Rico Argentine_SW_OCT 2011 Due:11/26/2011
TDF: DG-264 LIMS: C111016

EPB-U-6565

1258436 - R8 SDMS

ESAT Region 8 Chain of Custody Form
U.S. Environmental Protection Agency
Region 8 Superfund Program

Site Name: Rico. ARGENTINE SW OCT 2011 TDF: DG-264

Site Manager: STEVE WAY Work Order: C111016

Relinquished By:

Print Name	Date	Signature
Nick Philpot	11/30/11	

Received By:

Print Name	Date	Signature
Don Goodrich	11/30/11	

Relinquished By:

Print Name	Date	Signature

Received By:

Print Name	Date	Signature

Relinquished By:

Print Name	Date	Signature

Received By:

Print Name	Date	Signature

TechLaw, Inc.
Environmental Services Assistance Team
16194 W. 45th Drive, Golden, CO 80403
(303) 312-7708

Task Order:	40 - Analytical Spt & Data Validation (Non-Libby)
DCN#:	EP8 - 6 - 6565
Contract:	EP-W-06-33
TDF#:	D264
Line Item:	All
TDF Status:	Complete
Date:	11/30/2011
To:	Don Goodrich, USEPA, Region 8 ESAT Task Order Project Officer
From:	Scout DellaMia, ESAT Environmental Scientist
Through:	Mark McDaniel, Region 8 ESAT Team Manager
Subject:	Rico Argentine_Surface Water_OCT 2011 (C111016)

Comments:

WC - Anions by Ion Chromatography 2010
Total Recoverable Metals by ICP-OE
Total Recoverable Metals by ICP-MS
Dissolved Metals / Hardness by ICP-OE
Dissolved Metals ICP-MS

Thank You

Deliverable Submission and Evaluation Form

EPA Region 8 ESAT

Contractor: TechLaw | Updated: 05/05/11 | Contract No: EP-W-06-33

Submission Information (to be completed by ESAT):

Task Order: 40 - Analytical Spt & Data Validation (Non-Libby)					
DCN:	EP8 -6 - 6565				
TDF:	D264	Line Item:	All	TDF Status:	Complete
Submission Date: 11/30/2011					
Submitted By: Scout DellaMia, ESAT Environmental Scientist					
Deliverable Description:					
Rico Argentine_Surface Water_OCT 2011 (C111016)					
Submitter Comments:					
Hardcopy Data Report and Hardcopy Raw Data + CD-ROM with Data Report .pdf, Scribe EXCEL EDD, and Raw Data .pdf					

Evaluation Information (to be completed by EPA):

Review Date:	12-6-2011
Reviewed by:	Florence MacDonald
Evaluation:	☒ This deliverable is considered acceptable.
	☐ This deliverable requires revisions as noted below or per attached.
Evaluation Comments:	
completeness check 12-6-2011	

Deliverable Submission and Evaluation Form

EPA Region 8 ESAT

Contractor: TechLaw | Updated: 05/05/11 | Contract No: EP-W-06-33

Submission Information (to be completed by ESAT):

Task Order: 40 - Analytical Spt & Data Validation (Non-Libby)					
DCN:	EP8 -6 - 6565				
TDF:	D264	Line Item:	All	TDF Status:	Complete
Submission Date: 11/30/2011					
Submitted By: Scout DellaMia, ESAT Environmental Scientist					
Deliverable Description:					
Rico Argentine_Surface Water_OCT 2011 (C111016)					
Submitter Comments:					
Hardcopy Data Report and Hardcopy Raw Data + CD-ROM with Data Report .pdf, Scribe EXCEL EDD, and Raw Data .pdf					

Evaluation Information (to be completed by EPA):

Review Date: 11/30/11	
Reviewed by:	
Evaluation:	☑ This deliverable is considered acceptable.
	☐ This deliverable requires revisions as noted below or per attached.
Evaluation Comments:	

TLF-05.04	SOP: QAQ-04.00	Eff. Date: 06/16/2009

ESAT Region 8

Data Package Completeness and Tracking Form

The attached data package has been reviewed for completeness for the following items by the ESAT Document Control Officer and the ESAT Region 8 Manager

LIMS: C111016	Project Name: RICO-ARGENTINE_SW_OCT_2011
TDF: DG-264	Due Date: 11/26/11

Data Package Deliverable Element	ESAT Mgmt. / DCO / QAQC Rev.	
Final Report Data Deliverable Cover Page with DCN and Project Description	☑	Initials: M
Analytical Data Review Forms and raw data for each analysis	☑	Initials:
Copy of MDL's	☑	Initials:
Certificates of Analysis (COAs) for Standards	☑	Initials:
Hardness Calculation Verification Form for Dissolved Analysis	☑	Initials:
Sample Cross Reference	☑	Initials:
Copy of COC's	☑	Initials:
Copy of project TDF	☑	Initials: ✓
Case Narrative Reviewed	☑	Initials:
CD-ROM with EDD and .pdf of LIMS Report	☑	Initials:

Data Package Tracking

Destination	Date	Initials
Final Report Complete	11/29/11	M
Package to ESAT Mgmt. For Approval	11/30/11	✓
Package to DCO for CD-ROM and EPA Delivery	11/30/11	
Raw Data Scanned, Copied to CD	11/30/11	
Package Ready for EPA Courier		
Raw Data CD Ready for EPA Courier		
EPA Deliverable Submission and Eval. Form Returned		
Raw Data Returned		

TLF-07.01	SOP: QAQ-04.00	Eff. Date: 1/17/2007

ESAT Region 8

Final Report Review Form

LIMS: C111016	Project: Rio-Argentine_SW_Oct 2011
TDF: 06-264	Due Date: 11/26/11

QA/QC Review – Level III

Compare TDF to performed analysis / Ensure all analyses are complete	☒ Yes	☐ No
Review each Analytical Data Review form noting discrepancies for narrative	☒ Yes	☐ No
Examine each analytical sequence in LIMS using Data Entry Review application	☒ Yes	☐ No
Generate draft report, print QC section	☒ Yes	☐ No
Confirm presence of each analytical batch, QC samples	☒ Yes	☐ No
Examine analytical results (Form I) for accuracy and completeness	☒ Yes	☐ No
Check spike recoveries of LCSs, matrix spikes and post-digestion spikes	☒ Yes	☐ No
Verify serial dilution %D and duplicate RPD for each metals batch	☒ Yes	☐ No

Narrative Comments

None.

Review By: [signature]	Date: 11-29-11

ESAT Management Review – Level IV

All analytical data and deliverable review forms present and complete	☑ Yes	☐ No
COC copy, received temp. noted, preservatives noted, signature present, holding times met	☑ Yes	☐ No
Copy of TDF present, Analytical requirements met	☑ Yes	☐ No
Case narrative checked for spelling, grammar, technical content and completeness	☑ Yes	☐ No
10% Validation of raw data to reported data on Form Ones	☑ Yes	☐ No
Standard Traceability COAs and ICP / ICP-MS MDL forms present	☑ Yes	☐ No
Final Report cover letter including DCN present	☑ Yes	☐ No
Deficiencies noted requiring correction before delivery to EPA Project Officer	☑ Yes	☐ No

Manager Review Comments

None

Review By: [signature]	Date: 11-30-11
Corrections By:	Date:

U.S. Environmental Protection Agency
Region 8
Technical and Management Services

Laboratory Services Program | Certificate of Analysis

Ref: 8TMS-L

MEMORANDUM

Date: 11/29/11

Subject: Analytical Results--- **Rico-Argentine_Surface Waters_OCT 2011_D264 / DG-264**

From: Don Goodrich; EPA Region 8 Analytical Chemistry WAM

To: Steve Way
Superfund
1595 Wynkoop Street

Received Sample Set(s), [Work Order : Date Received]:
[C111016 : 10/27/2011]

Attached are the analytical results for the samples received from the Rico-Argentine_Surface Waters_OCT 2011_D264 sampling event, according to TDF DG-264. All analyses were performed within their method specified holding times unless otherwise noted in the following narrative.

These samples were prepared, analyzed, and verified by the Environmental Services Assistance Team Laboratory (ESAT) according to the requirements of the Technical Direction Form (TDF).

Note: The laboratory herewith transmits this deliverable to the program/project partner for determination of "final data usability" which may include data validation and data quality asessment per and in accordance with EPA QA/G-8, *Guidance on Environmental Data Verification and Data Validation*, November 2002, EPA/240/R-02/004. Laboratory data qualifiers are applied based on the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004, referred to as "NFGI".

Case Narrative

C111016

Quality Assessment: Unless indicated by exception, the QA/QC associated with this sample set produced data within the TDF-specified criteria.

Holding Times: All samples were analyzed within their method-specified technical holding time(s).

1. Initial and Continuing calibration blanks (ICBs and CCBs).
   Exceptions: None.
2. Preparation (PB) / Method blanks (MB)
   Exceptions: None.
3. Interference Checks (ICSA / ICSAB) for ICP-MS and ICP-OE analyses only.
   Exceptions: None.
4. Initial and Continuing calibration verification analyses (ICVs and CCVs).
   Exceptions: None.
5. Laboratory Control Sample (LCS) or second source analysis or SRM.
   Exceptions: None.
6. Laboratory Fortified blank (LFB) / Blank spike (BS), same source as used for the matrix spikes. PBS performed with analyses/methods requiring preparation or digestion prior to analysis.
   Exceptions: None.
7. Contract Reporting Detection Limit Standard, labeled as CRA, CRDL or CRL.
   Exceptions: None.
8. Laboratory Duplicate (DUP). "Source" identifies field sample duplicated in the laboratory. If either the "source" or the duplicate result is <5X the reporting limit, the %D limit of 20% does not apply.
   Exceptions: None.
9. Laboratory Matrix Spike (MS) and spike duplicate (MSD). "Source" defines original field sample fortified prior to analysis. Percent recovery (%R) limits do not apply when sample concentration(s) exceed the corresponding analyte spike level by a factor of 4 or greater.
   Exceptions: None.
10. Serial Dilution sample analysis (SRD). "Source" is parent field sample diluted 1:5 in the laboratory. Performed for ICP-OE and ICP-MS metals analyses. Percent difference (%D) limits do not apply when analyte concentration(s) are below 50x the source sample's MDL (or 10x it's PQL).
    Exceptions: None.
11. Internal standards, criteria specified for ICP-MS analyses only, monitored at the instrument.
    Exceptions: None.
12. Any calibration using more than two-points produced a correlation coefficient equal to or greater than 0.995.
    Exceptions: None.

Acronyms and Definitions:

ESAT	Environmental Services Assistance Team
J	Data Estimated qualifier (also applied to all data less than PQL, greater than or equal to MDL)
MDL	Method Detection Limit
PQL	Practical Quantitation Limit, also known as reporting limit.
RPD	Relative Percent Difference (difference divided by the mean)
%D	Percent difference, serial dilution criteria unit, difference divided by the original result.
%R	Percent recovery, analyzed (less sample contribution) divided by true value
<	Analyte NOT DETECTED at or above the Method Detection Limit (MDL)
mg/L	Parts per million (millligrams per liter). Solids equivalent = mg/Kg.
ug/L	Parts per billion (micrograms per liter). Solids equivalent = ug/Kg.
NR	No Recovery (matrix spike) - Often seen for calcium/magnesium when their concentration exceeds the spike level by > 4x.
NFGI	*USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004
RE	Sample Re-analysis. Usually seen on raw data and sequences for required sample dilutions due to over-range analytes.

Method(s) Summary:

As defined in the Technical Direction Form (TDF), some or all of the methods listed below were used for the determination of the reported target analytes.

From EPA's *Methods for the Determination of Metals in Environmental Samples*, Supplement I, May 1994, dissolved, total, and/or total recoverable metals were determined by:

- Method 200.7 / 6010B using a PE Optima ICP-OE (ICP).
- Method 200.8 / 6020 using a Perkin-Elmer Elan 6000 ICP-MS.
- Method 200.2 for total recoverable metals (only) digestion.
- Method 245.1 using a Perkin-Elmer FIMS CVAA (aqueous mercury only).

From *Standard Methods for the Examination of Water and Wastewater*, 18th Edition, 1992, Method 2340B was used for the calculated hardness determination. Hardness is reported as mg (milligram) equivalent $CaCO_3$ per liter (L) determined as follows:

Calculated hardness = 2.497 * (Calcium, mg/L) + 4.118 * (Magnesium, mg/L).

From *EPA's Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW -846*,

- Method 3015A was used for microwave assisted total metals digestion.
- Method 7473 was used for mercury in solids.

From EPA's *Determination of Inorganic Anions by Ion Chromatography*, Revision 2.1, 1993, Method 300.0 was used to determine the anions.

From EPA's *Methods for Chemical Analysis of Water and Wastes*, March 1983:

- Method 310.1 was followed for the alkalinity determination.
- Method 160.1 was followed for gravimetric total dissolved solids (TDS) determination.
- Method 160.2 was used for gravimetric total suspended solids (TSS) determination.
- Method 415.3 was used for total organic carbon (TOC) determination using either an Apollo 9000 or Phoenix 8000 Non-Dispersive IR (NDIR) system. Also known as dissolved organic carbon (DOC) when performed on the dissolved sample fraction.

The quality control procedures listed in the TDF request were utilized by ESAT to verify accuracy of the results and to evaluate any matrix interferences.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: DR-3 **Date / Time Sampled:** 10/20/11 09:05 **Workorder:** C111016
EPA Tag No.: 8-A **Matrix:** Water **Lab Number:** C111016-01 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**30.2**	J	ug/L	20.0	1	11/28/2011	SW	1111097
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	11/28/2011	SW	1111097
200.7	**Calcium**	**221000**		ug/L	100	1	11/28/2011	SW	1111097
200.7	**Iron**	**1090**		ug/L	100	1	11/28/2011	SW	1111097
200.7	**Magnesium**	**19300**		ug/L	100	1	11/28/2011	SW	1111097
200.7	**Potassium**	**1630**		ug/L	250	1	11/28/2011	SW	1111097
200.7	**Sodium**	**9520**		ug/L	250	1	11/28/2011	SW	1111097
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111098
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/28/2011	SV	1111098
200.8	Barium	< 100	U	ug/L	50.0	10	11/28/2011	SV	1111098
200.8	**Cadmium**	**17.5**		ug/L	1.00	10	11/28/2011	SV	1111098
200.8	**Chromium**	**10.4**		ug/L	5.00	10	11/28/2011	SV	1111098
200.8	**Cobalt**	**1.16**	J	ug/L	1.00	10	11/28/2011	SV	1111098
200.8	Copper	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111098
200.8	Lead	< 2.00	U	ug/L	1.00	10	11/28/2011	SV	1111098
200.8	**Manganese**	**2250**		ug/L	2.00	10	11/28/2011	SV	1111098
200.8	**Molybdenum**	**13.5**		ug/L	1.00	10	11/28/2011	SV	1111098
200.8	Nickel	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111098
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111098
200.8	Silver	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111098
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111098
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/28/2011	SV	1111098
200.8	**Zinc**	**3810**		ug/L	20.0	10	11/28/2011	SV	1111098
2340B	**Hardness**	**631**		mg/L	2	1	11/28/2011	SW	1111097

"J" Qualifier indicates an estimated value

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: DR-3 **Date / Time Sampled:** 10/20/11 09:05 **Workorder:** C111016
EPA Tag No.: 8-B **Matrix:** Water **Lab Number:** C111016-02 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**195**		ug/L	20.0	1	11/28/2011	SW	1111087
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	11/28/2011	SW	1111087
200.7	**Calcium**	**211000**		ug/L	100	1	11/28/2011	SW	1111087
200.7	**Iron**	**3620**		ug/L	100	1	11/28/2011	SW	1111087
200.7	**Magnesium**	**18400**		ug/L	100	1	11/28/2011	SW	1111087
200.7	**Potassium**	**1600**		ug/L	250	1	11/28/2011	SW	1111087
200.7	**Sodium**	**9200**		ug/L	250	1	11/28/2011	SW	1111087
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111087
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/28/2011	SV	1111087
200.8	Barium	< 100	U	ug/L	50.0	10	11/28/2011	SV	1111087
200.8	**Cadmium**	**18.2**		ug/L	1.00	10	11/28/2011	SV	1111087
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111087
200.8	Cobalt	< 2.00	U	ug/L	1.00	10	11/28/2011	SV	1111087
200.8	**Copper**	**20.7**		ug/L	5.00	10	11/28/2011	SV	1111087
200.8	**Lead**	**1.20**	J	ug/L	1.00	10	11/28/2011	SV	1111087
200.8	**Manganese**	**2190**		ug/L	2.00	10	11/28/2011	SV	1111087
200.8	**Molybdenum**	**14.1**		ug/L	1.00	10	11/28/2011	SV	1111087
200.8	Nickel	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111087
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111087
200.8	Silver	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111087
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/28/2011	SV	1111087
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/28/2011	SV	1111087
200.8	**Zinc**	**3720**		ug/L	20.0	10	11/28/2011	SV	1111087

"J" Qualifier indicates an estimated value

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Classical Chemistry by EPA/ASTM/APHA Methods

Station ID: DR-3 **Date / Time Sampled:** 10/20/11 09:05 **Workorder:** C111016
EPA Tag No.: 8-C **Matrix:** Water **Lab Number:** C111016-03 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 300.0	Bromide	< 0.5	U	mg/L	0.2	1	11/02/2011	NP	1110131
EPA 300.0	Chloride	< 2.0	U	mg/L	1.0	1	11/02/2011	NP	1110131
EPA 300.0	**Fluoride**	**0.2**		mg/L	0.1	1	11/02/2011	NP	1110131
EPA 300.0	**Sulfate as SO4**	**53.5**		mg/L	2.0	1	11/02/2011	NP	1110131

"J" Qualifier indicates an estimated value

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPMS-PE DRC-II									
Batch 1111098 - No Lab Prep Reqd			*Water*						ICPMS-PE DRC-II
Method Blank (1111098-BLK1)		Dilution Factor: 1				Prepared & Analyzed: 11/28/11			
Vanadium	< 1.00	2.00	ug/L						
Chromium	< 0.500	1.00	"						
Manganese	< 0.200	0.500	"						
Cobalt	< 0.100	0.200	"						
Nickel	< 0.500	1.00	"						
Copper	< 0.500	1.00	"						
Zinc	< 2.00	5.00	"						
Arsenic	< 0.500	2.00	"						
Selenium	< 0.500	1.00	"						
Molybdenum	< 0.100	0.200	"						
Silver	< 0.500	1.00	"						
Cadmium	< 0.100	0.200	"						
Antimony	< 0.500	1.00	"						
Barium	< 5.00	10.0	"						
Thallium	< 0.500	1.00	"						
Lead	< 0.100	0.200	"						
Method Blank Spike (1111098-BS1)		Dilution Factor: 1				Prepared & Analyzed: 11/28/11			
Vanadium	96.7	2.00	ug/L	100		97	85-115		
Chromium	97.6	1.00	"	100		98	85-115		
Manganese	95.8	0.500	"	100		96	85-115		
Cobalt	100	0.200	"	100		100	85-115		
Nickel	96.9	1.00	"	100		97	85-115		
Copper	95.5	1.00	"	100		96	85-115		
Zinc	100	5.00	"	100		100	85-115		
Arsenic	100	2.00	"	100		100	85-115		
Selenium	508	1.00	"	500		102	85-115		
Molybdenum	95.7	0.200	"	100		96	85-115		
Silver	96.7	1.00	"	100		97	85-115		
Cadmium	94.2	0.200	"	100		94	85-115		
Antimony	95.2	1.00	"	100		95	85-115		
Barium	93.5	10.0	"	100		93	85-115		
Thallium	98.6	1.00	"	100		99	85-115		
Lead	98.5	0.200	"	100		99	85-115		

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1111098 - No Lab Prep Reqd			*Water*						ICPMS-PE DRC-II
Duplicate (1111098-DUP1)		Dilution Factor: 1	Source: C111016-01			Prepared & Analyzed: 11/28/11			
Vanadium	< 10.0	20.0	ug/L		< 10.0				20
Chromium	10.2	10.0	"		10.4			1	20
Manganese	2120	5.00	"		2250			6	20
Cobalt	< 1.00	2.00	"		1.16				20
Nickel	< 5.00	10.0	"		< 5.00				20
Copper	< 5.00	10.0	"		< 5.00				20
Zinc	3780	50.0	"		3810			0.8	20
Arsenic	< 5.00	20.0	"		< 5.00				20
Selenium	< 5.00	10.0	"		< 5.00				20
Molybdenum	13.6	2.00	"		13.5			0.4	20
Silver	< 5.00	10.0	"		< 5.00				20
Cadmium	17.3	2.00	"		17.5			1	20
Antimony	< 5.00	10.0	"		< 5.00				20
Barium	< 50.0	100	"		< 50.0				20
Thallium	< 5.00	10.0	"		< 5.00				20
Lead	< 1.00	2.00	"		< 1.00				20
Matrix Spike (1111098-MS1)		Dilution Factor: 1	Source: C111016-01			Prepared & Analyzed: 11/28/11			
Vanadium	93.5	20.0	ug/L	100	< 10.0	94	75-125		
Chromium	102	10.0	"	100	10.4	91	75-125		
Manganese	2190	5.00	"	100	2250	NR	75-125		
Cobalt	92.6	2.00	"	100	1.16	91	75-125		
Nickel	91.9	10.0	"	100	< 5.00	92	75-125		
Copper	91.1	10.0	"	100	< 5.00	91	75-125		
Zinc	3740	50.0	"	100	3810	NR	75-125		
Arsenic	103	20.0	"	100	< 5.00	103	75-125		
Selenium	508	10.0	"	500	< 5.00	102	75-125		
Molybdenum	108	2.00	"	100	13.5	94	75-125		
Silver	94.1	10.0	"	100	< 5.00	94	75-125		
Cadmium	111	2.00	"	100	17.5	94	75-125		
Antimony	95.2	10.0	"	100	< 5.00	95	75-125		
Barium	108	100	"	100	< 50.0	108	75-125		
Thallium	96.2	10.0	"	100	< 5.00	96	75-125		
Lead	96.1	2.00	"	100	< 1.00	96	75-125		

