3M Environmental Technology
and Services

PO Box 33331
St. Paul, MN 55133-3331
612 778 6442

3M

August 30, 1995

Federal Express

US EPA RECORDS CENTER REGION 5
1010302

Illinois Section
RCRA Permitting Branch, HRP-8J
Waste Management Division
U.S.EPA, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604
Attention: Ms. Juana Rojo

Subject: Revised Wastewater Treatment Plant Information Report
RCRA Part B Permit for Facility ID#ILD054236443

Dear Ms. Rojo:

By letter to USEPA Region 5 dated May 22, 1995, 3M submitted a background information report on the 3M Cordova wastewater treatment plant area and the sludge incorporation areas. This report was submitted in partial fulfillment of the terms and conditions of the RCRA Part B permit for the 3M Cordova facility.

Since submittal of that report, 3M has rewritten and reorganized the report to make it easier to use and to understand. The report itself is now contained in one small 3-ring notebook with all the appendices in an accompanying set of larger 3-ring notebooks.

Two copies of the rewritten report and two sets of the accompanying appendices are enclosed for use by the Agency. To avoid any confusion, I recommend that Region 5 discard the two copies of the older version of this report.

Please feel free to call me if you have any questions about this submittal or if you need any additional information. My telephone number is (612) 778-5251.

Sincerely,

John S. Hunter, III

John S. Hunter, III, P.E., Ph.D.
Senior Environmental Engineering Specialist
Building 41-01-05

Enclosures

Copy: Permits Section, Division of Land Pollution Control, IEPA

3M Environmental Technology
and Services

PO Box 33331
St. Paul, MN 55133-3331
612 778 6442

3M

May 22, 1995

RECEIVED
MAY 23 1995
RCRA PERMITTING BRANCH
OR/WMD
EPA, REGION V

FEDERAL EXPRESS

Illinois Section
RCRA Permitting Branch, HRP-8J
Waste Management Division
U.S.EPA, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

Subject: Wastewater Treatment Plant Information Report
RCRA Part B Permit for ID#ILD054236443

Dear Sir or Madam:

The enclosed report is being submitted in accordance with the terms and conditions of the RCRA Part B Permit for the 3M Cordova, Illinois, facility ID# ILD054236443.

Please feel free to contact me if you have any questions or need any further information. My telephone number is (612) 778-5251.

Sincerely yours,

John S. Hunter, III

John S. Hunter, III, P.E., Ph.D.
Senior Environmental Engineering Specialist
Building 41-01-05

CC: Permits Section, Div. of Land Pollution Control, IEPA

TABLE OF CONTENTS

Section No.	Description	Page No.
	Table of Contents	ii
	List of Tables	iii
	List of Figures	vi
	List of Appendices	vii
	EXECUTIVE SUMMARY	**x**
1	**INTRODUCTION**	**1-1**
2	**WASTEWATER TREATMENT PLANT**	**2-1**
	GENERAL DESCRIPTION	2-1
	WASTE STREAMS	2-3
	Audio and Video Technology Division (AVTD) Wastewaters	2-3
	Building 20 Wastewater	2-4
	Special Materials Division (SMD) Wastewaters	2-4
	Non-Contact Process Waters	2-5
	Sanitary Wastewaters	2-6
	ADDITIONAL CHARACTERIZATION OF BASIN SLUDGES	2-6
	HISTORIC DATA	2-10
	RFI-Related Data	2-11
	Not RFI-Related Data	2-15
3	**SLUDGE INCORPORATION AREA**	**3-1**
	GENERAL DESCRIPTION	3-1
	OPERATION OF SLUDGE INCORPORATION AREA	3-4
	PERMIT MONITORING DATA	3-5
	Sludge Volumes	3-5
	Soil Monitoring	3-6
	Groundwater Monitoring	3-6
	Sludge Monitoring	3-7
	Crop Monitoring	3-8
	HISTORIC DATA	3-8
	RFI-Related Data	3-8
	Not RFI Related	3-9
	EVALUATION OF ORGANIC COMPOUND APPLICATION	3-13
	CONCLUSIONS	3-41

LIST OF TABLES

Table No.	Description	Page No.
E-1	Summary of Groundwater, Soil and Sludge Detectors Not RFI-Related Data	xiii
E-2	Summary of Groundwater, Soil, and Sludge Dections RFI-Related Data	xix
E-3	Metal Loading on Sludge Application Areas at End of Year 1994	xxi
E-4	Summary of Estimated Concentration of Organic Constituents in the Sludge Incorporation Area	xxii
E-5	Estimated Phenanthrene Concentration in Sludge Incorporation Area with Biodegradation	xxiii
2-1	Analytical Results for RCRA Characteristics - Impoundment Sludge Samples November 2 and 3, 1993	2-7
2-2	Analytical Results for RCRA Characteristics - Surface Impoundment Sludge Samples June 2 and 3, 1994 and September 7, 1994	2-8
2-3	Summary of Sludge Sample Detections May 1987	2-12
2-4	Summary of NPDES Discharge Monitoring - Priority Pollutants	2-16
2-5	Summary of Analytical Detections for Polishing Ponds March 2, 1993	2-26
2-6	Results of Monthly Benzene TCLP Analysis of Equalization Basin II Influent	2-28
2-7	Results of Monthly Benzene TCLP Analysis of Equalization Basin II Influent	2-29
2-8	Interim Status Groundwater Monitoring Program Data - pH	2-32

LIST OF TABLES

Table No.	Description	Page No.
2-9	Interim Status Groundwater Monitoring Program Data - Specific Conductivity	2-33
2-10	Interim Status Groundwater Monitoring Program Data - Total Organic Carbon	2-34
2-11	Interim Status Groundwater Monitoring Program Data - Total Organic Halogen	2-35
2-12	Summary of Sludge Sample Detections Equalization Basin II RCRA Closure July 1994	2-36
2-13	Summary of Groundwater Sample Detections Equalization Basin II RCRA Closure July 1994	2-37
2-14	Toxic Characteristics Analytical Results of Sludge Samples February and April 1991	2-39
3-1	Summary of Detections-Sludge Samples December 1981	3-11
3-2	Summary of Detections-Groundwater Samples December 1981	3-12
3-3	Summary of Detections - Sludge Samples December 1986	3-14
3-4	Estimated Phenol Applied to Sludge Incorporation Area	3-15
3-5	Estimated Toluene Applied to Sludge Incorporation Area	3-17
3-6	Estimated Bis(2-ethylhexyl)phthalate Applied to Sludge Incorporation Area	3-19
3-7	Estimated Fluoranthene Applied to Sludge Incorporation Areas	3-21

LIST OF TABLES

Table No.	Description	Page No.
3-8	Estimated Phenanthrene Applied to Sludge Incorporation Areas	3-23
3-9	Estimated Phenol Applied to Sludge Incorporation Area	3-26
3-10	Estimated Toluene Applied to Sludge Incorporation Area	3-28
3-11	Estimated Bis(2-Ethyl Hexyl)Phalate Applied to Sludge Incorporation Area	3-30
3-12	Estimated Fluoranthene Applied to Sludge Incorporation Area	3-32
3-13	Estimated Phenanthrene Applied to Sludge Incorporation Area	3-34
3-14	Summary of Estimated Concentration of Organic Constituents in the Sludge Incorporation Area	3-36
3-15	Estimated Phenanthrene Concentration in Sludge Incorporation Area with Biodegradation	3-39

LIST OF FIGURES

Figure No.	Description	Page No.
1-1	Location Map	1-2
1-2	3M Cordova, Illinois Plant Site with Area Topography	1-3
1-3	Facility Diagram	1-4
2-1	Wastewater Treatment Facility	2-2
2-2	Monitoring Well Locations	2-30
3-1	Sludge Incorporation Zones and Soil Sample Locations	3-2
3-2	Monitor Well Locations	3-3
3-3	Degradation Pathway for Phenanthrene	3-37

LIST OF APPENDICES

Appendix No.	Description
1	As Built Drawings
2	Montgomery Watson and RUST Sample Collection (November 3, 1993 and June 2, 1994) Reports
3	RFI Additional Data on Surface Impoundments Sludge Hazardous Waste Characteristics Analysis Laboratory Reports Enesco (November 1993) Quanterra (June 1994) 3M Environmental Laboratory (September 1994)
4	Correspondence on the Ignitability Test for Sludge Samples
5	Pond Basin Sludge Data Laboratory Report EDI Engineering Science (May 1987)
6	Groundwater and Soil Data Investigation Report (November 28, 1990)
7	Polishing Pond #3 Effluent F039 Analysis Enesco Laboratory Report (March 1993)
8	Equalization Basin II Effluent Analysis of Benzene Laboratory Report 3M Data Summary

LIST OF APPENDICES

Appendix No.	Description
9	Interim Status Groundwater Monitoring Program 1992 Groundwater Assessment Plan 1993 Groundwater Assessment Plan Annual Report 1994 Groundwater Assessment Plan Annual Report
10	Equalization Basin II Closure - Groundwater PACE Laboratory Report (July 1994)
11	Aerobic Digester and Mag Basin - Sludge TC Analysis Laboratory Report February and April 1991
12	Preliminary Soil Investigation Report Soil Exploration Company (January 1986)
13	Sludge Application Volumes
14	Sludge Incorporation Areas Permit Monitoring Data - Soil
15	Sludge Incorporation Areas Permit Monitoring Data - Groundwater
16	Sludge Incorporation Areas Permit Monitoring Data - Sludge
17	Sludge Incorporation Area Permit Monitoring Data - Crop
18	Inorganic Holding Basin and Aerobic Digester - Sludge Laboratory Report Rocky Mountain Analytical Laboratory (December 1981)

LIST OF APPENDICES

Appendix No.	Description
19	Inorganic Sludge Holding Basin and Aerobic Digester Laboratory Report Envirite Corporation (December 1986)
20	Inorganic Sludge Holding Basin and Aerobic Digester Laboratory Report Envirite Corporation (December 1986)
21	Degradation Properties of Phenanthrene

EXECUTIVE SUMMARY

3M has operated the production facility at 22614 Route 84 N, Cordova, Illinois 61242 since 1970. The facility is located on the east bank of the Mississippi River in the northern portion of Rock Island County. Manufacturing occurs on an approximate 100-acre, triangular portion of the site near the river and west of Illinois Route 84. The remainder of the property is used for land incorporation of the sludges produced by the facility's wastewater treatment plant. A high capacity, alluvial well field that supplies the 3M facility with water is located in the 280-acre portion of the site located east of Illinois Route 84.

The Resource Conservation and Recovery Act (RCRA) Part B Permit granted to the facility and effective on March 24, 1995 includes Hazardous and Solid Waste Amendment of 1985 (HSWA) requirements for corrective action. Specifically, 3M must conduct an investigation to determine whether a release has occurred from the Sludge Incorporation Area (SIA) or six surface impoundments which are a part of the wastewater treatment system.

As part of this investigation, 3M must provide the U.S. Environmental Protection Agency (USEPA), Region 5 with documentation on the design and operation of six surface impoundments used to collect, store, or treat wastewater (Permit Standard Condition II.F.1.a). The required information is provided in this document for the following Solid Waste Management Units (SWMUs):

1. Three lined polishing ponds that follow an activated sludge biological treatment unit;

2. A concrete-lined inorganic sludge holding basin, known as the Inorganic Sludge Holding Basin, Mag Basin, or Inorganic Basin;

3. A second concrete-lined inorganic sludge holding basin, known as the Alternate Mag Basin or Alternate Inorganic Basin;

4. One concrete-lined aerobic digester; and

5. The Sludge Incorporation Area (SIA). The SIA is three plots used in land incorporation, consisting of a total of 367 acres containing one 93-acre plot, one 182-acre plot, and one 92-acre plot.

Historic data from several programs (some monitoring programs are ongoing) and investigations of these units are presented in this report. Also, the results from the sludge sampling event of the six surface impoundments required by the RCRA Part B Permit are presented.

As required by the RCRA Part B Permit, samples were collected from the three sludge holding ponds and three wastewater polishing ponds. The samples were analyzed for RCRA hazardous waste characteristics, except ignitability, using the Test Methods for Evaluating Solid Waste, Third Edition, (SW846) methods. The SW846 method for the ignitability characteristic is not recommended for sludge samples. Therefore, the Department of Transportation (DOT) method was used to test the six sludge samples for ignitability. The analytical results indicate that the sludges located in the six surface impoundments are not RCRA characteristic hazardous wastes.

In February and April 1991, a sample was collected from the Inorganic Sludge Holding Basin and the Aerobic Digester for toxic characteristic (TC) analysis using the toxic characteristic leaching procedure (TCLP). The results indicate that the sludges are not hazardous wastes due to the TC. Also, the two constituents detected, barium and methyl ethyl ketone, were at least three orders of magnitude less than the regulatory limit. The results indicate that constituents are not present at levels that could leach through the zone of incorporation into the underlying soil or groundwater.

The historic investigations and monitoring programs can be divided into two categories: **1)** not RCRA Facility Investigation (RFI)-related; and **2)** RFI-related. The results of these studies are consolidated in Tables E-1 and E-2. The detections are presented in ranges which are referenced to the appropriate study. Water and sludge samples from the lined polishing ponds, sludge samples from two concrete basins, soil samples and feed crop samples from the land treatment plots, and site groundwater monitoring wells have all been tested for hazardous constituents.

The cumulative amount of metals regulated by the IEPA applied to the SIA since 1975 is shown in Table E-3. This information is provided annually to IEPA as part of the monitoring required by the facility Land Incorporation Permit. All loadings are less than the permitted maximum loadings as shown in Table E-3.

In 1981, a sample was collected from the Inorganic Sludge Holding Basin and the Aerobic Digester. The two samples were analyzed for the 40 CFR 261, Appendix VIII constituents. Cumulative concentrations in SIA soil since 1975 were calculated for the five compounds detected in these samples (phenol, toluene, bis(2-ethylhexyl)phthalate, fluoranthene, and phenanthrene). Cumulative totals for all five compounds are less than the United States Environmental Protection Agency (USEPA), Region 5 Data Quality Levels (DQLs) for soils as shown in Table E-4.

The cumulative concentration of phenanthrene without biodegradation is estimated to be 428.80 µg per kg of soil. The phenanthrene concentration was also calculated using the first order biodegradation equation, as shown in Table E-5. Phenanthrene is biodegraded in soil by resident microorganisms. After 20 years, biodegradation decreases the concentration to 1.03 µg per kg of soil, using a biodegradation rate constant of 0.0196 per day. This value is two orders of magnitude less than the USEPA, Region 5 practical quantification limit (PQL) and the DQL for phenanthrene in soil of 660 µg/kg.

Any hazardous constituents present in the sludge applied to the SIA exist in low concentrations and are treated in the unit to below the USEPA, Region 5 DQLs. The Wastewater Treatment Plant and SIA are designed and are operated in a manner that prevents the release of hazardous constituents to the environment. This is demonstrated by the absence of hazardous constituents in groundwater samples collected throughout the site.

TABLE E-1. SUMMARY OF GROUNDWATER, SOIL AND SLUDGE DETECTORS NOT RFI-RELATED DATA

COMPOUND	CONCENTRATION RANGE	CONCENTRATION UNITS	REFERENCE	REGION V DQL/MCL	DQL/MCL UNITS
Sludge Data					
Acetone	ND-150,000	µg/kg	I	9,200,000	µg/kg
Acetonitrile	ND-240,000	µh/kg	I	230,000	µg/kg
Aluminum	345-11,000	mg/kg	D1		
	66.5-140	mg/L	D1		
Ammonia	ND- 1,300	mg/L	D1		
	ND-1,685	mg/kg	D1		
Anthracene	0.5	mg/kgd	F	1.9	mg/kg
Antimony	31-160	mg/kg	I	31	mg/kg
	0.038	mg/L	F	0.006	mg/L
Arsenic	2.2-4.2	mg/kg	I	0.97	mg/kg
	2	mg/kg	D1	0.97	mg/kg
	0.07	mg/L	D1	0.05	mg/L
Barium	67-165	mg/kg	I	5,500	mg/kg
Bis (2-Ethylhexyl) Phthalate	0.2	mg/kgd	F	61	mg/kg
Boron	0.5	mg/kg	D1		
Cadmium	ND-0.87	mg/L	D1	0.005	mg/L
	ND-40	mg/kg	I	39	mg/kg
	ND-2	mg/kg	D1	39	mg/kg
Calcium	2,340-30,060	mg/kg	D1		
Chromium	29-40	mg/kg	I	940	mg/kg
	ND-85	mg/kg	D1	940	mg/kg
	0.22	mg/L	F	0.1	mg/L
	0.32-4	mg/L	D1	0.1	mg/L
	46	mg/kgd	F	940	mg/kg
Chrysene	0.5	mg/kgd	F	0.8	mg/kg
Cobalt	30-76	mg/kg	I	0.1	mg/kg
	ND-6,400	mg/kg	D1	0.1	mg/kg
	0.2-56	mg/L	D1	0.01	mg/L
Copper	0.22	mg/L	F	1.3	mg/L
	38-130	mg/kg	I	2,900	mg/kg
	0.6-12	mg/L	D1	1.3	mg/L
	ND-110	mg/kg	D1	2,900	mg/kg
	30	mg/kgd	F	2,900	mg/kg
Cyanide	0.95	mg/L	F	0.2	mg/kg
	0.2	mg/L	D1	0.2	mg/kg
delta-BHC	1.1	µg/kgd	F	6.03	µg/kg
Dichloromethane	ND-19,000	µg/kg	I	22,000	µg/kg
Ethylbenzene	27,000-140,000	µg/kg	I	58,000	µg/kg
Fluoranthrene	0.9	mg/kgd	F	1,600	mg/kg
Fluorene	4.2	mg/kgd	F	28	mg/kg
Heptachlor	2.3	µg/kgd	F	190	µg/kg
Iron	46-86,000	mg/L	D1	0.3*	mg/L
	76-550,000	mg/kg	D1		
Kjeldahl Nitrogen	320-2,900	mg/kg	D1		
	ND-2,500	mg/L	D1		
Lead	ND-20	mg/L	D1	0.004	mg/L
	4.4-15	mg/kg	I	500	mg/kg
	ND-80	mg/kg	D1	500	mg/kg
	24	mg/kgd	F	500	mg/kg
	0.15	mg/L	F	0.004	mg/L
Lithium	0.08	mg/L	D1		

TABLE E-1. SUMMARY OF GROUNDWATER, SOIL AND SLUDGE DETECTORS NOT RFI-RELATED DATA

COMPOUND	CONCENTRATION RANGE	CONCENTRATION UNITS	REFERENCE	REGION V DQL/MCL	DQL/MCL UNITS
Magnesium	177-3,000	mg/kg	D1		
	57.5-123	mg/L	D1		
Manganese	0.4-680	mg/L	D1		
	2.9-6,900	mg/kg	D1		
Mercury	0.0028-0.58	mg/kg	D1	23	mg/kg
	ND-1.3	mg/kg	I	23	mg/kg
	0.009	mg/L	F	0.002	mg/L
	0.24	mg/kgd	F	23	mg/kg
	0.022-0.14	mg/L	D1	0.002	mg/L
Naphthalene	0.5	mg/kgd	F	80	mg/kg
Nickel	76-140	mg/kg	I	1,600	mg/kg
	0.38	mg/L	F	0.1	mg/L
	210	mg/kgd	F	1,600	mg/kg
	0.98-600	mg/kg	D1	1,600	mg/kg
	ND-220	mg/L	D1	0.1	mg/L
Nitrate-N	ND-280	mg/L	D1	10*	mg/L
	0.76-510	mg/kg	D1		
Nitrite-N	0.12	mg/L	D1	1*	mg/L
PCB-Aroclor 1242	1,400-4,400	µg/kg	I	110	µg/kg
PCB-Aroclor 1254	2.0	µg/L	F	0.26	µg/L
PCB-Aroclor 1260	ND-1,700	µg/kg	I	110	µg/kg
Phenanthrene	8.0	mg/kgd	F	0.66	mg/kg
Potassium	193	mg/L	D1		
Propionitrile	ND-210,000	µg/kg	I	100	µg/kg
Pyrene	0.3	mg/kgd	F	1,200	mg/kg
Silver	0.042	mg/L	F	0.05	mg/L
	1.0	mg/kgd	F	390	mg/kg
Sodium	1,750-2,200	mg/L	D1		
	1,183-20,000	mg/kg	D1		
TCLP Barium	0.1 - 0.18	mg/L	P	NA	
TCLP Methyl Ethyl Ketone	0.050	mg/L	P	NA	
Thallium	ND-2.2	mg/kg	I		
Titanium	392	mg/kg	D1		
Toluene	6.0	mg/kg	F	280	mg/kg
	330	µg/L	F	930	µg/L
	ND-1.0	µg/L	K	930	µg/L
	160-670	mg/kg	I	280	mg/kg
Total Fluoride	80-160	mg/L	D1		
	250-33,700	mg/kg	D1		
Total Phenols	0.85	mg/kgd	F		
	ND-135	µg/L	K		
Total Phosphorous	24-1,559	mg/L	D1		
	64-36,000	mg/kg	D1		
Vanadium	ND-11	mg/kg	I	550	mg/kg
Xylene	110,000-650,000	µg/kg	I	99,000	µg/kg
Zinc	30-78	mg/kg	I	23,000	mg/kg
	0.37	mg/L	F	11	mg/L
	73	mg/kgd	F	23,000	mg/kg
	1-640	mg/kg	D1	23,000	mg/kg
	0.7-64	mg/L	D1	11	mg/L

TABLE E-1. SUMMARY OF GROUNDWATER, SOIL AND SLUDGE DETECTORS NOT RFI-RELATED DATA

COMPOUND	CONCENTRATION RANGE	CONCENTRATION UNITS	REFERENCE	REGION V DQL/MCL	DQL/MCL UNITS
Groundwater Data					
Alk M	37 - 100	mg/L	D2		
Alk P	0 - 100	mg/L	D2		
Aluminum	ND - 140	mg/L	D2		
Ammonia	ND - 160	mg/L	D2		
Ammonia as N	ND - 190	mg/L	D2		
Benzene	ND-0.04	mg/L	H	0.00062	mg/L
Cadmium	ND - 0.02	mg/L	D2	0.005	mg/L
Chlorine	1 - 20	mg/L	D2		
Chloroform	ND-5	µg/L	F	0.28	µg/L
Di-n-Butyl Phthalate	ND-16	µg/L	F		
Flourine	0.2 - 0.3	mg/L	D2	0.31	mg/L
Kjeldahl Nitrogen	ND - 14.6	mg/L	D2		
Mercury	ND -0.7	mg/L	D2	0.002	mg/L
Nitrate	ND - 140	mg/L	D2	10*	mg/L
Nitrate as N	ND - 160	mg/L	D2		
Nitrite as N	ND - 8.25	mg/L	D2		
Nitrite plus Nitrate as N	ND - 110	mg/L	D2		
Nitrogen	ND - 0.02	mg/L	D2		
pH	4.37-8	units	H		
Selenium	ND-0.004	mg/L	F	0.05	mg/L
Sodium	2.2 - 12	mg/L	D2		
Soluble Iron	ND - 3.4	mg/L	D2		
Soluble Nickel	ND - 3.3	mg/L	D2		
Specific Conductivity	285-811	umhos/cm	H		
Toluene	ND-1	µg/L	F	93	µg/L
Total Alk	22 - 230	mg/L	D2		
Total Chromium	ND - 0.04	mg/L	D2	0.1	mg/L
Total Cobalt	ND - 0.09	mg/L	D2	0.01	mg/L
Total Copper	ND - 0.13	mg/L	D2	1.3	mg/L
	ND-0.016	mg/L	F	1.3	mg/L
Total Iron	ND - 606	mg/L	D2	0.3*	mg/L
Total Lead	ND-0.22	mg/L	F	0.004	mg/L
	ND - 0.20	mg/L	D2	0.004	mg/L
Total Nickel	ND- 0.95	mg/L	D2	0.1	mg/L
	ND-0.035	mg/L	F	0.1	mg/L
Total Organic Carbon	1.9-17.5	mg/L	H		
Total Organic Halogen	ND-1.42	mg/L	H		
Total Phosphorus	ND-4.9	mg/L	D2		
Trichloroethylene	ND-4	µg/L	F	2.5	µg/L
Xylene	ND-8.1	µg/L	I	1,900	µg/L
Zinc	ND-0.036	mg/L	F	11	mg/L
	ND - 360	mg/L	D2	11	mg/L
Soil Data					
Bray-Phosphorous	1.2-300	mg/kg	D3		
Chlorine	ND-195	mg/kg	D3		
Extractable Aluminum	26-1,600	mg/kg	D3		
Extractable Cadmium	ND-0.75	mg/kg	D3		
Extractable Chromium	ND-1.66	mg/kg	D3		
Extractable Iron	0.2-882	mg/kg	D3		
Extractable Lead	ND-6.5	mg/kg	D3		
Extractable Mercury	ND-0.3	mg/kg	D3		

TABLE E-1. SUMMARY OF GROUNDWATER, SOIL AND SLUDGE DETECTORS NOT RFI-RELATED DATA

COMPOUND	CONCENTRATION RANGE	CONCENTRATION UNITS	REFERENCE	REGION V DQL/MCL	DQL/MCL UNITS
Extractable Nickel	ND-46	mg/kg	D3		
Extractable Zinc	ND-17	mg/kg	D3		
ExtractableCobalt	ND-100	mg/kg	D3		
ExtractableCopper	ND-61	mg/kg	D3		
Extractable Fluoride	ND-68	mg/kg	D3		
Extractable Manganese	16-35	mg/kg	D3		
Nitrate	ND-80	mg/kg	D3		
Nitrite	ND-20.1	mg/kg	D3		
Total Cadmium	ND-0.6	mg/kg	D3	39	mg/kg
Total Chromium	7.7-66	mg/kg	D3	940	mg/kg
Total Cobalt	ND-1,600	mg/kg	D3	0.1	mg/kg
Total Copper	3-33	mg/kg	D3	2,900	mg/kg
Total Flouride	68-39,800	mg/kg	D3		
Total Iron	7,000-110,000	mg/kg	D3		
Total Lead	ND-30	mg/kg	D3	500	mg/kg
Total Mercury	ND-0.27	mg/kg	D3	23	mg/kg
Total Nickel	9-390	mg/kg	D3	1,600	mg/kg
Total Phosphorous	148-674	mg/kg	D3		
Total Zinc	12-120	mg/kg	D3	23,000	mg/kg
Crop Data					
Aluminum	ND-95	mg/kgd	D4		
Antimony	ND-0.14	mg/L	D4		
	ND-0.14	mg/kgd	D4	31	mg/kg
Arsenic	ND-0.07	mg/L	D4		
	ND-0.83	mg/kgd	D4	0.97	mg/kg
Barium	ND-5.2	mg/kgd	D4	5,500	mg/kg
Bray-Phosphorous	0.56-611.00	mg/kgd	D4		
Cadmium	ND-12	mg/kgd	D4	39	mg/kg
	ND-0.6	mg/L	D4		
CEC(meq)	ND-42.1	mg/kgd	D4		
Chromium	ND-61	mg/L	D4		
	ND-67	mg/kgd	D4	940	mg/kg
Cobalt	ND-1,400	mg/kgd	D4	0.1	mg/kg
	ND-560	mg/L	D4		
Copper	ND-9.9	mg/L	D4		
	ND-60	mg/kgd	D4	2,900	mg/kg
Cyanide	ND-0.95	mg/L	D4	1,600	mg/kg
Dissolved Cadmium	ND-0.396	mg/kgd	D4		
Dissolved Chromium	ND-1.57	mg/kgd	D4		
Dissolved Cobalt	ND-100.00	mg/kgd	D4		
Dissolved Copper	ND-61.00	mg/kgd	D4		
Dissolved Iron	0.20-882.00	mg/kgd	D4		
Dissolved Lead	ND-7.62	mg/kgd	D4		
Dissolved Nickel	ND-111.00	mg/kgd	D4		
Dissolved Zinc	ND-32.20	mg/kgd	D4		
Lead	ND-6.8	mg/L	D4		
	ND-60	mg/kgd	D4	500	mg/kg
Manganeese	3-10	mg/kgd	D4		
Mercury	ND-0.58	mg/kgd	D4	23	mg/kg
	ND-0.022	mg/L	D4		
Nickel	ND-220	mg/kgd	D4	1,600	mg/kg
	ND-58	mg/L	D4		

TABLE E-1. SUMMARY OF GROUNDWATER, SOIL AND SLUDGE DETECTORS NOT RFI-RELATED DATA

COMPOUND	CONCENTRATION RANGE	CONCENTRATION UNITS	REFERENCE	REGION V DQL/MCL	DQL/MCL UNITS
Silver	ND-0.042	mg/L	D4		
	ND-1	mg/kgd	D4	390	mg/kg
Total Phosphorous	0.1-674.0	mg/kgd	D4		
Zinc	ND-352	mg/kgd	D4	23,000	mg/kg
	0.28-71	mg/L	D4		
Wastewater Effluent Data					
Acetone	69 - 16,200	µg/L	E	770	µg/L
	ND - 58,000	µg/L	J		
Acetophenone	ND - 14	µg/L	J		
Anthracene	30	µg/L	E	2,300	µg/L
Barium	ND - 0.011	mg/L	J		
Benidine	400	µg/L	E		
Benzene	1 - 2.6	µg/L	E	0.62	µg/L
Bis (2-Ethylhexyl) Phthalate	5 - 45	µg/L	E	6.1	µg/L
Carbazole	5 - 18	µg/L	E		
Chloroethane, Ethyl Chloride	2.1 - 7.2	µg/L	E	710	µg/L
Chloromethane	2.1 - 8	µg/L	E	2.3	µg/L
1,2-Dichlorobenzene	1 - 2	µg/L	E		
1,1-Dichloroethane	1.1 - 4	µg/L	E	0.2	µg/L
Diethylpthalate	8 - 27	µg/L	E	29,000	µg/L
Dimethyl Disulfide	14	µg/L	E		
2,4-Dimethyl Phenol	8	µg/L	E	730	µg/L
1,2-Diphenylhydrazine	7 - 160	µg/L	E		
Ethanol	4,600 - 14,000	µg/L	E		
Ethyl Benzene	1 - 10	µg/L	E	700	µg/L
Ethyl Ether	11 - 2,900	µg/L	E		
Isophorone	42 - 91	µg/L	E	90	µg/L
Isopropanol	50 - 12,000	µg/L	E		
MEK	67 - 240	µg/L	E	2,500	µg/L
4-Methyl-2-Pentanone	390 - 1,710	µg/L	E	1,800	µg/L
Methylene Chloride	2 - 190	µg/L	E	5	µg/L
2-Methylphenol	6	µg/L	E	10	µg/L
	ND - 24	µg/L	J		
Naphthalene	14 - 22	µg/L	E	31	µg/L
n-Butanol	160 - 170	µg/L	E		
Nickel	ND - 0.17	mg/L	J		
Phenanthrene	7 - 24	µg/L	E	10	µg/L
Tert-Butanol	170 - 16,000	µg/L	E		
Tetrahydrofuran	72 - 5,000	µg/L	E		
Toluene	1 - 12	µg/L	E	930	µg/L
Total Fluoride	ND - 47.2	mg/L	J		
Total Organic Carbon	47.1 - 75.9	mg/L	J		
Total Suspended Solids	ND - 93.0	mg/L	J		
1,1,2-Trichloroethane	6	µg/L	E	0.32	µg/L
1,3,5-Trimethylbenzene	6 - 9	µg/L	E		
1,2,4-Trimethylbenzene	1 - 8	µg/L	E		

TABLE E-1. SUMMARY OF GROUNDWATER, SOIL AND SLUDGE DETECTORS NOT RFI-RELATED DATA

COMPOUND	CONCENTRATION RANGE	CONCENTRATION UNITS	REFERENCE	REGION V DQL/MCL	DQL/MCL UNITS
Xylene	4 - 63	µg/L	E	1,900	µg/L
	3.3 - 33.3	µg/L	E	1,900	µg/L
Zinc	ND - 0.026	mg/L	J		

NOTES:

1). Sludge sample DQL values were assumed as groundwater when units were in mg/L and soil when in mg/kg. Soil DQLs were used for all crop data and groundwater DQLs were used for wastewater data.
2). "*" = MCLs were used for compounds for which DQLs were not available.
3). ND = Not detected above method detection limit for specific analytical event.
4). NA = not applicable.

REFERENCES:

D. Sludge Incorporation Permit Monitoring Data
Metals and other inorganic parameters, 1975 to present.
(D-1) sludge
(D-2) groundwater
(D-3) soil
(D-4) crop

E. Wastewater Discharge Permit Monitoring Data
Pond #3 Effluent - Priority Pollutants
March 1992 to present.

F. Special One-Time Monitoring Event
Mag sludge, aerobic digester sludge, and monitoring wells
Priority Pollutants - December 1981

G. Soils Characterization Study
January 1986

H. Equalization Basin II RCRA Interim Status Monitoring
D018 Benzene
Groundwater Statistics

I. Equalization Basin II Closure
Appendix IX parameters for groundwater and sludge
July to November 1994
Clean closure approved by USEPA, Region 5 on March 15, 1995

J. Polishing Ponds
F039 analysis of wastewater
March 2, 1993

K. Sludge Sampling Event
December 1986

P. Sludge Sampling Event
TC Analysis
February and April 1991

TABLE E-2. SUMMARY OF GROUNDWATER, SOIL, AND SLUDGE DETECTIONS RFI-RELATED DATA

COMPOUND	CONCENTRATION RANGE	CONCENTRATION UNITS	REFERENCE	REGION V DQL/MCL	DQL/MCL UNITS
Groundwater Data					
Aluminum	ND - 1.4	mg/L	B		
Barium	0.036 - 0.22	mg/L	B	2	mg/L
Boron	ND - 0.24	mg/L	B		
Calcium	37.1 - 72.2	mg/L	B		
Cobalt	ND - 0.077	mg/L	B	0.010	mg/L
Cyanide, Tot.	ND - 0.11	mg/L	B	0.200	mg/L
Fluoride	ND - 4.3	mg/L	B	0.310*	mg/L
Iron	ND - 0.82	mg/L	B	0.30*	mg/L
Magnesium	13.4 - 25.0	mg/L	B		
Manganese	ND - 15.6	mg/L	B		
Nickel	ND - 0.13	mg/L	B	0.100	mg/L
Nitrate as N	2.40 - 52.2	mg/L	B	10*	mg/L
Potassium	ND - 41.2	mg/L	B		
Sodium	6.2 - 54.6	mg/L	B		
Strontium	0.080 - 0.35	mg/L	B		
Zinc	ND - 0.046	mg/L	B	11	mg/L
Soil Data					
Antimony	ND	mg/kg	B	31	mg/kg
Arsenic	ND - 3.6	mg/kg	B	0.970	mg/kg
Barium	24 -150	mg/kg	B	5,500	mg/kg
Beryllium	ND - 0.6	mg/kg	B	0.400	mg/kg
Cadmium	ND	mg/kg	B	39	mg/kg
Chromium (6+)	ND	mg/kg	B	940	mg/kg
Chromium (Tot)	7.1 - 31	mg/kg	B		
Cobalt	ND - 7	mg/kg	B	0.100	mg/kg
Copper	5.5 - 12	mg/kg	B	2,900	mg/kg
Lead	ND - 12	mg/kg	B	500	mg/kg
Nickel	10 - 20	mg/kg	B	1,600	mg/kg
Silver	ND	mg/kg	B	390	mg/kg
Strontium	11 - 32	mg/kg	B		
Thallium	ND	mg/kg	B	-	mg/kg
Tin	ND	mg/kg	B	47,000	mg/kg
Vanadium	11 - 69	mg/kg	B	550	mg/kg
Zinc	10 - 36	mg/kg	B	23,000	mg/kg
Sludge Data					
Acetaldehyde	ND - 0.88	mg/kg	A		
Arsenic	ND - 0.13	mg/L	C-2	0.050	mg/L
Barium	0.33 - 0.53	mg/L	C-1	2	mg/L
	0.036 - 0.43	mg/L	C-2	2	mg/L
Benzene	ND - 0.0064	mg/L	C-2	0.00062	mg/L
	ND - 0.0063	mg/L	C-1	0.00062	mg/L
	ND - 0.010	mg/kg	A	2.7	mg/kg
Bis(2-Ethyl Hexyl)Phthalate	ND - 0.50	mg/kg	A	61	mg/kg

TABLE E-2. SUMMARY OF GROUNDWATER, SOIL, AND SLUDGE DETECTIONS
RFI-RELATED DATA

COMPOUND	CONCENTRATION RANGE	CONCENTRATION UNITS	REFERENCE	REGION V DQL/MCL	DQL/MCL UNITS
2-Butanone	ND - 0.25	mg/L	C-1	2.5	mg/L
Carbon Disulfide	ND - 0.039	mg/kg	A	53	mg/kg
Chlorobenzene	ND - 0.012	mg/L	C-2	0.052	mg/L
Ethyl Benzene	ND - 0.006	mg/kg	A	58	mg/kg
Fluoranthene	ND - 0.34	mg/kg	A	1,600	mg/kg
Fluorene	ND - 1.1	mg/kg	A	28	mg/kg
Fluoride	1,200 - 5,800	mg/kg	A		
Lead	ND - 0.088	mg/L	C-2	0.004	mg/L
3/4-Methylphenol	ND - 0.021	mg/L	C-1	(1)	mg/L
	ND - 0.14	mg/L	C-2	(1)	mg/L
Phenanthrene	0.026 - 5.6	mg/kg	A	0.660	mg/kg
Phenol	ND - 0.072	mg/kg	A	23,000	mg/kg
Pyrene	ND - 0.53	mg/kg	A	1,200	mg/kg
Tetrachloroethene	ND - 0.0071	mg/L	C-2	0.0014	mg/L
Toluene	ND - 1.0	mg/kg	A	280	mg/kg
Xylene	ND - 0.10	mg/kg	A	99	mg/kg

NOTES:

1) The DQL for 3 - Methyphenol is 1.8 mg/kg. The DQL for 4 - Methyphenol is 0.08 mg/kg.
2) Sludge sample Data Quality Level (DQL) values were assumed as groundwater when units were in mg/L and soil when units were in mg/kg.
3) Maximum Contaminant Levels (MCLs) from the National Primary Drinking Water Regulations were used for compounds for which DQLs were not available.
4) ND = not detected above method detection limit for specific analytical event
5) * = MCLs were used for compounds for which DQLs were not available.

REFERENCES:

(A) May 1987 Appendix VIII sampling event
Pond #1 and #2 sludge, Mag sludge, and Aerobic Digestor sludge
Appendix VIII parameters SW-846

(B) 1989 Abbreviated RFI
Groundwater, soil, and sludge
Appendix IX parameters SW-846

(C) (Part B Permit requirement)
Sludges in all 6 surface impoundments tested for RCRA hazardous characteristics. SW-846
(C-1) November 1993
(C-2) June 1994

TABLE E-3 METAL LOADING ON SLUDGE APPLICATION AREAS AT END OF YEAR 1994

FIELD (ZONE)	Cd		Ni		Cu		Pb		Zn	
	LOADING (lbs/acre)	PERMIT MAXIMUM LOADING (lbs/acre)	LOADING (lbs/acre)	PERMIT MAXIMUM LOADING (lbs/acre)	LOADING (lbs/acre)	PERMIT MAXIMUM LOADING (lbs/acre)	LOADING (lbs/acre)	PERMIT MAXIMUM LOADING (lbs/acre)	LOADING (lbs/acre)	PERMIT MAXIMUM LOADING (lbs/acre)
1	0.73	10	85	200	6.96	250	13.5	1,000	37.0	500
2	0.83	10	118	200	9.98	250	17.1	1,000	43.7	500
3	0.68	10	93	200	8.57	250	12.4	1,000	36.0	500
4	0.98	10	110	200	9.55	250	15.3	1,000	41.9	500
5	2.22	10	186	200	14.4	250	48.2	1,000	45.1	500
6	0.87	10	125	200	9.15	250	21.0	1,000	26.1	500
7	1.89	10	148	200	10.5	250	21.3	1,000	73.4	500
8	0.50	10	47	200	4.9	250	6.3	1,000	43.3	500
9	0.58	10	92	200	8.3	250	19.9	1,000	29.7	500
10	0.46	10	121	200	2.9	250	10.8	1,000	10.0	500
11	0.23	10	69	200	2.1	250	4.5	1,000	11.7	500

TABLE E-4. SUMMARY OF ESTIMATED CONCENTRATION OF ORGANIC CONSTITUENTS IN THE SLUDGE INCORPORATION AREA

ORGANIC CONSTITUENT	UNITS	ESTIMATED CONCENTRATION IN SOIL	DQL
Phenol	µg compound/kg soil	224.00	23,000,000
Toluene	µg compound/kg soil	11.77	280,000
Bis(2-Ethyl Hexyl)-Phalate	µg compound/kg soil	62.19	61,000
Flouranthene	µg compound/kg soil	43.70	1,600,000
Phenanthrene	µg compound/kg soil	428.80	660

Note:

1) DQL = USEPA, Region 5, Data Quality Level, 1994

TABLE E-5. ESTIMATED PHENANTHRENE CONCENTRATION IN SLUDGE INCORPORATION AREA WITH BIODEGRADATION

DATE	ESTIMATED PHENANTHRENE APPLIED (µg compound/kg soil in the ZOI)																					
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76				2.72E-61		1.39E-61																		
3/16/76-4/1/76	2.13E-60																							
3/76-4/76			1.29E-60		1.40E-60		2.13E-60		1.82E-60															
5/19/76-6/3/76												2.05E-61												
6/7/76-7/1/76												1.44E-60												
7/9/76-8/3/76													1.31E-58											
8/4/76-8/24/76															1.98E-58									
10/76-12/76										1.65E-59		1.65E-59												
1/77																						1.30E-58		
3/77-4/77		1.80E-58		1.92E-58		2.13E-58		1.80E-58																
4/77-6/77										5.85E-58		5.84E-58												
5/77																3.63E-58								
5/77-6/77														5.60E-58										
6/77-7/77																		2.87E-57						
8/77-9/77																			1.53E-55					
11/77										1.40E-57		1.40E-57		1.40E-57		1.40E-57								
3/78-4/78										2.70E-55		2.70E-55		2.70E-55		2.70E-55								
4/78-5/78										4.56E-55		4.56E-55		5.47E-54		4.56E-55								
5/22/78-6/6/78	4.20E-54		4.49E-54		4.96E-54		4.20E-54																	
6/8/78-7/13/79		3.64E-51		3.89E-51		4.30E-51		3.64E-51																
7/17/78-8/30/78	8.35E-53		8.93E-53		9.87E-53		8.35E-53																	
8/30/78-10/9/78																	1.35E-52							
10/5/78-10/30/78																	1.45E-52							
10/5/78-10/30/78																	3.68E-53							
10/78																		1.51E-53		3.12E-53				
4/5/79-5/1/79																		1.93E-52						
5/2/79-5/18/79																3.34E-51								
5/23/79-6/7/79										4.03E-51														
7/9/79-8/10/79										1.45E-50														
8/13/79-11/1/79												5.19E-50												
10/29/79-10/30/79										1.44E-50														
11/79														9.72E-50		7.81E-50								
11/17/79-12/7/79			1.18E-48																					
1/26/79, 4/10/80-4/29/80												8.86E-50												
4/30/80-5/2/80		6.10E-49		6.52E-49																				
5/2/80-5/16/80						2.38E-48		1.97E-48																
6/30/80-9/30/80																		2.93E-47						
11/6/80-11/14/80	1.81E-46		1.93E-46		2.13E-46		1.81E-46																	
11/6/80-12/12/80		7.56E-47		8.08E-47		8.94E-47																		
11/6/80-12/17/80								8.34E-47																
12/15/80-12/18/80										8.40E-47														
3/16/81-3/30/81																		6.19E-46						
3/31/81-5/1/81	1.72E-44		1.63E-44		2.03E-44		1.72E-44																	
5/4/81-5/11/81																6.27E-45								
6/15/81-6/17/81										1.04E-44														
6/17/81-7/10/81												7.50E-45												
8/29/81-8/27/81												5.75E-45												
8/31/81-9/3/81											1.58E-43													
9/3/81-9/5/81														5.55E-44										
9/9/81-10/2/81										1.32E-43														
9/22/81-9/23/81																								
10/1/81-11/5/81																		2.79E-44						
10/27/81-11/4/81	5.48E-43		5.86E-43																					
12/5/81-12/8/81																		1.58E-44						
4/1/82-8/31/82	2.97E-40	1.89E-42	3.18E-40	2.03E-42		6.46E-41		5.47E-41				1.25E-41				5.30E-41		3.96E-41						
9/1/82-3/31/83	1.75E-38		1.96E-38			2.93E-39		2.42E-39										1.62E-39						
4/83-10/83		7.87E-38	2.64E-36			4.34E-37	3.10E-36		7.04E-37		7.05E-37	7.43E-38		1.50E-37		1.80E-37								
4/84-5/84	3.92E-35		1.76E-35			8.22E-36	5.89E-35																	
11/84-12/84		2.62E-35		2.35E-35					3.79E-33		2.73E-33					3.62E-34								
1/85-9/85		2.34E-32		3.37E-32		3.75E-32		3.17E-32	4.99E-31		5.00E-31		4.85E-31		3.23E-31									
3/86-7/86		1.96E-29		1.96E-29		1.96E-29		1.96E-29		4.53E-29		3.32E-29		2.74E-29			1.93E-28							
8/86-2/87		3.26E-28							4.02E-26	1.16E-27		1.16E-27	4.02E-26	1.25E-26				6.48E-28						
3/87-8/87		2.56E-27		2.56E-27		2.56E-27		2.56E-27	4.72E-25	7.88E-26	4.79E-25	1.43E-26	4.78E-25					4.99E-26						

TABLE E-5. ESTIMATED PHENANTHRENE CONCENTRATION IN SLUDGE INCORPORATION AREA WITH BIODEGRADATION

DATE	ESTIMATED PHENANTHRENE APPLIED (µg compound/kg soil in the ZOI)																					
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
9/87-11/87																		1.39E-25						
10/87-11/87									1.12E-23															
3/88-7/88		2.53E-23		2.53E-23		2.53E-23		2.53E-23	2.42E-22	7.11E-23	2.42E-22	7.11E-23	2.42E-22	7.11E-23			2.99E-22							
9/88-2/89		5.13E-22		5.13E-22		5.13E-22		5.13E-22	2.13E-20		2.13E-20	2.65E-21	2.13E-20											
3/89-8/89		4.76E-20		4.76E-20		4.76E-20		4.76E-20			8.37E-19		8.37E-19				4.33E-19	1.28E-20						
9/89-2/90																	2.79E-17	2.35E-18						
3/90-8/90		1.95E-17		1.98E-17		2.30E-17		5.84E-17	7.27E-16	5.14E-17	7.28E-16	5.18E-17	7.29E-16	5.12E-17			8.30E-16	9.87E-17						
9/90-2/91		1.33E-15		1.36E-15		1.58E-15		4.00E-15		9.63E-16	4.48E-14	9.54E-16	7.81E-15	6.02E-15										
3/91-8/91											1.98E-12			3.49E-13			1.06E-12	7.32E-14						
9/91-2/92										3.52E-12		1.48E-12					5.21E-11	1.54E-12						
3/92-8/92	1.54E-09		1.43E-09		1.63E-09		1.54E-09											1.09E-10						
9/92-2/93	7.94E-08		7.39E-08													4.47E-09								
1/93-12/93		1.45E-06		1.45E-06		5.31E-06		5.31E-06	1.42E-05		1.42E-05		1.42E-05				1.42E-05		4.10E-05					
1/94-12/94				4.40E-03		4.40E-03											1.39E-02							
3/94-4/94																							7.61E-04	
8/94-9/94																							5.82E-03	
11/94-12/94																							6.75E-02	
3/14/95-3/24/95		6.57E-03														1.96E-01	1.61E-01	1.90E-02					5.50E-01	
SUBTOTAL	8.0900E-08	6.5689E-03	7.5321E-08	4.3983E-03	1.6323E-09	4.4021E-03	1.5390E-09	5.3056E-06	1.4222E-05	3.5225E-12	1.4222E-05	1.4800E-12	1.4222E-05	3.5463E-13	3.2315E-31	1.9605E-01	1.7506E-01	1.9050E-02	4.0981E-05	3.1203E-53		1.2992E-58	6.2432E-01	
																						TOTAL APPLIED = DQL =		1.03 660

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
AD = Aerobic Digestor
ZOI = Zone of Incorporation
(3) Zone of Incorporation assumed to be 1.5 feet deep for these calculations.
(4) Blanks indicate no sludge applied to that zone on that date.
(5) Biodegradation rate constant = 0.0196 per day

SECTION 1

INTRODUCTION

3M has operated the production facility at 22614 Route 84 N, Cordova, Illinois 61242 since 1970. The facility is located on the east bank of the Mississippi River in the northern portion of Rock Island County. The plant location is shown in Figures 1-1 and 1-2. Manufacturing occurs on an approximate 100-acre, triangular portion of the site near the river and west of Illinois Route 84, as shown in Figure 1-3. The remainder of the property is used for land incorporation of the sludges produced by the facility's wastewater treatment plant. A high capacity, alluvial well field that supplies the 3M facility with water is located in the 280-acre portion of the site located east of Illinois Route 84.

The Resource Conservation and Recovery Act (RCRA) Part B Permit granted to the facility and effective on March 24, 1995 includes Hazardous and Solid Waste Amendment of 1985 (HSWA) requirements for corrective action. Specifically, 3M must conduct an investigation to determine whether a release has occurred from the Sludge Incorporation Area (SIA) or six surface impoundments which are a part of the wastewater treatment system.

As part of this investigation, 3M must provide the U.S. Environmental Protection Agency (USEPA), Region 5 with documentation on the design and operation of six surface impoundments used to collect, store, or treat wastewater (Permit Standard Condition II.F.1.a). The required information is provided in this document for the following Solid Waste Management Units (SWMUs):

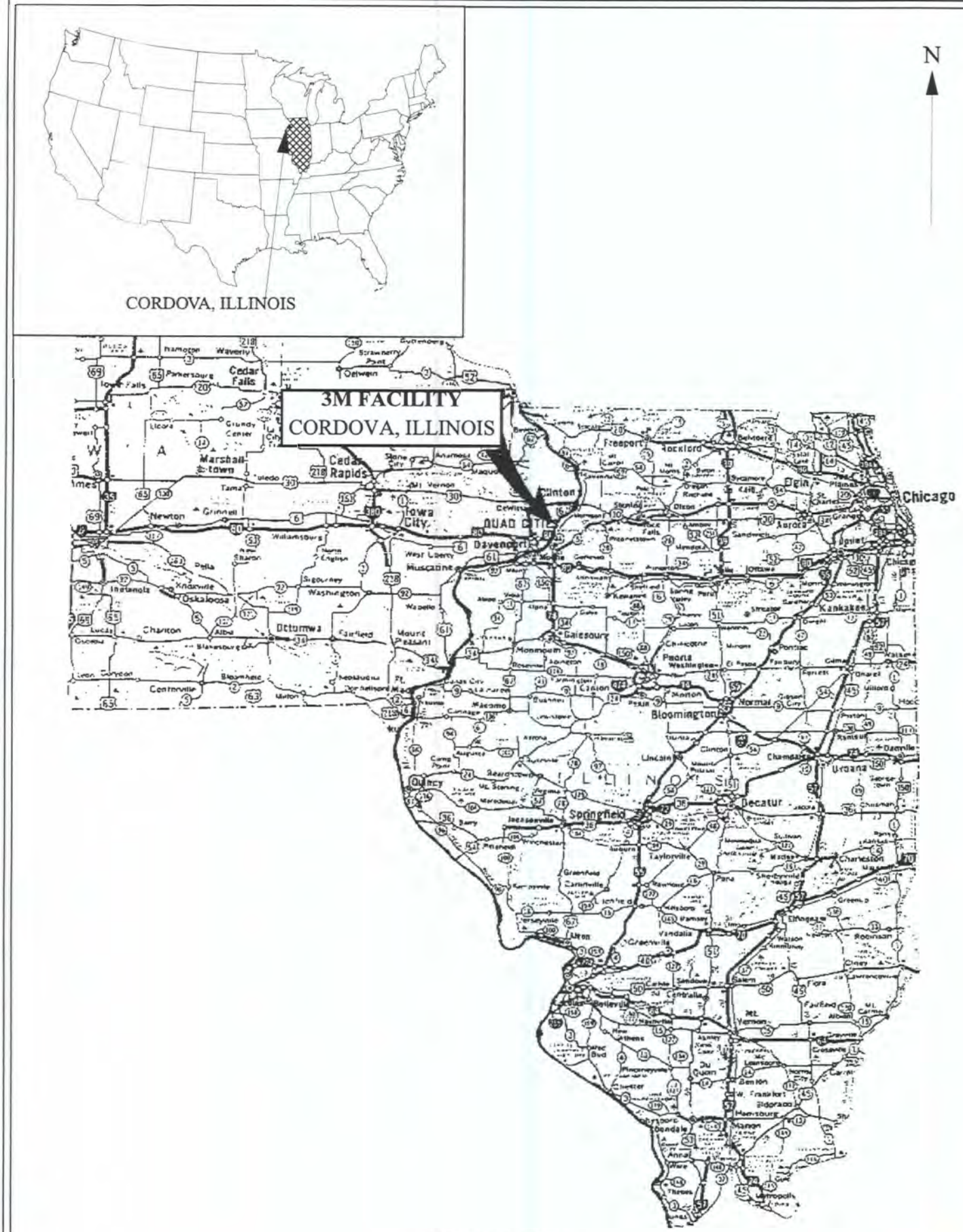


FIGURE 1-1
LOCATION MAP

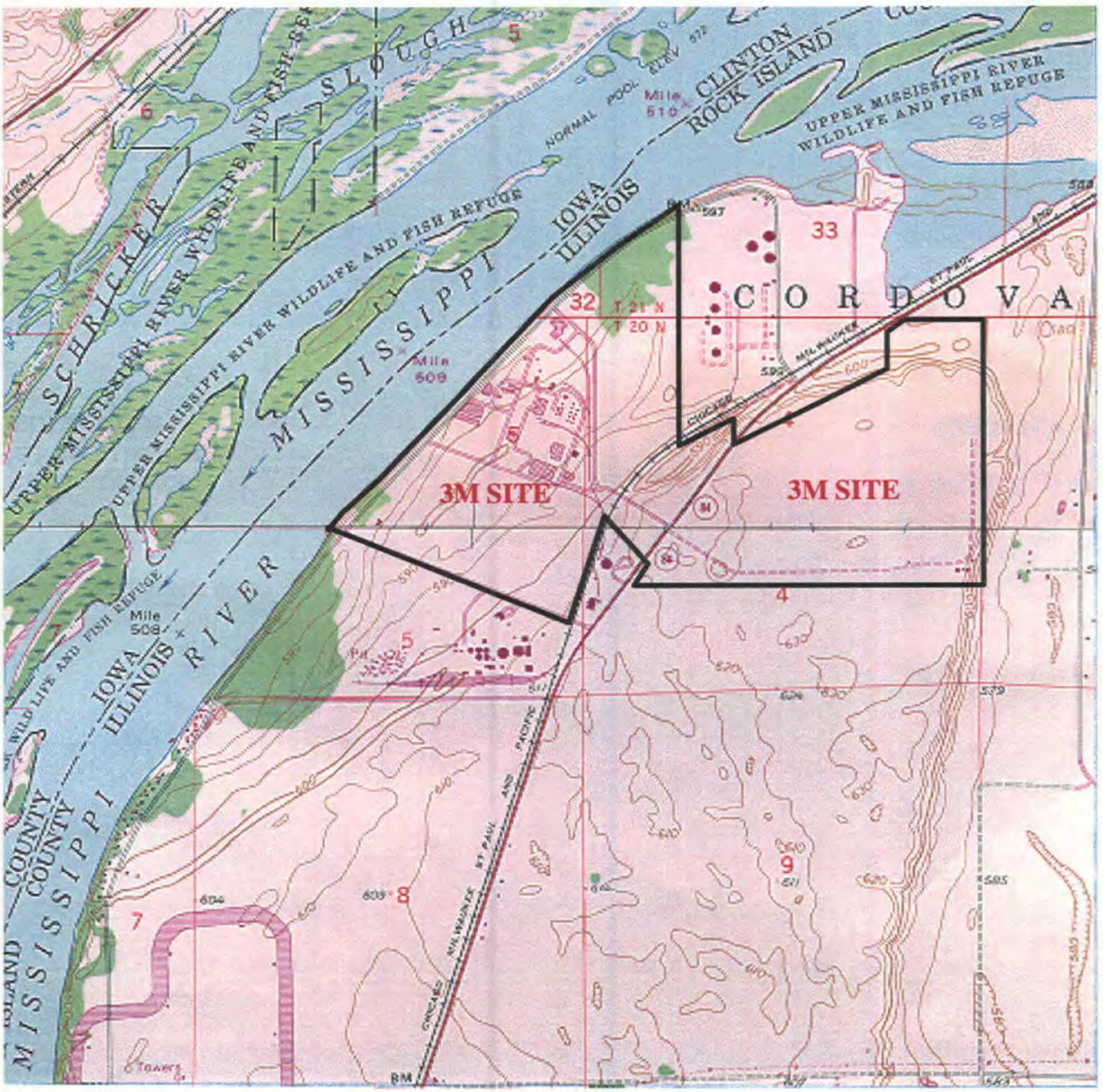


FIGURE 1-2

3M CORDOVA, ILLINOIS PLANT SITE WITH AREA TOPOGRAPHY

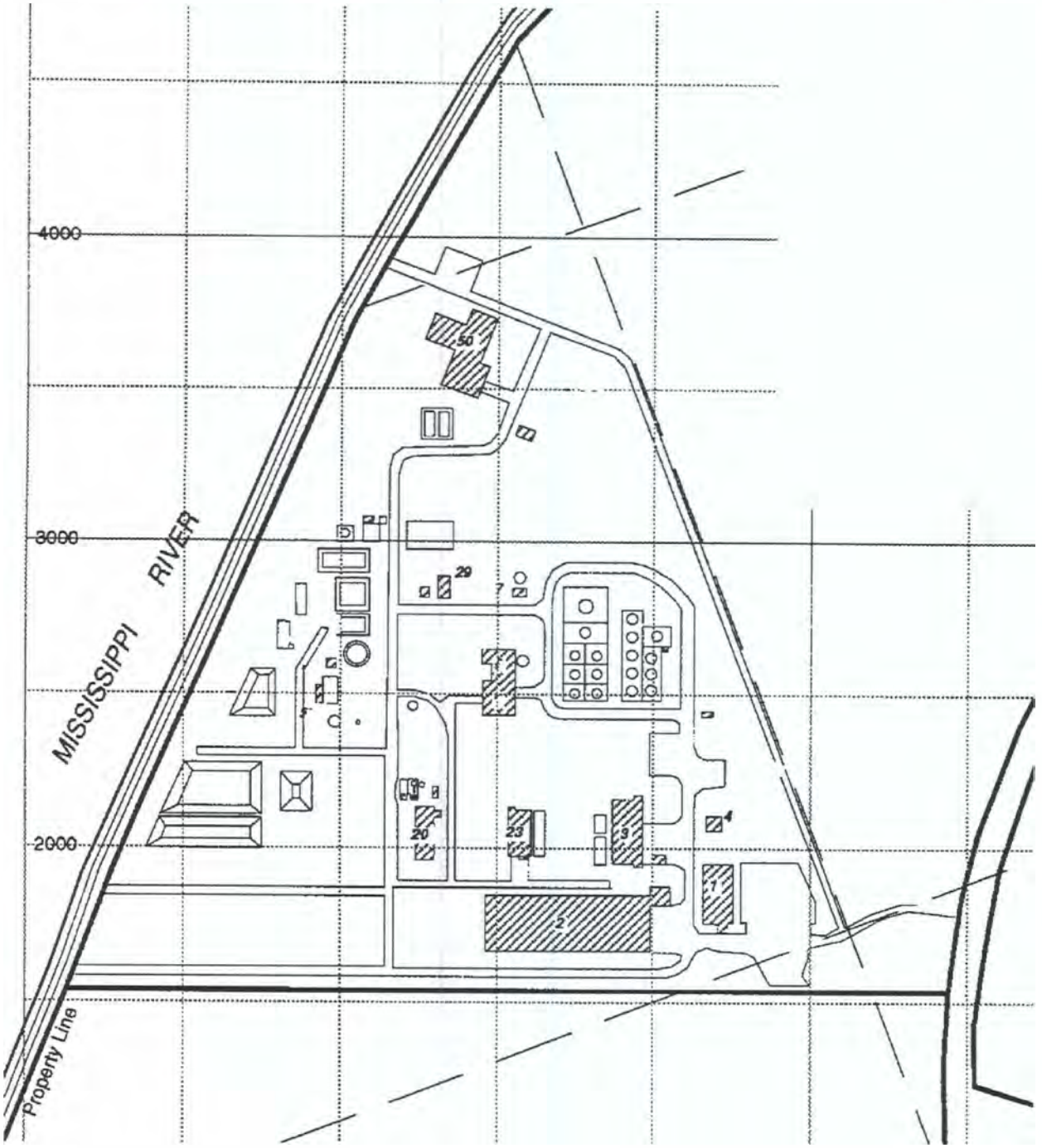


FIGURE 1-3
FACILITY DIAGRAM

1. Three lined polishing ponds that follow an activated sludge biological treatment unit;
2. A concrete-lined inorganic sludge holding basin, known as the Inorganic Sludge Holding Basin, Mag Basin, or Inorganic Basin;
3. A second concrete-lined inorganic sludge holding basin, known as the Alternate Mag Basin or Alternate Inorganic Basin;
4. One concrete-lined aerobic digester; and
5. The Sludge Incorporation Area (SIA). The SIA is three plots used in land incorporation, consisting of a total of 367 acres containing one 93-acre plot, one 182-acre plot, and one 92-acre plot.

SECTION 2

WASTEWATER TREATMENT PLANT

GENERAL DESCRIPTION

Wastewater treatment facilities were provided at the time that the initial manufacturing facilities were constructed. Additions to the wastewater treatment facility have been made to meet the needs of various plant expansions or changes in environmental regulatory requirements. A diagram of the wastewater treatment system is presented in Figure 2-1. The wastewater treatment facility is currently operating under National Pollutant Discharge Elimination System (NPDES) Permit No. IL0003140.

The wastewater treatment system consists of a variety of tanks and surface impoundments, connected with piping, that are used to process wastewaters and sludges by gravity flow or through pumping. The surface impoundments are lined with either concrete or synthetic liners, as shown in Figure 2-1. Polishing Ponds #2 and #3 are lined with 30 mil polyvinyl chloride (PVC) liners on the bottom with 30 mil CPE liners on the sides. Polishing Pond #1 is lined with a 30 hypalon liner. The Inorganic Sludge Holding Basin and the Aerobic Digester are lined with concrete. As-built drawings are provided in Appendix 1.

Two sludges produced from the wastewater treatment operations are land incorporated on-site. One is an inorganic sludge produced by a physical/chemical treatment process, and one is a biological sludge produced by an activated sludge treatment process. Land incorporation of these sludges has been conducted since 1975 in the areas east of Highway 84 and south of the main manufacturing facilities. A new area just east of the plant and west of Highway 84 and the railroad

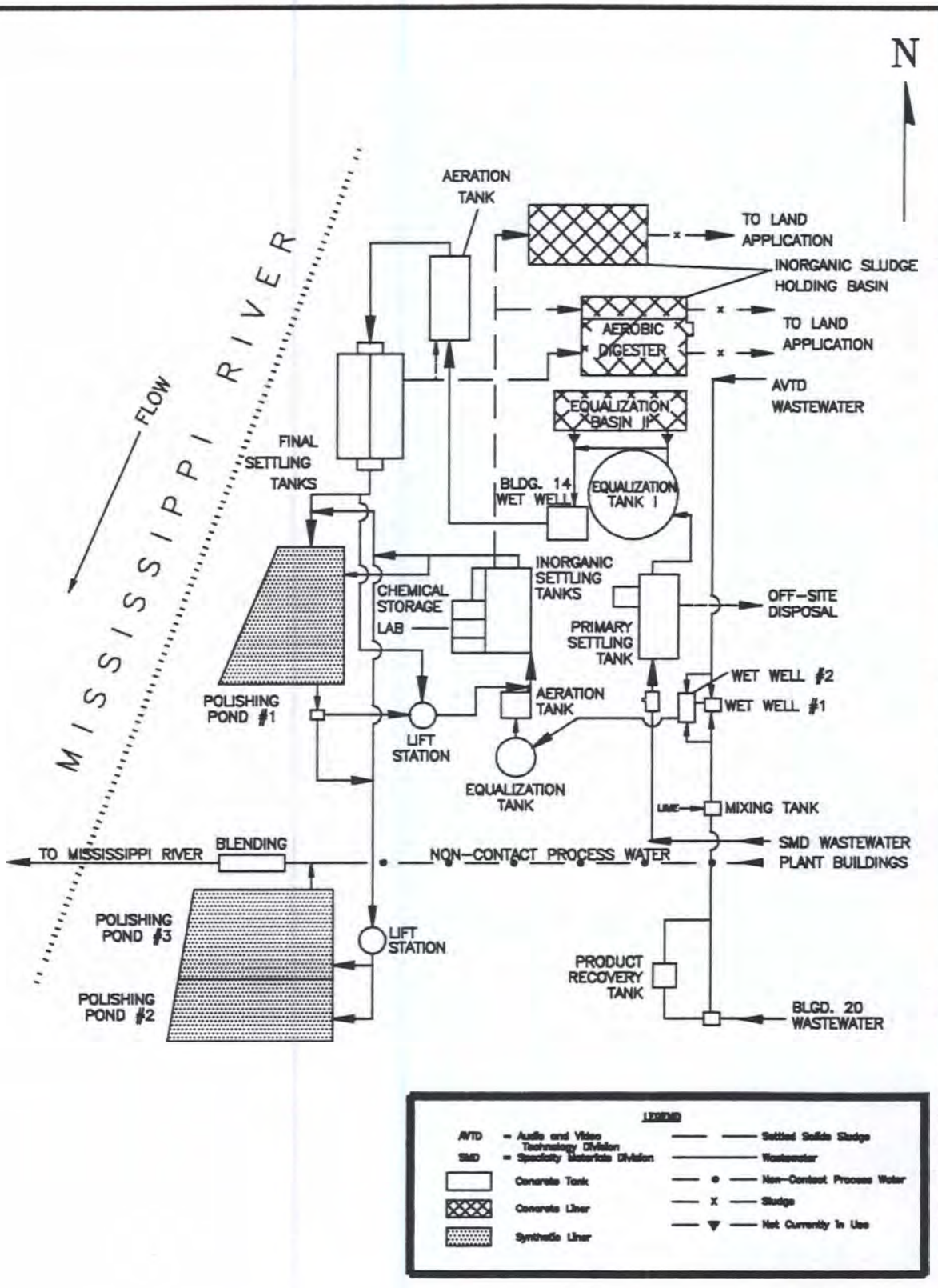


FIGURE 2-1
WASTEWATER TREATMENT FACILITY
3M COMPANY – CORDOVA, ILLINOIS

was added in the spring of 1994. Illinois Environmental Protection Agency (IEPA) Sludge Incorporation Permit No. 1995-SC-3408 prescribes how the SIA is to be managed by 3M.

WASTE STREAMS

Wastewaters produced at the plant that fall into five general areas are blended after intermediate treatment steps and combined into a single discharge to the Mississippi River. The five wastewater groups and generalized treatment descriptions are provided below.

Audio and Video Technology Division (AVTD) Wastewaters

AVTD manufactures iron oxide used in magnetic recording tapes. Wastewaters from these facilities contain high concentrations of iron which must be removed prior to discharge. Wastewater from this location is pumped to an on-ground equalization tank and metered into an aeration tank where soluble ferrous iron is converted to insoluble ferric oxide. Alum is added to coagulate the ferric oxide. Polymers are added to promote flocculation and settling. Settling occurs in the Inorganic Settling Tank. Treated wastewater from this tank is pumped to Polishing Pond #1, flows by gravity through Pond #2 and Pond #3, and then is discharged to the Mississippi River. Sludge removed from the Inorganic Settling Tank is pumped to the Inorganic Sludge Holding Basins where the sludge further consolidates. Supernatant from the Inorganic Sludge Holding Basins is returned to the AVTD sewer. The consolidated sludge is periodically transferred to the SIA for disposal.

Building 20 Wastewater

Fluorochemical products are manufactured in Building 20. Wastewaters from this area contain fluoride which must be treated with lime to produce insoluble calcium fluoride. Wastewater flows continuously through a mixing tank where lime is added. From the mix pit, this water flows into the AVTD wastewater lift station and combines with AVTD wastewaters prior to the AVTD equalization tank. The wastewater continues through the system mixed with the AVTD wastewater.

Special Materials Division (SMD) Wastewaters

SMD produces a variety of organic chemical products and intermediates which are used as feedstocks at other 3M facilities. Wastewaters from several of these processes have a high chemical oxygen demand (COD), and these wastewaters are treated in a biological treatment system. Settleable and floating materials are first removed in a Primary Settling Tank. The settled solids and floating materials are collected and disposed off-site. Wastewater from the Primary Settling Tank discharges into Equalization Tank I.

Wastewater in Equalization Tank I is pumped into the Aeration Tank and seeded with return activated sludge from the Final Settling Tanks. In this process, organic constituents are converted to carbon dioxide, water, and cell mass. The cell mass is removed as biological sludge in the Final Settling Tanks.

Treated wastewater from the Final Settling Tanks can flow directly into Polishing Pond #1, or it can first be diverted into the influent of the AVTD Inorganic Settling Tank and then into Pond #1. Wastewater from Pond #1 undergoes further polishing in Polishing Ponds #2 and #3 before being blended with non-contact process wastewater and discharged to the Mississippi River.

Excess biomass from the biological treatment system is removed at the Final Settling Tank and is metered into the Aerobic Digester, where it is further digested for stabilization and volume reduction. Before the periodic removal of sludge from the Aerobic Digester, the diffusers in the digester are shut off. After the sludge has settled, supernatant is removed and returned to the Organic Wastewater Treatment Plant. The sludge is transferred to the SIA for disposal.

In the past, Equalization Basin II was the first basin in a two-basin series with Equalization Basin I. In August 1993, Equalization Basin I was replaced with an on-ground tank, Equalization Tank I. In May 1994, Equalization Basin II was taken out of service for RCRA closure. The wastewater was removed, the sludge was removed and shipped off-site for disposal, the walls were cleaned by hydroblasting with water and steam, and samples were collected for analysis to demonstrate clean closure. A closure report and certification was submitted on January 10, 1995 to USEPA, Region 5. USEPA, Region 5 approved clean closure on March 15, 1995. 3M does not plan to return Equalization Basin II to use.

Non-Contact Process Waters

Much of the water used in the production areas is not contaminated with process residues. To reduce the volume of wastewater being discharged to the SMD, Building 20, and AVTD sewers, these process waters are segregated and discharged through separate sewers. These process waters will contain only those constituents which are already present in the groundwater supply to the facility. Non-contact process waters are blended with all other treated effluents at the outlet of Polishing Pond #3 and then discharged to the Mississippi River, as specified in the NPDES Permit.

Sanitary Wastewaters

Domestic wastewaters are mixed with chemical wastewaters in Equalization Tank I. These wastes are then processed in conjunction with the other chemical wastes and undergo biological treatment as well as settling prior to blending and discharge.

ADDITIONAL CHARACTERIZATION OF BASIN SLUDGES

Samples were collected from the six surface impoundments (three wastewater polishing ponds, two inorganic sludge holding ponds, and an aerobic digester) as specified in the RCRA Part B Permit (Attachment 2.f.). The samples were collected on November 3, 1993 and June 2, 1994. Montgomery Watson and RUST were contracted to collect the samples. The reports providing field notes, chain of custody, and description of the field activities are presented in Appendix 2.

The samples were analyzed for the hazardous waste characteristics as defined in 40 CFR 261, Subpart C (ignitability, reactivity, corrosivity, and toxicity) using methods described in Test Methods for Evaluating Solid Waste, Third Edition (PB-239223), known as SW-846. The methods and results are provided in the laboratory report as presented in Appendix 3 and summarized in Tables 2-1 and 2-2.

The SW-846 methods for testing for ignitability are not recommended for the analysis of sludge samples. A review of available information on the ignitability test indicated that the USEPA is currently recommending that the Department of Transportation (DOT) test for flammable solids be used for sludges. Correspondence on the ignitability test for sludges, including a response from USEPA, is provided in Appendix 4. Therefore, the DOT method was used to test the sludge samples collected from the ponds. The results are provided in Appendix 3 (3M Environmental Laboratory

TABLE 2-1. **ANALYTICAL RESULTS FOR RCRA CHARACTERISTICS**
SURFACE IMPOUNDMENT SLUDGE SAMPLES
NOVEMBER 2 AND 3, 1993

CHARACTERISTICS	UNITS	EPA REGULATORY LEVEL	INORGANIC	ALTERNATE MAG	INORGANIC DUPLICATE	ORGANIC	POLISHING POND 1	POLISHING POND 2	POLISHING POND 3
Ignitability	° F	Flash Point < 140	NA	NA	NA	No	No	NA	No
Corrosivity	standard units	2 >= pH >= 12.5	No	No	No	No	No	No	No
Reactivity	NA	NA	No	No	No	No	No	No	No
Toxicity									
Vinyl Chloride	mg/L	0.2	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	mg/L	0.7	ND	ND	ND	ND	ND	ND	ND
Chloroform	mg/L	6.0	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	mg/L	0.5	ND	ND	ND	ND	ND	ND	ND
2-Butanone	mg/L	200.0	ND	ND	ND	ND	0.018 (j)	ND	0.25
Carbon Tetrachloride	mg/L	0.5	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	mg/L	0.5	ND	ND	ND	ND	ND	ND	ND
Benzene	mg/L	0.5	ND	ND	ND	ND	0.0063 (j)	ND	ND
Tetrachloroethene	mg/L	0.7	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	mg/L	100.0	ND	ND	ND	ND	ND	ND	ND
Pyridine	mg/L	5.0	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	mg/L	7.5	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	mg/L	200.0	ND	ND	ND	ND	ND	ND	ND
3/4-Methylphenol	mg/L	200.0	0.021 (j)	ND	ND	ND	ND	ND	ND
Hexachloroethane	mg/L	3.0	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	mg/L	2.0	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	mg/L	0.5	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	mg/L	2.0	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	mg/L	400.0	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	mg/L	0.13	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	mg/L	0.13	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	mg/L	100.0	ND	ND	ND	ND	ND	ND	ND
Arsenic	mg/L	5.0	ND	ND	ND	ND	ND	ND	ND
Barium	mg/L	100.0	0.53	0.39	0.46	0.52	0.43	0.43	0.33
Cadmium	mg/L	1.0	ND	ND	ND	ND	ND	ND	ND
Chromium	mg/L	5.0	ND	ND	ND	ND	ND	ND	ND
Lead	mg/L	5.0	ND	ND	ND	ND	ND	ND	ND
Mercury	mg/L	0.2	ND	ND	ND	ND	ND	ND	ND
Selenium	mg/L	1.0	ND	ND	ND	ND	ND	ND	ND
Silver	mg/L	5.0	ND	ND	ND	ND	ND	ND	ND

Notes:
(1) (j) - Result is detected below the reporting limit or is an estimated concentration.
(2) ND - Not Detected at Laboratory reporting limit
(3) NA = SW846 Method for ignitability is not applicable. DOT flammability test was used as shown in Table 2-2.
(4) 3M Environmental Laboratory Report L3028
(5) Laboratory analysis by Enseco

TABLE 2-2. ANALYTICAL RESULTS FOR RCRA CHARACTERISTICS SURFACE IMPOUNDMENT SLUDGE SAMPLES JUNE 2 AND 3, 1994 AND SEPTEMBER 7, 1994

CHARACTERISTICS	UNITS	EPA REGULATORY LEVEL	INORGANIC	ALTERNATE MAG	INORGANIC DUPLICATE	POLISHING POND 2
Ignitability	° F	Flash Point < 140	No	No	No	No
Corrosivity	standard units	2 >= pH >=12.5	No	No	No	No
Reactivity	NA	NA	No	No	No	No
Toxicity						
Vinyl Chloride	mg/L	0.2	ND	ND	ND	ND
1,1-Dichloroethene	mg/L	0.7	ND	ND	ND	ND
Chloroform	mg/L	6.0	ND	ND	ND	ND
1,2-Dichloroethane	mg/L	0.5	ND	ND	ND	ND
2-Butanone	mg/L	200.0	ND	ND	ND	ND
Carbon Tetrachloride	mg/L	0.5	ND	ND	ND	ND
Trichloroethene	mg/L	0.5	ND	ND	ND	ND
Benzene	mg/L	0.5	ND	ND	0.0064	ND
Tetrachloroethene	mg/L	0.7	ND	ND	0.0071	ND
Chlorobenzene	mg/L	100.0	ND	ND	0.012	ND
Pyridine	mg/L	5.0	ND	ND	ND	ND
1,4-Dichlorobenzene	mg/L	7.5	ND	ND	ND	ND
2-Methylphenol	mg/L	200.0	ND	ND	ND	ND
3/4-Methylphenol	mg/L	200.0	ND	.14	ND	ND
Hexachloroethane	mg/L	3.0	ND	ND	ND	ND
Nitrobenzene	mg/L	2.0	ND	ND	ND	ND
Hexachlorobutadiene	mg/L	0.5	ND	ND	ND	ND
2,4,6-Trichlorophenol	mg/L	2.0	ND	ND	ND	ND
2,4,5-Trichlorophenol	mg/L	400.0	ND	ND	ND	ND
2,4-Dinitrotoluene	mg/L	0.1	ND	ND	ND	ND
Hexachlorobenzene	mg/L	0.1	ND	ND	ND	ND

TABLE 2-2. ANALYTICAL RESULTS FOR RCRA CHARACTERISTICS SURFACE IMPOUNDMENT SLUDGE SAMPLES JUNE 2 AND 3, 1994 AND SEPTEMBER 7, 1994

CHARACTERISTICS	UNITS	EPA REGULATORY LEVEL	INORGANIC	ALTERNATE MAG	INORGANIC DUPLICATE	POLISHING POND 2
Pentachlorophenol	mg/L	100.0	ND	ND	ND	ND
Arsenic	mg/L	5.0	0.13	ND	ND	ND
Barium	mg/L	0.100	0.036	0.10	0.043	0.043
Cadmium	mg/L	100.0	ND	ND	ND	ND
Chromium	mg/L	5.0	ND	ND	ND	ND
Lead	mg/L	5.0	0.088	ND	ND	ND
Mercury	mg/L	0.2	ND	ND	ND	ND
Selenium	mg/L	1.0	ND	ND	ND	ND
Silver	mg/L	5.0	ND	ND	ND	ND

Notes:

(1) ND - Not Detected at laboratory reporting limit

(2) 3M Environmental Laboratory Report M1944 and M2921

(3) September 7, 1994 samples only analyzed for flammability. The DOT 49 CFR, Appendix E, part 173, method was used by the 3M Environmental Laboratory.

(4) Laboratory analysis, except as stated in (3), by Quanterra

Report M2921). The DOT screening and test methods are located in the hazardous materials regulations (HMR), 49 CFR 173.124 and Appendix E.

The analytical results show that methyl ethyl ketone was detected above the method detection limit but below the Toxic Characteristic (TC) action level of 200 mg/L in the sample collected from Polishing Pond #3. All other TC organics were not detected above the method detection limit in any sample. Barium was detected above the method detection limit in each sample collected, including the blank, but was well below the TC action level of 100 mg/L. All other TC metals were not detected above the method detection limit in any sample. The pH values for each sample are within the non-hazardous range for corrosivity (2 to 12.5 S.U.). All samples were found not to be reactive based on sulfide level, cyanide level, and water reactivity. Three surface impoundment samples were resampled on September 7, 1994 and reanalyzed using the DOT flammability test, as shown in Table 2-2. The ignitability test was negative for all samples. Based on the analytical results, it has been determined that the sludges found in these six surface impoundments are not RCRA hazardous wastes by characteristic.

HISTORIC DATA

Several investigations and monitoring programs have been conducted at the facility which are described below. The data can be grouped into two general categories, RFI-related and not RFI-related, as discussed in the Executive Summary. A summary of the data is presented in Tables E-1 and E-2.

RFI-Related Data

In May 1987 sludge samples were collected from Polishing Pond #1, Polishing Pond #2, Mag (Inorganic Sludge Holding) Basin, and the Aerobic Digester. The samples were analyzed by EDI Engineering and Science. The laboratory report is presented in Appendix 5. The samples were analyzed for 40 CFR 261, Appendix VIII organic constituents, additional organics (in accordance with SW-846), and inorganic constituents (in accordance with SW-846 and 40 CFR 136) using the methods provided in the laboratory report. A summary of the detections are presented in Table 2-3. Volatile and semivolatile organics were detected in the sludge samples collected from the four ponds, except for the Aerobic Digester samples which did not result in the detection of volatile organics.

In 1989, 3M conducted an abbreviated RFI- style investigation to determine whether releases of hazardous constituents had occurred on the site. USEPA was notified in October 1989 of 3M's intention to conduct this work with some modifications. Groundwater, soil, and sludge samples were collected and analyzed from the wastewater treatment facility. Soil and groundwater investigations conducted by 3M in 1989 and 1990 were conducted in accordance with Contract Laboratory Procedures (CLP). The methods are specified in the following references.

1. U.S. Environmental Protection Agency. March 1983. Methods for Chemical Analysis of Waste Water and Wastes. EPA-600/4-79-020. Cincinnati, OH.
2. U.S. Environmental Protection Agency. April 1984. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. (SW-846); Washington. D.C.
3. U.S. Environmental Protection Agency. March 1986. Methods for Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. Cincinnati, OH.

TABLE 2-3. SUMMARY OF SLUDGE SAMPLE DETECTIONS MAY 1987

COMPOUND	UNITS	POND #1 1580-2	POND #2 1580-3	MAG SLUDGE 1580-4	AEROBIC DIGESTER 1580-5
APPENDIX VIII ANALYSIS					
Acetaldehyde	mg/kg	0.88	ND	ND	ND
Carbon Disulfide	mg/kg	ND	0.039	ND	ND
Fluoride	mg/kg	5300	5800	5600	1200
VOLATILE FRACTION					
Benzene	mg/kg	0.010	ND	ND	ND
Ethyl Benzene	mg/kg	0.006	ND	ND	ND
Toluene	mg/kg	0.017	1.0	0.007	ND
Xylene	mg/kg	0.10	ND	ND	ND
BASE-NEUTRAL FRACTION					
Bis(2-Ethyl Hexyl)Phthalate	mg/kg	ND	0.50	0.037	ND
Fluoranthene	mg/kg	ND	0.34	0.026	ND
Fluorene	mg/kg	ND	1.1	ND	ND
Phenanthrene	mg/kg	1.8	5.6	0.220	0.026
Pyrene	mg/kg	ND	0.53	ND	ND
ACID FRACTION					
Phenol	mg/kg	ND	ND	0.035	0.072

Notes:
(1) ND = not detected at reported method detection limit
(2) Laboratory analysis by EDI Engineering and Science

4. Federal Register, "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," 40 CFR, Part 136; Vol. 49, No. 209.

5. American Public Health Association, American Water Works Association, Water Pollution Control Federation. April 1985. Standard Methods for the Examination of Water and Wastewater, 16th edition. Washington, D.C.

Samples were taken and stored using appropriate tools and containers. Required preservatives were used, samples were shipped in accordance with requirements, and analyses were conducted within the specified holding times. Full chain-of-custody documentation was prepared. Both field duplicates and laboratory duplicates were collected and analyzed. Method spikes and travel blanks were also collected.

Analyses included the full 40 CFR 264, Appendix IX parameters, except dioxins and furans, and additional characteristic data. Data were also obtained on aluminum (Al), alkalinity, hardness, boron (B), calcium (Ca), chloride, fluoride, iron (Fe), magnesium (Mg), manganese (Mn), nitrate, potassium (K), silica, sodium (Na), strontium (Sr), and sulfates. The results were summarized in a report submitted to USEPA, Region 5 in November 1990. Summary tables and the laboratory report are provided in Appendix 6.

The results showed that there were no volatile organics (Method 624), semi-volatile organics (Method 625), organochlorine pesticides or polychlorinated biphenyls (PCBs) (Method 608), or herbicides (Method 615) present in any of the samples tested.

Both barium and strontium were detected in most of the well samples indicating a natural background condition. Cobalt was detected in MW 1-88 at a concentration of 0.077 mg/L. Cobalt was not detected in any of the other wells.

Nickel was also detected in both MW 1-88 and MW 8-90 at concentrations of 0.13 mg/L, which is only slightly above the detection level. This concentration is less than the 0.150 mg/L Recommended Allowable Limit (from the USEPA Office of Drinking Water, Final Health Advisory, March 31, 1987). Slightly elevated levels of zinc were also detected in these two wells just above detection levels.

Cyanide was detected in six of the monitoring wells in the vicinity of the Wastewater Treatment Plant Area. The concentrations were all below the Maximum Contaminant Level Goal (MCLG) and the Maximum Contaminant Level (MCL) of 0.1 mg/L recently proposed by USEPA.

With respect to water quality parameters, the iron and manganese concentrations in MW 1-88 were slightly above detection limits. The fluoride concentrations were also above site background conditions in MW 3-90 and MW 8-90 at concentrations of 4.3 and 3.2 mg/L, respectively. The fluoride concentration in MW 3-90 was just slightly above the 4.0 mg/L MCL. Elevated nitrate concentrations were detected in several of the monitoring wells for several years, apparently due to a fertilizer plant south of the 3M site.

With the exception of the nitrate, the source of which is discussed above, none of the wells located within the SIA showed elevated concentrations of any hazardous constituent or water quality parameters.

The results of the analysis of soil samples showed that there were no volatile organics (Method 624), semivolatile organics (Method 625), organochlorine pesticides/PCBs (Method 608), or herbicides (Method 615) present in any of the samples tested. With the exception of sample location 14 at 2.5 feet, none of the samples collected had above background concentrations of any other constituents. The concentrations of a number of constituents (arsenic, barium, cobalt, total

chromium, lead, strontium, vanadium, and zinc) in the same sample were slightly elevated above background. The sample taken at this same location 14 at 5 feet does not show values above background for any of these constituents.

Not RFI-Related Data

The Cordova facility has collected data on the treated effluent as part of Discharge Monitoring Reports (DMRs) required by the NPDES permit and special studies. A summary of the DMR data for priority pollutants found in the effluent from March 1992 to the present is shown in Table 2-4. The samples are collected from the effluent of Polishing Pond #3 prior to discharge through the permitted outfall.

In March 1993, wastewater samples were collected from three polishing ponds and analyzed under a special program to evaluate the ponds with respect to the universal treatment standard promulgated on September 19, 1994 (59 FR 47982). Initial grab and 24-hour composite samples were collected. The samples were analyzed for hazardous waste code F039 constituents and general inorganics using SW846 methods. The detections are summarized in Table 2-5 and the laboratory report is provided in Appendix 7. Acetone was detected in the initial grab but not the composite samples. Creosol was detected in two composite samples. Acetophenone, barium, and zinc were detected in one composite sample. Nickel was detected in three composite samples.

In 1991, 3M began a program to collect and analyze samples of wastewater entering Equalization Basin II from the Primary Settler for benzene. The program was developed in response to the TC Rule, promulgated on March 29, 1990 (55 FR 11798). In July 1994, an on-ground tank was constructed, and wastewater was directed through this tank (Equalization Tank I) prior to

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

	POLLUTANT (µg/L)			
DATE	METHYLENE CHLORIDE	PHENANTHRENE	TOLUENE	2,4-DIMETHYL PHENOL
Jan-92				
Feb-92		10	2,2	
Mar-92	8	18	10	8
Apr-92		12	3, 2	
May-92	180, 100		1	
Oct-92				
Nov-92		18		
Dec-92				
Jan-93	6			
Feb-93		21		
Mar-93			4, 4	
Apr-93		12	2, 2	
May-93		24	2, 1	
Jun-93	12		1	
Jul-93	33, 25		1, 1	
Aug-93	11, 4			
Sep-93	4, 3			
Oct-93	2, 2.9			
Nov-93				
Dec-93				
Jan-94			10, 6	
Feb-94	6, 9		12, 10	
Mar-94	50, 46		2.3, 1.8	
Apr-94		11	1.4, 1.2	
May-94			1.1, 1.7	
Jun-94	160,120		1.6	
Jul-94				
Aug-94				
Sep-94	160, 190			
Oct-94	100, 110		1.5	
Nov-94	61, 40			
Dec-94	6.4	7	1.3,1.2	
Jan-95	11, 9			
Feb-95	46, 35	9	1.1	
Mar-95	15, 2.9	20		

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANT (µg/L)				
DATE	**BENZENE**	**ETHYL BENZENE**	**XYLENE**	**ANTHRACENE**
Jan-92				
Feb-92			9,11	
Mar-92	1, 1	10	6, 63	
Apr-92			7	30
May-92				
Oct-92		2		
Nov-92				
Dec-92				
Jan-93		1		
Feb-93				
Mar-93			6, 7	
Apr-93				
May-93				
Jun-93			6	
Jul-93				
Aug-93				
Sep-93				
Oct-93				
Nov-93				
Dec-93				
Jan-94				
Feb-94				
Mar-94		1.1		
Apr-94	1.1			
May-94	1.2		4, 5.2	
Jun-94				
Jul-94				
Aug-94				
Sep-94				
Oct-94	2.6, 1.7			
Nov-94	1.1			
Dec-94				
Jan-95	1.4, 1.2			
Feb-95	1.8, 1.9			
Mar-95				

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANT (µg/L)				
DATE	ISOPHRONE	1,1,2-TRICHLORO-ETHANE	DIETHYL-PTHALATE	1,1-DICHLORO-ETHANE
Jan-92	91			
Feb-92				
Mar-92			27	
Apr-92				
May-92				
Oct-92				
Nov-92				
Dec-92				
Jan-93				
Feb-93				
Mar-93				
Apr-93				
May-93			8	
Jun-93				3
Jul-93				
Aug-93				2, 4
Sep-93				
Oct-93				
Nov-93				
Dec-93				
Jan-94				
Feb-94				
Mar-94				
Apr-94				
May-94				
Jun-94				
Jul-94				
Aug-94				
Sep-94				
Oct-94				1.1
Nov-94				
Dec-94	42			
Jan-95				
Feb-95				
Mar-95				

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANTS (µg/L)			
DATE	**BIS (2-ETHYL-HEXYL) PTHALATE**	**CHLORO-METHANE**	**CHLOROETHANE**
Jan-92			
Feb-92			
Mar-92			
Apr-92			
May-92			
Oct-92			
Nov-92			
Dec-92			
Jan-93			
Feb-93			
Mar-93			
Apr-93			
May-93			
Jun-93			
Jul-93			
Aug-93			
Sep-93			
Oct-93			
Nov-93			
Dec-93			
Jan-94			
Feb-94			
Mar-94	21		
Apr-94	16		
May-94			
Jun-94		8	
Jul-94	32		
Aug-94	29		
Sep-94	7		
Oct-94	5	4.2	
Nov-94	17		
Dec-94	19	4.9, 3.5	5.2, 6.6
Jan-95	13	2.1	2.1
Feb-95		6.4	5, 6.4
Mar-95	45	4.8, 3.3	7.2, 5.2

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANTS (µg/L)				
DATE	**1,2-DIPHENYL-HYDRAZINE**	**BENIDINE**	**MEK (2-BUTANONE)**	**ACETONE**
Jan-92				
Feb-92				
Mar-92				
Apr-92			67	5200, 4800
May-92			150, 76	150, 76
Oct-92				970
Nov-92				990, 1100
Dec-92			67	16200, 5800
Jan-93				2000, 2200
Feb-93				1000, 800
Mar-93				5700, 4800
Apr-93				15000, 6100
May-93				2100, 2300
Jun-93				3400, 290
Jul-93				
Aug-93				
Sep-93				990, 900
Oct-93				2000, 2400
Nov-93				220, 1500
Dec-93				5600, 7900
Jan-94			69	5400, 5100
Feb-94	7			8300, 6900
Mar-94	160			6600, 5000
Apr-94				7000, 6500
May-94				
Jun-94				5700, 4100
Jul-94				2700, 5000
Aug-94				3000, 2100
Sep-94				1100 (CE), 820 (Q)
Oct-94				5200, 3800 (CE)
Nov-94				69, 150 (Q)
Dec-94			240 (Q)	4500, 4100 (Q)
Jan-95				4000, 4600 (Q)
Feb-95		400		3900, 3800 (Q)
Mar-95				3200, 3200 (Q)

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANTS (µg/L)				
DATE	**ISOPROPANOL**	**THF**	**TERT-BUTANOL**	**2-METHYL-PHENOL**
Jan-92				
Feb-92				
Mar-92				
Apr-92				
May-92				
Oct-92	240	160, 130	1400, 1700	
Nov-92				6
Dec-92	1200, 210			
Jan-93	50			
Feb-93				
Mar-93	1000, 600			
Apr-93	340, 6800			
May-93	220, 230	150, 210	9500, 13000	
Jun-93	430	390, 240		
Jul-93		190, 150	15900, 2800	
Aug-93				
Sep-93	74, 85	110, 130		
Oct-93	460, 450	97, 98	1300, 2800	
Nov-93		280, 300		
Dec-93	2000, 12000	72, 200		
Jan-94	1300, 1300	190, 230		
Feb-94	420, 540	230, 220		
Mar-94	2000, 760	240, 220	170, 170	
Apr-94	300, 460			
May-94		210, 220	1700, 2700	
Jun-94	230, 250	290, 200		
Jul-94	77, 170	120, 120	4000, 3500	
Aug-94	470, 420	300, 260		
Sep-94				
Oct-94	220, 420 (CE)	5000 (CE)	8000, 8000 (CE)	
Nov-94		510, 360 (Q)	3300, 3900 (Q)	
Dec-94	770 (Q)	250, 190 (Q)	270, 520 (Q)	
Jan-95	350, 570	160, 150 (Q)	3300, 4200 (Q)	
Feb-95		410, 430 (Q)		
Mar-95	1000, 1500 (Q)	270, 270 (Q)	12000, 11000 (Q)	

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANTS (µg/L)				
DATE	**CARBAZOLE**	**ETHYL ETHER**	**XYLENE**	**1,3,5-TRIMETHYL-BENZENE**
Jan-92				
Feb-92				
Mar-92				
Apr-92				
May-92				
Oct-92				
Nov-92	7			
Dec-92				
Jan-93	12			
Feb-93				
Mar-93				
Apr-93				
May-93				
Jun-93				
Jul-93				
Aug-93				
Sep-93	5	13		
Oct-93				
Nov-93	18	11	20	9,6
Dec-93		25, 29	17	8,7
Jan-94			17, 12	
Feb-94				
Mar-94				
Apr-94				
May-94			4, 5.2	
Jun-94			8.5, 4.8	
Jul-94				
Aug-94			3.3, 4.1	
Sep-94		75, 130	16.3 (Q)	
Oct-94		190, 230 (Q)		
Nov-94		170, 240 (Q)	33.3 (CE)	
Dec-94		1400, 970 (Q)		
Jan-95		580, 450 (Q)		
Feb-95		2900, 2800 (Q)		
Mar-95		2700, 2100 (Q)		

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANTS (µg/L)				
DATE	**1,2,4-TRIMETHYL-BENZENE**	**1,2-DICHLORO-BENZENE**	**DIMETHYL DISULFIDE**	**ETHANOL**
Jan-92				
Feb-92				
Mar-92				
Apr-92				
May-92				
Oct-92				
Nov-92				
Dec-92				
Jan-93				
Feb-93				
Mar-93				
Apr-93				
May-93				
Jun-93				
Jul-93				
Aug-93				
Sep-93				
Oct-93				
Nov-93	4,8			
Dec-93	1,2	2		
Jan-94				
Feb-94				
Mar-94				
Apr-94				
May-94			14	
Jun-94		1		
Jul-94				
Aug-94				
Sep-94				
Oct-94				10000, 14000 (CE)
Nov-94				14000, 14000 (Q)
Dec-94				4600, 8400 (Q)
Jan-95				
Feb-95				6900, 6300 (Q)
Mar-95				9600, 6700 (Q)

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANTS (µg/L)			
DATE	**4-METHYL-2-PENTANONE**	**NAPHTHALENE**	**N-BUTANOL**
Jan-92			
Feb-92			
Mar-92			
Apr-92			
May-92			
Oct-92			
Nov-92			
Dec-92			
Jan-93			
Feb-93			
Mar-93			
Apr-93			
May-93			
Jun-93			
Jul-93			
Aug-93			
Sep-93			
Oct-93			
Nov-93			
Dec-93			
Jan-94			
Feb-94			
Mar-94			
Apr-94			
May-94			
Jun-94			
Jul-94			
Aug-94			
Sep-94			
Oct-94			
Nov-94			

TABLE 2-4. SUMMARY OF NPDES DISCHARGE MONITORING - PRIORITY POLLUTANTS

POLLUTANTS (µg/L)			
DATE	**4-METHYL-2-PENTANONE**	**NAPHTHALENE**	**N-BUTANOL**
Dec-94	1710, 390 (Q)		
Jan-95		19, 17 (Q)	
Feb-95		14, 19 (Q)	
Mar-95		19, 22 (Q)	160, 170 (Q)

NOTES:

(1) Q = Quantitated using response factor from continuing calibration standard

(2) CE = Quantitated using response factor from continuing calibration standard but estimated due to levels above linear range of calibration curve

(3) Laboratory analysis conducted by

TABLE 2-5. SUMMARY OF ANALYTICAL DETECTIONS FOR POLISHING PONDS
MARCH 2, 1993

PARAMETER	UNITS	REPORT LIMIT	POND #1 INFLUENT		REPORT LIMIT	POND #2 INFLUENT		REPORT LIMIT	POND #3 INFLUENT	
			24-HOUR COMPOSITE 027907-0001-SA	INITIAL GRAB 027907-0004-SA		24-HOUR COMPOSITE 027907-0002-SA	INITIAL GRAB 027907-0005-SA		24-HOUR COMPOSITE 027907-0003-SA	INITIAL GRAB 027907-0006-SA
GENERAL INORGANICS										
Total Organic Carbon (TOC)	mg/L	1.0	68.3	75.9	1.0	64.6	56.6	1.0	47.1	52.1
Total Fluoride	mg/L	0.20	47.2	ND	0.20	38.6	ND	0.20	36.4	ND
Total Suspended Solids (TSS)	mg/L	5.0	93.0	ND	5.0	65.0	ND	5.0	44.0	ND
VOLATILE ORGANICS										
Acetone	µg/L	2,000	ND	26,000	2,500	ND	26,000	5,000	ND	58,000
SEMIVOLATILE ORGANICS										
o-Cresol	µg/L	10	24	ND	10	11	ND		ND	ND
Acetophenone	µg/L		ND	ND	10	14	ND		ND	ND
METALS										
Barium	mg/L		ND	ND	0.010	0.011	ND		ND	ND
Nickel	mg/L	0.040	0.064	ND	0.040	0.17	ND	0.040	0.17	ND
Zinc	mg/L		ND	ND	0.020	0.026	ND		ND	ND

Notes:
(1) ND = not detected at reported method detection limit
(2) Laboratory analysis by Enseco

flowing into Equalization Basin II. The sample collection point was moved to the effluent of Equalization Tank 1 since this was the influent to Equalization Basin II. The results are summarized in Table 2-6 (primary settler effluent) and Table 2-7 (Equalization Tank 1 effluent), and the laboratory reports are provided in Appendix 8. Benzene was detected in samples collected from the Primary Settler from July 1991 through April 1992. All detections were less than the TC level of 0.5 mg/L for benzene. Since that time, benzene has not been detected in the influent to Equalization Basin II.

In response to data indicating that the wastewater entering Equalization Basin II was a characteristic hazardous waste due to benzene, 3M initiated an interim status groundwater monitoring program in 1991 as specified in 40 CFR 265.90. Two wells were installed (MW 1-91 and MW 2-91) and used in conjunction with to two existing wells (MW 4-90, background, and MW 7-90). These four wells were used in the interim status groundwater monitoring program. The well locations are shown in Figure 2-2.

On October 8, 1992, the first semi-annual sampling event for indicator parameters was conducted. The indicator parameters are total organic carbon (TOC), pH, specific conductivity, and total organic halides (TOX). The statistical analysis of the data indicated that there may have been a statistically significant change in pH levels in the monitoring wells when compared to the pH levels in the background database. A Groundwater Assessment Plan was submitted to USEPA, Region 5 in July 1993 and is provided in Appendix 9. Under the Groundwater Assessment Plan, semi-annual monitoring continued until the approval of closure, groundwater flow direction was evaluated, river elevation was evaluated to determine whether it had an impact on flow direction, and a new background database was developed. Results were submitted to USEPA, Region 5 by March 1, 1994 and again in 1995, as presented in Appendix 9.

TABLE 2-6. RESULTS OF MONTHLY BENZENE TCLP ANALYSIS OF EQUALIZATION BASIN II INFLUENT (1)

DATE	BENZENE CONCENTRATION (mg/L)
30-May-91	< 0.01
01-Jul-91	0.01
29-Jul-91	0.015
12-Aug-91	0.009
23-Sep-91	0.022
28-Oct-91	0.02
19-Dec-92	0.01
27-Jan-92	0.03
27-Feb-92	0.04
25-Mar-92	0.03
28-Apr-92	0.03
27-May-92	0.01
29-Jun-92	< 0.1
24-Jul-92	< 0.1
21-Sep-92	< 0.1
28-Oct-92	< 0.05
30-Nov-92	< 0.1
14-Dec-92	< 0.5
18-Jan-93	< 0.1
28-Apr-93	< 0.1
05-Oct-93	< 0.2
03-Nov-93	< 0.1
02-Dec-93	< 0.2

Notes:

(1) Samples collected from the primary settler which is the influent to Equalization Basin II during this time period

(2) "<" indicates that benzene was not detected above the method detection limit (MDL)

(3) TCLP = toxic characteristic leaching procedure

TABLE 2-7. RESULTS OF MONTHLY BENZENE TCLP ANALYSIS OF EQUALIZATION BASIN II INFLUENT (1)

DATE	BENZENE CONCENTRATION (mg/L)
03-Jan-94	< 0.2
04-Feb-94	< 0.1
01-Mar-94	< 0.001
06-Apr-94	< 0.1
03-May-94	< 0.1
01-Jun-94	< 0.05
05-Jul-94	< 0.10
01-Aug-94	< 0.10

Notes:

(1) Samples collected from Equalization Tank I which is the influent to Equalization Basin II during this time period

(2) "<" indicates that benzene was not detected above the method detection limit (MDL)

(3) TCLP = toxic characteristic leaching procedure

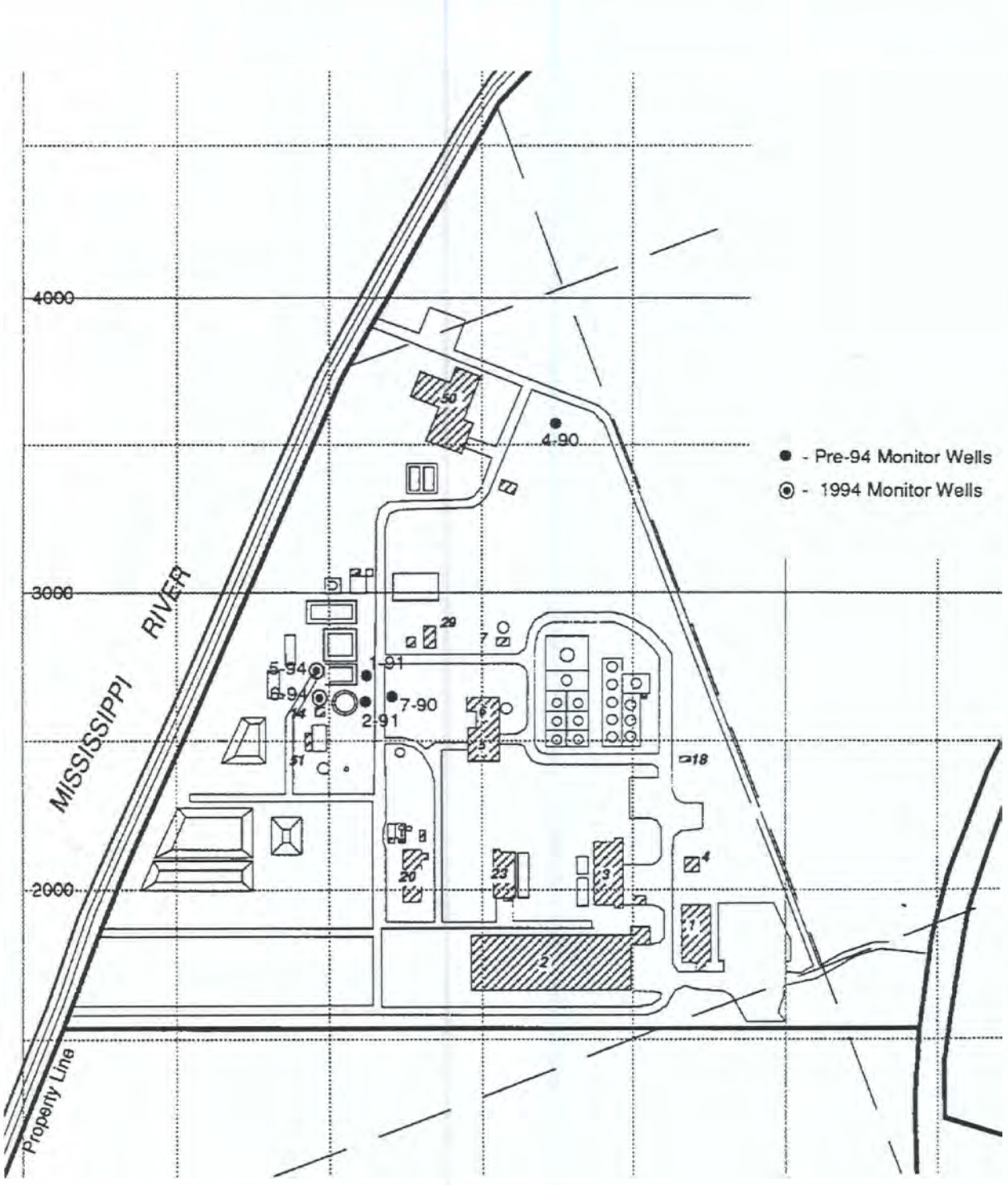


FIGURE 2-2
MONITORING WELL LOCATIONS

A summary of the indicator parameter results is provided in Tables 2-8 through 2-11. From October 1992 until March 1995, the pH samples collected from the three monitoring wells ranged from 6.5 S.U. to 8.0 S.U.; the specific conductivity ranged from 285 to 811 µmhos/cm; the TOC ranged from 2.6 mg/L to 17.5 mg/L; and the TOX ranged from not detected to 1.42 mg/L.

In 1994, Equalization Basin II was closed in accordance with a RCRA Closure Plan approved by USEPA, Region 5. The basin has not been used since that time. The closure entailed collecting groundwater samples from four wells, collecting facility water samples, collecting sludge samples, removing wastewater from the basin, removing and disposing of sludge, cleaning the basin walls, and collecting wall rinsate samples. Sludge samples were collected and analyzed using SW-846 methods. The detections are summarized in Table 2-12.

Samples were collected from one background (MW 4-90) and three monitoring wells (MW 7-90, MW 1-91, and MW 2-91) in the vicinity of the basin. Wells 4-90 and 7-90 are also a part of the RFI to be conducted at the facility. The samples were analyzed by PACE Laboratory for 40 CFR 264, Appendix IX constituents using SW-846 methods. Method 8240 was used for volatile analysis. Method 8270 was used for semivolatile analysis. Method 8080 was used for analysis of PCBs. Method 6010 was used for analysis of metals. Method 7470 was used for the analysis of mercury.

