



OFFICE
- DATA -

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NAVSTA NEWPORT RI
5090 3a

1/19/92

TRC Environmental Consultants, Inc.

5 Waterside Crossing, Windsor, CT 06095 (203) 289-8631
Fax (203) 298-6399

February 17, 1992

Mr. Francisco LaGreca
U.S. Department of the Navy
Northern Division - NAVFAC
U.S. Naval Base, Building 77L
Philadelphia, PA 19112-5094

RE: Follow-up Surface Soil Sample Results
Site 09 - Old Fire Fighting Training Area
U.S. Navy NETC, Newport, Rhode Island
TRC Project No. 6760-N81

Dear Mr. LaGreca:

TRC Environmental Consultants, Inc. (TRC) is pleased to present the analytical results for follow-up surface soil samples collected on December 12, 1991 from the subject site.

Six surface soil samples were originally collected by TRC from Site 09 under the Phase I Remedial Investigation (RI) of the site. A surface soil sample, SS-02, collected from the site during the RI was split with the EPA for analysis. Elevated levels of metals were detected in the EPA split sample, but not in the associated TRC sample. Given the current use of the area by a child care facility, it was decided that this sample location (SS-02) would be resampled to resolve the sample data inconsistencies and identify any potential immediate human health concerns at the site. At the time of resampling, four additional surface soil samples were also collected from around the location of potential concern. The locations of the initial and additional surface soil sampling conducted at Site 09 are shown on Figure 1. All of the follow-up surface soil samples were analyzed for target analyte list (TAL) metals. In addition, a field blank collected during the surface soil sampling was also analyzed for the TAL metals.

The analytical results for the second round of surface soil samples and field blank ("FB" notation) are provided in Table 1. The surface soil sample data in Table 1 is preliminary, pending validation of the data. Copies of the laboratory metals data report forms for these surface soil samples and the Phase I surface soil sample SS-02 are provided in Attachment A.

Surface soil sample SS-07 was collected at the same location as Phase I surface soil sample SS-02 which was split with the EPA. For comparison purposes, the metals sample results for the three samples collected from this location are provided in Table 2.

The results of the resampling show a good correlation between the Phase I TRC sample results and the follow-up TRC sample results (SS-07) for location SS-02. In addition, the analytical results of

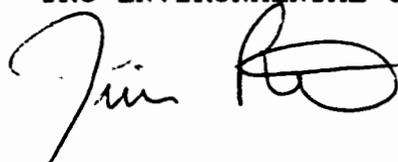
the other five surface soil samples (including one duplicate) collected during the follow-up sampling show levels of metals similar to those measured in the other two TRC samples. Generally, the TRC surface soil sample data presented with this letter do not indicate the presence of elevated levels of metals in the surface soils within the fenced child care facility play area from which the samples were collected.

An explanation for the significant difference in the TRC and EPA split surface soil sample data cannot be provided by TRC based upon the available information. According to the data validation report for the EPA split sample data, some limitations were identified in the quality control review of the EPA split sample data, which resulted in much of the data being qualified as approximate. The findings of the validation of the Phase I TRC surface soil sample SS-02 resulted in qualification of the thallium, silver, and arsenic data (see Attachment B) and concluded that the data was acceptable. As presented above, the follow-up surface soil sample data has not yet been validated. Upon validation of the surface soil data, a copy of the validation report will be forwarded to the Navy.

We hope this provides you with the information you require at this time. Please call me or Bob Smith with any questions.

Sincerely,

TRC ENVIRONMENTAL CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Jim Peronto". The signature is fluid and cursive, with a large, stylized "P" at the end.