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1111098 - No Lab Prep Reqd			*Water*						ICPMS-PE DRC-II
Matrix Spike Dup (1111098-MSD1)		Dilution Factor: 1	Source: C111016-01			Prepared & Analyzed: 11/28/11			
Vanadium	94.9	20.0	ug/L	100	< 10.0	95	75-125	1	20
Chromium	103	10.0	"	100	10.4	92	75-125	1	20
Manganese	2200	5.00	"	100	2250	NR	75-125	0.4	20
Cobalt	96.5	2.00	"	100	1.16	95	75-125	4	20
Nickel	94.5	10.0	"	100	< 5.00	95	75-125	3	20
Copper	92.4	10.0	"	100	< 5.00	92	75-125	1	20
Zinc	3800	50.0	"	100	3810	NR	75-125	2	20
Arsenic	103	20.0	"	100	< 5.00	103	75-125	0.4	20
Selenium	512	10.0	"	500	< 5.00	102	75-125	0.7	20
Molybdenum	112	2.00	"	100	13.5	99	75-125	4	20
Silver	97.8	10.0	"	100	< 5.00	98	75-125	4	20
Cadmium	113	2.00	"	100	17.5	95	75-125	1	20
Antimony	97.2	10.0	"	100	< 5.00	97	75-125	2	20
Barium	108	100	"	100	< 50.0	108	75-125	0.3	20
Thallium	97.0	10.0	"	100	< 5.00	97	75-125	0.9	20
Lead	97.6	2.00	"	100	< 1.00	98	75-125	2	20
Batch 1111103 - 1111098			*Water*						ICPMS-PE DRC-II
Serial Dilution (1111103-SRD1)		Dilution Factor: 5	Source: C111016-01			Prepared & Analyzed: 11/28/11			
Vanadium	< 25.0	50.0	ug/L		< 5.00				10
Chromium	< 25.0	50.0	"		10.4				10
Manganese	2170	50.0	"		2250			3	10
Cobalt	< 25.0	50.0	"		1.16				10
Nickel	< 25.0	50.0	"		< 5.00				10
Copper	< 25.0	50.0	"		< 5.00				10
Zinc	3700	50.0	"		3810			3	10
Arsenic	< 25.0	50.0	"		< 5.00				10
Selenium	< 25.0	50.0	"		< 5.00				10
Molybdenum	< 25.0	50.0	"		13.5				10
Silver	< 25.0	50.0	"		< 5.00				10
Cadmium	< 25.0	50.0	"		17.5				10
Antimony	< 25.0	50.0	"		< 5.00				10
Barium	< 25.0	50.0	"		< 5.00				10
Thallium	< 25.0	50.0	"		< 5.00				10
Lead	< 25.0	50.0	"		< 5.00				10

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPOE - PE Optima									
Batch 1111097 - No Lab Prep Reqd			*Water*						ICPOE - PE Optima
Method Blank (1111097-BLK1)		Dilution Factor: 1				Prepared & Analyzed: 11/28/11			
Aluminum	< 20.0	50.0	ug/L						
Beryllium	< 2.00	5.00	"						
Calcium	< 100	250	"						
Iron	< 100	250	"						
Potassium	< 250	1000	"						
Magnesium	< 100	250	"						
Sodium	< 250	500	"						
Method Blank Spike (1111097-BS1)		Dilution Factor: 1				Prepared & Analyzed: 11/28/11			
Aluminum	9917	50.0	ug/L	10100		98	85-115		
Beryllium	99.32	5.00	"	100		99	85-115		
Calcium	10100	250	"	10100		100	85-115		
Iron	10010	250	"	10100		99	85-115		
Potassium	10210	1000	"	10100		101	85-115		
Magnesium	10100	250	"	10100		100	85-115		
Sodium	10140	500	"	10100		100	85-115		
Duplicate (1111097-DUP1)		Dilution Factor: 1	Source: C111016-01			Prepared & Analyzed: 11/28/11			
Aluminum	32.52	50.0	ug/L		30.17			8	20
Beryllium	< 2.00	5.00	"		< 2.00				20
Calcium	219600	250	"		220900			0.6	20
Iron	1076	250	"		1087			0.9	20
Potassium	1643	1000	"		1632			0.7	20
Magnesium	19280	250	"		19270			0.03	20
Sodium	9458	500	"		9518			0.6	20
Matrix Spike (1111097-MS1)		Dilution Factor: 1	Source: C111016-01			Prepared & Analyzed: 11/28/11			
Aluminum	10150	50.0	ug/L	10100	30.17	100	75-125		
Beryllium	97.35	5.00	"	100	< 2.00	97	75-125		
Calcium	225800	250	"	10100	220900	48	75-125		
Iron	10940	250	"	10100	1087	98	75-125		
Potassium	12130	1000	"	10100	1632	104	75-125		
Magnesium	28990	250	"	10100	19270	96	75-125		
Sodium	19660	500	"	10100	9518	100	75-125		

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1111097 - No Lab Prep Reqd			*Water*						ICPOE - PE Optima
Matrix Spike Dup (1111097-MSD1)		Dilution Factor: 1	Source: C111016-01			Prepared & Analyzed: 11/28/11			
Aluminum	10140	50.0	ug/L	10100	30.17	100	75-125	0.08	20
Beryllium	98.13	5.00	"	100	< 2.00	98	75-125	0.8	20
Calcium	221700	250	"	10100	220900	7	75-125	2	20
Iron	10970	250	"	10100	1087	98	75-125	0.2	20
Potassium	12180	1000	"	10100	1632	104	75-125	0.4	20
Magnesium	28660	250	"	10100	19270	93	75-125	1	20
Sodium	19520	500	"	10100	9518	99	75-125	0.7	20
Batch 1111100 - 1111097			*Water*						ICPOE - PE Optima
Serial Dilution (1111100-SRD1)		Dilution Factor: 5	Source: C111016-01			Prepared & Analyzed: 11/28/11			
Aluminum	100.4	250	ug/L		30.17				10
Beryllium	< 100	250	"		< 20.00				10
Calcium	214400	250	"		220900			3	10
Iron	1059	250	"		1087			3	10
Potassium	1304	250	"		1632			22	10
Magnesium	18990	250	"		19270			1	10
Sodium	9214	250	"		9518			3	10

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.
RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPMS-PE DRC-II									
Batch 1111087 - 200.2 - TR Metals			*Water*						**ICPMS-PE DRC-II**
Method Blank (1111087-BLK2)		Dilution Factor: 5				Prepared: 11/21/11 Analyzed: 11/28/11			
Vanadium	< 5.00	10.0	ug/L						
Chromium	< 2.50	5.00	"						
Manganese	< 1.00	2.50	"						
Cobalt	< 0.500	1.00	"						
Nickel	< 2.50	5.00	"						
Copper	< 2.50	5.00	"						
Zinc	< 10.0	25.0	"						
Arsenic	< 2.50	10.0	"						
Selenium	< 2.50	5.00	"						
Molybdenum	< 0.500	1.00	"						
Silver	< 2.50	5.00	"						
Cadmium	< 0.500	1.00	"						
Antimony	< 2.50	5.00	"						
Barium	< 25.0	50.0	"						
Thallium	< 2.50	5.00	"						
Lead	< 0.500	1.00	"						
Duplicate (1111087-DUP2)		Dilution Factor: 1	Source: C111016-02			Prepared: 11/21/11 Analyzed: 11/28/11			
Vanadium	< 10.0	20.0	ug/L		< 10.0				20
Chromium	< 5.00	10.0	"		< 5.00				20
Manganese	2228	5.00	"		2189			2	20
Cobalt	1.013	2.00	"		< 1.00				20
Nickel	< 5.00	10.0	"		< 5.00				20
Copper	21.61	10.0	"		20.73			4	20
Zinc	3735	50.0	"		3719			0.4	20
Arsenic	< 5.00	20.0	"		< 5.00				20
Selenium	< 5.00	10.0	"		< 5.00				20
Molybdenum	14.19	2.00	"		14.11			0.5	20
Silver	< 5.00	10.0	"		< 5.00				20
Cadmium	18.36	2.00	"		18.24			0.7	20
Antimony	< 5.00	10.0	"		< 5.00				20
Barium	< 50.0	100	"		< 50.0				20
Thallium	< 5.00	10.0	"		< 5.00				20
Lead	1.165	2.00	"		1.195			3	20

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1111087 - 200.2 - TR Metals			*Water*						ICPMS-PE DRC-II
Matrix Spike (1111087-MS2)		Dilution Factor: 1		Source: C111016-02		Prepared: 11/21/11 Analyzed: 11/28/11			
Vanadium	266.4	20.0	ug/L	300	< 10.0	89	75-125		
Chromium	374.7	10.0	"	400	< 5.00	94	75-125		
Manganese	2213	5.00	"	200	2189	12	75-125		
Cobalt	194.8	2.00	"	200	< 1.00	97	75-125		
Nickel	475.5	10.0	"	500	< 5.00	95	75-125		
Copper	313.6	10.0	"	300	20.73	98	75-125		
Zinc	3931	50.0	"	200	3719	106	75-125		
Arsenic	794.2	20.0	"	800	< 5.00	99	75-125		
Selenium	2004	10.0	"	2000	< 5.00	100	75-125		
Molybdenum	387.1	2.00	"	400	14.11	93	75-125		
Silver	70.06	10.0	"	75.0	< 5.00	93	75-125		
Cadmium	208.4	2.00	"	200	18.24	95	75-125		
Antimony	754.3	10.0	"	800	< 5.00	94	75-125		
Barium	194.2	100	"	200	< 50.0	97	75-125		
Thallium	1914	10.0	"	2000	< 5.00	96	75-125		
Lead	972.9	2.00	"	1000	1.195	97	75-125		
Matrix Spike Dup (1111087-MSD2)		Dilution Factor: 1		Source: C111016-02		Prepared: 11/21/11 Analyzed: 11/28/11			
Vanadium	268.7	20.0	ug/L	300	< 10.0	90	75-125	0.9	20
Chromium	371.2	10.0	"	400	< 5.00	93	75-125	0.9	20
Manganese	2199	5.00	"	200	2189	5	75-125	0.6	20
Cobalt	190.1	2.00	"	200	< 1.00	95	75-125	2	20
Nickel	462.6	10.0	"	500	< 5.00	93	75-125	3	20
Copper	304.0	10.0	"	300	20.73	94	75-125	3	20
Zinc	4008	50.0	"	200	3719	144	75-125	2	20
Arsenic	796.5	20.0	"	800	< 5.00	100	75-125	0.3	20
Selenium	2039	10.0	"	2000	< 5.00	102	75-125	2	20
Molybdenum	388.9	2.00	"	400	14.11	94	75-125	0.5	20
Silver	71.40	10.0	"	75.0	< 5.00	95	75-125	2	20
Cadmium	211.8	2.00	"	200	18.24	97	75-125	2	20
Antimony	785.3	10.0	"	800	< 5.00	98	75-125	4	20
Barium	200.5	100	"	200	< 50.0	100	75-125	3	20
Thallium	1904	10.0	"	2000	< 5.00	95	75-125	0.5	20
Lead	984.6	2.00	"	1000	1.195	98	75-125	1	20

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1111087 - 200.2 - TR Metals			*Water*						ICPMS-PE DRC-II
Post Spike (1111087-PS2)		Dilution Factor: 1	Source: C111016-02			Prepared: 11/21/11 Analyzed: 11/28/11			
Vanadium	89.91		ug/L	100	-1.755	92	80-120		
Chromium	94.69		"	100	4.555	90	80-120		
Manganese	2238		"	100	2189	49	80-120		
Cobalt	93.72		"	100	0.8889	93	80-120		
Nickel	90.37		"	100	2.346	88	80-120		
Copper	112.0		"	100	20.73	91	80-120		
Zinc	3668		"	100	3719	NR	80-120		
Arsenic	103.8		"	100	-1.254	105	80-120		
Selenium	517.1		"	500	-0.9323	104	80-120		
Molybdenum	110.4		"	100	14.11	96	80-120		
Silver	94.95		"	100	0.1353	95	80-120		
Cadmium	115.6		"	100	18.24	97	80-120		
Antimony	99.14		"	100	-0.01280	99	80-120		
Barium	108.4		"	100	16.53	92	80-120		
Thallium	116.4		"	100	0.1399	116	80-120		
Lead	99.98		"	100	1.195	99	80-120		
Reference (1111087-SRM2)		Dilution Factor: 2				Prepared: 11/21/11 Analyzed: 11/28/11			
Vanadium	935.8	40.0	ug/L	1000		94	80-120		
Chromium	967.8	20.0	"	1000		97	80-120		
Manganese	934.1	10.0	"	1000		93	80-120		
Cobalt	963.7	4.00	"	1000		96	80-120		
Nickel	967.1	20.0	"	1000		97	80-120		
Copper	1001	20.0	"	1000		100	80-120		
Zinc	1053	100	"	1000		105	80-120		
Arsenic	1915	40.0	"	2000		96	80-120		
Selenium	986.4	20.0	"	1000		99	80-120		
Molybdenum	959.3	4.00	"	1000		96	80-120		
Silver	246.0	20.0	"	250		98	80-120		
Cadmium	1000	4.00	"	1000		100	80-120		
Antimony	2001	20.0	"	2000		100	80-120		
Barium	963.0	200	"	1000		96	80-120		
Thallium	4982	20.0	"	5000		100	80-120		
Lead	2073	4.00	"	2000		104	80-120		

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1111104 - 1111087			*Water*						ICPMS-PE DRC-II
Serial Dilution (1111104-SRD1)		Dilution Factor: 5	Source: C111016-02			Prepared: 11/21/11 Analyzed: 11/28/11			
Vanadium	< 5.00	10.0	ug/L		< 1.00				10
Chromium	10.79	10.0	"		< 1.00				10
Manganese	2137	10.0	"		2189			2	10
Cobalt	< 5.00	10.0	"		< 1.00				10
Nickel	< 5.00	10.0	"		< 1.00				10
Copper	17.79	10.0	"		20.73			15	10
Zinc	3731	10.0	"		3719			0.3	10
Arsenic	< 5.00	10.0	"		< 1.00				10
Selenium	< 5.00	10.0	"		< 1.00				10
Molybdenum	14.46	10.0	"		14.11			2	200
Silver	< 5.00	10.0	"		< 1.00				10
Cadmium	19.04	10.0	"		18.24			4	10
Antimony	< 5.00	10.0	"		< 1.00				10
Barium	14.59	10.0	"		< 1.00				10
Thallium	< 5.00	10.0	"		< 1.00				10
Lead	< 5.00	10.0	"		1.195				10

ICPOE - PE Optima

Batch 1111087 - 200.2 - TR Metals			*Water*						ICPOE - PE Optima
Method Blank (1111087-BLK1)		Dilution Factor: 1				Prepared: 11/21/11 Analyzed: 11/28/11			
Aluminum	< 20.0	50.0	ug/L						
Beryllium	< 2.00	5.00	"						
Calcium	< 100	250	"						
Iron	< 100	250	"						
Potassium	< 250	1000	"						
Magnesium	< 100	250	"						
Sodium	< 250	500	"						

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1111087 - 200.2 - TR Metals			*Water*						ICPOE - PE Optima
Duplicate (1111087-DUP1)		Dilution Factor: 1	Source: C111016-02			Prepared: 11/21/11		Analyzed: 11/28/11	
Aluminum	199.8	50.0	ug/L		195.1			2	20
Beryllium	< 2.00	5.00	"		< 2.00				20
Calcium	213400	250	"		210800			1	20
Iron	3639	250	"		3619			0.5	20
Potassium	1599	1000	"		1598			0.1	20
Magnesium	18730	250	"		18440			2	20
Sodium	9246	500	"		9204			0.5	20
Matrix Spike (1111087-MS1)		Dilution Factor: 1	Source: C111016-02			Prepared: 11/21/11		Analyzed: 11/28/11	
Aluminum	2064	50.0	ug/L	2000	195.1	93	75-125		
Beryllium	194.3	5.00	"	200	< 2.00	97	75-125		
Calcium	212600	250	"	1000	210800	187	75-125		
Iron	6413	250	"	3000	3619	93	75-125		
Potassium	11470	1000	"	10000	1598	99	75-125		
Magnesium	20440	250	"	2000	18440	100	75-125		
Sodium	12130	500	"	3000	9204	97	75-125		
Matrix Spike Dup (1111087-MSD1)		Dilution Factor: 1	Source: C111016-02			Prepared: 11/21/11		Analyzed: 11/28/11	
Aluminum	2101	50.0	ug/L	2000	195.1	95	75-125	2	20
Beryllium	194.8	5.00	"	200	< 2.00	97	75-125	0.2	20
Calcium	216300	250	"	1000	210800	556	75-125	2	20
Iron	6500	250	"	3000	3619	96	75-125	1	20
Potassium	11670	1000	"	10000	1598	101	75-125	2	20
Magnesium	20900	250	"	2000	18440	123	75-125	2	20
Sodium	12390	500	"	3000	9204	106	75-125	2	20
Post Spike (1111087-PS1)		Dilution Factor: 1	Source: C111016-02			Prepared: 11/21/11		Analyzed: 11/28/11	
Aluminum	10610		ug/L	10100	195.1	103	80-120		
Beryllium	98.14		"	100	0.1355	98	80-120		
Calcium	220200		"	10100	210800	94	80-120		
Iron	13760		"	10100	3619	100	80-120		
Potassium	12400		"	10100	1598	107	80-120		
Magnesium	28850		"	10100	18440	103	80-120		
Sodium	19760		"	10100	9204	104	80-120		

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1111087 - 200.2 - TR Metals			*Water*						ICPOE - PE Optima
Reference (1111087-SRM1)		Dilution Factor: 1				Prepared: 11/21/11 Analyzed: 11/28/11			
Aluminum	927.9	50.0	ug/L	1000		93	80-120		
Beryllium	980.3	5.00	"	1000		98	80-120		
Calcium	903.7	250	"	1000		90	80-120		
Iron	903.8	250	"	1000		90	80-120		
Potassium	4686	1000	"	5000		94	80-120		
Magnesium	956.3	250	"	1000		96	80-120		
Sodium	913.0	500	"	1000		91	80-120		
Batch 1111101 - 1111087			*Water*						ICPOE - PE Optima
Serial Dilution (1111101-SRD1)		Dilution Factor: 5	Source: C111016-02			Prepared: 11/21/11 Analyzed: 11/28/11			
Aluminum	263.5	250	ug/L		195.1			30	10
Beryllium	< 10.0	25.0	"		< 2.00				10
Calcium	211200	1250	"		210800			0.2	10
Iron	3701	1250	"		3619			2	10
Potassium	1319	5000	"		1598			19	10
Magnesium	18600	1250	"		18440			0.9	10
Sodium	9030	2500	"		9204			2	10

NOTE: %R = % Recovery. %R limits do not apply when sample levels exceed 4x the spike level.
RPD = Relative Percent Difference. %D = % Difference. DL = Detection Limit for QC sample

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

Classical Chemistry by EPA/ASTM/APHA Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ESAT Dionex IC									
Batch 1110131 - No Prep Req			*Water*						**ESAT Dionex IC**
Method Blank (1110131-BLK1)		Dilution Factor: 1				Prepared & Analyzed: 11/02/11			
Fluoride	< 0.1	0.2	mg/L						
Chloride	< 1.0	2.0	"						
Bromide	< 0.2	0.5	"						
Sulfate as SO4	< 2.0	5.0	"						
Method Blank Spike (1110131-BS1)		Dilution Factor: 1				Prepared & Analyzed: 11/02/11			
Fluoride	4.7	0.2	mg/L	5.00		95	80-120		
Chloride	25.5	2.0	"	25.0		102	80-120		
Bromide	10.3	0.5	"	10.0		103	80-120		
Sulfate as SO4	25.3	5.0	"	25.0		101	80-120		
Duplicate (1110131-DUP1)		Dilution Factor: 1	Source: C111016-03			Prepared & Analyzed: 11/02/11			
Fluoride	0.2	0.2	mg/L		0.2			24	20
Chloride	< 1.0	2.0	"		< 1.0				20
Bromide	< 0.2	0.5	"		< 0.2				20
Sulfate as SO4	53.3	5.0	"		53.5			0.3	20
Matrix Spike (1110131-MS1)		Dilution Factor: 1	Source: C111016-03			Prepared & Analyzed: 11/02/11			
Fluoride	4.6	0.2	mg/L	5.00	0.2	89	80-120		
Chloride	23.6	2.0	"	25.0	< 1.0	94	80-120		
Bromide	9.6	0.5	"	10.0	< 0.2	96	80-120		
Sulfate as SO4	77.3	5.0	"	25.0	53.5	95	80-120		
Matrix Spike Dup (1110131-MSD1)		Dilution Factor: 1	Source: C111016-03			Prepared & Analyzed: 11/02/11			
Fluoride	4.6	0.2	mg/L	5.00	0.2	89	80-120	0.1	20
Chloride	23.5	2.0	"	25.0	< 1.0	94	80-120	0.09	20
Bromide	9.5	0.5	"	10.0	< 0.2	95	80-120	0.2	20
Sulfate as SO4	77.3	5.0	"	25.0	53.5	95	80-120	0.02	20

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.
RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: EPA 300.0 Analysis Name: WC - Anions by Ion Chromatography

Instrument: ESAT Dionex IC Work Order: Nu C111016

Analytical Sequence: 1111040 Dissolved Concentration Units: mg/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Fluoride	0.00	1	2	3	4	1110131-BLK1	NA	0.20
		0.00				0.00	NA	
		5	6	7	8			
Chloride	0.00	1	2	3	4	1110131-BLK1	NA	2.00
		0.00				0.00	NA	
		5	6	7	8			
Bromide	0.00	1	2	3	4	1110131-BLK1	NA	0.50
		0.00				0.00	NA	
		5	6	7	8			
Sulfate as SO4	0.00	1	2	3	4	1110131-BLK1	NA	5.00
		0.00				0.00	NA	
		5	6	7	8			

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.7 Analysis Name: ICPOE Diss. Metals-2010

Instrument: ICPOE - PE Optima Work Order: Nu C111016

Analytical Sequence: 1111100 Dissolved Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Aluminum	0.05	1	2	3	4	1111097-BLK1	NA	50.00
		2.73	0.57			-2.15	NA	
		5	6	7	8			
Beryllium	0.13	1	2	3	4	1111097-BLK1	NA	5.00
		0.04	0.07			-0.02	NA	
		5	6	7	8			
Calcium	0.89	1	2	3	4	1111097-BLK1	NA	250.00
		6.89	2.63			-0.71	NA	
		5	6	7	8			
Iron	0.27	1	2	3	4	1111097-BLK1	NA	250.00
		14.33	3.26			4.63	NA	
		5	6	7	8			
Potassium	4.53	1	2	3	4	1111097-BLK1	NA	1,000.00
		9.64	5.96			-4.02	NA	
		5	6	7	8			
Magnesium	1.35	1	2	3	4	1111097-BLK1	NA	250.00
		4.94	2.72			1.14	NA	
		5	6	7	8			
Sodium	1.16	1	2	3	4	1111097-BLK1	NA	500.00
		5.07	13.27			2.17	NA	
		5	6	7	8			

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.7 Analysis Name: ICPOE Tot. Rec Metals-2010

