0081792

RECEIVED SEPTEMBER 30, 2008

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FLUOR

Memorandum

M4W41-SLF-08-1103

To: H. Hampt E6-35 Date: September 29, 2008

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

cc: w/Attachments

T. F. Dale	S3-30	J. E. Trechter	S3-30
A. J. Kopriva	S3-30	S. J. Trent	E6-35
H. K. Meznarich	S3-30	File/LB	
P. D. Mix	S3-30		

Subject: FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20081722 – SAF NUMBER F08-093

Reference:
(1) Groundwater Protection Program-Letter of Instruction, FH-EIS-2003-MEM-001, October 31, 2002

(2) HNF-SD-CD-QAPP-017, Rev. 9, Waste Sampling & Characterization Facility Quality Assurance Plan

This letter contains the following information for sample delivery group WSCF20081722:

- Cover Sheet (Attachment 1)
- Narrative (Attachment 2)
- Analytical Results (Attachment 3)
- Sample Receipt Information (Attachment 4)

SLF/grf

Attachments 4

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M4W41-SLF-08-1103

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF NUMBER CROSS REFERENCE

Group#:	WSCF20081722	
Data Deliverable Date:	25-sep-2008	
Data Deliverable:	Cover Sheet	

SAF#	Sample ID	WSCF#	Matrix
F08-093	B1WB33	W08GR03325	SOIL
	B1WB34	W08GR03326	SOIL

M4W41-SLF-08-1103

ATTACHMENT 2

NARRATIVE

Consisting of 4 pages
Including cover page

Introduction

Two S&GRP samples were received at the WSCF Laboratory on August 13, 2008. Samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report,* pages 12 through 13, for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per GRP Letter of Instruction. See pages 18 through 21 for QC details. Analytical Note(s):

- Sample results were D flagged if dilution(s) were required.
- Sample results that were less than the reportable limit, however greater than the method detection limit, were B flagged.
- Duplicate, Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1WB32 (SDG# 20081670, SAF# F08-093), and B1WB33 (SDG# 20081722, SAF# F08-093).
- Phosphate-P – Matrix Spike and Matrix Spike Duplicate recoveries were less than established laboratory limits. Affected sample results in this batch were N flagged.

All other QC controls are within the established limits.

Cyanide – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per GRP Letter of Instruction. See page 22 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1WB32 (SDG# 20081670, SAF# F08-093).
- MSD recovery was slightly lower than the established laboratory limit of 75% at 69%.

All QC controls are within the established limits.

ICP-AES Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per the GRP Letter of Instruction. See pages 23 through 25 for QC details. Analytical Note(s):

- Sample results were D flagged if dilution(s) were required.
- Sample results that were less than five times the reportable limit, however greater than the method detection limit, were B flagged.
- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1VHR2 (SDG# 20081738, SAF# F08-093).
- Aluminum. Calcium, Iron, Magnesium and Titanium – Sample concentrations exceeded spiking levels by a factor of 4. Matrix Spike and Matrix Spike Duplicate recoveries exceeded established laboratory limits. Spike recoveries are not valid.
- Check standard was analyzed to ensure linearity, because the sample results exceeded the calibration standard.
- Sodium – Matrix Spike and Matrix Spike Duplicate recoveries exceeded established laboratory limits. Affected sample results were N flagged.
- Boron – Results were biased high due to interference from Iron. Sample results were E flagged (estimated).

All other QC controls are within the established limits.

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group per the GRP Letter of Instruction. See pages 26 through 30 for QC details. Analytical Note(s):

- Matrix Spikes and Matrix Spike Duplicates were analyzed on samples B1WB33 (SDG# 20081722, SAF# F08-093) B1WB34 (SDG# 20081722, SAF# F08-093), and B1WMD9 (SDG# 20081859, SAF# F08-148).
- Mercury – Mercury was analyzed after the hold time had expired. Affected samples results were X flagged.

All other QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – There are no hold times associated with WSCF's radiochemical methods. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 36 through 40 for QC details. Analytical Note(s):

- Americium-241 and 243 (tracer) – Duplicate QC was analyzed on sample# B1VHN9 (SDG# 20081217, SAF# F08-093).

- Uranium-233/234, 235, 238 and 232 (tracer) – Duplicate QC was analyzed on sample# B1WB33 (SDG# 20081722, SAF# F08-093).

- Uranium-Duplicate – The duplicate RPD values did not meet the laboratory limits. We attributed the elevated RPD values to the non-homogeneous nature of soil and the low count rate of the sample

All QC controls are within the established limits.

I certify that this data package is in compliance with the LOI, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager and Client Services as verified by the following signatures.

Scot L. Fitzgerald
WSCF Analytical Laboratory Manager

Andrew J. Kopriva
WSCF Client Services

M4W41-SLF-08-1103

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 34 pages
Including cover page

WSCF
ANALYTICAL RESULTS REPORT

for

Groundwater Remediation Program

Richland, WA 99354

Attention: Steve Trent

Analytical: S. Fitzgerald 9/30/08

Client Services: A. Kopriva 9/29/08

All results are reported on an "as received" basis unless otherwise noted in the comment section.

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Contract#: FH-EIS-2003-MEM-001
Report#: WSCF20081722
Report Date: 29-sep-2008
Report WGPP/ver. 5.2
Groundwater Remediation Program

w13qlog v4.2 29-sep-2008 10:10:15

Department: Inorganic

W13q Worklist/Batch/QC Report for Group# WSCF20081722

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37586	10	38026	42422	BLANK		Cyanide by Midi/Spectrophotom
37586	11	38026	42422	LCS		Cyanide by Midi/Spectrophotom
37586	13	38026	42422	MS	W08GR03258	Cyanide by Midi/Spectrophotom
37586	14	38026	42422	MSD	W08GR03258	Cyanide by Midi/Spectrophotom
37586	14	38026	42422	SPK-RPD	W08GR03258	Cyanide by Midi/Spectrophotom
37586	15	38026	42422	SAMPLE	W08GR03325	Cyanide by Midi/Spectrophotom
37586	16	38026	42422	SAMPLE	W08GR03326	Cyanide by Midi/Spectrophotom
37718	2	38151	42522	BLANK		Anions by Ion Chromatography
37718	17	38151	42522	BLANK		Anions by Ion Chromatography
37718	3	38151	42522	LCS		Anions by Ion Chromatography
37718	5	38151	42522	DUP	W08GR03258	Anions by Ion Chromatography
37718	6	38151	42522	MS	W08GR03258	Anions by Ion Chromatography
37718	7	38151	42522	MSD	W08GR03258	Anions by Ion Chromatography
37718	7	38151	42522	SPK-RPD	W08GR03258	Anions by Ion Chromatography
37718	13	38151	42522	SAMPLE	W08GR03326	Anions by Ion Chromatography
37802	2	38226	42600	BLANK		Anions by Ion Chromatography
37802	12	38226	42600	BLANK		Anions by Ion Chromatography
37802	3	38226	42600	LCS		Anions by Ion Chromatography
37802	5	38226	42600	DUP	W08GR03325	Anions by Ion Chromatography
37802	6	38226	42600	MS	W08GR03325	Anions by Ion Chromatography
37802	7	38226	42600	MSD	W08GR03325	Anions by Ion Chromatography
37802	4	38226	42600	SAMPLE	W08GR03325	Anions by Ion Chromatography
37802	7	38226	42600	SPK-RPD	W08GR03325	Anions by Ion Chromatography
37929	1	38356	42770	BLANK		ICP-200.8 MS All possible meta
37929	2	38356	42770	LCS		ICP-200.8 MS All possible meta
37929	5	38356	42770	MS	W08GR03325	ICP-200.8 MS All possible meta
37929	6	38356	42770	MSD	W08GR03325	ICP-200.8 MS All possible meta
37929	4	38356	42770	SAMPLE	W08GR03325	ICP-200.8 MS All possible meta
37929	6	38356	42770	SPK-RPD	W08GR03325	ICP-200.8 MS All possible meta
37929	8	38356	42770	MS	W08GR03326	ICP-200.8 MS All possible meta
37929	9	38356	42770	MSD	W08GR03326	ICP-200.8 MS All possible meta
37929	7	38356	42770	SAMPLE	W08GR03326	ICP-200.8 MS All possible meta
37929	9	38356	42770	SPK-RPD	W08GR03326	ICP-200.8 MS All possible meta
37929	11	38356	42770	MS	W08GR03514	ICP-200.8 MS All possible meta
37929	12	38356	42770	MSD	W08GR03514	ICP-200.8 MS All possible meta
37929	12	38356	42770	SPK-RPD	W08GR03514	ICP-200.8 MS All possible meta
38158	1	38566	43041	BLANK		ICP Metals Analysis, Grd H20 P
38158	2	38566	43041	LCS		ICP Metals Analysis, Grd H20 P
38158	7	38566	43041	SAMPLE	W08GR03325	ICP Metals Analysis, Grd H20 P
38158	8	38566	43041	SAMPLE	W08GR03326	ICP Metals Analysis, Grd H20 P
38158	4	38566	43041	MS	W08GR03336	ICP Metals Analysis, Grd H20 P
38158	5	38566	43041	MSD	W08GR03336	ICP Metals Analysis, Grd H20 P
38158	5	38566	43041	SPK-RPD	W08GR03336	ICP Metals Analysis, Grd H20 P