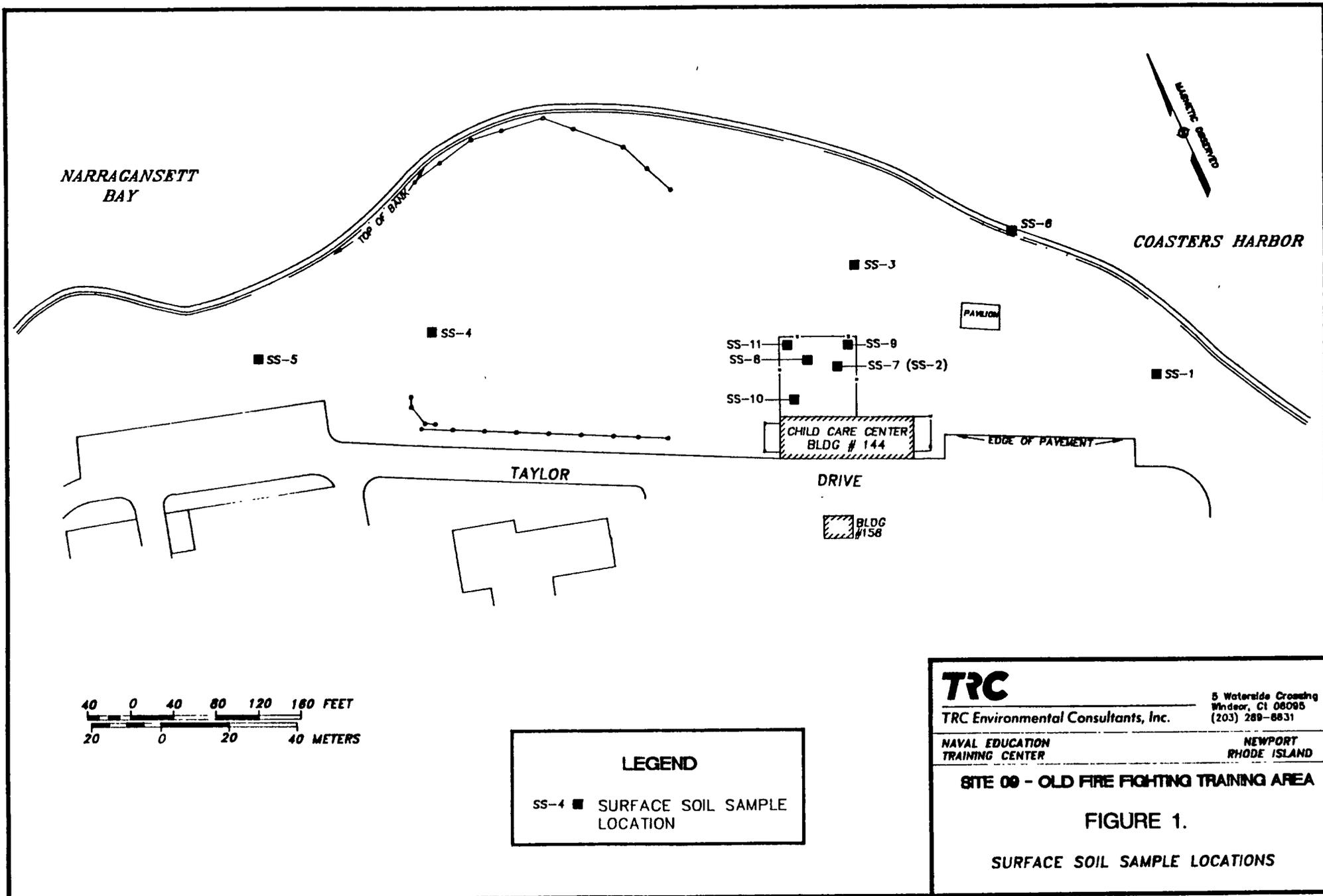
Jim Peronto, P.E.
Project Manager

Attachments

cc: R. Smith, TRC-ECI

TRC

FIGURES



TRC

TRC Environmental Consultants, Inc.

5 Waterside Crossing
Wineor, CT 06095
(203) 289-8831

NAVAL EDUCATION
TRAINING CENTER

NEWPORT
RHODE ISLAND

SITE 09 - OLD FIRE FIGHTING TRAINING AREA

FIGURE 1.