Instrument: ICPOE - PE Optima Work Order: Nu C111016

Analytical Sequence: 1111101 **Total Recoverable** Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Aluminum	0.05	1	2	3	4	1111087-BLK1	NA	50.00
		2.73	0.57	-0.11		-1.69	NA	
		5	6	7	8			
Beryllium	0.13	1	2	3	4	1111087-BLK1	NA	5.00
		0.04	0.07	0.04		-0.08	NA	
		5	6	7	8			
Calcium	0.89	1	2	3	4	1111087-BLK1	NA	250.00
		6.89	2.63	7.81		4.80	NA	
		5	6	7	8			
Iron	0.27	1	2	3	4	1111087-BLK1	NA	250.00
		14.33	3.26	12.02		6.37	NA	
		5	6	7	8			
Potassium	4.53	1	2	3	4	1111087-BLK1	NA	1,000.00
		9.64	5.96	11.60		-0.75	NA	
		5	6	7	8			
Magnesium	1.35	1	2	3	4	1111087-BLK1	NA	250.00
		4.94	2.72	3.10		0.60	NA	
		5	6	7	8			
Sodium	1.16	1	2	3	4	1111087-BLK1	NA	500.00
		5.07	13.27	9.34		0.79	NA	
		5	6	7	8			

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.8 Analysis Name: ICPMS Diss. Metals-2010

Instrument: ICPMS-PE DRC-II Work Order: Nu C111016

Analytical Sequence: 1111103 **Dissolved** Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Vanadium	0.01	1	2	3	4	1111098-BLK1	NA	2.00
		0.03	0.05			0.01	NA	
		5	6	7	8			
Chromium	-0.03	1	2	3	4	1111098-BLK1	NA	1.00
		0.01	0.04			0.04	NA	
		5	6	7	8			
Manganese	0.00	1	2	3	4	1111098-BLK1	NA	0.50
		0.00	0.01			-0.02	NA	
		5	6	7	8			
Cobalt	0.00	1	2	3	4	1111098-BLK1	NA	0.20
		0.00	0.00			-0.01	NA	
		5	6	7	8			
Nickel	0.00	1	2	3	4	1111098-BLK1	NA	1.00
		0.00	0.00			-0.02	NA	
		5	6	7	8			
Copper	-0.07	1	2	3	4	1111098-BLK1	NA	1.00
		0.06	0.05			-0.04	NA	
		5	6	7	8			
Zinc	-0.05	1	2	3	4	1111098-BLK1	NA	5.00
		-0.03	-0.01			-0.30	NA	
		5	6	7	8			
Arsenic	0.04	1	2	3	4	1111098-BLK1	NA	2.00
		-0.01	-0.03			0.06	NA	
		5	6	7	8			

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.8 Analysis Name: ICPMS Diss. Metals-2010

Instrument: ICPMS-PE DRC-II Work Order: Nu C111016

Analytical Sequence: 1111103 **Dissolved** Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Selenium	0.05	1	2	3	4	1111098-BLK1	NA	1.00
		-0.06	-0.12			-0.08	NA	
		5	6	7	8			
Molybdenum	0.07	1	2	3	4	1111098-BLK1	NA	0.20
		0.10	0.05			0.02	NA	
		5	6	7	8			
Silver	0.10	1	2	3	4	1111098-BLK1	NA	1.00
		0.11	0.10			0.04	NA	
		5	6	7	8			
Cadmium	0.01	1	2	3	4	1111098-BLK1	NA	0.20
		0.00	0.00			-0.01	NA	
		5	6	7	8			
Antimony	0.05	1	2	3	4	1111098-BLK1	NA	1.00
		0.09	0.08			0.00	NA	
		5	6	7	8			
Barium	-0.02	1	2	3	4	1111098-BLK1	NA	10.00
		-0.02	-0.01			-0.04	NA	
		5	6	7	8			
Thallium	0.01	1	2	3	4	1111098-BLK1	NA	1.00
		0.01	0.00			-0.01	NA	
		5	6	7	8			
Lead	0.00	1	2	3	4	1111098-BLK1	NA	0.20
		0.01	0.00			-0.02	NA	
		5	6	7	8			

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.8 Analysis Name: ICP-MS Tot. Rec. Metals-2010

Instrument: ICPMS-PE DRC-II Work Order: Nu C111016

Analytical Sequence: 1111104 **Total Recoverable** Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Vanadium	0.01	1	2	3	4	NA	1111087-BLK2	2.00
		0.03	0.05	0.04		NA	-0.45	
		5	6	7	8			
Chromium	-0.03	1	2	3	4	NA	1111087-BLK2	1.00
		0.01	0.04	-0.02		NA	0.33	
		5	6	7	8			
Manganese	0.00	1	2	3	4	NA	1111087-BLK2	0.50
		0.00	0.01	0.01		NA	0.01	
		5	6	7	8			
Cobalt	0.00	1	2	3	4	NA	1111087-BLK2	0.20
		0.00	0.00	0.00		NA	0.00	
		5	6	7	8			
Nickel	0.00	1	2	3	4	NA	1111087-BLK2	1.00
		0.00	0.00	0.00		NA	-0.01	
		5	6	7	8			
Copper	-0.07	1	2	3	4	NA	1111087-BLK2	1.00
		0.06	0.05	0.02		NA	0.07	
		5	6	7	8			
Zinc	-0.05	1	2	3	4	NA	1111087-BLK2	5.00
		-0.03	-0.01	-0.01		NA	0.22	
		5	6	7	8			
Arsenic	0.04	1	2	3	4	NA	1111087-BLK2	2.00
		-0.01	-0.03	-0.01		NA	-0.22	
		5	6	7	8			

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.8 Analysis Name: ICP-MS Tot. Rec. Metals-2010

Instrument: ICPMS-PE DRC-II Work Order: Nu C111016

Analytical Sequence: 1111104 Total Recoverable Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Selenium	0.05	1	2	3	4	NA	1111087-BLK2	1.00
		-0.06	-0.12	-0.12		NA	-0.01	
		5	6	7	8			
Molybdenum	0.07	1	2	3	4	NA	1111087-BLK2	0.20
		0.10	0.05	0.06		NA	0.04	
		5	6	7	8			
Silver	0.10	1	2	3	4	NA	1111087-BLK2	1.00
		0.11	0.10	0.10		NA	0.05	
		5	6	7	8			
Cadmium	0.01	1	2	3	4	NA	1111087-BLK2	0.20
		0.00	0.00	-0.01		NA	0.01	
		5	6	7	8			
Antimony	0.05	1	2	3	4	NA	1111087-BLK2	1.00
		0.09	0.08	0.09		NA	-0.01	
		5	6	7	8			
Barium	-0.02	1	2	3	4	NA	1111087-BLK2	10.00
		-0.02	-0.01	0.00		NA	-0.01	
		5	6	7	8			
Thallium	0.01	1	2	3	4	NA	1111087-BLK2	1.00
		0.01	0.00	0.17		NA	0.02	
		5	6	7	8			
Lead	0.00	1	2	3	4	NA	1111087-BLK2	0.20
		0.01	0.00	0.00		NA	0.01	
		5	6	7	8			

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ESAT Dionex IC Method: EPA 300.0 Analysis Name: WC - Anions by Ion Chromatography 2010

Sequence: 1111040 Work Order: C111016 Units: mg/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Bromide	50.1	48.5	96.8		1			2			3	
				10.0	10.1	101.0						
					4			5			6	
					7			8			9	
Chloride	15.1	14.3	94.7		1			2			3	
				40.0	40.5	101.3						
					4			5			6	
					7			8			9	
Fluoride	9.98	9.2	92.2		1			2			3	
				4.00	3.6	90.0						
					4			5			6	
					7			8			9	
Sulfate as SO4	75.2	77.4	102.9		1			2			3	
				100	103	103.0						
					4			5			6	
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima Method: 200.7 Analysis Name: ICPOE Diss. Metals-2010

Sequence: 1111100 Work Order: C111016 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Aluminum	1000	960.3	96.0		1			2			3	
				12500	12480	99.8	12500	12370	99.0			
					4			5			6	
					7			8			9	
Beryllium	1000	986.8	98.7		1			2			3	
				500	520.6	104.1	500	515.2	103.0			
					4			5			6	
					7			8			9	
Calcium	1000	919.1	91.9		1			2			3	
				12500	12540	100.3	12500	12430	99.4			
					4			5			6	
					7			8			9	
Iron	1000	921.8	92.2		1			2			3	
				12500	12740	101.9	12500	12550	100.4			
					4			5			6	
					7			8			9	
Magnesium	1000	980.7	98.1		1			2			3	
				12500	12640	101.1	12500	12500	100.0			
					4			5			6	
					7			8			9	
Potassium	5000	4806	96.1		1			2			3	
				25000	24820	99.3	25000	24620	98.5			
					4			5			6	
					7			8			9	

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima Method: 200.7 Analysis Name: ICPOE Diss. Metals-2010

Sequence: 1111100 Work Order: C111016 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
					1			2			3	
				12500	12460	99.7	12500	12360	98.9			
Sodium	1000	931.2	93.1		4			5			6	
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima Method: 200.7 Analysis Name: ICPOE Tot. Rec Metals-2010

Sequence: 1111101 Work Order: C111016 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Aluminum	1000	960.3	96.0		1			2			3	
				12500	12480	99.8	12500	12370	99.0	12500	12520	100.2
					4			5			6	
					7			8			9	
Beryllium	1000	986.8	98.7		1			2			3	
				500	520.6	104.1	500	515.2	103.0	500	515.2	103.0
					4			5			6	
					7			8			9	
Calcium	1000	919.1	91.9		1			2			3	
				12500	12540	100.3	12500	12430	99.4	12500	12520	100.2
					4			5			6	
					7			8			9	
Iron	1000	921.8	92.2		1			2			3	
				12500	12740	101.9	12500	12550	100.4	12500	12650	101.2
					4			5			6	
					7			8			9	
Magnesium	1000	980.7	98.1		1			2			3	
				12500	12640	101.1	12500	12500	100.0	12500	12620	101.0
					4			5			6	
					7			8			9	
Potassium	5000	4806	96.1		1			2			3	
				25000	24820	99.3	25000	24620	98.5	25000	24810	99.2
					4			5			6	
					7			8			9	

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima Method: 200.7 Analysis Name: ICPOE Tot. Rec Metals-2010

Sequence: 1111101 Work Order: C111016 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
					1			2			3	
				12500	12460	99.7	12500	12360	98.9	12500	12520	100.2
Sodium	1000	931.2	93.1		4			5			6	
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Diss. Metals-2010

Sequence: 1111103 Work Order: C111016 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Antimony	50.0	49.7	99.4		1			2			3	
				50.0	49.0	98.0	50.0	49.3	98.6			
					4			5			6	
					7			8			9	
Arsenic	50.0	52.2	104.4		1			2			3	
				50.0	50.1	100.2	50.0	48.8	97.6			
					4			5			6	
					7			8			9	
Barium	50.0	49.4	98.8		1			2			3	
				50.0	48.5	97.0	50.0	48.0	96.0			
					4			5			6	
					7			8			9	
Cadmium	50.0	49.2	98.4		1			2			3	
				50.0	50.3	100.6	50.0	49.9	99.8			
					4			5			6	
					7			8			9	
Chromium	50.0	51.0	102.0		1			2			3	
				50.0	50.1	100.2	50.0	48.7	97.4			
					4			5			6	
					7			8			9	
Cobalt	50.0	52.7	105.4		1			2			3	
				50.0	51.3	102.6	50.0	48.7	97.4			
					4			5			6	
					7			8			9	

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Diss. Metals-2010

Sequence: 1111103 Work Order: C111016 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Copper	50.0	52.2	104.4		1			2			3	
				50.0	49.4	98.8	50.0	49.0	98.0			
					4			5			6	
					7			8			9	
Lead	50.0	50.5	101.0		1			2			3	
				50.0	49.8	99.6	50.0	50.0	100.0			
					4			5			6	
					7			8			9	
Manganese	50.0	50.5	101.0		1			2			3	
				50.0	50.1	100.2	50.0	47.4	94.8			
					4			5			6	
					7			8			9	
Molybdenum	50.0	49.3	98.6		1			2			3	
				50.0	49.1	98.2	50.0	49.2	98.4			
					4			5			6	
					7			8			9	
Nickel	50.0	50.2	100.4		1			2			3	
				50.0	48.2	96.4	50.0	47.9	95.8			
					4			5			6	
					7			8			9	
Selenium	250	254	101.6		1			2			3	
				50.0	49.4	98.8	50.0	48.3	96.6			
					4			5			6	
					7			8			9	

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Diss. Metals-2010

Sequence: 1111103 Work Order: C111016 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Silver	50.0	50.6	101.2		1			2			3	
				50.0	49.5	99.0	50.0	49.3	98.6			
					4			5			6	
					7			8			9	
Thallium	50.0	50.8	101.6		1			2			3	
				50.0	49.9	99.8	50.0	50.0	100.0			
					4			5			6	
					7			8			9	
Vanadium	50.0	50.0	100.0		1			2			3	
				50.0	48.5	97.0	50.0	46.9	93.8			
					4			5			6	
					7			8			9	
Zinc	50.0	52.0	104.0		1			2			3	
				50.0	50.1	100.2	50.0	48.6	97.2			
					4			5			6	
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICP-MS Tot. Rec. Metals-2010

Sequence: 1111104 Work Order: C111016 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Antimony	50.0	49.69	99.4		1			2			3	
				50.0	49.02	98.0	50.0	49.31	98.6	50.0	49.25	98.5
					4			5			6	
					7			8			9	
Arsenic	50.0	52.16	104.3		1			2			3	
				50.0	50.09	100.2	50.0	48.80	97.6	50.0	47.86	95.7
					4			5			6	
					7			8			9	
Barium	50.0	49.37	98.7		1			2			3	
				50.0	48.45	96.9	50.0	48.04	96.1	50.0	47.76	95.5
					4			5			6	
					7			8			9	
Cadmium	50.0	49.16	98.3		1			2			3	
				50.0	50.28	100.6	50.0	49.85	99.7	50.0	49.17	98.3
					4			5			6	
					7			8			9	
Chromium	50.0	50.95	101.9		1			2			3	
				50.0	50.10	100.2	50.0	48.66	97.3	50.0	47.89	95.8
					4			5			6	
					7			8			9	
Cobalt	50.0	52.65	105.3		1			2			3	
				50.0	51.33	102.7	50.0	48.71	97.4	50.0	48.85	97.7
					4			5			6	
					7			8			9	

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICP-MS Tot. Rec. Metals-2010

Sequence: 1111104 Work Order: C111016 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Copper	50.0	52.21	104.4		1			2			3	
				50.0	49.44	98.9	50.0	48.97	97.9	50.0	48.67	97.3
					4			5			6	
					7			8			9	
Lead	50.0	50.54	101.1		1			2			3	
				50.0	49.82	99.6	50.0	49.99	100.0	50.0	50.47	100.9
					4			5			6	
					7			8			9	
Manganese	50.0	50.49	101.0		1			2			3	
				50.0	50.12	100.2	50.0	47.45	94.9	50.0	48.78	97.6
					4			5			6	
					7			8			9	
Molybdenum	50.0	49.29	98.6		1			2			3	
				50.0	49.10	98.2	50.0	49.23	98.5	50.0	48.96	97.9
					4			5			6	
					7			8			9	
Nickel	50.0	50.19	100.4		1			2			3	
				50.0	48.17	96.3	50.0	47.89	95.8	50.0	48.19	96.4
					4			5			6	
					7			8			9	
Selenium	250	254.0	101.6		1			2			3	
				50.0	49.43	98.9	50.0	48.28	96.6	50.0	48.55	97.1
					4			5			6	
					7			8			9	

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICP-MS Tot. Rec. Metals-2010

Sequence: 1111104 Work Order: C111016 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Silver	50.0	50.60	101.2		1			2			3	
				50.0	49.52	99.0	50.0	49.34	98.7	50.0	48.93	97.9
					4			5			6	
					7			8			9	
Thallium	50.0	50.81	101.6		1			2			3	
				50.0	49.95	99.9	50.0	50.01	100.0	50.0	50.67	101.3
					4			5			6	
					7			8			9	
Vanadium	50.0	50.05	100.1		1			2			3	
				50.0	48.48	97.0	50.0	46.91	93.8	50.0	47.68	95.4
					4			5			6	
					7			8			9	
Zinc	50.0	51.95	103.9		1			2			3	
				50.0	50.08	100.2	50.0	48.60	97.2	50.0	49.54	99.1
					4			5			6	
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

ICP Interference Check Sample

ICPMS-PE DRC-II

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1111103	Analysis: ICPMS Diss. Metals-2010					
Antimony	IFA1	0.0	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Arsenic	IFA1	0.0	ug/L			2.00
	IFB1	20.0	ug/L	20	100	2.00
Barium	IFA1	0.2	ug/L			10.0
	IFB1	0.1	ug/L			10.0
Cadmium	IFA1	0.0	ug/L			0.200
	IFB1	19.5	ug/L	20	98	0.200
Chromium	IFA1	0.6	ug/L			1.00
	IFB1	20.6	ug/L	20	103	1.00
Cobalt	IFA1	-0.1	ug/L			0.200
	IFB1	19.8	ug/L	20	99	0.200
Copper	IFA1	0.6	ug/L			1.00
	IFB1	20.4	ug/L	20	102	1.00
Lead	IFA1	0.1	ug/L			0.200
	IFB1	0.0	ug/L			0.200
Manganese	IFA1	0.0	ug/L			0.500
	IFB1	19.4	ug/L	20	97	0.500
Molybdenum	IFA1	203.4	ug/L	200	102	0.200
	IFB1	198.1	ug/L	200	99	0.200
Nickel	IFA1	0.0	ug/L			1.00
	IFB1	19.6	ug/L	20	98	1.00
Selenium	IFA1	-0.1	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Silver	IFA1	0.0	ug/L			1.00
	IFB1	19.1	ug/L	20	96	1.00
Thallium	IFA1	0.0	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Vanadium	IFA1	-0.1	ug/L			2.00
	IFB1	-0.3	ug/L			2.00
Zinc	IFA1	2.2	ug/L			5.00
	IFB1	21.4	ug/L	20	107	5.00

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

ICP Interference Check Sample

ICPMS-PE DRC-II

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1111104	Analysis: ICP-MS Tot. Rec. Metals-2010					
Antimony	IFA1	0.0	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Arsenic	IFA1	0.0	ug/L			2.00
	IFB1	20.0	ug/L	20	100	2.00
Barium	IFA1	0.2	ug/L			10.0
	IFB1	0.1	ug/L			10.0
Cadmium	IFA1	0.0	ug/L			0.200
	IFB1	19.5	ug/L	20	98	0.200
Chromium	IFA1	0.6	ug/L			1.00
	IFB1	20.6	ug/L	20	103	1.00
Cobalt	IFA1	-0.1	ug/L			0.200
	IFB1	19.8	ug/L	20	99	0.200
Copper	IFA1	0.6	ug/L			1.00
	IFB1	20.4	ug/L	20	102	1.00
Lead	IFA1	0.1	ug/L			0.200
	IFB1	0.0	ug/L			0.200
Manganese	IFA1	0.0	ug/L			0.500
	IFB1	19.4	ug/L	20	97	0.500
Molybdenum	IFA1	203.4	ug/L	200	102	0.200
	IFB1	198.1	ug/L	200	99	0.200
Nickel	IFA1	0.0	ug/L			1.00
	IFB1	19.6	ug/L	20	98	1.00
Selenium	IFA1	-0.1	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Silver	IFA1	0.0	ug/L			1.00
	IFB1	19.1	ug/L	20	96	1.00
Thallium	IFA1	0.0	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Vanadium	IFA1	-0.1	ug/L			2.00
	IFB1	-0.3	ug/L			2.00
Zinc	IFA1	2.2	ug/L			5.00
	IFB1	21.4	ug/L	20	107	5.00

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

ICP Interference Check Sample

ICPOE - PE Optima

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1111100 Analysis: ICPOE Diss. Metals-2010						
Aluminum	IFA1	58,374.3	ug/L	60,000	97	50.0
	IFB1	61,134.1	ug/L	60,000	102	50.0
Beryllium	IFA1	-0.9	ug/L			5.00
	IFB1	95.2	ug/L	100	95	5.00
Calcium	IFA1	286,344.0	ug/L	300,000	95	250
	IFB1	299,025.6	ug/L	300,000	100	250
Iron	IFA1	219,579.1	ug/L	250,000	88	250
	IFB1	229,863.6	ug/L	250,000	92	250
Magnesium	IFA1	139,106.1	ug/L	150,000	93	250
	IFB1	145,635.2	ug/L	150,000	97	250
Potassium	IFA1	-97.6	ug/L			1000
	IFB1	21,443.1	ug/L	20,000	107	1000
Sodium	IFA1	50,237.1	ug/L	50,000	100	500
	IFB1	52,045.7	ug/L	50,000	104	500

*Criteria = 80-120%R of True Value or +/- PQL
See raw data for complete analyte list and results.

