1Kg} \times \frac{1mg}{1000\mu g} \times \frac{1}{0.808} = 20.9\ mg/Kg$ dry weight

MERCURY

Hg: MAM121 (1.00 mg/Kg)

Calc: $1.63\ ug/L \times \frac{100ml}{0.21g} \times \frac{1L}{1000ml} \times \frac{1000g}{1Kg} \times \frac{1g}{1000\mu g} \times \frac{1}{0.75} = 1.03\ mg/Kg$ dry weight

CYANIDE

CN: MAM122 (1.60 mg/Kg)

Calc: $26.05\ ug/L \times \frac{1L}{1000ml} \times \frac{1000g}{1Kg} \times \frac{1mg}{1000ug} \times \frac{1}{0.811} \times \frac{250ml}{5.03g} = 1.59\ mg/Kg$ dry weight

For soil samples, the following equation may be necessary to convert raw data values (usually reported in ug/L) to actual sample concentrations (mg/kg):

The lab is required to use 1 gram sample (wet weight) to 200 ml.

Wet weight concentration =

$$\text{digest conc. in } \frac{ug}{L} \times \frac{200ml}{1\ gm} \times \frac{1L}{1000\ ml} \times \frac{1000gm}{1kg} \times \frac{1mg}{1000ug} = \frac{mg}{kg}$$

In addition the sample results are converted to dry weight using the percent solids calculations:

$$\frac{\text{Wet weight conc.}}{\%\text{solids}} \times 100 = \text{final concentration, dry weight (mg/kg)}$$

Region 1

INORGANIC REGIONAL DATA ASSESSMENT

CASE NO. 13968 SITE NEWPORT NAVAL

LABORATORY SKINNER AND SHERMAN LABS, INC. NO. OF SAMPLES/ MATRIX 3 / SOIL

SDG# MAM120 REVIEWER (IF NOT ESD) FPC

SOW# 7/88 REVIEWER'S NAME MEI CHING TSE

DPO: ACTION _____ FYI ✓ COMPLETION DATE 6/12/90

DATA ASSESSMENT SUMMARY

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

O = Data had 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~~: O^1 - non-detected Be results in all samples are estimated (UJ) due to poor linearity near the CRDL. X^2 - accept data, but raise the detection limits due to blank contamination for Be in MAM122 and for Cd in MAM120 and MAM121. O^3 - Positive Ni results in all samples

AREAS OF CONCERN: are estimated (J) due to poor lab. precision. M^4 - Positive Cr, Cu, Fe, Pb, Mn, V and Zn in all samples, positive Sb results in MAM120 and MAM121 are estimated (J) and non-detected Sb result in MAM122 is estimated (UJ) due to poor field duplicate precision. M^5 - Positive As

NOTABLE PERFORMANCE: results in all sample are estimated (J) and non-detected Se results in all sample are estimated (UJ) due to low matrix spike recoveries. M^6 - Se in MAM122A has RSD = 31.9%, Se in all samples and Tl in MAM122 do not meet 85-115% criteria. Non-detected Se results in all samples are already estimated (UJ) due to matrix spike recovery. Tl %R > 115 in MAM122.
X^7 - Non-detected Mercury result in MAM120 is accepted and positive Hg results in MAM121 and MAM122 are estimated (J) due to high matrix spike recoveries.

DQO SUMMARY FORM

1. SITE

NAME Newport Naval
LOCATION Newport, RI
NUMBER 201077

EPA REGION 1
PHASE
RI 1 RI 2 RI 3 ERA FS RD RA
(CIRCLE ONE)

2. MEDIA (CIRCLE ONE)	SOIL	GW	SW SED	AIR	BIO	OTHER

3. USE (CIRCLE ALL THAT APPLY)	SITE CHARAC. (H&S)	RISK ASSESS	EVAL ALTS.	ENG'G DESIGN	PRP DETER.	MONITORING REMEDIAL ACTION	OTHER
							Oversight

4. OBJECTIVE FPC will collect samples for comparison to PRP's samples

5. SITE INFORMATION

AREA _____ DEPTH TO GROUND WATER WI 10'
GROUND WATER USE Non-Potable
SOIL TYPES Glacial Outwash
SENSITIVE RECEPTORS Narragansett Bay

6. DATA TYPES (CIRCLE APPROPRIATE DATA TYPES)

A. ANALYTICAL DATA

pH	PESTICIDES	TOX
CONDUCTIVITY	PCB	TOC
VOA	METALS	BTX
ABN	CYANIDE	COD
TCLP		

B. PHYSICAL DATA

PERMEABILITY	HYDRAULIC HEAD
POROSITY	PENETRATION TEST
GRAIN SIZE	HARDNESS
BULK DENSITY	

7. SAMPLING METHOD (CIRCLE METHOD(S) TO BE USED)

ENVIRONMENTAL	BIASED	GRAB	NON-INTRUSIVE	PHASED
SOURCE	GRID	COMPOSITE	INTRUSIVE	

8. ANALYTICAL LEVELS (INDICATE LEVEL(S) AND EQUIPMENT & METHODS)

LEVEL 1 FIELD SCREENING - EQUIPMENT
LEVEL 2 FIELD ANALYSIS - EQUIPMENT
LEVEL 3 NON-CLP LABORATORY - METHODS
LEVEL 4 CLP/RAS - METHODS Auger & boiler
LEVEL 5 NON STANDARD

9. SAMPLING PROCEDURES

BACKGROUND - 2 PER EVENT OR None
CRITICAL (LIST)
PROCEDURES Soil samples collected via auger, water via boiler

10. QUALITY CONTROL SAMPLES (CONFIRM OR SET STANDARD)

A. FIELD
COLLOCATED - 5% OR
REPLICATE - 5% OR
FIELD BLANK - 5% OR
TRIP BLANK - 1 PER DAY OR 2

B. LABORATORY
REAGENT BLANK - 1 PER ANALYSIS BATCH OR
REPLICATE - 1 PER ANALYSIS BATCH OR
MATRIX SPIKE - 1 PER ANALYSIS BATCH OR
OTHER

11. BUDGET REQUIREMENTS

BUDGET _____ SCHEDULE week of 6/11/90
STAFF Mike Kulbersh & Mary Pothier

CONTRACTOR FPC PRIME CONTRACTOR FPC
SITE MANAGER Mike Kulbersh DATE 6/4/90

FOR DETAILS SEE SAMPLING & ANALYSIS PLAN

CDM SF DQO 1 002