SURFACE SOIL SAMPLE LOCATIONS

TABLES

TABLE 1

SITE 09 - OLD FIRE FIGHTING TRAINING AREA
 CONSTITUENTS DETECTED IN SURFACE SOIL SAMPLES

SAMPLE IDENTIFICATION:	SS-07 (1)	SS-08 (2)	SS-12	SS-09	SS-10	SS-11	FB-1219
***** INORGANICS (ppm) *****							
SILVER.....							
ALUMINUM.....	4160	3430	2420	6120	6350	6570	
ARSENIC.....	3.5	2.2 B	2 B	5.6	4	4.4	
BARIUM.....	17 B	19.4 B	14 B	22.7 B	28.4 B	21.9 B	
BERYLLIUM.....			0.32 B	0.31 B	0.43 B	0.5 B	
CALCIUM.....	1090 B	859 B	628 B	1090 B	1220 B	1100 B	
CADMIUM.....							
COBALT.....	2.7 B	2.4 B	1.8 B	4.2 B	4 B	4.5 B	
CHROMIUM.....	8.7	5.8	4.3	10.3	10	8.5	
COPPER.....	8.4	9.8	6.9	9.7	13.4	11.4	
IRON.....	6760	6160	4470	9670	9470	10100	
MERCURY.....		0.08 B	0.07 B	0.07 B	0.09 B		
POTASSIUM.....	273 B	433 B	373 B	290 B	411 B		
MAGNESIUM.....	783 B	932 B	717 B	886 B	1010 B	945 B	
MANGANESE.....	143	166	117	189	197	201	
SODIUM.....							
NICKEL.....				8.6 B	6.2 B	5.1 B	
LEAD.....	22.2	27.5	26	32.4	38.7	20.6	
ANTIMONY.....							
SELENIUM.....							
THALLIUM.....							
VANADIUM.....	6.2 B	5.3 B	4.6 B	9.1 B	9.8 B	10.1 B	5.5 B
ZINC.....	36.1	38.1	26.6	34.9	46.5	35.3	

Note: (1) SS-07 was collected from the same location as SS-02.
 (2) SS-12 is a duplicate sample of SS-8.
 B = Indicates that the reported value is less than the CRDL

TABLE 2

SITE 09 - OLD FIRE FIGHTING TRAINING AREA
SURFACE SOIL SAMPLE RESULTS COMPARISON

SAMPLE IDENTIFICATION:	TRC	EPA/CDM	TRC
	SS-02	SS-02	SS-07 *
DATE COLLECTED:	4/25/90	4/25/90	12/21/91
***** INORGANICS (ppm) *****			
SILVER.....	0.68 J	2.3	
ALUMINUM.....	6080	13500	4160
ARSENIC.....	5.1 J	20.9 J	3.5
BARIUM.....	18.7	152	17 B
BERYLLIUM.....		0.2 UJ	
CALCIUM.....	673 B	3740 J	1090 B
CADMIUM.....			
COBALT.....	5.7 B	23.4	2.7 B
CHROMIUM.....	6.8	108 J	8.7
COPPER.....	11.2	813 J	8.4
IRON.....	10100	57500 J	6760
MERCURY.....		0.1 UJ	
POTASSIUM.....	229 B	403	273 B
MAGNESIUM.....	917 B	4510	783 B
MANGANESE.....	174	731	143
SODIUM.....	49 B	131	
NICKEL.....	5.4 B	119 J	
LEAD.....	19	648 J	22.2
ANTIMONY.....		53.4 J	
SELENIUM.....		0.7 UJ	
THALLIUM.....			
VANADIUM.....	9.8 B	141 J	6.2 B
ZINC.....	26.2	2210 J	36.1

Note: * SS-07 was collected from the same location as SS-02.
 B = Indicates that the reported value is less than the CRDL but greater than the IDL.
 J = Quantitation is approximate due to limitations identified in the quality control review.
 UJ= Quantitation is approximate due to limitations identified in the quality control review.

ATTACHMENTS

ATTACHMENT A

- LABORATORY DATA REPORT FORMS -

U.S. EPA - CLP

EPA SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

FFSS2425

Lab Name: WESTON-LIONVILLE

Contract: 68-W8-0057

Lab Code: WESTON

Case No.: TRC

SAS No.:

SDG No.: CLP166

Matrix (soil/water): SOIL

Lab Sample ID: 9004L166-005

Level (low/med): LOW

Date Received: 04/26/90

% Solids: 81.2

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6080	-		P
7440-36-0	Antimony	4.8	U		P
7440-38-2	Arsenic	5.1		NS	F
7440-39-3	Barium	18.7	B		P
7440-41-7	Beryllium	0.22	U		P
7440-43-9	Cadmium	0.66	U		P
7440-70-2	Calcium	673	B		P
7440-47-3	Chromium	6.8			P
7440-48-4	Cobalt	5.7	B		P
7440-50-8	Copper	11.2			P
7439-89-6	Iron	10100			P
7439-92-1	Lead	19.0			F
7439-95-4	Magnesium	917	B		P
7439-96-5	Manganese	174			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	5.4	B		P
7440-09-7	Potassium	229	B		P
7782-49-2	Selenium	0.37	U		F
7440-22-4	Silver	0.68	B		P
7440-23-5	Sodium	49.0	B		P
7440-28-0	Thallium	0.74	U	NW	F
7440-62-2	Vanadium	9.8	B		P
7440-66-6	Zinc	26.2			P
	Cyanide	0.62	U		C

