010001

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

FINAL REPORT

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 04/03/03

Matrix: Water

Project No.: 20.06002.01.081

SRR: 24075

TO: 030403-8

Sample ID	Lab System ID	Lead Results (mg/L)	Chloride Results (mg/L)
Prep Blank	----	<0.003	<0.1
Lab Control	----	0.495	201
True Value	----	0.500	200
Recovery	----	99.0%	101%
#1 PbCl2 Soln	223134	1600	1399
Duplicate result	223134	1630	1387
RPD	223134	1.86%	0.86%
Spike result	223134	2100	1718
Spike added	223134	500	400
Recovery	223134	100%	79.8%
#2 PbCl2 Soln	223135	1520	1292

Reporting Limit: 0.003 mg/L 0.1 mg/L

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SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010003

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 04/03/03

Matrix: Water

Project No.: 20.06002.01.081

SRR: 24075

TO: 030403-8

Sample ID	Lab System ID	Lead Results (mg/L)
Prep Blank	----	<0.003
Lab Control	----	0.495
True Value	----	0.500
Recovery	----	99.0%
#1 PbCl2 Soln	223134	1600
Duplicate result	223134	1630
RPD	223134	1.86%
Spike result	223134	2100
Spike added	223134	500
Recovery	223134	100%
#2 PbCl2 Soln	223135	1520

Reporting Limit: 0.003 mg/L

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010004

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

Work Orders/01-QPP-015

Southwest Research Institute

Laboratory Task Order

TO #: 030403-8 Revision: 0

SDG: 223134
VTSR: 04/03/03
CASE: YPAN/CNWRA

SRR #'s: 24075
Client(s): DIV 20

Project(s): 06002.01.081
Manager(s): DAMMANN, MIKE
To PM: 04/04/03
To QA: 04/15/03
To Client: 04/15/03

010005

Instructions

TASK ORDER is NUCLEAR SAFETY RELATED 10 CFR 50, PART 21, APPENDIX B. Please contact Institute QA (Charlie Butcher 5928, pager 271.5172) before starting ANY work. Lead and Chloride analysis by ICP and IC. Lead preliminary results needed on 04/04/03. 14-day TAT on hard copy. Description on samples: Supersaturated PbCl2 solution (pH 0.5), 1:10 dilution. Div. 20 contact is Yiming Pan, ext. 6640.

Documents Related to this task order: 4923

Test: DIL-DILUTION
Section: METALPREP

Holding: 28 days from CED

Prep, Dilution

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
223134		1	Water	#1 PbCl2 Soln	03 Apr 03	01 May 03
223135		1	Water	#2 PbCl2 Soln	03 Apr 03	01 May 03

Test: IC-300.0
Section: WETCHEM

Holding: 28 days from CED

IC Method 300.0 anions (only for Bromide, Chloride, Fluoride, Sulfate)

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
223134		1	Water	#1 PbCl2 Soln	03 Apr 03	01 May 03
223135		1	Water	#2 PbCl2 Soln	03 Apr 03	01 May 03

Test: ICP-SWRI
Section: METALS

Holding: 180 days from CED

ICP Analysis by SwRI Method

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
223134		1	Water	#1 PbCl2 Soln	03 Apr 03	30 Sep 03
223135		1	Water	#2 PbCl2 Soln	03 Apr 03	30 Sep 03

ver 03/28/2003

010006

Sample Receipt

Sample Receipt Number: 24075

Southwest Research Institute

VTSR: 04/03/03

Time: 14:20:00

Project: 06002.01.081
Case #: CNWRA
Client: DIV 20

Manager: DAMMANN, MIKE
Logged in by: kedrisi
Creation Date: 04/03/03

Notes

Samples were received hand delivered at ambient temperature (22.0 °C).

QC Note: As per method.

Parameters: Analysis for Pb and Cl. As per COC.

Note: Project is Nuclear Safety Related, 10 CFR 50, Part 21, Appendix B.

Note: Contact Joann Boyd @ 2169 or Pager 351-1617. For Institute QA contact before starting any work on this project.

Note: Have SPQP (Latest Revision) on the bench at the time of prep or analysis of samples.

Note: All personnel must be QA Nuclear Certified.

Note: See chain of custody as part of the work order system for more information. Contact Project Manager for questions. POC- is Yiming Pan ext.# 6640.

Note: Turnaround time is 14 days from VTSR.

Note: Samples were received intact.
*** kedrisi Apr 3 2003 2:58PM ***

System ID	Customer ID	CED	Matrix	Containers
223134	#1 PbCl2 Soln	04/03/03	Water	1
223135	#2 PbCl2 Soln	04/03/03	Water	1
Containers: 2				Samples: 2

These documents are associated with this receipt: 4923

Thermometer: 026
Temperature: 22.0

Client: DIV 20

SR#: 2407

FRM-002

Page Printed: 7 Apr 2003 9:59:49
ver (03/28/2003)

010007

01-QPP-015
Division 01
Revision 4
November 2002

Document No. 3

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IF STAMP IS NOT RED, THIS DOCUMENT IS UNCONTROLLED

Division 01

Chemistry and Chemical
Engineering Division

QUALITY PROJECT PLAN FOR

PERFORMANCE OF CHEMICAL ANALYSES FOR COMMERCIAL NUCLEAR POWER PLANTS WITHIN THE DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

SOUTHWEST RESEARCH INSTITUTE
Chemistry and Chemical Engineering Division
6220 CULEBRA ROAD, SAN ANTONIO, TEXAS 78238

QUALITY PROJECT PLAN FOR PERFORMANCE OF CHEMICAL ANALYSES FOR COMMERCIAL NUCLEAR POWER PLANTS WITHIN THE DEPARTMENT OF ANALYTICAL AND ENVIONMENTAL CHEMISTRY

SwRI AUTHORIZATION SIGNATORIES

This is to certify that this Quality Project Plan of Southwest Research Institute (SwRI) has been reviewed and approved by the following personnel:

JOANN BOYD (210) 522-2169 — 10/30/02 **DATE**
Quality Assurance Manager

REZA KARIMI (210) 522-2412 — 10/30/02 **DATE**
Director, Department of Analytical and Environmental Chemistry

for **MICHAEL G. MACNAUGHTON** (210) 522-5162 — 10/30/02 **DATE**
Vice President, Chemistry and Chemical Engineering Division

CHRISTOPHER HOBSON (210) 522-5838 — 10/30/02 **DATE**
Quality Assurance Engineer

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PERFORMANCE OF CHEMICAL ANALYSES FOR COMMERCIAL NUCLEAR POWER PLANTS WITHIN THE DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

1.0 INTRODUCTION

This Quality Project Plan (QPP) defines the Quality Assurance (QA) program requirements for personnel providing the chemical analyses for commercial nuclear power plants. Southwest Research Institute (SwRI) ***Program Quality Plan (PQP-Nuclear)***, *Nuclear Services* shall implement the QA requirements. Project activities controlled by the PQP-Nuclear shall be accomplished as specified by the appropriate sections of **01-QAP-004**, *Quality Assurance Plan for Analytical and Environmental Services* and/or nationally recognized testing methods as specified on individual purchase orders. This QPP shall be applied to all projects initiated for nuclear utilities in the Department of Analytical and Environmental Chemistry. If, as a result of complexity, duration, or other factors, it is determined that a unique, project-specific quality plan is required, the project QAE shall notify the Project Manager and a project-specific quality plan shall be generated in accordance with **SOP-01-5.2**, *Preparation and Revision of Plans*.

2.0 SCOPE

This Quality Project Plan shall be applied to the chemical analyses performed for commercial nuclear power plants by the Department of Analytical and Environmental Chemistry within the Chemistry and Chemical Engineering Division. Although the majority of the work performed for nuclear facilities resides within the Department of Analytical and Environmental Chemistry, other departments within the division may utilize this Quality Project Plan as deemed necessary when nuclear projects are conducted.

3.0 REFERENCES

3.1 *SwRI Quality System Manual – 2000*

3.2 *10 CFR 50, Appendix B, ASME NQA-1*

3.3 *SwRI Program Quality Plan (PQP-Nuclear), Nuclear Services*

3.4 01-QAP-004, *Quality Assurance Plan for Analytical and Environmental Services*

4.0 APPLICABLE SECTIONS OF SwRI PROGRAM QUALITY PLAN (PQP-NUCLEAR)

4.1 Indoctrination and Training

4.1.1 Personnel performing duties affecting quality shall receive quality training to the *SwRI Program Quality Plan (PQP-Nuclear), Nuclear Services* prior to performing any work on projects for nuclear utilities. Institute Quality Systems (IQS) personnel shall perform this training and documentation shall be evident in the personnel training files maintained in Division Quality Assurance.

4.1.2 Indoctrination and training of personnel shall be conducted in accordance with **SOP-01-18.1**, *Qualification and Training*.

4.2 Qualification of Personnel

4.2.1 Testing personnel shall be designated as qualified to perform applicable project activities as specified in **SOP-01-18.1**, *Qualification and Training*.

4.2.2 During the performance of each testing process, testing personnel shall have access to the necessary documented procedures, i.e., QPP, QAP, Work Order, Division Quality System Standard Operating Procedures (SOPs), and applicable test/analytical procedures (TAPs) available for ready reference.

4.2.3 Any person who has not performed testing activities associated with any particular method being used for nuclear utilities projects for a period of one year shall be reevaluated prior to the conduct of the test.

4.2.4 Quality Assurance personnel witnessing the testing process for nuclear utilities shall have documented evidence of qualifications maintained by Institute Quality Systems.

4.3 Design Control

Not applicable to activities conducted within the Department of Analytical and Environmental Chemistry.

4.4 Right of Access

4.4.1 Procurement documents shall provide for access to the suppliers' facilities and records for surveillance, inspection, or audit by SwRI and clients.

4.4.2 Where appropriate, quality clause **Q32** shall be noted on the procurement documents to indicate that right of access for inspection and surveillance of activities associated with the order shall be afforded to SwRI and clients.

4.5 Control of Supplier-Generated Documents

4.5.1 Client documents shall be controlled in accordance with procedures under **SOP-01-5.0**, *Document and Data Control*, depending on the type of document supplied. These procedures provide the requirements for the preparation, review, approval, issue, distribution, and revision of documents controlled by the Chemistry and Chemical Engineering Division.

4.5.2 Documents may be controlled as Plans or Work Instructions and shall be accessible through the Division Intranet link, ***Contract Requirements*** as PDF files.

4.5.3 Nationally recognized test methods shall be of the most current issue or as specified in the purchase order. Work orders shall identify the applicable test methods to be used on the nuclear project.

4.6 Acceptance of Services Only

Not applicable to activities conducted within the Department of Analytical and Environmental Chemistry.

4.7 Commercial Grade Items

4.7.1 Where an item is to be incorporated into a test or deliverable to a client, and that item is not subject to design or specification requirements that are unique to nuclear facilities, used in applications other then nuclear facilities, and procured from the supplier on the specifications set forth in the manufacturers' published product and description, the item shall be considered "commercial grade".

4.7.2 Chemical reagents and standards used for testing purposes shall be ordered to specific chemical grades and certificates of analysis shall be required with each lot.

4.7.3 Controls for procurement planning, supplier selection, supplier performance evaluation, and acceptance of procured items and services other than chemical reagents and standards shall be as identified in **SOP-01-6.1**, *Purchasing*, and any referenced document within that procedure.

4.7.4 Receipt inspection of chemical reagents, standards, and test items for use on nuclear safety-related projects shall be performed by department personnel and documented on the *SwRI Receipt Traveler* or **FRM-109**, *Item Receipt Report*, as specified in **SOP-01-10.1**, *Inspection and Test Conduct*. Any discrepancy such as a damaged container or container label shall be documented on the form and the client shall be contacted for disposition.

4.7.5 Prior or acceptance of a commercial grade item, the receipt inspection shall determine the following:

(a) Damage was not sustained during shipment;

(b) The item has satisfied the specified acceptance criteria; and

(c) Specified documentation, as applicable to the item, was received and is acceptable.

4.7.6 Receipt inspection of chemical reagents and standards shall also consist of verification of chemical type, grade, container integrity, certificate of analysis, and shelf life, where applicable. Upon acceptance of chemical reagents and standards, the containers shall be labeled with the following:

(a) Chemical name;

(b) Chemical grade;

(c) Lot code;

(d) Date received; and

(e) Shelf life, when applicable.

4.7.7 Expired shelf life items shall not be used for testing purposes.

4.7.8 Lot codes of chemical reagents and standards used during equipment standardization and testing shall be recorded on the individual testing data sheets to provide traceability.

4.7.9 Samples supplied to SwRI for testing shall be received by the Sample Custodian and logged into the laboratory logbook. Sample documentation and sample custody shall be maintained in accordance with **TAP-01-0407-001**, *Sample Receipt and Login*, and **TAP-01-0407-035**, *Sample/Extract Storage and Custody*.

4.7.10 Samples supplied to SwRI for testing shall be labeled with the following:

(a) Sample control number;

(b) Purchase order number;

(c) Purchase order line item number, as applicable;

(d) Work order number;

(e) Nuclear QA label; and

(f) Sample retention date, when applicable.

4.7.11 In the event that samples are damaged upon receipt, a ***Sample Discrepancy Record*** shall be generated from the Division Intranet.

4.7.12 The testing work order shall list the project number, tests required, test methods required, and shall be labeled *Nuclear Quality*.

4.7.13 Identification and traceability shall be maintained in accordance with **SOP-01-8.1**, *Item Identification and Traceability*.

4.8 Inspection

4.8.1 Inspection for acceptance shall be performed by qualified persons other than those who conduct or directly supervise the work being inspected.

4.8.2 Institute Quality System (IQS) personnel shall perform surveillance activities as required to ensure compliance with the contract and this Quality Project Plan. Specific areas in which IQS may perform surveillance activities include, but are not limited to, the following:

(a) Receiving inspection and labeling of chemical reagents, standards, and testing samples;

(b) Testing processes;

(c) Calibration and major equipment;

(d) Sample and record retention; and

(e) Test records.

4.9 Inspection and Testing

4.9.1 Required tests for acceptance shall be conducted under appropriate environmental conditions using the tools and equipment necessary to conduct the test in a manner to fulfill test requirements and acceptance criteria.

4.9.2 Tests shall be conducted, controlled, and verified in accordance with **SOP-01-10.1**, *Inspection and Test Conduct*.

4.9.3 Controls for measuring and test equipment shall be as specified in **SOP-01-11.1**, *Control of Measuring and Test Equipment*.

4.9.4 Controls for identification, segregation, reporting, and resolution of nonconforming items and conditions shall be as specified in **SOP-01-13.1**, *Nonconformance Reporting*.

4.10 Handling, Storage, Packaging, Preservation, and Delivery

4.10.1 Controls for handling, storage, packaging, preservation, and delivery of items are identified in **SOP-01-15.1**, *Handling, Storage, Packaging, Preservation, and Delivery of Items*.

4.10.2 Samples specified on the purchase order to be returned to the client shall be prepared and packaged as specified on the purchase order. Each package shall be marked legibly and indelibly with the purchase order/release number and line item number(s) relevant to the package.

4.11 Quality Assurance Records

4.11.1 Quality assurance records shall furnish documentary evidence that items or activities meet specified quality requirements. Documents that ensure this evidence include **TAP-01-0407-014**, *Inventory of Case File Purges*, and **SOP-01-16.1**, *Storage and Maintenance of Quality Records*. These documents and this QPP ensure that QA records shall be legible, identifiable, retrievable, and maintained in dual storage.

4.11.2 Records shall be traceable to associated items and activities and shall accurately reflect the work accomplished or information required.

4.11.3 Documents shall be considered valid records only if stamped, initialed or signed and dated by authorized personnel or otherwise authenticated.

4.11.4 Records of test analyses performed by the Department of Analytical and Environmental Chemistry are classified as *nonpermanent* and shall be retained for a minimum of five years. Nonpermanent records are those required to show evidence that an activity was performed in accordance with the applicable requirements, but need not be retained for the life of the item. Based on the use of the final data, the client shall be responsible for determining and implementing permanent storage requirements.

4.11.5 In order to satisfy duplicate storage requirements, one copy of the QA record shall maintained by the Project Manager in Building 70 and a separate copy shall be maintained in the Division Quality Assurance Archives in Building 201. Storage requirements shall be as stated in **SOP-01-16.1**, *Storage and Maintenance of Quality Records*, to ensure protection against the risk of damage or destruction.

4.12 10 CFR, Part 21

4.12.1 SwRI procurement documents shall include requirements for reporting and approving disposition of supplier nonconformances and, when required, compliance to 10 CFR, Part 21.

4.12.2 The Manager of Institute Quality Assurance or Director of Institute Quality Systems shall determine if a nonconforming condition is reportable under 10 CFR, Part 21, and initiate reporting and condition in accordance with the SwRI Operating Policies and Procedures (OPP). Safety hazards or defects that could create a substantial safety hazard shall be reported. Substantial safety hazard means a loss of safety function to the extent that there is a major reduction in the degree of protection provided to public health and safety.

4.13 Certified Test Report

The Project Manager and Institute Quality Assurance Manager as complying with all contractual requirements shall certify test reports. The certified test report shall reference the purchase order/release number, the test methods performed, and the purchase order/release line item number.

4.14 Valid Documents List

The Department of Analytical and Environmental Chemistry work order shall specify all applicable documents and appropriate document revision level for each document. The work order shall then serve as the Valid Documents List (VDL) for each individual project.

5.0 HISTORY OF REVISIONS

Revision 4
Title of document changed from the Standard Project Quality Plan *SPQP-CH/AN* to Quality Project Plan, *QPP-015*
Extensive revision to comply with Project Quality Plan PQP-Nuclear, *Nuclear Services*, which replaces SwRI NQAPM, *Nuclear Quality Assurance Program Manual.*

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
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VTSR: April 03, 2003
PROJECT#: 06002.01.081

Chain of Custody/Login Paperwork

4923

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Shipper Name/Address: Y. Pan, Div. 20, Bldg. 57, Ext. 6640

Client: 010017 CNWRA

Client Purchase Order/Other ID:

Site/Zone ID:

Requested Turnaround:
- [x] 2 Weeks
- [ ] 3 Weeks
- [ ] Other: _____

SwRI Contact:

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	ICP (PB)	IC (Cl)									REMARKS
#1 $PbCl_2$ Soln	4/3/03		W		1	1	1									Intact
#2 $PbCl_2$ Soln	4/3/03		W		1	1	1									✓

Preservation
- **a** = HCl to pH <2
- **b** = HNO_3 to pH <2
- **c** = H_2SO_4 to pH <2
- **d** = NaOH to pH >12
- **e** = Cool (4°C±2°C)
- **f** = Other (specify)

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22°C

Therm #: 026

Comments:

Relinquished by (Print/Signature)	Date	Time
DRamirez for YP	4/3/03	2:00pm

Received by (Print/Signature)	Date	Time

Relinquished by (Print/Signature)	Date	Time

Received by (Print/Signature)	Date	Time

Relinquished by (Print/Signature)	Date	Time

SwRI Project#: 20.06002.01.081

Received by SwRI Lab: (Signature)

Date: 4/3/03 Time: 1420

Samples Disposed: Date: Time:

Samples Disposed by:

Div 01 COC Form 01-01-001, Rev 8/02

SAMPLE LOG-IN SHEET

010018

Lab Name: Southwest Research Institute

Page 1 of 1

Received By (Print Name): Khaled Edrisi

Log-in Date: 04/03/2003

Received By (Signature): Khaled El

Case Number: CNWRA

Sample Delivery Group No.

SAS Number: N/A

Remarks: 06002.01.081

			EPA Sample #	Corresponding Sample Tag #	Corresponding Assigned Lab #	Remarks: Condition of Sample Shipment, etc
1.	Custody Seal(s)	Present/Absent* Intact/Broken	#1 PbCl2 Soln	None	223134	Intact
			#2 PbCl2 Soln	None	223135	Intact
2.	Custody Seal Nos.	N/A				
3.	Chain-of Custody Records	Present/Absent*				
4.	Traffic Reports or Packing Lists	Present/Absent*				
5.	Airbill	Airbill/Sticker Present/Absent*				
6.	Airbill No.	HAND DELIVERED				
7.	Sample Tags	Present/Absent*				
	Sample Tag Numbers	Listed/Not listed on Chain of Custody				
8.	Sample Condition	Intact/Broken*/ Leaking				
9.	Cooler Temperature	22.0C				
10.	Does Information on custody records, traffic reports, and sample tags agree?	Yes/No*				
11.	Date Received at Lab	04/03/2003				
12.	Time Received	14:20:00				

Sample Transfer

Fraction	Fraction
ICP, IC	
Area # Inorg 1	Area # 4/3/03
By KE	By KE
On 4/3/03	On

* Contact SMO and attach record of resolution

Reviewed By: CYNTHIA A. SALCEDA

Date: 04/07/03

Logbook No.: Sample Receipt (24075)

Logbook Page No.: 4665 (3 of 4)

FORM DC-1

OLMO4.2

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

Copies of Login Book

Sample Login Book

Apr 03, 2003

SwRI Login Area
Division 1

Sample Receipt: 24074 | Project: 06334.02.00X | Client: URS Corporation
VTSR Date: Apr 03, 2003 | VTSR Time: 13:20:00 | Manager: BARCLAY, BILL

System ID	Customer Sample ID	Matrix
223116	298-MW-18 DUP 13213	Ground Water
223117	299-MW-19 13214	Ground Water
223118	300-MW-19B 13215	Ground Water
223119	309-MW-7C 13218	Ground Water
223120	313-MW-20 13222	Ground Water
223121	314-MW-21 13223	Ground Water
223122	315-MW-21B 13224	Ground Water
223123	320-MW-104B 13231	Ground Water
223124	320-MW-104B DUP 13232	Ground Water
223125	321-MW-105B 13233	Ground Water
223126	322-MW-106B 13234	Ground Water
223127	323-MW-107B 13235	Ground Water
223128	324-MW-108B 13236	Ground Water
223129	330-MW-114B 13242	Ground Water
223130	331-MW-115B 13243	Ground Water
223131	361-MW-106A 13256	Ground Water
223132	362-MW-108A 13257	Ground Water
223133	366-MW-22 13262	Ground Water

Sample Receipt: 24075 | Project: 06002.01.081 | Client: DIV 20
VTSR Date: Apr 03, 2003 | VTSR Time: 14:20:00 | Manager: DAMMANN, MIKE

System ID	Customer Sample ID	Matrix
223134	#1 PbCl2 Soln	Water
223135	#2 PbCl2 Soln	Water

Sample Receipt: 24076 | Project: 05935.08.00X | Client: JACADS
VTSR Date: Apr 03, 2003 | VTSR Time: 15:30:00 | Manager: BOYD, JO ANN

System ID	Customer Sample ID	Matrix
223136	14524	Solid

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

RAW DATA

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010022

SOUTHWEST RESEARCH INSTITUTE

6220 Culebra Rd
San Antonio, Texas 78228

TJA TRACE ICP DAILY LOG

ANALYST [illegible] DATE 4-4-03

As 189.042 Profile Line As Intensity: 577.053

PEAK POSITION .035061
VERNIER POSITION 294
AUTOSAMPLER Yes X No

QC PREP DATE:	
CCV/ICV	03C17
CRI	03C24
ICSA	03C24
ICSAB	03C10

STDs PREP DATE:	
CLP_STD1_SC	03C03
CLP_STD2_SC	03C03
CLP_STD3_SC	03001
CLP_STD4_SC	03C24
CLP_STD5_SC	03C10
CLP_STD6_SC	03001
BLK_SC	03C17

COMMENTS	FILE	CLIENT	WO#	PROJECT NO.	METHOD
A030A038	Daily26	Dilzo	030403-8	06002.01.081	Daily1
A030327A	1	W.L. Gore	030327-4.1	03001.0AA6.003	1 5223X

4-4-03

COMMENTS:

MAINTENANCE:

REVIEWED BY: Verance O'Brien DATE: 4/4/03

010023

ICP Calibration Blank/ICB/CCB Solution

ID: BLK- 03C17

Date Prepared: 3.17.03 Prepared By: [signature]

Make up as needed in 1000ml volumetric flask.

Added ✓ 10 ml HNO3 INORG #: 3917

Added ✓ 50 ml HCL INORG #: 3948

Added ✓ 1000ul of 10000ppm Sc (INORG. VENT.) EXP. Date: 3683 INORG #: 10-1-03

ICP Calibration Blank/ICB/CCB Solution

ID: BLK- 03007

Date Prepared: 4-7-03 Prepared By: [signature]

Make up as needed in 1000ml volumetric flask.

Added ✓ 10 ml HNO3 INORG #: 4011

Added ✓ 50 ml HCL INORG #: 3950

Added ✓ 1000ul of 10000ppm Sc (INORG. VENT.) EXP. Date: 10-1-03 INORG #: 3683

ICP Calibration Blank/ICB/CCB Solution

ID: BLK-

Date Prepared:_____ Prepared By:_____

Make up as needed in 1000ml volumetric flask.

Added_____ 10 ml HNO3 INORG #:_____

Added_____ 50 ml HCL INORG #:_____

Added_____ 1000ul of 10000ppm Sc (INORG. VENT.) EXP. Date: _____INORG #:_____

ICP Calibration Blank/ICB/CCB Solution

ID: BLK-

Date Prepared:_____ Prepared By:_____

Make up as needed in 1000ml volumetric flask.

Added_____ 10 ml HNO3 INORG #:_____

Added_____ 50 ml HCL INORG #:_____

Added_____ 1000ul of 10000ppm Sc (INORG. VENT.) EXP. Date: _____INORG #:_____

ICP ICV/CCV SOLUTION

CCV- 03C17

Date Prepared: 3-17-03 Prepared By: [signature]

HNO3 INORG #: 3917 HCl INORG #: 3948

Make up as needed in 1000ml volumetric flask in 1% HNO3 AND 5% HCl.

03C17

Element	Std Conc (ppm)	Amt added	Check	Source	Inorg #	Stock Conc (ppm)	Exp Date
Sc	10	1ml	✓	INORGVENT	3683	10000	10-1-03
B	5	5ml	✓	SPEX	3611	1000	8-15-03
Li	5	5ml	✓	SPEX	3612	1000	8-15-03
Mo	5	5ml	✓	SPEX	3613	1000	8-15-03
P	5	5ml	✓	SPEX	3927	1000	1-15-04
Si	5	5ml	✓	SPEX	3858	1000	12-15-03
Ti	5	5ml	✓	SPEX	3857	1000	12-15-03
Sr	5	5ml	✓	SPEX	3961	1000	2-15-04
Sn	5	5ml	✓	SPEX	3644	1000	8-15-03
Bi	5	5ml	✓	SPEX	3643	1000	8-15-03
La	5	5ml	✓	SPEX	3645	1000	8-15-03
Y	5	5ml	✓	SPEX	3647	1000	8-15-03
Pd	1	1ml	✓	SPEX	3928	1000	1-15-04
S	1	1ml	✓	SPEX	3562	1000	7-15-03
Th	1	1ml	✓	SPEX	3684	1000	9-15-03
U	1	1ml	✓	SPEX	3533	1000	6-30-03
W	1	1ml	✓	SPEX	3646	1000	8-15-03
Zr	5	5ml	✓	SPEX	3608	1000	7-30-03
Na	10	1ml	✓	SPEX	3951	10000	2-15-04
ICV-2A	vary	10ml	✓	SPEX	3773	mix	11-30-03
ICV-2B	vary	1ml	✓	SPEX	3774	mix	11-30-03
ICV-2C	vary	10ml	✓	SPEX	3775	mix	11-30-03

Expiration Date: 6-30-03

ICP Calibration Standards

010025

Date Prepared: 3-3-03 Prepared By: [illegible]

HNO3 INORG #: 3917 HCl INORG #: 3947

Make up as needed in 500 ml volumetric flasks in 1% HNO3 and 5% HCl.

Prepared	Standard Name	Element	Std Conc (ppm)	Added ml	Check	Source	INORG #	Stock Conc (ppm)	Exp Date
3-3-03 DH	STD1- 03C03	Al	50	2.50	✓	INORVENT	3649	10000	9-1-03
		Ca	50	2.50	✓	INORVENT	3900	10000	2-1-04
		Fe	50	2.50	✓	INORVENT	3963	10000	3-1-04
		K	50	2.50	✓	INORVENT	3738	10000	11-1-03
		Mg	25	1.25	✓	INORVENT	3564	10000	8-1-03
		Na	50	2.50	✓	INORVENT	3565	10000	8-1-03 DH
		Li	10	5.00	✓	INORVENT	3736	1000	11-1-03
		Sc	10	0.500	✓	INORVENT	3683	10000	10-1-03
3-3-03 DH	STD2- 03C03	Ba	10	5.00	✓	INORVENT	3393	1000	4-1-03
		Be	5	2.50	✓	INORVENT	3499	1000	7-1-03
		Cr	10	5.00	✓	INORVENT	3732	1000	11-1-03
		Cu	10	5.00	✓	INORVENT	3955	1000	3-1-04
		Ni	10	5.00	✓	INORVENT	3400	1000	4-1-03
		Sc	10	0.500	✓	INORVENT	3683	10000	10-1-03
	STD3-	Cd	10	5.00		INORVENT		1000	
		Co	10	5.00		INORVENT		1000	
		Mn	10	5.00		INORVENT		1000	
		V	10	5.00		INORVENT		1000	
		Zn	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD4-	Ag	2	1.00		INORVENT		1000	
		As	10	5.00		INORVENT		1000	
		Pb	10	5.00		INORVENT		1000	
		Sb	10	5.00		INORVENT		1000	
		Se	10	5.00		INORVENT		1000	
		TL	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD5-	B	10	5.00		INORVENT		1000	
		Mo	10	5.00		INORVENT		1000	
		P	10	5.00		INORVENT		1000	
		Si	10	5.00		INORVENT		1000	
		Ti	10	5.00		INORVENT		1000	
		Sr	10	5.00		INORVENT		1000	
		Sn	10	5.00		INORVENT		1000	
		Bi	5	2.50		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
3-3-03 DH	STD6- 03C03	La	10	5.00	✓	INORVENT	3650	1000	9-1-03
		Na	1	0.05	✓	INORVENT	3565	10000	8-1-03
		Pd	10	5.00	✓	INORVENT	3964	1000	3-1-04
		S	10	5.00	✓	INORVENT	3739	1000	11-1-03
		Th	10	5.00	✓	INORVENT	3681	1000	10-1-03
		U	10	5.00	✓	INORVENT	3397	1000	4-1-03
		W	5	2.50	✓	INORVENT	3568	1000	8-1-03
		Y	10	5.00	✓	INORVENT	3654	1000	9-1-03
		Zr	10	5.00	✓	INORVENT	3398	1000	4-1-03
		SC	10	0.500	✓	INORVENT	3683	10000	10-1-03

Expiration Dates:

STD1: 8-1-03 **STD4:**

STD2: 4.1.03 **STD5:**

STD3: **STD6:** 4-1-03

010026

ICP Calibration Standards

Date Prepared: 4-1-03 Prepared By: [illegible]

HNO3 INORG #: ~~3949~~ 4011 HCl INORG #: ~~3949~~ 3950

Make up as needed in 500 ml volumetric flasks in 1% HNO3 and 5% HCl.

Prepared	Standard Name	Element	Std Conc (ppm)	Added ml	Check	Source	INORG #	Stock Conc (ppm)	Exp Date
	STD1-	Al	50	2.50		INORVENT		10000	
		Ca	50	2.50		INORVENT		10000	
		Fe	50	2.50		INORVENT		10000	
		K	50	2.50		INORVENT		10000	
		Mg	25	1.25		INORVENT		10000	
		Na	50	2.50		INORVENT		10000	
		Li	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD2-	Ba	10	5.00		INORVENT		1000	
		Be	5	2.50		INORVENT		1000	
		Cr	10	5.00		INORVENT		1000	
		Cu	10	5.00		INORVENT		1000	
		Ni	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
4-1-03	STD3- 03001	Cd	10	5.00	✓	INORVENT	3972	1000	3-1-04
		Co	10	5.00	✓	INORVENT	3973	1000	3-1-04
		Mn	10	5.00	✓	INORVENT	3921	1000	2-1-04
		V	10	5.00	✓	INORVENT	3740	1000	11-1-03
		Zn	10	5.00	✓	INORVENT	3741	1000	11-1-03
		Sc	10	0.500	✓	INORVENT	3683	10000	10-1-03
	STD4-	Ag	2	1.00		INORVENT		1000	
		As	10	5.00		INORVENT		1000	
		Pb	10	5.00		INORVENT		1000	
		Sb	10	5.00		INORVENT		1000	
		Se	10	5.00		INORVENT		1000	
		TL	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD5-	B	10	5.00		INORVENT		1000	
		Mo	10	5.00		INORVENT		1000	
		P	10	5.00		INORVENT		1000	
		Si	10	5.00		INORVENT		1000	
		Ti	10	5.00		INORVENT		1000	
		Sr	10	5.00		INORVENT		1000	
		Sn	10	5.00		INORVENT		1000	
		Bi	5	2.50		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
4-1-03	STD6- 03001	La	10	5.00	✓	INORVENT	3650	1000	9-1-03
		Na	1	0.05	✓	INORVENT	3565	10000	8-1-03
		Pd	10	5.00	✓	INORVENT	3964	1000	3-1-04
		S	10	5.00	✓	INORVENT	3759	1000	11-1-03
		Th	10	5.00	✓	INORVENT	3641	1000	10-1-03
		U	10	5.00	✓	INORVENT	3501	1000	7-1-03
		W	5	2.50	✓	INORVENT	3568	1000	8-1-03
		Y	10	5.00	✓	INORVENT	3654	1000	9-1-03
		Zr	10	5.00	✓	INORVENT	3958	1000	5-1-04
		SC	10	0.500	✓	INORVENT	3683	10000	10-1-03

Expiration Dates:

STD1: **STD4:**

STD2: **STD5:**

STD3: 10-3-01 **STD6:** 7-1-03

ICP Calibration Standards

010027

Date Prepared: 3-24-03 Prepared By: D

HNO3 INORG #: 3919 HCl INORG #: 3949

Make up as needed in 500 ml volumetric flasks in 1% HNO3 and 5% HCl.