The results also indicated that no constituents, other than xylene, were detected in the groundwater samples from all four wells, as shown in the summary of detections presented in Table 2-13. The laboratory report is provided in Appendix 10. Xylene was detected in the sample collected from MW 1-91 at 8.1 µg/L with a PACE Reporting Limit of 5 µg/L. The Practical Quantification Limit (PQL), as specified in 40 CFR 264, Appendix IX, is 5 µg/L. The USEPA, Region 5, Data Quality Level (DQL) for xylene is 1,900 µg/L. Therefore, the concentration of xylene in the

TABLE 2-8. INTERIM STATUS GROUNDWATER MONITORING PROGRAM DATA - pH

pH (units)							
DATE	DESCRIPTION	WELL 4-90 (background)	WELL 7-90	WELL 1-91	WELL 2-91	WELL 5-94	WELL 6-94
FIRST 1992 SEMIANNUAL SAMPLING EVENT							
08-Oct-92		7.4	7.8	8.0	7.7		
08-Oct-92	Replicate #1	7.4	7.4	8.0	7.7		
08-Oct-92	Replicate #2	7.4	7.4	8.0	7.7		
08-Oct-92	Replicate #3	7.4	7.4	8.0	7.7		
FIRST 1993 SEMIANNUAL SAMPLING EVENT							
07-Jan-93		6.8	7.1	7.5	NA		
07-Jan-93	Replicate #1	6.8	7.1	7.5	NA		
07-Jan-93	Replicate #2	6.8	7.1	7.5	NA		
07-Jan-93	Replicate #3	6.8	7.1	7.5	NA		
03-Mar-93		6.7	7.2	7.5	7.2		
03-Mar-93	Replicate #1	NA	NA	NA	7.2		
03-Mar-93	Replicate #2	NA	NA	NA	7.2		
03-Mar-93	Replicate #3	NA	NA	NA	7.2		
RESAMPLING OF FIRST 1992 SEMIANNUAL SAMPLING EVENT							
11-Jun-93		7.04	7.15	6.64			
11-Jun-93	Replicate #1	6.99	7.19	6.63			
11-Jun-93	Replicate #2	6.94	7.20	6.64			
11-Jun-93	Replicate #3	6.86	7.20	6.63			
14-Jun-93					7.09		
14-Jun-93	Replicate #1				7.10		
14-Jun-93	Replicate #2				7.11		
14-Jun-93	Replicate #3				7.13		
SECOND 1993 SEMIANNUAL SAMPLING EVENT							
12-Jul-93		6.93	7.31				
12-Jul-93	Replicate #1	6.94	7.35				
12-Jul-93	Replicate #2	7.03	7.34				
12-Jul-93	Replicate #3	7.01	7.33				
13-Jul-93				6.54	7.28		
13-Jul-93	Replicate #1			6.54	7.31		
13-Jul-93	Replicate #2			6.55	7.30		
13-Jul-93	Replicate #3			6.57	7.28		
RESAMPLING OF SECOND 1993 SEMIANNUAL SAMPLING EVENT							
02-Dec-93		7.03	7.18	N/A	7.20		
02-Dec-93	Replicate #1	7.04	7.18	N/A	7.20		
02-Dec-93	Replicate #2	7.05	7.19	N/A	7.20		
02-Dec-93	Replicate #3	7.05	7.20	N/A	7.21		
FIRST 1994 SEMIANNUAL SAMPLING EVENT							
04-Jan-94		7.0	7.3	6.8	7.0		
04-Jan-94	Replicate #1	6.9	7.2	6.9	7.0		
04-Jan-94	Replicate #2	7.0	7.3	6.9	7.0		
04-Jan-94	Replicate #3	7.0	7.3	6.9	7.0		
RESAMPLING OF FIRST 1994 SEMIANNUAL SAMPLING EVENT							
04-May-94		7.11					
04-May-94	Replicate #1	7.11					
04-May-94	Replicate #2	7.11					
04-May-94	Replicate #3	7.11					
05-May-94			7.20	7.67	7.39		
05-May-94	Replicate #1		7.20	7.66	7.39		
05-May-94	Replicate #2		7.21	7.66	7.39		
05-May-94	Replicate #3		7.21	7.67	7.40		
SECOND 1994 SEMIANNUAL SAMPLING EVENT							
07-Jul-94		6.39	7.31	7.40	7.25	7.45	7.62
07-Jul-94	Replicate #1	6.40	7.29	7.42	7.24	7.42	7.65
07-Jul-94	Replicate #2	6.41	7.29	7.39	7.24	7.46	7.66
07-Jul-94	Replicate #3	6.40	7.31	7.40	7.26	7.47	7.61
RESAMPLING OF SECOND 1994 SEMIANNUAL SAMPLING EVENT							
06-Oct-94		6.44	7.10	7.33	6.93	NA	NA
06-Oct-94	Replicate #1	6.56	7.23	7.31	6.97	NA	NA
06-Oct-94	Replicate #2	6.58	7.25	7.28	6.97	NA	NA
06-Oct-94	Replicate #3	6.60	7.26	7.28	6.96	NA	NA
FIRST 1995 SEMIANNUAL SAMPLING EVENT							
06-Jan-95		4.40	7.02	7.29	6.90	7.59	7.50
06-Jan-95	Replicate #1	4.38	7.01	7.28	6.91	7.56	7.50
06-Jan-95	Replicate #2	4.37	7.05	7.27	6.88	7.51	7.51
06-Jan-95	Replicate #3	4.39	7.04	7.28	6.88	7.50	7.48
RESAMPLING OF FIRST 1995 SEMIANNUAL SAMPLING EVENT							
14-Mar-95		6.78	NA	7.56	NA	NA	NA
14-Mar-95	Replicate #1	6.80	NA	7.57	NA	NA	NA
14-Mar-95	Replicate #2	6.79	NA	7.56	NA	NA	NA
14-Mar-95	Replicate #3	6.79	NA	7.56	NA	NA	NA

NOTES:
(1) N/A = Not Applicable, because Coefficient of Variance > 1.00
(2) NA = Not Analyzed or Not Applicable
(3) Laboratory analysis conducted by PACE

TABLE 2-9. INTERIM STATUS GROUNDWATER MONITORING PROGRAM DATA - SPECIFIC CONDUCTIVITY

SPECIFIC CONDUCTIVITY (umhos/cm)							
DATE	DESCRIPTION	WELL 4-90 (background)	WELL 7-90	WELL 1-91	WELL 2-91	WELL 5-94	WELL 6-94
FIRST 1992 SEMIANNUAL SAMPLING EVENT							
08-Oct-92		345	345	455	750		
08-Oct-92	Replicate #1	345	345	455	750		
08-Oct-92	Replicate #2	345	345	455	750		
08-Oct-92	Replicate #3	345	345	455	750		
FIRST 1993 SEMIANNUAL SAMPLING EVENT							
07-Jan-93		285	380	430			
07-Jan-93	Replicate #1	285	380	430			
07-Jan-93	Replicate #2	285	380	430			
07-Jan-93	Replicate #3	285	380	430			
03-Mar-93					440		
03-Mar-93	Replicate #1				440		
03-Mar-93	Replicate #2				435		
03-Mar-93	Replicate #3				440		
SECOND 1993 SEMIANNUAL SAMPLING EVENT							
12-Jul-93		419	399				
12-Jul-93	Replicate #1	418	402				
12-Jul-93	Replicate #2	425	404				
12-Jul-93	Replicate #3	426	402				
13-Jul-93				388	439		
13-Jul-93	Replicate #1			387	438		
13-Jul-93	Replicate #2			385	441		
13-Jul-93	Replicate #3			384	438		
FIRST 1994 SEMIANNUAL SAMPLING EVENT							
04-Jan-94		579	610	625	707		
04-Jan-94	Replicate #1	584	613	621	699		
04-Jan-94	Replicate #2	591	608	615	689		
04-Jan-94	Replicate #3	588	609	611	682		
RESAMPLING OF FIRST 1994 SEMIANNUAL SAMPLING EVENT							
04-May-94		438					
04-May-94	Replicate #1	438					
04-May-94	Replicate #2	438					
04-May-94	Replicate #3	438					
05-May-94			586	787	481		
05-May-94	Replicate #1		591	811	482		
05-May-94	Replicate #2		587	791	480		
05-May-94	Replicate #3		586	793	480		
SECOND 1994 SEMIANNUAL SAMPLING EVENT							
07-Jul-94		450	701	710	480	412	403
07-Jul-94	Replicate #1	451	710	701	481	415	412
07-Jul-94	Replicate #2	453	715	712	481	420	405
07-Jul-94	Replicate #3	441	709	712	484	421	399
RESAMPLING OF SECOND 1994 SEMIANNUAL SAMPLING EVENT							
06-Oct-94		NA	620	755	NA	NA	NA
06-Oct-94	Replicate #1	NA	625	743	NA	NA	NA
06-Oct-94	Replicate #2	NA	625	744	NA	NA	NA
06-Oct-94	Replicate #3	NA	631	746	NA	NA	NA
FIRST 1995 SEMIANNUAL SAMPLING EVENT							
06-Jan-95		457	640	370	515	399	365
06-Jan-95	Replicate #1	455	631	370	523	397	370
06-Jan-95	Replicate #2	457	625	370	517	396	368
06-Jan-95	Replicate #3	457	628	378	518	397	371
RESAMPLING OF FIRST 1995 SEMIANNUAL SAMPLING EVENT							
14-Mar-95		NA	502	NA	NA	NA	NA
14-Mar-95	Replicate #1	NA	506	NA	NA	NA	NA
14-Mar-95	Replicate #2	NA	508	NA	NA	NA	NA
14-Mar-95	Replicate #3	NA	510	NA	NA	NA	NA

NOTES:
(1) NA = Not Analyzed or Not Applicable
(2) Laboratory analysis conducted by PACE

TABLE 2-10. INTERIM STATUS GROUNDWATER MONITORING PROGRAM DATA - TOTAL ORGANIC CARBON

TOTAL ORGANIC CARBON (mg/L)							
DATE	DESCRIPTION	WELL 4-90 (background)	WELL 7-90	WELL 1-91	WELL 2-91	WELL 5-94	WELL 6-94
FIRST 1992 SEMIANNUAL SAMPLING EVENT							
08-Oct-92		12.9	14.5	15.7	16.3		
08-Oct-92	Replicate #1	12.2	12.3	15.0	16.9		
08-Oct-92	Replicate #2	12.8	13.6	17.2	13.1		
08-Oct-92	Replicate #3	14.9	11.8	17.5	12.6		
FIRST 1993 SEMIANNUAL SAMPLING EVENT							
07-Jan-93		2.0	3.1	4.3			
07-Jan-93	Replicate #1	1.9	2.8	4.1			
07-Jan-93	Replicate #2	2.3	2.6	5.8			
07-Jan-93	Replicate #3	1.9	3.4	5.3			
03-Mar-93					6.0		
03-Mar-93	Replicate #1				6.0		
03-Mar-93	Replicate #2				6.0		
03-Mar-93	Replicate #3				6.0		
SECOND 1993 SEMIANNUAL SAMPLING EVENT							
12-Jul-93		3.0	3.8				
12-Jul-93	Replicate #1	3.1	4.7				
12-Jul-93	Replicate #2	3.0	3.1				
12-Jul-93	Replicate #3	2.8	3.7				
13-Jul-93				7.6	9.0		
13-Jul-93	Replicate #1			7.2	8.1		
13-Jul-93	Replicate #2			6.6	13.1		
13-Jul-93	Replicate #3			3.9	6.5		
FIRST 1994 SEMIANNUAL SAMPLING EVENT							
04-Jan-94		2.6	3.0	3.6	3.2		
04-Jan-94	Replicate #1	2.4	2.8	4.7	3.0		
04-Jan-94	Replicate #2	2.5	2.9	3.6	3.2		
04-Jan-94	Replicate #3	2.4	3.0	3.6	3.0		
RESAMPLING OF FIRST 1994 SEMIANNUAL SAMPLING EVENT							
04-May-94		2.1	NA	NA	NA		
04-May-94	Replicate #1	2.0	NA	NA	NA		
04-May-94	Replicate #2	2.1	NA	NA	NA		
04-May-94	Replicate #3	2.1	NA	NA	NA		
SECOND 1994 SEMIANNUAL SAMPLING EVENT							
07-Jul-94		2.8	3.8	6.1	2.6	2.8	3.2
07-Jul-94	Replicate #1	3.3	5.0	7.6	3.0	3.4	2.9
07-Jul-94	Replicate #2	2.5	4.5	7.8	3.0	3.3	3.2
07-Jul-94	Replicate #3	3.2	5.6	7.5	3.1	3.2	2.7
FIRST 1995 SEMIANNUAL SAMPLING EVENT							
06-Jan-95		<5	<5	6	<5	<5	<5
06-Jan-95	Replicate #1	<5	5	<5	<5	<5	<5
06-Jan-95	Replicate #2	<5	6	<5	<5	<5	<5
06-Jan-95	Replicate #3	<5	5	<5	<5	<5	<5
RESAMPLING OF FIRST 1995 SEMIANNUAL SAMPLING EVENT							
14-Mar-95		3.0	3.4	3.6	3.0	NA	NA
14-Mar-95	Replicate #1	2.8	3.1	3.2	2.9	NA	NA
14-Mar-95	Replicate #2	2.6	2.9	3.2	3.0	NA	NA
14-Mar-95	Replicate #3	2.7	3.1	3.3	2.8	NA	NA

NOTES:
(1) NA = Not Analyzed or Not Applicable
(2) Laboratory analysis conducted by PACE

TABLE 2-11. INTERIM STATUS GROUNDWATER MONITORING PROGRAM DATA - TOTAL ORGANIC HALOGEN

TOTAL ORGANIC HALOGEN (mg/L)							
DATE	**DESCRIPTION**	**WELL 4-90 (background)**	**WELL 7-90**	**WELL 1-91**	**WELL 2-91**	**WELL 5-94**	**WELL 6-94**
FIRST 1992 SEMIANNUAL SAMPLING EVENT							
08-Oct-92		<0.004	<0.004	0.016	0.012		
08-Oct-92	Replicate #1	<0.004	<0.004	<0.004	0.052		
08-Oct-92	Replicate #2	<0.004	<0.004	<0.004	0.017		
08-Oct-92	Replicate #3	<0.004	<0.004	<0.004	0.022		
FIRST 1993 SEMIANNUAL SAMPLING EVENT							
07-Jan-93		<0.004	0.007	0.005			
07-Jan-93	Replicate #1	<0.004	<0.004	<0.004			
07-Jan-93	Replicate #2	<0.004	0.046	<0.004			
07-Jan-93	Replicate #3	<0.004	<0.004	0.004			
03-Mar-93					0.22		
03-Mar-93	Replicate #1				0.24		
03-Mar-93	Replicate #2				0.26		
03-Mar-93	Replicate #3				0.28		
SECOND 1993 SEMIANNUAL SAMPLING EVENT							
12-Jul-93		0.204	<0.010				
12-Jul-93	Replicate #1	0.231	0.061				
12-Jul-93	Replicate #2	0.115	0.109				
12-Jul-93	Replicate #3	0.051	0.045				
13-Jul-93				0.037	0.062		
13-Jul-93	Replicate #1			0.088	0.090		
13-Jul-93	Replicate #2			<0.010	0.134		
13-Jul-93	Replicate #3			0.117	0.056		
RESAMPLING OF SECOND 1993 SEMIANNUAL SAMPLING EVENT							
02-Dec-92		1.42	NA	NA	NA		
02-Dec-92	Replicate #1	NA	NA	NA	NA		
02-Dec-92	Replicate #2	NA	NA	NA	NA		
02-Dec-92	Replicate #3	NA	NA	NA	NA		
FIRST 1994 SEMIANNUAL SAMPLING EVENT							
04-Jan-94		0.233	0.178	0.089	0.141		
04-Jan-94	Replicate #1	0.274	<0.010	0.291	0.385		
04-Jan-94	Replicate #2	0.196	0.136	0.043	0.146		
04-Jan-94	Replicate #3	0.162	0.167	0.109	0.213		
RESAMPLING OF FIRST 1994 SEMIANNUAL SAMPLING EVENT							
04-May-94		0.015					
04-May-94	Replicate #1	0.013					
04-May-94	Replicate #2	0.017					
04-May-94	Replicate #3	0.038					
05-May-94			0.028	0.068	0.035		
05-May-94	Replicate #1		0.044	0.068	0.025		
05-May-94	Replicate #2		0.350	0.110	0.026		
05-May-94	Replicate #3		0.081	0.050	0.047		
SECOND 1994 SEMIANNUAL SAMPLING EVENT							
07-Jul-94		<0.010	0.052	0.035	0.026	0.020	0.021
07-Jul-94	Replicate #1	<0.010	<0.010	0.016	0.046	0.024	0.079
07-Jul-94	Replicate #2	<0.010	<0.010	0.033	0.037	0.035	0.026
07-Jul-94	Replicate #3	0.042	0.022	0.036	0.039	0.029	0.061
FIRST 1995 SEMIANNUAL SAMPLING EVENT							
06-Jan-95		<0.005	0.065	0.060	0.028	0.068	0.015
06-Jan-95	Replicate #1	0.016	0.090	0.016	0.037	<0.005	0.015
06-Jan-95	Replicate #2	<0.005	0.050	0.062	0.100	<0.005	0.120
06-Jan-95	Replicate #3	0.025	0.038	0.039	<0.005	0.013	0.016

NOTES:
(1) NA = Not Analyzed or Not Applicable
(2) Laboratory analysis conducted by PACE

TABLE 2-12. SUMMARY OF SLUDGE SAMPLE DETECTIONS EQUALIZATION BASIN II RCRA CLOSURE JULY 1994

CONSTITUENT	UNITS	SW846 PQL	SW CORNER	SE CORNER	NW CORNER	NE CORNER	DUP - NE CORNER
Acetone	µg/kg	100	60,000	150,000	ND	26,000	130,000
Acetonitrile	µg/kg	100	ND	ND	240,000	ND	ND
Antimony	mg/kg	0.3	160	65	84	62	31
Arsenic	mg/kg	0.1	2.5	3.6	4.2	2.2	2.4
Barium	mg/kg	0.2	165	67	69	71	73
Cadmium	mg/kg	0.01	40	ND	ND	ND	1.0
Chromium	mg/kg	0.1	40	35	38	29	31
Cobalt	mg/kg	0.1	76	30	45	38	32
Copper	mg/kg	0.6	130	68	63	38	42
Dichloromethane	µg/kg	5	17,000	ND	19,000	5,700	ND
Ethylbenzene	µg/kg	5	90,000	140,000	77,000	27,000	32,000
Lead	mg/kg	0.1	15	6.9	7.1	4.6	4.4
Mercury	mg/kg	0.1	1.3	ND	ND	ND	ND
Nickel	mg/kg	2	85	100	140	76	99
PCB-Aroclor 1242	µg/kg	-	2,000	1,400	4,400	1,700	4,000
PCB-Aroclor 1260	µg/kg	-	ND	ND	ND	650	1,700
Propionitrile	µg/kg	100	ND	ND	210,000	ND	ND
Thallium	mg/kg	0.1	ND	ND	ND	2.2	ND
Toluene	µg/kg	5	450,000	670,000	450,000	160,000	170,000
Vanadium	mg/kg	-	ND	ND	ND	11	ND
Xylene	µg/kg	5	420,000	650,000	360,000	110,000	140,000
Zinc	mg/kg		78	57	50	30	43

NOTES:

(1) 40 CFR 264, Appendix IX, constituents for which there was a detection.

(2) PQL = SW846 Practical Quantification Limit

(3) ND = Not Detected at the PACE Reporting Limit for this analysis

(4) Laboratory analysis conducted by PACE, Incorporated.

TABLE 2-13. SUMMARY OF GROUNDWATER SAMPLE DETECTIONS
EQUALIZATION BASIN II RCRA CLOSURE
JULY 1994

CONSTITUENT	UNITS	REGION 5 DQL	SW846 PQL	WELL 7-90	WELL 4-90	WELL 1-91	WELL 2-91
Xylene	µg/L	1,900	5	ND	ND	8.1	ND

Notes:
(1) DQL = U. S. Environmental Protection Agency, Region 5, Office of RCRA, DQL, 1994, for groundwater
(2) ND = Not detected at PACE Reporting Limit
(3) Laboratory analysis conducted by PACE, Incorporated.

groundwater sample was three orders of magnitude lower than the DQL, and no further action was required. The Closure Report and Certification was approved by USEPA, Region 5 on March 15, 1995.

In February and April 1991, a sample was collected from the Inorganic Sludge Holding Basin and the Aerobic Digester for toxic characteristic (TC) analysis using the toxic characteristic leaching procedure (TCLP). The results indicate that the sludges are not hazardous wastes due to the TC. Also, the two constituents detected, barium and methyl ethyl ketone, were at least three orders of magnitude less than the regulatory limit. The results are summarized in Table 2-14. The laboratory report is presented in Appendix 11. The results indicate that constituents are not present at levels that could leach through the Zone of Incorporation (ZOI) into the underlying soil or groundwater.

TABLE 2-14. TOXIC CHARACTERISTIC ANALYTICAL RESULTS OF SLUDGE SAMPLES FEBRUARY AND APRIL 1991

CONSTITUENT	UNITS	REGULATORY LIMIT	LABORATORY REPORTING LIMIT	MAG BASIN 59146	LABORATORY REPORTING LIMIT	AEROBIC DIGESTER 63048
Metals						
Silver	mg/L	5.0	0.05	< 0.05	0.01	< 0.01
Arsenic	mg/L	5.0	0.2	< 0.2	0.20	< 0.20
Barium	mg/L	100	0.01	0.1		0.18
Cadmium	mg/L	1.0	0.01	< 0.01	0.02	< 0.02
Chromium	mg/L	5.0	0.05	< 0.05	0.08	< 0.08
Mercury	mg/L	0.2	0.2	< 0.2	0.0005	< 0.0005
Lead	mg/L	5.0	0.5	< 0.5	0.11	< 0.11
Selenium	mg/L	1.0	0.3	< 0.3	0.20	< 0.20
Volatiles						
Benzene	mg/L	0.5	0.001	< 0.001	0.01	< 0.01
Carbon Tetrachloride	mg/L	0.5	0.005	< 0.005	0.04	< 0.04
Chlorobenzene	mg/L	100.0	0.001	< 0.001	0.01	< 0.01
Chloroform	mg/L	6.0	0.001	< 0.001	0.01	< 0.01
1,2-Dichloroethane	mg/L	0.5	0.002	< 0.002	0.02	< 0.02
1,1-Dichloroethylene	mg/L	0.7	0.002	< 0.002	0.02	< 0.02
Methyl Ethyl Ketone	mg/L	200.0		0.050	0.50	< 0.50
Pyridine	mg/L	5.0	0.30	< 0.30	3.0	< 3.0
Tetrachloroethylene	mg/L	0.7	0.002	< 0.002	0.02	< 0.02
Trichloroethylene	mg/L	0.5	0.002	< 0.002	0.02	< 0.02
Vinyl Chloride	mg/L	0.2	0.010	< 0.010	0.12	< 0.12
Semivolatiles						
1,4-Dichlorobenzene	mg/L	7.5	0.005	< 0.005	0.003	< 0.003
2,4-Dinitrotoluene	mg/L	0.13	0.012	< 0.012	0.018	< 0.018
Hexachlorobenzene	mg/L	0.13	0.006	< 0.006	0.006	< 0.006
Hexachlorobutadiene	mg/L	0.5	0.006	< 0.006	0.006	< 0.006
Hexachloroethane	mg/L	3.0	0.011	< 0.011	0.007	< 0.007
Nitrobenzene	mg/L	2.0	0.005	< 0.005	0.004	< 0.004
Pentachlorophenol	mg/L	100.0	0.020	< 0.020	0.020	< 0.020
2,4,6-Trichlorophenol	mg/L	2.0	0.005	< 0.005	0.007	< 0.007
2,4,5-Trichlorophenol	mg/L	400	0.050	< 0.050	0.071	< 0.071
2-Methyl Phenol	mg/L	200.0	0.006	< 0.006	0.005	< 0.005
3-Methyl Phenol	mg/L	200.0	0.006	< 0.006	0.005	< 0.005
4-Methyl Phenol	mg/L	200.0	0.006	< 0.006	0.005	< 0.005

Notes:

1) Analysis of samples conducted by WW Engineering and Science
2) Laboratory Reporting Limit = the method detection limit for this analytical event
3) Analysis for toxic characteristic using the toxic characteristic leaching procedure (TCLP)

SECTION 3

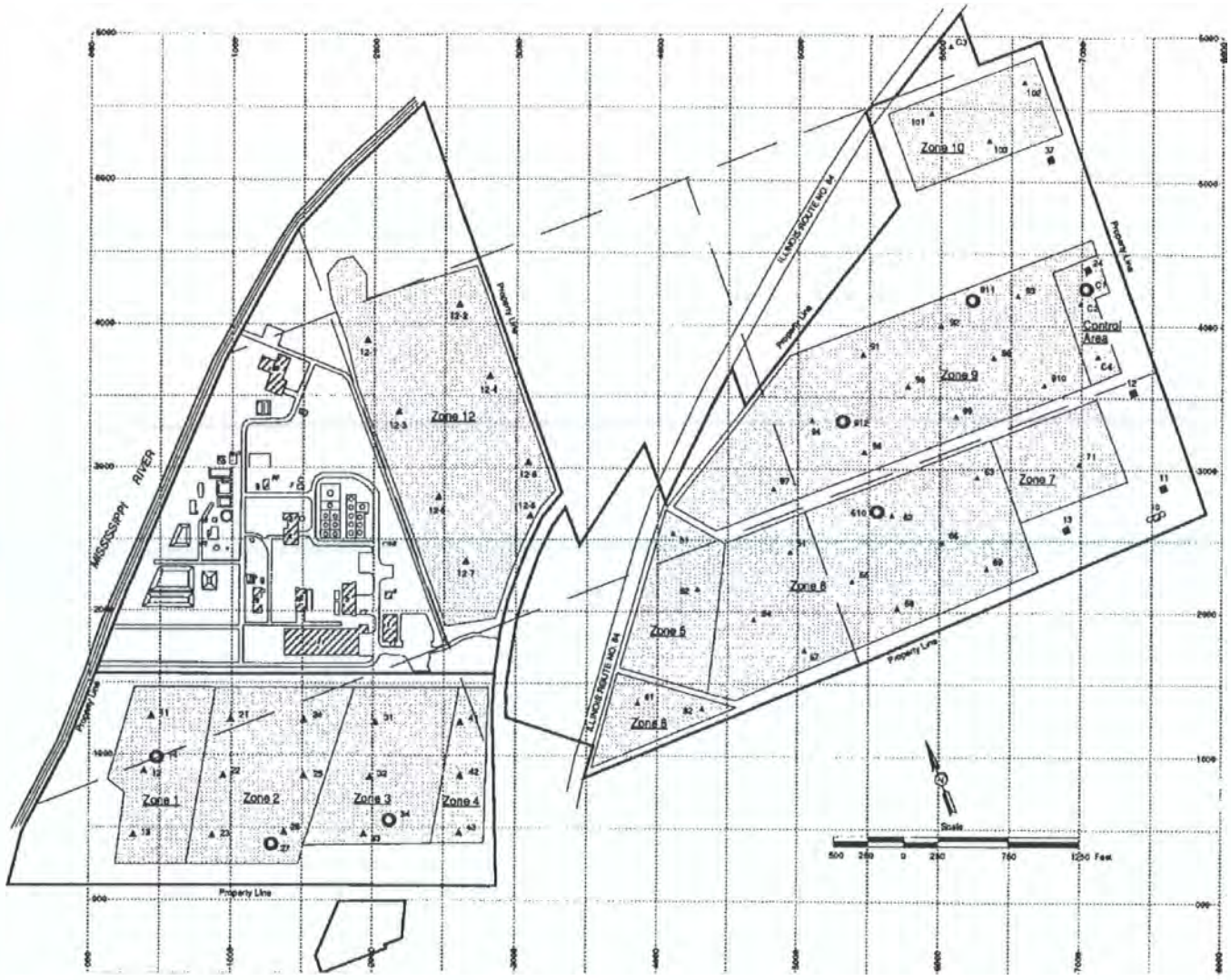
SLUDGE INCORPORATION AREA

GENERAL DESCRIPTION

3M Cordova utilizes land incorporation to dispose of the two sludges generated by the plant wastewater treatment system. In 1975, 3M received a permit from IEPA to incorporate the aerobic digester sludge produced at the wastewater treatment plant. This permit was modified at a later date to incorporate inorganic and pond sludges. The first load of sludge was incorporated in November 1975 into the field south of the manufacturing facility. Sludge was first incorporated into the field located east of Highway 84 in the Spring of 1976. The current IEPA Sludge Incorporation Permit for land application of sludge is 1995 - SC - 3408 and went into effect on June 12, 1995.

The SIA zones and soil sample locations are shown in Figure 3-1. The locations of groundwater monitoring wells are provided in Figure 3-2. A 367-acre area is used for landspreading. A 93-acre tract is located west of Highway 84, and a 182-acre area is located east of the highway. The tract located to the west of the highway includes a control plot for baseline soil monitoring and crop analysis. An additional 92-acre piece of land located just north of the manufacturing buildings and west of Highway 84 was purchased by 3M for land farming in 1993. This new area is not a SWMU listed in the current RCRA Part B permit. The SIA permit was modified, effective March 7, 1994, to include this land.

A preliminary soil investigation was conducted in 1975. The report is provided as Appendix 6. A generalized soil profile consists of a thin layer of silty sand, clayey sand, or clayey silt topsoil and/or a thin stratum of silty clay, geologically noted as fine alluvium, overlying coarse alluvium



3M

CORDOVA

Sludge Incorporation Zones and Soil Sample Locations

■ - Production Wells

O - Soil Sample Location Included in Corrective Action Program (Sample Depths of 2.5' & 5.0')

▲ - Sludge Incorporation Soil Sample Location

FIGURE 3-1

Revised 1/25/95 - JWB

3M

CORDOVA

Monitor Well Locations

- ● - 1988-90-91-93-94 2" DI Monitor Wells
- ⊙ - 1979-81 5" Dia. Monitor Wells
- ■ - Production Wells
- ⊖ - 8" Dia. Observation Wel

FIGURE 3-2

Revised 1/25/95 - JWB

to the depth of the borings. An exception to this was encountered at the boring location #9 where 1.5 feet of fill was encountered overlying the coarse alluvial materials.

The topsoil and fine alluvial materials were noted as being soft or very loose to loose based on the N values recorded (the N value is an index of the consistency of cohesive soils and the relative density of cohesionless soils).

Sand is the primary soil type noted in the coarse alluvial stratum (the term alluvial refers to soils deposited in water). The sands are noted as ranging from loose to very dense based on the resistance to penetration (N values). The density of the coarse alluvial soils generally improves quite remarkedly with increasing depth.

OPERATION OF SLUDGE INCORPORATION AREA

Land incorporation is a managed technology that involves controlled application of a waste onto the soil surface for the incorporation into the upper soil zone. As a result, the constituents in the applied wastes are degraded, immobilized, or transformed to environmentally acceptable components.

An important factor in the design of land incorporation systems is the ability of soil to adsorb heavy metal constituents. It is recognized that the application of sludges will enrich the soil with heavy metals.

Limitations on application rates specified in the IEPA permit and continued monitoring ensure that concentrations in soil, groundwater, and crops contain acceptable levels of these constituents. Approximately 400,000 gallons of aerobically digested sludge (3.8 percent solids) and 700,000 gallons of inorganic sludge (17 percent solids) are incorporated each year. Sludge

application rates must not exceed the maximum allowable total cumulative heavy metal loadings specified in the permit of 1,000 pounds Pb per acre, 500 pounds Zn per acre, 250 pounds Cu per acre, 200 pounds Ni per acre, and 10 pounds Cd per acre.

Sludge application is typically conducted in "campaigns" when either the aerobic digester or the inorganic sludge holding basins become filled. Land application typically occurs from March through November as permitted by prevailing weather conditions. A portion of the land application area is usually left open for application during the summer. After fall harvest, the sludges are again land applied. Spreading rates are based on agronomic requirements (nitrogen content) and have averaged about 8,000 gallons per acre per year. Land application zones are rotated to provide for uniform distribution. Sludges are typically spread on the surface followed by incorporation with a plow. Corn is planted, harvested, and sold annually.

PERMIT MONITORING DATA

The soil and groundwater data submitted to IEPA in accordance with the SIA permit demonstrate that the metals are being held by the top layer of soil and are not migrating downward. Samples from the sludges being land applied are collected and analyzed on a semi-annual basis. Groundwater monitoring wells are sampled and analyzed on a quarterly basis. Soil samples are collected and analyzed once per year.

Sludge Volumes

Volumes of sludge and dates applied are provided in Appendix 13. This table shows quantities of metals applied per SIA zone.

Soil Monitoring

The soil sampling data show elevated concentrations of nickel, cobalt, and zinc in the upper layers of the soil. However, the concentrations are reduced to background levels at the background depth. The historic database is presented in Appendix 14. Surface samples have been taken from the top 6 inches at 44 locations, including 3 within the control plot. Beginning in 1993, these samples have been taken from 8 to 12 inches below the soil surface. Each surface sample consists of a composite of five discrete samples taken in the area surrounding the sample point. At six locations, including one in the control plot, samples are also taken at depths of 2.5 and 5 feet. Each of these samples is a discrete sample taken near the prescribed sample point. Soil samples are analyzed for both extractable and total metals.

Groundwater Monitoring

A number of wells were drilled at the Cordova plant site in 1976, 1979, and 1981 for the purpose of monitoring the groundwater quality in the SIA. The 1976 wells were two-inch diameter, PVC-cased wells with short galvanized steel screens placed near the top of the water table. These wells were replaced in 1979 and 1981 with a network of five-inch diameter, mild-steel cased wells with a short (3 foot) section of stainless steel screen placed approximately 20 to 30 feet below the top of the water table. These wells are designated as 1-79, 3-79, 4-79, 81-1, 81-2, 81-3, 81-4, 81-5, and the Barn, shown previously in Figure 3-1. The Barn is a water well located in the plant recreational area. Well 81-1 is located within the manufacturing area of the site and is considered to be upgradient from the SIA.

IEPA's monitoring requirements have focused on hazardous constituents which are present in the sludges at elevated concentrations or which are of particular concern in soil environments. Certain hazardous constituents which are not used at the plant and are not contained in either of the land applied sludges, such as cadmium, are monitored due to their environmental significance.

The historic database of groundwater monitoring data is provided in Appendix 15. Samples were analyzed for total chromium, cobalt, copper, lead, and nickel from 1976 through 1987. In 1988, analysis for soluble metals began. Prior to 1992, soluble nickel and lead had been detected in a few samples, at or near the method detection limit. Soluble chromium and copper were added to the list of constituents for analysis in 1992. Since 1992, soluble chromium, soluble cobalt, soluble copper, and soluble lead have not been detected in any samples. Soluble nickel was detected in samples collected in October 1994.

Sludge Monitoring

As part of the SIA permit, grab samples of the aerobically digested and inorganic sludges have been obtained at least semi-annually since 1975 when 3M obtained its permit from IEPA. A summary of the data is presented in Appendix 16. As specified in the permit, the samples are analyzed for percent total solids, total Kjeldahl nitrogen (TKN), pH, ammonia nitrogen, nitrate nitrogen, phosphorus, total iron, total copper, total nickel, total zinc, total lead, total cadmium, total cobalt, total manganese, trivalent chromium, hexavalent chromium, and total cobalt using the methods described in 40 CFR 136.

Results from the sampling indicate that total copper, total cobalt, total nickel, and total zinc are present in the aerobic digester sludge. The results also indicate that total cobalt, total chromium, total copper, total nickel, total zinc, and occasionally, total lead are present in the inorganic sludge.

Crop Monitoring

Feed corn is the only agricultural crop currently harvested from the SIA. Corn samples are taken at the end of each growing season at approximately 12 locations. The number of sampling locations is dependent on the size of the harvest. Each sample consists of five ears of corn taken from within the sampling location. These locations typically include two from the control areas, one from zone 10, and the remaining locations are selected randomly from around the planted fields. These samples are composited and analyzed for heavy metals. The yield is also recorded. The results are submitted to IEPA and indicate that the uptake of sludge constituents is minimal to non-existent. A summary of the results is presented in Appendix 17.

HISTORIC DATA

Several investigations have been conducted at the facility which are described below. The data are grouped into two general categories, RFI-related and not RFI-related, as discussed in the Executive Summary. A summary of the data is presented in Tables E-1 and E-2.

RFI-Related Data

Soil sampling was conducted in October 1989 as part of the abbreviated RFI. These results are also provided in Appendix 9. 3M collected six samples each at two locations. This provided

information on concentrations both within and at the base of the incorporation zone. A general definition of incorporation zone is the zone of waste and soil in which degradation, transformation, and/or immobilization occurs, extending no more than 5 feet (150 cm) below the surface and no more than 5 feet above the water table.

The 40 CFR 136 Methods were used for the analysis of samples. Analytical sample results showed that there were no volatile organics (Method 624), semi-volatile organics (Method 625), organochlorine pesticides/PCBs (Method 608), or herbicides (Method 615) present in any of the samples tested. With the exception of sample location 14 at 2.5 feet, none of the samples collected had above background concentrations of any other constituents. The concentrations of a number of constituents (As, Ba, Co, Cr-total, Pb, Sr, Vd, Zn) in location 14 were slightly elevated above background. The sample taken at location 14 at five feet did not have concentrations above background for any of these constituents.

Not RFI-Related

In December 1981, sludge samples were collected from the Aerobic Digester and Inorganic (Mag) Sludge Holding Basins. The samples were analyzed for the compounds found on the priority pollutant list by Rocky Mountain Analytical Laboratory. Metals, phenolics, and cyanide were analyzed using methods given in "Methods for Chemical Analysis of Water and Wastes" (EPA, EMSL - Cincinnati, Ohio, March 1979). Organic compounds were analyzed using the methods described in the December 3, 1979 Federal Register (44 FR 233). Volatile organic analyses were performed using EPA Method 624. Semivolatile organic analyses were performed using EPA Method 625. Pesticide and PCB analyses were performed using EPA Method 608. Metals and

organic constituents were detected in the two samples. The detections are summarized in Table 3-1. The laboratory report is provided in Appendix 16.

In December 1981, 3M collected samples from six monitoring wells located in the SIA. The samples were analyzed for priority pollutants by Rocky Mountain Analytical Laboratory. Samples were analyzed for organic compounds using methods described in the December 3, 1979 Federal Register (44 FR 233) as follows.

Analysis	Method
Volatile organics	EPA Method 624
Semivolatile organics	EPA Method 625
Pesticides and PCBs	EPA Method 608
Metals, phenolics, and cyanides	"Method for Chemical Analysis of Water and Wastes" (EPA, EMSL - Cincinnati, Ohio, March 1979)

A summary of the detections is found in Table 3-2. The laboratory report is provided in Appendix 19. Methylene chloride and chloroform were routinely found in the samples, but are considered laboratory contaminants. No cyanide, phenols, pesticides, or dioxin were detected in any well. No volatile organic compounds were detected except toluene (in wells 3-79, 5-79, and 81-5) and trichloroethylene (in well 81-2). No semivolatile organic compounds were found in any of the wells except di-n-butylphthalate (in wells 3-79 and 4-79). Zinc (Wells 4-90 and 81-5), lead (Well 81-5), copper (Well 81-5), nickel (Well 81-5), and selenium (Well 5-79) were detected in some of the samples collected. When compared to the USEPA, Region 5 Data Quality Levels (DQLs), all detections are less than the DQL except lead in well 81-5 (220 µg/L result, 4 µg/L DQL) and trichloroethylene in well 81-2 (4 µg/L result, 2.5 µg/L DQL).

TABLE 3-1. SUMMARY OF DETECTIONS-SLUDGE SAMPLES DECEMBER 1981

COMPOUND	CORDOVA MAG 1581-01	UNITS	CORDOVA AD 1581-02	UNITS
METALS, CYANIDE & TOTAL PHENOLS				
1 M. Antimony, Total	ND	mg/kg dry	0.038	mg/L
5M. Chromium, Total	46	mg/kg dry	0.22	mg/L
6M. Copper, Total	30	mg/kg dry	0.22	mg/L
7M. Lead, Total	24	mg/kg dry	0.15	mg/L
8M. Mercury, Total	0.24	mg/kg dry	0.009	mg/L
9M. Nickel, Total	210	mg/kg dry	0.38	mg/L
11 M. Silver, Total	1.0	mg/kg dry	0.042	mg/L
13M. Zinc, Total	73	mg/kg dry	0.37	mg/L
14 M. Cyanide, Total	ND	mg/kg dry	0.95	mg/L
15M. Phenols, Total	0.85	mg/kg dry	ND	mg/L
PESTICIDES				
5P. delta-BHC	1.1	µg/kg dry	ND	µg/L
16P. Heptachlor	2.3	µg/kg dry	ND	µg/L
19P. PCB-1254	ND	µg/kg dry	2.0	µg/L
VOLATILE COMPOUNDS				
25V. Toluene	6.0	mg/kg dry	330	µg/L
BASE/NEUTRAL COMPOUNDS				
3B. Anthracene	0.5	mg/kg dry	ND	µg/L
13B. Bis (2-Ethylhexyl) Phthalate	0.2	mg/kg dry	ND	µg/L
18B. Chrysene	0.5	mg/kg dry	ND	µg/L
31B. Fluoranthene	0.9	mg/kg dry	ND	µg/L
32B. Fluorene	4.2	mg/kg dry	ND	µg/L
39B. Naphthalene	0.5	mg/kg dry	ND	µg/L
44B. Phenanthrene	8.0	mg/kg dry	ND	µg/L
45B. Pyrene	0.3	mg/kg dry	ND	µg/L

Notes:
(1) ND = Not detected at reported method detection limit
(2) Laboratory analysis by Rocky Mountain Analytical Laboratory

TABLE 3-2. SUMMARY OF DETECTIONS-GROUNDWATER SAMPLES DECEMBER 1981

COMPOUND	UNITS	MW 1-79 1633-01	MW 3-79 1633-02	MW 4-79 1633-03	MW 5-79 1633-04	MW 81-2 1633-05	MW 81-5 1633-06
METALS, CYANIDE & TOTAL PHENOLS							
6M. Copper, Total	mg/L	ND	ND	ND	ND	ND	0.016
7M. Lead, Total	mg/L	0.051	ND	ND	ND	ND	0.22
9M. Nickel, Total	mg/L	ND	ND	ND	ND	ND	0.035
10 M. Selenium, Total	mg/L	ND	ND	ND	0.004	ND	ND
13M. Zinc, Total	mg/L	ND	ND	0.014	ND	ND	0.036
VOLATILE COMPOUNDS							
11V. Chloroform	µg/L	ND	ND	1	ND	5	1
25V. Toluene	µg/L	ND	1	ND	1	ND	1
29V. Trichloroethylene	µg/L	ND	ND	ND	ND	4	ND
BASE/NEUTRAL COMPOUNDS							
26B. DI-N-Butyl Phthalate	µg/L	ND	12	16	ND	ND	ND

Notes:
(1) ND = Not detected at reported method detection limit.
(2) Laboratory analysis by Rocky Mountain Analytical Laboratory

In December 1986, one sludge sample was collected from the Aerobic Digester and one was collected from the Inorganic Sludge Holding Basin. Envirite Corporation analyzed the samples using EPA Method 624 (volatile organics) and EPA Method 625 (semi-volatile organics). Toluene and phenol were detected in the aerobic digester sample at low levels (6.0 µg/L and 135 µg/L, respectively). No organic constituents were detected in the inorganic basin sludge. Results demonstrate that the concentration of potentially leachable organics in the sludge are extremely low. A summary of detections is provided in Table 3-3. The laboratory report is provided in Appendix 20.

EVALUATION OF ORGANIC COMPOUND APPLICATION

The amount of 40 CFR 261, Appendix VIII constituents applied to the SIA since 1975 was estimated by multiplying the volume of sludge applied to each zone by the 1987 analytical result (one sample from the Inorganic Sludge Holding Basin or one sample from the Aerobic Digester) provided in Table 2-3 and Appendix 5. The estimated amount of phenol, toluene, bis(2-ethylhexyl)phthalate, fluoranthene, and phenanthrene in pounds is provided in Tables 3-4 through 3-8.

An estimate of the concentration in each zone was calculated by dividing the pounds applied by the volume of soil in the ZOI. Several assumptions were made as presented below.

1. The 1987 analytical data for one sludge sample are representative of all sludges applied to the landfarms since 1981.
2. The analytical data are reported as wet weight.
3. The organic constituents do not undergo degradation in the soil.

TABLE 3-3. SUMMARY OF DETECTIONS - SLUDGE SAMPLES DECEMBER 1986

CONSTITUENT	UNITS	DETECTION LIMIT	AEROBIC DIGESTOR	INORGANIC BASIN SLUDGE
Toluene	µg/L	1.0	6.0	ND
Phenol	µg/L	25	135	ND

Notes:
(1) ND = not detected at the reported method detection limit
(2) Laboratory analysis by Envirite Analytical Services

TABLE 3-4. ESTIMATED PHENOL APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED PHENOL APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76				0.3633		0.0703																		
3/16/76-4/1/76	0.0398																							
3/76-4/76			0.0539		0.0222		0.0133		0.0245															
5/19/76-6/3/76												0.0498												
6/7/76-7/1/76												0.1802												
7/9/76-8/3/76													0.1325											
8/4/76-8/24/76															0.1000									
10/76-12/76										0.0324		0.1155												
1/77																						0.0594		
3/77-4/77		0.0458		0.1093		0.0458		0.0153																
4/77-6/77										0.0324		0.1155												
5/77																0.0237								
5/77-6/77														0.0265										
6/77-7/77																		0.5044						
8/77-9/77																			0.0976					
11/77										0.0039		0.0138		0.0033		0.0025								
3/78-4/78										0.0386		0.1378		0.0331		0.0248								
4/78-5/78										0.0362		0.1293		0.3723		0.0233								
5/22/78-6/6/78	0.0132		0.0314		0.0132		0.0044																	
6/8/78-7/13/79		0.0752		0.1794		0.0752		0.0251																
7/17/78-8/30/78	0.0496		0.1182		0.0496		0.0165																	
8/30/78-10/9/78																	0.1497							
10/5/78-10/30/78																	0.1066							
10/5/78-10/30/78																	0.0271							
10/78																		0.3423		0.1500				
4/5/79-5/1/79																		0.0685						
5/2/79-5/18/79																0.0955								
5/23/79-6/7/79										0.1211														
7/9/79-8/10/79										0.1244														
8/13/79-11/1/79												0.3125												
10/29/79-10/30/79										0.0252														
11/79														0.1405		0.0847								
11/17/79-12/7/79			0.1751																					
1/26/79, 4/10/80-4/29/80												0.0157												
4/30/80-5/2/80		0.0396		0.0945																				
5/2/80-5/16/80						0.0996		0.0324																
6/30/80-9/30/80																		0.4053						
11/6/80-11/14/80	0.0145		0.0345		0.0145		0.0048																	
11/6/80-12/12/80		0.0609		0.1453		0.0609																		
11/6/80-12/17/80								0.0203																
12/15/80-12/18/80										0.0432														
3/16/81-3/30/81																		0.2464						
3/31/81-5/1/81	0.0512		0.1086		0.0512		0.0171																	
5/4/81-5/11/81																0.1232								
6/15/81-6/17/81										0.1535														
6/17/81-7/10/81												0.2529												
8/29/81-8/27/81												0.0757												
8/31/81-9/3/81											0.1040													
9/3/81-9/5/81														0.1470										
9/9/81-10/2/81										0.2400														
9/22/81-9/23/81																				0.1381				
10/1/81-11/5/81																		0.1492						
10/27/81-11/4/81	0.0418		0.0996																					

TABLE 3-4. ESTIMATED PHENOL APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED PHENOL APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/5/81-12/8/81																		0.0443						
4/1/82-8/31/82	0.0633	0.0070	0.1510	0.0168		0.2027		0.0676				0.1189				0.0908		0.6029						
9/1/82-3/31/83	0.0584		0.1460			0.1441		0.0468									0.0385	0.3873						
4/83-10/83		0.1243	0.5348			0.5801	0.0937		0.0458		0.1640	0.3008		0.1459		0.1315								
4/84-5/84	0.0547		0.0547			0.1689	0.0274																	
11/84-12/84		0.0096		0.0192					0.0572		0.1471					0.0612								
1/85-9/85		0.0399		0.1282		0.0540		0.0180	0.0350		0.1255		0.0292		0.0146									
3/86-7/86		0.0878		0.1959		0.0743		0.0293		0.1459		0.3819		0.0757			0.2043							
8/86-2/87		0.0216							0.1100	0.0552		0.1970	0.0943	0.5107				0.1765						
3/87-8/87		0.0049		0.0109		0.0041		0.0016	0.0372	0.1081	0.1349	0.0703	0.0323					0.3909						
9/87-11/87																		0.1801						
10/87-11/87									0.1460															
3/88-7/88		0.0679		0.1516		0.0575		0.0226	0.0269	0.1373	0.0960	0.4903	0.0230	0.1177			0.1897							
9/88-2/89		0.0204		0.0456		0.0173		0.0068	0.0350		0.1248	0.2702	0.0300											
3/89-8/89		0.0545		0.1215		0.0461		0.0182			0.1412		0.0339				0.1168	0.0600						
9/89-2/90																	0.2043	0.3002						
3/90-8/90		0.0174		0.0396		0.0174		0.0174	0.0269	0.0330	0.0960	0.1189	0.0231	0.0282			0.1751	0.3627						
9/90-2/91		0.0324		0.0739		0.0324		0.0324		0.0168	0.1605	0.0594	0.0067	0.0901										
3/91-8/91											0.2043			0.1501			0.1751	0.2102						
9/91-2/92										0.0480		0.0721					0.2335	0.1201						
3/92-8/92	0.0474		0.0985		0.0426		0.0158											0.2402						
9/92-2/93	0.0664		0.1379													0.0300								
1/93-12/93		0.0558		0.1244		0.1723		0.0679	0.0225		0.0804		0.0193				0.1287		0.0788					
1/94-12/94				0.2943		0.1116											0.0980							
3/94-4/94																							0.4900	
8/94-9/94																							0.1868	
11/94-12/94																							0.3640	
3/14/95-3/24/95		0.0215														0.2964	0.1244	0.2560					0.3239	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
(3) AD = Aerobic Digestor
(4) Blanks indicate no sludge applied to that zone on that date.

TABLE 3-5. ESTIMATED TOLUENE APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED TOLUENE APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76																								
3/16/76-4/1/76	7.97E-03																							
3/76-4/76			1.08E-02		4.44E-03		2.66E-03		4.90E-03															
5/19/76-6/3/76																								
6/7/76-7/7/76																								
7/9/76-8/3/76													2.65E-02											
8/4/76-8/24/76															2.00E-02									
10/76-12/76																								
1/77																								
3/77-4/77																								
4/77-6/77																								
5/77																								
5/77-6/77																								
6/77-7/77																								
8/77-9/77																			1.95E-02					
11/77																								
3/78-4/78																								
4/78-5/78																								
5/22/78-6/6/78	2.64E-03		6.28E-03		2.64E-03		8.78E-04																	
6/8/78-7/13/79																								
7/17/78-8/30/78	9.91E-03		2.36E-02		9.91E-03		3.30E-03																	
8/30/78-10/9/78																	2.99E-02							
10/5/78-10/30/78																	2.13E-02							
10/5/78-10/30/78																	5.42E-03							
10/78																								
4/5/79-5/1/79																								
5/2/79-5/18/79																								
5/23/79-6/7/79																								
7/9/79-8/10/79																								
8/13/79-11/1/79																								
10/29/79-10/30/79																								
11/79																								
11/17/79-12/7/79			3.50E-02																					
1/26/79, 4/10/80-4/29/80																								
4/30/80-5/2/80																								
5/2/80-5/16/80																								
6/30/80-9/30/80																								
11/6/80-11/14/80	2.89E-03		6.90E-03		2.89E-03		9.65E-04																	
11/6/80-12/12/80																								
11/6/80-12/17/80																								
12/15/80-12/18/80																								
3/16/81-3/30/81																								
3/31/81-5/1/81	1.02E-02		2.17E-02		1.02E-02		3.42E-03																	
5/4/81-5/11/81																								
6/15/81-6/17/81																								
6/17/81-7/10/81																								
8/29/81-8/27/81																								
8/31/81-9/3/81											2.08E-02													
9/3/81-9/5/81																								
9/9/81-10/2/81																								
9/22/81-9/23/81																								
10/1/81-11/5/81																								
10/27/81-11/4/81	8.36E-03		1.99E-02																					

TABLE 3-5. ESTIMATED TOLUENE APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED TOLUENE APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/5/81-12/8/81																								
4/1/82-8/31/82	1.27E-02		3.02E-02																					
9/1/82-3/31/83	1.17E-02		2.92E-02														7.71E-03							
4/83-10/83			1.07E-01				1.87E-02		9.17E-03		3.28E-02													
4/84-5/84	1.09E-02		1.09E-02				5.47E-03																	
11/84-12/84									1.14E-02		2.94E-02													
1/85-9/85									7.01E-03		2.51E-02		5.84E-03		2.92E-03									
3/86-7/86																	4.09E-02							
8/86-2/87									2.20E-02				1.89E-02											
3/87-8/87									7.44E-03		2.70E-02		6.46E-03											
9/87-11/87																								
10/87-11/87									2.92E-02															
3/88-7/88									5.38E-03		1.92E-02		4.61E-03				3.79E-02							
9/88-2/89									6.99E-03		2.50E-02		5.99E-03											
3/89-8/89											2.82E-02		6.78E-03				2.34E-02							
9/89-2/90																	4.09E-02							
3/90-8/90									5.37E-03		1.92E-02		4.61E-03				3.50E-02							
9/90-2/91											3.21E-02		1.34E-03											
3/91-8/91											4.09E-02						3.50E-02							
9/91-2/92																	4.67E-02							
3/92-8/92	9.49E-03		1.97E-02		8.51E-03		3.16E-03																	
9/92-2/93	1.33E-02		2.76E-02																					
1/93-12/93									4.50E-03		1.61E-02		3.86E-03				2.57E-02		1.58E-02					
1/94-12/94																	1.96E-02							
3/94-4/94																							9.80E-02	
8/94-9/94																							3.74E-02	
11/94-12/94																							7.28E-02	
3/14/95-3/24/95																	2.49E-02						6.48E-02	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHG = Inorganic Sludge Holding Pond
(3) AD = Aerobic Digestor
(4) Blanks indicate no sludge applied to that zone on that date.

TABLE 3-6. ESTIMATED BIS(2-ETHYL HEXYL)PHALATE APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED BIS(2-ETHYL HEXYL)PHALATE APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76																								
3/16/76-4/1/76	4.21E-02																							
3/76-4/76			5.70E-02		2.35E-02		1.40E-02		2.59E-02															
5/19/76-6/3/76																								
6/7/76-7/7/76																								
7/9/76-8/3/76													1.40E-01											
8/4/76-8/24/76															1.06E-01									
10/76-12/76																								
1/77																								
3/77-4/77																								
4/77-6/77																								
5/77																								
5/77-6/77																								
6/77-7/77																								
8/77-9/77																			1.03E-01					
11/77																								
3/78-4/78																								
4/78-5/78																								
5/22/78-6/6/78	1.39E-02		3.32E-02		1.39E-02		4.64E-03																	
6/8/78-7/13/79																								
7/17/78-8/30/78	5.24E-02		1.25E-01		5.24E-02		1.75E-02																	
8/30/78-10/9/78																	1.58E-01							
10/5/78-10/30/78																	1.13E-01							
10/5/78-10/30/78																	2.87E-02							
10/78																								
4/5/79-5/1/79																								
5/2/79-5/18/79																								
5/23/79-6/7/79																								
7/9/79-8/10/79																								
8/13/79-11/1/79																								
10/29/79-10/30/79																								
11/79																								
11/17/79-12/7/79			1.85E-01																					
1/26/79, 4/10/80-4/29/80																								
4/30/80-5/2/80																								
5/2/80-5/16/80																								
6/30/80-9/30/80																								
11/6/80-11/14/80	1.53E-02		3.65E-02		1.53E-02		5.10E-03																	
11/6/80-12/12/80																								
11/6/80-12/17/80																								
12/15/80-12/18/80																								
3/16/81-3/30/81																								
3/31/81-5/1/81	5.42E-02		1.15E-01		5.42E-02		1.81E-02																	
5/4/81-5/11/81																								
6/15/81-6/17/81																								
6/17/81-7/10/81																								
8/29/81-8/27/81																								
8/31/81-9/3/81											1.10E-01													
9/3/81-9/5/81																								
9/9/81-10/2/81																								
9/22/81-9/23/81																								
10/1/81-11/5/81																								
10/27/81-11/4/81	4.42E-02		1.05E-01																					

TABLE 3-6. ESTIMATED BIS(2-ETHYL HEXYL)PHALATE APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED BIS(2-ETHYL HEXYL)PHALATE APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/5/81-12/8/81																								
4/1/82-8/31/82	6.70E-02		1.60E-01																					
9/1/82-3/31/83	6.17E-02		1.54E-01														4.07E-02							
4/83-10/83			5.65E-01				9.91E-02		4.84E-02		1.73E-01													
4/84-5/84	5.79E-02		5.79E-02				2.89E-02																	
11/84-12/84									6.05E-02		1.56E-01													
1/85-9/85									3.70E-02		1.33E-01		3.09E-02		1.54E-02									
3/86-7/86																	2.16E-01							
8/86-2/87									1.16E-01				9.97E-02											
3/87-8/87									3.93E-02		1.43E-01		3.41E-02											
9/87-11/87																								
10/87-11/87									1.54E-01															
3/88-7/88									2.84E-02		1.02E-01		2.44E-02				2.01E-01							
9/88-2/89									3.69E-02		1.32E-01		3.17E-02											
3/89-8/89											1.49E-01		3.58E-02				1.23E-01							
9/89-2/90																	2.16E-01							
3/90-8/90									2.84E-02		1.02E-01		2.44E-02				1.85E-01							
9/90-2/91											1.70E-01		7.10E-03											
3/91-8/91											2.16E-01						1.85E-01							
9/91-2/92																	2.47E-01							
3/92-8/92	5.01E-02		1.04E-01		4.50E-02		1.67E-02																	
9/92-2/93	7.02E-02		1.46E-01																					
1/93-12/93									2.38E-02		8.50E-02		2.04E-02				1.36E-01		8.33E-02					
1/94-12/94																	1.04E-01							
3/94-4/94																							5.18E-01	
8/94-9/94																							1.97E-01	
11/94-12/94																							3.85E-01	
3/14/95-3/24/95																	1.32E-01						3.42E-01	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
(3) AD = Aerobic Digestor
(4) Blanks indicate no sludge applied to that zone on that date.

TABLE 3-7. ESTIMATED FLUORANTHENE APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED FLUORANTHENE APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76																								
3/16/76-4/1/76	2.96E-02																							
3/76-4/76			4.00E-02		1.65E-02		9.87E-03		1.82E-02															
5/19/76-6/3/76																								
6/7/76-7/7/76																								
7/9/76-8/3/76													9.84E-02											
8/4/76-8/24/76															7.43E-02									
10/76-12/76																								
1/77																								
3/77-4/77																								
4/77-6/77																								
5/77																								
5/77-6/77																								
6/77-7/77																								
8/77-9/77																			7.25E-02					
11/77																								
3/78-4/78																								
4/78-5/78																								
5/22/78-6/6/78	9.79E-03		2.33E-02		9.79E-03		3.26E-03																	
6/8/78-7/13/79																								
7/17/78-8/30/78	3.68E-02		8.78E-02		3.68E-02		1.23E-02																	
8/30/78-10/9/78																	1.11E-01							
10/5/78-10/30/78																	7.92E-02							
10/5/78-10/30/78																	2.01E-02							
10/78																								
4/5/79-5/1/79																								
5/2/79-5/18/79																								
5/23/79-6/7/79																								
7/9/79-8/10/79																								
8/13/79-11/1/79																								
10/29/79-10/30/79																								
11/79																								
11/17/79-12/7/79			1.30E-01																					
1/26/79, 4/10/80-4/29/80																								
4/30/80-5/2/80																								
5/2/80-5/16/80																								
6/30/80-9/30/80																								
11/6/80-11/14/80	1.08E-02		2.56E-02		1.08E-02		3.58E-03																	
11/6/80-12/12/80																								
11/6/80-12/17/80																								
12/15/80-12/18/80																								
3/16/81-3/30/81																								
3/31/81-5/1/81	3.81E-02		8.07E-02		3.81E-02		1.27E-02																	
5/4/81-5/11/81																								
6/15/81-6/17/81																								
6/17/81-7/10/81																								
8/29/81-8/27/81																								
8/31/81-9/3/81											7.73E-02													
9/3/81-9/5/81																								
9/9/81-10/2/81																								
9/22/81-9/23/81																								
10/1/81-11/5/81																								
10/27/81-11/4/81	3.10E-02		7.40E-02																					

TABLE 3-7. ESTIMATED FLUORANTHENE APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED FLUORANTHENE APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/5/81-12/8/81																								
4/1/82-8/31/82	4.71E-02		1.12E-01																					
9/1/82-3/31/83	4.34E-02		1.08E-01														2.86E-02							
4/83-10/83			3.97E-01				6.96E-02		3.40E-02		1.22E-01													
4/84-5/84	4.07E-02		4.07E-02				2.03E-02																	
11/84-12/84									4.25E-02		1.09E-01													
1/85-9/85									2.60E-02		9.32E-02		2.17E-02		1.08E-02									
3/86-7/86																	1.52E-01							
8/86-2/87									8.17E-02				7.01E-02											
3/87-8/87									2.76E-02		1.00E-01		2.40E-02											
9/87-11/87																								
10/87-11/87									1.08E-01															
3/88-7/88									2.00E-02		7.13E-02		1.71E-02				1.41E-01							
9/88-2/89									2.60E-02		9.27E-02		2.23E-02											
3/89-8/89											1.05E-01		2.52E-02				8.67E-02							
9/89-2/90																	1.52E-01							
3/90-8/90									1.99E-02		7.13E-02		1.71E-02				1.30E-01							
9/90-2/91											1.19E-01		4.99E-03											
3/91-8/91											1.52E-01						1.30E-01							
9/91-2/92																	1.73E-01							
3/92-8/92	3.52E-02		7.32E-02		3.16E-02		1.17E-02																	
9/92-2/93	4.93E-02		1.02E-01																					
1/93-12/93									1.67E-02		5.97E-02		1.43E-02				9.56E-02		5.85E-02					
1/94-12/94																	7.28E-02							
3/94-4/94																							3.64E-01	
8/94-9/94																							1.39E-01	
11/94-12/94																							2.70E-01	
3/14/95-3/24/95																	9.24E-02						2.41E-01	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
(3) AD = Aerobic Digestor
(4) Blanks indicate no sludge applied to that zone on that date.

TABLE 3-8. ESTIMATED PHENANTHRENE APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED PHENANTHRENE APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76				1.31E-01		2.54E-02																		
3/16/76-4/1/76	2.50E-01																							
3/76-4/76			3.39E-01		1.40E-01		8.35E-02		1.54E-01															
5/19/76-6/3/76												1.80E-02												
6/7/76-7/7/76												6.51E-02												
7/9/76-8/3/76													8.33E-01											
8/4/76-8/24/76															6.29E-01									
10/76-12/76										1.17E-02		4.17E-02												
1/77																						2.15E-02		
3/77-4/77		1.65E-02		3.95E-02		1.65E-02		5.52E-03																
4/77-6/77										1.17E-02		4.17E-02												
5/77																8.56E-03								
5/77-6/77														9.59E-03										
6/77-7/77																		1.82E-01						
8/77-9/77																			6.14E-01					
11/77										1.39E-03		4.98E-03		1.19E-03		8.96E-04								
3/78-4/78										1.39E-02		4.97E-02		1.19E-02		8.95E-03								
4/78-5/78										1.31E-02		4.67E-02		1.34E-01		8.40E-03								
5/22/78-6/6/78	8.28E-02		1.98E-01		8.28E-02		2.76E-02																	
6/8/78-7/13/79		2.72E-02		6.48E-02		2.72E-02		9.05E-03																
7/17/78-8/30/78	3.12E-01		7.43E-01		3.12E-01		1.04E-01																	
8/30/78-10/9/78																	9.41E-01							
10/5/78-10/30/78																	6.70E-01							
10/5/78-10/30/78																	1.70E-01							
10/78																		1.24E-01		5.42E-02				
4/5/79-5/1/79																		2.47E-02						
5/2/79-5/18/79																3.45E-02								
5/23/79-6/7/79										4.37E-02														
7/9/79-8/10/79										4.49E-02														
8/13/79-11/1/79												1.13E-01												
10/29/79-10/30/79										9.11E-03														
11/79														5.07E-02		3.06E-02								
11/17/79-12/7/79			1.10E+00																					
1/26/79, 4/10/80-4/29/80												5.66E-03												
4/30/80-5/2/80		1.43E-02		3.41E-02																				
5/2/80-5/16/80						3.60E-02		1.17E-02																
6/30/80-9/30/80																		1.46E-01						
11/6/80-11/14/80	9.10E-02		2.17E-01		9.10E-02		3.03E-02																	
11/6/80-12/12/80		2.20E-02		5.25E-02		2.20E-02																		
11/6/80-12/17/80								7.33E-03																
12/15/80-12/18/80										1.56E-02														
3/16/81-3/30/81																		8.90E-02						
3/31/81-5/1/81	3.22E-01		6.83E-01		3.22E-01		1.07E-01																	
5/4/81-5/11/81																4.45E-02								
6/15/81-6/17/81										5.54E-02														
6/17/81-7/10/81												9.13E-02												
8/29/81-8/27/81												2.73E-02												
8/31/81-9/3/81											6.54E-01													
9/3/81-9/5/81														5.31E-02										
9/9/81-10/2/81										8.66E-02														
9/22/81-9/23/81																				4.99E-02				
10/1/81-11/5/81																		5.39E-02						
10/27/81-11/4/81	2.63E-01		6.26E-01																					

TABLE 3-8. ESTIMATED PHENANTHRENE APPLIED TO SLUDGE INCORPORATION AREAS

DATE	ESTIMATED PHENANTHRENE APPLIED (LBS)																							
	Zone 1		Zone 2		Zone 3		Zone 4		Zone 5		Zone 6		Zone 7		Zone 8		Zone 9		Zone 10		Zone 11		Zone 12	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/5/81-12/8/81																		1.60E-02						
4/1/82-8/31/82	3.98E-01	2.54E-03	9.49E-01	6.05E-03		7.32E-02		2.44E-02				4.29E-02				3.28E-02		2.18E-01						
9/1/82-3/31/83	3.67E-01		9.17E-01			5.20E-02		1.69E-02									2.42E-01	1.40E-01						
4/83-10/83		4.49E-02	3.36E+00			2.09E-01	5.89E-01		2.88E-01		1.03E+00	1.09E-01		5.27E-02		4.75E-02								
4/84-5/84	3.44E-01		3.44E-01			6.10E-02	1.72E-01																	
11/84-12/84		3.47E-03		6.94E-03					3.60E-01		9.25E-01					2.21E-02								
1/85-9/85		1.44E-02		4.63E-02		1.95E-02		6.51E-03	2.20E-01		7.89E-01		1.83E-01		9.17E-02									
3/86-7/86		3.17E-02		7.07E-02		2.68E-02		1.06E-02		5.27E-02		1.38E-01		2.73E-02			1.28E+00							
8/86-2/87		7.81E-03							6.92E-01	1.99E-02		7.12E-02	5.93E-01	1.84E-01				6.38E-02						
3/87-8/87		1.77E-03		3.95E-03		1.50E-03		5.90E-04	2.34E-01	3.90E-02	8.48E-01	2.54E-02	2.03E-01					1.41E-01						
9/87-11/87																		6.51E-02						
10/87-11/87									9.17E-01															
3/88-7/88		2.45E-02		5.47E-02		2.08E-02		8.18E-03	1.69E-01	4.96E-02	6.04E-01	1.77E-01	1.45E-01	4.25E-02			1.19E+00							
9/88-2/89		7.38E-03		1.65E-02		6.24E-03		2.46E-03	2.20E-01		7.85E-01	9.76E-02	1.88E-01											
3/89-8/89		1.97E-02		4.39E-02		1.66E-02		6.56E-03			8.88E-01		2.13E-01				7.34E-01	2.17E-02						
9/89-2/90																	1.28E+00	1.08E-01						
3/90-8/90		6.29E-03		1.43E-02		6.29E-03		6.29E-03	1.69E-01	1.19E-02	6.04E-01	4.29E-02	1.45E-01	1.02E-02			1.10E+00	1.31E-01						
9/90-2/91		1.17E-02		2.67E-02		1.17E-02		1.17E-02		6.07E-03	1.01E+00	2.15E-02	4.22E-02	3.25E-02										
3/91-8/91											1.28E+00			5.42E-02			1.10E+00	7.59E-02						
9/91-2/92										1.73E-02		2.60E-02					1.47E+00	4.34E-02						
3/92-8/92	2.98E-01		6.19E-01		2.68E-01		9.94E-02											8.67E-02						
9/92-2/93	4.17E-01		8.67E-01													1.08E-02								
1/93-12/93		2.01E-02		4.49E-02		6.22E-02		2.45E-02	1.42E-01		5.05E-01		1.21E-01				8.09E-01		4.95E-01					
1/94-12/94				1.06E-01		4.03E-02											6.16E-01							
3/94-4/94																							3.08E+00	
8/94-9/94																							1.17E+00	
11/94-12/94																							2.29E+00	
3/14/95-3/24/95		7.77E-03														1.07E-01	7.82E-01	9.24E-02					2.04E+00	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
(3) AD = Aerobic Digestor
(4) Blanks indicate no sludge applied to that zone on that date.

4. The ZOI is 1.5 feet deep.

5. The density of the soil (weight) is assumed to be 1 ton per cubic yard. This is a conservative assumption.

The individual concentration estimates for each constituent were calculated and compared to the USEPA, Region 5 DQL as shown in Tables 3-9 through 3-13. As summarized in Table 3-14, all constituents are below the corresponding DQL.

Although less than the DQL, the phenanthrene estimate of 428.80 µg/kg is close to the DQL of 660 µg/kg. As shown in Appendix 21, the half-life of phenanthrene in two sandy loam soils is reported to be 16 days and 35 days. The half-life is reported to be 25 days for phenanthrene by another source provided in Appendix 21. The biodegradation rate constant is reported as 0.0447 per day and 0.0196 per day for two sandy loam soils. The degradation pathway is illustrated in Figure 3-3.

The concentration of phenanthrene in the SIA was re-calculated to take biodegradation into account. Landfarming is a proven technology for treating organic sludges and inorganic sludges that have nutrient value. Numerous industrial and Public Owned Treatment Works (POTW) sludges contain phenanthrene, and the ability of soil microorganisms to degrade this compound is well-documented (as shown in Appendix 21). The conservative biodegradation rate constant for a sandy loam soil of 0.0196 per day was used in the following equation.

$$C_t = C_o e^{-kt} \qquad \textbf{(3-1)}$$

TABLE 3-9. ESTIMATED PHENOL APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED PHENOL APPLIED (µg compound/kg soil in the ZOI)																							
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76				1.73		0.88																		
3/16/76-4/1/76	0.42																							
3/76-4/76			0.26		0.28		0.42		0.36															
5/19/76-6/3/76												0.21												
6/7/76-7/7/76												0.74												
7/9/76-8/3/76													2.28											
8/4/76-8/24/76															2.30									
10/76-12/76										0.48		0.48												
1/77																						2.05		
3/77-4/77		0.49		0.52		0.57		0.49																
4/77-6/77										0.48		0.48												
5/77																0.54								
5/77-6/77														0.46										
6/77-7/77																		1.30						
8/77-9/77																			1.19					
11/77										0.06		0.06		0.06		0.06								
3/78-4/78										0.57		0.57		0.57		0.57								
4/78-5/78										0.53		0.53		6.41		0.53								
5/22/78-6/6/78	0.14		0.15		0.17		0.14																	
6/8/78-7/13/79		0.80		0.85		0.94		0.80																
7/17/78-8/30/78	0.53		0.56		0.62		0.53																	
8/30/78-10/9/78																	0.39							
10/5/78-10/30/78																	0.28							
10/5/78-10/30/78																	0.07							
10/78																		0.88		1.82				
4/5/79-5/1/79																		0.18						
5/2/79-5/18/79																2.19								
5/23/79-6/7/79										1.79														
7/9/79-8/10/79										1.84														
8/13/79-11/1/79												1.29												
10/29/79-10/30/79										0.37														
11/79														2.42		1.94								
11/17/79-12/7/79			0.83																					
1/26/79, 4/10/80-4/29/80												0.06												
4/30/80-5/2/80		0.42		0.45																				
5/2/80-5/16/80						1.25		1.03																
6/30/80-9/30/80																		1.05						
11/6/80-11/14/80	0.15		0.16		0.18		0.15																	
11/6/80-12/12/80		0.65		0.69		0.76																		
11/6/80-12/17/80								0.65																
12/15/80-12/18/80										0.64														
3/16/81-3/30/81																		0.64						
3/31/81-5/1/81	0.54		0.52		0.64		0.54																	
5/4/81-5/11/81																2.83								
6/15/81-6/17/81										2.27														
6/17/81-7/10/81												1.05												
8/29/81-8/27/81												0.31												
8/31/81-9/3/81											0.43													
9/3/81-9/5/81														2.53										
9/9/81-10/2/81										3.54														
9/22/81-9/23/81																				1.68				
10/1/81-11/5/81																		0.39						
10/27/81-11/4/81	0.44		0.47																					
12/5/81-12/8/81																		0.11						
4/1/82-8/31/82	0.67	0.07	0.72	0.08		2.54		2.15				0.49				2.08		1.56						
9/1/82-3/31/83	0.62		0.69			1.80		1.49									0.10	1.00						
4/83-10/83		1.32	2.54			7.26	2.98		0.68		0.68	1.24		2.51		3.02								

TABLE 3-9. ESTIMATED PHENOL APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED PHENOL APPLIED (µg compound/kg soil in the ZOI)																					
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
4/84-5/84	0.58		0.26			2.11	0.87																	
11/84-12/84		0.10		0.09					0.84		0.61					1.41								
1/85-9/85		0.42		0.61		0.68		0.57	0.52		0.52		0.50		0.34									
3/86-7/86		0.93		0.93		0.93		0.93		2.15		1.58		1.30			0.53							
8/86-2/87		0.23							1.62	0.81		0.81	1.62	8.79				0.46						
3/87-8/87		0.05		0.05		0.05		0.05	0.55	1.60	0.56	0.29	0.56					1.01						
9/87-11/87																		0.47						
10/87-11/87									2.15															
3/88-7/88		0.72		0.72		0.72		0.72	0.40	2.03	0.40	2.03	0.40	2.03			0.49							
9/88-2/89		0.22		0.22		0.22		0.22	0.52		0.52	1.12	0.52											
3/89-8/89		0.58		0.58		0.58		0.58			0.58		0.58				0.30	0.16						
9/89-2/90																	0.53	0.78						
3/90-8/90		0.18		0.19		0.22		0.55	0.40	0.49	0.40	0.49	0.40	0.49			0.45	0.94						
9/90-2/91		0.34		0.35		0.41		1.03		0.25	0.66	0.25	0.12	1.55										
3/91-8/91											0.84			2.58			0.45	0.54						
9/91-2/92										0.71		0.30					0.60	0.31						
3/92-8/92	0.50		0.47		0.53		0.50											0.62						
9/92-2/93	0.70		0.66													0.69								
1/93-12/93		0.59		0.59		2.16		2.16	0.33		0.33		0.33				0.33		0.96					
1/94-12/94				1.40		1.40											0.25							
3/94-4/94																							1.66	
8/94-9/94																							0.63	
11/94-12/94																							1.23	
3/14/95-3/24/95		0.23														6.80	0.32	0.66					1.10	
SUBTOTAL	5.30	8.34	8.28	10.04	2.42	25.48	6.13	13.41	8.37	20.59	6.52	14.37	7.30	31.70	2.63	22.67	5.09	13.04	2.14	3.50		2.05	4.62	
																					TOTAL APPLIED =		224.00	
																					DQL =		23,000,000	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
AD = Aerobic Digestor
ZOI = Zone of Incorporation
(3) Zone of Incorporation assumed to be 1.5 feet deep for these calculations.
(4) Blanks indicate no sludge applied to that zone on that date.
(5) The density of the soil is assumed to be 1 ton per cubic yard.

TABLE 3-10. ESTIMATED TOLUENE APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED TOLUENE APPLIED (µg compound/kg soil in the ZOI)																							
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76																								
3/16/76-4/1/76	8.44E-02																							
3/76-4/76			5.12E-02		5.56E-02		8.44E-02		7.24E-02															
5/19/76-6/3/76																								
6/7/76-7/7/76																								
7/9/76-8/3/76													4.56E-01											
8/4/76-8/24/76															4.59E-01									
10/76-12/76																								
1/77																								
3/77-4/77																								
4/77-6/77																								
5/77																								
5/77-6/77																								
6/77-7/77																								
8/77-9/77																			2.37E-01					
11/77																								
3/78-4/78																								
4/78-5/78																								
5/22/78-6/6/78	2.79E-02		2.98E-02		3.30E-02		2.79E-02																	
6/8/78-7/13/79																								
7/17/78-8/30/78	1.05E-01		1.12E-01		1.24E-01		1.05E-01																	
8/30/78-10/9/78																	7.73E-02							
10/5/78-10/30/78																	5.51E-02							
10/5/78-10/30/78																	1.40E-02							
10/78																								
4/5/79-5/1/79																								
5/2/79-5/18/79																								
5/23/79-6/7/79																								
7/9/79-8/10/79																								
8/13/79-11/1/79																								
10/29/79-10/30/79																								
11/79																								
11/17/79-12/7/79			1.66E-01																					
1/26/79, 4/10/80-4/29/80																								
4/30/80-5/2/80																								
5/2/80-5/16/80																								
6/30/80-9/30/80																								
11/6/80-11/14/80	3.07E-02		3.28E-02		3.63E-02		3.07E-02																	
11/6/80-12/12/80																								
11/6/80-12/17/80																								
12/15/80-12/18/80																								
3/16/81-3/30/81																								
3/31/81-5/1/81	1.09E-01		1.03E-01		1.28E-01		1.09E-01																	
5/4/81-5/11/81																								
6/15/81-6/17/81																								
6/17/81-7/10/81																								
8/29/81-8/27/81																								
8/31/81-9/3/81											8.60E-02													
9/3/81-9/5/81																								
9/9/81-10/2/81																								
9/22/81-9/23/81																								
10/1/81-11/5/81																								
10/27/81-11/4/81	8.85E-02		9.46E-02																					
12/5/81-12/8/81																								
4/1/82-8/31/82	1.34E-01		1.43E-01																					
9/1/82-3/31/83	1.24E-01		1.39E-01														1.99E-02							
4/83-10/83			5.08E-01				5.96E-01		1.35E-01		1.36E-01													

TABLE 3-10. ESTIMATED TOLUENE APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED TOLUENE APPLIED (µg compound/kg soil in the ZOI)																					
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
4/84-5/84	1.16E-01		5.20E-02				1.74E-01																	
11/84-12/84									1.69E-01		1.22E-01													
1/85-9/85									1.03E-01		1.04E-01		1.01E-01		6.70E-02									
3/86-7/86																	1.06E-01							
8/86-2/87									3.25E-01				3.25E-01											
3/87-8/87									1.10E-01		1.11E-01		1.11E-01											
9/87-11/87																								
10/87-11/87									4.31E-01															
3/88-7/88									7.94E-02		7.94E-02		7.94E-02				9.80E-02							
9/88-2/89									1.03E-01		1.03E-01		1.03E-01											
3/89-8/89											1.17E-01		1.17E-01				6.03E-02							
9/89-2/90																	1.06E-01							
3/90-8/90									7.93E-02		7.94E-02		7.94E-02				9.05E-02							
9/90-2/91											1.33E-01		2.31E-02											
3/91-8/91											1.69E-01						9.05E-02							
9/91-2/92																	1.21E-01							
3/92-8/92	1.01E-01		9.36E-02		1.07E-01		1.01E-01																	
9/92-2/93	1.41E-01		1.31E-01																					
1/93-12/93									6.65E-02		6.65E-02		6.65E-02				6.65E-02		1.91E-01					
1/94-12/94																	5.06E-02							
3/94-4/94																							3.32E-01	
8/94-9/94																							1.27E-01	
11/94-12/94																							2.47E-01	
3/14/95-3/24/95																	6.43E-02						2.19E-01	
SUBTOTAL	1.06		1.66		0.48		1.23		1.67		1.30		1.46		0.53		1.02		0.43				0.92	
																					TOTAL APPLIED =		11.77	
																					DQL =		280,000	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.

(2) IHB = Inorganic Sludge Holding Pond
AD = Aerobic Digestor
ZOI = Zone of Incorporation

(3) Zone of Incorporation assumed to be 1.5 feet deep for these calculations.

(4) Blanks indicate no sludge applied to that zone on that date.

(5) The density of the soil is assumed to be 1 ton per cubic yard.

TABLE 3-11. ESTIMATED BIS(2-ETHYL HEXYL)PHALATE APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED BIS(2-ETHYL HEXYL)PHALATE APPLIED (µg compound/kg soil in the ZOI)																							
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76																								
3/16/76-4/1/76	4.46E-01																							
3/76-4/76			2.71E-01		2.94E-01		4.46E-01		3.83E-01															
5/19/76-6/3/76																								
6/7/76-7/7/76																								
7/9/76-8/3/76													2.41E+00											
8/4/76-8/24/76															2.43E+00									
10/76-12/76																								
1/77																								
3/77-4/77																								
4/77-6/77																								
5/77																								
5/77-6/77																								
6/77-7/77																								
8/77-9/77																			1.25E+00					
11/77																								
3/78-4/78																								
4/78-5/78																								
5/22/78-6/6/78	1.48E-01		1.58E-01		1.74E-01		1.48E-01																	
6/8/78-7/13/79																								
7/17/78-8/30/78	5.55E-01		5.93E-01		6.56E-01		5.55E-01																	
8/30/78-10/9/78																	4.09E-01							
10/5/78-10/30/78																	2.91E-01							
10/5/78-10/30/78																	7.40E-02							
10/78																								
4/5/79-5/1/79																								
5/2/79-5/18/79																								
5/23/79-6/7/79																								
7/9/79-8/10/79																								
8/13/79-11/1/79																								
10/29/79-10/30/79																								
11/79																								
11/17/79-12/7/79			8.79E-01																					
1/26/79, 4/10/80-4/29/80																								
4/30/80-5/2/80																								
5/2/80-5/16/80																								
6/30/80-9/30/80																								
11/6/80-11/14/80	1.62E-01		1.73E-01		1.92E-01		1.62E-01																	
11/6/80-12/12/80																								
11/6/80-12/17/80																								
12/15/80-12/18/80																								
3/16/81-3/30/81																								
3/31/81-5/1/81	5.74E-01		5.45E-01		6.78E-01		5.74E-01																	
5/4/81-5/11/81																								
6/15/81-6/17/81																								
6/17/81-7/10/81																								
8/29/81-8/27/81																								
8/31/81-9/3/81											4.54E-01													
9/3/81-9/5/81																								
9/9/81-10/2/81																								
9/22/81-9/23/81																								
10/1/81-11/5/81																								
10/27/81-11/4/81	4.68E-01		5.00E-01																					
12/5/81-12/8/81																								
4/1/82-8/31/82	7.09E-01		7.58E-01																					
9/1/82-3/31/83	6.54E-01		7.33E-01														1.05E-01							
4/83-10/83			2.69E+00				3.15E+00		7.15E-01		7.17E-01													

TABLE 3-11. ESTIMATED BIS(2-ETHYL HEXYL)PHALATE APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED BIS(2-ETHYL HEXYL)PHALATE APPLIED (µg compound/kg soil in the ZOI)																					
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
4/84-5/84	6.13E-01		2.75E-01				9.20E-01																	
11/84-12/84									8.93E-01		6.43E-01													
1/85-9/85									5.46E-01		5.48E-01		5.31E-01		3.54E-01									
3/86-7/86																	5.58E-01							
8/86-2/87									1.72E+00				1.72E+00											
3/87-8/87									5.80E-01		5.89E-01		5.88E-01											
9/87-11/87																								
10/87-11/87									2.28E+00															
3/88-7/88									4.19E-01		4.19E-01		4.19E-01				5.18E-01							
9/88-2/89									5.45E-01		5.45E-01		5.45E-01											
3/89-8/89											6.17E-01		6.17E-01				3.19E-01							
9/89-2/90																	5.58E-01							
3/90-8/90									4.19E-01		4.20E-01		4.20E-01				4.78E-01							
9/90-2/91											7.01E-01		1.22E-01											
3/91-8/91											8.93E-01						4.78E-01							
9/91-2/92																	6.38E-01							
3/92-8/92	5.31E-01		4.95E-01		5.63E-01		5.31E-01																	
9/92-2/93	7.44E-01		6.93E-01																					
1/93-12/93									3.51E-01		3.51E-01		3.51E-01				3.51E-01		1.01E+00					
1/94-12/94																	2.68E-01							
3/94-4/94																							1.75E+00	
8/94-9/94																							6.69E-01	
11/94-12/94																							1.30E+00	
3/14/95-3/24/95																	3.40E-01						1.16E+00	
SUBTOTAL	5.60		8.76		2.56		6.48		8.85		6.90		7.72		2.78		5.38		2.27				4.89	
																					TOTAL APPLIED =		62.19	
																					DQL =		61,000	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
AD = Aerobic Digestor
ZOI = Zone of Incorporation
(3) Zone of Incorporation assumed to be 1.5 feet deep for these calculations.
(4) Blanks indicate no sludge applied to that zone on that date.
(5) The density of the soil is assumed to be 1 ton per cubic yard.

TABLE 3-12. ESTIMATED FLUORANTHENE APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED FLUORANTHENE APPLIED (µg compound/kg soil in the ZOI)																							
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76																								
3/16/76-4/1/76	3.14E-01																							
3/76-4/76			1.90E-01		2.06E-01		3.14E-01		2.69E-01															
5/19/76-6/3/76																								
6/7/76-7/7/76																								
7/9/76-8/3/76													1.69E+00											
8/4/76-8/24/76															1.71E+00									
10/76-12/76																								
1/77																								
3/77-4/77																								
4/77-6/77																								
5/77																								
5/77-6/77																								
6/77-7/77																								
8/77-9/77																			8.82E-01					
11/77																								
3/78-4/78																								
4/78-5/78																								
5/22/78-6/6/78	1.04E-01		1.11E-01		1.23E-01		1.04E-01																	
6/8/78-7/13/79																								
7/17/78-8/30/78	3.90E-01		4.17E-01		4.61E-01		3.90E-01																	
8/30/78-10/9/78																	2.87E-01							
10/5/78-10/30/78																	2.05E-01							
10/5/78-10/30/78																	5.20E-02							
10/78																								
4/5/79-5/1/79																								
5/2/79-5/18/79																								
5/23/79-6/7/79																								
7/9/79-8/10/79																								
8/13/79-11/1/79																								
10/29/79-10/30/79																								
11/79																								
11/17/79-12/7/79			6.18E-01																					
1/26/79, 4/10/80-4/29/80																								
4/30/80-5/2/80																								
5/2/80-5/16/80																								
6/30/80-9/30/80																								
11/6/80-11/14/80	1.14E-01		1.22E-01		1.35E-01		1.14E-01																	
11/6/80-12/12/80																								
11/6/80-12/17/80																								
12/15/80-12/18/80																								
3/16/81-3/30/81																								
3/31/81-5/1/81	4.03E-01		3.83E-01		4.77E-01		4.03E-01																	
5/4/81-5/11/81																								
6/15/81-6/17/81																								
6/17/81-7/10/81																								
8/29/81-8/27/81																								
8/31/81-9/3/81											3.19E-01													
9/3/81-9/5/81																								
9/9/81-10/2/81																								
9/22/81-9/23/81																								
10/1/81-11/5/81																								
10/27/81-11/4/81	3.29E-01		3.52E-01																					
12/5/81-12/8/81																								
4/1/82-8/31/82	4.99E-01		5.33E-01																					
9/1/82-3/31/83	4.59E-01		5.15E-01														7.39E-02							
4/83-10/83			1.89E+00				2.21E+00		5.02E-01		5.04E-01													

TABLE 3-12. ESTIMATED FLUORANTHENE APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED FLUORANTHENE APPLIED (µg compound/kg soil in the ZOI)																					
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
4/84-5/84	4.31E-01		1.93E-01				6.46E-01																	
11/84-12/84									6.27E-01		4.52E-01													
1/85-9/85									3.84E-01		3.85E-01		3.73E-01		2.49E-01									
3/86-7/86																	3.92E-01							
8/86-2/87									1.21E+00				1.21E+00											
3/87-8/87									4.08E-01		4.14E-01		4.13E-01											
9/87-11/87																								
10/87-11/87									1.60E+00															
3/88-7/88									2.95E-01		2.95E-01		2.95E-01				3.64E-01							
9/88-2/89									3.83E-01		3.83E-01		3.83E-01											
3/89-8/89											4.34E-01		4.34E-01				2.24E-01							
9/89-2/90																	3.92E-01							
3/90-8/90									2.94E-01		2.95E-01		2.95E-01				3.36E-01							
9/90-2/91											4.93E-01		8.59E-02											
3/91-8/91											6.27E-01						3.36E-01							
9/91-2/92																	4.48E-01							
3/92-8/92	3.73E-01		3.48E-01		3.96E-01		3.73E-01																	
9/92-2/93	5.23E-01		4.87E-01																					
1/93-12/93									2.47E-01		2.47E-01		2.47E-01				2.47E-01		7.11E-01					
1/94-12/94																	1.88E-01							
3/94-4/94																							1.23E+00	
8/94-9/94																							4.70E-01	
11/94-12/94																							9.16E-01	
3/14/95-3/24/95																	2.39E-01						8.15E-01	
SUBTOTAL	3.94		6.15		1.80		4.56		6.22		4.85		5.43		1.95		3.78		1.59				3.43	
																					TOTAL APPLIED =		43.70	
																					DQL =		1,600,000	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
AD = Aerobic Digestor
ZOI = Zone of Incorporation
(3) Zone of Incorporation assumed to be 1.5 feet deep for these calculations.
(4) Blanks indicate no sludge applied to that zone on that date.
(5) The density of the soil is assumed to be 1 ton per cubic yard.

TABLE 3-13. ESTIMATED PHENANTHRENE APPLIED TO SLUDGE INCORPORATION AREA

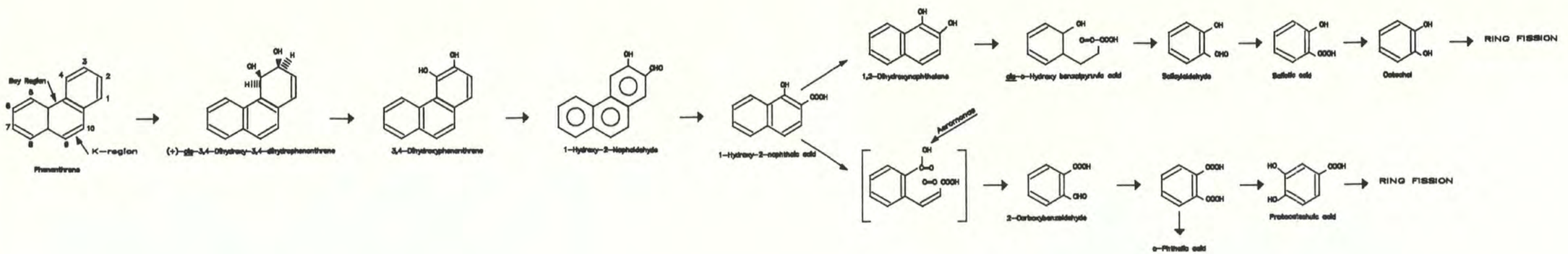
DATE	ESTIMATED PHENANTHRENE APPLIED (µg compound/kg soil in the ZOI)																							
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76				6.23E-01		3.18E-01																		
3/16/76-4/1/76	2.65E+00																							
3/76-4/76			1.61E+00		1.75E+00		2.65E+00		2.27E+00															
5/19/76-6/3/76												7.43E-02												
6/7/76-7/7/76												2.69E-01												
7/9/76-8/3/76													1.43E+01											
8/4/76-8/24/76															1.44E+01									
10/76-12/76										1.72E-01		1.72E-01												
1/77																						7.39E-01		
3/77-4/77		1.75E-01		1.87E-01		2.07E-01		1.75E-01																
4/77-6/77										1.72E-01		1.72E-01												
5/77																1.96E-01								
5/77-6/77														1.65E-01										
6/77-7/77																		4.70E-01						
8/77-9/77																			7.46E+00					
11/77										2.06E-02		2.06E-02		2.06E-02		2.06E-02								
3/78-4/78										2.06E-01		2.06E-01		2.06E-01		2.06E-01								
4/78-5/78										1.93E-01		1.93E-01		2.31E+00		1.93E-01								
5/22/78-6/6/78	8.78E-01		9.38E-01		1.04E+00		8.78E-01																	
6/8/78-7/13/79		2.88E-01		3.08E-01		3.40E-01		2.88E-01																
7/17/78-8/30/78	3.30E+00		3.53E+00		3.90E+00		3.30E+00																	
8/30/78-10/9/78																	2.43E+00							
10/5/78-10/30/78																	1.73E+00							
10/5/78-10/30/78																	4.40E-01							
10/78																		3.19E-01		6.58E-01				
4/5/79-5/1/79																		6.38E-02						
5/2/79-5/18/79																7.92E-01								
5/23/79-6/7/79										6.45E-01														
7/9/79-8/10/79										6.63E-01														
8/13/79-11/1/79												4.66E-01												
10/29/79-10/30/79										1.34E-01														
11/79														8.74E-01		7.02E-01								
11/17/79-12/7/79			5.23E+00																					
1/26/79, 4/10/80-4/29/80												2.34E-02												
4/30/80-5/2/80		1.52E-01		1.62E-01																				
5/2/80-5/16/80						4.50E-01		3.72E-01																
6/30/80-9/30/80																		3.78E-01						
11/6/80-11/14/80	9.64E-01		1.03E+00		1.14E+00		9.64E-01																	
11/6/80-12/12/80		2.33E-01		2.49E-01		2.76E-01																		
11/6/80-12/17/80								2.33E-01																
12/15/80-12/18/80										2.30E-01														
3/16/81-3/30/81																		2.30E-01						
3/31/81-5/1/81	3.41E+00		3.24E+00		4.03E+00		3.41E+00																	
5/4/81-5/11/81																1.02E+00								
6/15/81-6/17/81										8.18E-01														
6/17/81-7/10/81												3.77E-01												
8/29/81-8/27/81												1.13E-01												
8/31/81-9/3/81											2.70E+00													
9/3/81-9/5/81														9.14E-01										
9/9/81-10/2/81										1.28E+00														
9/22/81-9/23/81																								
10/1/81-11/5/81																		1.39E-01						
10/27/81-11/4/81	2.78E+00		2.97E+00																					
12/5/81-12/8/81																		4.13E-02						
4/1/82-8/31/82	4.22E+00	2.69E-02	4.51E+00	2.87E-02		9.16E-01		7.75E-01				1.77E-01				7.53E-01		5.62E-01						
9/1/82-3/31/83	3.89E+00		4.36E+00			6.52E-01		5.38E-01									6.25E-01	3.61E-01						
4/83-10/83		4.76E-01	1.60E+01			2.62E+00	1.87E+01		4.25E+00		4.26E+00	4.49E-01		9.07E-01		1.09E+00								

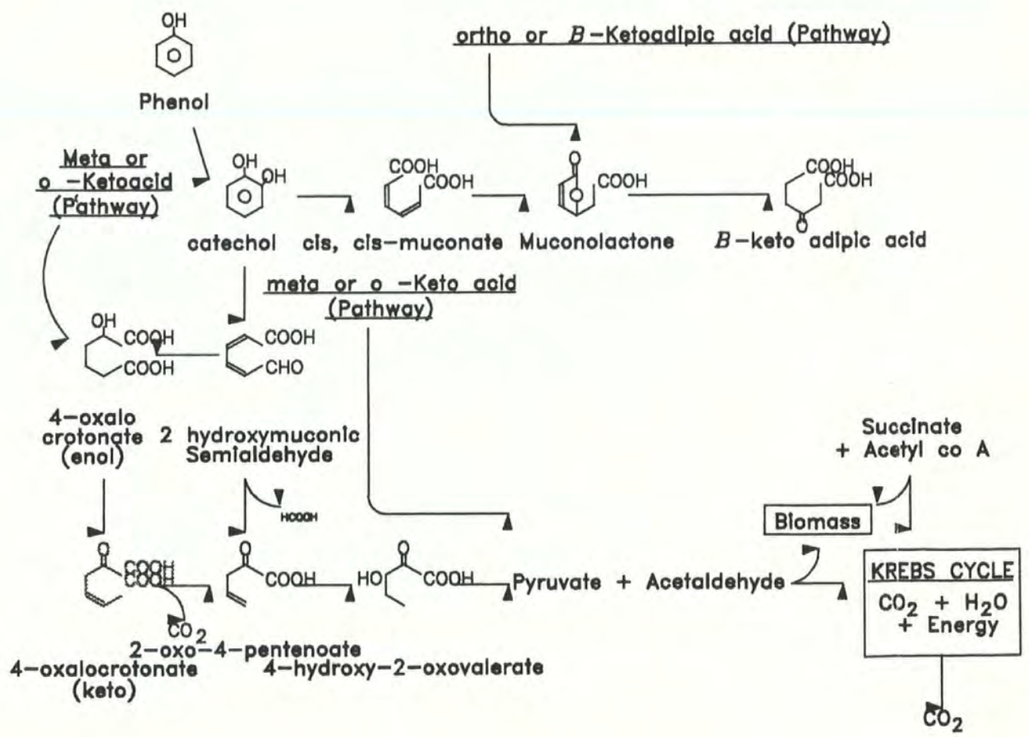
TABLE 3-13. ESTIMATED PHENANTHRENE APPLIED TO SLUDGE INCORPORATION AREA

DATE	ESTIMATED PHENANTHRENE APPLIED (µg compound/kg soil in the ZOI)																					
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
4/84-5/84	3.65E+00		1.63E+00			7.64E-01	5.47E+00																	
11/84-12/84		3.68E-02		3.30E-02					5.31E+00		3.82E+00					5.08E-01								
1/85-9/85		1.53E-01		2.20E-01		2.44E-01		2.07E-01	3.25E+00		3.26E+00		3.16E+00		2.11E+00									
3/86-7/86		3.36E-01		3.36E-01		3.36E-01		3.36E-01		7.78E-01		5.70E-01		4.70E-01			3.32E+00							
8/86-2/87		8.27E-02							1.02E+01	2.94E-01		2.94E-01	1.02E+01	3.18E+00				1.65E-01						
3/87-8/87		1.88E-02		1.88E-02		1.88E-02		1.88E-02	3.45E+00	5.76E-01	3.50E+00	1.05E-01	3.49E+00					3.65E-01						
9/87-11/87																		1.68E-01						
10/87-11/87									1.35E+01															
3/88-7/88		2.60E-01		2.60E-01		2.60E-01		2.60E-01	2.49E+00	7.32E-01	2.49E+00	7.32E-01	2.49E+00	7.32E-01			3.08E+00							
9/88-2/89		7.81E-02		7.81E-02		7.81E-02		7.81E-02	3.24E+00		3.24E+00	4.03E-01	3.24E+00											
3/89-8/89		2.08E-01		2.08E-01		2.08E-01		2.08E-01			3.67E+00		3.67E+00				1.90E+00	5.60E-02						
9/89-2/90																	3.32E+00	2.80E-01						
3/90-8/90		6.66E-02		6.80E-02		7.87E-02		2.00E-01	2.49E+00	1.76E-01	2.49E+00	1.77E-01	2.50E+00	1.75E-01			2.84E+00	3.38E-01						
9/90-2/91		1.24E-01		1.27E-01		1.47E-01		3.72E-01		8.96E-02	4.17E+00	8.87E-02	7.27E-01	5.60E-01										
3/91-8/91											5.31E+00			9.33E-01			2.84E+00	1.96E-01						
9/91-2/92										2.56E-01		1.08E-01					3.79E+00	1.12E-01						
3/92-8/92	3.16E+00		2.94E+00		3.35E+00		3.16E+00											2.24E-01						
9/92-2/93	4.42E+00		4.12E+00													2.49E-01								
1/93-12/93		2.13E-01		2.13E-01		7.79E-01		7.79E-01	2.09E+00		2.09E+00		2.09E+00				2.09E+00		6.02E+00					
1/94-12/94				5.05E-01		5.05E-01											1.59E+00							
3/94-4/94																							1.04E+01	
8/94-9/94																							3.98E+00	
11/94-12/94																							7.75E+00	
3/14/95-3/24/95		8.23E-02														2.46E+00	2.02E+00	2.39E-01					6.90E+00	
SUBTOTAL	33.32	3.01	52.08	3.63	15.21	9.20	38.56	4.84	52.59	7.43	41.01	5.19	45.91	11.45	16.54	8.19	32.01	4.71	13.48	0.66		0.74	29.05	
																					TOTAL APPLIED =		428.80	
																					DQL =		660	

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
AD = Aerobic Digestor
ZOI = Zone of Incorporation
(3) Zone of Incorporation assumed to be 1.5 feet deep for these calculations.
(4) Blanks indicate no sludge applied to that zone on that date.
(5) The density of the soil is assumed to be 1 ton per cubic yard.





BRENTWOOD, TENNESSEE

FIGURE 3-3

DEGRADATION PATHWAY FOR PHENANTHRENE

where:

C_t = estimated concentration in the soil on July 31, 1995, mg/kg;

C_o = estimated concentration in the soil on the day sludge was applied, mg/kg;

k = 0.0196, per day; and

t = time from the application date to July 31, 1995, days

The estimated concentration of phenanthrene in the SIA zones on July 31, 1995 from each application and the total concentration is shown in Table 3-15. The estimated concentration of phenanthrene is 1.03 µg per kg of soil. The estimate was calculated using the following assumptions.

1. Biodegradation rate constant is 0.0196 per day.
2. Temperature does not change the biodegradation rate constant.
3. The July 1987 analytical result is representative of all sludge applied to the landfarms.
4. Biodegradation only occurs in the ZOI which is 1.5 feet deep.

In general, 99 percent or more of a constituent will be degraded in 10 half-lives. Using the conservative reported half-life of 35 days, it can be concluded that biodegradation of phenanthrene is complete in 350 days. In addition, the estimated concentration of phenanthrene in the SIA soil of 1.03 µg per kg of soil is less than the USEPA, Region 5 PQL and DQL.

TABLE 3-15. ESTIMATED PHENANTHRENE CONCENTRATION IN SLUDGE INCORPORATION AREA WITH BIODEGRADATION

DATE	ESTIMATED PHENANTHRENE APPLIED (µg compound/kg soil in the ZOI)																							
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
12/75-3/76				2.72E-61		1.39E-61																		
3/16/76-4/1/76	2.13E-60																							
3/76-4/76			1.29E-60		1.40E-60		2.13E-60		1.82E-60															
5/19/76-6/3/76												2.05E-61												
6/7/76-7/7/76												1.44E-60												
7/9/76-8/3/76													1.31E-58											
8/4/76-8/24/76															1.98E-58									
10/76-12/76										1.65E-59		1.65E-59												
1/77																						1.30E-58		
3/77-4/77		1.80E-58		1.92E-58		2.13E-58		1.80E-58																
4/77-6/77										5.85E-58		5.84E-58												
5/77																3.63E-58								
5/77-6/77														5.60E-58										
6/77-7/77																		2.87E-57						
8/77-9/77																			1.53E-55					
11/77										1.40E-57		1.40E-57		1.40E-57		1.40E-57								
3/78-4/78										2.70E-55		2.70E-55		2.70E-55		2.70E-55								
4/78-5/78										4.56E-55		4.56E-55		5.47E-54		4.56E-55								
5/22/78-6/6/78	4.20E-54		4.49E-54		4.96E-54		4.20E-54																	
6/8/78-7/13/79		3.64E-51		3.89E-51		4.30E-51		3.64E-51																
7/17/78-8/30/78	8.35E-53		8.93E-53		9.87E-53		8.35E-53																	
8/30/78-10/9/78																	1.35E-52							
10/5/78-10/30/78																	1.45E-52							
10/5/78-10/30/78																	3.68E-53							
10/78																		1.51E-53		3.12E-53				
4/5/79-5/1/79																		1.93E-52						
5/2/79-5/18/79																3.34E-51								
5/23/79-6/7/79										4.03E-51														
7/9/79-8/10/79										1.45E-50														
8/13/79-11/1/79												5.19E-50												
10/29/79-10/30/79										1.44E-50														
11/79														9.72E-50		7.81E-50								
11/17/79-12/7/79			1.18E-48																					
1/26/79, 4/10/80-4/29/80												8.86E-50												
4/30/80-5/2/80		6.10E-49		6.52E-49																				
5/2/80-5/16/80						2.38E-48		1.97E-48																
6/30/80-9/30/80																		2.93E-47						
11/6/80-11/14/80	1.81E-46		1.93E-46		2.13E-46		1.81E-46																	
11/6/80-12/12/80		7.56E-47		8.08E-47		8.94E-47																		
11/6/80-12/17/80								8.34E-47																
12/15/80-12/18/80										8.40E-47														
3/16/81-3/30/81																		6.19E-46						
3/31/81-5/1/81	1.72E-44		1.63E-44		2.03E-44		1.72E-44																	
5/4/81-5/11/81																6.27E-45								
6/15/81-6/17/81										1.04E-44														
6/17/81-7/10/81												7.50E-45												
8/29/81-8/27/81												5.75E-45												
8/31/81-9/3/81											1.58E-43													
9/3/81-9/5/81														5.55E-44										
9/9/81-10/2/81										1.32E-43														
9/22/81-9/23/81																								
10/1/81-11/5/81																		2.79E-44						
10/27/81-11/4/81	5.48E-43		5.86E-43																					
12/5/81-12/8/81																		1.58E-44						
4/1/82-8/31/82	2.97E-40	1.89E-42	3.18E-40	2.03E-42		6.46E-41		5.47E-41				1.25E-41				5.30E-41		3.96E-41						
9/1/82-3/31/83	1.75E-38		1.96E-38			2.93E-39		2.42E-39									2.81E-39	1.62E-39						
4/83-10/83		7.87E-38	2.64E-36			4.34E-37	3.10E-36		7.04E-37		7.05E-37	7.43E-38		1.50E-37		1.80E-37								
4/84-5/84	3.92E-35		1.76E-35			8.22E-36	5.89E-35																	
11/84-12/84		2.62E-35		2.35E-35					3.79E-33		2.73E-33					3.62E-34								
1/85-9/85		2.34E-32		3.37E-32		3.75E-32		3.17E-32	4.99E-31		5.00E-31		4.85E-31		3.23E-31									
3/86-7/86		1.96E-29		1.96E-29		1.96E-29		1.96E-29		4.53E-29		3.32E-29		2.74E-29			1.93E-28							
8/86-2/87		3.26E-28							4.02E-26	1.16E-27		1.16E-27	4.02E-26	1.25E-26				6.48E-28						
3/87-8/87		2.56E-27		2.56E-27		2.56E-27		2.56E-27	4.72E-25	7.88E-26	4.79E-25	1.43E-26	4.78E-25					4.99E-26						

TABLE 3-15. ESTIMATED PHENANTHRENE CONCENTRATION IN SLUDGE INCORPORATION AREA WITH BIODEGRADATION

DATE	ESTIMATED PHENANTHRENE APPLIED (µg compound/kg soil in the ZOI)																					
	Zone 1 19.5 acres		Zone 2 43.5 acres		Zone 3 16.5 acres		Zone 4 6.5 acres		Zone 5 14 acres		Zone 6 50 acres		Zone 7 12 acres		Zone 8 9 acres		Zone 9 80 acres		Zone 10 17 acres		Zone 11 6 acres		Zone 12 61 acres	
	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD	IHB	AD
9/87-11/87																		1.39E-25						
10/87-11/87									1.12E-23															
3/88-7/88		2.53E-23		2.53E-23		2.53E-23		2.53E-23	2.42E-22	7.11E-23	2.42E-22	7.11E-23	2.42E-22	7.11E-23			2.99E-22							
9/88-2/89		5.13E-22		5.13E-22		5.13E-22		5.13E-22	2.13E-20		2.13E-20	2.65E-21	2.13E-20											
3/89-8/89		4.76E-20		4.76E-20		4.76E-20		4.76E-20			8.37E-19		8.37E-19				4.33E-19	1.28E-20						
9/89-2/90																	2.79E-17	2.35E-18						
3/90-8/90		1.95E-17		1.98E-17		2.30E-17		5.84E-17	7.27E-16	5.14E-17	7.28E-16	5.18E-17	7.29E-16	5.12E-17			8.30E-16	9.87E-17						
9/90-2/91		1.33E-15		1.36E-15		1.58E-15		4.00E-15		9.63E-16	4.48E-14	9.54E-16	7.81E-15	6.02E-15										
3/91-8/91											1.98E-12			3.49E-13			1.06E-12	7.32E-14						
9/91-2/92										3.52E-12		1.48E-12					5.21E-11	1.54E-12						
3/92-8/92	1.54E-09		1.43E-09		1.63E-09		1.54E-09											1.09E-10						
9/92-2/93	7.94E-08		7.39E-08													4.47E-09								
1/93-12/93		1.45E-06		1.45E-06		5.31E-06		5.31E-06	1.42E-05		1.42E-05		1.42E-05				1.42E-05		4.10E-05					
1/94-12/94				4.40E-03		4.40E-03											1.39E-02							
3/94-4/94																							7.61E-04	
8/94-9/94																							5.82E-03	
11/94-12/94																							6.75E-02	
3/14/95-3/24/95		6.57E-03														1.96E-01	1.61E-01	1.90E-02					5.50E-01	
SUBTOTAL	8.0900E-08	6.5689E-03	7.5321E-08	4.3983E-03	1.6323E-09	4.4021E-03	1.5390E-09	5.3056E-06	1.4222E-05	3.5225E-12	1.4222E-05	1.4800E-12	1.4222E-05	3.5463E-13	3.2315E-31	1.9605E-01	1.7506E-01	1.9050E-02	4.0981E-05	3.1203E-53		1.2992E-58	6.2432E-01	
																					TOTAL APPLIED =				1.03
																					DQL =				660

Note:

(1) Estimated using one sample result (May 1987) and historic database of volume of sludge applied to each zone.
(2) IHB = Inorganic Sludge Holding Pond
AD = Aerobic Digestor
ZOI = Zone of Incorporation
(3) Zone of Incorporation assumed to be 1.5 feet deep for these calculations.
(4) Blanks indicate no sludge applied to that zone on that date.
(5) Biodegradation rate constant = 0.0196 per day

CONCLUSIONS

Hazardous constituents as defined by 40 CFR 264, Appendix IX have been found to be present in samples collected from the sludges applied to the SIA. However, migration of these constituents through the soil into the groundwater or crops has not occurred.