J
J
UJ

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

FF-SS7

Lab Name: ROY F. WESTON, INC - L372 Contract: 2724-03-01

Lab Code: WESTON Case No.: TRC SAS No.: SDG No.: CLP853

Matrix (soil/water): SOIL Lab Sample ID: 911285301

Level (low/med): LOW Date Received: 12/21/91

% Solids: 74.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4160.00	-	E	P
7440-36-0	Antimony	6.15	U	N	P
7440-38-2	Arsenic	3.50		N	F
7440-39-3	Barium	17.00	B		P
7440-41-7	Beryllium	.27	U		P
7440-43-9	Cadmium	.80	U		P
7440-70-2	Calcium	1090.00	B		P
7440-47-3	Chromium	8.70			P
7440-48-4	Cobalt	2.70	B		P
7440-50-8	Copper	8.40			P
7439-89-6	Iron	6760.00		E	P
7439-92-1	Lead	22.20			F
7439-95-4	Magnesium	783.00	B		P
7439-96-5	Manganese	143.00		E	P
7439-97-6	Mercury	.07	U		CV
7440-02-0	Nickel	4.82	U		P
7440-09-7	Potassium	273.00	B		P
7782-49-2	Selenium	.54	U	NW	F
7440-22-4	Silver	1.07	U		P
7440-23-5	Sodium	171.00	U		P
7440-28-0	Thallium	.54	U	W	F
7440-62-2	Vanadium	6.20	B		P
7440-66-6	Zinc	36.10			P
	Cyanide				NR

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

FF-SS8

Lab Nam : ROY F. WESTON, INC - L372 Contract: 2724-03-01

Lab Code: WESTON Case No.: TRC SAS No.: SDG No.: CLP853

Matrix (soil/water): SOIL Lab Sample ID: 911285302

Level (low/med): LOW Date Received: 12/21/91

% Solids: 76.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3430.00	-	E	P
7440-36-0	Antimony	5.82	U	N	P
7440-38-2	Arsenic	2.20	B	N	F
7440-39-3	Barium	19.40	B		P
7440-41-7	Beryllium	.25	U		P
7440-43-9	Cadmium	.76	U		P
7440-70-2	Calcium	859.00	B		P
7440-47-3	Chromium	5.80			P
7440-48-4	Cobalt	2.40	B		P
7440-50-8	Copper	9.80			P
7439-89-6	Iron	6160.00		E	P
7439-92-1	Lead	27.50			F
7439-95-4	Magnesium	932.00	B		P
7439-96-5	Manganese	166.00		E	P
7439-97-6	Mercury	.08	B		CV
7440-02-0	Nickel	4.56	U		P
7440-09-7	Potassium	433.00	B		P
7782-49-2	Selenium	.50	U	NW	F
7440-22-4	Silver	1.03	U		P
7440-23-5	Sodium	161.00	U		P
7440-28-0	Thallium	.50	U	W	F
7440-62-2	Vanadium	5.30	B		P
7440-66-6	Zinc	38.10			P
	Cyanide				NR

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

FF-SS9

Lab Name: ROY F. WESTON, INC - L372 Contract: 2724-03-01

Lab Code: WESTON Case No.: TRC SAS No.: SDG No.: CLP853

Matrix (soil/water): SOIL Lab Sample ID: 911285303

Level (low/med): LOW Date Received: 12/21/91

% Solids: 80.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6120.00	-	E	P
7440-36-0	Antimony	5.46	U	N	P
7440-38-2	Arsenic	5.60		N	F
7440-39-3	Barium	22.70	B		P
7440-41-7	Beryllium	.31	B		P
7440-43-9	Cadmium	.71	U		P
7440-70-2	Calcium	1090.00	B		P
7440-47-3	Chromium	10.30			P
7440-48-4	Cobalt	4.20	B		P
7440-50-8	Copper	9.70			P
7439-89-6	Iron	9670.00		E	P
7439-92-1	Lead	32.40			F
7439-95-4	Magnesium	886.00	B		P
7439-96-5	Manganese	189.00		E	P
7439-97-6	Mercury	.07	B		CV
7440-02-0	Nickel	8.60	B		P
7440-09-7	Potassium	290.00	B		P
7782-49-2	Selenium	.47	U	NW	F
7440-22-4	Silver	.94	U		P
7440-23-5	Sodium	151.00	U		P
7440-28-0	Thallium	.47	U	W	F
7440-62-2	Vanadium	9.10	B		P
7440-66-6	Zinc	34.90			P
	Cyanide				NR

