ORIGINAL (Red)

116519

QUALITY ASSURANCE SUMMARY REPORT AND DATA VALIDATION

RESAMPLING FOR LEAD
PHEASANT HILL SUPPLY WELL

Prepared for
Novak RI/FS PRP Group
South Whitehall Township, Pennsylvania

January 1991

Geraghty & Miller, Inc.
Environmental Services
990 Vincent Avenue
Hackensack, New Jersey 07601

GERAGHTY & MILLER, INC.
Environmental Services

ORIGINAL (RED)

Ground Water *Engineering* *Hydrocarbon* *Remediation* *Education*

January 16, 1991

Ms. Lisa Nichols
Remedial Project Manager
United States Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Re: Analytical Results for Lead in the Pheasant Hill Supply Well;
Novak Sanitary Landfill RI

Dear Ms. Nichols:

As requested by Mr. Mark Travers of de maximis, inc., we are enclosing seven copies (six bound, one unbound) of the Quality Assurance Summary Report and Data Validation packages for lead analyses of the follow-up samples collected from the Pheasant Hill private community supply well. As you are aware, this well was resampled due to the measurement of an estimated lead concentration of 66.0 ug/L in the initial March 15, 1990 remedial investigation (RI) sample (NSL-RW-11-01). Previous testing of the Pheasant Hill well by the owner's consultant had not shown an unacceptable level of lead, and the presence of elevated lead concentrations in the aquifer was not supported by the remainder of the RI data base for the twelve monitoring wells and ten other nearby residential/township supply wells. Thus, the initial lead result for the Pheasant Hill well was considered highly questionable.

The Pheasant Hill well was resampled for lead on September 13, 1990 (NSL-RW-11-02) and on November 12, 1990 (NSL-RW-11-04). Lead concentrations of 9.6 ug/L and 10.0 ug/L, respectively were detected in these two samples. The validated results are considered acceptable and useful for all purposes.

Sincerely,

GERAGHTY & MILLER, INC.

Jaclyn A. Baron
Associate/Project Manager

JAB:es
enclosures

cc: M. Travers, de maximis (enclosure)
L. Diamond, Hannoch Weisman

NJ06401\011491

Quality Assurance Summary Report and Data Validation
Resampling for Lead
Pheasant Hill Supply Well

TABLE OF CONTENTS

GERAGHTY & MILLER, INC.

January 2, 1991

MEMORANDUM

TO: Jackie Baron

FROM: Warren Ankerberg

RE: Data Validation Report for Lead Analysis on Private Well Water-Novak Site - Project No. NJ06401 - NET (Cambridge) - Work Order No. 9009187

One ground-water sample was collected September 13, 1990, given the identification of NSL-RW-11-02, and submitted to Net Atlantic, Inc., Cambridge Division for analysis of total lead by EPA Method 239.2 (AA furnace). The above-referenced data package was submitted for validation review December 15, 1990.

The review of the data in this package has revealed the following:

1. Field Data: No field data was provided to support the data collection efforts. No evaluation of the sample representativeness may be inferred from this report by itself.

2. Chain-of-Custody - Acceptable

3. Laboratory Data -

a.	Method: AA furnace (239.2)	Acceptable
b.	Calibration: Four points	Acceptable
c.	Initial Calibration Verification (ICVS):	Acceptable
d.	Continuing Calibration Verification (CCVS):	Acceptable
e.	CRDL Standard: 99%R	Acceptable
f.	Calibration Blanks: All BDL	Acceptable
g.	Method Preparation Blank: BDL	Acceptable
h.	Spike Sample Result: 115.5%	Acceptable
i.	Lab Control Sample: 97.5%R	Acceptable
j.	Duplicate: 7.0 RPD	Acceptable
k.	Detection Limits: 3.0 IDL	Acceptable
l.	Post Digestion Analytical Spike: 96.5%R	Acceptable
m.	% RSD on Dual Injections: <20%	Acceptable

Based on the above analytical data, the results may be considered acceptable and valid for all purposes.

Attachments: Data Package

143\novakdv2.net

ORIGINAL
(Red)

AR304200

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730
Tel: (617) 275-3535
Fax: (617) 275-7411

(Formerly Cambridge Analytical Associates, Inc.)

September 27, 1990

Ms. Jackie Baron
Geraghty & Miller, Inc.
290 Vincent Avenue
Hackensack, NJ 07601

Re: Lead Analysis on Private Well Water--Novak Site.

Dear Jackie:

Enclosed please find the data package for one sample analyzed for Lead following CLP procedures. This sample was collected by Geraghty & Miller on September 13, 1990 and logged in as NET work order 90-09-187. This is part of the Novak Residential Wells program with your Project Number NJ10901.

The data enclosed are the second digestion/analysis of this particular sample. The sample was received as a sample, duplicate and spike in three separate bottles. Originally the samples were digested as noted on the bottles (with the duplicate and spike from their own bottles). The data from these original analyses were inconsistant. We then took three aliqouts (for sample, duplicate and spike) from the "sample" bottle for reanalysis. The reanalysis data are reported in this package.

There were no other problems with these analyses. If you have any questions or require additional information, please feel free to call me.

Sincerely,

Edward A. Lawler
Project Manager

NC 1 - CAMBRIDGE DIVISION

Document Inventory:

Case: NOVAK - Private W

Project Number: 9009187 PUSH Pb only

CLP Data Manager: Tara M. Prendergast

Lead ONLY

Item	Page
Cover Page - Inorganic Analysis Data Package	1
Inorganic Analyses Data Sheet(s)	2
Q.C. Report - Initial and Continuing Calibration	2A
Q.C. Report - CRDL Standards	3
Q.C. Report - Blanks	4
Q.C. Report - ICP Interference Check Sample	NR
Q.C. Report - Spike Sample Recovery	5
Q.C. Report - Post Digest Spike Recovery	NR
Q.C. Report - Duplicates	6
Q.C. Report - Laboratory Control Standard	7
Q.C. Report - Standard Addition Results	NR
Q.C. Report - ICP Serial Dilution	NR
Q.C. Report - Holding Times	8
Q.C. Report - Instrument Detection Limits	9
Q.C. Report - Interelement Correction Factors	NR
Q.C. Report - ICP Linear Ranges	NR
Raw Data - ICP Listings	NR
Raw Data - Sb Worksheet(s)	NR
Raw Data - As Worksheet(s)	NR
Raw Data - Cd Worksheet(s)	NR
Raw Data - Pb Worksheet(s)	10
Raw Data - Se Worksheet(s)	NR
Raw Data - Tl Worksheet(s)	NR
Raw Data - Hg Worksheet(s)	NR
Raw Data - CN Worksheet(s)	NR
Raw Data - Sample Preparation Log(s)	19.
Raw Data - Working Standard Preparation Log(s)	23
Inorganics Traffic Report	

GERAGHTY & MILLER, INC.
Ground-Water Consultants

CHAIN-OF-CUSTODY RECORD

4009187

Page __ of 1

Project Number ~~NJ06401~~ NJ10901
Project Location So. Whitehall Pa.
Laboratory NET
Sampler(s) Bill Delaney

SAMPLE IDENTITY	Date Sampled	Pb Total 1 liter plastic HNO3 preserved										TOTAL
NSL-RW-11-02	9-13-90	4										4

Total No. of Bottles/ Containers: 4

Relinquished by: Bill Delaney	Organization: Geraghty and Miller	Date 9/13/90 Time 6:30	Seal Intact? (Yes) No N/A
Received by: [signature]	Organization: NET [illegible]	Date 9/14/90 Time 9:50	
Relinquished by:	Organization:	Date / / Time	Seal Intact? Yes No N/A
Received by:	Organization:	Date / / Time	

Special Instructions/Remarks:

NET

Delivery Method: ☐ In Person ☒ Common Carrier Fed EX (SPECIFY) ☐ Lab Courier ☐ Other ___ (SPECIFY)

AR904203

Cambridge Analytical Associates

Inorganic CLP SOW 7/87 Data Qualifiers

Form I-IN includes fields for three types of result qualifiers.

- C Qualifier - (concentration qualifier)

  " B " - If the reported value is less than the Contract Required Detection Limit (CRDL), but greater than the Instrument Detection Limit (IDL).

  " U " - Analyte was not detected. The result of the analyte is less than the Instrument Detection Limit (IDL).

- Q Qualifier -

  " E " - The reported value is estimated because of the presence of interference. If the 5-fold dilution analysis for one or more analytes is not within 10%, a chemical or physical interference effect must be suspected, and the data for all affected analytes in the samples received associated with that serial dilution must be flagged with an "E" on Form IX-IN and Form I-IN.

  " M " - Duplicate injection precision not met.

  " N " - Spike sample recovery not within control limits.

  " S " - The reported value was determined by the Method of Standard Addition (MSA)

  " W " - Postdigested spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

  " * " - Duplicate analysis not within control limits.

  " + " - Correlation coefficient for the MSA is less than 0.995.

- M (Method) Qualifier -

  " P " - for ICP

  " A " - for Flame AA

  " F " - for Furnace AA

  " CV "- for Manual Cold Vapor AA

  " C " - for Manual Spectrophotometric

  " NR "- if the analyte is not required to be analyzed

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVAK PROSAS No.: SDG No.: 2425CW

SOW No.: 7/87

EPA Sample No.	Lab Sample ID.
NSL-RW-11-02	09187-01S
NSL-RW-11-02D	09187-01S2
NSL-RW-11-02S	09187-01DS
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Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager: Claro M. Rouchugoo for P. Epelman

Date: 9/21/90

NET

U.S. EPA - CLP

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

1102
NSL-RW-11-02

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVA PROSAS No.: SDG No.: 24250U

Matrix (soil/water): WATER Lab Sample ID: 09187-01S

Level (low/med): LOW Date Received: 09/14/90

% 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				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	9.6			F
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOV4W PROSAS No.: SDG No.: 24C5CU

Initial Calibration Source: EPALV

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	97.5	99.95	102.5	100.0	101.00	101.0			F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVAK PROJAS No.: SDG No.: 24250

AA CRDL Standard Source: CONTRACTOR

ICP CRDL Standard Source:

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	5.0	4.95	99.0					
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

4

3
BLANKS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVAK SAS No.: SDG No.: 0405CU

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	3.0	U	3.0	U	~~3.0~~	~~U~~			3.0	U	F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

SP 7/24/90

NET

U.S. EPA - CLP

EA

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

11008
NSL-RW-11-02

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVA SAS No.: SDG No.: 24250W

Matrix (soil/water): WATER Level (low/med): LOW

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	C	M
Aluminum									NR
Antimony									NR
Arsenic									P
Barium									NR
Beryllium									NR
Cadmium									P
Calcium									NR
Chromium									P
Cobalt									NR
Copper									NR
Iron									NR
Lead	75-125	32.7500		9.6500		20.0	115.5		P
Magnesium									NR
Manganese									NR
Mercury									CV
Nickel									P
Potassium									NR
Selenium									P
Silver									P
Sodium									NR
Thallium									P
Vanadium									P
Zinc									P
Cyanide									NR

Comments:

FORM V (PART 1) - IN 7/87

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

11000R
NSL-RW-11-02

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVAM PROJAS No.: SDG No.: C42501

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								NR
Lead	5.0	9.6500		10.3500		7.0		F
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc								NR
Cyanide								NR

LABORATORY CONTROL SAMPLE

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVAY PROSAS No.: SDG No.: D4CE1J

Solid LCS Source:

Aqueous LCS Source: CAMBRG

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20.0	19.50	97.5						
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

U.S. EPA - CLP

HOLDING TIMES

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVAK PROSAS No.: SDG No.: 24050U

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
1102	WATER	09/14/90				
[illegible]	WATER	09/14/90				
[illegible]	WATER	09/14/90				

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVA PROJAS No.: SDG No.: 2425CW

ICP ID Number: Date: 1/90

Flame AA ID Number:

Furnace AA ID Number: PB

Analyte	Wavelength (nm)	Background	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		
Antimony			60		
Arsenic			10		
Barium			200		
Beryllium			5		
Cadmium			5		
Calcium			5000		
Chromium			10		
Cobalt			50		
Copper			25		
Iron			100		
Lead	283.30		5	3.0	F
Magnesium			5000		
Manganese			15		
Mercury			0.2		
Nickel			40		
Potassium			5000		
Selenium			5		
Silver			5		
Sodium			5000		
Thallium			10		
Vanadium			50		
Zinc			20		

Comments:

PB: Perkin-Elmer 2380 AA (Furnace) (B)

GRAPHITE FURNACE ANALYTICAL RECORD Case # _____

1. Element Lead
2. Date 9/24/90
3. Calibration Standard Information
   - Preparation Date 9/24/90
   - Matrix HNO3
   - Standard Log Reference Stock 4
4. Instrument Calibration
   - Auto-Zero (A/Z) 0.00 ppb
   - Standard 1 (S1) 5.00 ppb
   - Standard 2 (S2) 100.00 ppb
   - Standard 3 (S3) 200.00 ppb
5. Sample Volume (ul) 20 ul
6. Integration Time 10.0 sec
7. Instrument Code PB
8. Background Correction D2

C L P M E T A L S 2.20c

clp pb

Run id: PB 9026701
Perkin-Elmer 2380 AA (Furnace) (B)

Acquired: 09/24/90 by MK
Crunched: 09/24/90 by MWF
Time: 1609
Processing protocol: 7/87

Element: Pb

Pos	Sample	Code	Prep Batch	Dil	M	Solution measured	Final Conc'n	Units	Flags
1	0.00 PPB	WS0		1.00		0.0000	0.0000	ug/L	#
2	5.00 PPB	WS1		1.00		0.0000	0.0000	ug/L	#
3	100.00 PPB	WS2		1.00		0.0000	0.0000	ug/L	#
4	200.00 PPB	WS3		1.00		0.0000	0.0000	ug/L	#
5	ICV-4	ICV		1.00		99.9500	99.9500	ug/L	
6	CAL BLK	ICB		1.00		-0.0500	3.0000	ug/L	U
7	5.00 PPB	CRA0		1.00		4.9500	4.9500	ug/L	B
8	PBW	PBW	2425CW	1.00	W	1.7000	3.0000	ug/L	U
9	PBW	ASPBW	2425CW	1.00	W	11.0500	11.0500	ug/L	
10	LCSHNO3	LCSW	2425CW	1.00	W	19.5000	19.5000	ug/L	
11	LCSHNO3	ASLCSW	2425CW	1.00	W	30.5000	30.5000	ug/L	
12	9009187-01	S	2425CW	1.00	W	9.6500	9.6500	ug/L	
13	9009187-01	AS	2425CW	1.00	W	19.3000	19.3000	ug/L	
14	9009187-01	S2	2425CW	1.00	W	10.3500	10.3500	ug/L	
15	9009187-01	AS2	2425CW	1.00	W	20.7000	20.7000	ug/L	
16	9009187-01	DS	2425CW	1.00	W	32.7500	32.7500	ug/L	
17	100.00 PPB	CCV		1.00		101.0000	101.0000	ug/L	
18	CAL BLK	CCB		1.00		-0.5000	3.0000	ug/L	U

C L P M E T A L S 2.20c

clp pb

Run id: PB 9026701
Perkin-Elmer 2380 AA (Furnace) (B)

Element: Pb

Acquired: 09/24/90 by MWF
Crunched: 09/24/90 by MWF
Time: 1609
Processing protocol: 7/87

INSTRUMENT RUN QC REPORT

CALIBRATION VERIFICATIONS

Position	Sample ID	Code	True Value	Found Value	% Recovery	
5	ICV-4	ICV	97.5000	99.9500	102.5	
17	100.00 PPB	CCV	100.0000	101.0000	101.0	

CALIBRATION BLANKS

Position	Sample ID	Code	CRDL	Found Value	Flag
6	CAL BLK	ICB	5.0000	3.0000	U
18	CAL BLK	CCB	5.0000	3.0000	U

CRDL STANDARDS

Position	Sample ID	Code	True Value	Found Value	% Recovery	
7	5.00 PPB	CRA0	5.0000	4.9500	99.0	B

C L P M E T A L S 2.20c

clp pb

Run id: PB 9026701
Perkin-Elmer 2380 AA (Furnace) (B)

Element: Pb

Acquired: 09/24/90 by MWr
Crunched: 09/24/90 by MWF
Time: 1609
Processing protocol: 7/87

CRDL: 5.00 IDL: 3.00
Analytical spike: 2CRDL at dilution 1.0: true value 10.00 ppb.

Calibration points

0.00 PPB	0.0000
5.00 PPB	0.0000
100.00 PPB	0.0000
200.00 PPB	0.0000

High std = 200.000000
Regression will not be performed.

Pos	Sample ID	Code	Burn 1	Burn 2	Mean	%RSD
1	0.00 PPB	WS0			0.0000	0.0 #
2	5.00 PPB	WS1			0.0000	0.0 #
3	100.00 PPB	WS2			0.0000	0.0 #
4	200.00 PPB	WS3			0.0000	0.
5	ICV-4	ICV	95.9	104.0	99.9500	5.7
6	CAL BLK	ICB	0.2	-0.3	-0.0500	0.0 U
7	5.00 PPB	CRA0	5.4	4.5	4.9500	0.0 B
8	PBW	PBW	2.2	1.2	1.7000	0.0 U
9	PBW	ASPBW	11.3	10.8	11.0500	3.2
10	LCSHNO3	LCSW	19.5	19.5	19.5000	0.0
11	LCSHNO3	ASLCSW	30.4	30.6	30.5000	0.5
12	9009187-01	S	9.6	9.7	9.6500	0.7
13	9009187-01	AS	19.6	19.0	19.3000	2.2
14	9009187-01	S2	10.6	10.1	10.3500	3.4
15	9009187-01	ASS2	20.9	20.5	20.7000	1.4
16	9009187-01	DS	33.2	32.3	32.7500	1.9
17	100.00 PPB	CCV	102.1	99.9	101.0000	1.5
18	CAL BLK	CCB	-0.5	-0.0	-0.5000	0.0 U

C L P M E T A L S 2.20c

clp pb

Run id: PB 9026701
Perkin-Elmer 2380 AA (Furnace) (B)

Element: Pb

Acquired: 09/24/90 by MW
Crunched: 09/24/90 by MWF
Time: 1609
Processing protocol: 7/87

Pos	Sample	Code	Preparation Method	Client ID	Date	Time
1	0.00 PPB	WS0		S0	09/24/90	14:05
2	5.00 PPB	WS1		S5.00	09/24/90	14:07
3	100.00 PPB	WS2		S100.00	09/24/90	14:10
4	200.00 PPB	WS3		S200.00	09/24/90	14:12
5	ICV-4	ICV		ICV	09/24/90	14:17
6	CAL BLK	ICB		ICB	09/24/90	14:22
7	5.00 PPB	CRA0		CRA	09/24/90	14:26
8	PBW	PBW	HNO3	PBW	09/24/90	14:31
9	PBW	ASPBW	HNO3	PBWA	09/24/90	14:36
10	LCSHNO3	LCSW	HNO3	LCSW	09/24/90	14:40
11	LCSHNO3	ASLCSW	HNO3	LCSWA	09/24/90	14:45
12	9009187-01	S	HNO3	1102	09/24/90	14:50
13	9009187-01	AS	HNO3	1102A	09/24/90	14:54
14	9009187-01	S2	HNO3	1102D	09/24/90	14:59
15	9009187-01	ASS2	HNO3	1102DA	09/24/90	15:[illegible]
16	9009187-01	DS	HNO3	1102S	09/24/90	15:[illegible]
17	100.00 PPB	CCV		CCV	09/24/90	15:29
18	CAL BLK	CCB		CCB	09/24/90	15:34

Concentrations

15

S	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
	0.00 PPB	WS0		1.00x	09/24/90	14:05
			Pb			
	Burn 1		0.00			
	Sample value		3.00U			
2	5.00 PPB	WS1		1.00x	09/24/90	14:07
			Pb			
	Burn 1		0.04			
	Sample value		3.00U			
3	100.00 PPB	WS2		1.00x	09/24/90	14:10
			Pb			
	Burn 1		60.40			
	Sample value		60.40			
4	200.00 PPB	WS3		1.00x	09/24/90	14:12
			Pb			
	Burn 1		256.10			
	Sample value		256.10			
5	ICV-4	ICV		1.00x	09/24/90	14:17
			Pb			
	Burn 1		95.90			
	Burn 2		104.00			
	Mean		99.95			
	RSD		5.73			
	Sample value		99.95			
6	CAL BLK	ICB		1.00x	09/24/90	14:22
			Pb			
	Burn 1		0.20			
	Burn 2		-0.30			
	Mean		-0.05			
	RSD		707.11			
	Sample value		3.00U			
7	5.00 PPB	CRA0		1.00x	09/24/90	14:26
			Pb			
	Burn 1		5.40			
	Burn 2		4.50			
	Mean		4.95			
	RSD		12.86			
	Sample value		4.95			

Concentrations

ons	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
8	PBW	PBW		1.00x	09/24/90	14:31

	Pb
Burn 1	2.20
Burn 2	1.20
Mean	1.70
RSD	41.59
Sample value	3.00U

9	PBW	ASPBW		1.00x	09/24/90	14:36

	Pb
Burn 1	11.30
Burn 2	10.80
Mean	11.05
RSD	3.20
Sample value	11.05
Spike added	10.00
Spike recovery, %	110.50

10	LCSHNO3	LCSW		1.00x	09/24/90	14:40

	Pb
Burn 1	19.50
Burn 2	19.50
Mean	19.50
RSD	0.00
Sample value	19.50

11	LCSHNO3	ASLCSW		1.00x	09/24/90	14:45

	Pb
Burn 1	30.40
Burn 2	30.60
Mean	30.50
RSD	0.46
Sample value	30.50
Spike added	10.00
Spike recovery, %	110.00

12	9009187-01	S		1.00x	09/24/90	14:50

	Pb
Burn 1	9.60
Burn 2	9.70
Mean	9.65
RSD	0.73
Sample value	9.65

13	-01	AS		1.00x	09/24/90	14:54

	Pb
Burn 1	19.60
Burn 2	19.00
Mean	19.30
RSD	2.20
Sample value	19.30
Spike added	10.00

96.5

19.3 - 9.65

Concentrations

S	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
14	-01	S2		1.00x	09/24/90	14:59

	Pb
Burn 1	10.60
Burn 2	10.10
Mean	10.35
RSD	3.42
Sample value	10.35

15	-01	ASS2		1.00x	09/24/90	15:04

	Pb
Burn 1	20.90
Burn 2	20.50
Mean	20.70
RSD	1.37
Sample value	20.70
Spike added	10.00
Spike recovery, %	103.50

16	-01	DS		1.00x	09/24/90	15:20

	Pb
Burn 1	33.20
Burn 2	32.30
Mean	32.75
RSD	1.94
Sample value	32.75

17	100.00 PPB	CCV		1.00x	09/24/90	15:29

	Pb
Burn 1	102.10
Burn 2	99.90
Mean	101.00
RSD	1.54
Sample value	101.00

18	CAL BLK	CCB		1.00x	09/24/90	15:34

	Pb
Burn 1	-0.50
Burn 2	0.00
Mean	-0.25
RSD	141.42
Sample value	3.00U

19	900848602	DS		1.00x	09/24/90	15:39

mw 9/24/90

	Pb
Burn 1	47.90
Burn 2	47.30
Mean	47.60
RSD	0.89
Sample value	47.60

18

Concentrations

S	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
	9008513-04 MWE 9/24/90	S		1.00x	09/24/90	15:43

	Pb
Burn 1	27.70
Burn 2	26.90
Mean	27.30
RSD	2.07
Sample value	27.30

21	-04	AS		1.00x	09/24/90	15:48

	Pb
Burn 1	38.60
Burn 2	38.10
Mean	38.35
RSD	0.92
Sample value	38.35
Spike added	10.00
Spike recovery, %	110.50

22	100.00 PPB	CCV		1.00x	09/24/90	15:53

	Pb
Burn 1	105.90
Burn 2	103.80
Mean	104.85
RSD	1.42
Sample value	104.85

23	CAL BLK	CCB		1.00x	09/24/90	15:57

	Pb
Burn 1	-0.20
Burn 2	-0.50
Mean	-0.35
RSD	60.61
Sample value	3.00U

NET

[illegible]

Identification			Digest [illegible]		Digest [illegible]		Digest [illegible]		Digest [illegible]	
[illegible]	Sample ID	Lab Code	Initial	Final	Initial	Final	Initial	Final	Initial	Final
	900515T-[illegible]	[illegible]	[illegible]	[illegible]						
	900515T-[illegible]	[illegible]	[illegible]	[illegible]						
	[illegible]	[illegible]	[illegible]	[illegible]						
	[illegible]	[illegible]	[illegible]	[illegible]						
	[illegible]	[illegible]	[illegible]	[illegible]						

NET

U.S. EPA - CLP

CP

CRDL STANDARD FOR AA AND ICP

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NOVA SAS No.: SDG No.: C4C5C1

AA CRDL Standard Source: CONTRACTOR

ICP CRDL Standard Source:

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	5.0	4.95	99.0					
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

NET

BLANKS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NONE SDGAS No.: SDG No.: 24250

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	3.0	U	3.0	U	[illegible]				3.0	U	P
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

9/26/90

SAMPLE PREPARATION REPORT [illegible]

[illegible] [illegible]

Page 2
Date: [illegible]
Accepted:

Sample identification				Digest. 1: HNO3			Digest. 2:			Digest. 3:			Digest. 4:		
Sample ID	Lab code	pH	pH(CN)	Date extr.	Anal.	Overall dilution	Date extr.	Anal.	Overall dilution	Date extr.	Anal.	Overall dilution	Date extr.	Anal.	Overall dilution
[illegible]	DS	2.0		09/18/90	TMS	[illegible]									
[illegible]	S	2.0		09/18/90	VB	1.00									
[illegible]	DS	2.0		09/18/90	TMS	1.00									
[illegible]	*LCS*			09/18/90	VB	1.00									
[illegible]	[illegible]			09/18/90	VB	1.00									

NET

AR304227

21

AQUEOUS DIGESTION LOG

NET

PAGE 25
SUPV. EDW

CLP or Comm

Anal. V A Anal. V A Anal.