Prepared	Standard Name	Element	Std Conc (ppm)	Added ml	Check	Source	INORG #	Stock Conc (ppm)	Exp Date
	STD1-	Al	50	2.50		INORVENT		10000	
		Ca	50	2.50		INORVENT		10000	
		Fe	50	2.50		INORVENT		10000	
		K	50	2.50		INORVENT		10000	
		Mg	25	1.25		INORVENT		10000	
		Na	50	2.50		INORVENT		10000	
		Li	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD2-	Ba	10	5.00		INORVENT		1000	
		Be	5	2.50		INORVENT		1000	
		Cr	10	5.00		INORVENT		1000	
		Cu	10	5.00		INORVENT		1000	
		Ni	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD3-	Cd	10	5.00		INORVENT		1000	
		Co	10	5.00		INORVENT		1000	
		Mn	10	5.00		INORVENT		1000	
		V	10	5.00		INORVENT		1000	
		Zn	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD4-	Ag	2	1.00	✓	INORVENT	3653	1000	9-1-03
		As	10	5.00	✓	INORVENT	3899	1000	2-1-04
		Pb	10	5.00	✓	INORVENT	3735	1000	11-1-03
	03C24	Sb	10	5.00	✓	INORVENT	3953	1000	3-1-04
DH 3-24-03		Se	10	5.00	✓	INORVENT	3652	1000	9-1-03
		TL	10	5.00	✓	INORVENT	3922	1000	2-1-04
		Sc	10	0.500	✓	INORVENT	3683	10000	10-1-03
	STD5-	B	10	5.00		INORVENT		1000	
		Mo	10	5.00		INORVENT		1000	
		P	10	5.00		INORVENT		1000	
		Si	10	5.00		INORVENT		1000	
		Ti	10	5.00		INORVENT		1000	
		Sr	10	5.00		INORVENT		1000	
		Sn	10	5.00		INORVENT		1000	
		Bi	5	2.50		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	~~STD6-~~	La	10	5.00	✓	INORVENT	3652	1000	~~9-1-03~~
		~~Na~~	1	0.05	✓	INORVENT	3565	~~10000~~	8-1-03
		Pd	~~10~~	5.00	✓	INORVENT	~~3964~~	1000	3-1-04
		S	10	~~5.00~~	✓	~~INORVENT~~	3739	1000	11-1-03
		Th	10	5.00	✓	~~INORVENT~~	3681	1000	10-1-03
		U	10	~~5.00~~	✓	INORVENT	~~3501~~	1000	7-1-03
		W	5	2.50	✓	INORVENT	3568	1000	8-1-03
		Y	10	5.00	✓	INORVENT	3654	~~1000~~	9-1-03
		Zr	10	5.00	✓	INORVENT	3958	1000	~~3-1-04~~
		SC	10	0.500	✓	INORVENT	3683	10000	10-1-03

Expiration Dates:

STD1:

STD2:

STD3:

STD4: 9-1-03

STD5:

STD6: 7-1-03

ICP Calibration Standards

010028

Date Prepared: 3-10-03 Prepared By: D

HNO3 INORG #: 3918 HCl INORG #: 3948

Make up as needed in 500 ml volumetric flasks in 1% HNO3 and 5% HCl.

Prepared	Standard Name	Element	Std Conc (ppm)	Added ml	Check	Source	INORG #	Stock Conc (ppm)	Exp Date
	STD1-	Al	50	2.50		INORVENT		10000	
		Ca	50	2.50		INORVENT		10000	
		Fe	50	2.50		INORVENT		10000	
		K	50	2.50		INORVENT		10000	
		Mg	25	1.25		INORVENT		10000	
		Na	50	2.50		INORVENT		10000	
		Li	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD2-	Ba	10	5.00		INORVENT		1000	
		Be	5	2.50		INORVENT		1000	
		Cr	10	5.00		INORVENT		1000	
		Cu	10	5.00		INORVENT		1000	
		Ni	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD3-	Cd	10	5.00		INORVENT		1000	
		Co	10	5.00		INORVENT		1000	
		Mn	10	5.00		INORVENT		1000	
		V	10	5.00		INORVENT		1000	
		Zn	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
	STD4-	Ag	2	1.00		INORVENT		1000	
		As	10	5.00		INORVENT		1000	
		Pb	10	5.00		INORVENT		1000	
		Sb	10	5.00		INORVENT		1000	
		Se	10	5.00		INORVENT		1000	
		TL	10	5.00		INORVENT		1000	
		Sc	10	0.500		INORVENT		10000	
3-10-03	STD5- 03C10	B	10	5.00	✓	INORVENT	3954	1000	3-1-04
		Mo	10	5.00	✓	INORVENT	3956	1000	3-1-04
		P	10	5.00	✓	INORVENT	3901	1000	~~12-1~~ 2-1-04 DA
		Si	10	5.00	✓	INORVENT	3500	1000	7-1-03
		Ti	10	5.00	✓	INORVENT	3762	1000	12-1-03
		Sr	10	5.00	✓	INORVENT	3566	1000	8-1-03
		Sn	10	5.00	✓	INORVENT	3552	1000	7-1-03
		Bi	5	2.50	✓	INORVENT	3606	1000	8-1-03
		Sc	10	0.500	✓	INORVENT	3683	10000	10-1-03
	STD6-	La	10	5.00		INORVENT		1000	
		Na	1	0.05		INORVENT		10000	
		Pd	10	5.00		INORVENT		1000	
		S	10	5.00		INORVENT		1000	
		Th	10	5.00		INORVENT		1000	
		U	10	5.00		INORVENT		1000	
		W	5	2.50		INORVENT		1000	
		Y	10	5.00		INORVENT		1000	
		Zr	10	5.00		INORVENT		1000	
		SC	10	0.500		INORVENT		10000	

Expiration Dates:

STD1: **STD4:**

STD2: **STD5:** 7-1-03

STD3: **STD6:**

div 20
wo#030403-8
06002.01.081

010029

system id	elem	result	qual	units	rl	tv	rec
222134	Pb220	1600		mg/L	3		
222134d	Pb220	1630		mg/L	3		
222134s	Pb220	2100		mg/L	3	500	100.0%
222135	Pb220	1520		mg/L	3		
lcsw	Pb220	0.495		mg/L	0.003	0.5	99.0%
pbw	Pb220	0.003	U	mg/L	0.003		

4/7/03

4/11/03

010030

ICP ANALYSIS

PROJ. NO.	PROJECT	TO#	DATE	MATRIX	LOGBK PG
0600201.081	DIV 20	0304038	4-4-03	Liquid	

INSTRUMENT: TRACE 1 FILENAME: A0304038

INSTRUMENT DL: _____

Standardization Rpt. 04/04/03 10:18:38 AM page 1

Method: DAILY1 Standard: blk
Run Time: 04/04/03 10:13:38

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Avge	-.00002	.0004	-.0001	.0001	-.0000	-.0001	.0000
SDev	.00002	.0000	.0000	.0000	.0000	.0000	.0000
%RSD	120.30	1.027	6.755	29.99	3.896	1.816	47.68
#1	-.00003	.0004	-.0001	.0001	-.0000	-.0001	.0000
#2	-.00000	.0004	-.0001	.0001	-.0000	-.0001	.0000

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Avge	.0001	.0000	-.0000	-.0000	.0003	-.0000	.0017
SDev	.0000	.0000	.0000	.0000	.0000	.0000	.0002
%RSD	3.512	13.46	12.25	46.60	4.519	41.30	11.47
#1	.0001	.0000	-.0000	-.0000	.0003	-.0000	.0016
#2	.0001	.0000	-.0000	-.0000	.0003	-.0000	.0018

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Avge	.0005	.0001	-.0000	.0000	-.0000	-.0077	-.0001
SDev	.0000	.0000	.0000	.0000	.0000	.0001	.0000
%RSD	3.129	1.380	115.5	20.80	32.06	1.313	22.98
#1	.0005	.0001	-.0000	.0000	-.0000	-.0078	-.0001
#2	.0005	.0001	-.0000	.0000	-.0000	-.0076	-.0001

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Avge	-.0000	.0001	.0001	-.0000	-.0000	.0000	.0000
SDev	.0000	.0000	.0001	.0000	.0000	.0000	.0000
%RSD	17.65	30.55	95.34	28.87	419.5	67.46	141.4
#1	-.0000	.0001	.0000	-.0000	.0000	.0000	.0000
#2	-.0000	.0001	.0002	-.0000	-.0000	.0000	.0000

Elem	Sc3613	1960/1	1960/2	Si2881	Sn1899	Sr4215	Th2837
Avge	76.89	-.0001	.0002	.0012	.0000	.0000	.0000
SDev	.47	.0000	.0000	.0000	.0001	.0000	.0000
%RSD	.6058	19.40	10.54	1.147	1087.	.6075	8.049
#1	77.22	-.0001	.0002	.0012	.0000	.0000	.0000
#2	76.56	-.0001	.0003	.0012	-.0000	.0000	.0000

Elem	Ti3372	Tl1908	U_3859	V_2924	W_2079	Y_3710	Zn2062
Avge	-.0015	-.0000	.0043	-.0000	.0001	-.0000	.0000
SDev	.0000	.0000	.0000	.0000	.0000	.0000	.0000
%RSD	1.924	123.0	.0336	.6075	1.671	113.4	18.28
#1	-.0014	-.0001	.0043	-.0000	.0001	-.0000	.0000
#2	-.0015	.0000	.0043	-.0000	.0001	-.0000	.0000

Elem	Zr3496
Avge	.0002
SDev	.0001
%RSD	29.85
#1	.0002
#2	.0001

4/6/03

4-4-03

Standardization Rpt. 04/04/03 10:18:38 AM page 2

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	768862	10000	--	--	--	--	--
SDev	4671.148	.0000000	--	--	--	--	--
%RSD	.6075404	.0000000	--	--	--	--	--
#1	772165	10000	--	--	--	--	--
#2	765559	10000	--	--	--	--	--

Standardization Rpt. 04/04/03 10:23:03 AM page 1

Method: DAILY1 Standard: clp_std4
Run Time: 04/04/03 10:18:48

Elem	Ag3280	As1890	2203/1	2203/2	Sb2068	1960/1	1960/2
Avge	.05351	.1311	.5129	.5276	.1341	.2808	.4811
SDev	.00006	.0000	.0038	.0047	.0003	.0038	.0056
%RSD	.11593	.0022	.7459	.8829	.2449	1.360	1.157
#1	.05355	.1311	.5102	.5243	.1339	.2781	.4772
#2	.05346	.1311	.5156	.5308	.1344	.2835	.4851

Elem	T11908
Avge	.0361
SDev	.0001
%RSD	.3065
#1	.0362
#2	.0360

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	771700	10000	--	--	--	--	--
SDev	4113.947	.0000000	--	--	--	--	--
%RSD	.5331019	.0000000	--	--	--	--	--
#1	774609	10000	--	--	--	--	--
#2	768791	10000	--	--	--	--	--

Standardization Rpt. 04/04/03 10:27:27 AM page 1

Method: DAILY1 Standard: clp_std1
Run Time: 04/04/03 10:23:12

Elem	Al3082	Ca3179	Fe2714	K_7664	Li6707	Mg2790	Na3302
Avge	.1291	.1579	.1127	1.427	2.988	.0586	.0121
SDev	.0005	.0003	.0000	.000	.002	.0001	.0001
%RSD	.3737	.1858	.0086	.0080	.0741	.1246	.7225
#1	.1288	.1577	.1127	1.427	2.989	.0586	.0120
#2	.1295	.1581	.1127	1.427	2.986	.0587	.0121

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	738812	10000	--	--	--	--	--
SDev	2106.471	.0000000	--	--	--	--	--
%RSD	.2851158	.0000000	--	--	--	--	--
#1	737323	10000	--	--	--	--	--
#2	740302	10000	--	--	--	--	--

Standardization Rpt. 04/04/03 10:31:30 AM page 1

Method: DAILY1 Standard: clp_std5
Run Time: 04/04/03 10:27:37

Elem	B_2496	Bi2230	Mo2020	P_1782	Si2881	Sn1899	Sr4215
Avge	.4347	.0675	.1890	.0461	.1342	.2316	1.442
SDev	.0051	.0000	.0031	.0006	.0007	.0004	.001
%RSD	1.176	.0159	1.611	1.186	.5240	.1766	.0519
#1	.4311	.0675	.1869	.0458	.1347	.2313	1.441
#2	.4383	.0675	.1912	.0465	.1337	.2319	1.442

Elem	Ti3372
Avge	1.100
SDev	.005
%RSD	.4171
#1	1.103
#2	1.097

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	748536	10000	--	--	--	--	--
SDev	1756.453	.0000000	--	--	--	--	--
%RSD	.2346518	.0000000	--	--	--	--	--
#1	747294	10000	--	--	--	--	--
#2	749778	10000	--	--	--	--	--

Standardization Rpt. 04/04/03 10:35:11 AM page 1

Method: DAILY1 Standard: clp_std2
Run Time: 04/04/03 10:31:40

Elem	Ba4934	Be3130	Cr2677	Cu3247	Ni2316
Avge	.5740	.2527	.3394	.3119	.8932
SDev	.0000	.0016	.0016	.0002	.0045
%RSD	.0002	.6205	.4839	.0642	.5015
#1	.5740	.2516	.3382	.3117	.8900
#2	.5740	.2538	.3405	.3120	.8964

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	741734	10000	--	--	--	--	--
SDev	13667.67	.0000000	--	--	--	--	--
%RSD	1.842663	.0000000	--	--	--	--	--
#1	732070	10000	--	--	--	--	--
#2	751399	10000	--	--	--	--	--

Standardization Rpt. 04/04/03 10:39:36 AM page 1

Method: DAILY1 Standard: clp_std3
Run Time: 04/04/03 10:35:21

Elem	Cd2265	Co2286	Mn2576	V_2924	Zn2062
Avge	1.392	.3203	.4702	.0796	.1131
SDev	.007	.0018	.0024	.0001	.0010
%RSD	.5174	.5572	.5155	.1550	.9183
#1	1.387	.3190	.4685	.0795	.1124
#2	1.397	.3215	.4719	.0797	.1138

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	749940	10000	--	--	--	--	--
SDev	1935.351	.0000000	--	--	--	--	--
%RSD	.2580676	.0000000	--	--	--	--	--
#1	751308	10000	--	--	--	--	--
#2	748571	10000	--	--	--	--	--

Standardization Rpt. 04/04/03 10:44:44 AM page 1

Method: DAILY1 Standard: clp_std6
Run Time: 04/04/03 10:39:46

Elem	La4086	Na5889	Pd3404	S_1820	Th2837	U_3859	W_2079
Avge	.3598	.1174	.1497	.0579	.0596	.0306	.1244
SDev	.0013	.0005	.0001	.0004	.0002	.0001	.0003
%RSD	.3543	.4200	.0861	.6463	.3217	.2945	.2515
#1	.3607	.1178	.1496	.0581	.0594	.0307	.1242
#2	.3588	.1171	.1498	.0576	.0597	.0306	.1246

Elem	Y_3710	Zr3496
Avge	.9910	1.203
SDev	.0032	.000
%RSD	.3203	.0260
#1	.9932	1.203
#2	.9887	1.202

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	764129	10000	--	--	--	--	--
SDev	3360.171	.0000000	--	--	--	--	--
%RSD	.4397388	.0000000	--	--	--	--	--
#1	766505	10000	--	--	--	--	--
#2	761753	10000	--	--	--	--	--

Standardization Report 04/04/03 10:44:44 AM page 1

Method: DAILY1 Slope = Conc(SIR)/IR

Element	Wavelen	High std	Low std	Slope	Y-intercept	Date Standardized
Ag3280	328.068	clp_std4	blk	37.3661	.000654	04/04/03 10:39:46
Al3082	308.215	clp_std1	blk	388.468	-.170275	04/04/03 10:39:46
As1890	189.042	clp_std4	blk	76.2262	.004561	04/04/03 10:39:46
B_2496	249.678	clp_std5	blk	23.0070	-.001513	04/04/03 10:39:46
Ba4934	493.409	clp_std2	blk	17.4209	.000487	04/04/03 10:39:46
Be3130	313.042	clp_std2	blk	19.7809	.001505	04/04/03 10:39:46
Bi2230	223.061	clp_std5	blk	73.5538	-.001150	04/04/03 10:39:46
Ca3179	317.933	clp_std1	blk	316.780	-.021216	04/04/03 10:39:46
Cd2265	226.502	clp_std3	blk	7.18345	-.000051	04/04/03 10:39:46
Co2286	228.616	clp_std3	blk	31.2229	.000223	04/04/03 10:39:46
Cr2677	267.716	clp_std2	blk	29.4677	.000115	04/04/03 10:39:46
Cu3247	324.753	clp_std2	blk	32.0965	-.009788	04/04/03 10:39:46
Fe2714	271.441	clp_std1	blk	443.351	.017032	04/04/03 10:39:46
K_7664	766.491	clp_std1	blk	35.0725	-.060006	04/04/03 10:39:46
La4086	408.672	clp_std6	blk	26.9039	-.012756	04/04/03 10:39:46
Li6707	670.784	clp_std1	blk	3.34736	-.000398	04/04/03 10:39:46
Mg2790	279.078	clp_std1	blk	426.196	.003038	04/04/03 10:39:46
Mn2576	257.610	clp_std3	blk	21.2670	-.000097	04/04/03 10:39:46
Mo2020	202.030	clp_std5	blk	52.8976	.001340	04/04/03 10:39:46
Na5889	588.995	clp_std6	blk	7.99077	.061602	04/04/03 10:39:46
Na3302	330.232	clp_std1	blk	4104.80	.480157	04/04/03 10:39:46
Ni2316	231.604	clp_std2	blk	11.1953	.000451	04/04/03 10:39:46
P_1782	178.287	clp_std5	blk	217.173	-.022435	04/04/03 10:39:46
2203/1	220.351	clp_std4	blk	19.5034	-.002480	04/04/03 10:39:46
2203/2	220.352	clp_std4	blk	18.9547	.000493	04/04/03 10:39:46
Pd3404	340.458	clp_std6	blk	67.8134	.000268	04/04/03 10:39:46
S_1820	182.040	clp_std6	blk	173.144	-.002144	04/04/03 10:39:46
Sb2068	206.838	clp_std4	blk	74.5528	-.001071	04/04/03 10:39:46
Sc3613	361.384	blk	dark	1.30272	-.164990	04/04/03 10:39:46
1960/1	196.021	clp_std4	blk	35.5946	.004007	04/04/03 10:39:46
1960/2	196.022	clp_std4	blk	20.7965	-.005006	04/04/03 10:39:46
Si2881	288.158	clp_std5	blk	74.9630	-.089458	04/04/03 10:39:46
Pb220	220.353	NONE	NONE	.000000	.000000	*NOT STANDARDIZED
Se196	196.026	NONE	NONE	1.00000	.000000	*NOT STANDARDIZED
Sn1899	189.989	clp_std5	blk	43.2111	-.000245	04/04/03 10:39:46
Sr4215	421.552	clp_std5	blk	6.93594	-.000117	04/04/03 10:39:46
Th2837	283.730	clp_std6	blk	176.296	-.002179	04/04/03 10:39:46
Ti3372	337.280	clp_std5	blk	9.07757	.013313	04/04/03 10:39:46
Tl1908	190.864	clp_std4	blk	276.441	.011104	04/04/03 10:39:46
U_3859	385.958	clp_std6	blk	379.976	-1.64397	04/04/03 10:39:46
V_2924	292.402	clp_std3	blk	125.630	.001144	04/04/03 10:39:46
W_2079	207.910	clp_std6	blk	40.2186	-.003479	04/04/03 10:39:46
Y_3710	371.030	clp_std6	blk	10.0891	.000066	04/04/03 10:39:46
Zn2062	206.200	clp_std3	blk	88.4280	-.000921	04/04/03 10:39:46
Zr3496	349.621	clp_std6	blk	8.84699	-.001362	04/04/03 10:39:46

Analysis Report QC Standard 04/04/03 10:49:53 AM page 1

Method: DAILY1 Sample Name: icv/ccv Operator:
Run Time: 04/04/03 10:44:55
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	1.0233	9.884	5.092	4.777	9.986	1.047	5.017
SDev	.0012	.033	.029	.020	.032	.000	.020
%RSD	.11451	.3353	.5731	.4235	.3253	.0027	.4057
#1	1.0225	9.908	5.113	4.763	10.01	1.047	5.031
#2	1.0242	9.861	5.072	4.791	9.963	1.047	5.003
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	1.0000	10.00	5.000	5.000	10.00	1.000	5.000
Range	10.000	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	20.33	1.008	5.022	1.994	2.033	10.28	18.04
SDev	.11	.007	.024	.013	.003	.07	.13
%RSD	.5554	.6816	.4766	.6679	.1277	.6444	.7267
#1	20.40	1.013	5.039	2.003	2.032	10.33	18.14
#2	20.25	1.003	5.005	1.985	2.035	10.24	Q17.95
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	20.00	1.000	5.000	2.000	2.000	10.00	20.00
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	5.051	4.848	19.95	1.026	5.098	Q45.10	27.40
SDev	.003	.038	.11	.006	.015	.43	.22
%RSD	.0548	.7864	.5291	.5625	.2977	.9558	.7931
#1	5.053	4.875	20.03	1.030	5.087	Q45.40	27.55
#2	5.049	4.821	19.88	1.022	5.109	Q44.79	27.25
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Fail	QC Pass
Value	5.000	5.000	20.00	1.000	5.000	30.00	30.00
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	4.885	4.833	4.985	5.086	1.025	.9898	1.011
SDev	.016	.176	.015	.002	.003	.0161	.008
%RSD	.3245	3.642	.2935	.0352	.3224	1.630	.8060
#1	4.896	4.708	4.995	5.085	1.027	.9784	1.017
#2	4.874	4.957	4.975	5.087	1.022	1.001	1.006
Errors	QC Pass	QC Pass	NOCHECK	NOCHECK	QC Pass	QC Pass	QC Pass
Value	5.000	5.000			1.000	1.000	1.000
Range	10.00	10.00			10.00	10.00	10.00

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899

Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	97.50	5.279	5.270	4.982	5.047	5.268	4.978
SDev	.20	.001	.015	.024	.004	.009	.047
%RSD	.2096	.0235	.2811	.4890	.0729	.1795	.9493
#1	97.36	5.279	5.281	5.000	5.050	5.275	5.011
#2	97.65	5.280	5.260	4.965	5.045	5.261	4.944
Errors	NOCHECK	NOCHECK	NOCHECK	QC Pass	QC Pass	QC Pass	QC Pass
Value				5.000	5.000	5.000	5.000
Range				10.00	10.00	10.00	10.00

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	5.228	1.004	4.915	5.416	1.002	5.038	Q1.307
SDev	.012	.014	.003	.022	.018	.025	.001
%RSD	.2227	1.433	.0594	.4021	1.810	.4938	.1050
#1	5.237	1.015	4.917	5.401	1.015	5.056	Q1.308
#2	5.220	.9942	4.913	5.432	.9891	5.021	Q1.306
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Fail
Value	5.000	1.000	5.000	5.000	1.000	5.000	1.000
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	5.068	1.023	4.935
SDev	.008	.010	.001
%RSD	.1647	.9665	.0157
#1	5.074	1.030	4.936
#2	5.062	1.016	4.935
Errors	QC Pass	QC Pass	QC Pass
Value	5.000	1.000	5.000
Range	10.00	10.00	10.00

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	749652	10000	--	--	--	--	--
SDev	1547.150	.0000000	--	--	--	--	--
%RSD	.2063824	.0000000	--	--	--	--	--
#1	748558	10000	--	--	--	--	--
#2	750746	10000	--	--	--	--	--

Analysis Report Blank Sample 04/04/03 10:57:22 AM page 1

Method: DAILY1 Sample Name: icb/ccb Operator:
Run Time: 04/04/03 10:52:23
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.00004	.0071	.0016	.0020	.0004	.0000	.0002
SDev	.00006	.0042	.0021	.0003	.0003	.0002	.0005
%RSD	136.81	58.46	133.4	12.87	73.60	448.8	307.8
#1	-.00000	.0101	.0031	.0022	.0006	.0002	.0005
#2	-.00009	.0042	.0001	.0018	.0002	-.0001	-.0002
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.00500	.0500	.0050	.0500	.0050	.0050	.0050
Low	-.00500	-.0500	-.0050	-.0500	-.0050	-.0050	-.0050

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.0042	-.0000	-.0000	.0002	-.0002	-.0040	-.0000
SDev	.0006	.0002	.0005	.0002	.0001	.0033	.0000
%RSD	13.88	604.0	1982.	76.22	40.88	83.45	168.5
#1	-.0038	-.0001	.0003	.0004	-.0002	-.0063	-.0001
#2	-.0046	.0001	-.0004	.0001	-.0001	-.0016	.0000
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0500	.0050	.0050	.0050	.0050	.0250	.1000
Low	-.0500	-.0050	-.0050	-.0050	-.0050	-.0250	-.1000

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0001	.0001	-.0014	-.0000	H.0050	-.0076	-.0111
SDev	.0001	.0001	.0008	.0001	.0025	.0016	.1363
%RSD	87.38	103.0	55.02	206.1	48.96	21.34	1228.
#1	.0002	.0002	-.0020	.0000	H.0068	-.0065	H.0853
#2	.0000	.0000	-.0009	-.0001	.0033	-.0088	L-.1075
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC High	LC Pass	LC Pass
High	.0050	.0050	.0500	.0050	.0050	.0500	.0500
Low	-.0050	-.0050	-.0500	-.0050	-.0050	-.0500	-.0500

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0005	-.0060	.0000	.0016	-.0011	.0032	-.0014
SDev	.0005	.0018	.0011	.0013	.0013	.0031	.0013
%RSD	99.79	30.37	75690.	80.25	122.2	95.30	90.14
#1	.0009	-.0047	-.0008	.0024	-.0001	.0054	-.0005
#2	.0002	-.0073	.0008	.0007	-.0020	.0010	-.0023
Errors	LC Pass	LC Pass	NOCHECK	NOCHECK	LC Pass	LC Pass	LC Pass
High	.0050	.0100			.0050	.0100	.0100
Low	-.0050	-.0100			-.0050	-.0100	-.0100

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899

Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	98.99	-.0001	-.0014	.0000	.0010	-.0010	-.0029
SDev	.09	.0053	.0026	.0006	.0005	.0035	.0008
%RSD	.0879	3737.	191.4	3311.	45.07	370.3	26.08
#1	98.93	.0036	.0005	.0004	.0014	.0015	-.0035
#2	99.05	-.0039	-.0032	-.0004	.0007	-.0034	-.0024
Errors	NOCHECK	NOCHECK	NOCHECK	LC Pass	LC Pass	LC Pass	LC Pass
High				.0100	.0030	.0050	.0050
Low				-.0100	-.0030	-.0050	-.0050

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0002	-.0012	.0001	.0029	.0064	.0007	.0014
SDev	.0001	.0005	.0002	.0049	.0067	.0005	.0018
%RSD	61.96	44.18	475.4	165.8	104.9	70.59	124.0
#1	.0003	-.0016	.0002	.0064	.0112	.0010	.0002
#2	.0001	-.0008	-.0001	-.0005	.0017	.0003	.0027
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0050	.0100	.0050	.0100	.1000	.0050	.0100
Low	-.0050	-.0100	-.0050	-.0100	-.1000	-.0050	-.0100

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	.0003	-.0009	.0003
SDev	.0001	.0002	.0007
%RSD	54.02	28.71	237.6
#1	.0004	-.0007	.0008
#2	.0002	-.0010	-.0002
Errors	LC Pass	LC Pass	LC Pass
High	.0050	.0050	.0050
Low	-.0050	-.0050	-.0050

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	761050	10000	--	--	--	--	--
SDev	656.1951	.0000000	--	--	--	--	--
%RSD	.0862223	.0000000	--	--	--	--	--
#1	760586	10000	--	--	--	--	--
#2	761514	10000	--	--	--	--	--

Analysis Report 04/04/03 11:02:53 AM page 1

Method: DAILY1 Sample Name: pbw Operator:
Run Time: 04/04/03 10:57:32
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00040	.0102	.0003	.0011	-.0000	-.0000	-.0004
SDev	.00049	.0049	.0009	.0003	.0000	.0002	.0006
%RSD	120.69	48.56	270.1	21.86	14.45	3401.	156.1
#1	.00006	.0137	.0010	.0010	-.0000	-.0002	-.0007
#2	.00075	.0067	-.0003	.0013	-.0000	.0001	.0000
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.00500	.0500	.0050	.0500	.0050	.0050	.0050
Low	-.00500	-.0500	-.0050	-.0500	-.0050	-.0050	-.0050

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.0033	.0001	.0007	-.0001	.0032	-.0066	.0020
SDev	.0002	.0002	.0002	.0003	.0001	.0026	.0182
%RSD	5.884	237.7	27.14	277.1	4.050	39.67	905.0
#1	-.0035	.0002	.0006	-.0003	.0033	-.0048	-.0108
#2	-.0032	-.0001	.0009	.0001	.0031	-.0085	.0149
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0500	.0050	.0050	.0050	.0050	.0250	.1000
Low	-.0500	-.0050	-.0050	-.0050	-.0050	-.0250	-.1000

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0004	-.0001	.0014	-.0001	.0024	-.0096	-.0333
SDev	.0003	.0000	.0016	.0000	.0004	.0027	.1409
%RSD	84.36	26.97	113.5	60.14	18.67	28.38	423.1
#1	.0002	-.0001	.0025	-.0000	.0028	-.0115	L-.1330
#2	.0006	-.0001	.0003	-.0001	.0021	-.0076	H.0663
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0050	.0050	.0500	.0050	.0050	.0500	.0500
Low	-.0050	-.0050	-.0500	-.0050	-.0050	-.0500	-.0500

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0003	.0053	.0001	-.0009	.0007	-.0018	.0012
SDev	.0000	.0075	.0004	.0026	.0018	.0034	.0009
%RSD	12.65	142.3	660.4	277.5	253.4	190.4	75.26
#1	.0003	H.0106	.0003	-.0028	-.0006	.0006	.0006
#2	.0004	-.0000	-.0002	.0009	.0020	-.0042	.0018
Errors	LC Pass	LC Pass	NOCHECK	NOCHECK	LC Pass	LC Pass	LC Pass
High	.0050	.0100			.0050	.0100	.0100
Low	-.0050	-.0100			-.0050	-.0100	-.0100

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899

Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	97.93	.0010	-.0018	.0018	-.0006	-.0008	-.0016
SDev	.57	.0027	.0025	.0001	.0016	.0008	.0002
%RSD	.5834	267.5	145.2	4.267	265.1	98.09	9.707
#1	97.52	-.0009	.0000	.0019	-.0017	-.0003	-.0015
#2	98.33	.0029	-.0035	.0017	.0005	-.0014	-.0017
Errors	NOCHECK	NOCHECK	NOCHECK	LC Pass	LC Pass	LC Pass	LC Pass
High				.0100	.0030	.0050	.0050
Low				-.0100	-.0030	-.0050	-.0050

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0000	.0005	-.0002	.0036	.0130	.0007	.0061
SDev	.0000	.0004	.0003	.0007	.0127	.0000	.0009
%RSD	30.24	86.50	175.7	20.26	97.75	.2445	15.21
#1	.0000	.0008	-.0004	.0041	.0040	.0007	.0054
#2	.0000	.0002	.0000	.0031	.0221	.0007	.0067
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0050	.0100	.0050	.0100	.1000	.0050	.0100
Low	-.0050	-.0100	-.0050	-.0100	-.1000	-.0050	-.0100

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	-.0000	-.0009	.0002
SDev	.0000	.0001	.0002
%RSD	116.9	9.547	93.61
#1	-.0000	-.0009	.0001
#2	-.0000	-.0008	.0003
Errors	LC Pass	LC Pass	LC Pass
High	.0050	.0050	.0050
Low	-.0050	-.0050	-.0050

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	752948	10000	--	--	--	--	--
SDev	4425.781	.0000000	--	--	--	--	--
%RSD	.5877941	.0000000	--	--	--	--	--
#1	749818	10000	--	--	--	--	--
#2	756077	10000	--	--	--	--	--

Analysis Report 04/04/03 11:08:23 AM page 1

Method: DAILY1 Sample Name: lcsw Operator:
Run Time: 04/04/03 11:03:03 Smc Blank spiked with 25 uL Pb (100ppm) # 3735
Comment:
Mode: CONC Corr. Factor: 1 DL 4-4-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00061	.0113	-.0004	.0007	.0000	-.0002	-.0020
SDev	.00029	.0017	.0034	.0001	.0000	.0001	.0010
%RSD	47.716	15.03	890.7	20.73	1265.	27.33	51.26
#1	.00082	.0101	-.0028	.0008	-.0000	-.0002	-.0027
#2	.00041	.0125	.0020	.0006	.0000	-.0002	-.0013

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.0005	-.0001	.0010	.0000	-.0003	-.0077	.0003
SDev	.0006	.0001	.0000	.0003	.0005	.0060	.0245
%RSD	135.9	112.5	4.139	5247.	158.0	77.67	7564.
#1	-.0000	-.0000	.0010	-.0002	.0000	-.0119	.0177
#2	-.0009	-.0001	.0010	.0002	-.0007	-.0035	-.0170

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0003	-.0001	.0016	-.0001	.0014	-.0120	-.1512
SDev	.0001	.0001	.0003	.0000	.0002	.0006	.2548
%RSD	31.44	106.5	19.29	46.43	14.17	5.104	168.6
#1	.0004	-.0000	.0014	-.0001	.0013	-.0116	.0290
#2	.0003	-.0001	.0019	-.0001	.0016	-.0125	-.3314

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0005	.0036	.4985	.4942	.0001	-.0004	.0009
SDev	.0001	.0015	.0005	.0089	.0001	.0020	.0010
%RSD	23.60	42.23	.1005	1.798	102.1	481.9	118.1
#1	.0006	.0047	.4981	.5004	.0001	-.0018	.0016
#2	.0004	.0025	.4988	.4879	.0000	.0010	.0001

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899
Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	98.03	.0012	-.0048	.0018	.4951	-.0028	.0006
SDev	1.12	.0003	.0035	.0006	.0057	.0022	.0028
%RSD	1.140	28.12	72.92	33.56	1.161	79.55	428.4
#1	98.82	.0009	-.0023	.0022	.4992	-.0012	-.0013
#2	97.24	.0014	-.0073	.0014	.4910	-.0043	.0026

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0000	-.0015	-.0003	-.0026	.0112	.0006	.0046
SDev	.0000	.0016	.0000	.0016	.0362	.0001	.0008
%RSD	108.4	109.2	10.94	62.35	322.5	18.20	16.52
#1	.0000	-.0026	-.0002	-.0038	.0369	.0005	.0041
#2	.0000	-.0003	-.0003	-.0015	-.0144	.0006	.0052

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	.0000	-.0007	.0001
SDev	.0000	.0002	.0001
%RSD	150.9	24.72	258.9
#1	-.0000	-.0008	.0002
#2	.0000	-.0006	-.0000

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	753688	10000	--	--	--	--	--
SDev	8659.229	.0000000	--	--	--	--	--
%RSD	1.148914	.0000000	--	--	--	--	--
#1	759811	10000	--	--	--	--	--
#2	747565	10000	--	--	--	--	--

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Method: DAILY1 Sample Name: 222134 dF 1000 on 4-7-03 Operator:
Run Time: 04/04/03 11:08:33
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00004	.0082	.0018	.0022	-.0000	-.0001	-.0010
SDev	.00009	.0099	.0027	.0000	.0000	.0001	.0010
%RSD	236.20	121.0	151.3	.0494	43.77	81.92	99.82
#1	.00010	.0152	.0037	.0022	-.0000	-.0000	-.0016
#2	-.00002	.0012	-.0001	.0022	-.0000	-.0002	-.0003

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0126	-.0000	.0007	-.0002	-.0001	-.0059	-.0006
SDev	.0007	.0001	.0003	.0004	.0002	.0035	.0084
%RSD	5.828	879.4	40.86	229.3	146.3	58.49	1511.
#1	.0132	-.0001	.0009	.0001	.0000	-.0084	.0054
#2	.0121	.0000	.0005	-.0005	-.0003	-.0035	-.0065