Sequence: 1111101 Analysis: ICPOE Tot. Rec Metals-2010						
Aluminum	IFA1	58,374.3	ug/L	60,000	97	50.0
	IFB1	61,134.1	ug/L	60,000	102	50.0
Beryllium	IFA1	-0.9	ug/L			5.00
	IFB1	95.2	ug/L	100	95	5.00
Calcium	IFA1	286,344.0	ug/L	300,000	95	250
	IFB1	299,025.6	ug/L	300,000	100	250
Iron	IFA1	219,579.1	ug/L	250,000	88	250
	IFB1	229,863.6	ug/L	250,000	92	250
Magnesium	IFA1	139,106.1	ug/L	150,000	93	250
	IFB1	145,635.2	ug/L	150,000	97	250
Potassium	IFA1	-97.6	ug/L			1000
	IFB1	21,443.1	ug/L	20,000	107	1000
Sodium	IFA1	50,237.1	ug/L	50,000	100	500
	IFB1	52,045.7	ug/L	50,000	104	500

*Criteria = 80-120%R of True Value or +/- PQL
See raw data for complete analyte list and results.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Detection Limit (PQL) Standard

ICPMS-PE DRC-II

Metals (Dissolved) by EPA 200/7000 Series Methods

Sequence: 1111103

Analyte	True	Found	%R	Units
Antimony	1.00	1.05	105	ug/L
Arsenic	2.00	2.08	104	ug/L
Barium	0.500	0.508	102	ug/L
Cadmium	0.200	0.196	98	ug/L
Chromium	1.00	0.992	99	ug/L
Cobalt	0.200	0.207	104	ug/L
Copper	1.00	0.977	98	ug/L
Lead	0.200	0.263	132	ug/L
Manganese	0.200	0.224	112	ug/L
Molybdenum	0.200	0.218	109	ug/L
Nickel	1.00	1.00	100	ug/L
Selenium	1.00	1.13	113	ug/L
Silver	0.500	0.536	107	ug/L
Thallium	0.200	0.200	100	ug/L
Vanadium	2.00	2.05	103	ug/L
Zinc	5.00	5.52	110	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Detection Limit (PQL) Standard

ICPOE - PE Optima

Metals (Dissolved) by EPA 200/7000 Series Methods

Sequence: 1111100

Analyte	True	Found	%R	Units
Aluminum	100	101.2	101	ug/L
Beryllium	5.00	5.177	104	ug/L
Calcium	250	262.3	105	ug/L
Iron	100	99.84	100	ug/L
Magnesium	1000	1053	105	ug/L
Potassium	1000	1066	107	ug/L
Sodium	1000	1061	106	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Detection Limit (PQL) Standard

ICPMS-PE DRC-II

Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1111104

Analyte	True	Found	%R	Units
Antimony	1.00	1.048	105	ug/L
Arsenic	2.00	2.082	104	ug/L
Barium	0.500	0.5076	102	ug/L
Cadmium	0.200	0.1961	98	ug/L
Chromium	1.00	0.9917	99	ug/L
Cobalt	0.200	0.2072	104	ug/L
Copper	1.00	0.9770	98	ug/L
Lead	0.200	0.2635	132	ug/L
Manganese	0.200	0.2236	112	ug/L
Molybdenum	0.200	0.2180	109	ug/L
Nickel	1.00	1.000	100	ug/L
Selenium	1.00	1.131	113	ug/L
Silver	0.500	0.5360	107	ug/L
Thallium	0.200	0.2000	100	ug/L
Vanadium	2.00	2.051	103	ug/L
Zinc	5.00	5.524	110	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw, Inc. - ESAT Region 8

Detection Limit (PQL) Standard

ICPOE - PE Optima

Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1111101

Analyte	True	Found	%R	Units
Aluminum	100	101.2	101	ug/L
Beryllium	5.00	5.177	104	ug/L
Calcium	250	262.3	105	ug/L
Iron	100	99.84	100	ug/L
Magnesium	1000	1053	105	ug/L
Potassium	1000	1066	107	ug/L
Sodium	1000	1061	106	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: EPA 300.0 **Dissolved** **Sequence ID#:** 1111040

Instrument ID #: ESAT Dionex IC Water **LSR #:** DG-264

Analysis ID	Sample Name	Analysis Date	Analysis Time
1111040-ICV1	Initial Cal Check	11/02/11	19:11
1111040-ICB1	Initial Cal Blank	11/02/11	19:29
1110131-BLK1	Blank	11/02/11	19:46
1110131-BS1		11/02/11	20:04
C111016-03	DR-3	11/02/11	20:21
1110131-DUP1	Duplicate	11/02/11	20:39
1110131-MS1	Matrix Spike	11/02/11	20:57
1110131-MSD1	Matrix Spike Dup	11/02/11	21:14
1111040-CCV1	Calibration Check	11/02/11	21:32
1111040-CCB1	Calibration Blank	11/02/11	21:49

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.7 **Dissolved** **Sequence ID#:** 1111100

Instrument ID #: ICPOE - PE Optima Water **LSR #:** DG-264

Analysis ID	Sample Name	Analysis Date	Analysis Time
1111100-ICV1	Initial Cal Check	11/28/11	12:57
1111100-ICB1	Initial Cal Blank	11/28/11	13:00
1111100-CRL1	Instrument RL Check	11/28/11	13:03
1111100-IFA1	Interference Check A	11/28/11	13:06
1111100-IFB1	Interference Check B	11/28/11	13:10
1111100-CCV1	Calibration Check	11/28/11	13:14
1111100-CCB1	Calibration Blank	11/28/11	13:17
1111097-BLK1	Blank	11/28/11	13:20
1111097-BS1		11/28/11	13:23
C111016-01	DR-3	11/28/11	13:26
1111097-DUP1	Duplicate	11/28/11	13:31
1111100-SRD1	Serial Dilution	11/28/11	13:35
1111097-MS1	Matrix Spike	11/28/11	13:38
1111097-MSD1	Matrix Spike Dup	11/28/11	13:42
1111100-CCV2	Calibration Check	11/28/11	13:55
1111100-CCB2	Calibration Blank	11/28/11	13:58

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.7 **Total Recoverable** **Sequence ID#:** 1111101

Instrument ID #: ICPOE - PE Optima Water **LSR #:** DG-264

Analysis ID	Sample Name	Analysis Date	Analysis Time
1111101-ICV1	Initial Cal Check	11/28/11	12:57
1111101-ICB1	Initial Cal Blank	11/28/11	13:00
1111101-CRL1	Instrument RL Check	11/28/11	13:03
1111101-IFA1	Interference Check A	11/28/11	13:06
1111101-IFB1	Interference Check B	11/28/11	13:10
1111101-CCV1	Calibration Check	11/28/11	13:14
1111101-CCB1	Calibration Blank	11/28/11	13:17
1111087-BLK1	Blank	11/28/11	13:46
1111087-SRM1	Reference	11/28/11	13:49
1111101-CCV2	Calibration Check	11/28/11	13:55
1111101-CCB2	Calibration Blank	11/28/11	13:58
C111016-02	DR-3	11/28/11	14:02
1111087-DUP1	Duplicate	11/28/11	14:06
1111101-SRD1	Serial Dilution	11/28/11	14:10
1111087-MS1	Matrix Spike	11/28/11	14:13
1111087-MSD1	Matrix Spike Dup	11/28/11	14:17
1111087-PS1	Post Spike	11/28/11	14:21
1111101-CCV3	Calibration Check	11/28/11	14:28
1111101-CCB3	Calibration Blank	11/28/11	14:32

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.8 **Dissolved** **Sequence ID#:** 1111103

Instrument ID #: ICPMS-PE DRC-II Water **LSR #:** DG-264

Analysis ID	Sample Name	Analysis Date	Analysis Time
1111103-ICV1	Initial Cal Check	11/28/11	13:08
1111103-ICB1	Initial Cal Blank	11/28/11	13:11
1111103-CRL1	Instrument RL Check	11/28/11	13:14
1111103-IFA1	Interference Check A	11/28/11	13:17
1111103-IFB1	Interference Check B	11/28/11	13:20
1111103-CCV1	Calibration Check	11/28/11	13:23
1111103-CCB1	Calibration Blank	11/28/11	13:26
1111098-BLK1	Blank	11/28/11	13:29
C111016-01	DR-3	11/28/11	13:32
1111098-DUP1	Duplicate	11/28/11	13:35
1111103-SRD1	Serial Dilution	11/28/11	13:38
1111098-BS1		11/28/11	13:40
1111098-MS1	Matrix Spike	11/28/11	13:43
1111098-MSD1	Matrix Spike Dup	11/28/11	13:46
1111103-CCV2	Calibration Check	11/28/11	13:57
1111103-CCB2	Calibration Blank	11/28/11	14:00

Project Name: Rico-Argentine_Surface Waters_OCT 2011_D264 **Certificate of Analysis**

TDF #: DG-264

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.8 **Total Recoverable** **Sequence ID#:** 1111104

Instrument ID #: ICPMS-PE DRC-II Water **LSR #:** DG-264

Analysis ID	Sample Name	Analysis Date	Analysis Time
1111104-ICV1	Initial Cal Check	11/28/11	13:08
1111104-ICB1	Initial Cal Blank	11/28/11	13:11
1111104-CRL1	Instrument RL Check	11/28/11	13:14
1111104-IFA1	Interference Check A	11/28/11	13:17
1111104-IFB1	Interference Check B	11/28/11	13:20
1111104-CCV1	Calibration Check	11/28/11	13:23
1111104-CCB1	Calibration Blank	11/28/11	13:26
1111087-BLK2	Blank	11/28/11	13:49
C111016-02	DR-3	11/28/11	13:52
1111104-CCV2	Calibration Check	11/28/11	13:57
1111104-CCB2	Calibration Blank	11/28/11	14:00
1111087-DUP2	Duplicate	11/28/11	14:04
1111104-SRD1	Serial Dilution	11/28/11	14:06
1111087-SRM2	Reference	11/28/11	14:09
1111087-MS2	Matrix Spike	11/28/11	14:12
1111087-MSD2	Matrix Spike Dup	11/28/11	14:15
1111087-PS2	Post Spike	11/28/11	14:18
1111104-CCV3	Calibration Check	11/28/11	14:30
1111104-CCB3	Calibration Blank	11/28/11	14:33

TechLaw

ESAT Region 8

Perkin Elmer Optima 4300 ICP-OE

2011 MDLs and PQLs
Contract: EP-W-06-33

2011		Dissolved MDL u g/L	Tot Rec. MDL u g/L	Practical MDL u g/L	PQL H20 u g/L	PQL Soil mg/Kg	Linear Range mg/L
Ag	Silver	0.349	0.188	2	10.0	1.0	5
Al	Aluminum	4.42	3.77	20	50.0	5.0	100
As	Arsenic	51.4	18.9	60	100.0	10.0	20
B	Boron	2.43	3.5	50	250.0	25.0	100
Ba	Barium	0.261	0.248	2	5.0	0.5	20
Be	Beryllium	0.122	0.088	2	5.0	0.5	10
Ca	Calcium	16.7	2.63	100	250.0	25.0	1000
Cd	Cadmium	0.798	0.74	2	5.0	0.5	20
Co	Cobalt	1.18	0.907	2	5.0	0.5	20
Cr	Chromium	0.587	0.462	2	5.0	0.5	20
Cu	Copper	0.589	0.538	2	2.0	1.0	100
Fe	Iron	15.2	17.4	100	250.0	25.0	500
K	Potassium	39	24.2	250	1000.0	100.0	500
Mg	Magnesium	6.01	27.2	100	250.0	25.0	500
Mn	Manganese	0.102	0.07	2	5.0	0.5	40
Mo	Molybdenum	5.44	1.61	6	10.0	1.0	50
Na	Sodium	25.6	5.36	250	1000.0	100.0	500
Ni	Nickel	3.07	2.38	5	10.0	1.0	100
Pb	Lead	8.81	7.37	10	25.0	2.5	100
Sb	Antimony	22.2	23.7	40	100.0	10.0	20
Se	Selenium	56.3	52.8	60	100.0	10.0	20
SiO2	Silica	3.25	2.73	250	1000.0	100.0	100
Sr	Strontium	0.08	0.078	2	10.0	1.0	1
Ti	Titanium	0.263	0.084	5	10.0	1.0	10
Tl	Thallium	13	2.53	20	50.0	5.0	20
V	Vanadium	1.68	1.41	10	50.0	5.0	25
Zn	Zinc	3.59	3.4	10	20.0	2.0	100

ICP-OE * MDL determined: August 2011
Last Updated: August 2011

TechLaw

ESAT Region 8

Perkin Elmer ELAN DRC-II ICP-MS

2011 MDLs and PQLs
Contract: EP-W-06-33

2010	Dissolved MDL u g/L	Tot Rec. MDL u g/L	Practical MDL u g/L	PQL H20 ug/L	PQL Soil ug/Kg
Ag 107	0.08	0.06	0.10	0.5	50.0
Al 27	1.18	1.32	5.00	20.0	2000.0
As 75	0.08	0.05	0.50	2.0	200.0
Ba 135	0.14	0.08	5.00	10.0	1000.0
Be 9	0.05	0.10	0.10	0.2	20.0
Cd 111	0.04	0.02	0.10	0.2	20.0
Co 59	0.01	0.01	0.10	0.2	20.0
Cr 52	0.07	0.09	0.50	1.0	100.0
Cu 65	0.15	0.06	0.50	1.0	100.0
Mn 55	0.01	0.03	0.20	0.5	50.0
Mo 98	0.09	0.02	0.10	0.2	20.0
Ni 60	0.02	0.03	0.50	1.0	100.0
Pb 208	0.01	0.01	0.10	0.2	20.0
Sb 121	0.03	0.03	0.50	1.0	100.0
Se 82	0.36	0.19	0.50	1.0	100.0
Tl 205	0.01	0.01	0.50	1.0	100.0
Th 232	0.05	0.14	0.50	1.0	100.0
U 238	0.01	0.01	0.10	0.2	20.0
V 51	0.08	0.09	1.00	2.0	200.0
Zn 66	0.40	0.27	2.00	5.0	500.0

ICP-MS * MDL determined: March 2011

Last Updated: March 2011

TechLaw, Inc.
Environmental Services Assistance Team
16194 W. 45th Drive, Golden, CO 80403
303-312-7720

Task Order: 40
TDF: DG-264
LIMS: C111016
DCN #: EP8-6-6565
Contract: EP-W-06-33

Rico Argentine - Surface Water - OCT 2011

Sample Calculation for Hardness

Sample ID: C111016-01

Calcium (µg/L)			Ca Hardness, mg/L
221000	divide by 1000, then x 2.497	=	551.84

Magnesium (µg/L)			Mg Hardness, mg/L
19300	divide by 1000, then x 4.118	=	79.48

Calculated Hardness, mg/L 631.31

TechLaw, Inc.
Environmental Services Assistance Team
16194 W. 45th Drive, Golden, CO 80403
303-312-7720

Task Order: 40
TDF: DG-264
LIMS: C111016
DCN #: EP8-6-6565
Contract: EP-W-06-33

Rico Argentine – Surface Water – OCT 2011

Sample Identification
Cross-Reference Information

EPA Sample ID	ESAT LIMS ID
DR-3	C111016-01
DR-3	C111016-02
DR-3	C111016-03

WORK ORDER

Printed: 10/28/2011 12:09:23PM

C111016

TechLaw, Inc. - ESAT Region 8

Client: Superfund
Project: Rico-Argentine_Surface Waters_OCT 2011_D264
Project Manager: Scott VanOvermeiren
Project Number: DG-264

Report To:
Superfund
Steve Way
1595 Wynkoop Street
Denver, CO 80202
Phone: (303) 312-7720
Fax: (303) 312-7801

Invoice To:
Superfund
Steve Way
1595 Wynkoop Street
Denver, CO 80202
Phone :(303) 312-7720
Fax: (303) 312-7801

Date Due: 11/26/11 00:00 (30 day TAT)

Received By: Nick Philpot
Date Received: 10/27/11 09:00

Logged In By: Nick Philpot
Date Logged In: 10/28/11 12:06

Samples Received at: 2.5°C

Custody Seals	No	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confin	Yes		

Analysis	Due	TAT	Expires	Comments
C111016-01 DR-3 [Water] Sampled 10/20/11 09:05 Dateline				
Dissolved Metals + Hardness	11/17/11 00:00	21	04/17/12 15:05	
C111016-02 DR-3 [Water] Sampled 10/20/11 09:05 Dateline				
Total Recoverable Metals	11/17/11 00:00	21	04/17/12 15:05	
C111016-03 DR-3 [Water] Sampled 10/20/11 09:05 Dateline				
WC - Anions by Ion Chromatography 2	11/26/11 00:00	30	11/17/11 14:05	

Reviewed By

Date

WORK ORDER

Printed: 10/28/2011 12:09:23PM

C111016

TechLaw, Inc. - ESAT Region 8

Client:	**Superfund**	**Project Manager:**	**Scott VanOvermeiren**
Project:	**Rico-Argentine_Surface Waters_OCT 2011_D264**	**Project Number:**	**DG-264**

Analysis groups included in this work order

Dissolved Metals + Hardness

ICPOE Diss. Metals-2010 ICPMS Diss. Metals-2010 DM-Hardness - Calculated

Total Recoverable Metals

ICPOE Tot. Rec Metals-20 ICP-MS Tot. Rec. Metals-2

Reviewed By

Date

USEPA
DateShipped: 10/24/2011
CarrierName: FedEx
TDF No: DG-220

CHAIN OF CUSTODY RECORD
Rico Argentine St. Louis Tunnel
Contact Name: Jan Christner
Contact Phone: 720-810-0759

No: 8-102311-060015-0004

Lab: ESAT - Region 8 Laboratory
Lab Phone: 303.312.7708

Lab #	Sample #	Location	Analyses	Matrix	Collection Method	Collected	Sample Time	Numb Cont	Container	Preservative	MS/MSD
	10032011-0017	DR-3	Total Metals	Water	Grab	10/20/2011	09:05	1	250 mL poly	HNO3 pH<2	N
	10032011-0017	DR-3	Dissolved Metals	Water	Grab	10/20/2011	09:05	1	250 mL poly	HNO3 pH<2	N
	10032011-0017	DR-3	Cl, Br, SO4, F	Water	Grab	10/20/2011	09:05	1	250 mL poly	4 C	N

Special Instructions: DG 264

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	Jan M Christner	10/24/11	[illegible]	10/27/11	0900						

C 111016

ESAT Technical Direction Form

Contract No. EPW06033
EPA Region 8

Site ID: 08BU
TDF ID: DG-264

Date Issued: 6/10/2011
Date Updated: 10/4/2011

Date Closed By:

Name: Rico-Argentine Superfund Site Samples

Details: The Contractor shall analyze approximately 20 water samples for total recoverable and dissolved metals including hardness as indicated in the analytical information section. The samples are expected to arrive at the R8 ESAT Laboratory following the sampling event which is tentatively scheduled for June 20-24, 2011.

Five additional samples for total recoverable and dissolved metals including hardness, anions (Br, Cl, SO4) and pH are expected to arrive at the ESAT R8 laboratory on 8/8/11.

20 additional samples for total recoverable and dissolved metals including hardness, anions (Br, Cl, F, SO4) and pH are expected to arrive at the ESAT R8 laboratory on 10/12/11.

The EPA OSC for this site is Steve Way.

Analytical

MATRIX

☑ Water ☐ Soils ☐ Vegetation ☐ Biota

WET CHEM

☐ TSS ☐ TDS ☐ DOC ☐ Alk ☑ Chloride ☑ Sulfate ☑ Fluoride ☐ Nitrate ☐ Nitrite
Other bromide, pH

METALS

☑ Dissolved ☑ Total Recoverable ☐ Total ☑ Hardness (Calc)

200.7: ☐ Ag ☑ Al ☐ As ☐ Ba ☑ Be ☐ B ☑ Ca ☐ Cd ☐ Co ☐ Cr ☐ Cu ☑ Fe ☑ K ☑ Mg
☐ Mn ☐ Mo ☑ Na ☐ Ni ☐ Pb ☐ Sb ☐ Se ☐ Sr ☐ Ti ☐ Tl ☐ V ☐ Zn ☐ SiO2

200.8: ☑ Ag ☐ Al ☑ As ☑ Ba ☑ Be ☑ Cd ☑ Co ☑ Cr ☑ Cu ☑ Mn ☑ Mo ☑ Ni ☑ Pb ☑ Sb
☑ Se ☐ Th ☑ Tl ☐ U ☑ V ☑ Zn

7470/7471/747 ☐ Hg

FIBERS

☐ PLM ☐ TEM

Deliverable

ID	*Description*	*Due Date*	*Submission Date*
1	Provide final deliverable package to Task Monitor no later than 30 days after delivery of samples.	7/28/2011	8/3/2011
2	Provide final deliverable package to Task Monitor no later than 30 days after delivery of samples.		
3	Provide final deliverable package to Task Monitor no later than 30 days after delivery of samples.		

TechLaw
Quality & Integrity

Ion Chromatography
EPA Method 300.0 / SW-846 Method 9056

Analysis Date: 11/02/2011 Analyst: Nick Philpot

TDF #: DG-264 Project Name: Rico-Argentine SW LIMS #: C111016

Standards Traceability Documentation

Vendor	Standard	LIMS ID #:	Expires	Purpose
Inorganic Ventures	QCP-QCS-5	1040749	3-1-12	ICV / LCS
Inorganic Ventures	10,000 ppm Cl	1040750	3-1-12	Calibration
Inorganic Ventures	10,000 ppm NO_2	1040754	3-1-12	Calibration
Inorganic Ventures	10,000 ppm Br	1040752	3-1-12	Calibration
Inorganic Ventures	10,000 ppm PO_4	1040755	3-1-12	Calibration
Inorganic Ventures	10,000 ppm Fl	1040751	3-1-12	Calibration
Inorganic Ventures	10,000 ppm SO_4	1040756	3-1-12	Calibration
Inorganic Ventures	10,000 ppm NO_3	1040753	3-1-12	Calibration
ESAT	Cl + SO_4 + F	1052401	3-1-12	Spike

Calibration Standards

Cal Stock LIMS ID #: 1052601 Prepared: 05-24-2011 Exp: 3-1-2012

Name	F^- mg/L	Cl^- mg/L	Br^- mg/L	NO_2-N g/L	NO_3-N mg/L	PO_4 mg/L	SO_4^- mg/L
Stock	20	200	50	50	50	20	500
Std. 1	0.2	2	0.5	0.5	0.5	0.2	5.0
Std. 2	0.4	4	1	1	1	0.4	10
Std. 3	1	10	2.5	2.5	2.5	1	25
Std. 4	4	40	10	10	10	4	100
Std. 5	10	100	25	25	25	10	250

Instrument Analysis Parameters

Column Press.: Approx 2600 Eluent Cond.: 00.0 Eluent Prep.Date: 11/02/2011

Cal. Date: 6/28/2011 Cal. By: NP

Analytical Run Information

CCV LIMS ID #: 1052602 Prepared: 05-24-2011 Exp: 3-1-2012

Spiked Sample ID: C111016-03 mL Sample: 10 mL Spike: 0.100

Analytical Batch ID: 1110131

Sequence ID: 1111040

Upload Date: 11/7/2011 Upload By: NP

Peer Review Date: 11-8-11 By: [signature]

ANALYSIS SEQUENCE

1111040

Instrument: ESAT Dionex IC Sequence Date: 11/07/11 00:00 Printed: 11/7/2011 12:34:09PM

Lab Number	Dilut. Factor	Analysis	STD ID	Sample/Std Name	EPA Tag ID	Source Sple	Comments
1111040-ICV1		QC	1040749	Initial Cal Check		-	
1111040-ICB1		QC	1040749	Initial Cal Blank		-	
1110131-BLK1		QC		Blank		-	
1110131-BS1		QC		LCS		-	
C111016-03 A		nions by Ion Chromatograp		DR-3	8-C		
1110131-DUP1		QC		Duplicate		C111016-03	
1110131-MS1		QC		Matrix Spike		C111016-03	
1110131-MSD1		QC		Matrix Spike Dup		C111016-03	
1111040-CCV1		QC	1052602	Calibration Check		-	
1111040-CCB1		QC		Calibration Blank		-	

PREPARATION BENCH SHEET

1110131

TechLaw, Inc. - ESAT Region 8

Printed: 10/31/2011 11:23:24AM

Matrix: Water

Date Prepared: 10/31/11 11:22 By: NP

Prepared using: WETCHEM - No Prep Req

Lab Number	Analysis	EPA Tag ID	Initial (mL)	Final (mL)	Spike1 ID	ul Spike1	Spike2 ID	ul Spike2	Source ID	QC Code	Extraction Comments
1110131-BLK1	QC		10	10						Blank	
1110131-BS1	QC		10	10	1052401	100				LCS	
1110131-DUP1	QC		10	10					C111016-03	Duplicate	
1110131-MS1	QC		10	10	1052401	100			C111016-03	Matrix Spike	
1110131-MSD1	QC		10	10	1052401	100			C111016-03	Matrix Spike Dup	
C111016-03 A	nions by Ion Chromatograpl	8-C	10	10						DR-3	