CLIENT	NET-ID	FURN DATE 09/19/90 Initial Volume (ml)	FURN Final Volume (ml)	KAP DATE Initial Volume (ml)	KAP Final Volume (ml)	HG DATE Initial Volume (ml)	Ph
9009187							
GER-MIL-NJ	9009187-01	100	100				6.2 ✓
	-01DS -02B	↓					↓
	-0152-03S	100					
	LCSW	—					
	PBW	—	↓				↓
	PBW	—	100				✓

2425CW

PREP CH

AR304226

Method Reference EPA/CLP

Page 20
Analyst V. B.
Sup. [illegible]
Date 09119190

CLP Case No.	CAA Work Order/Sample	Color	Texture	Clarity	PH	Artifacts
BER-MIL-NY	9009187-01	colorless		clear		
	-02	colorless		clear		
	-03	colorless		clear		

NET

9/24/90	1 ppm stock 4	10 ppm stock 4		50 mL	500 mL	2% HNO_3	
23	As	See 9/24/90 mWF					
	Se						
	Pb						
	Tl						
	0.1 ppm std						
9/24/90	Stock 4	1 ppm stock 4		10.0 mL	100 mL	2% HNO_3	
	As, Se	See 9/24/90 (above) mWF		5.0		+	
	100 ppb			4.0		2 mL	
	50			1.0		5% NH_4OH	
	40			0.5			
	10			0.0			
	5						
	0.0						
9/24/90	Stock 4	1 ppm stock 4		20.0 mL	100 mL	2% HNO_3	
	Pb, Tl			10.0			
	200 ppb	See 9/24/90 above mWF		5.0			
	100.0			4.0			
	50.0			1.0			
	40.0			0.5			
	10.0			0.0			
	0.5						

Date	Standard ID	Stock	Manufacturer	Lot # / Exp. Date	Volume stock	Volume final	Solvent	Verified	Preparer
3/9/90	~~Blank~~ FURNACE DIGESTION SPIKE STOCK	1000ppm Cd	Fisher	883476-24 3/90	1 ml	200ml	2% HNO_3	KS EP against EPA ICV's	~~MFV~~ ECW
		1000ppm Se	SPEX	1-107-Se 10/90	2 ml				
		1000ppm Pb	Fisher	883795-24 7/90	4 ml				
		1000ppm As	Fisher	883562-24 10/90	8 ml				
		1000ppm Tl	SPEX	1-12-MD 9/90	10 ml				
3/9/90	FURNACE DIGESTION SPIKE SOLUTION	FURNACE DIGESTION SPIKE STOCK	see above		20mls	200mls	2% HNO_3	" "	~~MFV~~ ECW
3/28/90	50ppm Ag	1000 ppm Ag	Spex	1-118-Ag 12/30/90	~~1200~~ 20.0	200mls	3% HNO_3	CME	CME
3/28/90	5.0 ppm Ag	50 ppm Ag	See above		10.0	200mls	3% HNO_3	CME	CME
3/28/90	IDL 1	1a	Spex		20.0	1 liter	3% HNO_3	CME	CME
		1b			50.0				
		2			10.0				
		3			10.0				
		4 (5ppm Ag)			10.0				

Date	Standard ID	Stock	Manufacturer	Lot #/ Exp.Date	Volume stock	Volume final	Solvent	Verifier	Preparer
6/20/90	SPEC	ICAL 1 ICAL 2 ICAL 3	SPEX	8/31/90 ↓	5 10 5	500	2% HNO_3 1% HCL	DWH	DWH
6/25/90	1ppm Ag	50ppm Ag		See 5/10/90	10.0	500	3% HNO_3	CME	CME
6/26/90	Spec	ICAL 1 ICAL 2 ICAL 3	Spex ↓	2-58-VS 8/90 2-58-VS 4/91 2-59-VS 8/90	5.0 10.0 5.0	500	3% HNO_3	CME	CME
6/27/90	ICV-2	ICV-2	EPA	0989	~~100.00~~ 5.0ml	100ml	2% HNO_3	L.T.	MWF
6/27/90	LCS[illegible]	100 ppm Ag " " Co	Spex Spex	1-118-AG 12/30/90 1-86-MO 11/30/90	100 100	1000	5% HNO_3	DWH	J.K.
6/27/90	LCS HNO_3	50 ppm Tl 20 ppm Pb 20 ppm As 10 ppm Se 5 ppm Cd	Spex Fisher Fisher Spex Fisher	1-12-MD 9/30/90 883795-24 7/19/90 883562-24 10/90 1-107-SE 10/31/90 883496-24 8/31/90	50 20 20 10 5	1000	2% HNO_3	J.K. Ecw	JK

GERAGHTY & MILLER, INC.

January 2, 1991

MEMORANDUM

TO: Jackie Baron

FROM: Warren Ankerberg

RE: Data Validation Report for Lead Analysis on Private Well Water-Novak Site - Project No. NJ06401 - NET (Cambridge) - Work Order No. 90-11259

One ground-water sample was collected November 12, 1990, given the identification of NSL-RW-11-04, and submitted to Net Atlantic, Inc., Cambridge Division for analysis of total lead by EPA Method 239.2 (AA furnace). The above-referenced data package was submitted for validation review December 15, 1990.

The review of the data in this package has revealed the following:

1. Field Data: No field data was provided to support the data collection efforts. No evaluation of the sample representativeness may be inferred from this report by itself.

2. Chain-of-Custody - Acceptable

3. Laboratory Data -

a.	Method: AA furnace (239.2)	Acceptable
b.	Calibration: Four points	Acceptable
c.	Correlation Coefficients: >0.995	Acceptable
d.	Initial Calibration Verification (ICVS):	Acceptable
e.	Continuing Calibration Verification (CCVS): Five performed; limits 90-110%R. One out of five out of control = 89.9%R	See below for explanation
f.	Calibration Blanks: All BDL	Acceptable
g.	Method Preparation Blanks: All BDL	Acceptable
h.	Spike Sample Result: 90.5%R	Acceptable
i.	CRDL Standard: 102%R	Acceptable
j.	Duplicate: RPD 12.6%	Acceptable
k.	Lab Control Sample: 87.8%R	Acceptable
l.	Holding Times	Acceptable
m.	Detection Limits: 2.0 IDL	Acceptable
n.	Post Digestion Spike: 93.5%R	Acceptable
o.	% RSD on Dual Injections: 6.33	Acceptable

The EPA Laboratory Data Validation Functional Guidelines for Inorganic Analysis specify that if any ICV or CCV is out of control limit of 90-110%R, all associated data should be flagged J as estimated if between 75-89% (flag L for Region III). In this instance, 1 CCV was 89.9%R, all others were within acceptable control limits. The one out of control immediately followed the analysis of the sample. However, since the out of control event is exceedingly small (0.1%), and since all other CCVs and other QC data were well within acceptance criteria, the data is considered acceptable and useful for all purposes.

Attachments: Data Package

143\novakdv.net

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730
Tel: (617) 275-3535
Fax: (617) 275-7411

(Formerly Cambridge Analytical Associates, Inc.)

December 07, 1990

Ms. Jackie Baron
Geraghty & Miller, Inc.
290 Vincent Avenue
Hackensack, NJ 07601

RE: Data Report for NET Work Order 90-11259: Novak Lead Analysis

Dear Jackie:

Enclosed is the data report for the sample from the Novak site which arrived at our facility on November 13, 1990. This sample was to be analyzed for lead only and was logged-in as NET work order 90-11-259. As per your request this sample was also logged-in for duplicate and spike analysis. All work went smoothly and there are no incidents to report.

If I don't speak to you before, have a great holiday and take care.

Sincerely,

D. Wesley Miller
Project Manager

R E P O R T T O

Geraghty & Miller, Inc.
290 Vincent Avenue
Hackensack, NJ 07601

Attn: Ms. Jackie Baron

Work ID: NSL-RW-11-04 for Lead Again
Work Order: 90-11-259

P.O. No.: NJ06401

NET Atlantic, Cambridge Division
12 Oak Park
Bedford, MA 01730

Received: 11/13/90 12/07/90 14:33:37

REPORT TO: Geraghty & Miller, Inc.
290 Vincent Avenue
Hackensack, NJ 07601

ATTEN: Ms. Jackie Baron

CLIENT: GER_MIL_NJ SAMPLES: 1
COMPANY: Geraghty & Miller, Inc.
FACILITY: 290 Vincent Avenue
Hackensack, NJ 07601

WORK ID: NSL-RW-11-04 for Lead Again
TAKEN: by Client/B.DElaney
TRANS: by Fedex # 7825057365
TYPE: Aq
P.O. #: NJ06401
INVOICE: under separate cover

PREPARED BY: NET Atlantic, Cambridge Div.
12 Oak Park
Bedford, MA 01730

ATTEN:
PHONE: 617-275-3535

CERTIFIED BY

CONTACT MILLER

This report is approved for release by the following staff:
Laboratory Director: Michael P. Deluca
Inorganic Laboratory:
Organic Laboratory:

Chain of Custody documentation is attached.

SAMPLE IDENTIFICATION

01 NSL-RW-11-04
01 NSL-RW-11-04 SPIKE
01 NSL-RW-11-04 DUPLICATE

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. NA

CHAIN-OF-CUSTODY RECORD

Project Number NJ06401
Project Location South Whitehall Pa.
Laboratory NET
Sampler(s)/Affiliation Bill Delaney (G&M)

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	1 Liter Plastic Pb pres. c HNO3									TOTAL
NSL-RW-11-04	L	11-12-90 10:10	—	3									3

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 3

Relinquished by: Bill Delaney Received by:	Organization: Geraghty and Miller Organization:	Date 11/12/90 Time 3:00 pm	Seal Intact? (Yes) No N/A
Relinquished by: Received by: E. Carter	Organization: Organization: NET - CAMBS	Date 11/13/90 Time 10:00 Am	Seal Intact? (Yes) No N/A

Special Instructions/Remarks:

Analyze Sample, Spike + Duplicate out of ONE ("same") Bottle. Other 2 bottles are "ext" -EC

Delivery Method: ☐ In Person ☒ Common Carrier Fed X. (SPECIFY) ☐ Lab Courier ☐ Other ______ (SPECIFY)

AR304238

Cambridge Analytical Associates

Inorganic CLP SOW 7/87 Data Qualifiers

Form I-IN includes fields for three types of result qualifiers.

- C Qualifier - (concentration qualifier)

  " B " - If the reported value is less than the Contract Required Detection Limit (CRDL), but greater than the Instrument Detection Limit (IDL).

  " U " - Analyte was not detected. The result of the analyte is less than the Instrument Detection Limit (IDL).

- Q Qualifier -

  " E " - The reported value is estimated because of the presence of interference. If the 5-fold dilution analysis for one or more analytes is not within 10%, a chemical or physical interference effect must be suspected, and the data for all affected analytes in the samples received associated with that serial dilution must be flagged with an "E" on Form IX-IN and Form I-IN.

