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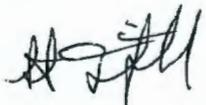
# FLUOR

## Memorandum

M4W41-SLF-08-319

To: H. Hampt E6-35 Date: March 24, 2008

From: S. L. Fitzgerald, Manager  
WSCF Analytical Lab



cc: w/Attachments

T. F. Dale	S3-30	C.J. Thompson (PNNL)	K6-96
D. Felmy (PNNL)	K6-75	J. E. Trechter	S3-30
H. K. Meznarich	S3-30	S. J. Trent	E6-35
P. D. Mix	S3-30	File/LB	

Subject: RDR# R4720 - SAMPLE DELIVERY GROUP WSCF20071517

- Reference:
- 1) Memo, SL Fitzgerald to H Hampt, Final Results for SDG WSCF20071517 (M4W41-SLF-07-700), dated October 2, 2007
  - 2) Letter of Instruction for Analytical Services for the Groundwater Performance Assessment Project and Analytical Laboratory Transition Plan, FH-0602422, September 19, 2006
  - 3) HNF-SD-CD-QAPP-017, Rev. 8, Waste Sampling & Characterization Facility Quality Assurance Plan

On March 19, 2008, RDR #R4720 was received by the WSCF Laboratory. After review of the data, the Fluoride result was manually integrated and corrected. This transmittal contains the following RDR information for sample delivery group WSCF WSCF20071517:

- Cover Sheet (Attachment 1)
- Analytical Results (Attachment 2)
- DIONEX (Raw Data) (Attachment 3)
- Recheck, Recount, or Reanalysis Order #R4720, dated March 19, 2008 (Attachment 4)

SLF/grf

Attachments 4

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M4W41-SLF-08-319

ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

## WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20071517  
Data Deliverable Date: 04-oct-2007  
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix
I07-062	B1P665	W07P001558	WATER
	B1P666	W07P001559	WATER
	B1P696	W07P001563	WATER
	B1P697	W07P001564	WATER
	B1P6B1	W07P001565	WATER
	B1P6B2	W07P001566	WATER
	B1P6B6	W07P001561	WATER
	B1P6B7	W07P001562	WATER
	B1P6C8	W07P001567	WATER
	B1P6C9	W07P001568	WATER
	B1P6F3	W07P001569	WATER
	B1P6F4	W07P001573	WATER
	B1P6F8	W07P001570	WATER
	B1P6F9	W07P001574	WATER
	B1P6H3	W07P001571	WATER
	B1P6H4	W07P001576	WATER
	B1P6H8	W07P001572	WATER
	B1P6H9	W07P001575	WATER
W07-008	B1P8P6	W07P001554	WATER
	B1P8W6	W07P001578	WATER
	B1P9F4	W07P001552	WATER
	B1P9F9	W07P001553	WATER
	B1P9H4	W07P001555	WATER
	B1P9H9	W07P001556	WATER
	B1P9J4	W07P001557	WATER
	B1P9X6	W07P001560	WATER
B1PB22	W07P001577	WATER	

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ATTACHMENT 2

**ANALYTICAL RESULTS**

Consisting of 2 pages  
Including cover page

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35  
**SAF Number:** W07-008  
**Sample #** W07P001552  
**Client ID:** B1P9F4 PNNL-GPP  
WSCF

**Matrix:** WATER

**Group #:** WSCF20071517  
**Department:** Inorganic  
**Sampled:** 08/23/07  
**Received:** 08/23/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Anions by Ion Chromatography</b>											
Fluoride	16984-48-8	LA-533-410	BDX	0.248	mg/L			3.00	0.018		08/24/07
Chloride	16887-00-6	LA-533-410	D	56.9	mg/L			33.00	0.99		08/24/07
Nitrogen in Nitrite	NO2-N	LA-533-410	DU	< 0.0300	mg/L			3.00	0.030		08/24/07
Nitrogen in Nitrate	NO3-N	LA-533-410	D	96.4	mg/L			33.00	0.16		08/24/07
Sulfate	14808-79-8	LA-533-410	D	189	mg/L			33.00	2.3		08/24/07
<b>Cyanide</b>											
Cyanide	57-12-5	LA-695-402		10.4	ug/L			1.00	4.0		08/30/07
<b>Total Alkalinity as mg/L CaCO3</b>											
Total Alkalinity as mg/L CaCO3	ALKALINITY	LA-531-411		95.0	mg/L			1.00	1.0		08/31/07

**MDL=Minimum Detection Limit**  
**RQ=Result Qualifier**  
**TP Err=Total Propagated Error**  
**DF=Dilution Factor**

B - The analyte < the RDL but > = the IDL/MDL (inorg)  
 D - Analyte was identified at a secondary dilution factor(inorg)  
 X - Other flags/notes described in the comments/narrative(inorg)

C - The Analyte was found in the Associated Blank. (inorg)  
 U - Analyzed for but not detected above limiting criteria(inorg)

\* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2  
 GPAP

M4W41-SLF-08-319

ATTACHMENT 3

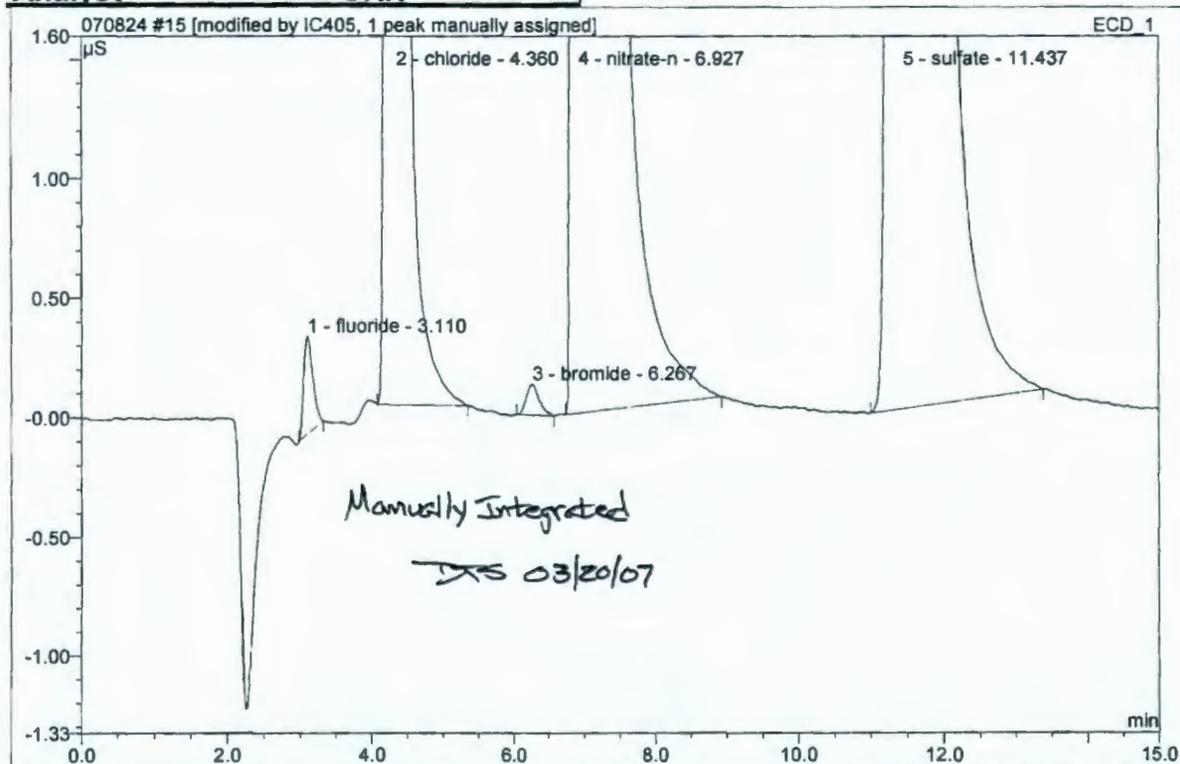
**DIONEX (Raw Data)**

Consisting of 17 pages  
Including cover page

**15 W07P001552**

Sample Name:	W07P001552	Injection Volume:	20.0
Recording Time:	8/24/2007 10:13		
Vial Number:	5	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	3
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