w13qlog v4.2 29-sep-2008 10:10:15

Department: Radiochemistry

W13q Worklist/Batch/QC Report for Group# WSCF20081722

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37833	1	38260	42686	BLANK		Americium by AEA
37833	2	38260	42686	LCS		Americium by AEA
37833	3	38260	42686	DUP	W08GR01803	Americium by AEA
37833	14	38260	42686	SAMPLE	W08GR03325	Americium by AEA
37833	15	38260	42686	SURR	W08GR03325	Americium by AEA
37833	17	38260	42686	SAMPLE	W08GR03326	Americium by AEA
37833	16	38260	42686	SURR	W08GR03326	Americium by AEA
37887	1	38313	42792	BLANK		Strontium 89/90
37887	2	38313	42792	LCS		Strontium 89/90
37887	3	38313	42792	DUP	W08GR03325	Strontium 89/90
37887	4	38313	42792	SAMPLE	W08GR03325	Strontium 89/90
37887	5	38313	42792	SURR	W08GR03325	Strontium 89/90
37887	6	38313	42792	SAMPLE	W08GR03326	Strontium 89/90
37887	7	38313	42792	SURR	W08GR03326	Strontium 89/90
38028	1	38450	42959	BLANK		Uranium Isotopics by AEA
38028	2	38450	42959	LCS		Uranium Isotopics by AEA
38028	3	38450	42959	DUP	W08GR03325	Uranium Isotopics by AEA
38028	6	38450	42959	SAMPLE	W08GR03325	Uranium Isotopics by AEA
38028	7	38450	42959	SURR	W08GR03325	Uranium Isotopics by AEA
38028	8	38450	42959	SAMPLE	W08GR03326	Uranium Isotopics by AEA
38028	9	38450	42959	SURR	W08GR03326	Uranium Isotopics by AEA
38029	1	38451	43028	BLANK		Plutonium Isotopics by AEA
38029	2	38451	43028	LCS		Plutonium Isotopics by AEA
38029	3	38451	43028	DUP	W08GR03325	Plutonium Isotopics by AEA
38029	6	38451	43028	SAMPLE	W08GR03325	Plutonium Isotopics by AEA
38029	7	38451	43028	SURR	W08GR03325	Plutonium Isotopics by AEA
38029	8	38451	43028	SAMPLE	W08GR03326	Plutonium Isotopics by AEA
38029	9	38451	43028	SURR	W08GR03326	Plutonium Isotopics by AEA
38190	1	38615	43045	BLANK		Gamma Energy Analysis-grd H2O
38190	2	38615	43045	LCS		Gamma Energy Analysis-grd H2O
38190	3	38615	43045	DUP	W08GR03325	Gamma Energy Analysis-grd H2O
38190	4	38615	43045	SAMPLE	W08GR03325	Gamma Energy Analysis-grd H2O
38190	5	38615	43045	SAMPLE	W08GR03326	Gamma Energy Analysis-grd H2O

WSCF
METHOD REFERENCES REPORT

Department: Inorganic

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory or industry methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though the WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-505-411 LA-505-411: ELEMENTAL ANALYSIS BY INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPE

HEIS 6010_METALS_ICP	Inductively Coupled Plasma-Atomic Emmision Spectrometry

LA-505-412 LA-505-412: DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY

EPA-600/R-94-111 200.8	DETERMINATION OF TRACE ELEMENTS IN WATERS AND WASTES BY INDUCTIVELY COUPLED PLAS
HEIS 200.8_METALS_ICPMS	Inductively Coupled Plasma - Mass Spectrometry
HEIS RADISOTOPES_ICPMS	Radioisotopes by ICP/MS

LA-533-410 LA-533-410: ANION ANALYSIS BY ION CHROMATOGRAPHY

EPA-600/R-94-111 300.0	DETERMINATION OF INORGANIC ANIONS BY ION CHROMATOGRAPHY
HEIS 300.0_ANIONS_IC	Determination of Inorganic Anions by Ion Chromatography

LA-695-402 LA-695-402: DETERMINATION OF CYANIDE BY MIDIDISTILLATION AND SPECTROPHOTOMETRIC

EPA-600/4-79-020 335.2	Cyanide, Total
HEIS 335.2_CYANIDE	Cyanide, Total

Note: A complete list of WSCF analytical procedures and referenced regulatory or industry methods is available online at http://www2.rl.gov/phmc/as-dol.

WSCF
METHOD REFERENCES REPORT

Department: Radiochemistry

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory or industry methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though the WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-508-415 LA-508-415: OPERATION OF THE PROTEAN 2-INCH ALPHA/BETA COUNTING SYSTEM FOR GROSS

HEIS	**ALPHA_GPC**	GROSS ALPHA GPC
HEIS	**BETA_GPC**	GROSS BETA GPC
HEIS	**SRTOT_SEP_PRECIP_GP**	Strontium 89/90

LA-508-471 LA-508-471: ALPHA ENERGY ANALYZER DATA ACQUISITION AND SYSTEM CHECKOUT USING ALP

HEIS	**PUISO_IE_PRECIP_AEA**	Plutonium by Alpha Energy Analysis
HEIS	**RAISO_AEA**	Radium-226

LA-508-481 LA-508-481: GAMMA ENERGY ANALYSIS USING PROCOUNT SOFTWARE

HEIS	**GAMMA_GS**	Gamma Emmision Spectrometry

Note: A complete list of WSCF analytical procedures and referenced regulatory or industry methods is available online at http://www2.rl.gov/phmc/as-dol.

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-093
Sample # W08GR03325
Client ID: B1WB33 TRENT WSCF

Matrix: SOIL

Group #: WSCF20081722
Department: Inorganic
Sampled: 08/06/08
Received: 08/13/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Anions by Ion Chromatography Prep											**08/27/08**
Anions by Ion Chromatography											
Fluoride	16984-48-8	LA-533-410	DU	< 0.300	mg/kg			50.00	0.30		08/27/08
Chloride	16887-00-6	LA-533-410	DU	< 1.50	mg/kg			50.00	1.5		08/27/08
Nitrogen in Nitrite	NO2-N	LA-533-410	DU	< 0.500	mg/kg			50.00	0.50		08/27/08
Nitrogen in Nitrate	NO3-N	LA-533-410	BD	1.15	mg/kg			50.00	0.25		08/27/08
Phosphate (P) by IC	PO4-P	LA-533-410	DNU	< 2.00	mg/kg			50.00	2.0		08/27/08
Sulfate	14808-79-8	LA-533-410	BD	4.98	mg/kg			50.00	3.5		08/27/08
Cyanide											
Cyanide	57-12-5	LA-695-402	NU	< 0.200	mg/kg			1.00	0.20		08/14/08
ICP Metals Analysis, Grd H20 P Prep											**09/25/08**
ICP Metals Analysis, Grd H20 P											
Aluminum	7429-90-5	LA-505-411		7.73e+03	mg/kg			95.40	5.0		09/25/08
Iron	7439-89-6	LA-505-411		1.54e+04	mg/kg			95.40	2.4		09/25/08
Magnesium	7439-95-4	LA-505-411		5.16e+03	mg/kg			95.40	4.8		09/25/08
Potassium	7440-09-7	LA-505-411		1.58e+03	mg/kg			95.40	16		09/25/08
Sodium	7440-23-5	LA-505-411	N	120	mg/kg			95.40	4.9		09/25/08
Barium	7440-39-3	LA-505-411		81.8	mg/kg			95.40	0.38		09/25/08
Calcium	7440-70-2	LA-505-411		1.13e+04	mg/kg			95.40	7.0		09/25/08
Lithium	7439-93-2	LA-505-411		9.92	mg/kg			95.40	0.38		09/25/08
Molybdenum	7439-98-7	LA-505-411	B	0.712	mg/kg			95.40	0.48		09/25/08
Strontium	7440-24-6	LA-505-411		27.4	mg/kg			95.40	0.38		09/25/08
Titanium	7440-32-6	LA-505-411		756	mg/kg			95.40	0.38		09/25/08
Arsenic	7440-38-2	LA-505-411	U	< 7.44	mg/kg			95.40	7.4		09/25/08
Beryllium	7440-41-7	LA-505-411	B	0.398	mg/kg			95.40	0.38		09/25/08

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)
N - Spike sample recovery is outside control limits.(inorg)
U - Analyzed for but not detected above limiting criteria.