  " M " - Duplicate injection precision not met.

  " N " - Spike sample recovery not within control limits.

  " S " - The reported value was determined by the Method of Standard Addition (MSA)

  " W " - Postdigested spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

  " * " - Duplicate analysis not within control limits.

  " + " - Correlation coefficient for the MSA is less than 0.995.

- M (Method) Qualifier -

  " P " - for ICP

  " A " - for Flame AA

  " F " - for Furnace AA

  " CV "- for Manual Cold Vapor AA

  " C " - for Manual Spectrophotometric

  " NR "- if the analyte is not required to be analyzed

Document Inventory:

Case:

Project Number: 9011859

CLP Data Manager: Tara M. Lambert

Item	Page
Cover Page - Inorganic Analysis Data Package	1
Inorganic Analyses Data Sheet(s)	2
Q.C. Report - Initial and Continuing Calibration	3
Q.C. Report - CRDL Standards	7
Q.C. Report - Blanks	8
Q.C. Report - ICP Interference Check Sample	NR
Q.C. Report - Spike Sample Recovery	11
Q.C. Report - Post Digest Spike Recovery	NR
Q.C. Report - Duplicates	12
Q.C. Report - Laboratory Control Standard	13
Q.C. Report - Standard Addition Results	14
Q.C. Report - ICP Serial Dilution	NR
Q.C. Report - Holding Times	15
Q.C. Report - Instrument Detection Limits	16
Q.C. Report - Interelement Correction Factors	NR
Q.C. Report - ICP Linear Ranges	NR
Raw Data - ICP Listings	NR
Raw Data - Sb Worksheet(s)	NR
Raw Data - As Worksheet(s)	NR
Raw Data - Cd Worksheet(s)	NR
Raw Data - Pb Worksheet(s)	17
Raw Data - Se Worksheet(s)	NR
Raw Data - Tl Worksheet(s)	NR
Raw Data - Hg Worksheet(s)	NR
Raw Data - CN Worksheet(s)	NR
Raw Data - Sample Preparation Log(s)	42
Raw Data - Working Standard Preparation Log(s)	46
Inorganics Traffic Report	

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: NET-CAMBRIDGE DIVIS Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: 25750W

SOW No.: 7/87

EPA Sample No.	Lab Sample ID.
RW1104	11259-013
RW1104D	11259-013D
RW1104S	11259-013S

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager: Clara M. Lombard for L. Epelman

Date: 12/5/90

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

RW1104

Lab Name: NET-CAMBRIDGE DIVIS ON Contract:

Lab Code: CAMBRG Case No.: ITL SAS No.: SDG No.: 2F2ECU

Matrix (soil/water): WATER Lab Sample ID: A1259-01S

Level (low/med): LOW Date Received: 11/10/90

% 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				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-41-7	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead	10.00			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRC Case No.: NSL SAS No.: SDG No.: 2T35CW

Initial Calibration Source: CPI/IV

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									
Calcium									
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	97.5	103.20	106.3	100.0	89.90	89.9	101.95	102.0	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET-CANBRIDGE DIVISIO Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: 88150

Initial Calibration Source: CPALV

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									R
Calcium									R
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				100.0	96.25	96.2	103.35	103.4	R
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

SA

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: PL SAS No.: SDG No.: 253ECJ

Initial Calibration Source: STALV

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									
Calcium									
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				100.0	109.25	109.4	99.25	99.4	P
Magnesium									NR
Manganese									R
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: NET-CAMBRIDGE [illegible] Contract:

Lab Code: CAMBRG Case No.: [illegible] SAS No.: SDG No.: 25350W

Initial Calibration Source: EPALV

Continuing Calibration Source: CONTRACTOR

Concentration Units: ug/L

Analyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				100.0	109.20	109.2	102.90	102.9	P
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2B

CRDL STANDARD FOR AA AND ICP

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRD Case No.: CL SAS No.: SDG No.: CF35CW

AA CRDL Standard Source: CONTRACTOR

ICP CRDL Standard Source:

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standards for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	5.0	5.13	103.0					
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP

3
BLANKS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: MSL SAS No.: SDG No.: 25350W

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											
Beryllium											
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

AR304248

FORM III - IN 7/87

U.S. EPA - CLP

3
BLANKS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: 25350

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg):

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepar-ation Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											
Beryllium											
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U	2.0	U			F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

U.S. EPA - CLP

3
BLANKS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: 25350

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg):

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											R
Beryllium											
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U					P
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

U.S. EPA - CLP

SW
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.
RW1104C

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: ESO50W

Matrix (soil/water): WATER Level (low/med): LOW

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									P
Arsenic									P
Barium									PW
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	75-125	25.1500		10.0500		20.0	75.5		P
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									P
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

Comments:

FORM V (PART 1) - IN 3/87

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.
RW1104D

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: 2535CW

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

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

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								
Lead	5.0	10.0500		11.4019		12.6		P
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc								NR
Cyanide								NR

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7

LABORATORY CONTROL SAMPLE

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: 35030W

Solid LCS Source:

Aqueous LCS Source: CAMBRG

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	20.0	17.55	87.8					
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								
Cyanide								

Control limit 80 - 120%

U.S. EPA - CLP

8
STANDARD ADDITION RESULTS

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: 253534

Concentration Units: ug/L

EPA Sample No.	An	Dil	0 ADD ABS	1 ADD CON	1 ADD ABS	2 ADD CON	2 ADD ABS	3 ADD CON	3 ADD ABS	Final Conc.	r	
RW1104D	PB	1	5.100	5	6.900	10	8.900	20	13.600	11.4	0.9951	

FORM VIII - IN 7/87

U.S. EPA - CLP

1O

HOLDING TIMES

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBRG Case No.: NSL SAS No.: SDG No.: 2525CW

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
RW1104	WATER	11/13/90				
RW1104D	WATER	11/13/90				
RW1104S	WATER	11/13/90				

FORM X - IN

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

ORIGINAL (Red)

Lab Name: NET-CAMBRIDGE DIVISION Contract:

Lab Code: CAMBR3 Case No.: NSL SAS No.: SDG No.: 2535CW

ICP ID Number: Date: 10/08/90

Flame AA ID Number:

Furnace AA ID Number: P3

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		
Antimony			60		
Arsenic			10		
Barium			200		
Beryllium			5		
Cadmium			5		
Calcium			5000		
Chromium			10		
Cobalt			50		
Copper			25		
Iron			100		
Lead	283.30	BZ	5	2.0	F
Magnesium			5000		
Manganese			15		
Mercury			0.2		
Nickel			40		
Potassium			5000		
Selenium			5		
Silver			10		
Sodium			5000		
Thallium			10		
Vanadium			50		
Zinc			20		

Comments:

P3: Perkin-Elmer Zeeman/5000 AA (Furnace) B

GRAPHITE FURNACE ANALYTICAL RECORD Run #

1. Element Lead
2. Date 12/4/90
3. Calibration Standard Information
   Preparation Date 12/4/90
   Matrix HNO_3
   Standard Log Reference Stock 4
4. Instrument Calibration
   Auto-Zero (A/Z) 0.00 ppb
   Standard 1 (S1) 5.00 ppb
   Standard 2 (S2) 100.00 ppb
   Standard 3 (S3) 200.00 ppb
5. Sample Volume (ul) 20 ul
6. Integration Time 10.0 sec
7. Instrument Code P3
8. Background Correction BZ

CLP METALS 2.20c

CLP Lead-2535CW,1641CS

Run id: P3 9033B02
Perkin-Elmer Zeeman/5000 AA (Furnace) B

Acquired: 12/05/90 by TKL
Crunched: 12/05/90 by T
Time: 1452
Processing protocol: 7/87

Element: Pb

Pos	Sample	Code	Prep Batch	Dil	M	Solution measured	Final Conc'n	Units	Flag
1	0.00 PPB	WS0		1.00		0.0000	0.0000	ug/L	#
2	5.00 PPB	WS1		1.00		0.0000	0.0000	ug/L	#
3	100.00 PPB	WS2		1.00		0.0000	0.0000	ug/L	#
4	200.00 PPB	WS3		1.00		0.0000	0.0000	ug/L	#
5	ICV-4	ICV		1.00		102.5000	103.5000	ug/L	
6	CAL BLK	ICB		1.00		0.6500	2.0000	ug/L	U
7	5.00 PPB	CRA0		1.00		5.1500	5.1500	ug/L	
8	PBW	PBW	2535CW	1.00	W	0.9000	2.0000	ug/L	U
9	PBW	ASPBW	2535CW	1.00	W	9.6000	9.6000	ug/L	
10	LCSHNGS	LCSW	2535CW	1.00	W	17.5500	17.5500	ug/L	
11	LCSHNGS	ASLCSW	2535CW	1.00	W	27.9500	27.9500	ug/L	
12	9011259-01	S	2535CW	1.00	W	10.0500	10.0500	ug/L	
13	9011259-01	AS	2535CW	1.00	W	19.4000	19.4000	ug/L	
14	9011259-01	DS	2535CW	1.00	W	28.1500	28.1500	ug/L	
15	9011259-01	S2	2535CW	1.00	W	11.2500	11.2500	ug/L	
16	9011259-01	ASS2	2535CW	1.00	W	19.5000	19.5000	ug/L	E
17	100.00 PPB	CCV		1.00		89.9000	89.9000	ug/L	
18	CAL BLK	CCB		1.00		0.2000	2.0000	ug/L	
23	9011259-01	MOS2	2535CW	1.00	W	5.1000	11.4019	ug/L	
24	9011259-01	M1S2	2535CW	1.00	W	6.9000	6.9000	ug/L	
25	9011259-01	M2S2	2535CW	1.00	W	8.9000	8.9000	ug/L	
26	9011259-01	M3S2	2535CW	1.00	W	13.6000	13.6000	ug/L	
31	100.00 PPB	CCV		1.00		101.9500	101.9500	ug/L	
32	CAL BLK	CCB		1.00		0.7500	2.0000	ug/L	U
33	PBS	PBS	1641CS	1.00	S	1.8500	0.4000	ug/g	U
34	PBS	ASPBS	1641CS	1.00	S	10.4500	10.4500	ug/L	
35	LCSHNGS	LCSS	1641CS	10.00	S	116.7500	232.5000	ug/g	
36	LCSHNGS	ASLCSS	1641CS	10.00	S	138.1000	1381.0000	ug/L	E
37	9010247-01	S	1641CS	1.00	S	467.4000	111.0215	ug/g	COM
38	9010247-01	AS	1641CS	1.00	S	856.2000	856.2000	ug/L	QC
39	9010247-01	DS	1641CS	1.00	S	924.2000	219.5252	ug/g	QC
40	9010247-02	S	1641CS	1.00	S	24.0500	5.3208	ug/g	
41	9010247-02	AS	1641CS	1.00	S	38.1500	38.1500	ug/L	E
42	100.00 PPB	CCV		1.00		96.2500	96.2500	ug/L	
43	CAL BLK	CCB		1.00		0.6000	2.0000	ug/L	U
44	9010247-02	S2	1641CS	1.00	S	21.8500	4.8341	ug/g	
45	9010247-02	ASS2	1641CS	1.00	S	31.8500	31.8500	ug/L	
46	9010247-03	S	1641CS	1.00	S	15.6500	3.2878	ug/g	
47	9010247-03	AS	1641CS	1.00	S	24.1000	24.1000	ug/L	E
48	9010247-04	S	1641CS	1.00	S	138.8500	32.0670	ug/g	
49	9010247-04	AS	1641CS	1.00	S	151.1000	151.1000	ug/L	E
50	9010247-05	S	1641CS	1.00	S	58.0500	14.1241	ug/g	
51	9010247-05	AS	1641CS	1.00	S	68.6500	68.6500	ug/L	