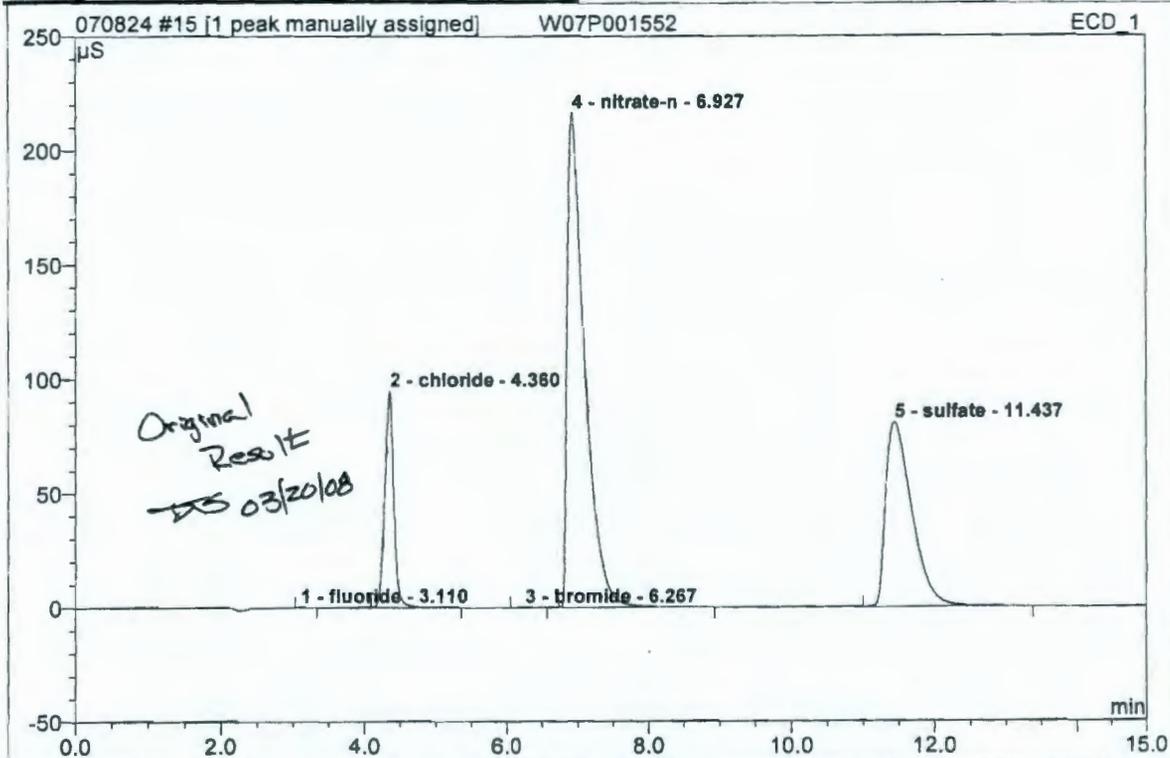


No.	Ret. Time min	Peak Name	Amount ppm	Area μS*min	Rel. Area %	Height μS	Type
1	3.11	fluoride	0.2481	0.060	0.055	0.410	BMB*
2	4.36	chloride	53.8624	13.796	12.655	94.677	BMB
3	6.27	bromide	0.3764	0.026	0.024	0.129	BMB
4	6.93	nitrate-n	64.0968	60.905	55.867	216.558	BMB^
5	11.44	sulfate	183.4453	34.230	31.399	80.647	BMB
Total:			302.029	109.018	100.000	392.42	

**15 W07P001552**

Sample Name:	W07P001552	Injection Volume:	20.0
Recording Time:	8/24/2007 10:13		
Vial Number:	5	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	3
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst **CRN**



No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	3.11	fluoride	0.1809	0.044	0.040	0.336	BMB
2	4.36	chloride	53.8624	13.796	12.657	94.677	BMB
3	6.27	bromide	0.3764	0.026	0.024	0.129	BMB
4	6.93	nitrate-n	64.0968	60.905	55.875	216.558	BMB^
5	11.44	sulfate	183.4453	34.230	31.403	80.647	BMB
<b>Total:</b>			301.962	109.002	100.000	392.35	

Batch

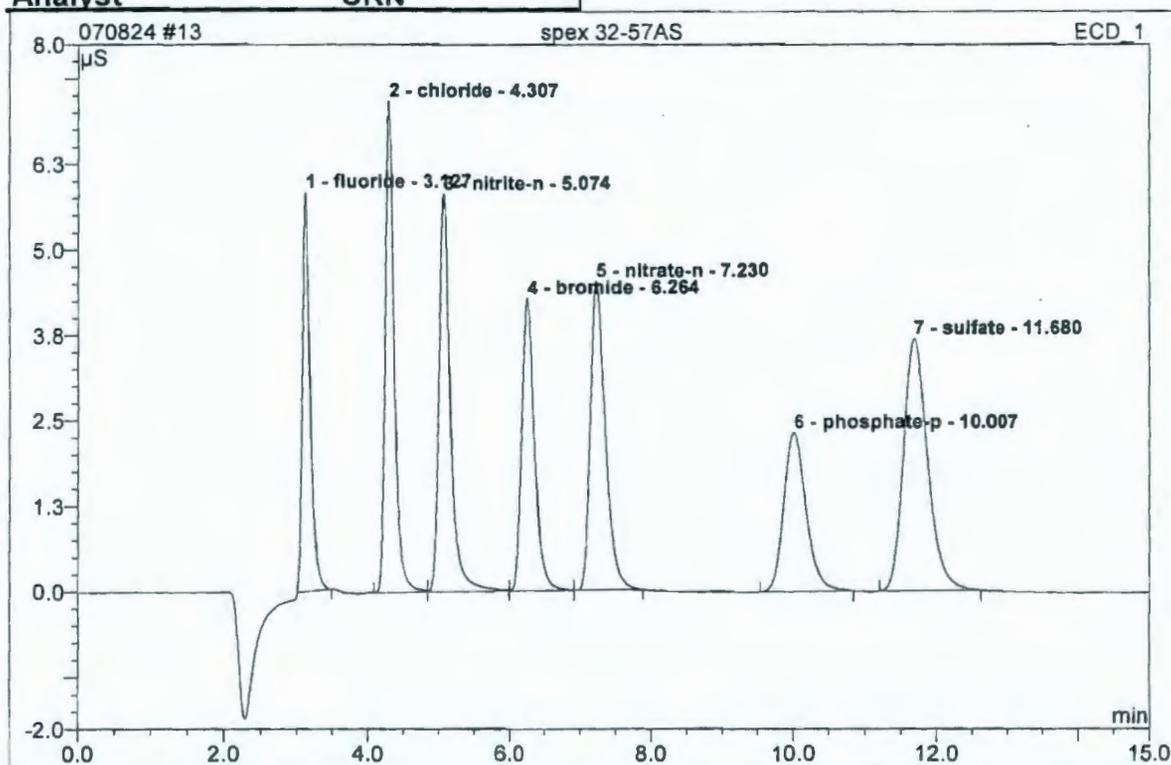
QC

DTS 03/20/08

**13 spex 32-57AS**

Sample Name:	spex 32-57AS	Injection Volume:	20.0
Recording Time:	8/24/2007 9:33		
Vial Number:	3	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	102
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