D - Analyte was identified at a secondary dilution factor
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-093
Sample # W08GR03325
Client ID: B1WB33 TRENT WSCF

Matrix: SOIL

Group #: WSCF20081722
Department: Inorganic
Sampled: 08/06/08
Received: 08/13/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Boron	7440-42-8	LA-505-411	E	11.5	mg/kg			95.40	1.9		09/25/08
Bismuth	7440-69-9	LA-505-411	U	< 3.34	mg/kg			95.40	3.3		09/25/08
ICP-200.8 MS All possible meta Prep											**09/09/08**
ICP-200.8 MS All possible meta											
Manganese	7439-96-5	LA-505-412		262	mg/kg			0.98	0.0976		09/09/08
Nickel	7440-02-0	LA-505-412		12.7	mg/kg			0.98	0.195		09/09/08
Silver	7440-22-4	LA-505-412	U	< 0.0976	mg/kg			0.98	0.0976		09/09/08
Antimony	7440-36-0	LA-505-412	U	< 0.293	mg/kg			0.98	0.293		09/09/08
Cadmium	7440-43-9	LA-505-412		0.110	mg/kg			0.98	0.0976		09/09/08
Chromium	7440-47-3	LA-505-412		16.8	mg/kg			0.98	0.488		09/09/08
Cobalt	7440-48-4	LA-505-412		6.34	mg/kg			0.98	0.0488		09/09/08
Copper	7440-50-8	LA-505-412		12.2	mg/kg			0.98	0.0976		09/09/08
Vanadium	7440-62-2	LA-505-412		30.6	mg/kg			0.98	0.195		09/09/08
Zinc	7440-66-6	LA-505-412		42.0	mg/kg			0.98	0.781		09/09/08
Lead	7439-92-1	LA-505-412		7.65	mg/kg			0.98	0.0976		09/09/08
Mercury	7439-97-6	LA-505-412	UX	< 0.0488	mg/kg			0.98	0.0488		09/09/08
Uranium	7440-61-1	LA-505-412		0.720	mg/kg			0.98	0.0488		09/09/08
Selenium	7782-49-2	LA-505-412		< 0.293	mg/kg			0.98	0.293		09/09/08
Thallium	7440-28-0	LA-505-412		0.360	mg/kg			0.98	0.0976		09/09/08

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)
N - Spike sample recovery is outside control limits.(inorg)
U - Analyzed for but not detected above limiting criteria.

D - Analyte was identified at a secondary dilution factor
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-093
Sample # W08GR03326
Client ID: B1WB34 TRENT WSCF

Matrix: SOIL

Group #: WSCF20081722
Department: Inorganic
Sampled: 08/06/08
Received: 08/13/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Anions by Ion Chromatography Prep											**08/20/08**
Anions by Ion Chromatography											
Fluoride	16984-48-8	LA-533-410	DU	< 0.300	mg/kg			50.00	0.30		08/20/08
Chloride	16887-00-6	LA-533-410	DU	< 1.50	mg/kg			50.00	1.5		08/20/08
Nitrogen in Nitrite	NO2-N	LA-533-410	DU	< 0.500	mg/kg			50.00	0.50		08/20/08
Nitrogen in Nitrate	NO3-N	LA-533-410	BD	1.44	mg/kg			50.00	0.25		08/20/08
Phosphate (P) by IC	PO4-P	LA-533-410	DNU	< 2.00	mg/kg			50.00	2.0		08/20/08
Sulfate	14808-79-8	LA-533-410	BD	5.38	mg/kg			50.00	3.5		08/20/08
Cyanide											
Cyanide	57-12-5	LA-695-402	NU	< 0.197	mg/kg			0.99	0.20		08/14/08
ICP Metals Analysis, Grd H20 P Prep											**09/25/08**
ICP Metals Analysis, Grd H20 P											
Aluminum	7429-90-5	LA-505-411		8.16e+03	mg/kg			99.21	5.2		09/25/08
Iron	7439-89-6	LA-505-411		1.56e+04	mg/kg			99.21	2.5		09/25/08
Magnesium	7439-95-4	LA-505-411		5.22e+03	mg/kg			99.21	5.0		09/25/08
Potassium	7440-09-7	LA-505-411		1.46e+03	mg/kg			99.21	17		09/25/08
Sodium	7440-23-5	LA-505-411	N	121	mg/kg			99.21	5.1		09/25/08
Barium	7440-39-3	LA-505-411		93.1	mg/kg			99.21	0.40		09/25/08
Calcium	7440-70-2	LA-505-411		1.08e+04	mg/kg			99.21	7.2		09/25/08
Lithium	7439-93-2	LA-505-411		9.50	mg/kg			99.21	0.40		09/25/08
Molybdenum	7439-98-7	LA-505-411	U	< 0.496	mg/kg			99.21	0.50		09/25/08
Strontium	7440-24-6	LA-505-411		26.5	mg/kg			99.21	0.40		09/25/08
Titanium	7440-32-6	LA-505-411		662	mg/kg			99.21	0.40		09/25/08
Arsenic	7440-38-2	LA-505-411	B	8.03	mg/kg			99.21	7.7		09/25/08
Beryllium	7440-41-7	LA-505-411	B	0.445	mg/kg			99.21	0.40		09/25/08

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)
N - Spike sample recovery is outside control limits.(inorg)
U - Analyzed for but not detected above limiting criteria.

D - Analyte was identified at a secondary dilution factor
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-093
Sample # W08GR03326
Client ID: B1WB34 TRENT WSCF

Matrix: SOIL

Group #: WSCF20081722
Department: Inorganic
Sampled: 08/06/08
Received: 08/13/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Boron	7440-42-8	LA-505-411	E	11.7	mg/kg			99.21	2.0		09/25/08
Bismuth	7440-69-9	LA-505-411	U	< 3.47	mg/kg			99.21	3.5		09/25/08
ICP-200.8 MS All possible meta Prep											**09/09/08**
ICP-200.8 MS All possible meta											
Manganese	7439-96-5	LA-505-412		331	mg/kg			0.99	0.0991		09/09/08
Nickel	7440-02-0	LA-505-412		15.2	mg/kg			0.99	0.198		09/09/08
Silver	7440-22-4	LA-505-412		0.100	mg/kg			0.99	0.0991		09/09/08
Antimony	7440-36-0	LA-505-412		0.340	mg/kg			0.99	0.297		09/09/08
Cadmium	7440-43-9	LA-505-412		0.180	mg/kg			0.99	0.0991		09/09/08
Chromium	7440-47-3	LA-505-412		16.2	mg/kg			0.99	0.496		09/09/08
Cobalt	7440-48-4	LA-505-412		8.23	mg/kg			0.99	0.0496		09/09/08
Copper	7440-50-8	LA-505-412		17.4	mg/kg			0.99	0.0991		09/09/08
Vanadium	7440-62-2	LA-505-412		31.5	mg/kg			0.99	0.198		09/09/08
Zinc	7440-66-6	LA-505-412		49.6	mg/kg			0.99	0.793		09/09/08
Lead	7439-92-1	LA-505-412		11.3	mg/kg			0.99	0.0991		09/09/08
Mercury	7439-97-6	LA-505-412	UX	< 0.0496	mg/kg			0.99	0.0496		09/09/08
Uranium	7440-61-1	LA-505-412		0.850	mg/kg			0.99	0.0496		09/09/08
Selenium	7782-49-2	LA-505-412		< 0.297	mg/kg			0.99	0.297		09/09/08
Thallium	7440-28-0	LA-505-412		0.880	mg/kg			0.99	0.0991		09/09/08

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)
N - Spike sample recovery is outside control limits.(inorg)
U - Analyzed for but not detected above limiting criteria.

D - Analyte was identified at a secondary dilution factor
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: Anions by Ion Chromatography

Sample Date: 08/05/08
Receive Date:08/07/08

Lab ID: W08GR03258
BATCH QC ASSOCIATED WITH SAMPLE

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
DUP	Chloride	16887-00-6	<1.5		RPD			n/a	20.000	U	08/20/08
DUP	Fluoride	16984-48-8	<0.3		RPD			n/a	20.000	U	08/20/08
DUP	Nitrogen in Nitrite	NO2-N	<0.5		RPD			n/a	20.000	U	08/20/08
DUP	Nitrogen in Nitrate	NO3-N	5.5052		RPD			4.074	20.000		08/20/08
DUP	Phosphate (P) by IC	PO4-P	<2		RPD			n/a	20.000	U	08/20/08
DUP	Sulfate	14808-79-8	11.425		RPD			7.192	20.000		08/20/08
MS	Chloride	16887-00-6	0.914156	91.416	% Recov	80.000	120.000				08/20/08
MS	Fluoride	16984-48-8	0.427734	85.890	% Recov	80.000	120.000				08/20/08
MS	Nitrogen in Nitrite	NO2-N	0.45714	91.980	% Recov	80.000	120.000				08/20/08
MS	Nitrogen in Nitrate	NO3-N	0.44175	98.167	% Recov	80.000	120.000				08/20/08
MS	Phosphate (P) by IC	PO4-P	0.746214	77.168	% Recov	80.000	120.000				08/20/08
MS	Sulfate	14808-79-8	1.764066	89.094	% Recov	80.000	120.000				08/20/08
MSD	Chloride	16887-00-6	0.926652	92.665	% Recov	80.000	120.000				08/20/08
MSD	Fluoride	16984-48-8	0.432818	86.911	% Recov	80.000	120.000				08/20/08
MSD	Nitrogen in Nitrite	NO2-N	0.46895	94.356	% Recov	80.000	120.000				08/20/08
MSD	Nitrogen in Nitrate	NO3-N	0.448948	99.766	% Recov	80.000	120.000				08/20/08
MSD	Phosphate (P) by IC	PO4-P	0.756792	78.262	% Recov	80.000	120.000				08/20/08
MSD	Sulfate	14808-79-8	1.7526	88.515	% Recov	80.000	120.000				08/20/08
SPK-RPD	Chloride	16887-00-6	92.665		RPD			1.357	20.000		08/20/08
SPK-RPD	Fluoride	16984-48-8	86.911		RPD			1.182	20.000		08/20/08
SPK-RPD	Nitrogen in Nitrite	NO2-N	94.356		RPD			2.550	20.000		08/20/08
SPK-RPD	Nitrogen in Nitrate	NO3-N	99.766		RPD			1.616	20.000		08/20/08
SPK-RPD	Phosphate (P) by IC	PO4-P	78.262		RPD			1.408	20.000		08/20/08
SPK-RPD	Sulfate	14808-79-8	88.515		RPD			0.652	20.000		08/20/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: Anions by Ion Chromatography

Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
BATCH QC											
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	08/20/08
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	08/20/08
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	08/20/08
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	08/20/08
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	08/20/08
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	08/20/08
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	08/20/08
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	08/20/08
BLANK	Phosphate (P) by IC	PO4-P	<4e-2	n/a	mg/L	0.000	0.200			U	08/20/08
BLANK	Phosphate (P) by IC	PO4-P	<4e-2	n/a	mg/L	0.000	0.200			U	08/20/08
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	08/20/08
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	08/20/08
LCS	Chloride	16887-00-6	194.763	96.897	% Recov	80.000	120.000				08/20/08
LCS	Fluoride	16984-48-8	105.3685	105.792	% Recov	80.000	120.000				08/20/08
LCS	Nitrogen in Nitrite	NO2-N	99.4537	100.054	% Recov	80.000	120.000				08/20/08
LCS	Nitrogen in Nitrate	NO3-N	92.2328	102.367	% Recov	80.000	120.000				08/20/08
LCS	Phosphate (P) by IC	PO4-P	195.9225	101.304	% Recov	80.000	120.000				08/20/08
LCS	Sulfate	14808-79-8	387.2632	97.794	% Recov	80.000	120.000				08/20/08
Lab ID: W08GR03325											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Chloride	16887-00-6	<1.5		RPD			n/a	20.000	U	08/27/08
DUP	Fluoride	16984-48-8	<0.3		RPD			n/a	20.000	U	08/27/08
DUP	Nitrogen in Nitrite	NO2-N	<0.5		RPD			n/a	20.000	U	08/27/08
DUP	Nitrogen in Nitrate	NO3-N	1.2718		RPD			10.154	20.000		08/27/08
DUP	Phosphate (P) by IC	PO4-P	<2		RPD			n/a	20.000	U	08/27/08
DUP	Sulfate	14808-79-8	4.8651		RPD			2.376	20.000		08/27/08
MS	Chloride	16887-00-6	0.907026	90.703	% Recov	80.000	120.000				08/27/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: Anions by Ion Chromatography

Sample Date: 08/06/08
Receive Date:08/13/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MS	Fluoride	16984-48-8	0.418776	84.092	% Recov	80.000	120.000				08/27/08
MS	Nitrogen in Nitrite	NO2-N	0.458676	92.289	% Recov	80.000	120.000				08/27/08
MS	Nitrogen in Nitrate	NO3-N	0.430752	95.723	% Recov	80.000	120.000				08/27/08
MS	Phosphate (P) by IC	PO4-P	0.694078	71.776	% Recov	80.000	120.000			•	08/27/08
MS	Sulfate	14808-79-8	1.734526	87.602	% Recov	80.000	120.000				08/27/08
MSD	Chloride	16887-00-6	0.90297	90.297	% Recov	80.000	120.000				08/27/08
MSD	Fluoride	16984-48-8	0.422318	84.803	% Recov	80.000	120.000				08/27/08
MSD	Nitrogen in Nitrite	NO2-N	0.456486	91.848	% Recov	80.000	120.000				08/27/08
MSD	Nitrogen in Nitrate	NO3-N	0.42305	94.011	% Recov	80.000	120.000				08/27/08
MSD	Phosphate (P) by IC	PO4-P	0.691636	71.524	% Recov	80.000	120.000			•	08/27/08
MSD	Sulfate	14808-79-8	1.735782	87.666	% Recov	80.000	120.000				08/27/08
SPK-RPD	Chloride	16887-00-6	90.297		RPD			0.449	20.000		08/27/08
SPK-RPD	Fluoride	16984-48-8	84.803		RPD			0.842	20.000		08/27/08
SPK-RPD	Nitrogen in Nitrite	NO2-N	91.848		RPD			0.479	20.000		08/27/08
SPK-RPD	Nitrogen in Nitrate	NO3-N	94.011		RPD			1.805	20.000		08/27/08
SPK-RPD	Phosphate (P) by IC	PO4-P	71.524		RPD			0.352	20.000		08/27/08
SPK-RPD	Sulfate	14808-79-8	87.666		RPD			0.073	20.000		08/27/08

BATCH QC

BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	08/27/08
BLANK	Chloride	16887-00-6	<3e-2	n/a	mg/L	0.000	0.030			U	08/27/08
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	08/27/08
BLANK	Fluoride	16984-48-8	<6e-3	n/a	mg/L	0.000	0.030			U	08/27/08
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	08/27/08
BLANK	Nitrogen in Nitrite	NO2-N	<1e-2	n/a	mg/L	0.000	0.020			U	08/27/08
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	08/27/08
BLANK	Nitrogen in Nitrate	NO3-N	<5e-3	n/a	mg/L	0.000	0.040			U	08/27/08
BLANK	Phosphate (P) by IC	PO4-P	<4e-2	n/a	mg/L	0.000	0.200			U	08/27/08
BLANK	Phosphate (P) by IC	PO4-P	<4e-2	n/a	mg/L	0.000	0.200			U	08/27/08
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	08/27/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: Anions by Ion Chromatography

Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
BLANK	Sulfate	14808-79-8	<7e-2	n/a	mg/L	0.000	0.200			U	08/27/08
LCS	Chloride	16887-00-6	190.0995	94.577	% Recov	80.000	120.000				08/27/08
LCS	Fluoride	16984-48-8	101.0017	101.407	% Recov	80.000	120.000				08/27/08
LCS	Nitrogen in Nitrite	NO2-N	98.0407	98.632	% Recov	80.000	120.000				08/27/08
LCS	Nitrogen in Nitrate	NO3-N	89.5276	99.365	% Recov	80.000	120.000				08/27/08
LCS	Phosphate (P) by IC	PO4-P	187.1325	96.759	% Recov	80.000	120.000				08/27/08
LCS	Sulfate	14808-79-8	373.5957	94.342	% Recov	80.000	120.000				08/27/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: Cyanide by Midi/Spectrophotom

Sample Date: 08/05/08
Receive Date:08/07/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR03258											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Cyanide by Midi/Spectrophotom	57-12-5	1.88	94.000	% Recov	75.000	125.000				08/14/08
MSD	Cyanide by Midi/Spectrophotom	57-12-5	1.36	69.388	% Recov	75.000	125.000		•		08/14/08
SPK-RPD	Cyanide by Midi/Spectrophotom	57-12-5	69.388		RPD			30.127	20.000 •		08/14/08
BATCH QC											
BLANK	Cyanide by Midi/Spectrophotom	57-12-5	< 4	n/a	ug/L	-4.000	4.000			U	08/14/08
LCS	Cyanide by Midi/Spectrophotom	57-12-5	43	86.000	% Recov	85.000	115.000				08/14/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 08/07/08
Receive Date:08/14/08