Total Metals

RECEIVED
AUG 11 1995
RCRA PERMITTING BRANCH
OR/WMD
EPA, REGION V

08/07/1995 ENVIRONMENTAL LABORATORY FINAL REPORT

LAB REQUEST NO. M3639

REQUESTOR NAME: MT EINABARAWY/JSH/MJK
DEPARTMENT: 0222
PROJECT NO: 20-7903
DATE RECEIVED: 12/01/1994
DESC: CORDOVA ANNUAL SOIL SAMPLES 1994

CONTRACT LAB(S): RUST
MVTL
EXP COMP DATE: 02/02/1995
DATE COMPLETED: 08/07/1995
PROJECT LEAD: RR ROBIDEAU
PHONE NO: 612-778-7065
3M FAX NO: 612-778-6176

Soil samples required under Land Application of Sludge permit #1992-SC-0270.

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
1	11/29/94	8"-12" DEEP	C1		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	25 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	9.9 MG/KG	3
			IRON	17000 MG/KG	50
			LEAD	9.4 MG/KG	1
			MERCURY	0.03 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	21 MG/KG	3
			ZINC	47 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	200 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.3 UNITS	
			1:1 PH IN WATER MATRIX	6.6 UNITS	
			*BRAY EXTRACT - AVAIL. P	39 MG/KG	
			CATION EXCHANGE CAPACITY	18.3 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.47 MMHOS/CM	
2	11/29/94	8"-12" DEEP	C4		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	22 MG/KG	3
			COBALT	9 MG/KG	5
			COPPER	8.3 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	7.6 MG/KG	1
			MERCURY	0.01 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	17 MG/KG	3
			ZINC	39 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	200 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.6 UNITS	
			1:1 PH IN WATER MATRIX	6.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	42 MG/KG	
			CATION EXCHANGE CAPACITY	18.0 MEQ/100G	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
2	11/29/94	8"-12" DEEP	C4		
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.37 MMHOS/CM	
3	11/30/94	8"-12" DEEP	11		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	32 MG/KG	3
			COBALT	30 MG/KG	5
			COPPER	12 MG/KG	3
			IRON	22000 MG/KG	50
			LEAD	10 MG/KG	1
			MERCURY	0.03 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	26 MG/KG	3
			ZINC	42 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	420 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.9 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	36 MG/KG	
			CATION EXCHANGE CAPACITY	21.4 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.08 MMHOS/CM	
4	11/30/94	8"-12" DEEP	12		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	33 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	12 MG/KG	3
			IRON	21000 MG/KG	50
			LEAD	13 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	29 MG/KG	3
			ZINC	51 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	580 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.8 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	60 MG/KG	
			CATION EXCHANGE CAPACITY	20.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
4	11/30/94	8"-12" DEEP	12		
		SOLUBLE SALTS		#1.15 MMHOS/CM	
5	11/30/94	8"-12" DEEP	13		
		CADMIUM		<1 MG/KG	1
		CHROMIUM		23 MG/KG	3
		COBALT		10 MG/KG	5
		COPPER		8.9 MG/KG	3
		IRON		15000 MG/KG	50
		LEAD		9.5 MG/KG	1
		MERCURY		0.02 MG/KG	0.01
		METALS SAMPLE PREPARATION		COMPLETE	
		NICKEL		16 MG/KG	3
		ZINC		38 MG/KG	2
		*TOT FLUORIDE (DISTILLED)		210 MG/KG	
		0.01M CACL2 ELECTROMETRIC		6.8 UNITS	
		1:1 PH IN WATER MATRIX		7.0 UNITS	
		*BRAY EXTRACT - AVAIL. P		18 MG/KG	
		CATION EXCHANGE CAPACITY		22.3 MEQ/100G	
		LIME REQUIREMENT		NONE	
		SOIL PREPARATION		COMPLETE	
		SOLUBLE SALTS		#1.21 MMHOS/CM	
6	11/30/94	8"-12" DEEP	21		
		CADMIUM		<1 MG/KG	1
		CHROMIUM		29 MG/KG	3
		COBALT		120 MG/KG	5
		COPPER		9.5 MG/KG	3
		IRON		26000 MG/KG	50
		LEAD		12 MG/KG	1
		MERCURY		0.03 MG/KG	0.01
		METALS SAMPLE PREPARATION		COMPLETE	
		NICKEL		38 MG/KG	3
		ZINC		50 MG/KG	2
		*TOT FLUORIDE (DISTILLED)		1120 MG/KG	
		0.01M CACL2 ELECTROMETRIC		7.2 UNITS	
		1:1 PH IN WATER MATRIX		7.4 UNITS	
		*BRAY EXTRACT - AVAIL. P		49 MG/KG	
		CATION EXCHANGE CAPACITY		23.5 MEQ/100G	
		LIME REQUIREMENT		NONE	
		SOIL PREPARATION		COMPLETE	
		SOLUBLE SALTS		#1.11 MMHOS/CM	
7	11/30/94	8"-12" DEEP	22		
		CADMIUM		<1 MG/KG	1

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
7	11/30/94	8"-12" DEEP	22		
			CHROMIUM	43 MG/KG	3
			COBALT	220 MG/KG	5
			COPPER	13 MG/KG	3
			IRON	42000 MG/KG	50
			LEAD	20 MG/KG	1
			MERCURY	0.087 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	64 MG/KG	3
			ZINC	88 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1300 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.9 UNITS	
			1:1 PH IN WATER MATRIX	7.0 UNITS	
			*BRAY EXTRACT - AVAIL. P	76 MG/KG	
			CATION EXCHANGE CAPACITY	35.1 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.59 MMHOS/CM	
8	11/30/94	8"-12" DEEP	23		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	29 MG/KG	3
			COBALT	58 MG/KG	5
			COPPER	10 MG/KG	3
			IRON	21000 MG/KG	50
			LEAD	12 MG/KG	1
			MERCURY	0.03 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	28 MG/KG	3
			ZINC	47 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	350 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.8 UNITS	
			1:1 PH IN WATER MATRIX	7.0 UNITS	
			*BRAY EXTRACT - AVAIL. P	34 MG/KG	
			CATION EXCHANGE CAPACITY	25.2 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.27 MMHOS/CM	
9	11/30/94	8"-12" DEEP	24		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	27 MG/KG	3
			COBALT	40 MG/KG	5

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
9	11/30/94	8"-12" DEEP	24		
			COPPER	10 MG/KG	3
			IRON	19000 MG/KG	50
			LEAD	9.8 MG/KG	1
			MERCURY	0.03 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	24 MG/KG	3
			ZINC	51 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	410 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.3 UNITS	
			1:1 PH IN WATER MATRIX	6.7 UNITS	
			*BRAY EXTRACT - AVAIL. P	24 MG/KG	
			CATION EXCHANGE CAPACITY	20.3 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.48 MMHOS/CM	
10	11/30/94	8"-12" DEEP	25		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	28 MG/KG	3
			COBALT	190 MG/KG	5
			COPPER	7 MG/KG	3
			IRON	30000 MG/KG	50
			LEAD	13 MG/KG	1
			MERCURY	0.04 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	49 MG/KG	3
			ZINC	46 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	840 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.2 UNITS	
			1:1 PH IN WATER MATRIX	7.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	41 MG/KG	
			CATION EXCHANGE CAPACITY	20.7 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.58 MMHOS/CM	
11	11/30/94	8"-12" DEEP	26		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	50 MG/KG	3
			COBALT	140 MG/KG	5
			COPPER	17 MG/KG	3
			IRON	37000 MG/KG	50

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
11	11/30/94	8"-12" DEEP	26		
			LEAD	21 MG/KG	1
			MERCURY	0.11 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	51 MG/KG	3
			ZINC	99 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1600 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.3 UNITS	
			1:1 PH IN WATER MATRIX	6.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	60 MG/KG	
			CATION EXCHANGE CAPACITY	28.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.08 MMHOS/CM	
12	11/30/94	8"-12" DEEP	31		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	39 MG/KG	3
			COBALT	73 MG/KG	5
			COPPER	12 MG/KG	3
			IRON	26000 MG/KG	50
			LEAD	12 MG/KG	1
			MERCURY	0.05 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	31 MG/KG	3
			ZINC	46 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	560 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.8 UNITS	
			1:1 PH IN WATER MATRIX	6.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	31 MG/KG	
			CATION EXCHANGE CAPACITY	19.3 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.26 MMHOS/CM	
13	11/30/94	8"-12" DEEP	32		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	25 MG/KG	3
			COBALT	80 MG/KG	5
			COPPER	8.1 MG/KG	3
			IRON	21000 MG/KG	50
			LEAD	8.2 MG/KG	1
			MERCURY	0.03 MG/KG	0.01

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
13	11/30/94	8"-12" DEEP	32		
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	29 MG/KG	3
			ZINC	38 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1100 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.5 UNITS	
			1:1 PH IN WATER MATRIX	6.9 UNITS	
			*BRAY EXTRACT - AVAIL. P	46 MG/KG	
			CATION EXCHANGE CAPACITY	15.2 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.32 MMHOS/CM	
14	11/30/94	8"-12" DEEP	33		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	34 MG/KG	3
			COBALT	94 MG/KG	5
			COPPER	9.6 MG/KG	3
			IRON	25000 MG/KG	50
			LEAD	9.6 MG/KG	1
			MERCURY	0.03 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	32 MG/KG	3
			ZINC	45 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1400 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.9 UNITS	
			1:1 PH IN WATER MATRIX	6.5 UNITS	
			*BRAY EXTRACT - AVAIL. P	20 MG/KG	
			CATION EXCHANGE CAPACITY	15.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.24 MMHOS/CM	
15	11/30/94	8"-12" DEEP	41		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	29 MG/KG	3
			COBALT	20 MG/KG	5
			COPPER	7.3 MG/KG	3
			IRON	17000 MG/KG	50
			LEAD	7.3 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	21 MG/KG	3

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
15	11/30/94	8"-12" DEEP	41		
			ZINC	35 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	340 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.6 UNITS	
			1:1 PH IN WATER MATRIX	7.0 UNITS	
			*BRAY EXTRACT - AVAIL. P	43 MG/KG	
			CATION EXCHANGE CAPACITY	10.5 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.29 MMHOS/CM	
16	11/30/94	8"-12" DEEP	42		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	30 MG/KG	3
			COBALT	55 MG/KG	5
			COPPER	9 MG/KG	3
			IRON	23000 MG/KG	50
			LEAD	14 MG/KG	1
			MERCURY	0.073 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	26 MG/KG	3
			ZINC	60 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	580 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.5 UNITS	
			1:1 PH IN WATER MATRIX	7.0 UNITS	
			*BRAY EXTRACT - AVAIL. P	37 MG/KG	
			CATION EXCHANGE CAPACITY	15.0 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.24 MMHOS/CM	
17	11/29/94	8"-12" DEEP	43		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	29 MG/KG	3
			COBALT	230 MG/KG	5
			COPPER	11 MG/KG	3
			IRON	31000 MG/KG	50
			LEAD	13 MG/KG	1
			MERCURY	0.059 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	41 MG/KG	3
			ZINC	35 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1000 MG/KG	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
17	11/29/94	8"-12" DEEP	43		
			0.01M CACL2 ELECTROMETRIC	6.5 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	48 MG/KG	
			CATION EXCHANGE CAPACITY	15.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.26 MMHOS/CM	
18	11/30/94	8"-12" DEEP	51		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	18 MG/KG	3
			COBALT	57 MG/KG	5
			COPPER	7.6 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	7.6 MG/KG	1
			MERCURY	0.03 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	30 MG/KG	3
			ZINC	39 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1500 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.1 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	38 MG/KG	
			CATION EXCHANGE CAPACITY	13.1 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.61 MMHOS/CM	
19	11/30/94	8"-12" DEEP	52		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	39 MG/KG	3
			COBALT	430 MG/KG	5
			COPPER	14 MG/KG	3
			IRON	46000 MG/KG	50
			LEAD	18 MG/KG	1
			MERCURY	0.14 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	120 MG/KG	3
			ZINC	73 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	8000 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.2 UNITS	
			1:1 PH IN WATER MATRIX	7.4 UNITS	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
19	11/30/94	8"-12" DEEP	52		
			*BRAY EXTRACT - AVAIL. P	49 MG/KG	
			CATION EXCHANGE CAPACITY	13.1 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.06 MMHOS/CM	
20	11/30/94	8"-12" DEEP	61		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	32 MG/KG	3
			COBALT	140 MG/KG	5
			COPPER	12 MG/KG	3
			IRON	26000 MG/KG	50
			LEAD	14 MG/KG	1
			MERCURY	0.070 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	51 MG/KG	3
			ZINC	68 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	2800 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.9 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	41 MG/KG	
			CATION EXCHANGE CAPACITY	15.3 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.53 MMHOS/CM	
21	11/30/94	8"-12" DEEP	62		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	29 MG/KG	3
			COBALT	55 MG/KG	5
			COPPER	10 MG/KG	3
			IRON	22000 MG/KG	50
			LEAD	10 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	33 MG/KG	3
			ZINC	48 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1500 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.9 UNITS	
			1:1 PH IN WATER MATRIX	7.0 UNITS	
			*BRAY EXTRACT - AVAIL. P	43 MG/KG	
			CATION EXCHANGE CAPACITY	22.4 MEQ/100G	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
21	11/30/94	8"-12" DEEP	62		
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.96 MMHOS/CM	
22	11/30/94	8"-12" DEEP	63		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	26 MG/KG	3
			COBALT	73 MG/KG	5
			COPPER	11 MG/KG	3
			IRON	21000 MG/KG	50
			LEAD	10 MG/KG	1
			MERCURY	0.10 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	39 MG/KG	3
			ZINC	51 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	2100 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.2 UNITS	
			1:1 PH IN WATER MATRIX	7.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	42 MG/KG	
			CATION EXCHANGE CAPACITY	23.5 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.59 MMHOS/CM	
23	11/30/94	8"-12" DEEP	64		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	18 MG/KG	3
			COBALT	85 MG/KG	5
			COPPER	6 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	7.4 MG/KG	1
			MERCURY	0.078 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	30 MG/KG	3
			ZINC	33 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1600 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.9 UNITS	
			1:1 PH IN WATER MATRIX	7.0 UNITS	
			*BRAY EXTRACT - AVAIL. P	64 MG/KG	
			CATION EXCHANGE CAPACITY	14.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
23	11/30/94	8"-12" DEEP	64		
			SOLUBLE SALTS	#0.59 MMHOS/CM	
24	11/30/94	8"-12" DEEP	65		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	19 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	7.3 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	8.7 MG/KG	1
			MERCURY	0.01 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	25 MG/KG	3
			ZINC	39 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	840 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.7 UNITS	
			1:1 PH IN WATER MATRIX	6.9 UNITS	
			*BRAY EXTRACT - AVAIL. P	40 MG/KG	
			CATION EXCHANGE CAPACITY	17.3 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.39 MMHOS/CM	
25	11/30/94	8"-12" DEEP	66		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	18 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	6.3 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	6.7 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	28 MG/KG	3
			ZINC	34 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1700 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.0 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	35 MG/KG	
			CATION EXCHANGE CAPACITY	18.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.78 MMHOS/CM	
26	11/30/94	8"-12" DEEP	67		
			CADMIUM	<1 MG/KG	1

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
26	11/30/94	8"-12" DEEP	67		
			CHROMIUM	19 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	6.3 MG/KG	3
			IRON	14000 MG/KG	50
			LEAD	5.9 MG/KG	1
			MERCURY	0.04 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	19 MG/KG	3
			ZINC	35 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	570 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.9 UNITS	
			1:1 PH IN WATER MATRIX	6.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	28 MG/KG	
			CATION EXCHANGE CAPACITY	18.0 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.25 MMHOS/CM	
27	11/30/94	8"-12" DEEP	68		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	14 MG/KG	3
			COBALT	30 MG/KG	5
			COPPER	5.4 MG/KG	3
			IRON	12000 MG/KG	50
			LEAD	4.9 MG/KG	1
			MERCURY	0.03 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	16 MG/KG	3
			ZINC	29 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	3800 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.7 UNITS	
			1:1 PH IN WATER MATRIX	6.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	29 MG/KG	
			CATION EXCHANGE CAPACITY	16.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.27 MMHOS/CM	
28	11/30/94	8"-12" DEEP	69		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	15 MG/KG	3
			COBALT	30 MG/KG	5

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
28	11/30/94	8"-12" DEEP	69		
			COPPER	5.8 MG/KG	3
			IRON	14000 MG/KG	50
			LEAD	6.2 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	14 MG/KG	3
			ZINC	31 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	270 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.5 UNITS	
			1:1 PH IN WATER MATRIX	6.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	23 MG/KG	
			CATION EXCHANGE CAPACITY	18.0 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.19 MMHOS/CM	
29	11/30/94	8"-12" DEEP	71		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	14 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	5.7 MG/KG	3
			IRON	14000 MG/KG	50
			LEAD	5.7 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	23 MG/KG	3
			ZINC	30 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1300 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.0 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	39 MG/KG	
			CATION EXCHANGE CAPACITY	22.5 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.54 MMHOS/CM	
30	11/30/94	8"-12" DEEP	81		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	15 MG/KG	3
			COBALT	30 MG/KG	5
			COPPER	4 MG/KG	3
			IRON	14000 MG/KG	50

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
30	11/30/94	8"-12" DEEP	81		
			LEAD	5.5 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	16 MG/KG	3
			ZINC	27 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	230 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.1 UNITS	
			1:1 PH IN WATER MATRIX	6.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	46 MG/KG	
			CATION EXCHANGE CAPACITY	11.1 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.55 MMHOS/CM	
31	11/30/94	8"-12" DEEP	82		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	11 MG/KG	3
			COBALT	20 MG/KG	5
			COPPER	4 MG/KG	3
			IRON	11000 MG/KG	50
			LEAD	4.6 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	12 MG/KG	3
			ZINC	24 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	140 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.9 UNITS	
			1:1 PH IN WATER MATRIX	6.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	48 MG/KG	
			CATION EXCHANGE CAPACITY	8.7 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.17 MMHOS/CM	
32	11/29/94	8"-12" DEEP	91		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	21 MG/KG	3
			COBALT	20 MG/KG	5
			COPPER	8.2 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	7.3 MG/KG	1
			MERCURY	0.02 MG/KG	0.01

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
32	11/29/94	8"-12" DEEP	91		
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	24 MG/KG	3
			ZINC	39 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	720 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.0 UNITS	
			1:1 PH IN WATER MATRIX	7.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	41 MG/KG	
			CATION EXCHANGE CAPACITY	20.1 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.46 MMHOS/CM	
33	11/29/94	8"-12" DEEP	92		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	23 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	7 MG/KG	3
			IRON	17000 MG/KG	50
			LEAD	7.3 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	30 MG/KG	3
			ZINC	38 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1100 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.2 UNITS	
			1:1 PH IN WATER MATRIX	7.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	41 MG/KG	
			CATION EXCHANGE CAPACITY	20.1 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.58 MMHOS/CM	
34	11/29/94	8"-12" DEEP	93		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	23 MG/KG	3
			COBALT	30 MG/KG	5
			COPPER	8.7 MG/KG	3
			IRON	17000 MG/KG	50
			LEAD	7.3 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	26 MG/KG	3

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
34	11/29/94	8"-12" DEEP	93		
			ZINC	40 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	970 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.8 UNITS	
			1:1 PH IN WATER MATRIX	7.2 UNITS	
			*BRAY EXTRACT - AVAIL. P	37 MG/KG	
			CATION EXCHANGE CAPACITY	23.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.45 MMHOS/CM	
35	11/29/94	8"-12" DEEP	94		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	18 MG/KG	3
			COBALT	56 MG/KG	5
			COPPER	7.4 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	7.2 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	33 MG/KG	3
			ZINC	38 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	870 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.1 UNITS	
			1:1 PH IN WATER MATRIX	7.2 UNITS	
			*BRAY EXTRACT - AVAIL. P	47 MG/KG	
			CATION EXCHANGE CAPACITY	16.5 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.83 MMHOS/CM	
36	11/29/94	8"-12" DEEP	95		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	20 MG/KG	3
			COBALT	56 MG/KG	5
			COPPER	6.6 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	7 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	33 MG/KG	3
			ZINC	37 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1500 MG/KG	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
36	11/29/94	8"-12" DEEP	95		
			0.01M CACL2 ELECTROMETRIC	7.1 UNITS	
			1:1 PH IN WATER MATRIX	7.2 UNITS	
			*BRAY EXTRACT - AVAIL. P	47 MG/KG	
			CATION EXCHANGE CAPACITY	20.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.30 MMHOS/CM	
37	11/29/94	8"-12" DEEP	96		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	18 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	6.4 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	6.9 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	24 MG/KG	3
			ZINC	32 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1200 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.2 UNITS	
			1:1 PH IN WATER MATRIX	7.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	38 MG/KG	
			CATION EXCHANGE CAPACITY	20.2 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.98 MMHOS/CM	
38	11/29/94	8"-12" DEEP	97		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	17 MG/KG	3
			COBALT	60 MG/KG	5
			COPPER	6.6 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	7.4 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	28 MG/KG	3
			ZINC	35 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1500 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.1 UNITS	
			1:1 PH IN WATER MATRIX	7.3 UNITS	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
38	11/29/94	8"-12" DEEP	97		
			*BRAY EXTRACT - AVAIL. P	51 MG/KG	
			CATION EXCHANGE CAPACITY	18.3 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.80 MMHOS/CM	
39	11/29/94	8"-12" DEEP	98		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	20 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	7.3 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	6.7 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	27 MG/KG	3
			ZINC	35 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1300 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.3 UNITS	
			1:1 PH IN WATER MATRIX	7.5 UNITS	
			*BRAY EXTRACT - AVAIL. P	42 MG/KG	
			CATION EXCHANGE CAPACITY	19.4 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.67 MMHOS/CM	
40	11/29/94	8"-12" DEEP	99		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	19 MG/KG	3
			COBALT	30 MG/KG	5
			COPPER	25 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	6.4 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	25 MG/KG	3
			ZINC	34 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	870 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.1 UNITS	
			1:1 PH IN WATER MATRIX	7.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	40 MG/KG	
			CATION EXCHANGE CAPACITY	21.2 MEQ/100G	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
40	11/29/94	8"-12" DEEP	99		
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.52 MMHOS/CM	
41	11/29/94	8"-12" DEEP	910		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	19 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	6.4 MG/KG	3
			IRON	13000 MG/KG	50
			LEAD	5.5 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	17 MG/KG	3
			ZINC	32 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	330 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.2 UNITS	
			1:1 PH IN WATER MATRIX	6.7 UNITS	
			*BRAY EXTRACT - AVAIL. P	36 MG/KG	
			CATION EXCHANGE CAPACITY	21.3 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.25 MMHOS/CM	
42	11/29/94	8"-12" DEEP	101		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	24 MG/KG	3
			COBALT	20 MG/KG	5
			COPPER	7.1 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	7.3 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	19 MG/KG	3
			ZINC	33 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	520 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.2 UNITS	
			1:1 PH IN WATER MATRIX	6.6 UNITS	
			*BRAY EXTRACT - AVAIL. P	44 MG/KG	
			CATION EXCHANGE CAPACITY	23.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
42	11/29/94	8"-12" DEEP	101		
			SOLUBLE SALTS	#0.39 MMHOS/CM	
43	11/29/94	8"-12" DEEP	102		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	25 MG/KG	3
			COBALT	30 MG/KG	5
			COPPER	7.9 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	7.8 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	22 MG/KG	3
			ZINC	32 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1000 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.2 UNITS	
			1:1 PH IN WATER MATRIX	6.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	40 MG/KG	
			CATION EXCHANGE CAPACITY	26.5 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.91 MMHOS/CM	
44	11/29/94	8"-12" DEEP	103		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	24 MG/KG	3
			COBALT	30 MG/KG	5
			COPPER	6.5 MG/KG	3
			IRON	14000 MG/KG	50
			LEAD	6.7 MG/KG	1
			MERCURY	0.01 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	20 MG/KG	3
			ZINC	30 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	660 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.3 UNITS	
			1:1 PH IN WATER MATRIX	6.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	49 MG/KG	
			CATION EXCHANGE CAPACITY	21.5 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.87 MMHOS/CM	
45	12/01/94	8"-12" DEEP	121		
			CADMIUM	<1 MG/KG	1

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
45	12/01/94	8"-12" DEEP	121		
			CHROMIUM	33 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	8.8 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	12 MG/KG	1
			MERCURY	0.058 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	17 MG/KG	3
			ZINC	41 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	430 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.2 UNITS	
			1:1 PH IN WATER MATRIX	5.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	49 MG/KG	
			CATION EXCHANGE CAPACITY	26.7 MEQ/100G	
			LIME REQUIREMENT	3.1 TONS/ACRE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.42 MMHOS/CM	
46	12/01/94	8"-12" DEEP	122		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	30 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	7.7 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	11 MG/KG	1
			MERCURY	0.061 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	18 MG/KG	3
			ZINC	41 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	310 MG/KG	
			0.01M CACL2 ELECTROMETRIC	4.8 UNITS	
			1:1 PH IN WATER MATRIX	5.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	44 MG/KG	
			CATION EXCHANGE CAPACITY	28.0 MEQ/100G	
			LIME REQUIREMENT	3.1 TONS/ACRE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.77 MMHOS/CM	
47	12/01/94	8"-12" DEEP	123		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	26 MG/KG	3
			COBALT	9 MG/KG	5

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
47	12/01/94	8"-12" DEEP	123		
			COPPER	8.8 MG/KG	3
			IRON	13000 MG/KG	50
			LEAD	11 MG/KG	1
			MERCURY	0.04 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	17 MG/KG	3
			ZINC	46 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	320 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.0 UNITS	
			1:1 PH IN WATER MATRIX	5.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	53 MG/KG	
			CATION EXCHANGE CAPACITY	29.0 MEQ/100G	
			LIME REQUIREMENT	3.1 TONS/ACRE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.60 MMHOS/CM	
48	12/01/94	8"-12" DEEP	124		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	34 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	10 MG/KG	3
			IRON	19000 MG/KG	50
			LEAD	11 MG/KG	1
			MERCURY	0.052 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	20 MG/KG	3
			ZINC	45 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	340 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.8 UNITS	
			1:1 PH IN WATER MATRIX	5.9 UNITS	
			*BRAY EXTRACT - AVAIL. P	21 MG/KG	
			CATION EXCHANGE CAPACITY	28.5 MEQ/100G	
			LIME REQUIREMENT	2.4 TONS/ACRE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.90 MMHOS/CM	
49	12/01/94	8"-12" DEEP	125		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	30 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	10 MG/KG	3
			IRON	17000 MG/KG	50

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
49	12/01/94	8"-12" DEEP	125		
			LEAD	10 MG/KG	1
			MERCURY	0.04 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	18 MG/KG	3
			ZINC	40 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	360 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.4 UNITS	
			1:1 PH IN WATER MATRIX	5.5 UNITS	
			*BRAY EXTRACT - AVAIL. P	18 MG/KG	
			CATION EXCHANGE CAPACITY	26.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.26 MMHOS/CM	
50	12/01/94	8"-12" DEEP	126		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	26 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	9.1 MG/KG	3
			IRON	16000 MG/KG	50
			LEAD	11 MG/KG	1
			MERCURY	0.051 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	18 MG/KG	3
			ZINC	48 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	360 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.3 UNITS	
			1:1 PH IN WATER MATRIX	5.6 UNITS	
			*BRAY EXTRACT - AVAIL. P	38 MG/KG	
			CATION EXCHANGE CAPACITY	30.0 MEQ/100G	
			LIME REQUIREMENT	4.7 TONS/ACRE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.79 MMHOS/CM	
51	12/01/94	8"-12" DEEP	127		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	21 MG/KG	3
			COBALT	9 MG/KG	5
			COPPER	6.2 MG/KG	3
			IRON	13000 MG/KG	50
			LEAD	7.3 MG/KG	1
			MERCURY	0.04 MG/KG	0.01

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
51	12/01/94	8"-12" DEEP	127		
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	15 MG/KG	3
			ZINC	32 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	290 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.1 UNITS	
			1:1 PH IN WATER MATRIX	5.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	16 MG/KG	
			CATION EXCHANGE CAPACITY	20.9 MEQ/100G	
			LIME REQUIREMENT	3.1 TONS/ACRE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.92 MMHOS/CM	
52	12/01/94	8"-12" DEEP	128		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	17 MG/KG	3
			COBALT	9 MG/KG	5
			COPPER	6 MG/KG	3
			IRON	12000 MG/KG	50
			LEAD	7.2 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	13 MG/KG	3
			ZINC	31 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	250 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.4 UNITS	
			1:1 PH IN WATER MATRIX	5.8 UNITS	
			*BRAY EXTRACT - AVAIL. P	40 MG/KG	
			CATION EXCHANGE CAPACITY	18.4 MEQ/100G	
			LIME REQUIREMENT	3.1 TONS/ACRE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.74 MMHOS/CM	
53	11/29/94	2.5' DEEP	C2		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	15 MG/KG	3
			COBALT	5 MG/KG	5
			COPPER	8.5 MG/KG	3
			IRON	11000 MG/KG	50
			LEAD	3.5 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	15 MG/KG	3

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
53	11/29/94	2.5' DEEP	C2		
			ZINC	20 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	99 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.3 UNITS	
			1:1 PH IN WATER MATRIX	6.0 UNITS	
			*BRAY EXTRACT - AVAIL. P	50 MG/KG	
			CATION EXCHANGE CAPACITY	8.4 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.18 MMHOS/CM	
54	11/29/94	2.5' DEEP	C3		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	17 MG/KG	3
			COBALT	5 MG/KG	5
			COPPER	11 MG/KG	3
			IRON	13000 MG/KG	50
			LEAD	3.7 MG/KG	1
			MERCURY	0.01 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	14 MG/KG	3
			ZINC	21 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	110 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.2 UNITS	
			1:1 PH IN WATER MATRIX	6.0 UNITS	
			*BRAY EXTRACT - AVAIL. P	41 MG/KG	
			CATION EXCHANGE CAPACITY	7.1 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.07 MMHOS/CM	
55	11/30/94	2.5' DEEP	14		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	22 MG/KG	3
			COBALT	7 MG/KG	5
			COPPER	12 MG/KG	3
			IRON	13000 MG/KG	50
			LEAD	5 MG/KG	1
			MERCURY	0.01 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	15 MG/KG	3
			ZINC	24 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	140 MG/KG	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
55	11/30/94	2.5' DEEP	14		
			0.01M CACL2 ELECTROMETRIC	6.0 UNITS	
			1:1 PH IN WATER MATRIX	6.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	16 MG/KG	
			CATION EXCHANGE CAPACITY	10.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.37 MMHOS/CM	
56	11/30/94	2.5' DEEP	27		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	19 MG/KG	3
			COBALT	6 MG/KG	5
			COPPER	6.4 MG/KG	3
			IRON	12000 MG/KG	50
			LEAD	4.4 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	13 MG/KG	3
			ZINC	20 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	100 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.7 UNITS	
			1:1 PH IN WATER MATRIX	5.9 UNITS	
			*BRAY EXTRACT - AVAIL. P	7 MG/KG	
			CATION EXCHANGE CAPACITY	10.0 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.43 MMHOS/CM	
57	11/30/94	2.5' DEEP	34		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	17 MG/KG	3
			COBALT	<5 MG/KG	5
			COPPER	6.7 MG/KG	3
			IRON	11000 MG/KG	50
			LEAD	3.7 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	14 MG/KG	3
			ZINC	19 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	100 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.6 UNITS	
			1:1 PH IN WATER MATRIX	6.3 UNITS	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
57	11/30/94	2.5' DEEP	34		
			*BRAY EXTRACT - AVAIL. P	64 MG/KG	
			CATION EXCHANGE CAPACITY	12.1 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.10 MMHOS/CM	
58	11/30/94	2.5' DEEP	610		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	15 MG/KG	3
			COBALT	5 MG/KG	5
			COPPER	7.7 MG/KG	3
			IRON	11000 MG/KG	50
			LEAD	3.7 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	16 MG/KG	3
			ZINC	19 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	100 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.5 UNITS	
			1:1 PH IN WATER MATRIX	6.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	60 MG/KG	
			CATION EXCHANGE CAPACITY	7.9 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.17 MMHOS/CM	
59	11/29/94	2.5' DEEP	911		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	17 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	10 MG/KG	3
			IRON	13000 MG/KG	50
			LEAD	3.8 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	20 MG/KG	3
			ZINC	40 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	210 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.5 UNITS	
			1:1 PH IN WATER MATRIX	6.8 UNITS	
			*BRAY EXTRACT - AVAIL. P	58 MG/KG	
			CATION EXCHANGE CAPACITY	8.6 MEQ/100G	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
59	11/29/94	2.5' DEEP	911		
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.20 MMHOS/CM	
60	11/29/94	2.5' DEEP	912		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	15 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	8.2 MG/KG	3
			IRON	11000 MG/KG	50
			LEAD	3.2 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	18 MG/KG	3
			ZINC	48 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	280 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.8 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	46 MG/KG	
			CATION EXCHANGE CAPACITY	6.0 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.28 MMHOS/CM	
61	11/29/94	5' DEEP	C2		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	11 MG/KG	3
			COBALT	6 MG/KG	5
			COPPER	7.7 MG/KG	3
			IRON	9200 MG/KG	50
			LEAD	2.8 MG/KG	1
			MERCURY	0.01 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	15 MG/KG	3
			ZINC	14 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	86 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.8 UNITS	
			1:1 PH IN WATER MATRIX	6.3 UNITS	
			*BRAY EXTRACT - AVAIL. P	32 MG/KG	
			CATION EXCHANGE CAPACITY	2.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
61	11/29/94	5' DEEP	C2		
		SOLUBLE SALTS		#0.11 MMHOS/CM	
62	11/30/94	5' DEEP	14		
		CADMIUM		<1 MG/KG	1
		CHROMIUM		24 MG/KG	3
		COBALT		8 MG/KG	5
		COPPER		11 MG/KG	3
		IRON		17000 MG/KG	50
		LEAD		8 MG/KG	1
		MERCURY		0.03 MG/KG	0.01
		METALS SAMPLE PREPARATION		COMPLETE	
		NICKEL		21 MG/KG	3
		ZINC		37 MG/KG	2
		*TOT FLUORIDE (DISTILLED)		200 MG/KG	
		0.01M CACL2 ELECTROMETRIC		5.7 UNITS	
		1:1 PH IN WATER MATRIX		6.0 UNITS	
		*BRAY EXTRACT - AVAIL. P		24 MG/KG	
		CATION EXCHANGE CAPACITY		19.0 MEQ/100G	
		LIME REQUIREMENT		NONE	
		SOIL PREPARATION		COMPLETE	
		SOLUBLE SALTS		#0.65 MMHOS/CM	
63	11/30/94	5' DEEP	27		
		CADMIUM		<1 MG/KG	1
		CHROMIUM		21 MG/KG	3
		COBALT		8 MG/KG	5
		COPPER		11 MG/KG	3
		IRON		14000 MG/KG	50
		LEAD		4.8 MG/KG	1
		MERCURY		0.02 MG/KG	0.01
		METALS SAMPLE PREPARATION		COMPLETE	
		NICKEL		19 MG/KG	3
		ZINC		24 MG/KG	2
		*TOT FLUORIDE (DISTILLED)		140 MG/KG	
		0.01M CACL2 ELECTROMETRIC		5.8 UNITS	
		1:1 PH IN WATER MATRIX		6.2 UNITS	
		*BRAY EXTRACT - AVAIL. P		13 MG/KG	
		CATION EXCHANGE CAPACITY		9.1 MEQ/100G	
		LIME REQUIREMENT		NONE	
		SOIL PREPARATION		COMPLETE	
		SOLUBLE SALTS		#0.37 MMHOS/CM	
64	11/30/94	5' DEEP	34		
		CADMIUM		<1 MG/KG	1

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
64	11/30/94	5' DEEP	34		
		CHROMIUM		11 MG/KG	3
		COBALT		5 MG/KG	5
		COPPER		6.1 MG/KG	3
		IRON		8800 MG/KG	50
		LEAD		2.6 MG/KG	1
		MERCURY		0.02 MG/KG	0.01
		METALS SAMPLE PREPARATION		COMPLETE	
		NICKEL		13 MG/KG	3
		ZINC		13 MG/KG	2
		*TOT FLUORIDE (DISTILLED)		72 MG/KG	
		0.01M CACL2 ELECTROMETRIC		5.8 UNITS	
		1:1 PH IN WATER MATRIX		6.4 UNITS	
		*BRAY EXTRACT - AVAIL. P		14 MG/KG	
		CATION EXCHANGE CAPACITY		3.1 MEQ/100G	
		LIME REQUIREMENT		NONE	
		SOIL PREPARATION		COMPLETE	
		SOLUBLE SALTS		#0.08 MMHOS/CM	
65	11/30/94	5' DEEP	610		
		CADMIUM		<1 MG/KG	1
		CHROMIUM		9.6 MG/KG	3
		COBALT		6 MG/KG	5
		COPPER		5.2 MG/KG	3
		IRON		7100 MG/KG	50
		LEAD		2.5 MG/KG	1
		MERCURY		0.01 MG/KG	0.01
		METALS SAMPLE PREPARATION		COMPLETE	
		NICKEL		11 MG/KG	3
		ZINC		12 MG/KG	2
		*TOT FLUORIDE (DISTILLED)		130 MG/KG	
		0.01M CACL2 ELECTROMETRIC		6.6 UNITS	
		1:1 PH IN WATER MATRIX		6.8 UNITS	
		*BRAY EXTRACT - AVAIL. P		22 MG/KG	
		CATION EXCHANGE CAPACITY		3.0 MEQ/100G	
		LIME REQUIREMENT		NONE	
		SOIL PREPARATION		COMPLETE	
		SOLUBLE SALTS		#0.21 MMHOS/CM	
66	11/29/94	5' DEEP	911		
		CADMIUM		<1 MG/KG	1
		CHROMIUM		7.9 MG/KG	3
		COBALT		7 MG/KG	5

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
66	11/29/94	5' DEEP	911		
			COPPER	7.1 MG/KG	3
			IRON	7100 MG/KG	50
			LEAD	2.8 MG/KG	1
			MERCURY	0.01 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	12 MG/KG	3
			ZINC	12 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	150 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.6 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	25 MG/KG	
			CATION EXCHANGE CAPACITY	2.5 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.17 MMHOS/CM	
67	11/29/94	5' DEEP	912		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	14 MG/KG	3
			COBALT	20 MG/KG	5
			COPPER	8.6 MG/KG	3
			IRON	12000 MG/KG	50
			LEAD	3.4 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	20 MG/KG	3
			ZINC	20 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	350 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.5 UNITS	
			1:1 PH IN WATER MATRIX	7.8 UNITS	
			*BRAY EXTRACT - AVAIL. P	34 MG/KG	
			CATION EXCHANGE CAPACITY	3.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.28 MMHOS/CM	
68	11/30/94	8"-12" DEEP	FIELD DUP 26		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	21 MG/KG	3
			COBALT	9 MG/KG	5
			COPPER	7.8 MG/KG	3
			IRON	14000 MG/KG	50

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
68	11/30/94	8"-12" DEEP	FIELD DUP 26		
			LEAD	7.5 MG/KG	1
			MERCURY	0.04 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	18 MG/KG	3
			ZINC	36 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	850 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.3 UNITS	
			1:1 PH IN WATER MATRIX	6.5 UNITS	
			*BRAY EXTRACT - AVAIL. P	70 MG/KG	
			CATION EXCHANGE CAPACITY	43.9 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.09 MMHOS/CM	
69	11/30/94	8"-12" DEEP	FIELD DUP 52		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	18 MG/KG	3
			COBALT	170 MG/KG	5
			COPPER	6.4 MG/KG	3
			IRON	21000 MG/KG	50
			LEAD	28 MG/KG	1
			MERCURY	0.05 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	52 MG/KG	3
			ZINC	35 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	3700 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.2 UNITS	
			1:1 PH IN WATER MATRIX	7.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	64 MG/KG	
			CATION EXCHANGE CAPACITY	18.7 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#1.04 MMHOS/CM	
70	11/30/94	8"-12" DEEP	FIELD DUP 71		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	20 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	6.8 MG/KG	3
			IRON	17000 MG/KG	50
			LEAD	7 MG/KG	1
			MERCURY	0.02 MG/KG	0.01

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
70	11/30/94	8"-12" DEEP	FIELD DUP 71		
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	26 MG/KG	3
			ZINC	34 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1500 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.0 UNITS	
			1:1 PH IN WATER MATRIX	7.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	40 MG/KG	
			CATION EXCHANGE CAPACITY	28.4 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.54 MMHOS/CM	
71	11/29/94	8"-12" DEEP	FIELD DUP 98		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	16 MG/KG	3
			COBALT	40 MG/KG	5
			COPPER	6.4 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	6.1 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	25 MG/KG	3
			ZINC	31 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	1040 MG/KG	
			0.01M CACL2 ELECTROMETRIC	7.2 UNITS	
			1:1 PH IN WATER MATRIX	7.4 UNITS	
			*BRAY EXTRACT - AVAIL. P	41 MG/KG	
			CATION EXCHANGE CAPACITY	25.4 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.65 MMHOS/CM	
72	11/30/94	2.5' DEEP	FIELD DUP 14		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	22 MG/KG	3
			COBALT	7 MG/KG	5
			COPPER	7 MG/KG	3
			IRON	13000 MG/KG	50
			LEAD	5 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	15 MG/KG	3

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
72	11/30/94	2.5' DEEP	FIELD DUP 14		
			ZINC	22 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	130 MG/KG	
			0.01M CACL2 ELECTROMETRIC	6.3 UNITS	
			1:1 PH IN WATER MATRIX	6.5 UNITS	
			*BRAY EXTRACT - AVAIL. P	14 MG/KG	
			CATION EXCHANGE CAPACITY	11.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.38 MMHOS/CM	
73	11/30/94	5' DEEP	FIELD DUP 14		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	34 MG/KG	3
			COBALT	9 MG/KG	5
			COPPER	14 MG/KG	3
			IRON	22000 MG/KG	50
			LEAD	9.2 MG/KG	1
			MERCURY	0.04 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	23 MG/KG	3
			ZINC	48 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	210 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.8 UNITS	
			1:1 PH IN WATER MATRIX	6.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	24 MG/KG	
			CATION EXCHANGE CAPACITY	21.0 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.66 MMHOS/CM	
74	11/29/94	8"-12" DEEP	DUP #1 C1		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	22 MG/KG	3
			COBALT	15 MG/KG	5
			COPPER	9.1 MG/KG	3
			IRON	17000 MG/KG	50
			LEAD	9.8 MG/KG	1
			MERCURY	0.03 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	20 MG/KG	3
			ZINC	45 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	210 MG/KG	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
74	11/29/94	8"-12" DEEP	DUP #1 C1		
			0.01M CACL2 ELECTROMETRIC	#6.2 UNITS	
			1:1 PH IN WATER MATRIX	#6.6 UNITS	
			*BRAY EXTRACT - AVAIL. P	38 MG/KG	
			CATION EXCHANGE CAPACITY	17.6 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.47 MMHOS/CM	
75	11/29/94	8"-12" DEEP	DUP #2 C4		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	22 MG/KG	3
			COBALT	10 MG/KG	5
			COPPER	8.6 MG/KG	3
			IRON	15000 MG/KG	50
			LEAD	7.6 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	33 MG/KG	3
			ZINC	38 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	220 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.6 UNITS	
			1:1 PH IN WATER MATRIX	6.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	42 MG/KG	
			CATION EXCHANGE CAPACITY	18.2 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.37 MMHOS/CM	
76	11/29/94	2.5' DEEP	DUP #53 C2		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	14 MG/KG	3
			COBALT	7 MG/KG	5
			COPPER	9.2 MG/KG	3
			IRON	11000 MG/KG	50
			LEAD	3.5 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	16 MG/KG	3
			ZINC	20 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	110 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.4 UNITS	
			1:1 PH IN WATER MATRIX	6.0 UNITS	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
76	11/29/94	2.5′ DEEP	DUP #53 C2		
			*BRAY EXTRACT - AVAIL. P	48 MG/KG	
			CATION EXCHANGE CAPACITY	8.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.18 MMHOS/CM	
77	11/29/94	2.5′ DEEP	DUP #54 C3		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	17 MG/KG	3
			COBALT	6 MG/KG	5
			COPPER	11 MG/KG	3
			IRON	12000 MG/KG	50
			LEAD	3.3 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	16 MG/KG	3
			ZINC	20 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	120 MG/KG	
			0.01M CACL2 ELECTROMETRIC	5.2 UNITS	
			1:1 PH IN WATER MATRIX	6.1 UNITS	
			*BRAY EXTRACT - AVAIL. P	34 MG/KG	
			CATION EXCHANGE CAPACITY	7.8 MEQ/100G	
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.07 MMHOS/CM	
78	11/29/94	5′ DEEP	DUP #61 C2		
			CADMIUM	<1 MG/KG	1
			CHROMIUM	11 MG/KG	3
			COBALT	6 MG/KG	5
			COPPER	8.7 MG/KG	3
			IRON	9200 MG/KG	50
			LEAD	2.9 MG/KG	1
			MERCURY	0.02 MG/KG	0.01
			METALS SAMPLE PREPARATION	COMPLETE	
			NICKEL	13 MG/KG	3
			ZINC	15 MG/KG	2
			*TOT FLUORIDE (DISTILLED)	91 MG/KG	
			0.01M CACL2 ELECTROMETRIC	#5.7 UNITS	
			1:1 PH IN WATER MATRIX	#6.2 UNITS	
			*BRAY EXTRACT - AVAIL. P	37 MG/KG	
			CATION EXCHANGE CAPACITY	2.9 MEQ/100G	

* = CONTRACT LAB DATA # = UPDATED DATA

LAB REQUEST NO. M3639 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
78	11/29/94	5' DEEP	DUP #61 C2		
			LIME REQUIREMENT	NONE	
			SOIL PREPARATION	COMPLETE	
			SOLUBLE SALTS	#0.11 MMHOS/CM	

MDL's are expressed in the same units as test results.

Project Lead Review: _____ Date: _____

= UPDATED DATA

DATE: 01/20/1995

3M ENVIRONMENTAL LABORATORY
CONTRACT LABORATORY WORK ORDER BY PARAMETER

LAB REQUEST NO. M9639

CONTRACT LAB : MVTL

PROJECT NUMBER : 20-7903

SHIP DATE : 1-20-95

PROJECT LEAD: RR ROBIDEAU

TELEPHONE : 612-778-7065

FAX : 612-778-6176

Computer Code	Test Name	Sample Numbers	Sample Available Date	Result Due Date
BRAY-1-P	BRAY EXTRACT - AVAIL. P	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78	01/17/1995	01/27/1995
TOT-P	TOT FLUORIDE (DISTILLED)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78	01/17/1995	01/27/1995

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02673

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau
3M Facility	3M Cordova
3M Project Title	
3M Project Number	20-7903
Address	
3M Facility Contact	Pat Sheller
3M Department Number	0222
City, State, Zip Code	
3M Telephone Number	612-778-7065
Lab Request/Template Number	See Below

Sampled By (Print)	Jeff Lowenberg
Sampler Signature	Jeffrey J. Lowenberg
Contractor	RUST E & I
Date	11/30/94

☐ Samples Split See Attachment

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: Preservatives None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
													Lab Request
1	61: 6"	11/30/94	1405	Soil	✓							1	M3640
2	61: 8"-12"		1410		✓							1	M3639
3	62: 6"		1415		✓							1	M3640
4	62: 8"-12"		1420		✓							1	M3639
5	63: 6"		1440		✓							1	M3640
6	63: 8"-12"		1445		✓							1	M3639
7	64: 6"		1525		✓							1	M3640
8	64: 8"-12"		1530		✓							1	M3639
9	65: 6"		1515		✓							1	M3640
10	65: 8"-12"		1520		✓							1	M3639
11	66: 6"		1500		✓							1	M3640
12	66: 8-12"		1505		✓							1	M3639
13					✓ JL							1 JL	

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-12	Lowenberg / RUST E & I	1500	12/1/94	Fed Ex	[illegible] 3M	0930	12/1/94

Original - Accompanying Samples Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02674

3M Requester	MTE/JSH/MJK
3M Project Lead	RR Robideau

3M Facility: 3M Cordova	3M Project Title:	3M Project Number: 20-7903	
Address:	3M Facility Contact: Pat Sheller	3M Department Number: 0222	
City, State, Zip Code:	3M Telephone Number: 612-778-7065	Lab Request/Template Number: see Below	

Sampled By (Print): Jeff Lowenberg	Contractor: RUST E&I
Sampler Signature: Jeffrey J. Lowenberg	Date: 11/30/94

☐ Samples Split See Attachment

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
					Preservatives								
1	67: 6"	11/30/94	1535	Soil	✓							1	Lab Request M3640
2	67: 8"-12"	↓	1540	↓	✓							1	M3639
3	68: 6"		1550		✓							1	M3640
4	68: 8"-12"		1555		✓							1	M3639
5	69: 6"		1600		✓							1	M3640
6	69: 8"-12"		1605		✓							1	M3639
7	610: 2.5'		1430		✓							1	↓
8	610: 5'	↓	1435	↓	✓							1	
9													
10													
11													
12													
13													

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-8	Lowenberg/RUST E&I	1500	12/1/94	Fed Ex	3M	0930	12/2/94

Original - Accompanying Samples Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02675

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau

3M Facility: 3M Cordova	3M Project Title:	3M Project Number: 20-7903
Address:	3M Facility Contact: Pat Sheller	3M Department Number: 0222
City, State, Zip Code:	3M Telephone Number: 612-778-7065	Lab Request/Template Number: see Below

Sampled By (Print): Jeff Lowenberg	Contractor: RUST E&I
Sampler Signature: Jeffrey J. Lowenberg	Date: 11/29/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
					Preservatives								☐ Samples Split See Attachment
1	97: 6"	11/29/94	1415	Soil	✓							1	Lab Request
2	97: 8"-12"	↓	1420	↓	✓							1	M3640
3	98: 6"		1435		✓							1	M3639
4	Field Dup 1 - 98:6"		1435		✓							1	M3640
5	98: 8"-12"		1440		✓							1	↓
6	Field Dup 2 - 98:8"-12"		1440		✓							1	M3639
7	99: 6"		1500		✓							1	↓
8	99: 8"-12"	↓	1505	↓	✓							1	M3640
9													M3639
10													
11													
12													
13													

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-8	Lowenberg / RUST E&I	1500	12/1/94	Fed Ex	3M	0930	12/2/94

Original - Accompanying Samples Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02676

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau
3M Facility	3M Cordova
3M Project Title	
3M Project Number	20-7903
Address	
3M Facility Contact	Pat Sheller
3M Department Number	0222
City, State, Zip Code	
3M Telephone Number	612-778-7065
Lab Request/Template Number	see Below

Sampled By (Print)	Jeff Lowenberg
Sampler Signature	Jeffrey J. Lowenberg
Contractor	RUST E & I
Date	11/29/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
					Preservatives								☐ Samples Split See Attachment
1	91: 6"	11/29/94	1151	Soil	✓							1	Lab Request
2	91: 8"-12"		1156		✓							1	M3640
3	92: 6"		1207		✓							1	M3639
4	92: 8"-12"		1210		✓							1	M3640
5	93: 6"		1238		✓							1	M3639
6	93: 8"-12"		1243		✓							1	M3640
7	94: 6"		1325		✓							1	M3639
8	94: 8"-12"		1329		✓							1	M3640
9	95: 6"		1310		✓							1	M3639
10	95: 8"-12"		1315		✓							1	M3640
11	96: 6"		1256		✓							1	M3639
12	96: 8"-12"	↓	1304	↓	✓							1	M3640
13													M3639

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-12	Lowenberg / RUST E & I	1500	12/1/94	FedEx	3M	0930	12/2/94

Original - Accompanying Samples Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02677

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau
3M Facility	3M Cordova
3M Project Title	
3M Project Number	20-7903
Address	
3M Facility Contact	Pat Sheller
3M Department Number	0222
City, State, Zip Code	
3M Telephone Number	612-778-7065
Lab Request/Template Number	M3639

Sampled By (Print)	Jeff Lowenberg
Sampler Signature	Jeffrey J. Lowenberg
Contractor	RUST E & I
Date	12/1/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item
					Preservatives							
1	121 : 8" - 12"	12/1/94	0850	Soil	✓							1
2	122 : 8" - 12"		1020		✓							1
3	123 : 8" - 12"		0825		✓							1
4	124 : 8" - 12"		0955		✓							1
5	125 : 8" - 12"		0810		✓							1
6	126 : 8" - 12"		0930		✓							1
7	127 : 8" - 12"		0755		✓							1
8	128 : 8" - 12"		0915		✓							1
9												
10												
11												
12												
13												

☐ Samples Split See Attachment

Comments

Lab Request
M3639

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-8	Lowenberg / RUST E&I	1500	12/1/94	FedEX	[signature] 3M	0930	12/2/94

Original - Accompanying Sa... Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02678

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau
3M Facility	3M Cordova
3M Project Title	
3M Project Number	20-7903
Address	
3M Facility Contact	Pat Sheller
3M Department Number	0222
City, State, Zip Code	
3M Telephone Number	612-778-7065
Lab Request/Template Number	see Below

Sampled By (Print)	Jeff Lowenberg
Sampler Signature	Jeffrey J. Lowenberg
Contractor	RUST E & I
Date	11/29/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: Preservatives None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
													☐ Samples Split See Attachment
													Comments
1	910: 6"	11/29/94	1515	Soil	✓							1	Lab Request
2	910: 8"-12"		1520		✓							1	M3640
3	911: 2.5'		1227		✓							1	M3639
4	911: 5'		1230		✓							1	↓
5	912: 2.5'		1445		✓							1	
6	912: 5'		1450		✓							1	↓
7	101: 6"		~~1052~~		✓							1	M3640
8	101: 8"-12"		1100		✓							1	M3639
9	102: 6"		1113		✓							1	M3640
10	102: 8"-12"		1118		✓							1	M3639
11	103: 6"		1130		✓							1	M3640
12	103: 8"-12"	↓	1135	↓	✓							1	M3639
13													

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-12	Lowenberg / RUST E & I	1500	12/1/94	FedEx	[illegible] 3M	0930	12/2/94

Original - Accompanying Sam... Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02679

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau
3M Facility	3M Cordova
3M Project Title	
3M Project Number	20-7903
Address	
3M Facility Contact	Pat Sheller
3M Department Number	0222
City, State, Zip Code	
3M Telephone Number	612-778-7065
Lab Request/Template Number	see Below

Sampled By (Print)	Jeff Lowenberg
Sampler Signature	Jeffrey J. Lowenberg
Contractor	RUST E & I
Date	11/30/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
					Preservatives								☐ Samples Split See Attachment
1	21: 6"	11/30/94	1100	Soil	✓							1	Lab Request
2	21: 8"-12"		1105		✓							1	M3640
3	22: 6"		1025		✓							1	M3639
4	22: 8"-12"		1030		✓							1	M3640
5	23: 6"		0920		✓							1	M3639
6	23: 8"-12"		0925		✓							1	M3640
7	24: 6"		1205		✓							1	M3639
8	24: 8"-12"		1210		✓							1	M3640
9	25: 6"		1040		✓							1	M3639
10	25: 8"-12"		1045		✓							1	M3640
11	26: 6"		0850		✓							1	M3639
12	Field Dup 3 = 26: 6"	↓	0850	↓	✓							1	M3640
13												1	↓

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-12	Lowenberg / RUST E & I	1500	12/1/94	FedEX	3M	0930	12/2/94

Original - Accompanying Sam... Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02680

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau

3M Facility: 3M Cordova	3M Project Title:	3M Project Number: 20-7903
Address:	3M Facility Contact: Pat Sheller	3M Department Number: 0222
City, State, Zip Code:	3M Telephone Number: 612-778-7065	Lab Request/Template Number: See Below

Sampled By (Print): Jeff Lowenberg
Sampler Signature: Jeffrey L. Lowenberg
Contractor: RUST E&I
Date: 11/30/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: Preservatives None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
													☐ Samples Split See Attachment
													Comments
1	26: 8"-12"	11/30/94	0855	Soil	✓							1	Lab Request
2	Field Dup 4 - 26: 8"-12"		0855		✓							1	M3639
3	27: 2.5'		0910		✓							1	↓
4	27: 5'		0915		✓							1	↓
5	81: 6"		1625		✓							1	↓
6	81: 8"-12"		1630		✓							1	M3640
7	82: 6"		1615		✓							1	M3639
8	82: 8"-12"	↓	1620	↓	✓							1	M3640
9													M3639
10													
11													
12													
13													

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-8	Lowenberg / RUST E&I	1500	12/1/94	Fed Ex	[illegible]	0930	12/2/94

Original / Accompanying Samples Last Page / Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02681

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau

3M Facility: 3M Cordova	3M Project Title:	3M Project Number: 20-7903
Address:	3M Facility Contact: Pat Sheller	3M Department Number: 0222
City, State, Zip Code:	3M Telephone Number: 612-778-7065	Lab Request/Template Number: see Below

Sampled By (Print): Jeff Lowenberg	Contractor: RUST E & I
Sampler Signature: Jeffrey J. Lowenberg	Date: 11/30/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: Preservatives None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	☐ Samples Split See Attachment — Comments
1	11:6"	11/30/94	1115	Soil	✓							1	Lab Request
2	11:8"-12"		1120		✓							1	M3640
3	12:6"		0950		✓							1	M3639
4	12:8"-12"		0955		✓							1	M3640
5	13:6"		0935		✓							1	M3639
6	13:8"-12"		0940		✓							1	M3640
7	14:2.5'		1005		✓							1	M3639
8	Field Dup 5 - 14:2.5'		1005		✓							1	
9	14:5'		1010		✓							1	
10	Field Dup 6 - 14:5'		1010		✓							1	
11													
12													
13													

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-10	Lowenberg / RUST E & I	1500	12/1/94	FedEx	[signature] 3M	0930	12/2/94

Original - Accompanying Samples Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02682

3M Requester	MTE / JSH / MJK
3M Project Lead	RR Robideau
3M Facility	3M Cordova
3M Project Title	
3M Project Number	20-7903
Address	
3M Facility Contact	Pat Sheller
3M Department Number	0222
City, State, Zip Code	
3M Telephone Number	612-778-7065
Lab Request/Template Number	See Below

Sampled By (Print)	Jeff Lowenberg
Sampler Signature	Jeffrey J. Lowenberg
Contractor	RUST E & I
Date	11/29/94 - 11/30/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
					Preservatives								☐ Samples Split See Attachment
1	41:6"	11/30/94	1240	Soil	✓							1	Lab Request
2	41:8"-12"		1245		✓							1	M3640
3	42:6"		1135		✓							1	M3639
4	42:8"-12"	↓	1140		✓							1	M3640
5	43:6"	11/29/94	1620		✓							1	M3639
6	43:8"-12"	↓	1625		✓							1	M3640
7	71:6"	11/30/94	1450		✓							1	M3639
8	71:8"-12"		1455		✓							1	M3640
9	Field Dup 8 - 71:8"-12"	↓	1455	↓	✓							1	M3639
10													↓
11													
12													
13													

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-9	Howerly / RUST E&I	1500	12/1/94	FedEX	[signature]	0930	12/2/94

Originator Accompanying Samples — Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02683

3M Requester	MTE/JSH/MJK
3M Project Lead	RR Robideau
3M Facility	3M Cordova
3M Project Title	
3M Project Number	20-7903
Address	
3M Facility Contact	Pat Sheller
3M Department Number	0222
City, State, Zip Code	
3M Telephone Number	612-778-7065
Lab Request/Template Number	see Below

Sampled By (Print)	Jeff Lowenberg
Sampler Signature	Jeffrey J. Lowenberg
Contractor	RUST E & I
Date	11/29/94 - 11/30/94

☐ Samples Split See Attachment

Item #	Sample Description	Date	Time	Matrix	Number Containers of each Preservatives: None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	Comments
													Lab Request
1	S1: 6"	11/30/94	1338	Soil	✓							1	M3640
2	S1: 8"-12"		1343		✓							1	M3639
3	S2: 6"		1350		✓							1	M3640
4	S2: 8"-12"		1355		✓							1	M3639
5	Field Dup 7-S2: 8"-12"		1355		✓							1	↓
6	C1: 6"	11/29/94	545		✓							1	M3640
7	C1: 8"-12"		1550		✓							1	M3639
8	C2: 2.5'		1605		✓							1	↓
9	C2: 5'		1610		✓							1	↓
10	C3: 2.5'		1040		✓							1	↓
11	C4: 6"		1530		✓							1	M3640
12	C4: 8"-12"	↓	1535	↓	✓							1	M3639
13													

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-12	Lowenberg/RUST E&I	1500	12/1/94	FedEX	[illegible] 3M	0930	12/2/94

Original - Accompanying Samples Last Page - Originator

See Reverse Side For Instructions

Chain of Custody Record

3M Environmental Laboratory

Form 35176 - PWO

02684

3M Requester	MTE/JSH/MJK
3M Project Lead	RR Robideau

3M Facility: 3M Cordova	3M Project Title:	3M Project Number: 20-7903
Address:	3M Facility Contact: Pat Sheller	3M Department Number: 0222
City, State, Zip Code:	3M Telephone Number: 612-778-7065	Lab Request/Template Number: see Below

Sampled By (Print): Jeff Lowenberg	Contractor: RUST E & I
Sampler Signature: Jeffrey J. Lowenberg	Date: 11/30/94

Item #	Sample Description	Date	Time	Matrix	Number Containers of each: Preservatives None	HNO_3	H_2SO_4	NaOH	VOC			Total Containers of Each Item	☐ Samples Split See Attachment — Comments
													Lab Request
1	31: 6"	11/30/94	1225	Soil	✓							1	M3640
2	31: 8"-12"		1230		✓							1	M3639
3	32: 6"		1150		✓							1	M3640
4	32: 8"-12"		1155		✓							1	M3639
5	33: 6"		0840		✓							1	M3640
6	33: 8"-12"		0845		✓							1	M3639
7	34: 2.5'		0827		✓							1	↓
8	34: 5'	↓	0833	↓	✓							1	↓
9													
10													
11													
12													
13													

Item #	Relinquished By/Affiliation	Time	Date	Shipped Via	Received By/Affiliation	Time	Date
1-8	Lowenberg/RUST E&I	1500	12/1/94	FedEX	[illegible] 3M	0930	12/2/94

Original - Accompanying Samples Last Page - Originator

See Reverse Side For Instructions

ENVIRONMENTAL LABORATORY

SOIL WATER CONTENT

PERCENTAGE OF WATER IN THE SAMPLE ON A DRY-MASS BASIS

Gardner, Walter. 1986. Water Content. p. 493-544. In Arnold Klute (Ed.). Methods of Soil Analysis, Part 1. Physical and Mineralogical Methods. Agronomy Monograph No. 9 (2nd Edition).

$$\% \text{ Water Content} = \left(\frac{\text{Weight of Wet Soil} - \text{Weight of Dry Soil}}{\text{Weight of Dry Soil}}\right) \times 100$$

SAMPLE DESCRIPTION		Wet Soil g (air-dried)	Dry Soil g (oven -dried)	NET LOSS g	%
M3639 8"-12" Deep C1	1	43.319	43.000	0.319	0.74
C4	2	41.669	41.311	0.358	0.87
11	3	54.273	53.752	0.521	0.97
12	4	45.100	44.770	0.330	0.74
13	5	40.107	39.879	0.228	0.57
21	6	39.426	39.178	0.248	0.63
22	7	41.513	41.109	0.404	0.98
23	8	44.278	43.900	0.378	0.86
24	9	40.628	40.142	0.486	1.21
25	10	42.300	42.100	0.200	0.48
26	11	40.658	40.085	0.573	1.43
31	12	41.454	41.126	0.328	0.80
32	13	42.534	42.212	0.322	0.76
33	14	41.358	40.930	0.428	1.05
41	15	42.700	42.534	0.166	0.39
42	16	43.981	43.511	0.470	1.08
43	17	38.159	37.776	0.383	1.01
51	18	40.308	40.092	0.216	0.54
52	19	39.000	38.666	0.334	0.86
61	20	37.100	36.689	0.411	1.12
62	21	47.660	47.191	0.469	0.99
63	22	41.579	40.629	0.950	2.34
64	23	48.265	48.045	0.220	0.46
65	24	48.412	48.051	0.361	0.75
66	25	53.058	52.483	0.575	1.10
67	26	55.171	54.756	0.415	0.76

ANALYST: [signature]

DATE: 12/4-5/94

ENVIRONMENTAL LABORATORY

SOIL WATER CONTENT
PERCENTAGE OF WATER IN THE SAMPLE ON A DRY-MASS BASIS

Gardner, Walter. 1986. Water Content. p. 493-544. In Arnold Klute (Ed.). Methods of Soil Analysis, Part 1. Physical and Mineralogical Methods. Agronomy Monograph No. 9 (2nd Edition).

$$\% \text{ Water Content} = \left(\frac{\text{Weight of Wet Soil} - \text{Weight of Dry Soil}}{\text{Weight of Dry Soil}}\right) \times 100$$

SAMPLE DESCRIPTION		Wet Soil g (air-dried)	Dry Soil g (oven -dried)	NET LOSS g	%
M3639 8"-12" DEEP 168	27	59.220	58.830	0.390	0.66
69	28	61.661	61.293	0.368	0.60
71	29	50.632	50.389	0.243	0.48
81	30	44.010	43.847	0.163	0.37
82	31	47.571	47.411	0.160	0.34
91	32	46.200	45.910	0.290	0.63
92	33	49.365	49.094	0.271	0.55
93	34	50.039	49.766	0.273	0.55
94	35	50.539	50.315	0.224	0.45
95	36	53.066	52.789	0.277	0.52
96	37	52.500	52.278	0.222	0.42
97	38	54.476	54.207	0.269	0.50
98	39	51.313	51.070	0.243	0.48
99	40	49.174	48.908	0.266	0.54
910	41	52.134	51.966	0.168	0.32
101	42	60.904	60.635	0.269	0.44
102	43	67.107	66.780	0.327	0.49
103	44	61.900	61.672	0.228	0.37
121	45	62.776	62.423	0.353	0.57
122	46	60.549	60.204	0.345	0.57
123	47	64.826	64.470	0.356	0.55
124	48	61.984	61.556	0.428	0.70
125	49	64.504	64.122	0.382	0.60
126	50	55.270	55.000	0.270	0.49
127	51	56.344	56.040	0.304	0.54
128	52	53.537	53.363	0.174	0.32

ANALYST: 12/4-5/94

DATE: 3/7/JW

ENVIRONMENTAL LABORATORY

SOIL WATER CONTENT
PERCENTAGE OF WATER IN THE SAMPLE ON A DRY-MASS BASIS

Gardner, Walter. 1986. Water Content. p. 493-544. In Arnold Klute (Ed.). Methods of Soil Analysis, Part 1. Physical and Mineralogical Methods. Agronomy Monograph No. 9 (2nd Edition).

$$\% \text{ Water Content} = \left(\frac{\text{Weight of Wet Soil} - \text{Weight of Dry Soil}}{\text{Weight of Dry Soil}}\right) \times 100$$

SAMPLE DESCRIPTION			Wet Soil g (air-dried)	Dry Soil g (oven -dried)	NET LOSS g	%
M3639 2.5' DEEP	C2	53	49.176	49.093	0.083	0.17
	C3	54	47.776	47.703	0.073	0.15
	14	55	65.858	65.691	0.167	0.25
	27	56	59.243	59.090	0.153	0.26
	34	57	54.991	54.726	0.265	0.48
	610	58	51.704	51.527	0.177	0.34
	911	59	49.600	49.415	0.185	0.37
	912	60	49.193	49.083	0.110	0.22
	5' DEEP C2	61	55.733	55.659	0.074	0.13
	14	62	67.066	66.462	0.604	0.91
	27	63	54.000	53.761	0.239	0.44
	34	64	57.300	57.209	0.091	0.16
	610	65	56.652	56.570	0.082	0.14
	911	66	57.083	56.946	0.137	0.24
	912	67	56.200	56.108	0.092	0.16
8"-12" Deep Field Dup	26	68	57.655	57.076	0.579	1.01
# # # #	52	69	44.291	44.010	0.281	0.64
	71	70	51.322	50.941	0.381	0.75
↓ ↓ ↓ ↓	98	71	53.939	53.631	0.308	0.57
2.5' DEEP Field Dup	14	72	58.304	58.087	0.217	0.37
5' DEEP Field Dup	14	73	44.520	44.076	0.444	1.01
Dup #1	C1	74	refer to #1			0.74
Dup #2	C4	75	refer to #2			0.87
Dup #53	C2	76	refer to #53			0.17
Dup #54	C3	77	refer to #54			0.15
Dup #61	C2	78	refer to #61			0.13

ANALYST: [signature]

DATE: 12/4-5/97

ENVIRONMENTAL LABORATORY

SOIL pH and LIME REQUIREMENT(LR)

McLean, E. O. 1982. Soil pH and Lime Requirement. p. 199-224. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

2.00 mm air-dried soil used.

Soil - to - Millipore Milli-Q™ Water Ratio 1:1, 10 g plus 10 mL.
For LR, SMP single-buffer method used, Soil - to - SMP Buffer Ratio 1:2, 10 g plus 20 mL.

SAMPLE DESCRIPTION	pHw (pH in water)	pHs (pH in 0.01M CaCl2)	Soil-Buffer pH	LR (T/A)
M3639 - 1	6.56	6.29	7.2	NONE
2	6.11	5.59	7.0	NONE
3	7.09	6.87	—	NONE
4	7.11	6.84	—	NONE
5	6.96	6.80	—	NONE
6	7.36	7.17	—	NONE
7	7.03	6.94	—	NONE
8	6.96	6.84	—	NONE
9	6.72	6.34	7.3	NONE
10	7.42	7.20	—	NONE
11	6.31	6.29	7.1	NONE
12	6.38	5.82	7.2	NONE
13	6.91	6.50	—	NONE
14	6.46	5.90	7.3	NONE
15	7.01	6.58	—	NONE
16	7.00	6.53	—	NONE
17	7.07	6.54	—	NONE
18	7.11	7.06	—	NONE
19	7.38	7.22	—	NONE
20	7.07	6.94	—	NONE
21	6.96	6.84	—	NONE
22	7.41	7.19	—	NONE
23	7.03	6.93	—	NONE
24	6.90	6.74	—	NONE
25	7.09	7.02	—	NONE
26	6.34	5.93	7.1	NONE

ANALYST: _____

DATE: 2/1/95

ENVIRONMENTAL LABORATORY

SOIL pH and LIME REQUIREMENT(LR)

McLean, E. O. 1982. Soil pH and Lime Requirement. p. 199-224. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

2.00 mm air-dried soil used.

Soil - to - Millipore Milli-Q™ Water Ratio 1:1, 10 g plus 10 mL.
For LR, SMP single-buffer method used, Soil - to - SMP Buffer Ratio 1:2, 10 g plus 20 mL.

SAMPLE DESCRIPTION	pHw (pH in water)	pHs (pH in 0.01M CaCl2)	Soil-Buffer pH	LR (T/A)
M3639 – 27	6.30	5.74	6.9	NONE
28	6.07	5.51	6.9	NONE
29	7.13	6.99	—	NONE
30	6.44	6.10	7.0	NONE
31	6.39	5.93	7.1	NONE
32	7.31	6.99	—	NONE
33	7.40	7.19	—	NONE
34	7.18	6.81	—	NONE
35	7.21	7.09	—	NONE
36	7.14	7.08	—	NONE
37	7.30	7.20	—	NONE
38	7.28	7.14	—	NONE
39	7.45	7.25	—	NONE
40	7.27	7.05	—	NONE
41	6.73	6.23	7.1	NONE
42	6.57	6.22	7.1	NONE
43	6.27	6.23	6.9	NONE
44	6.40	6.33	7.0	NONE
45	5.34	5.22	6.5	3.1
46	5.39	4.80	6.5	3.1
47	5.11	5.02	6.5	3.1
48	5.93	5.79	6.6	2.4
49	5.58	5.41	6.9	NONE
50	5.58	5.27	6.3	4.4
51	5.35	5.09	6.5	3.1
52	5.75	5.43	6.5	3.1

ANALYST: [signature]
DATE: 2/1/95

ENVIRONMENTAL LABORATORY

SOIL pH and LIME REQUIREMENT(LR)

McLean, E. O. 1982. Soil pH and Lime Requirement. p. 199-224. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

2.00 mm air-dried soil used.

Soil - to - Millipore Milli-Q™ Water Ratio 1:1, 10 g plus 10 mL.
For LR, SMP single-buffer method used, Soil - to - SMP Buffer Ratio 1:2, 10 g plus 20 mL.

SAMPLE DESCRIPTION	pHw (pH in water)	pHs (pH in 0.01M CaCl2)	Soil-Buffer pH	LR (T/A)
M3639- 53	5.98	5.33	*	
54	6.03	5.18	*	
55	6.35	6.00	*	
56	5.91	5.70	*	
57	6.34	5.64	*	
58	6.08	5.49	*	
59	6.83	6.54	*	
60	7.11	6.80	*	
61	6.32	5.77	*	
62	5.99	5.74	*	
63	6.21	5.81	*	
64	6.40	5.78	*	
65	6.82	6.57	*	
66	7.05	6.58	*	
67	7.82	7.45	*	
68	6.46	6.34	7.1	NONE
69	7.36	7.17	—	NONE
70	7.09	6.97	—	NONE
71	7.44	7.23	—	NONE
72	6.48	6.26	*	
73	6.08	5.84	*	
74	6.62	6.15	7.1	NONE
75	6.11	5.59	7.0	NONE
76	5.98	5.34	*	
77	6.04	5.18	*	
78	6.21	5.73	*	

*Samples #53 to 67 are 2.5' deep and 5' deep samples. The lime-requirement test is not applicable or appropriate for soil samples at these depths. Also included are samples # 72, 73, 76, 77, 78.

ANALYST: [signature]
DATE: 2/1/95

ENVIRONMENTAL LABORATORY

SOLUBLE SALTS BY ELECTRICAL CONDUCTIVITY

Rhoades, J. D. 1982. Soluble Salts. p. 167-179. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

Extracts prepared using 2.00 mm air-dried soil. Soil - to - Water Ratio 1:5, 20 g soil plus 100 mL Millipore Milli-Q™ water; dilution factor of 5*.

Determination of Cell Constant:

C = (0.001412) [1 + (0.0191 (t - 25))] 1 / K kcl

Where : K kcl = measured resistance, ohms; t = observed temperature, °C

K kcl = 0.001412 ohms, t = 25.0 °C, C = 1.00

Standard Solution Used: Chempure Brand 0.010 M KCl Lot 490428 Exp 4/22/95

Conductivity Calculations:

K = (Km) (C) / 1 + 0.0191 (t - 25)

Where: K = Conductivity, µmhos/cm; Km = measured conductivity, µmhos/cm at t ° C

SAMPLE DESCRIPTION	t, °C	Km	K	x 5*	mmhos/cm
M3639 - 1	25.0	93.8	93.8	469	0.47
2	25.0	73.0	73.0	365	0.37
3	25.0	215	215	1075	1.08
4	25.0	230	230	1150	1.15
5	25.0	241	241	1205	1.21
6	25.0	222	222	1110	1.11
7	25.0	318	318	1590	1.59
8	25.0	254	254	1270	1.27
9	25.0	95.4	95.4	477	0.48
10	25.0	116	116	580	0.58
11	25.0	216	216	1080	1.08
12	25.0	51.2	51.2	256	0.26
13	25.0	62.9	62.9	314.5	0.32
14	25.0	47.1	47.1	235.5	0.24
15	25.0	57.0	57.0	285	0.29
16	25.0	48.4	48.4	242	0.24
17	25.0	52.2	52.2	261	0.26
18	25.0	121	121	605	0.61
19	25.0	212	212	1060	1.06
20	25.0	106	106	530	0.53
21	25.0	192	192	960	0.96
22	25.0	118	118	590	0.59
23	25.0	118	118	590	0.59
24	25.0	77.2	77.2	386	0.39
25	25.0	156	156	780	0.78
26	25.0	49.9	49.9	249.5	0.25
27	25.0	53.2	53.2	266	0.27

ANALYST: _____

DATE: 3/2/95

ENVIRONMENTAL LABORATORY

SOLUBLE SALTS BY ELECTRICAL CONDUCTIVITY

Rhoades, J. D. 1982. Soluble Salts. p. 167-179. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

Extracts prepared using 2.00 mm air-dried soil. Soil - to - Water Ratio 1:5, 20 g soil plus 100 mL Millipore Milli-Q™ water; dilution factor of 5*.

Determination of Cell Constant:

C = (0.001412) [1 + (0.0191 (t - 25))] 1 / K kcl

Where : K kcl = measured resistance, ohms; t = observed temperature, °C

K kcl = 0.001412 ohms, t = 25.0 °C, C = 1.00

Standard Solution Used: Chempure Brand 0.010M KCl Lot 490428 Exp 7/22/95

Conductivity Calculations:

K = (Km) (C) / 1 + 0.0191 (t - 25)

Where: K = Conductivity, µmhos/cm; Km = measured conductivity, µmhos/cm at t ° C

SAMPLE DESCRIPTION	t, °C	Km	K	x 5*	mmhos/cm
M3639- 28	25.0	38.0	38.0	190	0.19
29	25.0	108	108	540	0.54
30	25.0	109	109	545	0.55
31	25.0	32.9	32.9	164.5	0.17
32	25.0	92.5	92.5	462.5	0.46
33	25.0	115	115	575	0.58
34	25.0	88.9	88.9	444.5	0.45
35	25.0	1666	1666	830	0.83
36	25.0	2600	2600	1300	1.30
37	25.0	195	195	975	0.98
38	25.0	160	160	800	0.80
39	25.0	133	133	665	0.67
40	25.0	104	104	520	0.52
41	25.0	50.7	50.7	253.5	0.25
42	25.0	78.1	78.1	390.5	0.39
43	25.0	181	181	905	0.91
44	25.0	174	174	870	0.87
45	25.0	284	284	1420	1.42
46	25.0	153	153	765	0.77
47	25.0	119	119	595	0.60
48	25.0	180	180	900	0.90
49	25.0	251	251	1255	1.26
50	25.0	157	157	785	0.79
51	25.0	183	183	915	0.92
52	25.0	147	147	735	0.74
53	25.0	36.5	36.5	182.5	0.18
54	25.0	14.8	14.8	74	0.07

ANALYST : _____

DATE: 2/2/95

ENVIRONMENTAL LABORATORY

SOLUBLE SALTS BY ELECTRICAL CONDUCTIVITY

Rhoades, J. D. 1982. Soluble Salts. p. 167-179. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

Extracts prepared using 2.00 mm air-dried soil. Soil - to - Water Ratio 1:5, 20 g soil plus 100 mL Millipore Milli-Q™ water; dilution factor of 5*.

Determination of Cell Constant:

C = (0.001412) [1 + (0.0191 (t - 25))] 1 / K kcl

Where : K kcl = measured resistance, ohms; t = observed temperature, °C

K kcl = 0.001412 ohms, t = 25.0 °C, C = 1.00

Standard Solution Used: Chempure Brand 0.010M KCl Lot 490428 Exp 7/22/95

Conductivity Calculations:

K = (Km) (C) / 1 + 0.0191 (t - 25)

Where: K = Conductivity, µmhos/cm; Km = measured conductivity, µmhos/cm at t ° C

SAMPLE DESCRIPTION	t, °C	Km	K	x 5*	mmhos/cm
M3639 55	25.0	74.0	74.0	370	0.37
56	25.0	86.8	86.8	434	0.43
57	25.0	20.5	20.5	102.5	0.10
58	25.0	34.0	34.0	170	0.17
59	25.0	40.7	40.7	203.5	0.20
60	25.0	56.0	56.0	280	0.28
61	25.0	22.4	22.4	112	0.11
62	25.0	130	130	650	0.65
63	25.0	74.0	74.0	370	0.37
64	25.0	15.8	15.8	79	0.08
65	25.0	42.4	42.4	212	0.21
66	25.0	34.7	34.7	173.5	0.17
67	25.0	55.0	55.0	275	0.28
68	25.0	217	217	1085	1.09
69	25.0	207	207	1035	1.04
70	25.0	108	108	540	0.54
71	25.0	129	129	645	0.65
72	25.0	75.1	75.1	375.5	0.38
73	25.0	132	132	660	0.66
74	25.0	93.0	93.0	465	0.47
75	25.0	73.4	73.4	367	0.37
76	25.0	36.7	36.7	183.5	0.18
77	25.0	13.7	13.7	68.5	0.07
78	25.0	21.3	21.3	106.5	0.11
NIST Traceable Cond Calib. Std Lot 1227	24.9	993	995		

Exp 5/2/95 Certified 994 µmhos/cm

ANALYST: [signature]

DATE: 2/2/95

ENVIRONMENTAL LABORATORY

CATION EXCHANGE CAPACITY (CEC) BY SODIUM SATURATION

Rhoades, J. D. 1982. Cation Exchange Capacity. p. 149-157. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

Extracts prepared using 0.500 mm air-dried soil. Cation Exchange Capacity by Sodium Saturation; modification of method is as follows:

*ADSORPTION Batch equilibrium method (over-night) with 1.0 N NaOAc pH 8.2 as saturation solution.

*WASHED Two washings with 2-Propanol.

*DESORPTION Batch equilibrium method (over-night) with 1.0N NH4OAc pH 7.0 as extraction solution.

CEC EQUATION: (0.1 Na ppm/ 23 / oven-dried wt. of soil g) x 100 = meq/ 100 g soil

SAMPLE DESCRIPTION		AIR-DRIED WT. g	OVEN-DRIED WT. g	mg Na / L	meq / 100 g soil
M3639	1	5.000	4.963	209	18.3
	2	5.000	4.956	205	18.0
	3	5.000	4.951	244	21.4
	4	5.000	4.963	237	20.8
	5	5.000	4.971	255	22.3
	6	5.000	4.968	269	23.5
	7	5.000	4.951	400	35.1
	8	5.000	4.957	287	25.2
	9	5.000	4.939	231	20.3
	10	5.000	4.976	237	20.7
	11	5.000	4.929	327	28.8
	12	5.000	4.960	220	19.3
	13	5.000	4.962	173	15.2
	14	5.000	4.948	177	15.6
	15	5.000	4.981	120	10.5
	16	5.000	4.946	171	15.0
	17	5.000	4.950	178	15.6
	18	5.000	4.973	150	13.1
	19	5.000	4.957	149	13.1
	20	5.000	4.944	174	15.3
	21	5.000	4.951	255	22.4
	22	5.000	4.883	264	23.5
	23	5.000	4.977	167	14.6
	24	5.000	4.963	198	17.3
	25	5.000	4.945	214	18.8

ANALYST: _____

DATE: 2/2/95

ENVIRONMENTAL LABORATORY

CATION EXCHANGE CAPACITY (CEC)
BY SODIUM SATURATION

Rhoades, J. D. 1982. Cation Exchange Capacity. p. 149-157. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

Extracts prepared using 0.500 mm air-dried soil. Cation Exchange Capacity by Sodium Saturation; modification of method is as follows:

*ADSORPTION Batch equilibrium method (over-night) with 1.0 N NaOAc pH 8.2 as saturation solution.

*WASHED Two washings with 2-Propanol.

*DESORPTION Batch equilibrium method (over-night) with 1.0N NH4OAc pH 7.0 as extraction solution.

CEC EQUATION: (0.1 Na ppm/ 23 / oven-dried wt. of soil g) x 100 = meq/ 100 g soil

SAMPLE DESCRIPTION		AIR-DRIED WT. g	OVEN-DRIED WT. g	mg Na / L	meq / 100 g soil
M3639	26	5.000	4.962	205	18.0
	27	5.000	4.967	190	16.6
	28	5.000	4.970	206	18.0
	29	5.000	4.976	257	22.5
	30	5.000	4.982	127	11.1
	31	5.000	4.983	100	8.7
	32	5.000	4.969	230	20.1
	33	5.000	4.973	230	20.1
	34	5.000	4.973	272	23.8
	35	5.000	4.978	189	16.5
	36	5.000	4.974	238	20.8
	37	5.000	4.979	231	20.2
	38	5.000	4.975	209	18.3
	39	5.000	4.976	222	19.4
	40	5.000	4.973	242	21.2
	41	5.000	4.984	244	21.3
	42	5.000	4.978	273	23.8
	43	5.000	4.975	303	26.5
	44	5.000	4.981	246	21.5
	45	5.000	4.971	305	26.7
	46	5.000	4.971	320	28.0
	47	5.000	4.972	332	29.0
	48	5.000	4.965	326	28.5
	49	5.000	4.970	304	26.6
	50	5.000	4.975	343	30.0

ANALYST: _____

DATE: 2/2/95

ENVIRONMENTAL LABORATORY

CATION EXCHANGE CAPACITY (CEC)
BY SODIUM SATURATION

Rhoades, J. D. 1982. Cation Exchange Capacity. p. 149-157. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

Extracts prepared using 0.500 mm air-dried soil. Cation Exchange Capacity by Sodium Saturation; modification of method is as follows:

*ADSORPTION Batch equilibrium method (over-night) with 1.0 N NaOAc pH 8.2 as saturation solution.

*WASHED Two washings with 2-Propanol.

*DESORPTION Batch equilibrium method (over-night) with 1.0N NH4OAc pH 7.0 as extraction solution.

CEC EQUATION: (0.1 Na ppm/ 23 / oven-dried wt. of soil g) x 100 = meq/ 100 g soil

SAMPLE DESCRIPTION	AIR-DRIED WT. g	OVEN-DRIED WT. g	mg Na / L	meq / 100 g soil
M36039 51	5.000	4.943	239	20.9
52	5.000	4.984	211	18.4
53	5.000	4.991	97	8.4
54	5.000	4.992	81	7.1
55	5.000	4.987	122	10.6
56	5.000	4.987	115	10.0
57	5.000	4.976	139	12.1
58	5.000	4.983	91	7.9
59	5.000	4.981	98	8.6
60	5.000	4.989	69	6.0
61	5.000	4.993	32	2.8
62	5.000	4.954	217	19.0
63	5.000	4.978	104	9.1
64	5.000	4.992	36	3.1
65	5.000	4.993	34	3.0
66	5.000	4.988	29	2.5
67	5.000	4.992	41	3.6
68	5.000	4.949	500	43.9
69	5.000	4.968	214	18.7
70	5.000	4.966	324	28.4
71	5.000	4.971	290	25.4
72	5.000	4.981	133	11.6
73	5.000	4.949	239	21.0
74	5.000	4.963	201	17.6
75	5.000	4.956	208	18.2

ANALYST: [signature]

DATE: 2/2/95

ENVIRONMENTAL LABORATORY

CATION EXCHANGE CAPACITY (CEC)
BY SODIUM SATURATION

Rhoades, J. D. 1982. Cation Exchange Capacity. p. 149-157. In A. L. Page, R. H. Miller & D. R. Keeney (Eds.) Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties, Agronomy Monograph No. 9 (2nd Edition).

Extracts prepared using 0.500 mm air-dried soil. Cation Exchange Capacity by Sodium Saturation; modification of method is as follows:

*ADSORPTION Batch equilibrium method (over-night) with 1.0 N NaOAc pH 8.2 as saturation solution.

*WASHED Two washings with 2-Propanol.

*DESORPTION Batch equilibrium method (over-night) with 1.0N NH4OAc pH 7.0 as extraction solution.

CEC EQUATION: (0.1 Na ppm/ 23 / oven-dried wt. of soil g) x 100 = meq/ 100 g soil

SAMPLE DESCRIPTION	AIR-DRIED WT. g	OVEN-DRIED WT. g	mg Na / L	meq / 100 g soil
M3639 76	5.000	4.991	101	8.8
77	5.000	4.992	89	7.8
78	5.000	4.993	33	2.9

ANALYST: [signature] 3

DATE: 2/2/95

M23639_ Na

2-295

Blank	rep	1	Sodium	em	107.5	Na for CEC			
	rep	2	Sodium	em	76.7				
	rep	3	Sodium	em	73.1				
[redacted]k									
Sodium	av	85.76		sd	18.899	%cv	22.04		
#4 standard	rep	1	Sodium	em	11709.5	conc	100.00		
	rep	2	Sodium	em	11916.1	conc	100.00		
	rep	3	Sodium	em	11838.2	conc	100.00		
#4 standard									
Sodium	av	11754.61		sd	144.353	%cv	1.23	conc	100.00
ICPS 300ppm	rep	1	Sodium	conc	273.29	mg/l	3rd Les 3838		
	rep	2	Sodium	conc	274.29	mg/l	to 10ml w701		
	rep	3	Sodium	conc	275.52	mg/l			
ICPS 300ppm							2 recovery		
Sodium	av	274.37	mg/l	sd	1.117	%cv	0.41	91	
-1	rep	1	Sodium	conc	213.18	mg/l			
	rep	2	Sodium	conc	206.79	mg/l			
	rep	3	Sodium	conc	205.93	mg/l			
-1									
Sodium	av	208.63	mg/l	sd	3.960	%cv	1.90		
-2	rep	1	Sodium	conc	205.67	mg/l			
	rep	2	Sodium	conc	205.01	mg/l			
	rep	3	Sodium	conc	205.14	mg/l			
-2									
[redacted]Sodium	av	205.27	mg/l	sd	0.349	%cv	0.17		
-3	rep	1	Sodium	conc	245.47	mg/l			
	rep	2	Sodium	conc	243.02	mg/l			
	rep	3	Sodium	conc	243.92	mg/l			
-3									
Sodium	av	244.14	mg/l	sd	1.239	%cv	0.51		
-4	rep	1	Sodium	conc	238.67	mg/l			
	rep	2	Sodium	conc	235.68	mg/l			
	rep	3	Sodium	conc	236.58	mg/l			
-4									
Sodium	av	236.98	mg/l	sd	1.535	%cv	0.65		
-5	rep	1	Sodium	conc	254.97	mg/l			
	rep	2	Sodium	conc	254.53	mg/l			
	rep	3	Sodium	conc	254.00	mg/l			
-5									
Sodium	av	254.50	mg/l	sd	0.486	%cv	0.19		
-6	rep	1	Sodium	conc	270.34	mg/l			
	rep	2	Sodium	conc	267.23	mg/l			
	rep	3	Sodium	conc	267.68	mg/l			
-6									
Sodium	av	269.09	mg/l	sd	1.335	%cv	0.50		
[redacted]	rep	1	Sodium	conc	399.20	mg/l			
	rep	2	Sodium	conc	399.44	mg/l			
	rep	3	Sodium	conc	401.98	mg/l			
-7									
Sodium	av	400.21	mg/l	sd	1.509	%cv	0.38		

-8	rep	1	Sodium	conc	286.44 mg/l		
	rep	2	Sodium	conc	285.30 mg/l		
	rep	3	Sodium	conc	289.70 mg/l		
Sodium	av	287.15 mg/l		sd	2.285 %cv	0.80	
-9	rep	1	Sodium	conc	229.80 mg/l		
	rep	2	Sodium	conc	231.80 mg/l		
	rep	3	Sodium	conc	231.28 mg/l		
-9							
Sodium	av	230.96 mg/l		sd	1.041 %cv	0.45	
DI	rep	1	Sodium	conc	1.76 mg/l		
	rep	2	Sodium	conc	0.52 mg/l		
	rep	3	Sodium	conc	0.68 mg/l		
DI							
Sodium	av	0.99 mg/l		sd	0.678 %cv	68.81	
Soln C_2	rep	1	Sodium	conc	90.74 mg/l		
	rep	2	Sodium	conc	92.03 mg/l		
	rep	3	Sodium	conc	91.95 mg/l		
Soln C_2							
Sodium	av	91.57 mg/l		sd	0.720 %cv	0.79	
ICPS 300ppm	rep	1	Sodium	conc	273.96 mg/l		
	rep	2	Sodium	conc	270.25 mg/l		
	rep	3	Sodium	conc	273.86 mg/l		
ICPS 300ppm							
Sodium	av	272.69 mg/l		sd	2.111 %cv	0.77	2 money 91
-10	rep	1	Sodium	conc	242.37 mg/l		
	rep	2	Sodium	conc	235.30 mg/l		
	rep	3	Sodium	conc	232.51 mg/l		
-10							
Sodium	av	236.73 mg/l		sd	5.080 %cv	2.15	
-11	rep	1	Sodium	conc	329.01 mg/l		
	rep	2	Sodium	conc	325.96 mg/l		
	rep	3	Sodium	conc	326.13 mg/l		
-11							
Sodium	av	327.03 mg/l		sd	1.712 %cv	0.52	
-12	rep	1	Sodium	conc	220.34 mg/l		
	rep	2	Sodium	conc	218.44 mg/l		
	rep	3	Sodium	conc	219.36 mg/l		
-12							
Sodium	av	219.55 mg/l		sd	1.213 %cv	0.55	
-13	rep	1	Sodium	conc	173.92 mg/l		
	rep	2	Sodium	conc	174.24 mg/l		
	rep	3	Sodium	conc	171.96 mg/l		
-13							
Sodium	av	173.37 mg/l		sd	1.235 %cv	0.71	
	rep	1	Sodium	conc	176.47 mg/l		
	rep	2	Sodium	conc	178.16 mg/l		
	rep	3	Sodium	conc	177.82 mg/l		
-14							
Sodium	av	177.48 mg/l		sd	0.893 %cv	0.50	

-15		rep	1	Sodium	conc	120.48	mg/l			
		rep	2	Sodium	conc	118.55	mg/l			
		rep	3	Sodium	conc	120.91	mg/l			
	Sodium	av	119.97	mg/l	sd	1.340	%cv	1.04		
-16		rep	1	Sodium	conc	171.71	mg/l			
		rep	2	Sodium	conc	172.16	mg/l			
		rep	3	Sodium	conc	170.41	mg/l			
-16										
	Sodium	av	171.42	mg/l	sd	0.911	%cv	0.53		
-17		rep	1	Sodium	conc	177.78	mg/l			
		rep	2	Sodium	conc	177.00	mg/l			
		rep	3	Sodium	conc	177.78	mg/l			
-17										
	Sodium	av	177.52	mg/l	sd	0.451	%cv	0.25		
#4 standard		rep	1	Sodium	em	10710.4	conc	100.00		
		rep	2	Sodium	em	10497.9	conc	100.00		
		rep	3	Sodium	em	10711.5	conc	100.00		
#4 standard										
	Sodium	av	10706.69	11754	sd	206.260	%cv	1.93	conc	100.00
-18		rep	1	Sodium	conc	150.15	mg/l			
		rep	2	Sodium	conc	149.89	mg/l			
		rep	3	Sodium	conc	150.46	mg/l			
-18										
	Sodium	av	150.17	mg/l	sd	0.287	%cv	0.19		
-19		rep	1	Sodium	conc	150.64	mg/l			
		rep	2	Sodium	conc	147.99	mg/l			
		rep	3	Sodium	conc	148.51	mg/l			
-19										
	Sodium	av	149.05	mg/l	sd	1.406	%cv	0.94		
-20		rep	1	Sodium	conc	174.30	mg/l			
		rep	2	Sodium	conc	173.44	mg/l			
		rep	3	Sodium	conc	173.18	mg/l			
-20										
	Sodium	av	173.64	mg/l	sd	0.593	%cv	0.34		
-21		rep	1	Sodium	conc	254.93	mg/l			
		rep	2	Sodium	conc	254.54	mg/l			
		rep	3	Sodium	conc	256.49	mg/l			
-21										
	Sodium	av	255.32	mg/l	sd	1.035	%cv	0.41		
-22		rep	1	Sodium	conc	263.52	mg/l			
		rep	2	Sodium	conc	264.72	mg/l			
		rep	3	Sodium	conc	265.04	mg/l			
-22										
	Sodium	av	264.43	mg/l	sd	0.800	%cv	0.30		
		rep	1	Sodium	conc	167.53	mg/l			
		rep	2	Sodium	conc	166.06	mg/l			
		rep	3	Sodium	conc	167.78	mg/l			
-23										
	Sodium	av	167.14	mg/l	sd	0.945	%cv	0.57		

-24		rep	1	Sodium	conc	196.07 mg/l		
		rep	2	Sodium	conc	199.06 mg/l		
		rep	3	Sodium	conc	198.30 mg/l		
-24								
	Sodium	av	197.81 mg/l		sd	1.556 %cv	0.79	
-25		rep	1	Sodium	conc	214.48 mg/l		
		rep	2	Sodium	conc	213.14 mg/l		
		rep	3	Sodium	conc	214.36 mg/l		
-25								
	Sodium	av	214.00 mg/l		sd	0.745 %cv	0.35	
ICPS 300ppm		rep	1	Sodium	conc	288.98 mg/l		
		rep	2	Sodium	conc	297.13 mg/l		
		rep	3	Sodium	conc	292.37 mg/l		
ICPS 300ppm								
	Sodium	av	291.16 mg/l		sd	6.657 %cv	2.29	Recovery 97
-26		rep	1	Sodium	conc	204.63 mg/l		
		rep	2	Sodium	conc	203.53 mg/l		
		rep	3	Sodium	conc	205.39 mg/l		
-26								
	Sodium	av	204.52 mg/l		sd	0.935 %cv	0.46	
-27		rep	1	Sodium	conc	190.07 mg/l		
		rep	2	Sodium	conc	190.52 mg/l		
		rep	3	Sodium	conc	190.82 mg/l		
	Sodium	av	190.47 mg/l		sd	0.379 %cv	0.20	
-28		rep	1	Sodium	conc	206.64 mg/l		
		rep	2	Sodium	conc	205.67 mg/l		
		rep	3	Sodium	conc	204.48 mg/l		
-28								
	Sodium	av	205.59 mg/l		sd	1.081 %cv	0.53	
-29		rep	1	Sodium	conc	257.69 mg/l		
		rep	2	Sodium	conc	254.42 mg/l		
		rep	3	Sodium	conc	257.40 mg/l		
-29								
	Sodium	av	256.50 mg/l		sd	1.809 %cv	0.71	
-30		rep	1	Sodium	conc	126.10 mg/l		
		rep	2	Sodium	conc	126.68 mg/l		
		rep	3	Sodium	conc	127.93 mg/l		
-30								
	Sodium	av	126.90 mg/l		sd	0.935 %cv	0.74	
-31		rep	1	Sodium	conc	100.20 mg/l		
		rep	2	Sodium	conc	99.89 mg/l		
		rep	3	Sodium	conc	100.59 mg/l		
-31								
	Sodium	av	100.23 mg/l		sd	0.348 %cv	0.35	
-32		rep	1	Sodium	conc	229.40 mg/l		
		rep	2	Sodium	conc	230.49 mg/l		
		rep	3	Sodium	conc	230.73 mg/l		
-32								
	Sodium	av	230.21 mg/l		sd	0.710 %cv	0.31	

-33	rep	1	Sodium	conc	229.29 mg/l				
	rep	2	Sodium	conc	230.11 mg/l				
	rep	3	Sodium	conc	231.12 mg/l				
Sodium	av	230.17 mg/l		sd	0.920 %cv	0.40			
#4 standard	rep	1	Sodium	em	10813.3	conc	100.00		
	rep	2	Sodium	em	10715.5	conc	100.00		
	rep	3	Sodium	em	10692.2	conc	100.00		
#4 standard									
Sodium	av	10740.36	Previous 10706	sd	64.268 %cv	0.60	conc	100.00	

Interlock - RF overload

-34	rep	1	Sodium	conc	-0.80 mg/l		
	rep	2	Sodium	conc	-0.80 mg/l		
	rep	3	Sodium	conc	-0.80 mg/l		window edge
-34							
Sodium	av	-0.80 mg/l		sd	0.004 %cv	0.44	
-35	rep	1	Sodium	conc	-0.80 mg/l		window edge
	rep	2	Sodium	conc	-0.80 mg/l		
	rep	3	Sodium	conc	-0.80 mg/l		
-35							
Sodium	av	-0.80 mg/l		sd	0.004 %cv	0.51	
-36	rep	1	Sodium	conc	-0.80 mg/l		window edge
	rep	2	Sodium	conc	-0.79 mg/l		
	rep	3	Sodium	conc	-0.80 mg/l		

Interlock - RF overload

blank	rep	1	Sodium	em	62.2			
	rep	2	Sodium	em	67.1			
	rep	3	Sodium	em	56.5			
[illegible]k								
Sodium	av	61.95		sd	5.321	%cv	8.59	
standard	rep	1	Sodium	em	9833.0	conc	100.00	
	rep	2	Sodium	em	9899.9	conc	100.00	
	rep	3	Sodium	em	9857.2	conc	100.00	
standard								
Sodium	av	9863.34		sd	33.903	%cv	0.34	conc 100.00
ICPS 300ppm	rep	1	Sodium	conc	296.83	mg/l		
	rep	2	Sodium	conc	295.42	mg/l		
	rep	3	Sodium	conc	292.29	mg/l		
ICPS 300ppm								
Sodium	av	294.85	mg/l	sd	2.327	%cv	0.79	
-34	rep	1	Sodium	conc	274.01	mg/l		
	rep	2	Sodium	conc	270.56	mg/l		
	rep	3	Sodium	conc	271.66	mg/l		
-34								
Sodium	av	272.08	mg/l	sd	1.761	%cv	0.65	
-35	rep	1	Sodium	conc	188.81	mg/l		
	rep	2	Sodium	conc	189.60	mg/l		
	rep	3	Sodium	conc	187.99	mg/l		
-35								
Sodium	av	188.80	mg/l	sd	0.806	%cv	0.43	
-36	rep	1	Sodium	conc	237.92	mg/l		
	rep	2	Sodium	conc	236.93	mg/l		
	rep	3	Sodium	conc	237.79	mg/l		
-36								
Sodium	av	237.55	mg/l	sd	0.539	%cv	0.23	
-37	rep	1	Sodium	conc	231.61	mg/l		
	rep	2	Sodium	conc	227.64	mg/l		
	rep	3	Sodium	conc	232.66	mg/l		
-37								
Sodium	av	230.64	mg/l	sd	2.647	%cv	1.15	
-38	rep	1	Sodium	conc	210.08	mg/l		
	rep	2	Sodium	conc	209.01	mg/l		
	rep	3	Sodium	conc	209.33	mg/l		
-38								
Sodium	av	209.47	mg/l	sd	0.549	%cv	0.26	
-39	rep	1	Sodium	conc	225.37	mg/l		
	rep	2	Sodium	conc	221.24	mg/l		
	rep	3	Sodium	conc	220.44	mg/l		
-39								
Sodium	av	222.35	mg/l	sd	2.648	%cv	1.19	
[illegible]	rep	1	Sodium	conc	241.76	mg/l		
	rep	2	Sodium	conc	242.33	mg/l		
	rep	3	Sodium	conc	242.96	mg/l		
-40								
Sodium	av	242.35	mg/l	sd	0.597	%cv	0.25	

[illegible] 98

-41		rep	1	Sodium	conc	241.29	mg/l		
		rep	2	Sodium	conc	241.24	mg/l		
		rep	3	Sodium	conc	249.77	mg/l		
	Sodium	av	244.11	mg/l	sd	4.922	%cv	2.02	
-42		rep	1	Sodium	conc	270.81	mg/l		
		rep	2	Sodium	conc	270.54	mg/l		
		rep	3	Sodium	conc	277.60	mg/l		
-42									
	Sodium	av	272.98	mg/l	sd	4.003	%cv	1.47	
DI		rep	1	Sodium	conc	4.43	mg/l		
		rep	2	Sodium	conc	0.40	mg/l		
		rep	3	Sodium	conc	0.39	mg/l		
DI									
	Sodium	av	1.76	mg/l	sd	2.359	%cv	134.34	
#4 standard		rep	1	Sodium	em	10007.8	conc	100.00	
		rep	2	Sodium	em	10145.0	conc	100.00	
		rep	3	Sodium	em	10090.8	conc	100.00	
#4 standard									
	Sodium	av	10081.23		sd	69.102	%cv	0.69	conc 100.00
ICPS 300ppm		rep	1	Sodium	conc	295.01	mg/l		
		rep	2	Sodium	conc	296.83	mg/l		
		rep	3	Sodium	conc	297.62	mg/l		
ICPS 300ppm									
	Sodium	av	296.15	mg/l	sd	1.385	%cv	0.45	
-43		rep	1	Sodium	conc	304.73	mg/l		
		rep	2	Sodium	conc	303.83	mg/l		
		rep	3	Sodium	conc	298.96	mg/l		
-43									
	Sodium	av	302.51	mg/l	sd	3.108	%cv	1.03	
-44		rep	1	Sodium	conc	248.00	mg/l		
		rep	2	Sodium	conc	245.03	mg/l		
		rep	3	Sodium	conc	243.96	mg/l		
-44									
	Sodium	av	245.67	mg/l	sd	2.096	%cv	0.85	
-45		rep	1	Sodium	conc	304.27	mg/l		
		rep	2	Sodium	conc	304.04	mg/l		
		rep	3	Sodium	conc	306.50	mg/l		
-45									
	Sodium	av	305.20	mg/l	sd	1.157	%cv	0.38	
-46		rep	1	Sodium	conc	323.27	mg/l		
		rep	2	Sodium	conc	321.09	mg/l		
		rep	3	Sodium	conc	316.73	mg/l		
-46									
	Sodium	av	320.36	mg/l	sd	3.299	%cv	1.03	
		rep	1	Sodium	conc	329.21	mg/l		
		rep	2	Sodium	conc	332.20	mg/l		
		rep	3	Sodium	conc	333.38	mg/l		
-47									
	Sodium	av	331.59	mg/l	sd	2.148	%cv	0.65	

Recovery
99

-48		rep	1	Sodium	conc	327.35	mg/l			
		rep	2	Sodium	conc	323.38	mg/l			
		rep	3	Sodium	conc	327.62	mg/l			
	Sodium	av	326.08	mg/l	sd	2.433	%cv	0.75		
-49		rep	1	Sodium	conc	304.20	mg/l			
		rep	2	Sodium	conc	303.56	mg/l			
		rep	3	Sodium	conc	304.51	mg/l			
-49										
	Sodium	av	304.09	mg/l	sd	0.487	%cv	0.16		
-50		rep	1	Sodium	conc	345.62	mg/l			
		rep	2	Sodium	conc	342.03	mg/l			
		rep	3	Sodium	conc	342.52	mg/l			
-50										
	Sodium	av	343.39	mg/l	sd	1.930	%cv	0.57		
-51		rep	1	Sodium	conc	236.94	mg/l			
		rep	2	Sodium	conc	239.08	mg/l			
		rep	3	Sodium	conc	241.23	mg/l			
-51										
	Sodium	av	239.08	mg/l	sd	2.144	%cv	0.90		
-52		rep	1	Sodium	conc	211.07	mg/l			
		rep	2	Sodium	conc	210.17	mg/l			
		rep	3	Sodium	conc	211.27	mg/l			
-52										
	Sodium	av	210.84	mg/l	sd	0.586	%cv	0.28		
#4 standard		rep	1	Sodium	em	9415.2	conc	100.00		
		rep	2	Sodium	em	9542.4	conc	100.00		
		rep	3	Sodium	em	9734.7	conc	100.00		
#4 standard										
	Sodium	av	9564.08		sd	160.057	%cv	1.68	conc	100.00
-53		rep	1	Sodium	conc	99.37	mg/l			
		rep	2	Sodium	conc	96.44	mg/l			
		rep	3	Sodium	conc	96.29	mg/l			
-53										
	Sodium	av	97.36	mg/l	sd	1.730	%cv	1.78		
-54		rep	1	Sodium	conc	81.42	mg/l			
		rep	2	Sodium	conc	80.65	mg/l			
		rep	3	Sodium	conc	80.40	mg/l			
-54										
	Sodium	av	80.82	mg/l	sd	0.535	%cv	0.66		
-55		rep	1	Sodium	conc	121.29	mg/l			
		rep	2	Sodium	conc	123.20	mg/l			
		rep	3	Sodium	conc	122.32	mg/l			
-55										
	Sodium	av	122.23	mg/l	sd	0.955	%cv	0.78		
		rep	1	Sodium	conc	115.28	mg/l			
		rep	2	Sodium	conc	114.34	mg/l			
		rep	3	Sodium	conc	114.09	mg/l			
-56										
	Sodium	av	114.57	mg/l	sd	0.616	%cv	0.54		

-57		rep	1	Sodium	conc	138.87	mg/l	
		rep	2	Sodium	conc	138.16	mg/l	
		rep	3	Sodium	conc	139.60	mg/l	
	Sodium	av		138.87 mg/l	sd	0.719	%cv	0.52
-58		rep	1	Sodium	conc	90.46	mg/l	
		rep	2	Sodium	conc	91.05	mg/l	
		rep	3	Sodium	conc	89.70	mg/l	
-58								
	Sodium	av		90.50 mg/l	sd	0.820	%cv	0.92
~~-59~~		rep	1	Sodium	conc	511.32	mg/l	
		rep	2	Sodium	conc	515.49	mg/l	
		rep	3	Sodium	conc	527.13	mg/l	
~~-59~~								
	Sodium	av		517.98 mg/l	sd	8.193	%cv	1.58
-60		rep	1	Sodium	conc	60.36	mg/l	
		rep	2	Sodium	conc	60.93	mg/l	
		rep	3	Sodium	conc	58.03	mg/l	
-60								
	Sodium	av		59.78 mg/l	sd	1.535	%cv	2.57
-61		rep	1	Sodium	conc	32.60	mg/l	
		rep	2	Sodium	conc	31.85	mg/l	
		rep	3	Sodium	conc	31.25	mg/l	
-61								
	Sodium	av		31.91 mg/l	sd	0.690	%cv	2.16
-62		rep	1	Sodium	conc	215.38	mg/l	
		rep	2	Sodium	conc	219.40	mg/l	
		rep	3	Sodium	conc	215.36	mg/l	
-62								
	Sodium	av		216.71 mg/l	sd	2.320	%cv	1.07
ICPS 300ppm		rep	1	Sodium	conc	0.01	mg/l	
		rep	2	Sodium	conc	0.71	mg/l	
		rep	3	Sodium	conc	-0.04	mg/l	
ICPS 300ppm								
	Sodium	av		0.22 mg/l	sd	0.421	%cv	187.36
-63		rep	1	Sodium	conc	103.69	mg/l	
		rep	2	Sodium	conc	104.57	mg/l	
		rep	3	Sodium	conc	103.45	mg/l	
-63								
	Sodium	av		103.91 mg/l	sd	0.588	%cv	0.57
-64		rep	1	Sodium	conc	36.60	mg/l	
		rep	2	Sodium	conc	36.49	mg/l	
		rep	3	Sodium	conc	36.32	mg/l	
-64								
	Sodium	av		36.49 mg/l	sd	0.182	%cv	0.50
		rep	1	Sodium	conc	34.13	mg/l	
		rep	2	Sodium	conc	33.50	mg/l	
		rep	3	Sodium	conc	33.57	mg/l	
-65								
	Sodium	av		33.73 mg/l	sd	0.348	%cv	1.02

Enc 615 2838
Enc 71

-accuracy
104

out of sample

-75	rep	1	Sodium	conc	210.16 mg/l		
	rep	2	Sodium	conc	207.22 mg/l		
	rep	3	Sodium	conc	208.04 mg/l		
Sodium	av	208.47 mg/l		sd	1.517 %cv	0.73	
-76	rep	1	Sodium	conc	98.94 mg/l		
	rep	2	Sodium	conc	101.22 mg/l		
	rep	3	Sodium	conc	101.35 mg/l		
-76 Sodium	av	100.50 mg/l		sd	1.355 %cv	1.35	
-77	rep	1	Sodium	conc	88.88 mg/l		
	rep	2	Sodium	conc	88.27 mg/l		
	rep	3	Sodium	conc	89.08 mg/l		
-77 Sodium	av	88.74 mg/l		sd	0.422 %cv	0.48	
-78	rep	1	Sodium	conc	33.20 mg/l		
	rep	2	Sodium	conc	32.71 mg/l		
	rep	3	Sodium	conc	32.88 mg/l		
-78 Sodium	av	32.93 mg/l		sd	0.249 %cv	0.76	
DI	rep	1	Sodium	conc	0.28 mg/l		
	rep	2	Sodium	conc	0.19 mg/l		
	rep	3	Sodium	conc	0.11 mg/l		
DI Sodium	av	0.19 mg/l		sd	0.088 %cv	45.82	
Soln C_2	rep	1	Sodium	conc	110.10 mg/l		
	rep	2	Sodium	conc	109.12 mg/l		
	rep	3	Sodium	conc	111.48 mg/l		
Soln C_2 Sodium	av	110.23 mg/l		sd	1.185 %cv	1.08	
ICPS 300ppm	rep	1	Sodium	conc	0.08 mg/l		
	rep	2	Sodium	conc	-0.08 mg/l		
	rep	3	Sodium	conc	-0.02 mg/l		
ICPS 300ppm Sodium	av	-0.01 mg/l		sd	0.077 %cv	921.75	

out of sample

Na result for
M3639-59
98 mg/L

3M
Worldwide Sponsor
1992 Olympic Games

-66	rep	1	Sodium	conc	28.71	mg/l		
	rep	2	Sodium	conc	30.86	mg/l		
	rep	3	Sodium	conc	29.30	mg/l		
Sodium	av	29.99	mg/l	sd	0.854	%cv	1.22	
-67	rep	1	Sodium	conc	41.44	mg/l		
	rep	2	Sodium	conc	41.47	mg/l		
	rep	3	Sodium	conc	41.48	mg/l		
-67								
Sodium	av	41.47	mg/l	sd	0.025	%cv	0.06	
-68	rep	1	Sodium	conc	501.33	mg/l		
	rep	2	Sodium	conc	505.65	mg/l		
	rep	3	Sodium	conc	492.45	mg/l		
-68								
Sodium	av	499.81	mg/l	sd	6.729	%cv	1.35	
-69	rep	1	Sodium	conc	214.76	mg/l		
	rep	2	Sodium	conc	210.82	mg/l		
	rep	3	Sodium	conc	212.98	mg/l		
-69								
Sodium	av	213.85	mg/l	sd	0.987	%cv	0.41	
-70	rep	1	Sodium	conc	330.20	mg/l		
	rep	2	Sodium	conc	322.11	mg/l		
	rep	3	Sodium	conc	319.63	mg/l		
-70								
Sodium	av	323.99	mg/l	sd	5.542	%cv	1.71	
Soln C_2	rep	1	Sodium	conc	104.75	mg/l		
	rep	2	Sodium	conc	102.95	mg/l		
	rep	3	Sodium	conc	104.21	mg/l		
Soln C_2								
Sodium	av	103.97	mg/l	sd	0.926	%cv	0.89	
-71	rep	1	Sodium	conc	290.12	mg/l		
	rep	2	Sodium	conc	293.47	mg/l		
	rep	3	Sodium	conc	287.02	mg/l		
-71								
Sodium	av	290.21	mg/l	sd	3.224	%cv	1.11	
-72	rep	1	Sodium	conc	133.18	mg/l		
	rep	2	Sodium	conc	131.34	mg/l		
	rep	3	Sodium	conc	134.49	mg/l		
-72								
Sodium	av	133.00	mg/l	sd	1.582	%cv	1.19	
-73	rep	1	Sodium	conc	236.60	mg/l		
	rep	2	Sodium	conc	237.30	mg/l		
	rep	3	Sodium	conc	241.53	mg/l		
-73								
Sodium	av	238.58	mg/l	sd	2.752	%cv	1.15	
	rep	1	Sodium	conc	201.00	mg/l		
	rep	2	Sodium	conc	199.10	mg/l		
	rep	3	Sodium	conc	202.17	mg/l		
-74								
Sodium	av	301.03	mg/l	sd	1.670	%cv	0.55	

M Analysis
Form 1038 - C

File	Sec.	Date	Sheet No.
M3639	STW	1-24-95	012495STW5

mg/kg

	A Hg	B	C	D	E	F Hg	G	H	J	K	L Hg	M	N	O	P	R
M3639-1	0.03			-18		0.03			-35		0.02					
-2	0.01			-19		0.14			-36		0.02					
-3	0.03			-20		0.070			-37		0.02					
-4	0.02			-21		0.02			-38		0.02					
-5	0.02			-22		0.10			-39		0.02					
-6	0.03			-23		0.078			-40		0.02					
-7	0.087			-24		0.01			-41		0.02					
-8	0.03			-25		0.02			-42		0.02					
-9	0.03			-26		0.04			-43		0.02					
-10	0.04			-27		0.03			-44		0.01					
-11	0.11			-28		0.02			-45		0.058					
-12	0.05			-29		0.02			-46		0.061					
-13	0.03			-30		0.02			-47		0.04					
-14	0.03			-31		0.02			-48		0.052					
-15	0.02			-32		0.02			-49		0.04					
-16	0.073			-33		0.02			-50		0.051					
-17	0.059			-34		0.02			-51		0.04					

M Analysis
Form 1038 - C

File: M3639 Cont | Sec. STW | Date: 1-26-95 | Sheet No.: 012695STW8

mg/kg

	A (Hg)	B	C	D	E	F (Hg)	G	H	J	K	L	M	N (Hg)	O	P	R
M3639-52	0.02			-69		0.05			DUP M3639-19				0.14			
-53	0.02			-70		0.02			DUP M3639-49				0.058			
-54	0.01			-71		0.02										
-55	0.01			-72		0.02										
-56	0.02			-73		0.04										
-57	0.02			-74		0.03										
-58	0.02			-75		0.02										
-59	0.02			-76		0.02										
-60	0.02			-77		0.02										
-61	0.01			-78		0.02										
-62	0.03		DUP ug/L			0.007										
-63	0.02		DUP ug/L			0.015										
-64	0.02		DUP ug/L			0.039										
-65	0.01		DES 2262			1.3										
-66	0.01		DES 1353			0.09										
-67	0.02		DUP M3639-11			0.063										
-68	0.04															

MERCURY PREPARATION WORKSHEET

Following Standard Methods 3112

Date 1-25-95

Analyst STW

→ Sample is weighed or measured into a 150 mL acid cleaned glass jar. Solids - 1gm Liquids - 50 mL
Add 2.5 mL H_2SO_4 and 1.25 mL HNO_3 and mix.
Add 7.5 mL $KMnO_4$ and let sit for 15 minutes to insure that purple color persists. Additional $KMnO_4$ may be needed.
Add 4 mL $K_2S_2O_8$ and heat for 2 hours in a water bath set at 95 C.
When samples are cooled to room temperature, add enough NaCl-hydroxylamine chloride to reduce excess $KMnO_4$.
Analyze samples using Automated Mercury Analyzer.