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

SS10

Lab Name: ROY F. WESTON, INC - L372 Contract: 2724-03-01

Lab Code: WESTON Case No.: TRC SAS No.: SDG No.: CLP853

Matrix (soil/water): SOIL Lab Sample ID: 911285304

Level (low/med): LOW Date Received: 12/21/91

% Solids: 72.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6350.00		E	P
7440-36-0	Antimony	6.19	U	N	P
7440-38-2	Arsenic	4.00		N	F
7440-39-3	Barium	28.40	B		P
7440-41-7	Beryllium	.43	B		P
7440-43-9	Cadmium	.81	U		P
7440-70-2	Calcium	1220.00	B		P
7440-47-3	Chromium	10.00			P
7440-48-4	Cobalt	4.00	B		P
7440-50-8	Copper	13.40			P
7439-89-6	Iron	9470.00		E	P
7439-92-1	Lead	38.70			F
7439-95-4	Magnesium	1010.00	B		P
7439-96-5	Manganese	197.00		E	P
7439-97-6	Mercury	.09	B		CV
7440-02-0	Nickel	6.20	B		P
7440-09-7	Potassium	411.00	B		P
7782-49-2	Selenium	.54	U	NW	F
7440-22-4	Silver	1.05	U		P
7440-23-5	Sodium	172.00	U		P
7440-28-0	Thallium	.54	U	W	F
7440-62-2	Vanadium	9.80	B		P
7440-66-6	Zinc	46.50			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE
 Color After: BROWN Clarity After: Artifacts:
 Comments:

1
INORGANIC ANALYSIS DATA SHEET

SS11

Lab Name: ROY F. WESTON, INC - L372 Contract: 2724-03-01

Lab Code: WESTON Case No.: TRC SAS No.: SDG No.: CLP853

Matrix (soil/water): SOIL Lab Sample ID: 911285305

Level (low/med): LOW Date Received: 12/21/91

% Solids: 73.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6570.00	-	E	P
7440-36-0	Antimony	6.02	U	N	P
7440-38-2	Arsenic	4.40		N	F
7440-39-3	Barium	21.90	B		P
7440-41-7	Beryllium	.50	B		P
7440-43-9	Cadmium	.79	U		P
7440-70-2	Calcium	1100.00	B		P
7440-47-3	Chromium	8.50			P
7440-48-4	Cobalt	4.50	B		P
7440-50-8	Copper	11.40			P
7439-89-6	Iron	10100.00		E	P
7439-92-1	Lead	20.60			F
7439-95-4	Magnesium	945.00	B		P
7439-96-5	Manganese	201.00		E	P
7439-97-6	Mercury	.07	U		CV
7440-02-0	Nickel	5.10	B		P
7440-09-7	Potassium	192.00	U		P
7782-49-2	Selenium	.52	U	NW	F
7440-22-4	Silver	1.04	U		P
7440-23-5	Sodium	167.00	U		P
7440-28-0	Thallium	.52	U	W	F
7440-62-2	Vanadium	10.10	B		P
7440-66-6	Zinc	35.30			P
	Cyanide				NR

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

SS12

Lab Name: ROY F. WESTON, INC - L372 Contract: 2724-03-01

Lab Code: WESTON Case No.: TRC SAS No.: SDG No.: CLP853

Matrix (soil/water): SOIL Lab Sample ID: 911285306

Level (low/med): LOW Date Received: 12/21/91

% Solids: 76.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2420.00		E	P
7440-36-0	Antimony	5.69	U	N	P
7440-38-2	Arsenic	2.00	B	N	F
7440-39-3	Barium	14.00	B		P
7440-41-7	Beryllium	.32	B		P
7440-43-9	Cadmium	.74	U		P
7440-70-2	Calcium	628.00	B		P
7440-47-3	Chromium	4.30			P
7440-48-4	Cobalt	1.80	B		P
7440-50-8	Copper	6.90			P
7439-89-6	Iron	4470.00		E	P
7439-92-1	Lead	26.00			F
7439-95-4	Magnesium	717.00	B		P
7439-96-5	Manganese	117.00		E	P
7439-97-6	Mercury	.07	B		CV
7440-02-0	Nickel	4.45	U		P
7440-09-7	Potassium	373.00	B		P
7782-49-2	Selenium	.50	U	NW	F
7440-22-4	Silver	.97	U		P
7440-23-5	Sodium	158.00	U		P
7440-28-0	Thallium	.50	U	W	F
7440-62-2	Vanadium	4.60	B		P
7440-66-6	Zinc	26.60			P
	Cyanide				NR