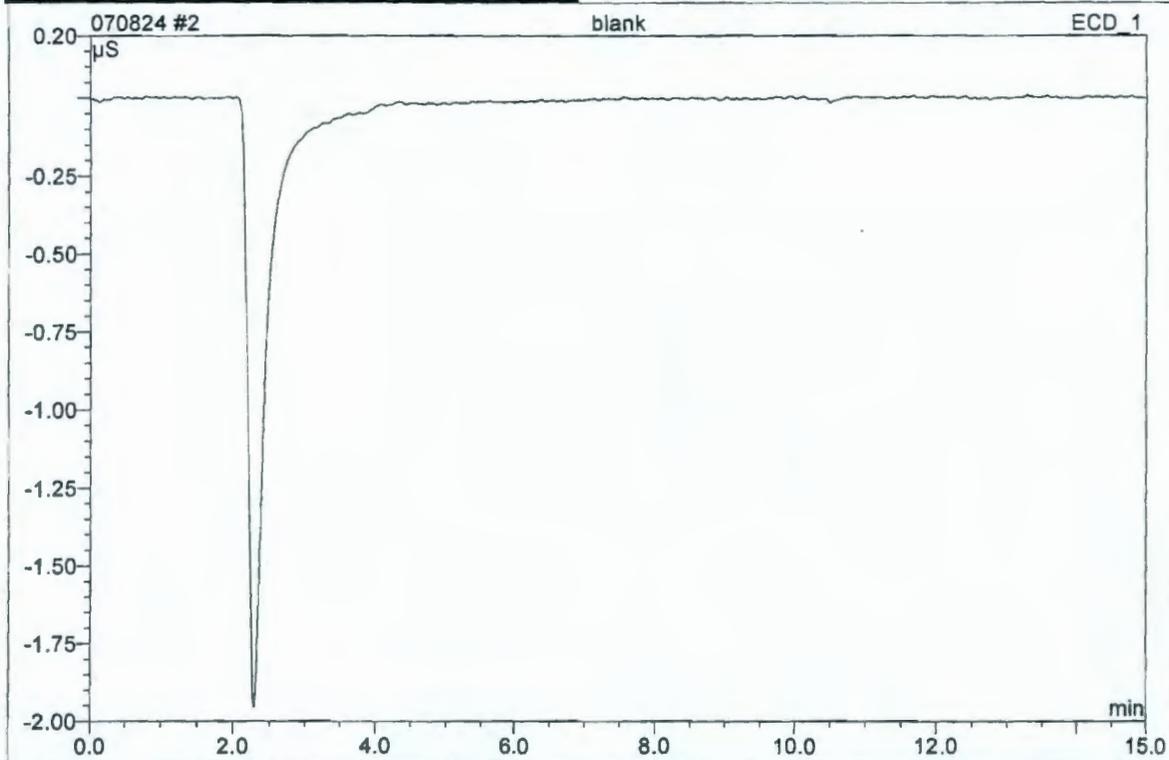


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	3.13	fluoride	99.2499	0.733	10.314	5.832	BMB
2	4.31	chloride	197.0095	1.037	14.580	7.181	BM
3	5.07	nitrite-n	97.4584	1.078	15.159	5.812	M
4	6.26	bromide	400.5091	0.877	12.330	4.279	M
5	7.23	nitrate-n	90.8361	1.096	15.406	4.514	MB
6	10.01	phosphate-p	190.2144	0.842	11.847	2.327	BMB
7	11.68	sulfate	378.7397	1.448	20.364	3.691	BMB
<b>Total:</b>			1454.017	7.111	100.000	33.64	

**2 blank**

Sample Name:	blank	Injection Volume:	20.0
Recording Time:	8/24/2007 9:14		
Vial Number:	1	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	XQuad	Dilution Factor:	1
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst **CRN**

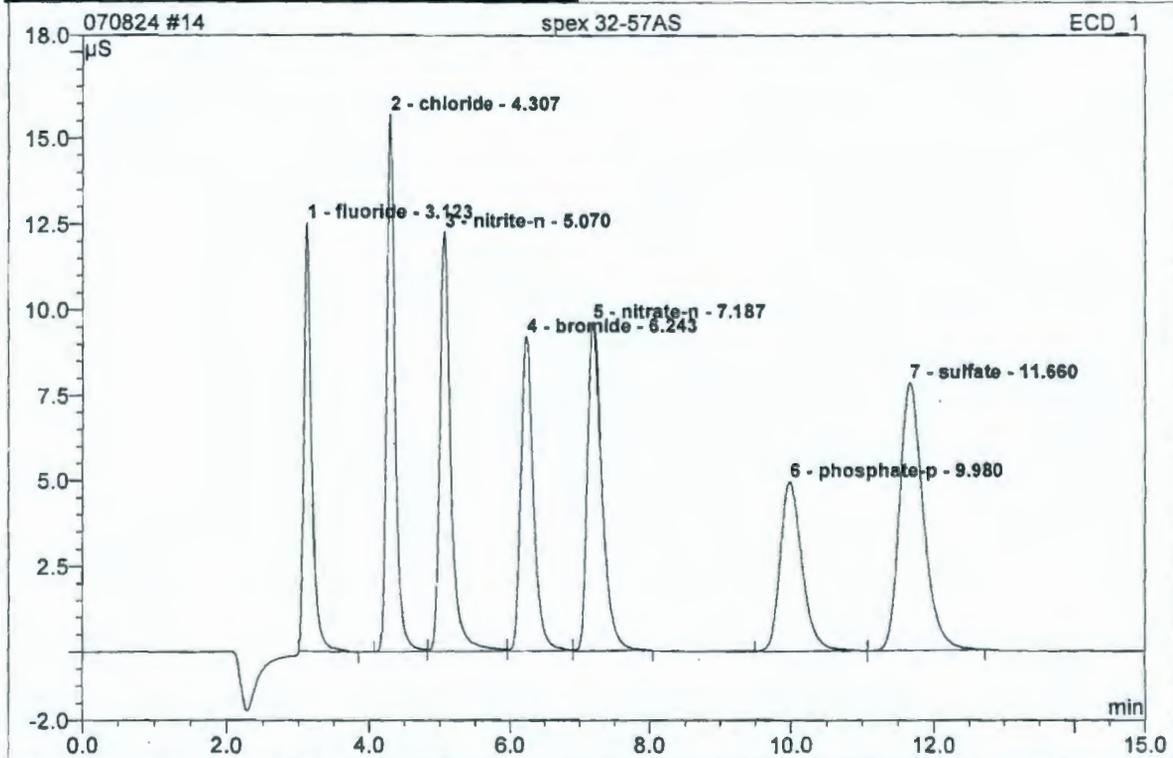


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
<b>Total:</b>			0.000	0.000	0.000	0.00	

**14 spex 32-57AS**

Sample Name:	spex 32-57AS	Injection Volume:	20.0
Recording Time:	8/24/2007 9:53		
Vial Number:	4	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	52
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