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0002	-.0001	-.0001	-.0001	.0007	-.0051	-.0940
SDev	.0005	.0000	.0004	.0000	.0002	.0002	.0722
%RSD	239.0	28.76	673.2	2.519	27.21	4.617	76.78
#1	.0005	-.0001	-.0003	-.0001	.0008	-.0049	-.0430
#2	-.0001	-.0001	.0002	-.0001	.0006	-.0052	-.1450

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0005	-.0071	1.601	1.605	-.0003	.0023	-.0002
SDev	.0001	.0108	.002	.014	.0012	.0006	.0012
%RSD	31.15	153.4	.0967	.8711	391.7	26.84	517.8
#1	.0006	.0006	1.602	1.615	.0005	.0019	-.0011
#2	.0004	-.0147	1.600	1.595	-.0012	.0027	.0006

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899
Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	98.53	.0009	-.0027	.0129	1.602	-.0015	.0000
SDev	.60	.0018	.0013	.0005	.010	.0002	.0006
%RSD	.6089	205.7	47.26	4.110	.6134	16.62	1216.
#1	98.11	.0021	-.0036	.0133	1.609	-.0017	.0004
#2	98.95	-.0004	-.0018	.0125	1.595	-.0013	-.0004

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0000	-.0003	-.0003	-.0084	-.0021	.0004	.0035
SDev	.0000	.0016	.0001	.0004	.0100	.0001	.0009
%RSD	113.7	631.0	25.60	4.415	467.1	29.09	24.45
#1	.0000	-.0014	-.0004	-.0087	.0049	.0005	.0041
#2	.0000	.0009	-.0003	-.0082	-.0092	.0003	.0029

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	-.0000	.0008	-.0000
SDev	.0001	.0008	.0002
%RSD	503.5	97.50	718.5
#1	.0001	.0013	.0001
#2	-.0001	.0002	-.0002

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	757508	10000	--	--	--	--	--
SDev	4625.185	.0000000	--	--	--	--	--
%RSD	.6105787	.0000000	--	--	--	--	--
#1	754238	10000	--	--	--	--	--
#2	760779	10000	--	--	--	--	--

Analysis Report 04/04/03 11:18:59 AM

Method: DAILY1 Sample Name: 222134d DF 1000 Operator:
Run Time: 04/04/03 11:13:40 DH 4-2-03
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00031	.0104	-.0022	.0017	.0000	-.0002	-.0015
SDev	.00049	.0022	.0004	.0002	.0001	.0001	.0020
%RSD	159.86	21.25	17.57	13.43	467.6	37.17	134.3
#1	-.00004	.0088	-.0019	.0015	-.0000	-.0002	-.0001
#2	.00066	.0120	-.0025	.0018	.0000	-.0003	-.0029

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0164	.0000	.0005	.0000	-.0000	.0012	.0048
SDev	.0001	.0001	.0002	.0001	.0001	.0022	.0030
%RSD	.5266	303.9	34.28	590.8	164.2	182.9	61.97
#1	.0164	-.0001	.0004	-.0001	.0000	.0027	.0027
#2	.0165	.0001	.0006	.0001	-.0001	-.0004	.0069

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0000	-.0001	.0007	-.0000	.0011	-.0070	-.0870
SDev	.0005	.0000	.0016	.0000	.0008	.0004	.0572
%RSD	1891.	33.27	214.0	403.2	68.52	5.212	65.73
#1	-.0003	-.0001	-.0004	-.0000	.0006	-.0073	-.1274
#2	.0004	-.0001	.0019	.0000	.0016	-.0068	-.0466

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0003	.0029	1.620	1.631	-.0004	.0028	-.0003
SDev	.0003	.0085	.011	.005	.0002	.0013	.0005
%RSD	88.96	287.1	.6532	.3041	47.21	47.03	154.1
#1	.0005	-.0030	1.613	1.628	-.0005	.0037	.0000
#2	.0001	.0089	1.628	1.635	-.0003	.0019	-.0007

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899
Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	97.40	-.0000	-.0014	.0130	1.626	-.0009	-.0009
SDev	.22	.0006	.0000	.0004	.007	.0002	.0009
%RSD	.2292	1584.	1.249	3.205	.4199	20.40	102.7
#1	97.56	.0004	-.0014	.0133	1.621	-.0008	-.0002
#2	97.24	-.0005	-.0014	.0127	1.631	-.0011	-.0015

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0000	.0003	-.0006	-.0037	-.0084	.0006	.0012
SDev	.0000	.0003	.0001	.0042	.0044	.0001	.0026
%RSD	66.58	95.25	12.40	114.7	51.78	21.63	206.0
#1	.0000	.0001	-.0006	-.0007	-.0053	.0005	-.0006
#2	.0001	.0005	-.0005	-.0066	-.0115	.0007	.0030

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	.0000	.0034	-.0000
SDev	.0001	.0002	.0004
%RSD	147.6	5.085	2311.
#1	-.0000	.0033	-.0003
#2	.0001	.0036	.0003

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	748902	10000	--	--	--	--	--
SDev	1772.717	.0000000	--	--	--	--	--
%RSD	.2367089	.0000000	--	--	--	--	--
#1	750155	10000	--	--	--	--	--
#2	747648	10000	--	--	--	--	--

Analysis Report 04/04/03 11:24:07 AM page 1

Method: DAILY1 Sample Name: 222134s 2F1000 DH 4-7-03 Operator:
Run Time: 04/04/03 11:19:08 5mL sample spiked with 25uL Pb(100ppm) #3735
Comment:
Mode: CONC Corr. Factor: 1 DL 4-4-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00033	.0103	.0027	.0020	-.0000	-.0001	-.0005
SDev	.00011	.0033	.0011	.0001	.0000	.0000	.0002
%RSD	31.936	32.44	42.33	2.943	157.0	25.11	42.18
#1	.00041	.0079	.0035	.0020	.0000	-.0001	-.0007
#2	.00026	.0126	.0019	.0019	-.0000	-.0001	-.0004

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0054	.0001	.0001	.0000	.0002	-.0040	.0059
SDev	.0008	.0001	.0002	.0001	.0001	.0066	.0024
%RSD	14.61	183.9	174.1	188.6	34.65	165.6	39.99
#1	.0048	-.0000	.0003	-.0000	.0002	-.0087	.0042
#2	.0059	.0002	-.0000	.0001	.0001	.0007	.0076

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0002	-.0001	.0019	-.0000	.0010	-.0067	.0395
SDev	.0003	.0000	.0000	.0000	.0003	.0009	.0067
%RSD	196.3	16.27	.0734	.1176	30.01	13.75	16.88
#1	.0004	-.0001	.0019	-.0000	.0008	-.0074	.0443
#2	-.0001	-.0001	.0019	-.0000	.0012	-.0061	.0348

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0000	.0027	2.096	2.106	.0002	.0053	-.0002
SDev	.0003	.0023	.007	.002	.0001	.0024	.0007
%RSD	2908.	84.93	.3371	.0776	30.94	44.60	427.6
#1	.0002	.0043	2.091	2.105	.0003	.0070	-.0007
#2	-.0002	.0011	2.101	2.107	.0002	.0037	.0003

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899
Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	97.72	.0020	-.0012	.0144	2.101	-.0002	-.0005
SDev	.61	.0000	.0020	.0016	.003	.0014	.0018
%RSD	.6248	1.871	163.9	11.07	.1638	866.7	334.6
#1	98.15	.0020	.0002	.0132	2.098	.0008	.0007
#2	97.29	.0019	-.0027	.0155	2.103	-.0011	-.0018

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0000	.0006	-.0002	.0057	.0093	.0004	-.0004
SDev	.0000	.0006	.0003	.0092	.0031	.0003	.0023
%RSD	124.6	97.47	134.9	159.1	33.14	87.69	541.6
#1	.0000	.0002	-.0004	.0122	.0071	.0002	.0012
#2	.0000	.0010	-.0000	-.0007	.0115	.0007	-.0020

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	.0000	.0014	.0000
SDev	.0001	.0006	.0003
%RSD	185.5	41.33	2577.
#1	-.0000	.0018	-.0002
#2	.0001	.0010	.0002

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	751329	10000	--	--	--	--	--
SDev	4652.763	.0000000	--	--	--	--	--
%RSD	.6192710	.0000000	--	--	--	--	--
#1	754619	10000	--	--	--	--	--
#2	748039	10000	--	--	--	--	--

Analysis Report 04/04/03 11:29:13 AM page 1

Method: DAILY1 Sample Name: 222135 dc 1000 Operator:
Run Time: 04/04/03 11:24:16 DH 4-7-03
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.00019	.0115	-.0000	.0017	-.0000	-.0002	.0004
SDev	.00056	.0035	.0006	.0002	.0000	.0001	.0013
%RSD	303.45	30.24	1709.	11.01	166.0	61.63	355.2
#1	-.00058	.0090	-.0004	.0019	-.0000	-.0001	.0013
#2	.00021	.0139	.0004	.0016	.0000	-.0002	-.0006

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0071	-.0000	.0013	.0002	.0001	.0055	.0043
SDev	.0004	.0001	.0005	.0001	.0003	.0091	.0017
%RSD	5.766	593.5	39.17	52.20	208.1	166.3	39.11
#1	.0069	-.0001	.0009	.0001	.0004	-.0010	.0055
#2	.0074	.0001	.0016	.0002	-.0001	.0119	.0031

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.0003	-.0001	.0002	-.0000	.0009	-.0068	-.0399
SDev	.0006	.0000	.0032	.0000	.0006	.0005	.0333
%RSD	190.3	28.13	1275.	2.223	73.18	7.897	83.51
#1	-.0008	-.0002	-.0020	-.0000	.0013	-.0064	-.0635
#2	.0001	-.0001	.0025	-.0000	.0004	-.0072	-.0163

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.0002	.0007	1.511	1.525	.0006	.0060	.0018
SDev	.0002	.0113	.009	.001	.0022	.0027	.0018
%RSD	72.57	1521.	.5979	.0856	347.0	45.40	100.8
#1	-.0003	-.0072	1.505	1.524	-.0009	.0080	.0031
#2	-.0001	.0087	1.517	1.526	.0021	.0041	.0005

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899
Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	98.19	.0029	-.0005	.0129	1.519	.0006	.0024
SDev	.32	.0005	.0022	.0001	.004	.0016	.0006
%RSD	.3262	17.25	444.8	.9030	.2554	250.0	26.13
#1	98.42	.0032	.0010	.0130	1.516	.0018	.0019
#2	97.96	.0025	-.0020	.0128	1.522	-.0005	.0028

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.0000	.0008	-.0006	-.0061	.0130	.0007	.0019
SDev	.0000	.0009	.0003	.0046	.0024	.0001	.0022
%RSD	241.3	110.5	52.33	75.21	18.68	14.87	115.8
#1	-.0000	.0002	-.0004	-.0094	.0147	.0007	.0003
#2	.0000	.0014	-.0008	-.0029	.0113	.0008	.0035

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	.0000	.0005	-.0001
SDev	.0000	.0001	.0002
%RSD	.3158	15.81	124.2
#1	.0000	.0005	-.0003
#2	.0000	.0006	-.0000

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	754911	10000	--	--	--	--	--
SDev	2456.489	.0000000	--	--	--	--	--
%RSD	.3254011	.0000000	--	--	--	--	--
#1	756648	10000	--	--	--	--	--
#2	753174	10000	--	--	--	--	--

Analysis Report QC Standard 04/04/03 11:39:05 AM page 1

Method: DAILY1 Sample Name: icv/ccv Operator:
Run Time: 04/04/03 11:34:05
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	1.0257	9.907	5.086	4.741	10.03	1.042	5.004
SDev	.0035	.013	.042	.062	.08	.007	.041
%RSD	.34398	.1308	.8199	1.301	.8021	.7100	.8139
#1	1.0282	9.897	5.056	4.697	9.973	1.036	4.975
#2	1.0232	9.916	5.115	4.785	10.09	1.047	5.033
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	1.0000	10.00	5.000	5.000	10.00	1.000	5.000
Range	10.000	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	20.20	.9990	5.004	1.989	2.038	10.25	18.19
SDev	.11	.0111	.040	.013	.012	.06	.06
%RSD	.5402	1.112	.8060	.6421	.5685	.5401	.3518
#1	20.12	.9912	4.976	1.980	2.030	10.21	18.15
#2	20.28	1.007	5.033	1.998	2.046	10.29	18.24
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	20.00	1.000	5.000	2.000	2.000	10.00	20.00
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	5.071	4.889	19.87	1.026	5.079	Q45.59	27.43
SDev	.016	.034	.14	.009	.057	.27	.21
%RSD	.3246	.7040	.6935	.8596	1.113	.5821	.7589
#1	5.059	4.865	19.77	1.019	5.039	Q45.40	27.58
#2	5.083	4.914	19.97	1.032	5.119	Q45.78	27.28
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Fail	QC Pass
Value	5.000	5.000	20.00	1.000	5.000	30.00	30.00
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	4.847	4.889	5.004	5.019	1.024	.9602	1.013
SDev	.049	.091	.032	.036	.000	.0012	.005
%RSD	1.005	1.854	.6391	.7176	.0256	.1271	.4664
#1	4.813	4.825	4.981	4.994	1.024	.9594	1.010
#2	4.882	4.953	5.027	5.045	1.024	.9611	1.016
Errors	QC Pass	QC Pass	NOCHECK	NOCHECK	QC Pass	QC Pass	QC Pass
Value	5.000	5.000			1.000	1.000	1.000
Range	10.00	10.00			10.00	10.00	10.00

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899

Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	96.43	5.287	5.252	4.967	5.009	5.259	4.951
SDev	.10	.042	.049	.028	.035	.047	.044
%RSD	.1047	.7885	.9328	.5681	.6915	.8845	.8899
#1	96.50	5.258	5.218	4.947	4.985	5.226	4.920
#2	96.36	5.317	5.287	4.987	5.034	5.292	4.982
Errors	NOCHECK	NOCHECK	NOCHECK	QC Pass	QC Pass	QC Pass	QC Pass
Value				5.000	5.000	5.000	5.000
Range				10.00	10.00	10.00	10.00

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	5.238	.9998	4.931	5.415	.9917	5.033	Q1.294
SDev	.019	.0101	.003	.066	.0044	.025	.005
%RSD	.3684	1.007	.0630	1.216	.4445	.5049	.4242
#1	5.224	.9927	4.933	5.369	.9885	5.015	Q1.290
#2	5.252	1.007	4.928	5.462	.9948	5.051	Q1.298
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Fail
Value	5.000	1.000	5.000	5.000	1.000	5.000	1.000
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	5.072	1.008	4.962
SDev	.007	.012	.002
%RSD	.1297	1.169	.0355
#1	5.067	.9998	4.963
#2	5.076	1.016	4.961
Errors	QC Pass	QC Pass	QC Pass
Value	5.000	1.000	5.000
Range	10.00	10.00	10.00

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	741444	10000	--	--	--	--	--
SDev	770.0393	.0000000	--	--	--	--	--
%RSD	.1038566	.0000000	--	--	--	--	--
#1	741989	10000	--	--	--	--	--
#2	740900	10000	--	--	--	--	--

Analysis Report Blank Sample 04/04/03 11:46:33 AM page 1

Method: DAILY1 Sample Name: icb/ccb Operator:
Run Time: 04/04/03 11:41:34
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130	Bi2230
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00060	.0125	.0020	.0026	.0005	-.0001	.0002
SDev	.00015	.0046	.0044	.0004	.0004	.0000	.0051
%RSD	24.022	36.89	216.5	16.48	73.62	29.29	2690.
#1	.00050	.0093	H.0051	.0029	.0008	-.0001	.0038
#2	.00071	.0158	-.0011	.0023	.0003	-.0000	-.0034
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.00500	.0500	.0050	.0500	.0050	.0050	.0050
Low	-.00500	-.0500	-.0050	-.0500	-.0050	-.0050	-.0050

Elem	Ca3179	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.0035	.0002	-.0002	.0004	.0001	.0038	-.0115
SDev	.0011	.0001	.0007	.0001	.0001	.0029	.0152
%RSD	31.45	82.46	269.4	24.46	227.1	76.96	131.6
#1	-.0027	.0003	.0002	.0005	-.0000	.0058	-.0223
#2	-.0043	.0001	-.0007	.0003	.0002	.0017	-.0008
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0500	.0050	.0050	.0050	.0050	.0250	.1000
Low	-.0500	-.0050	-.0050	-.0050	-.0050	-.0250	-.1000

Elem	La4086	Li6707	Mg2790	Mn2576	Mo2020	Na5889	Na3302
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0006	-.0000	.0025	.0000	.0049	-.0173	L-.1712
SDev	.0006	.0000	.0008	.0001	.0012	.0025	.1272
%RSD	88.07	180.1	30.13	194.1	24.74	14.69	74.30
#1	.0002	.0000	.0020	.0001	H.0057	-.0192	L-.2612
#2	.0010	-.0000	.0031	-.0000	.0040	-.0155	L-.0813
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Low
High	.0050	.0050	.0500	.0050	.0050	.0500	.0500
Low	-.0050	-.0050	-.0500	-.0050	-.0050	-.0500	-.0500

Elem	Ni2316	P_1782	2203/1	2203/2	Pd3404	S_1820	Sb2068
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0005	.0090	.0001	.0021	-.0009	.0038	-.0003
SDev	.0002	.0051	.0039	.0004	.0017	.0046	.0018
%RSD	40.73	56.02	3536.	17.30	184.0	121.3	519.2
#1	.0007	.0055	.0028	.0024	.0003	.0005	.0009
#2	.0004	H.0126	-.0026	.0019	-.0021	.0071	-.0016
Errors	LC Pass	LC Pass	NOCHECK	NOCHECK	LC Pass	LC Pass	LC Pass
High	.0050	.0100			.0050	.0100	.0100
Low	-.0050	-.0100			-.0050	-.0100	-.0100

Elem	Sc3613	1960/1	1960/2	Si2881	Pb220	Se196	Sn1899

Units	%R	ppm	ppm	ppm	ppm	ppm	ppm
Avge	100.1	.0010	-.0017	-.0004	.0015	-.0008	-.0002
SDev	.2	.0012	.0041	.0003	.0015	.0031	.0001
%RSD	.2344	120.1	240.7	61.98	104.9	403.1	31.02
#1	100.3	.0019	.0012	-.0002	.0025	.0014	-.0002
#2	99.93	.0002	-.0046	-.0006	.0004	-.0030	-.0003
Errors	NOCHECK	NOCHECK	NOCHECK	LC Pass	LC Pass	LC Pass	LC Pass
High				.0100	.0030	.0050	.0050
Low				-.0100	-.0030	-.0050	-.0050

Elem	Sr4215	Th2837	Ti3372	Tl1908	U_3859	V_2924	W_2079
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0003	.0008	-.0002	-.0018	.0147	.0012	.0015
SDev	.0002	.0006	.0002	.0051	.0084	.0005	.0014
%RSD	69.41	74.78	150.3	277.8	57.02	39.94	94.22
#1	.0004	.0004	.0000	-.0054	.0207	.0015	.0025
#2	.0002	.0012	-.0003	.0018	.0088	.0009	.0005
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0050	.0100	.0050	.0100	.1000	.0050	.0100
Low	-.0050	-.0100	-.0050	-.0100	-.1000	-.0050	-.0100

Elem	Y_3710	Zn2062	Zr3496
Units	ppm	ppm	ppm
Avge	.0004	-.0009	.0005
SDev	.0003	.0002	.0004
%RSD	81.65	28.02	83.08
#1	.0006	-.0010	.0007
#2	.0002	-.0007	.0002
Errors	LC Pass	LC Pass	LC Pass
High	.0050	.0050	.0050
Low	-.0050	-.0050	-.0050

IntStd	1	2	3	4	5	6	7
Mode	*Counts	Time	NOTUSED	NOTUSED	NOTUSED	NOTUSED	NOTUSED
Elem	Sc	--	--	--	--	--	--
Wavlen	361.384	--	--	--	--	--	--
Avge	769591	10000	--	--	--	--	--
SDev	1774.838	.0000000	--	--	--	--	--
%RSD	.2306209	.0000000	--	--	--	--	--
#1	770846	10000	--	--	--	--	--
#2	768336	10000	--	--	--	--	--

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010065

Southwest Research Institute

CMS 3/18/03

Schedule File: C:\PeakNet\schedule\030318.sch

Line	Sample	Sample Type	Level	Method	Data File	Dilution
1	0 PPM 199-08-IC3	Calibration St	1	anions030318.met	030318_001.dxd	1
2	0.1 PPM 199-07-IC3	Calibration St	2	anions030318.met	030318_002.dxd	1
3	0.5 PPM 199-06-IC3	Calibration St	3	anions030318.met	030318_003.dxd	1
4	1.0 PPM 199-05-IC3	Calibration St	4	anions030318.met	030318_004.dxd	1
5	5.0 PPM 199-04-IC3	Calibration St	5	anions030318.met	030318_005.dxd	1
6	10 PPM 199-03-IC3	Calibration St	6	anions030318.met	030318_006.dxd	1
7	15 PPM 199-02-IC3	Calibration St	7	anions030318.met	030318_007.dxd	1
8	20 PPM 199-01-IC3	Calibration St	8	anions030318.met	030318_008.dxd	1
9	ICV	Sample		anions030318.met	030318_009.dxd	20
10	ICB	Sample		anions030318.met	030318_010.dxd	1
11	MDL-1	Sample		anions030318.met	030318_011.dxd	1
12	MDL-2	Sample		anions030318.met	030318_012.dxd	1
13	MDL-3	Sample		anions030318.met	030318_013.dxd	1
14	MDL-4	Sample		anions030318.met	030318_014.dxd	1
15	MDL-5	Sample		anions030318.met	030318_015.dxd	1
16	MDL-6	Sample		anions030318.met	030318_016.dxd	1
17	MDL-7	Sample		anions030318.met	030318_017.dxd	1
18	DOC-1	Sample		anions030318.met	030318_018.dxd	1
19	DOC-2	Sample		anions030318.met	030318_019.dxd	1
20	DOC-3	Sample		anions030318.met	030318_020.dxd	1
21	CCV	Sample		anions030318.met	030318_021.dxd	20
22	CCB	Sample		anions030318.met	030318_022.dxd	1
23	DOC-4	Sample		anions030318.met	030318_023.dxd	1
24	CCV	Sample		anions030318.met	030318_024.dxd	20
25	CCB	Sample		anions030318.met	030318_025.dxd	1
26	CCB	Sample		astop.met	030318_001.dxd	1

Default Method Path: C:\PEAKNET\METHOD
Default Data Path: C:\PEAKNET\DATA\030318
Comment:

CMS 3/18/03

Book/Page: 10 017

Southwest Research Institute

Dionex DX500 Ion Chromatography Daily Log

010066

Analyst: ams

Date: 3/18/03

Conductivity: 16.8

Client	Project #	TO #	Analytical Method
Div 01	0H001.113	NA	300
			9056

Loop: 40uL

Method: Anions 030318

Column: AS14: 13535

Calibration: 3/18/03

Comments: The MDL and DOC were not used

ICV/CCV/MS:

1st Source: Spex (Inorg# 3989)

2nd Source: Nitrite

Lot #: 24-79AS

Lot #: 190-DI-IC3

CCV Conc: 1:20

CCV Conc: 1:20

MS Conc:

MS Conc:

✓ ELUENT SOLUTION PREP:

FV = 2.0L DI H20

1.0 mM Sodium Bicarbonate & 3.5 mM Sodium Carbonate

Weight: 0.168 g $NaHCO_3$

Weight: 0.7419 g Na_2HCO_3

Source: Aldrich

Source: Aldrich

Lot: 15308ET

Lot: 14315BO

____ Other Eluent:

50 mA-Autoregen (ASRS)

____ Other Regen:

Bjorner 4/11/03

FRM-226 (Rev 3/Mar 03)

Balance: 34

Pipets: 5000 G
1000 E
200 D

Book/Page: 10 034

010067

Southwest Research Institute

AMS 4/4/03

Schedule File: C:\PeakNet\schedule\04APR03.sch

Line	Sample	Sample Type	Level	Method	Data File	Dilution
1	ICV	Sample		anions030318.met	030404_001.dxd	20
2	ICB	Sample		anions030318.met	030404_002.dxd	1
3	223134	Sample		anions030318.met	030404_003.dxd	200
4	223134D	Sample		anions030318.met	030404_004.dxd	200
5	223134MS	Sample		anions030318.met	030404_005.dxd	200
6	223135	Sample		anions030318.met	030404_006.dxd	200
7	CCV	Sample		anions030318.met	030404_007.dxd	20
8	CCB	Sample		anions030318.met	030404_008.dxd	1
9	CCB	Sample		astop.met	030404_001.dxd	1

Default Method Path: C:\PEAKNET\METHOD
Default Data Path: c:\peaknet\data\030404
Comment:
Division 20 06002.01.081 TO# 030403-8

AMS 4/4/03

Book/Page: 10 035

Southwest Research Institute

Dionex DX500 Ion Chromatography Daily Log

010068

Analyst: ams

Date: 4/4/03

Conductivity: 1.e.7

Client	Project #	TO #	Analytical Method
Div 20	06002.01.081	030403-8	300

Loop: 40 uL

Method: anions 030318

Column: AS14: 13535

Calibration: 3/18/03

Comments:

ICV/CCV/MS:

1st Source: Spex Snag# 3989

2nd Source: Nitrite

Lot #: 24-79AS

Lot #: 190-01-IC3

CCV Conc: 1:20

CCV Conc: 1:20

MS Conc: 1:100

MS Conc: 1:100

✓ ELUENT SOLUTION PREP:

FV = 2.0L DI H20

1.0 mM Sodium Bicarbonate & 3.5 mM Sodium Carbonate

Weight: 0.1168 $NaHCO_3$

Weight: 0.7419 Na_2HCO_3

Source: Aldrich

Source: Aldrich

Lot: 15308 ET

Lot: 14315 BO

____ Other Eluent:

50 mA-Autoregen (ASRS)

____ Other Regen:

R Jones 4/10/03

11/4/03

Balance: 34

Eppendorfs 5000 G
1000 E
200 D

190 TITLE

SwRI

PROJECT NO.

BOOK NO. IC3

010069

190-01-IC3 Nitrite-N (100 ppm)

Diluted 0.0492 Sodium Nitrite in 100mL DI H_2O

(Fisher, Lot # 934669B, Inorg # 037A)

Balance #34

WAN 01/10/03

SIGNATURE L Warren A. Naegeli

DATE 01/10/03

DISCLOSED TO AND UNDERSTOOD BY ams

DATE 1/20/03

WITNESS

DATE

Work continued from Page

199-01-IC3 20 ppm Anions Standard expires 6/15/03

Anion	Std Vol(ml)	Std conc ppm	Std Lot#	Supp Source	Exp Date
Fluoride	1.0	1000	3895	23-109AS	1/15/2004
Chloride	1.0	1000	3487	21-58AS	6/15/2003
Nitrite-N	3.3	304	3488	5-255 VY	6/15/2003
Bromide	1.0	1000	3490	22-114AS	6/15/2003
Nitrate-N	1.0	1000	3960	23-82AS	2/15/2004
Phosphate-P	3.07	326	3880	24-63AS	12/15/2003
Sulfate	1.0	1000	3489	6-76 VY	6/15/2003

FV = 50ml

199-02-IC3 15 ppm Std
3ml 199-01-IC3 + 1ml DI H_2O

199-03-IC3 10 ppm Std
2ml 199-01-IC3 + 2ml DI H_2O

199-04-IC3 5 ppm Std
2ml 199-03-IC3 + 2ml DI H_2O

199-05-IC3 1 ppm Std
1ml 199-04-IC3 + 4ml DI H_2O

199-06-IC3 0.5 ppm Std
2ml 199-05-IC3 + 2ml DI H_2O

199-07-IC3 0.1 ppm Std
1ml 199-06-IC3 + 4ml DI H_2O

199-08-IC3 0 ppm Std
DI H_2O

Balance: 34
Eppendorfs: 5000G
1000E

SIGNATURE AMS DATE 3/18/03

DISCLOSED TO AND UNDERSTOOD BY RSpry DATE WITNESS DATE 4/11/03

Schedule File: C:\PeakNet\schedule\030318.sch

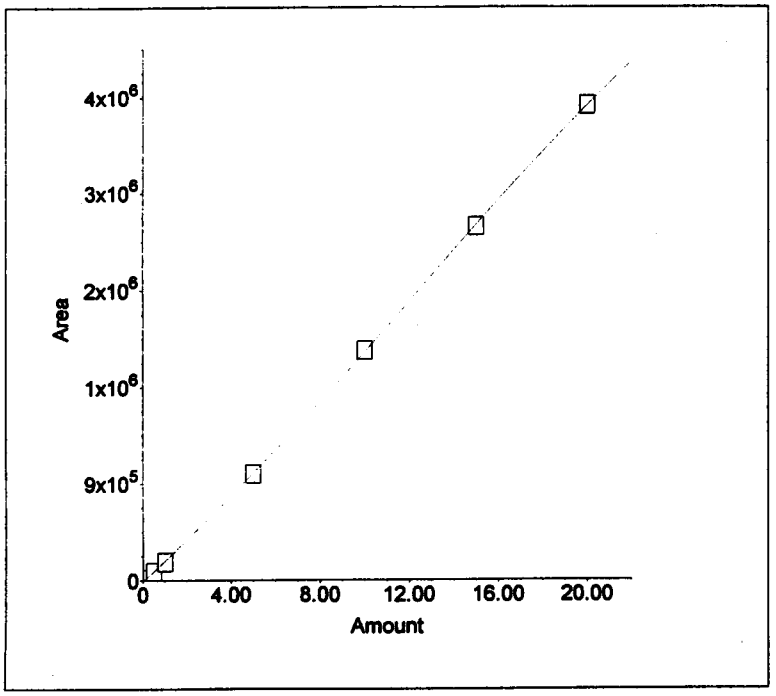
Line	Sample	Sample Type	Level	Method	Data File	Dilution
1	0 PPM 199-08-IC3	Calibration St	1	anions030318.met	030318_001.dxd	1
2	0.1 PPM 199-07-IC3	Calibration St	2	anions030318.met	030318_002.dxd	1
3	0.5 PPM 199-06-IC3	Calibration St	3	anions030318.met	030318_003.dxd	1
4	1.0 PPM 199-05-IC3	Calibration St	4	anions030318.met	030318_004.dxd	1
5	5.0 PPM 199-04-IC3	Calibration St	5	anions030318.met	030318_005.dxd	1
6	10 PPM 199-03-IC3	Calibration St	6	anions030318.met	030318_006.dxd	1
7	15 PPM 199-02-IC3	Calibration St	7	anions030318.met	030318_007.dxd	1
8	20 PPM 199-01-IC3	Calibration St	8	anions030318.met	030318_008.dxd	1
9	ICV	Sample		anions030318.met	030318_009.dxd	20
10	ICB	Sample		anions030318.met	030318_010.dxd	1

010071

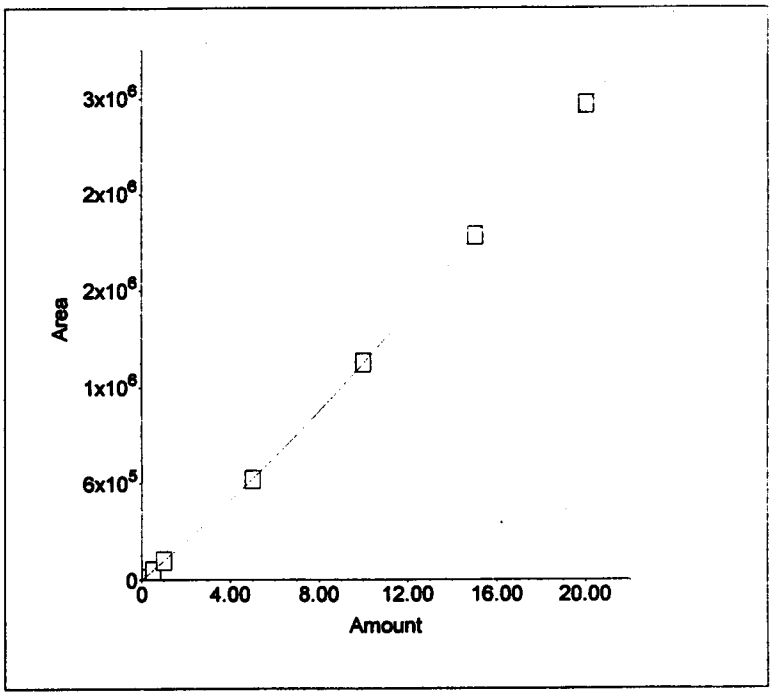
Default Method Path: C:\PEAKNET\METHOD
Default Data Path: C:\PEAKNET\DATA\030318
Comment:

010072

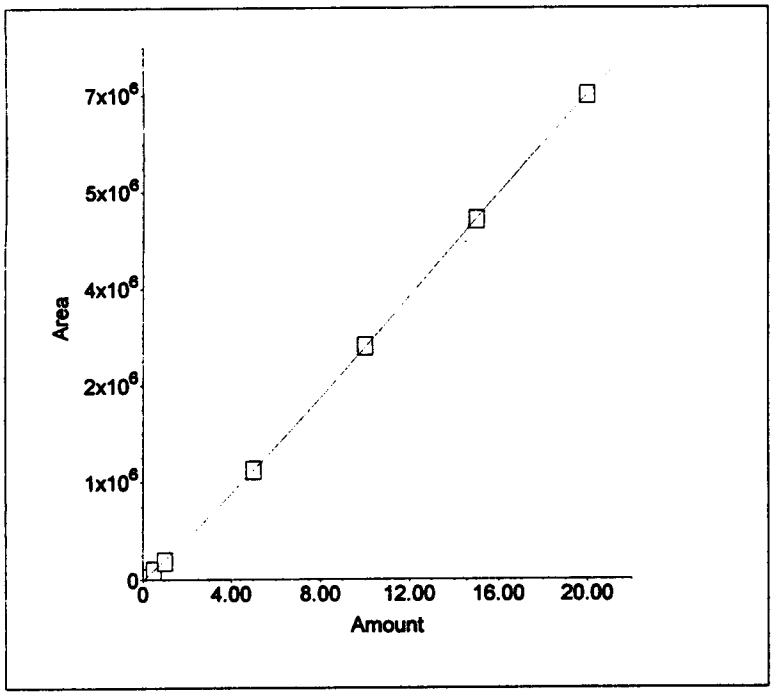
1. Component:FLUORIDE
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999963
Amt=4.560939e-020*Resp³+
-3.796787e-013*Resp²+
4.988197e-006*Resp+0.05228