Pos	Sample	Code	Prep Batch	Dil	M	Solution measured	Final Conc'n	Units (Wet)	Flags
52	9010247-06	S	1641CS	1.00	S	68.0000	16.4649	ug/g	
53	9010247-06	AS	1641CS	1.00	S	77.2500	77.2500	ug/L	
54	100.00 PPB	CCV		1.00		103.3500	103.3500	ug/L	
55	CAL BLK	CCB		1.00		0.4500	2.0000	ug/L	U
56	9010247-07	S	1641CS	1.00	S	21.1500	4.6229	ug/g	
57	9010247-07	AS	1641CS	1.00	S	36.9500	36.8500	ug/L	E
58	9010247-08	S	1641CS	1.00	S	46.0000	11.1786	ug/g	
59	9010247-08	AS	1641CS	1.00	S	55.2500	55.2500	ug/L	
60	9010247-09	S	1641CS	1.00	S	59.0000	14.3030	ug/g	
61	9010247-09	AS	1641CS	1.00	S	73.8500	73.8500	ug/L	E
62	9010247-10	S	1641CS	1.00	S	31.9500	6.9306	ug/g	
63	9010247-10	AS	1641CS	1.00	S	41.9500	41.9500	ug/L	
64	100.00 PPB	CCV		1.00		109.3500	109.3500	ug/L	
65	CAL BLK	CCB		1.00		0.7500	2.0000	ug/L	U
66	9010247-01	S	1641CS	50.00	S	9.6000	114.0144	ug/g	
67	9010247-01	AS	1641CS	50.00	S	19.2500	963.5000	ug/L	
68	9010247-01	DS	1641CS	50.00	S	11.0500	131.2253	ug/g	
69	100.00 PPB	CCV		1.00		99.3500	99.3500	ug/L	
70	CAL BLK	CCB		1.00		0.9000	2.0000	ug/L	U
71	9010247-04	M0S	1641CS	1.00	S	57.4000	20.7777	ug/g	E
72	9010247-04	M1S	1641CS	1.00	S	69.8000	69.8000	ug/L	
73	9010247-04	M2S	1641CS	1.00	S	90.1000	90.1000	ug/L	
74	9010247-04	M3S	1641CS	1.00	S	121.0000	121.0000	ug/L	
75	9010247-07	M0S	1641CS	1.00	S	9.0000	3.9824	ug/g	S
76	9010247-07	M1S	1641CS	1.00	S	13.6000	13.6000	ug/L	
77	9010247-07	M2S	1641CS	1.00	S	18.0000	18.0000	ug/L	
78	9010247-07	M3S	1641CS	1.00	S	33.0000	33.0000	ug/L	
79	9010247-09	M0S	1641CS	1.00	S	25.8000	11.4403	ug/g	S
80	9010247-09	M1S	1641CS	1.00	S	36.1000	36.1000	ug/L	
81	9010247-09	M2S	1641CS	1.00	S	51.7000	51.7000	ug/L	
82	9010247-09	M3S	1641CS	1.00	S	79.6000	79.6000	ug/L	
83	9010247-02	M0S	1641CS	1.00	S	10.2000	4.7191	ug/g	S
84	9010247-02	M1S	1641CS	1.00	S	15.3000	15.3000	ug/L	
85	9010247-02	M2S	1641CS	1.00	S	19.3000	19.3000	ug/L	
86	9010247-02	M3S	1641CS	1.00	S	34.2000	34.2000	ug/L	
87	9010247-02	M0S2	1641CS	1.00	S	8.7000	3.7410	ug/g	S
88	9010247-02	M1S2	1641CS	1.00	S	14.0000	14.0000	ug/L	
89	9010247-02	M2S2	1641CS	1.00	S	18.4000	18.4000	ug/L	
90	9010247-02	M3S2	1641CS	1.00	S	34.3000	34.3000	ug/L	
91	100.00 PPB	CCV		1.00		109.2000	109.2000	ug/L	
92	CAL BLK	CCB		1.00		0.6000	2.0000	ug/L	U
93	9010247-03	M0S	1641CS	1.00	S	7.8000	3.5697	ug/g	S
94	9010247-03	M1S	1641CS	1.00	S	11.7000	11.7000	ug/L	
95	9010247-03	M2S	1641CS	1.00	S	15.9000	15.9000	ug/L	
96	9010247-03	M3S	1641CS	1.00	S	29.6000	29.6000	ug/L	
97	100.00 PPB	CCV		1.00		103.9000	103.9000	ug/L	
99	CAL BLK	CCB		1.00		1.2000	2.0000	ug/L	U

C L P M E T A L S 2.20c

CLP Lead-2535CW.1641CS

Run id: P3 9033802
Perkin-Elmer Zeeman/5000 AA (Furnace) B

Element: Pb

Acquired: 12/05/90 by TM
Crunched: 12/05/90 by T
Time: 1458
Processing protocol: 7/87

INSTRUMENT RUN QC REPORT

CALIBRATION VERIFICATIONS

Position	Sample ID	Code	True Value	Found Value	% Recovery
5	ICV-4	ICV	97.0000	103.5000	106.8
17	100.00 PPB	CCV	100.0000	89.5000	89.5
31	100.00 PPB	CCV	100.0000	101.9500	102.0
42	100.00 PPB	CCV	100.0000	96.2500	96.2
54	100.00 PPB	CCV	100.0000	103.2500	103.4
64	100.00 PPB	CCV	100.0000	109.3500	109.4
69	100.00 PPB	CCV	100.0000	99.3500	99.4
91	100.00 PPB	CCV	100.0000	109.2000	109.2
97	100.00 PPB	CCV	100.0000	103.9000	103.9

CALIBRATION BLANKS

Position	Sample ID	Code	CRDL	Found Value	Flag
6	CAL BLK	ICB	5.0000	2.0000	U
18	CAL BLK	CCB	5.0000	2.0000	U
30	CAL BLK	CCB	5.0000	2.0000	U
43	CAL BLK	CCB	5.0000	2.0000	U
55	CAL BLK	CCB	5.0000	2.0000	U
65	CAL BLK	CCB	5.0000	2.0000	U
70	CAL BLK	CCB	5.0000	2.0000	U
92	CAL BLK	CCB	5.0000	2.0000	U
99	CAL BLK	CCB	5.0000	2.0000	U

CRDL STANDARDS

Position	Sample ID	Code	True Value	Found Value	% Recovery
7	5.00 PPB	CRA0	5.0000	5.1500	103.0

CLP Lead-2535CW.164108

Run id: P3 9033802
Perkin-Elmer Zeeman/5000 AA (Furnace) B
Element: Pb

Acquired: 12/05/90 by TML
Crunched: 12/05/90 by
Time: 1458
Processing protocol: 7/87

Pos	Sample ID	Code	Observed	Spike	Flag
83	9010247-02	M0S	10.2000	0.00	
84	9010247-02	M1S	15.3000	10.00	
85	9010247-02	M2S	19.3000	20.00	
86	9010247-02	M3S	34.2000	50.00	
Slope:	0.477857	Y Intercept:	10.192857	X Intercept:	-21.3303
Correl:	0.9995	Calculated value:	21.3303 S		
93	9010247-03	M0S	7.3000	0.00	
94	9010247-03	M1S	11.7000	10.00	
95	9010247-03	M2S	15.9000	20.00	
96	9010247-03	M3S	29.6000	50.00	
Slope:	0.439286	Y Intercept:	7.464286	X Intercept:	-16.9919
Correl:	0.9995	Calculated value:	16.9919 S		
71	9010247-04	M0S	57.4000	0.00	
72	9010247-04	M1S	69.8000	20.00	
73	9010247-04	M2S	90.1000	50.00	
74	9010247-04	M3S	121.0000	100.00	
Slope:	0.638458	Y Intercept:	57.440529	X Intercept:	-89.9676
Correl:	0.9995	Calculated value:	89.9676 S		
75	9010247-07	M0S	9.0000	0.00	
76	9010247-07	M1S	13.6000	10.00	
77	9010247-07	M2S	18.0000	20.00	
78	9010247-07	M3S	33.0000	50.00	
Slope:	0.481429	Y Intercept:	8.771429	X Intercept:	-18.2196
Correl:	0.9996	Calculated value:	16.2196 S		
79	9010247-09	M0S	25.8000	0.00	
80	9010247-09	M1S	36.1000	20.00	
81	9010247-09	M2S	51.7000	50.00	
82	9010247-09	M3S	79.6000	100.00	
Slope:	0.538502	Y Intercept:	25.413656	X Intercept:	-47.1932
Correl:	0.9998	Calculated value:	47.1932 S		
87	9010247-02	M0S2	8.7000	0.00	
88	9010247-02	M1S2	14.0000	10.00	
89	9010247-02	M2S2	18.4000	20.00	
90	9010247-02	M3S2	34.3000	50.00	
Slope:	0.510714	Y Intercept:	8.635714	X Intercept:	-16.9091
Correl:	0.9996	Calculated value:	16.9091 S		
23	9011259-01	M0S2	5.1000	0.00	

Ea 9011259-01 Msec [illegible]

Slope: 0.428000 Y Intercept: 4.680000 X Intercept: -11.4015
Correl: 0.9981 Calculated value: 11.4019 S

22

* Analytical spike recovery for 9010247-02 at position 41 is 141.0%.
MSA must be used.
* Analytical spike recovery for 9010247-03 at position 47 is 64.5%.
MSA must be used.
* Analytical spike recovery for 9010247-04 at position 49 is 122.5%.
MSA must be used.
* Analytical spike recovery for 9010247-07 at position 57 is 157.0%.
MSA must be used.
* Analytical spike recovery for 9010247-09 at position 61 is 148.5%.
MSA must be used.
* Analytical spike recovery for LCSHN035 at position 36 is 213.5%.
MSA must be used.
* Analytical spike recovery for 9011259-01 at position 16 is 72.5%.
MSA must be used.

This run has no postdigestion spikes
* Sample duplicate out of range for sample 9010247-02
Sample value: 5.32. Duplicate value: 3.74. RPD = 34.9%

AR304262

C L P M E T A L S 2.20c

CLP Lead-2535CW.1641CS

Run id: P3 9033302
Perkin-Elmer Zeeman/5000 AA (Furnace) B

Acquired: 12/05/90 b
Crunched: 12/05/90 b
Time: 1459
Element: Pb
Processing protocol: 7/87

CRDL: 5.00 IDL: 2.00
Analytical spike: 2CRDL at dilution 1.0: true value 10.00 ppb.

Calibration points

0.00 PPB	0.0000
5.00 PPB	0.0000
100.00 PPB	0.0000
200.00 PPB	0.0000

High std = 200.000000
Regression will not be performed.

Pos	Sample ID	Code	Burn 1	Burn 2	Mean	%RSD	
1	0.00 PPB	WS0			0.0000	0.0	#
2	5.00 PPB	WS1			0.0000	0.0	#
3	100.00 PPB	WS2			0.0000	0.0	#
4	200.00 PPB	WS3			0.0000	0.0	#
5	ICV-4	ICV	104.6	102.4	103.5000	1.5	
6	CAL BLK	ICB	0.8	0.5	0.6500	0.	
7	5.00 PPB	CRA0	5.2	5.1	5.1500	1.4	
8	PBW	PBW	0.5	1.3	0.9000	0.0	U
9	PBW	ASPBW	9.3	9.9	9.6000	4.4	
10	LCSHNO3	LCSW	16.8	18.3	17.5500	6.0	
11	LCSHNO3	ASLCSW	27.6	28.3	27.9500	1.8	
12	9011259-01	S	10.5	9.6	10.0500	6.3	
13	9011259-01	AS	19.2	19.6	19.4000	1.5	
14	9011259-01	DS	27.7	28.6	28.1500	2.3	
15	9011259-01	S2	11.8	10.7	11.2500	6.9	
16	9011259-01	ASS2	18.3	18.7	18.5000	1.5	
17	100.00 PPB	CCV	89.8	90.0	89.9000	0.2	
18	CAL BLK	CCB	0.1	0.3	0.2000	0.0	U
23	9011259-01	MOS2	5.1		5.1000	0.0	
24	9011259-01	M1S2	6.9		6.9000	0.0	
25	9011259-01	M2S2	8.9		8.9000	0.0	
26	9011259-01	M3S2	13.6		13.6000	0.0	
31	100.00 PPB	CCV	100.7	103.2	101.9500	1.7	
32	CAL BLK	CCB	0.8	0.7	0.7500	0.0	U
33	PBS	PBS	1.9	1.8	1.8500	0.0	U
34	PBS	ASPBS	11.6	9.3	10.4500	15.6	
35	LCSHNO3S	LCSS	118.5	115.0	116.7500	2.1	
36	LCSHNO3S	ASLCSS	136.0	140.2	138.1000	2.3	
37	9010247-01	S	01	933.8	467.4000	141.1	QCM
38	9010247-01	AS	859.0	853.4	856.2000	0.5	QC
39	9010247-01	DS	913.2	935.2	924.2000	1.7	QC
40	9010247-02	S	24.6	23.5	24.0500	3.	
41	9010247-02	AS	38.3	38.0	38.1500	0.5	
42	100.00 PPB	CCV	97.2	95.3	96.2500	1.4	
43	CAL BLK	CCB	0.7	0.5	0.6000	0.0	U
44	9010247-02	S2	21.9	21.8	21.8500	0.3	
45	9010247-02	ASS2	31.9	31.8	31.8500	0.2	