**Analyst CRN**

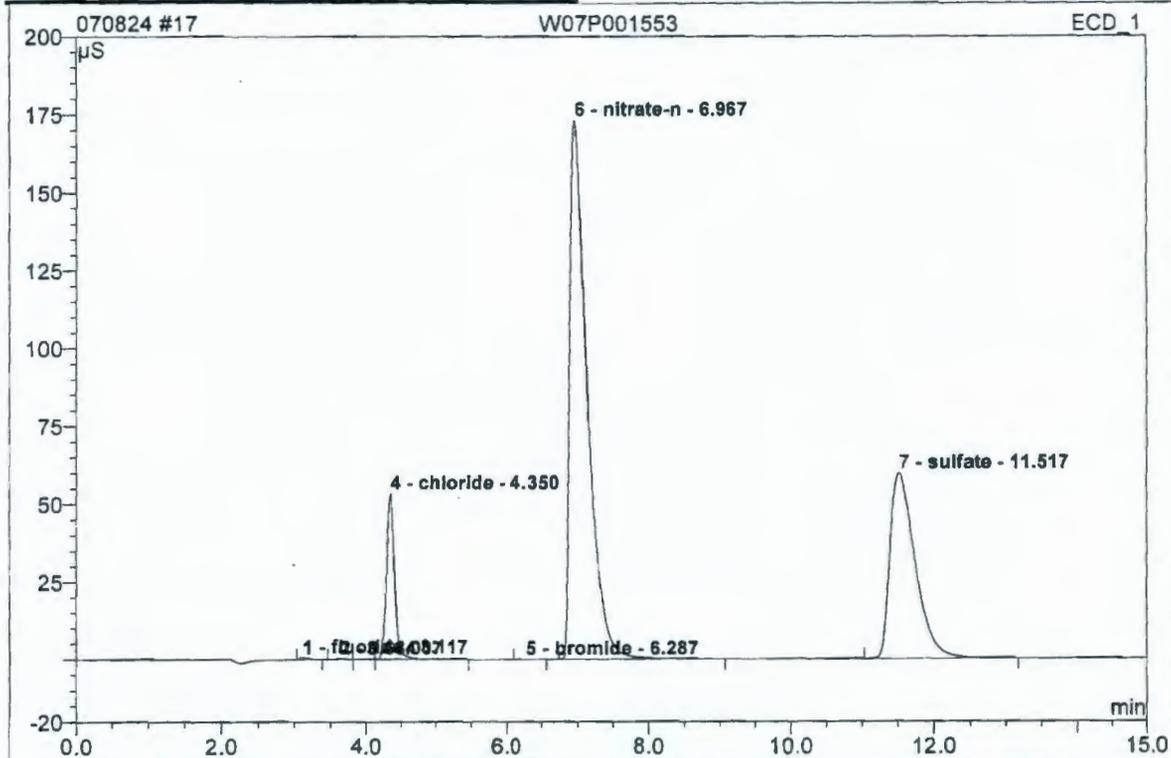


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	3.12	fluoride	105.5907	1.601	10.676	12.519	BMB
2	4.31	chloride	201.6487	2.191	14.611	15.682	BM
3	5.07	nitrite-n	98.8833	2.241	14.947	12.263	M
4	6.24	bromide	407.9163	1.850	12.339	9.194	M
5	7.19	nitrate-n	92.8723	2.324	15.497	9.594	MB
6	9.98	phosphate-p	195.6923	1.771	11.813	4.953	BM
7	11.66	sulfate	390.9132	3.016	20.118	7.832	MB
<b>Total:</b>			1493.517	14.994	100.000	72.04	

**17 W07P001553**

Sample Name:	W07P001553	Injection Volume:	20.0
Recording Time:	8/24/2007 10:52		
Vial Number:	7	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	2
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

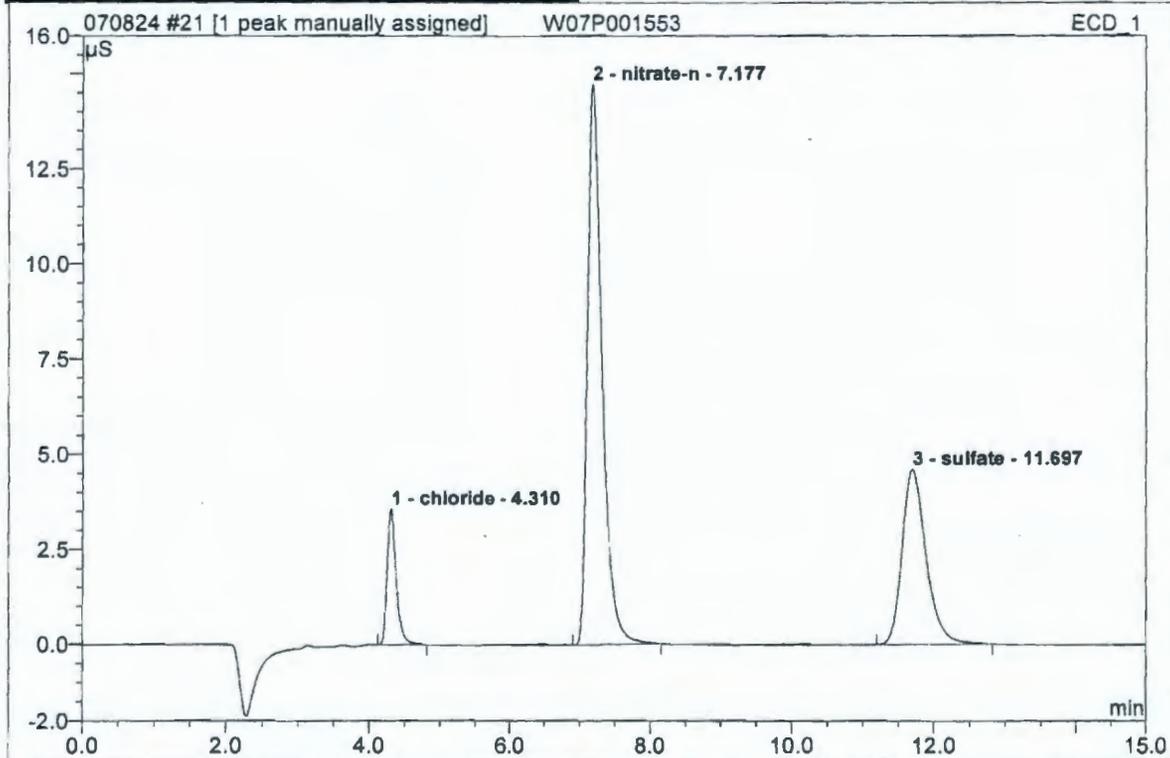


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	3.12	fluoride	0.2287	0.083	0.103	0.619	BMB
2	3.63	n.a.	n.a.	0.046	0.057	0.259	BM
3	4.01	n.a.	n.a.	0.038	0.047	0.170	M
4	4.35	chloride	21.3505	7.080	8.828	53.322	MB
5	6.29	bromide	0.1072	0.011	0.014	0.054	BMB
6	6.97	nitrate-n	37.0986	48.742	60.777	173.086	BMB
7	11.52	sulfate	93.5537	24.198	30.173	59.630	BMB
<b>Total:</b>			152.339	80.198	100.000	287.14	

**21 W07P001553**

Sample Name:	W07P001553	Injection Volume:	20.0
Recording Time:	8/24/2007 12:10		
Vial Number:	11	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	20
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