Calibration Stds	Vol. of 100ppb	$KMnO_4$ added	Final vol.	Standard prep
0 ppb	—	7.5 ml	50 ml	1.0 ml Hg 10 mg/L (prepared 12-1-94) diluted to 100 ml with DI water containing 0.2 ml HNO_3 = 100 ng/L
0.5 ppb	0.25 ml			
1.0	0.50			
5.0	2.50			
10.0	5.0			

Check Stds	Volume used	$KMnO_4$ added	Final vol.	Check standard prep
0.8 ppb	0.4 ml	7.5 ml	50 ml	1.0 ml Spex 2781 (Hg 10 mg/L) diluted to 100 ml with DI water containing 0.2 ml HNO_3 = 100 ng/L
2.0	1.0 ml	"	"	

ID	Sample wt/vol	$KMnO_4$ added	Final Vol.	Factor	Comments
M3639-33	1.1813g	7.5 ml	50 ml	42.33	
-34	1.0132g			49.35	
-35	1.0694g			46.76	
-36	1.1171g			44.76	
-37	1.0476g			47.73	
-38	1.0158g			49.22	
-39	1.0279g			48.64	
-40	1.0238g			48.84	
-41	1.0527g			47.50	
-42	1.1968g			41.78	

Mercury Prep Sheet Pg 2 of 2

ID	Sample wt/vol	KmnO4 used	Final volume	Factor	Comments
M13639-43	1.0043g	7.5ml	50 ml	49.78	
-44	1.0282g			48.63	
-45	1.1623g			43.02	
-46	1.1085g			45.11	
-47	1.0609g			47.13	
-48	1.0014g			49.93	
-49	1.0155g			49.24	
-50	1.0383g			48.16	
-51	1.0490g			47.66	
-52	1.0099g			49.51	
-53	1.1013g			45.40	
-54	1.0957g			45.63	
-55	1.0309g			48.50	
-56	1.0290g			48.59	
-57	1.0461g			47.80	
LCB	50ml			—	
dup 2262	1.2556g			39.82	

012695STW8

Protocol: samples

Folder: M3639 Rev: 2.008 Time: 15:06:28 26 Jan 1995
User: Seq: 0 Print: On
State: Idle Batch: Id: Ck3 Cup: 2 12 Gas: 0.30 LPM
Xmit: Off Autosampler: On

AUTOSAMPLER: Rack entry Rack M3639 Range 1 -44 Clear seQ Undo eXit

cup	Id	Extended id	Weight	Volume	Macro	checK	Help
1	M3639-33		1.0000	1.0000			
2	M3639-34		1.0000	1.0000			
3	M3639-35		1.0000	1.0000			
4	M3639-36		1.0000	1.0000			
5	M3639-37		1.0000	1.0000			
6	M3639-38		1.0000	1.0000			
7	M3639-39		1.0000	1.0000			
8	M3639-40		1.0000	1.0000			
9	M3639-41		1.0000	1.0000			
10	M3639-42		1.0000	1.0000			
11	M3639-43		1.0000	1.0000			
12	M3639-44		1.0000	1.0000			
13	M3639-45		1.0000	1.0000			
14	M3639-46		1.0000	1.0000			
15	M3639-47		1.0000	1.0000			

PgDn

Column entry, Ins to switch

```
Protocol: samples
                    Rev: 2.008   Time: 15:06:32  26 Jan 1995
Folder: M3639       Seq: 0                      Print: On
User:               Batch:              Id: Ck3        Cup: 2 12 Gas:    0.30 LPM
State: Idle                                            Xmit: Off Autosampler: On
```

```
AUTOSAMPLER:  Rack entry   Rack M3639    Range 1 -44 Clear seQ Undo eXit    PgUp
cup Id          Extended id          Weight Volume Macro checK Help
16 M3639-48                          1.0000 1.0000
17 M3639-49                          1.0000 1.0000
18 M3639-50                          1.0000 1.0000
19 QCB                               1.0000 1.0000
20 M3639-51                          1.0000 1.0000
21 M3639-52                          1.0000 1.0000
22 M3639-53                          1.0000 1.0000
23 M3639-54                          1.0000 1.0000
24 M3639-55                          1.0000 1.0000
25 M3639-56                          1.0000 1.0000
26 M3639-57                          1.0000 1.0000
27 QCS 2262                          1.0000 1.0000
28 ID                                1.0000 1.0000
29 ID                                1.0000 1.0000
30 IK                                1.0000 1.0000
                                                                          PgDn
```

```
                                                Column entry, Ins to switch
```

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 1 Rep: 1

Hg .000 ppb 272
Ave. Int. = 272

Seq: 0 15:10:36 26 Jan 1995 HG

189 80
180 S. D. = 96

*** Standard: 1 Rep: 1

Hg .000 ppb 275
Ave. Int. = 275

Seq: 1 15:13:37 26 Jan 1995 HG

185 77
179 S. D. = 99

*** Standard: 1 Rep: 2

Hg .000 ppb 483
Ave. Int. = 483

Seq: 2 15:16:38 26 Jan 1995 HG

385 261
376 S. D. = 111

*** Standard: 1 Rep: 3

Hg .000 ppb 488
Ave. Int. = 488

Seq: 3 15:19:39 26 Jan 1995 HG

372 384
415 S. D. = 64

*** Standard: 2 Rep: 1

Hg .500 ppb 6463
Ave. Int. = 6463

Seq: 4 15:22:40 26 Jan 1995 HG

6485 6334
6427 S. D. = 82

*** Standard: 2 Rep: 2

Hg .500 ppb 6433
Ave. Int. = 6433

Seq: 5 15:25:41 26 Jan 1995 HG

6356 6348
6379 S. D. = 47

*** Standard: 2 Rep: 3

Hg .500 ppb 6243
Ave. Int. = 6243

Seq: 6 15:28:42 26 Jan 1995 HG

6186 6126
6185 S. D. = 59

*** Standard: 3 Rep: 1

Hg 1.00 ppb 12321
Ave. Int. = 12321

Seq: 7 15:31:43 26 Jan 1995 HG

12290 12294
12302 S. D. = 17

*** Standard: 3 Rep: 2

Hg 1.00 ppb 12153
Ave. Int. = 12153

Seq: 8 15:34:44 26 Jan 1995 HG

12190 12334
12226 S. D. = 96

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Standard: 3 Rep: 3				Seq: 9		15:37:45 26 Jan 1995 HG		
Hg	1.00	ppb	12309	12316	12225			
			Ave. Int. =	12283 S. D. =	51			
*** Standard: 4 Rep: 1				Seq: 10		15:40:46 26 Jan 1995 HG		
Hg	5.00	ppb	58566	58118	58555			
			Ave. Int. =	58413 S. D. =	256			
*** Standard: 4 Rep: 2				Seq: 11		15:43:58 26 Jan 1995 HG		
Hg	5.00	ppb	57616	58295	58095			
			Ave. Int. =	58002 S. D. =	349			
*** Standard: 4 Rep: 3				Seq: 12		15:47:05 26 Jan 1995 HG		
Hg	5.00	ppb	58142	58263	58447			
			Ave. Int. =	58284 S. D. =	154			
*** Standard: 5 Rep: 1				Seq: 13		15:50:16 26 Jan 1995 HG		
Hg	10.0	ppb	114595	114717	114621			
			Ave. Int. =	114644 S. D. =	64			
*** Standard: 5 Rep: 2				Seq: 14		15:53:28 26 Jan 1995 HG		
Hg	10.0	ppb	114330	114441	114240			
			Ave. Int. =	114337 S. D. =	101			
*** Standard: 5 Rep: 3				Seq: 15		15:56:40 26 Jan 1995 HG		
Hg	10.0	ppb	114479	114272	115174			
			Ave. Int. =	114642 S. D. =	472			

Protocol: SAMPLES

Rev: 2.008 Time: 15:56:48 26 Jan 1995

Folder: M3639 Seq: 16 Print: On

User: Batch: Id: Std5Rep3 Cup: 2 12 Gas: 0.30 LPM

State: Idle Macro CAL2 56 : F3 Print Xmit: Off Autosampler: On

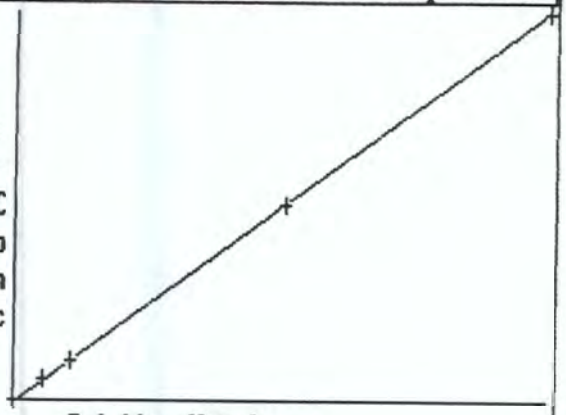
CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted LiNear
S1	.000	-.031	-.031	Quadratic
S2	.500	.495	-.005	WtdLinear
S3	1.00	1.02	.016	C
S4	5.00	5.04	.043	Accept o
S5	10.0	9.98	-.023	n
S6				StdAdd c

A .0000000 r .999975

B 8.76199e-5 C -5.93122e-2



	Mean	%RSD	Relative Absorbance		
S1	323	39.13	179	376	415
S2	6330	2.02	6427	6379	6185
S3	12270	0.32	12302	12226	12283
S4	58233	0.36	58413	58002	58284
S5	114541	0.15	114644	114337	114642
S6			-2958?	-1485?	-998?

New cal coefficients stored

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: M3639-33				Seq: 16		15:59:51 26 Jan 1995 HG		
Hg	.475	ppb	.005	.470	.476	.480		
*** Sample ID: M3639-34				Seq: 17		16:02:47 26 Jan 1995 HG		
Hg	.498	ppb	.006	.503	.499	.491		
*** Sample ID: M3639-35				Seq: 18		16:05:43 26 Jan 1995 HG		
Hg	.476	ppb	.004	.474	.480	.473		
*** Sample ID: M3639-36				Seq: 19		16:08:39 26 Jan 1995 HG		
Hg	.430	ppb	.006	.423	.435	.433		
*** Sample ID: M3639-37				Seq: 20		16:11:35 26 Jan 1995 HG		
Hg	.426	ppb	.005	.423	.431	.423		
*** Sample ID: M3639-38				Seq: 21		16:14:31 26 Jan 1995 HG		
Hg	.340	ppb	.002	.340	.342	.338		
*** Sample ID: M3639-39				Seq: 22		16:17:27 26 Jan 1995 HG		
Hg	.452	ppb	.003	.449	.452	.454		
*** Sample ID: M3639-40				Seq: 23		16:20:23 26 Jan 1995 HG		
Hg	.402	ppb	.006	.397	.408	.400		

*** Check Standard: 1 Ck1 Seq: 24 16:23:21 26 Jan 1995 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.023	.200	ppb	.005

*** Sample ID: M3639-41				Seq: 25		16:26:18 26 Jan 1995 HG		
Hg	.526	ppb	.002	.525	.526	.528		
*** Sample ID: M3639-42				Seq: 26		16:29:14 26 Jan 1995 HG		
Hg	.565	ppb	.002	.563	.565	.566		

*** Check Standard: 2 Ck2 Seq: 27 16:32:12 26 Jan 1995 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		94.7	.757	.800	ppb	.006

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: M3639-43				Seq: 28	16:35:09 26 Jan 1995 HG			
Hg	.455	ppb	.002	.455	.456	.453		
*** Sample ID: M3639-44				Seq: 29	16:38:05 26 Jan 1995 HG			
Hg	.240	ppb	.001	.240	.241	.239		
*** Check Standard: 3 Ck3				Seq: 30	16:41:02 26 Jan 1995 HG			
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		89.0	1.78	2.00	ppb	.009		
*** Sample ID: M3639-45				Seq: 31	16:44:00 26 Jan 1995 HG			
Hg	1.36	ppb	.015	1.36	1.34	1.37		
*** Sample ID: M3639-46				Seq: 32	16:46:57 26 Jan 1995 HG			
Hg	1.35	ppb	.007	1.34	1.35	1.34		
*** Sample ID: M3639-47				Seq: 33	16:49:54 26 Jan 1995 HG			
Hg	.922	ppb	.004	.918	.923	.926		
*** Sample ID: M3639-48				Seq: 34	16:52:48 26 Jan 1995 HG			
Hg	1.05	ppb	.005	1.04	1.05	1.05		
*** Check Standard: 1 Ck1				Seq: 35	16:55:45 26 Jan 1995 HG			
Line	Flag	Found	Range(+/-)	Units	SD/RSD			
Hg		-.032	.200	ppb	.004			
*** Sample ID: M3639-49				Seq: 36	16:58:41 26 Jan 1995 HG			
Hg	.895	ppb	.005	.891	.894	.901		
*** Sample ID: M3639-50				Seq: 37	17:01:36 26 Jan 1995 HG			
Hg	1.05	ppb	.007	1.05	1.04	1.05		
*** Sample ID: QCB				Seq: 38	17:04:30 26 Jan 1995 HG			
Hg	.015	ppb	.004	.019	.012	.013		
*** Sample ID: M3639-51				Seq: 39	17:07:24 26 Jan 1995 HG			
Hg	.781	ppb	.003	.777	.784	.781		

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 2 Ck2 Seq: 40 17:10:21 26 Jan 1995 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		92.5	.740	.800	ppb	.008

*** Sample ID: M3639-52 Seq: 41 17:13:17 26 Jan 1995 HG

Hg	.435	ppb	.006	.430	.435	.442

*** Sample ID: M3639-53 Seq: 42 17:16:12 26 Jan 1995 HG

Hg	.378	ppb	.006	.375	.374	.384

*** Sample ID: M3639-54 Seq: 43 17:19:07 26 Jan 1995 HG

Hg	.274	ppb	.008	.264	.277	.280

*** Sample ID: M3639-55 Seq: 44 17:22:00 26 Jan 1995 HG

Hg	.308	ppb	.002	.308	.310	.305

*** Check Standard: 1 Ck1 Seq: 45 17:24:55 26 Jan 1995 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.015	.200	ppb	.002

*** Check Standard: 3 Ck3 Seq: 46 17:27:53 26 Jan 1995 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		87.0	1.74	2.00	ppb	.006

*** Sample ID: M3639-56 Seq: 47 17:30:50 26 Jan 1995 HG

Hg	.330	ppb	.002	.328	.332	.331

*** Sample ID: M3639-57 Seq: 48 17:33:43 26 Jan 1995 HG

Hg	.437	ppb	.004	.441	.434	.437

*** Sample ID: QCS 2262 Seq: 49 17:36:36 26 Jan 1995 HG

Hg	32.2	ppb	.072	32.1	32.1	32.3

*** Sample ID: ID Seq: 50 17:40:00 26 Jan 1995 HG

Hg	-.357	ppb	.002	-.357	-.359	-.355

*** Sample ID: ID Seq: 51 17:42:57 26 Jan 1995 HG

Hg	-.140	ppb	.003	-.139	-.138	-.143

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: IK				Seq: 52	17:45:51 26 Jan 1995 HG			
Hg	-.126	ppb	.002	-.124	-.126	-.127		
*** Check Standard: 2 Ck2				Seq: 53	17:48:47 26 Jan 1995 HG			
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		91.9	.735	.800	ppb	.002		
*** Sample ID: IK				Seq: 54	17:51:43 26 Jan 1995 HG			
Hg	-.093	ppb	.000	-.093	-.093	-.094		
*** Check Standard: 1 Ck1				Seq: 55	17:54:39 26 Jan 1995 HG			
Line	Flag	Found	Range(+/-)	Units	SD/RSD			
Hg		-.015	.200	ppb	.004			
*** Sample ID: ID M3639-35				Seq: 56	17:57:36 26 Jan 1995 HG			
Hg	.443	ppb	.005	.439	.442	.448	Reruns 0.476	
*** Sample ID: ID M3639-48				Seq: 57	18:00:30 26 Jan 1995 HG			
Hg	1.29	ppb	.008	1.29	1.29	1.30	Reruns 1.05	
*** Sample ID: IK M3639-45+1				Seq: 58	18:03:25 26 Jan 1995 HG			
Hg	2.55	ppb	.007	2.55	2.55	2.56	Bkgd 1.36	% recovery 119
*** Sample ID: IK M3639-50+1				Seq: 59	18:06:22 26 Jan 1995 HG			
Hg	2.21	ppb	.023	2.19	2.22	2.24	Bkgd 1.05	% recovery 116

M3639

Hg2

Mercury Prep Sheet Pg 2 of 3

ID	Sample wt/vol	KmnO4 used	Final volume	Factor	Comments
M3665	50ml	7.5ml	50ml	—	
-6	50ml			—	
M3639-1	1.0176g			49.14	
-2	1.0460g			47.80	
-3	1.0110g			49.46	
-4	1.0613g			47.11	
-5	1.0371g			48.21	
-6	1.0248g			48.79	
-7	1.0109g			49.46	
-8	1.0085g			49.58	
-9	1.0628g			47.04	
-10	1.0037g			49.82	
-11	1.0012g			49.94	
-12	1.0314g			48.48	
-13	1.0158g			49.22	
-14	1.0330g			48.40	
-15	1.0901g			45.87	
-16	1.0218g			48.93	
-17	1.0648g			46.96	
-18	1.0161g			49.21	
-19	1.0145g			49.29	
-20	1.0263g			48.72	
-21	1.0420g			47.98	
-22	1.0332g			48.39	
MB	50ml			—	
MS1376	0.5424g			92.18	
D					
1009-4	0.382g			131	

M3639
Raw data filed w/N1009

1-24-95
012495 STWS

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 2 Ck2 Seq: 40 16:04:52 24 Jan 1995 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg	L	79.2	.634	.800	ppb	.010

*** Sample ID: M3639-2 Seq: 41 16:07:48 24 Jan 1995 HG

Hg	.289	ppb	.003	.293	.289	.286

*** Sample ID: M3639-3 Seq: 42 16:10:43 24 Jan 1995 HG

Hg	.524	ppb	.006	.531	.522	.520

*** Sample ID: M3639-4 Seq: 43 16:13:38 24 Jan 1995 HG

Hg	.524	ppb	.001	.523	.525	.525

*** Sample ID: M3639-5 Seq: 44 16:16:31 24 Jan 1995 HG

Hg	.369	ppb	.005	.363	.371	.372

*** Check Standard: 1 Ck1 Seq: 45 16:19:26 24 Jan 1995 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.015	.200	ppb	.001

*** Check Standard: 3 Ck3 Seq: 46 16:22:24 24 Jan 1995 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		91.9	1.84	2.00	ppb	.012

*** Sample ID: M3639-6 Seq: 47 16:25:21 24 Jan 1995 HG

Hg	.672	ppb	.007	.665	.674	.678

*** Sample ID: M3639-7 Seq: 48 16:28:14 24 Jan 1995 HG

Hg	1.75	ppb	.003	1.75	1.75	1.76

*** Sample ID: M3639-8 Seq: 49 16:31:09 24 Jan 1995 HG

Hg	.521	ppb	.005	.527	.519	.518

*** Sample ID: M3639-9 Seq: 50 16:34:02 24 Jan 1995 HG

Hg	.651	ppb	.011	.638	.654	.660

*** Sample ID: M3639-10 Seq: 51 16:36:56 24 Jan 1995 HG

Hg	.838	ppb	.004	.841	.833	.839

MERCURY PREPARATION WORKSHEET

Following Standard Methods 3112

Date 1-30-95

Analyst JTW

Sample is weighed or measured into a 150 mL acid cleaned glass jar. Solids - 1gm Liquids - 50 mL
Add 2.5 mL H_2SO_4 and 1.25 mL HNO_3 and mix.
Add 7.5 mL $KMnO_4$ and let sit for 15 minutes to insure that purple color persists. Additional $KMnO_4$ may be needed.
Add 4 mL $K_2S_2O_8$ and heat for 2 hours in a water bath set at 95 C.
When samples are cooled to room temperature, add enough NaCl-hydroxylamine chloride to reduce excess $KMnO_4$.
Analyze samples using Automated Mercury Analyzer.

Calibration Stds	Vol. of 100ppb	$KMnO_4$ added	Final vol.	Standard prep
C ppb	—	7.5 mL	50 mL	
0.5	0.25 mL			
1	0.50			
5	2.50			
10	5.00	"	"	

Check Stds	Volume used	$KMnO_4$ added	Final vol.	Check standard prep
0.8 ppb	0.4 mL	7.5 mL	50 mL	
2.0	1.0 mL	"	"	

ID	Sample wt/vol	$KMnO_4$ added	Final Vol.	Factor	Comments
M3689-58	1.0096 g	7.5 mL	50 mL	49.52	
-59	1.0380 g			48.17	
-60	1.0040 g			49.80	
-61	1.0063 g			49.69	
-62	1.0274 g			48.67	
-63	1.0896 g			45.89	
-64	1.1243 g			44.47	
-65	1.0225 g			48.90	
-66	1.0514 g			47.56	
-67	1.0636 g	"	"	47.01	

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639

SPIKE SOLN. S1376

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Hg

M3639-12 (0.017 mg/l)(0.05L) - (0.05 mg/kg)(1.0986 g)(1/1000)

(0.6874g)(1.44 mg/kg)(1/1000)

$\frac{0.00085 - 0.000055}{0.00099}$ X 100% = 81%

Element Hg

M3639-23 (0.0134 mg/l)(0.05L) - (0.078 mg/kg)(1.1207 g)(1/1000)

(0.5286g)(1.44 mg/kg)(1/1000)

$\frac{0.00067 - 0.000087}{0.00076}$ X 100% = 77%

Element Hg

M3639-51 (0.0148 mg/l)(0.05L) - (0.04 mg/kg)(1.0768 g)(1/1000)

(0.5531 g)(1.44 mg/kg)(1/1000)

$\frac{0.74 - 0.043}{0.796}$ X 100% = 88%

Element

(mg/l)(0.05L) - (mg/kg)(g)(1/1000)

( )( )(1/1000)

X100%

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID: M3639-61				Seq: 52		18:17:16 31 Jan 1995 HG		
Hg	.294	ppb	.001	.295	.295	.292		
*** Check Standard: 2 Ck2				Seq: 53		18:20:12 31 Jan 1995 HG		
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg	L	70.8	.567	.800	ppb	.005		
*** Sample ID: M3639-62				Seq: 54		18:23:08 31 Jan 1995 HG		
Hg	.669	ppb	.007	.668	.676	.663		
*** Sample ID: M3639-63				Seq: 55		18:26:02 31 Jan 1995 HG		
Hg	.394	ppb	.003	.396	.394	.391		
*** Check Standard: 1 Ck1				Seq: 56		18:28:58 31 Jan 1995 HG		
Line	Flag	Found	Range(+/-)	Units	SD/RSD			
Hg		.059	.200	ppb	.006			
*** Sample ID: M3639-64				Seq: 57		18:31:54 31 Jan 1995 HG		
Hg	.377	ppb	.005	.372	.376	.381		
*** Sample ID: M3639-65				Seq: 58		18:34:47 31 Jan 1995 HG		
Hg	.238	ppb	.003	.235	.239	.242		
*** Sample ID: M3639-66				Seq: 59		18:37:39 31 Jan 1995 HG		
Hg	.313	ppb	.001	.312	.313	.313		
*** Sample ID: M3639-67				Seq: 60		18:40:31 31 Jan 1995 HG		
Hg	.379	ppb	.002	.379	.381	.377		
*** Check Standard: 3 Ck3				Seq: 61		18:43:28 31 Jan 1995 HG		
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg	L	74.2	1.48	2.00	ppb	.007		
*** Sample ID: M3639-68				Seq: 62		18:46:24 31 Jan 1995 HG		
Hg	.753	ppb	.003	.750	.756	.752		
*** Sample ID: M3639-69				Seq: 63		18:49:18 31 Jan 1995 HG		
Hg	.993	ppb	.005	.988	.997	.995		

CORDOVA RESULTS

Reported results		Cordova Soils						
MG/KG	CD	CO	CR	CU	FE	NI	PB-MS	ZN
M3639-1	<1	10	25	9.9	17000	21	9.4	47
-2	<1	9	22	8.3	15000	17	7.6	39
-3	<1	30	32	12	22000	26	10	42
-4	<1	40	33	12	21000	29	13	51
-5	<1	10	23	8.9	15000	16	9.5	38
-6	<1	120	29	9.5	26000	38	12	50
-7	<1	220	43	13	42000	64	20	88
-8	<1	58	29	10	21000	28	12	47
-9	<1	40	27	10	19000	24	9.8	51
-10	<1	190	28	7	30000	49	13	46
-11	<1	140	50	17	37000	51	21	99
-12	<1	73	39	12	26000	31	12	46
-13	<1	80	25	8.1	21000	29	8.2	38
-14	<1	94	34	9.6	25000	32	9.6	45
-15	<1	20	29	7.3	17000	21	7.3	35
16	<1	55	30	9	23000	26	14	60
-17	<1	230	29	11	31000	41	13	35
-18	<1	57	18	7.6	16000	30	7.6	39
-19	<1	430	39	14	46000	120	18	73
-20	<1	140	32	12	26000	51	14	68
-21	<1	55	29	10	22000	33	10	48
-22	<1	73	26	11	21000	39	10	51
-23	<1	85	18	6	16000	30	7.4	33
-24	<1	40	19	7.3	15000	25	8.7	39
-25	<1	40	18	6.3	15000	28	6.7	34
-26	<1	40	19	6.3	14000	19	5.9	35
-27	<1	30	14	5.4	12000	16	4.9	29
-28	<1	30	15	5.8	14000	14	6.2	31
-29	<1	40	14	5.7	14000	23	5.7	30
-30	<1	30	15	4	14000	16	5.5	27
-31	<1	20	11	4	11000	12	4.6	24
-32	<1	20	21	8.2	15000	24	7.3	39
-33	<1	40	23	7	17000	30	7.3	38
-34	<1	30	23	8.7	17000	26	7.3	40
-35	<1	56	18	7.4	16000	33	7.2	38
-36	<1	56	20	6.6	16000	33	7	37
-37	<1	40	18	6.4	15000	24	6.9	32
-38	<1	60	17	6.6	15000	28	7.4	35
-39	<1	40	20	7.3	16000	27	6.7	35
-40	<1	30	19	25	15000	25	6.4	34
-41	<1	10	19	6.4	13000	17	5.5	32
-42	<1	20	24	7.1	15000	19	7.3	33
-43	<1	30	25	7.9	16000	22	7.8	32
-44	<1	30	24	6.5	14000	20	6.7	30
-45	<1	10	33	8.8	16000	17	12	41
-46	<1	10	30	7.7	16000	18	11	41
-47	<1	9	26	8.8	13000	17	11	46
-48	<1	10	34	10	19000	20	11	45
-49	<1	10	30	10	17000	18	10	40
-50	<1	10	26	9.1	16000	18	11	48
-51	<1	9	21	6.2	13000	15	7.3	32
-52	<1	9	17	6	12000	13	7.2	31
-53	<1	5	15	8.5	11000	15	3.5	20
-54	<1	5	17	11	13000	14	3.7	21

CORDOVA RESULTS

	CD	CO	CR	CU	FE	NI	PB-MS	ZN
-55	<1	7	22	12	13000	15	5	24
-56	<1	6	19	6.4	12000	13	4.4	20
-57	<1	<5	17	6.7	11000	14	3.7	19
-58	<1	5	15	7.7	11000	16	3.7	19
-59	<1	10	17	10	13000	20	3.8	40
-60	<1	10	15	8.2	11000	18	3.2	48
-61	<1	6	11	7.7	9200	15	2.8	14
-62	<1	8	24	11	17000	21	8	37
-63	<1	8	21	11	14000	19	4.8	24
-64	<1	5	11	6.1	8800	13	2.6	13
-65	<1	6	9.6	5.2	7100	11	2.5	12
-66	<1	7	7.9	7.1	7100	12	2.8	12
-67	<1	20	14	8.6	12000	20	3.4	20
-68	<1	9	21	7.8	14000	18	7.5	36
-69	<1	170	18	6.4	21000	52	28	35
-70	<1	40	20	6.8	17000	26	7	34
-71	<1	40	16	6.4	15000	25	6.1	31
-72	<1	7	22	7	13000	15	5	22
-73	<1	9	34	14	22000	23	9.2	48
-74	<1	15	22	9.1	17000	20	9.8	45
-75	<1	10	22	8.6	15000	33	7.6	38
-76	<1	7	14	9.2	11000	16	3.5	20
-77	<1	6	17	11	12000	16	3.3	20
-78	<1	6	11	8.7	9200	13	2.9	15
QCB mg/l	0.008	-0.011	-0.002	-0.001	-0.43	-0.01	2.14 UG/L	0.041
QCB mg/l	0.003	0.018	0.005	0.002	-0.1	-0.01	-0.2	-0.003
QCB mg/l	0.002	-0.012	0.03	-0.003	0.11	-0.007	-0.66	0.004
QCB mg/l	0.002	0.002	0.004	0.002	0.04	0.022	-0.61	0.005
QCS 2262	0.5	12	82	29	31000	73	13	95
QCS 1376	3	11	97	94	34000	38	150	410
QCS 1366	<0.5	3	8	<3	36000	4	7	65
QCS 1367	<0.5	2	16	11	11000	8	8.7	39
QCD-1	<1	10	22	9	17000	20	9.8	45
QCD-2	<1	10	21	8	15000	17	15	38
QCD-21	<1	58	23	10	22000	33	14	46
QCD-22	<1	75	20	10	21000	36	10	49
QCD-42	<1	18	22	7	15000	20	7.1	34
QCD-52	<1	8	18	5	12000	14	6.7	30
QCD-61	<1	6	13	8	9900	14	3	14
QCD-62	<1	6	26	12	18000	20	7.4	38

3M/ENVIRONMENTAL LABORATORY
METALS - SAMPLE PREPARATION

DATE: 12-27-94
ANALYST: SRW

LR#: M3639 DESC: CORDOVA ANNUAL SOIL SAMPLES 199 REQUESTER: MTE/JSH/MJK
PROJ NO: 20-7903 DEPT:0222 METAL-PREP DUE DATE:

SAMPLE	SAMP WT	INI VOL	FIN VOL	FACTOR	PREPARATION AND OBSERVATIONS
M3639- 1	1.0048		50ml	49.76	5ml HNO_3, heat, 2ml $HClO_4$, heat
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 2	1.0077			49.62	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 3	1.0510			47.57	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 4	1.0165			49.19	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 5	1.0240			48.83	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 6	1.0507			47.59	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 7	1.0064			49.68	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 8	1.1890			42.05	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 9	1.0295			48.57	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 10	1.0214			48.95	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 11	1.0399			48.08	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 12	1.0177			49.13	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 13	1.0265			48.71	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 14	1.0295			48.57	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 15	1.0491			47.66	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
QCD-1 M3639-1	0.5159			96.92	
QCD-2 M3639-2	0.5061			98.79	
QCK-1 M3639-3	1.0177 sample 1.0051 S2262			2.0228 total	
QCK-2 M3639-4	1.1096 sample 1.0059 S2262			2.1155 total	
QCS-1 S2262	1.0069			49.66	
QCB-1	0			—	

Samples 1-15 12-27-94

delete

3M/ENVIRONMENTAL LABORATORY
METALS - SAMPLE PREPARATION

DATE: 1-3-95
ANALYST: SDW (21-40)

LR#: M3639 DESC: CORDOVA ANNUAL SOIL SAMPLES 199 REQUESTER: MIE/JSH/MJK
PROJ NO: 20-7903 DEPT:0222 METAL-PREP DUE DATE:

SAMPLE	SAMP WT	INI VOL	FIN VOL	FACTOR	PREPARATION AND OBSERVATIONS
M3639- 16	1.0165		50ml	49.19	5ml HNO_3, heat, 2ml $HClO_4$, heat
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					Dilute
M3639- 17	1.0182			49.11	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 18	1.0271			48.68	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 19	1.0268			48.69	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 20	1.0555			47.37	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 21	1.0267			46.97	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 22	~~1.0144~~ 1.0348			48.32	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 23	1.0041			49.80	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 24	1.0180			49.12	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 25	1.0285			48.61	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 26	1.1235			44.50	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 27	1.0177			49.13	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 28	1.0103			49.49	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 29	1.0215			48.95	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 30	1.0112			49.45	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
QCD-B	M3639-21	0.5418		92.23	
QCD-4	M3639-22	0.5173		96.66	
QC-3	M3639-23	1.0516 sample + 1.0032 S12263		2.0548 total	
QC-4	M3639-24	1.0166 sample + 1.0226 S13576		2.0392 total	
QCS-2	S13576	1.0270		48.68	
QCB-2	Blank	0		—	

3M/ENVIRONMENTAL LABORATORY
METALS - SAMPLE PREPARATION

DATE: 1-3-95
ANALYST: SDW

LR#: M3639 DESC: CORDOVA ANNUAL SOIL SAMPLES 199 REQUESTER: MTE/JSH/MJK
PROJ NO: 20-7903 DEPT:0222 METAL-PREP DUE DATE:

SAMPLE	SAMP WT	INI VOL	FIN VOL	FACTOR	PREPARATION AND OBSERVATIONS
M3639- 31	1.0170		50ml	49.16	5ml HNO_3, heat, 5ml $HClO_4$, heat to dense
M3639- 32	1.0491			47.66	
M3639- 33	1.0371			48.21	
M3639- 34	1.0015			49.92	
M3639- 35	1.0209			48.98	
M3639- 36	1.0079			49.61	
M3639- 37	1.0103			49.49	
M3639- 38	1.0292			48.58	
M3639- 39	1.0486			47.68	
M3639- 40	1.0542			47.43	
M3639- 41	1.0061			49.70	
M3639- 42	1.0273			48.67	
M3639- 43	1.0260			48.73	
M3639- 44	1.0235			48.85	
M3639- 45	1.0303			48.53	

CD CO CR CU FE HG METAL-PREP NI PB-MS ZN

1-3-95
21-40

1-47
41-60
STW

3M/ENVIRONMENTAL LABORATORY
METALS - SAMPLE PREPARATION

DATE: 1-17-95
ANALYST: JW

LR#: M3639 DESC: CORDOVA ANNUAL SOIL SAMPLES 199 REQUESTER: MTE/JSH/MJK
PROJ NO: 20-7903 DEPT:0222 METAL-PREP DUE DATE:

SAMPLE	SAMP WT	INI VOL	FIN VOL	FACTOR	PREPARATION AND OBSERVATIONS
M3639- 46	1.0041		50ml	49.80	5ml HNO3, heat, 2ml HClO4 heat
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					delete
M3639- 47	1.0048			49.76	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 48	1.0312			48.49	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 49	1.0271			48.68	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 50	1.0308			48.51	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 51	1.0410			48.03	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 52	1.0251			48.78	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 53	1.0173			49.15	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 54	1.0073			49.64	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 55	1.0442			47.88	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 56	1.0130			49.36	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 57	1.0275			48.66	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 58	1.0508			47.58	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 59	1.0092			49.54	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
M3639- 60	1.0335			48.43	
CD CO CR CU FE HG METAL-PREP NI PB-MS ZN					
QCB-3	CB3	0			
QCS-3	CB 1366	1.0179g		49.12	
QCD-5	CD-42	0.5641g		88.64	
QCD-6	CD-52	0.5250g		95.24	
QCK-5	ML-45	1.0442g / 1.3114g	-45 S1366		
QCK-6	ML-55	1.0093g / 1.2224g	-55 S1366		

1-17
41-60
SW

3M/ENVIRONMENTAL LABORATORY
METALS - SAMPLE PREPARATION

DATE: 1-23-95
ANALYST: SDW

LR#: M3639 DESC: CORDOVA ANNUAL SOIL SAMPLES 199 REQUESTER: MTE/JSH/MJK
PROJ NO: 20-7903 DEPT:0222 METAL-PREP DUE DATE:

SAMPLE	SAMP WT	INI VOL	FIN VOL	FACTOR	PREPARATION AND OBSERVATIONS
M3639- 61	1.1513		50ml	~~49.90~~ 43.43	5ml HNO3, heat, 2ml HClO4, heat dilute
M3639- 62	1.0019			49.90	
M3639- 63	1.0140			49.31	
M3639- 64	1.0381			48.16	
M3639- 65	1.0459			46.91	
M3639- 66	1.0354			48.29	
M3639- 67	1.0207			48.98	
M3639- 68	1.2613			39.64	
M3639- 69	1.0137			49.32	
M3639- 70	1.0257			48.75	
M3639- 71	1.0469			46.86	
M3639- 72	1.2208			40.96	
M3639- 73	1.0347			48.32	
M3639- 74	1.0346 Dup1			48.33	
M3639- 75	1.0171 Dup2			49.16	
QCD-7	M3639-61	0.5677		88.07	
QCD-8	M3639-62	0.4772		104.78	
QCK-7	M3639-63	1.0562 sample 1.0410 S1367		total 2.0972	
QCK-8	M3639-64	1.0601 sample 1.0130 S1367		total 2.0731	
QCS-4	S1367	1.0233		48.86	
QCB-4		0			

3M/ENVIRONMENTAL LABORATORY
METALS - SAMPLE PREPARATION

DATE: 1-23-95
ANALYST: SQN

LR#: M3639 DESC: CORDOVA ANNUAL SOIL SAMPLES 199 REQUESTER: MTE/JSH/MJK
PROJ NO: 20-7903 DEPT:0222 METAL-PREP DUE DATE:

SAMPLE	SAMP WT	INI VOL	FIN VOL	FACTOR	PREPARATION AND OBSERVATIONS
M3639- 76 CD CO CR CU FE HG METAL-PREP NI PB-MS ZN	1.1505	dup 53	50ml	43.46	5ml HNO_3, heat, 2ml HCl Aq, heat dilute
M3639- 77 CD CO CR CU FE HG METAL-PREP NI PB-MS ZN	1.0667	dup 54		46.87	
M3639- 78 CD CO CR CU FE HG METAL-PREP NI PB-MS ZN	1.2741	dup 61		39.24	

24 QC Samples
+ 5 dups (74-78)
29 total of 73 samples = 40% QC

Its possible 74+75 got switched. They are dups, so that will help. There are 3 replicates of those samples (#1+2)

74 #1
75 #2
76 - #53
77 - #54
78 - #61

			Cordova Soils		
mg/l in solut.	M3639-1	M3639-2	M3639-3	M3639-4	M3639-5
Cadmium	0.005	0.008	0.001	0.007	0.006
Cobalt	0.247	0.190	0.710	0.815	0.282
Chromium	0.495	0.450	0.669	0.663	0.467
Copper	0.198	0.167	0.262	0.241	0.183
Iron	346.480	303.400	457.790	426.000	311.660
Nickel	0.426	0.348	0.548	0.580	0.329
Lead	0.189	0.153	0.220	0.255	0.194
Zinc	0.940	0.796	0.885	1.032	0.774
Digestion Fact.	49.760	49.620	47.570	49.190	48.830
Reported mg/kg	M36369-1	M3639-2	M3639-3	M3639-4	M3639-5
Cadmium	0.249	0.397	0.048	0.344	0.293
Cobalt	12.291	9.428	33.775	40.090	13.770
Chromium	24.631	22.329	31.824	32.613	22.804
Copper	9.852	8.287	12.463	11.855	8.936
Iron	17240.845	15054.708	21777.070	20954.940	15218.358
Nickel	21.198	17.268	26.068	28.530	16.065
Lead	9.405	7.592	10.465	12.543	9.473
Zinc	46.774	39.498	42.099	50.764	37.794
mg/l in solut.	M3639-6	M3639-7	M3639-8	M3639-9	M3639-10
Cadmium	0.011	0.014	0.006	0.009	0.007
Cobalt	2.549	4.471	1.379	0.833	3.905
Chromium	0.611	0.866	0.686	0.549	0.571
Copper	0.199	0.257	0.238	0.214	0.144
Iron	538.300	843.920	504.700	397.910	621.870
Nickel	0.802	1.291	0.658	0.496	0.994
Lead	0.262	0.398	0.290	0.201	0.273
Zinc	1.043	1.762	1.120	1.047	0.946
Digestion Fact.	47.590	49.680	42.050	48.570	48.950
Reported mg/kg	M3639-6	M3639-7	M3639-8	M3639-9	M3639-10
Cadmium	0.523	0.696	0.252	0.437	0.343
Cobalt	121.307	222.119	57.987	40.459	191.150
Chromium	29.077	43.023	28.846	26.665	27.950
Copper	9.470	12.768	10.008	10.394	7.049
Iron	25617.697	41925.946	21222.635	19326.489	30440.537
Nickel	38.167	64.137	27.669	24.091	48.656
Lead	12.469	19.773	12.195	9.763	13.363

Zinc	49.636	87.536	47.096	50.853	46.307
mg/l in solut.	M3639-11	M3639-12	M3639-13	M3639-14	M3639-15
Cadmium	0.016	0.012	0.013	0.006	0.004
Cobalt	3.026	1.491	1.643	1.930	0.426
Chromium	1.037	0.796	0.512	0.699	0.604
Copper	0.349	0.239	0.167	0.197	0.153
Iron	763.150	532.740	434.750	510.400	357.200
Nickel	1.066	0.630	0.586	0.668	0.441
Lead	0.445	0.252	0.169	0.197	0.153
Zinc	2.051	0.930	0.781	0.918	0.743
Digestion Fact.	48.080	49.130	48.710	48.570	47.660
Reported mg/kg	M3639-11	M3639-12	M3639-13	M3639-14	M3639-15
Cadmium	0.769	0.590	0.633	0.291	0.191
Cobalt	145.490	73.253	80.031	93.740	20.303
Chromium	49.859	39.107	24.940	33.950	28.787
Copper	16.780	11.742	8.135	9.568	7.292
Iron	36692.252	26173.516	21176.673	24790.128	17024.152
Nickel	51.253	30.952	28.544	32.445	21.018
Lead	21.396	12.381	8.232	9.568	7.292
Zinc	98.612	45.691	38.043	44.587	35.411
mg/l in solut.	M3639-16	M3639-17	M3639-18	M3639-19	M3639-20
Cadmium	0.007	0.006	0.005	0.017	0.007
Cobalt	1.121	4.614	1.174	8.929	2.951
Chromium	0.601	0.600	0.372	0.807	0.686
Copper	0.182	0.219	0.156	0.280	0.257
Iron	471.620	624.030	332.360	951.900	540.310
Nickel	0.533	0.838	0.614	2.451	1.079
Lead	0.276	0.260	0.156	0.379	0.291
Zinc	1.221	1.319	0.797	1.506	1.428
Digestion Fact.	49.190	49.110	48.680	48.690	47.370
Reported mg/kg	M3639-16	M3639-17	M3639-18	M3639-19	M3639-20
Cadmium	0.344	0.295	0.243	0.828	0.332
Cobalt	55.142	226.594	57.150	434.753	139.789
Chromium	29.563	29.466	18.109	39.293	32.496
Copper	8.953	10.755	7.594	13.633	12.174
Iron	23198.988	30646.113	16179.285	46348.011	25594.485
Nickel	26.218	41.154	29.890	119.339	51.112
Lead	13.576	12.769	7.594	18.454	13.785

Zinc	60.061	64.776	38.798	73.327	67.644
mg/l in solut.	M3639-21	M3639-22	M3639-23	M3639-24	M3639-25
Cadmium	0.003	0.004	0.005	0.002	0.004
Cobalt	1.168	1.508	1.715	0.807	0.901
Chromium	0.616	0.532	0.360	0.383	0.371
Copper	0.221	0.228	0.121	0.148	0.130
Iron	466.750	442.630	324.810	301.870	308.510
Nickel	0.712	0.813	0.606	0.518	0.575
Lead	0.221	0.214	0.148	0.177	0.138
Zinc	1.021	1.057	0.668	0.790	0.708
Digestion Fact.	46.920	48.320	49.800	49.120	48.610
Reported mg/kg	M3639-21	M3639-22	M3639-23	M3639-24	M3639-25
Cadmium	0.141	0.193	0.249	0.098	0.194
Cobalt	54.803	72.867	85.407	39.640	43.798
Chromium	28.903	25.706	17.928	18.813	18.034
Copper	10.369	11.017	6.026	7.270	6.319
Iron	21899.910	21387.882	16175.538	14827.854	14996.671
Nickel	33.407	39.284	30.179	25.444	27.951
Lead	10.369	10.340	7.370	8.694	6.708
Zinc	47.905	51.074	33.266	38.805	34.416
mg/l in solut.	M3639-26	M3639-27	M3639-28	M3639-29	M3639-30
Cadmium	-0.001	0.009	0.004	-0.001	0.001
Cobalt	0.888	0.532	0.573	0.840	0.566
Chromium	0.436	0.282	0.295	0.280	0.313
Copper	0.142	0.109	0.117	0.117	0.088
Iron	316.900	238.500	280.630	281.050	277.900
Nickel	0.422	0.317	0.292	0.465	0.317
Lead	0.132	0.100	0.126	0.116	0.112
Zinc	0.787	0.596	0.626	0.616	0.554
Digestion Fact.	44.500	49.130	49.490	48.950	49.450
Reported mg/kg	M3639-26	M3639-27	M3639-28	M3639-29	M3639-30
Cadmium	-0.045	0.442	0.198	-0.049	0.049
Coblat	39.516	26.137	28.358	41.118	27.989
Chromium	19.402	13.855	14.600	13.706	15.478
Copper	6.319	5.355	5.790	5.727	4.352
Iron	14102.050	11717.505	13888.379	13757.398	13742.155
Nickel	18.779	15.574	14.451	22.762	15.676
Lead	5.874	4.913	6.236	5.678	5.538
Zinc	35.022	29.281	30.981	30.153	27.395

mg/l in solut.	M3639-31	M3639-32	M3639-33	M3639-34	M3639-35
Cadmium	-0.001	0.006	0.008	0.002	0.007
Cobalt	0.324	0.476	0.852	0.570	1.148
Chromium	0.217	0.432	0.468	0.467	0.376
Copper	0.085	0.172	0.145	0.174	0.151
Iron	215.450	306.070	347.920	340.290	330.370
Nickel	0.239	0.495	0.612	0.515	0.676
Lead	0.094	0.154	0.152	0.145	0.147
Zinc	0.495	0.827	0.795	0.809	0.779
Digestion Fact.	49.160	47.660	48.210	49.920	48.980
Reported mg/kg	M3639-31	M3639-32	M3639-33	M3639-34	M3639-35
Cadmium	-0.049	0.286	0.386	0.100	0.343
Coblat	15.928	22.686	41.075	28.454	56.229
Chromium	10.668	20.589	22.562	23.313	18.416
Copper	4.179	8.198	6.990	8.686	7.396
Iron	10591.522	14587.296	16773.223	16987.277	16181.523
Nickel	11.749	23.592	29.505	25.709	33.110
Lead	4.621	7.340	7.328	7.238	7.200
Zinc	24.334	39.415	38.327	40.385	38.155
mg/l in solut.	M3639-36	M3639-37	M3639-38	M3639-39	M3639-40
Cadmium	0.007	0.000	0.005	-0.001	0.002
Cobalt	1.139	0.721	1.228	0.931	0.636
Chromium	0.409	0.372	0.353	0.410	0.406
Copper	0.134	0.129	0.136	0.154	0.520
Iron	328.090	312.560	304.350	334.340	316.640
Nickel		0.478	0.577	0.576	0.520
Lead	0.142	0.140	0.152	0.141	0.134
Zinc	0.745	0.648	0.715	0.736	0.712
Digestion Fact.	49.610	49.490	48.580	47.680	47.430
Reported mg/kg	M3639-36	M3639-37	M3639-38	M3639-39	M3639-40
Cadmium	0.347	0.000	0.243	-0.048	0.095
Coblat	56.506	35.682	59.656	44.390	30.165
Chromium	20.290	18.410	17.149	19.549	19.257
Copper	6.648	6.384	6.607	7.343	24.664
Iron	16276.545	15468.594	14785.323	15941.331	15018.235
Nickel	0.000	23.656	28.031	27.464	24.664
Lead	7.045	6.929	7.384	6.723	6.356
Zinc	36.959	32.070	34.735	35.092	33.770

mg/l in solut.	M3639-41	M3639-42	M3639-43	M3639-44	M3639-45
Cadmium	0.008	0.008	0.003	0.006	0.004
Cobalt	0.291	0.352	0.673	0.522	0.256
Chromium	0.376	0.486	0.509	0.483	0.672
Copper	0.129	0.146	0.163	0.134	0.181
Iron	266.430	312.600	333.810	294.410	328.370
Nickel	0.343	0.386	0.459	0.418	0.358
Lead	0.111	0.149	0.161	0.137	0.239
Zinc	0.636	0.680	0.648	0.606	0.835
Digestion Fact.	49.700	48.670	48.730	48.850	48.530
Reported mg/kg	M3639-41	M3639-42	M3639-43	M3639-44	M3639-45
Cadmium	0.398	0.389	0.146	0.293	0.194
Coblat	14.463	17.132	32.795	25.500	12.424
Chromium	18.687	23.654	24.804	23.595	32.612
Copper	6.411	7.106	7.943	6.546	8.784
Iron	13241.571	15214.242	16266.561	14381.929	15935.796
Nickel	17.047	18.787	22.367	20.419	17.374
Lead	5.517	7.252	7.846	6.692	11.599
Zinc	31.609	33.096	31.577	29.603	40.523
mg/l in solut.	M3639-46	M3639-47	M3639-48	M3639-49	M3639-50
Cadmium	0.004	0.005	0.005	0.006	0.005
Cobalt	0.203	0.190	0.284	0.237	0.208
Chromium	0.594	0.521	0.698	0.615	0.531
Copper	0.154	0.176	0.216	0.209	0.187
Iron	327.640	327.760	386.980	345.250	326.000
Nickel	0.353	0.333	0.409	0.371	0.367
Lead	0.213	0.230	0.236	0.214	0.221
Zinc	0.830	0.916	0.926	0.827	0.993
Digestion Fact.	49.800	49.760	48.490	48.680	48.510
Reported mg/kg	M3639-46	M3639-47	M3639-48	M3639-49	M3639-50
Cadmium	0.199	0.249	0.242	0.292	0.243
Coblat	10.109	9.454	13.771	11.537	10.090
Chromium	29.581	25.925	33.846	29.938	25.759
Copper	7.669	8.758	10.474	10.174	9.071
Iron	16316.472	16309.338	18764.660	16806.770	15814.260
Nickel	17.579	16.570	19.832	18.060	17.803
Lead	10.607	11.445	11.444	10.418	10.721

Zinc	41.334	45.580	44.902	40.258	48.170
mg/l in solut.	M3639-51	M3639-52	M3639-53	M3639-54	M3639-55
Cadmium	0.005	0.002	0.007	0.006	-0.003
Cobalt	0.184	0.182	0.102	0.110	0.142
Chromium	0.435	0.351	0.298	0.347	0.459
Copper	0.129	0.122	0.172	0.218	0.250
Iron	264.280	252.210	229.460	258.570	278.430
Nickel	0.319	0.268	0.304	0.287	0.306
Lead	0.151	0.148	0.072	0.074	0.104
Zinc	0.664	0.632	0.403	0.420	0.508
Digestion Fact.	48.030	48.780	49.150	49.640	47.880
Reported mg/kg	M3639-51	M3639-52	M3639-53	M3639-54	M3639-55
Cadmium	0.240	0.098	0.344	0.298	-0.144
Coblat	8.838	8.878	5.013	5.460	6.799
Chromium	20.893	17.122	14.647	17.225	21.977
Copper	6.196	5.951	8.454	10.822	11.970
Iron	12693.368	12302.804	11277.959	12835.415	13331.228
Nickel	15.322	13.073	14.942	14.247	14.651
Lead	7.253	7.219	3.539	3.673	4.980
Zinc	31.892	30.829	19.807	20.849	24.323
mg/l in solut.	M3639-56	M3639-57	M3639-58	M3639-59	M3639-60
Cadmium	0.005	0.000	-0.005	0.006	0.006
Cobalt	0.126	0.084	0.113	0.197	0.287
Chromium	0.395	0.343	0.320	0.345	0.300
Copper	0.129	0.138	0.161	0.205	0.170
Iron	239.580	224.080	239.750	257.160	220.080
Nickel	0.261	0.280	0.328	0.403	0.373
Lead	0.089	0.077	0.077	0.077	0.067
Zinc	0.400	0.397	0.407	0.463	0.361
Digestion Fact.	49.360	48.660	47.580	49.540	48.430
Reported mg/kg	M3639-56	M3639-57	M3639-58	M3639-59	M3639-60
Cadmium	0.247	0.000	-0.238	0.297	0.291
Coblat	6.219	4.087	5.377	9.759	13.899
Chromium	19.497	16.690	15.226	17.091	14.529
Copper	6.367	6.715	7.660	10.156	8.233
Iron	11825.669	10903.733	11407.305	12739.706	10658.474
Nickel	12.883	13.625	15.606	19.965	18.064
Lead	4.393	3.747	3.664	3.815	3.245

Zinc	19.744	19.318	19.365	22.937	17.483
mg/l in solut.	M3639-61	M3639-62	M3639-63	M3639-64	M3639-65
Cadmium	0.005	0.005	0.001	0.005	0.002
Cobalt	0.139	0.161	0.169	0.111	0.136
Chromium	0.246	0.488	0.416	0.233	0.204
Copper	0.177	0.222	0.222	0.127	0.110
Iron	211.040	344.440	293.390	182.370	151.580
Nickel	0.351	0.430	0.385	0.270	0.238
Lead	0.064	0.160	0.097	0.055	0.054
Zinc	0.330	0.736	0.491	0.270	0.256
Digestion Fact.	43.430	49.900	49.310	48.160	46.910
Reported mg/kg	M3639-61	M3639-62	M3639-63	M3639-64	M3639-65
Cadmium	0.217	0.250	0.049	0.241	0.094
Coblat	6.037	8.034	8.333	5.346	6.380
Chromium	10.684	24.351	20.513	11.221	9.570
Copper	7.687	11.078	10.947	6.116	5.160
Iron	9165.467	17187.556	14467.061	8782.939	7110.618
Nickel	15.244	21.457	18.984	13.003	11.165
Lead	2.780	7.984	4.783	2.649	2.533
Zinc	14.332	36.726	24.211	13.003	12.009
mg/l in solut.	M3639-66	M3639-67	M3639-68	M3639-69	M3639-70
Cadmium	0.003	0.001	0.005	0.003	0.000
Cobalt	0.150	0.359	0.238	3.389	0.895
Chromium	0.164	0.284	0.541	0.365	0.418
Copper	0.147	0.176	0.196	0.129	0.140
Iron	146.650	242.990	351.380	430.070	345.340
Nickel	0.240	0.412	0.456	1.055	0.535
Lead	0.058	0.069	0.188	0.568	0.143
Zinc	0.243	0.405	0.921	0.719	0.699
Digestion Fact.	48.290	48.980	39.640	49.320	48.750
Reported mg/kg	M3639-66	M3639-67	M3639-68	M3639-69	M3639-70
Cadmium	0.145	0.049	0.198	0.148	0.000
Coblat	7.244	17.584	9.434	167.145	43.631
Chromium	7.920	13.910	21.445	18.002	20.378
Copper	7.099	8.620	7.769	6.362	6.825
Iron	7081.729	11901.650	13928.703	21211.052	16835.325
Nickel	11.590	20.180	18.076	52.033	26.081
Lead	2.801	3.380	7.452	28.014	6.971
Zinc	11.734	19.837	36.508	35.461	34.076

			M3639 QC					
mg/l in solut.	QCS 2262	QCD-1	QCD-2	QCB 1-20	QCS 1376	QCD-21	QCD-22	QCB 21-40
Cadmium	0.011	0.004	0.005	0.008	0.068	0.003	0.005	0.003
Cobalt	0.238	0.153	0.115	-0.011	0.222	0.624	0.772	0.018
Chromium	1.652	0.223	0.217	-0.002	2.002	0.249	0.204	0.005
Copper	0.585	0.094	0.083	-0.001	1.938	0.113	0.107	0.002
Iron	615.660	170.480	147.630	-0.430	702.190	237.980	215.190	-0.100
Nickel	1.473	0.202	0.177	-0.010	0.787	0.362	0.373	-0.010
Lead	0.258	0.101	0.149	2.14 ug/l	3.180	0.152	0.105	-0.280
Zinc	1.921	0.469	0.381	0.041	8.436	0.504	0.507	-0.003
Digestion Fact.	49.660	96.920	98.790		48.680	92.230	96.660	
Reported mg/kg	QCS 2262	QCD-1	QCD-2		QCS 1376	QCD-21	QCD-22	
Cadmium	0.546	0.388	0.494		3.310	0.277	0.483	
Cobalt	11.819	14.829	11.361		10.807	57.552	74.622	
Chromium	82.038	21.613	21.437		97.457	22.965	19.719	
Copper	29.051	9.110	8.200		94.342	10.422	10.343	
Iron	30573.676	16522.922	14584.368		34182.609	21948.895	20800.265	
Nickel	73.149	19.578	17.486		38.311	33.387	36.054	
Lead	12.812	9.789	14.720		154.802	14.019	10.149	
Zinc	95.397	45.455	37.639		410.664	46.484	49.007	
mg/l in solut.	QCS 1366	QCD-42	QCD-52	QCB 41-6	QCS 1367	QCD-61	QCD-62	QCB
Cadmium	0.001	0.002	0.008	0.002	0.007	0.006	0.000	0.002
Cobalt	0.067	0.207	0.081	-0.012	0.051	0.073	0.056	0.002
Chromium	0.172	0.254	0.194	0.030	0.335	0.143	0.248	0.004
Copper	0.014	0.080	0.057	-0.003	0.220	0.086	0.110	0.002
Iron	723.050	171.850	130.540	0.110	225.880	112.600	171.340	0.040
Nickel	0.077	0.222	0.144	-0.007	0.162	0.161	0.189	0.022
Lead	0.145	0.080	0.070	-0.660	0.179	0.034	0.071	-0.610
Zinc	1.333	0.385	0.311	0.004	0.800	0.162	0.362	0.005
Digestion Fact.	49.120	88.640	95.240		48.860	88.070	104.780	
Reported mg/kg	QCS 1366	QCD-42	QCD-52		QCS 1367	QCD-61	QCD-62	
Cadmium	0.049	0.177	0.762		0.342	0.528	0.000	
Cobalt	3.291	18.348	7.714		2.492	6.429	5.868	
Chromium	8.449	22.515	18.477		16.368	12.594	25.985	
Copper	0.688	7.091	5.429		10.749	7.574	11.526	
Iron	35516.216	15232.784	12432.630		11036.497	9916.682	17953.005	
Nickel	3.782	19.678	13.715		7.915	14.179	19.803	
Lead	7.122	7.091	6.667		8.746	2.994	7.439	
Zinc	65.477	34.126	29.620		39.088	14.267	37.930	

mg/l in solut.	M3639-71	M3639-72	M3639-73	M3639-74	M3639-75
Cadmium	0.002	0.004	0.004	0.003	0.001
Cobalt	0.871	0.167	0.190	1.804	0.214
Chromium	0.339	0.548	0.696	0.743	0.446
Copper	0.137	0.171	0.290	0.264	0.174
Iron	314.140	314.400	447.030	551.490	302.680
Nickel	0.525	0.359	0.480	0.678	0.353
Lead	0.130	0.121	0.191	0.314	0.154
Zinc	0.655	0.531	0.986	1.387	0.774
Digestion Fact.	46.860	40.960	48.320	48.330	49.160
Reported mg/kg	M3639-71	M3639-72	M3639-73	M3639-74	M3639-75
Cadmium	0.094	0.164	0.193	0.145	0.049
Coblat	40.815	6.840	9.181	87.187	10.520
Chromium	15.886	22.446	33.631	35.909	21.925
Copper	6.420	7.004	14.013	12.759	8.554
Iron	14720.600	12877.824	21600.490	26653.512	14879.749
Nickel	24.602	14.705	23.194	32.768	17.353
Lead	6.092	4.956	9.229	15.176	7.571
Zinc	30.693	21.750	47.644	67.034	38.050
mg/l in solut.	M3639-76	M3639-77	M3639-78		
Cadmium	0.000	-0.002	0.003		
Cobalt	0.154	0.129	0.145		
Chromium	0.318	0.355	0.269		
Copper	0.212	0.235	0.222		
Iron	255.430	262.110	235.420		
Nickel	0.376	0.351	0.340		
Lead	0.081	0.071	0.074		
Zinc	0.451	0.421	0.386		
Digestion Fact.	43.460	46.870	39.240		
Reported mg/kg	M3639-76	M3639-77	M3639-78		
Cadmium	0.000	-0.094	0.118		
Coblat	6.693	6.046	5.690		
Chromium	13.820	16.639	10.556		
Copper	9.214	11.014	8.711		
Iron	11100.988	12285.096	9237.881		
Nickel	16.341	16.451	13.342		
Lead	3.520	3.328	2.904		
Zinc	19.600	19.732	15.147		

Recheck

Blank	rep	1	Nickel	em		3.6		
	rep	2	Nickel	em		3.3		window edge
	rep	3	Nickel	em		4.4		
blank								
Nickel	av		3.51		sd	1.060	%cv	30.42
standard	rep	1	Nickel	em		157.0	conc	1.000
	rep	2	Nickel	em		166.6	conc	1.000
	rep	3	Nickel	em		153.4	conc	1.000
standard								
Nickel	av		162.018		sd	4.0665	%cv	3.00 conc 1.000
QCS 2687	rep	1	Nickel	conc		1.041	mg/l	
	rep	2	Nickel	conc		1.064	mg/l	
	rep	3	Nickel	conc		1.063	mg/l	
QCS 2687								
Nickel	av		1.056 mg/l		sd	0.0131	%cv	1.24
M3639-36	rep	1	Nickel	conc		0.664	mg/l	
	rep	2	Nickel	conc		0.648	mg/l	
	rep	3	Nickel	conc		0.674	mg/l	
M3639-36								
Nickel	av		0.662 mg/l		sd	0.0132	%cv	1.99
M3639-74	rep	1	Nickel	conc		0.720	mg/l	
	rep	2	Nickel	conc		0.693	mg/l	
	rep	3	Nickel	conc		0.686	mg/l	
M3639-74								
Nickel	av		0.700 mg/l		sd	0.0252	%cv	3.60
Soln A	rep	1	Nickel	conc		1.057	mg/l	
	rep	2	Nickel	conc		0.954	mg/l	
	rep	3	Nickel	conc		1.023	mg/l	
Soln A								
Nickel	av		1.011 mg/l		sd	0.0526	%cv	5.20

IV
1

D. Clover
10b

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-3 Page

SPIKE SOLN. S2262

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Cd

(0.020 mg/l)(0.05L) - (< 1 mg/kg)(1.0177 g)(1/1000)
(1.0051g)(0.38 mg/kg)(1/1000)

0.001 − 0 / 0.00038 x 100% = —

Element Co

(0.890 mg/l)(0.05L) - (30 mg/kg)(1.0177 g)(1/1000)
(1.0051g)(13.4 mg/kg)(1/1000)

0.0445 − 0.0305 / 0.0135 x 100% = 104%

Element Cr

(2.511 mg/l)(0.05L) - (32 mg/kg)(1.0177 g)(1/1000)
(1.0051g)(130 mg/kg)(1/1000)

0.1255 − 0.0326 / 0.1307 x 100% = 71%

Element Cu

(0.842 mg/l)(0.05L) - (12 mg/kg)(1.0177 g)(1/1000)
(1.0051g)(34.6 mg/kg)(1/1000)

0.0421 − 0.0122 / 0.0348 x100% = 86%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-3

Page

SPIKE SOLN.

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Fe

(1048 mg/l)(0.05L) - (22000 mg/kg)(1.0177 g)(1/1000)
(1.0051g)(35000 mg/kg)(1/1000)

52.4 − 22.4 / 35.2 x 100% = 85%

Element Ni

(1.942 mg/l)(0.05L) - (26 mg/kg)(1.0177 g)(1/1000)
(1.0051g)(88 mg/kg)(1/1000)

0.0971 − 0.0265 / 0.0884 x 100% = 80%

Element Pb-208

(0.493 mg/l)(0.05L) - (10 mg/kg)(1.0177 g)(1/1000)
(1.0051g)(18.9 mg/kg)(1/1000)

0.02465 − 0.01018 / 0.01899 x 100% = 76%

Element Zn

(2.735 mg/l)(0.05L) - (42 mg/kg)(1.0177 g)(1/1000)
(1.0051g)(106 mg/kg)(1/1000)

0.1367 − 0.0427 / 0.1065 x100% = 88%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M36394

Page

SPIKE SOLN. S2262

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Cd

(0.015 mg/l)(0.05L) - (< 1 mg/kg)(1.1096 g)(1/1000)

(1.0059 g)(0.38 mg/kg)(1/1000)

0.00075 — 0 / 0.00038 x 100%

Element Co

(1.128 mg/l)(0.05L) - (40 mg/kg)(1.1096 g)(1/1000)

(1.0059 g)(13.4 mg/kg)(1/1000)

0.0564 — 0.0444 / 0.0135 x 100% 89%

Element Cr

(1.955 mg/l)(0.05L) - (33 mg/kg)(1.1096 g)(1/1000)

(1.0059 g)(130 mg/kg)(1/1000)

0.09775 — 0.03661 / 0.1308 x 100% 47%

Element Cu

(0.818 mg/l)(0.05L) - (12 mg/kg)(1.1096 g)(1/1000)

(1.0059 g)(34.6 mg/kg)(1/1000)

0.0409 — 0.0133 / 0.0348 x100% 79%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M36394

Page

SPIKE SOLN. 522162

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Fe

(975 mg/l)(0.05L) - (21000 mg/kg)(1.1096 g)(1/1000)
(1.0059 g)(35000 mg/kg)(1/1000)

$\frac{48.75 - 23.30}{35.21}$ X 100% 72%

Element Ni

(1.984 mg/l)(0.05L) - (29 mg/kg)(1.1096 g)(1/1000)
(1.0059 g)(88 mg/kg)(1/1000)

$\frac{0.0992 - 0.0322}{0.0885}$ X 100% 76%

Element Pb-MS

(0536 mg/l)(0.05L) - (13 mg/kg)(1.1096 g)(1/1000)
(1.0059 g)(18.9 mg/kg)(1/1000)

$\frac{0.0268 - 0.0144}{0.0190}$ X 100% 65%

Element Zn

(2.915 mg/l)(0.05L) - (51 mg/kg)(1.1096 g)(1/1000)
(1.0059 g)(106 mg/kg)(1/1000)

$\frac{0.1457 - 0.0566}{0.1066}$ X100% 84%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-23

Page

SPIKE SOLN. S2263

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Cd

$$\frac{(0.408\ \text{mg/l})(0.05\text{L}) - (<1\ \text{mg/kg})(1.0516\ \text{g})(1/1000)}{(1.0032\ \text{g})(21.8\ \text{mg/kg})(1/1000)} \times 100\% = \frac{0.0204 - 0}{0.0219} \times 100\% = 93\%$$

Element Co

$$\frac{(1.822\ \text{mg/l})(0.05\text{L}) - (85\ \text{mg/kg})(1.0516\ \text{g})(1/1000)}{(1.0032\ \text{g})(10\ \text{mg/kg})(1/1000)} \times 100\% = \frac{0.0911 - 0.0894}{0.0100} \times 100\% = 17\%$$

Insufficient spike

Element Cr

$$\frac{(0.774\ \text{mg/l})(0.05\text{L}) - (18\ \text{mg/kg})(1.0516\ \text{g})(1/1000)}{(1.0032\ \text{g})(39\ \text{mg/kg})(1/1000)} \times 100\% = \frac{0.0387 - 0.0189}{0.0391} \times 100\% = 51\%$$

Element Cu

$$\frac{(57.4\ \text{mg/l})(0.05\text{L}) - (6\ \text{mg/kg})(1.0516\ \text{g})(1/1000)}{(1.0032\ \text{g})(2950\ \text{mg/kg})(1/1000)} \times 100\% = \frac{2.87 - 0.0063}{2.96} \times 100\% = 97\%$$

Over Spike

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-23

Page

SPIKE SOLN. S2263

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Fe

(861 mg/l)(0.05L) - (16000 mg/kg)(1.0516 g)(1/1000)
(1.0032g)(33800 mg/kg)(1/1000)

$\frac{43.05 - 16.82}{33.91}$ x 100% 77%

Element Ni

(0.772 mg/l)(0.05L) - (30 mg/kg)(1.0516 g)(1/1000)
(1.0032g)(14.3 mg/kg)(1/1000)

$\frac{0.0386 - 0.0315}{0.0143}$ x 100% 50%

Element Mn

(116 mg/l)(0.05L) - (7.4 mg/kg)(1.0516 g)(1/1000)
(1.0032g)(5532 mg/kg)(1/1000) over spike

$\frac{5.8 - 0.008}{5.55}$ x 100% 104%

Element Zn

(117 mg/l)(0.05L) - (33 mg/kg)(1.0516 g)(1/1000)
(1.0032g)(6952 mg/kg)(1/1000) over spike

$\frac{5.85 - 0.03}{6.97}$ x100% 84%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-24

Page

SPIKE SOLN. S1376

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Cd

(0.075 mg/l)(0.05L) - (<1 mg/kg)(1.0166 g)(1/1000)
1.0226
(~~1.0226~~ g)(3.45 mg/kg)(1/1000)

0.00375 − 0 / 0.00353 x 100% = 106%

Element Co

(0.984 mg/l)(0.05L) - (40 mg/kg)(1.0166 g)(1/1000)
(1.0226g)(14 mg/kg)(1/1000)

0.0492 − 0.0407 / 0.0143 x 100% = 59%

Element Cr

(2.178 mg/l)(0.05L) - (19 mg/kg)(1.0166 g)(1/1000)
(1.0226g)(135 mg/kg)(1/1000)

0.1089 − 0.0193 / 0.1380 x 100% = 65%

Element Cu

(2.071 mg/l)(0.05L) - (7.3 mg/kg)(1.0166 g)(1/1000)
(1.0226g)(98.6 mg/kg)(1/1000)

0.1036 − 0.0074 / 0.1008 x100% = 95%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-24

Page

SPIKE SOLN. S1376

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Fe

(964.7 mg/l)(0.05L) - (15000 mg/kg)(1.0166 g)(1/1000)

(1.0226g)(41100 mg/kg)(1/1000)

48.24 − 15.25 / 42.03 x 100% = 79%

Element Ni

(1.242 mg/l)(0.05L) - (35 mg/kg)(1.0166 g)(1/1000)

(1.0226g)(44.1 mg/kg)(1/1000)

0.0621 − 0.0354 / 0.0451 x 100% = 81%

Element Rb

(3.85 mg/l)(0.05L) - (8.7 mg/kg)(1.0166 g)(1/1000)

(1.0226g)(161 mg/kg)(1/1000)

0.1925 − 0.0088 / 0.1646 x 100% = 112%

Element Zn

(9.659 mg/l)(0.05L) - (39 mg/kg)(1.0166 g)(1/1000)

(1.0226g)(438 mg/kg)(1/1000)

0.4830 − 0.0396 / 0.4479 x100% = 99%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-45

Page

SPIKE SOLN. S1366

(Soike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Cd

(0.011 mg/l)(0.05L) - (< 1 mg/kg)(1.0442 g)(1/1000)

(1.3114g)(———)(1/1000)

——— X 100% ———

Element Co

(0.349 mg/l)(0.05L) - (10 mg/kg)(1.0442g)(1/1000)

(1.3114g)(9 mg/kg)(1/1000)

0.01745 − 0.0104 / 0.0118 X 100% 60%.

Element Cr

(0.778 mg/l)(0.05L) - (33 mg/kg)(1.0442g)(1/1000)

(1.3114g)(16 mg/kg)(1/1000)

0.0389 − 0.0344 / 0.0209 X 100% 22%.

Element Cu

(0.217 mg/l)(0.05L) - (8.8 mg/kg)(1.0442g)(1/1000)

(1.3114g)(7 mg/kg)(1/1000)

0.01085 − 0.0092 / 0.0092 X100% 18%.

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-45

Page

SPIKE SOLN.

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Fe

(1223 mg/l)(0.05L) - (16000 mg/kg)(1.0442g)(1/1000)

(1.3114g)(55600 mg/kg)(1/1000)

61.15 − 16.71 / 72.91 x 100% = 61%

Element Ni

(0.457 mg/l)(0.05L) - (17 mg/kg)(1.0442 g)(1/1000)

(1.3114g)(8 mg/kg)(1/1000)

0.0228 − 0.01775 / 0.01049 x 100% = 48%

Element Pb ms

(0.568 mg/l)(0.05L) - (12 mg/kg)(1.0442 g)(1/1000)

(1.3114g)(21 mg/kg)(1/1000)

0.0284 − 0.0175 / 0.0275 x 100% = 58%

Element Zn

(2.500 mg/l)(0.05L) - (41 mg/kg)(1.0442 g)(1/1000)

(1.3114g)(124 mg/kg)(1/1000)

0.125 − 0.0428 / 0.1626 x100% = 51%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M363955

Page

SPIKE SOLN. S1366

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Cd

(<0.01 mg/l)(0.05L) - (<1 mg/kg)(1.0093 g)(1/1000)

(1.1224g)(———)(1/1000)

——————— X 100% ———

Element Co

(0.245 mg/l)(0.05L) - (7 mg/kg)(1.0093 g)(1/1000)

(1.1224g)(9 mg/kg)(1/1000)

0.01225 — 0.0071 / 0.01010 X 100% = 51%

Element Cr

(0.600 mg/l)(0.05L) - (22 mg/kg)(1.0093 g)(1/1000)

(1.1224g)(16 mg/kg)(1/1000)

0.030 — 0.0222 / 0.0179 X 100% = 44%

Element Cu

(0.161 mg/l)(0.05L) - (12 mg/kg)(1.0093 g)(1/1000)

(1.1224g)(7 mg/kg)(1/1000)

0.0080 — 0.0121 / 0.0078 X100% = —

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-55

Page

SPIKE SOLN.

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Fe

(1013 mg/l)(0.05L) - (13000 mg/kg)(1.0093 g)(1/1000)
(1.1224g)(55600 mg/kg)(1/1000)

50.65 − 13.12 / 62.40 x 100% = 60%

Element Ni

(0.366 mg/l)(0.05L) - (15 mg/kg)(1.0093 g)(1/1000)
(1.1224g)(8 mg/kg)(1/1000)

0.0183 − 0.0151 / 0.0089 x 100% = 36%

Element Rb-MS

(0.259 mg/l)(0.05L) - (5 mg/kg)(1.0093 g)(1/1000)
(1.1224g)(21 mg/kg)(1/1000)

0.0129 − 0.005 / 0.0236 x 100% = 33%

Element Zn

(1.860 mg/l)(0.05L) - (24 mg/kg)(1.0093 g)(1/1000)
(1.1224g)(124 mg/kg)(1/1000)

0.093 − 0.024 / 0.01392 x100% = 50%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-63

Page

SPIKE SOLN. S1367

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Cd

(<0.01 mg/l)(0.05L) - (<1 mg/kg)(1.0562 g)(1/1000)

(1.0410g)(—)(1/1000)

— X 100% —

Element Co

(0.213 mg/l)(0.05L) - (8 mg/kg)(1.0562 g)(1/1000)

(1.0410 g)(8 mg/kg)(1/1000)

0.01065 — 0.0084 / 0.0083 X 100% = 27%

Element Cr

(0.726 mg/l)(0.05L) - (21 mg/kg)(1.0526 g)(1/1000)

(1.0410g)(26 mg/kg)(1/1000)

0.03363 — 0.0221 / 0.0271 X 100% = 52%

Element Cu

(0.462 mg/l)(0.05L) - (11 mg/kg)(1.0526 g)(1/1000)

(1.0410g)(17 mg/kg)(1/1000)

0.0231 — 0.01158 / 0.0177 X100% = 65%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-63

Page

SPIKE SOLN. S13167

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Fe

(497 mg/l)(0.05L) - (14000 mg/kg)(1.0562g)(1/1000)
(1.0410g)(15100 mg/kg)(1/1000)

24.85 − 14.79 / 15.72 x 100% = 64%

Element Ni

(0.523 mg/l)(0.05L) - (19 mg/kg)(1.0562g)(1/1000)
(1.0410g)(16 mg/kg)(1/1000)

0.02615 − 0.02007 / 0.01666 x 100% = 36%

Element Pb-MS

(0.392 mg/l)(0.05L) - (4.8 mg/kg)(1.0562g)(1/1000)
(1.0410g)(14 mg/kg)(1/1000)

0.0196 − 0.00507 / 0.01457 x 100% = 100%

Element Zn

(1.263 mg/l)(0.05L) - (24 mg/kg)(1.0562g)(1/1000)
(1.0410g)(52 mg/kg)(1/1000)

0.06315 − 0.0353 / 0.0541 x100% = 70%

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-64

Page

SPIKE SOLN. 813467

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Cd

(<0.01 mg/l)(0.05L) - (<1 mg/kg)(1.0601 g)(1/1000)

(1.0130 g)(—)(1/1000)

X 100%

Element Co

(0.181 mg/l)(0.05L) - (5 mg/kg)(1.0601 g)(1/1000)

(1.0130g)(8 mg/kg)(1/1000)

$\frac{0.00905 - 0.0053}{0.0081}$ X 100% = 462.

Element Cr

(0.615 mg/l)(0.05L) - (11 mg/kg)(1.0601 g)(1/1000)

(1.0130g)(26 mg/kg)(1/1000)

$\frac{0.03075 - 0.01166}{0.02634}$ X 100% = 727.

Element Cu

(0.368 mg/l)(0.05L) - (6.1 mg/kg)(1.0601 g)(1/1000)

(1.0130g)(17 mg/kg)(1/1000)

$\frac{0.0184 - 0.0065}{0.01722}$ X100% = 697.

SPIKE RECOVERY CALCULATIONS

LAB REQUEST M3639-64

Page

SPIKE SOLN. S1367

(Spike conc. mg/L)(0.05L) - (Bkgd conc. mg/kg)(gms. smpl used)(1kg/1000g) x 100%
(gms. spike used)(Std. T.V. mg/kg)(1kg/1000g)

Element Fe

(400 mg/l)(0.05L) - (8800 mg/kg)(1.0601 g)(1/1000)
(1.0130g)(15100 mg/kg)(1/1000)

$\frac{20 - 9.33}{15.30}$ x 100% 70%

Element Ni

(0.409 mg/l)(0.05L) - (13 mg/kg)(1.0601 g)(1/1000)
(1.0130g)(16 mg/kg)(1/1000)

$\frac{0.02045 - 0.01378}{0.01621}$ x 100% 41%

Element Pb-MS

(0.226 mg/l)(0.05L) - (2.6 mg/kg)(1.0601 g)(1/1000)
(1.0130g)(14 mg/kg)(1/1000)

$\frac{0.0113 - 0.00276}{0.01418}$ x 100% 60%

Element Zn

(1.098 mg/l)(0.05L) - (13 mg/kg)(1.0601 g)(1/1000)
(1.0130g)(52 mg/kg)(1/1000)

$\frac{0.0549 - 0.01378}{0.05267}$ x100% 78%

M73639

1-6-95

010695STW3

[redacted]erlock - Water

interlock - Water Argon

interlock - Water

standard	rep	1	Lead	em	51.6	conc	1.00		
	rep	1	Chromium	em	72.1	conc	1.000		
	rep	1	Nickel	em	277.7	conc	1.000		
	rep	1	Zinc	em	277.1	conc	1.000		
	rep	1	Cr_267	em	1217.1	conc	1.000		
	rep	1	Cobalt	em	242.7	conc	1.000		
	rep	1	Copper	em	1599.8	conc	1.000		
	rep	1	Cd_228	em	504.5	conc	1.000		
	rep	1	Co_231	em	161.8	conc	1.000		
	rep	2	Lead	em	09.5	conc	1.00		
	rep	2	Chromium	em	72.8	conc	1.000		
	rep	2	Nickel	em	275.9	conc	1.000		
	rep	2	Zinc	em	268.5	conc	1.000		
	rep	2	Cr_267	em	1210.1	conc	1.000		
	rep	2	Cobalt	em	240.3	conc	1.000		
	rep	2	Copper	em	1615.0	conc	1.000		
	rep	2	Cd_228	em	487.2	conc	1.000		
	rep	2	Co_231	em	142.7	conc	1.000		
	rep	3	Lead	em	50.9	conc	1.00		
	rep	3	Chromium	em	74.5	conc	1.000		
	rep	3	Nickel	em	285.2	conc	1.000		
	rep	3	Zinc	em	273.1	conc	1.000		
	rep	3	Cr_267	em	1190.4	conc	1.000		
	rep	3	Cobalt	em	252.2	conc	1.000		
	rep	3	Copper	em	1602.8	conc	1.000		
	rep	3	Cd_228	em	500.4	conc	1.000		
	rep	3	Co_231	em	152.7	conc	1.000		

standard							
Lead	av	47.33	sd	6.747	%cv	14.26	conc 1.00
Chromium	av	73.145	sd	1.2672	%cv	1.73	conc 1.000
Nickel	av	279.596	sd	4.9878	%cv	1.77	conc 1.000
Zinc	av	281.221	sd	6.2055	%cv	2.24	conc 1.000
Cr_267	av	1205.839	sd	13.8537	%cv	1.15	conc 1.000
Cobalt	av	247.724	sd	4.7980	%cv	1.94	conc 1.000
Copper	av	1605.857	sd	8.0302	%cv	0.50	conc 1.000
Cd_228	av	498.036	sd	9.6690	%cv	1.94	conc 1.000
Co_231	av	152.231	sd	9.3122	%cv	6.12	conc 1.000

standard	rep	1	Co_231	em	151.3	conc	1.000		
	rep	1	Lead	em	40.2	conc	1.00		
	rep	2	Co_231	em	148.2	conc	1.000		
	rep	2	Lead	em	46.2	conc	1.00		
	rep	3	Co_231	em	152.0	conc	1.000		
	rep	3	Lead	em	47.4	conc	1.00		
standard									
Co_231	av	150.514	sd	1.9999	%cv	1.33	conc	1.000	
Lead	av	44.93	sd	4.620	%cv	10.28	conc	1.00	

standard	rep	1	Fe_250	em	37901.2	conc	100.00
	rep	2	Fe_250	em	38016.6	conc	100.00
	rep	3	Fe_250	em	39290.1	conc	100.00
standard							
Fe_250	av	38402.63	sd	772.420	%cv	2.01	conc 100.00

blank	rep	1	Lead	em	2.2		
	rep	1	Chromium	em	3.7		
	rep	1	Nickel	em	10.1		
	rep	1	Zinc	em	5.3		
	rep	1	Fe_258	em	406.5		
	rep	1	Cobalt	em	3.0		
	rep	1	Cr_267	em	5.1		window edge
	rep	1	Cd_228	em	-0.3		window edge
	rep	1	Copper	em	24.2		
	rep	1	Co_231	em	3.7		
	rep	2	Lead	em	11.8		
	rep	2	Chromium	em	2.7		
	rep	2	Nickel	em	9.3		
	rep	2	Zinc	em	1.9		window edge
	rep	2	Fe_258	em	55.9		
	rep	2	Cobalt	em	3.0		
	rep	2	Cr_267	em	15.0		
	rep	2	Cd_228	em	1.6		
	rep	2	Copper	em	29.0		
	rep	2	Co_231	em	2.1		
	rep	3	Lead	em	0.3		window edge
	rep	3	Chromium	em	3.4		
	rep	3	Nickel	em	11.1		
	rep	3	Zinc	em	3.3		
	rep	3	Fe_258	em	47.6		
	rep	3	Cobalt	em	5.8		
	rep	3	Cr_267	em	20.5		
	rep	3	Cd_228	em	2.1		
	rep	3	Copper	em	22.7		
	rep	3	Co_231	em	1.5		window edge

blank						
Lead	av	4.57	sd	5.874	%cv	128.49
Chromium	av	3.256	sd	0.5417	%cv	16.64
Nickel	av	9.811	sd	1.4800	%cv	15.09
Zinc	av	3.569	sd	1.7825	%cv	49.95
Fe_258	av	179.80	sd	222.320	%cv	123.65
Cobalt	av	3.942	sd	1.6175	%cv	41.03
Cr_267	av	13.648	sd	7.9141	%cv	57.99
Cd_228	av	1.115	sd	1.2678	%cv	113.66
Copper	av	25.411	sd	3.4506	%cv	13.61
Co_231	av	2.436	sd	1.1275	%cv	46.29

QCS 2607	rep	1	Lead	conc	2.12 mg/l
	rep	1	Chromium	conc	1.020 mg/l
	rep	1	Nickel	conc	1.000 mg/l
	rep	1	Zinc	conc	1.014 mg/l
	rep	1	Fe_258	conc	1.60 mg/l
	rep	1	Cobalt	conc	0.994 mg/l
	rep	1	Cr_267	conc	1.008 mg/l
	rep	1	Cd_228	conc	1.002 mg/l
	rep	1	Copper	conc	1.050 mg/l
	rep	1	Co_231	conc	1.020 mg/l
	rep	2	Lead	conc	2.26 mg/l
	rep	2	Chromium	conc	1.100 mg/l
	rep	2	Nickel	conc	1.030 mg/l
	rep	2	Zinc	conc	1.040 mg/l
	rep	2	Fe_258	conc	1.76 mg/l
	rep	2	Cobalt	conc	1.000 mg/l
	rep	2	Cr_267	conc	1.071 mg/l
	rep	2	Cd_228	conc	1.002 mg/l

	rep	2	Copper	conc	1.078	mg/l			
	rep	2	Co_231	conc	0.961	mg/l			
	rep	3	Chromium	conc	1.003	mg/l			
	rep	3	Lead	conc	2.33	mg/l			
	rep	3	Zinc	conc	1.072	mg/l			
	rep	3	Nickel	conc	1.03	mg/l			
	rep	3	Cobalt	conc	0.999	mg/l			
	rep	3	Fe_258	conc	1.74	mg/l			
	rep	3	Cd_228	conc	2.048	mg/l			
	rep	3	Cr_267	conc	1.037	mg/l			
	rep	3	Co_231	conc	0.943	mg/l			
	rep	3	Copper	conc	1.102	mg/l			
QCS 2557				N					Recovery
Chromium	av	1.044	mg/l	1	sd	0.0525	%cv	5.02	104
Lead	av	2.20	mg/l	2	sd	0.109	%cv	4.88	111
Zinc	av	1.043	mg/l	1	sd	0.0289	%cv	2.77	104
Nickel	av	1.063	mg/l	1	sd	0.0291	%cv	2.74	106
Cobalt	av	0.990	mg/l	1	sd	0.0223	%cv	2.25	99
Fe_258	av	1.73	mg/l	2	sd	0.041	%cv	2.36	87
Cd_228	av	2.011	mg/l	2.1	sd	0.0342	%cv	1.70	96
Cr_267	av	1.038	mg/l	1	sd	0.0315	%cv	3.03	104
Co_231	av	0.977	mg/l	1	sd	0.0438	%cv	4.48	98
Copper	av	1.082	mg/l	1	sd	0.0275	%cv	2.55	108

QCB	rep	1	Lead	conc	0.12	mg/l
	rep	1	Chromium	conc	0.012	mg/l
	rep	1	Nickel	conc	-0.010	mg/l
	rep	1	Zinc	conc	0.043	mg/l
	rep	1	Fe_258	conc	-0.43	mg/l
	rep	1	Cobalt	conc	0.004	mg/l
	rep	1	Cr_267	conc	0.002	mg/l
	rep	1	Cd_228	conc	0.012	mg/l
	rep	1	Copper	conc	-0.001	mg/l
	rep	1	Co_231	conc	0.003	mg/l
	rep	2	Lead	conc	0.04	mg/l
	rep	2	Chromium	conc	-0.005	mg/l
	rep	2	Nickel	conc	-0.014	mg/l
	rep	2	Zinc	conc	0.040	mg/l
	rep	2	Fe_258	conc	-0.42	mg/l
	rep	2	Cobalt	conc	-0.008	mg/l
	rep	2	Cr_267	conc	-0.009	mg/l
	rep	2	Cd_228	conc	0.003	mg/l
	rep	2	Copper	conc	0.002	mg/l
	rep	2	Co_231	conc	-0.030	mg/l
	rep	3	Lead	conc	-0.14	mg/l
	rep	3	Chromium	conc	-0.014	mg/l
	rep	3	Nickel	conc	-0.005	mg/l
	rep	3	Zinc	conc	0.030	mg/l
	rep	3	Fe_258	conc	-0.44	mg/l
	rep	3	Cobalt	conc	-0.011	mg/l
	rep	3	Cr_267	conc	0.004	mg/l
	rep	3	Cd_228	conc	0.010	mg/l
	rep	3	Copper	conc	-0.004	mg/l
	rep	3	Co_231	conc	-0.02	mg/l

window edge
window edge
window edge

Lead	av	0.01	mg/l	sd	0.131	%cv	2255.8
Chromium	av	-0.002	mg/l	sd	0.0130	%cv	541.04
Nickel	av	-0.010	mg/l	sd	0.0046	%cv	48.34
Zinc	av	0.041	mg/l	sd	0.0060	%cv	15.53
Fe_258	av	-0.43	mg/l	sd	0.013	%cv	2.99

Cobalt	av	-0.005 mg/l	sd	0.0079 %cv	157.81	
Cr_267	av	-0.001 mg/l	sd	0.0067 %cv	900.36	
Cd_228	av	0.008 mg/l	sd	0.0048 %cv	57.39	
Copper	av	-0.001 mg/l	sd	0.0032 %cv	323.73	
Co_231	av	-0.011 mg/l	sd	0.0139 %cv	134.85	

M3609-1	rep	1 Lead	conc	-0.4 mg/l		window edge
	rep	1 Chromium	conc	0.404 mg/l		
	rep	1 Nickel	conc	0.471 mg/l		
	rep	1 Zinc	conc	0.970 mg/l		
	rep	1 Fe_258	conc	333.69 mg/l		
	rep	1 Cobalt	conc	0.265 mg/l		
	rep	1 Cr_267	conc	0.498 mg/l		
	rep	1 Cd_228	conc	0.007 mg/l		
	rep	1 Copper	conc	0.193 mg/l		
	rep	1 Co_231	conc	0.241 mg/l		
	rep	2 Lead	conc	-0.31 mg/l		window edge
	rep	2 Chromium	conc	0.504 mg/l		
	rep	2 Nickel	conc	0.415 mg/l		
	rep	2 Zinc	conc	0.911 mg/l		
	rep	2 Fe_258	conc	351.81 mg/l		
	rep	2 Cobalt	conc	0.244 mg/l		
	rep	2 Cr_267	conc	0.488 mg/l		
	rep	2 Cd_228	conc	-0.001 mg/l		
	rep	2 Copper	conc	0.204 mg/l		
	rep	2 Co_231	conc	0.255 mg/l		
	rep	3 Lead	conc	-0.53 mg/l		window edge
	rep	3 Chromium	conc	0.458 mg/l		
	rep	3 Nickel	conc	0.394 mg/l		
	rep	3 Zinc	conc	0.935 mg/l		
	rep	3 Fe_258	conc	358.95 mg/l		
	rep	3 Cobalt	conc	0.302 mg/l		
	rep	3 Cr_267	conc	0.499 mg/l		
	rep	3 Cd_228	conc	0.008 mg/l		
	rep	3 Copper	conc	0.196 mg/l		
	rep	3 Co_231	conc	0.246 mg/l		

M3609-1

Lead	av	-0.42 mg/l	sd	0.109 %cv	26.20
Chromium	av	0.495 mg/l	sd	0.0345 %cv	6.97
Nickel	av	0.426 mg/l	sd	0.0399 %cv	9.36
Zinc	av	0.940 mg/l	sd	0.0018 %cv	0.32
Fe_258	av	346.48 mg/l	sd	11.134 %cv	3.21
Cobalt	av	0.270 mg/l	sd	0.0296 %cv	10.93
Cr_267	av	0.495 mg/l	sd	0.0061 %cv	1.24
Cd_228	av	0.006 mg/l	sd	0.0048 %cv	90.39
Copper	av	0.198 mg/l	sd	0.0061 %cv	3.07
Co_231	av	0.247 mg/l	sd	0.0071 %cv	2.88

M3609-2	rep	1 Lead	conc	-0.18 mg/l		
	rep	1 Chromium	conc	0.432 mg/l		
	rep	1 Nickel	conc	0.342 mg/l		
	rep	1 Zinc	conc	0.780 mg/l		
	rep	1 Fe_258	conc	306.70 mg/l		
	rep	1 Cobalt	conc	0.218 mg/l		
	rep	1 Cr_267	conc	0.479 mg/l		
	rep	1 Cd_228	conc	0.007 mg/l		
	rep	1 Copper	conc	0.175 mg/l		
	rep	1 Co_231	conc	0.202 mg/l		
	rep	2 Lead	conc	-0.13 mg/l		
	rep	2 Chromium	conc	0.449 mg/l		

	rep	2	Nickel	conc	0.115 mg/l	window edge
	rep	2	Zinc	conc	0.519 mg/l	
	rep	2	Fe_258	conc	299.44 mg/l	
	rep	2	Cobalt	conc	0.207 mg/l	
	rep	2	Cr_267	conc	0.466 mg/l	
	rep	2	Cd_228	conc	0.003 mg/l	
	rep	2	Copper	conc	0.161 mg/l	
	rep	2	Co_231	conc	0.215 mg/l	
	rep	3	Lead	conc	0.01 mg/l	
	rep	3	Chromium	conc	0.458 mg/l	
	rep	3	Nickel	conc	0.355 mg/l	
	rep	3	Zinc	conc	0.787 mg/l	
	rep	3	Fe_258	conc	302.04 mg/l	
	rep	3	Cobalt	conc	0.192 mg/l	
	rep	3	Cr_267	conc	0.461 mg/l	
	rep	3	Cd_228	conc	0.008 mg/l	
	rep	3	Copper	conc	0.166 mg/l	
	rep	3	Co_231	conc	0.193 mg/l	

M3639-2

Lead	av	-0.09 mg/l		sd	0.087 %cv	92.14
Chromium	av	0.450 mg/l		sd	0.0178 %cv	3.97
Nickel	av	~~0.271~~ mg/l	0.348	sd	0.1349 %cv	~~49.80~~
Zinc	av	0.796 mg/l		sd	0.0209 %cv	2.63
Fe_258	av	303.40 mg/l		sd	4.778 %cv	1.57
Cobalt	av	0.204 mg/l		sd	0.0105 %cv	5.14
Cr_267	av	0.465 mg/l		sd	0.0126 %cv	2.72
Cd_228	av	0.003 mg/l		sd	0.0005 %cv	5.72
Copper	av	0.167 mg/l		sd	0.0074 %cv	4.42
Co_231	av	0.190 mg/l		sd	0.0267 %cv	14.05

M3639-3

rep	1	Lead	conc	-0.50 mg/l	window edge
rep	1	Chromium	conc	0.630 mg/l	
rep	1	Nickel	conc	0.545 mg/l	
rep	1	Zinc	conc	0.951 mg/l	
rep	1	Fe_258	conc	465.99 mg/l	
rep	1	Cobalt	conc	0.888 mg/l	
rep	1	Cr_267	conc	0.681 mg/l	
rep	1	Cd_228	conc	0.000 mg/l	
rep	1	Copper	conc	0.259 mg/l	
rep	1	Co_231	conc	0.731 mg/l	
rep	2	Lead	conc	-0.50 mg/l	window edge
rep	2	Chromium	conc	0.675 mg/l	
rep	2	Nickel	conc	0.526 mg/l	
rep	2	Zinc	conc	0.915 mg/l	
rep	2	Fe_258	conc	463.74 mg/l	
rep	2	Cobalt	conc	0.709 mg/l	
rep	2	Cr_267	conc	0.653 mg/l	
rep	2	Cd_228	conc	-0.001 mg/l	window edge
rep	2	Copper	conc	0.251 mg/l	
rep	2	Co_231	conc	0.720 mg/l	
rep	3	Lead	conc	-0.33 mg/l	window edge
rep	3	Chromium	conc	0.700 mg/l	
rep	3	Nickel	conc	0.574 mg/l	
rep	3	Zinc	conc	0.977 mg/l	
rep	3	Fe_258	conc	443.44 mg/l	
rep	3	Cobalt	conc	0.707 mg/l	
rep	3	Cr_267	conc	0.671 mg/l	
rep	3	Cd_228	conc	0.000 mg/l	
rep	3	Copper	conc	0.270 mg/l	
rep	3	Co_231	conc	0.679 mg/l	

M3639-3

Lead	av	-0.45	mg/l	sd	0.108	%cv 24.01
Chromium	av	0.669	mg/l	sd	0.0371	%cv 5.55
Nickel	av	0.548	mg/l	sd	0.024	%cv 4.40
Zinc	av	0.835	mg/l	sd	0.0273	%cv 3.09
Fe_258	av	457.79	mg/l	sd	12.469	%cv 2.72
Cobalt	av	0.701	mg/l	sd	0.0133	%cv 1.89
Cr_267	av	0.668	mg/l	sd	0.0146	%cv 2.18
Cd_228	av	0.001	mg/l	sd	0.0018	%cv 244.25
Copper	av	0.262	mg/l	sd	0.0128	%cv 4.90
Co_231	av	0.710	mg/l	sd	0.0326	%cv 4.59

M3639-4	rep	1	Lead	conc	-0.26 mg/l
	rep	1	Chromium	conc	0.678 mg/l
	rep	1	Nickel	conc	0.597 mg/l
	rep	1	Zinc	conc	1.018 mg/l
	rep	1	Fe_258	conc	422.79 mg/l
	rep	1	Cobalt	conc	0.807 mg/l
	rep	1	Cr_267	conc	0.638 mg/l
	rep	1	Cd_228	conc	0.005 mg/l
	rep	1	Copper	conc	0.245 mg/l
	rep	1	Co_231	conc	0.840 mg/l
	rep	2	Lead	conc	-0.09 mg/l
	rep	2	Chromium	conc	0.651 mg/l
	rep	2	Nickel	conc	0.556 mg/l
	rep	2	Zinc	conc	1.034 mg/l
	rep	2	Fe_258	conc	423.30 mg/l
	rep	2	Cobalt	conc	0.836 mg/l
	rep	2	Cr_267	conc	0.604 mg/l
	rep	2	Cd_228	conc	0.008 mg/l
	rep	2	Copper	conc	0.239 mg/l
	rep	2	Co_231	conc	0.767 mg/l
	rep	3	Lead	conc	0.03 mg/l
	rep	3	Chromium	conc	0.660 mg/l
	rep	3	Nickel	conc	0.587 mg/l
	rep	3	Zinc	conc	1.044 mg/l
	rep	3	Fe_258	conc	431.90 mg/l
	rep	3	Cobalt	conc	0.800 mg/l
	rep	3	Cr_267	conc	0.665 mg/l
	rep	3	Cd_228	conc	0.006 mg/l
	rep	3	Copper	conc	0.239 mg/l
	rep	3	Co_231	conc	0.838 mg/l