DG-264

ANION SUMMARY REPORT

No.	Name	Time min Fluoride ECD_1	Area µS*min Fluoride ECD_1	Rel.Area % Fluoride ECD_1	Height µS Fluoride ECD_1	Rel.Height % Fluoride ECD_1	Amount mg/L Fluoride ECD_1
1	Std 0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2	Std 1	3.023	0.0542	3.94	0.39	6.24	0.1975
3	Std 2	3.023	0.1023	3.76	0.78	6.25	0.4068
4	Std 3	3.023	0.2392	3.39	1.96	5.86	0.9949
5	Std 4	3.030	0.9753	3.03	8.16	5.25	4.0010
6	Std 5	3.020	2.6256	2.89	21.67	5.28	9.9999
7	SEQ-ICV	3.003	2.3916	7.26	16.86	12.07	9.1998
8	SEQ-ICB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
9	1110131-BLK1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
10	1110131-BS1	3.000	1.1634	6.22	7.97	8.41	4.7317
11	C111016-03	3.003	0.0506	0.70	0.27	1.29	0.1818
12	1110131-DUP1	3.007	0.0621	0.87	0.28	1.33	0.2319
13	1110131-MS1	3.000	1.1382	4.59	7.71	7.05	4.6348
14	1110131-MSD1	2.997	1.1366	4.58	7.69	7.05	4.6282
15	SEQ-CCV	3.003	0.8833	2.72	5.91	4.02	3.6382
16	SEQ-CCB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
17	STOP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Sum:	36.133	10.822	43.958	79.659	70.100	42.846
	Average:	3.011	0.902	3.663	6.638	5.842	3.571
	Rel.Std.Dev:	0.393 %	98.056 %	51.961 %	102.930 %	49.943 %	95.338 %

No.	Name	Time min Chloride ECD_1	Area µS*min Chloride ECD_1	Rel.Area % Chloride ECD_1	Height µS Chloride ECD_1	Rel.Height % Chloride ECD_1	Amount mg/L Chloride ECD_1
1	Std 0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2	Std 1	4.62	0.315	22.95	2.254	35.75	2.3540
3	Std 2	4.62	0.623	22.89	4.507	36.02	3.9937
4	Std 3	4.62	1.681	23.79	12.495	37.34	9.5367
5	Std 4	4.65	8.016	24.91	61.251	39.41	40.1288
6	Std 5	4.67	22.833	25.16	162.961	39.72	99.9866
7	SEQ-ICV	4.50	2.604	7.91	17.545	12.55	14.2560
8	SEQ-ICB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
9	1110131-BLK1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
10	1110131-BS1	4.50	4.890	26.16	34.217	36.14	25.5345
11	C111016-03	4.49	0.005	0.07	0.033	0.16	0.6878
12	1110131-DUP1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
13	1110131-MS1	4.50	4.482	18.06	31.329	28.63	23.5617
14	1110131-MSD1	4.49	4.477	18.06	31.212	28.61	23.5401
15	SEQ-CCV	4.51	8.092	24.88	57.183	38.87	40.4693
16	SEQ-CCB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
17	STOP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Sum:	50.153	58.019	214.851	414.988	333.205	284.049
Average:	4.559	5.274	19.532	37.726	30.291	25.823
Rel.Std.Dev:	1.611 %	122.752 %	42.602 %	123.015 %	42.023 %	109.450 %

No.	Name	Time min Nitrite ECD_1	Area µS*min Nitrite ECD_1	Rel.Area % Nitrite ECD_1	Height µS Nitrite ECD_1	Rel.Height % Nitrite ECD_1	Amount mg/L Nitrite ECD_1
1	Std 0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2	Std 1	5.673	0.171	12.436	0.951	15.092	0.535
3	Std 2	5.670	0.329	12.076	1.860	14.861	0.979
4	Std 3	5.667	0.867	12.265	4.854	14.504	2.479
5	Std 4	5.687	3.662	11.380	20.863	13.425	10.008
6	Std 5	5.693	9.699	10.687	53.125	12.949	24.999
7	SEQ-ICV	5.493	5.460	16.585	29.009	20.753	14.640
8	SEQ-ICB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
9	1110131-BLK1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
10	1110131-BS1	5.480	3.629	19.417	19.797	20.908	9.922
11	C111016-03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
12	1110131-DUP1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
13	1110131-MS1	5.473	3.298	13.292	18.206	16.637	9.050
14	1110131-MSD1	5.473	3.292	13.276	18.142	16.632	9.035
15	SEQ-CCV	5.480	3.576	10.996	19.589	13.315	9.783
16	SEQ-CCB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
17	STOP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Sum:	55.790	33.983	132.412	186.396	159.077	91.431
	Average:	5.579	3.398	13.241	18.640	15.908	9.143
	Rel.Std.Dev:	1.878 %	82.286 %	20.654 %	81.734 %	18.136 %	78.918 %

No.	Name	Time min Bromide ECD_1	Area µS*min Bromide ECD_1	Rel.Area % Bromide ECD_1	Height µS Bromide ECD_1	Rel.Height % Bromide ECD_1	Amount mg/L Bromide ECD_1
1	Std 0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2	Std 1	6.943	0.033	2.371	0.164	2.594	0.474
3	Std 2	6.943	0.066	2.426	0.326	2.604	1.004
4	Std 3	6.933	0.164	2.316	0.812	2.426	2.531
5	Std 4	6.943	0.663	2.060	3.336	2.147	9.991
6	Std 5	6.930	1.782	1.963	9.146	2.229	25.001
7	SEQ-ICV	6.630	3.839	11.661	18.836	13.476	48.489
8	SEQ-ICB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
9	1110131-BLK1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
10	1110131-BS1	6.620	0.681	3.644	3.276	3.460	10.254
11	C111016-03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
12	1110131-DUP1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
13	1110131-MS1	6.610	0.633	2.552	3.042	2.780	9.562

14	1110131-MSD1	6.610	0.632	2.547	3.029	2.777	9.541
15	SEQ-CCV	6.617	0.670	2.060	3.236	2.199	10.096
16	SEQ-CCB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
17	STOP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Sum:	67.780	9.162	33.600	45.203	36.692	126.942
	Average:	6.778	0.916	3.360	4.520	3.669	12.694
	Rel.Std.Dev:	2.501 %	124.471 %	87.941 %	124.640 %	94.490 %	113.303 %

No.	Name	Time min Nitrate ECD_1	Area µS*min Nitrate ECD_1	Rel.Area % Nitrate ECD_1	Height µS Nitrate ECD_1	Rel.Height % Nitrate ECD_1	Amount mg/L Nitrate ECD_1
1	Std 0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2	Std 1	7.873	0.189	13.716	0.818	12.971	0.521
3	Std 2	7.870	0.373	13.697	1.612	12.884	1.000
4	Std 3	7.853	0.953	13.483	4.178	12.484	2.472
5	Std 4	7.840	4.240	13.176	18.724	12.048	10.007
6	Std 5	7.793	12.366	13.625	51.979	12.670	24.999
7	SEQ-ICV	7.483	4.246	12.897	17.505	12.523	10.021
8	SEQ-ICB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
9	1110131-BLK1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
10	1110131-BS1	7.463	4.454	23.832	18.919	19.981	10.460
11	C111016-03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
12	1110131-DUP1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
13	1110131-MS1	7.453	4.084	16.460	17.356	15.861	9.676
14	1110131-MSD1	7.457	4.074	16.431	17.278	15.839	9.655
15	SEQ-CCV	7.460	4.309	13.250	18.368	12.485	10.155
16	SEQ-CCB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
17	STOP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Sum:	76.547	39.287	150.567	166.736	139.747	88.967
	Average:	7.655	3.929	15.057	16.674	13.975	8.897
	Rel.Std.Dev:	2.652 %	87.901 %	22.194 %	87.015 %	18.052 %	78.662 %

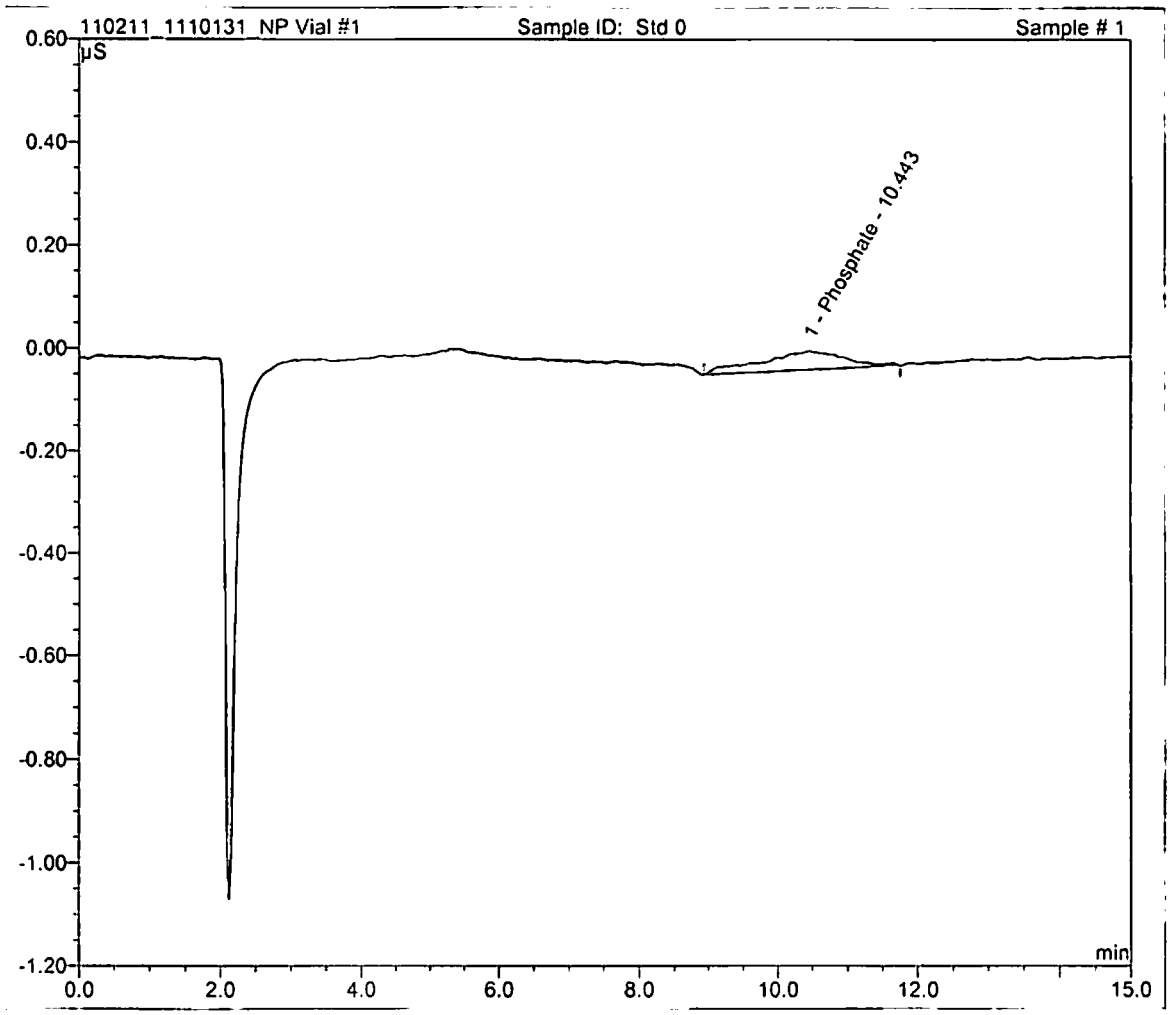
No.	Name	Time min Phosphate ECD_1	Area µS*min Phosphate ECD_1	Rel.Area % Phosphate ECD_1	Height µS Phosphate ECD_1	Rel.Height % Phosphate ECD_1	Amount mg/L Phosphate ECD_1
1	Std 0	10.443	0.051	100.000	0.036	100.000	0.366
2	Std 1	10.343	0.022	1.583	0.061	0.966	0.153
3	Std 2	10.333	0.069	2.540	0.140	1.115	0.503
4	Std 3	10.330	0.128	1.808	0.325	0.972	0.933
5	Std 4	10.333	0.557	1.732	1.440	0.927	4.012
6	Std 5	10.310	1.445	1.592	3.821	0.931	9.999
7	SEQ-ICV	9.960	3.766	11.440	9.818	7.024	23.865
8	SEQ-ICB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
9	1110131-BLK1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

10	1110131-BS1	9.973	0.667	3.569	1.545	1.632	4.779
11	C111016-03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
12	1110131-DUP1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
13	1110131-MS1	10.010	0.590	2.379	1.230	1.124	4.243
14	1110131-MSD1	10.010	0.601	2.422	1.247	1.143	4.315
15	SEQ-CCV	9.997	0.525	1.614	1.162	0.790	3.784
16	SEQ-CCB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
17	STOP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Sum:	112.043	8.420	130.678	20.826	116.623	56.953
	Average:	10.186	0.765	11.880	1.893	10.602	5.178
	Rel.Std.Dev:	1.875 %	140.648 %	247.184 %	149.936 %	280.175 %	131.820 %

No.	Name	Time min Sulfate ECD_1	Area µS*min Sulfate ECD_1	Rel.Area % Sulfate ECD_1	Height µS Sulfate ECD_1	Rel.Height % Sulfate ECD_1	Amount mg/L Sulfate ECD_1
1	Std 0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2	Std 1	11.693	0.591	43.002	1.663	26.388	5.682
3	Std 2	11.693	1.160	42.612	3.288	26.271	10.021
4	Std 3	11.697	3.035	42.948	8.841	26.417	24.067
5	Std 4	11.770	14.065	43.710	41.626	26.786	100.257
6	Std 5	11.850	39.974	44.046	107.337	26.163	249.973
7	SEQ-ICV	11.453	10.608	32.220	30.173	21.586	77.428
8	SEQ-ICB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
9	1110131-BLK1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
10	1110131-BS1	11.403	3.205	17.150	8.963	9.466	25.326
11	C111016-03	11.427	7.120	99.223	20.469	98.549	53.471
12	1110131-DUP1	11.433	7.096	99.133	20.429	98.670	53.308
13	1110131-MS1	11.453	10.586	42.666	30.551	27.919	77.280
14	1110131-MSD1	11.453	10.583	42.682	30.482	27.944	77.263
15	SEQ-CCV	11.467	14.467	44.484	41.666	28.322	102.859
16	SEQ-CCB	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
17	STOP	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Sum:	138.793	122.490	593.877	345.488	444.480	856.935
	Average:	11.566	10.208	49.490	28.791	37.040	71.411
	Rel.Std.Dev:	1.387 %	102.898 %	49.477 %	98.378 %	78.873 %	91.451 %

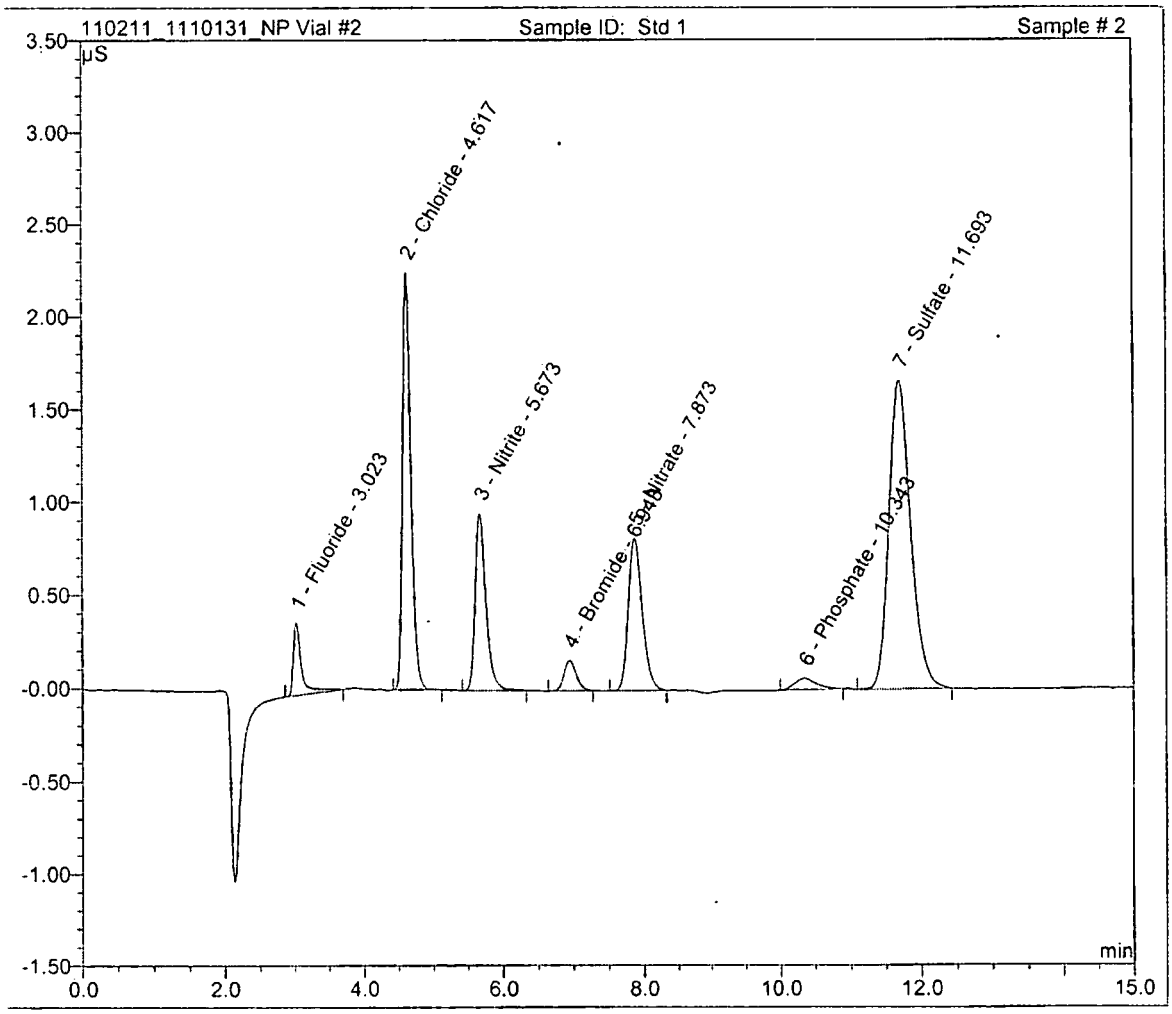
Sample Name:	**Std 0**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**1**
Inj. Date/Time:	**06.28.11 09:04**	*Run Number:*	**1**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	10.44	Phosphate	BMB	0.051	0.036	0.3659



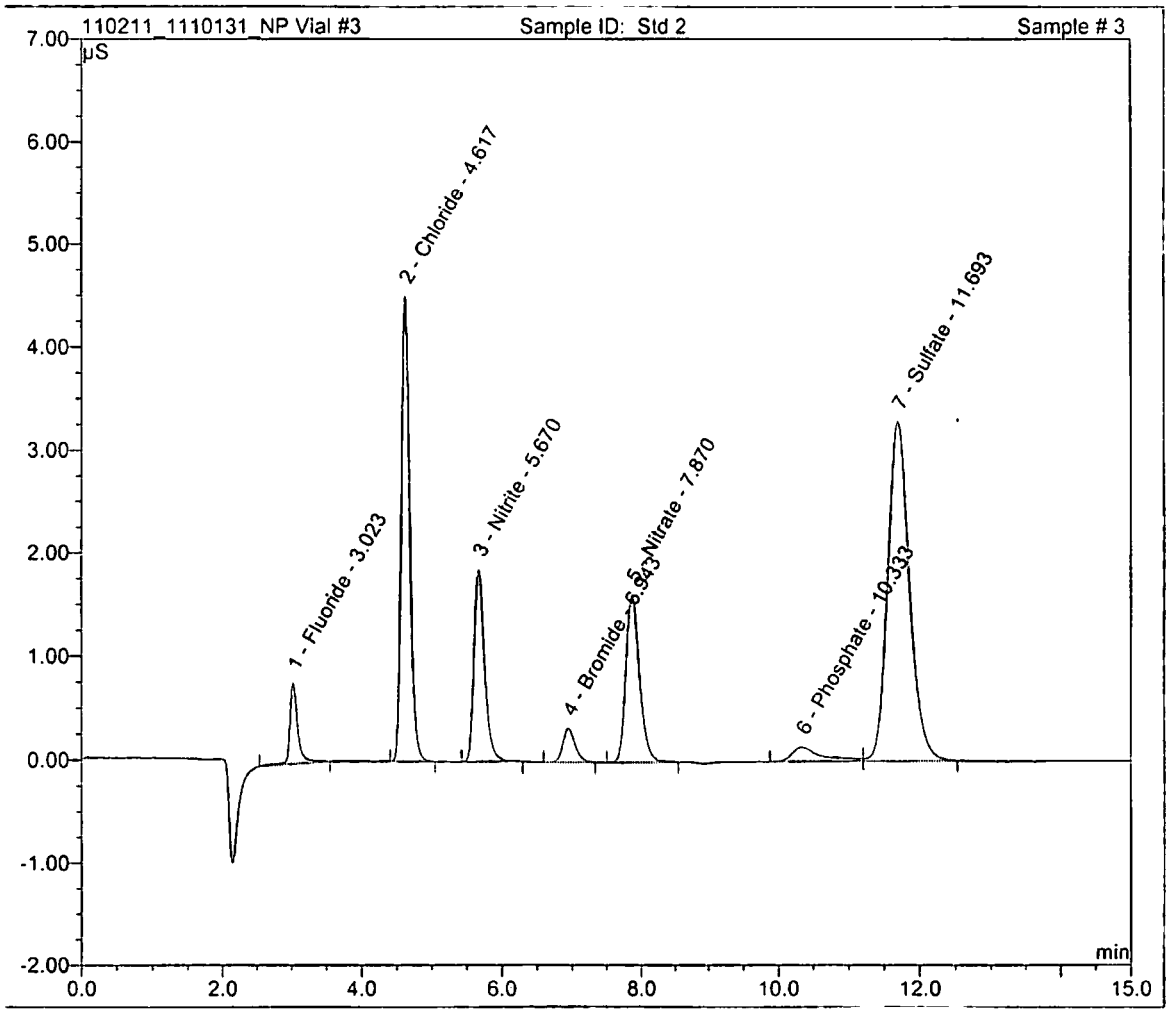
Sample Name:	**Std 1**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**2**
Inj. Date/Time:	**06.28.11 09:21**	*Run Number:*	**2**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.02	Fluoride	BMB	0.054	0.393	0.1975
2	4.62	Chloride	BMB	0.315	2.254	2.3540
3	5.67	Nitrite	BMB	0.171	0.951	0.5353
4	6.94	Bromide	BMB	0.033	0.164	0.4736
5	7.87	Nitrate	BMB	0.189	0.818	0.5209
6	10.34	Phosphate	BMB	0.022	0.061	0.1528
7	11.69	Sulfate	BMB	0.591	1.663	5.6818