CLP Lead-2535CW,1641CS

Pos	Sample ID	Code	Burn 1	Burn 2	Mean	%RSD	
46	9010247-03	S	15.9	15.4	15.6500	2.3	
47	9010247-03	AS	24.3	23.9	24.1000	1.2	
48	9010247-04	S	141.8	135.9	138.8500	3.0	
49	9010247-04	AS	142.0	160.2	151.1000	9.5	
50	9010247-05	S	57.6	58.5	58.0500	1.1	
51	9010247-05	AS	72.2	65.1	68.6500	7.3	
52	9010247-06	S	64.9	71.1	68.0000	6.4	
53	9010247-06	AS	76.9	77.6	77.2500	0.6	
54	100.00 PPB	CCV	104.3	102.4	103.3500	1.3	
55	CAL BLK	CCB	0.6	0.3	0.4500	0.0	U
56	9010247-07	S	21.5	20.8	21.1500	2.3	
57	9010247-07	AS	37.6	36.1	36.8500	2.9	
58	9010247-08	S	46.4	45.6	46.0000	1.2	
59	9010247-08	AS	56.0	54.5	55.2500	1.9	
60	9010247-09	S	57.9	60.1	59.0000	2.6	
61	9010247-09	AS	73.2	74.5	73.8500	1.2	
62	9010247-10	S	32.5	31.4	31.9500	2.4	
63	9010247-10	AS	41.8	42.1	41.9500	0.5	
64	100.00 PPB	CCV	109.4	109.3	109.3500	0.1	
65	CAL BLK	CCB	0.4	1.1	0.7500	0.0	U
66	9010247-01	S	9.7	9.5	9.6000	1.5	
67	9010247-01	AS	19.3	19.3	19.2500	0.4	
68	9010247-01	DS	10.3	11.8	11.0500	9.6	
69	100.00 PPB	CCV	98.7	100.0	99.3500	0.9	
70	CAL BLK	CCB	0.5	1.3	0.9000	0.0	U
71	9010247-04	MOS	57.4		57.4000	0.0	
72	9010247-04	M1S	69.8		69.8000	0.0	
73	9010247-04	M2S	90.1		90.1000	0.0	
74	9010247-04	M3S	121.0		121.0000	0.0	
75	9010247-07	MOS	9.0		9.0000	0.0	
76	9010247-07	M1S	13.6		13.6000	0.0	
77	9010247-07	M2S	18.0		18.0000	0.0	
78	9010247-07	M3S	33.0		33.0000	0.0	
79	9010247-09	MOS	25.8		25.8000	0.0	
80	9010247-09	M1S	36.1		36.1000	0.0	
81	9010247-09	M2S	51.7		51.7000	0.0	
82	9010247-09	M3S	79.6		79.6000	0.0	
83	9010247-02	MOS	10.2		10.2000	0.0	
84	9010247-02	M1S	15.3		15.3000	0.0	
85	9010247-02	M2S	19.3		19.3000	0.0	
86	9010247-02	M3S	34.2		34.2000	0.0	
87	9010247-02	MOS2	8.7		8.7000	0.0	
88	9010247-02	M1S2	14.0		14.0000	0.0	
89	9010247-02	M2S2	18.4		18.4000	0.0	
90	9010247-02	M3S2	34.3		34.3000	0.0	
91	100.00 PPB	CCV	109.2		109.2000	0.0	
92	CAL BLK	CCB	0.6		0.6000	0.0	U
93	9010247-03	MOS	7.8		7.8000	0.0	
94	9010247-03	M1S	11.7		11.7000	0.0	
95	9010247-03	M2S	15.9		15.9000	0.0	
96	9010247-03	M3S	29.6		29.6000	0.0	
97	100.00 PPB	CCV	103.9		103.9000	0.0	
99	CAL BLK	CCB	1.2		1.2000	0.0	

C L P M E T A L S 2.20c

CLP Lead-2535CW.1641CS

Run id: P3 9033802
Perkin-Elmer Zeeman/5000 AA (Furnace) B

Acquired: 12/05/90 b
Crunched: 12/05/90 b
Time: 1458

Element: Pb

Processing protocol: 7/87

Pos	Sample	Code	Preparation Method	Client ID	Date	Time
1	0.00 PPB	WS0		S0	12/04/90	12:02
2	5.00 PPB	WS1		S5.00	12/04/90	12:05
3	100.00 PPB	WS2		S100.00	12/04/90	12:07
4	200.00 PPB	WS3		S200.00	12/04/90	12:09
5	ICV-4	ICV		ICV	12/04/90	12:18
6	CAL BLK	ICB		ICB	12/04/90	12:23
7	5.00 PPB	CRA0		CRA	12/04/90	12:27
8	PBW	PBW	HNO3	PBW	12/04/90	12:32
9	PBW	ASPBW	HNO3	PBWA	12/04/90	12:36
10	LCSHNO3	LCSW	HNO3	LCSW	12/04/90	12:41
11	LCSHNO3	ASLCSW	HNO3	LCSWA	12/04/90	12:45
12	9011259-01	S	HNO3	RW1104	12/04/90	13:00
13	9011259-01	AS	HNO3	RW1104A	12/04/90	13:13
14	9011259-01	DS	HNO3	RW1104S	12/04/90	13:17
15	9011259-01	S2	HNO3	RW1104D	12/04/90	13:21
16	9011259-01	AS2	HNO3	RW1104DA	12/04/90	13
17	100.00 PPB	CCV		CCV	12/04/90	13
18	CAL BLK	CCB		CCB	12/04/90	13:32
23	9011259-01	MS2	HNO3	RW1104D0	12/04/90	13:46
24	9011259-01	M1S2	HNO3	RW1104D1	12/04/90	13:49
25	9011259-01	M2S2	HNO3	RW1104D2	12/04/90	13:51
26	9011259-01	M3S2	HNO3	RW1104D3	12/04/90	13:53
31	100.00 PPB	CCV		CCV	12/04/90	14:07
32	CAL BLK	CCB		CCB	12/04/90	14:11
33	PBS	PBS	HNO3	PBS	12/04/90	14:16
34	PBS	ASPBS	HNO3	PBSA	12/04/90	14:20
35	LCSHNO3S	LCSS	HNO3	LCSS	12/04/90	14:40
36	LCSHNO3S	ASLCSS	HNO3	LCSSA	12/04/90	14:45
37	9010247-01	S	HNO3	SPSB-25	12/04/90	14:49
38	9010247-01	AS	HNO3	SPSB-25A	12/04/90	14:54
39	9010247-01	DS	HNO3	spike	12/04/90	14:58
40	9010247-02	S	HNO3	SPSB-25	12/04/90	15:03
41	9010247-02	AS	HNO3	SPSB-25A	12/04/90	15:07
42	100.00 PPB	CCV		CCV	12/04/90	15:21
43	CAL BLK	CCB		CCB	12/04/90	15:26
44	9010247-02	S2	HNO3	duplica	12/04/90	15:30
45	9010247-02	AS2	HNO3	duplicaA	12/04/90	15:35
46	9010247-03	S	HNO3	SPSB-26	12/04/90	15:39
47	9010247-03	AS	HNO3	SPSB-26A	12/04/90	15:44
48	9010247-04	S	HNO3	SPSB-24	12/04/90	15:48
49	9010247-04	AS	HNO3	SPSB-24A	12/04/90	15:53
50	9010247-05	S	HNO3	SPSB-24	12/04/90	15
51	9010247-05	AS	HNO3	SPSB-24A	12/04/90	16

MSA

CLP Lead-2535CW,1641CS

Pos	Sample	Code	Preperation Method	Client ID		
52	9010247-06	S	HNO3	SPSB24.	12/04/90	16:0
53	9010247-06	AS	HNO3	SPSB24.A	12/04/90	16:.
54	100.00 PPB	CCV		CCV	12/04/90	16:15
55	CAL BLK	CCB		CCB	12/04/90	16:20
56	9010247-07	S	HNO3	SPSB-24	12/04/90	16:25
57	9010247-07	AS	HNO3	SPSB-24A	12/04/90	16:29
58	9010247-08	S	HNO3	SPSB-21	12/04/90	16:34
59	9010247-08	AS	HNO3	SPSB-21A	12/04/90	16:38
60	9010247-09	S	HNO3	SPSB-21	12/04/90	16:43
61	9010247-09	AS	HNO3	SPSB-21A	12/04/90	16:47
62	9010247-10	S	HNO3	SPSB-21	12/04/90	16:52
63	9010247-10	AS	HNO3	SPSB-21A	12/04/90	16:56
64	100.00 PPB	CCV		CCV	12/04/90	17:01
65	CAL BLK	CCB		CCB	12/04/90	17:05
66	9010247-01	S	HNO3	SPSB-26	12/04/90	17:10
67	9010247-01	AS	HNO3	SPSB-26A	12/04/90	17:14
68	9010247-01	DS	HNO3	spike	12/04/90	17:30
69	100.00 PPB	CCV		CCV	12/04/90	17:35
70	CAL BLK	CCB		CCB	12/04/90	17:39
71	9010247-04	MOS	HNO3	SPSB-240	12/04/90	17:42
72	9010247-04	M1S	HNO3	SPSB-241	12/04/90	17:44
73	9010247-04	M2S	HNO3	SPSB-242	12/04/90	17:46
74	9010247-04	M3S	HNO3	SPSB-243	12/04/90	17:48
75	9010247-07	MOS	HNO3	SPSB-240	12/04/90	17:51
76	9010247-07	M1S	HNO3	SPSB-241	12/04/90	17:53
77	9010247-07	M2S	HNO3	SPSB-242	12/04/90	17:5
78	9010247-07	M3S	HNO3	SPSB-243	12/04/90	17:
79	9010247-09	MOS	HNO3	SPSB-210	12/04/90	18:..
80	9010247-09	M1S	HNO3	SPSB-211	12/04/90	18:03
81	9010247-09	M2S	HNO3	SPSB-212	12/04/90	18:04
82	9010247-09	M3S	HNO3	SPSB-213	12/04/90	18:07
83	9010247-02	MOS	HNO3	SPSB-260	12/04/90	18:09
84	9010247-02	M1S	HNO3	SPSB-261	12/04/90	18:11
85	9010247-02	M2S	HNO3	SPSB-262	12/04/90	18:13
86	9010247-02	M3S	HNO3	SPSB-263	12/04/90	18:16
87	9010247-02	MOS2	HNO3	duplica0	12/04/90	18:18
88	9010247-02	M1S2	HNO3	duplica1	12/04/90	18:20
89	9010247-02	M2S2	HNO3	duplica2	12/04/90	18:22
90	9010247-02	M3S2	HNO3	duplica3	12/04/90	18:25
91	100.00 PPB	CCV		CCV	12/04/90	18:27
92	CAL BLK	CCB		CCB	12/04/90	18:30
93	9010247-03	MOS	HNO3	SPSB-260	12/04/90	18:31
94	9010247-03	M1S	HNO3	SPSB-261	12/04/90	18:34
95	9010247-03	M2S	HNO3	SPSB-262	12/04/90	18:36
96	9010247-03	M3S	HNO3	SPSB-263	12/04/90	18:38
97	100.00 PPB	CCV		CCV	12/04/90	18:40
99	CAL BLK	CCB		CCB	12/04/90	18:45

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
1	0.00 PPB	WS0		1.00x	12/04/90	12:02
			pb			
	Burn 1		0.00			
	Sample value		2.00U			
2	5.00 PPB	WS1		1.00x	12/04/90	12:05
			pb			
	Burn 1		0.05			
	Sample value		2.00U			
3	100.00 PPB	WS2		1.00x	12/04/90	12:07
			pb			
	Burn 1		65.30			
	Sample value		65.30			
4	200.00 PPB	WS3		1.00x	12/04/90	12:09
			pb			
	Burn 1		203.80			
	Sample value		203.80			
5	ICV-4	ICV		1.00x	12/04/90	12:18
			pb			
	Burn 1		104.60			
	Burn 2		102.40			
	Mean		103.50			
	RSD		1.50			
	Sample value		103.50			
6	CAL BLK	ICB		1.00x	12/04/90	12:23
			pb			
	Burn 1		0.80			
	Burn 2		0.50			
	Mean		0.65			
	RSD		32.63			
	Sample value		2.00U			
7	5.00 PPB	CRA0		1.00x	12/04/90	12:27
			pb			
	Burn 1		5.20			
	Burn 2		5.10			
	Mean		5.15			
	RSD		1.37			
	Sample value		5.15			