M3639-4

Lead	av	-0.10	mg/l	sd	0.147	%cv 142.46
Chromium	av	0.663	mg/l	sd	0.0110	%cv 1.66
Nickel	av	0.580	mg/l	sd	0.0213	%cv 3.67
Zinc	av	1.032	mg/l	sd	0.0133	%cv 1.29
Fe_258	av	426.00	mg/l	sd	5.119	%cv 1.20
Cobalt	av	0.814	mg/l	sd	0.0172	%cv 2.36
Cr_267	av	0.636	mg/l	sd	0.0191	%cv 3.11
Cd_228	av	0.007	mg/l	sd	0.0014	%cv 20.92
Copper	av	0.241	mg/l	sd	0.0036	%cv 1.50
Co_231	av	0.816	mg/l	sd	0.0419	%cv 5.14

M3639-5	rep	1	Lead	conc	0.08 mg/l
	rep	1	Chromium	conc	0.485 mg/l
	rep	1	Nickel	conc	0.322 mg/l
	rep	1	Zinc	conc	0.795 mg/l
	rep	1	Fe_258	conc	311.21 mg/l
	rep	1	Cobalt	conc	0.581 mg/l

	rep	1	Cr_267	conc	0.497	mg/l	
	rep	1	Cd_228	conc	0.007	mg/l	
	rep	1	Copper	conc	0.180	mg/l	
	rep	1	Co_231	conc	0.270	mg/l	
	rep	2	Lead	conc	-0.22	mg/l	window edge
	rep	2	Chromium	conc	0.436	mg/l	
	rep	2	Nickel	conc	0.326	mg/l	
	rep	2	Zinc	conc	0.764	mg/l	
	rep	2	Fe_258	conc	311.07	mg/l	
	rep	2	Cobalt	conc	0.286	mg/l	
	rep	2	Cr_267	conc	0.480	mg/l	
	rep	2	Cd_228	conc	0.008	mg/l	
	rep	2	Copper	conc	0.194	mg/l	
	rep	2	Co_231	conc	0.280	mg/l	
	rep	3	Lead	conc	-0.26	mg/l	
	rep	3	Chromium	conc	0.499	mg/l	
	rep	3	Nickel	conc	0.339	mg/l	
	rep	3	Zinc	conc	0.782	mg/l	
	rep	3	Fe_258	conc	313.71	mg/l	
	rep	3	Cobalt	conc	0.308	mg/l	
	rep	3	Cr_267	conc	0.500	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Copper	conc	0.172	mg/l	
	rep	3	Co_231	conc	0.287	mg/l	
M3639-5							
Lead	av		-0.15 mg/l	sd	0.156	%cv	103.45
Chromium	av		0.467 mg/l	sd	0.0315	%cv	6.75
Nickel	av		0.329 mg/l	sd	0.0090	%cv	2.73
Zinc	av		0.774 mg/l	sd	0.0183	%cv	2.37
Fe_258	av		311.66 mg/l	sd	0.910	%cv	0.29
Cobalt	av		0.293 mg/l	sd	0.0112	%cv	3.76
Cr_267	av		0.492 mg/l	sd	0.0110	%cv	2.23
Cd_228	av		0.006 mg/l	sd	0.0020	%cv	33.76
Copper	av		0.183 mg/l	sd	0.0109	%cv	5.93
Co_231	av		0.282 mg/l	sd	0.0052	%cv	1.83
M3639-6	rep	1	Lead	conc	-0.18	mg/l	window edge
	rep	1	Chromium	conc	0.508	mg/l	
	rep	1	Nickel	conc	0.311	mg/l	
	rep	1	Zinc	conc	1.021	mg/l	
	rep	1	Fe_258	conc	534.55	mg/l	
	rep	1	Cobalt	conc	2.637	mg/l	
	rep	1	Cr_267	conc	0.594	mg/l	
	rep	1	Cd_228	conc	0.009	mg/l	
	rep	1	Copper	conc	0.203	mg/l	
	rep	1	Co_231	conc	2.542	mg/l	
	rep	2	Lead	conc	-0.17	mg/l	window edge
	rep	2	Chromium	conc	0.523	mg/l	
	rep	2	Nickel	conc	0.310	mg/l	
	rep	2	Zinc	conc	1.090	mg/l	
	rep	2	Fe_258	conc	540.24	mg/l	
	rep	2	Cobalt	conc	2.630	mg/l	
	rep	2	Cr_267	conc	0.598	mg/l	
	rep	2	Cd_228	conc	0.010	mg/l	
	rep	2	Copper	conc	0.195	mg/l	
	rep	2	Co_231	conc	2.525	mg/l	
	rep	3	Lead	conc	-0.09	mg/l	
	rep	3	Chromium	conc	0.503	mg/l	
	rep	3	Nickel	conc	0.301	mg/l	
	rep	3	Zinc	conc	1.013	mg/l	

	rep	3	Fe_260	conc	540.10	mg/l		
	rep	3	Cobalt	conc	2.655	mg/l		
	rep	3	Cr_267	conc	0.620	mg/l		
	rep	3	Cd_228	conc	0.011	mg/l		
	rep	3	Copper	conc	0.198	mg/l		
	rep	3	Co_231	conc	2.582	mg/l		
M3639-3								
Lead	av	-0.09	mg/l	sd	0.154	%cv	173.78	
Chromium	av	0.611	mg/l	sd	0.0107	%cv	1.75	
Nickel	av	0.002	mg/l	sd	0.0175	%cv	2.19	
Zinc	av	1.040	mg/l	sd	0.0407	%cv	3.90	
Fe_260	av	538.30	mg/l	sd	3.243	%cv	0.60	
Cobalt	av	2.638	mg/l	sd	0.0192	%cv	0.73	
Cr_267	av	0.606	mg/l	sd	0.0192	%cv	3.17	
Cd_228	av	0.011	mg/l	sd	0.0016	%cv	14.64	
Copper	av	0.199	mg/l	sd	0.0043	%cv	2.14	
Co_231	av	2.549	mg/l	sd	0.0293	%cv	1.15	
#1 standard	rep	1	Lead	em	49.9	conc	1.00	
	rep	1	Chromium	em	77.2	conc	1.000	
	rep	1	Nickel	em	288.2	conc	1.000	
	rep	1	Zinc	em	301.2	conc	1.000	
	rep	1	Cr_267	em	1274.6	conc	1.000	
	rep	1	Cobalt	em	269.7	conc	1.000	
	rep	1	Copper	em	1690.8	conc	1.000	
	rep	1	Cd_228	em	505.4	conc	1.000	
	rep	1	Co_231	em	151.2	conc	1.000	
	rep	2	Lead	em	52.8	conc	1.00	
	rep	2	Chromium	em	80.1	conc	1.000	
	rep	2	Nickel	em	287.5	conc	1.000	
	rep	2	Zinc	em	300.8	conc	1.000	
	rep	2	Cr_267	em	1272.9	conc	1.000	
	rep	2	Cobalt	em	257.4	conc	1.000	
	rep	2	Copper	em	1695.8	conc	1.000	
	rep	2	Cd_228	em	525.9	conc	1.000	
	rep	2	Co_231	em	149.9	conc	1.000	
	rep	3	Lead	em	45.0	conc	1.00	
	rep	3	Chromium	em	83.1	conc	1.000	
	rep	3	Nickel	em	299.8	conc	1.000	
	rep	3	Zinc	em	303.9	conc	1.000	
	rep	3	Cr_267	em	1320.2	conc	1.000	
	rep	3	Cobalt	em	276.1	conc	1.000	
	rep	3	Copper	em	1775.2	conc	1.000	
	rep	3	Cd_228	em	509.1	conc	1.000	
	rep	3	Co_231	em	159.2	conc	1.000	
#1 standard				Revrun				
Lead	av	49.20		47	sd	3.970	%cv	8.07 conc 1.00
Chromium	av	80.148		73	sd	2.9131	%cv	3.64 conc 1.000
Nickel	av	291.801		279	sd	6.894	%cv	2.36 conc 1.000
Zinc	av	301.900		281	sd	1.7022	%cv	0.57 conc 1.000
Cr_267	av	1289.209		1205	sd	26.8876	%cv	2.08 conc 1.000
Cobalt	av	267.934		247	sd	9.5100	%cv	3.55 conc 1.000
Copper	av	1723.285		1605	sd	44.9011	%cv	2.61 conc 1.000
Cd_228	av	513.475		498	sd	10.7272	%cv	2.13 conc 1.000
Co_231	av	153.457		152	sd	5.0112	%cv	3.27 conc 1.000
#3 standard	rep	1	Fe_260	em	40039.3	conc	100.00	
	rep	2	Fe_260	em	40201.1	conc	100.00	
	rep	3	Fe_260	em	41285.6	conc	100.00	
#3 standard								

Fe_258	av	4055.71	38403	sd	642.066	%cv	1.58	conc 100.00
39-7	rep	1	Lead	conc	0.06	mg/l		
	rep	1	Chromium	conc	0.917	mg/l		
	rep	1	Nickel	conc	1.329	mg/l		
	rep	1	Zinc	conc	1.780	mg/l		
	rep	1	Fe_253	conc	849.35	mg/l		
	rep	1	Cobalt	conc	4.469	mg/l		
	rep	1	Cr_267	conc	0.841	mg/l		
	rep	1	Cd_228	conc	0.013	mg/l		
	rep	1	Copper	conc	0.261	mg/l		
	rep	1	Co_231	conc	4.508	mg/l		
	rep	2	Lead	conc	-0.30	mg/l		window edge
	rep	2	Chromium	conc	0.784	mg/l		
	rep	2	Nickel	conc	1.268	mg/l		
	rep	2	Zinc	conc	1.770	mg/l		
	rep	2	Fe_258	conc	839.13	mg/l		
	rep	2	Cobalt	conc	4.339	mg/l		
	rep	2	Cr_267	conc	0.859	mg/l		
	rep	2	Cd_228	conc	0.019	mg/l		
	rep	2	Copper	conc	0.251	mg/l		
	rep	2	Co_231	conc	4.414	mg/l		
	rep	3	Lead	conc	0.07	mg/l		
	rep	3	Chromium	conc	0.896	mg/l		
	rep	3	Nickel	conc	1.276	mg/l		
	rep	3	Zinc	conc	1.734	mg/l		
	rep	3	Fe_258	conc	842.77	mg/l		
	rep	3	Cobalt	conc	4.430	mg/l		
	rep	3	Cr_267	conc	0.863	mg/l		
	rep	3	Cd_228	conc	0.012	mg/l		
	rep	3	Copper	conc	0.268	mg/l		
	rep	3	Co_231	conc	4.411	mg/l		

M3639-7

Lead	av	0.05	mg/l	sd	0.035	%cv 677.55
Chromium	av	0.866	mg/l	sd	0.0715	%cv 8.27
Nickel	av	1.291	mg/l	sd	0.0330	%cv 2.56
Zinc	av	1.762	mg/l	sd	0.0243	%cv 1.38
Fe_258	av	843.92	mg/l	sd	5.459	%cv 0.65
Cobalt	av	4.413	mg/l	sd	0.0670	%cv 1.52
Cr_267	av	0.855	mg/l	sd	0.0117	%cv 1.37
Cd_228	av	0.014	mg/l	sd	0.0037	%cv 25.94
Copper	av	0.257	mg/l	sd	0.0095	%cv 3.85
Co_231	av	4.471	mg/l	sd	0.1014	%cv 2.27

M3639-8	rep	1	Lead	conc	0.02 mg/l
	rep	1	Chromium	conc	0.889 mg/l
	rep	1	Nickel	conc	0.686 mg/l
	rep	1	Zinc	conc	1.145 mg/l
	rep	1	Fe_258	conc	500.74 mg/l
	rep	1	Cobalt	conc	1.364 mg/l
	rep	1	Cr_267	conc	0.705 mg/l
	rep	1	Cd_228	conc	0.008 mg/l
	rep	1	Copper	conc	0.240 mg/l
	rep	1	Co_231	conc	1.428 mg/l
	rep	2	Lead	conc	-0.26 mg/l
	rep	2	Chromium	conc	0.838 mg/l
	rep	2	Nickel	conc	0.645 mg/l
	rep	2	Zinc	conc	1.126 mg/l
	rep	2	Fe_258	conc	505.27 mg/l
	rep	2	Cobalt	conc	1.356 mg/l

	rep	2	Cr_267	conc	0.710	mg/l
	rep	2	Cd_228	conc	0.007	mg/l
	rep	2	Copper	conc	0.233	mg/l
	rep	2	Co_231	conc	1.346	mg/l
	rep	3	Lead	conc	-0.12	mg/l
	rep	3	Chromium	conc	0.588	mg/l
	rep	3	Nickel	conc	0.640	mg/l
	rep	3	Zinc	conc	1.090	mg/l
	rep	3	Fe_258	conc	508.10	mg/l
	rep	3	Cobalt	conc	1.387	mg/l
	rep	3	Cr_267	conc	0.700	mg/l
	rep	3	Cd_228	conc	0.002	mg/l
	rep	3	Copper	conc	0.242	mg/l
	rep	3	Co_231	conc	1.364	mg/l

M3639-8

Lead	av	-0.12 mg/l	sd	0.136 %cv	114.75
Chromium	av	0.586 mg/l	sd	0.0037 %cv	0.64
Nickel	av	0.658 mg/l	sd	0.0243 %cv	3.69
Zinc	av	1.120 mg/l	sd	0.0283 %cv	2.53
Fe_258	av	504.70 mg/l	sd	3.713 %cv	0.74
Cobalt	av	1.379 mg/l	sd	0.0128 %cv	0.93
Cr_267	av	0.706 mg/l	sd	0.0063 %cv	0.89
Cd_228	av	0.006 mg/l	sd	0.0032 %cv	54.58
Copper	av	0.238 mg/l	sd	0.0048 %cv	2.01
Co_231	av	1.379 mg/l	sd	0.0430 %cv	3.12

M3639-9

	rep	1	Lead	conc	-0.25 mg/l	window edge
	rep	1	Chromium	conc	0.525 mg/l	
	rep	1	Nickel	conc	0.475 mg/l	
	rep	1	Zinc	conc	1.053 mg/l	
	rep	1	Fe_258	conc	395.14 mg/l	
	rep	1	Cobalt	conc	0.840 mg/l	
	rep	1	Cr_267	conc	0.572 mg/l	
	rep	1	Cd_228	conc	0.002 mg/l	
	rep	1	Copper	conc	0.204 mg/l	
	rep	1	Co_231	conc	0.826 mg/l	
	rep	2	Lead	conc	-0.07 mg/l	
	rep	2	Chromium	conc	0.565 mg/l	
	rep	2	Nickel	conc	0.538 mg/l	
	rep	2	Zinc	conc	1.037 mg/l	
	rep	2	Fe_258	conc	395.70 mg/l	
	rep	2	Cobalt	conc	0.861 mg/l	
	rep	2	Cr_267	conc	0.554 mg/l	
	rep	2	Cd_228	conc	0.011 mg/l	
	rep	2	Copper	conc	0.220 mg/l	
	rep	2	Co_231	conc	0.838 mg/l	
	rep	3	Lead	conc	0.21 mg/l	
	rep	3	Chromium	conc	0.557 mg/l	
	rep	3	Nickel	conc	0.475 mg/l	
	rep	3	Zinc	conc	1.050 mg/l	
	rep	3	Fe_258	conc	402.89 mg/l	
	rep	3	Cobalt	conc	0.850 mg/l	
	rep	3	Cr_267	conc	0.575 mg/l	
	rep	3	Cd_228	conc	0.010 mg/l	
	rep	3	Copper	conc	0.219 mg/l	
	rep	3	Co_231	conc	0.837 mg/l	

M3639-9

Lead	av	-0.04 mg/l	sd	0.234 %cv	618.13
Chromium	av	0.549 mg/l	sd	0.0210 %cv	3.83
Nickel	av	0.496 mg/l	sd	0.0361 %cv	7.28

Zinc	av	1.047 mg/l	sd	0.0008 %cv	0.84
Fe_258	av	397.91 mg/l	sd	4.317 %cv	1.09
Cobalt	av	0.951 mg/l	sd	0.0108 %cv	1.27
Cr_267	av	0.567 mg/l	sd	0.0113 %cv	2.00
Cd_228	av	0.009 mg/l	sd	0.0058 %cv	67.19
Copper	av	0.214 mg/l	sd	0.0086 %cv	4.03
Co_231	av	0.835 mg/l	sd	0.0060 %cv	0.72

M3639-10	rep	1	Lead	conc	0.19 mg/l
	rep	1	Chromium	conc	0.538 mg/l
	rep	1	Nickel	conc	0.970 mg/l
	rep	1	Zinc	conc	0.930 mg/l
	rep	1	Fe_258	conc	613.00 mg/l
	rep	1	Cobalt	conc	0.809 mg/l
	rep	1	Cr_267	conc	0.608 mg/l
	rep	1	Cd_228	conc	0.007 mg/l
	rep	1	Copper	conc	0.144 mg/l
	rep	1	Co_231	conc	0.931 mg/l
	rep	2	Lead	conc	-0.00 mg/l
	rep	2	Chromium	conc	0.586 mg/l
	rep	2	Nickel	conc	0.986 mg/l
	rep	2	Zinc	conc	0.952 mg/l
	rep	2	Fe_258	conc	631.25 mg/l
	rep	2	Cobalt	conc	0.867 mg/l
	rep	2	Cr_267	conc	0.566 mg/l
	rep	2	Cd_228	conc	0.006 mg/l
	rep	2	Copper	conc	0.137 mg/l
	rep	2	Co_231	conc	0.910 mg/l
	rep	3	Chromium	conc	0.589 mg/l
	rep	3	Lead	conc	-0.00 mg/l
	rep	3	Zinc	conc	0.955 mg/l
	rep	3	Nickel	conc	1.020 mg/l
	rep	3	Cobalt	conc	0.975 mg/l
	rep	3	Fe_258	conc	620.57 mg/l
	rep	3	Cd_228	conc	0.008 mg/l
	rep	3	Cr_267	conc	0.578 mg/l
	rep	3	Co_231	conc	0.875 mg/l
	rep	3	Copper	conc	0.152 mg/l

M3639-10						
Chromium	av	0.571 mg/l	sd	0.0284 %cv	4.98
Lead	av	0.04 mg/l	sd	0.139 %cv	396.05
Zinc	av	0.946 mg/l	sd	0.0135 %cv	1.43
Nickel	av	0.994 mg/l	sd	0.0221 %cv	2.22
Cobalt	av	0.894 mg/l	sd	0.0710 %cv	1.03
Fe_258	av	621.87 mg/l	sd	8.797 %cv	1.41
Cd_228	av	0.007 mg/l	sd	0.0007 %cv	9.23
Cr_267	av	0.584 mg/l	sd	0.0221 %cv	3.78
Co_231	av	0.905 mg/l	sd	0.0285 %cv	0.73
Copper	av	0.144 mg/l	sd	0.0076 %cv	5.30

M3639-11	rep	1	Lead	conc	-0.11 mg/l
	rep	1	Chromium	conc	0.960 mg/l
	rep	1	Nickel	conc	1.047 mg/l
	rep	1	Zinc	conc	2.042 mg/l
	rep	1	Fe_258	conc	765.53 mg/l
	rep	1	Cobalt	conc	3.048 mg/l
	rep	1	Cr_267	conc	1.004 mg/l
	rep	1	Cd_228	conc	0.019 mg/l
	rep	1	Copper	conc	0.358 mg/l
	rep	1	Co_231	conc	3.167 mg/l

	rep	2	Chromium	conc	1.015 mg/l	
	rep	2	Lead	conc	0.12 mg/l	
	rep	2	Zinc	conc	2.103 mg/l	
	rep	2	Nickel	conc	1.051 mg/l	
	rep	2	Cobalt	conc	2.987 mg/l	
	rep	2	Fe_258	conc	769.43 mg/l	
	rep	2	Cd_228	conc	0.013 mg/l	
	rep	2	Cr_267	conc	0.984 mg/l	
	rep	2	Co_231	conc	2.882 mg/l	
	rep	2	Copper	conc	0.352 mg/l	
	rep	3	Chromium	conc	1.129 mg/l	
	rep	3	Lead	conc	-0.03 mg/l	window edge
	rep	3	Zinc	conc	2.007 mg/l	
	rep	3	Nickel	conc	1.039 mg/l	
	rep	3	Cobalt	conc	3.009 mg/l	
	rep	3	Fe_258	conc	764.48 mg/l	
	rep	3	Cd_228	conc	0.018 mg/l	
	rep	3	Cr_267	conc	0.995 mg/l	
	rep	3	Co_231	conc	3.039 mg/l	
	rep	3	Copper	conc	0.337 mg/l	

M3639-11

Chromium	av	1.037 mg/l	sd	0.0828 %cv	7.98
Lead	av	-0.13 mg/l	sd	0.249 %cv	197.63
Zinc	av	2.051 mg/l	sd	0.0488 %cv	2.38
Nickel	av	1.066 mg/l	sd	0.0214 %cv	2.01
Cobalt	av	2.980 mg/l	sd	0.0821 %cv	2.76
Fe_258	av	763.15 mg/l	sd	3.260 %cv	0.43
Cd_228	av	0.016 mg/l	sd	0.0039 %cv	24.30
Cr_267	av	0.974 mg/l	sd	0.0097 %cv	0.98
Co_231	av	3.026 mg/l	sd	0.1376 %cv	4.55
Copper	av	0.347 mg/l	sd	0.0107 %cv	3.08

M3639-12

rep	1	Lead	conc	-0.57 mg/l	window edge
rep	1	Chromium	conc	0.783 mg/l	
rep	1	Nickel	conc	0.648 mg/l	
rep	1	Zinc	conc	0.950 mg/l	
rep	1	Fe_258	conc	531.32 mg/l	
rep	1	Cobalt	conc	1.441 mg/l	
rep	1	Cr_267	conc	0.783 mg/l	
rep	1	Cd_228	conc	0.008 mg/l	
rep	1	Copper	conc	0.246 mg/l	
rep	1	Co_231	conc	1.502 mg/l	
rep	2	Lead	conc	-0.31 mg/l	window edge
rep	2	Chromium	conc	0.915 mg/l	
rep	2	Nickel	conc	0.598 mg/l	
rep	2	Zinc	conc	0.940 mg/l	
rep	2	Fe_258	conc	536.79 mg/l	
rep	2	Cobalt	conc	1.500 mg/l	
rep	2	Cr_267	conc	0.804 mg/l	
rep	2	Cd_228	conc	0.016 mg/l	
rep	2	Copper	conc	0.236 mg/l	
rep	2	Co_231	conc	1.453 mg/l	
rep	3	Lead	conc	-0.36 mg/l	window edge
rep	3	Chromium	conc	0.792 mg/l	
rep	3	Nickel	conc	0.644 mg/l	
rep	3	Zinc	conc	0.900 mg/l	
rep	3	Fe_258	conc	530.12 mg/l	
rep	3	Cobalt	conc	1.479 mg/l	
rep	3	Cr_267	conc	0.778 mg/l	
rep	3	Cd_228	conc	0.012 mg/l	

	rep	3	Copper	conc	0.335	mg/l		
	rep	3	Co_231	conc	1.535	mg/l		
09-12								
Lead	av	-0.41	mg/l	sd	0.140	%cv	33.97	
Chromium	av	0.796	mg/l	sd	0.0168	%cv	2.11	
Nickel	av	0.630	mg/l	sd	0.0280	%cv	4.44	
Zinc	av	0.930	mg/l	sd	0.0264	%cv	2.83	
Fe_258	av	532.74	mg/l	sd	3.557	%cv	0.67	
Cobalt	av	1.472	mg/l	sd	0.0301	%cv	2.04	
Cr_267	av	0.788	mg/l	sd	0.0138	%cv	1.76	
Cd_228	av	0.012	mg/l	sd	0.0040	%cv	34.03	
Copper	av	0.239	mg/l	sd	0.0063	%cv	2.64	
Co_231	av	1.491	mg/l	sd	0.0240	%cv	1.61	

#1 standard	rep	1	Lead	em	46.6	conc	1.00
	rep	1	Chromium	em	80.0	conc	1.000
	rep	1	Nickel	em	313.4	conc	1.000
	rep	1	Zinc	em	310.8	conc	1.000
	rep	1	Cr_267	em	1307.0	conc	1.000
	rep	1	Cobalt	em	260.8	conc	1.000
	rep	1	Copper	em	1806.3	conc	1.000
	rep	1	Cd_228	em	525.8	conc	1.000
	rep	1	Co_231	em	158.3	conc	1.000
	rep	2	Lead	em	47.3	conc	1.00
	rep	2	Chromium	em	83.0	conc	1.000
	rep	2	Nickel	em	315.0	conc	1.000
	rep	2	Zinc	em	298.0	conc	1.000
	rep	2	Cr_267	em	1264.3	conc	1.000
	rep	2	Cobalt	em	262.3	conc	1.000
	rep	2	Copper	em	1757.3	conc	1.000
	rep	2	Cd_228	em	530.2	conc	1.000
	rep	2	Co_231	em	155.9	conc	1.000
	rep	3	Lead	em	48.2	conc	1.00
	rep	3	Chromium	em	82.0	conc	1.000
	rep	3	Nickel	em	314.4	conc	1.000
	rep	3	Zinc	em	298.2	conc	1.000
	rep	3	Cr_267	em	1288.1	conc	1.000
	rep	3	Cobalt	em	268.3	conc	1.000
	rep	3	Copper	em	1794.3	conc	1.000
	rep	3	Cd_228	em	531.6	conc	1.000
	rep	3	Co_231	em	156.6	conc	1.000

#1 standard									
Lead	av	47.40	49	sd	0.821	%cv	1.73	conc	1.00
Chromium	av	81.687	80	sd	1.5435	%cv	1.89	conc	1.000
Nickel	av	314.263	291	sd	0.8033	%cv	0.26	conc	1.000
Zinc	av	302.321	301	sd	7.3173	%cv	2.42	conc	1.000
Cr_267	av	1286.758	1289	sd	21.7571	%cv	1.69	conc	1.000
Cobalt	av	263.736	267	sd	3.9732	%cv	1.51	conc	1.000
Copper	av	1786.188	1723	sd	25.3193	%cv	1.42	conc	1.000
Cd_228	av	531.364	513	sd	6.1373	%cv	1.16	conc	1.000
Co_231	av	156.930	153	sd	1.2075	%cv	0.77	conc	1.000

#3 standard	rep	1	Fe_258	em	41553.1	conc	100.00	
	rep	2	Fe_258	em	41823.1	conc	100.00	
	rep	3	Fe_258	em	41523.4	conc	100.00	
#3 standard								
Fe_258	av	41567.20	40551	sd	80.913	%cv	0.12	conc 100.00

D1	rep	1	Lead	conc	0.07	mg/l	
	rep	1	Chromium	conc	0.019	mg/l	

	rep	1	Nickel	conc	0.003	mg/l
	rep	1	Zinc	conc	0.003	mg/l
	rep	1	Fe_258	conc	0.03	mg/l
	rep	1	Cobalt	conc	0.005	mg/l
	rep	1	Cr_267	conc	0.004	mg/l
	rep	1	Cd_228	conc	-0.001	mg/l
	rep	1	Copper	conc	0.007	mg/l
	rep	1	Co_231	conc	-0.029	mg/l
	rep	2	Chromium	conc	-0.005	mg/l
	rep	2	Lead	conc	-0.06	mg/l
	rep	2	Zinc	conc	0.001	mg/l
	rep	2	Nickel	conc	-0.020	mg/l
	rep	2	Cobalt	conc	0.002	mg/l
	rep	2	Fe_258	conc	-0.26	mg/l
	rep	2	Cd_228	conc	0.005	mg/l
	rep	2	Cr_267	conc	0.001	mg/l
	rep	2	Co_231	conc	0.009	mg/l
	rep	2	Copper	conc	0.005	mg/l
	rep	3	Chromium	conc	-0.017	mg/l
	rep	3	Lead	conc	-0.05	mg/l
	rep	3	Zinc	conc	-0.000	mg/l
	rep	3	Nickel	conc	0.001	mg/l
	rep	3	Cobalt	conc	-0.000	mg/l
	rep	3	Fe_258	conc	-0.14	mg/l
	rep	3	Cd_228	conc	0.002	mg/l
	rep	3	Cr_267	conc	-0.002	mg/l
	rep	3	Co_231	conc	0.010	mg/l
	rep	3	Copper	conc	0.005	mg/l

Chromium	av	-0.001	mg/l	sd	0.0103	%cv 3287.6
Lead	av	-0.01	mg/l	sd	0.071	%cv 559.21
Zinc	av	0.001	mg/l	sd	0.0017	%cv 122.22
Nickel	av	-0.008	mg/l	sd	0.0171	%cv 215.04
Cobalt	av	0.002	mg/l	sd	0.0025	%cv 110.35
Fe_258	av	0.17	mg/l	sd	0.656	%cv 379.15
Cd_228	av	0.002	mg/l	sd	0.0034	%cv 191.15
Cr_267	av	0.001	mg/l	sd	0.0031	%cv 308.74
Co_231	av	-0.003	mg/l	sd	0.0225	%cv 669.84
Copper	av	0.006	mg/l	sd	0.0008	%cv 13.31

ICPS/500Fe	rep	1	Lead	conc	10.41	mg/l
	rep	1	Chromium	conc	3.000	mg/l
	rep	1	Nickel	conc	2.741	mg/l
	rep	1	Zinc	conc	2.899	mg/l
	rep	1	Fe_258	conc	454.34	mg/l
	rep	1	Cobalt	conc	2.793	mg/l
	rep	1	Cr_267	conc	2.851	mg/l
	rep	1	Cd_228	conc	2.874	mg/l
	rep	1	Copper	conc	2.979	mg/l
	rep	1	Co_231	conc	2.740	mg/l
	rep	2	Chromium	conc	2.936	mg/l
	rep	2	Lead	conc	10.25	mg/l
	rep	2	Zinc	conc	2.986	mg/l
	rep	2	Nickel	conc	2.677	mg/l
	rep	2	Cobalt	conc	2.836	mg/l
	rep	2	Fe_258	conc	457.30	mg/l
	rep	2	Cd_228	conc	2.970	mg/l
	rep	2	Cr_267	conc	3.025	mg/l
	rep	2	Co_231	conc	2.686	mg/l
	rep	2	Copper	conc	2.940	mg/l

	rep	3	Chromium	conc	2.020	mg/l		
	rep	3	Lead	conc	10.07	mg/l		
	rep	3	Zinc	conc	3.117	mg/l		
	rep	3	Nickel	conc	2.743	mg/l		
	rep	3	Cobalt	conc	2.855	mg/l		
	rep	3	Fe_258	conc	469.12	mg/l		
	rep	3	Cd_228	conc	2.048	mg/l		
	rep	3	Cr_267	conc	2.909	mg/l		
	rep	3	Co_231	conc	2.794	mg/l		
	rep	3	Copper	conc	2.845	mg/l		
ICPS/500Fe								
Chromium	av	2.921	mg/l	3	sd	0.0073	%cv	2.99
Lead	av	10.24	mg/l	10	sd	0.173	%cv	1.68
Zinc	av	3.001	mg/l	3	sd	0.1095	%cv	3.65
Nickel	av	2.721	mg/l	3	sd	0.0367	%cv	1.35
Cobalt	av	2.828	mg/l	3	sd	0.0318	%cv	1.13
Fe_258	av	463.62	mg/l	500	sd	8.078	%cv	1.74
Cd_228	av	2.898	mg/l	3	sd	0.0663	%cv	2.29
Cr_267	av	2.928	mg/l	3	sd	0.0885	%cv	3.02
Co_231	av	2.730	mg/l	3	sd	0.0699	%cv	2.56
Copper	av	2.889	mg/l	3	sd	0.0780	%cv	2.70
M3639-13	rep	1	Lead	conc	-0.04	mg/l		window edge
	rep	1	Chromium	conc	0.529	mg/l		
	rep	1	Nickel	conc	0.593	mg/l		
	rep	1	Zinc	conc	0.771	mg/l		
	rep	1	Fe_258	conc	488.46	mg/l		
	rep	1	Cobalt	conc	1.685	mg/l		
	rep	1	Cr_267	conc	0.530	mg/l		
	rep	1	Cd_228	conc	0.026	mg/l		
	rep	1	Copper	conc	0.163	mg/l		
	rep	1	Co_231	conc	1.841	mg/l		
	rep	2	Chromium	conc	0.532	mg/l		
	rep	2	Lead	conc	-0.08	mg/l		
	rep	2	Zinc	conc	0.769	mg/l		
	rep	2	Nickel	conc	0.582	mg/l		
	rep	2	Cobalt	conc	1.786	mg/l		
	rep	2	Fe_258	conc	481.81	mg/l		
	rep	2	Cd_228	conc	0.007	mg/l		
	rep	2	Cr_267	conc	0.512	mg/l		
	rep	2	Co_231	conc	1.824	mg/l		
	rep	2	Copper	conc	0.161	mg/l		
	rep	3	Lead	conc	-0.38	mg/l		window edge
	rep	3	Chromium	conc	0.475	mg/l		
	rep	3	Nickel	conc	0.584	mg/l		
	rep	3	Zinc	conc	0.803	mg/l		
	rep	3	Fe_258	conc	488.98	mg/l		
	rep	3	Cobalt	conc	1.660	mg/l		
	rep	3	Cr_267	conc	0.500	mg/l		
	rep	3	Cd_228	conc	0.007	mg/l		
	rep	3	Copper	conc	0.170	mg/l		
	rep	3	Co_231	conc	1.855	mg/l		
M3639-13								
Lead	av	-0.17	mg/l		sd	0.185	%cv	108.45
Chromium	av	0.512	mg/l		sd	0.0024	%cv	0.34
Nickel	av	0.586	mg/l		sd	0.0053	%cv	0.90
Zinc	av	0.781	mg/l		sd	0.0190	%cv	2.44
Fe_258	av	486.78	mg/l		sd	3.391	%cv	0.70
Cobalt	av	1.711	mg/l		sd	0.0653	%cv	3.87
Cr_267	av	0.524	mg/l		sd	0.0102	%cv	1.94

0.1ml Sc32441
1ml Sc52838
to 10ml with acid blank

interference Check

	Recovery
	97
	102
	100
	91
	94
	93
	97
	98
	91
	96

Cd_228	av	0.010 mg/l	sd	0.0110 %cv	84.07	
Copper	av	0.187 mg/l	sd	0.0097 %cv	5.79	
Co_231	av	1.640 mg/l	sd	0.0206 %cv	1.24	

M3639-14	rep	1 Lead	conc	-0.49 mg/l		window edge
	rep	1 Chromium	conc	0.744 mg/l		
	rep	1 Nickel	conc	0.678 mg/l		
	rep	1 Zinc	conc	0.925 mg/l		
	rep	1 Fe_258	conc	518.56 mg/l		
	rep	1 Cobalt	conc	1.977 mg/l		
	rep	1 Cr_267	conc	0.720 mg/l		
	rep	1 Cd_228	conc	0.001 mg/l		
	rep	1 Copper	conc	0.200 mg/l		
	rep	1 Co_231	conc	1.710 mg/l		
	rep	2 Chromium	conc	0.685 mg/l		
	rep	2 Lead	conc	-0.64 mg/l		window edge
	rep	2 Zinc	conc	0.905 mg/l		
	rep	2 Nickel	conc	0.666 mg/l		
	rep	2 Cobalt	conc	1.956 mg/l		
	rep	2 Fe_258	conc	505.99 mg/l		
	rep	2 Cd_228	conc	0.005 mg/l		
	rep	2 Cr_267	conc	0.740 mg/l		
	rep	2 Co_231	conc	1.939 mg/l		
	rep	2 Copper	conc	0.202 mg/l		
	rep	3 Chromium	conc	0.668 mg/l		
	rep	3 Lead	conc	0.07 mg/l		
	rep	3 Zinc	conc	0.926 mg/l		
	rep	3 Nickel	conc	0.661 mg/l		
	rep	3 Cobalt	conc	1.953 mg/l		
	rep	3 Fe_258	conc	506.83 mg/l		
	rep	3 Cd_228	conc	0.011 mg/l		
	rep	3 Cr_267	conc	0.722 mg/l		
	rep	3 Co_231	conc	1.941 mg/l		
	rep	3 Copper	conc	0.190 mg/l		

M3639-14

Chromium	av	0.699 mg/l	sd	0.0400 %cv	5.73
Lead	av	-0.35 mg/l	sd	0.369 %cv	104.68
Zinc	av	0.918 mg/l	sd	0.0121 %cv	1.32
Nickel	av	0.668 mg/l	sd	0.0090 %cv	1.35
Cobalt	av	1.928 mg/l	sd	0.0449 %cv	2.33
Fe_258	av	510.40 mg/l	sd	7.079 %cv	1.39
Cd_228	av	0.006 mg/l	sd	0.0047 %cv	79.56
Cr_267	av	0.729 mg/l	sd	0.0121 %cv	1.66
Co_231	av	1.930 mg/l	sd	0.0171 %cv	0.88
Copper	av	0.197 mg/l	sd	0.0063 %cv	3.13

M3639-15	rep	1 Lead	conc	-0.27 mg/l		
	rep	1 Chromium	conc	0.558 mg/l		
	rep	1 Nickel	conc	0.483 mg/l		
	rep	1 Zinc	conc	0.749 mg/l		
	rep	1 Fe_258	conc	381.88 mg/l		
	rep	1 Cobalt	conc	0.503 mg/l		
	rep	1 Cr_267	conc	0.609 mg/l		
	rep	1 Cd_228	conc	0.001 mg/l		
	rep	1 Copper	conc	0.153 mg/l		
	rep	1 Co_231	conc	0.457 mg/l		
	rep	2 Lead	conc	-0.32 mg/l		window edge
	rep	2 Chromium	conc	0.580 mg/l		
	rep	2 Nickel	conc	0.411 mg/l		
	rep	2 Zinc	conc	0.747 mg/l		

	rep	2	Fe_258	conc	354.77	mg/l
	rep	2	Cobalt	conc	0.454	mg/l
	rep	2	Cr_267	conc	0.593	mg/l
	rep	2	Cd_228	conc	0.010	mg/l
	rep	2	Copper	conc	0.162	mg/l
	rep	2	Co_231	conc	0.402	mg/l
	rep	3	Lead	conc	-0.52	mg/l
	rep	3	Chromium	conc	0.553	mg/l
	rep	3	Nickel	conc	0.451	mg/l
	rep	3	Zinc	conc	0.734	mg/l
	rep	3	Fe_258	conc	354.95	mg/l
	rep	3	Cobalt	conc	0.450	mg/l
	rep	3	Cr_267	conc	0.647	mg/l
	rep	3	Cd_228	conc	-0.001	mg/l
	rep	3	Copper	conc	0.155	mg/l
	rep	3	Co_231	conc	0.405	mg/l

window edge

M3639-15

Lead	av	-0.37 mg/l	sd	0.131 %cv	35.74
Chromium	av	0.604 mg/l	sd	0.0472 %cv	7.82
Nickel	av	0.441 mg/l	sd	0.0269 %cv	6.10
Zinc	av	0.743 mg/l	sd	0.0082 %cv	1.10
Fe_258	av	357.20 mg/l	sd	4.059 %cv	1.14
Cobalt	av	0.469 mg/l	sd	0.0295 %cv	6.28
Cr_267	av	0.616 mg/l	sd	0.0277 %cv	4.49
Cd_228	av	0.004 mg/l	sd	0.0057 %cv	160.38
Copper	av	0.153 mg/l	sd	0.0018 %cv	1.17
Co_231	av	0.426 mg/l	sd	0.0380 %cv	8.93

39-16	rep	1	Lead	conc	0.01	mg/l
	rep	1	Chromium	conc	0.600	mg/l
	rep	1	Nickel	conc	0.547	mg/l
	rep	1	Zinc	conc	1.252	mg/l
	rep	1	Fe_258	conc	402.85	mg/l
	rep	1	Cobalt	conc	1.190	mg/l
	rep	1	Cr_267	conc	0.644	mg/l
	rep	1	Cd_228	conc	0.002	mg/l
	rep	1	Copper	conc	0.177	mg/l
	rep	1	Co_231	conc	1.072	mg/l
	rep	2	Chromium	conc	0.591	mg/l
	rep	2	Lead	conc	0.27	mg/l
	rep	2	Zinc	conc	1.207	mg/l
	rep	2	Nickel	conc	0.517	mg/l
	rep	2	Cobalt	conc	1.176	mg/l
	rep	2	Fe_258	conc	465.57	mg/l
	rep	2	Cd_228	conc	0.009	mg/l
	rep	2	Cr_267	conc	0.633	mg/l
	rep	2	Co_231	conc	1.148	mg/l
	rep	2	Copper	conc	0.185	mg/l
	rep	3	Lead	conc	-0.02	mg/l
	rep	3	Chromium	conc	0.579	mg/l
	rep	3	Nickel	conc	0.505	mg/l
	rep	3	Zinc	conc	1.206	mg/l
	rep	3	Fe_258	conc	466.44	mg/l
	rep	3	Cobalt	conc	1.151	mg/l
	rep	3	Cr_267	conc	0.664	mg/l
	rep	3	Cd_228	conc	0.009	mg/l
	rep	3	Copper	conc	0.183	mg/l
	rep	3	Co_231	conc	1.148	mg/l

window edge

M3639-16

Lead	av	0.09 mg/l	sd	0.100 %cv	100.70

Chromium	av	0.601	mg/l	sd	0.0284	%cv 4.72
Nickel	av	0.500	mg/l	sd	0.0150	%cv 3.02
Zinc	av	1.221	mg/l	sd	0.0264	%cv 2.16
Fe_258	av	471.83	mg/l	sd	7.100	%cv 2.06
Cobalt	av	1.176	mg/l	sd	0.0144	%cv 1.22
Cr_267	av	0.647	mg/l	sd	0.0157	%cv 2.43
Cd_228	av	0.007	mg/l	sd	0.0042	%cv 63.54
Copper	av	0.182	mg/l	sd	0.0046	%cv 2.58
Co_231	av	1.121	mg/l	sd	0.0435	%cv 3.90

M3639-17	rep	1	Lead	conc	-0.32	mg/l
	rep	1	Chromium	conc	0.577	mg/l
	rep	1	Nickel	conc	0.460	mg/l
	rep	1	Zinc	conc	1.326	mg/l
	rep	1	Fe_258	conc	624.89	mg/l
	rep	1	Cobalt	conc	4.753	mg/l
	rep	1	Cr_267	conc	0.696	mg/l
	rep	1	Cd_228	conc	0.010	mg/l
	rep	1	Copper	conc	0.215	mg/l
	rep	1	Co_231	conc	4.581	mg/l
	rep	2	Lead	conc	-0.07	mg/l
	rep	2	Chromium	conc	0.604	mg/l
	rep	2	Nickel	conc	0.340	mg/l
	rep	2	Zinc	conc	1.317	mg/l
	rep	2	Fe_258	conc	611.12	mg/l
	rep	2	Cobalt	conc	4.704	mg/l
	rep	2	Cr_267	conc	0.686	mg/l
	rep	2	Cd_228	conc	-0.000	mg/l window edge
	rep	2	Copper	conc	0.219	mg/l
	rep	2	Co_231	conc	4.646	mg/l
	rep	3	Lead	conc	0.21	mg/l
	rep	3	Chromium	conc	0.619	mg/l
	rep	3	Nickel	conc	0.615	mg/l
	rep	3	Zinc	conc	1.315	mg/l
	rep	3	Fe_258	conc	636.08	mg/l
	rep	3	Cobalt	conc	4.595	mg/l
	rep	3	Cr_267	conc	0.651	mg/l
	rep	3	Cd_228	conc	0.008	mg/l
	rep	3	Copper	conc	0.223	mg/l
	rep	3	Co_231	conc	4.616	mg/l

M3639-17						
Lead	av	-0.06	mg/l	sd	0.260	%cv 432.45
Chromium	av	0.600	mg/l	sd	0.0215	%cv 3.57
Nickel	av	0.838	mg/l	sd	0.0225	%cv 2.69
Zinc	av	1.319	mg/l	sd	0.0051	%cv 0.39
Fe_258	av	624.03	mg/l	sd	12.502	%cv 2.00
Cobalt	av	4.609	mg/l	sd	0.0371	%cv 1.06
Cr_267	av	0.668	mg/l	sd	0.0248	%cv 3.72
Cd_228	av	0.006	mg/l	sd	0.0055	%cv 93.79
Copper	av	0.219	mg/l	sd	0.0040	%cv 1.85
Co_231	av	4.614	mg/l	sd	0.0324	%cv 0.70

M3639-18	rep	1	Lead	conc	-0.24	mg/l window edge
	rep	1	Chromium	conc	0.376	mg/l
	rep	1	Nickel	conc	0.287	mg/l
	rep	1	Zinc	conc	0.736	mg/l
	rep	1	Fe_258	conc	331.76	mg/l
	rep	1	Cobalt	conc	1.270	mg/l
	rep	1	Cr_267	conc	0.423	mg/l
	rep	1	Cd_228	conc	0.000	mg/l

	rep	1	Copper	conc	0.142	mg/l		
	rep	1	Co_231	conc	1.192	mg/l		
	rep	2	Lead	conc	-0.27	mg/l		window edge
	rep	2	Chromium	conc	0.377	mg/l		
	rep	2	Nickel	conc	0.560	mg/l		
	rep	2	Zinc	conc	0.795	mg/l		
	rep	2	Fe_258	conc	339.39	mg/l		
	rep	2	Cobalt	conc	1.157	mg/l		
	rep	2	Cr_267	conc	0.404	mg/l		
	rep	2	Cd_228	conc	0.005	mg/l		
	rep	2	Copper	conc	0.162	mg/l		
	rep	2	Co_231	conc	1.189	mg/l		
	rep	3	Lead	conc	-0.05	mg/l		
	rep	3	Chromium	conc	0.363	mg/l		
	rep	3	Nickel	conc	0.647	mg/l		
	rep	3	Zinc	conc	0.811	mg/l		
	rep	3	Fe_258	conc	325.42	mg/l		
	rep	3	Cobalt	conc	1.205	mg/l		
	rep	3	Cr_267	conc	0.425	mg/l		
	rep	3	Cd_228	conc	0.002	mg/l		
	rep	3	Copper	conc	0.165	mg/l		
	rep	3	Co_231	conc	1.152	mg/l		
M3639-18								
Lead	av	-0.19	mg/l	sd	0.117	%cv	62.62	
Chromium	av	0.372	mg/l	sd	0.0080	%cv	2.14	
Nickel	av	0.614	mg/l	sd	0.0413	%cv	6.72	
Zinc	av	0.797	mg/l	sd	0.0125	%cv	1.57	
Fe_258	av	332.36	mg/l	sd	7.252	%cv	2.18	
Cobalt	av	1.211	mg/l	sd	0.0583	%cv	4.81	
Cr_267	av	0.417	mg/l	sd	0.0115	%cv	2.75	
Cd_228	av	0.005	mg/l	sd	0.0027	%cv	54.04	
Copper	av	0.156	mg/l	sd	0.0126	%cv	8.04	
Co_231	av	1.174	mg/l	sd	0.0200	%cv	1.70	
#1 standard	rep	1	Lead	em	49.2	conc	1.00	
	rep	1	Chromium	em	77.7	conc	1.000	
	rep	1	Nickel	em	310.7	conc	1.000	
	rep	1	Zinc	em	309.9	conc	1.000	
	rep	1	Cr_267	em	1335.0	conc	1.000	
	rep	1	Cobalt	em	266.5	conc	1.000	
	rep	1	Copper	em	1758.3	conc	1.000	
	rep	1	Cd_228	em	533.3	conc	1.000	
	rep	1	Co_231	em	157.1	conc	1.000	
	rep	2	Lead	em	40.9	conc	1.00	
	rep	2	Chromium	em	79.0	conc	1.000	
	rep	2	Nickel	em	310.3	conc	1.000	
	rep	2	Zinc	em	310.0	conc	1.000	
	rep	2	Cr_267	em	1300.1	conc	1.000	
	rep	2	Cobalt	em	267.6	conc	1.000	
	rep	2	Copper	em	1359.4	conc	1.000	
	rep	2	Cd_228	em	542.6	conc	1.000	
	rep	2	Co_231	em	155.3	conc	1.000	
	rep	3	Lead	em	56.4	conc	1.00	
	rep	3	Chromium	em	37.2	conc	1.000	
	rep	3	Nickel	em	326.4	conc	1.000	
	rep	3	Zinc	em	311.5	conc	1.000	
	rep	3	Cr_267	em	1351.6	conc	1.000	
	rep	3	Cobalt	em	265.2	conc	1.000	
	rep	3	Copper	em	1735.1	conc	1.000	
	rep	3	Cd_228	em	520.9	conc	1.000	

	rep	3	Co_231	em	155.3	conc	1.000		
standard									
Lead	av	47.85	47	sd	6.296	%cv	13.63	conc	1.00
Chromium	av	81.300	81	sd	5.1333	%cv	6.31	conc	1.000
Nickel	av	318.440	314	sd	7.0435	%cv	2.45	conc	1.000
Zinc	av	310.483	302	sd	0.9667	%cv	0.31	conc	1.000
Cr_267	av	1308.911	1286	sd	11.2340	%cv	0.84	conc	1.000
Cobalt	av	266.433	263	sd	1.1743	%cv	0.44	conc	1.000
Copper	av	1784.233	1786	sd	66.0914	%cv	3.70	conc	1.000
Cd_228	av	533.216	531	sd	9.4079	%cv	1.76	conc	1.000
Co_231	av	155.266	156	sd	1.0069	%cv	1.21	conc	1.000
#3 standard	rep	1	Fe_258	em	44835.0	conc	100.00		
	rep	2	Fe_258	em	43255.0	conc	100.00		
	rep	3	Fe_258	em	45554.0	conc	100.00		
#3 standard									
Fe_258	av	44547.99	41567	sd	1176.047	%cv	2.64	conc	100.00
M3639-19	rep	1	Lead	conc	-0.00	mg/l			
	rep	1	Chromium	conc	0.821	mg/l			
	rep	1	Nickel	conc	2.470	mg/l			
	rep	1	Zinc	conc	1.496	mg/l			
	rep	1	Fe_258	conc	957.18	mg/l			
	rep	1	Cobalt	conc	8.600	mg/l			
	rep	1	Cr_267	conc	0.779	mg/l			
	rep	1	Cd_228	conc	0.018	mg/l			
	rep	1	Copper	conc	0.200	mg/l			
	rep	1	Co_231	conc	8.750	mg/l			
	rep	2	Lead	conc	0.26	mg/l			
	rep	2	Chromium	conc	0.824	mg/l			
	rep	2	Nickel	conc	2.435	mg/l			
	rep	2	Zinc	conc	1.474	mg/l			
	rep	2	Fe_258	conc	959.31	mg/l			
	rep	2	Cobalt	conc	8.816	mg/l			
	rep	2	Cr_267	conc	0.787	mg/l			
	rep	2	Cd_228	conc	0.020	mg/l			
	rep	2	Copper	conc	0.251	mg/l			
	rep	2	Co_231	conc	9.047	mg/l			
	rep	3	Chromium	conc	0.777	mg/l			
	rep	3	Lead	conc	0.23	mg/l			
	rep	3	Zinc	conc	1.549	mg/l			
	rep	3	Nickel	conc	2.440	mg/l			
	rep	3	Cobalt	conc	8.946	mg/l			
	rep	3	Fe_258	conc	938.92	mg/l			
	rep	3	Cd_228	conc	0.012	mg/l			
	rep	3	Cr_267	conc	0.801	mg/l			
	rep	3	Co_231	conc	8.933	mg/l			
	rep	3	Copper	conc	0.200	mg/l			
M3639-19									
Chromium	av	0.807	mg/l	sd	0.0262	%cv	3.24		
Lead	av	0.15	mg/l	sd	0.140	%cv	93.63		
Zinc	av	1.506	mg/l	sd	0.0382	%cv	2.53		
Nickel	av	2.451	mg/l	sd	0.0180	%cv	0.73		
Cobalt	av	8.756	mg/l	sd	0.1293	%cv	1.48		
Fe_258	av	951.90	mg/l	sd	11.311	%cv	1.19		
Cd_228	av	0.017	mg/l	sd	0.0042	%cv	24.83		
Cr_267	av	0.789	mg/l	sd	0.0109	%cv	1.37		
Co_231	av	8.929	mg/l	sd	0.151	%cv	1.70		
Copper	av	0.230	mg/l	sd	0.0008	%cv	0.29		

M3639-20	rep	1	Lead	conc	-0.34	mg/l		window edge
	rep	1	Chromium	conc	0.595	mg/l		
	rep	1	Nickel	conc	1.042	mg/l		
	rep	1	Zinc	conc	1.433	mg/l		
	rep	1	Fe_258	conc	530.72	mg/l		
	rep	1	Cobalt	conc	2.796	mg/l		
	rep	1	Cr_267	conc	0.661	mg/l		
	rep	1	Cd_228	conc	0.004	mg/l		
	rep	1	Copper	conc	0.257	mg/l		
	rep	1	Co_231	conc	3.013	mg/l		
	rep	2	Lead	conc	-0.37	mg/l		window edge
	rep	2	Chromium	conc	0.662	mg/l		
	rep	2	Nickel	conc	1.066	mg/l		
	rep	2	Zinc	conc	1.412	mg/l		
	rep	2	Fe_258	conc	535.11	mg/l		
	rep	2	Cobalt	conc	2.841	mg/l		
	rep	2	Cr_267	conc	0.649	mg/l		
	rep	2	Cd_228	conc	0.009	mg/l		
	rep	2	Copper	conc	0.262	mg/l		
	rep	2	Co_231	conc	2.831	mg/l		
	rep	3	Lead	conc	-0.40	mg/l		window edge
	rep	3	Chromium	conc	0.701	mg/l		
	rep	3	Nickel	conc	1.128	mg/l		
	rep	3	Zinc	conc	1.440	mg/l		
	rep	3	Fe_258	conc	547.09	mg/l		
	rep	3	Cobalt	conc	2.938	mg/l		
	rep	3	Cr_267	conc	0.651	mg/l		
	rep	3	Cd_228	conc	0.008	mg/l		
	rep	3	Copper	conc	0.253	mg/l		
	rep	3	Co_231	conc	3.009	mg/l		
M3639-20								
Lead	av	-0.37	mg/l	sd	0.027	%cv	7.28	
Chromium	av	0.686	mg/l	sd	0.0215	%cv	3.13	
Nickel	av	1.079	mg/l	sd	0.0445	%cv	4.12	
Zinc	av	1.428	mg/l	sd	0.0144	%cv	1.01	
Fe_258	av	540.31	mg/l	sd	6.147	%cv	1.14	
Cobalt	av	2.855	mg/l	sd	0.0768	%cv	2.69	
Cr_267	av	0.654	mg/l	sd	0.0060	%cv	0.92	
Cd_228	av	0.007	mg/l	sd	0.0028	%cv	38.91	
Copper	av	0.257	mg/l	sd	0.0046	%cv	1.77	
Co_231	av	2.951	mg/l	sd	0.1041	%cv	3.53	
QCD M3639-1	rep	1	Lead	conc	-0.30	mg/l		window edge
	rep	1	Chromium	conc	0.218	mg/l		
	rep	1	Nickel	conc	0.196	mg/l		
	rep	1	Zinc	conc	0.460	mg/l		
	rep	1	Fe_258	conc	168.28	mg/l		
	rep	1	Cobalt	conc	0.161	mg/l		
	rep	1	Cr_267	conc	0.260	mg/l		
	rep	1	Cd_228	conc	-0.001	mg/l		
	rep	1	Copper	conc	0.000	mg/l		
	rep	1	Co_231	conc	0.154	mg/l		
	rep	2	Lead	conc	-0.03	mg/l		
	rep	2	Chromium	conc	0.234	mg/l		
	rep	2	Nickel	conc	0.200	mg/l		
	rep	2	Zinc	conc	0.457	mg/l		
	rep	2	Fe_258	conc	171.75	mg/l		
	rep	2	Cobalt	conc	0.132	mg/l		
	rep	2	Cr_267	conc	0.260	mg/l		
	rep	2	Cd_228	conc	0.010	mg/l		

	rep	2	Copper	conc	0.030	mg/l	
	rep	2	Co_231	conc	0.137	mg/l	
	rep	3	Lead	conc	-0.32	mg/l	window edge
	rep	3	Chromium	conc	0.218	mg/l	
	rep	3	Nickel	conc	0.200	mg/l	
	rep	3	Zinc	conc	0.431	mg/l	
	rep	3	Fe_258	conc	171.41	mg/l	
	rep	3	Cobalt	conc	0.147	mg/l	
	rep	3	Cr_267	conc	0.260	mg/l	
	rep	3	Cd_228	conc	-0.000	mg/l	
	rep	3	Copper	conc	0.105	mg/l	
	rep	3	Co_231	conc	0.157	mg/l	

QCD M3639-1

Lead	av	-0.21 mg/l	sd	0.165 %cv	78.29
Chromium	av	0.223 mg/l	sd	0.0090 %cv	4.03
Nickel	av	0.202 mg/l	sd	0.0061 %cv	3.01
Zinc	av	0.469 mg/l	sd	0.0105 %cv	2.24
Fe_258	av	170.48 mg/l	sd	1.914 %cv	1.12
Cobalt	av	0.147 mg/l	sd	0.0148 %cv	10.07
Cr_267	av	0.260 mg/l	sd	0.0005 %cv	0.18
Cd_228	av	0.004 mg/l	sd	0.0081 %cv	193.91
Copper	av	0.094 mg/l	sd	0.0096 %cv	10.26
Co_231	av	0.153 mg/l	sd	0.0152 %cv	9.94

QCD M3639-2	rep	1	Lead	conc	0.07	mg/l	
	rep	1	Chromium	conc	0.188	mg/l	
	rep	1	Nickel	conc	0.189	mg/l	
	rep	1	Zinc	conc	0.359	mg/l	
	rep	1	Fe_258	conc	146.81	mg/l	
	rep	1	Cobalt	conc	0.123	mg/l	
	rep	1	Cr_267	conc	0.229	mg/l	
	rep	1	Cd_228	conc	0.006	mg/l	
	rep	1	Copper	conc	0.091	mg/l	
	rep	1	Co_231	conc	0.117	mg/l	
	rep	2	Lead	conc	-0.13	mg/l	
	rep	2	Chromium	conc	0.215	mg/l	
	rep	2	Nickel	conc	0.184	mg/l	
	rep	2	Zinc	conc	0.391	mg/l	
	rep	2	Fe_258	conc	150.60	mg/l	
	rep	2	Cobalt	conc	0.102	mg/l	
	rep	2	Cr_267	conc	0.228	mg/l	
	rep	2	Cd_228	conc	0.005	mg/l	
	rep	2	Copper	conc	0.073	mg/l	
	rep	2	Co_231	conc	0.113	mg/l	
	rep	3	Chromium	conc	0.249	mg/l	
	rep	3	Lead	conc	-0.28	mg/l	window edge
	rep	3	Zinc	conc	0.394	mg/l	
	rep	3	Nickel	conc	0.177	mg/l	
	rep	3	Cobalt	conc	0.115	mg/l	
	rep	3	Fe_258	conc	146.49	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Cr_267	conc	0.220	mg/l	
	rep	3	Co_231	conc	0.114	mg/l	
	rep	3	Copper	conc	0.085	mg/l	

M3639-2

Chromium	av	0.217 mg/l	sd	0.0309 %cv	14.21
Lead	av	-0.11 mg/l	sd	0.171 %cv	152.68
Zinc	av	0.381 mg/l	sd	0.0195 %cv	5.12
Nickel	av	0.177 mg/l	sd	0.0126 %cv	7.14
Cobalt	av	0.115 mg/l	sd	0.0116 %cv	9.56

Fe_258	av	147.93 mg/l	sd	2.652	%cv	1.80
Cd_228	av	0.005 mg/l	sd	0.0007	%cv	14.52
Cr_267	av	0.227 mg/l	sd	0.0031	%cv	1.36
Co_231	av	0.115 mg/l	sd	0.0021	%cv	1.82
Copper	av	0.083 mg/l	sd	0.0092	%cv	11.11

QCK M3639-3	rep	1 Lead	conc	-0.27	mg/l	
	rep	1 Chromium	conc	2.513	mg/l	
	rep	1 Nickel	conc	1.945	mg/l	
	rep	1 Zinc	conc	2.770	mg/l	
	rep	1 Fe_258	conc	1058.34	mg/l	
	rep	1 Cobalt	conc	0.851	mg/l	
	rep	1 Cr_267	conc	2.584	mg/l	
	rep	1 Cd_228	conc	0.021	mg/l	
	rep	1 Copper	conc	0.813	mg/l	
	rep	1 Co_231	conc	0.805	mg/l	
	rep	2 Lead	conc	-0.83	mg/l	window edge
	rep	2 Chromium	conc	2.551	mg/l	
	rep	2 Nickel	conc	1.925	mg/l	
	rep	2 Zinc	conc	2.697	mg/l	
	rep	2 Fe_258	conc	1043.20	mg/l	
	rep	2 Cobalt	conc	0.877	mg/l	
	rep	2 Cr_267	conc	2.466	mg/l	
	rep	2 Cd_228	conc	0.022	mg/l	
	rep	2 Copper	conc	0.850	mg/l	
	rep	2 Co_231	conc	0.858	mg/l	
	rep	3 Chromium	conc	2.466	mg/l	
	rep	3 Lead	conc	-0.92	mg/l	window edge
	rep	3 Zinc	conc	2.739	mg/l	
	rep	3 Nickel	conc	1.958	mg/l	
	rep	3 Cobalt	conc	0.893	mg/l	
	rep	3 Fe_258	conc	1051.87	mg/l	
	rep	3 Cd_228	conc	0.017	mg/l	
	rep	3 Cr_267	conc	2.537	mg/l	
	rep	3 Co_231	conc	0.927	mg/l	
	rep	3 Copper	conc	0.858	mg/l	

QCK M3639-3						
Chromium	av	2.511 mg/l	sd	0.0427	%cv	1.70
Lead	av	-0.67 mg/l	sd	0.355	%cv	52.70
Zinc	av	2.735 mg/l	sd	0.0366	%cv	1.34
Nickel	av	1.942 mg/l	sd	0.0168	%cv	0.86
Cobalt	av	0.874 mg/l	sd	0.0216	%cv	2.47
Fe_258	av	1043.50 mg/l	sd	4.584	%cv	0.44
Cd_228	av	0.020 mg/l	sd	0.0030	%cv	14.83
Cr_267	av	2.529 mg/l	sd	0.0597	%cv	2.36
Co_231	av	0.890 mg/l	sd	0.0345	%cv	3.88
Copper	av	0.842 mg/l	sd	0.0259	%cv	3.08

QCK M3639-4	rep	1 Lead	conc	-0.07	mg/l	
	rep	1 Chromium	conc	2.040	mg/l	
	rep	1 Nickel	conc	1.962	mg/l	
	rep	1 Zinc	conc	2.872	mg/l	
	rep	1 Fe_258	conc	907.40	mg/l	
	rep	1 Cobalt	conc	1.050	mg/l	
	rep	1 Cr_267	conc	2.031	mg/l	
	rep	1 Cd_228	conc	0.023	mg/l	
	rep	1 Copper	conc	0.835	mg/l	
	rep	1 Co_231	conc	1.105	mg/l	
	rep	2 Lead	conc	0.14	mg/l	
	rep	2 Chromium	conc	1.925	mg/l	

	rep	2	Nickel	conc	2.006	mg/l	
	rep	2	Zinc	conc	2.376	mg/l	
	rep	2	Fe_258	conc	950.57	mg/l	
	rep	2	Cobalt	conc	1.081	mg/l	
	rep	2	Cr_267	conc	2.090	mg/l	
	rep	2	Cd_228	conc	0.006	mg/l	
	rep	2	Copper	conc	0.803	mg/l	
	rep	2	Co_231	conc	1.181	mg/l	
	rep	3	Chromium	conc	1.896	mg/l	
	rep	3	Lead	conc	-0.14	mg/l	
	rep	3	Zinc	conc	2.996	mg/l	
	rep	3	Nickel	conc	1.934	mg/l	
	rep	3	Cobalt	conc	1.091	mg/l	
	rep	3	Fe_258	conc	935.26	mg/l	
	rep	3	Cd_228	conc	0.014	mg/l	
	rep	3	Cr_267	conc	1.971	mg/l	
	rep	3	Co_231	conc	1.099	mg/l	
	rep	3	Copper	conc	0.818	mg/l	
QCK M3639-4							
Chromium	av	1.956	mg/l	sd	0.0779	%cv	3.98
Lead	av	-0.03	mg/l	sd	0.148	%cv	535.75
Zinc	av	2.915	mg/l	sd	0.0700	%cv	2.40
Nickel	av	1.984	mg/l	sd	0.0216	%cv	1.09
Cobalt	av	1.067	mg/l	sd	0.0212	%cv	1.98
Fe_258	av	975.41	mg/l	sd	18.948	%cv	1.94
Cd_228	av	0.015	mg/l	sd	0.0085	%cv	58.84
Cr_267	av	2.031	mg/l	sd	0.0596	%cv	2.93
Co_231	av	1.128	mg/l	sd	0.0459	%cv	4.07
Copper	av	0.818	mg/l	sd	0.0162	%cv	1.98
QCS 2262	rep	1	Lead	conc	-0.49	mg/l	window edge
	rep	1	Chromium	conc	1.684	mg/l	
	rep	1	Nickel	conc	1.405	mg/l	
	rep	1	Zinc	conc	1.887	mg/l	
	rep	1	Fe_258	conc	621.98	mg/l	
	rep	1	Cobalt	conc	0.235	mg/l	
	rep	1	Cr_267	conc	1.663	mg/l	
	rep	1	Cd_228	conc	0.013	mg/l	
	rep	1	Copper	conc	0.571	mg/l	
	rep	1	Co_231	conc	0.212	mg/l	
	rep	2	Chromium	conc	1.697	mg/l	
	rep	2	Lead	conc	-0.29	mg/l	window edge
	rep	2	Zinc	conc	1.904	mg/l	
	rep	2	Nickel	conc	1.467	mg/l	
	rep	2	Cobalt	conc	0.225	mg/l	
	rep	2	Fe_258	conc	624.19	mg/l	
	rep	2	Cd_228	conc	0.012	mg/l	
	rep	2	Cr_267	conc	1.686	mg/l	
	rep	2	Co_231	conc	0.202	mg/l	
	rep	2	Copper	conc	0.582	mg/l	
	rep	3	Lead	conc	0.07	mg/l	
	rep	3	Chromium	conc	1.576	mg/l	
	rep	3	Nickel	conc	1.349	mg/l	
	rep	3	Zinc	conc	1.890	mg/l	
	rep	3	Fe_258	conc	600.80	mg/l	
	rep	3	Cobalt	conc	0.203	mg/l	
	rep	3	Cr_267	conc	1.691	mg/l	
	rep	3	Cd_228	conc	0.009	mg/l	
	rep	3	Copper	conc	0.603	mg/l	
	rep	3	Co_231	conc	0.271	mg/l	

QCS 2262

Lead	av	-0.24 mg/l	sd	0.280 %cv	120.29
Chromium	av	1.652 mg/l	sd	0.0664 %cv	4.02
Nickel	av	1.473 mg/l	sd	0.0724 %cv	4.91
Zinc	av	1.921 mg/l	sd	0.0553 %cv	2.88
Fe_258	av	615.66 mg/l	sd	12.912 %cv	2.10
Cobalt	av	0.231 mg/l	sd	0.0050 %cv	2.17
Cr_267	av	1.674 mg/l	sd	0.0155 %cv	0.93
Cd_228	av	0.011 mg/l	sd	0.0019 %cv	16.83
Copper	av	0.585 mg/l	sd	0.0162 %cv	2.76
Co_231	av	0.238 mg/l	sd	0.0303 %cv	12.71

Soln A

rep	1	Lead	conc	1.07 mg/l		
rep	1	Chromium	conc	1.089 mg/l		
rep	1	Nickel	conc	0.978 mg/l		
rep	1	Zinc	conc	0.947 mg/l		
rep	1	Fe_258	conc	7.42 mg/l		
rep	1	Cobalt	conc	1.099 mg/l		
rep	1	Cr_267	conc	1.275 mg/l		
rep	1	Cd_228	conc	0.272 mg/l		
rep	1	Copper	conc	0.014 mg/l		
rep	1	Co_231	conc	0.029 mg/l		
rep	2	Lead	conc	-0.01 mg/l		
rep	2	Chromium	conc	-0.012 mg/l		
rep	2	Nickel	conc	-0.005 mg/l		
rep	2	Zinc	conc	-0.000 mg/l		
rep	2	Fe_258	conc	-0.38 mg/l		
rep	2	Cobalt	conc	0.006 mg/l		
rep	2	Cr_267	conc	0.001 mg/l		
rep	2	Cd_228	conc	0.003 mg/l		
rep	2	Copper	conc	0.020 mg/l		
rep	2	Co_231	conc	0.020 mg/l		
rep	3	Lead	conc	-0.00 mg/l		
rep	3	Chromium	conc	-0.003 mg/l		
rep	3	Nickel	conc	-0.024 mg/l		window edge
rep	3	Zinc	conc	-0.006 mg/l		window edge
rep	3	Fe_258	conc	-0.38 mg/l		
rep	3	Cobalt	conc	-0.011 mg/l		
rep	3	Cr_267	conc	-0.003 mg/l		
rep	3	Cd_228	conc	0.010 mg/l		
rep	3	Copper	conc	-0.004 mg/l		
rep	3	Co_231	conc	-0.002 mg/l		

Soln A

Lead	av	0.36 mg/l	sd	0.621 %cv	174.96
Chromium	av	0.359 mg/l	sd	0.6333 %cv	175.03
Nickel	av	0.315 mg/l	sd	0.5700 %cv	181.11
Zinc	av	0.314 mg/l	sd	0.5483 %cv	174.85
Fe_258	av	2.22 mg/l	sd	4.503 %cv	202.87
Cobalt	av	0.365 mg/l	sd	0.6361 %cv	174.39
Cr_267	av	0.424 mg/l	sd	0.7370 %cv	173.87
Cd_228	av	0.075 mg/l	sd	0.1500 %cv	200.69
Copper	av	0.010 mg/l	sd	0.0124 %cv	126.55
Co_231	av	0.016 mg/l	sd	0.0162 %cv	100.98

n Fe_100

rep	1	Lead	conc	-0.15 mg/l	window edge
rep	1	Chromium	conc	-0.013 mg/l	window edge
rep	1	Nickel	conc	0.011 mg/l	
rep	1	Zinc	conc	0.014 mg/l	
rep	1	Fe_258	conc	106.69 mg/l	
rep	1	Cobalt	conc	0.006 mg/l	

Cut D Sample

	rep	1	Cr_267	conc	0.019	mg/l
	rep	1	Cd_228	conc	0.007	mg/l
	rep	1	Copper	conc	-0.022	mg/l window edge
	rep	1	Co_231	conc	0.007	mg/l
	rep	2	Lead	conc	0.05	mg/l
	rep	2	Chromium	conc	-0.019	mg/l
	rep	2	Nickel	conc	-0.029	mg/l
	rep	2	Zinc	conc	0.009	mg/l
	rep	2	Fe_258	conc	99.34	mg/l
	rep	2	Cobalt	conc	-0.007	mg/l
	rep	2	Cr_267	conc	0.009	mg/l
	rep	2	Cd_228	conc	0.005	mg/l
	rep	2	Copper	conc	-0.002	mg/l
	rep	2	Co_231	conc	-0.027	mg/l window edge
	rep	3	Lead	conc	0.01	mg/l
	rep	3	Chromium	conc	-0.003	mg/l
	rep	3	Nickel	conc	0.010	mg/l
	rep	3	Zinc	conc	0.014	mg/l
	rep	3	Fe_258	conc	99.58	mg/l
	rep	3	Cobalt	conc	0.009	mg/l
	rep	3	Cr_267	conc	0.010	mg/l
	rep	3	Cd_228	conc	0.001	mg/l
	rep	3	Copper	conc	-0.020	mg/l window edge
	rep	3	Co_231	conc	0.010	mg/l

Soln Fe_100

Lead	av	-0.03	mg/l	sd	0.108	%cv 344.06
Chromium	av	-0.013	mg/l	sd	0.0039	%cv 66.37
Nickel	av	-0.003	mg/l	sd	0.0227	%cv 778.02
Zinc	av	0.013	mg/l	sd	0.0029	%cv 22.98
Fe_258	av	101.87	mg/l	sd	4.177	%cv 4.10
Cobalt	av	0.002	mg/l	sd	0.0079	%cv 327.12
Cr_267	av	0.013	mg/l	sd	0.0053	%cv 41.65
Cd_228	av	0.005	mg/l	sd	0.0037	%cv 78.76
Copper	av	-0.014	mg/l	sd	0.0109	%cv 75.96
Co_231	av	-0.004	mg/l	sd	0.0207	%cv 500.67

DI

	rep	1	Lead	conc	-0.10	mg/l window edge
	rep	1	Chromium	conc	-0.005	mg/l
	rep	1	Nickel	conc	-0.003	mg/l window edge
	rep	1	Zinc	conc	0.000	mg/l
	rep	1	Fe_258	conc	0.12	mg/l
	rep	1	Cobalt	conc	0.004	mg/l
	rep	1	Cr_267	conc	0.001	mg/l
	rep	1	Cd_228	conc	-0.001	mg/l window edge
	rep	1	Copper	conc	-0.006	mg/l
	rep	1	Co_231	conc	0.023	mg/l
	rep	2	Chromium	conc	-0.054	mg/l window edge
	rep	2	Lead	conc	0.01	mg/l
	rep	2	Zinc	conc	0.012	mg/l
	rep	2	Nickel	conc	0.014	mg/l
	rep	2	Cobalt	conc	0.003	mg/l
	rep	2	Fe_258	conc	-0.27	mg/l
	rep	2	Cd_228	conc	0.002	mg/l
	rep	2	Cr_267	conc	0.002	mg/l
	rep	2	Co_231	conc	0.005	mg/l
	rep	2	Copper	conc	0.008	mg/l
	rep	3	Chromium	conc	-0.013	mg/l
	rep	3	Lead	conc	0.15	mg/l
	rep	3	Zinc	conc	0.004	mg/l
	rep	3	Nickel	conc	0.004	mg/l

	rep	3	Cobalt	conc	0.002	mg/l	
	rep	3	Fe_258	conc	-0.27	mg/l	
	rep	3	Cd_228	conc	-0.002	mg/l	window edge
	rep	3	Cr_267	conc	0.002	mg/l	
	rep	3	Co_231	conc	0.016	mg/l	
	rep	3	Copper	conc	-0.003	mg/l	

DI

Chromium	av	-0.024	mg/l	sd	0.0260	%cv 108.77
Lead	av	0.02	mg/l	sd	0.127	%cv 511.73
Zinc	av	0.005	mg/l	sd	0.0062	%cv 114.05
Nickel	av	0.005	mg/l	sd	0.0082	%cv 162.30
Cobalt	av	0.003	mg/l	sd	0.0008	%cv 27.41
Fe_258	av	-0.14	mg/l	sd	0.227	%cv 164.10
Cd_228	av	-0.000	mg/l	sd	0.0017	%cv 700.28
Cr_267	av	0.002	mg/l	sd	0.0006	%cv 29.56
Co_231	av	0.015	mg/l	sd	0.0093	%cv 61.91
Copper	av	-0.001	mg/l	sd	0.0073	%cv 1307.1

ID

	rep	1	Lead	conc	0.02	mg/l	window edge
	rep	1	Chromium	conc	-0.015	mg/l	
	rep	1	Nickel	conc	-0.009	mg/l	window edge
	rep	1	Zinc	conc	-0.004	mg/l	
	rep	1	Fe_258	conc	-0.40	mg/l	window edge
	rep	1	Cobalt	conc	0.000	mg/l	
	rep	1	Cr_267	conc	0.004	mg/l	
	rep	1	Cd_228	conc	0.002	mg/l	
	rep	1	Copper	conc	0.001	mg/l	
	rep	1	Co_231	conc	-0.003	mg/l	
	rep	2	Lead	conc	-0.06	mg/l	window edge
	rep	2	Chromium	conc	-0.005	mg/l	
	rep	2	Nickel	conc	-0.007	mg/l	
	rep	2	Zinc	conc	-0.006	mg/l	
	rep	2	Fe_258	conc	-0.40	mg/l	window edge
	rep	2	Cobalt	conc	0.007	mg/l	window edge
	rep	2	Cr_267	conc	-0.000	mg/l	
	rep	2	Cd_228	conc	-0.002	mg/l	
	rep	2	Copper	conc	0.006	mg/l	
	rep	2	Co_231	conc	0.003	mg/l	
	rep	3	Lead	conc	0.00	mg/l	
	rep	3	Chromium	conc	-0.014	mg/l	
	rep	3	Nickel	conc	-0.012	mg/l	
	rep	3	Zinc	conc	-0.004	mg/l	
	rep	3	Fe_258	conc	-0.38	mg/l	
	rep	3	Cobalt	conc	0.005	mg/l	
	rep	3	Cr_267	conc	0.001	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Copper	conc	-0.001	mg/l	
	rep	3	Co_231	conc	-0.020	mg/l	window edge

ID

Lead	av	0.01	mg/l	sd	0.068	%cv 539.56
Chromium	av	-0.011	mg/l	sd	0.0055	%cv 48.33
Nickel	av	-0.009	mg/l	sd	0.0024	%cv 26.00
Zinc	av	-0.004	mg/l	sd	0.0013	%cv 29.64
Fe_258	av	-0.39	mg/l	sd	0.014	%cv 3.51
Cobalt	av	0.004	mg/l	sd	0.0036	%cv 85.60
Cr_267	av	0.002	mg/l	sd	0.0025	%cv 160.65
Cd_228	av	0.001	mg/l	sd	0.0029	%cv 236.91
Copper	av	0.002	mg/l	sd	0.0036	%cv 186.35
Co_231	av	-0.008	mg/l	sd	0.0140	%cv 193.44

IK

rep	1	Lead	conc	0.06 mg/l	
rep	1	Chromium	conc	-0.001 mg/l	
rep	1	Nickel	conc	0.008 mg/l	
rep	1	Zinc	conc	-0.001 mg/l	
rep	1	Fe_258	conc	-0.39 mg/l	
rep	1	Cobalt	conc	-0.007 mg/l	
rep	1	Cr_267	conc	-0.015 mg/l	window edge
rep	1	Cd_228	conc	-0.009 mg/l	window edge
rep	1	Copper	conc	-0.002 mg/l	
rep	1	Co_231	conc	0.017 mg/l	
rep	2	Lead	conc	-0.05 mg/l	window edge
rep	2	Chromium	conc	-0.006 mg/l	
rep	2	Nickel	conc	-0.002 mg/l	
rep	2	Zinc	conc	-0.002 mg/l	
rep	2	Fe_258	conc	-0.38 mg/l	
rep	2	Cobalt	conc	0.001 mg/l	
rep	2	Cr_267	conc	-0.001 mg/l	
rep	2	Cd_228	conc	0.004 mg/l	
rep	2	Copper	conc	-0.001 mg/l	
rep	2	Co_231	conc	0.003 mg/l	
rep	3	Lead	conc	0.07 mg/l	
rep	3	Chromium	conc	-0.012 mg/l	
rep	3	Nickel	conc	0.005 mg/l	
rep	3	Zinc	conc	-0.007 mg/l	
rep	3	Fe_258	conc	-0.38 mg/l	
rep	3	Cobalt	conc	-0.006 mg/l	window edge
rep	3	Cr_267	conc	-0.002 mg/l	
rep	3	Cd_228	conc	0.002 mg/l	
rep	3	Copper	conc	0.001 mg/l	
rep	3	Co_231	conc	-0.005 mg/l	

IK

Lead	av	0.03 mg/l	sd	0.068	%cv	270.61
Chromium	av	-0.006 mg/l	sd	0.0037	%cv	93.97
Nickel	av	0.003 mg/l	sd	0.0039	%cv	148.04
Zinc	av	-0.003 mg/l	sd	0.0030	%cv	94.42
Fe_258	av	-0.38 mg/l	sd	0.004	%cv	1.00
Cobalt	av	-0.004 mg/l	sd	0.0041	%cv	110.61
Cr_267	av	-0.006 mg/l	sd	0.0080	%cv	132.22
Cd_228	av	-0.001 mg/l	sd	0.0072	%cv	757.95
Copper	av	-0.001 mg/l	sd	0.0014	%cv	167.11
Co_231	av	0.007 mg/l	sd	0.0110	%cv	168.35

Coin A

rep	1	Lead	conc	1.14 mg/l	
rep	1	Chromium	conc	0.952 mg/l	
rep	1	Nickel	conc	1.135 mg/l	
rep	1	Zinc	conc	1.070 mg/l	
rep	1	Fe_258	conc	0.89 mg/l	
rep	1	Cobalt	conc	1.061 mg/l	
rep	1	Cd_228	conc	1.095 mg/l	
rep	1	Cr_267	conc	1.084 mg/l	
rep	1	Co_231	conc	1.081 mg/l	
rep	1	Copper	conc	1.126 mg/l	
rep	2	Lead	conc	1.02 mg/l	
rep	2	Chromium	conc	1.023 mg/l	
rep	2	Nickel	conc	1.084 mg/l	
rep	2	Zinc	conc	1.091 mg/l	
rep	2	Fe_258	conc	0.94 mg/l	
rep	2	Cobalt	conc	1.056 mg/l	
rep	2	Cr_267	conc	1.036 mg/l	
rep	2	Cd_228	conc	1.120 mg/l	

	rep	2	Copper	conc	1.109 mg/l		
	rep	2	Co_231	conc	1.149 mg/l		
	rep	3	Chromium	conc	0.994 mg/l		
	rep	3	Lead	conc	1.23 mg/l		
	rep	3	Zinc	conc	1.086 mg/l		
	rep	3	Nickel	conc	1.111 mg/l		
	rep	3	Cobalt	conc	1.076 mg/l		
	rep	3	Fe_258	conc	0.90 mg/l		
	rep	3	Cd_228	conc	1.105 mg/l		
	rep	3	Cr_267	conc	1.152 mg/l		
	rep	3	Co_231	conc	1.146 mg/l		
	rep	3	Copper	conc	1.109 mg/l		
Soln A							
Chromium	av	0.989 mg/l		sd	0.0343 %cv	3.47	
Lead	av	1.23 mg/l		sd	0.091 %cv	7.39	
Zinc	av	1.080 mg/l		sd	0.0084 %cv	0.77	
Nickel	av	1.107 mg/l		sd	0.0212 %cv	1.91	
Cobalt	av	1.068 mg/l		sd	0.0072 %cv	0.67	
Fe_258	av	0.91 mg/l		sd	0.027 %cv	2.93	
Cd_228	av	1.107 mg/l		sd	0.0125 %cv	1.13	
Cr_267	av	1.151 mg/l		sd	0.0139 %cv	1.21	
Co_231	av	1.125 mg/l		sd	0.0387 %cv	3.44	
Copper	av	1.115 mg/l		sd	0.0098 %cv	0.88	
ID_M3639-10	rep	1	Lead	conc	0.23 mg/l		
	rep	1	Chromium	conc	0.608 mg/l		
	rep	1	Nickel	conc	1.068 mg/l		
	rep	1	Zinc	conc	1.008 mg/l		
	rep	1	Fe_258	conc	674.83 mg/l		
	rep	1	Cobalt	conc	4.257 mg/l		
	rep	1	Cr_267	conc	0.700 mg/l		
	rep	1	Cd_228	conc	-0.010 mg/l		window edge
	rep	1	Copper	conc	0.167 mg/l		
	rep	1	Co_231	conc	4.421 mg/l		
	rep	2	Chromium	conc	0.597 mg/l		
	rep	2	Lead	conc	0.23 mg/l		
	rep	2	Zinc	conc	1.006 mg/l		
	rep	2	Nickel	conc	1.039 mg/l		
	rep	2	Cobalt	conc	4.263 mg/l		
	rep	2	Fe_258	conc	662.86 mg/l		
	rep	2	Cd_228	conc	0.012 mg/l		
	rep	2	Cr_267	conc	0.675 mg/l		
	rep	2	Co_231	conc	4.519 mg/l		
	rep	2	Copper	conc	0.161 mg/l		
	rep	3	Lead	conc	0.34 mg/l		
	rep	3	Chromium	conc	0.625 mg/l		
	rep	3	Nickel	conc	1.018 mg/l		
	rep	3	Zinc	conc	1.016 mg/l		
	rep	3	Fe_258	conc	652.09 mg/l		
	rep	3	Cobalt	conc	4.247 mg/l		
	rep	3	Cr_267	conc	0.648 mg/l		
	rep	3	Cd_228	conc	0.012 mg/l		
	rep	3	Copper	conc	0.160 mg/l		
	rep	3	Co_231	conc	4.577 mg/l		
M3639-10				Reviews			2 Suff.
Lead	av	0.27 mg/l		0.04	sd	0.064 %cv	23.97	—
Chromium	av	0.610 mg/l		0.<,71	sd	0.0145 %cv	2.37	7
Nickel	av	1.042 mg/l		0.994	sd	0.0253 %cv	2.43	5
Zinc	av	1.010 mg/l		0.946	sd	0.0050 %cv	0.49	6
Fe_258	av	663.26 mg/l		621.87	sd	11.379 %cv	1.72	6

Cobalt	av	4.256 mg/l	3.905	sd	0.0079	%cv	0.19	9
Cr_267	av	0.674 mg/l	0.584	sd	0.0257	%cv	3.81	14
Cd_228	av	0.005 mg/l	0.007	sd	0.0127	%cv	259.94	—
Copper	av	0.163 mg/l	0.144	sd	0.0037	%cv	2.26	12
Co_231	av	4.506 mg/l	3.905	sd	0.0789	%cv	1.75	14

IK_39-15+5	rep	1	Lead	conc	0.45 mg/l
	rep	1	Chromium	conc	1.155 mg/l
	rep	1	Nickel	conc	1.089 mg/l
	rep	1	Zinc	conc	1.286 mg/l
	rep	1	Fe_258	conc	383.54 mg/l
	rep	1	Cobalt	conc	1.045 mg/l
	rep	1	Cr_267	conc	1.257 mg/l
	rep	1	Cd_228	conc	0.535 mg/l
	rep	1	Copper	conc	0.727 mg/l
	rep	1	Co_231	conc	0.999 mg/l
	rep	2	Chromium	conc	1.149 mg/l
	rep	2	Lead	conc	0.49 mg/l
	rep	2	Zinc	conc	1.261 mg/l
	rep	2	Nickel	conc	1.058 mg/l
	rep	2	Cobalt	conc	0.992 mg/l
	rep	2	Fe_258	conc	372.24 mg/l
	rep	2	Cd_228	conc	0.517 mg/l
	rep	2	Cr_267	conc	1.245 mg/l
	rep	2	Co_231	conc	0.971 mg/l
	rep	2	Copper	conc	0.724 mg/l
	rep	3	Lead	conc	0.56 mg/l
	rep	3	Chromium	conc	1.107 mg/l
	rep	3	Nickel	conc	1.012 mg/l
	rep	3	Zinc	conc	1.260 mg/l
	rep	3	Fe_258	conc	369.78 mg/l
	rep	3	Cobalt	conc	1.037 mg/l
	rep	3	Cr_267	conc	1.203 mg/l
	rep	3	Cd_228	conc	0.517 mg/l
	rep	3	Copper	conc	0.732 mg/l
	rep	3	Co_231	conc	0.917 mg/l

+0.05ml QCS3019
to 10ml) M363915

0.
IK_39-15+5 8%gl

								% recovery
Lead	av	0.50 mg/l	0.37	sd	0.052	%cv	10.37	100
Chromium	av	1.142 mg/l	0.604	sd	0.0311	%cv	2.73	108
Nickel	av	1.053 mg/l	0.441	sd	0.0390	%cv	3.70	122
Zinc	av	1.266 mg/l	0.743	sd	0.0184	%cv	1.45	105
Fe_258	av	375.18 mg/l	—	sd	7.347	%cv	1.96	—
Cobalt	av	1.025 mg/l	0.469	sd	0.0271	%cv	2.64	111
Cr_267	av	1.235 mg/l	0.616	sd	0.0287	%cv	2.32	124
Cd_228	av	0.523 mg/l	0.004	sd	0.0100	%cv	1.93	104
Copper	av	0.724 mg/l	0.153	sd	0.0025	%cv	0.34	114
Co_231	av	0.963 mg/l	0.426	sd	0.0416	%cv	4.32	107

1N-3639

r11-95

011195STW2

#1 standard	rep	1	Lead	em	46.6	conc	1.00		
	rep	1	Chromium	em	65.5	conc	1.000		
	rep	1	Nickel	em	258.7	conc	1.000		
	rep	1	Zinc	em	257.5	conc	1.000		
	rep	1	Cr_267	em	1144.1	conc	1.000		
	rep	1	Cobalt	em	232.4	conc	1.000		
	rep	1	Copper	em	1470.2	conc	1.000		
	rep	1	Cd_228	em	475.3	conc	1.000		
	rep	1	Co_231	em	147.0	conc	1.000		
	rep	2	Lead	em	37.2	conc	1.00		
	rep	2	Chromium	em	68.0	conc	1.000		
	rep	2	Nickel	em	278.3	conc	1.000		
	rep	2	Zinc	em	272.5	conc	1.000		
	rep	2	Cr_267	em	1118.7	conc	1.000		
	rep	2	Cobalt	em	244.3	conc	1.000		
	rep	2	Copper	em	1540.3	conc	1.000		
	rep	2	Cd_228	em	483.1	conc	1.000		
	rep	2	Co_231	em	135.3	conc	1.000		
	rep	3	Chromium	em	68.8	conc	1.000		
	rep	3	Lead	em	46.0	conc	1.00		
	rep	3	Zinc	em	272.7	conc	1.000		
	rep	3	Nickel	em	255.3	conc	1.000		
	rep	3	Cobalt	em	245.8	conc	1.000		
	rep	3	Cr_267	em	1181.5	conc	1.000		
	rep	3	Cd_228	em	492.6	conc	1.000		
	rep	3	Copper	em	1574.4	conc	1.000		
	rep	3	Co_231	em	152.6	conc	1.000		
#1 standard									
Chromium	av	67.474		sd	1.6490	%cv	2.44	conc	1.000
Lead	av	43.26		sd	5.299	%cv	12.25	conc	1.00
Zinc	av	267.563		sd	8.6929	%cv	3.25	conc	1.000
Nickel	av	264.237		sd	12.2238	%cv	4.63	conc	1.000
Cobalt	av	240.852		sd	7.3363	%cv	3.05	conc	1.000
Cr_267	av	1148.096		sd	31.5897	%cv	2.75	conc	1.000
Cd_228	av	483.683		sd	8.6494	%cv	1.79	conc	1.000
Copper	av	1528.281		sd	53.1179	%cv	3.48	conc	1.000
Co_231	av	144.980		sd	8.8654	%cv	6.11	conc	1.000
#3 standard	rep	1	Fe_258	em	36717.3	conc	100.00		
	rep	2	Fe_258	em	35759.4	conc	100.00		
	rep	3	Fe_258	em	37534.1	conc	100.00		
#3 standard									
Fe_258	av	36670.28		sd	888.277	%cv	2.42	conc	100.00
blank	rep	1	Lead	em	4.4				
	rep	1	Chromium	em	0.8				window edge
	rep	1	Nickel	em	4.0				window edge
	rep	1	Zinc	em	4.2				
	rep	1	Fe_258	em	77.0				
	rep	1	Cobalt	em	4.7				
	rep	1	Cr_267	em	13.3				
	rep	1	Cd_228	em	3.7				
	rep	1	Copper	em	21.6				
	rep	1	Co_231	em	-0.6				window edge
	rep	2	Chromium	em	2.3				
	rep	2	Lead	em	9.0				
	rep	2	Zinc	em	1.2				

	rep	2	Cobalt	em	0.7
	rep	2	Fe_258	em	54.9
	rep	2	Cd_228	em	2.0
	rep	2	Cr_267	em	33.3
	rep	2	Co_231	em	1.0
	rep	2	Copper	em	13.5
	rep	3	Lead	em	4.2
	rep	3	Chromium	em	4.4
	rep	3	Nickel	em	10.0
	rep	3	Zinc	em	3.1
	rep	3	Fe_258	em	36.1
	rep	3	Cobalt	em	5.0
	rep	3	Cr_267	em	13.4
	rep	3	Cd_228	em	1.0
	rep	3	Copper	em	25.4
	rep	3	Co_231	em	-2.3 window edge

blank

Lead	av	5.85	sd	2.749	%cv	46.97
Chromium	av	2.511	sd	1.7979	%cv	71.61
Nickel	av	9.140	sd	4.7890	%cv	52.40
Zinc	av	2.870	sd	1.5189	%cv	52.92
Fe_258	av	55.99	sd	20.434	%cv	36.49
Cobalt	av	4.531	sd	0.5681	%cv	12.54
Cr_267	av	17.334	sd	6.8557	%cv	39.55
Cd_228	av	2.221	sd	1.3704	%cv	61.71
Copper	av	20.141	sd	6.0586	%cv	30.08
Co_231	av	-0.346	sd	2.0410	%cv	589.22

QCS 2687	rep	1	Lead	conc	2.14 mg/l
	rep	1	Chromium	conc	1.015 mg/l
	rep	1	Nickel	conc	1.011 mg/l
	rep	1	Zinc	conc	0.960 mg/l
	rep	1	Fe_258	conc	2.05 mg/l
	rep	1	Cobalt	conc	1.026 mg/l
	rep	1	Cr_267	conc	1.050 mg/l
	rep	1	Cd_228	conc	1.986 mg/l
	rep	1	Copper	conc	1.073 mg/l
	rep	1	Co_231	conc	1.035 mg/l
	rep	2	Lead	conc	2.15 mg/l
	rep	2	Chromium	conc	1.095 mg/l
	rep	2	Nickel	conc	1.060 mg/l
	rep	2	Zinc	conc	1.002 mg/l
	rep	2	Fe_258	conc	2.02 mg/l
	rep	2	Cobalt	conc	0.950 mg/l
	rep	2	Cr_267	conc	1.070 mg/l
	rep	2	Cd_228	conc	2.000 mg/l
	rep	2	Copper	conc	1.036 mg/l
	rep	2	Co_231	conc	1.023 mg/l
	rep	3	Lead	conc	2.42 mg/l
	rep	3	Chromium	conc	1.152 mg/l
	rep	3	Nickel	conc	1.064 mg/l
	rep	3	Zinc	conc	1.033 mg/l
	rep	3	Fe_258	conc	2.09 mg/l
	rep	3	Cobalt	conc	1.004 mg/l
	rep	3	Cr_267	conc	1.087 mg/l
	rep	3	Cd_228	conc	2.001 mg/l
	rep	3	Copper	conc	1.060 mg/l
	rep	3	Co_231	conc	0.975 mg/l

Chromium	av	1.091 mg/l	1	sd	0.0703 %cv	6.72	109
Nickel	av	1.052 mg/l	1	sd	0.0373 %cv	3.56	105
Zinc	av	1.011 mg/l	1	sd	0.0477 %cv	4.74	101
Fe_250	av	2.05 mg/l	2	sd	0.035 %cv	1.70	164
Cobalt	av	1.000 mg/l	1	sd	0.0465 %cv	4.63	100
Cr_267	av	1.074 mg/l	1	sd	0.0147 %cv	1.37	107
Cd_228	av	1.999 mg/l	2.1	sd	0.0326 %cv	1.63	95
Copper	av	1.059 mg/l	1	sd	0.0200 %cv	1.89	106
Co_231	av	1.011 mg/l	1	sd	0.0319 %cv	3.15	101

QCB	rep	1	Lead	conc	0.00 mg/l	
	rep	1	Chromium	conc	-0.003 mg/l	
	rep	1	Nickel	conc	0.003 mg/l	
	rep	1	Zinc	conc	0.000 mg/l	
	rep	1	Fe_250	conc	-0.09 mg/l	
	rep	1	Cobalt	conc	0.003 mg/l	
	rep	1	Cr_267	conc	0.003 mg/l	
	rep	1	Cd_228	conc	0.004 mg/l	
	rep	1	Copper	conc	0.001 mg/l	
	rep	1	Co_231	conc	0.015 mg/l	
	rep	2	Lead	conc	-0.25 mg/l	window edge
	rep	2	Chromium	conc	0.011 mg/l	
	rep	2	Nickel	conc	-0.006 mg/l	window edge
	rep	2	Zinc	conc	-0.006 mg/l	
	rep	2	Fe_250	conc	-0.09 mg/l	
	rep	2	Cobalt	conc	0.002 mg/l	
	rep	2	Cr_267	conc	-0.000 mg/l	
	rep	2	Cd_228	conc	0.005 mg/l	
	rep	2	Copper	conc	0.004 mg/l	
	rep	2	Co_231	conc	0.024 mg/l	
	rep	3	Lead	conc	-0.18 mg/l	window edge
	rep	3	Chromium	conc	0.006 mg/l	
	rep	3	Nickel	conc	-0.027 mg/l	window edge
	rep	3	Zinc	conc	-0.005 mg/l	
	rep	3	Fe_250	conc	-0.11 mg/l	
	rep	3	Cobalt	conc	-0.000 mg/l	
	rep	3	Cr_267	conc	-0.001 mg/l	
	rep	3	Cd_228	conc	0.000 mg/l	
	rep	3	Copper	conc	0.001 mg/l	
	rep	3	Co_231	conc	0.016 mg/l	

QCB						
Lead	av	-0.14 mg/l	sd	0.129 %cv	90.48	
Chromium	av	0.005 mg/l	sd	0.0063 %cv	149.46	
Nickel	av	-0.010 mg/l	sd	0.0152 %cv	157.43	
Zinc	av	-0.003 mg/l	sd	0.0048 %cv	130.19	
Fe_250	av	-0.10 mg/l	sd	0.011 %cv	11.01	
Cobalt	av	-0.001 mg/l	sd	0.0061 %cv	493.22	
Cr_267	av	0.001 mg/l	sd	0.0021 %cv	343.16	
Cd_223	av	0.003 mg/l	sd	0.0023 %cv	78.53	
Copper	av	0.002 mg/l	sd	0.0018 %cv	97.06	
Co_231	av	0.010 mg/l	sd	0.0047 %cv	25.02	

19-21	rep	1	Lead	conc	-0.42 mg/l	window edge
	rep	1	Chromium	conc	0.015 mg/l	
	rep	1	Nickel	conc	0.091 mg/l	
	rep	1	Zinc	conc	.021 mg/l	
	rep	1	Fe_250	conc	466.80 mg/l	
	rep	1	Cobalt	conc	1.145 mg/l	
	rep	1	Cr_267	conc	0.534 mg/l	

	rep	1	Copper	conc	0.233 mg/l	
	rep	1	Co_231	conc	1.136 mg/l	
	rep	1	Chromium	conc	0.580 mg/l	
	rep	2	Lead	conc	-0.53 mg/l	window edge
	rep	2	Zinc	conc	1.011 mg/l	
	rep	2	Nickel	conc	0.703 mg/l	
	rep	2	Cobalt	conc	1.125 mg/l	
	rep	2	Fe_258	conc	480.61 mg/l	
	rep	2	Cd_228	conc	0.001 mg/l	
	rep	2	Cr_267	conc	0.524 mg/l	
	rep	2	Co_231	conc	1.173 mg/l	
	rep	2	Copper	conc	0.218 mg/l	
	rep	3	Lead	conc	-0.47 mg/l	window edge
	rep	3	Chromium	conc	0.652 mg/l	
	rep	3	Nickel	conc	0.711 mg/l	
	rep	3	Zinc	conc	1.031 mg/l	
	rep	3	Fe_258	conc	472.75 mg/l	
	rep	3	Cobalt	conc	1.161 mg/l	
	rep	3	Cr_267	conc	0.547 mg/l	
	rep	3	Cd_228	conc	0.006 mg/l	
	rep	3	Copper	conc	0.222 mg/l	
	rep	3	Co_231	conc	1.143 mg/l	

M3639-21

Lead	av	-0.49 mg/l	sd	0.080 %cv	16.39
Chromium	av	0.616 mg/l	sd	0.0357 %cv	5.79
Nickel	av	0.712 mg/l	sd	0.0211 %cv	2.96
Zinc	av	1.021 mg/l	sd	0.0102 %cv	1.00
Fe_258	av	466.75 mg/l	sd	6.074 %cv	1.30
Cobalt	av	1.144 mg/l	sd	0.0183 %cv	1.60
Cr_267	av	0.535 mg/l	sd	0.0113 %cv	2.11
Cd_228	av	0.003 mg/l	sd	0.0026 %cv	80.76
Copper	av	0.221 mg/l	sd	0.0026 %cv	1.18
Co_231	av	1.168 mg/l	sd	0.0225 %cv	1.92

M3639-22

rep	1	Lead	conc	-0.17 mg/l	
rep	1	Chromium	conc	0.523 mg/l	
rep	1	Nickel	conc	0.820 mg/l	
rep	1	Zinc	conc	1.061 mg/l	
rep	1	Fe_258	conc	448.39 mg/l	
rep	1	Cobalt	conc	1.324 mg/l	
rep	1	Cr_267	conc	0.488 mg/l	
rep	1	Cd_228	conc	0.010 mg/l	
rep	1	Copper	conc	0.225 mg/l	
rep	1	Co_231	conc	1.519 mg/l	
rep	2	Lead	conc	-0.55 mg/l	window edge
rep	2	Chromium	conc	0.533 mg/l	
rep	2	Nickel	conc	0.825 mg/l	
rep	2	Zinc	conc	1.090 mg/l	
rep	2	Fe_258	conc	443.93 mg/l	
rep	2	Cobalt	conc	1.521 mg/l	
rep	2	Cr_267	conc	0.494 mg/l	
rep	2	Cd_228	conc	-0.000 mg/l	window edge
rep	2	Copper	conc	0.231 mg/l	
rep	2	Co_231	conc	1.457 mg/l	
rep	3	Lead	conc	-0.44 mg/l	window edge
rep	3	Chromium	conc	0.540 mg/l	
rep	3	Nickel	conc	0.790 mg/l	
rep	3	Zinc	conc	1.021 mg/l	
rep	3	Fe_258	conc	466.80 mg/l	

	rep	3	Cr_267	conc	0.505	mg/l		
	rep	3	Cd_228	conc	0.003	mg/l		
	rep	3	Copper	conc	0.220	mg/l		
	rep	3	Co_231	conc	1.543	mg/l		
M3639-22								
Lead	av	-0.38	mg/l	sd	0.194	%cv	50.63	
Chromium	av	0.532	mg/l	sd	0.0086	%cv	1.62	
Nickel	av	0.813	mg/l	sd	0.0171	%cv	2.11	
Zinc	av	1.057	mg/l	sd	0.0346	%cv	3.27	
Fe_258	av	442.60	mg/l	sd	5.906	%cv	1.33	
Cobalt	av	1.565	mg/l	sd	0.0529	%cv	3.38	
Cr_267	av	0.496	mg/l	sd	0.0084	%cv	1.68	
Cd_228	av	0.004	mg/l	sd	0.0057	%cv	140.06	
Copper	av	0.220	mg/l	sd	0.0028	%cv	1.22	
Co_231	av	1.503	mg/l	sd	0.0464	%cv	3.08	
M3639-23	rep	1	Lead	conc	0.02	mg/l		
	rep	1	Chromium	conc	0.536	mg/l		
	rep	1	Nickel	conc	0.807	mg/l		
	rep	1	Zinc	conc	0.631	mg/l		
	rep	1	Fe_258	conc	328.61	mg/l		
	rep	1	Cobalt	conc	1.745	mg/l		
	rep	1	Cr_267	conc	0.343	mg/l		
	rep	1	Cd_228	conc	0.002	mg/l		
	rep	1	Copper	conc	0.124	mg/l		
	rep	1	Co_231	conc	1.662	mg/l		
	rep	2	Chromium	conc	0.343	mg/l		
	rep	2	Lead	conc	0.08	mg/l		
	rep	2	Zinc	conc	0.600	mg/l		
	rep	2	Nickel	conc	0.618	mg/l		
	rep	2	Cobalt	conc	1.832	mg/l		
	rep	2	Fe_258	conc	322.24	mg/l		
	rep	2	Cd_228	conc	0.010	mg/l		
	rep	2	Cr_267	conc	0.351	mg/l		
	rep	2	Co_231	conc	1.758	mg/l		
	rep	2	Copper	conc	0.121	mg/l		
	rep	3	Chromium	conc	0.352	mg/l		
	rep	3	Lead	conc	-0.12	mg/l		window edge
	rep	3	Zinc	conc	0.664	mg/l		
	rep	3	Nickel	conc	0.594	mg/l		
	rep	3	Cobalt	conc	1.756	mg/l		
	rep	3	Fe_258	conc	323.59	mg/l		
	rep	3	Cd_228	conc	0.001	mg/l		
	rep	3	Cr_267	conc	0.350	mg/l		
	rep	3	Co_231	conc	1.733	mg/l		
	rep	3	Copper	conc	0.117	mg/l		
M3639-23								
Chromium	av	0.360	mg/l	sd	0.0226	%cv	6.28	
Lead	av	-0.01	mg/l	sd	0.103	%cv	1072.3	
Zinc	av	0.668	mg/l	sd	0.0099	%cv	1.47	
Nickel	av	0.606	mg/l	sd	0.0110	%cv	1.86	
Cobalt	av	1.770	mg/l	sd	0.0471	%cv	2.65	
Fe_258	av	324.81	mg/l	sd	3.342	%cv	1.03	
Cd_228	av	0.005	mg/l	sd	0.0051	%cv	111.86	
Cr_267	av	0.348	mg/l	sd	0.0045	%cv	1.31	
Co_231	av	1.715	mg/l	sd	0.0473	%cv	2.76	
Copper	av	0.121	mg/l	sd	0.0037	%cv	3.06	
M3639-24	rep	1	Lead	conc	-0.17	mg/l		

rep	1	Nickel	conc	0.481	mg/l
rep	1	Zinc	conc	0.300	mg/l
rep	1	Fe_250	conc	297.94	mg/l
rep	1	Cobalt	conc	0.315	mg/l
rep	1	Cr_267	conc	0.366	mg/l
rep	1	Cd_228	conc	0.000	mg/l
rep	1	Copper	conc	0.140	mg/l
rep	1	Co_231	conc	0.512	mg/l
rep	2	Chromium	conc	0.359	mg/l
rep	2	Lead	conc	0.10	mg/l
rep	2	Zinc	conc	0.783	mg/l
rep	2	Nickel	conc	0.556	mg/l
rep	2	Cobalt	conc	0.778	mg/l
rep	2	Fe_250	conc	304.62	mg/l
rep	2	Cd_228	conc	-0.002	mg/l
rep	2	Cr_267	conc	0.371	mg/l
rep	2	Co_231	conc	0.784	mg/l
rep	2	Copper	conc	0.150	mg/l
rep	3	Lead	conc	-0.14	mg/l
rep	3	Chromium	conc	0.379	mg/l
rep	3	Nickel	conc	0.516	mg/l
rep	3	Zinc	conc	0.787	mg/l
rep	3	Fe_250	conc	301.04	mg/l
rep	3	Cobalt	conc	0.823	mg/l
rep	3	Cr_267	conc	0.377	mg/l
rep	3	Cd_228	conc	0.005	mg/l
rep	3	Copper	conc	0.146	mg/l
rep	3	Co_231	conc	0.824	mg/l

M0639-24

Lead	av	-0.07	mg/l	sd	0.146	%cv 217.65
Chromium	av	0.383	mg/l	sd	0.0141	%cv 3.69
Nickel	av	0.518	mg/l	sd	0.0374	%cv 7.23
Zinc	av	0.790	mg/l	sd	0.0087	%cv 1.11
Fe_250	av	301.87	mg/l	sd	2.445	%cv 0.81
Cobalt	av	0.805	mg/l	sd	0.0234	%cv 2.90
Cr_267	av	0.371	mg/l	sd	0.0055	%cv 1.49
Cd_228	av	0.002	mg/l	sd	0.0032	%cv 176.02
Copper	av	0.148	mg/l	sd	0.0021	%cv 1.41
Co_231	av	0.807	mg/l	sd	0.0205	%cv 2.54

M0639-25

rep	1	Lead	conc	-0.15	mg/l
rep	1	Chromium	conc	0.395	mg/l
rep	1	Nickel	conc	0.577	mg/l
rep	1	Zinc	conc	0.702	mg/l
rep	1	Fe_250	conc	315.75	mg/l
rep	1	Cobalt	conc	0.919	mg/l
rep	1	Cr_267	conc	0.350	mg/l
rep	1	Cd_228	conc	0.010	mg/l
rep	1	Copper	conc	0.132	mg/l
rep	1	Co_231	conc	0.918	mg/l
rep	2	Lead	conc	-0.40	mg/l
rep	2	Chromium	conc	0.380	mg/l
rep	2	Nickel	conc	0.875	mg/l
rep	2	Zinc	conc	0.720	mg/l
rep	2	Fe_250	conc	306.71	mg/l
rep	2	Cobalt	conc	0.931	mg/l
rep	2	Cr_267	conc	0.358	mg/l
rep	2	Cd_228	conc	-0.00.	mg/l
rep	2	Copper	conc	0.138	mg/l

window edge

	rep	3	Chromium	conc	0.350	mg/l	
	rep	3	Lead	conc	-0.19	mg/l	
	rep	3	Zinc	conc	0.699	mg/l	
	rep	3	Nickel	conc	0.574	mg/l	
	rep	3	Cobalt	conc	0.727	mg/l	
	rep	3	Fe_258	conc	303.03	mg/l	
	rep	3	Cd_228	conc	0.003	mg/l	
	rep	3	Cr_267	conc	0.359	mg/l	
	rep	3	Co_231	conc	0.904	mg/l	
	rep	3	Copper	conc	0.133	mg/l	