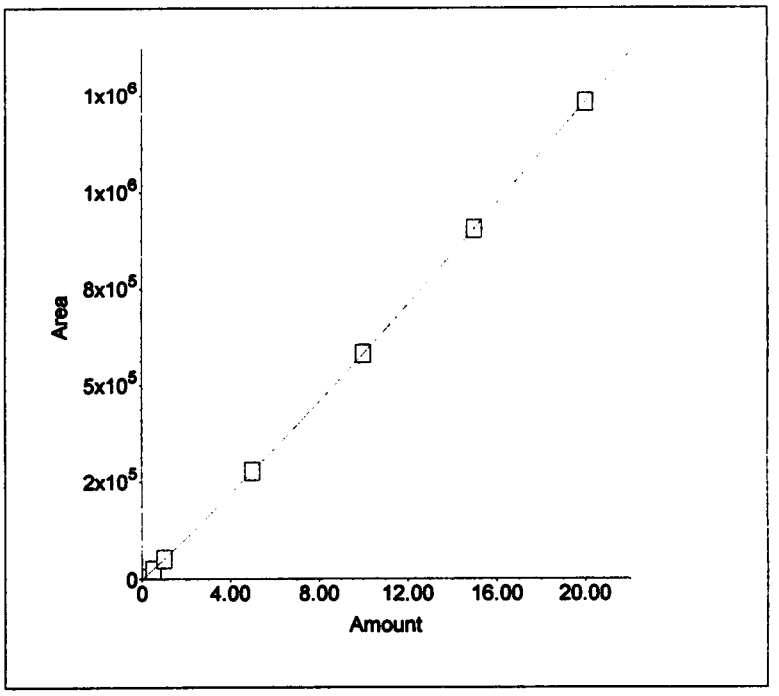
2. Component:CHLORIDE
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999994
Amt=9.097756e-020*Resp³+
-7.575694e-013*Resp²+
7.421034e-006*Resp+0.003143



3. Component:NITRITE-N
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999973
Amt=1.127229e-020*Resp³+
-1.520875e-013*Resp²+
3.286842e-006*Resp+0.04943

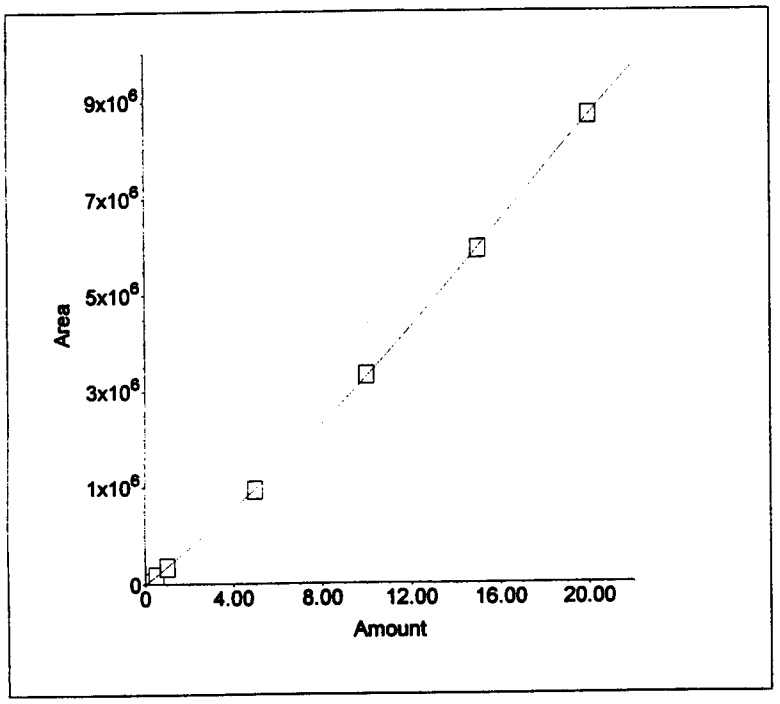


4. Component:BROMIDE
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999995
Amt=9.491457e-019*Resp³+
-3.118417e-012*Resp²+
1.748685e-005*Resp+0.03193

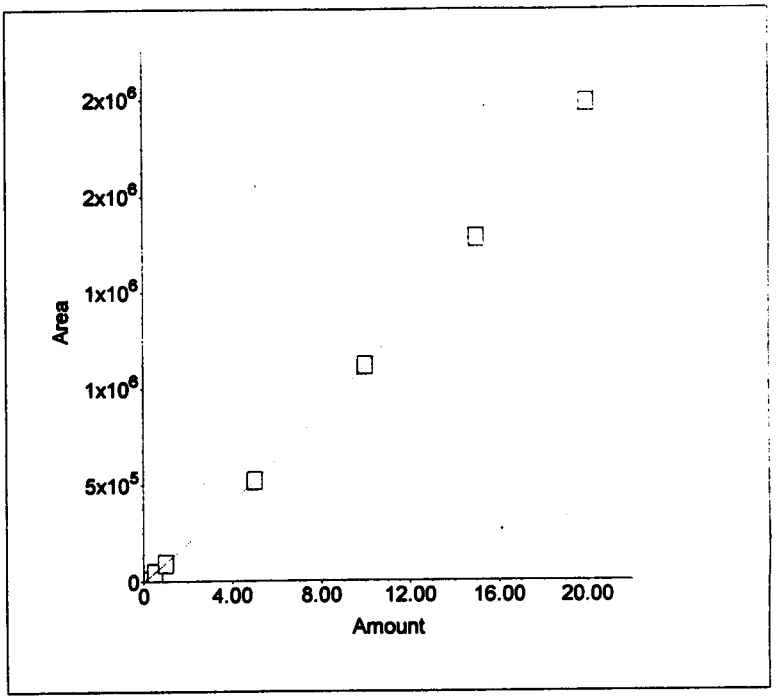


010073

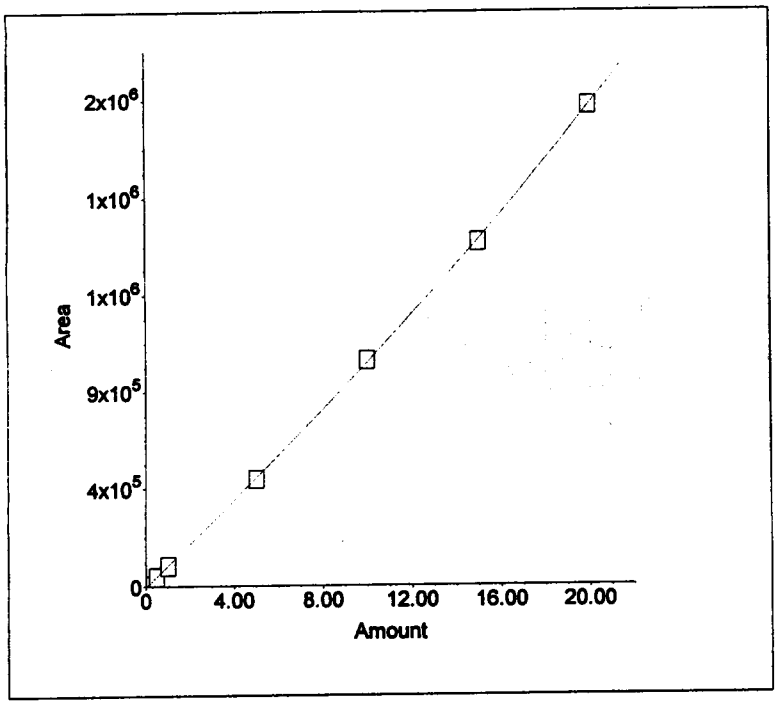
5. Component:NITRATE-N
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999969
Amt=7.448464e-021*Resp³+
-1.522719e-013*Resp²+
2.990313e-006*Resp+0.03198



6. Component:PHOSPHATE-P
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999992
Amt=1.478626e-019*Resp³+
-1.109022e-012*Resp²+
9.076872e-006*Resp+0.04326



7. Component:SULFATE
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999936
Amt=-6.918347e-021*Resp³+
-4.728284e-013*Resp²+
9.744727e-006*Resp+0.04657



010074

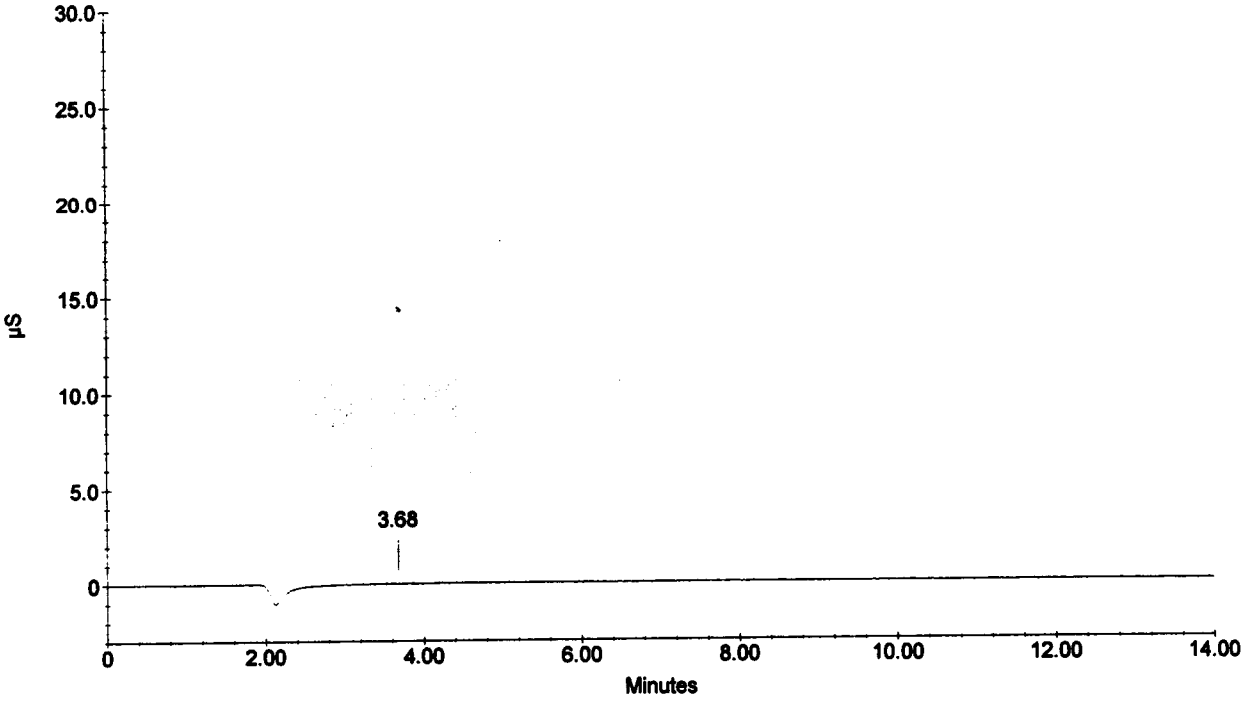
Sample Name : 0 PPM 199-08-IC3
Dilution Factor : 1.00
Injection Number : 1
Data File Name : ...\030318_001.DXD
Method File Name : ...\ANIONS030318.met
Schedule File Name : c:\peaknet\schedule\030318.sch

Date Time Collected : 3/18/03 3:51:45 PM
Date Time Updated : 3/19/03 10:27:27 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : ams

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	3.68		0.00	589	90
		CHLORIDE			
		NITRITE-N			
		BROMIDE			
		NITRATE-N			
		PHOSPHATE-P			
		SULFATE			

0 PPM 199-08-IC3



Sample Name : 0.1 PPM 199-07-IC3
Dilution Factor : 1.00
Injection Number : 2
Data File Name : c:\peaknet\data\030318\030318_002.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\030318.sch

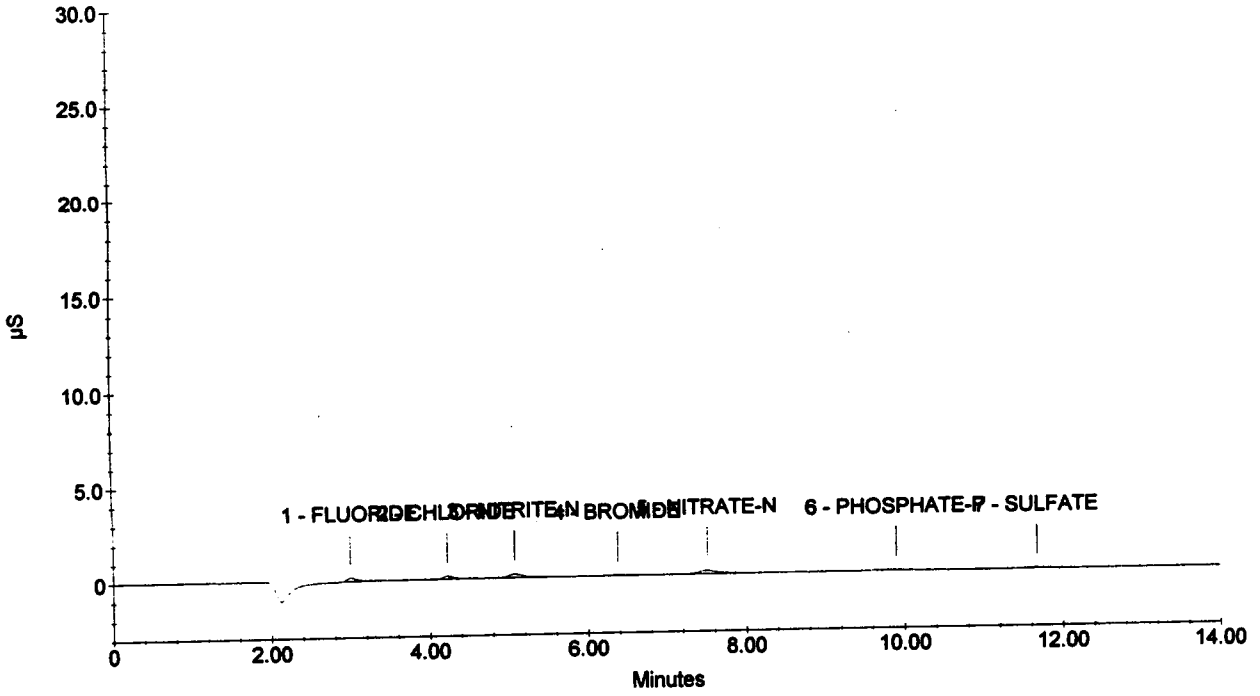
Date Time Collected : 3/18/03 4:08:24 PM
Date Time Updated : 3/18/03 4:24:55 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : ams

010075

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	3.00	FLUORIDE	0.10	13730	1785
2	4.22	CHLORIDE	0.10	13218	1541
3	5.08	NITRITE-N	0.10	24273	1898
4	6.38	BROMIDE	0.10	3949	340
5	7.52	NITRATE-N	0.10	30325	1745
6	9.90	PHOSPHATE-P	0.10	4642	317
7	11.68	SULFATE	0.10	5356	310

0.1 PPM 199-07-IC3



010076

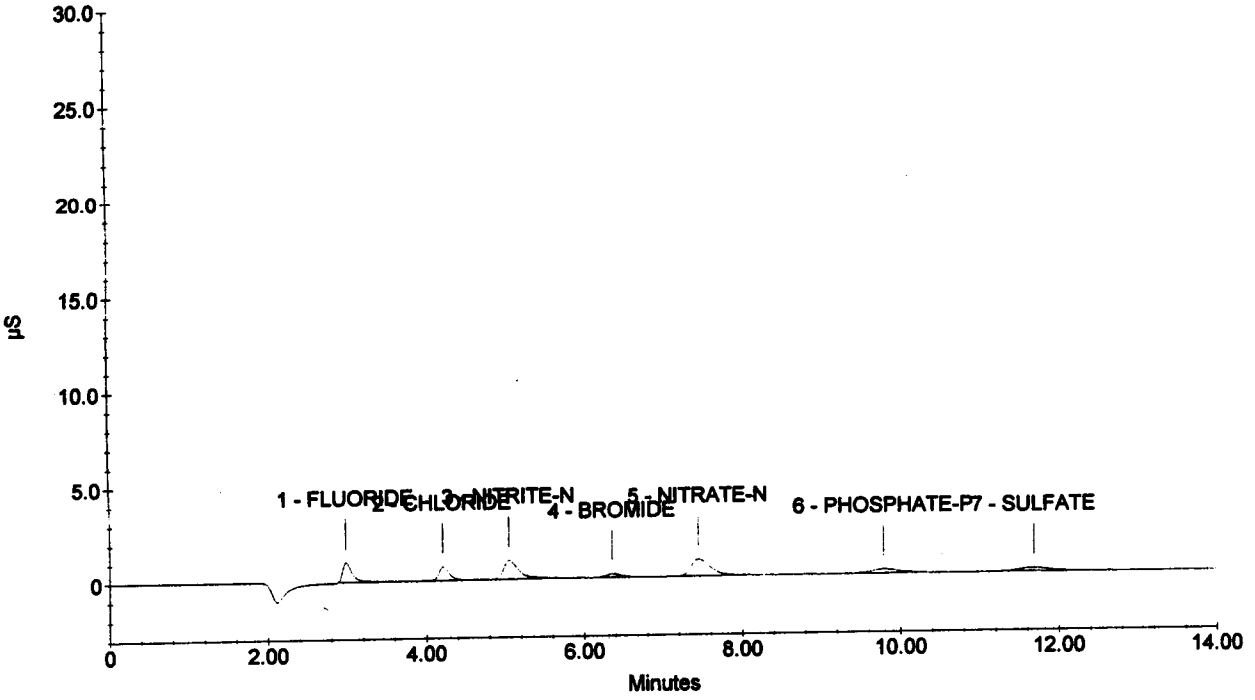
Sample Name : 0.5 PPM 199-06-IC3
Dilution Factor : 1.00
Injection Number : 3
Data File Name : c:\peaknet\data\030318\030318_003.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\030318.sch

Date Time Collected : 3/18/03 4:25:05 PM
Date Time Updated : 3/18/03 4:41:36 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : ams

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.98	FLUORIDE	0.50	86272	10330
2	4.21	CHLORIDE	0.50	66360	7251
3	5.05	NITRITE-N	0.50	132062	10042
4	6.36	BROMIDE	0.50	25330	1873
5	7.45	NITRATE-N	0.50	152281	8939
6	9.80	PHOSPHATE-P	0.50	50112	2163
7	11.69	SULFATE	0.50	45512	1773

0.5 PPM 199-06-IC3



Sample Name : 1.0 PPM 199-05-IC3
Dilution Factor : 1.00
Injection Number : 4
Data File Name : c:\peaknet\data\030318\030318_004.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\030318.sch

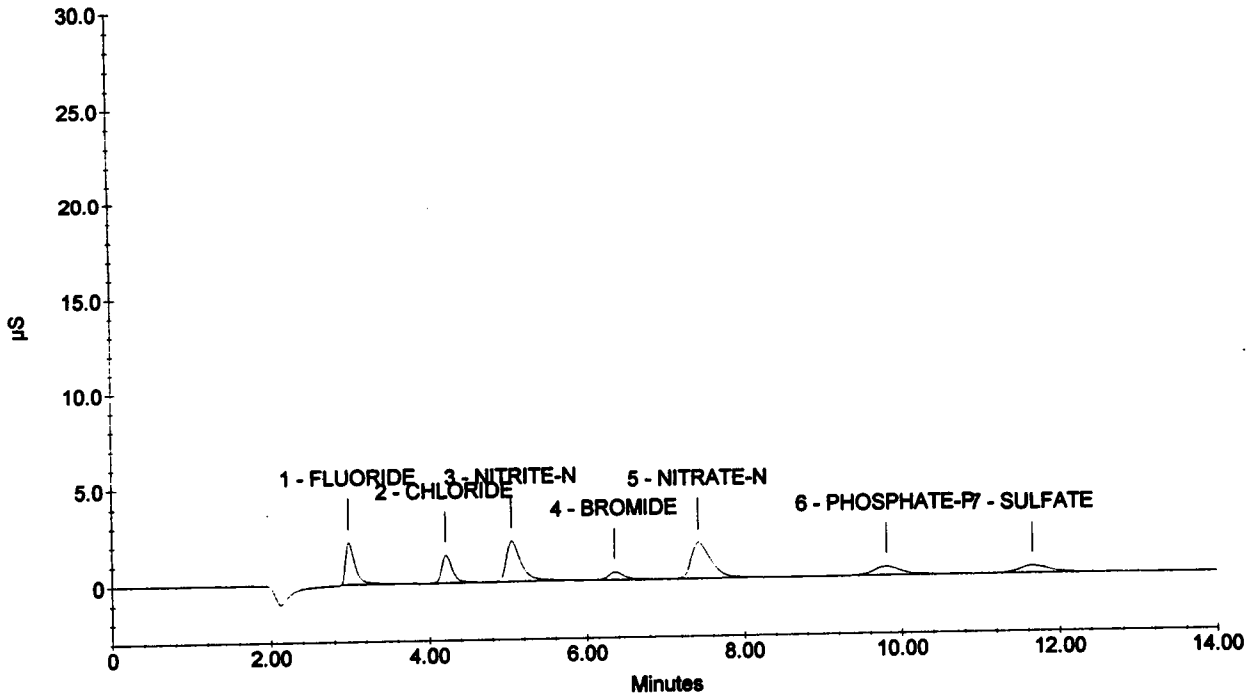
Date Time Collected : 3/18/03 4:41:44 PM
Date Time Updated : 3/18/03 4:58:16 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : ams

010077

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.98	FLUORIDE	1.00	181934	21611
2	4.21	CHLORIDE	1.00	134489	14086
3	5.05	NITRITE-N	1.00	271640	20921
4	6.36	BROMIDE	1.00	55197	3852
5	7.42	NITRATE-N	1.00	319757	18682
6	9.81	PHOSPHATE-P	1.00	103514	4278
7	11.66	SULFATE	1.00	96561	3647

1.0 PPM 199-05-IC3



010078

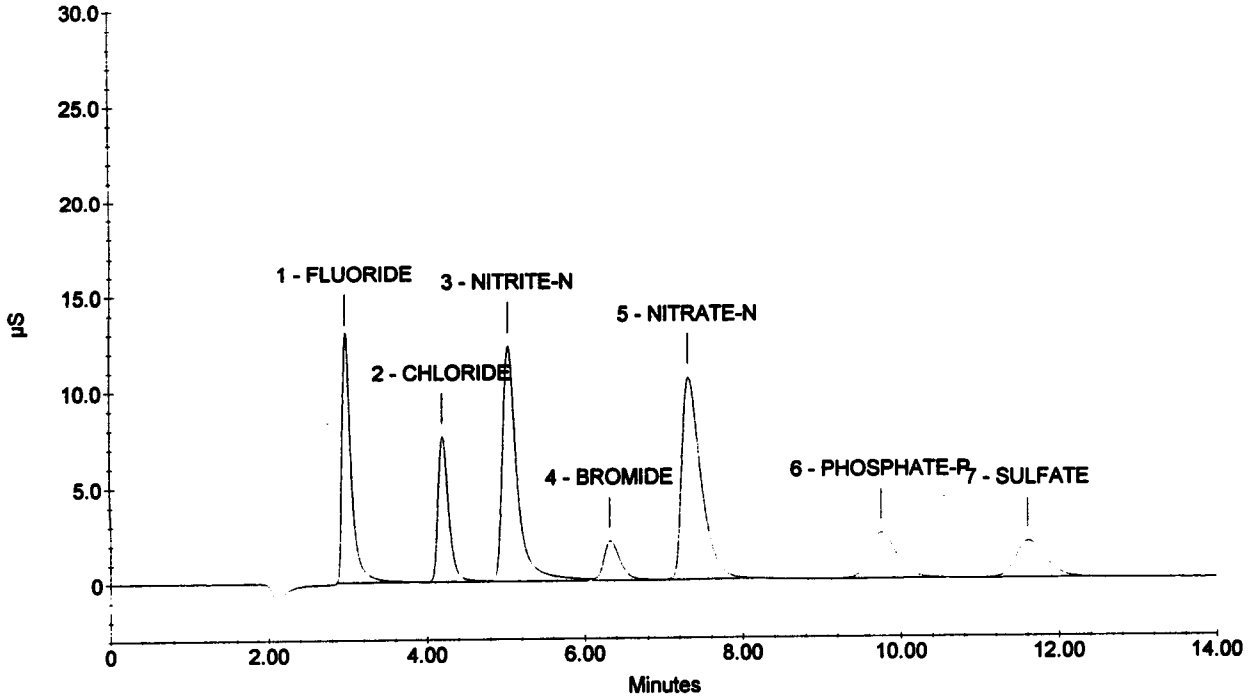
Sample Name : 5.0 PPM 199-04-IC3
Dilution Factor : 1.00
Injection Number : 5
Data File Name : c:\peaknet\data\030318\030318_005.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\030318.sch

Date Time Collected : 3/18/03 4:58:25 PM
Date Time Updated : 3/18/03 5:14:55 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : ams

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.97	FLUORIDE	5.00	1059616	127211
2	4.20	CHLORIDE	5.00	718692	75551
3	5.04	NITRITE-N	5.00	1608860	122628
4	6.32	BROMIDE	5.00	299013	20725
5	7.32	NITRATE-N	5.00	1793767	105411
6	9.76	PHOSPHATE-P	5.00	584472	24051
7	11.61	SULFATE	5.00	513489	19362

5.0 PPM 199-04-IC3



010079

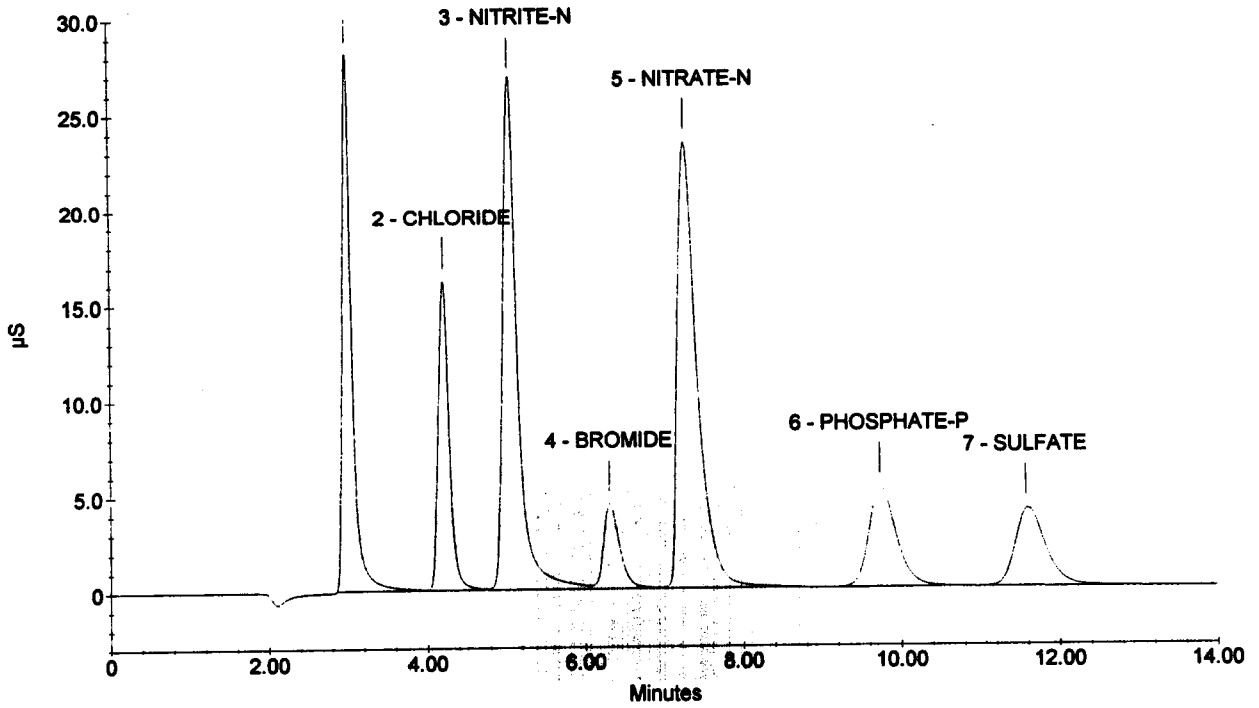
Sample Name : 10 PPM 199-03-IC3
Dilution Factor : 1.00
Injection Number : 6
Data File Name : c:\peaknet\data\030318\030318_006.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\030318.sch

Date Time Collected : 3/18/03 5:15:04 PM
Date Time Updated : 3/18/03 5:31:36 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : ams

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.98	FLUORIDE	10.00	2300140	279678
2	4.21	CHLORIDE	10.00	1551559	161330
3	5.04	NITRITE-N	10.00	3450232	266157
4	6.30	BROMIDE	10.00	626766	44087
5	7.26	NITRATE-N	10.00	4019438	233270
6	9.74	PHOSPHATE-P	10.00	1259660	52354
7	11.58	SULFATE	10.00	1091937	40532

10 PPM 199-03-IC3



Sample Name : 15 PPM 199-02-IC3
Dilution Factor : 1.00
Injection Number : 7
Data File Name : c:\peaknet\data\030318\030318_007.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\030318.sch

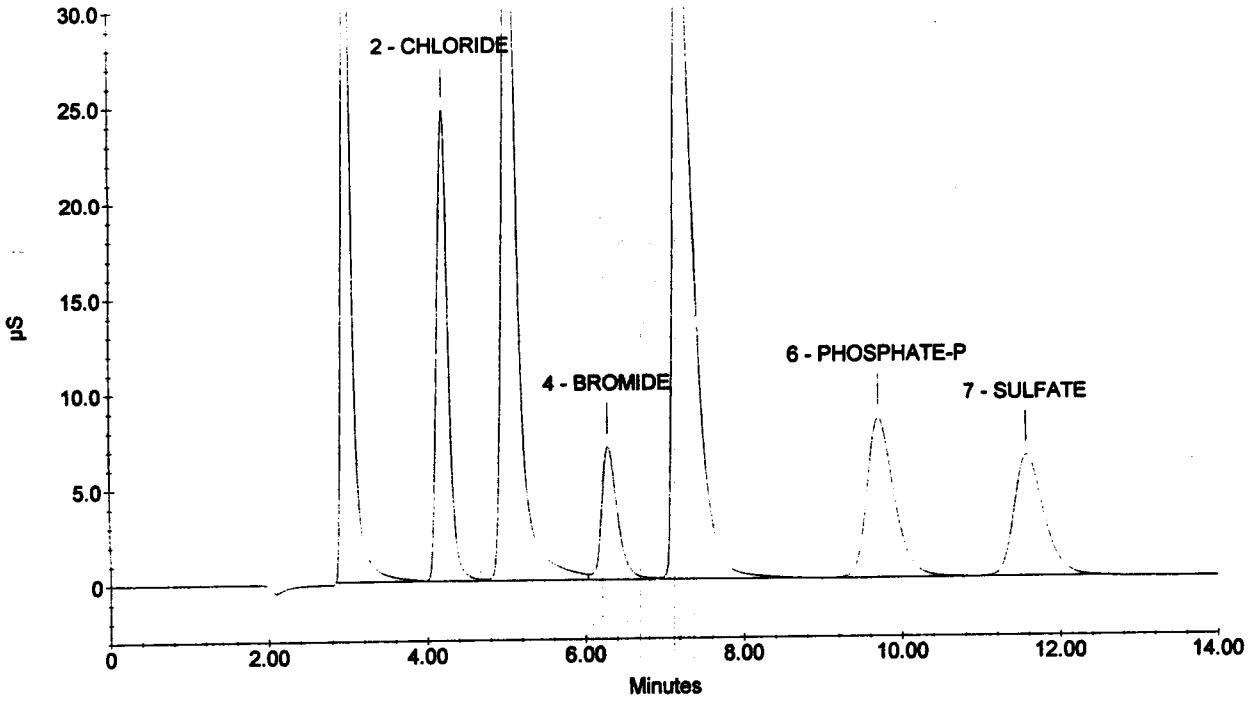
Date Time Collected : 3/18/03 5:31:45 PM
Date Time Updated : 3/18/03 5:48:16 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : ams

010080

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.98	FLUORIDE	15.00	3533095	412978
2	4.21	CHLORIDE	15.00	2450707	246283
3	5.05	NITRITE-N	15.00	5334974	411021
4	6.29	BROMIDE	15.00	975050	69684
5	7.21	NITRATE-N	15.00	6435271	368588
6	9.72	PHOSPHATE-P	15.00	2007302	83915
7	11.58	SULFATE	15.00	1664855	63447

15 PPM 199-02-IC3



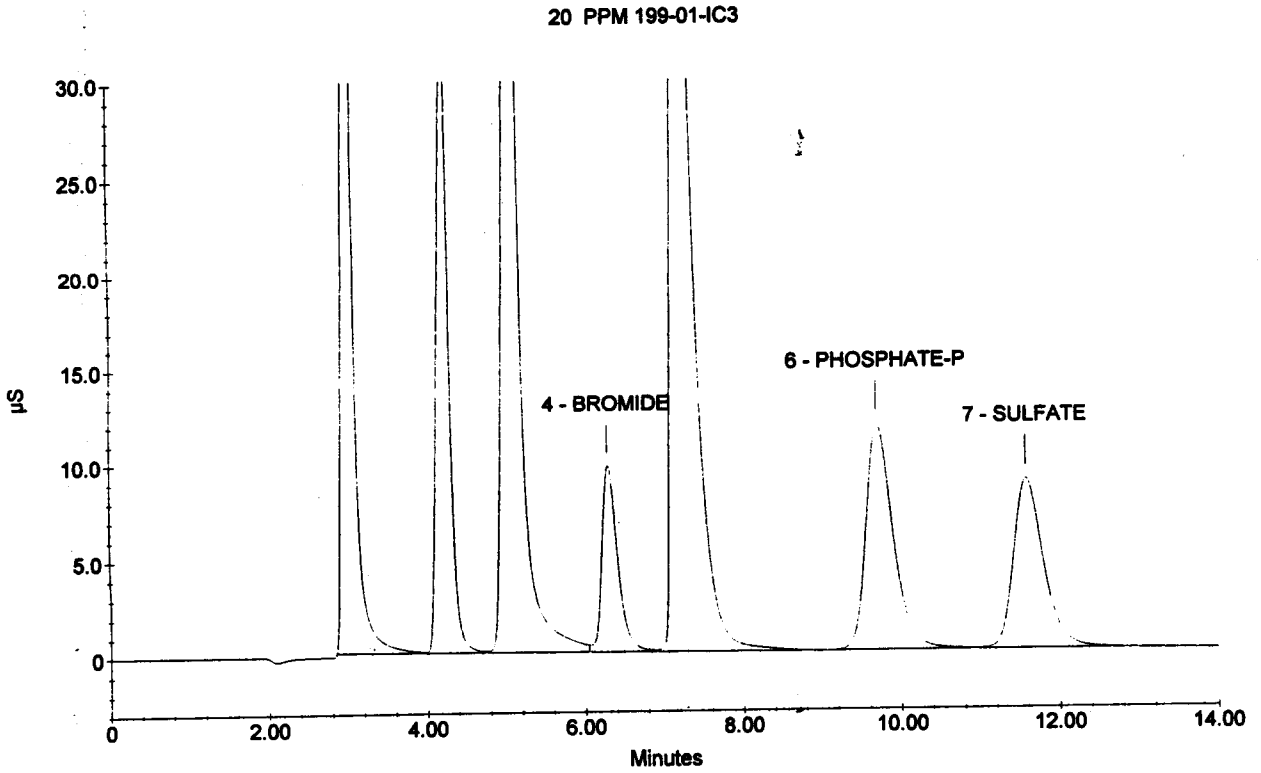
Sample Name : 20 PPM 199-01-IC3
Dilution Factor : 1.00
Injection Number : 8
Data File Name : c:\peaknet\data\030318\030318_008.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\030318.sch

Date Time Collected : 3/18/03 5:48:25 PM
Date Time Updated : 3/18/03 6:04:56 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : ams