Lab ID: W08GR03336
BATCH QC ASSOCIATED WITH SAMPLE

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MS	Aluminum	7429-90-5	1816	903.483	% Recov	75.000	125.000			•	09/25/08
MS	Arsenic	7440-38-2	198.9	98.955	% Recov	75.000	125.000				09/25/08
MS	Boron	7440-42-8	192.31	95.677	% Recov	75.000	125.000				09/25/08
MS	Barium	7440-39-3	89.86	89.413	% Recov	75.000	125.000				09/25/08
MS	Beryllium	7440-41-7	99.32	99.320	% Recov	75.000	125.000				09/25/08
MS	Bismuth	7440-69-9	190.2	94.627	% Recov	75.000	125.000				09/25/08
MS	Calcium	7440-70-2	1060	527.363	% Recov	75.000	125.000			•	09/25/08
MS	Iron	7439-89-6	1810	900.498	% Recov	75.000	125.000			•	09/25/08
MS	Potassium	7440-09-7	1602.8	79.741	% Recov	75.000	125.000				09/25/08
MS	Lithium	7439-93-2	87.506	87.071	% Recov	70.000	130.000				09/25/08
MS	Magnesium	7439-95-4	594	295.522	% Recov	75.000	125.000			•	09/25/08
MS	Molybdenum	7439-98-7	194.0097	96.522	% Recov	75.000	125.000				09/25/08
MS	Sodium	7440-23-5	268.7	133.682	% Recov	75.000	125.000			•	09/25/08
MS	Strontium	7440-24-6	98.64	98.640	% Recov	75.000	125.000				09/25/08
MS	Titanium	7440-32-6	482	239.801	% Recov	75.000	125.000			•	09/25/08
MSD	Aluminum	7429-90-5	1892	946.000	% Recov	75.000	125.000			•	09/25/08
MSD	Arsenic	7440-38-2	196.3	98.150	% Recov	75.000	125.000				09/25/08
MSD	Boron	7440-42-8	190.11	95.055	% Recov	75.000	125.000				09/25/08
MSD	Barium	7440-39-3	95.36	95.360	% Recov	75.000	125.000				09/25/08
MSD	Beryllium	7440-41-7	98.23	98.230	% Recov	75.000	125.000				09/25/08
MSD	Bismuth	7440-69-9	189.1	94.550	% Recov	75.000	125.000				09/25/08
MSD	Calcium	7440-70-2	510	255.000	% Recov	75.000	125.000			•	09/25/08
MSD	Iron	7439-89-6	540	270.000	% Recov	75.000	125.000			•	09/25/08
MSD	Potassium	7440-09-7	1638.8	81.940	% Recov	75.000	125.000				09/25/08
MSD	Lithium	7439-93-2	89.456	89.456	% Recov	75.000	125.000				09/25/08
MSD	Magnesium	7439-95-4	650	325.000	% Recov	75.000	125.000			•	09/25/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: ICP Metals Analysis, Grd H20 P

Sample Date: 08/07/08
Receive Date:08/14/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Molybdenum	7439-98-7	191.5097	95.755	% Recov	75.000	125.000				09/25/08
MSD	Sodium	7440-23-5	271.8	135.900	% Recov	75.000	125.000			*	09/25/08
MSD	Strontium	7440-24-6	98.44	98.440	% Recov	75.000	125.000				09/25/08
MSD	Titanium	7440-32-6	295	147.500	% Recov	75.000	125.000			*	09/25/08
SPK-RPD	Aluminum	7429-90-5	946.000		RPD			4.598	20.000		09/25/08
SPK-RPD	Arsenic	7440-38-2	98.150		RPD			0.817	20.000		09/25/08
SPK-RPD	Boron	7440-42-8	95.055		RPD			0.652	20.000		09/25/08
SPK-RPD	Barium	7440-39-3	95.360		RPD			6.437	20.000		09/25/08
SPK-RPD	Beryllium	7440-41-7	98.230		RPD			1.104	20.000		09/25/08
SPK-RPD	Bismuth	7440-69-9	94.550		RPD			0.081	20.000		09/25/08
SPK-RPD	Calcium	7440-70-2	255.000		RPD			69.626	20.000 *		09/25/08
SPK-RPD	Iron	7439-89-6	270.000		RPD			107.732	20.000 *		09/25/08
SPK-RPD	Potassium	7440-09-7	81.940		RPD			2.720	20.000		09/25/08
SPK-RPD	Lithium	7439-93-2	89.456		RPD			2.702	20.000		09/25/08
SPK-RPD	Magnesium	7439-95-4	325.000		RPD			9.501	20.000		09/25/08
SPK-RPD	Molybdenum	7439-98-7	95.755		RPD			0.798	20.000		09/25/08
SPK-RPD	Sodium	7440-23-5	135.900		RPD			1.646	20.000		09/25/08
SPK-RPD	Strontium	7440-24-6	98.440		RPD			0.203	20.000		09/25/08
SPK-RPD	Titanium	7440-32-6	147.500		RPD			47.864	20.000 *		09/25/08

BATCH QC

BLANK	Aluminum	7429-90-5	<5.2e-2	n/a	ug/mL					U	09/25/08
BLANK	Arsenic	7440-38-2	<7.8e-2	n/a	ug/mL					U	09/25/08
BLANK	Boron	7440-42-8	<2e-2	n/a	ug/mL					U	09/25/08
BLANK	Barium	7440-39-3	<4e-3	n/a	ug/mL					U	09/25/08
BLANK	Beryllium	7440-41-7	<4e-3	n/a	ug/mL					U	09/25/08
BLANK	Bismuth	7440-69-9	<3.5e-2	n/a	ug/mL					U	09/25/08
BLANK	Calcium	7440-70-2	<7.3e-2	n/a	ug/mL					U	09/25/08
BLANK	Iron	7439-89-6	<2.5e-2	n/a	ug/mL					U	09/25/08
BLANK	Potassium	7440-09-7	<0.17	n/a	ug/mL					U	09/25/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: ICP Metals Analysis, Grd H20 P

Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
BLANK	Lithium	7439-93-2	<4e-3	n/a	ug/mL					U	09/25/08
BLANK	Magnesium	7439-95-4	<5e-2	n/a	ug/mL					U	09/25/08
BLANK	Molybdenum	7439-98-7	<5e-3	n/a	ug/mL					U	09/25/08
BLANK	Sodium	7440-23-5	<5.1e-2	n/a	ug/mL					U	09/25/08
BLANK	Strontium	7440-24-6	<4e-3	n/a	ug/mL					U	09/25/08
BLANK	Titanium	7440-32-6	<4e-3	n/a	ug/mL					U	09/25/08
LCS	Aluminum	7429-90-5	9449	73.820	% Recov	44.000	157.000				09/25/08
LCS	Arsenic	7440-38-2	243.5	97.012	% Recov	79.000	121.000				09/25/08
LCS	Boron	7440-42-8	127.4	98.760	% Recov	45.000	156.000				09/25/08
LCS	Barium	7440-39-3	587.8	95.422	% Recov	80.000	120.000				09/25/08
LCS	Beryllium	7440-41-7	171.4	96.292	% Recov	81.000	119.000				09/25/08
LCS	Bismuth	7440-69-9	95.73	95.634	% Recov	80.000	120.000				09/25/08
LCS	Calcium	7440-70-2	10370	102.673	% Recov	76.000	124.000				09/25/08
LCS	Iron	7439-89-6	16360	87.487	% Recov	47.000	152.000				09/25/08
LCS	Potassium	7440-09-7	3389	72.106	% Recov	64.000	136.000				09/25/08
LCS	Lithium	7439-93-2	7.204	0.000	% Recov	80.000	120.000				09/25/08
LCS	Magnesium	7439-95-4	4117	89.695	% Recov	71.000	129.000				09/25/08
LCS	Molybdenum	7439-98-7	116	90.625	% Recov	79.000	121.000				09/25/08
LCS	Sodium	7440-23-5	474.7	88.071	% Recov	51.000	149.000				09/25/08
LCS	Strontium	7440-24-6	115.7	94.065	% Recov	74.000	126.000				09/25/08
LCS	Titanium	7440-32-6	454.3	101.633	% Recov	9.000	191.000				09/25/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: ICP-200.8 MS All possible meta

Sample Date: 08/06/08
Receive Date:08/13/08

Lab ID: W08GR03325
BATCH QC ASSOCIATED WITH SAMPLE

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MS	Silver	7440-22-4	175.7	87.850	% Recov	70.000	130.000				09/09/08
MS	Cadmium	7440-43-9	188.29	94.145	% Recov	70.000	130.000				09/09/08
MS	Cobalt	7440-48-4	177.56	88.780	% Recov	70.000	130.000				09/09/08
MS	Chromium	7440-47-3	184.22	92.110	% Recov	70.000	130.000				09/09/08
MS	Copper	7440-50-8	177.6	88.800	% Recov	70.000	130.000				09/09/08
MS	Mercury	7439-97-6	2.11	105.500	% Recov	70.000	130.000				09/09/08
MS	Manganese	7439-96-5	198.5	99.250	% Recov	70.000	130.000				09/09/08
MS	Nickel	7440-02-0	182.33	91.165	% Recov	70.000	130.000				09/09/08
MS	Lead	7439-92-1	189.85	94.925	% Recov	70.000	130.000				09/09/08
MS	Antimony	7440-36-0	166.6	83.300	% Recov	70.000	130.000				09/09/08
MS	Selenium	7782-49-2	205.15	102.575	% Recov	70.000	130.000				09/09/08
MS	Thallium	7440-28-0	180.34	90.170	% Recov	70.000	130.000				09/09/08
MS	Uranium	7440-61-1	193.28	96.640	% Recov	70.000	130.000				09/09/08
MS	Vanadium	7440-62-2	180.92	90.460	% Recov	70.000	130.000				09/09/08
MS	Zinc	7440-66-6	187.97	93.985	% Recov	70.000	130.000				09/09/08
MSD	Silver	7440-22-4	171.5	85.750	% Recov	70.000	130.000				09/09/08
MSD	Cadmium	7440-43-9	182.09	91.045	% Recov	70.000	130.000				09/09/08
MSD	Cobalt	7440-48-4	167.66	83.830	% Recov	70.000	130.000				09/09/08
MSD	Chromium	7440-47-3	171.02	85.510	% Recov	70.000	130.000				09/09/08
MSD	Copper	7440-50-8	165.8	82.900	% Recov	70.000	130.000				09/09/08
MSD	Mercury	7439-97-6	2.03	101.500	% Recov	70.000	130.000				09/09/08
MSD	Manganese	7439-96-5	171.9	85.950	% Recov	70.000	130.000				09/09/08
MSD	Nickel	7440-02-0	169.93	84.965	% Recov	70.000	130.000				09/09/08
MSD	Lead	7439-92-1	183.65	91.825	% Recov	70.000	130.000				09/09/08
MSD	Antimony	7440-36-0	168.4	84.200	% Recov	70.000	130.000				09/09/08
MSD	Selenium	7782-49-2	199.05	99.525	% Recov	70.000	130.000				09/09/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: ICP-200.8 MS All possible meta