M3639-25

Chromium	av	0.371	mg/l	sd	0.0209	%cv 5.63
Lead	av	-0.27	mg/l	sd	0.182	%cv 66.50
Zinc	av	0.700	mg/l	sd	0.0133	%cv 1.88
Nickel	av	0.575	mg/l	sd	0.0015	%cv 0.26
Cobalt	av	0.926	mg/l	sd	0.0066	%cv 0.72
Fe_258	av	308.51	mg/l	sd	6.528	%cv 2.12
Cd_228	av	0.004	mg/l	sd	0.0051	%cv 123.78
Cr_267	av	0.357	mg/l	sd	0.0031	%cv 0.87
Co_231	av	0.901	mg/l	sd	0.0188	%cv 2.09
Copper	av	0.130	mg/l	sd	0.0067	%cv 5.28

M3639-26	rep	1	Lead	conc	0.01	mg/l	
	rep	1	Chromium	conc	0.466	mg/l	
	rep	1	Nickel	conc	0.428	mg/l	
	rep	1	Zinc	conc	0.775	mg/l	
	rep	1	Fe_258	conc	314.72	mg/l	
	rep	1	Cobalt	conc	0.913	mg/l	
	rep	1	Cr_267	conc	0.421	mg/l	
	rep	1	Cd_228	conc	0.005	mg/l	
	rep	1	Copper	conc	0.135	mg/l	
	rep	1	Co_231	conc	0.869	mg/l	
	rep	2	Lead	conc	-0.17	mg/l	
	rep	2	Chromium	conc	0.451	mg/l	
	rep	2	Nickel	conc	0.404	mg/l	
	rep	2	Zinc	conc	0.829	mg/l	
	rep	2	Fe_258	conc	316.10	mg/l	
	rep	2	Cobalt	conc	0.897	mg/l	
	rep	2	Cr_267	conc	0.395	mg/l	
	rep	2	Cd_228	conc	-0.003	mg/l	
	rep	2	Copper	conc	0.137	mg/l	
	rep	2	Co_231	conc	0.898	mg/l	
	rep	3	Lead	conc	-0.07	mg/l	
	rep	3	Chromium	conc	0.372	mg/l	
	rep	3	Nickel	conc	0.433	mg/l	
	rep	3	Zinc	conc	0.755	mg/l	
	rep	3	Fe_258	conc	319.87	mg/l	
	rep	3	Cobalt	conc	0.867	mg/l	
	rep	3	Cr_267	conc	0.412	mg/l	
	rep	3	Cd_228	conc	-0.006	mg/l	window edge
	rep	3	Copper	conc	0.136	mg/l	
	rep	3	Co_231	conc	0.896	mg/l	

[redacted]-26

Lead	av	-0.08	mg/l	sd	0.092	%cv 120.00
Chromium	av	0.436	mg/l	sd	0.0390	%cv 8.93
Nickel	av	0.422	mg/l	sd	0.0156	%cv 3.70
Zinc	av	0.787	mg/l	sd	0.0378	%cv 4.81
Fe_258	av	316.90	mg/l	sd	2.664	%cv 0.84
Cobalt	av	0.892	mg/l	sd	0.0234	%cv 2.62

Cd_228	av	-0.001 mg/l		sd	0.0057	%cv	509.01	
Copper	av	0.142 mg/l		sd	0.0128	%cv	9.01	
Co_231	av	0.838 mg/l		sd	0.0163	%cv	1.94	

#1 standard	rep	1	Lead	em	46.3	conc	1.00
	rep	1	Chromium	em	78.9	conc	1.000
	rep	1	Nickel	em	284.5	conc	1.000
	rep	1	Zinc	em	297.1	conc	1.000
	rep	1	Cr_267	em	1244.0	conc	1.000
	rep	1	Cobalt	em	249.8	conc	1.000
	rep	1	Copper	em	1669.0	conc	1.000
	rep	1	Cd_228	em	515.8	conc	1.000
	rep	1	Co_231	em	151.4	conc	1.000
	rep	2	Lead	em	45.7	conc	1.00
	rep	2	Chromium	em	82.7	conc	1.000
	rep	2	Nickel	em	298.1	conc	1.000
	rep	2	Zinc	em	295.8	conc	1.000
	rep	2	Cr_267	em	1219.6	conc	1.000
	rep	2	Cobalt	em	250.2	conc	1.000
	rep	2	Copper	em	1670.1	conc	1.000
	rep	2	Cd_228	em	510.1	conc	1.000
	rep	2	Co_231	em	150.2	conc	1.000
	rep	3	Lead	em	49.6	conc	1.00
	rep	3	Chromium	em	74.4	conc	1.000
	rep	3	Nickel	em	290.0	conc	1.000
	rep	3	Zinc	em	276.9	conc	1.000
	rep	3	Cr_267	em	1290.3	conc	1.000
	rep	3	Cobalt	em	256.0	conc	1.000
	rep	3	Copper	em	1664.7	conc	1.000
	rep	3	Cd_228	em	505.0	conc	1.000
	rep	3	Co_231	em	153.7	conc	1.000

Revised

#1 standard								
Lead	av	47.22	48	sd	2.116	%cv	4.48 conc	1.00
Chromium	av	78.635	67	sd	4.1379	%cv	5.26 conc	1.000
Nickel	av	290.874	264	sd	6.8480	%cv	2.35 conc	1.000
Zinc	av	289.720	267	sd	11.2157	%cv	3.87 conc	1.000
Cr_267	av	1251.286	1148	sd	35.9304	%cv	2.87 conc	1.000
Cobalt	av	252.027	240	sd	3.4703	%cv	1.38 conc	1.000
Copper	av	1667.920	1528	sd	2.8272	%cv	0.17 conc	1.000
Cd_228	av	510.227	483	sd	5.2704	%cv	1.03 conc	1.000
Co_231	av	151.770	144	sd	1.7656	%cv	1.16 conc	1.000

#3 standard	rep	1	Fe_259	em	40018.3	conc	100.00
	rep	2	Fe_259	em	39316.2	conc	100.00
	rep	3	Fe_259	em	40344.0	conc	100.00
#3 standard							
Fe_259	av	39892.86	36670	sd	535.261	%cv	1.32 conc 100.00

M3039-27	rep	1	Lead	conc	-0.11 mg/l
	rep	1	Chromium	conc	0.267 mg/l
	rep	1	Nickel	conc	0.315 mg/l
	rep	1	Zinc	conc	0.598 mg/l
	rep	1	Fe_259	conc	232.64 mg/l
	rep	1	Cobalt	conc	0.517 mg/l
	rep	1	Cr_267	conc	0.293 mg/l
	rep	1	Cd_228	conc	0.011 mg/l
	rep	1	Copper	conc	0.113 mg/l
	rep	1	Co_231	conc	0.503 mg/l
	rep	2	Chromium	conc	0.301 mg/l

	rep	2	Zinc	conc	0.614	mg/l	
	rep	2	Nickel	conc	0.310	mg/l	
	rep	2	Cobalt	conc	0.535	mg/l	
	rep	2	Fe_250	conc	242.01	mg/l	
	rep	2	Cd_228	conc	0.012	mg/l	
	rep	2	Cr_267	conc	0.299	mg/l	
	rep	2	Co_231	conc	0.551	mg/l	
	rep	2	Copper	conc	0.113	mg/l	
	rep	3	Lead	conc	-0.10	mg/l	
	rep	3	Chromium	conc	0.259	mg/l	
	rep	3	Nickel	conc	0.326	mg/l	
	rep	3	Zinc	conc	0.576	mg/l	
	rep	3	Fe_250	conc	240.13	mg/l	
	rep	3	Cobalt	conc	0.551	mg/l	
	rep	3	Cr_267	conc	0.287	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Copper	conc	0.103	mg/l	
	rep	3	Co_231	conc	0.513	mg/l	
M3639-27							
Lead	av	-0.05	mg/l	sd	0.091	%cv	173.92
Chromium	av	0.282	mg/l	sd	0.0424	%cv	15.03
Nickel	av	0.317	mg/l	sd	0.0081	%cv	2.56
Zinc	av	0.596	mg/l	sd	0.0187	%cv	3.14
Fe_250	av	238.50	mg/l	sd	5.326	%cv	2.23
Cobalt	av	0.535	mg/l	sd	0.0171	%cv	3.21
Cr_267	av	0.294	mg/l	sd	0.0065	%cv	2.21
Cd_228	av	0.009	mg/l	sd	0.0045	%cv	49.98
Copper	av	0.109	mg/l	sd	0.0051	%cv	4.66
Co_231	av	0.532	mg/l	sd	0.0192	%cv	3.61
M3639-28	rep	1	Lead	conc	-0.21	mg/l	window edge
	rep	1	Chromium	conc	0.296	mg/l	
	rep	1	Nickel	conc	0.287	mg/l	
	rep	1	Zinc	conc	0.631	mg/l	
	rep	1	Fe_250	conc	280.95	mg/l	
	rep	1	Cobalt	conc	0.532	mg/l	
	rep	1	Cr_267	conc	0.316	mg/l	
	rep	1	Cd_228	conc	0.006	mg/l	
	rep	1	Copper	conc	0.123	mg/l	
	rep	1	Co_231	conc	0.580	mg/l	
	rep	2	Lead	conc	-0.41	mg/l	window edge
	rep	2	Chromium	conc	0.302	mg/l	
	rep	2	Nickel	conc	0.267	mg/l	
	rep	2	Zinc	conc	0.610	mg/l	
	rep	2	Fe_250	conc	279.65	mg/l	
	rep	2	Cobalt	conc	0.504	mg/l	
	rep	2	Cr_267	conc	0.313	mg/l	
	rep	2	Cd_228	conc	-0.001	mg/l	
	rep	2	Copper	conc	0.117	mg/l	
	rep	2	Co_231	conc	0.571	mg/l	
	rep	3	Lead	conc	-0.18	mg/l	window edge
	rep	3	Chromium	conc	0.287	mg/l	
	rep	3	Nickel	conc	0.333	mg/l	
	rep	3	Zinc	conc	0.636	mg/l	
	rep	3	Fe_250	conc	281.80	mg/l	
	rep	3	Cobalt	conc	0.550	mg/l	
	rep	3	Cr_267	conc	0.312	mg/l	
	rep	3	Cd_228	conc	0.000	mg/l	
	rep	3	Copper	conc	0.110	mg/l	

39-20						
Lead	av	-0.37 mg/l	sd	0.128	%cv	40.31
Chromium	av	0.295 mg/l	sd	0.0077	%cv	2.60
Nickel	av	0.292 mg/l	sd	0.0201	%cv	9.60
Zinc	av	0.636 mg/l	sd	0.0136	%cv	2.17
Fe_258	av	280.63 mg/l	sd	0.871	%cv	0.31
Cobalt	av	0.555 mg/l	sd	0.0263	%cv	4.74
Cr_267	av	0.314 mg/l	sd	0.0022	%cv	0.70
Cd_228	av	0.004 mg/l	sd	0.0045	%cv	100.10
Copper	av	0.117 mg/l	sd	0.0066	%cv	5.66
Co_231	av	0.573 mg/l	sd	0.0056	%cv	0.98

M3639-29	rep	1	Lead	conc	-0.34 mg/l	window edge
	rep	1	Chromium	conc	0.281 mg/l	
	rep	1	Nickel	conc	0.458 mg/l	
	rep	1	Zinc	conc	0.618 mg/l	
	rep	1	Fe_258	conc	276.28 mg/l	
	rep	1	Cobalt	conc	0.379 mg/l	
	rep	1	Cr_267	conc	0.314 mg/l	
	rep	1	Cd_228	conc	-0.001 mg/l	
	rep	1	Copper	conc	0.119 mg/l	
	rep	1	Co_231	conc	0.845 mg/l	
	rep	2	Lead	conc	-0.18 mg/l	
	rep	2	Chromium	conc	0.299 mg/l	
	rep	2	Nickel	conc	0.471 mg/l	
	rep	2	Zinc	conc	0.627 mg/l	
	rep	2	Fe_258	conc	277.32 mg/l	
	rep	2	Cobalt	conc	0.384 mg/l	
	rep	2	Cr_267	conc	0.311 mg/l	
	rep	2	Cd_228	conc	-0.000 mg/l	
	rep	2	Copper	conc	0.110 mg/l	
	rep	2	Co_231	conc	0.823 mg/l	
	rep	3	Chromium	conc	0.261 mg/l	
	rep	3	Lead	conc	-0.35 mg/l	window edge
	rep	3	Zinc	conc	0.607 mg/l	
	rep	3	Nickel	conc	0.472 mg/l	
	rep	3	Cobalt	conc	0.370 mg/l	
	rep	3	Fe_258	conc	289.57 mg/l	
	rep	3	Cd_228	conc	-0.001 mg/l	
	rep	3	Cr_267	conc	0.322 mg/l	
	rep	3	Co_231	conc	0.851 mg/l	
	rep	3	Copper	conc	0.123 mg/l	

M3639-29						
Chromium	av	0.280 mg/l	sd	0.0189	%cv	6.75
Lead	av	-0.29 mg/l	sd	0.092	%cv	31.86
Zinc	av	0.616 mg/l	sd	0.0099	%cv	1.60
Nickel	av	0.465 mg/l	sd	0.0106	%cv	2.28
Cobalt	av	0.879 mg/l	sd	0.0056	%cv	0.64
Fe_258	av	281.05 mg/l	sd	7.399	%cv	2.63
Cd_228	av	-0.001 mg/l	sd	0.0003	%cv	51.86
Cr_267	av	0.316 mg/l	sd	0.0056	%cv	1.78
Co_231	av	0.840 mg/l	sd	0.0150	%cv	1.79
Copper	av	0.117 mg/l	sd	0.0064	%cv	5.47

M3639-30	rep	1	Lead	conc	-0.18 mg/l
	rep	1	Chromium	conc	0.312 mg/l
	rep	1	Nickel	conc	0.276 mg/l
	rep	1	Zinc	conc	0.607 mg/l
	rep	1	Fe_258	conc	271.70 mg/l

	rep	1	Cr_267	conc	0.309	mg/l
	rep	1	Cd_228	conc	0.002	mg/l
	rep	1	Copper	conc	0.093	mg/l
	rep	1	Co_231	conc	0.560	mg/l
	rep	2	Lead	conc	0.13	mg/l
	rep	2	Chromium	conc	0.275	mg/l
	rep	2	Nickel	conc	0.335	mg/l
	rep	2	Zinc	conc	0.576	mg/l
	rep	2	Fe_258	conc	265.24	mg/l
	rep	2	Cobalt	conc	0.602	mg/l
	rep	2	Cr_267	conc	0.307	mg/l
	rep	2	Cd_228	conc	0.001	mg/l
	rep	2	Copper	conc	0.087	mg/l
	rep	2	Co_231	conc	0.592	mg/l
	rep	3	Lead	conc	0.17	mg/l
	rep	3	Chromium	conc	0.349	mg/l
	rep	3	Nickel	conc	0.338	mg/l
	rep	3	Zinc	conc	0.560	mg/l
	rep	3	Fe_258	conc	276.72	mg/l
	rep	3	Cobalt	conc	0.579	mg/l
	rep	3	Cr_267	conc	0.314	mg/l
	rep	3	Cd_228	conc	0.002	mg/l
	rep	3	Copper	conc	0.085	mg/l
	rep	3	Co_231	conc	0.546	mg/l

window edge

M3639-30

Lead	av	0.06	mg/l	sd	0.144	%cv 235.48
Chromium	av	0.313	mg/l	sd	0.0370	%cv 11.81
Nickel	av	0.317	mg/l	sd	0.0348	%cv 11.00
Zinc	av	0.554	mg/l	sd	0.0250	%cv 4.52
Fe_258	av	277.90	mg/l	sd	6.836	%cv 2.46
Cobalt	av	0.592	mg/l	sd	0.0121	%cv 2.04
Cr_267	av	✕ 0.310	mg/l	sd	0.0037	%cv 1.19
Cd_228	av	0.001	mg/l	sd	0.0005	%cv 36.51
Copper	av	0.088	mg/l	sd	0.0042	%cv 4.71
Co_231	av	0.566	mg/l	sd	0.0233	%cv 4.12

M3639-31

rep	1	Lead	conc	0.02	mg/l	
rep	1	Chromium	conc	0.220	mg/l	
rep	1	Nickel	conc	0.229	mg/l	
rep	1	Zinc	conc	0.494	mg/l	
rep	1	Fe_258	conc	213.11	mg/l	
rep	1	Cobalt	conc	0.309	mg/l	
rep	1	Cr_267	conc	0.251	mg/l	
rep	1	Cd_228	conc	-0.003	mg/l	window edge
rep	1	Copper	conc	0.085	mg/l	
rep	1	Co_231	conc	0.320	mg/l	
rep	2	Chromium	conc	0.331	mg/l	
rep	2	Lead	conc	-0.12	mg/l	
rep	2	Zinc	conc	0.480	mg/l	
rep	2	Nickel	conc	0.249	mg/l	
rep	2	Cobalt	conc	0.314	mg/l	
rep	2	Fe_258	conc	219.69	mg/l	
rep	2	Cd_228	conc	0.002	mg/l	
rep	2	Cr_267	conc	0.250	mg/l	
rep	2	Co_231	conc	0.321	mg/l	
rep	2	Copper	conc	0.085	mg/l	
rep	3	Lead	conc	0.00	mg/l	
rep	3	Chromium	conc	0.209	mg/l	
rep	3	Nickel	conc	0.231	mg/l	window edge

	rep	3	Fe_258	conc	313.54	mg/l	
	rep	3	Cobalt	conc	0.340	mg/l	
	rep	3	Cr_267	conc	0.257	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Copper	conc	0.085	mg/l	
	rep	3	Co_231	conc	0.332	mg/l	
M3639-31							
Lead	av	-0.00	mg/l	sd	0.103	%cv	2439.2
Chromium	av	0.217	mg/l	sd	0.0066	%cv	3.02
Nickel	av	~~0.193~~	mg/l 0.239	sd	0.0087	%cv	45.16
Zinc	av	0.495	mg/l	sd	0.0158	%cv	3.20
Fe_258	av	215.45	mg/l	sd	3.679	%cv	1.71
Cobalt	av	0.332	mg/l	sd	0.0157	%cv	4.74
Cr_267	av	0.253	mg/l	sd	0.0036	%cv	1.39
Cd_228	av	-0.001	mg/l	sd	0.0062	%cv	998.76
Copper	av	0.085	mg/l	sd	0.0004	%cv	0.41
Co_231	av	0.324	mg/l	sd	0.0067	%cv	2.08
M3639-32	rep	1	Lead	conc	-0.05	mg/l	
	rep	1	Chromium	conc	0.457	mg/l	
	rep	1	Nickel	conc	0.499	mg/l	
	rep	1	Zinc	conc	0.840	mg/l	
	rep	1	Fe_258	conc	312.71	mg/l	
	rep	1	Cobalt	conc	0.496	mg/l	
	rep	1	Cr_267	conc	0.448	mg/l	
	rep	1	Cd_228	conc	0.007	mg/l	
	rep	1	Copper	conc	0.160	mg/l	
	rep	1	Co_231	conc	0.470	mg/l	
	rep	2	Lead	conc	0.04	mg/l	
	rep	2	Chromium	conc	0.430	mg/l	
	rep	2	Nickel	conc	0.501	mg/l	
	rep	2	Zinc	conc	0.812	mg/l	
	rep	2	Fe_258	conc	301.16	mg/l	
	rep	2	Cobalt	conc	0.497	mg/l	
	rep	2	Cr_267	conc	0.421	mg/l	
	rep	2	Cd_228	conc	0.002	mg/l	
	rep	2	Copper	conc	0.177	mg/l	
	rep	2	Co_231	conc	0.503	mg/l	
	rep	3	Lead	conc	-0.12	mg/l	
	rep	3	Chromium	conc	0.409	mg/l	
	rep	3	Nickel	conc	0.484	mg/l	
	rep	3	Zinc	conc	0.838	mg/l	
	rep	3	Fe_258	conc	304.34	mg/l	
	rep	3	Cobalt	conc	0.489	mg/l	
	rep	3	Cr_267	conc	0.442	mg/l	
	rep	3	Cd_228	conc	0.010	mg/l	
	rep	3	Copper	conc	0.170	mg/l	
	rep	3	Co_231	conc	0.454	mg/l	
M3639-32							
Lead	av	-0.04	mg/l	sd	0.075	%cv	177.08
Chromium	av	0.432	mg/l	sd	0.0240	%cv	5.57
Nickel	av	0.495	mg/l	sd	0.0091	%cv	1.83
Zinc	av	0.827	mg/l	sd	0.0138	%cv	1.66
Fe_258	av	306.07	mg/l	sd	5.965	%cv	1.95
Cobalt	av	0.494	mg/l	sd	0.0044	%cv	0.90
Cr_267	av	0.437	mg/l	sd	0.0138	%cv	3.15
Cd_228	av	0.006	mg/l	sd	0.0042	%cv	68.61
Copper	av	0.172	mg/l	sd	0.0047	%cv	2.67
Co_231	av	0.473	mg/l	sd	0.0251	%cv	5.23

standard	rep	1	Lead	em	45.7	conc	1.00			
	rep	1	Chromium	em	77.2	conc	1.000			
	rep	1	Nickel	em	302.1	conc	1.000			
	rep	1	Zinc	em	298.3	conc	1.000			
	rep	1	Cr_267	em	1310.9	conc	1.000			
	rep	1	Cobalt	em	274.7	conc	1.000			
	rep	1	Copper	em	1750.1	conc	1.000			
	rep	1	Cd_228	em	500.4	conc	1.000			
	rep	1	Co_231	em	152.5	conc	1.000			
	rep	2	Lead	em	59.1	conc	1.00			
	rep	2	Chromium	em	83.5	conc	1.000			
	rep	2	Nickel	em	319.7	conc	1.000			
	rep	2	Zinc	em	311.1	conc	1.000			
	rep	2	Cr_267	em	1269.5	conc	1.000			
	rep	2	Cobalt	em	265.0	conc	1.000			
	rep	2	Copper	em	1758.0	conc	1.000			
	rep	2	Cd_228	em	529.5	conc	1.000			
	rep	2	Co_231	em	159.4	conc	1.000			
	rep	3	Lead	em	52.9	conc	1.00			
	rep	3	Chromium	em	77.6	conc	1.000			
	rep	3	Nickel	em	306.8	conc	1.000			
	rep	3	Zinc	em	305.6	conc	1.000			
	rep	3	Cr_267	em	1299.6	conc	1.000			
	rep	3	Cobalt	em	264.6	conc	1.000			
	rep	3	Copper	em	1755.8	conc	1.000			
	rep	3	Cd_228	em	531.9	conc	1.000			
	rep	3	Co_231	em	153.5	conc	1.000			

standard			Reviews						
Lead	av	52.57	47	sd	6.678	%cv	12.70	conc	1.00
Chromium	av	79.459	78	sd	3.5306	%cv	4.44	conc	1.000
Nickel	av	309.530	290	sd	9.0695	%cv	2.93	conc	1.000
Zinc	av	305.001	289	sd	6.4154	%cv	2.10	conc	1.000
Cr_267	av	1293.323	1251	sd	21.3883	%cv	1.65	conc	1.000
Cobalt	av	268.117	252	sd	5.6784	%cv	2.12	conc	1.000
Copper	av	1754.656	1667	sd	4.0789	%cv	0.23	conc	1.000
Cd_228	av	520.626	510	sd	17.5424	%cv	3.37	conc	1.000
Co_231	av	155.150	151	sd	3.7382	%cv	2.41	conc	1.000

#8 standard	rep	1	Fe_258	em	40526.7	conc	100.00		
	rep	2	Fe_258	em	41980.6	conc	100.00		
	rep	3	Fe_258	em	41469.2	conc	100.00		
#8 standard									
Fe_258	av	41325.50	39892	sd	737.496	%cv	1.78	conc	100.00

DI	rep	1	Lead	conc	-0.05 mg/l	
	rep	1	Chromium	conc	-0.013 mg/l	
	rep	1	Nickel	conc	-0.011 mg/l	
	rep	1	Zinc	conc	-0.003 mg/l	
	rep	1	Fe_258	conc	0.04 mg/l	
	rep	1	Cobalt	conc	-0.004 mg/l	
	rep	1	Cr_267	conc	0.002 mg/l	
	rep	1	Cd_228	conc	0.004 mg/l	
	rep	1	Copper	conc	0.001 mg/l	
	rep	1	Co_231	conc	0.017 mg/l	
	rep	2	Lead	conc	-0.13 mg/l	window edge
	rep	2	Chromium	conc	0.002 mg/l	
	rep	2	Nickel	conc	0.002 mg/l	
	rep	2	Zinc	conc	0.002 mg/l	
	rep	2	Fe_258	conc	0.06 mg/l	
	rep	2	Cobalt	conc	[illegible]	

	rep	2	Cr_267	conc	-0.007	mg/l
	rep	2	Cd_228	conc	0.005	mg/l
	rep	2	Copper	conc	0.005	mg/l
	rep	2	Co_231	conc	0.015	mg/l
	rep	3	Lead	conc	-0.06	mg/l
	rep	3	Chromium	conc	-0.006	mg/l
	rep	3	Nickel	conc	0.004	mg/l
	rep	3	Zinc	conc	0.004	mg/l
	rep	3	Fe_258	conc	-0.02	mg/l
	rep	3	Cobalt	conc	-0.004	mg/l
	rep	3	Cr_267	conc	0.002	mg/l
	rep	3	Cd_228	conc	-0.003	mg/l
	rep	3	Copper	conc	0.007	mg/l
	rep	3	Co_231	conc	0.009	mg/l

window edge

DI

Lead	av	-0.08	mg/l	sd	0.043 %cv 53.24
Chromium	av	-0.016	mg/l	sd	0.0190 %cv 120.59
Nickel	av	-0.002	mg/l	sd	0.0080 %cv 447.39
Zinc	av	0.001	mg/l	sd	0.0035 %cv 383.24
Fe_258	av	0.03	mg/l	sd	0.045 %cv 169.65
Cobalt	av	-0.005	mg/l	sd	0.0010 %cv 21.65
Cr_267	av	-0.001	mg/l	sd	0.0050 %cv 518.30
Cd_228	av	0.002	mg/l	sd	0.0043 %cv 234.40
Copper	av	0.004	mg/l	sd	0.0032 %cv 74.04
Co_231	av	0.014	mg/l	sd	0.0043 %cv 30.56

ICPS/500Fe

rep	1	Lead	conc	4.86	mg/l
rep	1	Chromium	conc	1.537	mg/l
rep	1	Nickel	conc	1.385	mg/l
rep	1	Zinc	conc	1.532	mg/l
rep	1	Fe_258	conc	470.84	mg/l
rep	1	Cobalt	conc	1.315	mg/l
rep	1	Cr_267	conc	1.477	mg/l
rep	1	Cd_228	conc	1.512	mg/l
rep	1	Copper	conc	1.451	mg/l
rep	1	Co_231	conc	1.373	mg/l
rep	2	Lead	conc	4.84	mg/l
rep	2	Chromium	conc	1.554	mg/l
rep	2	Nickel	conc	1.484	mg/l
rep	2	Zinc	conc	1.523	mg/l
rep	2	Fe_258	conc	476.48	mg/l
rep	2	Cobalt	conc	1.379	mg/l
rep	2	Cr_267	conc	1.471	mg/l
rep	2	Cd_228	conc	1.507	mg/l
rep	2	Copper	conc	1.493	mg/l
rep	2	Co_231	conc	1.474	mg/l
rep	3	Lead	conc	4.80	mg/l
rep	3	Chromium	conc	1.526	mg/l
rep	3	Nickel	conc	1.433	mg/l
rep	3	Zinc	conc	1.576	mg/l
rep	3	Fe_258	conc	472.87	mg/l
rep	3	Cobalt	conc	1.456	mg/l
rep	3	Cr_267	conc	1.474	mg/l
rep	3	Cd_228	conc	1.554	mg/l
rep	3	Copper	conc	1.500	mg/l
rep	3	Co_231	conc	1.392	mg/l

0.05ml Des 2741
1ml Des 2838
to (one a)lacad blank

Recovery

ICPS/500Fe

Lead	av	4.74	mg/l	sd	0.204	%cv	4.30 95
Chromium	av	1.536	mg/l	sd	0.0276	%cv	1.80 104
Nickel	av	1.434	mg/l	sd	0.0425	%cv	2.97

Zinc	av	1.544	mg/l	1.5	sd	0.0231	%cv	1.52
Fe_250	av	476.07	mg/l	<700	sd	0.005	%cv	0.00
Cobalt	av	1.387	mg/l	1.5	sd	0.0759	%cv	5.47
Cr_267	av	1.474	mg/l		sd	0.0031	%cv	0.21
Cd_228	av	1.553	mg/l		sd	0.0476	%cv	3.06
Copper	av	1.481	mg/l		sd	0.0265	%cv	1.79
Co_231	av	1.413	mg/l	✓	sd	0.0537	%cv	3.80

M3639-33	rep	1	Lead	conc	-0.40	mg/l
	rep	1	Chromium	conc	0.463	mg/l
	rep	1	Nickel	conc	0.607	mg/l
	rep	1	Zinc	conc	0.777	mg/l
	rep	1	Fe_250	conc	340.24	mg/l
	rep	1	Cobalt	conc	0.393	mg/l
	rep	1	Cr_267	conc	0.447	mg/l
	rep	1	Cd_228	conc	0.010	mg/l
	rep	1	Copper	conc	0.156	mg/l
	rep	1	Co_231	conc	0.322	mg/l
	rep	2	Chromium	conc	0.487	mg/l
	rep	2	Lead	conc	-0.03	mg/l
	rep	2	Zinc	conc	0.805	mg/l
	rep	2	Nickel	conc	0.617	mg/l
	rep	2	Cobalt	conc	0.362	mg/l
	rep	2	Fe_250	conc	345.74	mg/l
	rep	2	Cd_228	conc	0.004	mg/l
	rep	2	Cr_267	conc	0.448	mg/l
	rep	2	Co_231	conc	0.338	mg/l
	rep	2	Copper	conc	0.131	mg/l
	rep	3	Lead	conc	0.04	mg/l
	rep	3	Chromium	conc	0.453	mg/l
	rep	3	Nickel	conc	0.183	mg/l
	rep	3	Zinc	conc	0.502	mg/l
	rep	3	Fe_250	conc	349.78	mg/l
	rep	3	Cobalt	conc	0.357	mg/l
	rep	3	Cr_267	conc	0.455	mg/l
	rep	3	Cd_228	conc	0.008	mg/l
	rep	3	Copper	conc	0.147	mg/l
	rep	3	Co_231	conc	0.394	mg/l

window edge

window edge

M3639-33								
Lead	av	-0.13	mg/l		sd	0.236	%cv	181.21
Chromium	av	0.468	mg/l		sd	0.0174	%cv	3.72
Nickel	av	~~0.462~~	mg/l	0.612	sd	0.2596	%cv	56.14
Zinc	av	0.795	mg/l		sd	0.0151	%cv	1.90
Fe_250	av	347.92	mg/l		sd	2.038	%cv	0.59
Cobalt	av	0.372	mg/l		sd	0.0223	%cv	2.56
Cr_267	av	0.450	mg/l		sd	0.0043	%cv	0.95
Cd_228	av	0.003	mg/l		sd	0.0030	%cv	89.99
Copper	av	0.145	mg/l		sd	0.0130	%cv	8.96
Co_231	av	0.352	mg/l		sd	0.0379	%cv	4.45

M3639-34	rep	1	Lead	conc	-0.06	mg/l
	rep	1	Chromium	conc	0.480	mg/l
	rep	1	Nickel	conc	0.527	mg/l
	rep	1	Zinc	conc	0.516	mg/l
	rep	1	Fe_250	conc	331.30	mg/l
	rep	1	Cobalt	conc	0.587	mg/l
	rep	1	Cr_267	conc	0.468	mg/l
	rep	1	Cd_228	conc	0.004	mg/l
	rep	1	Copper	conc	0.175	mg/l

	rep	2	Lead	conc	-0.47 mg/l	window edge
	rep	2	Chromium	conc	0.527 mg/l	
	rep	2	Nickel	conc	0.497 mg/l	
	rep	2	Zinc	conc	0.814 mg/l	
	rep	2	Fe_258	conc	348.40 mg/l	
	rep	2	Cobalt	conc	0.583 mg/l	
	rep	2	Cr_267	conc	0.474 mg/l	
	rep	2	Cd_228	conc	0.004 mg/l	
	rep	2	Copper	conc	0.169 mg/l	
	rep	2	Co_231	conc	0.577 mg/l	
	rep	3	Lead	conc	-0.26 mg/l	
	rep	3	Chromium	conc	0.414 mg/l	
	rep	3	Nickel	conc	0.520 mg/l	
	rep	3	Zinc	conc	0.798 mg/l	
	rep	3	Fe_258	conc	341.14 mg/l	
	rep	3	Cobalt	conc	0.543 mg/l	
	rep	3	Cr_267	conc	0.453 mg/l	
	rep	3	Cd_228	conc	-0.003 mg/l	
	rep	3	Copper	conc	0.177 mg/l	
	rep	3	Co_231	conc	0.569 mg/l	

M3639-34

Lead	av	-0.27 mg/l	sd	0.205 %cv	77.38
Chromium	av	0.467 mg/l	sd	0.0565 %cv	12.09
Nickel	av	0.515 mg/l	sd	0.0157 %cv	3.04
Zinc	av	0.809 mg/l	sd	0.0100 %cv	1.24
Fe_258	av	340.29 mg/l	sd	8.594 %cv	2.53
Cobalt	av	0.571 mg/l	sd	0.0241 %cv	4.22
Cr_267	av	0.465 mg/l	sd	0.0109 %cv	2.36
Cd_228	av	0.002 mg/l	sd	0.0043 %cv	230.37
Copper	av	0.174 mg/l	sd	0.0043 %cv	2.46
Co_231	av	0.570 mg/l	sd	0.0065 %cv	1.14

M3639-35

rep	1	Lead	conc	0.12 mg/l	
rep	1	Chromium	conc	0.325 mg/l	
rep	1	Nickel	conc	0.687 mg/l	
rep	1	Zinc	conc	0.762 mg/l	
rep	1	Fe_258	conc	327.81 mg/l	
rep	1	Cobalt	conc	1.156 mg/l	
rep	1	Cr_267	conc	0.407 mg/l	
rep	1	Cd_228	conc	0.004 mg/l	
rep	1	Copper	conc	0.143 mg/l	
rep	1	Co_231	conc	1.114 mg/l	
rep	2	Lead	conc	0.04 mg/l	
rep	2	Chromium	conc	0.373 mg/l	
rep	2	Nickel	conc	0.665 mg/l	
rep	2	Zinc	conc	0.779 mg/l	
rep	2	Fe_258	conc	334.56 mg/l	
rep	2	Cobalt	conc	1.151 mg/l	
rep	2	Cr_267	conc	0.391 mg/l	
rep	2	Cd_228	conc	0.007 mg/l	
rep	2	Copper	conc	0.161 mg/l	
rep	2	Co_231	conc	1.131 mg/l	
rep	3	Lead	conc	-0.03 mg/l	
rep	3	Chromium	conc	0.400 mg/l	
rep	3	Nickel	conc	0.675 mg/l	
rep	3	Zinc	conc	0.797 mg/l	
rep	3	Fe_258	conc	338.75 mg/l	
rep	3	Cobalt	conc	1.180 mg/l	
rep	3	Cr_267	conc	0.396 mg/l	

	rep	3	Copper	conc	0.150	mg/l		
	rep	3	Co_231	conc	1.157	mg/l		
M3639-35								
Lead	av	0.04	mg/l	sd	0.077	%cv	184.65	
Chromium	av	0.373	mg/l	sd	0.0441	%cv	11.75	
Nickel	av	0.676	mg/l	sd	0.0114	%cv	1.68	
Zinc	av	0.779	mg/l	sd	0.0176	%cv	2.26	
Fe_258	av	330.37	mg/l	sd	3.653	%cv	1.11	
Cobalt	av	1.153	mg/l	sd	0.0023	%cv	0.20	
Cr_267	av	0.395	mg/l	sd	0.0113	%cv	2.88	
Cd_228	av	0.007	mg/l	sd	0.0028	%cv	39.54	
Copper	av	0.151	mg/l	sd	0.0092	%cv	6.05	
Co_231	av	1.148	mg/l	sd	0.0298	%cv	2.60	
M3639-36	rep	1	Lead	conc	-0.17	mg/l		window edge
	rep	1	Chromium	conc	0.431	mg/l		
	rep	1	Nickel	conc	0.117	mg/l		window edge
	rep	1	Zinc	conc	0.735	mg/l		
	rep	1	Fe_258	conc	329.48	mg/l		
	rep	1	Cobalt	conc	1.145	mg/l		
	rep	1	Cr_267	conc	0.403	mg/l		
	rep	1	Cd_228	conc	0.006	mg/l		
	rep	1	Copper	conc	0.129	mg/l		
	rep	1	Co_231	conc	1.118	mg/l		
	rep	2	Lead	conc	-0.02	mg/l		
	rep	2	Chromium	conc	0.371	mg/l		
	rep	2	Nickel	conc	0.147	mg/l		window edge
	rep	2	Zinc	conc	0.746	mg/l		
	rep	2	Fe_258	conc	333.79	mg/l		
	rep	2	Cobalt	conc	1.111	mg/l		
	rep	2	Cr_267	conc	0.397	mg/l		
	rep	2	Cd_228	conc	0.009	mg/l		
	rep	2	Copper	conc	0.141	mg/l		
	rep	2	Co_231	conc	1.144	mg/l		
	rep	3	Lead	conc	-0.29	mg/l		window edge
	rep	3	Chromium	conc	0.425	mg/l		
	rep	3	Nickel	conc	0.118	mg/l		window edge
	rep	3	Zinc	conc	0.753	mg/l		
	rep	3	Fe_258	conc	320.99	mg/l		
	rep	3	Cobalt	conc	1.134	mg/l		
	rep	3	Cr_267	conc	0.392	mg/l		
	rep	3	Cd_228	conc	0.007	mg/l		
	rep	3	Copper	conc	0.132	mg/l		
	rep	3	Co_231	conc	1.155	mg/l		
M3639-36								
Lead	av	-0.16	mg/l	sd	0.138	%cv	87.38	
Chromium	av	0.409	mg/l	sd	0.0332	%cv	8.13	
Nickel	av	0.128	mg/l	sd	0.0173	%cv	13.56	
Zinc	av	0.745	mg/l	sd	0.0091	%cv	1.22	
Fe_258	av	328.09	mg/l	sd	6.512	%cv	1.98	
Cobalt	av	1.130	mg/l	sd	0.0172	%cv	1.50	
Cr_267	av	0.398	mg/l	sd	0.0057	%cv	1.43	
Cd_228	av	0.007	mg/l	sd	0.0019	%cv	26.64	
Copper	av	0.134	mg/l	sd	0.0064	%cv	4.80	
Co_231	av	1.139	mg/l	sd	0.0172	%cv	1.57	
M3639-37	rep	1	Lead	conc	-0.14	mg/l		
	rep	1	Chromium	conc	0.386	mg/l		
	rep	1	Nickel	conc	0.497	mg/l		

	rep	1	Fe_258	conc	309.72	mg/l		
	rep	1	Cobalt	conc	0.712	mg/l		
	rep	1	Cr_267	conc	0.363	mg/l		
	rep	1	Cd_228	conc	-0.003	mg/l		
	rep	1	Copper	conc	0.130	mg/l		
	rep	1	Co_231	conc	0.711	mg/l		
	rep	2	Lead	conc	-0.17	mg/l		
	rep	2	Chromium	conc	0.363	mg/l		
	rep	2	Nickel	conc	0.478	mg/l		
	rep	2	Zinc	conc	0.646	mg/l		
	rep	2	Fe_258	conc	313.25	mg/l		
	rep	2	Cobalt	conc	0.704	mg/l		
	rep	2	Cr_267	conc	0.362	mg/l		
	rep	2	Cd_228	conc	0.005	mg/l		
	rep	2	Copper	conc	0.121	mg/l		
	rep	2	Co_231	conc	0.720	mg/l		
	rep	3	Lead	conc	-0.17	mg/l		
	rep	3	Chromium	conc	0.386	mg/l		
	rep	3	Nickel	conc	0.458	mg/l		
	rep	3	Zinc	conc	0.647	mg/l		
	rep	3	Fe_258	conc	314.70	mg/l		
	rep	3	Cobalt	conc	0.744	mg/l		
	rep	3	Cr_267	conc	0.377	mg/l		
	rep	3	Cd_228	conc	-0.004	mg/l		window edge
	rep	3	Copper	conc	0.137	mg/l		
	rep	3	Co_231	conc	0.733	mg/l		
39-37								
Lead	av	-0.16	mg/l	sd	0.020	%cv	12.51	
Chromium	av	0.372	mg/l	sd	0.0125	%cv	3.37	
Nickel	av	0.478	mg/l	sd	0.0195	%cv	4.09	
Zinc	av	0.648	mg/l	sd	0.0033	%cv	0.50	
Fe_258	av	312.56	mg/l	sd	2.561	%cv	0.82	
Cobalt	av	0.720	mg/l	sd	0.0213	%cv	2.95	
Cr_267	av	0.367	mg/l	sd	0.0087	%cv	2.35	
Cd_228	av	-0.000	mg/l	sd	0.0051	%cv	1121.3	
Copper	av	0.129	mg/l	sd	0.0082	%cv	6.33	
Co_231	av	0.721	mg/l	sd	0.0108	%cv	1.50	
M3639-38	rep	1	Lead	conc	0.11	mg/l		
	rep	1	Chromium	conc	0.352	mg/l		
	rep	1	Nickel	conc	0.577	mg/l		
	rep	1	Zinc	conc	0.713	mg/l		
	rep	1	Fe_258	conc	301.03	mg/l		
	rep	1	Cobalt	conc	1.212	mg/l		
	rep	1	Cr_267	conc	0.331	mg/l		
	rep	1	Cd_228	conc	0.003	mg/l		
	rep	1	Copper	conc	0.144	mg/l		
	rep	1	Co_231	conc	1.131	mg/l		
	rep	2	Chromium	conc	0.358	mg/l		
	rep	2	Lead	conc	-0.22	mg/l		
	rep	2	Zinc	conc	0.707	mg/l		
	rep	2	Nickel	conc	0.57.	mg/l		
	rep	2	Cobalt	conc	1.212	mg/l		
	rep	2	Fe_258	conc	302.30	mg/l		
	rep	2	Cd_228	conc	0.004	mg/l		
	rep	2	Cr_267	conc	0.336	mg/l		
	rep	2	Co_231	conc	1.201	mg/l		
	rep	2	Copper	conc	0.133	mg/l		
	rep	3	Lead	conc	-0.05	mg/l		

	rep	3	Nickel	conc	0.564	mg/l	
	rep	3	Zinc	conc	0.725	mg/l	
	rep	3	Fe_258	conc	300.39	mg/l	
	rep	3	Cobalt	conc	1.240	mg/l	
	rep	3	Cr_267	conc	0.334	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Copper	conc	0.136	mg/l	
	rep	3	Co_231	conc	1.223	mg/l	

M3639-38

Lead	av	-0.05 mg/l	sd	0.164	%cv	304.03
Chromium	av	0.350 mg/l	sd	0.0050	%cv	1.40
Nickel	av	0.577 mg/l	sd	0.0137	%cv	2.38
Zinc	av	0.715 mg/l	sd	0.0092	%cv	1.27
Fe_258	av	304.35 mg/l	sd	3.537	%cv	1.16
Cobalt	av	1.222 mg/l	sd	0.0179	%cv	1.46
Cr_267	av	0.334 mg/l	sd	0.0024	%cv	0.72
Cd_228	av	0.005 mg/l	sd	0.0026	%cv	48.91
Copper	av	0.136 mg/l	sd	0.0077	%cv	5.64
Co_231	av	1.228 mg/l	sd	0.0504	%cv	4.11

#1 standard	rep	1	Lead	em	52.7	conc	1.00	
	rep	1	Chromium	em	85.1	conc	1.000	
	rep	1	Nickel	em	305.9	conc	1.000	
	rep	1	Zinc	em	309.5	conc	1.000	
	rep	1	Cr_267	em	1323.3	conc	1.000	
	rep	1	Cobalt	em	264.9	conc	1.000	
	rep	1	Copper	em	1760.3	conc	1.000	
	rep	1	Cd_228	em	544.0	conc	1.000	
	rep	1	Co_231	em	157.7	conc	1.000	
	rep	2	Lead	em	46.4	conc	1.00	
	rep	2	Chromium	em	76.3	conc	1.000	
	rep	2	Nickel	em	304.4	conc	1.000	
	rep	2	Zinc	em	309.9	conc	1.000	
	rep	2	Cr_267	em	1353.7	conc	1.000	
	rep	2	Cobalt	em	284.5	conc	1.000	
	rep	2	Copper	em	1749.4	conc	1.000	
	rep	2	Cd_228	em	530.1	conc	1.000	
	rep	2	Co_231	em	146.4	conc	1.000	
	rep	3	Chromium	em	81.6	conc	1.000	
	rep	3	Lead	em	44.5	conc	1.00	
	rep	3	Zinc	em	307.7	conc	1.000	
	rep	3	Nickel	em	314.7	conc	1.000	
	rep	3	Cobalt	em	275.1	conc	1.000	
	rep	3	Cr_267	em	1291.1	conc	1.000	
	rep	3	Cd_228	em	537.4	conc	1.000	
	rep	3	Copper	em	1770.4	conc	1.000	
	rep	3	Co_231	em	157.1	conc	1.000	

Reruns

#1 standard

Chromium	av	81.002	79	sd	4.4156	%cv	5.45	conc 1.000
Lead	av	47.57	52	sd	4.297	%cv	3.93	conc 1.00
Zinc	av	309.039	309	sd	1.1520	%cv	0.37	conc 1.000
Nickel	av	308.324	309	sd	5.5642	%cv	1.80	conc 1.000
Cobalt	av	274.807	267	sd	9.7971	%cv	3.57	conc 1.000
Cr_267	av	1322.712	1293	sd	31.3035	%cv	2.37	conc 1.000
Cd_228	av	537.164	520	sd	6.9224	%cv	1.29	conc 1.000
Copper	av	1762.894	1754	sd	11.5847	%cv	0.66	conc 1.000
Co_231	av	158.731	155	sd	6.6618	%cv	4.19	conc 1.000

#3 standard	rep	1	Fe_258	em	42477.3	conc	100.00

	rep	3	Fe_259	em	42366.4	conc	100.00		
standard Fe_259	av	42745.83	41325	sd	569.400	%cv	1.33	conc	100.00
M3639-39	rep	1	Lead	conc	-0.36	mg/l			window edge
	rep	1	Chromium	conc	0.413	mg/l			
	rep	1	Nickel	conc	0.567	mg/l			
	rep	1	Zinc	conc	0.734	mg/l			
	rep	1	Fe_259	conc	333.15	mg/l			
	rep	1	Cobalt	conc	0.937	mg/l			
	rep	1	Cr_267	conc	0.405	mg/l			
	rep	1	Cd_228	conc	-0.009	mg/l			window edge
	rep	1	Copper	conc	0.146	mg/l			
	rep	1	Co_231	conc	0.945	mg/l			
	rep	2	Chromium	conc	0.411	mg/l			
	rep	2	Lead	conc	-0.22	mg/l			window edge
	rep	2	Zinc	conc	0.759	mg/l			
	rep	2	Nickel	conc	0.581	mg/l			
	rep	2	Cobalt	conc	0.897	mg/l			
	rep	2	Fe_259	conc	330.51	mg/l			
	rep	2	Cd_228	conc	0.002	mg/l			
	rep	2	Cr_267	conc	0.398	mg/l			
	rep	2	Co_231	conc	0.952	mg/l			
	rep	2	Copper	conc	0.163	mg/l			
	rep	3	Lead	conc	-0.16	mg/l			
	rep	3	Chromium	conc	0.406	mg/l			
	rep	3	Nickel	conc	0.579	mg/l			
	rep	3	Zinc	conc	0.714	mg/l			
	rep	3	Fe_259	conc	339.35	mg/l			
	rep	3	Cobalt	conc	0.904	mg/l			
	rep	3	Cr_267	conc	0.391	mg/l			
	rep	3	Cd_228	conc	0.003	mg/l			
	rep	3	Copper	conc	0.151	mg/l			
	rep	3	Co_231	conc	0.897	mg/l			
M3639-39									
Lead	av	-0.25	mg/l	sd	0.102	%cv	41.37		
Chromium	av	0.410	mg/l	sd	0.0037	%cv	0.90		
Nickel	av	0.576	mg/l	sd	0.0078	%cv	1.36		
Zinc	av	0.736	mg/l	sd	0.0227	%cv	3.09		
Fe_259	av	334.34	mg/l	sd	4.538	%cv	1.36		
Cobalt	av	0.913	mg/l	sd	0.0217	%cv	2.37		
Cr_267	av	0.398	mg/l	sd	0.0073	%cv	1.84		
Cd_228	av	-0.001	mg/l	sd	0.0066	%cv	537.54		
Copper	av	0.154	mg/l	sd	0.0085	%cv	5.55		
Co_231	av	0.931	mg/l	sd	0.0300	%cv	3.22		
M3639-40	rep	1	Lead	conc	-0.24	mg/l			
	rep	1	Chromium	conc	0.439	mg/l			
	rep	1	Nickel	conc	0.604	mg/l			
	rep	1	Zinc	conc	0.714	mg/l			
	rep	1	Fe_259	conc	313.48	mg/l			
	rep	1	Cobalt	conc	0.594	mg/l			
	rep	1	Cr_267	conc	0.421	mg/l			
	rep	1	Cd_228	conc	-0.001	mg/l			
	rep	1	Copper	conc	0.196	mg/l			
	rep	1	Co_231	conc	0.627	mg/l			
	rep	2	Chromium	conc	0.436	mg/l			
	rep	2	Lead	conc	0.00	mg/l			
	rep	3	Zinc	conc	0.680	mg/l			

	rep	2	Cobalt	conc	0.534	mg/l	
	rep	2	Fe_258	conc	320.83	mg/l	
	rep	2	Cd_228	conc	0.004	mg/l	
	rep	2	Cr_267	conc	0.425	mg/l	
	rep	2	Co_231	conc	0.611	mg/l	
	rep	2	Copper	conc	0.194	mg/l	
	rep	3	Lead	conc	-0.57	mg/l	window edge
	rep	3	Chromium	conc	0.420	mg/l	
	rep	3	Nickel	conc	0.505	mg/l	
	rep	3	Zinc	conc	0.705	mg/l	
	rep	3	Fe_258	conc	315.55	mg/l	
	rep	3	Cobalt	conc	0.617	mg/l	
	rep	3	Cr_267	conc	0.421	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Copper	conc	0.196	mg/l	
	rep	3	Co_231	conc	0.670	mg/l	

M3639-40

Lead	av	-0.27	mg/l	sd	0.280	%cv 107.62
Chromium	av	0.406	mg/l	sd	0.0442	%cv 10.89
Nickel	av	0.520	mg/l	sd	0.0144	%cv 2.78
Zinc	av	0.712	mg/l	sd	0.0244	%cv 3.43
Fe_258	av	316.64	mg/l	sd	3.817	%cv 1.21
Cobalt	av	0.595	mg/l	sd	0.0189	%cv 3.17
Cr_267	av	0.422	mg/l	sd	0.0021	%cv 0.51
Cd_228	av	0.002	mg/l	sd	0.0027	%cv 120.24
Copper	av	0.192	mg/l	sd	0.0067	%cv 3.50
Co_231	av	0.636	mg/l	sd	0.0301	%cv 4.73

QCB M3639-21	rep	1	Lead	conc	0.04	mg/l
	rep	1	Chromium	conc	0.241	mg/l
	rep	1	Nickel	conc	0.379	mg/l
	rep	1	Zinc	conc	0.520	mg/l
	rep	1	Fe_258	conc	243.43	mg/l
	rep	1	Cobalt	conc	0.550	mg/l
	rep	1	Cr_267	conc	0.269	mg/l
	rep	1	Cd_228	conc	0.003	mg/l
	rep	1	Copper	conc	0.109	mg/l
	rep	1	Co_231	conc	0.635	mg/l
	rep	2	Chromium	conc	0.208	mg/l
	rep	2	Lead	conc	-0.07	mg/l
	rep	2	Zinc	conc	0.501	mg/l
	rep	2	Nickel	conc	0.326	mg/l
	rep	2	Cobalt	conc	0.573	mg/l
	rep	2	Fe_258	conc	235.43	mg/l
	rep	2	Cd_228	conc	-0.001	mg/l
	rep	2	Cr_267	conc	0.273	mg/l
	rep	2	Co_231	conc	0.601	mg/l
	rep	2	Copper	conc	0.113	mg/l
	rep	3	Lead	conc	-0.30	mg/l
	rep	3	Chromium	conc	0.213	mg/l
	rep	3	Nickel	conc	0.301	mg/l
	rep	3	Zinc	conc	0.470	mg/l
	rep	3	Fe_258	conc	235.08	mg/l
	rep	3	Cobalt	conc	0.536	mg/l
	rep	3	Cr_267	conc	0.270	mg/l
	rep	3	Cd_228	conc	0.000	mg/l
	rep	3	Copper	conc	0.117	mg/l
	rep	3	Co_231	conc	0.594	mg/l

QCB M3639-2.

Chromium	av	0.249	mg/l	sd	0.0358	%cv 14.40
Nickel	av	0.362	mg/l	sd	0.0011	%cv 0.60
Zinc	av	0.504	mg/l	sd	0.0152	%cv 3.01
Fe_258	av	237.98	mg/l	sd	4.726	%cv 1.99
Cobalt	av	0.577	mg/l	sd	0.0280	%cv 4.86
Cr_267	av	0.280	mg/l	sd	0.0118	%cv 4.20
Cd_228	av	0.003	mg/l	sd	0.0042	%cv 125.57
Copper	av	0.113	mg/l	sd	0.0044	%cv 3.92
Co_231	av	0.624	mg/l	sd	0.0192	%cv 3.09

QCD M3639-22	rep	1	Lead	conc	-0.11	mg/l
	rep	1	Chromium	conc	0.223	mg/l
	rep	1	Nickel	conc	0.373	mg/l
	rep	1	Zinc	conc	0.506	mg/l
	rep	1	Fe_258	conc	218.14	mg/l
	rep	1	Cobalt	conc	0.740	mg/l
	rep	1	Cr_267	conc	0.230	mg/l
	rep	1	Cd_228	conc	-0.001	mg/l
	rep	1	Copper	conc	0.105	mg/l
	rep	1	Co_231	conc	0.790	mg/l
	rep	2	Lead	conc	0.11	mg/l
	rep	2	Chromium	conc	0.199	mg/l
	rep	2	Nickel	conc	0.367	mg/l
	rep	2	Zinc	conc	0.499	mg/l
	rep	2	Fe_258	conc	211.41	mg/l
	rep	2	Cobalt	conc	0.703	mg/l
	rep	2	Cr_267	conc	0.238	mg/l
	rep	2	Cd_228	conc	0.004	mg/l
	rep	2	Copper	conc	0.112	mg/l
	rep	2	Co_231	conc	0.731	mg/l
	rep	3	Lead	conc	-0.18	mg/l window edge
	rep	3	Chromium	conc	0.139	mg/l
	rep	3	Nickel	conc	0.381	mg/l
	rep	3	Zinc	conc	0.517	mg/l
	rep	3	Fe_258	conc	216.03	mg/l
	rep	3	Cobalt	conc	0.726	mg/l
	rep	3	Cr_267	conc	0.246	mg/l
	rep	3	Cd_228	conc	0.011	mg/l
	rep	3	Copper	conc	0.103	mg/l
	rep	3	Co_231	conc	0.796	mg/l

QCD M3639-22						
Lead	av	-0.06	mg/l	sd	0.154	%cv 265.48
Chromium	av	0.204	mg/l	sd	0.0175	%cv 8.58
Nickel	av	0.373	mg/l	sd	0.0069	%cv 1.85
Zinc	av	0.507	mg/l	sd	0.0095	%cv 1.87
Fe_258	av	215.19	mg/l	sd	3.439	%cv 1.60
Cobalt	av	0.725	mg/l	sd	0.0224	%cv 3.09
Cr_267	av	0.238	mg/l	sd	0.0070	%cv 3.27
Cd_228	av	0.005	mg/l	sd	0.0061	%cv 125.81
Copper	av	0.107	mg/l	sd	0.0040	%cv 4.49
Co_231	av	0.772	mg/l	sd	0.0357	%cv 4.62

1876	rep	1	Lead	conc	0.10 mg/l
	rep	1	Chromium	conc	2.027 mg/l
	rep	1	Nickel	conc	0.775 mg/l
	rep	1	Zinc	conc	0.977 mg/l
	rep	1	Fe_258	conc	893.47 mg/l
	rep	1	Cobalt	conc	0.240 mg/l
	rep	1	Cr_267	conc	1.740 mg/l

	rep	1	Copper	conc	1.942	mg/l		
	rep	1	Co_231	conc	0.220	mg/l		
	rep	2	Lead	conc	3.00	mg/l		
	rep	2	Chromium	conc	2.005	mg/l		
	rep	2	Nickel	conc	0.764	mg/l		
	rep	2	Zinc	conc	8.329	mg/l		
	rep	2	Fe_258	conc	713.07	mg/l		
	rep	2	Cobalt	conc	0.206	mg/l		
	rep	2	Cr_267	conc	1.930	mg/l		
	rep	2	Cd_228	conc	0.063	mg/l		
	rep	2	Copper	conc	1.901	mg/l		
	rep	2	Co_231	conc	0.214	mg/l		
	rep	3	Lead	conc	3.32	mg/l		
	rep	3	Chromium	conc	1.915	mg/l		
	rep	3	Nickel	conc	0.822	mg/l		
	rep	3	Zinc	conc	8.582	mg/l		
	rep	3	Fe_258	conc	702.02	mg/l		
	rep	3	Cobalt	conc	0.222	mg/l		
	rep	3	Cr_267	conc	2.000	mg/l		
	rep	3	Cd_228	conc	0.070	mg/l		
	rep	3	Copper	conc	1.972	mg/l		
	rep	3	Co_231	conc	0.226	mg/l		
QCS 1376								
Lead	av	3.18	mg/l		sd	0.122	%cv	3.83
Chromium	av	2.002	mg/l		sd	0.0781	%cv	3.90
Nickel	av	0.787	mg/l		sd	0.0305	%cv	3.88
Zinc	av	8.436	mg/l		sd	0.1309	%cv	1.55
Fe_258	av	702.19	mg/l		sd	9.801	%cv	1.40
Cobalt	av	0.225	mg/l		sd	0.0212	%cv	9.41
Cr_267	av	1.962	mg/l		sd	0.0338	%cv	1.72
Cd_228	av	0.069	mg/l		sd	0.0042	%cv	6.12
Copper	av	1.938	mg/l		sd	0.0354	%cv	1.83
Co_231	av	0.222	mg/l		sd	0.0064	%cv	2.90
QCK M3639-23	rep	1	Lead	conc	115.05	mg/l		
	rep	1	Chromium	conc	0.771	mg/l		
	rep	1	Nickel	conc	0.733	mg/l		
	rep	1	Zinc	conc	115.137	mg/l		
	rep	1	Fe_258	conc	859.24	mg/l		
	rep	1	Cobalt	conc	1.725	mg/l		
	rep	1	Cr_267	conc	0.850	mg/l		
	rep	1	Cd_228	conc	0.410	mg/l		
	rep	1	Copper	conc	58.758	mg/l		
	rep	1	Co_231	conc	1.730	mg/l		
	rep	2	Lead	conc	117.10	mg/l		
	rep	2	Chromium	conc	0.921	mg/l		
	rep	2	Nickel	conc	0.779	mg/l		
	rep	2	Zinc	conc	118.754	mg/l		
	rep	2	Fe_258	conc	868.22	mg/l		
	rep	2	Cobalt	conc	1.774	mg/l		
	rep	2	Cr_267	conc	0.819	mg/l		
	rep	2	Cd_228	conc	0.412	mg/l		
	rep	2	Copper	conc	56.850	mg/l		
	rep	2	Co_231	conc	1.868	mg/l		
	rep	3	Lead	conc	115.09	mg/l		
	rep	3	Chromium	conc	0.730	mg/l		
	rep	3	Nickel	conc	0.685	mg/l		
	rep	3	Zinc	conc	116.350	mg/l		
	rep	3	Fe_258	conc	861.72	mg/l		

	rep	3	Cr_267	conc	0.044	mg/l		
	rep	3	Cd_228	conc	0.402	mg/l		
	rep	3	Copper	conc	56.595	mg/l		
	rep	3	Co_231	conc	1.813	mg/l		
QCK M3639-23								
Lead	av	115.75	mg/l	sd	1.173	%cv	1.01	
Chromium	av	0.774	mg/l	sd	0.0456	%cv	5.91	
Nickel	av	0.772	mg/l	sd	0.0363	%cv	4.70	
Zinc	av	116.747	mg/l	sd	1.8408	%cv	1.58	
Fe_258	av	861.46	mg/l	sd	2.080	%cv	0.24	
Cobalt	av	1.775	mg/l	sd	0.0505	%cv	2.85	
Cr_267	av	0.837	mg/l	sd	0.0166	%cv	1.99	
Cd_228	av	0.400	mg/l	sd	0.0052	%cv	1.27	
Copper	av	57.401	mg/l	sd	1.1819	%cv	2.06	
Co_231	av	1.822	mg/l	sd	0.0440	%cv	2.41	
QCK M3639-24	rep	1	Lead	conc	4.09	mg/l		
	rep	1	Chromium	conc	2.204	mg/l		
	rep	1	Nickel	conc	1.223	mg/l		
	rep	1	Zinc	conc	9.693	mg/l		
	rep	1	Fe_258	conc	948.31	mg/l		
	rep	1	Cobalt	conc	0.934	mg/l		
	rep	1	Cr_267	conc	2.269	mg/l		
	rep	1	Cd_228	conc	0.070	mg/l		
	rep	1	Copper	conc	2.074	mg/l		
	rep	1	Co_231	conc	1.048	mg/l		
	rep	2	Lead	conc	3.67	mg/l		
	rep	2	Chromium	conc	2.046	mg/l		
	rep	2	Nickel	conc	1.289	mg/l		
	rep	2	Zinc	conc	9.695	mg/l		
	rep	2	Fe_258	conc	960.80	mg/l		
	rep	2	Cobalt	conc	0.935	mg/l		
	rep	2	Cr_267	conc	2.353	mg/l		
	rep	2	Cd_228	conc	0.079	mg/l		
	rep	2	Copper	conc	2.058	mg/l		
	rep	2	Co_231	conc	0.947	mg/l		
	rep	3	Lead	conc	3.80	mg/l		
	rep	3	Chromium	conc	2.203	mg/l		
	rep	3	Nickel	conc	1.313	mg/l		
	rep	3	Zinc	conc	9.587	mg/l		
	rep	3	Fe_258	conc	982.09	mg/l		
	rep	3	Cobalt	conc	0.953	mg/l		
	rep	3	Cr_267	conc	2.301	mg/l		
	rep	3	Cd_228	conc	0.074	mg/l		
	rep	3	Copper	conc	2.000	mg/l		
	rep	3	Co_231	conc	0.953	mg/l		
QCK M3639-24								
Lead	av	3.85	mg/l	sd	0.217	%cv	5.64	
Chromium	av	2.175	mg/l	sd	0.1210	%cv	5.56	
Nickel	av	1.242	mg/l	sd	0.0415	%cv	3.34	
Zinc	av	9.659	mg/l	sd	0.0607	%cv	0.63	
Fe_258	av	964.73	mg/l	sd	19.710	%cv	2.04	
Cobalt	av	0.940	mg/l	sd	0.0101	%cv	1.08	
Cr_267	av	2.268	mg/l	sd	0.0138	%cv	0.61	
Cd_228	av	0.075	mg/l	sd	0.0033	%cv	4.33	
Copper	av	2.071	mg/l	sd	0.0114	%cv	0.55	
Co_231	av	0.934	mg/l	sd	0.0556	%cv	5.65	
Coin A	rep	1	Lead	conc	1.07	mg/l		

	rep	1	Nickel	conc	1.075	mg/l	
	rep	1	Zinc	conc	1.023	mg/l	
	rep	1	Fe_258	conc	1.57	mg/l	
	rep	1	Cobalt	conc	1.004	mg/l	
	rep	1	Cr_267	conc	1.050	mg/l	
	rep	1	Cd_228	conc	1.033	mg/l	
	rep	1	Copper	conc	1.042	mg/l	
	rep	1	Co_231	conc	1.035	mg/l	
	rep	2	Lead	conc	1.15	mg/l	
	rep	2	Chromium	conc	0.935	mg/l	
	rep	2	Nickel	conc	1.041	mg/l	
	rep	2	Zinc	conc	1.034	mg/l	
	rep	2	Fe_258	conc	1.34	mg/l	
	rep	2	Cobalt	conc	1.002	mg/l	
	rep	2	Cr_267	conc	1.034	mg/l	
	rep	2	Cd_228	conc	1.010	mg/l	
	rep	2	Copper	conc	1.025	mg/l	
	rep	2	Co_231	conc	1.056	mg/l	
	rep	3	Lead	conc	1.06	mg/l	
	rep	3	Chromium	conc	1.040	mg/l	
	rep	3	Nickel	conc	1.014	mg/l	
	rep	3	Zinc	conc	1.070	mg/l	
	rep	3	Fe_258	conc	1.19	mg/l	
	rep	3	Cobalt	conc	0.987	mg/l	
	rep	3	Cr_267	conc	1.072	mg/l	
	rep	3	Cd_228	conc	1.000	mg/l	
	rep	3	Copper	conc	1.046	mg/l	
	rep	3	Co_231	conc	1.017	mg/l	

Soln A

Lead	av	1.09	mg/l	sd	0.049	%cv 4.51
Chromium	av	0.976	mg/l	sd	0.0566	%cv 5.80
Nickel	av	1.044	mg/l	sd	0.0305	%cv 2.92
Zinc	av	1.043	mg/l	sd	0.0249	%cv 2.39
Fe_258	av	1.36	mg/l	sd	0.193	%cv 14.15
Cobalt	av	0.991	mg/l	sd	0.0207	%cv 2.09
Cr_267	av	1.052	mg/l	sd	0.0190	%cv 1.81
Cd_228	av	1.014	mg/l	sd	0.0168	%cv 1.66
Copper	av	1.038	mg/l	sd	0.0114	%cv 1.10
Co_231	av	1.053	mg/l	sd	0.0339	%cv 3.22

Soln Fe_100	rep	1	Lead	conc	-0.04	mg/l
	rep	1	Chromium	conc	-0.014	mg/l
	rep	1	Nickel	conc	-0.011	mg/l
	rep	1	Zinc	conc	0.007	mg/l
	rep	1	Fe_258	conc	105.35	mg/l
	rep	1	Cobalt	conc	-0.002	mg/l
	rep	1	Cr_267	conc	0.020	mg/l
	rep	1	Cd_228	conc	0.004	mg/l
	rep	1	Copper	conc	-0.007	mg/l
	rep	1	Co_231	conc	0.019	mg/l
	rep	2	Lead	conc	-0.01	mg/l
	rep	2	Chromium	conc	0.002	mg/l
	rep	2	Nickel	conc	0.006	mg/l
	rep	2	Zinc	conc	0.017	mg/l
	rep	2	Fe_258	conc	106.88	mg/l
	rep	2	Cobalt	conc	0.004	mg/l
	rep	2	Cr_267	conc	0.016	mg/l
	rep	2	Cd_228	conc	0.002	mg/l
	rep	2	Copper	conc	-0.009	mg/l

	rep	3	Lead	conc	0.00	mg/l			
	rep	3	Chromium	conc	-0.011	mg/l			
	rep	3	Nickel	conc	0.010	mg/l			
	rep	3	Zinc	conc	0.000	mg/l			
	rep	3	Fe_258	conc	104.64	mg/l			
	rep	3	Cobalt	conc	-0.003	mg/l			
	rep	3	Cr_267	conc	-0.001	mg/l			
	rep	3	Cd_228	conc	0.002	mg/l			
	rep	3	Copper	conc	-0.021	mg/l			window edge
	rep	3	Co_231	conc	0.024	mg/l			
Soln Fe_100									
Lead	av	-0.02	mg/l	sd	0.023	%cv	150.11		
Chromium	av	-0.008	mg/l	sd	0.0086	%cv	109.51		
Nickel	av	0.002	mg/l	sd	0.0110	%cv	609.79		
Zinc	av	0.011	mg/l	sd	0.0055	%cv	52.55		
Fe_258	av	105.62	mg/l	sd	1.143	%cv	1.08		
Cobalt	av	-0.000	mg/l	sd	0.0037	%cv	4705.3		
Cr_267	av	0.011	mg/l	sd	0.0112	%cv	97.51		
Cd_228	av	0.002	mg/l	sd	0.0012	%cv	48.75		
Copper	av	-0.012	mg/l	sd	0.0074	%cv	59.92		
Co_231	av	0.021	mg/l	sd	0.0030	%cv	14.57		
DI	rep	1	Lead	conc	-0.11	mg/l			
	rep	1	Chromium	conc	-0.010	mg/l			
	rep	1	Nickel	conc	-0.032	mg/l			window edge
	rep	1	Zinc	conc	0.006	mg/l			
	rep	1	Fe_258	conc	0.55	mg/l			
	rep	1	Cobalt	conc	-0.004	mg/l			
	rep	1	Cr_267	conc	0.004	mg/l			
	rep	1	Cd_228	conc	0.000	mg/l			window edge
	rep	1	Copper	conc	0.007	mg/l			
	rep	1	Co_231	conc	-0.026	mg/l			window edge
	rep	2	Lead	conc	-0.06	mg/l			
	rep	2	Chromium	conc	-0.005	mg/l			
	rep	2	Nickel	conc	-0.002	mg/l			
	rep	2	Zinc	conc	0.007	mg/l			
	rep	2	Fe_258	conc	0.05	mg/l			
	rep	2	Cobalt	conc	-0.003	mg/l			
	rep	2	Cr_267	conc	-0.006	mg/l			
	rep	2	Cd_228	conc	0.005	mg/l			
	rep	2	Copper	conc	0.004	mg/l			
	rep	2	Co_231	conc	0.020	mg/l			
	rep	3	Lead	conc	0.01	mg/l			
	rep	3	Chromium	conc	0.007	mg/l			
	rep	3	Nickel	conc	-0.030	mg/l			window edge
	rep	3	Zinc	conc	0.007	mg/l			
	rep	3	Fe_258	conc	-0.04	mg/l			
	rep	3	Cobalt	conc	0.006	mg/l			
	rep	3	Cr_267	conc	0.004	mg/l			
	rep	3	Cd_228	conc	0.000	mg/l			
	rep	3	Copper	conc	0.008	mg/l			
	rep	3	Co_231	conc	0.003	mg/l			
Lead	av	-0.05	mg/l	sd	0.059	%cv	109.36		
Chromium	av	-0.002	mg/l	sd	0.0087	%cv	373.73		
Nickel	av	-0.021	mg/l	sd	0.0165	%cv	77.39		
Zinc	av	0.007	mg/l	sd	0.0004	%cv	6.26		
Fe_258	av	0.19	mg/l	sd	0.310	%cv	170.09		
Cobalt	av	-0.000	mg/l	sd	0.0053	%cv	1502.1		

Cd_228	av	0.002 mg/l	sd	0.0029	%cv	156.13	
Copper	av	0.006 mg/l	sd	0.0022	%cv	33.89	
Co_231	av	-0.001 mg/l	sd	0.0230	%cv	2036.3	

ID

M3639-30

rep	1	Lead	conc	0.05	mg/l		
rep	1	Chromium	conc	0.268	mg/l		
rep	1	Nickel	conc	0.339	mg/l		
rep	1	Zinc	conc	0.552	mg/l		
rep	1	Fe_258	conc	290.37	mg/l		
rep	1	Cobalt	conc	0.550	mg/l		
rep	1	Cr_267	conc	0.326	mg/l		
rep	1	Cd_228	conc	-0.002	mg/l		
rep	1	Copper	conc	0.118	mg/l		
rep	1	Co_231	conc	0.585	mg/l		
rep	2	Lead	conc	-0.09	mg/l		
rep	2	Chromium	conc	0.312	mg/l		
rep	2	Nickel	conc	0.316	mg/l		
rep	2	Zinc	conc	0.536	mg/l		
rep	2	Fe_258	conc	289.82	mg/l		
rep	2	Cobalt	conc	0.560	mg/l		
rep	2	Cr_267	conc	0.334	mg/l		
rep	2	Cd_228	conc	0.006	mg/l		
rep	2	Copper	conc	0.091	mg/l		
rep	2	Co_231	conc	0.623	mg/l		
rep	3	Lead	conc	0.05	mg/l		
rep	3	Chromium	conc	0.291	mg/l		
rep	3	Nickel	conc	0.307	mg/l		
rep	3	Zinc	conc	0.554	mg/l		
rep	3	Fe_258	conc	290.50	mg/l		
rep	3	Cobalt	conc	0.574	mg/l		
rep	3	Cr_267	conc	0.333	mg/l		
rep	3	Cd_228	conc	0.002	mg/l		
rep	3	Copper	conc	0.098	mg/l		
rep	3	Co_231	conc	0.580	mg/l		

-25 +0.5 200 Fe

D-30

3M
Worldwide Sponsor
1992 Olympic Games

Avg	Reisen	% diff
—	0.06	—
0.290	0.313	8
0.321	0.317	2
0.547	0.554	1
290.23	277.90	4
0.561	0.592	5
0.331	0.310	6
—	0.001	—
0.102	0.088	15
0.596	0.566	5

ID

IK

M3639-25

+0.5
200 Fe

rep	1	Lead	conc	0.53	mg/l		
rep	1	Chromium	conc	0.757	mg/l		
rep	1	Nickel	conc	0.973	mg/l		
rep	1	Zinc	conc	1.162	mg/l		
rep	1	Fe_258	conc	489.07	mg/l		
rep	1	Cobalt	conc	1.278	mg/l		
rep	1	Cr_267	conc	0.883	mg/l		
rep	1	Cd_228	conc	0.514	mg/l		
rep	1	Copper	conc	0.623	mg/l		
rep	1	Co_231	conc	1.366	mg/l		
rep	2	Lead	conc	0.43	mg/l		
rep	2	Chromium	conc	0.772	mg/l		
rep	2	Nickel	conc	0.919	mg/l		
rep	2	Zinc	conc	1.204	mg/l		
rep	2	Fe_258	conc	490.94	mg/l		
rep	2	Cobalt	conc	1.266	mg/l		
rep	2	Cr_267	conc	0.843	mg/l		
rep	2	Cd_228	conc	0.515	mg/l		
rep	2	Copper	conc	0.643	mg/l		
rep	2	Co_231	conc	1.322	mg/l		
rep	3	Chromium	conc	0.749	mg/l		
rep	3	Lead	conc	0.69	mg/l		
rep	3	Zinc	conc	1.168	mg/l		

+0.05 ml des 3019
0.4 ml des 2838
to 10.4 ml M3639-25

Avg	Bkgd	% recov
0.759	0.371	78
0.55	0.28	110
1.178	0.708	94

rep	3	Cobalt	conc	1.247	mg/l	1.264	0.926	68
rep	3	Fe_258	conc	501.43	mg/l	493.8	308.51	93
rep	3	Cd_228	conc	0.516	mg/l	0.515	0.004	102
rep	3	Cr_267	conc	0.843	mg/l	0.856	0.357	100
rep	3	Co_231	conc	1.300	mg/l	1.329	0.901	96
rep	3	Copper	conc	0.662	mg/l	0.643	0.130	103

IK

713639 41-60

1-2395
012395 STW1

standard	rep	1	Lead	em	52.7	conc	1.00		
	rep	1	Chromium	em	65.5	conc	1.000		
	rep	1	Nickel	em	297.2	conc	1.000		
	rep	1	Zinc	em	279.1	conc	1.000		
	rep	1	Cr_267	em	1289.1	conc	1.000		
	rep	1	Cobalt	em	255.0	conc	1.000		
	rep	1	Copper	em	1670.0	conc	1.000		
	rep	1	Cd_228	em	544.5	conc	1.000		
	rep	1	Co_231	em	156.7	conc	1.000		
	rep	2	Lead	em	51.0	conc	1.00		
	rep	2	Chromium	em	72.3	conc	1.000		
	rep	2	Nickel	em	302.5	conc	1.000		
	rep	2	Zinc	em	293.6	conc	1.000		
	rep	2	Cr_267	em	1311.9	conc	1.000		
	rep	2	Cobalt	em	243.4	conc	1.000		
	rep	2	Copper	em	1691.0	conc	1.000		
	rep	2	Cd_228	em	542.1	conc	1.000		
	rep	2	Co_231	em	155.0	conc	1.000		
	rep	3	Lead	em	51.6	conc	1.00		
	rep	3	Chromium	em	72.9	conc	1.000		
	rep	3	Nickel	em	299.1	conc	1.000		
	rep	3	Zinc	em	284.8	conc	1.000		
	rep	3	Cr_267	em	1322.5	conc	1.000		
	rep	3	Cobalt	em	241.2	conc	1.000		
	rep	3	Copper	em	1719.1	conc	1.000		
	rep	3	Cd_228	em	530.5	conc	1.000		
	rep	3	Co_231	em	150.6	conc	1.000		

standard									
Lead	av	51.84	sd	0.984	%cv	1.90	conc	1.00	
Chromium	av	70.220	sd	4.0871	%cv	5.82	conc	1.000	
Nickel	av	299.608	sd	2.6917	%cv	0.90	conc	1.000	
Zinc	av	285.853	sd	7.2876	%cv	2.55	conc	1.000	
Cr_267	av	1307.827	sd	17.0834	%cv	1.31	conc	1.000	
Cobalt	av	248.210	sd	6.8982	%cv	2.78	conc	1.000	
Copper	av	1693.487	sd	24.4880	%cv	1.45	conc	1.000	
Cd_228	av	539.024	sd	7.4629	%cv	1.38	conc	1.000	
Co_231	av	154.103	sd	3.1544	%cv	2.05	conc	1.000	

#8 standard	rep	1	Fe_258	em	41118.9	conc	100.00		
	rep	2	Fe_258	em	40849.6	conc	100.00		
	rep	3	Fe_258	em	41587.8	conc	100.00		
#8 standard									
Fe_258	av	41186.09	sd	374.686	%cv	0.91	conc	100.00	

blank	rep	1	Lead	em	6.4	
	rep	1	Chromium	em	0.6	window edge
	rep	1	Nickel	em	6.5	
	rep	1	Zinc	em	1.6	
	rep	1	Fe_258	em	26.3	
	rep	1	Cobalt	em	2.0	
	rep	1	Cr_267	em	14.0	
	rep	1	Cd_228	em	-1.0	window edge
	rep	1	Copper	em	27.5	
	rep	1	Co_231	em	1.7	
	rep	2	Lead	em	5.0	
	rep	2	Chromium	em	1.7	
	rep	2	Nickel	em	12.0	
	rep	2	Zinc	em	1.0	
	rep	2	Fe_258	em	9.3	
	rep	2	Cobalt	em	5.0	

	rep	2	Cr_267	em	19.6	
	rep	2	Cd_228	em	-0.3	
	rep	2	Copper	em	21.7	
	rep	2	Co_231	em	8.5	
	rep	3	Lead	em	14.0	
	rep	3	Chromium	em	8.6	window edge
	rep	3	Nickel	em	5.6	
	rep	3	Zinc	em	8.0	
	rep	3	Fe_258	em	20.5	
	rep	3	Cobalt	em	8.3	
	rep	3	Cr_267	em	21.7	
	rep	3	Cd_228	em	8.4	
	rep	3	Copper	em	19.0	
	rep	3	Co_231	em	6.7	

blank

Lead	av	8.57	sd	5.027 %cv	58.65
Chromium	av	0.983	sd	0.6622 %cv	67.38
Nickel	av	8.031	sd	3.4946 %cv	43.51
Zinc	av	1.946	sd	0.8970 %cv	46.10
Fe_258	av	18.87	sd	8.365 %cv	44.33
Cobalt	av	3.219	sd	1.8034 %cv	56.02
Cr_267	av	18.433	sd	3.9563 %cv	21.46
Cd_228	av	0.625	sd	2.4043 %cv	384.42
Copper	av	22.713	sd	4.3379 %cv	19.10
Co_231	av	3.956	sd	2.5300 %cv	63.95

QCS 2687

	rep	1	Lead	conc	2.17 mg/l
	rep	1	Chromium	conc	1.043 mg/l
	rep	1	Nickel	conc	1.068 mg/l
	rep	1	Zinc	conc	1.016 mg/l
	rep	1	Fe_258	conc	2.00 mg/l
	rep	1	Cobalt	conc	0.995 mg/l
	rep	1	Cr_267	conc	1.017 mg/l
	rep	1	Cd_228	conc	2.054 mg/l
	rep	1	Copper	conc	1.059 mg/l
	rep	1	Co_231	conc	0.909 mg/l
	rep	2	Chromium	conc	1.029 mg/l
	rep	2	Lead	conc	2.15 mg/l
	rep	2	Zinc	conc	1.003 mg/l
	rep	2	Nickel	conc	1.057 mg/l
	rep	2	Cobalt	conc	1.001 mg/l
	rep	2	Fe_258	conc	2.10 mg/l
	rep	2	Cd_228	conc	2.041 mg/l
	rep	2	Cr_267	conc	1.048 mg/l
	rep	2	Co_231	conc	1.022 mg/l
	rep	2	Copper	conc	1.048 mg/l
	rep	3	Lead	conc	2.10 mg/l
	rep	3	Chromium	conc	1.070 mg/l
	rep	3	Nickel	conc	1.020 mg/l
	rep	3	Zinc	conc	1.000 mg/l
	rep	3	Fe_258	conc	2.03 mg/l
	rep	3	Cobalt	conc	1.050 mg/l
	rep	3	Cr_267	conc	1.039 mg/l
	rep	3	Cd_228	conc	2.07. mg/l
	rep	3	Copper	conc	1.046 mg/l
	rep	3	Co_231	conc	0.970 mg/l

QCS 2687

Lead	av	2.14 mg/l	2	sd	0.039 %cv	1.81	107
Chromium	av	1.047 mg/l	1	sd	0.0112 %cv	2.00	105
Nickel	av	1.048 mg/l	1	sd	0.0251 %cv	2.39	105

Zinc	av	1.007 mg/l	1	sd	0.0031 %cv	0.31	101
Fe_258	av	3.07 mg/l	3	sd	0.043 %cv	1.39	104
Cobalt	av	1.016 mg/l	1	sd	0.0010 %cv	0.98	102
Cr_267	av	1.001 mg/l	1	sd	0.0136 %cv	1.36	103
Cd_228	av	2.056 mg/l	2.1	sd	0.0150 %cv	0.73	98
Copper	av	1.001 mg/l	1	sd	0.0073 %cv	0.69	105
Co_231	av	0.994 mg/l	1	sd	0.0251 %cv	2.54	99

QCB	rep	1	Lead	conc	-0.18 mg/l	window edge
	rep	1	Chromium	conc	0.042 mg/l	
	rep	1	Nickel	conc	-0.001 mg/l	
	rep	1	Zinc	conc	0.004 mg/l	
	rep	1	Fe_258	conc	0.09 mg/l	
	rep	1	Cobalt	conc	0.010 mg/l	
	rep	1	Cr_267	conc	-0.004 mg/l	
	rep	1	Cd_228	conc	0.007 mg/l	
	rep	1	Copper	conc	-0.002 mg/l	
	rep	1	Co_231	conc	-0.011 mg/l	
	rep	2	Lead	conc	-0.04 mg/l	
	rep	2	Chromium	conc	0.035 mg/l	
	rep	2	Nickel	conc	0.002 mg/l	
	rep	2	Zinc	conc	0.005 mg/l	
	rep	2	Fe_258	conc	0.11 mg/l	
	rep	2	Cobalt	conc	0.003 mg/l	
	rep	2	Cr_267	conc	-0.008 mg/l	
	rep	2	Cd_228	conc	-0.006 mg/l	window edge
	rep	2	Copper	conc	-0.005 mg/l	
	rep	2	Co_231	conc	-0.029 mg/l	window edge
	rep	3	Lead	conc	-0.06 mg/l	
	rep	3	Chromium	conc	0.014 mg/l	
	rep	3	Nickel	conc	-0.023 mg/l	window edge
	rep	3	Zinc	conc	0.002 mg/l	
	rep	3	Fe_258	conc	0.14 mg/l	
	rep	3	Cobalt	conc	0.007 mg/l	
	rep	3	Cr_267	conc	-0.001 mg/l	
	rep	3	Cd_228	conc	0.005 mg/l	
	rep	3	Copper	conc	-0.001 mg/l	
	rep	3	Co_231	conc	0.005 mg/l	

QCS

Lead	av	-0.08 mg/l	sd	0.060 %cv	75.36
Chromium	av	0.030 mg/l	sd	0.0147 %cv	48.53
Nickel	av	-0.007 mg/l	sd	0.0139 %cv	187.88
Zinc	av	0.004 mg/l	sd	0.0015 %cv	36.73
Fe_258	av	0.11 mg/l	sd	0.028 %cv	24.39
Cobalt	av	0.008 mg/l	sd	0.0013 %cv	15.38
Cr_267	av	-0.004 mg/l	sd	0.0039 %cv	93.10
Cd_228	av	0.002 mg/l	sd	0.0067 %cv	364.46
Copper	av	-0.003 mg/l	sd	0.0024 %cv	84.96
Co_231	av	-0.012 mg/l	sd	0.0167 %cv	141.55

M3639-41	rep	1	Lead	conc	-0.02 mg/l	
	rep	1	Chromium	conc	0.411 mg/l	
	rep	1	Nickel	conc	0.332 mg/l	
	rep	1	Zinc	conc	0.301 mg/l	
	rep	1	Fe_258	conc	265.98 mg/l	
	rep	1	Cobalt	conc	0.303 mg/l	
	rep	1	Cr_267	conc	0.388 mg/l	
	rep	1	Cd_228	conc	0.010 mg/l	
	rep	1	Copper	conc	0.134 mg/l	
	rep	1	Co_231	conc	0.281 mg/l	

	rep	2	Chromium	conc	0.325	mg/l		
	rep	2	Lead	conc	-0.23	mg/l		
	rep	2	Zinc	conc	0.600	mg/l		
	rep	2	Nickel	conc	0.330	mg/l		
	rep	2	Cobalt	conc	0.301	mg/l		
	rep	2	Fe_259	conc	260.85	mg/l		
	rep	2	Cd_228	conc	0.007	mg/l		
	rep	2	Cr_267	conc	0.375	mg/l		
	rep	2	Co_231	conc	0.286	mg/l		
	rep	2	Copper	conc	0.129	mg/l		
	rep	3	Lead	conc	-0.09	mg/l		
	rep	3	Chromium	conc	0.391	mg/l		
	rep	3	Nickel	conc	0.357	mg/l		
	rep	3	Zinc	conc	0.645	mg/l		
	rep	3	Fe_258	conc	272.66	mg/l		
	rep	3	Cobalt	conc	0.303	mg/l		
	rep	3	Cr_267	conc	0.388	mg/l		
	rep	3	Cd_228	conc	0.009	mg/l		
	rep	3	Copper	conc	0.128	mg/l		
	rep	3	Co_231	conc	0.305	mg/l		
M3639-41								
	Lead	av	-0.11	mg/l	sd	0.107	%cv	95.41
	Chromium	av	0.376	mg/l	sd	0.0450	%cv	11.98
	Nickel	av	0.343	mg/l	sd	0.0144	%cv	4.21
	Zinc	av	0.636	mg/l	sd	0.0077	%cv	1.21
	Fe_258	av	266.43	mg/l	sd	6.018	%cv	2.26
	Cobalt	av	0.304	mg/l	sd	0.0037	%cv	1.20
	Cr_267	av	0.382	mg/l	sd	0.0069	%cv	1.80
	Cd_228	av	0.008	mg/l	sd	0.0014	%cv	16.87
	Copper	av	0.129	mg/l	sd	0.0055	%cv	4.29
	Co_231	av	0.291	mg/l	sd	0.0125	%cv	4.29
M3639-42	rep	1	Lead	conc	-0.45	mg/l		window edge
	rep	1	Chromium	conc	0.446	mg/l		
	rep	1	Nickel	conc	0.392	mg/l		
	rep	1	Zinc	conc	0.875	mg/l		
	rep	1	Fe_258	conc	309.99	mg/l		
	rep	1	Cobalt	conc	0.389	mg/l		
	rep	1	Cr_267	conc	0.476	mg/l		
	rep	1	Cd_228	conc	0.007	mg/l		
	rep	1	Copper	conc	0.159	mg/l		
	rep	1	Co_231	conc	0.359	mg/l		
	rep	2	Lead	conc	-0.44	mg/l		window edge
	rep	2	Chromium	conc	0.515	mg/l		
	rep	2	Nickel	conc	0.391	mg/l		
	rep	2	Zinc	conc	0.693	mg/l		
	rep	2	Fe_258	conc	315.01	mg/l		
	rep	2	Cobalt	conc	0.413	mg/l		
	rep	2	Cr_267	conc	0.480	mg/l		
	rep	2	Cd_228	conc	0.010	mg/l		
	rep	2	Copper	conc	0.138	mg/l		
	rep	2	Co_231	conc	0.347	mg/l		
	rep	3	Chromium	conc	0.499	mg/l		
	rep	3	Lead	conc	-0.47	mg/l		window edge
	rep	3	Zinc	conc	0.671	mg/l		
	rep	3	Nickel	conc	0.376	mg/l		
	rep	3	Cobalt	conc	0.385	mg/l		
	rep	3	Fe_259	conc	313.80	mg/l		
	rep	3	Cd_228	conc	0.007	mg/l		
	rep	3	Cr_267	conc	0.480	mg/l		

	rep	3	Co_231	conc	0.340	mg/l		
	rep	3	Copper	conc	0.147	mg/l		
39-42								
Chromium	av	0.486	mg/l	sd	0.0358	%cv	7.36	
Lead	av	-0.45	mg/l	sd	0.016	%cv	3.55	
Zinc	av	0.680	mg/l	sd	0.0115	%cv	1.70	
Nickel	av	0.386	mg/l	sd	0.0092	%cv	2.38	
Cobalt	av	0.389	mg/l	sd	0.0237	%cv	6.10	
Fe_258	av	312.60	mg/l	sd	2.519	%cv	0.81	
Cd_228	av	0.008	mg/l	sd	0.0013	%cv	16.89	
Cr_267	av	0.479	mg/l	sd	0.0023	%cv	0.49	
Co_231	av	0.352	mg/l	sd	0.0059	%cv	1.68	
Copper	av	0.145	mg/l	sd	0.0080	%cv	5.45	
M3639-43	rep	1	Lead	conc	-0.37	mg/l		window edge
	rep	1	Chromium	conc	0.492	mg/l		
	rep	1	Nickel	conc	0.454	mg/l		
	rep	1	Zinc	conc	0.643	mg/l		
	rep	1	Fe_258	conc	328.55	mg/l		
	rep	1	Cobalt	conc	0.710	mg/l		
	rep	1	Cr_267	conc	0.512	mg/l		
	rep	1	Cd_228	conc	0.011	mg/l		
	rep	1	Copper	conc	0.166	mg/l		
	rep	1	Co_231	conc	0.720	mg/l		
	rep	2	Chromium	conc	0.509	mg/l		
	rep	2	Lead	conc	-0.46	mg/l		window edge
	rep	2	Zinc	conc	0.638	mg/l		
	rep	2	Nickel	conc	0.473	mg/l		
	rep	2	Cobalt	conc	0.752	mg/l		
	rep	2	Fe_258	conc	334.86	mg/l		
	rep	2	Cd_228	conc	0.001	mg/l		
	rep	2	Cr_267	conc	0.534	mg/l		
	rep	2	Co_231	conc	0.687	mg/l		
	rep	2	Copper	conc	0.171	mg/l		
	rep	3	Chromium	conc	0.525	mg/l		
	rep	3	Lead	conc	-0.17	mg/l		
	rep	3	Zinc	conc	0.664	mg/l		
	rep	3	Nickel	conc	0.444	mg/l		
	rep	3	Cobalt	conc	0.730	mg/l		
	rep	3	Fe_258	conc	333.01	mg/l		
	rep	3	Cd_228	conc	-0.004	mg/l		window edge
	rep	3	Cr_267	conc	0.506	mg/l		
	rep	3	Co_231	conc	0.688	mg/l		
	rep	3	Copper	conc	0.153	mg/l		
M3639-43								
Chromium	av	0.509	mg/l	sd	0.0165	%cv	3.24	
Lead	av	-0.34	mg/l	sd	0.151	%cv	45.00	
Zinc	av	0.648	mg/l	sd	0.0138	%cv	2.12	
Nickel	av	0.459	mg/l	sd	0.0177	%cv	3.85	
Cobalt	av	0.731	mg/l	sd	0.0212	%cv	2.91	
Fe_258	av	333.81	mg/l	sd	4.813	%cv	1.44	
Cd_228	av	0.003	mg/l	sd	0.0071	%cv	255.47	
Cr_267	av	0.517	mg/l	sd	0.0150	%cv	2.91	
Co_231	av	0.673	mg/l	sd	0.0446	%cv	6.62	
Copper	av	0.163	mg/l	sd	0.0096	%cv	5.90	
M3639-44	rep	1	Lead	conc	-0.32	mg/l		window edge
	rep	1	Chromium	conc	0.480	mg/l		
	rep	1	Nickel	conc	0.449	mg/l		
	rep	1	Zinc	conc	0.606	mg/l		

	rep	1	Fe_258	conc	291.44	mg/l	
	rep	1	Cobalt	conc	0.575	mg/l	
	rep	1	Cr_267	conc	0.469	mg/l	
	rep	1	Cd_228	conc	0.000	mg/l	
	rep	1	Copper	conc	0.131	mg/l	
	rep	1	Co_231	conc	0.518	mg/l	
	rep	2	Chromium	conc	0.450	mg/l	
	rep	2	Lead	conc	-0.27	mg/l	
	rep	2	Zinc	conc	0.604	mg/l	
	rep	2	Nickel	conc	0.400	mg/l	
	rep	2	Cobalt	conc	0.566	mg/l	
	rep	2	Fe_258	conc	297.26	mg/l	
	rep	2	Cd_228	conc	0.007	mg/l	
	rep	2	Cr_267	conc	0.451	mg/l	
	rep	2	Co_231	conc	0.521	mg/l	
	rep	2	Copper	conc	0.135	mg/l	
	rep	3	Lead	conc	-0.18	mg/l	
	rep	3	Chromium	conc	0.530	mg/l	
	rep	3	Nickel	conc	0.405	mg/l	
	rep	3	Zinc	conc	0.612	mg/l	
	rep	3	Fe_258	conc	294.53	mg/l	
	rep	3	Cobalt	conc	0.602	mg/l	
	rep	3	Cr_267	conc	0.455	mg/l	
	rep	3	Cd_228	conc	0.000	mg/l	
	rep	3	Copper	conc	0.135	mg/l	
	rep	3	Co_231	conc	0.530	mg/l	
M3639-44							
Lead	av	-0.26	mg/l	sd	0.072	%cv	27.83
Chromium	av	0.483	mg/l	sd	0.0431	%cv	8.91
Nickel	av	0.418	mg/l	sd	0.0270	%cv	6.47
Zinc	av	0.606	mg/l	sd	0.0064	%cv	1.06
Fe_258	av	294.41	mg/l	sd	2.911	%cv	0.99
Cobalt	av	0.581	mg/l	sd	0.0189	%cv	3.25
Cr_267	av	0.458	mg/l	sd	0.0093	%cv	2.04
Cd_228	av	0.006	mg/l	sd	0.0023	%cv	39.05
Copper	av	0.134	mg/l	sd	0.0024	%cv	1.82
Co_231	av	0.522	mg/l	sd	0.0074	%cv	1.41
M3639-45	rep	1	Lead	conc	-0.13	mg/l	
	rep	1	Chromium	conc	0.710	mg/l	
	rep	1	Nickel	conc	0.354	mg/l	
	rep	1	Zinc	conc	0.917	mg/l	
	rep	1	Fe_258	conc	323.14	mg/l	
	rep	1	Cobalt	conc	0.293	mg/l	
	rep	1	Cr_267	conc	0.621	mg/l	
	rep	1	Cd_228	conc	0.009	mg/l	
	rep	1	Copper	conc	0.184	mg/l	
	rep	1	Co_231	conc	0.262	mg/l	
	rep	2	Lead	conc	-0.50	mg/l	window edge
	rep	2	Chromium	conc	0.625	mg/l	
	rep	2	Nickel	conc	0.360	mg/l	
	rep	2	Zinc	conc	0.833	mg/l	
	rep	2	Fe_258	conc	328.50	mg/l	
	rep	2	Cobalt	conc	0.267	mg/l	
	rep	2	Cr_267	conc	0.528	mg/l	
	rep	2	Cd_228	conc	0.005	mg/l	
	rep	2	Copper	conc	0.170	mg/l	
	rep	2	Co_231	conc	0.256	mg/l	
	rep	3	Lead	conc	-0.07	mg/l	
	rep	3	Chromium	conc	0.651	mg/l	

	rep	3	Nickel	conc	0.358	mg/l	
	rep	3	Zinc	conc	0.865	mg/l	
	rep	3	Fe_258	conc	336.40	mg/l	
	rep	3	Cobalt	conc	0.265	mg/l	
	rep	3	Cr_267	conc	0.628	mg/l	
	rep	3	Cd_228	conc	-0.002	mg/l	window edge
	rep	3	Copper	conc	0.191	mg/l	
	rep	3	Co_231	conc	0.25_	mg/l	
M3639-45							
Lead	av	-0.20	mg/l	sd	0.203	%cv	99.83
Chromium	av	0.672	mg/l	sd	0.0423	%cv	6.30
Nickel	av	0.368	mg/l	sd	0.0047	%cv	1.31
Zinc	av	0.835	mg/l	sd	0.0191	%cv	2.30
Fe_258	av	328.37	mg/l	sd	7.066	%cv	2.15
Cobalt	av	0.275	mg/l	sd	0.0150	%cv	5.44
Cr_267	av	0.626	mg/l	sd	0.0041	%cv	0.66
Cd_228	av	0.004	mg/l	sd	0.0059	%cv	147.04
Copper	av	0.181	mg/l	sd	0.0107	%cv	5.89
Co_231	av	0.256	mg/l	sd	0.0057	%cv	2.24
M3639-46	rep	1	Lead	conc	-0.31	mg/l	window edge
	rep	1	Chromium	conc	0.572	mg/l	
	rep	1	Nickel	conc	0.352	mg/l	
	rep	1	Zinc	conc	0.817	mg/l	
	rep	1	Fe_258	conc	326.10	mg/l	
	rep	1	Cobalt	conc	0.262	mg/l	
	rep	1	Cr_267	conc	0.602	mg/l	
	rep	1	Cd_228	conc	0.003	mg/l	
	rep	1	Copper	conc	0.163	mg/l	
	rep	1	Co_231	conc	0.199	mg/l	
	rep	2	Lead	conc	-0.19	mg/l	
	rep	2	Chromium	conc	0.600	mg/l	
	rep	2	Nickel	conc	0.388	mg/l	
	rep	2	Zinc	conc	0.815	mg/l	
	rep	2	Fe_258	conc	326.89	mg/l	
	rep	2	Cobalt	conc	0.259	mg/l	
	rep	2	Cr_267	conc	0.575	mg/l	
	rep	2	Cd_228	conc	0.007	mg/l	
	rep	2	Copper	conc	0.151	mg/l	
	rep	2	Co_231	conc	0.214	mg/l	
	rep	3	Lead	conc	-0.07	mg/l	
	rep	3	Chromium	conc	0.609	mg/l	
	rep	3	Nickel	conc	0.319	mg/l	
	rep	3	Zinc	conc	0.950	mg/l	
	rep	3	Fe_258	conc	329.93	mg/l	
	rep	3	Cobalt	conc	0.242	mg/l	
	rep	3	Cr_267	conc	0.593	mg/l	
	rep	3	Cd_228	conc	-0.004	mg/l	window edge
	rep	3	Copper	conc	0.140	mg/l	
	rep	3	Co_231	conc	0.197	mg/l	
M3639-46							
Lead	av	-0.19	mg/l	sd	0.120	%cv	64.25
Chromium	av	0.594	mg/l	sd	0.0194	%cv	3.27
Nickel	av	0.353	mg/l	sd	0.0342	%cv	9.69
Zinc	av	0.830	mg/l	sd	0.0244	%cv	2.94
Fe_258	av	327.64	mg/l	sd	2.025	%cv	0.62
Cobalt	av	0.254	mg/l	sd	0.0103	%cv	4.24
Cr_267	av	0.590	mg/l	sd	0.0136	%cv	2.31
Cd_228	av	0.004	mg/l	sd	0.0065	%cv	153.67
Copper	av	0.154	mg/l	sd	0.0082	%cv	5.31

Co_231	av	0.203 mg/l			sd	0.0074 %cv	4.03			
standard	rep	1	Lead	em		52.3 conc	1.00			
	rep	1	Chromium	em		75.8 conc	1.000			
	rep	1	Nickel	em		300.6 conc	1.000			
	rep	1	Zinc	em		280.3 conc	1.000			
	rep	1	Cr_267	em		1333.2 conc	1.000			
	rep	1	Cobalt	em		247.5 conc	1.000			
	rep	1	Copper	em		1772.3 conc	1.000			
	rep	1	Cd_228	em		532.6 conc	1.000			
	rep	1	Co_231	em		148.7 conc	1.000			
	rep	2	Lead	em		53.7 conc	1.00			
	rep	2	Chromium	em		77.3 conc	1.000			
	rep	2	Nickel	em		312.5 conc	1.000			
	rep	2	Zinc	em		276.3 conc	1.000			
	rep	2	Cr_267	em		1314.0 conc	1.000			
	rep	2	Cobalt	em		250.0 conc	1.000			
	rep	2	Copper	em		1722.7 conc	1.000			
	rep	2	Cd_228	em		524.3 conc	1.000			
	rep	2	Co_231	em		148.7 conc	1.000			
	rep	3	Lead	em		54.1 conc	1.00			
	rep	3	Chromium	em		76.9 conc	1.000			
	rep	3	Nickel	em		305.6 conc	1.000			
	rep	3	Zinc	em		275.2 conc	1.000			
	rep	3	Cr_267	em		1314.3 conc	1.000			
	rep	3	Cobalt	em		246.5 conc	1.000			
	rep	3	Copper	em		1748.7 conc	1.000			
	rep	3	Cd_228	em		541.2 conc	1.000			
	rep	3	Co_231	em		149.7 conc	1.000			
standard										
Lead	av	53.06	Previous 51		sd	3.312 %cv	6.02	conc	1.00	
Chromium	av	76.423	70		sd	1.2524 %cv	1.64	conc	1.000	
Nickel	av	308.901	299		sd	3.4704 %cv	1.12	conc	1.000	
Zinc	av	278.612	285		sd	4.0871 %cv	1.47	conc	1.000	
Cr_267	av	1316.829	1307		sd	4.6504 %cv	0.35	conc	1.000	
Cobalt	av	251.337	248		sd	5.9406 %cv	2.36	conc	1.000	
Copper	av	1747.871	1693		sd	24.7238 %cv	1.41	conc	1.000	
Cd_228	av	532.682	529		sd	8.4402 %cv	1.58	conc	1.000	
Co_231	av	148.355	144		sd	1.5492 %cv	1.04	conc	1.000	
#3 standard	rep	1	Fe_258	em		40075.0 conc	100.00			
	rep	2	Fe_258	em		42352.1 conc	100.00			
	rep	3	Fe_258	em		41287.5 conc	100.00			
#3 standard										
Fe_258	av	41231.63	41186		sd	1138.597 %cv	2.74	conc	100.00	
M3309-47	rep	1	Lead	conc		-0.03 mg/l		window edge		
	rep	1	Chromium	conc		0.503 mg/l				
	rep	1	Nickel	conc		0.371 mg/l				
	rep	1	Zinc	conc		0.098 mg/l				
	rep	1	Fe_258	conc		329.20 mg/l				
	rep	1	Cobalt	conc		0.104 mg/l				
	rep	1	Cr_267	conc		0.651 mg/l				
	rep	1	Cd_228	conc		0.005 mg/l				
	rep	1	Copper	conc		0.153 mg/l				
	rep	1	Co_231	conc		0.200 mg/l				
	rep	2	Lead	conc		0.00 mg/l				
	rep	2	Chromium	conc		0.490 mg/l				
	rep	2	Nickel	conc		0.303 mg/l				
	rep	2	Zinc	conc		0.740 mg/l				

	rep	2	Fe_258	conc	327.08 mg/l	
	rep	2	Cobalt	conc	0.206 mg/l	
	rep	2	Cr_267	conc	0.564 mg/l	
	rep	2	Cd_228	conc	0.004 mg/l	
	rep	2	Copper	conc	0.180 mg/l	
	rep	2	Co_231	conc	0.178 mg/l	
	rep	3	Lead	conc	-0.65 mg/l	window edge
	rep	3	Chromium	conc	0.588 mg/l	
	rep	3	Nickel	conc	0.324 mg/l	
	rep	3	Zinc	conc	0.902 mg/l	
	rep	3	Fe_258	conc	327.01 mg/l	
	rep	3	Cobalt	conc	0.209 mg/l	
	rep	3	Cr_267	conc	0.563 mg/l	
	rep	3	Cd_228	conc	0.006 mg/l	
	rep	3	Copper	conc	0.179 mg/l	
	rep	3	Co_231	conc	0.197 mg/l	
M3639-47						
Lead	av	-0.29 mg/l		sd	0.270 %cv	95.07
Chromium	av	0.521 mg/l		sd	0.0201 %cv	3.85
Nickel	av	0.333 mg/l		sd	0.0345 %cv	10.36
Zinc	av	0.916 mg/l		sd	0.0280 %cv	3.05
Fe_258	av	327.76 mg/l		sd	1.254 %cv	0.38
Cobalt	av	0.200 mg/l		sd	0.0138 %cv	6.90
Cr_267	av	0.559 mg/l		sd	0.0074 %cv	1.32
Cd_228	av	0.005 mg/l		sd	0.0008 %cv	16.40
Copper	av	0.176 mg/l		sd	0.0069 %cv	3.93
Co_231	av	0.190 mg/l		sd	0.015. %cv	7.94
39-48	rep	1	Lead	conc	-0.00 mg/l	
	rep	1	Chromium	conc	0.555 mg/l	
	rep	1	Nickel	conc	0.372 mg/l	
	rep	1	Zinc	conc	0.943 mg/l	
	rep	1	Fe_258	conc	395.62 mg/l	
	rep	1	Cobalt	conc	0.318 mg/l	
	rep	1	Cr_267	conc	0.719 mg/l	
	rep	1	Cd_228	conc	0.000 mg/l	window edge
	rep	1	Copper	conc	0.222 mg/l	
	rep	1	Co_231	conc	0.303 mg/l	
	rep	2	Lead	conc	-0.39 mg/l	
	rep	2	Chromium	conc	0.696 mg/l	
	rep	2	Nickel	conc	0.456 mg/l	
	rep	2	Zinc	conc	0.735 mg/l	
	rep	2	Fe_258	conc	388.77 mg/l	
	rep	2	Cobalt	conc	0.305 mg/l	
	rep	2	Cr_267	conc	0.744 mg/l	
	rep	2	Cd_228	conc	0.001 mg/l	window edge
	rep	2	Copper	conc	0.215 mg/l	
	rep	2	Co_231	conc	0.269 mg/l	
	rep	3	Chromium	conc	0.742 mg/l	
	rep	3	Lead	conc	-0.14 mg/l	
	rep	3	Zinc	conc	0.899 mg/l	
	rep	3	Nickel	conc	0.430 mg/l	
	rep	3	Cobalt	conc	0.304 mg/l	
	rep	3	Fe_258	conc	381.55 mg/l	
	rep	3	Cd_228	conc	0.014 mg/l	
	rep	3	Cr_267	conc	0.720 mg/l	
	rep	3	Co_231	conc	0.280 mg/l	
	rep	3	Copper	conc	0.211 mg/l	
M3639-48						
Chromium	av	0.670 mg/l		sd	0.0432 %cv	6.20