010081

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	3.00	FLUORIDE	20.00	4737882	534154
2	4.22	CHLORIDE	20.00	3391142	327028
3	5.08	NITRITE-N	20.00	7189769	543842
4	6.29	BROMIDE	20.00	1329614	95991
5	7.20	NITRATE-N	20.00	8985285	508024
6	9.70	PHOSPHATE-P	20.00	2798840	117450
7	11.58	SULFATE	20.00	2319013	88034



Division 20
20.06002.01.081
TO# 030403-8

Analyst: AMS ams
Date 04/04/03
Method EPA 300

010082

Date Analyzed	System ID	Analyte	Conc. mg/L	RESULT mg/L	Qual	DL	TV	%REC %RPD
04/04/03	223134	CHLORIDE	1398.939	1399		20		
04/04/03	223134D	CHLORIDE	1386.964	1387		20		0.86%
04/04/03	223134MS	CHLORIDE	1717.916	1718		20	400	79.7%
04/04/03	223135	CHLORIDE	1292.378	1292		20		

PBpies 4/7/03

Division 20
20.06002.01.081
TO# 030403-8

Analyst: AMS
Date: 04/04/03
METHOD EPA 300

010083

QC DATA

Date Analyzed	System ID	Analyte	Conc. mg/L	RESULT mg/L	Qual	MDL	TV	%Rec/RPD	SOURCE
03/10/03	ICV	CHLORIDE	200.894	201		0.1	200	100%	24-79AS
03/10/03	ICB	CHLORIDE	0.056	0.1	U	0.1			

U = UNDETECTED

Schedule File: C:\PeakNet\schedule\04APR03.sch

Line	Sample	Sample Type	Level	Method	Data File	Dilution
1	ICV	Sample		anions030318.met	030404_001.dxd	20
2	ICB	Sample		anions030318.met	030404_002.dxd	1
3	223134	Sample		anions030318.met	030404_003.dxd	200
4	223134D	Sample		anions030318.met	030404_004.dxd	200
5	223134MS	Sample		anions030318.met	030404_005.dxd	200
6	223135	Sample		anions030318.met	030404_006.dxd	200
7	CCV	Sample		anions030318.met	030404_007.dxd	20
8	CCB	Sample		anions030318.met	030404_008.dxd	1
9	CCB	Sample		astop.met	030404_001.dxd	1

010084

Default Method Path: C:\PEAKNET\METHOD
Default Data Path: c:\peaknet\data\030404
Comment:
Division 20 06002.01.081 TO# 030403-8

ICV / CCV Source Spex 24-79AS (Inorg# 3989)
Cl 200 mg/L

MS Spiked 0.05 ml Spex into 5ml Sample (1:20).
ams 4/4/03

Sample Name : ICV
Dilution Factor : 20.00
Injection Number : 1
Data File Name : c:\peaknet\data\030404\030404_001.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\04apr03.sch

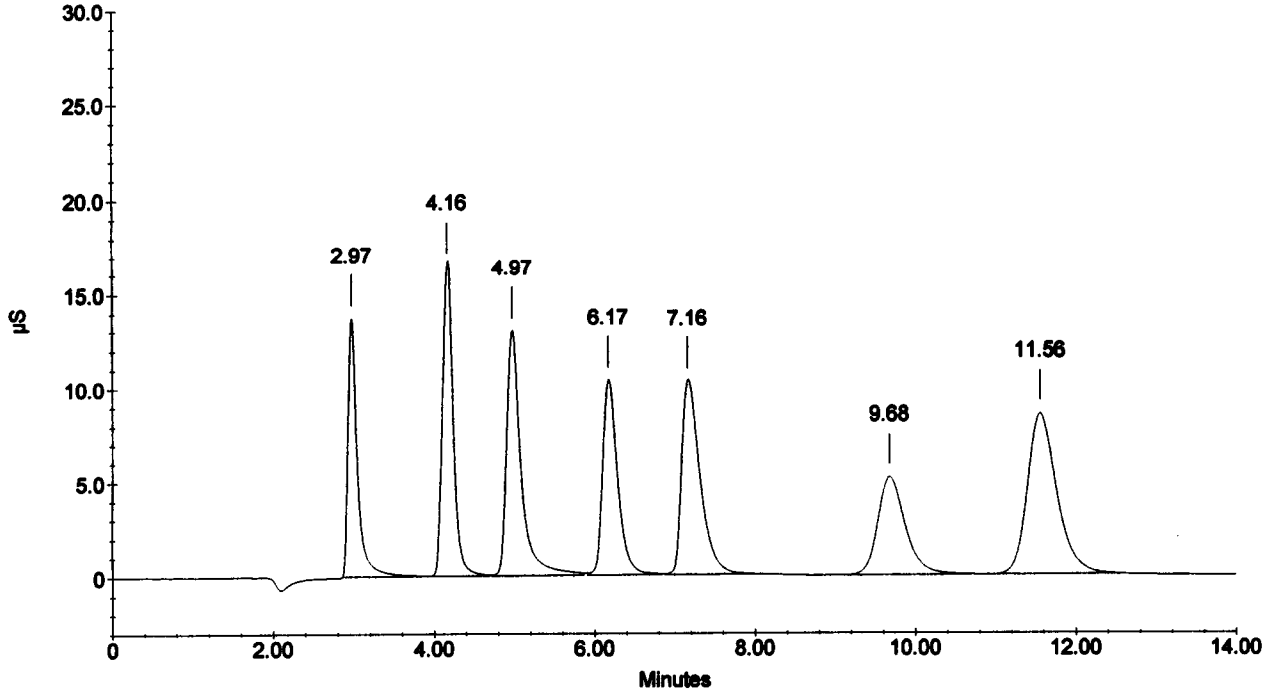
Date Time Collected : 4/4/03 11:31:21 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : AMS

010085

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	103.661	136871	1109836	1	-0.89
2	4.16	CHLORIDE	200.894	164464	1553535	2	-1.58
3	4.97	NITRITE-N	101.470	129618	1637568	2	-2.10
4	6.17	BROMIDE	404.444	103187	1345165	2	-1.91
5	7.16	NITRATE-N	91.450	102468	1645140	2	-0.56
6	9.68	PHOSPHATE-P	196.989	51727	1236314	2	-0.27
7	11.56	SULFATE	377.062	85191	2164430	2	-0.23
	0.00		—total(s)— 1475.971		10691988		

ICV



Sample Name : ICB
Dilution Factor : 1.00
Injection Number : 2
Data File Name : c:\peaknet\data\030404\030404_002.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\04apr03.sch

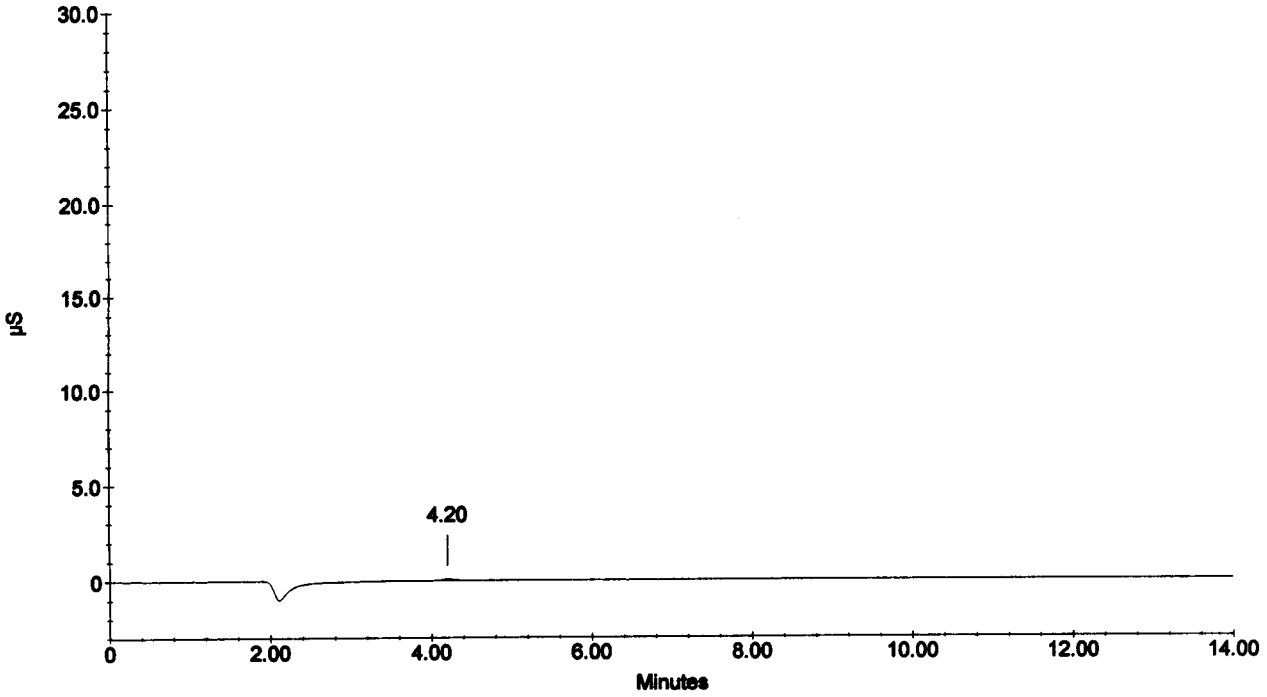
Date Time Collected : 4/4/03 11:48:08 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : AMS

010086

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.20	CHLORIDE	0.056	822	7107	1	-0.63
1	4.20	CHLORIDE	0.056	822	7107	1	-0.63
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			—total(s)—				
	0.00		0.112		14214		

ICB



010087

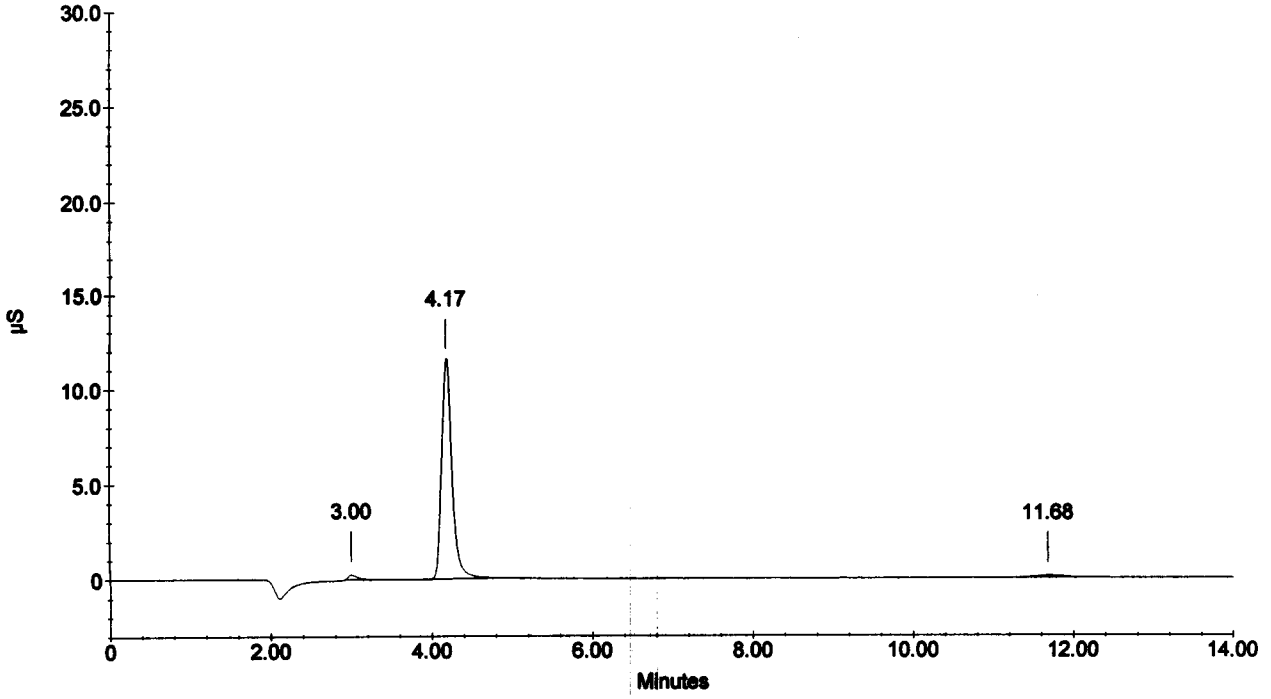
Sample Name : 223134
Dilution Factor : 200.00
Injection Number : 3
Data File Name : c:\peaknet\data\030404\030404_003.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\04apr03.sch

Date Time Collected : 4/4/03 12:04:47 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : AMS

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	3.00	FLUORIDE	32.062	2483	21693	1	0.00
2	4.17	CHLORIDE	1398.939	114051	1038490	1	-1.26
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
3	11.68	SULFATE	61.129	1070	26620	1	0.81
			—total(s)—				
	0.00		1492.130		1086804		

223134



010088

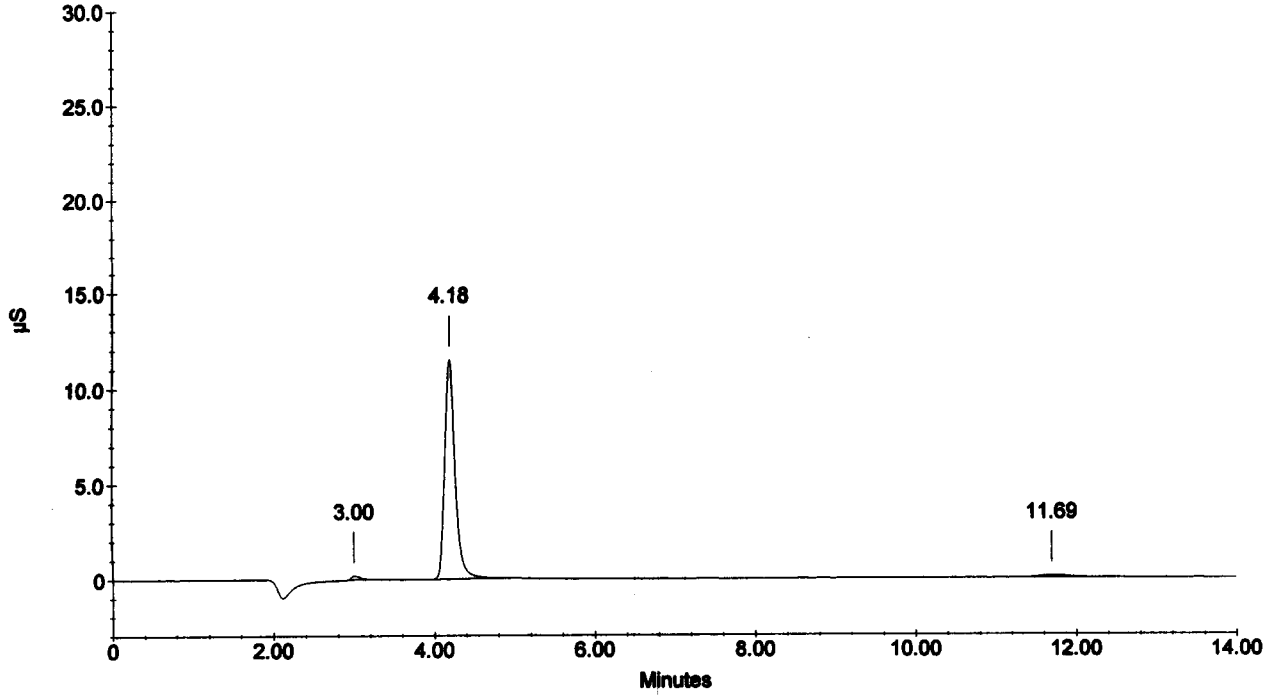
Sample Name : 223134D
Dilution Factor : 200.00
Injection Number : 4
Data File Name : c:\peaknet\data\030404\030404_004.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\04apr03.sch

Date Time Collected : 4/4/03 12:21:29 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : AMS

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	3.00	FLUORIDE	26.551	1997	16153	1	0.00
2	4.18	CHLORIDE	1386.964	114746	1028749	1	-0.95
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
3	11.69	SULFATE	63.096	1103	27633	1	0.92
	0.00		—total(s)— 1476.611		1072534		

223134D



Sample Name : 223134MS
Dilution Factor : 200.00
Injection Number : 5
Data File Name : c:\peaknet\data\030404\030404_005.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\04apr03.sch

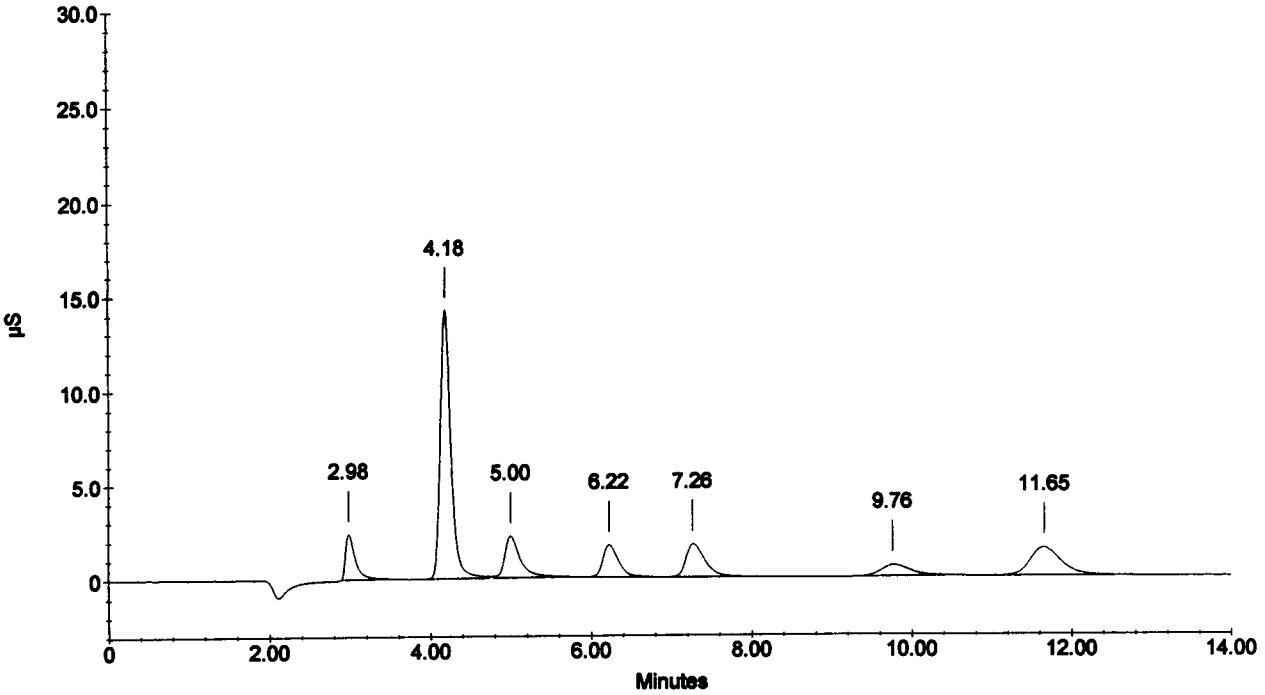
Date Time Collected : 4/4/03 12:38:09 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : AMS

010089

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.98	FLUORIDE	212.219	23941	205371	1	-0.44
2	4.18	CHLORIDE	1717.916	141841	1303300	2	-0.95
3	5.00	NITRITE-N	201.407	22047	295292	2	-1.58
4	6.22	BROMIDE	775.513	16946	228585	1	-1.06
5	7.26	NITRATE-N	176.099	17415	287916	1	0.93
6	9.76	PHOSPHATE-P	279.237	6019	151811	1	0.55
7	11.65	SULFATE	771.387	14866	398780	1	0.58
	0.00		—total(s)— 4133.778		2871056		

223134MS



Sample Name : 223135
Dilution Factor : 200.00
Injection Number : 6
Data File Name : c:\peaknet\data\030404\030404_006.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\04apr03.sch

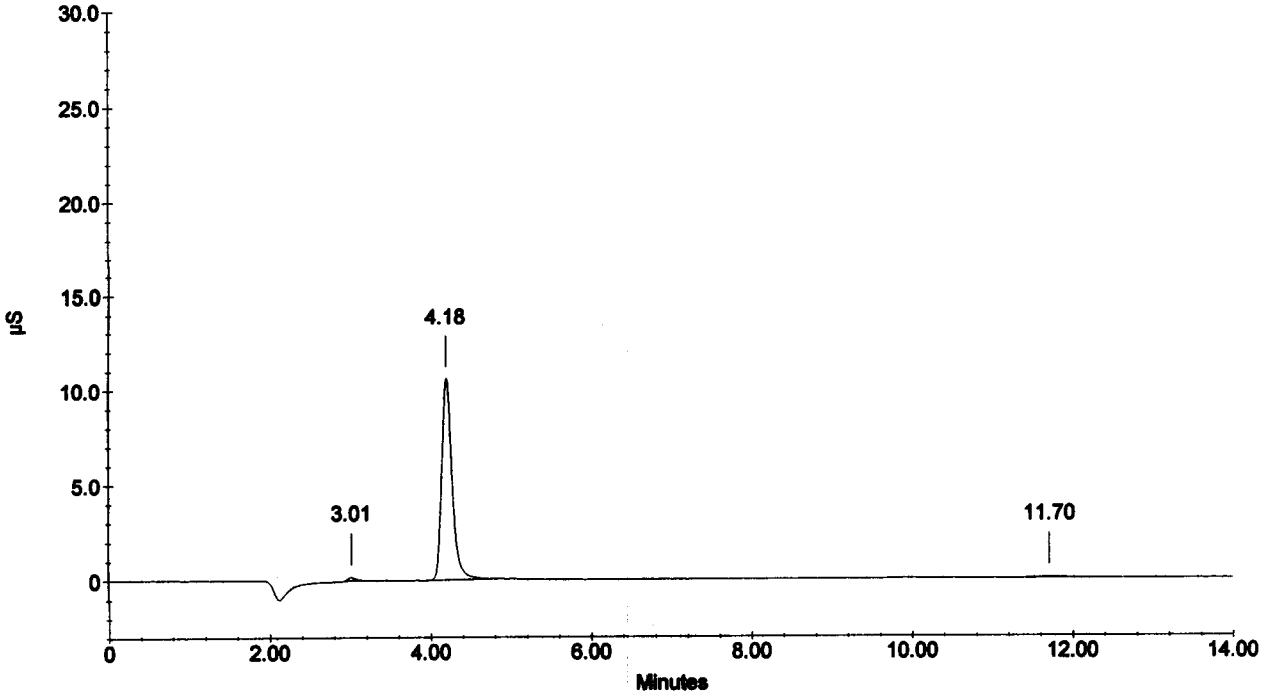
Date Time Collected : 4/4/03 12:54:50 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : AMS

010090

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	3.01	FLUORIDE	22.578	1615	12162	1	0.44
2	4.18	CHLORIDE	1292.378	104960	952324	1	-0.95
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
3	11.70	SULFATE	24.909	410	8005	1	1.04
	0.00		—total(s)— 1339.866		972492		

223135



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 7
Data File Name : c:\peaknet\data\030404\030404_007.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\04apr03.sch

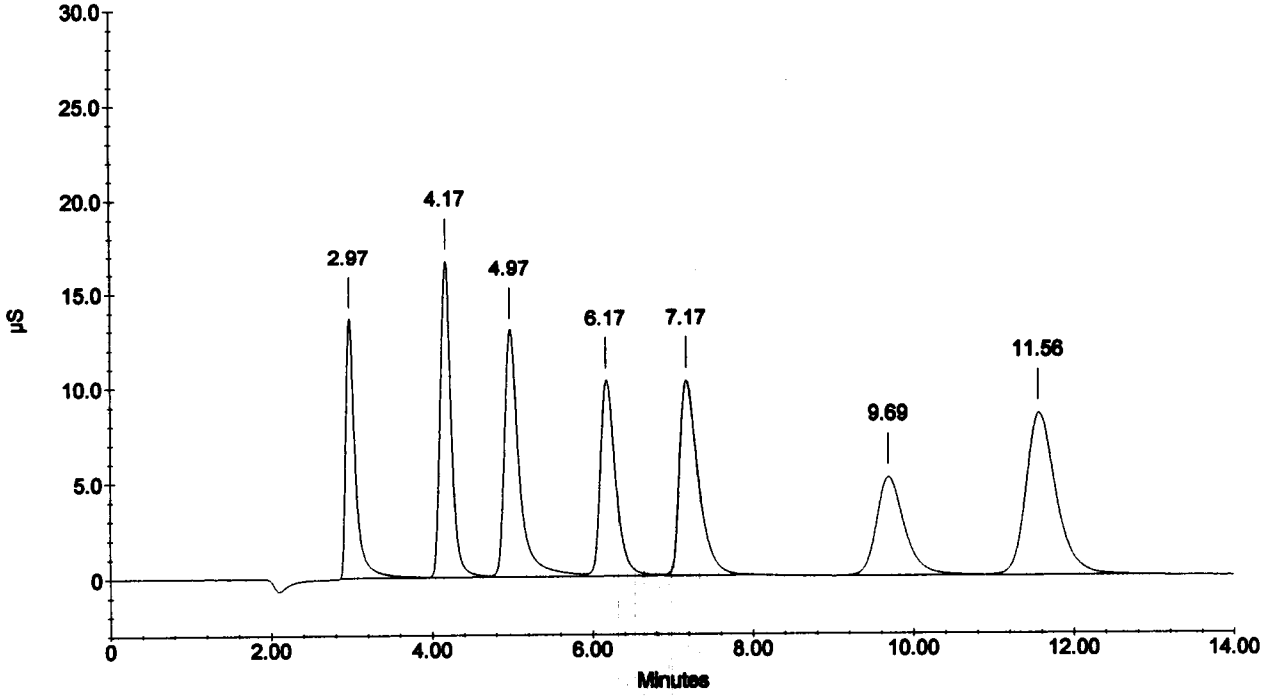
Date Time Collected : 4/4/03 1:11:32 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : AMS

010091

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	104.754	135264	1122509	2	-0.89
2	4.17	CHLORIDE	202.362	166267	1566364	2	-1.26
3	4.97	NITRITE-N	102.666	128673	1658340	2	-2.10
4	6.17	BROMIDE	407.565	101930	1356111	2	-1.91
5	7.17	NITRATE-N	92.179	102000	1659444	2	-0.37
6	9.69	PHOSPHATE-P	200.088	51453	1258454	2	-0.14
7	11.56	SULFATE	384.980	84684	2216704	2	-0.23
	0.00		---total(s)--- 1494.595		10837926		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 8
Data File Name : c:\peaknet\data\030404\030404_008.DXD
Method File Name : c:\peaknet\method\anions030318.met
Schedule File Name : c:\peaknet\schedule\04apr03.sch

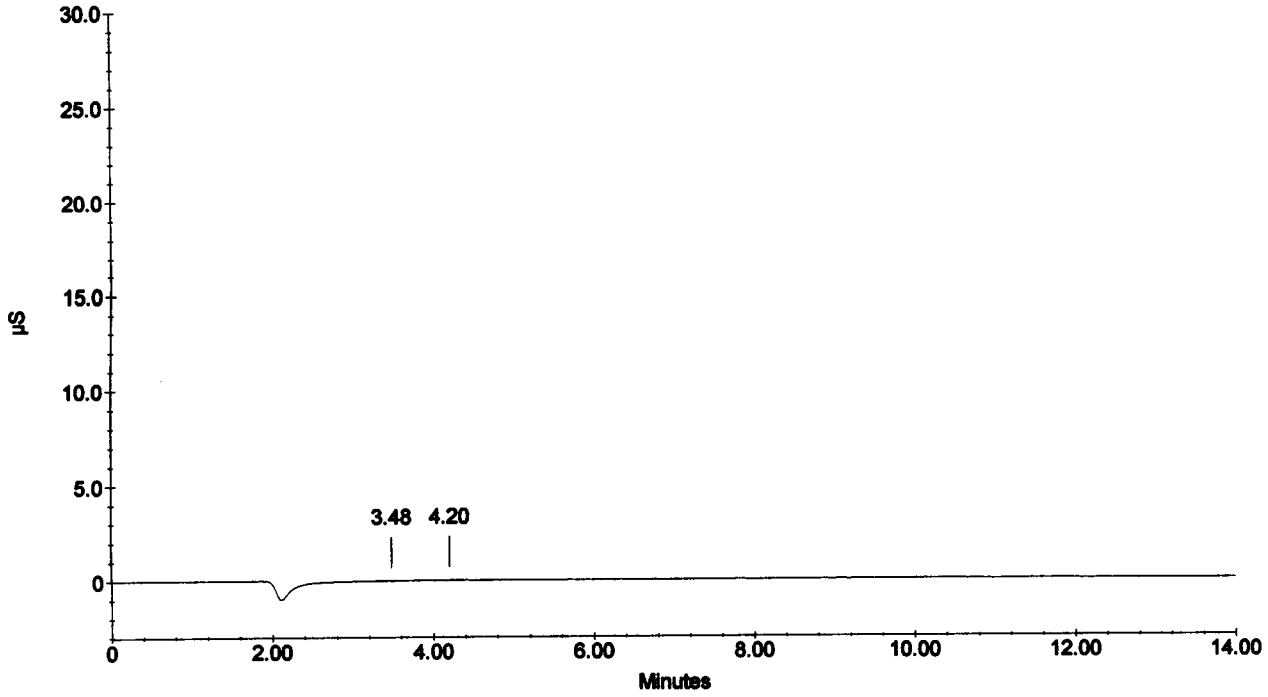
Date Time Collected : 4/4/03 1:28:14 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-#13535 AG14-#15177
System Operator : AMS

010092

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	3.48		0.000	96	370	1	
2	4.20	CHLORIDE	0.016	176	1773	1	-0.63
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.016		2143		

CCB



SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

Certificates of Analysis

FISHER SCIENTIFIC
TRACEMETAL GRADE NITRIC ACID

CERTIFICATE OF ANALYSIS

Catalog No. A509 **Lot No: 1102100**
Date: October, 2002

Tests	Units	Value
Assay	%	70%
Color	APHA	<10
Aluminum	ppb	<0.2
Antimony	ppb	<0.1
Arsenic	ppb	<0.1
Barium	ppb	<0.1
Beryllium	ppb	<0.1
Bismuth	ppb	<0.1
Boron	ppb	1
Cadmium	ppb	<0.1
Calcium	ppb	<0.5
Chromium	ppb	<0.1
Cobalt	ppb	<0.1
Copper	ppb	<0.1
Iron	ppb	<0.5
Lead	ppb	<0.1
Lithium	ppb	<0.1
Magnesium	ppb	<0.2
Manganese	ppb	<0.1
Mercury	ppb	<0.2
Molybdenum	ppb	<0.1
Nickel	ppb	<0.1
Potassium	ppb	<0.2
Selenium	ppb	<0.1
Silver	ppb	<0.1
Sodium	ppb	<0.2
Strontium	ppb	<0.1
Thorium	ppb	<0.1
Tin	ppb	<0.1
Titanium	ppb	<0.1
Uranium	ppb	<0.1
Vanadium	ppb	<0.1
Zinc	ppb	<0.2
Zirconium	ppb	<0.1

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/15/03
DATE EXPIRED: 01/15/2013
DATE OPENED: 01/15/03
INORG: 39147 3919 PO: F52073

Element concentrations are at the point of bottling. Concentrations of some elements in particular, Ca, Si, K, Na, B, Al, Mg & Mn will increase due to storage in glass bottles.

B McKelvey
Dr. B. McKelvey
QA/QC Manager

Fisher Scientific Chemical Division
Pittsburgh, PA., 15275 Phone (412) 490-8300

Fisher Chemical
A Fisher Scientific Company

FISHER SCIENTIFIC
TRACEMETAL GRADE HYDROCHLORIC ACID

010095

CERTIFICATE OF ANALYSIS

Catalog No. A508

Lot No: 4102080
Date: September, 2002

Tests	Units	Value
Assay	%	36%
Color	APHA	<10
Aluminum	ppb	<0.5
Antimony	ppb	<0.1
Arsenic	ppb	<0.1
Barium	ppb	<0.1
Beryllium	ppb	<0.1
Bismuth	ppb	<0.1
Boron	ppb	<1
Cadmium	ppb	<0.1
Calcium	ppb	<0.5
Chromium	ppb	<0.1
Cobalt	ppb	<0.1
Copper	ppb	<0.1
Iron	ppb	<0.5
Lead	ppb	<0.1
Lithium	ppb	<0.1
Magnesium	ppb	<0.5
Manganese	ppb	<0.1
Mercury	ppb	<0.2
Molybdenum	ppb	<0.1
Nickel	ppb	<0.1
Potassium	ppb	<0.1
Selenium	ppb	<0.1
Silver	ppb	<0.1
Sodium	ppb	<0.5
Strontium	ppb	<0.1
Thorium	ppb	<0.1
Tin	ppb	<0.1
Titanium	ppb	<0.1
Uranium	ppb	<0.1
Vanadium	ppb	<0.1
Zinc	ppb	<0.5
Zirconium	ppb	<0.1

DANNY -lot#4102080
F.(210)522-6938
ANNA MCMAHE GOEASMF
P.O.: 800-663-2330
DATE: MARCH 7/03

Element concentrations are at the point of bottling. Concentrations of some elements in particular, Ca, Fe, Na, Zn & Al will increase due to storage in polyethylene bottles.

B McKelvey
Dr. B. McKelvey
QA/QC Manager

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 2/07/03
DATE EXPIRED: 2/07/2013
DATE OPENED: 2/11/03
INORG: 3945-3950 PO: F52057

Fisher Chemical
A Fisher Scientific Company

Fisher Scientific Chemical Division
Pittsburgh, PA., 15275 Phone (412) 490-8300

Certificate of Analysis

CUSTOM-GRADE SOLUTION 10,000 µg/mL Scandium IN 5% HNO_3 (abs) 010096

Catalog Number: CGSC10-1and CGSC10-5

Lot Number: **T-QSC01104**

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 9/4/02
DATE EXPIRED: 10/1/2003 DR
DATE OPENED: 9/4/02
INORG: 3683 PO: F52048

Starting Material:	Sc_2O_3
Starting Material Purity:	99.999%
Starting Material Lot No:	632-5721

CERTIFIED VALUE: 10,056 µg/mL

The certified value is the average of the classical wet assay and instrument analysis unless otherwise specified. All standards are accurate to a relative precision of ± 0.5% at the 95% confidence level for a period of 1 year. (See expiration date below)

Classical Wet Assay: 10,040 µg/mL
Method: EDTA Titration vs NIST SRM 928 Lead Nitrate
Sufficient number of sample measurements were made to give a minimum relative precision of ± 0.3% at the 95% confidence level.

Instrument Analysis: 10,071 µg/mL
Method: Inductively Coupled Plasma Spectroscopy (ICP) vs NIST SRM 3148a
Sufficient number of sample measurements were made to give a minimum relative precision of ± 0.5% at the 95% confidence level.

TRACE METALLIC IMPURITIES DETERMINED BY ICP-MS AND ICP-OES IN µg/mL:

Custom-Grade solutions tested for trace metallic impurities by ICP-MS were analyzed in an ULPA-Filtered Clean Room.
An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm .

O	Al	<0.07	M	Dy	<0.006	M	Li	<0.01	M	Pr	<0.0003	M	Te	<0.03
M	Sb	<0.0005	M	Er	<0.005	M	Lu	<0.0004	M	Re	<0.001	M	Tb	<0.0003
M	As	<0.01	M	Eu	<0.003	M	Mg	<0.03	M	Rh	<0.001	M	Tl	<0.001
M	Ba	<0.01	M	Gd	<0.001	M	Mn	<0.004	M	Rb	<0.001	M	Th	0.028
M	Be	<0.0005	M	Ga	<0.001	O	Hg	i	M	Ru	<0.002	M	Tm	<0.0004
M	Bi	0.043	M	Ge	<0.006	M	Mo	<0.002	M	Sm	<0.001	M	Sn	<0.005
O	B	<0.034	M	Au	<0.003	M	Nd	<0.002	s	Sc		n	Ti	
M	Cd	<0.003	M	Hf	0.03	O	Ni	<0.084	O	Se	<0.67	M	W	<0.01
O	Ca	0.17	M	Ho	<0.0005	M	Nb	<0.0005	O	Si	<0.034	M	U	<0.002
M	Ce	<0.005	M	In	<0.001	n	Os		M	Ag	0.005	M	V	<0.002
M	Cs	<0.0003	M	Ir	<0.005	M	Pd	<0.005	O	Na	<0.16	M	Yb	<0.001
M	Cr	<0.005	O	Fe	<0.16	O	P	i	M	Sr	<0.0005	M	Y	<0.04
M	Co	<0.003	M	La	<0.0005	M	Pt	<0.002	n	S		M	Zn	0.075
M	Cu	<0.006	M	Pb	0.005	O	K	<5.01	M	Ta	<0.007	M	Zr	0.32

M - checked by ICP-MS O - checked by ICP-OES i - spectral interference n - not checked for s - solution standard element

ANALYZED DENSITY OF SOLUTION (measured at 22°C): 1.062 g/mL

QA:KL Rev.050302DN

(over)

Inorganic Ventures, Inc.
195 Lehigh Avenue • Suite 4 • Lakewood, NJ 08701
Orders: 800-669-6799 • FAX (732) 901-1903
Technical Support: 800-569-6799

Paul R. Haines
Quality Assurance Manager

EXPIRES
1-2003

SPECertificate™

010097

Certificate of Reference Material

Catalog Number: PLB9-2X/2Y/2T **Lot No.** 8-138B

Description: 1000 mg/L Boron

Matrix: H2O

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 998 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3107

The CRM is prepared gravimetrically using high purity Ammonium Tetraborate Lot# 08001E. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 998 mg/L

Method: Titration with Sodium Hydroxide using Phenolphthalein as indicator. Sodium Hydroxide standardized against Potassium Biphthalate NIST SRM # 84j

Instrumentation Analysis By ICP spectrometer: 998 mg/L

Uncertified Properties:

Density: 1.008 @ 26.7 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.07	Cu	<0.001	Pb	<0.002
As	<0.001	Fe	0.002	Re	<0.001
Ag	<0.001	Ga	<0.001	Rb	<0.001
Ba	<0.001	In	<0.001	Sr	<0.001
Be	<0.01	K	0.002	Sb	<0.001
Bi	<0.001	Li	<0.001	Sn	<0.001
Cd	<0.001	Mn	<0.001	Ti	<0.001
Co	<0.001	Mo	<0.001	Tl	<0.001
Ca	0.008	Mg	<0.001	V	<0.001
Cr	<0.004	Na	0.01	Zr	<0.001
		Ni	<0.001	Zn	<0.02

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: AUG 2 '02 Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 8/8/02
DATE EXPIRED: 8/15/2003
DATE OPENED: 8/9/02
INORG: 3611 PO: E52935

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010098

SPECertificate™

Certificate of Reference Material

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 8/8/03
DATE EXPIRED: 8/15/2003
DATE OPENED: 8/9/03
INORG: 3612 PO: F32035

Catalog Number: PLLI2-2X/2Y **Lot No.** 8-159LI

Description: 1000 mg/L Lithium

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1001 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3129a

The CRM is prepared gravimetrically using high purity Lithium Carbonate Lot# 11001A. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1002 mg/L

Method: Evaporate to dryness. Fume with Sulfuric Acid. Ignite and weigh as Li2SO4

Instrumentation Analysis By ICP spectrometer: 1000 mg/L

Uncertified Properties:

Density: 1.014 @ 24.3 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.01	Cu	<0.006	Pb	<0.009
As	<0.001	Fe	0.01	Re	0.01
Ag	<0.001	Ga	<0.001	Rb	<0.001
B	<0.02	In	<0.001	Sr	<0.001
Ba	0.006	K	0.03	Sb	<0.001
Be	<0.001	Mn	<0.001	Sn	<0.001
Bi	<0.001	Mo	<0.001	Ti	<0.001
Ca	0.05	Mg	0.009	Tl	<0.001
Cr	<0.004	Na	0.02	V	<0.001
Cd	<0.001	Ni	<0.001	Zr	<0.001
Co	<0.001			Zn	0.80

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: AUG 02 Certifying Officer: N. Kocherlakota

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SPEXertificate™

010099

Certificate of Reference Material

Catalog Number: PLMO9-2X/2Y/2T **Lot No.** 9-49MO

Description: 1000 mg/L Molybdenum

Matrix: H2O

DATE RECEIVED: 8/8/02
DATE EXPIRED: 8/15/2003
DATE OPENED: 8/9/02
INORG: 3613 PO: F52035

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1000 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3134

The CRM is prepared gravimetrically using high purity Ammonium Molybdate Lot# 03011C. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999 mg/L

Method: Precipitation using 8-Hydroxyquinoline. Filter, dry, and weigh as MoO2(C9H6NO)2

Instrumentation Analysis By ICP spectrometer: 1001 mg/L

Uncertified Properties:

Density: 0.9987 @ 24.6 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.001	Cu	0.004	Pb	0.001
As	0.04	Fe	<0.01	Re	0.03
Ag	<0.001	Ga	<0.001	Rb	<0.001
B	<0.003	In	<0.001	Sr	<0.001
Ba	<0.001	K	0.02	Sb	<0.001
Be	<0.001	Li	<0.001	Sn	<0.001
Bi	<0.001	Mg	0.007	Ti	0.004
Ca	0.006	Mn	<0.001	Tl	<0.001
Cr	<0.005	Na	0.009	V	0.004
Cd	<0.05	Ni	<0.001	Zr	<0.001
Co	<0.001			Zn	<0.001

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: AUG '02 Certifying Officer: N. Kocherlakota

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Certificate of Reference Material

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/16/03
DATE EXPIRED: 01/15/2004
DATE OPENED: 01/23/03
INORG: 3927 PO: F52073

Catalog Number: PLP9-2X/2Y/2T **Lot No.** 9-29P

Description: 1000 mg/L Phosphorus

Matrix: H2O

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1003.5 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3139a

The CRM is prepared gravimetrically using high purity (NH4)H2(PO4) Lot# A158. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1004 mg/L

Method: Precipitation using Magnesia mixture. Filter, ignite, and weigh as Mg2O2.

Instrumentation Analysis By ICP spectrometer: 1003 mg/L

Uncertified Properties:

Density: 0.9997 @ 22.9 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.05	Cu	<0.001	Pb	<0.001
As	<0.001	Fe	0.019	Rb	<0.001
Ag	<0.001	Ga	<0.001	Re	<0.001
B	<0.005	In	<0.001	Sn	0.006
Ba	<0.001	K	0.17	Sr	0.004
Be	<0.001	Li	0.004	Sb	0.01
Bi	<0.001	Mg	0.3	Ti	0.016
Ca	0.65	Mn	<0.001	Tl	<0.001
Cr	<0.001	Mo	<0.001	V	<0.001
Cd	<0.001	Na	0.5	Zr	<0.001
Co	<0.001	Ni	<0.001	Zn	6.7

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN.-- '03 Certifying Officer: N. Kocherlakota

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INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 12/9/02
DATE EXPIRED: 12/15/03
DATE OPENED: 12/9/02
INORG: 3858 PO: 252066

010101

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLSI9-2X/2Y/2T **Lot No.** 9-66SI

Description: 1000 mg/L Silicon

Matrix: H2O / Tr HF

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1001.5 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3150

The CRM is prepared gravimetrically using high purity Ammonium HexafluorosiliLot# 02021D. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1003 mg/L

Method: Precipitation using Ammonium Molybdate and 8-Hydroxy Quinoline. Filter, dry, and weigh as (C9H7ON)4(H4)[Si(Mo12O40)]

Instrumentation Analysis By ICP spectrometer: 1000 mg/L

Uncertified Properties:

Density: 1.001 @ 24.5 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.002	Cu	0.01	Pb	<0.001
As	<0.001	Fe	0.006	Rb	<0.001
Ag	0.009	Ga	<0.001	Re	<0.001
B	<0.05	In	<0.001	Sn	<0.001
Ba	<0.001	K	0.014	Sr	<0.001
Be	<0.001	Li	<0.001	Sb	<0.001
Bi	<0.001	Mg	<0.001	Ti	<0.002
Ca	0.004	Mn	<0.001	Tl	<0.001
Cr	<0.002	Mo	<0.001	V	<0.001
Cd	<0.001	Na	0.006	Zr	0.008
Co	<0.001	Ni	<0.001	Zn	0.02

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: DEC -- '02 Certifying Officer: N. Kocherlakota

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Catalog Number: PLTI9-2X/2Y/2T **Lot No.** 9-52TI

Description: 1000 mg/L Titanium

Matrix: H2O

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 995.5 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3162a

The CRM is prepared gravimetrically using high purity (NH4)2TiF6 Lot# 02021E. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 996 mg/L

Method: Precipitation using Ammonium Hydroxide. Filter, ignite, and weigh as TiO2.

Instrumentation Analysis By ICP spectrometer: 995 mg/ L

Uncertified Properties:

Density: 1.000 @ 23.9 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.01	Cu	0.35	Pb	0.002
As	<0.001	Fe	0.01	Rb	<0.001
Ag	<0.001	Ga	<0.001	Re	<0.001
B	<0.005	In	<0.001	Sn	<0.001
Ba	<0.001	K	<0.05	Sr	<0.001
Be	<0.002	Li	<0.001	Sb	0.005
Bi	0.008	Mg	0.008	Tl	<0.001
Ca	0.095	Mn	0.001	V	<0.001
Cr	<0.001	Mo	<0.001	Zr	0.20
Cd	<0.001	Na	0.009	Zn	0.030
Co	<0.001	Ni	0.001		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

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Catalog Number: PLSR2-2X/2Y/2T **Lot No.** 9-166SR

Description: 1000 mg/L Strontium in 2% HNO3

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1002.5 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3153a

The CRM is prepared gravimetrically using high purity Strontium Carbonate Lot# 02001B. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1002 mg/L

Method: EDTA titration using Methyl Thymol Blue as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumentation Analysis By ICP spectrometer: 1003 mg/L

Uncertified Properties:

Density: 1.010 @ 22.7 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.02	Cu	<0.001	Pb	<0.001
As	<0.001	Fe	0.001	Rb	<0.001
Ag	<0.002	Ga	<0.001	Re	<0.001
B	<0.003	In	<0.001	Si	0.043
Ba	0.008	K	0.10	Sb	<0.001
Be	<0.001	Li	0.007	Ti	<0.002
Bi	<0.001	Mg	<0.003	Tl	<0.001
Ca	0.014	Mn	<0.001	V	<0.001
Cr	0.001	Mo	<0.001	Zr	<0.001
Cd	<0.001	Na	0.01	Zn	0.04
Co	<0.001	Ni	<0.001		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: FEB -- '03 Certifying Officer: N. Kochotakota

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Catalog Number: PLSN5-2X/2Y/2T **Lot No.** 9-81SN
Description: 1000 mg/L Tin
Matrix: 20% HCL

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1002.5 mg/L
Uncertainty Associated with Measurement: +/- 3 mg/L
Certified Value is Traceable to: NIST SRM 3161

The CRM is prepared gravimetrically using high purity Tin Powder Lot# 10831R. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1006 mg/L

Method: Precipitation using ammonium hydroxide,filter,ignite and weigh as Sn02.

Instrumentation Analysis By ICP spectrometer: 999 mg/L
Uncertified Properties:

Density: 1.037 @ 25.0 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.008	Cu	<0.002	Pb	0.01
As	0.02	Fe	0.06	Rb	<0.001
Ag	0.02	Ga	<0.001	Re	<0.001
B	<0.02	In	0.10	Sr	<0.001
Ba	<0.001	K	<0.3	Sb	0.008
Be	<0.001	Li	<0.001	Ti	<0.003
Bi	<0.001	Mg	<0.001	Tl	<0.001
Ca	0.015	Mn	<0.001	V	0.3
Cr	<0.002	Mo	<0.001	Zr	<0.001
Cd	<0.001	Na	0.05	Zn	4
Co	0.009	Ni	0.06		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: AUG -- '02 Certifying Officer: N. Kocherlakota

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Certificate of Reference Material

Catalog Number: PLBI4-2X/2Y **Lot No.** 9-36BI

Description: 1000 mg/L Bismuth

Matrix: 10% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1001 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3106

The CRM is prepared gravimetrically using high purity Bismuth Metal Lot# 04941B. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L

Method: EDTA titration using Xylenol Orange as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumentation Analysis By ICP spectrometer: 1001 mg/L

Uncertified Properties:

Density: 1.052 @ 23.1 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.002	Cu	0.034	Pb	0.006
As	<0.001	Fe	0.001	Re	<0.001
Ag	0.002	Ga	<0.001	Rb	<0.001
B	<0.04	In	<0.001	Sr	<0.001
Ba	<0.001	K	0.001	Sb	<0.001
Be	<0.001	Li	<0.001	Sn	<0.001
Cd	<0.001	Mn	<0.001	Ti	<0.001
Co	<0.001	Mo	<0.001	Tl	<0.001
Ca	0.006	Mg	<0.001	V	<0.002
Cr	<0.005	Na	0.005	Zr	<0.001
		Ni	<0.001	Zn	0.02

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

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Catalog Number: PLLA2-2X/2Y **Lot No.** 9-17LA

Description: 1000 mg/L Lanthanum

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 996.5 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3127a

The CRM is prepared gravimetrically using high purity Lanthanum Oxide Lot# 06981D. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 998 mg/L

Method: EDTA titration using Methyl Thymol Blue as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumentation Analysis By ICP spectrometer: 995 mg/L

Uncertified Properties:

Density: 1.010 @ 23.8 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ce	0.009	Lu	<0.001	Tm	<0.001
Ca	0.05	Mn	<0.001	Ti	<0.001
Dy	<0.001	Mo	<0.001	Tb	<0.001
Er	<0.001	Nd	<0.001	Ta	<0.001
Eu	<0.001	Ni	<0.001	Tl	<0.001
Fe	0.006	Na	0.006	V	<0.001
Gd	<0.2	Pr	<0.001	W	<0.001
Ga	<0.001	Rb	<0.001	Y	<0.001
Hf	<0.001	Sc	<0.003	Yb	<0.001
Ho	<0.001	Sm	<0.001	Zr	<0.001
In	<0.001	Th	<0.001		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

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Catalog Number: PLY2-2X/2Y/2T **Lot No.** 8-170Y

Description: 1,000 mg/L Yttrium

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1000 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3167a

The CRM is prepared gravimetrically using high purity Yttrium Oxide Lot# 06011A. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1002 mg/L

Method: EDTA titration using Methyl Thymol Blue as indicator.EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumentation Analysis By ICP spectrometer: 998 mg/L

Uncertified Properties:

Density: 1.012 @ 22.8 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ce	<0.001	La	<0.001	Tb	<0.001
Ca	0.006	Lu	<0.001	Tm	<0.001
Dy	<0.001	Mn	<0.001	Tl	<0.001
Er	<0.001	Mo	<0.001	Th	<0.001
Eu	<0.001	Nd	<0.001	Ta	<0.001
Fe	0.005	Ni	<0.005	Ti	<0.001
Gd	<0.001	Na	0.03	V	<0.001
Ga	<0.001	Pr	<0.001	W	<0.001
Hf	<0.001	Rb	<0.001	Yb	<0.001
Ho	<0.001	Sc	0.001	Zr	<0.001
In	<0.001	Sm	<0.001		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: AUG -- '02 Certifying Officer: N. Kocherlakota

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Catalog Number: PLPD3-2X/2Y **Lot No.** 9-74PD

Description: 1000 mg/L Palladium

Matrix: 10% HCl

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 995 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3138

The CRM is prepared gravimetrically using high purity Palladium Powder Lot# 07991E. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 990 mg/L

Method: Precipitation using dimethyl glyoxime,filter,dry and weigh as Pd(C4H702N2)2.

Instrumentation Analysis By ICP spectrometer: 1000 mg/L

Uncertified Properties:

Density: 1.025 @ 26.3 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	<0.004	Cr	<0.009	Pt	<0.004
Au	0.03	Fe	0.02	Re	<0.001
Ag	0.007	Ga	<0.001	Rh	0.002
B	<0.05	Ir	<0.001	Rb	<0.001
Be	<0.002	In	<0.001	Ru	<0.001
Bi	<0.001	Mg	<0.005	Sn	0.08
Ca	0.02	Mn	<0.001	Te	<0.001
Cd	<0.001	Na	<0.03	Ti	<0.001
Co	<0.001	Ni	0.004	W	<0.001
Cu	<0.006	Pb	<0.04	Zr	<0.001
				Zn	0.16

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN -- '03 Certifying Officer: N. Kocherlakota

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Certificate of Reference Material

Catalog Number: PLS9-2X/2Y/2T **Lot No.** 9-64S

Description: 1000 mg/L Sulfur

Matrix: H2O

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1000.5 +/- 3 mg/L

Uncertainty Associated with Measurement:

Certified Value is Traceable to: NIST SRM 3154

The CRM is prepared gravimetrically using high purity AMMONIUM SULFATE Lot# 0891NK. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L

Method: PRECIPITATION USING BARIUM CHLORIDE,FILTER,IGNITE AND WEIGH AS BaS04.

Instrumentation Analysis By ICP spectrometer: 1000 mg/L

Uncertified Properties:

Density: 1.007 @ 23.6 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ag	<0.001	Cu	<0.01	Pb	<0.1
Al	0.002	Fe	0.012	Rb	<0.001
As	<0.001	Ga	<0.001	Re	<0.001
Ba	<0.001	In	<0.001	Sn	<0.001
Be	<0.001	K	<0.08	Sr	<0.001
B	<0.006	Li	<0.001	Sb	<0.001
Bi	<0.001	Mg	0.02	Ti	<0.001
Cr	0.002	Mn	<0.001	Tl	<0.001
Co	<0.001	Mo	<0.001	V	<0.001
Cd	<0.001	Na	0.02	Zr	<0.001
Ca	0.015	Ni	<0.001	Zn	0.38

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: Jul -- '02 Certifying Officer: N. Kocherlakota

7/10/02
7/15/2003
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3562 F51959

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Certificate of Reference Material

Catalog Number: PLTH2-2X/2Y **Lot No.** 9-95TH

Description: 1000 mg/Lthorium

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1000 mg/L +/- 3 mg/L

Uncertainty Associated with Measurement:

Certified Value is Traceable to: NIST SRM 3159

The CRM is prepared gravimetrically using high purity Th(NO3)4-4H2O Lot# 01851R. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L

Method: EDTA titration using Xylenol Orange as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumentation Analysis By ICP spectrometer: 999 mg/L

Uncertified Properties:

Density: 1.043 @ 25.2 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ce	0.008	La	0.002	Tb	<0.001
Ca	0.01	Lu	<0.001	Tm	<0.001
Dy	<0.001	Mn	<0.001	Ti	<0.002
Er	<0.001	Mo	<0.001	Ta	<0.001
Eu	<0.001	Nd	0.002	Tl	<0.001
Fe	<0.01	Ni	<0.001	V	<0.001
Gd	<0.001	Na	0.03	W	<0.001
Ga	<0.001	Pr	<0.001	Y	0.001
Hf	<0.001	Rb	<0.001	Yb	<0.001
Ho	<0.001	Sc	0.002	Zr	0.002
In	<0.001	Sm	<0.001		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: SEP -- '02 Certifying Officer: N. Kocherlakota

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Certificate of Reference Material

Catalog Number: PLU2-2X/2Y **Lot No.** 8-123U

Description: 1000 mg/L Uranium

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1000.5 mg/L +/- 3 mg/L

Traceable to: NIST SRM 3164

The CRM is prepared gravimetrically using high purity Uranium Oxide Lot# 04001D. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L

Method: Evaporate to dryness,ignite and weigh as U3 O8.

Instrumentation Analysis By ICP spectrometer: 1000 mg/L

Uncertified Properties:

Density: 1.018 @ 23.5 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.05	Cu	0.02	Pb	<0.007
As	0.05	Fe	0.10	Rb	<0.001
Ag	<0.005	Ga	<0.001	Re	<0.001
B	<0.004	In	<0.001	Sn	<0.001
Ba	0.003	K	0.06	Sr	0.004
Be	<0.001	Li	<0.001	Sb	0.003
Bi	0.002	Mg	0.003	Ti	<0.001
Ca	.12	Mn	0.003	Tl	<0.001
Cr	<0.003	Mo	0.005	V	0.005
Cd	<0.001	Na	0.1	Zr	<0.001
Co	<0.001	Ni	<0.002	Zn	0.02

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUN -- '02 Certifying Officer: N. Kocherlakota

3533

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SPECertificate™ 010112

Certificate of Reference Material

Catalog Number: PLW9-2X/2Y **Lot No.** 8-135W

Description: 1000 mg/L Tungsten

Matrix: H2O

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 999.5 mg/L +/- 3 mg/L

Traceable to: NIST SRM 3163

The CRM is prepared gravimetrically using high purity Ammonium Tungstate Lot# 02001H. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 997 mg/L

Method: Fume with Sulfuric Acid to dryness, ignite and weigh as WO3.

Instrumentation Analysis By ICP spectrometer: 1002 mg/L

Uncertified Properties:

Density: 1.006 @ 25.2 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.005	Cu	<0.001	Pb	<0.008
As	0.006	Fe	0.003	Rb	<0.001
Ag	<0.004	Ga	<0.001	Re	0.009
B	<0.004	In	<0.001	Sn	0.001
Ba	<0.001	K	0.07	Sr	<0.001
Be	<0.001	Li	0.04	Sb	0.002
Bi	<0.001	Mg	0.006	Ti	<0.002
Ca	0.008	Mn	<0.001	Tl	<0.001
Cr	<0.005	Mo	0.005	V	<0.001
Cd	<0.001	Na	0.03	Zr	<0.001
Co	<0.001	Ni	<0.001	Zn	<0.2

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: AUG -- '02 Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 8/20/02
DATE EXPIRED: 8/15/03
DATE OPENED: 8/22/02 DK
INORG: 3696 PO: FS2036

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SPEXertificate™ 010113

Certificate of Reference Material

Catalog Number: PLZR2-2X/2Y/2T **Lot No.** 9-07ZR

Description: 1000 mg/L Zirconium

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 997 mg/L

Uncertainty Associated with Measurement: +/- 3 mg/L

Certified Value is Traceable to: NIST SRM 3169

The CRM is prepared gravimetrically using high purity Zirconyl Nitrate Lot# 11011C. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 996 mg/L

Method: Fume with Sulfuric Acid to dryness,ignite and weigh as ZrO2.

Instrumentation Analysis By ICP spectrometer: 998 mg/L

Uncertified Properties:

Density: 1.009 @ 25.0 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.02	Cu	<0.001	Pb	<0.001
As	<0.002	Fe	0.039	Rb	<0.001
Ag	0.2	Ga	<0.001	Re	<0.001
B	<0.05	In	<0.001	Sn	<0.001
Ba	<0.001	K	<0.08	Sr	<0.001
Be	<0.001	Li	<0.005	Sb	<0.001
Bi	<0.001	Mg	<0.002	Ti	<0.002
Ca	0.04	Mn	<0.001	Tl	<0.001
Cr	<0.005	Mo	<0.001	V	<0.001
Cd	0.004	Na	<0.03	Zn	0.005
Co	<0.001	Ni	<0.001		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUL -- '02 Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 08/01/02
DATE EXPIRED: 07/30/2003
DATE OPENED: 08/02/02
INORG: 36028 PO: F52011

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SPEXertificate™ 010114

Certificate of Reference Material

Catalog Number: PLNA2-3X/3Y **Lot No.** T8-73NA

Description: 10,000 mg/L Sodium

Matrix: 5% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 10,036.5 mg/L

Uncertainty Associated with Measurement: +/- 30 mg/L

Certified Value is Traceable to: NIST SRM 3152a

The CRM is prepared gravimetrically using high purity Sodium Carbonate Lot# 02021A. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 10,039 mg/L

Method: Evaporate to dryness. Fume with Sulfuric Acid. Ignite and weigh as Na2SO4.

Instrumentation Analysis By ICP spectrometer: 10,034 mg/ L

Uncertified Properties:

Density: 1.048 @ 23.9 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.02	Cu	<0.002	Pb	<0.001
As	<0.08	Fe	0.03	Re	<0.001
Ag	<0.02	Ga	<0.001	Rb	<0.001
B	<0.1	In	<0.001	Sr	<0.001
Ba	0.008	K	1.36	Sb	<0.001
Be	<0.01	Li	<0.002	Sn	<0.001
Bi	<0.001	Mg	0.60	Ti	<0.03
Ca	0.60	Mn	<0.02	Tl	<0.001
Cr	0.002	Mo	<0.001	V	<0.001
Cd	<0.01	Ni	<0.003	Zr	<0.001
Co	<0.001			Zn	<0.05

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: FEB -- '03 Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 02/13/03
DATE EXPIRED: 02/15/2004
DATE OPENED: 02/13/03
INORG: 3951 PO: E52060

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DATE RECEIVED: 11/19/02
DATE EXPIRED: 11/30/2003
DATE OPENED: 11/19/02 AR
INORG: 3323 PO: F82064

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Certificate of Reference Material

Catalog Number: ICV-2A **Lot No.:** 22-12AS
Description: **Initial Calibration Verification Standard II**
Matrix: 5% Nitric Acid

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentration.

Refer to side 2 for details of measurement uncertainties.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Measured (mg/L)	NIST SRM	Element	Labeled (mg/L)	Measured (mg/L)	NIST SRM
Ca	2,000	2,005.40	3109a	Ni	500	500.58	3136
K	2,000	1,997.89	3141a	V	500	504.23	3165
Mg	2,000	1,992.26	3131a	Cr	200	203.21	3112a
Na	2,000	1,992.99	3152a	Cu	200	199.75	3114
Al	1,000	1,005.90	3101a	Ag	100	100.46	3151
Ba	1,000	1,001.51	3104a	Be	100	100.04	3105a
Fe	1,000	1,003.17	3126a	Mn	100	100.64	3132
Co	500	505.10	3113	Zn	100	100.52	3168a

Spex Reference Multi: Lot #4-63BD, 14-125AS

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the certified concentrations with no single component exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: NOV -- '02 Certifying Officer: N. Kocherlakota

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INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 11/19/02
DATE EXPIRED: 11/30/2003 DK
DATE OPENED: 11/19/02
INORG: 3224 PO: E52064

SPECertificate™ 010116

Certificate of Reference Material

Catalog Number: PLSB7-2X/2Y/2T **Lot No.:** 8-175SB-X/Y/T
Description: 1000 mg/L Antimony
Matrix: Water/0.6% Tartaric Acid/tr HNO_3

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Antimony(Sb): 999 mg/L ± 3 mg/L
Traceable to: NIST SRM 3102a

The CRM is prepared gravimetrically using high purity Antimony Metal (Sb) Lot#R1198A. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis.
Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 998 mg/L
Method: Gravimetric analysis by evaporating to dryness, fuming with Nitric Acid, igniting and weighing as Sb_2O_4.
Instrumental Analysis by ICP spectrometer: 1000 mg/L
Uncertified Properties:
Density: 1.007 at 24.0°C

Trace Metallic Impurities in the Actual Solution via ICP Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ag	<0.001	Cu	<0.001	Pb	<0.001
Al	0.030	Fe	0.013	Rb	<0.001
As	0.001	Ga	<0.001	Re	<0.001
B	<0.001	In	<0.001	Sn	<0.001
Ba	<0.001	K	0.030	Sr	<0.001
Be	<0.001	Li	<0.001	Ti	0.001
Bi	<0.001	Mg	0.003	Tl	<0.001
Ca	0.012	Mn	<0.001	V	<0.001
Cd	<0.001	Mo	<0.001	Zn	<0.010
Co	<0.001	Na	0.005	Zr	<0.001
Cr	<0.001	Ni	<0.001		

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable to +/- 0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: NOV -- '02 Certifying Officer: N. Kocherlakota

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Certificate of Reference Material

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 11/14/02
DATE EXPIRED: 11/30/2003
DATE OPENED: 11/19/02
INORG: 3775 PO: F50664

Catalog Number: ICV-2C **Lot No.:** 22-13AS
Description: **Initial Calibration Verification Standard II**
Matrix: 5% Nitric Acid

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentration.

Refer to side 2 for details of measurement uncertainties.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Measured (mg/L)	NIST SRM
As	500	497.85	3103a
Pb	500	495.41	3128
Se	500	501.98	3149
TL	500	501.89	3158
Cd	100	99.77	3108

Spex Reference Multi: Lot #4-51BDREF, 15-39AS, 11-173AS

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the certified concentrations with no single element exceeding +/- 2%. This includes uncertainty of measurements and other effects, such as transpiration losses. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: NOV -- '02 Certifying Officer: N. Kocherlakota

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Certificate of Analysis

010118

CUSTOM-GRADE SOLUTION 1000 μg/mL Silver in 3.5% HNO_3 (abs)

Catalog Number: CGAG1-1, CGAG1-2 and CGAG1-5

Lot Number: **T-AG02013**

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 08/23/02
DATE EXPIRED: 09/01/2003
DATE OPENED: 08/26/02
INORG: 3653 PO: F52042

Starting Material:	Silver Metal
Starting Material Purity:	99.999%
Starting Material Lot No:	F15102

CERTIFIED CONCENTRATION: 996 ± 3 μg/mL

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n} \qquad \text{Uncertainty } (\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean x_i = individual results n = number of measurements $\sum S_i$ = The summation of all significant estimated errors.

Classical Wet Assay: 998 ± 3 μg/mL
Method: Volhard Titration vs NIST SRM 999a Potassium Chloride

Instrument Analysis: 996 ± 3 μg/mL
Method: Inductively Coupled Plasma Spectroscopy (ICP) vs NIST SRM 3151.

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

TRACE METALLIC IMPURITIES DETERMINED BY ICP-MS AND ICP-OES IN μg/mL:

Custom-Grade solutions tested for trace metallic impurities by ICP-MS were analyzed in an ULPA-Filtered Clean Room.
An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 μm.

M	Al	<0.0009	M	Dy	<0.0006	M	Li	<0.001	M	Pr	<0.00003	M	Te	<0.003
M	Sb	0.0006	M	Er	<0.0005	M	Lu	<0.00004	M	Re	<0.0001	M	Tb	0.00003
M	As	<0.001	M	Eu	<0.0003	M	Mg	<0.003	n	Rh		M	Tl	<0.0001
M	Ba	<0.001	M	Gd	<0.0001	M	Mn	<0.0004	M	Rb	<0.0001	M	Th	<0.0001
M	Be	<0.00005	M	Ga	<0.0001	O	Hg	<0.02	n	Ru		M	Tm	<0.00004
M	Bi	0.0007	M	Ge	0.001	M	Mo	<0.0002	M	Sm	<0.0001	M	Sn	<0.0005
M	B	<0.007	M	Au	<0.0003	M	Nd	<0.0002	M	Sc	<0.001	M	Ti	<0.005
O	Cd	<0.01	M	Hf	<0.0002	O	Ni	<0.05	O	Se	<0.4	M	W	<0.001
O	Ca	<0.01	M	Ho	<0.00005	M	Nb	<0.00005	O	Si	<0.02	M	U	<0.0002
M	Ce	<0.0005	O	In	<0.03	n	Os		s	Ag		M	V	<0.0002
M	Cs	<0.00003	M	Ir	<0.0005	n	Pd		O	Na	<0.09	M	Yb	<0.0001
M	Cr	<0.002	O	Fe	<0.05	O	P	<0.05	M	Sr	<0.00005	M	Y	<0.004
M	Co	<0.0003	M	La	<0.00005	M	Pt	<0.0002	n	S		M	Zn	0.006
M	Cu	<0.0006	M	Pb	<0.0003	n	K		M	Ta	<0.0007	M	Zr	<0.0005

M - checked by ICP-MS O - checked by ICP-OES i - spectral interference n - not checked for s - solution standard element

ANALYZED DENSITY OF SOLUTION (measured at 22°C): 1.025 g/mL (over)

Inorganic Ventures, Inc.
195 Lehigh Avenue • Suite 4 • Lakewood, NJ 08701
Orders: 800-669-6799 • FAX (732) 901-1903
Technical Support: 800-569-6799

Paul R. Haines
Quality Assurance Manager

EXPIRES
1 2003

Certificate of Analysis

010119

CUSTOM-GRADE SOLUTION 1000 μg/mL Arsenic in 1.4% HNO_3 (abs)

Catalog Number: CGAS1-1, CGAS1-2 and CGAS1-5

Lot Number: **T-AS02019**

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/09/03
DATE EXPIRED: 02/01/2004 DR
DATE OPENED: 01/10/03
INORG: 3899 PO: F52071

Starting Material:	Arsenic Metal
Starting Material Purity:	99.999%
Starting Material Lot No:	23014

CERTIFIED CONCENTRATION: 1006 ± 3 μg/mL

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n} \qquad \text{Uncertainty } (\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean x_i = individual results n = number of measurements $\sum S_i$ = The summation of all significant estimated errors.

Calculated Value: 1003 μg/mL
Method: Calculated, based on starting material.

Instrument Analysis: 1006 ± 3 μg/mL (Average of 3 runs)
Method: Inductively Coupled Plasma Spectroscopy (ICP) vs NIST SRM 3103a.

TRACE METALLIC IMPURITIES DETERMINED BY ICP-MS AND ICP-OES IN μg/mL:

Custom-Grade solutions tested for trace metallic impurities by **ICP-MS** were analyzed in an **ULPA-Filtered Clean Room**.
An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 μm .