**Analyst CRN**

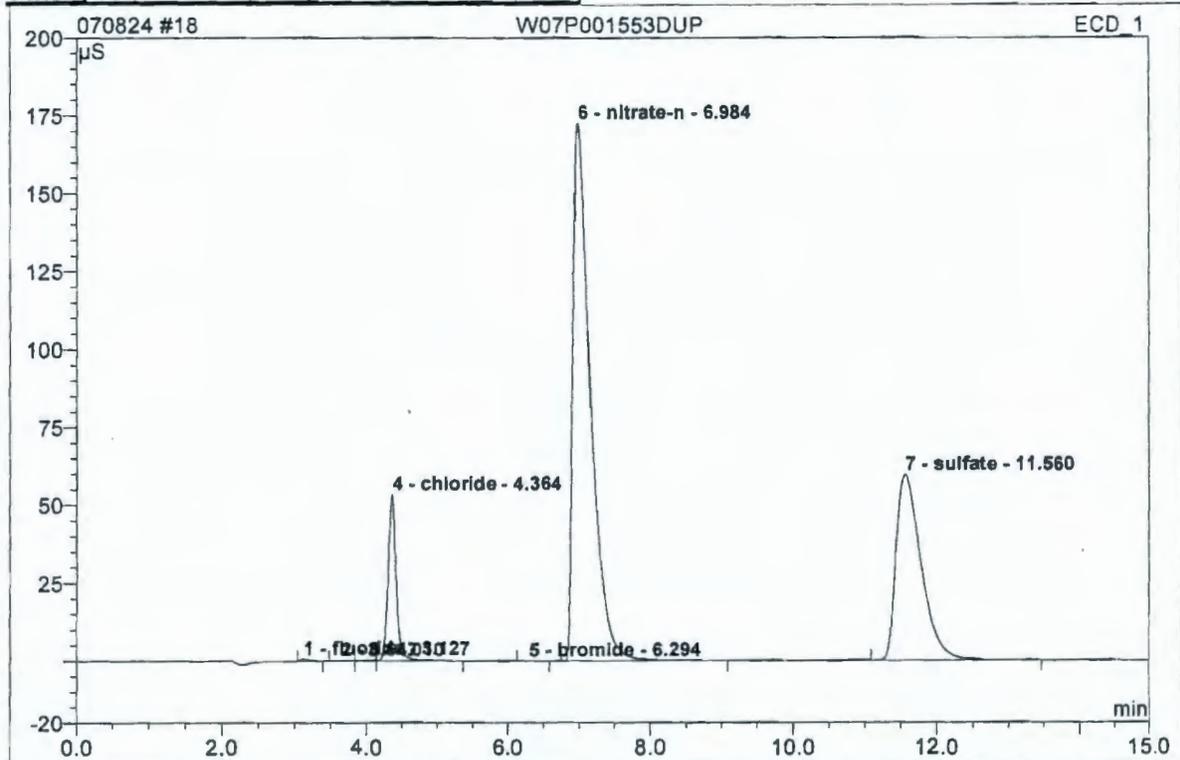


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	4.31	chloride	19.9756	0.523	8.853	3.564	BMB
2	7.18	nitrate-n	52.3916	3.581	60.655	14.725	BMB^
3	11.70	sulfate	91.7075	1.800	30.491	4.597	BMB
<b>Total:</b>			164.075	5.904	100.000	22.88	

**18 W07P001553DUP**

Sample Name:	W07P001553DUP	Injection Volume:	20.0
Recording Time:	8/24/2007 11:12		
Vial Number:	8	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	2
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

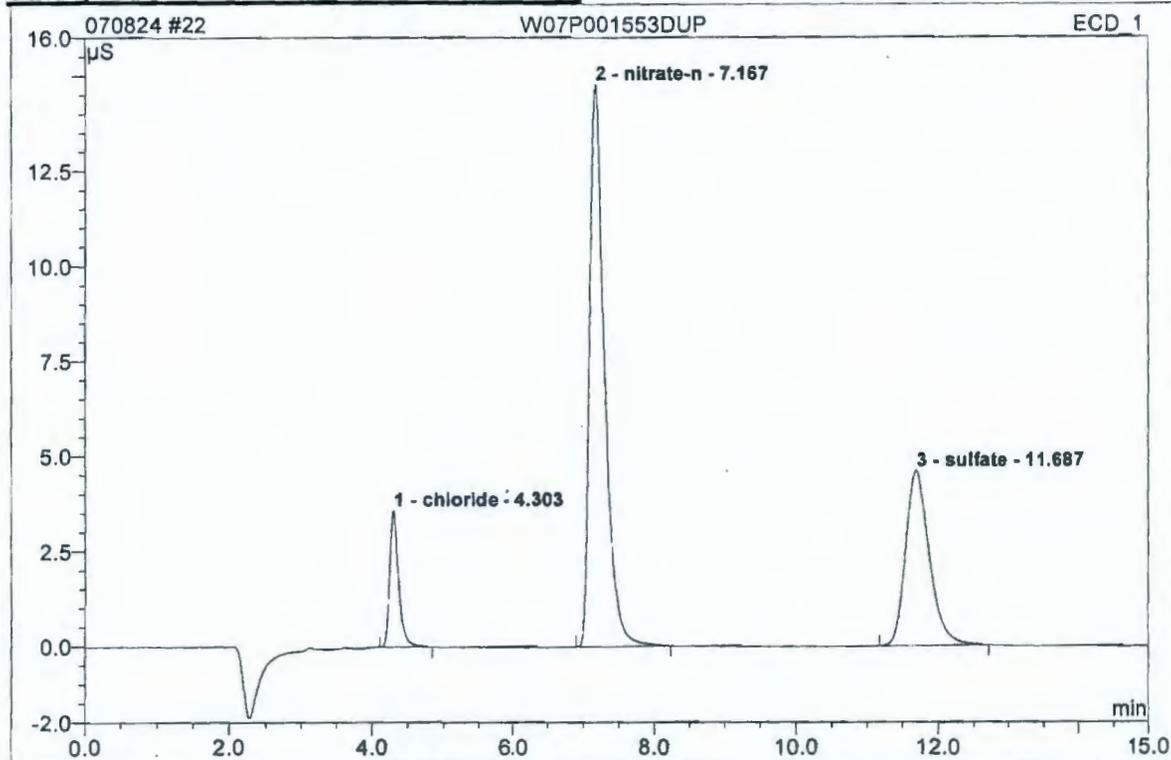


No.	Ret. Time min	Peak Name	Amount ppm	Area $\mu\text{S} \cdot \text{min}$	Rel. Area %	Height $\mu\text{S}$	Type
1	3.13	fluoride	0.2297	0.083	0.104	0.617	BMB
2	3.65	n.a.	n.a.	0.046	0.057	0.259	BM
3	4.01	n.a.	n.a.	0.037	0.046	0.166	M
4	4.36	chloride	21.3262	7.070	8.807	53.287	MB
5	6.29	bromide	0.0960	0.010	0.013	0.052	BMB
6	6.98	nitrate-n	37.1248	48.796	60.787	172.567	BMB
7	11.56	sulfate	93.6567	24.232	30.186	59.492	BMB
<b>Total:</b>			<b>152.433</b>	<b>80.274</b>	<b>100.000</b>	<b>286.44</b>	

**22 W07P001553DUP**

Sample Name:	W07P001553DUP	Injection Volume:	20.0
Recording Time:	8/24/2007 12:30		
Vial Number:	12	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	20
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