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
8	PBW	PBW	2535CW	1.00x	12/04/90	12:32

	pb
Burn 1	0.50
Burn 2	1.30
Mean	0.90
RSD	62.84
Sample value	2.00U

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
9	PBW	ASPBW		1.00x	12/04/90	12:36

	pb
Burn 1	9.30
Burn 2	9.90
Mean	9.60
RSD	4.42
Sample value	9.60
Spike added	10.00
Spike recovery, %	96.00

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
10	LCSHNO3	LCSW		1.00x	12/04/90	12:41

	pb
Burn 1	16.60
Burn 2	18.30
Mean	17.55
RSD	6.04
Sample value	17.55

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
11	LCSHNO3	ASLCSW		1.00x	12/04/90	12:45

	pb
Burn 1	27.60
Burn 2	28.30
Mean	27.95
RSD	1.77
Sample value	27.95
Spike added	10.00
Spike recovery, %	104.00

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
12	9011259-01	S		1.00x	12/04/90	13:08

	pb
Burn 1	10.50
Burn 2	9.60
Mean	10.05
RSD	6.33
Sample value	10.05

ok

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
13	-01	AS		1.00x	12/04/90	13:12

	pb
Burn 1	19.20
Burn 2	19.60
Mean	19.40
RSD	1.46
Sample value	19.40
Spike added	10.00

93.50 % ok

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
4	-01	DS		1.00x	12/04/90	13:17

	pb
Burn 1	27.70
Burn 2	28.60
Mean	28.15
RSD	2.26
Sample value	28.15

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
15	-01	S2		1.00x	12/04/90	13:21

	pb
Burn 1	11.80
Burn 2	10.70
Mean	11.25
RSD	6.91
Sample value	11.25

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
16	-01	ASS2		1.00x	12/04/90	13:26

	pb	
Burn 1	18.30	
Burn 2	18.70	
Mean	18.50	
RSD	1.53	
Sample value	18.50	
Spike added	10.00	
Spike recovery, %	72.50	***

needs MSD

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
17	100.00 PPB	CCV		1.00x	12/04/90	13:30

	pb
Burn 1	89.80
Burn 2	90.00
Mean	89.90
RSD	0.16
Sample value	89.90

out of control

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
18	CAL BLK	CCB		1.00x	12/04/90	13:35

	pb
Burn 1	0.10
Burn 2	0.30
Mean	0.20
RSD	70.70
Sample value	2.00U

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
19	9011259-01	MOS		1.00x	12/04/90	13:37

	pb
Burn 1	5.90
Sample value	5.90

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
20	-01	M1S		1.00x	12/04/90	13:40
			pb			
	Burn 1		7.40			
	Sample value		7.40			
21	-01	M2S		1.00x	12/04/90	13:42
			pb			
	Burn 1		9.00			
	Sample value		9.00			
22	-01	M3S		1.00x	12/04/90	13:44
			pb			
	Burn 1		13.80			
	Sample value		13.80			
23	-01	M0S2		1.00x	12/04/90	13:46
			pb			
	Burn 1		5.10			
	Sample value		5.10			
24	-01	M1S2		1.00x	12/04/90	13:49
			pb			
	Burn 1		6.90			
	Sample value		6.90			
25	-01	M2S2		1.00x	12/04/90	13:51
			pb			
	Burn 1		8.90			
	Sample value		8.90			
26	-01	M3S2		1.00x	12/04/90	13:53
			pb			
	Burn 1		13.60			
	Sample value		13.60			
27	-01	M0S		1.00x	12/04/90	13:55
			pb			
	Burn 1		5.50			
	Sample value		5.50			
28	-01	M1S		1.00x	12/04/90	13:58
			pb			
	Burn 1		7.00			
	Sample value		7.00			

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
29	-01	M2S		1.00x	12/04/90	14:00

	pb
Burn 1	8.90
Sample value	8.90

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
30	-01	M3S		1.00x	12/04/90	14:02

	pb
Burn 1	14.50
Sample value	14.50

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
31	100.00 PPB	CCV		1.00x	12/04/90	14:07

	pb
Burn 1	100.70
Burn 2	103.20
Mean	101.95
RSD	1.73
Sample value	101.95

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
32	CAL BLK	CCB		1.00x	12/04/90	14:11

	pb
Burn 1	0.80
Burn 2	0.70
Mean	0.75
RSD	9.43
Sample value	2.00U

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
33	PBS	PBS	1641CS	1.00x	12/04/90	14:16

	pb
Burn 1	1.90
Burn 2	1.80
Mean	1.85
RSD	3.82
Sample value	2.00U

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
34	PBS	ASPBS		1.00x	12/04/90	14:20

	pb
Burn 1	11.60
Burn 2	9.30
Mean	10.45
RSD	15.56
Sample value	10.45
Spike added	10.00
Spike recovery, %	104.50

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
35	LCSHNO3S	LCSS		10.00x	12/04/90	14:40

	pb
Burn 1	118.50
Burn 2	115.00
Mean	116.75
RSD	2.12
Sample value	1167.50

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
36	LCSHNO3S	ASLCSS		10.00x	12/04/90	14:45

	pb
Burn 1	136.00
Burn 2	140.20
Mean	138.10
RSD	2.15
Sample value	1381.00
Spike added	10.00
Spike recovery, %	213.50 ***

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
37	9010247-01	S		1.00x	12/04/90	14:49

	pb
Burn 1	1.00
Burn 2	933.80
Mean	467.40
RSD	141.10 ***
Sample value	467.40

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
38	-01	AS		1.00x	12/04/90	14:54

	pb
Burn 1	859.00
Burn 2	853.40
Mean	856.20
RSD	0.46
Sample value	856.20
Spike added	10.00
Spike recovery, %	3888.00 ***

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
39	-01	DS		1.00x	12/04/90	14:58

	pb
Burn 1	913.20
Burn 2	935.20
Mean	924.20
RSD	1.68
Sample value	924.20

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
40	-02	S		1.00x	12/04/90	15:03

	pb
Burn 1	24.60
Burn 2	23.50
Mean	24.05
RSD	3.23
Sample value	24.05

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
41	-02	AS		1.00x	12/04/90	15:07

	pb
Burn 1	38.30
Burn 2	38.00
Mean	38.15
RSD	0.56
Sample value	38.15
Spike added	10.00
Spike recovery, %	141.00 ***

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
42	100.00 PPB	CCV		1.00x	12/04/90	15:21

	pb
Burn 1	97.20
Burn 2	95.30
Mean	96.25
RSD	1.40
Sample value	96.25

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
43	CAL BLK	CCB		1.00x	12/04/90	15:26

	pb
Burn 1	0.70
Burn 2	0.50
Mean	0.60
RSD	23.57
Sample value	2.00U

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
44	9010247-02	S2		1.00x	12/04/90	15:30

	pb
Burn 1	21.90
Burn 2	21.80
Mean	21.85
RSD	0.32
Sample value	21.85

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
45	-02	ASS2		1.00x	12/04/90	15:35

	pb
Burn 1	31.90
Burn 2	31.80
Mean	31.85
RSD	0.22
Sample value	31.85
Spike added	10.00
Spike recovery, %	100.00

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
46	-03	S		1.00x	12/04/90	15:39

	pb
Burn 1	15.90
Burn 2	15.40
Mean	15.65
RSD	2.26
Sample value	15.65

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
47	-03	AS		1.00x	12/04/90	15:44

	pb	
Burn 1	24.30	
Burn 2	23.90	
Mean	24.10	
RSD	1.17	
Sample value	24.10	
Spike added	10.00	
Spike recovery, %	84.50	***

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
48	-04	S		1.00x	12/04/90	15:48

	pb
Burn 1	141.80
Burn 2	135.90
Mean	138.85
RSD	3.00
Sample value	138.85

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
49	-04	AS		1.00x	12/04/90	15:53

	pb	
Burn 1	142.00	
Burn 2	160.20	
Mean	151.10	
RSD	8.52	
Sample value	151.10	
Spike added	10.00	
Spike recovery, %	122.50	***

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
50	-05	S		1.00x	12/04/90	15:57

	pb
Burn 1	57.60
Burn 2	58.50
Mean	58.05
RSD	1.10
Sample value	58.05

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
51	-05	AS		1.00x	12/04/90	16:02

	pb	
Burn 1	72.20	
Burn 2	65.10	
Mean	68.65	
RSD	7.31	
Sample value	68.65	
Spike added	10.00	
Spike recovery, %	106.00	

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
52	-06	S		1.00x	12/04/90	16:06

	pb
Burn 1	64.90
Burn 2	71.10
Mean	68.00
RSD	6.45
Sample value	68.00

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
53	-06	AS		1.00x	12/04/90	16:11

	pb
Burn 1	76.90
Burn 2	77.60
Mean	77.25
RSD	0.64
Sample value	77.25
Spike added	10.00
Spike recovery, %	92.50

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
54	100.00 PPB	CCV		1.00x	12/04/90	16:15

	pb
Burn 1	104.30
Burn 2	102.40
Mean	103.35
RSD	1.30
Sample value	103.35

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
55	CAL BLK	CCB		1.00x	12/04/90	16:20

	pb
Burn 1	0.60
Burn 2	0.30
Mean	0.45
RSD	47.13
Sample value	2.00U

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
56	9010247-07	S		1.00x	12/04/90	16:25

	pb
Burn 1	21.50
Burn 2	20.80
Mean	21.15
RSD	2.34
Sample value	21.15

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
57	-07	AS		1.00x	12/04/90	16:29

	pb
Burn 1	37.60
Burn 2	36.10
Mean	36.85
RSD	2.88
Sample value	36.85
Spike added	10.00
Spike recovery, %	157.00 ***

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
58	-08	S		1.00x	12/04/90	16:34

	pb
Burn 1	46.40
Burn 2	45.60
Mean	46.00
RSD	1.23
Sample value	46.00

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
59	-08	AS		1.00x	12/04/90	16:38

	pb
Burn 1	56.00
Burn 2	54.50
Mean	55.25
RSD	1.92
Sample value	55.25
Spike added	10.00
Spike recovery, %	92.50

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
60	-09	S		1.00x	12/04/90	16:43

	pb
Burn 1	57.90
Burn 2	60.10
Mean	59.00
RSD	2.64
Sample value	59.00

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
61	-09	AS		1.00x	12/04/90	16:47

	pb
Burn 1	73.20
Burn 2	74.50
Mean	73.85
RSD	1.24
Sample value	73.85
Spike added	10.00
Spike recovery, %	148.50 ***

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
62	-10	S		1.00x	12/04/90	16:52

	pb
Burn 1	32.50
Burn 2	31.40
Mean	31.95
RSD	2.43
Sample value	31.95

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
63	-10	AS		1.00x	12/04/90	16:56

	pb
Burn 1	41.80
Burn 2	42.10
Mean	41.95
RSD	0.51
Sample value	41.95
Spike added	10.00

p0.0

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
64	100.00 PPB	CCV		1.00x	12/04/90	17:01

	pb
Burn 1	109.40
Burn 2	109.30
Mean	109.35
RSD	0.06
Sample value	109.35

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
65	CAL BLK	CCB		1.00x	12/04/90	17:05

	pb
Burn 1	0.40
Burn 2	1.10
Mean	0.75
RSD	65.99
Sample value	2.00U

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
66	9010247-01	S		50.00x	12/04/90	17:10

	pb
Burn 1	9.70
Burn 2	9.50
Mean	9.60
RSD	1.47
Sample value	480.00

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
67	-01	AS		50.00x	12/04/90	17:14

	pb
Burn 1	19.20
Burn 2	19.30
Mean	19.25
RSD	0.37
Sample value	962.50
Spike added	10.00
Spike recovery, %	96.50