O	Al	0.00030	M	Dy	<0.012	O	Li	<0.000020	M	Pr	<0.00060	M	Te	<0.060
O	Sb	<0.010	M	Er	<0.010	M	Lu	<0.00080	O	Re	<0.010	M	Tb	<0.00060
s	As		M	Eu	<0.0060	O	Mg	<0.000030	M	Rh	<0.0020	M	Tl	<0.0020
M	Ba	<0.020	M	Gd	<0.0020	O	Mn	<0.000030	M	Rb	<0.0020	M	Th	<0.0020
M	Be	<0.0010	M	Ga	<0.0020	O	Hg	<0.012	M	Ru	<0.0040	M	Tm	<0.00080
M	Bi	<0.00080	M	Ge	<0.012	M	Mo	<0.0040	M	Sm	<0.0020	O	Sn	0.00053
O	B	<0.012	M	Au	<0.0060	M	Nd	<0.0040	M	Sc	<0.020	M	Ti	<0.10
M	Cd	<0.0060	M	Hf	<0.0040	M	Ni	<0.016	M	Se	<0.016	M	W	<0.020
O	Ca	<0.0015	M	Ho	<0.0010	O	Nb	<0.0020	O	Si	0.0077	M	U	<0.0040
M	Ce	<0.010	M	In	<0.020	n	Os		M	Ag	<0.0040	M	V	<0.0040
M	Cs	<0.00060	M	Ir	<0.010	M	Pd	<0.010	O	Na	0.00096	M	Yb	<0.0020
M	Cr	<0.010	O	Fe	<0.0011	O	P	<0.0026	M	Sr	<0.0010	M	Y	<0.080
M	Co	<0.0060	M	La	<0.0010	M	Pt	<0.0040	O	S	<0.025	O	Zn	0.00019
M	Cu	<0.012	M	Pb	<0.0060	O	K	0.00096	M	Ta	<0.014	M	Zr	<0.010

M - checked by ICP-MS O - checked by ICP-OES i - spectral interference n - not checked for s - solution standard element

ANALYZED DENSITY OF SOLUTION (measured at 22°C): 1.010 g/mL

QA:KSL Rev.061202DN

(over)

Paul R. Hames
Quality Assurance Manager

Inorganic Ventures, Inc.
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Technical Support: 800-569-6799

EXPIRES
1 FEB 2004

Certificate of Analysis

010120

CUSTOM-GRADE SOLUTION 1000 µg/mL Lead in 0.35% HNO_3 (abs)

Catalog Number: CGPB1-1, CGPB1-2 and CGPB1-5

Lot Number: **T-PB02110**

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 10/22/02
DATE EXPIRED: 11/01/2003
DATE OPENED: 10/23/02
INORG: 3735 PO: F52057

Starting Material:	Lead Nitrate
Starting Material Purity:	99.995%
Starting Material Lot No:	22150

CERTIFIED CONCENTRATION: 1004 ± 2 µg/mL

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n} \qquad \text{Uncertainty } (\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean x_i = individual results n = number of measurements $\sum S_i$ = The summation of all significant estimated errors.

Classical Wet Assay: 1004 ± 2 µg/mL
Method: EDTA Titration vs NIST SRM 928 Lead Nitrate.

Instrument Analysis: 995 ± 8 µg/mL
Method: Inductively Coupled Plasma Spectroscopy (ICP) vs NIST SRM 3128.

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

TRACE METALLIC IMPURITIES DETERMINED BY ICP-MS AND ICP-OES IN µg/mL:

Custom-Grade solutions tested for trace metallic impurities by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	<0.040	M	Dy	<0.00060	M	Li	<0.0010	M	Pr	<0.000030	M	Te	<0.0030
M	Sb	<0.000050	M	Er	<0.00050	M	Lu	<0.000040	M	Re	<0.00010	M	Tb	<0.000030
M	As	<0.0010	M	Eu	<0.00030	M	Mg	<0.0030	M	Rh	<0.020	M	Tl	<0.0050
M	Ba	<0.0010	M	Gd	<0.00010	M	Mn	<0.00040	M	Rb	<0.00010	M	Th	<0.00010
M	Be	<0.000050	M	Ga	<0.00010	O	Hg	<0.090	M	Ru	<0.00020	M	Tm	<0.000040
M	Bi	<0.0010	M	Ge	<0.00060	M	Mo	<0.00020	M	Sm	<0.00010	M	Sn	<0.00050
O	B	<0.020	M	Au	<0.00030	M	Nd	<0.00020	M	Sc	<0.0010	M	Ti	<0.0050
M	Cd	<0.00030	M	Hf	<0.00020	O	Ni	<0.050	O	Se	<0.40	M	W	<0.0010
O	Ca	<0.010	M	Ho	<0.000050	M	Nb	<0.000050	O	Si	<0.020	M	U	<0.00020
M	Ce	<0.00050	O	In	<0.030	n	Os		i	Na		M	V	<0.00020
M	Cs	<0.000030	M	Ir	<0.00050	M	Pd	<0.00050	M	Sr	0.00034	M	Yb	<0.00010
M	Cr	<0.00050	O	Fe	<0.050	O	P	<0.050	n	S		M	Y	<0.0040
M	Co	<0.00030	M	La	<0.000050	M	Pt	<0.00020	M	Ta	<0.00070	M	Zn	<0.0020
M	Cu	<0.00060	s	Pb		n	K					M	Zr	0.00120

M - checked by ICP-MS O - checked by ICP-OES i - spectral interference n - not checked for s - solution standard element

ANALYZED DENSITY OF SOLUTION (measured at 22°C): 1.002 g/mL

(over)

QA:KSL Rev.061702JTS

Paul R. Haines
Quality Assurance Manager

Inorganic Ventures, Inc.
195 Lehigh Avenue • Suite 4 • Lakewood, NJ 08701
Orders: 800-669-6799 • FAX (732) 901-1903
Technical Support: 800-569-6799

EXPIRES
1 02003

010121

Certificate of Analysis

CUSTOM-GRADE SOLUTION **1000 µg/mL Antimony** in 0.7% HNO_3 (abs) / 3% Tartaric Acid

Catalog Number: CGSB1-1, CGSB1-2 and CGSB1-5

Lot Number: **T-SB02074**

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 02/13/03
DATE EXPIRED: 03/01/2004
DATE OPENED: 02/13/03
INORG: 3953 PO: F52060

Starting Material:	Antimony Metal
Starting Material Purity:	99.995%
Starting Material Lot No:	E14H25

CERTIFIED CONCENTRATION: 1003 ± 2 µg/mL

The Certified Value is the instrument analysis value. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n} \qquad \text{Uncertainty } (\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean x_i = individual results n = number of measurements $\sum S_i$ = The summation of all significant estimated errors.

Calculated Value: 999 µg/mL
Method: Calculated, based on starting material.

Instrument Analysis: 1003 ± 2 µg/mL (Average of 2 runs)
Method: Inductively Coupled Plasma Spectroscopy (ICP) vs NIST SRM 3102a.

TRACE METALLIC IMPURITIES DETERMINED BY ICP-MS AND ICP-OES IN µg/mL:

Custom-Grade solutions tested for trace metallic impurities by **ICP-MS** were analyzed in an **ULPA-Filtered Clean Room.**
An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Al	<0.0050	M	Dy	<0.00060	M	Li	<0.0010	M	Pr	<0.000030	n	Te	
s	Sb		M	Er	<0.00050	M	Lu	<0.000040	M	Re	<0.00010	M	Tb	<0.000030
M	As	<0.0010	M	Eu	<0.00030	M	Mg	<0.0030	M	Rh	<0.00010	M	Tl	0.00030
O	Ba	<0.020	M	Gd	<0.00010	M	Mn	0.0080	M	Rb	<0.00010	M	Th	<0.00010
M	Be	<0.000050	M	Ga	<0.00010	O	Hg	<0.030	M	Ru	<0.00020	M	Tm	<0.000040
M	Bi	0.00070	M	Ge	<0.00060	M	Mo	<0.00020	M	Sm	<0.00010	n	Sn	
M	B	<0.0070	M	Au	<0.00030	M	Nd	<0.00020	M	Sc	<0.0010	M	Ti	<0.0050
M	Cd	<0.00030	M	Hf	<0.00020	O	Ni	<0.050	O	Se	<0.40	M	W	<0.0010
O	Ca	<0.020	M	Ho	<0.000050	M	Nb	<0.000050	O	Si	<0.020	M	U	<0.00020
M	Ce	0.0018	O	In	<0.030	n	Os		M	Ag	<0.00020	M	V	<0.00020
M	Cs	<0.000030	M	Ir	<0.00050	M	Pd	<0.00050	O	Na	<0.090	M	Yb	<0.00010
M	Cr	0.031	O	Fe	<0.050	O	P	<0.050	M	Sr	<0.000050	M	Y	<0.0040
M	Co	<0.00030	M	La	<0.040	M	Pt	<0.00020	n	S		M	Zn	<0.0020
M	Cu	0.0016	M	Pb	0.0011	n	K		M	Ta	<0.00070	M	Zr	<0.00050

M - checked by ICP-MS O - checked by ICP-OES i - spectral interference n - not checked for s - solution standard element

ANALYZED DENSITY OF SOLUTION (measured at 22°C): 1.019 g/mL

(over)

QA:KL Rev.082202DN

Paul A. Haines
Quality Assurance Manager

Expires:

Inorganic Ventures, Inc.
195 Lehigh Avenue • Suite 4 • Lakewood, NJ 08701
Orders: 800-669-6799 • FAX (732) 901-1903
Technical Support: 800-569-6799

EXPIRES
1 MAR 2004

Certificate of Analysis

CUSTOM-GRADE SOLUTION 1000 µg/mL Selenium in 1.4% HNO_3 (abs) 010122

Catalog Number: CGSE1-1, CGSE1-2 and CGSE1-5

Lot Number: **T-SE01098**

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 08/23/02
DATE EXPIRED: 09/01/2003
DATE OPENED: 08/26/02
INORG: 3652 PO: F52042

Starting Material:	Selenium Metal
Starting Material Purity:	99.998%
Starting Material Lot No:	A09C08

CERTIFIED CONCENTRATION: 996 ± 4 µg/mL

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n} \qquad \text{Uncertainty } (\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean x_i = individual results n = number of measurements $\sum S_i$ = The summation of all significant estimated errors.

Calculated Value: 1005 µg/mL
Method: Calculated, based on starting material.

Instrument Analysis: 996 ± 4 µg/mL (Average of 2 runs)
Method: Inductively Coupled Plasma Spectroscopy (ICP) vs NIST SRM 3149.

TRACE METALLIC IMPURITIES DETERMINED BY ICP-MS AND ICP-OES IN µg/mL:

Custom-Grade solutions tested for trace metallic impurities by **ICP-MS** were analyzed in an **ULPA-Filtered Clean Room.**
An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	<0.04	M	Dy	<0.0006	M	Li	<0.001	M	Pr	<0.00003	M	Te	<0.003
M	Sb	<0.00005	M	Er	<0.0005	M	Lu	<0.00004	M	Re	<0.0001	M	Tb	<0.00003
M	As	0.004	M	Eu	<0.0003	M	Mg	<0.003	M	Rh	<0.0001	M	Tl	<0.0001
M	Ba	<0.001	M	Gd	<0.0001	M	Mn	0.0008	M	Rb	0.0002	M	Th	<0.0001
M	Be	<0.00005	M	Ga	<0.0001	O	Hg	<0.02	M	Ru	<0.0002	M	Tm	<0.00004
M	Bi	<0.00004	M	Ge	<0.0006	M	Mo	0.0024	M	Sm	<0.0001	M	Sn	<0.0005
M	B	<0.007	M	Au	<0.0003	M	Nd	<0.0002	M	Sc	<0.001	M	Ti	<0.005
M	Cd	<0.0003	M	Hf	<0.0002	O	Ni	<0.05	s	Se		M	W	0.0042
O	Ca	<0.01	M	Ho	<0.00005	M	Nb	<0.03	O	Si	<0.02	M	U	<0.0002
M	Ce	<0.0005	M	In	<0.0001	n	Os		M	Ag	<0.0002	M	V	0.0012
M	Cs	<0.00003	M	Ir	<0.0005	M	Pd	<0.0005	O	Na	<0.09	M	Yb	<0.0001
M	Cr	<0.0005	O	Fe	<0.05	O	P	<0.05	M	Sr	<0.00005	M	Y	<0.004
M	Co	<0.0003	M	La	<0.00005	M	Pt	<0.0002	n	S		M	Zn	0.0032
M	Cu	0.0035	M	Pb	<0.0003	M	K	<0.02	M	Ta	<0.0007	M	Zr	<0.004

M - checked by ICP-MS O - checked by ICP-OES i - spectral interference n - not checked for s - solution standard element

ANALYZED DENSITY OF SOLUTION (measured at 22°C): 1.009 g/mL

QA:KSL Rev.032502DN

(over)

Inorganic Ventures, Inc.
195 Lehigh Avenue • Suite 4 • Lakewood, NJ 08701
Orders: 800-669-6799 • FAX (732) 901-1903
Technical Support: 800-569-6799

Paul R. Haines
Quality Assurance Manager

EXPIRES 1 SEP 2003

Certificate of Analysis

CUSTOM-GRADE SOLUTION 1000 µg/mL Thallium in 0.5% HNO_3 (abs)

Catalog Number: CGTL1-1, CGTL1-2 and CGTL1-5

Lot Number: **T-TL01075**

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/16/03
DATE EXPIRED: 02/01/2004
DATE OPENED: 01/16/03
INORG: 3922 PO: F52073

Starting Material:	Thallium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No:	59001

CERTIFIED CONCENTRATION: 997 ± 1 µg/mL

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n} \qquad \text{Uncertainty } (\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean x_i = individual results n = number of measurements $\sum S_i$ = The summation of all significant estimated errors.

Calculated Value: 1000 µg/mL
Method: Calculated, based on starting material.

Instrument Analysis: 997 ± 1 µg/mL (Average of 2 runs)
Method: Inductively Coupled Plasma Spectroscopy (ICP) vs NIST SRM 3158.

TRACE METALLIC IMPURITIES DETERMINED BY ICP-MS AND ICP-OES IN µg/mL:

Custom-Grade solutions tested for trace metallic impurities by **ICP-MS** were analyzed in an **ULPA-Filtered Clean Room.**
An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	<0.040	M	Dy	<0.00060	M	Li	<0.0010	M	Pr	<0.000030	M	Te	<0.0030
M	Sb	0.000080	M	Er	<0.00050	M	Lu	<0.000040	M	Re	<0.00010	M	Tb	<0.000030
M	As	<0.0010	M	Eu	<0.00030	M	Mg	<0.0030	M	Rh	<0.00010	s	Tl	
M	Ba	<0.0010	M	Gd	<0.00010	M	Mn	<0.00040	M	Rb	<0.00010	M	Th	<0.00010
M	Be	<0.000050	M	Ga	<0.00010	O	Hg	i	M	Ru	<0.00020	M	Tm	<0.000040
M	Bi	<0.000040	M	Ge	<0.00060	M	Mo	<0.00020	M	Sm	<0.00010	M	Sn	0.00060
O	B	<0.020	M	Au	<0.00030	M	Nd	<0.00020	M	Sc	<0.0010	M	Ti	<0.0050
M	Cd	0.00090	M	Hf	0.0010	O	Ni	<0.050	O	Se	<0.40	M	W	<0.0010
O	Ca	<0.010	M	Ho	<0.000050	M	Nb	<0.000050	O	Si	<0.020	M	U	<0.00020
M	Ce	<0.00050	O	In	i	n	Os		M	Ag	<0.00020	M	V	<0.00020
M	Cs	0.00010	M	Ir	<0.00050	M	Pd	<0.00050	O	Na	<0.090	M	Yb	<0.00010
M	Cr	<0.00050	O	Fe	<0.050	O	P	i	M	Sr	<0.000050	M	Y	<0.0040
M	Co	<0.00030	M	La	<0.000050	M	Pt	<0.00020	n	S		M	Zn	0.015
M	Cu	<0.00060	M	Pb	<0.00030	n	K		M	Ta	<0.00070	M	Zr	<0.00050

M - checked by ICP-MS O - checked by ICP-OES i - spectral interference n - not checked for s - solution standard element

ANALYZED DENSITY OF SOLUTION (measured at 22°C): 1.002 g/mL

QA:KL Rev.031402DN

(over)

Paul R. Haines
Quality Assurance Manager

Inorganic Ventures, Inc.
195 Lehigh Avenue • Suite 4 • Lakewood, NJ 08701
Orders: 800-669-6799 • FAX (732) 901-1903
Technical Support: 800-569-6799

EXPIRES 1 FEB 2004

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Certificate of Analysis

PO NBR: 010123

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 3/10/03
DATE EXPIRED: 3/10/2013
DATE OPENED: 3/11/03
INORG: 3981 PO: 330225E

PRODUCT NUMBER: 20442-0

LOT NUMBER: 14315BO

PRODUCT NAME: SODIUM CARBONATE, 99.995%

FORMULA: NA2CO3

FORMULA WEIGHT: 105.99

APPEARANCE	WHITE GRANULAR POWDER
TITRATION	56.4% CO3 (WITH HCL)

TRACE ANALYSIS, ICP

CA,SI	< 5	PPM
B	3.1	PPM
GA	2.8	PPM
FE	2.2	PPM
NI	1.4	PPM
Y	1.0	PPM
CU	0.7	PPM
K,IR	0.4	PPM
AL	0.3	PPM
SR	0.2	PPM
ZR,CR	0.1	PPM
CS	0.07	PPM
SN	0.06	PPM
MG,MN	0.05	PPM
SC	0.03	PPM

ICP ASSAY	CONFIRMS SODIUM COMPONENT.
PURITY	99.995+% BASED ON TRACE METAL ANALYSIS.

CONTINUED ON NEXT PAGE

ALDRICH CHEMICAL COMPANY
DAVID SWESSEL
APRIL 4, 2001

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Certificate of Analysis

010124

SOUTHWEST RESEARCH INST
DARRY RAMIREZ
6220 CULEBRA RD
SAN ANTONIO TX 78238

PO NBR: 1306966

1/8/2001
1/9/2001 DR
1/9/2001
2636 1306966

PRODUCT NUMBER: 236527-500G

LOT NUMBER: 15308EI

PRODUCT NAME: SODIUM HYDROGENCARBONATE, 99.7+%, A.C.S. REAGENT

FORMULA: NAHCO3

FORMULA WEIGHT: 84.01

APPEARANCE	WHITE POWDER
TITRATION	100.3 % (WITH HCL)
ICP ASSAY	CONFIRMS SODIUM COMPONENT
INSOLUBLE MATTER	0.001% *
CALCIUM	0.0050%
CHLORIDE	0.0014% *
IRON	< 0.0001% *
HEAVY METALS	<5PPM (AS PB) *
POTASSIUM	<0.0020 % *
MAGNESIUM	0.00025%
AMMONIUM	<5PPM *
PHOSPHATE	<0.001% *
CALCIUM, MAGNESIUM & R2O3 PRECIPITATE	0.016% *

CONTINUED ON NEXT PAGE

ALDRICH CHEMICAL COMPANY
DAVID SWESSEL
JANUARY 5, 2001

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Certificate of Reference Material

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 3/19/03
DATE EXPIRED: 3/15/2004 DR
DATE OPENED: 3/19/03
INORG: 3989 PO: F52153

Catalog Number: ICMIX2-100 **Lot No.:** 24-79AS
Description: **IC Instrument Check Standard 2**
Matrix: H_2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single ion concentrates of individual elements using Class A laboratory ware to give precise concentration.
Refer to side 2 for details of measurement uncertainties.

Instrumental Analysis by ION Chromatography:

Analyte	Labeled (mg/L)	Measured (mg/L)	NIST SRM
F^-	100	98.7	3183
Cl^-	200	200	3182
Br^-	400	401	3184
NO_3^-	400	399	3185
HPO_4^{-2}	600	600	3186
SO_4^{-2}	400	399	3181

Spex Reference Multi: Lot #IC6-103VY

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the certified concentrations with no single component exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR '03 Certifying Officer: N. Kocherlakota

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FISHER SCIENTIFIC CHEMICAL DIVISION
One Reagent Lane, Fair Lawn, NJ 07410

010126

ANALYTICAL CONTROL LABORATORY ANALYSIS

Name & Grade:
SODIUM NITRITE, A.C.S.
Catalog Number: S347
Lot Number: 934669
P.O./ Other Customer ID:

Date of Testing/Mfg: 08/17/93

This is to certify that units of the above mentioned lot number were tested and found to comply with the specifications of the grade listed. The following are the actual analytical results obtained:

Test	Unit	Result
APPEARANCE	PASS/FAIL	PASS-YELLOW WHITE CRYSTALS
ASSAY	%	99.8000
CALCIUM IN %	%	0.0020
CHLORIDE	%	0.0010
HEAVY METALS	%	0.0002
IDENTIFICATION		PASS
INSOLUBLE MATTER	%	0.0020
IRON	%	0.00020
POTASSIUM	%	0.00100
SULFATE (SO4)	%	0.0020

Approved by: Frederick H. Turk, FL Analytical QA Supv. or Edgar E. Hess, BPF Analytical QA Supv.

Date: 08/25/93 (Signed and dated original is on file)

NOTE: The data listed is valid for all package sizes of this lot of product, expressed as a extension of the catalog number listed above. If there are any questions with this certificate, please call Steven P. Davis, Analytical QA Manager, at (201) 703-3149.

Ref. No. S347..934669.B1.

Location: FL

010127

SPEXertificate™

Certificate of Reference Material

Catalog Number: AS-F9-2X/2Y **Lot No.:** 23-109AS
Description: 1000 mg/L of Fluoride
Matrix: H_2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Fluoride (F^-): 999.5 mg/L ± 3 mg/L
Traceable to: NIST SRM 3183

The CRM is prepared gravimetrically using high purity Sodium Fluoride (NaF) Lot#M44142. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999 mg/L
Method: Potentiometric analysis using Fluoride combination Electrode.

Instrumental Analysis by Ion Chromatography: 1,000 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Element	mg/L
Cl^-	<10.00
NO_2^-	<0.20
Br^-	<0.20
NO_3^-	<0.20
PO_4^{-3}	<1.00
SO_4^{-2}	<0.50

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% of the certified concentration value for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN -- '03 Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/03/2003
DATE EXPIRED: 01/15/2004 DC
DATE OPENED: 01/03/2003
INORG: 3895 PO: F52071

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SPECertificate™ 010128

Certificate of Reference Material

Catalog Number: AS-CL9-2X/2Y **Lot No.:**21-58AS
Description: 1000 mg/L of Chloride
Matrix: Water

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Chloride (Cl^-): 997.75 mg/L ± 3 mg/L
Traceable to: NIST SRM 3182

The CRM is prepared gravimetrically using high purity Sodium Chloride (NaCl) Lot#12001B. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999.5 mg/L
Method: Gravimetric analysis by precipitation using Silver Nitrate, filtering, drying and weighing as AgCl.

Instrumental Analysis by Ion Chromatography: 996.0 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Component	mg/L	Component	mg/L
F^-	<0.1	PO_4^{3-}	<0.2
NO_2^-	<0.1	NO_3^-	<0.2
SO_4^{2-}	<0.1		

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable to +/- 0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUN '02 Certifying Officer: N. Kocherlakota

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010129

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Certificate of Reference Material

Catalog Number: AS-$NO_2$9-2X/2Y **Lot No.:**5-255VY
Description: 1000 mg/L of Nitrite
Matrix: H_2O

3468
6/13/02
6/15/2003
6/17/02
F51940

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Nitrite (NO_2^-): 1000.5 mg/L ± 3 mg/L
Traceable to: SPEX CRM 0601NO_2

The CRM is prepared gravimetrically using high purity Sodium Nitrite ($NaNO_2$) Lot#0791R. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1000 mg/L
Method: Titrimetric analysis using $KMnO_4$. KMnO4 standardized with As_2O_3 NIST SRM #83d.

Instrumental Analysis by Ion Chromatography: 1001 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Element	mg/L
F^-	<0.2
SO_4^{-2}	<0.2
Cl^-	<0.5
PO_4^{-3}	<0.5
Br^-	<10.0
NO_3^-	<10.0

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% of the certified concentration value for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUN '02 Certifying Officer: N. Kocherlakota

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Certificate of Reference Material

Catalog Number: AS-BR9-2X/2Y **Lot No.:**22-114AS
Description: 1000 mg/L of Bromide
Matrix: H_2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Bromide (Br^-): 992.5 mg/L $\pm$ 3 mg/L
Traceable to: NIST SRM 3184

The CRM is prepared gravimetrically using high purity Sodium Bromide (NaBr) Lot#04931B
The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 991 mg/L
Method: Gravimetric analysis by precipitation using Silver Nitrate, filtering, drying and weighing as AgBr.

Instrumental Analysis by Ion Chromatography: 994 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Element	mg/L
F^-	<0.10
Cl^-	<0.20
NO_2^-	<0.20
NO_3^-	<0.30
SO_4^{-2}	<0.20
PO_4^{-3}	<0.20

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others.
This CRM is guaranteed stable and accurate to +/- 0.5% of the certified concentration value for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUN '02 Certifying Officer: N. Kocherlakota

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SPEXertificate™

Certificate of Reference Material

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 2/24/03
DATE EXPIRED: 2/15/2004
DATE OPENED: 2/24/03 DK
INORG: 3960 PO: E52061

Catalog Number: AS-NO_3N9-2X/2Y **Lot No.:** 23-82AS
Description: 1000 mg/L of Nitrate-N
Matrix: H_2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Nitrate-N (NO_3^--N): 1002.5 mg/L $\pm$ 3 mg/L
Traceable to: NIST SRM 3185

The CRM is prepared gravimetrically using high purity Sodium Nitrate ($NaNO_3$) Lot#M14156. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1003 mg/L
Method: Gravimetric analysis by precipitation using Nitron Acetate, filtering, drying and weighing as Nitron Nitrate ($C_{20}H_{17}N_4.NO_3$).

Instrumental Analysis by Ion Chromatography: 1002 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Element	mg/L
F^-	<0.25
Cl^-	<0.5
NO_2^-	<0.5
Br^-	<1.0
SO_4^-	<1.0
PO_4^{3-}	<2.5

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable to +/- 0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: _____ Certifying Officer: N. Kocherlakota

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SPEXertificate™

010132

Certificate of Reference Material

Catalog Number: AS-$PO_4$9-2X/2Y **Lot No.:** 24-63AS
Description: 1000 mg/L of Phosphate
Matrix: H2O

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 12/17/02
DATE EXPIRED: 12/15/2003 DK
DATE OPENED: 12/17/02
INDEX: 3880 PO: FS2069

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Phosphate (PO_4^{-3}): 998.5 mg/L
Uncertainty Associated with Measurement: +/- 3 mg/L
Certified Value is Traceable to: NIST SRM 3186

The CRM is prepared gravimetrically using high purity Potassium Dihydrogen Phosphate (KH_2PO_4) Lot#08001F. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999 mg/L
Method: Gravimetric analysis by precipitation using Magnesia Mixture, filtering, igniting and weighing as $Mg_2P_2O_7$.

Instrumental Analysis by Ion Chromatography: 998 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Component	mg/L	Component	mg/L
F^-	<0.01	NO_3^-	<0.2
Br^-	<0.2	NO_2^-	<0.2
SO_4^{2-}	<0.2	Cl^-	<0.6

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable to +/- 0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: DEC -- '02 Certifying Officer: N. Kocherlakota

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SPEXertificate™ 010133

Certificate of Reference Material

Catalog Number: AS-SO49-2X/2Y **Lot No.** 6-76VY
Description: 1000 mg/L Sulfate
Matrix: H2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevent to the certified properties listed below.

Certified Value: 1000.5 mg/L
Traceable to: NIST SRM 3181

The CRM is prepared gravimetrically using high purity Potassium Sulfate Lot# T24163 . The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis.
Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 997 mg/L
Method: Precipitation using Barium Chloride, filter, ignite and weigh as BaSO4.

Instrumentation Analysis By ICP spectrometer: 1,004 mg/L
Uncertified Properties:

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Cl	<1.0	Br	<1.0		
F	<0.5	NO3	<0.5		
NO2	<1.0	PO4	<1.0		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUN '02 Certifying Officer: N. Kocherlakota

3489
6/13/03
6/15/2003
6/17/02
F51649

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SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

010134

Pipette Calibrations

Book/Page: 03 005

010135

SwRI – Div. 01, Inorganic Labs' Fixed Volume Pipette Verification Log

(Space provide for Inorganic Laboratories' Fixed Volume Pipette Verification Spreadsheet)

3-25-03

SwRI - Div. 01, Inorganic Labs' Fixed Volume Pipette Spreadsheet

Eppendorf #	True Value (uL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
Lab30	1000	1.0113	1.0114	1.0157	1.01	101.28
TMA1	1000	0.9976	1.0019	0.9990	1.00	99.95
TMA2	1000	1.0012	1.0044	1.0017	1.00	100.24
TMA3	1000	1.0162	1.0145	1.0127	1.01	101.45
TMA6	1000	0.9974	0.9984	0.9978	1.00	99.79
TMB1	900	0.9000	0.9004	0.8978	0.90	99.93
TMC1	800	0.7986	0.8019	0.8007	0.80	100.05
TMDD1	750	0.7535	0.7571	0.7541	0.75	100.65
TMD1	700	0.6986	0.6987	0.7025	0.70	99.99
TMD2	700	0.7034	0.7018	0.6997	0.70	100.23
TME1	600	0.6025	0.5991	0.5996	0.60	100.07
TMF2	500	0.4987	0.4966	0.4961	0.50	99.43
TMF5	500	0.4980	0.4996	0.4997	0.50	99.82
ICF1	500	0.4946	0.4940	0.4976	0.50	99.08
L30-500	500	0.4999	0.5064	0.5034	0.50	100.65
TMG3	400	0.4000	0.3999	0.4006	0.40	100.04
TMH1	300	0.3014	0.2995	0.3016	0.30	100.28
TMH2	300	0.2988	0.2984	0.2989	0.30	99.57
TMJ1	250	0.2482	0.2524	0.2484	0.25	99.87
TMJ2	250	0.2495	0.2513	0.2519	0.25	100.36
TMJ3	250	0.2550	0.2553	0.2542	0.25	101.93
TMK2	200	0.2026	0.2018	0.2004	0.20	100.80
TML1	150	0.1506	0.1496	0.1503	0.15	100.11
TMM1	120	0.1189	0.1194	0.1196	0.12	99.42
TMN3	100	0.0998	0.1005	0.0999	0.10	100.07
ICN1	100	0.0998	0.0987	0.0988	0.10	99.10
TMQ1	80	0.0799	0.0796	0.0800	0.08	99.79
TMR1	70	0.0701	0.0698	0.0693	0.07	99.62
TMS1	60	OUT	OF	SERVICE		
LAB-30A	50	0.0497	0.0498	0.0496	0.05	99.40
TMU1	40	0.0398	0.0399	0.0399	0.04	99.67
TMU2	40	0.0404	0.0398	0.0399	0.04	100.08
TMV1	30	0.0303	0.0295	0.0294	0.03	99.11
L30-20	20	0.0198	0.0200	0.0200	0.02	99.67
TMW1	25	0.0247	0.0251	0.0248	0.02	99.47
TMY1	15	0.0147	0.0149	0.0150	0.01	99.11

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SwRI - Div. 01, Inorganic Labs' Fixed Volume Pipette Verification Log

Balance #: 16 Thermometer #: G011 diH20 Temperature (°C): 21

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
Lab30	1000	1.0113	1.0114	1.0157
TMA1	1000	.9976	1.0019	.0990
TMA2	1000	1.0012	1.0044	1.0017
TMA3	1000	1.0162	1.0145	1.0127
TMA6	1000	.9974	.9984	.9978
TMB1	900	.9000	.9004	.8978
TMC1	800	.7986	.8019	.8007
TMDD1	750	.7535	.7571	.7541
TMD1	700	.6986	.6987	.7025
TMD2	700	.7034	.7018	.6997
TME1	600	.6025	.5991	.5996
TMF2	500	.4987	.4966	.4961
TMF5	500	.4980	.4996	.4997
ICF1	500	.4946	.4940	.4976
L30-500	500	.4999	.5064	.5034
TMG3	400	.4000	.3999	.4006
TMH1	300	.3014	.2995	.3016
TMH2	300	.2988	.2984	.2989
TMJ1	250	.2482	.2524	.2484
TMJ2	250	.2495	.2513	.2579
TMJ3	250	.2550	.2553	.2542
TMK2	200	.2026	.2018	.2004
TML1	150	.1506	.1496	.1503
TMM1	120	.1189	.1194	.1196
TMN3	100	JW 3-25-03 ~~.2550~~ .0998	JW 3-25-03 ~~.2553~~ .1005	.0999 ~~.2542~~ JW 3-25-03
ICN1	100	.0998	.0987	.0988
TMQ1	80	.0799	.0796	.0800
TMR1	70	.0701	.0698	.0693
TMS1	60	OUT	OF	SERVICE
LAB-30A	50	.0497	.0498	.0496
TMU1	40	.0398	.0399	.0399
TMU2	40	.0404	.0398	.0399
TMV1	30	.0303	.0295	.0294
L30-20	20	.0198	.0200	.0200
TMW1	25	.0247	.0251	.0248
TMY1	15	.0147	.0149	.0150

Analyst: John Wilber Date: 3-25-03

Reviewed by: J Ramyer Date: 4/11/03

FRM-243b (Rev 3/Mar 03)

Book/page: 03 001

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SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	20	0.0203	0.0203	0.0202	0.020	101.33
ADJ200-A	100	0.0996	0.0998	0.0994	0.100	99.60
	200	0.1995	0.1996	0.1989	0.199	99.67
	20	0.0204	0.0203	0.0201	0.020	101.33
ADJ200-C	100	0.0999	0.1001	0.0997	0.100	99.90
	200	0.2000	0.1998	0.1992	0.200	99.83
	20	0.0204	0.0203	0.0201	0.020	101.33
ADJ200-D	100	0.1008	0.1003	0.1004	0.101	100.50
	200	0.2022	0.2018	0.2026	0.202	101.10
	20	0.0204	0.0201	0.0201	0.020	101.00
ADJ200-E	100	0.0997	0.0990	0.1001	0.100	99.60
	200	0.2006	0.2011	0.2004	0.201	100.35
	20	0.0201	0.0204	0.0202	0.020	101.17
ADJ200-G	100	0.0987	0.0984	0.0985	0.099	98.53
	200	0.1981	0.1976	0.1984	0.198	99.02
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					

FRM-247a (Rev 2/Mar 03)

Book/page: 03 002

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log 010138

Balance #: 16 Thermometer #: G011 diH20 Temperature (° C) 21

20 µL – 200 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	20	.0203	.0203	.0202
ADJ200-A	100	.0996	.0998	.0994
	200	.1995	.1996	.1989
	20	.0204	.0203	.0201
ADJ200-C	100	JW 4-11-03 ~~OUT~~ .0999	JW 4-11-03 ~~OUT~~ .1001	JW 4-11-03 ~~SERVICE~~ .0997
	200	.2000	.1998	.1992
	20	.0204	.0203	.0201
ADJ200-D	100	JW 4-11-03 ~~.0999~~ .1008	.1003	.1004
	200	.2022	.2018	.2026
	20	.0204	.0201	.0201
ADJ200-E	100	.0997	.0990	.1001
	200	.2006	.2011	.2004
	20	.0201	.0204	.0202
ADJ200-G	100	.0987	.0984	.0985
	200	.1981	.1976	.1984
	20			
ADJ200	100			
	200			
	20			
ADJ200	100			
	200			
	20			
ADJ200	100			
	200			
	20			
ADJ200	100			
	200			