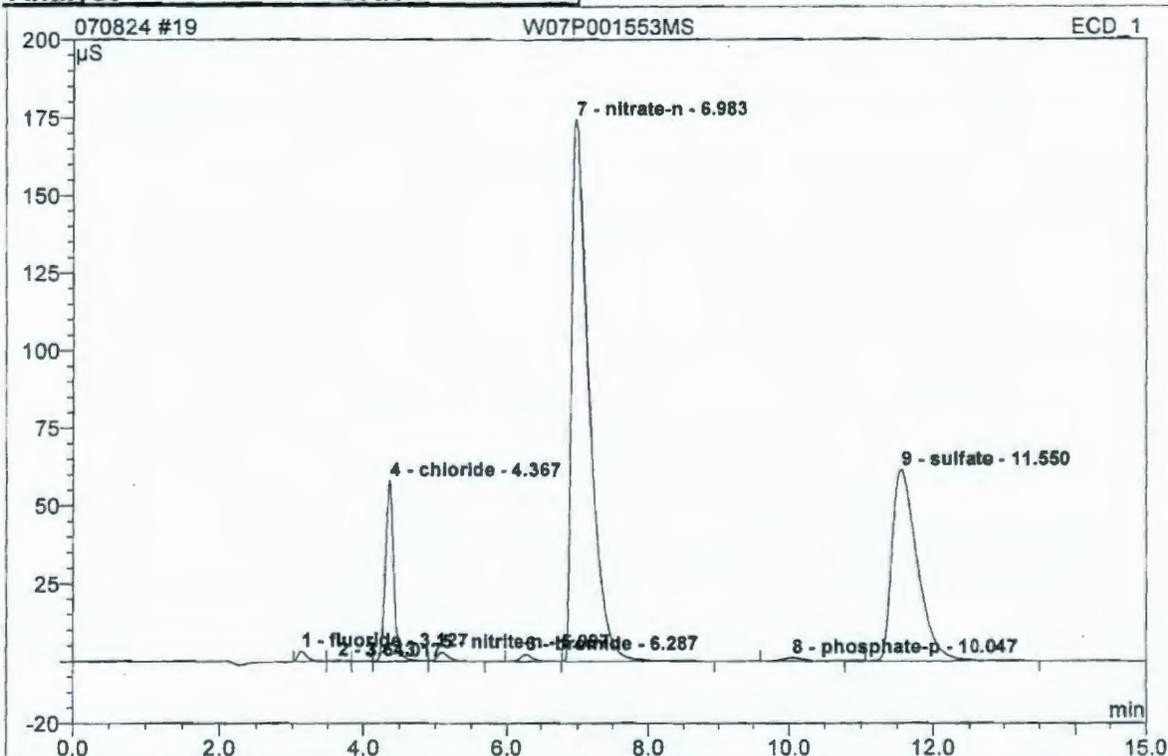


No.	Ret.Time min	Peak Name	Amount ppm	Area $\mu\text{S} \cdot \text{min}$	Rel.Area %	Height $\mu\text{S}$	Type
1	4.30	chloride	20.0661	0.525	8.899	3.587	BMB
2	7.17	nitrate-n	52.4135	3.583	60.717	14.777	BMB
3	11.69	sulfate	91.3488	1.793	30.384	4.595	BMB
<b>Total:</b>			163.828	5.901	100.000	22.96	

**19 W07P001553MS**

Sample Name:	W07P001553MS	Injection Volume:	20.0
Recording Time:	8/24/2007 11:31		
Vial Number:	9	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	2
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

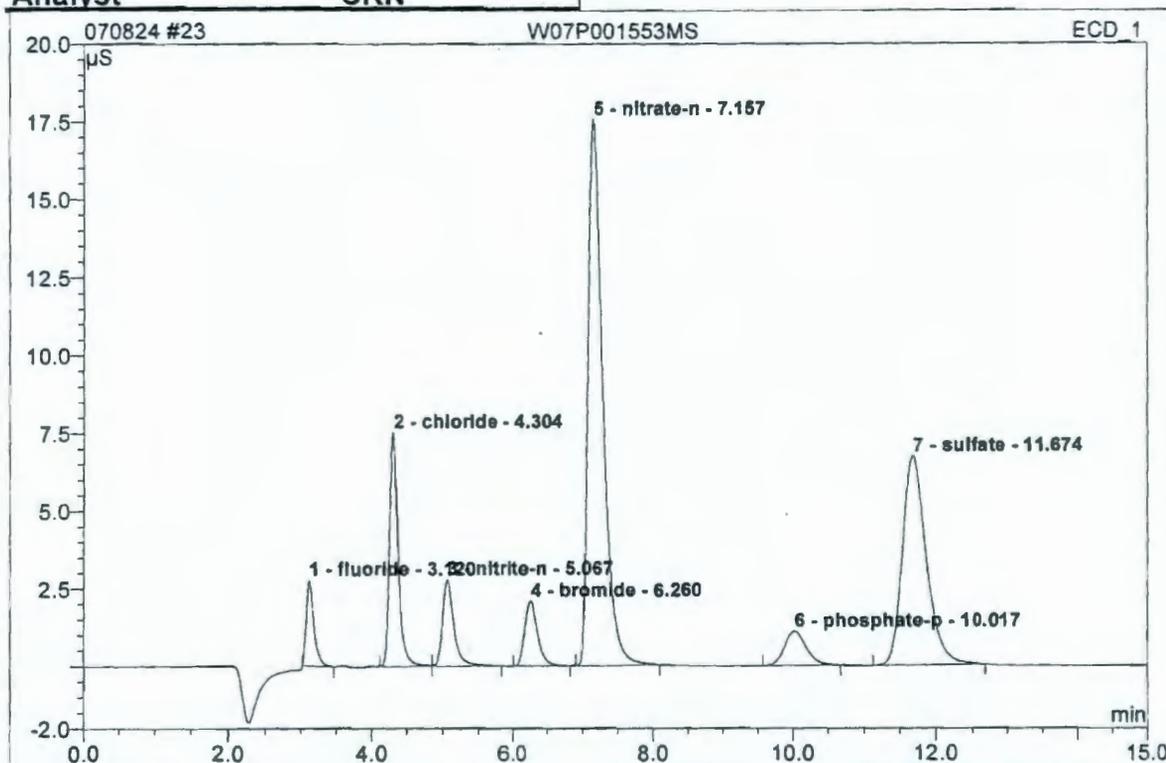


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	3.13	fluoride	1.2394	0.460	0.548	3.235	BM
2	3.64	n.a.	n.a.	0.041	0.049	0.245	M
3	4.02	n.a.	n.a.	0.027	0.032	0.134	M
4	4.37	chloride	22.9468	7.742	9.229	58.035	M
5	5.10	nitrite-n	0.9750	0.538	0.641	2.815	MB
6	6.29	bromide	4.0868	0.444	0.529	2.216	BMB
7	6.98	nitrate-n	37.2852	49.125	58.564	174.319	BMB
8	10.05	phosphate-p	1.8053	0.399	0.476	1.109	BMB
9	11.55	sulfate	96.3096	25.107	29.931	61.420	BMB
<b>Total:</b>			164.648	83.882	100.000	303.53	

### 23 W07P001553MS

Sample Name:	W07P001553MS	Injection Volume:	20.0
Recording Time:	8/24/2007 12:50		
Vial Number:	13	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	20
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