Sample Date: 08/06/08
Receive Date:08/13/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Thallium	7440-28-0	175.74	87.870	% Recov	70.000	130.000				09/09/08
MSD	Uranium	7440-61-1	188.48	94.240	% Recov	70.000	130.000				09/09/08
MSD	Vanadium	7440-62-2	172.22	86.110	% Recov	70.000	130.000				09/09/08
MSD	Zinc	7440-66-6	175.57	87.785	% Recov	70.000	130.000				09/09/08
SPK-RPD	Silver	7440-22-4	85.750		RPD			2.419	20.000		09/10/08
SPK-RPD	Cadmium	7440-43-9	91.045		RPD			3.348	20.000		09/10/08
SPK-RPD	Cobalt	7440-48-4	83.830		RPD			5.735	20.000		09/10/08
SPK-RPD	Chromium	7440-47-3	85.510		RPD			7.432	20.000		09/10/08
SPK-RPD	Copper	7440-50-8	82.900		RPD			6.872	20.000		09/10/08
SPK-RPD	Mercury	7439-97-6	101.500		RPD			3.865	20.000		09/10/08
SPK-RPD	Manganese	7439-96-5	85.950		RPD			14.363	20.000		09/10/08
SPK-RPD	Nickel	7440-02-0	84.965		RPD			7.040	20.000		09/10/08
SPK-RPD	Lead	7439-92-1	91.825		RPD			3.320	20.000		09/10/08
SPK-RPD	Antimony	7440-36-0	84.200		RPD			1.075	20.000		09/10/08
SPK-RPD	Selenium	7782-49-2	99.525		RPD			3.018	20.000		09/10/08
SPK-RPD	Thallium	7440-28-0	87.870		RPD			2.584	20.000		09/10/08
SPK-RPD	Uranium	7440-61-1	94.240		RPD			2.515	20.000		09/10/08
SPK-RPD	Vanadium	7440-62-2	86.110		RPD			4.927	20.000		09/10/08
SPK-RPD	Zinc	7440-66-6	87.785		RPD			6.822	20.000		09/10/08

Lab ID: W08GR03326
BATCH QC ASSOCIATED WITH SAMPLE

MS	Silver	7440-22-4	175.2	87.600	% Recov	70.000	130.000				09/09/08
MS	Cadmium	7440-43-9	185.62	92.810	% Recov	70.000	130.000				09/09/08
MS	Cobalt	7440-48-4	172.27	86.135	% Recov	70.000	130.000				09/09/08
MS	Chromium	7440-47-3	176.55	88.275	% Recov	70.000	130.000				09/09/08
MS	Copper	7440-50-8	170.24	85.120	% Recov	70.000	130.000				09/09/08
MS	Mercury	7439-97-6	2.02	101.000	% Recov	70.000	130.000				09/09/08
MS	Manganese	7439-96-5	165.1	82.550	% Recov	70.000	130.000				09/09/08
MS	Nickel	7440-02-0	174.92	87.460	% Recov	70.000	130.000				09/09/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: ICP-200.8 MS All possible meta

Sample Date: 08/06/08
Receive Date:08/13/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MS	Lead	7439-92-1	186.42	93.210	% Recov	70.000	130.000				09/09/08
MS	Antimony	7440-36-0	160.56	80.280	% Recov	70.000	130.000				09/09/08
MS	Selenium	7782-49-2	199.47	99.735	% Recov	70.000	130.000				09/09/08
MS	Thallium	7440-28-0	178.82	89.410	% Recov	70.000	130.000				09/09/08
MS	Uranium	7440-61-1	191.85	95.925	% Recov	70.000	130.000				09/09/08
MS	Vanadium	7440-62-2	177.22	88.610	% Recov	70.000	130.000				09/09/08
MS	Zinc	7440-66-6	180.8	90.400	% Recov	70.000	130.000				09/09/08
MSD	Silver	7440-22-4	167.8	83.900	% Recov	70.000	130.000				09/09/08
MSD	Cadmium	7440-43-9	182.42	91.210	% Recov	70.000	130.000				09/09/08
MSD	Cobalt	7440-48-4	167.87	83.935	% Recov	70.000	130.000				09/09/08
MSD	Chromium	7440-47-3	174.35	87.175	% Recov	70.000	130.000				09/09/08
MSD	Copper	7440-50-8	167.04	83.520	% Recov	70.000	130.000				09/09/08
MSD	Mercury	7439-97-6	1.99	99.500	% Recov	70.000	130.000				09/09/08
MSD	Manganese	7439-96-5	163.3	81.650	% Recov	70.000	130.000				09/09/08
MSD	Nickel	7440-02-0	172.22	86.110	% Recov	70.000	130.000				09/09/08
MSD	Lead	7439-92-1	184.52	92.260	% Recov	70.000	130.000				09/09/08
MSD	Antimony	7440-36-0	156.46	78.230	% Recov	70.000	130.000				09/09/08
MSD	Selenium	7782-49-2	198.27	99.135	% Recov	70.000	130.000				09/09/08
MSD	Thallium	7440-28-0	175.92	87.960	% Recov	70.000	130.000				09/09/08
MSD	Uranium	7440-61-1	189.75	94.875	% Recov	70.000	130.000				09/09/08
MSD	Vanadium	7440-62-2	173.12	86.560	% Recov	70.000	130.000				09/09/08
MSD	Zinc	7440-66-6	178.8	89.400	% Recov	70.000	130.000				09/09/08
SPK-RPD	Silver	7440-22-4	83.900		RPD			4.315	20.000		09/10/08
SPK-RPD	Cadmium	7440-43-9	91.210		RPD			1.739	20.000		09/10/08
SPK-RPD	Cobalt	7440-48-4	83.935		RPD			2.587	20.000		09/10/08
SPK-RPD	Chromium	7440-47-3	87.175		RPD			1.254	20.000		09/10/08
SPK-RPD	Copper	7440-50-8	83.520		RPD			1.898	20.000		09/10/08
SPK-RPD	Mercury	7439-97-6	99.500		RPD			1.496	20.000		09/10/08
SPK-RPD	Manganese	7439-96-5	81.650		RPD			1.096	20.000		09/10/08
SPK-RPD	Nickel	7440-02-0	86.110		RPD			1.556	20.000		09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: ICP-200.8 MS All possible meta

Sample Date: 08/06/08
Receive Date:08/13/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
SPK-RPD	Lead	7439-92-1	92.260		RPD			1.024	20.000		09/10/08
SPK-RPD	Antimony	7440-36-0	78.230		RPD			2.587	20.000		09/10/08
SPK-RPD	Selenium	7782-49-2	99.135		RPD			0.603	20.000		09/10/08
SPK-RPD	Thallium	7440-28-0	87.960		RPD			1.635	20.000		09/10/08
SPK-RPD	Uranium	7440-61-1	94.875		RPD			1.101	20.000		09/10/08
SPK-RPD	Vanadium	7440-62-2	86.560		RPD			2.341	20.000		09/10/08
SPK-RPD	Zinc	7440-66-6	89.400		RPD			1.112	20.000		09/10/08
Lab ID: W08GR03514											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Chromium	7440-47-3	185.19	92.595	% Recov	70.000	130.000				09/10/08
MS	Manganese	7439-96-5	171.5	85.750	% Recov	70.000	130.000				09/10/08
MSD	Chromium	7440-47-3	188.49	94.245	% Recov	70.000	130.000				09/10/08
MSD	Manganese	7439-96-5	169	84.500	% Recov	70.000	130.000				09/10/08
SPK-RPD	Chromium	7440-47-3	94.245		RPD			1.766	20.000		09/10/08
SPK-RPD	Manganese	7439-96-5	84.500		RPD			1.468	20.000		09/10/08
BATCH QC											
BLANK	Silver	7440-22-4	<0.1	n/a	ug/L					U	09/09/08
BLANK	Cadmium	7440-43-9	<0.1	n/a	ug/L					U	09/09/08
BLANK	Cobalt	7440-48-4	<5e-2	n/a	ug/L					U	09/09/08
BLANK	Chromium	7440-47-3	<0.5	n/a	ug/L					U	09/09/08
BLANK	Copper	7440-50-8	<0.1	n/a	ug/L					U	09/09/08
BLANK	Mercury	7439-97-6	<5e-2	n/a	ug/L					U	09/09/08
BLANK	Manganese	7439-96-5	<0.1	n/a	ug/L					U	09/09/08
BLANK	Nickel	7440-02-0	<0.2	n/a	ug/L					U	09/09/08
BLANK	Lead	7439-92-1	<0.1	n/a	ug/L					U	09/09/08
BLANK	Antimony	7440-36-0	<0.3	n/a	ug/L					U	09/09/08
BLANK	Selenium	7782-49-2	<0.3	n/a	ug/L					U	09/09/08
BLANK	Thallium	7440-28-0	<0.1	n/a	ug/L					U	09/09/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081722
Matrix: SOLID
Test: ICP-200.8 MS All possible meta