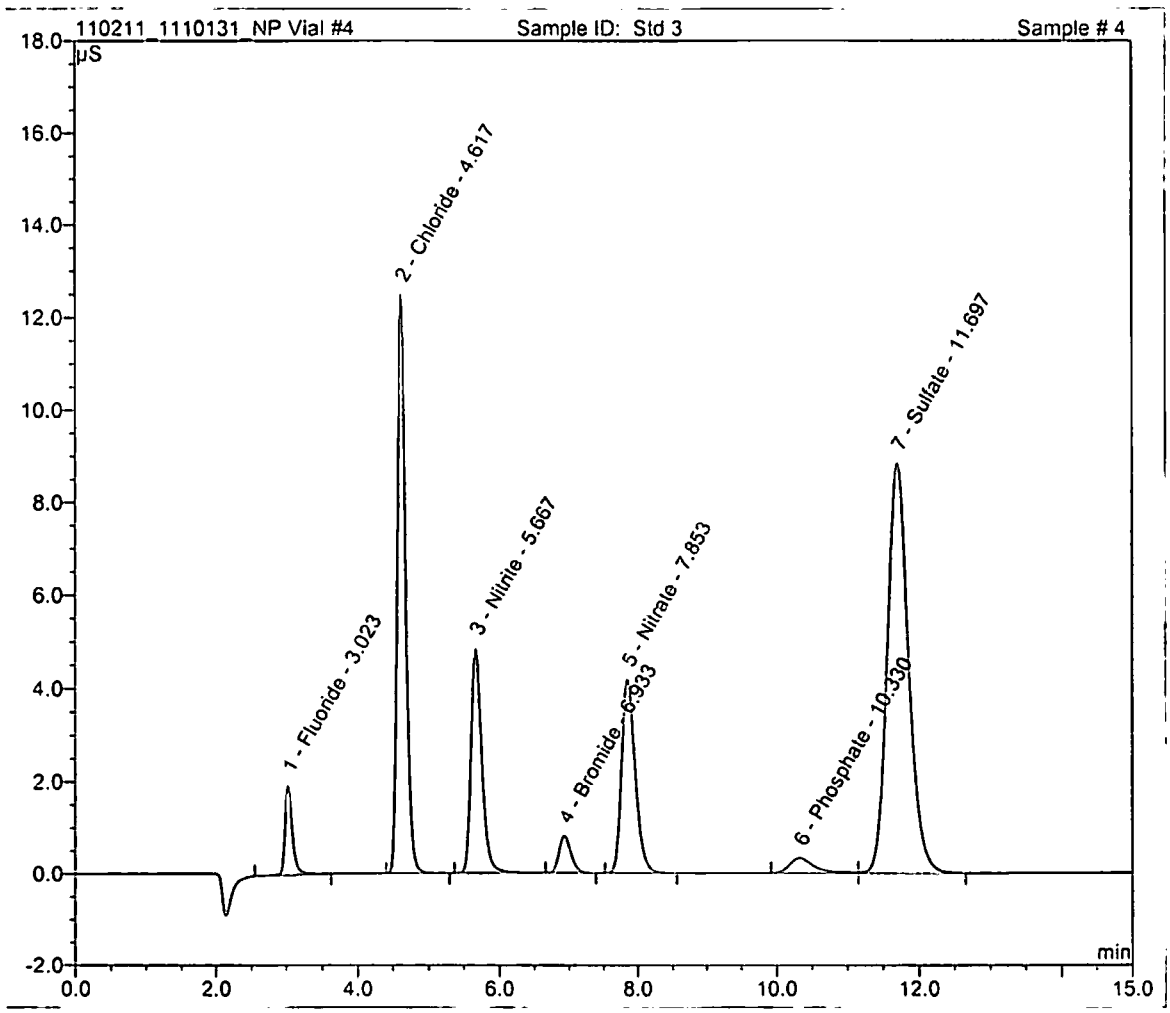
Sample Name:	**Std 2**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**3**
Inj. Date/Time:	**06.28.11 09:39**	*Run Number:*	**3**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.02	Fluoride	BMB	0.102	0.782	0.4068
2	4.62	Chloride	BMB	0.623	4.507	3.9937
3	5.67	Nitrite	BMB	0.329	1.860	0.9789
4	6.94	Bromide	BMB	0.066	0.326	1.0035
5	7.87	Nitrate	BMB	0.373	1.612	1.0002
6	10.33	Phosphate	BM	0.069	0.140	0.5030
7	11.69	Sulfate	MB	1.160	3.288	10.0211



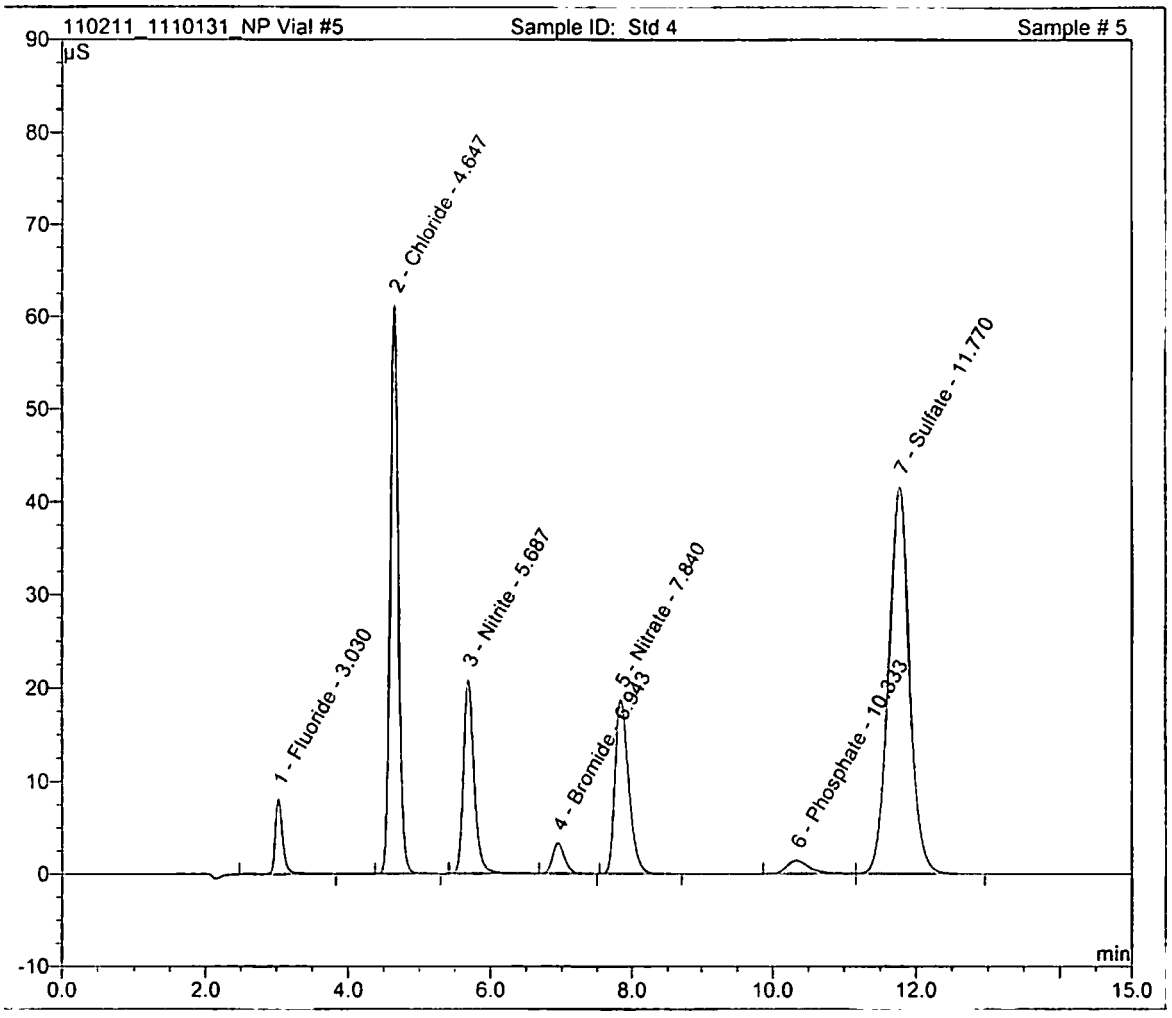
Sample Name:	Std 3	*Inj. Vol.:*	25.0
Sample Type:	standard	*Dilution Factor:*	1.0000
Program:	Program Anions Right	*Vial #:*	4
Inj. Date/Time:	06.28.11 09:57	*Run Number:*	4

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.02	Fluoride	BMB	0.239	1.961	0.9949
2	4.62	Chloride	BMB	1.681	12.495	9.5367
3	5.67	Nitrite	BMB	0.867	4.854	2.4787
4	6.93	Bromide	Rd	0.164	0.812	2.5313
5	7.85	Nitrate	BMB	0.953	4.178	2.4722
6	10.33	Phosphate	BM	0.128	0.325	0.9335
7	11.70	Sulfate	MB	3.035	8.841	24.0667



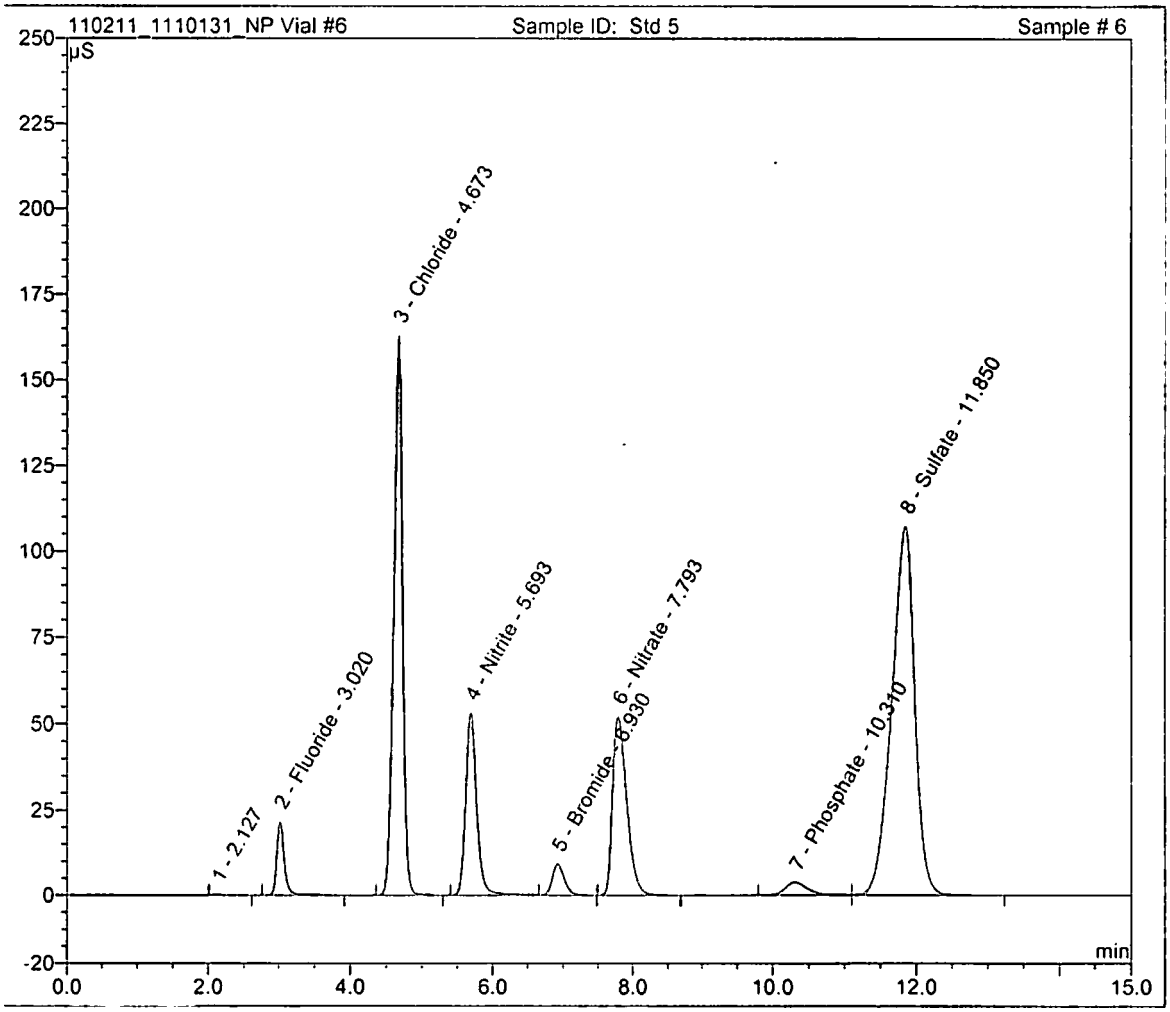
Sample Name:	**Std 4**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**5**
Inj. Date/Time:	**06.28.11 10:14**	*Run Number:*	**5**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.03	Fluoride	BMB	0.975	8.162	4.0010
2	4.65	Chloride	BMB	8.016	61.251	40.1288
3	5.69	Nitrite	BMB	3.662	20.863	10.0080
4	6.94	Bromide	Rd	0.663	3.336	9.9906
5	7.84	Nitrate	BMB	4.240	18.724	10.0074
6	10.33	Phosphate	BM	0.557	1.440	4.0119
7	11.77	Sulfate	MB	14.065	41.626	100.2571



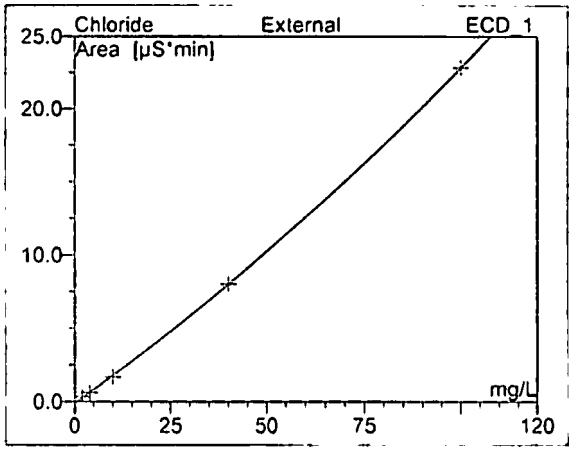
Sample Name:	**Std 5**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**6**
Inj. Date/Time:	**06.28.11 10:32**	*Run Number:*	**6**

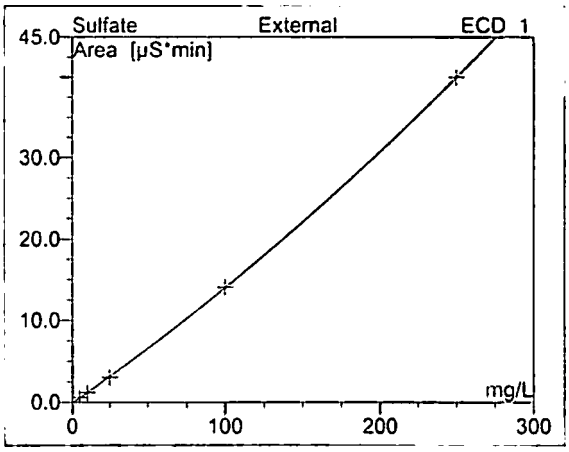
No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
2	3.02	Fluoride	BMB	2.626	21.667	9.9999
3	4.67	Chloride	BMB	22.833	162.961	99.9866
4	5.69	Nitrite	BM	9.699	53.125	24.9990
5	6.93	Bromide	Rd	1.782	9.146	25.0011
6	7.79	Nitrate	MB	12.366	51.979	24.9993
7	10.31	Phosphate	BM	1.445	3.821	9.9987
8	11.85	Sulfate	MB	39.974	107.337	249.9733

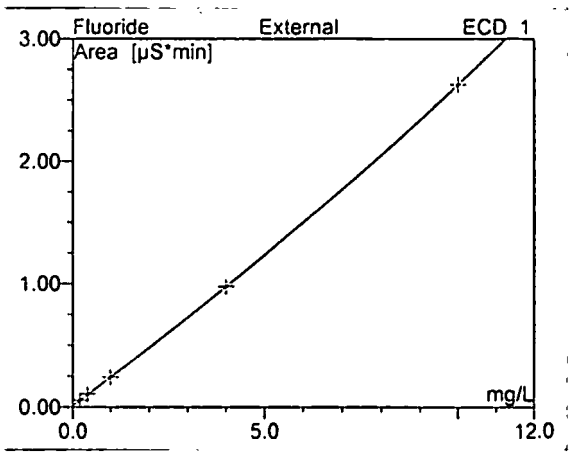


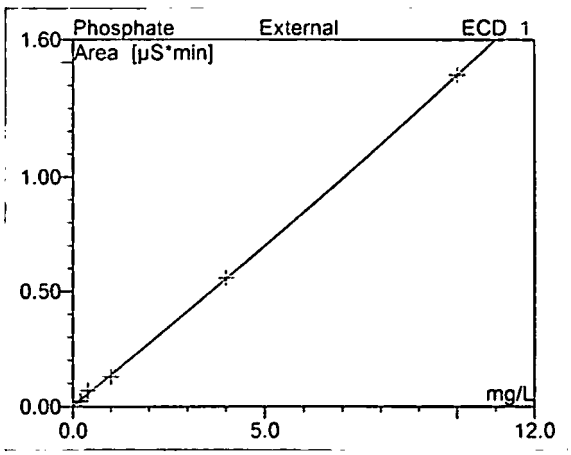
Calibration Batch Report

Sequence:	110211_1110131_NP	Inj. Vol.:	25.0
Program:	Program Anions Right	Operator:	ESAT
Inj. Date/Time:	06/28/11 10:32	Run Time:	15.00



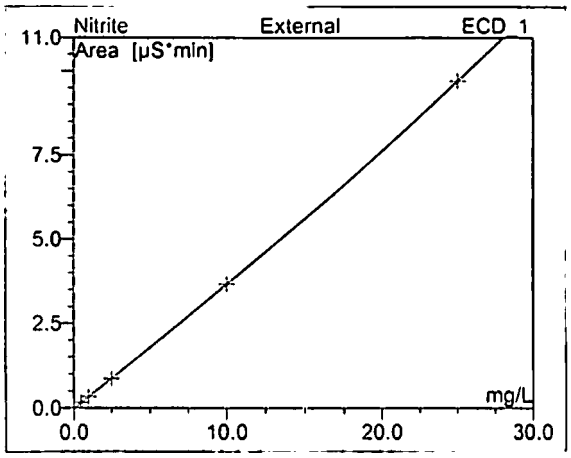


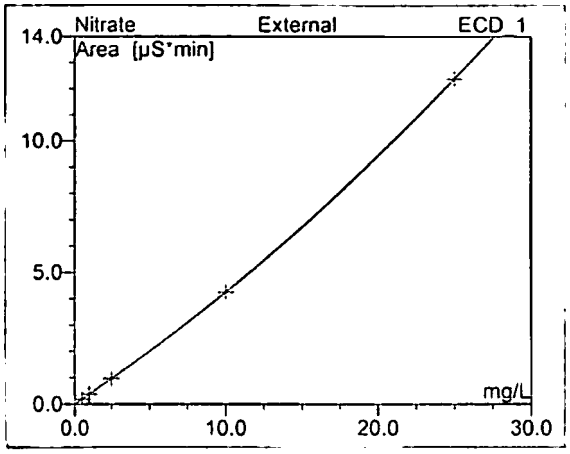


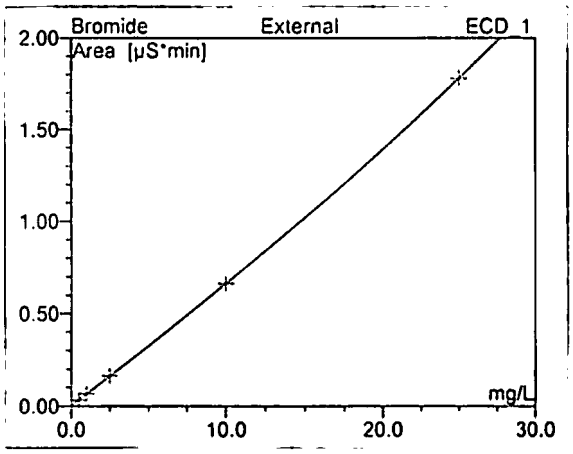


No.	Ret.Time min	Peak Name	Cal.Type	Points	Offset (C0)	Slope (C1)	Curve (C2)	Coeff.Det. %
2	3.02	Fluoride	QOff	5	0.009	0.228	0.003	99.9999
3	4.67	Chloride	QOff	5	-0.122	0.185	0.000	99.9964
4	5.69	Nitrite	QOff	5	-0.019	0.354	0.001	99.9996
5	6.93	Bromide	QOff	5	0.003	0.063	0.000	99.9997
6	7.79	Nitrate	QOff	5	-0.009	0.378	0.005	99.9998
7	10.31	Phosphate	QOff	5	0.001	0.135	0.001	99.9776
8	11.85	Sulfate	QOff	5	-0.147	0.129	0.000	99.9977
AVERAGE:					-0.0407	0.2101	0.0016	99.9958

Sequence:	**110211_1110131_NP**	*Inj. Vol.:*	**25.0**
Program:	**Program Anions Right**	*Operator:*	**n.a.**
Inj. Date/Time:	**06/28/11 10:32**	*Run Time:*	**15.00**