Color Before: BROWN

Clarity Before:

Texture: FINE

Color After: BROWN

Clarity After:

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

FB1219

Lab Nam : ROY F. WESTON, INC - L372 Contract: 2724-03-01

Lab Code: WESTON Case No.: TRC SAS No.: SDG No.: CLP853

Matrix (soil/water): WATER Lab Sample ID: 911285307

Level (low/med): LOW Date Received: 12/21/91

% 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	150.00	U		P
7440-36-0	Antimony	23.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	38.00	U		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	88.00	U		P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	5.00	U		P
7440-50-8	Copper	6.00	U		P
7439-89-6	Iron	39.00	U		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	78.00	U		P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	18.00	U		P
7440-09-7	Potassium	734.00	U		P
7782-49-2	Selenium	2.00	U		F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	638.00	U		P
7440-28-0	Thallium	2.00	U		F
7440-62-2	Vanadium	5.50	B		P
7440-66-6	Zinc	4.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

ATTACHMENT B

- QUALITY ASSURANCE REVIEW NARRATIVE -

Environmental Standards, Inc.

Specializing in Environmental Remediation and D... ..

1200 Valley Forge Road
Valley Forge, PA 19481

QUALITY ASSURANCE REVIEW

THE NETC, NEWPORT, RI PROJECT

MELVILLE NORTH LANDFILL

AND

FIREFIGHTER TRAINING CENTER

September 25, 1990

Prepared for:

TRC ENVIRONMENTAL CONSULTANTS
800 Connecticut Blvd.
East Hartford, CT 06108

Prepared by:

ENVIRONMENTAL STANDARDS, INC.
1220 Valley Forge Road
P.O. Box 911
Valley Forge, PA 19481

TABLE 1

SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW

<u>Sample</u>	<u>Analyses Performed</u>
MNMW5123	TAL Inorganics
MNMW5123 (Dup)	TAL Inorganics
MNMW5123 (MS)	TAL Inorganics
FFMW2123	TAL Inorganics
FFMW2223	TAL Inorganics
FFSS2425	TAL Inorganics
FFSS2425 (Dup)	TAL Inorganics
FFSS2425 (MS)	TAL Inorganics

Section 1 Quality Assurance Review

A. Inorganic Data

The inorganic analysis of 8 soil samples was performed by Weston Analytics of Lionville, Pennsylvania. These samples were collectively analyzed for cyanide and total metals in accordance with U.S. EPA Contract Laboratory Program (CLP) protocols. The samples analyzed are listed in Table 1.

The findings in this report are based upon a rigorous review of holding times, blank analysis results, pre- and post-digestion spike recoveries, laboratory duplicate analyses, quantitation of positive results, instrument sensitivity, calibrations, ICP interference checks, serial dilutions, laboratory control standard recoveries, graphite furnace QC, and adherence to the protocol and requirements specified in the CLP.

Overall, the data quality for the package was fair. All analytical requirements specified were met with the exception of the following deficiencies, which were noted during review of the data. It should be emphasized that the following items are contractual in nature and do not necessarily affect data usability. Data usability is addressed separately.

Correctable Deficiencies

1. The laboratory did not put TRC sample identification numbers in the raw data as required.
2. The laboratory did not report the solid quality control limits for the LCS (Form VII).
3. The quarterly instrument detection limit determination interelement correction determination for ICP analyses and the linear range analysis was exceeded.
4. The laboratory did not include the raw data for the selenium analysis associated with samples MNMW5123, FFMW2123 and FFMW2223.
5. The Chain-of-Custodies associated with sample FFSS2425 was incomplete due to poor photocopying.
6. The laboratory incorrectly flagged the result for thallium in sample MNMW5123 with a "W" qualifier. The post-digestion spike recovery for this analyte was within the 85-115% quality control limits.
7. The laboratory incorrectly flagged the results for antimony, lead and manganese in sample FFSS2425 with an "N" qualifier. The pre-digestion matrix spike recoveries for these analytes were in the pre-digestion matrix spike of the aforementioned sample were within the 75-125% quality control limits.