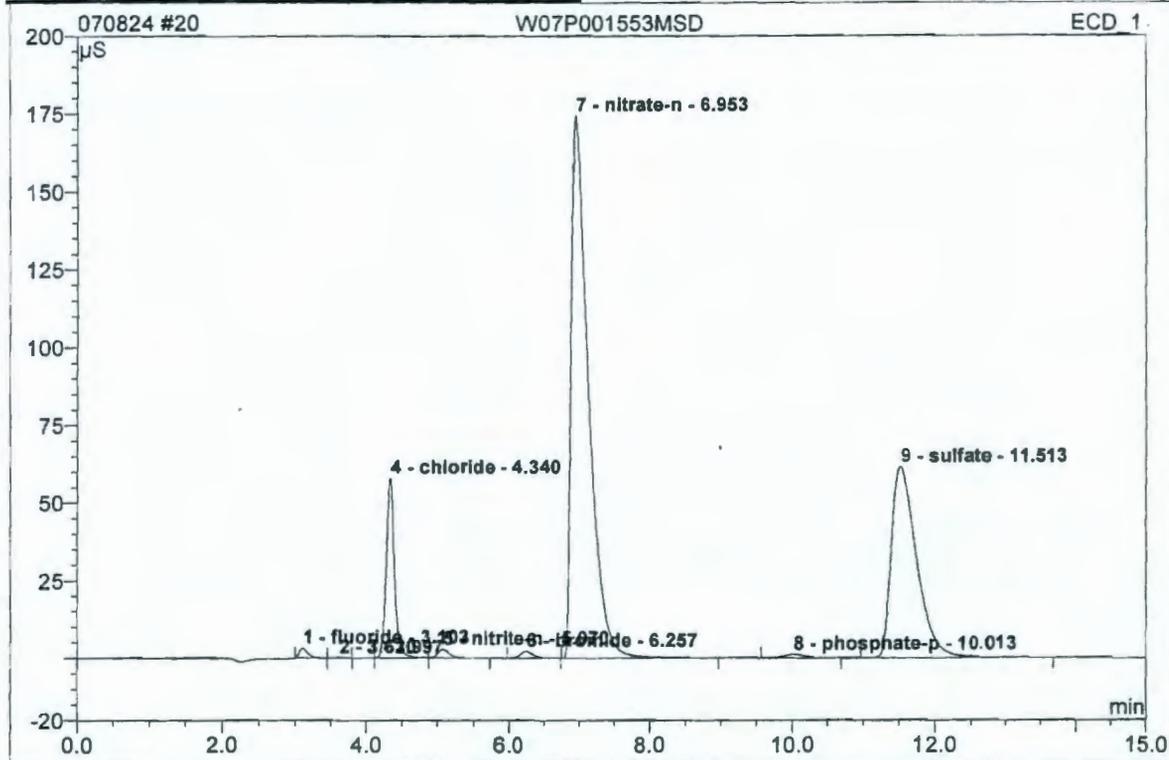


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	3.12	fluoride	9.5394	0.352	3.662	2.774	BMB
2	4.30	chloride	39.8109	1.070	11.141	7.524	BM
3	5.07	nitrite-n	9.3927	0.518	5.389	2.793	MB
4	6.26	bromide	39.6151	0.430	4.476	2.092	BMB
5	7.16	nitrate-n	60.7172	4.250	44.242	17.557	BMB
6	10.02	phosphate-p	17.7377	0.392	4.081	1.094	BMB
7	11.67	sulfate	130.2818	2.594	27.008	6.723	BMB
<b>Total:</b>			307.095	9.606	100.000	40.56	

**20 W07P001553MSD**

Sample Name:	W07P001553MSD	Injection Volume:	20.0
Recording Time:	8/24/2007 11:51		
Vial Number:	10	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	2
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

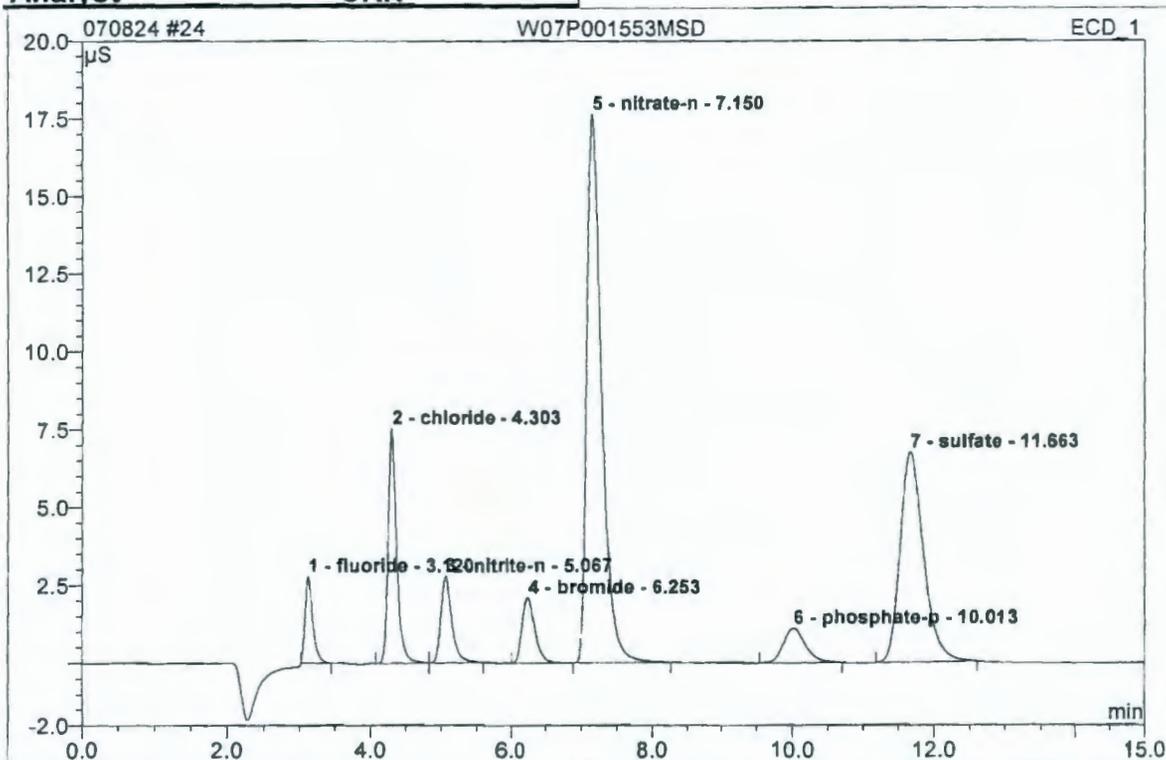


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	3.10	fluoride	1.2199	0.453	0.541	3.219	BM
2	3.62	n.a.	n.a.	0.039	0.047	0.237	M
3	4.00	n.a.	n.a.	0.028	0.033	0.137	M
4	4.34	chloride	22.8452	7.699	9.198	57.951	M
5	5.07	nitrite-n	0.9828	0.542	0.648	2.815	MB
6	6.26	bromide	4.0583	0.441	0.527	2.205	BMB
7	6.95	nitrate-n	37.2278	49.007	58.551	174.301	BMB
8	10.01	phosphate-p	1.7957	0.397	0.474	1.113	BMB
9	11.51	sulfate	96.2732	25.095	29.982	61.362	BMB
<b>Total:</b>			164.403	83.700	100.000	303.34	

**24 W07P001553MSD**

Sample Name:	W07P001553MSD	Injection Volume:	20.0
Recording Time:	8/24/2007 13:09		
Vial Number:	14	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	20
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