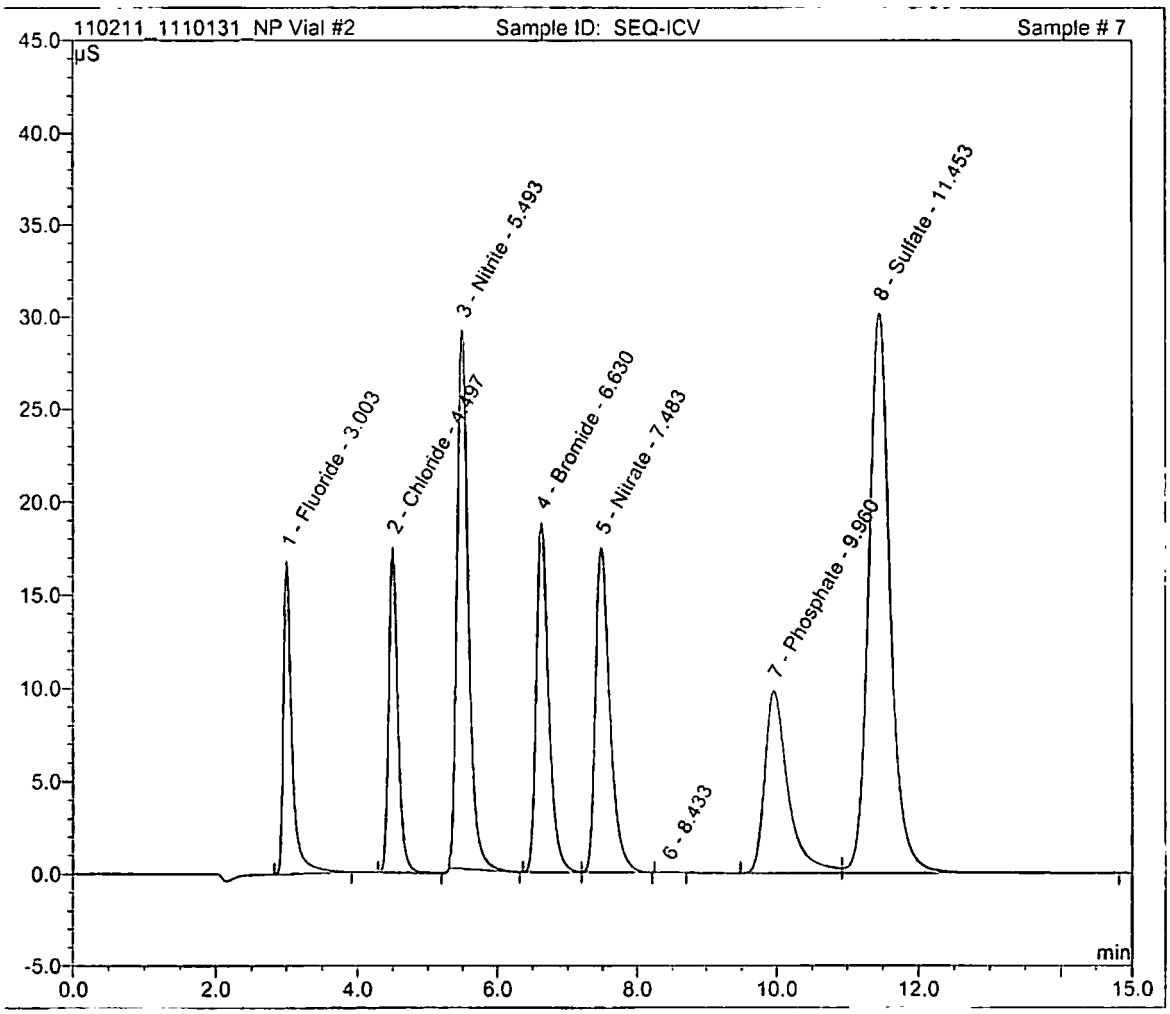




No.	Ret.Time min	Peak Name	Cal.Type	Points	Offset (C0)	Slope (C1)	Curve (C2)	Coeff.Det. %
2	3.02	Fluoride	QOff	5	0.009	0.228	0.003	99.9999
3	4.67	Chloride	QOff	5	-0.122	0.185	0.000	99.9964
4	5.69	Nitrite	QOff	5	-0.019	0.354	0.001	99.9996
5	6.93	Bromide	QOff	5	0.003	0.063	0.000	99.9997
6	7.79	Nitrate	QOff	5	-0.009	0.378	0.005	99.9998
7	10.31	Phosphate	QOff	5	0.001	0.135	0.001	99.9776
8	11.85	Sulfate	QOff	5	-0.147	0.129	0.000	99.9977
AVERAGE:					-0.0407	0.2101	0.0016	99.9958

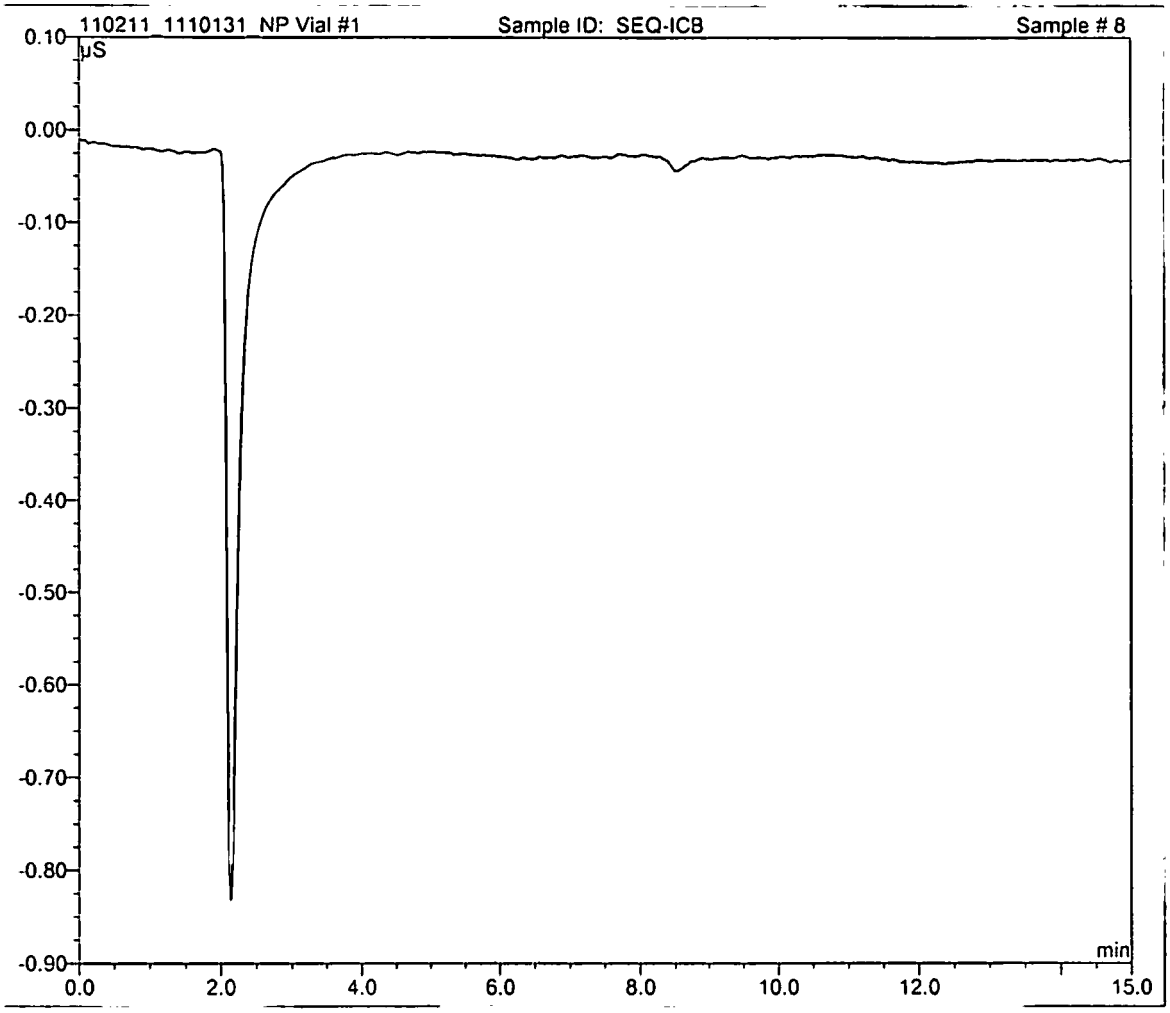
Sample Name:	**SEQ-ICV**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**2**
Inj. Date/Time:	**11.02.11 19:11**	*Run Number:*	7

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.00	Fluoride	BMB	2.392	16.865	9.1998
2	4.50	Chloride	BMB	2.604	17.545	14.2560
3	5.49	Nitrite	BMB	5.460	29.009	14.6400
4	6.63	Bromide	BM	3.839	18.836	48.4893
5	7.48	Nitrate	MB	4.246	17.505	10.0208
7	9.96	Phosphate	BM	3.766	9.818	23.8653
8	11.45	Sulfate	MB	10.608	30.173	77.4276



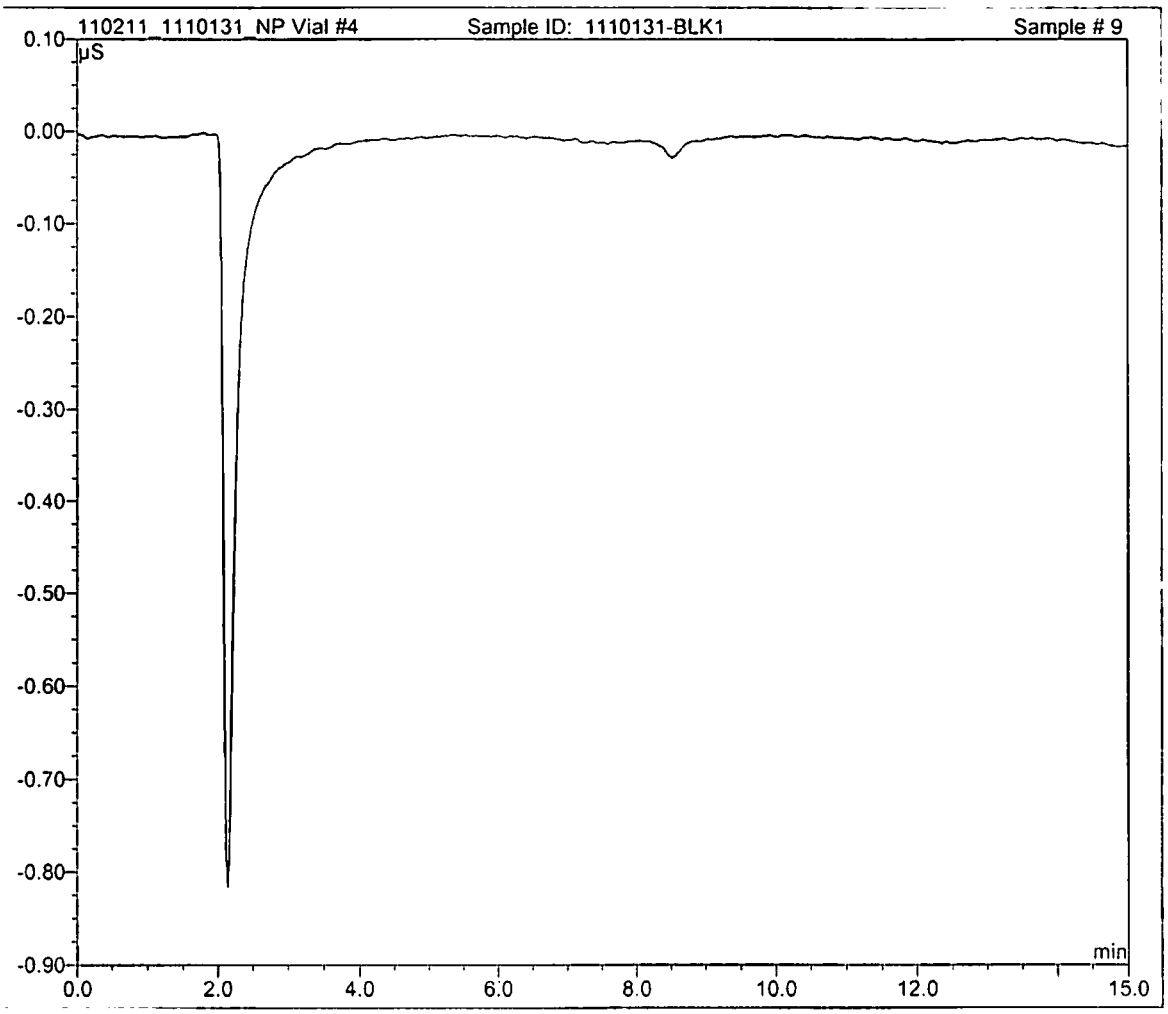
Sample Name:	SEQ-ICB	*Inj. Vol.:*	25.0
Sample Type:	unknown	*Dilution Factor:*	1.0000
Program:	Program Anions Right	*Vial #:*	1
Inj. Date/Time:	11.02.11 19:29	*Run Number:*	8

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L



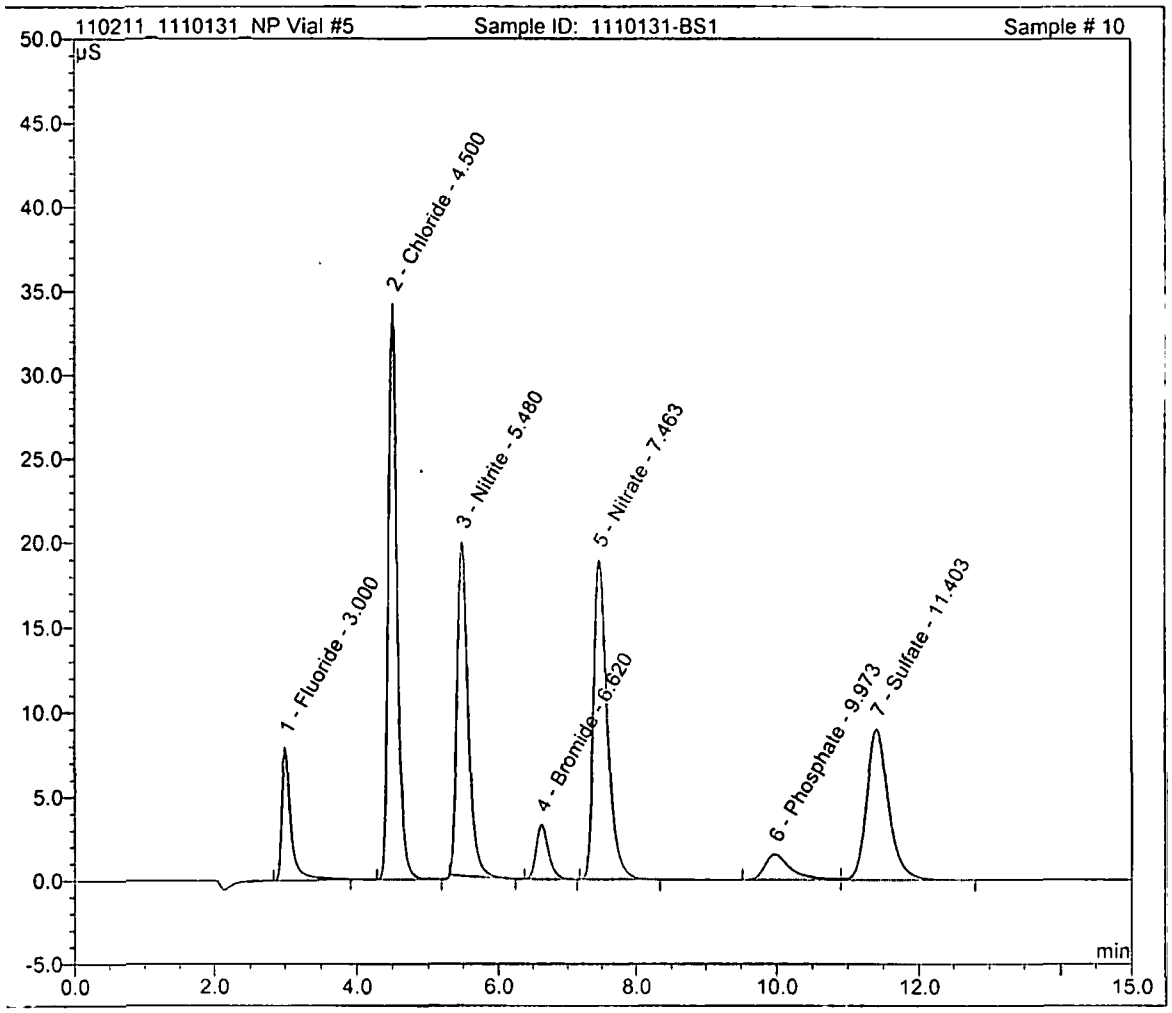
Sample Name:	**1110131-BLK1**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**4**
Inj. Date/Time:	**11.02.11 19:46**	*Run Number:*	**9**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L



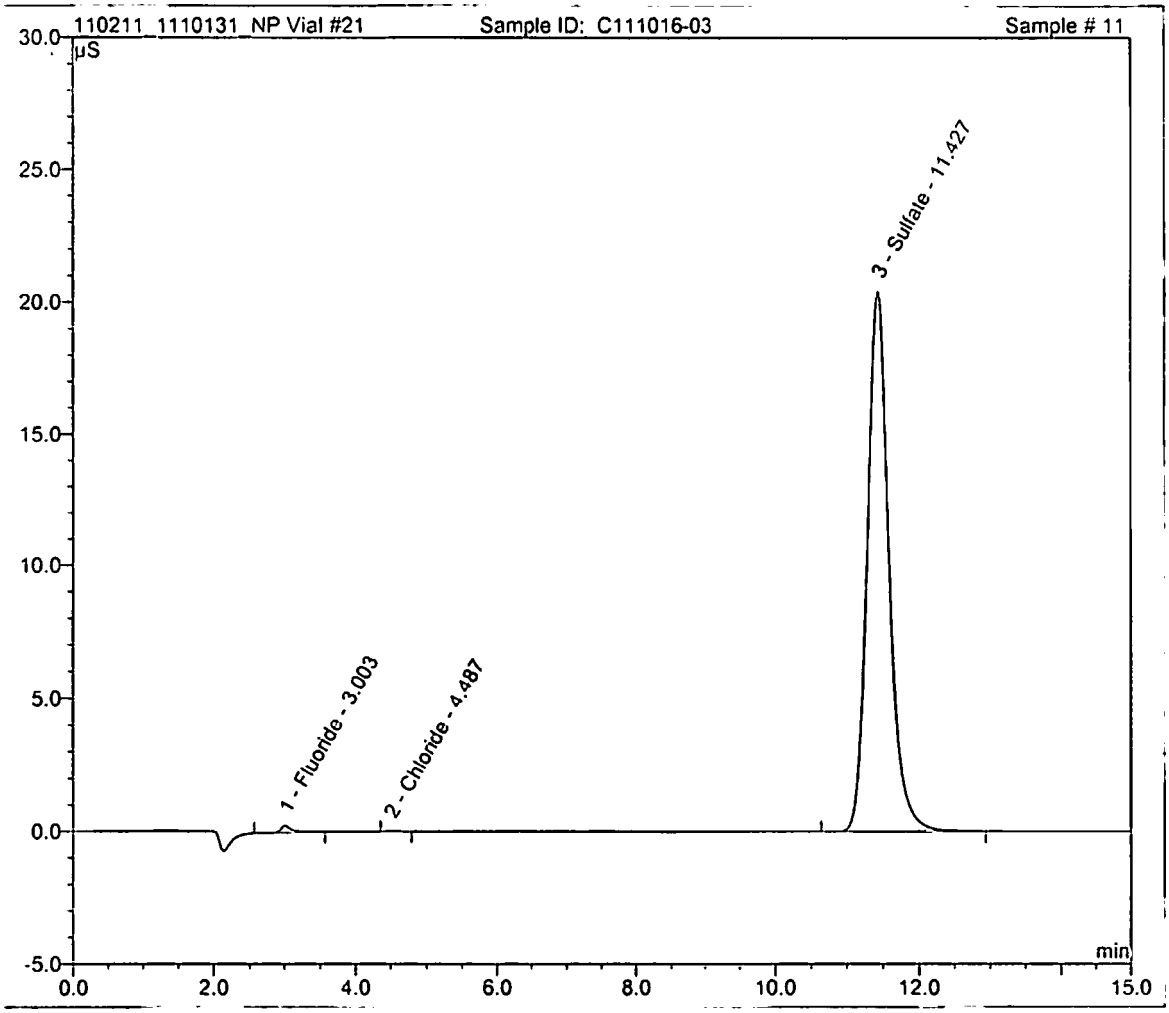
Sample Name:	**1110131-BS1**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**5**
Inj. Date/Time:	**11.02.11 20:04**	*Run Number:*	**10**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.00	Fluoride	BMB	1.163	7.967	4.7317
2	4.50	Chloride	BMB	4.890	34.217	25.5345
3	5.48	Nitrite	BMB	3.629	19.797	9.9220
4	6.62	Bromide	BMB	0.681	3.276	10.2537
5	7.46	Nitrate	BMB	4.454	18.919	10.4603
6	9.97	Phosphate	BM	0.667	1.545	4.7793
7	11.40	Sulfate	MB	3.205	8.963	25.3260



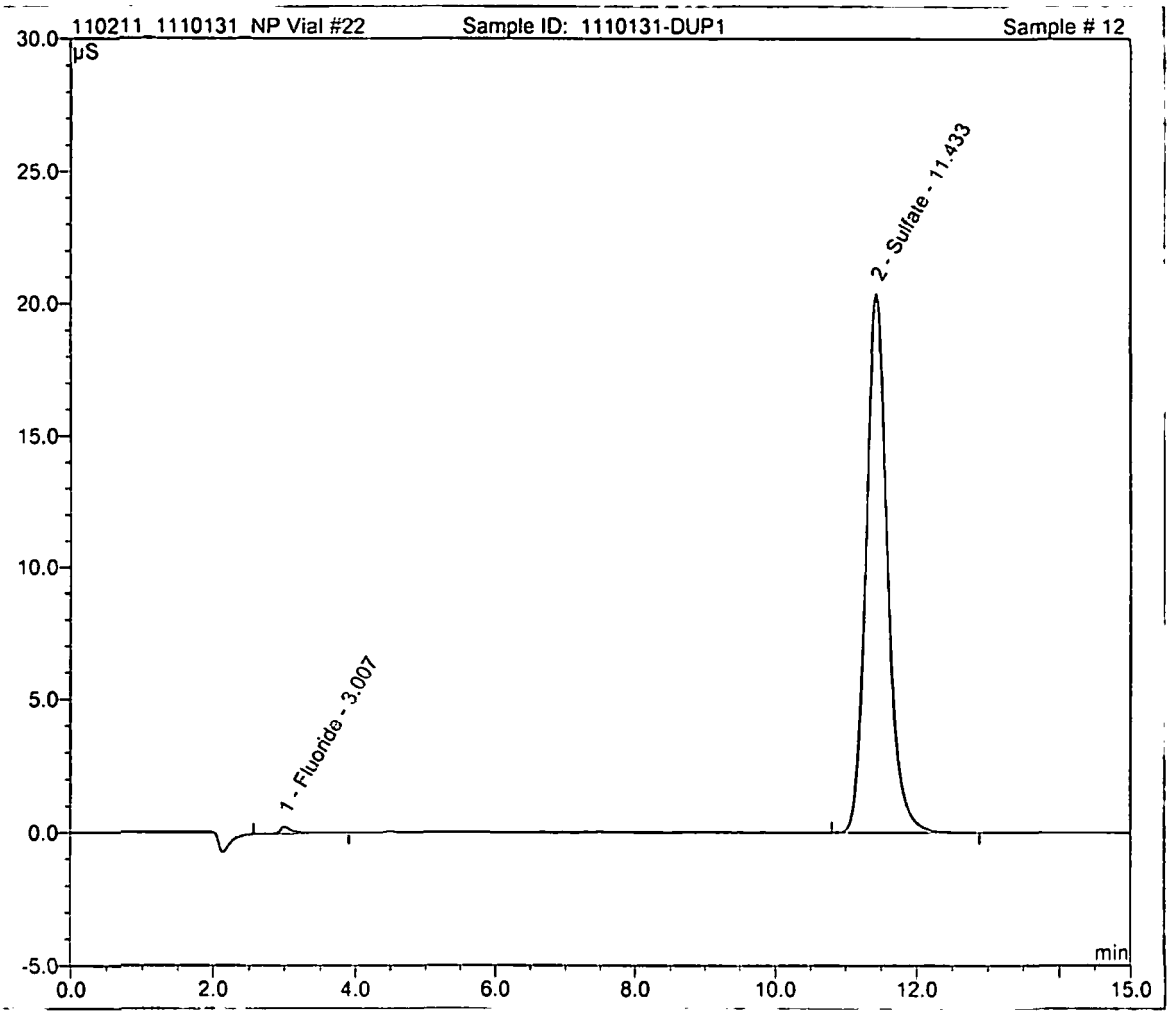
Sample Name:	C111016-03	*Inj. Vol.:*	25.0
Sample Type:	unknown	*Dilution Factor:*	1.0000
Program:	Program Anions Right	*Vial #:*	21
Inj. Date/Time:	11.02.11 20:21	*Run Number:*	11