8. The laboratory incorrectly flagged the results for aluminum, chromium, iron, nickel, silver and zinc in sample FFSS2425 with an "*" qualifier. The results for the laboratory duplicate for all of these analytes were within the relative percent difference (<35%) quality control limits.
9. The laboratory did not report the preparation blank in mg/kg as required for solid samples.

Noncorrectable Deficiency

The laboratory did not perform a matrix spike for cyanide as required (SOW 788, E-9).

With respect to data usability, principal areas of concern include blank contamination, pre- and post-digestion matrix spike recoveries, ICP interferences and laboratory duplicate results. Based upon a rigorous review of the data provided, the following data qualifiers are offered.

Inorganic Data Qualifiers

- Due to the low-level presence of antimony in a continuing calibration blank (CCB), the positive results for antimony in samples FFMW2123 and FFMW2223 should be considered "not detected" and have been flagged "U" on the qualified Form I's.
- Due to high pre-digestion matrix spike recoveries ($\geq 125\%$) the results for arsenic in all samples and lead in all samples except FFSS2425 should be considered estimated and have been flagged "J" on the qualified Form I's.
- Due to low pre-digestion matrix spike recoveries (30-75%), the reported results for manganese in samples MNMW5123, FFMW2123 and FFMW2223, and for silver in sample FFSS2425 should be considered estimated and have been flagged "J" on the qualified Form I's. Similarly, the actual detection limits for antimony in sample MNMW5123, silver in samples FFMW2123 and FFMW2223 and for thallium in all samples, may be higher than reported and have been flagged "UJ" on the qualified Form I's.
- The reported results for aluminum, chromium, iron, magnesium, nickel and zinc in samples MNMW5123, FFMW2123 and FFMW2223 should be considered estimated and have been flagged "J" on the qualified Form I's. High percent differences were obtained for these analytes in the laboratory duplicate analysis.
- The reported results for selenium in samples FFMW2123 and FFMW2223 should be considered estimated and have been flagged "J" on the qualified Form I's. Low post-digestion spike

recoveries were observed for s l nium in the aforem ntion d samples. Similarly, the actual d t ction limits for sel nium in sample MNMW5123 may be higher than reported and have been flagged "UJ" on the qualified Form I's.

- Due to ICP interferences, the results for cobalt, copper and vanadium in samples MNMW5123, FFMW2123 and FFMW2223, should be considered estimated and have been flagged "J" on the qualified Form I's. The instrument level concentration of iron in the aforementioned samples was greater than 50% of the ICP interference check solution. In addition, the interferences for these analytes were greater than the absolute value of two-times the instrument detection limit (IDL).
- The reviewer could not verify the reported results for selenium in samples MNMW5123, FFMW2123 and FFMW2223 as the raw data was not present in the data package.

A complete support documentation of this inorganic quality assurance review is presented in Section 3 of this report.

C. Conclusions

This quality assurance review has identified several aspects of the analytical data that have required qualification. A fair portion of the inorganic data should be considered estimated due to the results of the various quality control samples. To confidently use any of the analytical data within this sample set, the data user should understand the qualifications and limitations stated in this report. The recommendation summary is presented in Table 2.

Report prepared by:

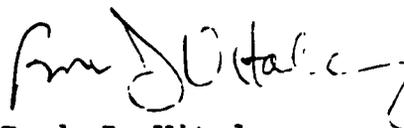


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TABLE 2

DATA RECOMMENDATION SUMMARY

<u>Sample</u>	<u>Metals</u>	<u>Cyanide</u>
MNMW5123	J	A ¹
FFMW2123	J	A ¹
FFMW2223	J	A ¹
FFSS2425	A ²	A ¹

-
- A¹ Accept all data; however a matrix spike was not performed for cyanide.
- A² Accept data, except for estimate (UJ) non-detects for thallium and estimate (J) the results for silver and arsenic due to matrix spike recoveries being out of control limits.
- J Estimate (J) the majority of positive results due to matrix spikes being out of control limits, ICP interferences and high relative percent differences for the laboratory duplicate analysis. Also, estimate (UJ) the majority of the non-detects due to low matrix spike recoveries.