Sample Date:
Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
BLANK	Uranium	7440-61-1	<5e-2	n/a	ug/L					U	09/09/08
BLANK	Vanadium	7440-62-2	<0.2	n/a	ug/L					U	09/09/08
BLANK	Zinc	7440-66-6	<0.8	n/a	ug/L					U	09/09/08
LCS	Silver	7440-22-4	110.6	109.505	% Recov	98.000	134.000				09/09/08
LCS	Cadmium	7440-43-9	75.9	114.135	% Recov	95.000	124.000				09/09/08
LCS	Cobalt	7440-48-4	72	98.495	% Recov	88.000	119.000				09/09/08
LCS	Chromium	7440-47-3	69.9	95.885	% Recov	77.000	125.000				09/09/08
LCS	Copper	7440-50-8	63.1	92.117	% Recov	84.000	122.000				09/09/08
LCS	Mercury	7439-97-6	8.3	100.242	% Recov	71.000	132.000				09/09/08
LCS	Manganese	7439-96-5	441	97.351	% Recov	83.000	118.000				09/09/08
LCS	Nickel	7440-02-0	53.9	96.942	% Recov	90.000	121.000				09/09/08
LCS	Lead	7439-92-1	146.7	112.846	% Recov	92.000	123.000				09/09/08
LCS	Antimony	7440-36-0	146.8	162.749	% Recov	114.000	260.000				09/09/08
LCS	Selenium	7782-49-2	183.3	113.851	% Recov	52.000	157.000				09/09/08
LCS	Thallium	7440-28-0	137	103.008	% Recov	92.000	123.000				09/09/08
LCS	Uranium	7440-61-1	390.6	97.650	% Recov	81.000	125.000				09/09/08
LCS	Vanadium	7440-62-2	79.4	95.663	% Recov	81.000	122.000				09/09/08
LCS	Zinc	7440-66-6	191.1	107.966	% Recov	85.000	130.000				09/09/08

WSCF
ANALYTICAL COMMENT REPORT

Attention: Steve Trent
Project Number F08-098

Group #: WSCF20081722
Department: Inorganic

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		IC Anion - MS/MSD recoveries out of limits for phosphate in sample W08GR03325; Data N-flagged. DTS ICP-MS: Mercury analyzed after the hold time expired. "X" flag U-234 duplicate is flagged for poor RPD due to the low countrate of the sample. lmh ICP-AES: [Samples W08GR3325-3326] Lithium and zirconium are not present in the LCS standard. Elements having results <5X MDL; "B" flag. Aluminum, calcium, iron, magnesium, and titanium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check and high standards used to ensure aluminum, calcium, iron, and magnesium linearity because sample results are greater than the calibration standard. High sodium spike recoveries; "N" flag. Iron interference causes high bias on boron results; "E" flag.

Lab Areas: VALGROUP - Group Validation
LOGSAMP - Login for Sample
VALTEST - Test Validation
LOGTEST - Login for Tests
TESTDATA - Test Data Entry

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WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-093
Sample # W08GR03325
Client ID: B1WB33 TRENT WSCF

Matrix: SOIL

Group #: WSCF20081722
Department: Radiochemistry
Sampled: 08/06/08
Received: 08/13/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Americium by AEA											
Americium-241	14596-10-2	LA-508-471	U	0.0120	pCi/g	+-0.0199	pCi/g	1.00	0.034		08/29/08
Am-243 tracer by AEA	AM243	LA-508-471		3.80	pCi/g			1.00	0.021		08/29/08
Gamma Energy Analysis-grd H2O											
Cesium-137	10045-97-3	LA-508-481	U	8.60e-03	pCi/g	+-0.0552	pCi/g	1.00	0.10		09/26/08
Europium-154	15585-10-1	LA-508-481	U	-0.217	pCi/g	+-0.217	pCi/g	1.00	0.29		09/26/08
Plutonium Isotopics by AEA											
Plutonium-238	13981-16-3	LA-508-471	U	-3.10e-03	pCi/g	+-0.0206	pCi/g	1.00	0.039		09/24/08
Pu-239/240 by AEA	PU-239/240	LA-508-471	U	3.10e-03	pCi/g	+-4.46e-03	pCi/g	1.00	4.3e-03		09/24/08
Pu-242 tracer by AEA	PU242	LA-508-471		5.90	pCi/g			1.00	4.2e-03		09/24/08
Strontium 89/90											
Strontium-89/90	SR-RAD	LA-508-415	U	-1.50	pCi/g	+-1.50	pCi/g	1.00	0.35		09/08/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		92.1	Percent			1.00	0.0		09/08/08
Uranium Isotopics by AEA											
Uranium-233/234	U-233/234	LA-508-471		0.180	pCi/g	+-0.0576	pCi/g	1.00	0.016		09/19/08
Uranium-235	15117-96-1	LA-508-471	U	0.0130	pCi/g	+-0.0127	pCi/g	1.00	0.017		09/19/08
Uranium-238	U-238	LA-508-471		0.170	pCi/g	+-0.0544	pCi/g	1.00	0.012		09/19/08
U-232 tracer by AEA	U232	LA-508-471		3.90	pCi/g			1.00	0.036		09/19/08

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)
N - Spike sample recovery is outside control limits.(inorg)
U - Analyzed for but not detected above limiting criteria.

D - Analyte was identified at a secondary dilution factor
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

WSCF
ANALYTICAL RESULTS REPORT

Attention: Steve Trent
SAF Number: F08-093
Sample # W08GR03326
Client ID: B1WB34 TRENT WSCF

Matrix: SOIL

Group #: WSCF20081722
Department: Radiochemistry
Sampled: 08/06/08
Received: 08/13/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Americium by AEA											
Americium-241	14596-10-2	LA-508-471	U	0.0220	pCi/g	+-0.0202	pCi/g	1.00	0.029		08/29/08
Am-243 tracer by AEA	AM243	LA-508-471		3.90	pCi/g			1.00	0.017		08/29/08
Gamma Energy Analysis-grd H2O											
Cesium-137	10045-97-3	LA-508-481	U	-0.0122	pCi/g	+-0.0425	pCi/g	1.00	0.074		09/26/08
Europium-154	15585-10-1	LA-508-481	U	0.155	pCi/g	+-0.156	pCi/g	1.00	0.31		09/26/08
Plutonium Isotopics by AEA											
Plutonium-238	13981-16-3	LA-508-471	U	1.70e-03	pCi/g	+-0.0140	pCi/g	1.00	0.027		09/24/08
Pu-239/240 by AEA	PU-239/240	LA-508-471	U	1.70e-03	pCi/g	+-5.90e-03	pCi/g	1.00	0.012		09/24/08
Pu-242 tracer by AEA	PU242	LA-508-471		6.10	pCi/g			1.00	4.6e-03		09/24/08
Strontium 89/90											
Strontium-89/90	SR-RAD	LA-508-415	U	-1.90	pCi/g	+-1.90	pCi/g	1.00	0.36		09/08/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		93.0	Percent			1.00	0.0		09/08/08
Uranium Isotopics by AEA											
Uranium-233/234	U-233/234	LA-508-471		0.200	pCi/g	+-0.0620	pCi/g	1.00	0.017		09/19/08
Uranium-235	15117-96-1	LA-508-471		0.0170	pCi/g	+-0.0126	pCi/g	1.00	0.013		09/19/08
Uranium-238	U-238	LA-508-471		0.230	pCi/g	+-0.0713	pCi/g	1.00	0.011		09/19/08
U-232 tracer by AEA	U232	LA-508-471		4.00	pCi/g			1.00	0.030		09/19/08

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)
N - Spike sample recovery is outside control limits.(inorg)
U - Analyzed for but not detected above limiting criteria.