Lead	av	-0.10 mg/l	sd	0.134 %cv	110.13	
Zinc	av	0.926 mg/l	sd	0.0233 %cv	2.52	
Nickel	av	0.409 mg/l	sd	0.0427 %cv	10.42	
Cobalt	av	0.309 mg/l	sd	0.0079 %cv	2.56	
Fe_258	av	386.73 mg/l	sd	7.503 %cv	1.94	
Cd_228	av	0.005 mg/l	sd	0.0074 %cv	144.97	
Cr_267	av	0.728 mg/l	sd	0.0142 %cv	1.96	
Co_231	av	0.284 mg/l	sd	0.0170 %cv	6.00	
Copper	av	0.216 mg/l	sd	0.0054 %cv	2.50	

M3639-49	rep	1	Lead	conc	0.03 mg/l	
	rep	1	Chromium	conc	0.571 mg/l	
	rep	1	Nickel	conc	0.396 mg/l	
	rep	1	Zinc	conc	0.822 mg/l	
	rep	1	Fe_258	conc	341.16 mg/l	
	rep	1	Cobalt	conc	0.255 mg/l	
	rep	1	Cr_267	conc	0.627 mg/l	
	rep	1	Cd_228	conc	0.007 mg/l	
	rep	1	Copper	conc	0.213 mg/l	
	rep	1	Co_231	conc	0.200 mg/l	
	rep	2	Lead	conc	-0.41 mg/l	window edge
	rep	2	Chromium	conc	0.803 mg/l	
	rep	2	Nickel	conc	0.354 mg/l	
	rep	2	Zinc	conc	0.826 mg/l	
	rep	2	Fe_258	conc	347.26 mg/l	
	rep	2	Cobalt	conc	0.247 mg/l	
	rep	2	Cr_267	conc	0.632 mg/l	
	rep	2	Cd_228	conc	0.006 mg/l	
	rep	2	Copper	conc	0.212 mg/l	
	rep	2	Co_231	conc	0.244 mg/l	
	rep	3	Lead	conc	-0.23 mg/l	
	rep	3	Chromium	conc	0.585 mg/l	
	rep	3	Nickel	conc	0.368 mg/l	
	rep	3	Zinc	conc	0.834 mg/l	
	rep	3	Fe_258	conc	347.32 mg/l	
	rep	3	Cobalt	conc	0.249 mg/l	
	rep	3	Cr_267	conc	0.641 mg/l	
	rep	3	Cd_228	conc	0.004 mg/l	
	rep	3	Copper	conc	0.202 mg/l	
	rep	3	Co_231	conc	0.267 mg/l	

M3639-49					
Lead	av	-0.20 mg/l	sd	0.232 %cv	116.91
Chromium	av	0.615 mg/l	sd	0.0474 %cv	7.72
Nickel	av	0.371 mg/l	sd	0.0220 %cv	5.93
Zinc	av	0.827 mg/l	sd	0.0063 %cv	0.76
Fe_258	av	345.26 mg/l	sd	3.537 %cv	1.02
Cobalt	av	✓ 0.250 mg/l	sd	0.0042 %cv	1.66
Cr_267	av	0.633 mg/l	sd	0.0076 %cv	1.19
Cd_228	av	0.006 mg/l	sd	0.0012 %cv	20.24
Copper	av	0.209 mg/l	sd	0.0061 %cv	2.91
Co_231	av	0.287 mg/l	sd	0.0041 %cv	14.37

M3639-50	rep	1	Lead	conc	-0.30 mg/l	window edge
	rep	1	Chromium	conc	0.539 mg/l	
	rep	1	Nickel	conc	0.364 mg/l	
	rep	1	Zinc	conc	1.010 mg/l	
	rep	1	Fe_258	conc	331.42 mg/l	
	rep	1	Cobalt	conc	0.271 mg/l	
	rep	1	Cr_267	conc	0.595 mg/l	
	rep	1	Cd_228	conc	0.004 mg/l	

	rep	1	Copper	conc	0.193 mg/l	
	rep	1	Co_231	conc	0.220 mg/l	
	rep	2	Chromium	conc	0.559 mg/l	
	rep	2	Lead	conc	-0.45 mg/l	window edge
	rep	2	Zinc	conc	0.906 mg/l	
	rep	2	Nickel	conc	0.351 mg/l	
	rep	2	Cobalt	conc	0.260 mg/l	
	rep	2	Fe_258	conc	33.79 mg/l	
	rep	2	Cd_228	conc	0.002 mg/l	window edge
	rep	2	Cr_267	conc	0.540 mg/l	
	rep	2	Co_231	conc	0.187 mg/l	
	rep	2	Copper	conc	0.185 mg/l	
	rep	3	Lead	conc	-0.40 mg/l	window edge
	rep	3	Chromium	conc	0.495 mg/l	
	rep	3	Nickel	conc	0.374 mg/l	
	rep	3	Zinc	conc	0.979 mg/l	
	rep	3	Fe_258	conc	324.50 mg/l	
	rep	3	Cobalt	conc	0.224 mg/l	
	rep	3	Cr_267	conc	0.535 mg/l	
	rep	3	Cd_228	conc	0.009 mg/l	
	rep	3	Copper	conc	0.184 mg/l	
	rep	3	Co_231	conc	0.215 mg/l	
M3639-50						
Lead	av	-0.41 mg/l		sd	0.038 %cv	9.10
Chromium	av	0.531 mg/l		sd	0.0331 %cv	6.23
Nickel	av	0.367 mg/l		sd	0.0068 %cv	1.86
Zinc	av	0.993 mg/l		sd	0.0181 %cv	1.83
Fe_258	av	326.00 mg/l		sd	5.424 %cv	1.66
Cobalt	av	0.252 mg/l		sd	0.0244 %cv	9.71
Cr_267	av	0.537 mg/l		sd	0.0026 %cv	0.49
Cd_228	av	0.005 mg/l		sd	0.0035 %cv	71.23
Copper	av	0.187 mg/l		sd	0.0049 %cv	2.61
Co_231	av	0.208 mg/l		sd	0.0184 %cv	8.85
M3639-51	rep	1	Lead	conc	-0.09 mg/l	
	rep	1	Chromium	conc	0.404 mg/l	
	rep	1	Nickel	conc	0.334 mg/l	
	rep	1	Zinc	conc	0.660 mg/l	
	rep	1	Fe_258	conc	267.43 mg/l	
	rep	1	Cobalt	conc	0.194 mg/l	
	rep	1	Cr_267	conc	0.472 mg/l	
	rep	1	Cd_228	conc	0.004 mg/l	window edge
	rep	1	Copper	conc	0.122 mg/l	
	rep	1	Co_231	conc	0.202 mg/l	
	rep	2	Lead	conc	-0.03 mg/l	
	rep	2	Chromium	conc	0.420 mg/l	
	rep	2	Nickel	conc	0.326 mg/l	
	rep	2	Zinc	conc	0.656 mg/l	
	rep	2	Fe_258	conc	265.61 mg/l	
	rep	2	Cobalt	conc	0.195 mg/l	
	rep	2	Cr_267	conc	0.486 mg/l	
	rep	2	Cd_228	conc	-0.002 mg/l	window edge
	rep	2	Copper	conc	0.125 mg/l	
	rep	2	Co_231	conc	0.175 mg/l	
	rep	3	Lead	conc	-0.04 mg/l	
	rep	3	Chromium	conc	0.402 mg/l	
	rep	3	Nickel	conc	0.306 mg/l	
	rep	3	Zinc	conc	0.667 mg/l	
	rep	3	Fe_258	conc	259.79 mg/l	
	rep	3	Cobalt	conc	0.204 mg/l	

	rep	3	Cr_267	conc	0.472	mg/l	
	rep	3	Cd_228	conc	0.014	mg/l	
	rep	3	Copper	conc	0.140	mg/l	
	rep	3	Co_231	conc	0.173	mg/l	
M0639-51							
Lead	av		-0.05 mg/l	sd	0.000	%cv	56.9
Chromium	av		0.435 mg/l	sd	0.0410	%cv	9.41
Nickel	av		0.319 mg/l	sd	0.0113	%cv	3.54
Zinc	av		0.684 mg/l	sd	0.0038	%cv	0.55
Fe_258	av		264.28 mg/l	sd	3.990	%cv	1.51
Cobalt	av		0.197 mg/l	sd	0.0056	%cv	2.82
Cr_267	av		0.467 mg/l	sd	0.0094	%cv	2.00
Cd_228	av		0.005 mg/l	sd	0.0080	%cv	154.11
Copper	av		0.129 mg/l	sd	0.0092	%cv	7.14
Co_231	av		0.184 mg/l	sd	0.0163	%cv	8.86
M0639-52	rep	1	Lead	conc	-0.33	mg/l	window edge
	rep	1	Chromium	conc	0.296	mg/l	
	rep	1	Nickel	conc	0.262	mg/l	
	rep	1	Zinc	conc	0.813	mg/l	
	rep	1	Fe_258	conc	253.24	mg/l	
	rep	1	Cobalt	conc	0.190	mg/l	
	rep	1	Cr_267	conc	0.380	mg/l	
	rep	1	Cd_228	conc	0.000	mg/l	window edge
	rep	1	Copper	conc	0.118	mg/l	
	rep	1	Co_231	conc	0.181	mg/l	
	rep	2	Chromium	conc	0.373	mg/l	
	rep	2	Lead	conc	-0.27	mg/l	window edge
	rep	2	Zinc	conc	0.634	mg/l	
	rep	2	Nickel	conc	0.295	mg/l	
	rep	2	Cobalt	conc	0.174	mg/l	
	rep	2	Fe_258	conc	253.59	mg/l	
	rep	2	Cd_228	conc	-0.001	mg/l	
	rep	2	Cr_267	conc	0.376	mg/l	
	rep	2	Co_231	conc	0.194	mg/l	
	rep	2	Copper	conc	0.125	mg/l	
	rep	3	Lead	conc	-0.16	mg/l	
	rep	3	Chromium	conc	0.334	mg/l	
	rep	3	Nickel	conc	0.247	mg/l	
	rep	3	Zinc	conc	0.640	mg/l	
	rep	3	Fe_258	conc	249.81	mg/l	
	rep	3	Cobalt	conc	0.170	mg/l	
	rep	3	Cr_267	conc	0.367	mg/l	
	rep	3	Cd_228	conc	0.006	mg/l	
	rep	3	Copper	conc	0.133	mg/l	
	rep	3	Co_231	conc	0.173	mg/l	
M0639-52							
Lead	av		-0.25 mg/l	sd	0.091	%cv	35.79
Chromium	av		0.351 mg/l	sd	0.0432	%cv	12.74
Nickel	av		0.268 mg/l	sd	0.0241	%cv	9.00
Zinc	av		0.632 mg/l	sd	0.079	%cv	2.83
Fe_258	av		252.21 mg/l	sd	2.088	%cv	0.83
Cobalt	av		0.181 mg/l	sd	0.0083	%cv	4.58
Cr_267	av		< 0.374 mg/l	sd	0.0068	%cv	1.82
Cd_228	av		0.002 mg/l	sd	0.0036	%cv	212.14
Copper	av		0.123 mg/l	sd	0.0035	%cv	2.90
Co_231	av		0.182 mg/l	sd	0.0106	%cv	5.80
#. standard	rep	1	Lead	em	53.5	conc	1.00
	rep	1	Chromium	em	78.2	conc	1.000

	rep	1	Nickel	em	316.2	conc	1.000			
	rep	1	Zinc	em	285.3	conc	1.000			
	rep	1	Cr_267	em	1340.1	conc	1.000			
	rep	1	Cobalt	em	246.6	conc	1.000			
	rep	1	Copper	em	1706.4	conc	1.000			
	rep	1	Cd_228	em	512.5	conc	1.000			
	rep	1	Co_231	em	148.7	conc	1.000			
	rep	2	Lead	em	53.0	conc	1.00			
	rep	2	Chromium	em	75.6	conc	1.000			
	rep	2	Nickel	em	326.7	conc	1.000			
	rep	2	Zinc	em	281.8	conc	1.000			
	rep	2	Cr_267	em	1309.1	conc	1.000			
	rep	2	Cobalt	em	251.6	conc	1.000			
	rep	2	Copper	em	1800.3	conc	1.000			
	rep	2	Cd_228	em	532.9	conc	1.000			
	rep	2	Co_231	em	152.8	conc	1.000			
	rep	3	Lead	em	52.4	conc	1.00			
	rep	3	Chromium	em	74.6	conc	1.000			
	rep	3	Nickel	em	307.7	conc	1.000			
	rep	3	Zinc	em	280.7	conc	1.000			
	rep	3	Cr_267	em	1335.5	conc	1.000			
	rep	3	Cobalt	em	238.5	conc	1.000			
	rep	3	Copper	em	1781.9	conc	1.000			
	rep	3	Cd_228	em	504.5	conc	1.000			
	rep	3	Co_231	em	149.7	conc	1.000			
#1 standard										
Lead	av	50.01	55	sd	6.056	%cv	10.81	conc	1.00	
Chromium	av	76.152	76	sd	1.8425	%cv	2.42	conc	1.000	
Nickel	av	316.849	308	sd	9.5040	%cv	3.00	conc	1.000	
Zinc	av	283.589	278	sd	1.7379	%cv	0.61	conc	1.000	
Cr_267	av	1330.254	1316	sd	19.0921	%cv	1.44	conc	1.000	
Cobalt	av	245.505	251	sd	6.6010	%cv	2.69	conc	1.000	
Copper	av	1789.537	1747	sd	9.5703	%cv	0.53	conc	1.000	
Cd_228	av	516.621	532	sd	14.6641	%cv	2.84	conc	1.000	
Co_231	av	150.397	148	sd	2.1266	%cv	1.41	conc	1.000	
#3 standard	rep	1	Fe_258	em	42903.3	conc	100.00			
	rep	2	Fe_258	em	42435.0	conc	100.00			
	rep	3	Fe_258	em	43172.1	conc	100.00			
#3 standard										
Fe_258	av	42847.07	41221	sd	375.623	%cv	0.88	conc	100.00	
DI	rep	1	Lead	conc	-0.06	mg/l				
	rep	1	Chromium	conc	0.021	mg/l				
	rep	1	Nickel	conc	-0.005	mg/l				
	rep	1	Zinc	conc	0.004	mg/l				
	rep	1	Fe_258	conc	0.13	mg/l				
	rep	1	Cobalt	conc	-0.005	mg/l			window edge	
	rep	1	Cr_267	conc	-0.006	mg/l				
	rep	1	Cd_228	conc	0.000	mg/l				
	rep	1	Copper	conc	0.006	mg/l				
	rep	1	Co_231	conc	-0.011	mg/l				
	rep	2	Chromium	conc	-0.001	mg/l			window edge	
	rep	2	Lead	conc	-0.02	mg/l				
	rep	2	Zinc	conc	0.003	mg/l				
	rep	2	Nickel	conc	0.006	mg/l				
	rep	2	Cobalt	conc	-0.000	mg/l				
	rep	2	Fe_258	conc	0.05	mg/l				
	rep	2	Cd_228	conc	0.007	mg/l				
	rep	2	Cr_267	conc	-0.010	mg/l			window edge	

	rep	2	Co_231	conc	-0.023 mg/l		
	rep	2	Copper	conc	-0.002 mg/l		
	rep	3	Chromium	conc	0.018 mg/l		
	rep	3	Lead	conc	-0.09 mg/l		window edge
	rep	3	Zinc	conc	0.004 mg/l		
	rep	3	Nickel	conc	0.019 mg/l		
	rep	3	Cobalt	conc	0.005 mg/l		
	rep	3	Fe_258	conc	0.04 mg/l		
	rep	3	Cd_228	conc	-0.001 mg/l		
	rep	3	Cr_267	conc	-0.007 mg/l		
	rep	3	Co_231	conc	-0.027 mg/l		window edge
	rep	3	Copper	conc	0.004 mg/l		

DI

Chromium	av	0.013 mg/l	sd	0.0118	%cv	91.53
Lead	av	-0.06 mg/l	sd	0.036	%cv	60.52
Zinc	av	0.004 mg/l	sd	0.0002	%cv	4.77
Nickel	av	0.007 mg/l	sd	0.0121	%cv	172.76
Cobalt	av	-0.001 mg/l	sd	0.0053	%cv	516.47
Fe_258	av	0.07 mg/l	sd	0.052	%cv	72.36
Cd_228	av	0.004 mg/l	sd	0.0050	%cv	114.95
Cr_267	av	-0.008 mg/l	sd	0.0018	%cv	24.30
Co_231	av	-0.020 mg/l	sd	0.0082	%cv	40.07
Copper	av	0.003 mg/l	sd	0.0040	%cv	144.46

ICPS/500Fe	rep	1	Lead	conc	0.40 mg/l	
	rep	1	Chromium	conc	0.481 mg/l	
	rep	1	Nickel	conc	0.512 mg/l	
	rep	1	Zinc	conc	0.523 mg/l	
	rep	1	Fe_258	conc	490.83 mg/l	
	rep	1	Cobalt	conc	0.475 mg/l	
	rep	1	Cr_267	conc	0.480 mg/l	
	rep	1	Cd_228	conc	0.504 mg/l	
	rep	1	Copper	conc	0.482 mg/l	
	rep	1	Co_231	conc	0.392 mg/l	
	rep	2	Chromium	conc	0.533 mg/l	
	rep	2	Lead	conc	0.53 mg/l	
	rep	2	Zinc	conc	0.566 mg/l	
	rep	2	Nickel	conc	0.471 mg/l	
	rep	2	Cobalt	conc	0.496 mg/l	
	rep	2	Fe_258	conc	489.37 mg/l	
	rep	2	Cd_228	conc	0.503 mg/l	
	rep	2	Cr_267	conc	0.486 mg/l	
	rep	2	Co_231	conc	0.446 mg/l	
	rep	2	Copper	conc	0.474 mg/l	
	rep	3	Lead	conc	0.53 mg/l	
	rep	3	Chromium	conc	0.533 mg/l	
	rep	3	Nickel	conc	0.515 mg/l	
	rep	3	Zinc	conc	0.531 mg/l	
	rep	3	Fe_258	conc	501.26 mg/l	
	rep	3	Cobalt	conc	0.492 mg/l	
	rep	3	Cr_267	conc	0.489 mg/l	
	rep	3	Cd_228	conc	0.499 mg/l	
	rep	3	Copper	conc	0.486 mg/l	
	rep	3	Co_231	conc	0.410 mg/l	

+0.05ml DCS3019
1ml DCS2838
to 10ml w/acid blank

G/500Fe			DV					% recovery
Lead	av	0.48 mg/l	0.5	sd	0.074	%cv	15.25	96
Chromium	av	0.515 mg/l		sd	0.0277	%cv	5.30	103
Nickel	av	0.499 mg/l		sd	0.0242	%cv	4.84	100
Zinc	av	0.542 mg/l		sd	0.0207	%cv	3.85	108
Fe_258	av	493.99 mg/l	500	sd	6.319	%cv	1.28	99

Cobalt	av	0.438 mg/l	sd	0.0110 %cv	2.26	98
Cr_267	av	0.485 mg/l	sd	0.0049 %cv	1.01	97
Cd_228	av	0.502 mg/l	sd	0.0027 %cv	0.54	100
Copper	av	0.481 mg/l	sd	0.0060 %cv	1.21	96
Co_231	av	0.415 mg/l	sd	0.0275 %cv	6.61	83

M3839-52

rep	1	Lead	conc	-0.10 mg/l
rep	1	Chromium	conc	0.306 mg/l
rep	1	Nickel	conc	0.305 mg/l
rep	1	Zinc	conc	0.411 mg/l
rep	1	Fe_258	conc	227.70 mg/l
rep	1	Cobalt	conc	0.132 mg/l
rep	1	Cr_267	conc	0.278 mg/l
rep	1	Cd_228	conc	0.008 mg/l
rep	1	Copper	conc	0.176 mg/l
rep	1	Co_231	conc	0.105 mg/l
rep	2	Lead	conc	-0.10 mg/l
rep	2	Chromium	conc	0.282 mg/l
rep	2	Nickel	conc	0.300 mg/l
rep	2	Zinc	conc	0.390 mg/l
rep	2	Fe_258	conc	230.33 mg/l
rep	2	Cobalt	conc	0.147 mg/l
rep	2	Cr_267	conc	0.274 mg/l
rep	2	Cd_228	conc	0.011 mg/l
rep	2	Copper	conc	0.166 mg/l
rep	2	Co_231	conc	0.103 mg/l
rep	3	Chromium	conc	0.307 mg/l
rep	3	Lead	conc	-0.06 mg/l
rep	3	Zinc	conc	0.409 mg/l
rep	3	Nickel	conc	0.299 mg/l
rep	3	Cobalt	conc	0.123 mg/l
rep	3	Fe_258	conc	230.35 mg/l
rep	3	Cd_228	conc	0.008 mg/l
rep	3	Cr_267	conc	0.298 mg/l
rep	3	Co_231	conc	0.099 mg/l
rep	3	Copper	conc	0.175 mg/l

M3839-53

Chromium	av	0.298 mg/l	sd	0.0140 %cv	4.81
Lead	av	-0.10 mg/l	sd	0.034 %cv	34.79
Zinc	av	0.403 mg/l	sd	0.0119 %cv	2.95
Nickel	av	0.304 mg/l	sd	0.0043 %cv	1.41
Cobalt	av	0.134 mg/l	sd	0.0118 %cv	8.78
Fe_258	av	229.46 mg/l	sd	1.524 %cv	0.66
Cd_228	av	0.007 mg/l	sd	0.0040 %cv	54.89
Cr_267	av	0.291 mg/l	sd	0.0129 %cv	4.53
Co_231	av	0.102 mg/l	sd	0.0030 %cv	2.97
Copper	av	0.172 mg/l	sd	0.0052 %cv	3.04

M3839-54

rep	1	Lead	conc	-0.10 mg/l	
rep	1	Chromium	conc	0.344 mg/l	
rep	1	Nickel	conc	0.273 mg/l	
rep	1	Zinc	conc	0.419 mg/l	
rep	1	Fe_258	conc	260.35 mg/l	
rep	1	Cobalt	conc	0.136 mg/l	
rep	1	Cr_267	conc	0.348 mg/l	
rep	1	Cd_228	conc	0.011 mg/l	
rep	1	Copper	conc	0.225 mg/l	
rep	1	Co_231	conc	0.114 mg/l	
rep	2	Lead	conc	-0.27 mg/l	window edge
rep	3	Chromium	conc	0.379 mg/l	

	rep	2	Nickel	conc	0.291	mg/l		
	rep	2	Zinc	conc	0.422	mg/l		
	rep	2	Fe_258	conc	256.90	mg/l		
	rep	2	Cobalt	conc	0.113	mg/l		
	rep	2	Cr_267	conc	0.368	mg/l		
	rep	2	Cd_228	conc	0.003	mg/l		
	rep	2	Copper	conc	0.219	mg/l		
	rep	2	Co_231	conc	0.103	mg/l		
	rep	3	Lead	conc	-0.06	mg/l		
	rep	3	Chromium	conc	0.317	mg/l		
	rep	3	Nickel	conc	0.298	mg/l		
	rep	3	Zinc	conc	0.420	mg/l		
	rep	3	Fe_258	conc	258.38	mg/l		
	rep	3	Cobalt	conc	0.104	mg/l		
	rep	3	Cr_267	conc	0.352	mg/l		
	rep	3	Cd_228	conc	-0.002	mg/l		window edge
	rep	3	Copper	conc	0.211	mg/l		
	rep	3	Co_231	conc	0.114	mg/l		
M3639-54								
Lead	av		-0.15	mg/l	sd	0.107	%cv	69.76
Chromium	av		0.347	mg/l	sd	0.0315	%cv	9.09
Nickel	av		0.287	mg/l	sd	0.0126	%cv	4.40
Zinc	av		0.420	mg/l	sd	0.0016	%cv	0.39
Fe_258	av		258.57	mg/l	sd	1.698	%cv	0.66
Cobalt	av		0.118	mg/l	sd	0.0162	%cv	13.81
Cr_267	av		0.355	mg/l	sd	0.0088	%cv	2.47
Cd_228	av		0.006	mg/l	sd	0.0071	%cv	124.05
Copper	av		0.218	mg/l	sd	0.0068	%cv	3.11
Co_231	av		0.110	mg/l	sd	0.0063	%cv	5.71
M3639-55	rep	1	Lead	conc	-0.17	mg/l		window edge
	rep	1	Chromium	conc	0.435	mg/l		
	rep	1	Nickel	conc	0.299	mg/l		
	rep	1	Zinc	conc	0.492	mg/l		
	rep	1	Fe_258	conc	270.73	mg/l		
	rep	1	Cobalt	conc	0.157	mg/l		
	rep	1	Cr_267	conc	0.470	mg/l		
	rep	1	Cd_228	conc	-0.004	mg/l		window edge
	rep	1	Copper	conc	0.148	mg/l		
	rep	1	Co_231	conc	0.143	mg/l		
	rep	2	Lead	conc	-0.30	mg/l		window edge
	rep	2	Chromium	conc	0.403	mg/l		
	rep	2	Nickel	conc	0.296	mg/l		
	rep	2	Zinc	conc	0.515	mg/l		
	rep	2	Fe_258	conc	300.29	mg/l		
	rep	2	Cobalt	conc	0.151	mg/l		
	rep	2	Cr_267	conc	0.471	mg/l		
	rep	2	Cd_228	conc	-0.010	mg/l		window edge
	rep	2	Copper	conc	0.148	mg/l		
	rep	2	Co_231	conc	0.148	mg/l		
	rep	3	Lead	conc	-0.02	mg/l		
	rep	3	Chromium	conc	0.540	mg/l		
	rep	3	Nickel	conc	0.324	mg/l		
	rep	3	Zinc	conc	0.519	mg/l		
	rep	3	Fe_258	conc	304.27	mg/l		
	rep	3	Cobalt	conc	0.166	mg/l		
	rep	3	Cr_267	conc	0.471	mg/l		
	rep	3	Cd_228	conc	0.004	mg/l		
	rep	3	Copper	conc	0.155	mg/l		
	rep	3	Co_231	conc	0.154	mg/l		

M0339-55

Lead	av	-0.16 mg/l	sd	0.141	%cv	86.79
Chromium	av	0.459 mg/l	sd	0.0716	%cv	15.59
Nickel	av	0.206 mg/l	sd	0.0149	%cv	4.88
Zinc	av	0.508 mg/l	sd	0.0141	%cv	2.77
Fe_258	av	273.40 mg/l	sd	8.960	%cv	3.50
Cobalt	av	0.150 mg/l	sd	0.0070	%cv	4.61
Cr_267	av	< 0.473 mg/l	sd	0.0037	%cv	0.70
Cd_228	av	-0.003 mg/l	sd	0.0056	%cv	194.88
Copper	av	0.150 mg/l	sd	0.0046	%cv	3.09
Co_231	av	0.142 mg/l	sd	0.0074	%cv	5.25

M0339-56	rep	1	Lead	conc	-0.21	mg/l
	rep	1	Chromium	conc	0.435	mg/l
	rep	1	Nickel	conc	0.206	mg/l
	rep	1	Zinc	conc	0.379	mg/l
	rep	1	Fe_258	conc	240.34	mg/l
	rep	1	Cobalt	conc	0.139	mg/l
	rep	1	Cr_267	conc	0.378	mg/l
	rep	1	Cd_228	conc	0.009	mg/l
	rep	1	Copper	conc	0.120	mg/l
	rep	1	Co_231	conc	0.126	mg/l
	rep	2	Lead	conc	-0.07	mg/l
	rep	2	Chromium	conc	0.370	mg/l
	rep	2	Nickel	conc	0.237	mg/l
	rep	2	Zinc	conc	0.412	mg/l
	rep	2	Fe_258	conc	243.92	mg/l
	rep	2	Cobalt	conc	0.130	mg/l
	rep	2	Cr_267	conc	0.384	mg/l
	rep	2	Cd_228	conc	0.003	mg/l
	rep	3	Copper	conc	0.137	mg/l
	rep	3	Co_231	conc	0.129	mg/l
	rep	3	Lead	conc	-0.02	mg/l
	rep	3	Chromium	conc	0.373	mg/l
	rep	3	Nickel	conc	0.260	mg/l
	rep	3	Zinc	conc	0.410	mg/l
	rep	3	Fe_258	conc	234.57	mg/l
	rep	3	Cobalt	conc	0.133	mg/l
	rep	3	Cr_267	conc	0.377	mg/l
	rep	3	Cd_228	conc	0.004	mg/l
	rep	3	Copper	conc	0.131	mg/l
	rep	3	Co_231	conc	0.123	mg/l

M0339-58

Lead	av	-0.10 mg/l	sd	0.097	%cv	98.70
Chromium	av	0.395 mg/l	sd	0.0344	%cv	8.69
Nickel	av	0.261 mg/l	sd	0.0245	%cv	9.40
Zinc	av	0.400 mg/l	sd	0.0183	%cv	4.57
Fe_258	av	209.58 mg/l	sd	4.709	%cv	1.97
Cobalt	av	0.144 mg/l	sd	0.0217	%cv	15.06
Cr_267	av	0.380 mg/l	sd	0.0039	%cv	1.03
Cd_228	av	0.005 mg/l	sd	0.0031	%cv	59.52
Copper	av	0.129 mg/l	sd	0.0004	%cv	0.30
Co_231	av	0.126 mg/l	sd	0.0031	%cv	2.48

39-57	rep	1	Lead	conc	-0.05	mg/l
	rep	1	Chromium	conc	0.344	mg/l
	rep	1	Nickel	conc	0.247	mg/l
	rep	1	Zinc	conc	0.400	mg/l
	rep	1	Fe_258	conc	232.25	mg/l
	rep	1	Cobalt	conc	0.131	mg/l

	rep	1	Cr_267	conc	0.388	mg/l		
	rep	1	Cd_228	conc	0.006	mg/l		
	rep	1	Copper	conc	0.134	mg/l		
	rep	1	Co_231	conc	0.086	mg/l		
	rep	2	Lead	conc	-0.15	mg/l		
	rep	2	Chromium	conc	0.306	mg/l		
	rep	2	Nickel	conc	0.291	mg/l		
	rep	2	Zinc	conc	0.404	mg/l		
	rep	2	Fe_258	conc	224.25	mg/l		
	rep	2	Cobalt	conc	0.105	mg/l		
	rep	2	Cr_267	conc	0.323	mg/l		
	rep	2	Cd_228	conc	0.001	mg/l		
	rep	2	Copper	conc	0.143	mg/l		
	rep	2	Co_231	conc	0.070	mg/l		
	rep	3	Chromium	conc	0.300	mg/l		
	rep	3	Lead	conc	-0.24	mg/l		window edge
	rep	3	Zinc	conc	0.388	mg/l		
	rep	3	Nickel	conc	0.302	mg/l		
	rep	3	Cobalt	conc	0.133	mg/l		
	rep	3	Fe_258	conc	225.73	mg/l		
	rep	3	Cd_228	conc	-0.009	mg/l		window edge
	rep	3	Cr_267	conc	0.331	mg/l		
	rep	3	Co_231	conc	0.096	mg/l		
	rep	3	Copper	conc	0.136	mg/l		
M3639-57								
Chromium	av		0.343	mg/l	sd	0.0369	%cv	10.75
Lead	av		-0.15	mg/l	sd	0.096	%cv	64.59
Zinc	av		0.397	mg/l	sd	0.0085	%cv	2.13
Nickel	av		0.280	mg/l	sd	0.0295	%cv	10.52
Cobalt	av		0.123	mg/l	sd	0.0157	%cv	12.74
Fe_258	av		224.08	mg/l	sd	1.746	%cv	0.78
Cd_228	av		-0.000	mg/l	sd	0.0076	%cv	1772.7
Cr_267	av		0.330	mg/l	sd	0.0062	%cv	1.88
Co_231	av		0.084	mg/l	sd	0.0120	%cv	15.26
Copper	av		0.138	mg/l	sd	0.0051	%cv	3.68
M3639-58	rep	1	Lead	conc	-0.24	mg/l		window edge
	rep	1	Chromium	conc	0.332	mg/l		
	rep	1	Nickel	conc	0.313	mg/l		
	rep	1	Zinc	conc	0.406	mg/l		
	rep	1	Fe_258	conc	237.00	mg/l		
	rep	1	Cobalt	conc	0.117	mg/l		
	rep	1	Cr_267	conc	0.327	mg/l		
	rep	1	Cd_228	conc	-0.001	mg/l		window edge
	rep	1	Copper	conc	0.159	mg/l		
	rep	1	Co_231	conc	0.122	mg/l		
	rep	2	Chromium	conc	0.307	mg/l		
	rep	2	Lead	conc	-0.13	mg/l		
	rep	2	Zinc	conc	0.381	mg/l		
	rep	2	Nickel	conc	0.320	mg/l		
	rep	2	Cobalt	conc	0.130	mg/l		
	rep	2	Fe_258	conc	240.80	mg/l		
	rep	2	Cd_228	conc	-0.009	mg/l		window edge
	rep	2	Cr_267	conc	0.327	mg/l		
	rep	2	Co_231	conc	0.108	mg/l		
	rep	3	Copper	conc	0.151	mg/l		
	rep	3	Lead	conc	-0.08	mg/l		
	rep	3	Chromium	conc	0.320	mg/l		
	rep	3	Nickel	conc	0.351	mg/l		
	rep	3	Zinc	conc	0.400	mg/l		

Fe_258	av	44134.60	42847	sd	231.203	%cv	0.51	conc	100.00	

39-59	rep	1	Lead	conc	-0.15	mg/l
	rep	1	Chromium	conc	0.353	mg/l
	rep	1	Nickel	conc	0.410	mg/l
	rep	1	Zinc	conc	0.480	mg/l
	rep	1	Fe_258	conc	255.13	mg/l
	rep	1	Cobalt	conc	0.204	mg/l
	rep	1	Cr_267	conc	0.342	mg/l
	rep	1	Cd_228	conc	0.011	mg/l
	rep	1	Copper	conc	0.203	mg/l
	rep	1	Co_231	conc	0.190	mg/l
	rep	2	Lead	conc	-0.01	mg/l
	rep	2	Chromium	conc	0.341	mg/l
	rep	2	Nickel	conc	0.412	mg/l
	rep	2	Zinc	conc	0.460	mg/l
	rep	2	Fe_258	conc	257.54	mg/l
	rep	2	Cobalt	conc	0.214	mg/l
	rep	2	Cr_267	conc	0.343	mg/l
	rep	2	Cd_228	conc	0.008	mg/l
	rep	2	Copper	conc	0.207	mg/l
	rep	2	Co_231	conc	0.184	mg/l
	rep	3	Chromium	conc	0.340	mg/l
	rep	3	Lead	conc	-0.17	mg/l
	rep	3	Zinc	conc	0.470	mg/l
	rep	3	Nickel	conc	0.384	mg/l
	rep	3	Cobalt	conc	0.226	mg/l
	rep	3	Fe_258	conc	258.82	mg/l
	rep	3	Cd_228	conc	-0.000	mg/l
	rep	3	Cr_267	conc	0.342	mg/l
	rep	3	Co_231	conc	0.215	mg/l
	rep	3	Copper	conc	0.205	mg/l

M3639-59

Chromium	av	0.345 mg/l	sd	0.0074 %cv	2.16
Lead	av	-0.11 mg/l	sd	0.094 %cv	82.75
Zinc	av	0.463 mg/l	sd	0.0140 %cv	3.02
Nickel	av	0.403 mg/l	sd	0.0163 %cv	4.04
Cobalt	av	0.225 mg/l	sd	0.0099 %cv	4.43
Fe_258	av	257.16 mg/l	sd	1.875 %cv	0.73
Cd_228	av	0.006 mg/l	sd	0.0060 %cv	94.04
Cr_267	av	0.344 mg/l	sd	0.0033 %cv	0.95
Co_231	av	0.197 mg/l	sd	0.0163 %cv	8.28
Copper	av	0.205 mg/l	sd	0.0016 %cv	0.79

M3639-60	rep	1	Lead	conc	-0.09	mg/l
	rep	1	Chromium	conc	0.306	mg/l
	rep	1	Nickel	conc	0.357	mg/l
	rep	1	Zinc	conc	0.362	mg/l
	rep	1	Fe_258	conc	221.06	mg/l
	rep	1	Cobalt	conc	0.215	mg/l
	rep	1	Cr_267	conc	0.290	mg/l
	rep	1	Cd_228	conc	0.006	mg/l
	rep	1	Copper	conc	0.176	mg/l
	rep	1	Co_231	conc	0.304	mg/l
	rep	2	Lead	conc	-0.01	mg/l
	rep	2	Chromium	conc	0.292	mg/l
	rep	2	Nickel	conc	0.375	mg/l
	rep	2	Zinc	conc	0.351	mg/l
	rep	2	Fe_258	conc	219.14	mg/l
	rep	2	Cobalt	conc	0.205	mg/l

	rep	3	Cr_267	conc	0.303	mg/l
	rep	3	Cd_228	conc	0.005	mg/l
	rep	3	Copper	conc	0.168	mg/l
	rep	3	Co_231	conc	0.284	mg/l
	rep	3	Lead	conc	-0.10	mg/l
	rep	3	Chromium	conc	0.311	mg/l
	rep	3	Nickel	conc	0.387	mg/l
	rep	3	Zinc	conc	0.371	mg/l
	rep	3	Fe_258	conc	220.05	mg/l
	rep	3	Cobalt	conc	0.332	mg/l
	rep	3	Cr_267	conc	0.284	mg/l
	rep	3	Cd_228	conc	0.009	mg/l
	rep	3	Copper	conc	0.165	mg/l
	rep	3	Co_231	conc	0.274	mg/l

M3639-60

Lead	av	-0.08 mg/l	sd	0.062	%cv 80.22
Chromium	av	0.300 mg/l	sd	0.0157	%cv 5.24
Nickel	av	0.373 mg/l	sd	0.0148	%cv 3.97
Zinc	av	0.361 mg/l	sd	0.0104	%cv 2.88
Fe_258	av	220.08 mg/l	sd	0.963	%cv 0.44
Cobalt	av	0.327 mg/l	sd	0.0107	%cv 3.26
Cr_267	av	0.288 mg/l	sd	0.0086	%cv 2.99
Cd_228	av	0.006 mg/l	sd	0.0032	%cv 52.12
Copper	av	0.170 mg/l	sd	0.0051	%cv 2.98
Co_231	av	0.287 mg/l	sd	0.0152	%cv 5.28

QCD M3639-42	rep	1	Lead	conc	-0.10	mg/l
	rep	1	Chromium	conc	0.251	mg/l
	rep	1	Nickel	conc	0.201	mg/l
	rep	1	Zinc	conc	0.333	mg/l
	rep	1	Fe_258	conc	172.94	mg/l
	rep	1	Cobalt	conc	0.203	mg/l
	rep	1	Cr_267	conc	0.270	mg/l
	rep	1	Cd_228	conc	0.002	mg/l
	rep	1	Copper	conc	0.079	mg/l
	rep	1	Co_231	conc	0.203	mg/l
	rep	2	Lead	conc	-0.10	mg/l
	rep	2	Chromium	conc	0.226	mg/l
	rep	2	Nickel	conc	0.223	mg/l
	rep	2	Zinc	conc	0.308	mg/l
	rep	2	Fe_258	conc	160.11	mg/l
	rep	2	Cobalt	conc	0.230	mg/l
	rep	2	Cr_267	conc	0.240	mg/l
	rep	2	Cd_228	conc	-0.001	mg/l window edge
	rep	2	Copper	conc	0.071	mg/l
	rep	2	Co_231	conc	0.227	mg/l
	rep	3	Lead	conc	-0.15	mg/l
	rep	3	Chromium	conc	0.295	mg/l
	rep	3	Nickel	conc	0.243	mg/l
	rep	3	Zinc	conc	0.386	mg/l
	rep	3	Fe_258	conc	174.51	mg/l
	rep	3	Cobalt	conc	0.218	mg/l
	rep	3	Cr_267	conc	0.265	mg/l
	rep	3	Cd_228	conc	0.005	mg/l
	rep	3	Copper	conc	0.089	mg/l
	rep	3	Co_231	conc	0.189	mg/l

QCD M3639-42

Lead	av	-0.12 mg/l	sd	0.020	%cv 24.49
Chromium	av	0.254 mg/l	sd	0.0272	%cv 11.43
Nickel	av	0.222 mg/l	sd	0.0211	%cv 9.52

Zinc	av	0.385	mg/l	sd	0.0026	%cv	0.66
Fe_258	av	171.85	mg/l	sd	3.336	%cv	1.94
Cobalt	av	0.218	mg/l	sd	0.0110	%cv	5.02
Cr_267	av	0.261	mg/l	sd	0.0114	%cv	4.39
Cd_228	av	0.003	mg/l	sd	0.0033	%cv	107.75
Copper	av	0.080	mg/l	sd	0.0008	%cv	11.07
Co_231	av	0.207	mg/l	sd	0.0193	%cv	9.35

QCD M3639-52	rep	1	Lead	conc	-0.19	mg/l	window edge
	rep	1	Chromium	conc	0.209	mg/l	
	rep	1	Nickel	conc	0.141	mg/l	
	rep	1	Zinc	conc	0.320	mg/l	
	rep	1	Fe_258	conc	128.85	mg/l	
	rep	1	Cobalt	conc	0.107	mg/l	
	rep	1	Cr_267	conc	0.181	mg/l	
	rep	1	Cd_228	conc	0.009	mg/l	
	rep	1	Copper	conc	0.056	mg/l	
	rep	1	Co_231	conc	0.048	mg/l	
	rep	2	Lead	conc	0.01	mg/l	
	rep	2	Chromium	conc	0.200	mg/l	
	rep	2	Nickel	conc	0.137	mg/l	
	rep	2	Zinc	conc	0.305	mg/l	
	rep	2	Fe_258	conc	132.47	mg/l	
	rep	2	Cobalt	conc	0.110	mg/l	
	rep	2	Cr_267	conc	0.186	mg/l	
	rep	2	Cd_228	conc	0.008	mg/l	
	rep	2	Copper	conc	0.061	mg/l	
	rep	2	Co_231	conc	0.097	mg/l	
	rep	3	Lead	conc	0.03	mg/l	
	rep	3	Chromium	conc	0.174	mg/l	
	rep	3	Nickel	conc	0.155	mg/l	
	rep	3	Zinc	conc	0.309	mg/l	
	rep	3	Fe_258	conc	130.31	mg/l	
	rep	3	Cobalt	conc	0.099	mg/l	
	rep	3	Cr_267	conc	0.195	mg/l	
	rep	3	Cd_228	conc	0.007	mg/l	
	rep	3	Copper	conc	0.055	mg/l	
	rep	3	Co_231	conc	0.097	mg/l	

QCD M3639-52							
Lead	av	-0.05	mg/l	sd	0.133	%cv	251.90
Chromium	av	0.194	mg/l	sd	0.0177	%cv	9.14
Nickel	av	0.144	mg/l	sd	0.0100	%cv	6.90
Zinc	av	0.311	mg/l	sd	0.0076	%cv	2.43
Fe_258	av	130.54	mg/l	sd	1.820	%cv	1.39
Cobalt	av	0.103	mg/l	sd	0.0095	%cv	8.79
Cr_267	av	0.187	mg/l	sd	0.0072	%cv	3.86
Cd_228	av	0.008	mg/l	sd	0.0009	%cv	12.33
Copper	av	0.057	mg/l	sd	0.0034	%cv	5.94
Co_231	av	0.081	mg/l	sd	0.0284	%cv	35.18

QCS 1366	rep	1	Lead	conc	-0.23	mg/l
	rep	1	Chromium	conc	0.150	mg/l
	rep	1	Nickel	conc	0.080	mg/l
	rep	1	Zinc	conc	1.341	mg/l
	rep	1	Fe_258	conc	716.45	mg/l
	rep	1	Cobalt	conc	0.079	mg/l
	rep	1	Cr_267	conc	0.153	mg/l
	rep	1	Cd_228	conc	0.003	mg/l
	rep	1	Copper	conc	0.007	mg/l
	rep	1	Co_231	conc	0.047	mg/l

	rep	2	Lead	conc	-0.31	mg/l
	rep	2	Chromium	conc	0.178	mg/l
	rep	2	Nickel	conc	0.060	mg/l
	rep	2	Zinc	conc	1.341	mg/l
	rep	2	Fe_258	conc	726.84	mg/l
	rep	2	Cobalt	conc	0.082	mg/l
	rep	2	Cr_267	conc	0.150	mg/l
	rep	2	Cd_228	conc	-0.011	mg/l
	rep	2	Copper	conc	0.014	mg/l
	rep	2	Co_231	conc	0.098	mg/l
	rep	3	Lead	conc	-0.18	mg/l
	rep	3	Chromium	conc	0.171	mg/l
	rep	3	Nickel	conc	0.110	mg/l
	rep	3	Zinc	conc	1.318	mg/l
	rep	3	Fe_258	conc	726.06	mg/l
	rep	3	Cobalt	conc	0.107	mg/l
	rep	3	Cr_267	conc	0.147	mg/l
	rep	3	Cd_228	conc	0.004	mg/l
	rep	3	Copper	conc	0.022	mg/l
	rep	3	Co_231	conc	0.058	mg/l

window edge

QCS 1368

Lead	av	-0.24	mg/l	sd	0.067 %cv 28.20
Chromium	av	0.172	mg/l	sd	0.0225 %cv 13.11
Nickel	av	0.077	mg/l	sd	0.0286 %cv 37.26
Zinc	av	1.333	mg/l	sd	0.0141 %cv 1.06
Fe_258	av	723.05	mg/l	sd	5.738 %cv 0.79
Cobalt	av	0.089	mg/l	sd	0.0153 %cv 17.16
Cr_267	av	0.150	mg/l	sd	0.0034 %cv 2.24
Cd_228	av	0.001	mg/l	sd	0.0101 %cv 1713.7
Copper	av	0.014	mg/l	sd	0.0074 %cv 51.62
Co_231	av	0.067	mg/l	sd	0.0258 %cv 38.21

QCR M3639-45

rep	1	Lead	conc	-0.19	mg/l
rep	1	Chromium	conc	0.789	mg/l
rep	1	Nickel	conc	0.444	mg/l
rep	1	Zinc	conc	2.511	mg/l
rep	1	Fe_258	conc	1217.88	mg/l
rep	1	Cobalt	conc	0.411	mg/l
rep	1	Cr_267	conc	0.766	mg/l
rep	1	Cd_228	conc	0.010	mg/l
rep	1	Copper	conc	0.209	mg/l
rep	1	Co_231	conc	0.302	mg/l
rep	2	Lead	conc	0.18	mg/l
rep	2	Chromium	conc	0.757	mg/l
rep	2	Nickel	conc	0.501	mg/l
rep	2	Zinc	conc	2.438	mg/l
rep	2	Fe_258	conc	1236.39	mg/l
rep	2	Cobalt	conc	0.394	mg/l
rep	2	Cr_267	conc	0.777	mg/l
rep	2	Cd_228	conc	0.005	mg/l
rep	2	Copper	conc	0.231	mg/l
rep	2	Co_231	conc	0.353	mg/l
rep	3	Lead	conc	-0.57	mg/l
rep	3	Chromium	conc	0.785	mg/l
rep	3	Nickel	conc	0.427	mg/l
rep	3	Zinc	conc	2.553	mg/l
rep	3	Fe_258	conc	1216.96	mg/l
rep	3	Cobalt	conc	0.410	mg/l
rep	3	Cr_267	conc	0.769	mg/l
rep	3	Cd_228	conc	0.017	mg/l

window edge

	rep	3	Copper	conc	0.210	mg/l			
	rep	3	Co_231	conc	0.357	mg/l			
M3639-45									
Lead	av	-0.19	mg/l	sd	0.370	%cv	-97.04		
Chromium	av	0.778	mg/l	sd	0.0180	%cv	2.31		
Nickel	av	0.457	mg/l	sd	0.0038	%cv	0.48		
Zinc	av	2.500	mg/l	sd	0.0560	%cv	2.27		
Fe_258	av	1223.74	mg/l	sd	10.962	%cv	0.90		
Cobalt	av	0.406	mg/l	sd	0.0102	%cv	2.50		
Cr_267	av	0.771	mg/l	sd	0.0059	%cv	0.77		
Cd_228	av	0.011	mg/l	sd	0.0057	%cv	53.91		
Copper	av	0.217	mg/l	sd	0.0126	%cv	5.80		
Co_231	av	0.349	mg/l	sd	0.0148	%cv	4.18		
QCK M3639-55	rep	1	Lead	conc	-0.85	mg/l		window edge	
	rep	1	Chromium	conc	0.579	mg/l			
	rep	1	Nickel	conc	0.340	mg/l			
	rep	1	Zinc	conc	1.817	mg/l			
	rep	1	Fe_258	conc	1000.09	mg/l			
	rep	1	Cobalt	conc	0.247	mg/l			
	rep	1	Cr_267	conc	0.599	mg/l			
	rep	1	Cd_228	conc	0.005	mg/l			
	rep	1	Copper	conc	0.170	mg/l			
	rep	1	Co_231	conc	0.226	mg/l			
	rep	2	Lead	conc	-0.49	mg/l		window edge	
	rep	2	Chromium	conc	0.590	mg/l			
	rep	2	Nickel	conc	0.351	mg/l			
	rep	2	Zinc	conc	1.860	mg/l			
	rep	2	Fe_258	conc	1010.56	mg/l			
	rep	2	Cobalt	conc	0.251	mg/l			
	rep	2	Cr_267	conc	0.567	mg/l			
	rep	2	Cd_228	conc	0.010	mg/l			
	rep	2	Copper	conc	0.171	mg/l			
	rep	2	Co_231	conc	0.256	mg/l			
	rep	3	Chromium	conc	0.632	mg/l			
	rep	3	Lead	conc	-0.81	mg/l		window edge	
	rep	3	Zinc	conc	1.904	mg/l			
	rep	3	Nickel	conc	0.400	mg/l			
	rep	3	Cobalt	conc	0.282	mg/l			
	rep	3	Fe_258	conc	1029.97	mg/l			
	rep	3	Cd_228	conc	0.007	mg/l			
	rep	3	Cr_267	conc	0.588	mg/l			
	rep	3	Co_231	conc	0.253	mg/l			
	rep	3	Copper	conc	0.144	mg/l			
QCK M3639-55									
Chromium	av	0.600	mg/l	sd	0.0279	%cv	4.65		
Lead	av	-0.72	mg/l	sd	0.195	%cv	27.13		
Zinc	av	1.860	mg/l	sd	0.0438	%cv	2.36		
Nickel	av	0.366	mg/l	sd	0.0291	%cv	7.94		
Cobalt	av	0.260	mg/l	sd	0.0025	%cv	1.01		
Fe_258	av	1013.81	mg/l	sd	14.906	%cv	1.46		
Cd_228	av	0.007	mg/l	sd	0.0029	%cv	39.78		
Cr_267	av	0.595	mg/l	sd	0.0163	%cv	2.80		
Co_231	av	0.345	mg/l	sd	0.0165	%cv	6.72		
Copper	av	0.161	mg/l	sd	0.0152	%cv	9.41		
Soln A	rep	1	Lead	conc	1.10	mg/l			
	rep	1	Chromium	conc	1.236	mg/l			
	rep	1	Nickel	conc	0.113	mg/l			
	rep	1	Zinc	conc	0.004	mg/l			

	rep	1	Fe_258	conc	0.10	mg/l
	rep	1	Cobalt	conc	0.002	mg/l
	rep	1	Cr_267	conc	-0.001	mg/l
	rep	1	Cd_228	conc	0.001	mg/l
	rep	1	Copper	conc	-0.000	mg/l
	rep	1	Co_231	conc	-0.015	mg/l
	rep	2	Lead	conc	-0.16	mg/l
	rep	2	Chromium	conc	0.032	mg/l
	rep	2	Nickel	conc	0.005	mg/l
	rep	2	Zinc	conc	-0.003	mg/l window edge
	rep	2	Fe_258	conc	-0.03	mg/l window edge
	rep	2	Cobalt	conc	0.012	mg/l
	rep	2	Cr_267	conc	-0.009	mg/l
	rep	2	Cd_228	conc	0.004	mg/l
	rep	2	Copper	conc	-0.001	mg/l
	rep	2	Co_231	conc	0.008	mg/l
	rep	3	Chromium	conc	-0.026	mg/l window edge
	rep	3	Lead	conc	-0.23	mg/l window edge
	rep	3	Zinc	conc	0.004	mg/l
	rep	3	Nickel	conc	0.008	mg/l
	rep	3	Cobalt	conc	-0.004	mg/l
	rep	3	Fe_258	conc	-0.03	mg/l window edge
	rep	3	Cd_228	conc	0.001	mg/l window edge
	rep	3	Cr_267	conc	0.005	mg/l
	rep	3	Co_231	conc	-0.011	mg/l
	rep	3	Copper	conc	0.002	mg/l

Soln A

Chromium	av	0.414 mg/l	sd	0.7127	%cv 172.13
Lead	av	0.24 mg/l	sd	0.746	%cv 313.24
Zinc	av	0.012 mg/l	sd	0.0194	%cv 164.87
Nickel	av	0.042 mg/l	sd	0.0614	%cv 145.99
Cobalt	av	0.008 mg/l	sd	0.0083	%cv 256.30
Fe_258	av	0.01 mg/l	sd	0.073	%cv 644.55
Cd_228	av	0.002 mg/l	sd	0.0018	%cv 75.83
Cr_267	av	-0.002 mg/l	sd	0.0072	%cv 423.51
Co_231	av	-0.006 mg/l	sd	0.0122	%cv 190.77
Copper	av	-0.001 mg/l	sd	0.0021	%cv 346.69

But Sample

Soln Fe_100	rep	1	Lead	conc	-0.06	mg/l
	rep	1	Chromium	conc	0.013	mg/l
	rep	1	Nickel	conc	0.009	mg/l
	rep	1	Zinc	conc	0.022	mg/l
	rep	1	Fe_258	conc	100.56	mg/l
	rep	1	Cobalt	conc	0.022	mg/l
	rep	1	Cr_267	conc	0.012	mg/l
	rep	1	Cd_228	conc	-0.010	mg/l window edge
	rep	1	Copper	conc	-0.011	mg/l
	rep	1	Co_231	conc	0.019	mg/l
	rep	2	Lead	conc	-0.02	mg/l
	rep	2	Chromium	conc	0.024	mg/l
	rep	2	Nickel	conc	-0.020	mg/l window edge
	rep	2	Zinc	conc	0.007	mg/l
	rep	2	Fe_258	conc	2.00	mg/l
	rep	2	Cobalt	conc	0.005	mg/l
	rep	2	Cr_267	conc	-0.009	mg/l
	rep	2	Cd_228	conc	0.002	mg/l
	rep	2	Copper	conc	0.002	mg/l
	rep	2	Co_231	conc	-0.010	mg/l
	rep	3	Lead	conc	-0.04	mg/l
	rep	3	Chromium	conc	0.010	mg/l

	rep	3	Nickel	conc	-0.020	mg/l		window edge
	rep	3	Zinc	conc	0.002	mg/l		
	rep	3	Fe_238	conc	-0.03	mg/l		
	rep	3	Cobalt	conc	-0.005	mg/l		
	rep	3	Cr_267	conc	-0.005	mg/l		
	rep	3	Cd_223	conc	0.004	mg/l		
	rep	3	Copper	conc	-0.003	mg/l		
	rep	3	Co_231	conc	-0.005	mg/l		
Soln Fe_100								
Lead	av	-0.04	mg/l	sd	0.020	%cv	46.37	
Chromium	av	0.020	mg/l	sd	0.0043	%cv	21.93	
Nickel	av	-0.013	mg/l	sd	0.0196	%cv	152.55	
Zinc	av	0.010	mg/l	sd	0.0105	%cv	102.01	
Fe_238	av	35.18	mg/l	sd	59.227	%cv	168.37	
Cobalt	av	0.007	mg/l	sd	0.0140	%cv	188.12	
Cr_267	av	-0.000	mg/l	sd	0.0109	%cv	3859.9	
Cd_223	av	-0.001	mg/l	sd	0.0075	%cv	522.67	
Copper	av	-0.004	mg/l	sd	0.0067	%cv	164.37	
Co_231	av	-0.001	mg/l	sd	0.0177	%cv	3263.7	
DI	rep	1	Lead	conc	-0.10	mg/l		
	rep	1	Chromium	conc	0.004	mg/l		
	rep	1	Nickel	conc	-0.005	mg/l		
	rep	1	Zinc	conc	0.007	mg/l		
	rep	1	Fe_238	conc	0.37	mg/l		
	rep	1	Cobalt	conc	0.015	mg/l		
	rep	1	Cr_267	conc	0.004	mg/l		
	rep	1	Cd_228	conc	0.011	mg/l		
	rep	1	Copper	conc	-0.001	mg/l		
	rep	1	Co_231	conc	-0.016	mg/l		
	rep	2	Lead	conc	-0.15	mg/l		window edge
	rep	2	Chromium	conc	0.024	mg/l		
	rep	2	Nickel	conc	-0.015	mg/l		
	rep	2	Zinc	conc	0.008	mg/l		
	rep	2	Fe_238	conc	0.23	mg/l		
	rep	2	Cobalt	conc	-0.004	mg/l		
	rep	2	Cr_267	conc	0.002	mg/l		
	rep	2	Cd_228	conc	0.003	mg/l		
	rep	2	Copper	conc	0.000	mg/l		
	rep	2	Co_231	conc	0.001	mg/l		
	rep	3	Chromium	conc	0.013	mg/l		
	rep	3	Lead	conc	-0.09	mg/l		
	rep	3	Zinc	conc	0.007	mg/l		
	rep	3	Nickel	conc	-0.012	mg/l		window edge
	rep	3	Cobalt	conc	0.002	mg/l		
	rep	3	Fe_238	conc	0.15	mg/l		
	rep	3	Cd_228	conc	0.005	mg/l		
	rep	3	Cr_267	conc	-0.013	mg/l		
	rep	3	Co_231	conc	-0.034	mg/l		window edge
	rep	3	Copper	conc	0.000	mg/l		
DI								
Chromium	av	0.013	mg/l	sd	0.0100	%cv	74.16	
Lead	av	-0.11	mg/l	sd	0.033	%cv	29.47	
Zinc	av	0.007	mg/l	sd	0.0007	%cv	9.95	
Nickel	av	-0.010	mg/l	sd	0.0050	%cv	51.05	
Cobalt	av	0.004	mg/l	sd	0.0095	%cv	218.15	
Fe_238	av	0.25	mg/l	sd	0.113	%cv	45.32	
Cd_228	av	0.006	mg/l	sd	0.0044	%cv	67.60	
Cr_267	av	-0.002	mg/l	sd	0.0076	%cv	401.20	
Co_231	av	-0.016	mg/l	sd	0.0174	%cv	107.01	

Copper	av	0.002 mg/l		sd	0.0047	%cv	170.66	
	rep	1	Lead	conc	0.01 mg/l			
	rep	1	Chromium	conc	0.606 mg/l			
	rep	1	Nickel	conc	0.353 mg/l			
	rep	1	Zinc	conc	0.877 mg/l			
	rep	1	Fe_258	conc	362.65 mg/l			
	rep	1	Cobalt	conc	0.275 mg/l			
	rep	1	Cr_267	conc	0.642 mg/l			
	rep	1	Cd_228	conc	0.003 mg/l			
	rep	1	Copper	conc	0.187 mg/l			
	rep	1	Co_231	conc	0.220 mg/l			
	rep	2	Lead	conc	-0.25 mg/l			
	rep	2	Chromium	conc	0.722 mg/l			
	rep	2	Nickel	conc	0.374 mg/l			
	rep	2	Zinc	conc	0.925 mg/l			
	rep	2	Fe_258	conc	367.82 mg/l			
	rep	2	Cobalt	conc	0.274 mg/l			
	rep	2	Cr_267	conc	0.637 mg/l			
	rep	2	Cd_228	conc	0.014 mg/l			
	rep	2	Copper	conc	0.191 mg/l			
	rep	2	Co_231	conc	0.276 mg/l			
	rep	3	Lead	conc	-0.43 mg/l			window edge
	rep	3	Chromium	conc	0.608 mg/l			
	rep	3	Nickel	conc	0.359 mg/l			
	rep	3	Zinc	conc	0.933 mg/l			
	rep	3	Fe_258	conc	365.73 mg/l			
	rep	3	Cobalt	conc	0.293 mg/l			
	rep	3	Cr_267	conc	0.617 mg/l			
	rep	3	Cd_228	conc	0.009 mg/l			
	rep	3	Copper	conc	0.168 mg/l			
	rep	3	Co_231	conc	0.217 mg/l			

ID M3639-46

			Reasons					% diff
Lead	av	-0.23 mg/l	<0.19	sd	0.220	%cv	97.86	—
Chromium	av	0.645 mg/l	0.594	sd	0.0663	%cv	10.28	8
Nickel	av	0.362 mg/l	0.353	sd	0.0109	%cv	3.02	2
Zinc	av	0.918 mg/l	0.830	sd	0.0189	%cv	2.05	10
Fe_258	av	365.40 mg/l	327.64	sd	2.598	%cv	0.71	11
Cobalt	av	0.281 mg/l	0.254	sd	0.0109	%cv	3.88	10
Cr_267	av	0.632 mg/l	0.590	sd	0.0135	%cv	2.13	7
Cd_228	av	0.009 mg/l	0.004	sd	0.0055	%cv	64.64	—
Copper	av	0.182 mg/l	0.154	sd	0.0125	%cv	6.85	17
Co_231	av	0.238 mg/l	0.203	sd	0.0334	%cv	14.07	16

IK

rep	1	Lead	conc	0.41 mg/l	
rep	1	Chromium	conc	0.937 mg/l	
rep	1	Nickel	conc	0.927 mg/l	
rep	1	Zinc	conc	1.213 mg/l	
rep	1	Fe_258	conc	309.31 mg/l	
rep	1	Cobalt	conc	1.073 mg/l	
rep	1	Cr_267	conc	0.994 mg/l	
rep	1	Cd_228	conc	0.515 mg/l	
rep	1	Copper	conc	0.654 mg/l	
rep	1	Co_231	conc	1.040 mg/l	
rep	2	Lead	conc	0.42 mg/l	
rep	2	Chromium	conc	1.012 mg/l	
rep	2	Nickel	conc	0.933 mg/l	
rep	2	Zinc	conc	1.149 mg/l	
rep	2	Fe_258	conc	299.34 mg/l	
rep	2	Cobalt	conc	1.092 mg/l	

rep	2	Cr_267	conc	1.013	mg/l
rep	2	Cd_228	conc	0.538	mg/l
rep	2	Copper	conc	0.675	mg/l
rep	2	Co_231	conc	1.003	mg/l
rep	3	Lead	conc	0.33	mg/l
rep	3	Chromium	conc	1.040	mg/l
rep	3	Nickel	conc	0.981	mg/l
rep	3	Zinc	conc	1.180	mg/l
rep	3	Fe_258	conc	299.44	mg/l
rep	3	Cobalt	conc	1.098	mg/l
rep	3	Cr_267	conc	1.007	mg/l
rep	3	Cd_228	conc	0.531	mg/l
rep	3	Copper	conc	0.668	mg/l
rep	3	Co_231	conc	1.092	mg/l

+0.05ml ECS3019
to 10ml w/ M3639-44

rx M3639-44+0.5

				Bkgd					% recovery
Lead	av	0.39	mg/l	0.26	sd	0.052	%cv	13.53	—
Chromium	av	0.996	mg/l	0.483	sd	0.0531	%cv	5.33	103
Nickel	av	0.947	mg/l	0.418	sd	0.0297	%cv	3.14	106
Zinc	av	1.181	mg/l	0.606	sd	0.0320	%cv	2.71	115
Fe_258	av	302.70	mg/l	294.41	sd	5.729	%cv	1.89	—
Cobalt	av	1.087	mg/l	0.581	sd	0.0132	%cv	1.21	101
Cr_267	av	1.005	mg/l	0.458	sd	0.0098	%cv	0.97	109
Cd_228	av	0.528	mg/l	0.006	sd	0.0117	%cv	2.22	104
Copper	av	0.666	mg/l	0.134	sd	0.0106	%cv	1.60	106
Co_231	av	1.049	mg/l	0.522	sd	0.0416	%cv	3.97	105

M3639

1-2895

012895STW1

Blank

rep	1	Lead	em	-0.8	
rep	1	Chromium	em	1.7	
rep	1	Nickel	em	-2.6	window edge
rep	1	Zinc	em	3.6	
rep	1	Fe_258	em	1.0	
rep	1	Cobalt	em	3.1	
rep	1	Cr_267	em	10.8	
rep	1	Cd_228	em	-1.2	window edge
rep	1	Copper	em	16.5	
rep	1	Co_231	em	2.4	
rep	2	Chromium	em	2.5	
rep	3	Lead	em	-1.9	window edge
rep	2	Zinc	em	1.5	
rep	2	Nickel	em	1.8	window edge
rep	2	Cobalt	em	3.5	
rep	2	Fe_258	em	24.7	
rep	2	Cd_228	em	4.3	
rep	2	Cr_267	em	17.5	
rep	2	Co_231	em	0.0	
rep	2	Copper	em	19.4	
rep	3	Chromium	em	1.2	
rep	3	Lead	em	2.3	
rep	3	Zinc	em	2.3	
rep	3	Nickel	em	7.4	window edge
rep	3	Cobalt	em	3.2	
rep	3	Fe_258	em	3.6	window edge
rep	3	Cd_228	em	3.3	
rep	3	Cr_267	em	6.9	
rep	3	Co_231	em	3.1	
rep	3	Copper	em	9.7	

Blank

Chromium	av	1.87	sd	0.684	%cv	36.55
Lead	av	-0.11	sd	2.191	%cv	2038.1
Zinc	av	2.10	sd	0.528	%cv	25.10
Nickel	av	2.20	sd	4.991	%cv	226.40
Cobalt	av	3.32	sd	0.178	%cv	5.35
Fe_258	av	9.79	sd	13.026	%cv	133.11
Cd_228	av	2.13	sd	2.909	%cv	136.80
Cr_267	av	14.40	sd	6.509	%cv	45.21
Co_231	av	1.83	sd	1.616	%cv	88.12
Copper	av	14.88	sd	4.884	%cv	32.83

Fl standard	rep	1	Lead	em	47.2	conc 1.00
	rep	1	Chromium	em	89.7	conc 1.000
	rep	1	Nickel	em	267.0	conc 1.000
	rep	1	Zinc	em	396.7	conc 1.000
	rep	1	Cr_267	em	1204.9	conc 1.000
	rep	1	Cobalt	em	261.2	conc 1.000
	rep	1	Copper	em	1595.4	conc 1.000
	rep	1	Cd_228	em	503.2	conc 1.000
	rep	1	Co_231	em	156.6	conc 1.000
	rep	2	Lead	em	50.3	conc 1.00
	rep	2	Chromium	em	89.0	conc 1.000
	rep	2	Nickel	em	272.0	conc 1.000
	rep	2	Zinc	em	391.1	conc 1.000
	rep	2	Cr_267	em	1233.7	conc 1.000
	rep	2	Cobalt	em	255.9	conc 1.000
	rep	2	Copper	em	1583.0	conc 1.000
	rep	2	Cd_228	em	508.7	conc 1.000
	rep	2	Co_231	em	155.2	conc 1.000

	rep	3	Chromium	em	69.8	conc	1.000			
	rep	3	Lead	em	30.6	conc	1.00			
	rep	3	Zinc	em	304.6	conc	1.000			
	rep	3	Nickel	em	276.4	conc	1.000			
	rep	3	Cobalt	em	270.8	conc	1.000			
	rep	3	Cr_267	em	1207.5	conc	1.000			
	rep	3	Cd_228	em	361.5	conc	1.000			
	rep	3	Copper	em	1639.3	conc	1.000			
	rep	3	Co_231	em	158.9	conc	1.000			
#1 standard										
Chromium	av	69.501			sd	0.4049	%cv	0.58	conc	1.000
Lead	av	45.38			sd	6.017	%cv	13.26	conc	1.00
Zinc	av	300.791			sd	3.9617	%cv	1.32	conc	1.000
Nickel	av	271.375			sd	4.1807	%cv	1.52	conc	1.000
Cobalt	av	262.449			sd	7.2520	%cv	2.76	conc	1.000
Cr_267	av	1211.754			sd	9.5693	%cv	0.79	conc	1.000
Cd_228	av	361.118			sd	2.2514	%cv	0.40	conc	1.000
Copper	av	1605.899			sd	29.6167	%cv	1.84	conc	1.000
Co_231	av	157.255			sd	1.4684	%cv	0.93	conc	1.000
#8 standard	rep	1	Fe_258	em	38710.7	conc	100.00			
	rep	2	Fe_258	em	38290.3	conc	100.00			
	rep	3	Fe_258	em	38020.4	conc	100.00			
#8 standard										
Fe_258	av	38607.15			sd	279.757	%cv	0.72	conc	100.00
DI	rep	1	Lead	conc	0.10	mg/l				
	rep	1	Chromium	conc	0.004	mg/l				
	rep	1	Nickel	conc	0.029	mg/l				
	rep	1	Zinc	conc	0.007	mg/l				
	rep	1	Fe_258	conc	0.47	mg/l				
	rep	1	Cobalt	conc	0.021	mg/l				
	rep	1	Cr_267	conc	0.004	mg/l				
	rep	1	Cd_228	conc	0.000	mg/l				
	rep	1	Copper	conc	0.004	mg/l				
	rep	1	Co_231	conc	0.015	mg/l				
	rep	2	Lead	conc	0.06	mg/l				
	rep	2	Chromium	conc	0.009	mg/l				
	rep	2	Nickel	conc	-0.004	mg/l			window edge	
	rep	2	Zinc	conc	0.002	mg/l				
	rep	2	Fe_258	conc	0.11	mg/l				
	rep	2	Cobalt	conc	0.001	mg/l				
	rep	2	Cr_267	conc	-0.003	mg/l				
	rep	2	Cd_228	conc	0.002	mg/l				
	rep	2	Copper	conc	0.011	mg/l				
	rep	2	Co_231	conc	0.006	mg/l				
	rep	3	Lead	conc	0.03	mg/l			window edge	
	rep	3	Chromium	conc	0.003	mg/l				
	rep	3	Nickel	conc	0.010	mg/l				
	rep	3	Zinc	conc	0.000	mg/l				
	rep	3	Fe_258	conc	0.05	mg/l				
	rep	3	Cobalt	conc	-0.001	mg/l				
	rep	3	Cr_267	conc	-0.001	mg/l				
	rep	3	Cd_228	conc	0.002	mg/l				
	rep	3	Copper	conc	0.000	mg/l				
	rep	3	Co_231	conc	0.007	mg/l				
DI										
Lead	av	0.08	mg/l		sd	0.052	%cv	67.94		
Chromium	av	0.005	mg/l		sd	0.0030	%cv	55.01		
Nickel	av	0.012	mg/l		sd	0.0164	%cv	132.18		

Zinc	av	0.003 mg/l		sd	0.0033 %cv	112.37	
Fe_258	av	0.21 mg/l		sd	0.228 %cv	108.65	
Cobalt	av	0.007 mg/l		sd	0.0124 %cv	171.34	
Cr_267	av	0.000 mg/l		sd	0.0037 %cv	1473.5	
Cd_228	av	0.001 mg/l		sd	0.0010 %cv	71.29	
Copper	av	0.006 mg/l		sd	0.0043 %cv	76.29	
Co_231	av	0.009 mg/l		sd	0.0048 %cv	53.29	

QCS 2687	rep	1	Lead	conc	2.15 mg/l	
	rep	1	Chromium	conc	1.018 mg/l	
	rep	1	Nickel	conc	1.067 mg/l	
	rep	1	Zinc	conc	0.990 mg/l	
	rep	1	Fe_258	conc	2.07 mg/l	
	rep	1	Cobalt	conc	1.010 mg/l	
	rep	1	Cr_267	conc	1.026 mg/l	
	rep	1	Cd_228	conc	1.952 mg/l	
	rep	1	Copper	conc	1.026 mg/l	
	rep	1	Co_231	conc	0.991 mg/l	
	rep	2	Chromium	conc	1.066 mg/l	
	rep	2	Lead	conc	2.05 mg/l	
	rep	2	Zinc	conc	1.012 mg/l	
	rep	2	Nickel	conc	1.065 mg/l	
	rep	2	Cobalt	conc	1.020 mg/l	
	rep	2	Fe_258	conc	2.16 mg/l	
	rep	2	Cd_228	conc	2.026 mg/l	
	rep	2	Cr_267	conc	1.037 mg/l	
	rep	2	Co_231	conc	1.047 mg/l	
	rep	2	Copper	conc	1.035 mg/l	
	rep	3	Lead	conc	2.07 mg/l	
	rep	3	Chromium	conc	1.078 mg/l	
	rep	3	Nickel	conc	1.073 mg/l	
	rep	3	Zinc	conc	1.019 mg/l	
	rep	3	Fe_258	conc	2.08 mg/l	
	rep	3	Cobalt	conc	1.055 mg/l	
	rep	3	Cr_267	conc	1.047 mg/l	
	rep	3	Cd_228	conc	1.932 mg/l	
	rep	3	Copper	conc	1.034 mg/l	
	rep	3	Co_231	conc	1.038 mg/l	

QCS 2687				N				Recovery
Lead	av	2.09 mg/l		2	sd	0.056 %cv	2.69	104
Chromium	av	1.054 mg/l		1	sd	0.0313 %cv	3.02	105
Nickel	av	1.068 mg/l		1	sd	0.0041 %cv	0.39	107
Zinc	av	1.007 mg/l		1	sd	0.0151 %cv	1.50	101
Fe_258	av	2.10 mg/l		2	sd	0.046 %cv	2.21	105
Cobalt	av	1.029 mg/l		1	sd	0.0237 %cv	2.31	103
Cr_267	av	1.037 mg/l		1	sd	0.0103 %cv	0.99	104
Cd_228	av	1.970 mg/l		2.1	sd	0.0497 %cv	2.52	94
Copper	av	1.032 mg/l		1	sd	0.0053 %cv	0.51	103
Co_231	av	1.025 mg/l		1	sd	0.0304 %cv	2.97	102

QCB	rep	1	Lead	conc	0.20 mg/l	
	rep	1	Chromium	conc	-0.001 mg/l	
	rep	1	Nickel	conc	0.006 mg/l	
	rep	1	Zinc	conc	0.011 mg/l	
	rep	1	Fe_258	conc	0.02 mg/l	
	rep	1	Cobalt	conc	-0.005 mg/l	
	rep	1	Cr_267	conc	-0.003 mg/l	window edge
	rep	1	Cd_228	conc	0.001 mg/l	
	rep	1	Copper	conc	0.009 mg/l	
	rep	1	Co_231	conc	0.015 mg/l	

	rep	2	Chromium	conc	-0.014	mg/l	
	rep	2	Lead	conc	0.15	mg/l	
	rep	2	Zinc	conc	0.003	mg/l	
	rep	2	Nickel	conc	0.022	mg/l	
	rep	2	Cobalt	conc	0.004	mg/l	
	rep	2	Fe_258	conc	0.05	mg/l	
	rep	2	Cd_228	conc	-0.000	mg/l	
	rep	2	Cr_267	conc	-0.009	mg/l	
	rep	2	Co_231	conc	-0.015	mg/l	window edge
	rep	2	Copper	conc	0.012	mg/l	
	rep	3	Lead	conc	0.12	mg/l	
	rep	3	Chromium	conc	0.027	mg/l	
	rep	3	Nickel	conc	0.039	mg/l	
	rep	3	Zinc	conc	0.002	mg/l	
	rep	3	Fe_258	conc	0.03	mg/l	
	rep	3	Cobalt	conc	-0.001	mg/l	
	rep	3	Cr_267	conc	-0.005	mg/l	
	rep	3	Cd_228	conc	0.006	mg/l	
	rep	3	Copper	conc	-0.017	mg/l	window edge
	rep	3	Co_231	conc	0.006	mg/l	

QCB

Lead	av	0.16	mg/l	sd	0.039	%cv 24.22
Chromium	av	0.004	mg/l	sd	0.0210	%cv 509.69
Nickel	av	0.022	mg/l	sd	0.0168	%cv 74.90
Zinc	av	0.005	mg/l	sd	0.0048	%cv 89.74
Fe_258	av	0.04	mg/l	sd	0.019	%cv 49.84
Cobalt	av	-0.000	mg/l	sd	0.0046	%cv 1002.6
Cr_267	av	-0.007	mg/l	sd	0.0019	%cv 26.20
Cd_228	av	0.002	mg/l	sd	0.0036	%cv 150.22
Copper	av	0.002	mg/l	sd	0.0164	%cv 1067.8
Co_231	av	0.002	mg/l	sd	0.0154	%cv 821.13

M8639-61	rep	1	Lead	conc	-0.19	mg/l	window edge
	rep	1	Chromium	conc	0.214	mg/l	
	rep	1	Nickel	conc	0.376	mg/l	
	rep	1	Zinc	conc	0.343	mg/l	
	rep	1	Fe_258	conc	208.58	mg/l	
	rep	1	Cobalt	conc	0.139	mg/l	
	rep	1	Cr_267	conc	0.249	mg/l	
	rep	1	Cd_228	conc	0.005	mg/l	
	rep	1	Copper	conc	0.101	mg/l	
	rep	1	Co_231	conc	0.122	mg/l	
	rep	2	Lead	conc	-0.14	mg/l	window edge
	rep	2	Chromium	conc	0.275	mg/l	
	rep	2	Nickel	conc	0.313	mg/l	
	rep	2	Zinc	conc	0.320	mg/l	
	rep	2	Fe_258	conc	210.90	mg/l	
	rep	2	Cobalt	conc	0.152	mg/l	
	rep	2	Cr_267	conc	0.260	mg/l	
	rep	2	Cd_228	conc	0.009	mg/l	
	rep	2	Copper	conc	0.171	mg/l	
	rep	2	Co_231	conc	0.156	mg/l	
	rep	3	Chromium	conc	0.280	mg/l	
	rep	3	Lead	conc	0.10	mg/l	
	rep	3	Zinc	conc	0.320	mg/l	
	rep	3	Nickel	conc	0.362	mg/l	
	rep	3	Cobalt	conc	0.150	mg/l	
	rep	3	Fe_258	conc	213.65	mg/l	
	rep	3	Cd_228	conc	0.001	mg/l	
	rep	3	Cr_267	conc	0.252	mg/l	

	rep	3	Co_231	conc	0.140	mg/l		
	rep	3	Copper	conc	0.130	mg/l		
39-61								
Chromium	av	0.246	mg/l	sd	0.0309	%cv	13.55	
Lead	av	-0.08	mg/l	sd	0.104	%cv	194.01	
Zinc	av	0.330	mg/l	sd	0.0117	%cv	3.55	
Nickel	av	0.351	mg/l	sd	0.0333	%cv	9.51	
Cobalt	av	0.147	mg/l	sd	0.0073	%cv	4.96	
Fe_258	av	211.04	mg/l	sd	2.537	%cv	1.20	
Cd_228	av	0.005	mg/l	sd	0.0042	%cv	78.85	
Cr_267	av	0.254	mg/l	sd	0.0056	%cv	2.20	
Co_231	av	0.139	mg/l	sd	0.0164	%cv	11.78	
Copper	av	0.177	mg/l	sd	0.0058	%cv	3.29	
M3639-62	rep	1	Lead	conc	0.13	mg/l		
	rep	1	Chromium	conc	0.486	mg/l		
	rep	1	Nickel	conc	0.428	mg/l		
	rep	1	Zinc	conc	0.726	mg/l		
	rep	1	Fe_258	conc	341.90	mg/l		
	rep	1	Cobalt	conc	0.153	mg/l		
	rep	1	Cr_267	conc	0.528	mg/l		
	rep	1	Cd_228	conc	0.002	mg/l		
	rep	1	Copper	conc	0.221	mg/l		
	rep	1	Co_231	conc	0.150	mg/l		
	rep	2	Lead	conc	-0.00	mg/l		
	rep	2	Chromium	conc	0.480	mg/l		
	rep	2	Nickel	conc	0.391	mg/l		
	rep	2	Zinc	conc	0.732	mg/l		
	rep	2	Fe_258	conc	344.80	mg/l		
	rep	2	Cobalt	conc	0.163	mg/l		
	rep	2	Cr_267	conc	0.504	mg/l		
	rep	2	Cd_228	conc	0.005	mg/l		
	rep	2	Copper	conc	0.219	mg/l		
	rep	2	Co_231	conc	0.158	mg/l		
	rep	3	Lead	conc	-0.09	mg/l		window edge
	rep	3	Chromium	conc	0.517	mg/l		
	rep	3	Nickel	conc	0.470	mg/l		
	rep	3	Zinc	conc	0.751	mg/l		
	rep	3	Fe_258	conc	346.54	mg/l		
	rep	3	Cobalt	conc	0.163	mg/l		
	rep	3	Cr_267	conc	0.485	mg/l		
	rep	3	Cd_228	conc	0.009	mg/l		
	rep	3	Copper	conc	0.220	mg/l		
	rep	3	Co_231	conc	0.175	mg/l		
M3639-62								
Lead	av	0.01	mg/l	sd	0.113	%cv	929.43	
Chromium	av	0.488	mg/l	sd	0.0286	%cv	5.87	
Nickel	av	0.430	mg/l	sd	0.0397	%cv	9.24	
Zinc	av	0.736	mg/l	sd	0.0102	%cv	1.39	
Fe_258	av	344.44	mg/l	sd	2.384	%cv	0.69	
Cobalt	av	0.162	mg/l	sd	0.0042	%cv	2.53	
Cr_267	av	0.506	mg/l	sd	0.0210	%cv	4.02	
Cd_228	av	0.005	mg/l	sd	0.0035	%cv	70.04	
Copper	av	0.222	mg/l	sd	0.0046	%cv	2.06	
Co_231	av	0.161	mg/l	sd	0.0126	%cv	7.82	
M3639-63	rep	1	Lead	conc	0.10	mg/l		
	rep	1	Chromium	conc	0.419	mg/l		
	rep	1	Nickel	conc	0.412	mg/l		
	rep	1	Zinc	conc	0.475	mg/l		

	rep	1	Fe_258	conc	291.97	mg/l
	rep	1	Cobalt	conc	0.178	mg/l
	rep	1	Cr_267	conc	0.422	mg/l
	rep	1	Cd_228	conc	-0.001	mg/l
	rep	1	Copper	conc	0.216	mg/l
	rep	1	Co_231	conc	0.156	mg/l
	rep	2	Lead	conc	0.00	mg/l
	rep	2	Chromium	conc	0.451	mg/l
	rep	2	Nickel	conc	0.368	mg/l
	rep	2	Zinc	conc	0.507	mg/l
	rep	2	Fe_258	conc	301.41	mg/l
	rep	2	Cobalt	conc	0.156	mg/l
	rep	2	Cr_267	conc	0.399	mg/l
	rep	2	Cd_228	conc	0.004	mg/l
	rep	2	Copper	conc	0.231	mg/l
	rep	2	Co_231	conc	0.177	mg/l
	rep	3	Chromium	conc	0.379	mg/l
	rep	3	Lead	conc	0.03	mg/l
	rep	3	Zinc	conc	0.492	mg/l
	rep	3	Nickel	conc	0.374	mg/l
	rep	3	Cobalt	conc	0.161	mg/l
	rep	3	Fe_258	conc	286.79	mg/l
	rep	3	Cd_228	conc	0.002	mg/l
	rep	3	Cr_267	conc	0.429	mg/l
	rep	3	Co_231	conc	0.171	mg/l
	rep	3	Copper	conc	0.220	mg/l

M3639-63

Chromium	av	0.416	mg/l	sd	0.0362	%cv 8.69
Lead	av	0.07	mg/l	sd	0.096	%cv 137.71
Zinc	av	0.491	mg/l	sd	0.0189	%cv 3.84
Nickel	av	0.385	mg/l	sd	0.0239	%cv 6.21
Cobalt	av	0.165	mg/l	sd	0.0116	%cv 7.03
Fe_258	av	293.39	mg/l	sd	7.412	%cv 2.53
Cd_228	av	0.001	mg/l	sd	0.0020	%cv 202.50
Cr_267	av	0.416	mg/l	sd	0.0158	%cv 3.78
Co_231	av	0.169	mg/l	sd	0.0086	%cv 5.06
Copper	av	0.222	mg/l	sd	0.0078	%cv 3.52

M3639-64	rep	1	Lead	conc	-0.04	mg/l	window edge
	rep	1	Chromium	conc	0.215	mg/l	
	rep	1	Nickel	conc	0.284	mg/l	
	rep	1	Zinc	conc	0.294	mg/l	
	rep	1	Fe_258	conc	184.38	mg/l	
	rep	1	Cobalt	conc	0.135	mg/l	
	rep	1	Cr_267	conc	0.250	mg/l	
	rep	1	Cd_228	conc	0.005	mg/l	
	rep	1	Copper	conc	0.129	mg/l	
	rep	1	Co_231	conc	0.128	mg/l	
	rep	2	Chromium	conc	0.244	mg/l	
	rep	2	Lead	conc	0.32	mg/l	
	rep	2	Zinc	conc	0.284	mg/l	
	rep	2	Nickel	conc	0.255	mg/l	
	rep	2	Cobalt	conc	0.131	mg/l	
	rep	2	Fe_258	conc	184.81	mg/l	
	rep	2	Cd_228	conc	0.006	mg/l	
	rep	2	Cr_267	conc	0.230	mg/l	
	rep	2	Co_231	conc	0.095	mg/l	
	rep	2	Copper	conc	0.101	mg/l	
	rep	3	Chromium	conc	0.340	mg/l	
	rep	3	Lead	conc	-0.01	mg/l	window edge

	rep	3	Zinc	conc	0.281	mg/l		
	rep	3	Nickel	conc	0.271	mg/l		
	rep	3	Cobalt	conc	0.133	mg/l		
	rep	3	Fe_258	conc	177.93	mg/l		
	rep	3	Cd_228	conc	0.006	mg/l		
	rep	3	Cr_267	conc	0.241	mg/l		
	rep	3	Co_231	conc	0.114	mg/l		
	rep	3	Copper	conc	0.120	mg/l		
M3639-64								
Chromium	av		0.233	mg/l	sd	0.0139	%cv	6.04
Lead	av		0.04	mg/l	sd	0.149	%cv	343.45
Zinc	av		0.286	mg/l	sd	0.0071	%cv	2.48
Nickel	av		0.270	mg/l	sd	0.0139	%cv	5.15
Cobalt	av		0.133	mg/l	sd	0.0011	%cv	0.84
Fe_258	av		182.37	mg/l	sd	3.855	%cv	2.11
Cd_228	av		0.005	mg/l	sd	0.0006	%cv	11.43
Cr_267	av		0.240	mg/l	sd	0.0099	%cv	4.12
Co_231	av		0.111	mg/l	sd	0.0154	%cv	13.79
Copper	av		0.127	mg/l	sd	0.0058	%cv	4.58
M3639-65	rep	1	Lead	conc	-0.21	mg/l		window edge
	rep	1	Chromium	conc	0.225	mg/l		
	rep	1	Nickel	conc	0.227	mg/l		
	rep	1	Zinc	conc	0.265	mg/l		
	rep	1	Fe_258	conc	148.51	mg/l		
	rep	1	Cobalt	conc	0.160	mg/l		
	rep	1	Cr_267	conc	0.193	mg/l		
	rep	1	Cd_228	conc	0.003	mg/l		
	rep	1	Copper	conc	0.107	mg/l		
	rep	1	Co_231	conc	0.128	mg/l		
	rep	2	Lead	conc	0.09	mg/l		
	rep	2	Chromium	conc	0.220	mg/l		
	rep	2	Nickel	conc	0.236	mg/l		
	rep	2	Zinc	conc	0.254	mg/l		
	rep	2	Fe_258	conc	152.83	mg/l		
	rep	2	Cobalt	conc	0.156	mg/l		
	rep	2	Cr_267	conc	0.203	mg/l		
	rep	2	Cd_228	conc	-0.002	mg/l		
	rep	2	Copper	conc	0.110	mg/l		
	rep	2	Co_231	conc	0.150	mg/l		
	rep	3	Lead	conc	0.05	mg/l		
	rep	3	Chromium	conc	0.198	mg/l		
	rep	3	Nickel	conc	0.251	mg/l		
	rep	3	Zinc	conc	0.248	mg/l		
	rep	3	Fe_258	conc	153.40	mg/l		
	rep	3	Cobalt	conc	0.147	mg/l		
	rep	3	Cr_267	conc	0.195	mg/l		
	rep	3	Cd_228	conc	0.005	mg/l		
	rep	3	Copper	conc	0.114	mg/l		
	rep	3	Co_231	conc	0.131	mg/l		
M3639-65								
Lead	av		-0.02	mg/l	sd	0.166	%cv	731.74
Chromium	av		0.204	mg/l	sd	0.0316	%cv	15.46
Nickel	av		0.238	mg/l	sd	0.0119	%cv	4.99
Zinc	av		0.256	mg/l	sd	0.0116	%cv	4.47
Fe_258	av		151.58	mg/l	sd	2.678	%cv	1.77
Cobalt	av		0.154	mg/l	sd	0.0069	%cv	4.45
Cr_267	av		0.197	mg/l	sd	0.0053	%cv	2.70
Cd_228	av		0.002	mg/l	sd	0.0032	%cv	171.54
Copper	av		0.110	mg/l	sd	0.0036	%cv	3.23

Co_231	av	0.136 mg/l			sd	0.0118	%cv	8.66	
09-66	rep	1	Lead	conc		0.12	mg/l		
	rep	1	Chromium	conc		0.151	mg/l		
	rep	1	Nickel	conc		0.249	mg/l		
	rep	1	Zinc	conc		0.252	mg/l		
	rep	1	Fe_258	conc		147.29	mg/l		
	rep	1	Cobalt	conc		0.157	mg/l		
	rep	1	Cr_267	conc		0.188	mg/l		
	rep	1	Cd_228	conc		0.005	mg/l		
	rep	1	Copper	conc		0.158	mg/l		
	rep	1	Co_231	conc		0.138	mg/l		
	rep	2	Lead	conc		0.13	mg/l		
	rep	2	Chromium	conc		0.178	mg/l		
	rep	2	Nickel	conc		0.238	mg/l		
	rep	2	Zinc	conc		0.231	mg/l		
	rep	2	Fe_258	conc		144.08	mg/l		
	rep	2	Cobalt	conc		0.139	mg/l		
	rep	2	Cr_267	conc		0.182	mg/l		
	rep	2	Cd_228	conc		-0.004	mg/l		
	rep	2	Copper	conc		0.134	mg/l		
	rep	2	Co_231	conc		0.140	mg/l		
	rep	3	Lead	conc		0.11	mg/l		
	rep	3	Chromium	conc		0.164	mg/l		
	rep	3	Nickel	conc		0.234	mg/l		
	rep	3	Zinc	conc		0.244	mg/l		
	rep	3	Fe_258	conc		140.58	mg/l		
	rep	3	Cobalt	conc		0.153	mg/l		
	rep	3	Cr_267	conc		0.199	mg/l		
	rep	3	Cd_228	conc		0.007	mg/l		
	rep	3	Copper	conc		0.149	mg/l		
	rep	3	Co_231	conc		0.113	mg/l		
M3639-66									
Lead	av	0.12 mg/l			sd	0.012	%cv	10.07	
Chromium	av	0.164 mg/l			sd	0.0135	%cv	8.23	
Nickel	av	0.240 mg/l			sd	0.0078	%cv	3.25	
Zinc	av	0.243 mg/l			sd	0.0108	%cv	4.44	
Fe_258	av	146.65 mg/l			sd	2.317	%cv	1.58	
Cobalt	av	0.150 mg/l			sd	0.0103	%cv	6.85	
Cr_267	av	0.183 mg/l			sd	0.0158	%cv	8.62	
Cd_228	av	0.003 mg/l			sd	0.0056	%cv	202.64	
Copper	av	0.147 mg/l			sd	0.0121	%cv	8.20	
Co_231	av	0.130 mg/l			sd	0.0237	%cv	17.21	
#1 standard	rep	1	Lead	em		44.1	conc	1.00	
	rep	1	Chromium	em		82.5	conc	1.000	
	rep	1	Nickel	em		293.8	conc	1.000	
	rep	1	Zinc	em		237.6	conc	1.000	
	rep	1	Cr_267	em		1213.5	conc	1.000	
	rep	1	Cobalt	em		266.5	conc	1.000	
	rep	1	Copper	em		1089.9	conc	1.000	
	rep	1	Cd_228	em		563.4	conc	1.000	
	rep	1	Co_231	em		159.2	conc	1.000	
	rep	2	Lead	em		46.7	conc	1.00	
	rep	2	Chromium	em		78.5	conc	1.000	
	rep	2	Nickel	em		287.9	conc	1.000	
	rep	2	Zinc	em		270.1	conc	1.000	
	rep	2	Cr_267	em		1301.3	conc	1.000	
	rep	2	Cobalt	em		269.5	conc	1.000	
	rep	2	Copper	em		1062.3	conc	1.000	

	rep	3	Cd_226	em	537.3	conc	1.000				
	rep	3	Co_231	em	158.7	conc	1.000				
	rep	3	Chromium	em	69.0	conc	1.000				
	rep	3	Lead	em	47.7	conc	1.00				
	rep	3	Zinc	em	310.8	conc	1.000				
	rep	3	Nickel	em	279.9	conc	1.000				
	rep	3	Cobalt	em	200.5	conc	1.000				
	rep	3	Cr_267	em	1220.4	conc	1.000				
	rep	3	Cd_228	em	504.1	conc	1.000				
	rep	3	Copper	em	1627.0	conc	1.000				
	rep	3	Co_231	em	163.9	conc	1.000				
#1 standard				Reruns							
Chromium	av	69.307		69	sd	6.5153	%cv	9.40	conc	1.000	
Lead	av	46.23		45	sd	1.907	%cv	4.13	conc	1.00	
Zinc	av	298.828		300	sd	11.6176	%cv	3.89	conc	1.000	
Nickel	av	287.180		271	sd	6.9777	%cv	2.43	conc	1.000	
Cobalt	av	272.164		262	sd	7.3327	%cv	2.69	conc	1.000	
Cr_267	av	1246.243		1211	sd	40.3093	%cv	3.23	conc	1.000	
Cd_228	av	568.250		561	sd	14.0578	%cv	2.47	conc	1.000	
Copper	av	1633.240		1605	sd	33.9617	%cv	2.08	conc	1.000	
Co_231	av	160.584		157	sd	2.9015	%cv	1.81	conc	1.000	
#3 standard	rep	1	Fe_258	em	39375.7	conc	100.00				
	rep	2	Fe_258	em	40518.3	conc	100.00				
	rep	3	Fe_258	em	38795.7	conc	100.00				
#3 standard											
Fe_258	av	39561.55		38607	sd	873.790	%cv	2.21	conc	100.00	
39-87	rep	1	Lead	conc	0.02	mg/l				window edge	
	rep	1	Chromium	conc	0.279	mg/l					
	rep	1	Nickel	conc	0.406	mg/l					
	rep	1	Zinc	conc	0.397	mg/l					
	rep	1	Fe_258	conc	240.35	mg/l					
	rep	1	Cobalt	conc	0.331	mg/l					
	rep	1	Cr_267	conc	0.297	mg/l					
	rep	1	Cd_228	conc	0.003	mg/l					
	rep	1	Copper	conc	0.170	mg/l					
	rep	1	Co_231	conc	0.376	mg/l					
	rep	2	Lead	conc	0.07	mg/l					
	rep	2	Chromium	conc	0.292	mg/l					
	rep	2	Nickel	conc	0.436	mg/l					
	rep	2	Zinc	conc	0.409	mg/l					
	rep	2	Fe_258	conc	245.31	mg/l					
	rep	2	Cobalt	conc	0.355	mg/l					
	rep	2	Cr_267	conc	0.301	mg/l					
	rep	2	Cd_228	conc	0.004	mg/l					
	rep	2	Copper	conc	0.170	mg/l					
	rep	2	Co_231	conc	0.349	mg/l					
	rep	3	Lead	conc	-0.26	mg/l				window edge	
	rep	3	Chromium	conc	0.280	mg/l					
	rep	3	Nickel	conc	0.395	mg/l					
	rep	3	Zinc	conc	0.400	mg/l					
	rep	3	Fe_258	conc	243.31	mg/l					
	rep	3	Cobalt	conc	0.340	mg/l					
	rep	3	Cr_267	conc	0.292	mg/l					
	rep	3	Cd_228	conc	-0.004	mg/l				window edge	
	rep	3	Copper	conc	0.138	mg/l					
	rep	3	Co_231	conc	0.353	mg/l					
M3839-87											
Lead	av	-0.06	mg/l		sd	0.179	%cv	313.35			

Chromium	av	0.284	mg/l	sd	0.0074	%cv	2.62
Nickel	av	0.412	mg/l	sd	0.0214	%cv	5.19
Zinc	av	0.405	mg/l	sd	0.0065	%cv	1.61
Fe_258	av	242.99	mg/l	sd	2.496	%cv	1.03
Cobalt	av	0.345	mg/l	sd	0.021	%cv	6.51
Cr_267	av	0.297	mg/l	sd	0.0048	%cv	1.65
Cd_228	av	0.001	mg/l	sd	0.0044	%cv	524.49
Copper	av	0.176	mg/l	sd	0.0104	%cv	5.93
Co_231	av	0.359	mg/l	sd	0.0146	%cv	4.07

M3639-68	rep	1	Lead	conc	0.19	mg/l
	rep	1	Chromium	conc	0.543	mg/l
	rep	1	Nickel	conc	0.469	mg/l
	rep	1	Zinc	conc	0.923	mg/l
	rep	1	Fe_258	conc	346.21	mg/l
	rep	1	Cobalt	conc	0.265	mg/l
	rep	1	Cr_267	conc	0.579	mg/l
	rep	1	Cd_228	conc	0.007	mg/l
	rep	1	Copper	conc	0.196	mg/l
	rep	1	Co_231	conc	0.236	mg/l
	rep	2	Lead	conc	-0.11	mg/l
	rep	2	Chromium	conc	0.498	mg/l
	rep	2	Nickel	conc	0.443	mg/l
	rep	2	Zinc	conc	0.920	mg/l
	rep	2	Fe_258	conc	356.91	mg/l
	rep	2	Cobalt	conc	0.252	mg/l
	rep	2	Cr_267	conc	0.556	mg/l
	rep	2	Cd_228	conc	0.006	mg/l
	rep	2	Copper	conc	0.196	mg/l
	rep	2	Co_231	conc	0.237	mg/l
	rep	3	Lead	conc	-0.29	mg/l window edge
	rep	3	Chromium	conc	0.582	mg/l
	rep	3	Nickel	conc	0.457	mg/l
	rep	3	Zinc	conc	0.919	mg/l
	rep	3	Fe_258	conc	352.02	mg/l
	rep	3	Cobalt	conc	0.252	mg/l
	rep	3	Cr_267	conc	0.580	mg/l
	rep	3	Cd_228	conc	0.000	mg/l
	rep	3	Copper	conc	0.195	mg/l
	rep	3	Co_231	conc	0.242	mg/l

M3639-68

Lead	av	-0.07	mg/l	sd	0.248	%cv	348.80
Chromium	av	0.541	mg/l	sd	0.0418	%cv	7.73
Nickel	av	0.456	mg/l	sd	0.0133	%cv	2.92
Zinc	av	0.921	mg/l	sd	0.0025	%cv	0.27
Fe_258	av	351.80	mg/l	sd	4.880	%cv	1.39
Cobalt	av	0.256	mg/l	sd	0.0078	%cv	3.00
Cr_267	av	0.558	mg/l	sd	0.0202	%cv	3.62
Cd_228	av	0.005	mg/l	sd	0.0021	%cv	39.49
Copper	av	0.196	mg/l	sd	0.0007	%cv	0.35
Co_231	av	0.238	mg/l	sd	0.0036	%cv	1.51

M3639-69	rep	1	Lead	conc	0.47	mg/l
	rep	1	Chromium	conc	0.347	mg/l
	rep	1	Nickel	conc	1.040	mg/l
	rep	1	Zinc	conc	0.713	mg/l
	rep	1	Fe_258	conc	418.97	mg/l
	rep	1	Cobalt	conc	0.303	mg/l
	rep	1	Cr_267	conc	0.304	mg/l
	rep	1	Cd_228	conc	-0.001	mg/l

	rep	1	Copper	conc	0.130	mg/l	
	rep	1	Co_231	conc	3.031	mg/l	
	rep	2	Lead	conc	0.55	mg/l	
	rep	2	Chromium	conc	0.340	mg/l	
	rep	2	Nickel	conc	1.030	mg/l	
	rep	2	Zinc	conc	0.744	mg/l	
	rep	2	Fe_258	conc	439.12	mg/l	
	rep	2	Cobalt	conc	3.229	mg/l	
	rep	2	Cr_267	conc	0.380	mg/l	
	rep	2	Cd_228	conc	0.005	mg/l	
	rep	2	Copper	conc	0.126	mg/l	
	rep	2	Co_231	conc	3.328	mg/l	
	rep	3	Lead	conc	0.48	mg/l	
	rep	3	Chromium	conc	0.400	mg/l	
	rep	3	Nickel	conc	1.085	mg/l	
	rep	3	Zinc	conc	0.698	mg/l	
	rep	3	Fe_258	conc	432.12	mg/l	
	rep	3	Cobalt	conc	3.322	mg/l	
	rep	3	Cr_267	conc	0.357	mg/l	
	rep	3	Cd_228	conc	0.007	mg/l	
	rep	3	Copper	conc	0.134	mg/l	
	rep	3	Co_231	conc	3.508	mg/l	
M3639-69							
Lead	av	0.50	mg/l	sd	0.044	%cv	8.78
Chromium	av	0.365	mg/l	sd	0.0305	%cv	8.33
Nickel	av	1.055	mg/l	sd	0.0266	%cv	2.53
Zinc	av	0.719	mg/l	sd	0.0233	%cv	3.25
Fe_258	av	430.07	mg/l	sd	10.229	%cv	2.38
Cobalt	av	3.285	mg/l	sd	0.0489	%cv	1.49
Cr_267	av	0.364	mg/l	sd	0.0139	%cv	3.82
Cd_228	av	0.003	mg/l	sd	0.0039	%cv	115.42
Copper	av	0.129	mg/l	sd	0.0039	%cv	2.98
Co_231	av	3.389	mg/l	sd	0.1030	%cv	3.04
M3639-70	rep	1	Lead	conc	-0.07	mg/l	
	rep	1	Chromium	conc	0.422	mg/l	
	rep	1	Nickel	conc	0.542	mg/l	
	rep	1	Zinc	conc	0.697	mg/l	
	rep	1	Fe_258	conc	350.70	mg/l	
	rep	1	Cobalt	conc	0.331	mg/l	
	rep	1	Cr_267	conc	0.440	mg/l	
	rep	1	Cd_228	conc	0.001	mg/l	
	rep	1	Copper	conc	0.138	mg/l	
	rep	1	Co_231	conc	0.892	mg/l	
	rep	2	Lead	conc	-0.30	mg/l	
	rep	2	Chromium	conc	0.444	mg/l	
	rep	2	Nickel	conc	0.525	mg/l	
	rep	2	Zinc	conc	0.603	mg/l	
	rep	2	Fe_258	conc	347.07	mg/l	
	rep	2	Cobalt	conc	0.836	mg/l	
	rep	2	Cr_267	conc	0.452	mg/l	
	rep	2	Cd_228	conc	-0.007	mg/l	window edge
	rep	2	Copper	conc	0.144	mg/l	
	rep	2	Co_231	conc	0.872	mg/l	
	rep	3	Lead	conc	0.20	mg/l	
	rep	3	Chromium	conc	0.388	mg/l	
	rep	3	Nickel	conc	0.537	mg/l	
	rep	3	Zinc	conc	0.712	mg/l	
	rep	3	Fe_258	conc	338.27	mg/l	
	rep	3	Cobalt	conc	0.730	mg/l	

	rep	3	Cr_267	conc	0.403	mg/l				
	rep	3	Cd_228	conc	0.006	mg/l				
	rep	3	Copper	conc	0.130	mg/l				
	rep	3	Co_231	conc	0.721	mg/l				
M3639-70										
Lead	av	-0.06	mg/l		sd	0.254	%cv	452.93		
Chromium	av	0.419	mg/l		sd	0.0284	%cv	6.78		
Nickel	av	0.535	mg/l		sd	0.0090	%cv	1.68		
Zinc	av	0.699	mg/l		sd	0.0120	%cv	1.72		
Fe_258	av	345.34	mg/l		sd	6.309	%cv	1.85		
Cobalt	av	0.900	mg/l		sd	0.0286	%cv	3.18		
Cr_267	av	0.442	mg/l		sd	0.0094	%cv	2.13		
Cd_228	av	-0.000	mg/l		sd	0.0064	%cv	2001.9		
Copper	av	0.140	mg/l		sd	0.0043	%cv	3.08		
Co_231	av	0.895	mg/l		sd	0.0243	%cv	2.72		
M3639-71	rep	1	Lead	conc	0.22	mg/l				
	rep	1	Chromium	conc	0.343	mg/l				
	rep	1	Nickel	conc	0.532	mg/l				
	rep	1	Zinc	conc	0.647	mg/l				
	rep	1	Fe_258	conc	310.85	mg/l				
	rep	1	Cobalt	conc	0.854	mg/l				
	rep	1	Cr_267	conc	0.348	mg/l				
	rep	1	Cd_228	conc	-0.000	mg/l				
	rep	1	Copper	conc	0.149	mg/l				
	rep	1	Co_231	conc	0.832	mg/l				
	rep	2	Lead	conc	-0.06	mg/l			window edge	
	rep	2	Chromium	conc	0.348	mg/l				
	rep	2	Nickel	conc	0.503	mg/l				
	rep	2	Zinc	conc	0.634	mg/l				
	rep	2	Fe_258	conc	311.44	mg/l				
	rep	2	Cobalt	conc	0.905	mg/l				
	rep	2	Cr_267	conc	0.376	mg/l				
	rep	2	Cd_228	conc	0.004	mg/l				
	rep	2	Copper	conc	0.134	mg/l				
	rep	2	Co_231	conc	0.883	mg/l				
	rep	3	Lead	conc	0.03	mg/l				
	rep	3	Chromium	conc	0.325	mg/l				
	rep	3	Nickel	conc	0.539	mg/l				
	rep	3	Zinc	conc	0.585	mg/l				
	rep	3	Fe_258	conc	312.13	mg/l				
	rep	3	Cobalt	conc	0.884	mg/l				
	rep	3	Cr_267	conc	0.366	mg/l				
	rep	3	Cd_228	conc	0.003	mg/l				
	rep	3	Copper	conc	0.127	mg/l				
	rep	3	Co_231	conc	0.847	mg/l				
M3639-71										
Lead	av	0.07	mg/l		sd	0.141	%cv	200.11		
Chromium	av	0.339	mg/l		sd	0.0120	%cv	3.54		
Nickel	av	0.525	mg/l		sd	0.0192	%cv	3.66		
Zinc	av	0.655	mg/l		sd	0.0263	%cv	4.01		
Fe_258	av	314.14	mg/l		sd	4.095	%cv	1.30		
Cobalt	av	0.881	mg/l		sd	0.0254	%cv	2.87		
Cr_267	av	0.363	mg/l		sd	0.0140	%cv	3.85		
Cd_228	av	0.002	mg/l		sd	0.0021	%cv	91.97		
Copper	av	0.137	mg/l		sd	0.0115	%cv	8.41		
Co_231	av	0.871	mg/l		sd	0.0203	%cv	2.33		
M3639-72	rep	1	Lead	conc	0.03	mg/l				
	rep	1	Chromium	conc	0.508	mg/l				

rep	1	Nickel	conc	0.341	mg/l	
rep	1	Zinc	conc	0.521	mg/l	
rep	1	Fe_258	conc	313.43	mg/l	
rep	1	Cobalt	conc	0.151	mg/l	
rep	1	Cr_267	conc	0.504	mg/l	
rep	1	Cd_228	conc	0.006	mg/l	
rep	1	Copper	conc	0.170	mg/l	
rep	1	Co_231	conc	0.166	mg/l	
rep	2	Chromium	conc	0.557	mg/l	
rep	2	Lead	conc	-0.03	mg/l	
rep	2	Zinc	conc	0.536	mg/l	
rep	2	Nickel	conc	0.401	mg/l	
rep	2	Cobalt	conc	0.172	mg/l	
rep	2	Fe_258	conc	319.17	mg/l	
rep	2	Cd_228	conc	0.008	mg/l	
rep	2	Cr_267	conc	0.516	mg/l	
rep	2	Co_231	conc	0.147	mg/l	
rep	2	Copper	conc	0.187	mg/l	
rep	3	Lead	conc	0.28	mg/l	
rep	3	Chromium	conc	0.518	mg/l	
rep	3	Nickel	conc	0.337	mg/l	
rep	3	Zinc	conc	0.537	mg/l	
rep	3	Fe_258	conc	313.62	mg/l	
rep	3	Cobalt	conc	0.183	mg/l	
rep	3	Cr_267	conc	0.512	mg/l	
rep	3	Cd_228	conc	-0.002	mg/l	
rep	3	Copper	conc	0.177	mg/l	
rep	3	Co_231	conc	0.170	mg/l	