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
68	-01	DS		50.00x	12/04/90	17:30

	pb
Burn 1	10.30
Burn 2	11.80
Mean	11.05
RSD	9.60
Sample value	552.50

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
69	100.00 PPB	CCV		1.00x	12/04/90	17:35

	pb
Burn 1	98.70
Burn 2	100.00
Mean	99.35
RSD	0.93
Sample value	99.35

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
70	CAL BLK	CCB		1.00x	12/04/90	17:39
			pb			
	Burn 1		0.50			
	Burn 2		1.30			
	Mean		0.90			
	RSD		62.84			
	Sample value		2.00U			
71	9010247-04	MOS		1.00x	12/04/90	17:42
			pb			
	Burn 1		57.40			
	Sample value		57.40			
72	-04	M1S		1.00x	12/04/90	17:44
			pb			
	Burn 1		69.80			
	Sample value		69.80			
73	-04	M2S		1.00x	12/04/90	17:46
			pb			
	Burn 1		90.10			
	Sample value		90.10			
74	-04	M3S		1.00x	12/04/90	17:48
			pb			
	Burn 1		121.00			
	Sample value		121.00			
75	-07	MOS		1.00x	12/04/90	17:51
			pb			
	Burn 1		9.00			
	Sample value		9.00			
76	-07	M1S		1.00x	12/04/90	17:53
			pb			
	Burn 1		13.60			
	Sample value		13.60			
77	-07	M2S		1.00x	12/04/90	17:55
			pb			
	Burn 1		18.00			
	Sample value		18.00			

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
78	-07	M3S		1.00x	12/04/90	17:58
			pb			
	Burn 1		33.00			
	Sample value		33.00			
79	-09	M0S		1.00x	12/04/90	18:00
			pb			
	Burn 1		25.80			
	Sample value		25.80			
80	-09	M1S		1.00x	12/04/90	18:02
			pb			
	Burn 1		36.10			
	Sample value		36.10			
81	-09	M2S		1.00x	12/04/90	18:04
			pb			
	Burn 1		51.70			
	Sample value		51.70			
82	-09	M3S		1.00x	12/04/90	18:07
			pb			
	Burn 1		79.60			
	Sample value		79.60			
83	-02	M0S		1.00x	12/04/90	18:09
			pb			
	Burn 1		10.20			
	Sample value		10.20			
84	-02	M1S		1.00x	12/04/90	18:11
			pb			
	Burn 1		15.30			
	Sample value		15.30			
85	-02	M2S		1.00x	12/04/90	18:13
			pb			
	Burn 1		19.30			
	Sample value		19.30			
86	-02	M3S		1.00x	12/04/90	18:16
			pb			
	Burn 1		34.20			
	Sample value		34.20			

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
87	-02	MOS2		1.00x	12/04/90	18:18
			pb			
	Burn 1		8.70			
	Sample value		8.70			
88	-02	M1S2		1.00x	12/04/90	18:20
			pb			
	Burn 1		14.00			
	Sample value		14.00			
89	-02	M2S2		1.00x	12/04/90	18:22
			pb			
	Burn 1		18.40			
	Sample value		18.40			
90	-02	M3S2		1.00x	12/04/90	18:25
			pb			
	Burn 1		34.30			
	Sample value		34.30			
91	100.00 PPB	CCV		1.00x	12/04/90	18:27
			pb			
	Burn 1		109.20			
	Sample value		109.20			
92	CAL BLK	CCB		1.00x	12/04/90	18:29
			pb			
	Burn 1		0.60			
	Sample value		2.00U			
93	9010247-03	MOS		1.00x	12/04/90	18:31
			pb			
	Burn 1		7.80			
	Sample value		7.80			
94	-03	M1S		1.00x	12/04/90	18:34
			pb			
	Burn 1		11.70			
	Sample value		11.70			
95	-03	M2S		1.00x	12/04/90	18:36
			pb			
	Burn 1		15.90			
	Sample value		15.90			

Concentrations

POS	SAMPLE ID	CODE	CLIENT ID	DILUTION	DATE	TIME
96	-03	MBS		1.00x	12/04/90	18:38
			pb			
	Burn 1		29.60			
	Sample value		29.60			
97	100.00 PPB	CCV		1.00x	12/04/90	18:40
			pb			
	Burn 1		103.90			
	Sample value		103.90			
98				1.00x	12/04/90	18:43
			pb			
	Burn 1		101.50			
	Sample value		101.50			
99	CAL BLK	CCB		1.00x	12/04/90	18:45
			pb			
	Burn 1		1.20			
	Sample value		2.00U			

SAMPLE PREPARATION REPORT: AQUEOUS

Prep batch#. 2535CW

Page 1
Date: 11/26/90
Approved: [signature]

Sample identification			Digest. 1: HNO3		Digest. 2:		Digest. 3:		Digest. 4:	
Client ID	Sample ID	Lab code	Initial vol, ml	Final vol, ml	Initial vol, ml	Final vol, ml	Initial vol, ml	Final vol, ml	Initial vol, ml	Final vol, ml
RW11045	9011259-01	DS	100.0	100						
RW1104	9011259-01	S	100.0	100						
RW11043	9011259-01	SD	100.0	100						
	LCSHNO3	LCS*	100.0	100						
	PBW	PB*	100.0	100						

SAMPLE PREPARATION REPORT: AMENDED

Page 2

Prep batch: 25350W

Date: 11/26/90

Approved:

Sample identification		Digest. 1: HNO3			Digest. 2:			Digest. 3:			Digest. 4:		
Sample ID	Lab code	ml	pH(ON)	Date extr.	Anal. dilution	Overall dilution	Date extr.	Anal. dilution	Overall dilution	Date extr.	Anal. dilution	Overall dilution	Date extr.	Anal. dilution	Overall dilution
9011359-01	01	2.0		11/26/90 VB	1.00										
9011359-02	02	2.0		11/26/90 VB	1.00										
9011359-03	03	2.0		11/26/90 VB	1.00										
LCSW30	LCSW	2.0		11/26/90 VB	1.00										
PBW	PBW			11/26/90 VB	1.00										

AR304283

Method Reference EPA/CLP

Page 10
Analyst VB
Sup. [illegible]
Date 11/26/90

CLP Case No.	CAA Work-Order/Sample	Color	Texture	Clarity	PH	Artifacts
GER-MIL-NJ	9011259-01	Colorless Clear	VB 11/26/90	Clear		

AQUEOU DIGESTION LOG

(CLP) or Comm

Anal. VB Anal. Anal.

PAGE 35
SUPV. SRJ

CLIENT	NET-ID	FURN DATE 11/26/90 Initial Volume (ml)	FURN DATE 11/26/90 Final Volume (ml)	ICAP DATE Initial Volume (ml)	ICAP DATE Final Volume (ml)	HG DATE Initial Volume (ml)	Ph 4.2
GER-MIL-NJ	9011259-01	100	100				↓
"	01D	↓	↓				↓
"	01S	100					
	LCSHNO3	—					
	PBW	—	↓				
	PBW	—	100				↓

AR304285

2535CW

PREP BATCH

Date	Stand ID	Stock	Manufacturer	Lot # / Exp. Date	Volume stock	Volume final	Solvent	Verified	Preparer
19/90	~~Date~~ FURNACE DIGESTION SPIKE STOCK	1000ppm Cd 1000ppm Se 1000ppm Pb 1000ppm As 1000ppm Tl	Fisher Spex Fisher Fisher Spex	883176-24 9/90 1-107-52 10/90 883795-24 7/90 883562-24 10/90 1-12-MD 9/90	1ml 2ml 4ml 8ml 10ml	200ml	2% HNO_3	KS EP against EPA ICV's	~~AAFV~~ ECW
19/90	FURNACE DIGESTION SPIKE SOLUTION	FURNACE DIGESTION SPIKE STOCK	See above		20mls	200mls	2% HNO_3	" "	~~AAFV~~ ECW
28/90	50ppm Ag	1000 ppm Ag	Spex	1-118 Ag 12/30/90	~~10.00~~ 20.0	200mls	3% HNO_3	CME	CME
18/90	5.0 ppm Ag	50 ppm Ag	See above		10.0	200mls	3% HNO_3	CME	CME
28/90	IDL	1a 1b 2 3 4 (5ppm Ag)	Spex		20.0 50.0 10.0 10.0 10.0	1liter	3% HNO_3	CME	CME

ECW

$(1000)(1) = x(200)$ $x = 5.005$ $2000 = x\ 200$ $x = 10$ 8/90   8/90

AR304286

Date	Standard ID	Stock	Manufacturer	Lot # / Exp. Date	Volume stock	Volume final	Solvent	Verified	Prepared
1/29/90	TCLP spike solution	1.000 ppm Pb	SPEX	1-102-Pb 08/30/91	10 mls	200 mls	2% HNO_3		V.B.
		" Cr	SPEX	1-61-MD 11/30/90	10 mls				
		" As	FISHER	883562-24 10/30/90	10 mls				
		" Ag	SPEX	1-118-AG 12/30/90	10 mls				
		" Cd	SPEX	1-81-MD 07/15/91	2 mls				
		" Se	SPEX	1-107-SE 10/31/90	2 mls				
1/29/90	LCS HNO_3 STOCK	1000 ppm Tl	SPEX	3-21-TL 09/30/91	50 mls	1.000 mls	2% HNO_3		V.B.
		" Pb	SPEX	1-112-PB 08/30/91	20 mls				
		" As	FISHER	883562-24 10/30/90	20 mls				
		" Se	SPEX	1-107-SE 10/31/90	10 mls				
		" Cd	SPEX	1-81-MD 07/15/91	5 mls				
10/30/90	Stock 4 ~~Hippo~~ 100.0 ppm 100.0 50.0 40.0 10.0 5.0 CalBlk	1 PPM	Stock 4 See 10/23/90 #4	→	40.0 ml 20.0 10.0 8.0 2.0 1.0 0.0	200.0 ml	2% HNO_3		mrs
10/ /90	LCS HNO_3 SOLUTION	LCS HNO_3 STOCK	see	above	10 ml	1.000 ml	2% HNO_3		V.B

AR304287

Date	Standard	Stock	Manufacturer	Lot Exp.	Volume stock	Volume final	Solvent	Verifier	Preparer
2/3/90	Stock4 1ppm	Stock4	10ppm	See 11/12/90 MWF	10.0ml	100ml	2% HNO3	MWF	MWF
2/3/90 Oi... (hcd)	Stock4 Pb, TL 200.0ppb 100.0 50.0 40.0 10.0 5.0 3.0 0.0 ↓	Stock 4	1.0ppm See above MWF →		20.0 ml 10.0 5.0 4.0 1.0 0.5 0.3 0.0 ↓	100ml ↓	2% HNO3	MWF	MWF
2/3/90	Stock4 AS, Se 100.0ppb 50.0 40.0 10.0 5.0 0.0 ↓	Stock	4 1.0 ppm See	above →	10.0 ml 5.0 4.0 1.0 0.5 0.0 ↓	100ml ↓	2% HNO3 + 2ml 5% Ni(NO3)2	MWF	MWF
12/4/90	Stock4 Pb, Te. 200.00ppb 100.00 50.00 40.00 10.0 5.0 3.0 0.0 ↓	STOCK4 →	1.0 ppm See 12/3/90	MWF →	20.0 ml 10.0 5.0 4.0 1.0 0.5 0.3 0.0 ↓	100ml ↓	2% HNO3 ↓	Ub	Ub.

AR304288

Date	Standard ID	Stock	Manufacturer	Lot # / Exp. Date	Volume stock	Volume final	Solvent	Verified	Preparer
11/12/90	Stock 4 10ppm As, Se Pb, Tl Cd	1600 ppm As Se Pb Tl Cd	Stock 4 Spex Spex Spex Spex Spex	1-218 AS (10/3/91) 1-1885B (6/30/91) 1-112-PB (CR-30-91) 3-21-TL (9/30/91) 1-81-MD (7/15/91)	10 ml ↓ 1 ml	1000 ml ↓ 1000 ml	2% HNO_3	MWF	MW
11/12/90	Stock 4 1 ppm As, Se Pb, Tl, Cd	10 ppm	Stock 4 See above	11/12/90 MWF	10 ml	100 ml	2% HNO_3	MWF	MWF
11/12/90	Stock 4 As, Se 100.0 ppb 50.0 40.0 10.0 5.0 0.0	1A Stock 4 1 ppm See 11/12/90 MWF			10.0 ml 5.0 4.0 1.0 0.5 0.0	100 ml ↓	2% HNO_3 + 2 ml 5% HNO_3 $Ni(NO_3)_2$	MWF	MW
11/12/90	Stock 4 Pb, Tl 200.0 ppb 100.0 ppb 50.0 40.0 10.0 5.0 0.0	Stock 4 1 ppm See 11/12/90 MWF			20.0 ml 1000 5.0 4.0 1.0 0.5 0.0	100 ml ↓	2% HNO_3	MWF	MW

AR304289