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.00	Fluoride	BMB	0.051	0.268	0.1818
2	4.49	Chloride	BMB	0.005	0.033	0.6878
3	11.43	Sulfate	BMB	7.120	20.469	53.4706



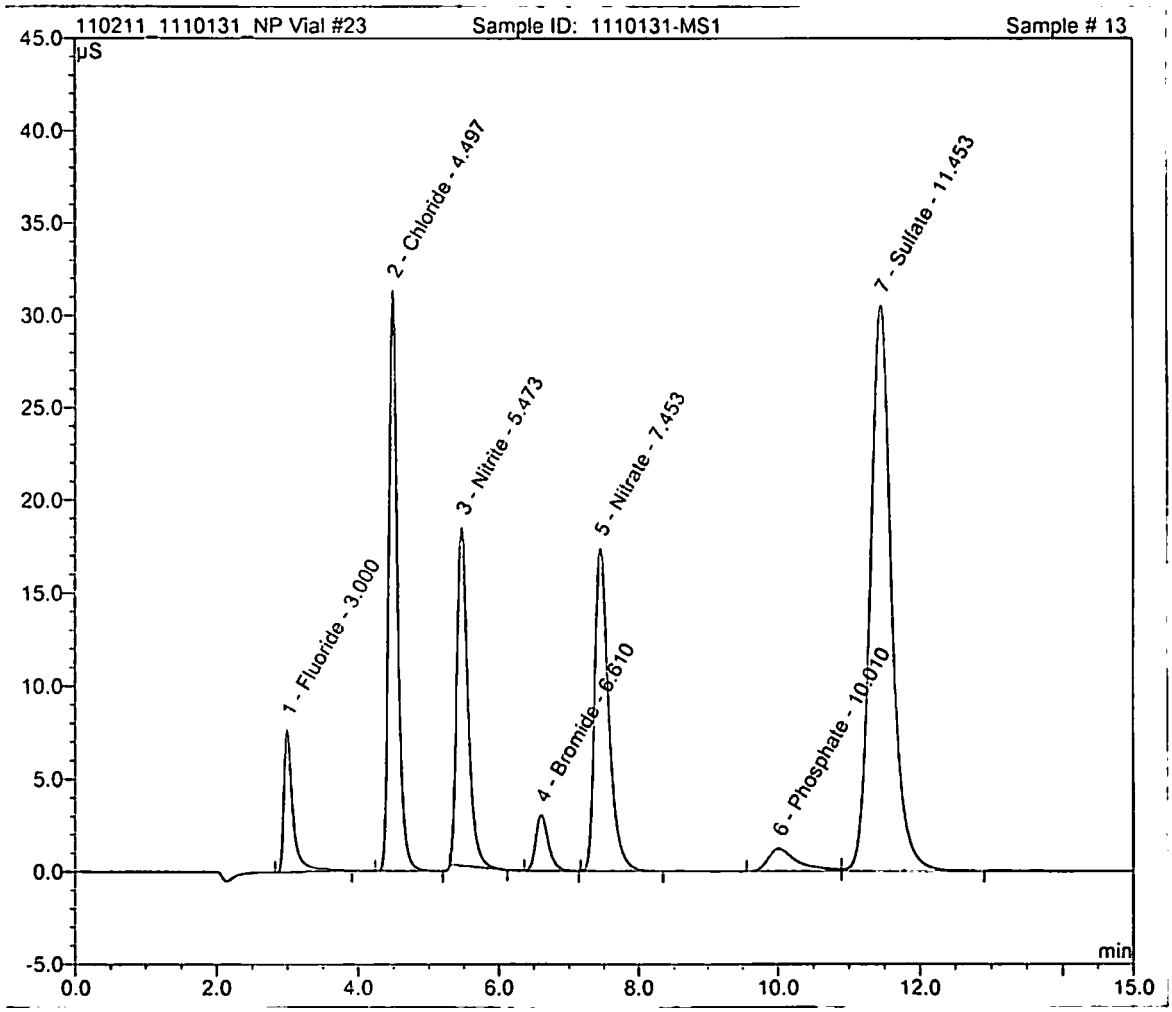
Sample Name:	1110131-DUP1	*Inj. Vol.:*	25.0
Sample Type:	unknown	*Dilution Factor:*	1.0000
Program:	Program Anions Right	*Vial #:*	22
Inj. Date/Time:	11.02.11 20:39	*Run Number:*	12

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.01	Fluoride	BMB	0.062	0.275	0.2319
2	11.43	Sulfate	BMB	7.096	20.429	53.3081



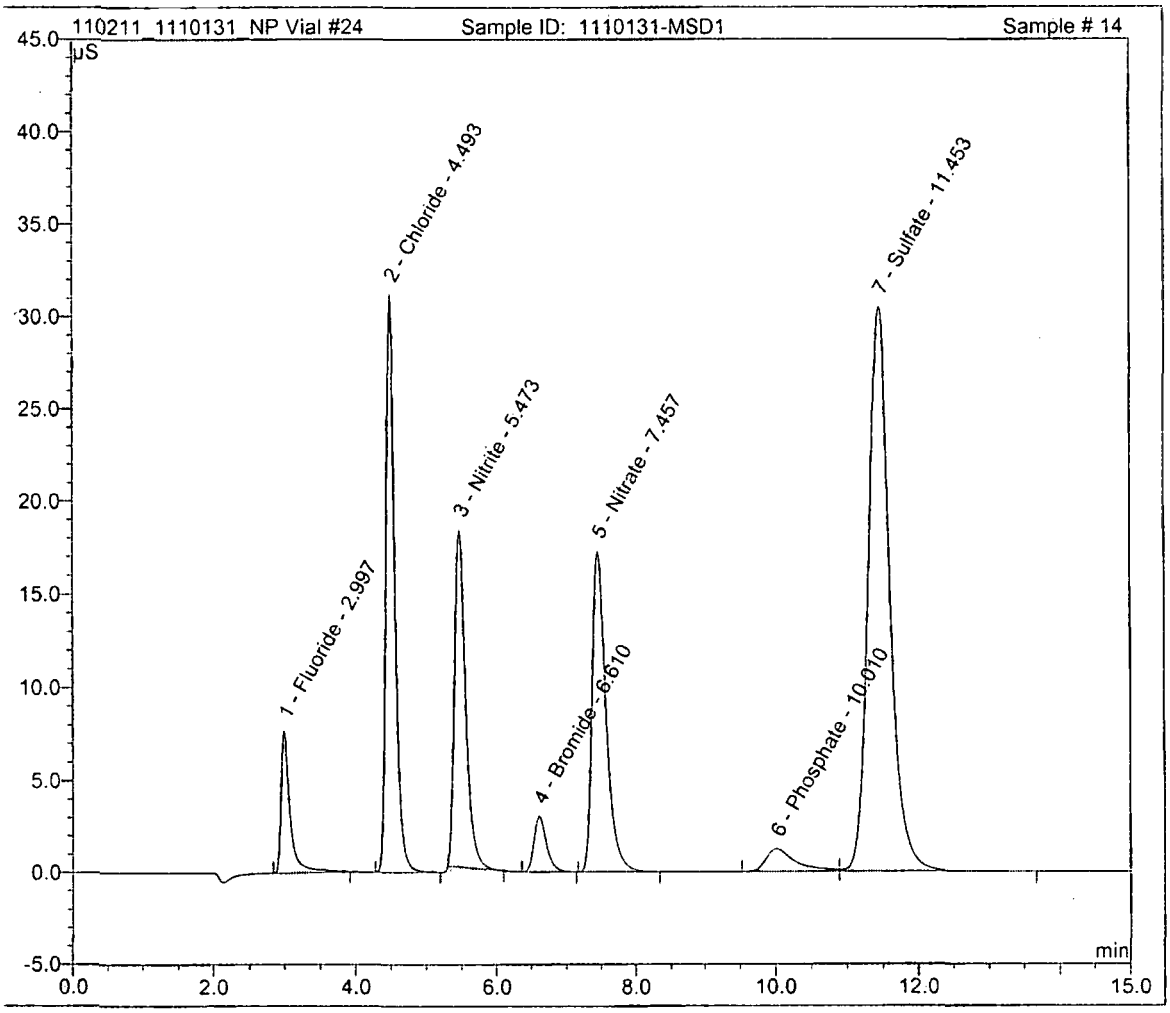
Sample Name:	1110131-MS1	*Inj. Vol.:*	25.0
Sample Type:	unknown	*Dilution Factor:*	1.0000
Program:	Program Anions Right	*Vial #:*	23
Inj. Date/Time:	11.02.11 20:57	*Run Number:*	13

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.00	Fluoride	BMB	1.138	7.714	4.6348
2	4.50	Chloride	BMB	4.482	31.329	23.5617
3	5.47	Nitrite	BMB	3.298	18.206	9.0504
4	6.61	Bromide	BMB	0.633	3.042	9.5618
5	7.45	Nitrate	BMB	4.084	17.356	9.6758
6	10.01	Phosphate	BM	0.590	1.230	4.2429
7	11.45	Sulfate	MB	10.586	30.551	77.2798



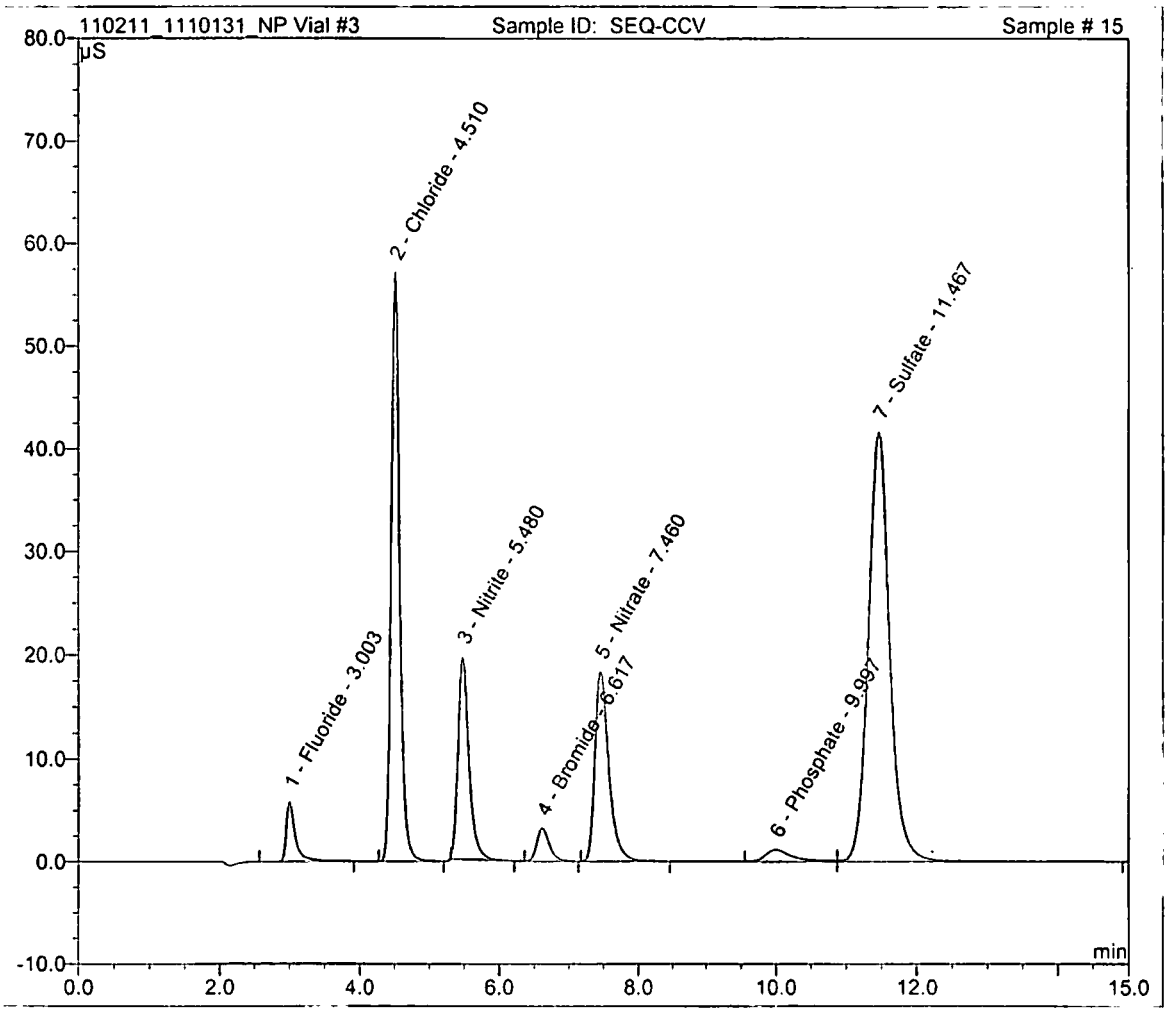
Sample Name:	**1110131-MSD1**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**24**
Inj. Date/Time:	**11.02.11 21:14**	*Run Number:*	**14**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.00	Fluoride	BMB	1.137	7.691	4.6282
2	4.49	Chloride	BMB	4.477	31.212	23.5401
3	5.47	Nitrite	BMB	3.292	18.142	9.0351
4	6.61	Bromide	BMB	0.632	3.029	9.5409
5	7.46	Nitrate	BMB	4.074	17.278	9.6547
6	10.01	Phosphate	BM	0.601	1.247	4.3155
7	11.45	Sulfate	MB	10.583	30.482	77.2633



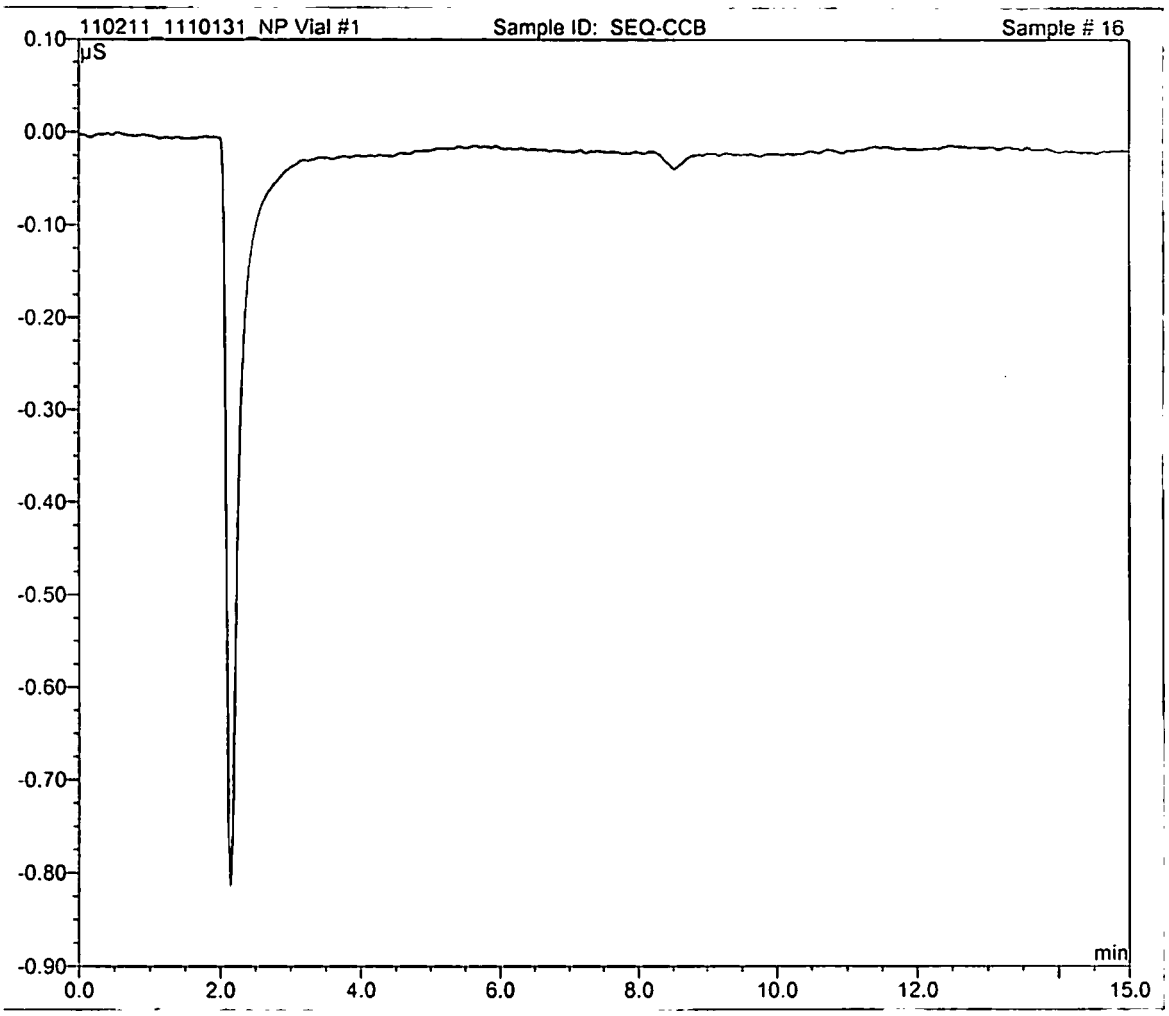
Sample Name:	**SEQ-CCV**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**3**
Inj. Date/Time:	**11.02.11 21:32**	*Run Number:*	**15**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L
1	3.00	Fluoride	BMB	0.883	5.913	3.6382
2	4.51	Chloride	BMB	8.092	57.183	40.4693
3	5.48	Nitrite	BMB	3.576	19.589	9.7835
4	6.62	Bromide	BMB	0.670	3.236	10.0964
5	7.46	Nitrate	BMB	4.309	18.368	10.1549
6	10.00	Phosphate	BM	0.525	1.162	3.7844
7	11.47	Sulfate	MB	14.467	41.666	102.8592



Sample Name:	**SEQ-CCB**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**Program Anions Right**	*Vial #:*	**1**
Inj. Date/Time:	**11.02.11 21:49**	*Run Number:*	**16**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount mg/L



Sample Name:	n.a.	*Inj. Vol.:*	25.0
Sample Type:	unknown	*Dilution Factor:*	1.0000
Program:	Program Stop	*Vial #:*	1
Inj. Date/Time:	n.a.	*Run Number:*	17

n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

110211_1110131_NP Vial #1 Sample ID: STOP Sample # 17

Can't open raw data file "C:\Chromel\data\Right_system\Sequences and Data\2011 ESAT\110211_1110131_NP.SEQ\ECD_1.CHL\66.acd".
The system cannot find the file specified.

PERKIN ELMER OPTIMA 4300DV ICP-OE

Project(s): Rio-Argentina Oct 2011 Date: 11 / 28 / 2011

Work Order(s): C111016 TDF: DG-264 Analyst: S. Walker

Batch Preparation Information

Digest / Prep: TR / Total / Diss.

Matrix: Water / Soil / Other

Batch ID: 111097 / 111087

Data Storage

Data File: X:/Metals Data Files/2011/DG 264_ 111097_ 111128.prn

Standard Information

Calibration Std. # 1 = Reagent Blank Solution

ICV: *(LIMS ID: 1041203)*

Prepped: 10-11-11 By: SW

CRQL Stock: *(LIMS ID: 1041206)*
Prepped: 4-12-2011 By: SV

CRQL Daily *(LIMS ID: 1041207)*

Prepped: 11-28-11 By: SW

Calibration Std. # 2 = ESAT High, LIMS: 1041201

Prepped: 8-26-11 By: SW

CCV: 1:2 of 1041201 *(LIMS ID: 1041202)*

Prepped: 11-28-11 By: SW

ICSA: 1041204 **Prepped: 4-12-2011**

ICSAB: 1041205 **Prepped: 4-12-2011**

Spike Information

Dissolved Spikes

Sample ID: C111016-01

Sample ID: —

Sample vol: 10 mL

PSS2007-219: 100 uL
QCS-3 Exp: 3-1-2012 (LIMS ID: 1050201)

SS-114-044: 100 uL
Salt Spike Prepped 4-12-2011 *(LIMS ID: 1041104)*

Tot. / Tot. Rec. Spikes

Sample ID: C111016-02

Sample Vol: 50 mL

PSS2007-220: 500 uL
WW-LFS1 Exp: 3-1-2012 *(LIMS ID: 1040736)*

PSS2007-221: 500 uL
WW-LFS2 Exp: 3-1-2012 *(LIMS ID: 1040737)*

Comments / Maintenance

Replace Nebulizer? Y / N New pump tubing? Y / N Replace torch or injector? Y / N

Analytes Reported:

Ag, Al, As, Ba, Be, B, Ca, Cd, Co, Cr, Cu, Fe, K, Mg,

Mn, Mo, Na, Ni, Pb, Sb, Se, SiO2, Sr, Ti, Tl, V, Zn

Sequence ID: 111100 / 111101

Lims Entry (Date / Init): 11/28/11