39-72

Lead	av	0.09	mg/l	sd	0.164	%cv 175.25
Chromium	av	0.548	mg/l	sd	0.0262	%cv 4.73
Nickel	av	0.359	mg/l	sd	0.0362	%cv 10.06
Zinc	av	0.531	mg/l	sd	0.0092	%cv 1.74
Fe_258	av	314.40	mg/l	sd	4.429	%cv 1.41
Cobalt	av	0.172	mg/l	sd	0.0108	%cv 6.30
Cr_267	av	0.511	mg/l	sd	0.0073	%cv 1.43
Cd_228	av	0.004	mg/l	sd	0.0053	%cv 107.61
Copper	av	0.171	mg/l	sd	0.0054	%cv 3.15
Co_231	av	0.167	mg/l	sd	0.0197	%cv 11.74

#1 standard	rep	1	Lead	em	51.2	conc	1.00
	rep	1	Chromium	em	77.0	conc	1.000
	rep	1	Nickel	em	295.0	conc	1.000
	rep	1	Zinc	em	279.1	conc	1.000
	rep	1	Cr_267	em	1204.0	conc	1.000
	rep	1	Cobalt	em	260.5	conc	1.000
	rep	1	Copper	em	1635.0	conc	1.000
	rep	1	Cd_228	em	550.7	conc	1.000
	rep	1	Co_231	em	185.9	conc	1.000
	rep	2	Chromium	em	71.6	conc	1.000
	rep	2	Lead	em	53.0	conc	1.00
	rep	2	Zinc	em	269.5	conc	1.000
	rep	2	Nickel	em	311.7	conc	1.000
	rep	2	Cobalt	em	258.2	conc	1.000
	rep	2	Cr_267	em	1312.8	conc	1.000
	rep	2	Cd_228	em	547.1	conc	1.000
	rep	2	Copper	em	1640.7	conc	1.000
	rep	2	Co_231	em	155.2	conc	1.000
	rep	3	Lead	em	49.5	conc	1.00
	rep	3	Chromium	em	73.3	conc	1.000

	rep	3	Nickel	em	290.9	conc	1.000			
	rep	3	Zinc	em	282.1	conc	1.000			
	rep	3	Cr_267	em	1350.0	conc	1.000			
	rep	3	Cobalt	em	262.3	conc	1.000			
	rep	3	Copper	em	1640.9	conc	1.000			
	rep	3	Cd_228	em	572.6	conc	1.000			
	rep	3	Co_231	em	155.9	conc	1.000			
#1 standard										
Lead	av	81.25		sd	1.741	%cv	3.40	conc	1.00	
Chromium	av	74.032		sd	2.7373	%cv	3.77	conc	1.000	
Nickel	av	301.857		sd	8.7065	%cv	2.80	conc	1.000	
Zinc	av	283.584		sd	5.3749	%cv	1.70	conc	1.000	
Cr_267	av	1315.847		sd	33.4704	%cv	2.55	conc	1.000	
Cobalt	av	260.477		sd	2.2960	%cv	0.83	conc	1.000	
Copper	av	1639.851		sd	4.4549	%cv	0.27	conc	1.000	
Cd_228	av	567.577		sd	13.0825	%cv	2.35	conc	1.000	
Co_231	av	155.677		sd	0.4299	%cv	0.28	conc	1.000	
#8 standard	rep	1	Fe_258	em	42050.7	conc	100.00			
	rep	2	Fe_258	em	40160.5	conc	100.00			
	rep	3	Fe_258	em	39999.8	conc	100.00			
#8 standard										
Fe_258	av	40739.61		sd	1138.585	%cv	2.79	conc	100.00	
DI	rep	1	Lead	conc	0.20	mg/l				
	rep	1	Chromium	conc	0.013	mg/l				
	rep	1	Nickel	conc	0.030	mg/l				
	rep	1	Zinc	conc	0.004	mg/l				
	rep	1	Fe_258	conc	0.38	mg/l				
	rep	1	Cobalt	conc	-0.001	mg/l				
	rep	1	Cr_267	conc	-0.009	mg/l				
	rep	1	Cd_228	conc	-0.008	mg/l			window edge	
	rep	1	Copper	conc	-0.005	mg/l			window edge	
	rep	1	Co_231	conc	-0.016	mg/l			window edge	
	rep	2	Lead	conc	-0.03	mg/l			window edge	
	rep	2	Chromium	conc	0.012	mg/l				
	rep	2	Nickel	conc	0.017	mg/l				
	rep	2	Zinc	conc	0.004	mg/l				
	rep	2	Fe_258	conc	0.17	mg/l				
	rep	2	Cobalt	conc	-0.003	mg/l				
	rep	2	Cr_267	conc	0.000	mg/l			window edge	
	rep	2	Cd_228	conc	-0.006	mg/l			window edge	
	rep	2	Copper	conc	0.000	mg/l				
	rep	2	Co_231	conc	-0.007	mg/l				
	rep	3	Lead	conc	0.05	mg/l				
	rep	3	Chromium	conc	0.018	mg/l				
	rep	3	Nickel	conc	0.026	mg/l				
	rep	3	Zinc	conc	0.005	mg/l				
	rep	3	Fe_258	conc	0.03	mg/l				
	rep	3	Cobalt	conc	-0.002	mg/l				
	rep	3	Cr_267	conc	0.006	mg/l				
	rep	3	Cd_228	conc	0.001	mg/l				
	rep	3	Copper	conc	0.015	mg/l				
	rep	3	Co_231	conc	0.012	mg/l				
Lead	av	0.08	mg/l	sd	0.119	%cv	142.56			
Chromium	av	0.014	mg/l	sd	0.003	%cv	22.11			
Nickel	av	0.024	mg/l	sd	0.0065	%cv	27.16			
Zinc	av	0.004	mg/l	sd	0.0009	%cv	21.47			
Fe_258	av	0.19	mg/l	sd	0.180	%cv	92.50			

Cobalt	av	-0.003 mg/l		sd	0.0020 %cv	72.97	
Cr_267	av	-0.001 mg/l		sd	0.0073 %cv	618.38	
Cd_228	av	-0.004 mg/l		sd	0.0049 %cv	118.29	
Copper	av	0.003 mg/l		sd	0.0107 %cv	307.12	
Co_231	av	-0.003 mg/l		sd	0.0140 %cv	400.76	

ICPS/500Fe	rep	1	Lead	conc	0.89 mg/l	
	rep	1	Chromium	conc	0.902 mg/l	
	rep	1	Nickel	conc	0.849 mg/l	
	rep	1	Zinc	conc	1.026 mg/l	
	rep	1	Fe_258	conc	481.59 mg/l	
	rep	1	Cobalt	conc	0.912 mg/l	
	rep	1	Cr_267	conc	0.894 mg/l	
	rep	1	Cd_228	conc	0.958 mg/l	
	rep	1	Copper	conc	0.921 mg/l	
	rep	1	Co_231	conc	0.900 mg/l	
	rep	2	Lead	conc	0.83 mg/l	
	rep	2	Chromium	conc	0.848 mg/l	
	rep	2	Nickel	conc	0.885 mg/l	
	rep	2	Zinc	conc	1.003 mg/l	
	rep	2	Fe_258	conc	480.76 mg/l	
	rep	2	Cobalt	conc	0.930 mg/l	
	rep	2	Cr_267	conc	0.942 mg/l	
	rep	2	Cd_228	conc	0.989 mg/l	
	rep	2	Copper	conc	0.996 mg/l	
	rep	2	Co_231	conc	0.816 mg/l	
	rep	3	Lead	conc	0.89 mg/l	
	rep	3	Chromium	conc	0.938 mg/l	
	rep	3	Nickel	conc	0.865 mg/l	
	rep	3	Zinc	conc	0.975 mg/l	
	rep	3	Fe_258	conc	459.51 mg/l	
	rep	3	Cobalt	conc	0.918 mg/l	
	rep	3	Cr_267	conc	0.922 mg/l	
	rep	3	Cd_228	conc	0.935 mg/l	
	rep	3	Copper	conc	0.968 mg/l	
	rep	3	Co_231	conc	0.864 mg/l	

0.1ml des 3019
1ml des 3838
to 10ml w/ acid blk

								Recovery
ICPS/500Fe								
Lead	av	0.87 mg/l		sd	0.034 %cv	3.88		87
Chromium	av	0.896 mg/l		sd	0.0455 %cv	5.08		90
Nickel	av	0.867 mg/l		sd	0.0181 %cv	2.09		87
Zinc	av	1.001 mg/l		sd	0.0254 %cv	2.53		100
Fe_258	av	473.95 mg/l	500	sd	12.512 %cv	2.64		95
Cobalt	av	0.920 mg/l		sd	0.0091 %cv	0.99		92
Cr_267	av	0.920 mg/l		sd	0.0240 %cv	2.61		92
Cd_228	av	0.961 mg/l		sd	0.0273 %cv	2.84		96
Copper	av	0.962 mg/l		sd	0.0377 %cv	3.92		96
Co_231	av	0.860 mg/l		sd	0.0423 %cv	4.92		86

M3639-73	rep	1	Lead	conc	-0.26 mg/l	window edge
	rep	1	Chromium	conc	0.693 mg/l	
	rep	1	Nickel	conc	0.510 mg/l	
	rep	1	Zinc	conc	1.001 mg/l	
	rep	1	Fe_258	conc	435.75 mg/l	
	rep	1	Cobalt	conc	0.201 mg/l	
	rep	1	Cr_267	conc	0.679 mg/l	
	rep	1	Cd_228	conc	0.002 mg/l	
	rep	1	Copper	conc	0.289 mg/l	
	rep	1	Co_231	conc	0.169 mg/l	
	rep	2	Chromium	conc	0.704 mg/l	
	rep	2	Lead	conc	-0.29 mg/l	window edge

	rep	3	Zinc	conc	0.951	mg/l	
	rep	2	Nickel	conc	0.437	mg/l	
	rep	2	Cobalt	conc	0.101	mg/l	
	rep	2	Fe_259	conc	449.79	mg/l	
	rep	2	Cd_228	conc	0.006	mg/l	
	rep	2	Cr_267	conc	0.710	mg/l	
	rep	2	Co_231	conc	0.190	mg/l	
	rep	2	Copper	conc	0.294	mg/l	
	rep	3	Lead	conc	-0.24	mg/l	window edge
	rep	3	Chromium	conc	0.693	mg/l	
	rep	3	Nickel	conc	0.494	mg/l	
	rep	3	Zinc	conc	1.007	mg/l	
	rep	3	Fe_259	conc	455.54	mg/l	
	rep	3	Cobalt	conc	0.190	mg/l	
	rep	3	Cr_267	conc	0.721	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Copper	conc	0.288	mg/l	
	rep	3	Co_231	conc	0.134	mg/l	
M3639-73							
Lead	av	-0.26	mg/l	sd	0.025	%cv	9.43
Chromium	av	0.696	mg/l	sd	0.0063	%cv	0.90
Nickel	av	0.480	mg/l	sd	0.0383	%cv	7.96
Zinc	av	0.986	mg/l	sd	0.0308	%cv	3.13
Fe_259	av	447.03	mg/l	sd	10.178	%cv	2.28
Cobalt	av	0.190	mg/l	sd	0.0101	%cv	5.29
Cr_267	av	0.703	mg/l	sd	0.0220	%cv	3.12
Cd_228	av	0.004	mg/l	sd	0.0021	%cv	50.85
Copper	av	0.290	mg/l	sd	0.0033	%cv	1.14
Co_231	av	0.164	mg/l	sd	0.0282	%cv	17.15
M3639-74	rep	1	Lead	conc	0.08	mg/l	
	rep	1	Chromium	conc	0.746	mg/l	
	rep	1	Nickel	conc	0.699	mg/l	
	rep	1	Zinc	conc	1.072	mg/l	
	rep	1	Fe_259	conc	528.91	mg/l	
	rep	1	Cobalt	conc	1.866	mg/l	
	rep	1	Cr_267	conc	0.719	mg/l	
	rep	1	Cd_228	conc	0.003	mg/l	
	rep	1	Copper	conc	0.258	mg/l	
	rep	1	Co_231	conc	1.305	mg/l	
	rep	2	Lead	conc	-0.25	mg/l	window edge
	rep	2	Chromium	conc	0.603	mg/l	
	rep	2	Nickel	conc	0.691	mg/l	
	rep	2	Zinc	conc	1.425	mg/l	
	rep	2	Fe_259	conc	565.03	mg/l	
	rep	2	Cobalt	conc	1.824	mg/l	
	rep	2	Cr_267	conc	0.724	mg/l	
	rep	2	Cd_228	conc	0.001	mg/l	
	rep	3	Copper	conc	0.263	mg/l	
	rep	3	Co_231	conc	1.846	mg/l	
	rep	3	Chromium	conc	0.799	mg/l	
	rep	3	Lead	conc	-0.26	mg/l	window edge
	rep	3	Zinc	conc	1.363	mg/l	
	rep	3	Nickel	conc	0.640	mg/l	
	rep	3	Cobalt	conc	1.877	mg/l	
	rep	3	Fe_259	conc	560.52	mg/l	
	rep	3	Cd_228	conc	0.004	mg/l	
	rep	3	Cr_267	conc	0.683	mg/l	
	rep	3	Co_231	conc	1.782	mg/l	
	rep	3	Copper	conc	0.270	mg/l	

M3639-74

Chromium	av	0.741	mg/l	sd	0.0502	%cv 9.33
Lead	av	-0.14	mg/l	sd	0.193	%cv 105.75
Zinc	av	1.397	mg/l	sd	0.0334	%cv 2.41
Nickel	av	0.678	mg/l	sd	0.0300	%cv 4.42
Cobalt	av	1.856	mg/l	sd	0.0281	%cv 1.51
Fe_258	av	551.47	mg/l	sd	19.632	%cv 3.57
Cd_228	av	0.003	mg/l	sd	0.0016	%cv 64.34
Cr_267	av	0.709	mg/l	sd	0.0225	%cv 3.18
Co_231	av	1.804	mg/l	sd	0.0416	%cv 2.31
Copper	av	0.264	mg/l	sd	0.0077	%cv 2.97

M3639-75	rep	1	Lead	conc	-0.31	mg/l window edge
	rep	1	Chromium	conc	0.382	mg/l
	rep	1	Nickel	conc	0.371	mg/l
	rep	1	Zinc	conc	0.770	mg/l
	rep	1	Fe_258	conc	297.19	mg/l
	rep	1	Cobalt	conc	0.213	mg/l
	rep	1	Cr_267	conc	0.454	mg/l
	rep	1	Cd_228	conc	0.001	mg/l
	rep	1	Copper	conc	0.166	mg/l
	rep	1	Co_231	conc	0.193	mg/l
	rep	2	Lead	conc	-0.21	mg/l window edge
	rep	2	Chromium	conc	0.490	mg/l
	rep	2	Nickel	conc	0.358	mg/l
	rep	2	Zinc	conc	0.775	mg/l
	rep	2	Fe_258	conc	306.76	mg/l
	rep	2	Cobalt	conc	0.195	mg/l
	rep	2	Cr_267	conc	0.454	mg/l
	rep	2	Cd_228	conc	-0.000	mg/l
	rep	2	Copper	conc	0.167	mg/l
	rep	2	Co_231	conc	0.234	mg/l
	rep	3	Lead	conc	-0.32	mg/l window edge
	rep	3	Chromium	conc	0.466	mg/l
	rep	3	Nickel	conc	0.331	mg/l
	rep	3	Zinc	conc	0.777	mg/l
	rep	3	Fe_258	conc	304.10	mg/l
	rep	3	Cobalt	conc	0.235	mg/l
	rep	3	Cr_267	conc	0.449	mg/l
	rep	3	Cd_228	conc	0.002	mg/l
	rep	3	Copper	conc	0.190	mg/l
	rep	3	Co_231	conc	0.185	mg/l

M3639-75

Lead	av	-0.28	mg/l	sd	0.060	%cv 21.27
Chromium	av	0.446	mg/l	sd	0.0568	%cv 12.74
Nickel	av	~~0.368~~	mg/l OK	sd	0.0205	%cv 5.80
Zinc	av	0.774	mg/l	sd	0.0033	%cv 0.43
Fe_258	av	302.60	mg/l	sd	4.936	%cv 1.60
Cobalt	av	0.214	mg/l	sd	0.0202	%cv 9.40
Cr_267	av	0.452	mg/l	sd	0.0030	%cv 0.66
Cd_228	av	0.001	mg/l	sd	0.0009	%cv 102.01
Copper	av	0.174	mg/l	sd	0.0130	%cv 7.09
Co_231	av	0.204	mg/l	sd	0.0261	%cv 12.76

39-76	rep	1	Lead	conc	0.01	mg/l
	rep	1	Chromium	conc	0.272	mg/l
	rep	1	Nickel	conc	0.290	mg/l
	rep	1	Zinc	conc	0.445	mg/l
	rep	1	Fe_258	conc	257.56	mg/l
	rep	1	Cobalt	conc	0.142	mg/l

	rep	1	Cr_267	conc	0.319	mg/l	
	rep	1	Cd_228	conc	0.001	mg/l	
	rep	1	Copper	conc	0.203	mg/l	
	rep	1	Co_231	conc	0.123	mg/l	
	rep	2	Lead	conc	0.10	mg/l	
	rep	2	Chromium	conc	0.321	mg/l	
	rep	2	Nickel	conc	0.120	mg/l	window edge
	rep	2	Zinc	conc	0.454	mg/l	
	rep	2	Fe_258	conc	252.97	mg/l	
	rep	2	Cobalt	conc	0.154	mg/l	
	rep	2	Cr_267	conc	0.318	mg/l	
	rep	2	Cd_228	conc	0.000	mg/l	
	rep	2	Copper	conc	0.219	mg/l	
	rep	2	Co_231	conc	0.171	mg/l	
	rep	3	Lead	conc	-0.13	mg/l	window edge
	rep	3	Chromium	conc	0.382	mg/l	
	rep	3	Nickel	conc	0.097	mg/l	window edge
	rep	3	Zinc	conc	0.454	mg/l	
	rep	3	Fe_258	conc	258.78	mg/l	
	rep	3	Cobalt	conc	0.155	mg/l	
	rep	3	Cr_267	conc	0.314	mg/l	
	rep	3	Cd_228	conc	-0.001	mg/l	
	rep	3	Copper	conc	0.215	mg/l	
	rep	3	Co_231	conc	0.120	mg/l	

M3639-76

Lead	av	0.02	mg/l	sd	0.157 %cv 609.67
Chromium	av	0.318	mg/l	sd	0.0448 %cv 14.06
Nickel	av	0.172	mg/l	sd	0.1099 %cv 64.03
Zinc	av	0.451	mg/l	sd	0.0055 %cv 1.23
Fe_258	av	255.48	mg/l	sd	2.310 %cv 0.90
Cobalt	av	0.154	mg/l	sd	0.0116 %cv 7.54
Cr_267	av	0.317	mg/l	sd	0.0026 %cv 0.84
Cd_228	av	0.000	mg/l	sd	0.0006 %cv 399.26
Copper	av	0.212	mg/l	sd	0.0089 %cv 4.18
Co_231	av	0.138	mg/l	sd	0.0283 %cv 20.52

M3639-77

rep	1	Lead	conc	-0.01	mg/l
rep	1	Chromium	conc	0.327	mg/l
rep	1	Nickel	conc	0.330	mg/l
rep	1	Zinc	conc	0.461	mg/l
rep	1	Fe_258	conc	264.88	mg/l
rep	1	Cobalt	conc	0.124	mg/l
rep	1	Cr_267	conc	0.341	mg/l
rep	1	Cd_228	conc	0.001	mg/l
rep	1	Copper	conc	0.200	mg/l
rep	1	Co_231	conc	0.127	mg/l
rep	2	Lead	conc	0.12	mg/l
rep	2	Chromium	conc	0.364	mg/l
rep	2	Nickel	conc	0.304	mg/l
rep	2	Zinc	conc	0.411	mg/l
rep	2	Fe_258	conc	267.78	mg/l
rep	2	Cobalt	conc	0.123	mg/l
rep	2	Cr_267	conc	0.338	mg/l
rep	2	Cd_228	conc	0.001	mg/l
rep	2	Copper	conc	0.240	mg/l
rep	2	Co_231	conc	0.124	mg/l
rep	3	Lead	conc	-0.03	mg/l
rep	3	Chromium	conc	0.374	mg/l
rep	3	Nickel	conc	0.393	mg/l
rep	3	Zinc	conc	0.493	mg/l

window edge

	rep	3	Fe_258	conc	260.71	mg/l	
	rep	3	Cobalt	conc	0.137	mg/l	
	rep	3	Cr_267	conc	0.341	mg/l	
	rep	3	Cd_228	conc	-0.000	mg/l	window edge
	rep	3	Copper	conc	0.236	mg/l	
	rep	3	Co_231	conc	0.070	mg/l	
M3839-77							
Lead	av	0.00	mg/l	sd	0.070	%cv	301.93
Chromium	av	0.355	mg/l	sd	0.0248	%cv	6.98
Nickel	av	0.237	mg/l	sd	0.1263	%cv	52.86
Zinc	av	0.421	mg/l	sd	0.0369	%cv	8.78
Fe_258	av	262.11	mg/l	sd	3.825	%cv	1.46
Cobalt	av	0.129	mg/l	sd	0.0090	%cv	6.98
Cr_267	av	0.340	mg/l	sd	0.0018	%cv	0.54
Cd_228	av	-0.002	mg/l	sd	0.0055	%cv	295.18
Copper	av	0.235	mg/l	sd	0.0048	%cv	2.05
Co_231	av	0.107	mg/l	sd	0.0322	%cv	30.00
M3839-78	rep	1	Lead	conc	0.07	mg/l	
	rep	1	Chromium	conc	0.276	mg/l	
	rep	1	Nickel	conc	0.377	mg/l	
	rep	1	Zinc	conc	0.331	mg/l	
	rep	1	Fe_258	conc	232.02	mg/l	
	rep	1	Cobalt	conc	0.170	mg/l	
	rep	1	Cr_267	conc	0.290	mg/l	
	rep	1	Cd_228	conc	0.003	mg/l	
	rep	1	Copper	conc	0.229	mg/l	
	rep	1	Co_231	conc	0.143	mg/l	
	rep	2	Lead	conc	0.13	mg/l	
	rep	2	Chromium	conc	0.268	mg/l	
	rep	2	Nickel	conc	0.118	mg/l	window edge
	rep	2	Zinc	conc	0.378	mg/l	
	rep	2	Fe_258	conc	237.29	mg/l	
	rep	2	Cobalt	conc	0.150	mg/l	
	rep	2	Cr_267	conc	0.280	mg/l	
	rep	2	Cd_228	conc	0.003	mg/l	
	rep	2	Copper	conc	0.211	mg/l	
	rep	2	Co_231	conc	0.138	mg/l	
	rep	3	Lead	conc	0.13	mg/l	
	rep	3	Chromium	conc	0.263	mg/l	
	rep	3	Nickel	conc	0.395	mg/l	
	rep	3	Zinc	conc	0.400	mg/l	
	rep	3	Fe_258	conc	236.13	mg/l	
	rep	3	Cobalt	conc	0.155	mg/l	
	rep	3	Cr_267	conc	0.309	mg/l	
	rep	3	Cd_228	conc	0.002	mg/l	
	rep	3	Copper	conc	0.228	mg/l	
	rep	3	Co_231	conc	0.155	mg/l	
M3839-78							
Lead	av	0.11	mg/l	sd	0.036	%cv	32.09
Chromium	av	0.369	mg/l	sd	0.0067	%cv	1.80
Nickel	av	0.297	mg/l	sd	0.1553	%cv	52.34
Zinc	av	0.388	mg/l	sd	0.0117	%cv	3.02
Fe_258	av	235.42	mg/l	sd	2.321	%cv	0.99
Cobalt	av	0.160	mg/l	sd	0.0093	%cv	5.15
Cr_267	av	0.293	mg/l	sd	0.0144	%cv	4.90
Cd_228	av	0.003	mg/l	sd	0.0005	%cv	17.51
Copper	av	0.222	mg/l	sd	0.0101	%cv	4.56
Co_231	av	0.145	mg/l	sd	0.0035	%cv	5.05

#1 standard	rep	1	Lead	em	51.7	conc	1.00			
	rep	1	Chromium	em	70.6	conc	1.000			
	rep	1	Nickel	em	80.2	conc	1.000			window edge
	rep	1	Zinc	em	291.1	conc	1.000			
	rep	1	Cr_267	em	1306.4	conc	1.000			
	rep	1	Cobalt	em	260.3	conc	1.000			
	rep	1	Copper	em	1760.1	conc	1.000			
	rep	1	Cd_228	em	575.2	conc	1.000			
	rep	1	Co_231	em	145.7	conc	1.000			
	rep	2	Lead	em	49.2	conc	1.00			
	rep	2	Chromium	em	71.4	conc	1.000			
	rep	2	Nickel	em	78.9	conc	1.000			window edge
	rep	2	Zinc	em	286.6	conc	1.000			
	rep	2	Cr_267	em	1023.7	conc	1.000			
	rep	2	Cobalt	em	250.9	conc	1.000			
	rep	2	Copper	em	1726.7	conc	1.000			
	rep	2	Cd_228	em	538.9	conc	1.000			
	rep	2	Co_231	em	153.7	conc	1.000			
	rep	3	Lead	em	48.7	conc	1.00			
	rep	3	Chromium	em	70.3	conc	1.000			
	rep	3	Nickel	em	77.8	conc	1.000			window edge
	rep	3	Zinc	em	300.6	conc	1.000			
	rep	3	Cr_267	em	1301.9	conc	1.000			
	rep	3	Cobalt	em	260.3	conc	1.000			
	rep	3	Copper	em	1704.4	conc	1.000			
	rep	3	Cd_228	em	565.0	conc	1.000			
	rep	3	Co_231	em	157.8	conc	1.000			
#1 standard										
Lead	av	49.90			sd	1.614	%cv	3.24	conc	1.00
Chromium	av	70.563			sd	0.7393	%cv	1.05	conc	1.000
Nickel	av	77.333			sd	3.1677	%cv	4.10	conc	1.000
Zinc	av	292.849			sd	7.289	%cv	2.49	conc	1.000
Cr_267	av	1310.631			sd	11.5193	%cv	0.88	conc	1.000
Cobalt	av	262.430			sd	5.0079	%cv	1.91	conc	1.000
Copper	av	1759.717			sd	29.7431	%cv	1.69	conc	1.000
Cd_228	av	559.679			sd	18.7094	%cv	3.34	conc	1.000
Co_231	av	152.410			sd	6.1493	%cv	4.03	conc	1.000
#8 standard	rep	1	Fe_258	em	40212.3	conc	100.00			
	rep	2	Fe_258	em	40493.8	conc	100.00			
	rep	3	Fe_258	em	41166.8	conc	100.00			
#8 standard										
Fe_258	av	40624.41			sd	490.103	%cv	1.21	conc	100.00
QCD M0639-61	rep	1	Lead	conc	0.04	mg/l				
	rep	1	Chromium	conc	0.151	mg/l				
	rep	1	Nickel	conc	0.770	mg/l				
	rep	1	Zinc	conc	0.158	mg/l				
	rep	1	Fe_258	conc	111.42	mg/l				
	rep	1	Cobalt	conc	0.057	mg/l				
	rep	1	Cr_267	conc	0.138	mg/l				
	rep	1	Cd_228	conc	0.004	mg/l				
	rep	1	Copper	conc	0.033	mg/l				
	rep	1	Co_231	conc	0.077	mg/l				
	rep	2	Chromium	conc	0.126	mg/l				
	rep	2	Lead	conc	0.10	mg/l				
	rep	2	Zinc	conc	0.155	mg/l				
	rep	2	Nickel	conc	0.709	mg/l				
	rep	2	Cobalt	conc	0.070	mg/l				
	rep	2	Fe_258	conc	111.13	mg/l				

	rep	2	Cd_228	conc	0.004	mg/l	
	rep	2	Cr_267	conc	0.129	mg/l	
	rep	2	Co_231	conc	0.061	mg/l	
	rep	2	Copper	conc	0.088	mg/l	
	rep	3	Lead	conc	-0.04	mg/l	window edge
	rep	3	Chromium	conc	0.180	mg/l	
	rep	3	Nickel	conc	0.751	mg/l	
	rep	3	Zinc	conc	0.162	mg/l	
	rep	3	Fe_258	conc	115.26	mg/l	
	rep	3	Cobalt	conc	0.070	mg/l	
	rep	3	Cr_267	conc	0.128	mg/l	
	rep	3	Cd_228	conc	0.010	mg/l	
	rep	3	Copper	conc	0.089	mg/l	
	rep	3	Co_231	conc	0.061	mg/l	
QCD M3639-61							
Lead	av	0.03	mg/l	sd	0.060	%cv	199.94
Chromium	av	0.143	mg/l	sd	0.0151	%cv	10.55
Nickel	av	~~0.761~~	mg/l	sd	0.0285	%cv	3.74
Zinc	av	0.162	mg/l	sd	0.0035	%cv	2.15
Fe_258	av	112.60	mg/l	sd	2.307	%cv	2.05
Cobalt	av	0.069	mg/l	sd	0.0103	%cv	15.02
Cr_267	av	0.130	mg/l	sd	0.0026	%cv	2.03
Cd_228	av	0.006	mg/l	sd	0.0035	%cv	56.77
Copper	av	0.086	mg/l	sd	0.0031	%cv	3.58
Co_231	av	0.073	mg/l	sd	0.0106	%cv	14.58
QCD M3639-62	rep	1	Lead	conc	0.04	mg/l	
	rep	1	Chromium	conc	0.224	mg/l	
	rep	1	Nickel	conc	0.732	mg/l	
	rep	1	Zinc	conc	0.357	mg/l	
	rep	1	Fe_258	conc	171.85	mg/l	
	rep	1	Cobalt	conc	0.054	mg/l	
	rep	1	Cr_267	conc	0.236	mg/l	
	rep	1	Cd_228	conc	0.001	mg/l	
	rep	1	Copper	conc	0.112	mg/l	
	rep	1	Co_231	conc	0.048	mg/l	
	rep	2	Chromium	conc	0.270	mg/l	
	rep	2	Lead	conc	-0.01	mg/l	
	rep	2	Zinc	conc	0.364	mg/l	
	rep	2	Nickel	conc	0.304	mg/l	window edge
	rep	2	Cobalt	conc	0.085	mg/l	
	rep	2	Fe_258	conc	173.02	mg/l	
	rep	2	Cd_228	conc	-0.003	mg/l	
	rep	2	Cr_267	conc	0.246	mg/l	
	rep	2	Co_231	conc	0.050	mg/l	
	rep	2	Copper	conc	0.110	mg/l	
	rep	3	Lead	conc	-0.15	mg/l	window edge
	rep	3	Chromium	conc	0.240	mg/l	
	rep	3	Nickel	conc	0.870	mg/l	
	rep	3	Zinc	conc	0.365	mg/l	
	rep	3	Fe_258	conc	169.14	mg/l	
	rep	3	Cobalt	conc	0.060	mg/l	
	rep	3	Cr_267	conc	0.234	mg/l	
	rep	3	Cd_228	conc	0.001	mg/l	
	rep	3	Copper	conc	0.100	mg/l	
	rep	3	Co_231	conc	0.068	mg/l	
QCD M3639-62							
Lead	av	-0.04	mg/l	sd	0.099	%cv	227.24
Chromium	av	0.240	mg/l	sd	0.0270	%cv	11.00
Nickel	av	~~0.633~~	mg/l	sd	0.3949	%cv	46.44

Zinc	av	0.362 mg/l	sd	0.0045	%cv	1.23
Fe_238	av	171.34 mg/l	sd	1.990	%cv	1.16
Cobalt	av	0.073 mg/l	sd	0.0190	%cv	25.97
Cr_267	av	0.209 mg/l	sd	0.0003	%cv	0.06
Cd_228	av	-0.000 mg/l	sd	0.0016	%cv	771.78
Copper	av	0.110 mg/l	sd	0.0020	%cv	1.83
Co_231	av	0.053 mg/l	sd	0.0104	%cv	19.44

QCS 1367	rep	1	Lead	conc	0.26	mg/l
	rep	1	Chromium	conc	0.347	mg/l
	rep	1	Nickel	conc	0.646	mg/l
	rep	1	Zinc	conc	0.806	mg/l
	rep	1	Fe_238	conc	226.92	mg/l
	rep	1	Cobalt	conc	0.087	mg/l
	rep	1	Cr_267	conc	0.290	mg/l
	rep	1	Cd_228	conc	0.001	mg/l
	rep	1	Copper	conc	0.224	mg/l
	rep	1	Co_231	conc	0.049	mg/l
	rep	2	Lead	conc	0.18	mg/l
	rep	2	Chromium	conc	0.331	mg/l
	rep	2	Nickel	conc	0.625	mg/l
	rep	2	Zinc	conc	0.800	mg/l
	rep	2	Fe_238	conc	225.99	mg/l
	rep	2	Cobalt	conc	0.094	mg/l
	rep	2	Cr_267	conc	0.317	mg/l
	rep	2	Cd_228	conc	0.015	mg/l
	rep	2	Copper	conc	0.225	mg/l
	rep	2	Co_231	conc	0.050	mg/l
	rep	3	Lead	conc	0.29	mg/l
	rep	3	Chromium	conc	0.329	mg/l
	rep	3	Nickel	conc	0.762	mg/l
	rep	3	Zinc	conc	0.793	mg/l
	rep	3	Fe_238	conc	224.71	mg/l
	rep	3	Cobalt	conc	0.079	mg/l
	rep	3	Cr_267	conc	0.311	mg/l
	rep	3	Cd_228	conc	0.004	mg/l
	rep	3	Copper	conc	0.212	mg/l
	rep	3	Co_231	conc	0.047	mg/l

QCS 1367						
Lead	av	0.23 mg/l	sd	0.075	%cv	32.12
Chromium	av	0.335 mg/l	sd	0.0097	%cv	2.90
Nickel	av	~~0.678 mg/l~~	sd	0.0736	%cv	10.87
Zinc	av	0.800 mg/l	sd	0.0065	%cv	0.82
Fe_238	av	226.88 mg/l	sd	1.108	%cv	0.49
Cobalt	av	0.086 mg/l	sd	0.0075	%cv	8.64
Cr_267	av	0.306 mg/l	sd	0.0140	%cv	4.56
Cd_228	av	0.007 mg/l	sd	0.0074	%cv	105.66
Copper	av	0.220 mg/l	sd	0.0075	%cv	3.41
Co_231	av	0.051 mg/l	sd	0.0059	%cv	11.26

DCK M8609-68	rep	1	Lead	conc	-0.36	mg/l	window edge
	rep	1	Chromium	conc	0.729	mg/l	
	rep	1	Nickel	conc	2.164	mg/l	
	rep	1	Zinc	conc	.255	mg/l	
	rep	1	Fe_238	conc	490.91	mg/l	
	rep	1	Cobalt	conc	0.23.	mg/l	
	rep	1	Cr_267	conc	0.686	mg/l	
	rep	1	Cd_228	conc	0.008	mg/l	
	rep	1	Copper	conc	0.406	mg/l	
	rep	1	Co_231	conc	0.196	mg/l	

	rep	2	Chromium	conc	0.740 mg/l	
	rep	2	Lead	conc	-0.14 mg/l	
	rep	2	Zinc	conc	1.239 mg/l	
	rep	2	Nickel	conc	1.910 mg/l	
	rep	2	Cobalt	conc	0.222 mg/l	
	rep	2	Fe_258	conc	493.93 mg/l	
	rep	2	Cd_228	conc	0.004 mg/l	
	rep	2	Cr_267	conc	0.699 mg/l	
	rep	2	Co_231	conc	0.225 mg/l	
	rep	2	Copper	conc	0.458 mg/l	
	rep	3	Lead	conc	-0.34 mg/l	window edge
	rep	3	Chromium	conc	0.702 mg/l	
	rep	3	Nickel	conc	2.091 mg/l	
	rep	3	Zinc	conc	1.276 mg/l	
	rep	3	Fe_258	conc	507.07 mg/l	
	rep	3	Cobalt	conc	0.215 mg/l	
	rep	3	Cr_267	conc	0.713 mg/l	
	rep	3	Cd_228	conc	0.011 mg/l	
	rep	3	Copper	conc	0.444 mg/l	
	rep	3	Co_231	conc	0.220 mg/l	
QCK M3639-63						
Lead	av	-0.28 mg/l		sd	0.123 %cv	44.29
Chromium	av	0.726 mg/l		sd	0.0232 %cv	3.20
Nickel	av	~~-2.055~~ mg/l		sd	0.1306 %cv	6.35
Zinc	av	1.263 mg/l		sd	0.0110 %cv	0.89
Fe_258	av	497.30 mg/l		sd	8.589 %cv	1.73
Cobalt	av	0.222 mg/l		sd	0.0081 %cv	3.63
Cr_267	av	0.699 mg/l		sd	0.0135 %cv	1.93
Cd_228	av	0.008 mg/l		sd	0.0033 %cv	41.62
Copper	av	0.462 mg/l		sd	0.0214 %cv	4.62
Co_231	av	0.213 mg/l		sd	0.0157 %cv	7.34
QCK M3639-64	rep	1	Lead	conc	0.03 mg/l	
	rep	1	Chromium	conc	0.648 mg/l	
	rep	1	Nickel	conc	1.592 mg/l	
	rep	1	Zinc	conc	1.087 mg/l	
	rep	1	Fe_258	conc	404.38 mg/l	
	rep	1	Cobalt	conc	0.203 mg/l	
	rep	1	Cr_267	conc	0.558 mg/l	
	rep	1	Cd_228	conc	0.013 mg/l	
	rep	1	Copper	conc	0.374 mg/l	
	rep	1	Co_231	conc	0.172 mg/l	
	rep	2	Lead	conc	0.10 mg/l	
	rep	2	Chromium	conc	0.612 mg/l	
	rep	2	Nickel	conc	1.575 mg/l	
	rep	2	Zinc	conc	1.146 mg/l	
	rep	2	Fe_258	conc	402.69 mg/l	
	rep	2	Cobalt	conc	0.183 mg/l	
	rep	2	Cr_267	conc	0.531 mg/l	
	rep	2	Cd_228	conc	-0.001 mg/l	
	rep	2	Copper	conc	0.362 mg/l	
	rep	2	Co_231	conc	0.176 mg/l	
	rep	3	Chromium	conc	0.585 mg/l	
	rep	3	Lead	conc	0.20 mg/l	
	rep	3	Zinc	conc	1.081 mg/l	
	rep	3	Nickel	conc	1.496 mg/l	
	rep	3	Cobalt	conc	0.172 mg/l	
	rep	3	Fe_258	conc	374.03 mg/l	
	rep	3	Cd_228	conc	0.000 mg/l	
	rep	3	Cr_267	conc	0.542 mg/l	

	rep	3	Co_231	conc	0.176	mg/l	
	rep	3	Copper	conc	0.367	mg/l	
M3537-64							
Chromium	av	0.615	mg/l	sd	0.0317	%cv	5.15
Lead	av	0.11	mg/l	sd	0.085	%cv	77.93
Zinc	av	1.098	mg/l	sd	0.0410	%cv	3.81
Nickel	av	~~1.654~~	mg/l	sd	0.051	%cv	3.29
Cobalt	av	0.186	mg/l	sd	0.0155	%cv	8.35
Fe_258	av	400.37	mg/l	sd	5.553	%cv	1.39
Cd_228	av	0.005	mg/l	sd	0.0074	%cv	152.67
Cr_267	av	0.544	mg/l	sd	0.0139	%cv	2.55
Co_231	av	0.181	mg/l	sd	0.0128	%cv	7.04
Copper	av	0.368	mg/l	sd	0.0059	%cv	1.60

Soln A	rep	1	Lead	conc	0.93	mg/l
	rep	1	Chromium	conc	1.020	mg/l
	rep	1	Nickel	conc	4.044	mg/l
	rep	1	Zinc	conc	0.927	mg/l
	rep	1	Fe_258	conc	1.60	mg/l
	rep	1	Cobalt	conc	0.946	mg/l
	rep	1	Cr_267	conc	1.021	mg/l
	rep	1	Cd_228	conc	0.943	mg/l
	rep	1	Copper	conc	0.997	mg/l
	rep	1	Co_231	conc	0.993	mg/l
	rep	2	Lead	conc	1.20	mg/l
	rep	2	Chromium	conc	1.112	mg/l
	rep	2	Nickel	conc	4.022	mg/l
	rep	2	Zinc	conc	0.943	mg/l
	rep	2	Fe_258	conc	1.36	mg/l
	rep	2	Cobalt	conc	0.943	mg/l
	rep	2	Cr_267	conc	1.033	mg/l
	rep	2	Cd_228	conc	0.939	mg/l
	rep	2	Copper	conc	0.999	mg/l
	rep	2	Co_231	conc	1.021	mg/l
	rep	3	Lead	conc	1.04	mg/l
	rep	3	Chromium	conc	1.132	mg/l
	rep	3	Nickel	conc	4.146	mg/l
	rep	3	Zinc	conc	0.963	mg/l
	rep	3	Fe_258	conc	1.41	mg/l
	rep	3	Cobalt	conc	0.929	mg/l
	rep	3	Cr_267	conc	1.054	mg/l
	rep	3	Cd_228	conc	0.971	mg/l
	rep	3	Copper	conc	0.998	mg/l
	rep	3	Co_231	conc	0.993	mg/l

Soln A						
Lead	av	1.06	mg/l	sd	0.135	%cv 12.74
Chromium	av	1.098	mg/l	sd	0.0719	%cv 6.54
Nickel	av	~~4.071~~	mg/l	sd	0.0664	%cv 1.63
Zinc	av	0.948	mg/l	sd	0.0209	%cv 2.21
Fe_258	av	1.46	mg/l	sd	0.123	%cv 8.45
Cobalt	av	0.941	mg/l	sd	0.0100	%cv 1.15
Cr_267	av	1.052	mg/l	sd	0.0308	%cv 2.93
Cd_228	av	0.951	mg/l	sd	0.0170	%cv 1.82
Copper	av	0.998	mg/l	sd	0.0000	%cv 0.00
Co_231	av	1.004	mg/l	sd	0.0150	%cv 1.50

Soln Fe_100	rep	1	Lead	conc	0.07	mg/l
	rep	1	Chromium	conc	0.005	mg/l
	rep	1	Nickel	conc	0.104	mg/l
	rep	1	Zinc	conc	0.022	mg/l

	rep	1	Fe_250	conc	102.31 mg/l	
	rep	1	Cobalt	conc	-0.002 mg/l	window edge
	rep	1	Cr_267	conc	0.014 mg/l	
	rep	1	Cd_228	conc	-0.000 mg/l	
	rep	1	Copper	conc	-0.003 mg/l	
	rep	1	Co_231	conc	0.000 mg/l	
	rep	2	Lead	conc	0.15 mg/l	
	rep	2	Chromium	conc	0.013 mg/l	
	rep	2	Nickel	conc	0.003 mg/l	
	rep	2	Zinc	conc	0.014 mg/l	
	rep	2	Fe_250	conc	105.82 mg/l	
	rep	2	Cobalt	conc	-0.002 mg/l	
	rep	2	Cr_267	conc	0.008 mg/l	
	rep	2	Cd_228	conc	0.000 mg/l	
	rep	2	Copper	conc	-0.002 mg/l	
	rep	2	Co_231	conc	-0.005 mg/l	
	rep	3	Lead	conc	0.12 mg/l	
	rep	3	Chromium	conc	0.013 mg/l	
	rep	3	Nickel	conc	0.010 mg/l	window edge
	rep	3	Zinc	conc	0.016 mg/l	
	rep	3	Fe_250	conc	108.98 mg/l	
	rep	3	Cobalt	conc	0.000 mg/l	
	rep	3	Cr_267	conc	0.004 mg/l	
	rep	3	Cd_228	conc	0.002 mg/l	
	rep	3	Copper	conc	-0.002 mg/l	
	rep	3	Co_231	conc	0.011 mg/l	

Soln Fe_100

Lead	av	0.11 mg/l		sd	0.042 %cv	36.48
Chromium	av	0.009 mg/l		sd	0.0038 %cv	41.38
Nickel	av	~~0.085~~ mg/l		sd	0.0771 %cv	89.52
Zinc	av	0.017 mg/l		sd	0.0043 %cv	25.07
Fe_250	av	105.80 mg/l		sd	3.184 %cv	3.01
Cobalt	av	0.001 mg/l		sd	0.0056 %cv	419.66
Cr_267	av	0.009 mg/l		sd	0.0052 %cv	60.12
Cd_228	av	-0.000 mg/l		sd	0.0026 %cv	4998.1
Copper	av	-0.002 mg/l		sd	0.0005 %cv	23.20
Co_231	av	0.002 mg/l		sd	0.0003 %cv	367.23

DI	rep	1	Lead	conc	0.13 mg/l	
	rep	1	Chromium	conc	-0.035 mg/l	window edge
	rep	1	Nickel	conc	0.052 mg/l	
	rep	1	Zinc	conc	0.006 mg/l	
	rep	1	Fe_250	conc	0.20 mg/l	
	rep	1	Cobalt	conc	-0.002 mg/l	
	rep	1	Cr_267	conc	-0.001 mg/l	
	rep	1	Cd_228	conc	0.001 mg/l	
	rep	1	Copper	conc	0.005 mg/l	
	rep	1	Co_231	conc	-0.002 mg/l	
	rep	2	Chromium	conc	0.016 mg/l	
	rep	2	Lead	conc	0.02 mg/l	
	rep	2	Zinc	conc	0.004 mg/l	
	rep	2	Nickel	conc	-0.030 mg/l	window edge
	rep	3	Cobalt	conc	0.006 mg/l	
	rep	2	Fe_250	conc	0.04 mg/l	
	rep	2	Cd_228	conc	0.002 mg/l	
	rep	2	Cr_267	conc	-0.006 mg/l	
	rep	2	Co_231	conc	0.001 mg/l	
	rep	2	Copper	conc	0.005 mg/l	
	rep	3	Lead	conc	0.05 mg/l	window edge
	rep	3	Chromium	conc	0.004 mg/l	

	rep	3	Nickel	conc	0.047	mg/l		
	rep	3	Zinc	conc	-0.001	mg/l		
	rep	3	Fe_258	conc	0.02	mg/l		
	rep	3	Cobalt	conc	-0.001	mg/l		
	rep	3	Cr_267	conc	-0.001	mg/l		
	rep	3	Cd_228	conc	-0.001	mg/l		
	rep	3	Copper	conc	0.006	mg/l		
	rep	3	Co_231	conc	0.025	mg/l		

DI

Lead	av	0.07	mg/l	sd	0.054	%cv	76.84
Chromium	av	-0.005	mg/l	sd	0.0264	%cv	517.90
Nickel	av	0.020	mg/l	sd	0.0505	%cv	246.62
Zinc	av	0.003	mg/l	sd	0.0036	%cv	122.25
Fe_258	av	0.11	mg/l	sd	0.146	%cv	129.12
Cobalt	av	0.001	mg/l	sd	0.0044	%cv	642.27
Cr_267	av	-0.002	mg/l	sd	0.0028	%cv	114.04
Cd_228	av	0.001	mg/l	sd	0.0013	%cv	224.93
Copper	av	0.005	mg/l	sd	0.0009	%cv	16.49
Co_231	av	0.008	mg/l	sd	0.0149	%cv	183.53

ID

	rep	1	Lead	conc	0.05	mg/l	
	rep	1	Chromium	conc	0.333	mg/l	
	rep	1	Nickel	conc	2.215	mg/l	
	rep	1	Zinc	conc	0.647	mg/l	
	rep	1	Fe_258	conc	323.61	mg/l	
	rep	1	Cobalt	conc	0.884	mg/l	
	rep	1	Cr_267	conc	0.377	mg/l	
	rep	1	Cd_228	conc	-0.005	mg/l	window edge
	rep	1	Copper	conc	0.141	mg/l	
	rep	1	Co_231	conc	0.892	mg/l	
	rep	2	Lead	conc	-0.12	mg/l	
	rep	2	Chromium	conc	0.413	mg/l	
	rep	2	Nickel	conc	2.385	mg/l	
	rep	2	Zinc	conc	0.645	mg/l	
	rep	2	Fe_258	conc	318.73	mg/l	
	rep	2	Cobalt	conc	0.858	mg/l	
	rep	2	Cr_267	conc	0.368	mg/l	
	rep	2	Cd_228	conc	0.004	mg/l	
	rep	2	Copper	conc	0.136	mg/l	
	rep	2	Co_231	conc	0.950	mg/l	
	rep	3	Chromium	conc	0.399	mg/l	
	rep	3	Lead	conc	0.14	mg/l	
	rep	3	Zinc	conc	0.649	mg/l	
	rep	3	Nickel	conc	0.607	mg/l	window edge
	rep	3	Cobalt	conc	0.873	mg/l	
	rep	3	Fe_258	conc	330.26	mg/l	
	rep	3	Cd_228	conc	0.002	mg/l	
	rep	3	Cr_267	conc	0.374	mg/l	
	rep	3	Co_231	conc	0.911	mg/l	
M3639-P1	rep	3	Copper	conc	0.147	mg/l	

ID

				Recovery					% diff
Chromium	av	0.382	mg/l	0.339	sd	0.0426	%cv	11.15	12
Lead	av	0.02	mg/l	0.07	sd	0.132	%cv	557.32	—
Zinc	av	0.647	mg/l	0.655	sd	0.0018	%cv	0.27	1
Nickel	av	~~1.735~~	mg/l		sd	0.9814	%cv	56.55	—
Cobalt	av	0.872	mg/l	0.881	sd	0.0130	%cv	1.49	1
Fe_258	av	324.20	mg/l	314.14	sd	5.786	%cv	1.78	3
Cd_228	av	0.000	mg/l	0.002	sd	0.0046	%cv	1520.5	—
Cr_267	av	0.373	mg/l	0.363	sd	0.0046	%cv	1.23	3
Co_231	av	0.917	mg/l	0.871	sd	0.0295	%cv	3.22	5

Copper	av	0.141 mg/l	0.137	sd	0.0050 %cv	3.56	3	
	rep	1	Lead	conc	0.38 mg/l			
	rep	1	Chromium	conc	0.558 mg/l			
	rep	1	Nickel	conc	2.215 mg/l			
	rep	1	Zinc	conc	0.493 mg/l			
	rep	1	Fe_258	conc	189.93 mg/l			
	rep	1	Cobalt	conc	0.381 mg/l			
	rep	1	Cr_267	conc	0.507 mg/l			
	rep	1	Cd_228	conc	0.250 mg/l			
	rep	1	Copper	conc	0.399 mg/l			
	rep	1	Co_231	conc	0.364 mg/l			
	rep	2	Lead	conc	0.33 mg/l			
	rep	2	Chromium	conc	0.515 mg/l			
	rep	2	Nickel	conc	2.003 mg/l			
	rep	2	Zinc	conc	0.508 mg/l			
	rep	2	Fe_258	conc	190.49 mg/l			
	rep	2	Cobalt	conc	0.363 mg/l			
	rep	2	Cr_267	conc	0.509 mg/l			
	rep	2	Cd_228	conc	0.242 mg/l			
	rep	2	Copper	conc	0.410 mg/l			
	rep	2	Co_231	conc	0.362 mg/l			
	rep	3	Chromium	conc	0.557 mg/l			
	rep	3	Lead	conc	0.42 mg/l			
	rep	3	Zinc	conc	0.540 mg/l			
	rep	3	Nickel	conc	2.049 mg/l			
	rep	3	Cobalt	conc	0.380 mg/l			
	rep	3	Fe_258	conc	192.41 mg/l			
	rep	3	Cd_228	conc	0.243 mg/l			
	rep	3	Cr_267	conc	0.528 mg/l			
	rep	3	Co_231	conc	0.339 mg/l			
	rep	3	Copper	conc	0.383 mg/l			

+0.25ml DES 3019
to 10ml w/ M3639-64

IK M3639-64 40.25

			BKgd				2 mony
Chromium	av	0.543 mg/l	0.233	sd	0.0245 %cv	4.52	124
Lead	av	0.37 mg/l	0.04	sd	0.046 %cv	12.32	—
Zinc	av	0.514 mg/l	0.286	sd	0.0237 %cv	4.62	91
Nickel	av	~~2.089~~ mg/l		sd	0.1116 %cv	5.34	—
Cobalt	av	0.375 mg/l	0.133	sd	0.0103 %cv	2.76	97
Fe_258	av	190.94 mg/l	—	sd	1.298 %cv	0.68	—
Cd_228	av	0.245 mg/l	0.005	sd	0.0045 %cv	1.84	96
Cr_267	av	0.515 mg/l	0.240	sd	0.0117 %cv	2.27	110
Co_231	av	0.355 mg/l	0.111	sd	0.0139 %cv	3.91	98
Copper	av	0.397 mg/l	0.127	sd	0.0134 %cv	3.38	108

standard	rep	1	Nickel	em	323.1 conc 1.000			
	rep	2	Nickel	em	320.1 conc 1.000			
	rep	3	Nickel	em	320.0 conc 1.000			
standard								
Nickel	av	321.109		sd	1.7668 %cv	0.55	conc	1.000
M3639-76	rep	1	Nickel	conc	0.540 mg/l			
	rep	2	Nickel	conc	0.565 mg/l			
	rep	3	Nickel	conc	0.477 mg/l			
39-76								
Nickel	av	0.527 mg/l		sd	0.0455 %cv	8.63		
again	rep	1	Nickel	conc	0.378 mg/l			
	rep	2	Nickel	conc	~~0.075 mg/l~~			window edge
	rep	3	Nickel	conc	0.374 mg/l			
again								

0.376

Nickel	av	0.276 mg/l		sd	0.1736 %cv	62.93		
[redacted]39-77	rep	1 Nickel	conc	0.339 mg/l				
	rep	2 Nickel	conc	0.003 mg/l			window edge	
	rep	3 Nickel	conc	0.372 mg/l			window edge	
M3639-77								
Nickel	av	0.168 mg/l		sd	0.1512 %cv	91.60		
standard	rep	1 Nickel	em	319.6 conc 1.000				
	rep	2 Nickel	em	327.5 conc 1.000				
	rep	3 Nickel	em	328.3 conc 1.000				
standard								
Nickel	av	325.109		sd	4.7916 %cv	1.47	conc	1.000
standard	rep	1 Nickel	em	334.3 conc 1.000				
	rep	2 Nickel	em	333.7 conc 1.000				
	rep	3 Nickel	em	311.1 conc 1.000				
standard								
Nickel	av	326.401		sd	13.2179 %cv	4.05	conc	1.000
M3639-77	rep	1 Nickel	conc	0.360 mg/l				
	rep	2 Nickel	conc	0.314 mg/l				
	rep	3 Nickel	conc	0.379 mg/l				
M3639-77								
Nickel	av	0.351 mg/l		sd	0.0335 %cv	9.56		
M3639-78	rep	1 Nickel	conc	0.364 mg/l				
	rep	2 Nickel	conc	0.319 mg/l				
	rep	3 Nickel	conc	0.337 mg/l				
[redacted]39-78								
Nickel	av	0.340 mg/l		sd	0.0227 %cv	6.69		
QCD-61	rep	1 Nickel	conc	0.187 mg/l				
	rep	2 Nickel	conc	0.130 mg/l				
	rep	3 Nickel	conc	0.157 mg/l				
QCD-61								
Nickel	av	0.161 mg/l		sd	0.0250 %cv	15.52		
QCD-62	rep	1 Nickel	conc	0.183 mg/l				
	rep	2 Nickel	conc	0.191 mg/l				
	rep	3 Nickel	conc	0.193 mg/l				
QCD-62								
Nickel	av	0.189 mg/l		sd	0.0053 %cv	2.81		
QCS 1367	rep	1 Nickel	conc	0.173 mg/l				
	rep	2 Nickel	conc	0.164 mg/l				
	rep	3 Nickel	conc	0.149 mg/l				
QCS 1367								
Nickel	av	0.162 mg/l		sd	0.0124 %cv	7.64		
QCK-63	rep	1 Nickel	conc	0.514 mg/l				
	rep	2 Nickel	conc	0.493 mg/l				
	rep	3 Nickel	conc	0.562 mg/l				
QCK-63								
[redacted]Nickel	av	0.523 mg/l		sd	0.0354 %cv	6.77		
QCK-64	rep	1 Nickel	conc	0.416 mg/l				
	rep	2 Nickel	conc	0.424 mg/l				
	rep	3 Nickel	conc	0.387 mg/l				
QCK-64								

Nickel	av	0.409 mg/l		sd	0.0195 %cv	4.78	
	rep	1 Nickel	conc	0.523 mg/l			
	rep	2 Nickel	conc	0.555 mg/l			
ID M3639-71	rep	3 Nickel	conc	0.531 mg/l			2 lab
Nickel	av	0.536 mg/l	Blank 0.525	sd	0.0168 %cv	3.13	2
IK	rep	1 Nickel	conc	0.493 mg/l			
	rep	2 Nickel	conc	0.524 mg/l			
IK M3639-64	rep	3 Nickel	conc	0.523 mg/l			2 recovery
Nickel	av	0.513 mg/l	Blank 0.270	sd	0.0175 %cv	3.40	97
Soln A	rep	1 Nickel	conc	1.004 mg/l			
	rep	2 Nickel	conc	1.033 mg/l			
	rep	3 Nickel	conc	1.040 mg/l			
Soln A							
Nickel	av	1.026 mg/l		sd	0.0192 %cv	1.87	

M3639

12:27:20 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

013095 ST03

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: 0ppb
Sample Description:
Sample Type: Standard
Sequence Number: 034
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 12:27:10 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	1213	311.0106	0	0.0000
209	40459	1658.4559	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.0300	7.687E-03			ug/l	
Bi 209	<Y	40459	1658.4559			ions/sec	

		Entered Conc.
Pb 208	?	0.0000
Bi 209	<Y	

12:28:58 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	20ppb
Sample Description:	
Sample Type:	Standard
Sequence Number:	035
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:28:48 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	6899	462.0883	0	0.0000
209	43955	1965.6520	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.1570	0.0105	20.0000	1.6559	ug/l	8.2794
Bi 209	<Y	43955	1965.6520			ions/sec	

		Entered Conc.
Pb 208	?	20.0000
Bi 209	<Y	

12:31:25 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	50ppb
Sample Description:	
Sample Type:	Standard
Sequence Number:	036
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:31:15 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	15805	1305.9343	0	0.0000
Bi 209	42495	1598.8384	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.3719	0.0307	50.3757	4.4768	ug/l	8.8869
Bi 209	<Y	42495	1598.8384			ions/sec	

		Entered Conc.
Pb 208	?	50.0000
Bi 209	<Y	

12:34:41 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	100ppb
Sample Description:	
Sample Type:	Standard
Sequence Number:	037
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:34:31 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	32676	1996.6252	0	0.0000
209	42496	2031.7639	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7689	0.0470	101.2684	6.3189	ug/l	6.2398
Bi 209	<Y	42496	2031.7639			ions/sec	

		Entered Conc.
Pb 208	?	100.0000
Bi 209	<Y	

12:36:14 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	200ppb
Sample Description:	
Sample Type:	Standard
Sequence Number:	038
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:36:04 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	70787	6186.3457	0	0.0000
209	45902	2767.6453	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.5421	0.1348	200.9119	17.6671	ug/l	8.7934
Bi 209	<Y	45902	2767.6453			ions/sec	

		Entered Conc.
Pb 208	?	200.0000
Bi 209	<Y	

12:37:24 Jan 30 1995

QUANTITATIVE ANALYSIS: CALIBRATION REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Calibration File: [Untitled]
Calibration: External Standard

Analyte		Slope	Intercept	Root Mean Square	Correlation Coefficient	Units	
Pb 208	?	0.007628	0.009473	0.016996	0.999708	ug/l	L
Bi 209	<Y					ions/sec	

12:38:38 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCS 2782 50ppb
Sample Description:	50ul QCS 2782, 1ml HNO3, 0.4ml HClO4, 8.6ml DI
Sample Type:	Sample
Sequence Number:	039
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:38:28 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	23	8.3829	0	0.0000
209	27	7.2938	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.8492	0.3128	110.0773	41.0036	ug/l	37.2499
Bi 209	<Y	27	7.2938			ions/sec	

12:40:46 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	again
Sample Description:	
Sample Type:	Sample
Sequence Number:	040
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:40:36 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	18700	1892.2480	0	0.0000
209	44293	1666.5364	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD	Z money
Pb 208	?	0.4222	0.0427	54.1011	5.6002	ug/l	10.3514	108
Bi 209	<Y	44293	1666.5364			ions/sec		

12:42:43 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - $HNO_3/HClO_4$
Parameter File:	Pb
Sample ID:	M3639-1
Sample Description:	
Sample Type:	Sample
Sequence Number:	041
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:42:33 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	36098	1639.9139	0	0.0000
209	24912	739.5450	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.4490	0.0658	188.7063	8.6292	ug/l	4.5728
Bi 209	<Y	24912	739.5450			ions/sec	

12:46:43 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	200ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	042
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:46:33 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	59575	3371.5017	0	0.0000
209	38679	1919.0687	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.5403	0.0872	200.6679	11.4265	ug/l	5.6942
Bi 209	<Y	38679	1919.0687			ions/sec	

12:50:21 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-2
Sample Description:	
Sample Type:	Sample
Sequence Number:	043
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:50:11 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	27454	1075.4441	0	0.0000
Bi 209	23380	512.8278	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1743	0.0460	152.6946	6.0300	ug/l	3.9490
Bi 209	<Y	23380	512.8278			ions/sec	

12:51:48 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-3
Sample Description:	
Sample Type:	Sample
Sequence Number:	044
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:51:38 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	37999	1439.6887	0	0.0000
209	22551	351.7090	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.6850	0.0638	219.6432	8.3688	ug/l	3.8102
Bi 209	<Y	22551	351.7090			ions/sec	

12:53:15 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-4
Sample Description:
Sample Type: Sample
Sequence Number: 045
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 12:53:05 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	44980	1293.8639	0	0.0000
209	23017	382.3502	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.9542	0.0562	254.9324	7.3689	ug/l	2.8905
Bi 209	<Y	23017	382.3502			ions/sec	

12:54:43 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-5
Sample Description:	
Sample Type:	Sample
Sequence Number:	046
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:54:34 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	40330	637.4619	0	0.0000
209	27039	751.6025	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.4915	0.0236	194.2829	3.0905	ug/l	1.5907
Bi 209	<Y	27039	751.6025			ions/sec	

12:56:11 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-6
Sample Description:
Sample Type: Sample
Sequence Number: 047
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 12:56:02 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	50278	1161.5652	0	0.0000
209	25080	279.2083	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	2.0047	0.0463	261.5542	6.0714	ug/l	2.3213
Bi 209	<Y	25080	279.2083			ions/sec	

12:57:38 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	20ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	048
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:57:29 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	20067	1534.1224	0	0.0000
209	50567	1492.9430	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.3968	0.0303	50.7802	3.9771	ug/l	7.8319
Bi 209	<Y	50567	1492.9430			ions/sec	

12:59:04 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-7
Sample Description:	
Sample Type:	Sample
Sequence Number:	049
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	12:58:55 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	64351	1031.9110	0	0.0000
209	21123	281.3651	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	3.0466	0.0489	398.1277	6.4041	ug/l	1.6086
Bi 209	<Y	21123	281.3651			ions/sec	

13:00:30 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-8
Sample Description:	
Sample Type:	Sample
Sequence Number:	050
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:00:20 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	48992	1261.2306	0	0.0000
209	22032	348.5415	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	2.2236	0.0572	290.2532	7.5042	ug/l	2.5854
Bi 209	<Y	22032	348.5415			ions/sec	

13:01:57 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-9
Sample Description:	
Sample Type:	Sample
Sequence Number:	051
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:01:47 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	37025	1035.6080	0	0.0000
209	24022	468.7009	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.5413	0.0431	200.8021	5.6513	ug/l	2.8144
Bi 209	<Y	24022	468.7009			ions/sec	

13:03:23 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-10
Sample Description:	
Sample Type:	Sample
Sequence Number:	052
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:03:13 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	51639	897.6066	0	0.0000
209	24705	234.7563	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	2.0902	0.0363	272.7641	4.7628	ug/l	1.7461
Bi 209	<Y	24705	234.7563			ions/sec	

13:04:49 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-11
Sample Description:	
Sample Type:	Sample
Sequence Number:	053
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:04:39 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	65929	1510.5208	0	0.0000
209	19357	382.6072	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	3.4059	0.0780	445.2282	10.2293	ug/l	2.2975
Bi 209	<Y	19357	382.6072			ions/sec	

13:06:15 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-12
Sample Description:	
Sample Type:	Sample
Sequence Number:	054
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:06:06 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	43692	1328.0475	0	0.0000
209	22601	406.7354	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.9332	0.0588	252.1770	7.7029	ug/l	3.0546
Bi 209	<Y	22601	406.7354			ions/sec	

13:07:42 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-13
Sample Description:	
Sample Type:	Sample
Sequence Number:	055
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:07:33 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	32046	1096.7683	0	0.0000
209	24656	409.2634	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.2997	0.0445	169.1374	5.8312	ug/l	3.4476
Bi 209	<Y	24656	409.2634			ions/sec	

13:09:09 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-14
Sample Description:	
Sample Type:	Sample
Sequence Number:	056
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:09:00 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	34482	982.6068	0	0.0000
209	22778	404.4731	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.5138	0.0431	197.2032	5.6550	ug/l	2.8676
Bi 209	<Y	22778	404.4731			ions/sec	

13:10:36 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	100ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	057
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:10:27 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	37930	2006.7170	0	0.0000
209	48866	1775.4849	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7762	0.0411	100.5091	5.3833	ug/l	5.3560
Bi 209	<Y	48866	1775.4849			ions/sec	

13:12:02 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-15
Sample Description:	
Sample Type:	Sample
Sequence Number:	058
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:11:53 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	28602	1313.5861	0	0.0000
209	24277	662.9728	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1782	0.0541	153.2014	7.0930	ug/l	4.6298
Bi 209	<Y	24277	662.9728			ions/sec	

13:13:30 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-16
Sample Description:	
Sample Type:	Sample
Sequence Number:	059
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:13:20 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	48825	674.9219	0	0.0000
209	23074	463.7593	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	2.1160	0.0293	276.1397	3.8344	ug/l	1.3886
Bi 209	<Y	23074	463.7593			ions/sec	

13:14:58 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-17
Sample Description:	
Sample Type:	Sample
Sequence Number:	060
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:14:48 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	44136	1169.5226	0	0.0000
Bi 209	22104	229.4075	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.9967	0.0529	260.5027	6.9358	ug/l	2.6625
Bi 209	<Y	22104	229.4075			ions/sec	

13:16:26 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-18
Sample Description:	
Sample Type:	Sample
Sequence Number:	061
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:16:16 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	29173	564.3590	0	0.0000
209	24335	672.1467	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1988	0.0232	155.9063	3.0401	ug/l	1.9499
Bi 209	<Y	24335	672.1467			ions/sec	

13:17:53 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-19
Sample Description:	
Sample Type:	Sample
Sequence Number:	062
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:17:43 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	55797	753.4808	0	0.0000
Bi 209	19245	388.3055	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.	% RSD
Pb 208	?	2.8993	0.0392	378.8253	5.1324 ug/l	1.3548
Bi 209	<Y	19245	388.3055		ions/sec	

13:19:19 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-20
Sample Description:
Sample Type: Sample
Sequence Number: 063
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 13:19:09 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	45773	725.8641	0	0.0000
209	20512	286.1148	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	2.2316	0.0354	291.2896	4.6389	ug/l	1.5925
Bi 209	<Y	20512	286.1148			ions/sec	

13:20:45 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-21
Sample Description:	
Sample Type:	Sample
Sequence Number:	064
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:20:35 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	38020	679.8959	0	0.0000
209	22411	476.3189	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.6965	0.0303	221.1501	3.9770	ug/l	1.7983
Bi 209	<Y	22411	476.3189			ions/sec	

13:22:11 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: 50ppb
Sample Description:
Sample Type: Sample
Sequence Number: 065
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 13:22:01 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	18369	1346.9014	0	0.0000
209	47594	1484.6375	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.3859	0.0283	49.3515	3.7098	ug/l	7.5171
Bi 209	<Y	47594	1484.6375			ions/sec	

13:23:37 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-22
Sample Description:	
Sample Type:	Sample
Sequence Number:	066
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:23:27 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	37944	803.7725	0	0.0000
209	23109	580.8861	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.6420	0.0348	214.0041	4.5595	ug/l	2.1306
Bi 209	<Y	23109	580.8861			ions/sec	

13:25:03 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-23
Sample Description:	
Sample Type:	Sample
Sequence Number:	067
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:24:53 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	31573	927.0002	0	0.0000
209	27632	991.3421	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1426	0.0335	148.5441	4.3978	ug/l	2.9606
Bi 209	<Y	27632	991.3421			ions/sec	

13:26:29 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-24
Sample Description:	
Sample Type:	Sample
Sequence Number:	068
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:26:19 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	35536	641.1369	0	0.0000
209	26077	469.5063	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.3627	0.0246	177.3967	3.2230	ug/l	1.8168
Bi 209	<Y	26077	469.5063			ions/sec	

13:27:56 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-25
Sample Description:	
Sample Type:	Sample
Sequence Number:	069
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:27:46 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	28245	1203.7197	0	0.0000
209	26589	1199.8693	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.0622	0.0453	138.0071	5.9345	ug/l	4.3001
Bi 209	<Y	26589	1199.8693			ions/sec	

13:29:23 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-26
Sample Description:	
Sample Type:	Sample
Sequence Number:	070
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:29:13 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	27513	660.3318	0	0.0000
209	27067	673.3756	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.0165	0.0244	132.0065	3.1980	ug/l	2.4226
Bi 209	<Y	27067	673.3756			ions/sec	

13:30:50 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-27
Sample Description:	
Sample Type:	Sample
Sequence Number:	071
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:30:40 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	23021	939.7686	0	0.0000
209	29746	535.5988	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7739	0.0316	100.2123	4.1415	ug/l	4.1327
Bi 209	<Y	29746	535.5988			ions/sec	

13:32:17 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-28
Sample Description:	
Sample Type:	Sample
Sequence Number:	072
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:32:07 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	28553	525.3795	0	0.0000
209	29301	760.1444	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.9745	0.0179	126.4995	2.3505	ug/l	1.8581
Bi 209	<Y	29301	760.1444			ions/sec	

13:33:45 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-29
Sample Description:	
Sample Type:	Sample
Sequence Number:	073
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:33:35 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	25171	995.4637	0	0.0000
209	28264	500.5939	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.8906	0.0352	115.5015	4.6169	ug/l	3.9973
Bi 209	<Y	28264	500.5939			ions/sec	

13:35:12 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	200ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	074
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:35:02 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	78902	5063.6919	0	0.0000
209	51052	2092.9670	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.5455	0.0992	201.3575	13.0022	ug/l	6.4573
Bi 209	<Y	51052	2092.9670			ions/sec	

13:36:39 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-30
Sample Description:	
Sample Type:	Sample
Sequence Number:	075
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:36:29 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	25376	914.7689	0	0.0000
209	29400	355.0856	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.8631	0.0311	111.9027	4.0787	ug/l	3.6449
Bi 209	<Y	29400	355.0856			ions/sec	

13:38:06 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-31
Sample Description:	
Sample Type:	Sample
Sequence Number:	076
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:37:56 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	22603	634.6177	0	0.0000
209	31130	667.7294	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7261	0.0204	93.9410	2.6724	ug/l	2.8447
Bi 209	<Y	31130	667.7294			ions/sec	

13:39:32 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-32
Sample Description:	
Sample Type:	Sample
Sequence Number:	077
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:39:22 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	30985	649.7020	0	0.0000
209	26098	298.3987	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1872	0.0249	154.3923	3.2634	ug/l	2.1137
Bi 209	<Y	26098	298.3987			ions/sec	

13:40:58 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-33
Sample Description:	
Sample Type:	Sample
Sequence Number:	078
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:40:48 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	29023	833.5317	0	0.0000
209	24800	290.6481	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1703	0.0336	152.1655	4.4058	ug/l	2.8954
Bi 209	<Y	24800	290.6481			ions/sec	

13:42:24 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-34
Sample Description:
Sample Type: Sample
Sequence Number: 079
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 13:42:14 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	28608	802.7155	0	0.0000
209	25683	316.9897	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1139	0.0313	144.7761	4.0971	ug/l	2.8300
Bi 209	<Y	25683	316.9897			ions/sec	

13:43:50 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-35
Sample Description:	
Sample Type:	Sample
Sequence Number:	080
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:43:40 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	29843	882.9105	0	0.0000
209	26463	608.3549	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1277	0.0334	146.5914	4.3736	ug/l	2.9835
Bi 209	<Y	26463	608.3549			ions/sec	

13:45:16 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-36
Sample Description:
Sample Type: Sample
Sequence Number: 081
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 13:45:06 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	29718	921.8647	0	0.0000
209	27100	533.0219	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.0966	0.0340	142.5072	4.4592	ug/l	3.1291
Bi 209	<Y	27100	533.0219			ions/sec	

13:46:43 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-37
Sample Description:
Sample Type: Sample
Sequence Number: 082
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 13:46:33 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	29946	720.1297	0	0.0000
209	27723	780.4279	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.0802	0.0260	140.3596	3.4052	ug/l	2.4260
Bi 209	<Y	27723	780.4279			ions/sec	

13:48:10 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: 0ppb
Sample Description:
Sample Type: Sample
Sequence Number: 083
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 13:48:00 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	946	353.4269	0	0.0000
209	51135	1935.8363	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.0185	6.912E-03	1.1823	0.9060	ug/l	76.6317
Bi 209	<Y	51135	1935.8363			ions/sec	

13:49:36 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-38
Sample Description:
Sample Type: Sample
Sequence Number: 084
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 13:49:26 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	32799	493.3813	0	0.0000
209	28026	573.4778	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1703	0.0176	152.1753	2.3078	ug/l	1.5165
Bi 209	<Y	28026	573.4778			ions/sec	

13:51:03 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-39
Sample Description:	
Sample Type:	Sample
Sequence Number:	085
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:50:53 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	29694	458.8905	0	0.0000
209	27440	468.1866	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.0821	0.0167	140.6157	2.1922	ug/l	1.5590
Bi 209	<Y	27440	468.1866			ions/sec	

13:52:30 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-40
Sample Description:	
Sample Type:	Sample
Sequence Number:	086
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:52:20 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	27748	820.5668	0	0.0000
209	26940	492.0185	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.0300	0.0305	133.7791	3.9929	ug/l	2.9847
Bi 209	<Y	26940	492.0185			ions/sec	

13:53:58 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-41
Sample Description:	
Sample Type:	Sample
Sequence Number:	087
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:53:48 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	24351	725.3991	0	0.0000
209	28459	876.2667	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.8556	0.0255	110.9236	3.3413	ug/l	3.0123
Bi 209	<Y	28459	876.2667			ions/sec	

13:55:26 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-42
Sample Description:	
Sample Type:	Sample
Sequence Number:	088
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:55:16 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	31026	956.0621	0	0.0000
209	27029	206.5616	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1479	0.0354	149.2317	4.6368	ug/l	3.1071
Bi 209	<Y	27029	206.5616			ions/sec	

13:56:53 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-43
Sample Description:
Sample Type: Sample
Sequence Number: 089
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 13:56:43 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	31898	1417.1466	0	0.0000
209	25838	1138.8075	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.2346	0.0548	160.5945	7.1899	ug/l	4.4770
Bi 209	<Y	25838	1138.8075			ions/sec	

13:58:19 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-44
Sample Description:	
Sample Type:	Sample
Sequence Number:	090
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:58:09 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	30517	646.2015	0	0.0000
Bi 209	28965	356.9811	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.0536	0.0223	136.8714	2.9246	ug/l	2.1367
Bi 209	<Y	28965	356.9811			ions/sec	

13:59:45 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-45
Sample Description:	
Sample Type:	Sample
Sequence Number:	091
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	13:59:35 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	48944	997.3876	0	0.0000
Bi 209	26665	353.8507	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.8356	0.0374	239.3796	4.9034	ug/l	2.0484
Bi 209	<Y	26665	353.8507			ions/sec	

14:01:11 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	100ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	092
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:01:01 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	42099	1410.3589	0	0.0000
209	54743	1310.9066	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7690	0.0258	99.5686	3.3773	ug/l	3.3919
Bi 209	<Y	54743	1310.9066			ions/sec	

14:02:37 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-46
Sample Description:	
Sample Type:	Sample
Sequence Number:	093
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:02:27 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	43977	1185.1594	0	0.0000
209	26947	517.8782	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.6320	0.0440	212.6977	5.7655	ug/l	2.7107
Bi 209	<Y	26947	517.8782			ions/sec	

14:04:03 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-47
Sample Description:	
Sample Type:	Sample
Sequence Number:	094
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:03:53 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	48655	1517.0214	0	0.0000
Bi 209	27594	415.2701	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.7632	0.0550	229.8990	7.2067	ug/l	3.1347
Bi 209	<Y	27594	415.2701			ions/sec	

14:05:29 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-48
Sample Description:
Sample Type: Sample
Sequence Number: 095
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 14:05:19 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	44979	1534.1383	0	0.0000
209	24808	349.0670	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.8131	0.0618	236.4389	8.1067	ug/l	3.4287
Bi 209	<Y	24808	349.0670			ions/sec	

14:06:56 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-49
Sample Description:	
Sample Type:	Sample
Sequence Number:	096
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:06:46 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	42950	1135.0175	0	0.0000
209	26108	452.0627	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.6451	0.0435	214.4105	5.6990	ug/l	2.6580
Bi 209	<Y	26108	452.0627			ions/sec	

14:08:23 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-50
Sample Description:	
Sample Type:	Sample
Sequence Number:	097
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:08:13 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	44766	803.6694	0	0.0000
209	26431	295.3554	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.6937	0.0304	220.7783	3.9859	ug/l	1.8054
Bi 209	<Y	26431	295.3554			ions/sec	

14:09:50 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-51
Sample Description:	
Sample Type:	Sample
Sequence Number:	098
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:09:40 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	33924	857.6375	0	0.0000
209	29267	633.2709	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1591	0.0293	150.7066	3.8414	ug/l	2.5489
Bi 209	<Y	29267	633.2709			ions/sec	

14:11:17 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-52
Sample Description:	
Sample Type:	Sample
Sequence Number:	099
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:11:07 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	34317	574.5147	0	0.0000
209	30144	591.6857	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1384	0.0191	147.9945	2.4984	ug/l	1.6882
Bi 209	<Y	30144	591.6857			ions/sec	

14:12:45 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-53
Sample Description:	
Sample Type:	Sample
Sequence Number:	100
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:12:35 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	18243	690.6713	0	0.0000
209	32684	585.4646	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5582	0.0211	71.9294	2.7702	ug/l	3.8512
Bi 209	<Y	32684	585.4646			ions/sec	

14:14:13 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCS 2782 50ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	101
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:14:03 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	23105	1284.4735	0	0.0000
209	55345	1492.4191	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.4175	0.0232	53.4853	3.0424	ug/l	5.6883
Bi 209	<Y	55345	1492.4191			ions/sec	

2 recovery
107

14:15:40 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-54
Sample Description:	
Sample Type:	Sample
Sequence Number:	102
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:15:30 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	18796	518.6682	0	0.0000
209	32565	1279.3871	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5772	0.0159	74.4221	2.0879	ug/l	2.8055
Bi 209	<Y	32565	1279.3871			ions/sec	

14:17:07 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-55
Sample Description:	
Sample Type:	Sample
Sequence Number:	103
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:16:57 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	25639	716.6545	0	0.0000
209	31979	366.8757	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.8017	0.0224	103.8548	2.9377	ug/l	2.8286
Bi 209	<Y	31979	366.8757			ions/sec	

14:18:33 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-56
Sample Description:	
Sample Type:	Sample
Sequence Number:	104
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:18:23 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
208	23406	579.7117	0	0.0000
209	34149	835.2664	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.6854	0.0170	88.6069	2.2254	ug/l	2.5115
Bi 209	<Y	34149	835.2664			ions/sec	

14:19:59 Jan 30 1995

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-57
Sample Description:	
Sample Type:	Sample
Sequence Number:	105
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:19:49 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	20556	614.4637	0	0.0000
Bi 209	34321	400.0128	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5989	0.0179	77.2719	2.3469	ug/l	3.0372
Bi 209	<Y	34321	400.0128			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-58
Sample Description:	
Sample Type:	Sample
Sequence Number:	106
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:21:15 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	20108	239.9671	0	0.0000
Bi 209	33839	451.7706	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5942	7.091E-03	76.6558	0.9296	ug/l	1.2127
Bi 209	<Y	33839	451.7706			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-59
Sample Description:	
Sample Type:	Sample
Sequence Number:	107
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:22:42 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	19827	459.5846	0	0.0000
Bi 209	33431	343.2305	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5931	0.0137	76.5020	1.8021	ug/l	2.3556
Bi 209	<Y	33431	343.2305			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-60
Sample Description:	
Sample Type:	Sample
Sequence Number:	108
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:24:09 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	18786	385.8440	0	0.0000
Bi 209	36317	468.4416	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5173	0.0106	66.5689	1.3927	ug/l	2.0922
Bi 209	<Y	36317	468.4416			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-61
Sample Description:
Sample Type: Sample
Sequence Number: 109
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 14:25:36 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	18763	494.7245	0	0.0000
Bi 209	37433	304.8027	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5012	0.0132	64.4655	1.7325	ug/l	2.6875
Bi 209	<Y	37433	304.8027			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	50ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	110
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:27:04 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	22869	806.6844	0	0.0000
Bi 209	58556	797.0117	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.3905	0.0138	49.9545	1.8059	ug/l	3.6151
Bi 209	<Y	58556	797.0117			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-62
Sample Description:	
Sample Type:	Sample
Sequence Number:	111
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:28:30 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	38996	739.0074	0	0.0000
Bi 209	31600	371.8430	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.2340	0.0234	160.5260	3.0657	ug/l	1.9098
Bi 209	<Y	31600	371.8430			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-63
Sample Description:	
Sample Type:	Sample
Sequence Number:	112
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:29:57 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	24948	730.9380	0	0.0000
Bi 209	33292	331.0325	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7494	0.0220	96.9927	2.8781	ug/l	2.9673
Bi 209	<Y	33292	331.0325			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-64
Sample Description:	
Sample Type:	Sample
Sequence Number:	113
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:31:24 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	16745	855.3422	0	0.0000
Bi 209	39178	776.6635	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.4274	0.0218	54.7878	2.8620	ug/l	5.2237
Bi 209	<Y	39178	776.6635			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-67
Sample Description:	
Sample Type:	Sample
Sequence Number:	116
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:35:47 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	18858	597.2758	0	0.0000
Bi 209	35361	607.0459	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5333	0.0169	68.6689	2.2142	ug/l	3.2245
Bi 209	<Y	35361	607.0459			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-68
Sample Description:	
Sample Type:	Sample
Sequence Number:	117
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:37:14 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	42218	816.3893	0	0.0000
Bi 209	29178	396.7659	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.4469	0.0280	188.4289	3.6678	ug/l	1.9465
Bi 209	<Y	29178	396.7659			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-69
Sample Description:	
Sample Type:	Sample
Sequence Number:	118
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:38:40 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	133586	1164.5665	0	0.0000
Bi 209	30745	492.4358	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	4.3450	0.0379	568.3339	4.9654	ug/l	0.8737
Bi 209	<Y	30745	492.4358			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	200ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	119
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:40:06 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	89890	4874.5991	0	0.0000
Bi 209	57866	1594.2103	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.5534	0.0842	202.3944	11.0429	ug/l	5.4561
Bi 209	<Y	57866	1594.2103			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-70
Sample Description:	
Sample Type:	Sample
Sequence Number:	120
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:41:32 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	33961	1270.2065	0	0.0000
Bi 209	30768	551.5889	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1038	0.0413	143.4521	5.4119	ug/l	3.7726
Bi 209	<Y	30768	551.5889			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-71
Sample Description:	
Sample Type:	Sample
Sequence Number:	121
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:42:58 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	32149	841.1948	0	0.0000
Bi 209	31991	551.2566	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.0049	0.0263	130.4911	3.4469	ug/l	2.6415
Bi 209	<Y	31991	551.2566			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-72
Sample Description:	
Sample Type:	Sample
Sequence Number:	122
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:44:24 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	29874	888.0117	0	0.0000
Bi 209	32112	364.2455	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.9303	0.0277	120.7087	3.6250	ug/l	3.0031
Bi 209	<Y	32112	364.2455			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: M3639-73
Sample Description:
Sample Type: Sample
Sequence Number: 123
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 14:45:51 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	41575	912.6304	0	0.0000
Bi 209	28382	658.4946	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.4648	0.0322	190.7823	4.2152	ug/l	2.2094
Bi 209	<Y	28382	658.4946			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-74
Sample Description:	
Sample Type:	Sample
Sequence Number:	124
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:47:18 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	59690	1038.5178	0	0.0000
Bi 209	24828	165.4745	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	2.4042	0.0418	313.9183	5.4833	ug/l	1.7467
Bi 209	<Y	24828	165.4745			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-75
Sample Description:	
Sample Type:	Sample
Sequence Number:	125
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:48:45 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	35473	1345.0739	0	0.0000
Bi 209	29983	334.2292	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1831	0.0449	153.8490	5.8808	ug/l	3.8225
Bi 209	<Y	29983	334.2292			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-76
Sample Description:	
Sample Type:	Sample
Sequence Number:	126
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:50:12 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	21268	684.7620	0	0.0000
Bi 209	34037	1011.3423	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.6248	0.0201	80.6677	2.6373	ug/l	3.2693
Bi 209	<Y	34037	1011.3423			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-77
Sample Description:	
Sample Type:	Sample
Sequence Number:	127
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:51:40 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	19693	821.4050	0	0.0000
Bi 209	35703	976.4921	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5516	0.0230	71.0642	3.0159	ug/l	4.2439
Bi 209	<Y	35703	976.4921			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	M3639-78
Sample Description:	
Sample Type:	Sample
Sequence Number:	128
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	14:53:08 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	21510	834.5079	0	0.0000
Bi 209	37444	933.0823	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5745	0.0223	74.0641	2.9216	ug/l	3.9446
Bi 209	<Y	37444	933.0823			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: 100ppb
Sample Description:
Sample Type: Sample
Sequence Number: 129
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 14:54:35 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	45058	1665.1478	0	0.0000
Bi 209	58898	947.2818	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7650	0.0283	99.0432	3.7061	ug/l	3.7419
Bi 209	<Y	58898	947.2818			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCB_1
Sample Description:	
Sample Type:	Sample
Sequence Number:	130
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:06:08 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	1548	50.0145	0	0.0000
Bi 209	59846	1424.3123	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.0259	8.357E-04	2.1491	0.1096	ug/l	5.0977
Bi 209	<Y	59846	1424.3123			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCB_2
Sample Description:	
Sample Type:	Sample
Sequence Number:	131
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:07:35 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	443	92.9969	0	0.0000
Bi 209	60749	1319.8638	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	7.299E-03	1.531E-03	-0.2849	0.2007	ug/l	70.4256
Bi 209	<Y	60749	1319.8638			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: QCB_3
Sample Description:
Sample Type: Sample
Sequence Number: 132
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 15:09:01 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	286	83.6880	0	0.0000
Bi 209	64863	1355.4459	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	4.404E-03	1.290E-03	-0.6644	0.1691	ug/l	25.4574
Bi 209	<Y	64863	1355.4459			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCB_4
Sample Description:	
Sample Type:	Sample
Sequence Number:	133
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:10:28 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	303	24.0075	0	0.0000
Bi 209	62482	1195.9594	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	4.848E-03	3.842E-04	-0.6062	0.0504	ug/l	8.3093
Bi 209	<Y	62482	1195.9594			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCS 2262 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	134
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:11:55 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	9153	213.9067	0	0.0000
Bi 209	44304	842.0613	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.2066	4.828E-03	25.8395	0.6329	ug/l	2.4494
Bi 209	<Y	44304	842.0613			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCS 1376 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	135
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:13:21 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	110001	1559.7209	0	0.0000
Bi 209	45567	703.5139	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	2.4141	0.0342	315.2162	4.4871	ug/l	1.4235
Bi 209	<Y	45567	703.5139			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCS 1366 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	136
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:14:48 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	5863	722.0601	0	0.0000
Bi 209	48825	373.0386	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.1201	0.0148	14.5004	1.9387	ug/l	13.3697
Bi 209	<Y	48825	373.0386			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCS 1367 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	137
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:16:15 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	5180	234.1253	0	0.0000
Bi 209	35461	841.5400	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.1461	6.602E-03	17.9069	0.8655	ug/l	4.8333
Bi 209	<Y	35461	841.5400			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	50ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	138
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:17:42 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	23214	460.4908	0	0.0000
Bi 209	60301	1059.1830	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.3850	7.637E-03	49.2231	1.0011	ug/l	2.0337
Bi 209	<Y	60301	1059.1830			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCD-1
Sample Description:	
Sample Type:	Sample
Sequence Number:	139
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:19:08 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	29780	660.4958	0	0.0000
Bi 209	38160	701.4308	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7804	0.0173	101.0589	2.2689	ug/l	2.2452
Bi 209	<Y	38160	701.4308			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCD-2
Sample Description:	
Sample Type:	Sample
Sequence Number:	140
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:20:35 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	17	6.5867	0	0.0000
Bi 209	15	3.3912	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1433	0.4391	148.6288	57.5627	ug/l	38.7291
Bi 209	<Y	15	3.3912			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCD-21
Sample Description:	
Sample Type:	Sample
Sequence Number:	141
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:22:03 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	17	12.4287	0	0.0000
Bi 209	15	4.6043	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.1664	0.8398	151.6545	110.0854	ug/l	72.5896
Bi 209	<Y	15	4.6043			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCD-22
Sample Description:	
Sample Type:	Sample
Sequence Number:	142
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:23:31 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	31940	453.1891	0	0.0000
Bi 209	39228	417.5623	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.8142	0.0116	105.4919	1.5144	ug/l	1.4356
Bi 209	<Y	39228	417.5623			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCD-42
Sample Description:	
Sample Type:	Sample
Sequence Number:	143
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:24:58 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	23890	597.8676	0	0.0000
Bi 209	38781	426.1804	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.6160	0.0154	79.5120	2.0209	ug/l	2.5417
Bi 209	<Y	38781	426.1804			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCD-52
Sample Description:	
Sample Type:	Sample
Sequence Number:	144
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:26:24 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	23141	920.6292	0	0.0000
Bi 209	42329	810.0825	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5467	0.0217	70.4224	2.8511	ug/l	4.0486
Bi 209	<Y	42329	810.0825			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCD-61
Sample Description:	
Sample Type:	Sample
Sequence Number:	145
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:27:50 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	12341	311.7083	0	0.0000
Bi 209	46393	806.1292	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.2660	6.719E-03	33.6294	0.8808	ug/l	2.6191
Bi 209	<Y	46393	806.1292			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCD-62
Sample Description:	
Sample Type:	Sample
Sequence Number:	146
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:29:16 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	22262	437.8174	0	0.0000
Bi 209	40337	1136.9634	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5519	0.0109	71.1055	1.4228	ug/l	2.0010
Bi 209	<Y	40337	1136.9634			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	500ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	147
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:30:42 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	22254	508.4861	0	0.0000
Bi 209	56797	1200.2085	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.3918	8.953E-03	50.1206	1.1736	ug/l	2.3415
Bi 209	<Y	56797	1200.2085			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	100ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	148
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:32:08 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	42049	782.8003	0	0.0000
Bi 209	55537	1080.5269	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7571	0.0141	98.0098	1.8477	ug/l	1.8852
Bi 209	<Y	55537	1080.5269			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCK-3 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	149
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:33:34 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	14547	124.3845	0	0.0000
Bi 209	37734	366.2790	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.3855	3.296E-03	49.2949	0.4321	ug/l	0.8766
Bi 209	<Y	37734	366.2790			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCK-4 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	150
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:35:00 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	16517	206.6942	0	0.0000
Bi 209	39506	967.6589	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.4181	5.232E-03	53.5633	0.6858	ug/l	1.2804
Bi 209	<Y	39506	967.6589			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCK-23 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	151
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:36:27 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

		Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	>	3000377	3.762E+04	0	0.0000
Bi 209		58511	732.9047	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	51.2792	0.6430	6720.8867	84.2912	ug/l	1.2542
Bi 209	<Y	58511	732.9047			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCK-25 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	152
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:37:49 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	152143	2.931E+04	0	0.0000
Bi 209	41062	973.9342	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	3.7052	0.7137	484.4722	93.5630	ug/l	19.3124
Bi 209	<Y	41062	973.9342			ions/sec	

Carry over possible
used IUP value

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCK-45 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	153
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:39:16 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	17462	5061.5132	0	0.0000
Bi 209	39465	741.0187	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.4425	0.1283	56.7600	16.8126	ug/l	29.6206
Bi 209	<Y	39465	741.0187			ions/sec	

Carry over possible

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCK-55 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	154
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:40:43 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	8571	1120.1310	0	0.0000
Bi 209	41431	908.3382	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.2069	0.0270	25.8773	3.5442	ug/l	13.6960
Bi 209	<Y	41431	908.3382			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCK-63 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	155
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:42:11 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	9852	164.7894	0	0.0000
Bi 209	31931	619.2673	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.3085	5.161E-03	39.2054	0.6765	ug/l	1.7256
Bi 209	<Y	31931	619.2673			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCK-64 1:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	156
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:43:39 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	6368	109.4810	0	0.0000
Bi 209	34956	308.2754	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.1822	3.132E-03	22.6385	0.4106	ug/l	1.8136
Bi 209	<Y	34956	308.2754			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	QCS 2782 50ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	157
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:45:06 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	22233	612.4471	0	0.0000
Bi 209	53853	1452.7834	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.4129	0.0114	52.8785	1.4908	ug/l	2.8193
Bi 209	<Y	53853	1452.7834			ions/sec	

Delaney 106

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	ID-7 2:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	158
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:46:33 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	25564	152.1321	0	0.0000
Bi 209	44001	620.6362	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5810	3.457E-03	74.9195	0.4532	ug/l	0.6050
Bi 209	<Y	44001	620.6362			ions/sec	

XS
374.6

Reruns
398

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	ID-11 2:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	159
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:47:59 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	25098	346.6250	0	0.0000
Bi 209	39264	941.3797	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.6392	8.828E-03	82.5508	1.1573	ug/l	1.4019
Bi 209	<Y	39264	941.3797			ions/sec	

x5
412.7

Reruns
445

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	ID-19 2:10
Sample Description:	
Sample Type:	Sample
Sequence Number:	160
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:49:25 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	21779	181.4487	0	0.0000
Bi 209	39090	716.6879	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.5571	4.642E-03	71.7930	0.6085	ug/l	0.8476
Bi 209	<Y	39090	716.6879			ions/sec	

XS
359.0

Rerun
378

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	ID-8
Sample Description:	
Sample Type:	Sample
Sequence Number:	161
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:50:51 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	61435	446.8711	0	0.0000
Bi 209	28152	314.6908	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	2.1822	0.0159	284.8246	2.0808	ug/l	0.7306
Bi 209	<Y	28152	314.6908			ions/sec	

Reviews
290

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	ID-41
Sample Description:	
Sample Type:	Sample
Sequence Number:	162
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:52:17 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	29057	528.6020	0	0.0000
Bi 209	33028	288.2582	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.8798	0.0160	114.0872	2.0981	ug/l	1.8390
Bi 209	<Y	33028	288.2582			ions/sec	

Previous
111

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	ID-63
Sample Description:	
Sample Type:	Sample
Sequence Number:	163
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:53:44 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	24756	558.0839	0	0.0000
Bi 209	32846	361.3742	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7537	0.0170	97.5583	2.2273	ug/l	2.2830
Bi 209	<Y	32846	361.3742			ions/sec	

Reruns 97

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set:	M3639
Data Set Description:	Cordova Soils - HNO3/HClO4
Parameter File:	Pb
Sample ID:	100ppb
Sample Description:	
Sample Type:	Sample
Sequence Number:	164
Blank:	Not Subtracted
Dilution Factor:	1
Number of Repeats:	5
Time:	15:55:12 Jan 30 1995
Signal Profile Processing:	Average
Spectral Peak Processing:	Average
Calibration File:	[Untitled]
Calibration:	External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	38800	746.6182	0	0.0000
Bi 209	51415	1047.7250	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.7546	0.0145	97.6821	1.9036	ug/l	1.9488
Bi 209	<Y	51415	1047.7250			ions/sec	

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: IK-27+100
Sample Description: 0.1 ml ds2282, 9.9 ml M3639-27
Sample Type: Sample
Sequence Number: 165
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 15:56:39 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	54792	754.6282	0	0.0000
Bi 209	34329	291.2021	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.5961	0.0220	207.9875	2.8816	ug/l	1.3855
Bi 209	<Y	34329	291.2021			ions/sec	

Bkgd 100.2 recovery 108

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M3639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: IK-55+100
Sample Description: 0.1 ml 082782, 9.9 ml M3639-55
Sample Type: Sample
Sequence Number: 166
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 15:58:06 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	59688	1417.5109	0	0.0000
Bi 209	35109	1114.3831	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	1.7001	0.0404	221.6205	5.2927	ug/l	2.3882
Bi 209	<Y	35109	1114.3831			ions/sec	

Bkgd 103.8

2 recovery 118

QUANTITATIVE ANALYSIS: SUMMARY REPORT

Data Set: M2639
Data Set Description: Cordova Soils - HNO3/HClO4
Parameter File: Pb

Sample ID: IK-61+50
Sample Description: 0.05mL DES2782, 10mL M2639-61
Sample Type: Sample
Sequence Number: 167
Blank: Not Subtracted
Dilution Factor: 1
Number of Repeats: 5
Time: 15:59:33 Jan 30 1995
Signal Profile Processing: Average
Spectral Peak Processing: Average

Calibration File: [Untitled]
Calibration: External Standard

	Sample Intensity	Std. Dev.	Blank Intensity	Std. Dev.
Pb 208	37998	1104.3170	0	0.0000
Bi 209	39669	409.6507	0	0.0000

		Net Ratio/ Intensity	Std. Dev.	Conc.	Std. Dev.		% RSD
Pb 208	?	0.9579	0.0278	124.3234	3.6493	ug/l	2.9353
Bi 209	<Y	39669	409.6507			ions/sec	

B249
64.48
% recovery
120

Parameter Entry Report

File name: Pb
Description:

Sweeps/Reading:	10
Readings/Replicate:	1
Number of Replicates:	5
Points Across Peak:	1
Resolution:	Normal
Scanning Mode:	Peak Hop
Baseline Time (ms):	0
Transfer Frequency:	Replicate
Polarity:	+

Element/ Mass	Mass	Internal Standard	Times (ms): Replicate	Dwell	OmniRange
Pb	208	?	1000	100	0.0
Bi	209	<Y	1000	100	0.0

Elemental Equations:

208 = Pb 208
209 = Bi 209

Manual Settings:

Plasma Flow:	12 L/min	RF Power:	1250 Watts
Nebulizer Flow:	0.55 L/min	CEM Voltage:	4 kV
Auxiliary Flow:	0.3 L/min	Sample Uptake:	1 mL/min

MVTL LABORATORIES, Inc.
P.O. BOX 249, 1126 N. FRONT STREET
NEW ULM, MN 56073-0249
PHONE (507) 354-8517 WATS (800) 782-3557 FAX (507) 359-2890

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

Report To: Rochelle Robideau
3M Environmental Lab
935 Bush Ave. Bldg 2-3E
St. Paul, MN 55106

Date: February 6, 1995

Work Order: 11-0101

Date Received: 01-25-95

Project No.: 20-7903
Desc: Cordova Annual Soil Samples 1994

Inorganics Lab No.	95-S137	95-S138	95-S139	95-S140	95-S141	95-S142
Soil Lab No.	1001-243	1001-244	1001-245	1001-246	1001-247	1001-248
Sample I.D.	M3639-1	M3639-2	M3639-3	M3639-4	M3639-5	M3639-6
Sample Description	C1 8-12"	C4 8-12"	11 8-12"	12 8-12"	13 8-12"	21 8-12"
ANALYTE						
Fluoride by Distillation mg/Kg	203	203	422	577	207	1120
Bray-I Phosphorus ..mg/Kg..	39	42	36	60	18	49

Report approved by:
Randall L. Hemb
By and for Minnesota Valley Testing Labs, Inc.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

MVTL LABORATORIES, Inc.
P.O. BOX 249, 1126 N. FRONT STREET
NEW ULM, MN 56073-0249
PHONE (507) 354-8517 WATS (800) 782-3557 FAX (507) 359-2890

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

Report To: Rochelle Robideau
3M Environmental Lab
935 Bush Ave. Bldg 2-3E
St. Paul, MN 55106

Date: February 6, 1995

Work Order: 11-0101

Date Received: 01-25-95

Project No.: 20-7903
Desc: Cordova Annual Soil Samples 1994

Inorganics Lab No.	95-S143	95-S144	95-S145	95-S146	95-S147	95-S148
Soil Lab No.	1001-249	1001-250	1001-251	1001-252	1001-253	1001-254
Sample I.D.	M3639-7	M3639-8	M3639-9	M3639-10	M3639-11	M3639-12
Sample Description	22 8-12"	23 8-12"	24 8-12"	25 8-12"	26 8-12"	31 8-12"
ANALYTE						
Fluoride by Distillation mg/Kg	1270	354	407	840	1630	561
Bray-I Phosphorus ..mg/Kg..	76	34	24	41	60	31

Report approved by:
Randall L. Hemb
By and for Minnesota Valley Testing Labs, Inc.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

MVTL LABORATORIES, Inc.
P.O. BOX 249, 1126 N. FRONT STREET
NEW ULM, MN 56073-0249
PHONE (507) 354-8517 WATS (800) 782-3557 FAX (507) 359-2890

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

Report To: Rochelle Robideau
3M Environmental Lab
935 Bush Ave. Bldg 2-3E
St. Paul, MN 55106

Date: February 6, 1995

Work Order: 11-0101

Date Received: 01-25-95

Project No.: 20-7903
Desc: Cordova Annual Soil Samples 1994

Inorganics Lab No.	95-S155	95-S156	95-S157	95-S158	95-S159	95-S160
Soil Lab No.	1001-261	1001-262	1001-263	1001-264	1001-265	1001-266
Sample I.D.	M3639-19	M3639-20	M3639-21	M3639-22	M3639-23	M3639-24
mple Description	52 8-12"	61 8-12"	62 8-12"	63 8-12"	64 8-12"	65 8-12"
ANALYTE						
Fluoride by Distillation mg/Kg	7990	2790	1490	2090	1620	837
Bray-I Phosphorus ..mg/Kg..	49	41	43	42	64	40

Report approved by:
Randall L. Hemb
By and for Minnesota Valley Testing Labs, Inc.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

MVTL LABORATORIES, Inc.
P.O. BOX 249, 1126 N. FRONT STREET
NEW ULM, MN 56073-0249
PHONE (507) 354-8517 WATS (800) 782-3557 FAX (507) 359-2890

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

Report To: Rochelle Robideau
3M Environmental Lab
935 Bush Ave. Bldg 2-3E
St. Paul, MN 55106

Date: February 6, 1995

Work Order: 11-0101

Date Received: 01-25-95

Project No.: 20-7903
Desc: Cordova Annual Soil Samples 1994

Inorganics Lab No.	95-S161	95-S162	95-S163	95-S164	95-S165	95-S166
Soil Lab No.	1001-267	1001-268	1001-269	1001-270	1001-271	1001-272
Sample I.D.	M3639-25	M3639-26	M3639-27	M3639-28	M3639-29	M3639-30
Sample Description	66 8-12"	67 8-12"	68 8-12"	69 8-12"	71 8-12"	81 8-12"
ANALYTE						
Fluoride by Distillation mg/Kg	1660	568	383	267	1300	227
Bray-I Phosphorus ..mg/Kg..	35	28	29	23	39	46

Report approved by:
Randall L. Hemb
By and for Minnesota Valley Testing Labs, Inc.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

MVTL LABORATORIES, Inc.
P.O. BOX 249, 1126 N. FRONT STREET
NEW ULM, MN 56073-0249
PHONE (507) 354-8517 WATS (800) 782-3557 FAX (507) 359-2890

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

Report To: Rochelle Robideau
3M Environmental Lab
935 Bush Ave. Bldg 2-3E
St. Paul, MN 55106

Date: February 6, 1995

Work Order: 11-0101

Date Received: 01-25-95

Project No.: 20-7903
Desc: Cordova Annual Soil Samples 1994

Inorganics Lab No.	95-S179	95-S180	95-S181	95-S182	95-S183	95-S184
Soil Lab No.	1001-285	1001-286	1001-287	1001-288	1001-289	1001-290
Sample I.D.	M3639-43	M3639-44	M3639-45	M3639-46	M3639-47	M3639-48
Sample Description	102 8-12"	103 8-12"	121 8-12"	122 8-12"	123 8-12"	124 8-12"
ANALYTE						
Fluoride by Distillation mg/Kg	997	658	427	309	318	342
Bray-I Phosphorus ..mg/Kg..	40	49	49	44	53	21

Report approved by:
Randall L. Hemb
By and for Minnesota Valley Testing Labs, Inc.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

MVTL LABORATORIES, Inc.
P.O. BOX 249, 1126 N. FRONT STREET
NEW ULM, MN 56073-0249
PHONE (507) 354-8517 WATS (800) 782-3557 FAX (507) 359-2890

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

Report To: Rochelle Robideau
3M Environmental Lab
935 Bush Ave. Bldg 2-3E
St. Paul, MN 55106

Date: February 6, 1995

Work Order: 11-0101

Date Received: 01-25-95

Project No.: 20-7903
Desc: Cordova Annual Soil Samples 1994

Inorganics Lab No.	95-S191	95-S192	95-S193	95-S194	95-S195	95-S196
Soil Lab No.	1001-297	1001-298	1001-299	1001-300	1001-301	1001-302
Sample I.D.	M3639-55	M3639-56	M3639-57	M3639-58	M3639-59	M3639-60
Sample Description	14 2.5'	27 2.5'	34 2.5'	610 2.5'	911 2.5'	C2 2.5'
ANALYTE						
Fluoride by Distillation mg/Kg	142	104	99.7	101	210	281
Bray-I Phosphorus ..mg/Kg..	16	7	64	60	58	46

Report approved by:
Randall L. Hemb
By and for Minnesota Valley Testing Labs, Inc.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

MVTL LABORATORIES, Inc.
P.O. BOX 249, 1126 N. FRONT STREET
NEW ULM, MN 56073-0249
PHONE (507) 354-8517 WATS (800) 782-3557 FAX (507) 359-2890

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

Report To: Rochelle Robideau
3M Environmental Lab
935 Bush Ave. Bldg 2-3E
St. Paul, MN 55106

Date: February 6, 1995

Work Order: 11-0101

Date Received: 01-25-95

Project No.: 20-7903
Desc: Cordova Annual Soil Samples 1994

Inorganics Lab No.	95-S197	95-S198	95-S199	95-S200	95-S201	95-S202
Soil Lab No.	1001-303	1001-304	1001-305	1001-306	1001-307	1001-308
Sample I.D.	M3639-61	M3639-62	M3639-63	M3639-64	M3639-65	M3639-66
Sample Description	C2 5' deep	14 5' deep	27 5' deep	34 5' deep	610 5' deep	911 5' deep
ANALYTE						
Fluoride by Distillation mg/Kg	85.8	204	141	71.5	133	151
Bray-I Phosphorus ..mg/Kg..	32	24	13	14	22	25

Report approved by:
Randall L. Hemb
By and for Minnesota Valley Testing Labs, Inc.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval

MVTL LABORATORIES, Inc.
P.O. BOX 249, 1126 N. FRONT STREET
NEW ULM, MN 56073-0249
PHONE (507) 354-8517 WATS (800) 782-3557 FAX (507) 359-2890

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

Report To: Rochelle Robideau
3M Environmental Lab
935 Bush Ave. Bldg 2-3E
St. Paul, MN 55106

Date: February 6, 1995

Work Order: 11-0101

Date Received: 01-25-95

Project No.: 20-7903
Desc: Cordova Annual Soil Samples 1994

Inorganics Lab No.	95-S209	95-S210	95-S211	95-S212	95-S213	95-S214
Soil Lab No.	1001-315	1001-316	1001-317	1001-318	1001-319	1001-320
Sample I.D.	M3639-73	M3639-74	M3639-75	M3639-76	M3639-77	M3639-78
Sample Description	Fd Dup 14 5' deep	Dup #1 C1 8-12"	Dup #2 C4 8-12"	Dup #53 C2 2.5'	Dup #54 C3 2.5'	Dup #61 C2 5'
ANALYTE						
Fluoride by Distillation mg/Kg	205	207	219	114	117	90.7
Bray-I Phosphorus ..mg/Kg..	24	38	42	48	34	37

Report approved by: Randall L. Hemb
Randall L. Hemb
By and for Minnesota Valley Testing Labs, Inc.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.