JW 4-11-03

Analyst: John Wilks Date: 4-11-06

Reviewed by: James Date: 4/11/06

Pipette calibration performed 4-4-03, entered in new book 4-11-06 JW

Book/page: 03 053

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SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	100	0.1001	0.1008	0.1000	0.100	100.30
ADJ1000-C	500	0.4985	0.4978	0.4964	0.498	99.51
	1000	0.9914	0.9887	0.9877	0.989	98.93
	100	0.1011	0.1014	0.1005	0.101	101.00
ADJ1000-D	500	0.4997	0.4998	0.4962	0.499	99.71
	1000	0.9949	0.9936	0.9919	0.993	99.35
	100	0.1018	0.1016	0.1019	0.102	101.77
ADJ1000-E	500	0.5090	0.5036	0.5026	0.505	101.01
	1000	1.0051	1.0049	1.0084	1.006	100.61
	100	0.0989	0.0990	0.0992	0.099	99.03
ADJ1000-F	500	0.4974	0.4978	0.4954	0.497	99.37
	1000	1.0081	1.0085	1.0003	1.006	100.56
	100	0.1013	0.1019	0.1013	0.102	101.50
ADJ1000-G	500	0.4965	0.4981	0.4986	0.498	99.55
	1000	1.0077	1.0015	0.9997	1.003	100.30
	100	0.1010	0.1006	0.1016	0.101	101.07
ADJ1000-H	500	0.4930	0.4938	0.4936	0.493	98.69
	1000	0.9895	0.9890	0.9881	0.989	98.89
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00

FRM-247b (Rev 1/Sept 02)

Book/page: 03 C54

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log 010140

Balance #: 16 Thermometer #: G011 diH20 Temperature (° C) 21

100 µL – 1000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	100	.1001	.1008	.1000
ADJ1000-C	500	.4985	.4978	.4964
	1000	.9914	.9887	.9877
	100	.1011	.1014	.1005
ADJ1000-D	500	.4997	.4998	.4962
	1000	.9949	.9936	.9919
	100	.1018	.1016	.1019
ADJ1000-E	500	.5090	.5036	.5026
	1000	1.0051	1.0049	1.0084
	100	.0989	.0990	.0992
ADJ1000-F	500	.4974	.4978	.4954
	1000	1.0081	1.0085	1.0003
	100	.1013	.1019	.1013
ADJ1000-G	500	.4965	.4981	.4986
	1000	1.0077	1.0015	.9997
	100	.1010	.1006	.1016
ADJ1000-H	500	.4930	.4938	.4936
	1000	.9895	.9890	.9881
	100			
ADJ1000	500			
	1000			
	100			
ADJ1000	500			
	1000			
	100			
ADJ1000	500			
	1000			

Jee 4-11-03

Analyst: John Wilks Date: 4-11-03

Reviewed by: ams Date: 4/11/03

Pipette calibration was performed 4-4-03, entered in new book 4-11-03 Jee

Book/page: 03 105

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SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

4-11-03

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	500	0.4955	0.5000	0.4987	0.498	99.61
ADJ5000-C	2500	2.4832	2.4856	2.4843	2.484	99.37
	5000	5.0111	5.0090	4.9978	5.006	100.12
	500	0.5020	0.5061	0.5071	0.505	101.01
ADJ5000-G	2500	2.5345	2.5348	2.5287	2.533	101.31
	5000	5.0244	5.0248	5.0151	5.021	100.43
	500	0.4928	0.4946	0.4911	0.493	98.57
ADJ5000-H	2500	2.4891	2.4875	2.4856	2.487	99.50
	5000	4.9966	5.0079	4.9925	4.999	99.98
	500	0.4976	0.4971	0.4986	0.498	99.55
ADJ5000-I	2500	2.5170	2.5134	2.5130	2.514	100.58
	5000	4.9933	4.9827	4.9881	4.988	99.76
	500	0.5071	0.5068	0.5070	0.507	101.39
ADJ5000-J	2500	2.5170	2.5109	2.5034	2.510	100.42
	5000	5.0171	5.0210	5.0069	5.015	100.30
	500	0.4982	0.4984	0.4982	0.498	99.65
ADJ5000-K	2500	2.4928	2.4979	2.4968	2.496	99.83
	5000	5.0161	5.0060	5.0044	5.009	100.18
	500	0.4985	0.4948	0.4951	0.496	99.23
ADJ5000-L	2500	2.4976	2.5047	2.5286	2.510	100.41
	5000	4.9965	4.9986	4.9878	4.994	99.89
	500					
ADJ5000	2500					
	5000					
	500					
ADJ5000	2500					
	5000					
	500					
ADJ5000	2500					
	5000					
	500					
ADJ5000	2500					
	5000					

4-11-03

FRM-247c (Rev 2/Mar 03)

Book/page: 03 106

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

010142

Balance #: 16 Thermometer #: G011 diH20 Temperature (° C) 21

500 µL – 5000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	500	.4955	.5000	.4987
ADJ5000-C	2500	2.4832	2.4856	2.4843
	5000	5.0111	5.0090	4.9978
	500	.5020	.5061	.5071
ADJ5000-G	2500	2.5345	2.5348	2.5287
	5000	5.0244	5.0248	5.0151
	500	.4938	.4946	.4911
ADJ5000-H	2500	2.4891	2.4875	2.4856
	5000	4.9966	5.0079	4.9925
	500	.4976	.4971	.4986
ADJ5000-I	2500	2.5170	2.5134	2.5130
	5000	4.9933	4.9827	4.9881
	500	.5071	.5068	.5070
ADJ5000-J	2500	2.5170	2.5109	2.5034
	5000	5.0171	5.0210	5.0069
	500	.4982	.4984	.4982
ADJ5000-K	2500	2.4928	2.4979	2.4968
	5000	5.0161	5.0060	5.0044
	500	.4985	.4948	.4951
ADJ5000-L	2500	2.4976	2.5047	2.5286
	5000	4.9965	4.9986	4.9878
	500			
ADJ5000	2500			
	5000			
	500			
ADJ5000	2500			
	5000			
	500			
ADJ5000	2500			
	5000			
	500			
ADJ5000	2500			
	5000			

JW 4-11-03

Analyst: John Willer Date: 4-11-03

Reviewed by: J Ames Date: 4/11/03

Pipette calibration performed JW 4-4-03, entered in new book 4-11-03 JW

FRM-244 (c) (Rev 3/Mar 03)

Book/page: 02 047

010143

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	20	0.0201	0.0200	0.0201	0.020	100.33
ADJ200-A	100	0.0996	0.1009	0.0992	0.100	99.90
	200	0.2018	0.2009	0.2000	0.201	100.45
	20					
ADJ200-B	100	Out of Service				
	200					
	20	0.0202	0.0201	0.0201	0.020	100.67
ADJ200-C	100	0.0994	0.0997	0.0993	0.099	99.47
	200	0.1989	0.1998	0.1988	0.199	99.58
	20	0.0201	0.0204	0.0202	0.020	101.17
ADJ200-D	100	0.0994	0.0990	0.0994	0.099	99.27
	200	0.1990	0.1992	0.1992	0.199	99.57
	20	0.0202	0.0204	0.0200	0.020	101.00
ADJ200-E	100	0.0998	0.1001	0.0997	0.100	99.87
	200	0.2008	0.2003	0.1996	0.200	100.12
	20	0.0204	0.0202	0.0198	0.020	100.67
ADJ200-G	100	0.0998	0.0989	0.0992	0.099	99.30
	200	0.1994	0.1990	0.1983	0.199	99.45
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					

FRM-247a (Rev 1/Sept 02)

Book/page: 02 048

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log 010144

Balance #: 16 Thermometer #: G011 diH20 Temperature (C) 21

20 µL – 200 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	20	.0201	.0200	.0201
ADJ200-A	100	.0996	.1009	.0992
	200	.2018	.2009	.2000
	20			
ADJ200-B	100	OUT	OF	Service
	200			
	20	.0202	.0201	.0201
ADJ200-C	100	.0994	.0997	.0993
	200	.1989	.1998	.1988
	20	.0201	.0204	.0202
ADJ200-D	100	.0994	.0990	.0994
	200	.1990	.1992	.1992
	20	.0202	.0204	.0200
ADJ200-E	100	.0998	.1001	.0997
	200	.2008	.2003	.1996
	20	.0204	.0202	.0198
ADJ200-G	100	.0998	.0989	.0992
	200	.1994	.1990	.1983
	20			
ADJ200	100			
	200			
	20			
ADJ200	100			
	200			
	20			
ADJ20	100			
	200			

3-14-03

Analyst: John Wilks Date: 3-14-03

Reviewed by: Laura Wright Date: 3/17/03

Book/page: 02 099

010145

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	100	0.0991	0.0999	0.0998	0.100	99.60
ADJ1000-C	500	0.4994	0.4988	0.4991	0.499	99.82
	1000	1.0066	1.0012	1.0065	1.005	100.48
	100	0.1000	0.0990	0.0993	0.099	99.43
ADJ1000-D	500	0.4987	0.4988	0.4981	0.499	99.71
	1000	0.9940	0.9939	0.9921	0.993	99.33
	100	0.0981	0.0991	0.0986	0.099	98.60
ADJ1000-E	500	0.4958	0.4949	0.4955	0.495	99.08
	1000	1.0026	0.9982	0.9987	1.000	99.98
	100	0.0982	0.0992	0.0989	0.099	98.77
ADJ1000-F	500	0.4939	0.4947	0.4918	0.493	98.69
	1000	0.9946	0.9972	1.0002	0.997	99.73
	100	0.1016	0.1018	0.1017	0.102	101.70
ADJ1000-G	500	0.5013	0.5013	0.4978	0.500	100.03
	1000	1.0002	1.0001	1.0127	1.004	100.43
	100	0.1008	0.1003	0.1006	0.101	100.57
ADJ1000-H	500	0.4987	0.4994	0.4991	0.499	99.81
	1000	1.0060	0.9998	1.0019	1.003	100.26
	100					
ADJ1000	500					
	1000					
	100					
ADJ1000	500					
	1000					
	100					
ADJ1000	500					
	1000					

FRM-247b (Rev 1/Sept 02)

Book/page: 02 100

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

010146

Balance #: 16 Thermometer #: G011 diH20 Temperature (C) 21

	Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
100 µL – 1000 µL		100	.0991	.0999	.0998
	ADJ1000-C	500	.4994	.4988	.4991
		1000	1.0066	1.0012	1.0065
		100	.1000	.0990	.0993
	ADJ1000-D	500	.4987	.4988	.4981
		1000	.9940	.9939	.9921
		100	.0981	.0991	.0986
	ADJ1000-E	500	.4958	.4949	.4955
		1000	1.0026	.9982	.9987
		100	.0982	.0992	.0989
	ADJ1000-F	500	.4939	.4947	.4918
		1000	.9946	.9972	1.0002
		100	.1016	.1018	.1017
	ADJ1000-G	500	.5013	.5013	.4978
		1000	1.0002	1.0001	1.0127
		100	.1008	.1003	.1006
	ADJ1000-H	500	.4987	.4994	.4991
		1000	1.0060	.9998	1.0019
		100			
	ADJ1000	500			
		1000			
		100			
	ADJ1000	500			
		1000			
		100			
	ADJ1000	500			
		1000			

NOTE: Calibration was performed 3-14-03, entered 3-17-03 JW

JW 3-17-03

Analyst: John Wells Date: 3-17-03

Reviewed by: Laura Wright Date: 3/17/03

Book/page: 02 151

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

010147

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	500	0.5061	0.5047	0.5052	0.505	101.07
ADJ5000-C	2500	2.5100	2.5184	2.5030	2.510	100.42
	5000	4.9989	5.0148	5.0186	5.011	100.22
	500					
ADJ5000-E	2500	OUT	OF	ORDER		
	5000					
	500					
ADJ5000-F	2500	OUT	OF	ORDER		
	5000					
	500	0.5040	0.5049	0.5056	0.505	100.97
ADJ5000-G	2500	2.5098	2.5074	2.5093	2.509	100.35
	5000	5.0521	5.0329	5.0210	5.035	100.71
	500	0.5042	0.5031	0.5038	0.504	100.74
ADJ5000-H	2500	2.5372	2.5326	2.5179	2.529	101.17
	5000	5.0511	5.0354	5.0401	5.042	100.84
	500	0.5034	0.5051	0.5044	0.504	100.86
ADJ5000-I	2500	2.4987	2.5052	2.5034	2.502	100.10
	5000	5.0115	5.0141	5.0092	5.012	100.23
	500	0.4972	0.4983	0.4992	0.498	99.65
ADJ5000-J	2500	2.4989	2.5011	2.4966	2.499	99.95
	5000	4.9982	4.9974	4.9847	4.993	99.87
	500	0.5032	0.5018	0.5036	0.503	100.57
ADJ5000-K	2500	2.5014	2.5031	2.5000	2.502	100.06
	5000	5.0101	5.0076	5.0260	5.015	100.29
	500	0.5000	0.5031	0.4983	0.500	100.09
ADJ5000-L	2500	2.4981	2.5060	2.5016	2.502	100.08
	5000	5.0414	5.0296	5.0136	5.028	100.56
	500					
ADJ5000	2500					
	5000					
	500					
ADJ5000	2500					
	5000					

FRM-247c (Rev 1/Sept 02)

Book/page: 02 152

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log 010148

Balance #: 16 Thermometer #: G011 diH20 Temperature (C) 21

500 µL – 5000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	500	.5061	.5047	.5052
ADJ5000-C	2500	2.5100	2.5184	2.5030
	5000	4.9989	5.0148	5.0186
	500			
ADJ5000-E	2500	OUT	OF	SERVICE
	5000			
	500			
ADJ5000-F	2500	OUT	OF	SERVICE
	5000			
	500	.5040	.5049	.5056
ADJ5000-G	2500	2.5098	2.5074	2.5093
	5000	5.0521	5.0329	5.0210
	500	.5042	.5031	.5038
ADJ5000-H	2500	2.5372	2.5326	2.5179
	5000	5.0511	5.0354	5.0401
	500	.5034	.5051	.5044
ADJ5000-I	2500	2.4987	2.5052	2.5034
	5000	5.0115	5.0141	5.0092
	500	.4972	.4983	.4992
ADJ5000-J	2500	2.4989	2.5011	2.4966
	5000	4.9982	4.9974	4.9847
	500	.5032	.5018	.5036
ADJ5000-K	2500	2.5014	2.5031	2.5000
	5000	5.0101	5.0076	5.0260
	500	.5000	.5031	.4983
ADJ5000-L	2500	2.4981	2.5060	2.5016
	5000	5.0414	5.0296	5.0136
	500			
ADJ5000	2500			
	5000		3-17-03	
	500			
ADJ5000	2500			
	5000			

NOTE: Calibration performed 3-14-03, entered on 3-17-03 gw

Analyst: John Wilder Date: 3-17-03

Reviewed by: Laura Wright Date: 3/17/03

Book/page: 03 001

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SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

4-11-03

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	20	0.0203	0.0203	0.0202	0.020	101.33
ADJ200-A	100	0.0996	0.0998	0.0994	0.100	99.60
	200	0.1995	0.1996	0.1989	0.199	99.67
	20	0.0204	0.0203	0.0201	0.020	101.33
ADJ200-C	100	0.0999	0.1001	0.0997	0.100	99.90
	200	0.2000	0.1998	0.1992	0.200	99.83
	20	0.0204	0.0203	0.0201	0.020	101.33
ADJ200-D	100	0.1008	0.1003	0.1004	0.101	100.50
	200	0.2022	0.2018	0.2026	0.202	101.10
	20	0.0204	0.0201	0.0201	0.020	101.00
ADJ200-E	100	0.0997	0.0990	0.1001	0.100	99.60
	200	0.2006	0.2011	0.2004	0.201	100.35
	20	0.0201	0.0204	0.0202	0.020	101.17
ADJ200-G	100	0.0987	0.0984	0.0985	0.099	98.53
	200	0.1981	0.1976	0.1984	0.198	99.02
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					

FRM-247a (Rev 2/Mar 03)

Book/page: 03 002

010150

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 16 Thermometer #: G011 diH20 Temperature (° C) 21

20 µL – 200 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	20	.0203	.0203	.0202
ADJ200-A	100	.0996	.0998	.0994
	200	.1995	.1996	.1989
	20	.0204	.0203	.0201
ADJ200-C	100	JW 4-11-03 ~~OUT~~ .0999	JW 4-11-03 ~~OUT~~ .1001	JW 4-11-03 ~~SERVICE~~ .0997
	200	.2000	.1998	.1992
	20	.0204	.0203	.0201
ADJ200-D	100	JW 4-11-03 ~~.0999~~ .1008	.1003	.1004
	200	.2022	.2018	.2026
	20	.0204	.0201	.0201
ADJ200-E	100	.0997	.0990	.1001
	200	.2006	.2011	.2004
	20	.0201	.0204	.0202
ADJ200-G	100	.0987	.0984	.0985
	200	.1981	.1976	.1984
	20			
ADJ200	100			
	200			
	20			
ADJ200	100			
	200			
	20			
ADJ200	100			
	200			
	20			
ADJ200	100			
	200			

JW 4-11-03

Analyst: John Wilks Date: 4-11-06

Reviewed by: James Date: 4/11/06

Pipette calibration performed 4-4-03, entered in new book 4-11-06 JW

Book/page: 03 053

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	100	0.1001	0.1008	0.1000	0.100	100.30
ADJ1000-C	500	0.4985	0.4978	0.4964	0.498	99.51
	1000	0.9914	0.9887	0.9877	0.989	98.93
	100	0.1011	0.1014	0.1005	0.101	101.00
ADJ1000-D	500	0.4997	0.4998	0.4962	0.499	99.71
	1000	0.9949	0.9936	0.9919	0.993	99.35
	100	0.1018	0.1016	0.1019	0.102	101.77
ADJ1000-E	500	0.5090	0.5036	0.5026	0.505	101.01
	1000	1.0051	1.0049	1.0084	1.006	100.61
	100	0.0989	0.0990	0.0992	0.099	99.03
ADJ1000-F	500	0.4974	0.4978	0.4954	0.497	99.37
	1000	1.0081	1.0085	1.0003	1.006	100.56
	100	0.1013	0.1019	0.1013	0.102	101.50
ADJ1000-G	500	0.4965	0.4981	0.4986	0.498	99.55
	1000	1.0077	1.0015	0.9997	1.003	100.30
	100	0.1010	0.1006	0.1016	0.101	101.07
ADJ1000-H	500	0.4930	0.4938	0.4936	0.493	98.69
	1000	0.9895	0.9890	0.9881	0.989	98.89
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00

FRM-247b (Rev 1/Sept 02)

Book/page: 03 054
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SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 16 Thermometer #: 6011 diH20 Temperature (° C) 21

100 µL – 1000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	100	.1001	.1008	.1000
ADJ1000-C	500	.4985	.4978	.4964
	1000	.9914	.9887	.9877
	100	.1011	.1014	.1005
ADJ1000-D	500	.4997	.4998	.4962
	1000	.9949	.9936	.9919
	100	.1018	.1016	.1019
ADJ1000-E	500	.5090	.5036	.5026
	1000	1.0051	1.0049	1.0084
	100	.0989	.0990	.0992
ADJ1000-F	500	.4974	.4978	.4954
	1000	1.0081	1.0085	1.0003
	100	.1013	.1019	.1013
ADJ1000-G	500	.4965	.4981	.4986
	1000	1.0077	1.0015	.9997
	100	.1010	.1006	.1016
ADJ1000-H	500	.4930	.4938	.4936
	1000	.9895	.9890	.9881
	100			
ADJ1000	500			
	1000			
	100			
ADJ1000	500			
	1000			
	100			
ADJ1000	500			
	1000			

jee 4-11-03

Analyst: John Wilks Date: 4-11-03

Reviewed by: ams Date: 4/11/03

Pipette calibration was performed 4-4-03, entered in new book 4-11-03 jee

010153

Book/page: 03 105

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

4-11-03

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	500	0.4955	0.5000	0.4987	0.498	99.61
ADJ5000-C	2500	2.4832	2.4856	2.4843	2.484	99.37
	5000	5.0111	5.0090	4.9978	5.006	100.12
	500	0.5020	0.5061	0.5071	0.505	101.01
ADJ5000-G	2500	2.5345	2.5348	2.5287	2.533	101.31
	5000	5.0244	5.0248	5.0151	5.021	100.43
	500	0.4928	0.4946	0.4911	0.493	98.57
ADJ5000-H	2500	2.4891	2.4875	2.4856	2.487	99.50
	5000	4.9966	5.0079	4.9925	4.999	99.98
	500	0.4976	0.4971	0.4986	0.498	99.55
ADJ5000-I	2500	2.5170	2.5134	2.5130	2.514	100.58
	5000	4.9933	4.9827	4.9881	4.988	99.76
	500	0.5071	0.5068	0.5070	0.507	101.39
ADJ5000-J	2500	2.5170	2.5109	2.5034	2.510	100.42
	5000	5.0171	5.0210	5.0069	5.015	100.30
	500	0.4982	0.4984	0.4982	0.498	99.65
ADJ5000-K	2500	2.4928	2.4979	2.4968	2.496	99.83
	5000	5.0161	5.0060	5.0044	5.009	100.18
	500	0.4985	0.4948	0.4951	0.496	99.23
ADJ5000-L	2500	2.4976	2.5047	2.5286	2.510	100.41
	5000	4.9965	4.9986	4.9878	4.994	99.89
	500					
ADJ5000	2500					
	5000					
	500					
ADJ5000	2500					
	5000					
	500					
ADJ5000	2500					
	5000					
	500					
ADJ5000	2500					
	5000					

4-11-03

FRM-247c (Rev 2/Mar 03)

Book/page: 03 106

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 16 Thermometer #: G011 diH20 Temperature (° C) 21

500 µL – 5000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	500	.4955	.5000	.4987
ADJ5000-C	2500	2.4832	2.4856	2.4843
	5000	5.0111	5.0090	4.9978
	500	.5020	.5061	.5071
ADJ5000-G	2500	2.5345	2.5348	2.5287
	5000	5.0244	5.0248	5.0151
	500	.4938	.4946	.4911
ADJ5000-H	2500	2.4891	2.4875	2.4856
	5000	4.9966	5.0079	4.9925
	500	.4976	.4971	.4986
ADJ5000-I	2500	2.5170	2.5134	2.5130
	5000	4.9933	4.9827	4.9881
	500	.5071	.5068	.5070
ADJ5000-J	2500	2.5170	2.5109	2.5034
	5000	5.0171	5.0210	5.0069
	500	.4982	.4984	.4982
ADJ5000-K	2500	2.4928	2.4979	2.4968
	5000	5.0161	5.0060	5.0044
	500	.4985	.4948	.4951
ADJ5000-L	2500	2.4976	2.5047	2.5286
	5000	4.9965	4.9986	4.9878
	500			
ADJ5000	2500			
	5000			
	500			
ADJ5000	2500			
	5000			
	500			
ADJ5000	2500			
	5000			
	500			
ADJ5000	2500			
	5000			

JW 4-11-03

Analyst: John Willer Date: 4-11-03

Reviewed by: J Ams Date: 4/11/03

Pipette calibration performed 4-4-03, entered in new book 4-11-03 JW

010155

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

Balance Calibrations

Southwest Research Institute
Division 01

BALANCE VERIFICATION LOG

BALANCE #	LAB #:	SERIAL #:	TOLERANCE:	COMMENTS:
16	28	P37987	±0.0005	
Date	Std Wt (g)	Recorded Wt (g)	Operator	
3/27/03	2.0000	2.0000	MW	Sh: 99-J50526-15
3-28-03	2.0000	2.0000	JW	"
3/31/03	2.0000	2.0000	MW	"
4-1-03	2.0000	2.0000	JW	"
4-2-03	2.0000	2.0000	JW	"
4-3-03	2.0000	2.0000	JW	"
4/4/03	2.0000	2.0000	MW	"
4-5-03	2.0000	2.0000	JW	"
4-7-03	2.0000	2.0000	JW	"
4/8/03	2.0000	2.0000	MW	"

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (x5896) for service.

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TOB
4/11/03

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Southwest Research Institute
Division 01

BALANCE VERIFICATION LOG

BALANCE #	LAB #:	SERIAL #:	TOLERANCE:	COMMENTS:
19	28	0068597	±0.05	
Date	Std Wt (g)	Recorded Wt (g)	Operator	
3-28-03	10.00	10.00	JeW	SN:99-J50624-6
3/31/03	10.00	10.00	MW	"
4-1-03	10.00	10.00	JeW	"
4-2-03	10.00	10.00	JeW	"
4-3-03	10.00	10.00	JeW	"
4/4/03	10.00	10.00	MW	"
4-7-03	10.00	10.00	JeW	"
4/8/03	10.00	10.00	MW	"
4/9/03	10.00	10.00	MW	"
4-10-03	10.00	10.00	JeW	"

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (x5896) for service.

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T.B
4/11/03

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Southwest Research Institute
Division 01

BALANCE VERIFICATION LOG

BALANCE #	LAB #:	SERIAL #:	TOLERANCE:	COMMENTS:
34	28	1116031935	±0.0005	
Date	Std Wt (g)	Recorded Wt (g)	Operator	
3/26/03	2.0000	2.0000	WW	SN: 99-J5052615
3/27/03	2.0000	2.0000	WW	"
3-28-03	2.0000	1.9999	JW	"
3/31/03	2.0000	2.0000	WW	"
4-1-03	2.0000	1.9999	JW	"
4-2-03	2.0000	2.0000	JW	"
4-3-03	2.0000	2.0000	JW	"
4/4/03	2.0000	2.0000	WW	"
4-7-03	2.0000	1.9999	JW	"
4/8/03	2.0000	2.0000	WW	"

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (x5896) for service.

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✓ ams
4/11/03

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Southwest Research Institute
Division 01
BALANCE VERIFICATION LOG

BALANCE #	LAB #:	SERIAL #:	TOLERANCE:	COMMENTS:
34	28	1116031935	±0.0005	
Date	Std Wt (g)	Recorded Wt (g)	Operator	
3-12-03	2.0000	2.0000	[illegible]	SN:99550526-15
3-13-03	2.0000	1.9999	[illegible]	"
3/14/03	2.0000	2.0000	MW	"
3/17/03	2.0000	2.0000	MW	"
3-18-03	2.0000	2.0001	[illegible]	"
3/19/03	2.0000	2.0000	MW	"
3/20/03	2.0000	2.0000	MW	"
3/21/03	2.0000	2.0000	MW	"
3/24/03	2.0000	2.0000	MW	"
3-25-03	2.0000	2.0000	[illegible]	"

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (x5896) for service.

✓ ams
4/11/03

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Southwest Research Institute
Division 01

BALANCE VERIFICATION LOG

BALANCE #	LAB #:	SERIAL #:	TOLERANCE:	COMMENTS:
34	28	1116031935	±0.0005	
Date	Std Wt (g)	Recorded Wt (g)	Operator	
3/26/03	2.0000	2.0000	MW	SN: 99-J50526-10
3/27/03	2.0000	2.0000	MW	"
3-28-03	2.0000	1.9999	JW	"
3/31/03	2.0000	2.0000	MW	"
4-1-03	2.0000	1.9999	JW	"
4.2.03	2.0000	2.0000	JW	"
4.3.03	2.0000	2.0000	JW	"
4/4/03	2.0000	2.0000	MW	"
4.7.03	2.0000	1.9999	JW	"
4/8/03	2.0000	2.0000	MW	"

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (x5896) for service.

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✓ AMS
4/11/03

Southwest Research Institute
Division 01

BALANCE VERIFICATION LOG

BALANCE #	LAB #:	SERIAL #:	TOLERANCE:	COMMENTS:
34	28	1116031935	±0.0005	
Date	Std Wt (g)	Recorded Wt (g)	Operator	
12-30-02	2.0000	2.0000	JW	S.N.: J50526-15
12/31/02	2.0000	1.9999	m	"
1-02-03	2.0000	1.9999	JW	"
1/03/03	2.0000	2.0000	m	"
1/06/03	2.0000	2.0000	m	"
1/07/03	2.0000	2.0000	m	"
1-8-03	2.0000	2.0000	JW	"
1-9-03	2.0000	2.0000	JW	"
1-10-03	2.0000	2.0000	JW	"
1/13/03	2.0000	2.0000	m	"

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (x5896) for service.

✓ ams
1/15/03

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SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

DI Water Verification

D.I. WATER SYSTEM NOTEBOOK
METALS LAB
SOUTHWEST RESEARCH INSTITUTE

01 023
010163

DATE	INITIALS	READING (M OHMS)	SET PT./ QC LT. Green=OK	CALL FOR Service LT. Green=OK	USAGE (GALS)	COMMENTS
3/11/03	DR	18.0	✓	✓	49355.8	6:32 p.m.
3/12/03	DR	18.0	✓	✓	49365.4	6:40 p.m.
3/13/03	DR	18.0	✓	✓	49381.0	7:55 p.m.
3/14/03	DR	18.0	✓	✓	49397.8	7 p.m.
3/17/03	DR	18.0	✓	✓	49408.0	6:11 pm
3/18/03	DR	18.0	✓	✓	49416.6	6:15pm
3/19/03	DR	18.0	✓	✓	49424.9	6:03 p.m.
3/20/03	DR	18.0	✓	✓	49431.8	6:30pm.
3/21/03	DR	18.0	✓	✓	49438.9	6:20pm
3/25/03	DR	18.0	✓	✓	49463.7	6:47 p.m.
3/26/03	DR	18.0	✓	✓	49480.6	6:38 p.m
3/27/03	DR	18.0	✓	✓	49486.8	4:33 p.m.
3/28/03	DR	18.0	✓	✓	49501.0	6:31 p.m
3/31/03	DR	18.0	✓	✓	49521.8	6:49 p.m.
4/1/03	DR	18.0	✓	✓	49535.8	7:20 pm
4/2/03	DR	18.0	✓	✓	49547.1	6:05 p.m.
4/3/03	DR	18.0	✓	✓	49557.0	4:20 p.m
4/4/03	DR	18.0	✓	yellow	49568.4	5:40 p.m
4/7/03	DR	18.0	✓	yellow	49587.5	Need Rep. I.P.O.
4/8/03	DR	tank	relocated from one side to another to allow space			
↓	↓	for construction in lab 27.			moved by	MIKE D. DAN R.
4/8/03	DR	18.0	✓	yellow	49600.1	5:40 p.m. P.O received, U.S
↓	↓	FILTER	CALLED.	U.S. FILTER	WILL BE	Here on 4/10/03 DR
4/9/03	DR	U.S. FILTER	CHANGED	CARBON TANK	AND MIX	BED. 4/9/03, 3:40pm.
4/9/03	DR	18.0	✓	✓	49617.7	3:42 p.m. Back on line.
4/10/03	DR	18.0	✓	✓	49631.1	5:53 p.m.
←		Reviewed	AMS	4/10/03		→

D.I. WATER SYSTEM NOTEBOOK 01 021
METALS LAB # 010164
SOUTHWEST RESEARCH INSTITUTE

DATE	INITIALS	READING (M OHMS)	SET PT./ QC LT. Green=OK	CALL FOR Service LT. Green=OK	USAGE (GALS)	COMMENTS
12/16/02	DR	18.0	✓	✓	48534.1	5:35 p.m.
12/17/02	DR	18.0	✓	✓	48546.2	9:25 p.m
12/18/02	DR	18.0	✓	✓	48562.0	5:56 p.m.
12/19/02	DR	18.0	✓	✓	48570.9	6:09 p.m.
12/20/02	DR	18.0	✓	✓	48585.4	6 p.m.
12/23/02	DR	18.0	✓	✓	48595.2	6:21 p.m
12/26/02	DR	18.0	✓	✓	48601.0	12:05 p.m.
12/27/02	DR	18.0	✓	✓	48617.5	5:35 p.m
12/30/02	DR	18.0	✓	✓	48629.2	6:04 p.m
1-31/03	DR	18.0	✓	✓	48632.0	10:15 a.m
01/02/2003	DR	18.0	✓	✓	48647.9	6:05 p.m [illegible]
01/03/2003	DR	18.0	✓	✓	48661.5	5:50 p.m
01/06/03	DR	18.0	✓	✓	48689.5	6:45 p.m.
01/07/03	DR	18.0	✓	✓	48699.7	6:21 p.m
01/08/03	DR	18.0	✓	✓	48705.8	7:30 p.m
01/09/03	DR	18.0	✓	✓	48735.2	6:38 p.m
01/10/03	DR	18.0	✓	✓	48767.4	6:15 p.m
01/13/03	DR	18.0	✓	✓	48791.6	7:40 p.m
01/14/03	DR	18.0	✓	✓	48814.6	10:55 p.m.
		Reviewed ams 1/15/03				
01/15/03	DR	18.0	✓	✓	48829.0	8:01 p.m
01/16/03	DR	18.0	✓	✓	48838.5	5:20 p.m.
1/17-1/19/03	System could not be checked due to asbestos abatement →					
		Reviewed ams 1/20/03				

D.I. WATER SYSTEM NOTEBOOK
METALS LAB
SOUTHWEST RESEARCH INSTITUTE

01 023
010165

DATE	INITIALS	READING (M OHMS)	SET PT./ QC LT. Green=OK	CALL FOR Service LT. Green=OK	USAGE (GALS)	COMMENTS
3/11/03	DR	18.0	✓	✓	49355.8	6:32 p.m.
3/12/03	DR	18.0	✓	✓	49365.4	6:40 p.m.
3/13/03	DR	18.0	✓	✓	49381.0	7:55 p.m
3/14/03	DR	18.0	✓	✓	49397.8	7 p.m.
3/17/03	DR	18.0	✓	✓	49408.0	6:11 p.m
3/18/03	DR	18.0	✓	✓	49416.6	6:15 pm
3/19/03	DR	18.0	✓	✓	49424.9	6:13 p.m.
3/20/03	DR	18.0	✓	✓	49431.8	6:30 pm.
3/21/03	DR	18.0	✓	✓	49438.9	6:30 pm
3/25/03	DR	18.0	✓	✓	49463.7	6:47 p.m
3/26/03	DR	18.0	✓	✓	49480.6	6:38 p.m
3/27/03	DR	18.0	✓	✓	49486.8	4:33 p.m.
3/28/03	DR	18.0	✓	✓	49501.0	6:31 p.m
3/31/03	DR	18.0	✓	✓	49521.8	6:49 p.m
4/1/03	DR	18.0	✓	✓	49535.8	7:30 p.m
4/2/03	DR	18.0	✓	✓	49547.1	6:05 p.m.
4/3/03	DR	18.0	✓	✓	49557.0	4:30 p.m
4/4/03	DR	18.0	✓	yellow	49568.4	5:40 p.m
4/7/03	DR	18.0	✓	yellow	49587.5	need Reg. IPC
4/8/03	DR	tank	relocated from	one side	to another	to allow space
↓	↓	for construction in		lab 37.	moved by	MIKE D. DAN R.
4/8/03	DR	18.0	✓	yellow	49600.1	5:40 p.m. P.O received, 12
↓	↓	FILTER	CALLED.	U.S. FILTER	WILL BE	Here on 4/10/03 DR
4/9/03	DR	U.S. FILTER	CHANGED	CARBON TANK	AND MTY	BED. 4/9/03, 3:40 pm.
4/9/03	DR	18.0	✓	✓	49617.7	3:42 p.m. Back on line.
4/10/03	DR	18.0	✓	✓	49631.1	5:53 p.m.
←		Reviewed	AMS	4/10/03		→

010166

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 030403-8
SRR: 24075
SDG: 223134
CASE: CNWRA
VTSR: April 03, 2003
PROJECT#: 06002.01.081

SURVEILLANCE REPORTS
From Division 30