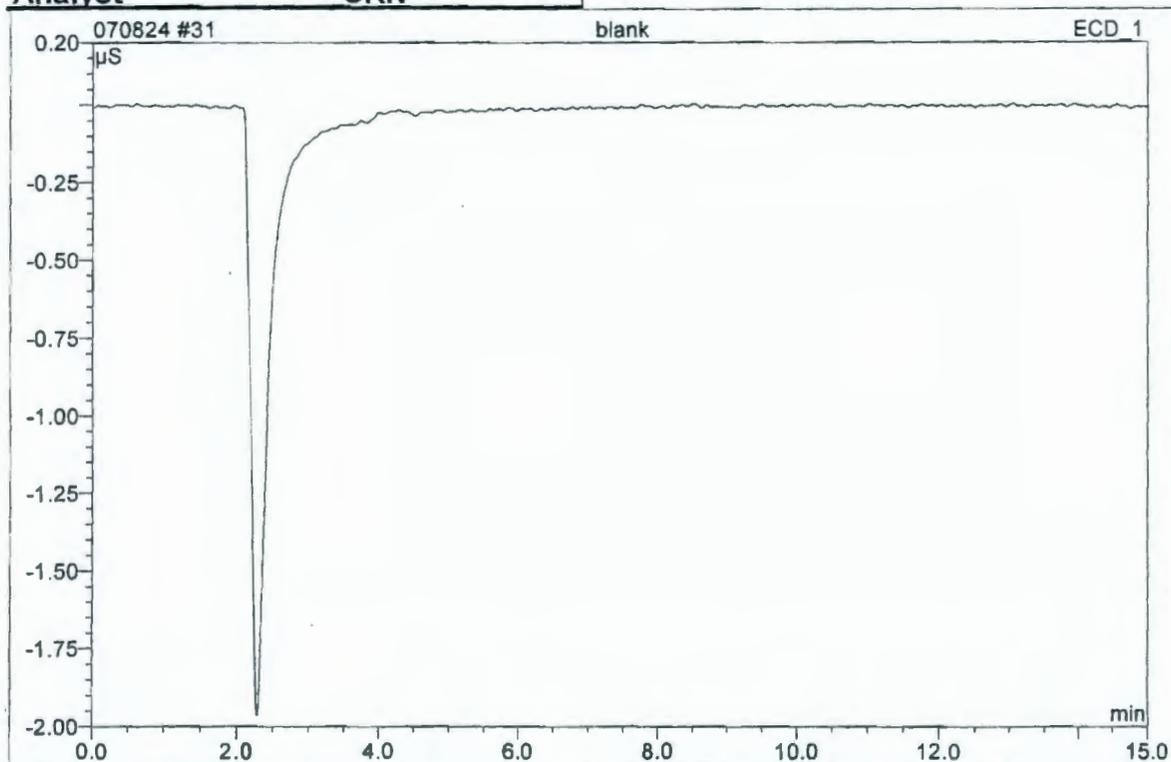


No.	Ret. Time min	Peak Name	Amount ppm	Area µS*min	Rel. Area %	Height µS	Type
1	3.12	fluoride	9.5101	0.351	3.644	2.774	BMB
2	4.30	chloride	39.8064	1.070	11.120	7.540	BM
3	5.07	nitrite-n	9.1653	0.505	5.247	2.773	MB
4	6.25	bromide	39.3851	0.427	4.442	2.094	Ru
5	7.15	nitrate-n	61.0368	4.276	44.438	17.627	BMB
6	10.01	phosphate-p	18.2843	0.404	4.202	1.106	BMB
7	11.66	sulfate	130.0360	2.589	26.907	6.736	BMB
<b>Total:</b>			307.224	9.623	100.000	40.65	

### 31 blank

Sample Name:	blank	Injection Volume:	20.0
Recording Time:	8/24/2007 15:26		
Vial Number:	2	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	1
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN

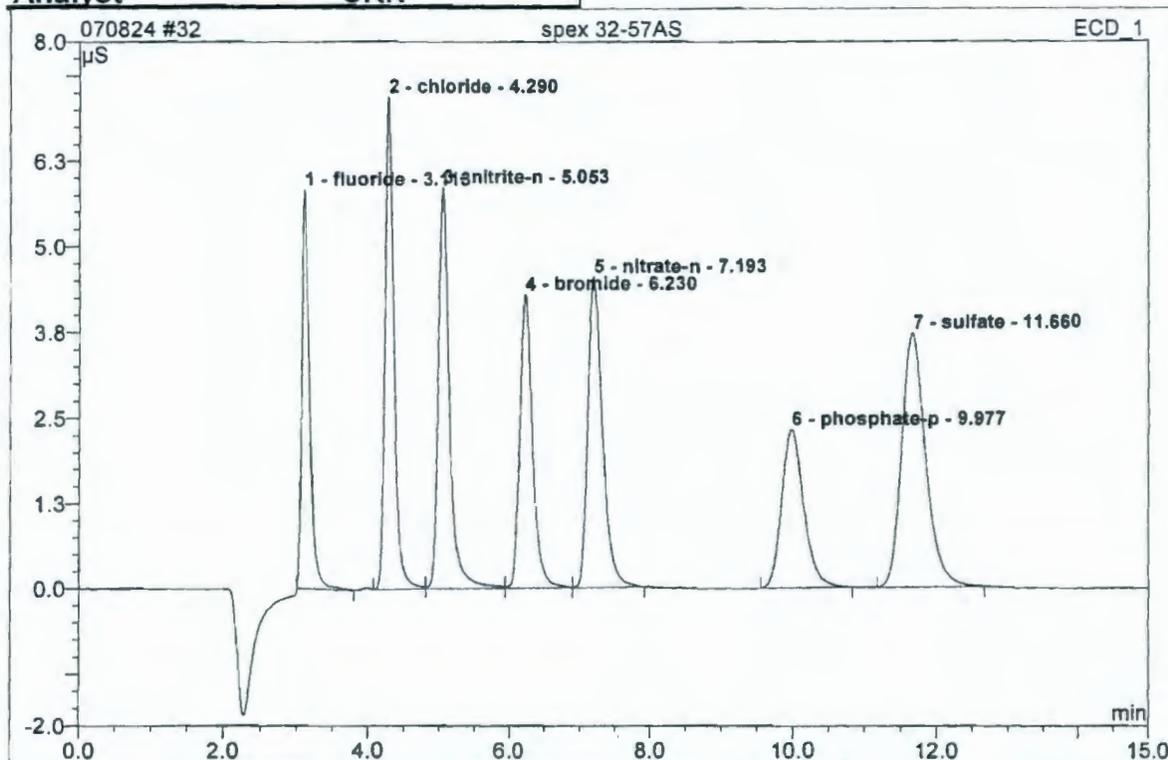


No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
Total:			0.000	0.000	0.000	0.00	

### 32 spex 32-57AS

Sample Name:	spex 32-57AS	Injection Volume:	20.0
Recording Time:	8/24/2007 15:46		
Vial Number:	3	Channel:	ECD_1
Sample Type:			
Control Program:	AS14		
Quantif. Method:	xquad	Dilution Factor:	102
		Sample Weight:	1.0000
Run Time (min):	25.50	Sample Amount:	1.0000
OmniLims Method/Protocol:	@IC-30		

Analyst CRN



No.	Ret.Time min	Peak Name	Amount ppm	Area µS*min	Rel.Area %	Height µS	Type
1	3.11	fluoride	100.8466	0.746	10.476	5.829	BMB
2	4.29	chloride	196.2700	1.033	14.507	7.196	BM
3	5.05	nitrite-n	97.9882	1.084	15.228	5.860	M
4	6.23	bromide	402.1159	0.881	12.369	4.292	M
5	7.19	nitrate-n	91.2352	1.101	15.460	4.536	MB
6	9.98	phosphate-p	188.0101	0.832	11.692	2.320	BMB
7	11.66	sulfate	377.3904	1.443	20.268	3.710	BMB
<b>Total:</b>			1453.856	7.119	100.000	33.74	

M4W41-SLF-08-319

ATTACHMENT 4

**RECHECK, RECOUNT, OR REANALYSIS ORDER**

Consisting of 2 pages  
Including cover page

03/19/2008  
RECHECK, RECOUNT, OR REANALYSIS ORDER  
CONTRACT NO MW6-SBB-A19981

Waste Sampling &  
600 AREA Hanford, MSIN  
Richland, WA 99352

Battelle PNNL Order Number: 080319WSCF-R4720

Sample Delivery Group: WSCF20071517

Special Instructions Please recheck the fluoride and rerun if no problems are found.

Samples(s)

Lab Sample ID	PNNL Sample	Action	TAT	METHOD_NAME:
W07P001552	B1P9F4	Reanalysis	15/15	300.0_ANIONS_IC

IC405 08/24/07 WL 33095

F<sup>-</sup> Original Result: 0.1809 ppm

After Manual Integration: 0.2481 ppm

Updated In LIMS

SS 03/20/08

Deliver Report Results to: Fluor Hanford, Inc.  
1200 Jadwin Ave.  
Richland, WA 99352  
C/O Mr. Steve Trent

The report results must reference the Battelle PNNL-order number, SDG number, and the Battelle PNNL sample identification number shown above.