D - Analyte was identified at a secondary dilution factor
E - Analyte is an estimate, has potentially larger errors(inorg)
U - Analyzed for but not detected above limiting criteria(inorg)
X - Other flags/notes described in the comments/narrative(inorg)

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

WSCF
TENTATIVELY IDENTIFIED PEAK REPORT

Attention: Steve Trent
Project Number F08-098 :F08-098

Group #: WSCF20081722
Department: Radiochemistry

Sample #	Client ID		Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	AC-228				1.1	pCi/g
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	AC-228 Count Error				41	%
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	BI-214				0.70	pCi/g
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	BI-214 Count Error				36	%
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	K-40				23	pCi/g
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	K-40 Count Error				15	%
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	PB-212				1.3	pCi/g
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	PB-212 Count Error				20	%
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	PB-214				0.68	pCi/g
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	PB-214 Count Error				29	%
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	RA-226				0.70	pCi/g
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	RA-226 Count Error				36	%
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	RA-228				1.1	pCi/g
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	RA-228 Count Error				41	%
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	TL-208				0.30	pCi/g
W08GR03325	B1WB33	TRENT	Gamma Energy Analysis-grd H2O	TL-208 Count Error				43	%
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	AC-228				0.90	pCi/g
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	AC-228 Count Error				46	%
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	BI-214				0.65	pCi/g
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	BI-214 Count Error				29	%
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	K-40				22	pCi/g
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	K-40 Count Error				15	%
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	PB-212				1.0	pCi/g
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	PB-212 Count Error				24	%
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	PB-214				0.83	pCi/g

RQ=Result Qualifier

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WSCF
TENTATIVELY IDENTIFIED PEAK REPORT

Attention: Steve Trent
Project Number F08-098 :F08-098

Group #: WSCF20081722
Department: Radiochemistry

Sample #	Client ID		Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	PB-214 Count Error				25	%
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	RA-226				0.65	pCi/g
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	RA-226 Count Error				29	%
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	RA-228				1.3	pCi/g
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	RA-228 Count Error				28	%
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	TL-208				0.34	pCi/g
W08GR03326	B1WB34	TRENT	Gamma Energy Analysis-grd H2O	TL-208 Count Error				36	%

RQ=Result Qualifier

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WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081722
Matrix: SOLID
Test: Americium by AEA

Sample Date: 06/10/08
Receive Date:06/17/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR01803											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Americium-241	14596-10-2	U8.1e-3		RPD			n/a	20.000		08/29/08
DUP	Am-243 tracer by AEA	AM243	3.971	81.720	% Recov	30.000	105.000				08/29/08
Lab ID: W08GR03325											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Am-243 tracer by AEA	AM243	3.812	95.360	% Recov	30.000	105.000				08/29/08
Lab ID: W08GR03326											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Am-243 tracer by AEA	AM243	3.886	86.720	% Recov	30.000	105.000				08/29/08
BATCH QC											
BLANK	Americium-241	14596-10-2	U2.1e-3	n/a	pCi/g	-10.000	1000.000				08/29/08
BLANK	Am-243 tracer by AEA	AM243	4.003	78.810	% Recov	30.000	105.000				08/29/08
LCS	Americium-241	14596-10-2	12.34	104.135	% Recov	80.000	120.000				08/29/08
LCS	Am-243 tracer by AEA	AM243	11.11	77.610	% Recov	30.000	105.000				08/29/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Radiochemistry**

SDG Number: WSCF20081722
Matrix: SOLID
Test: Gamma Energy Analysis-grd H2O

Sample Date: 08/06/08
Receive Date:08/13/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR03325											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Cesium-137	10045-97-3	U8.27e-3		RPD			n/a	20.000		09/26/08
DUP	Europium-154	15585-10-1	U-9.552e-2		RPD			n/a	20.000		09/26/08
BATCH QC											
BLANK	Cesium-137	10045-97-3	U-6.269e-3	n/a	pCi/g	-10.000	1000.000				09/26/08
BLANK	Europium-154	15585-10-1	U-2.017e-2	n/a	pCi/g	-10.000	1000.000				09/26/08
LCS	Cesium-137	10045-97-3	6274	103.874	% Recov	80.000	120.000				09/26/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081722
Matrix: SOLID
Test: Plutonium Isotopics by AEA

Sample Date: 08/06/08
Receive Date:08/13/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR03325											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Plutonium-238	13981-16-3	U6.1e-3		RPD			n/a	20.000		09/24/08
DUP	Pu-239/240 by AEA	PU-239/240	U3e-3		RPD			n/a	20.000		09/24/08
DUP	Pu-242 tracer by AEA	PU242	5.916	104.360	% Recov	30.000	105.000				09/24/08
SURR	Pu-242 tracer by AEA	PU242	5.939	98.710	% Recov	30.000	105.000				09/24/08
Lab ID: W08GR03326											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Pu-242 tracer by AEA	PU242	6.054	101.040	% Recov	30.000	105.000				09/24/08
BATCH QC											
BLANK	Plutonium-238	13981-16-3	U1.1e-2	n/a	pCi/g	-10.000	1000.000				09/24/08
BLANK	Pu-239/240 by AEA	PU-239/240	7e-2	0.070	pCi/g	-10.000	1000.000				09/24/08
BLANK	Pu-242 tracer by AEA	PU242	6.236	92.350	% Recov	30.000	105.000				09/24/08
LCS	Pu-239/240 by AEA	PU-239/240	11.9	92.643	% Recov	80.000	120.000				09/24/08
LCS	Pu-242 tracer by AEA	PU242	17.3	91.320	% Recov	30.000	105.000				09/24/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081722
Matrix: SOLID
Test: Strontium 89/90

Sample Date: 08/06/08
Receive Date:08/13/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR03325											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Sr-85 Tracer by Beta Counting	SR85	95.9	95.900	% Recov	30.000	105.000				09/08/08
DUP	Strontium-89/90	SR-RAD	-2.0		RPD			n/a	20.000		09/08/08
SURR	Sr-85 Tracer by Beta Counting	SR85	92.1	92.100	% Recov	30.000	105.000				09/08/08
Lab ID: W08GR03326											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	93.0	93.000	% Recov	30.000	105.000				09/08/08
BATCH QC											
BLANK	Sr-85 Tracer by Beta Counting	SR85	85.7	85.700	% Recov	30.000	105.000				09/08/08
BLANK	Strontium-89/90	10098-97-2	U-1.3	n/a	pCi/g	-10.000	300.000				09/08/08
LCS	Sr-85 Tracer by Beta Counting	SR85	75.7	75.700	% Recov	30.000	105.000				09/08/08
LCS	Strontium-89/90	10098-97-2	78.4	112.936	% Recov	80.000	120.000				09/08/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081722
Matrix: SOLID
Test: Uranium Isotopics by AEA

Sample Date: 08/06/08
Receive Date:08/13/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08GR03325											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	U-232 tracer by AEA	U232	3.879	106.250	% Recov	30.000	105.000		•		09/19/08
DUP	Uranium-233/234	U-233/234	0.22		RPD			20.000	20.000 •		09/19/08
DUP	Uranium-235	15117-96-1	U9.9e-3		RPD			n/a	20.000		09/19/08
DUP	Uranium-238	U-238	0.18		RPD			5.714	20.000		09/19/08
SURR	U-232 tracer by AEA	U232	3.894	87.920	% Recov	30.000	105.000				09/19/08
Lab ID: W08GR03326											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	U-232 tracer by AEA	U232	3.97	102.270	% Recov	30.000	105.000				09/19/08
BATCH QC											
BLANK	U-232 tracer by AEA	U232	4.089	81.390	% Recov	30.000	105.000				09/19/08
BLANK	Uranium-233/234	13966-29-5	U9.6e-3	n/a	pCi/g	-10.000	1000.000				09/19/08
BLANK	Uranium-235	15117-96-1	U-2.1e-3	n/a	pCi/g	-10.000	1000.000				09/19/08
BLANK	Uranium-238	24678-82-8	U3.9e-3	n/a	pCi/g	-10.000	1000.000				09/19/08
LCS	U-232 tracer by AEA	U232	11.35	93.790	% Recov	30.000	105.000				09/19/08
LCS	Uranium-233/234	13966-29-5	N/A	n/a	% Recov	75.000	125.000				09/19/08
LCS	Uranium-235	15117-96-1	N/A	n/a	% Recov	75.000	125.000				09/19/08
LCS	Uranium-238	24678-82-8	20.93	110.419	% Recov	80.000	120.000				09/19/08

WSCF
ANALYTICAL COMMENT REPORT

Attention: Steve Trent
Project Number F08-098

Group #: WSCF20081722
Department: Radiochemistry

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		IC Anion - MS/MSD recoveries out of limits for phosphate in sample W08GR03325; Data N-flagged. DTS ICP-MS: Mercury analyzed after the hold time expired. "X" flag U-234 duplicate is flagged for poor RPD due to the low countrate of the sample. lmh ICP-AES: [Samples W08GR3325-3326] Lithium and zirconium are not present in the LCS standard. Elements having results <5X MDL; "B" flag. Aluminum, calcium, iron, magnesium, and titanium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check and high standards used to ensure aluminum, calcium, iron, and magnesium linearity because sample results are greater than the calibration standard. High sodium spike recoveries; "N" flag. Iron interference causes high bias on boron results; "E" flag.

Lab Areas: VALGROUP - Group Validation
LOGSAMP - Login for Sample
VALTEST - Test Validation
LOGTEST - Login for Tests
TESTDATA - Test Data Entry

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M4W41-SLF-08-1103

ATTACHMENT 4

SAMPLE RECEIPT INFORMATION

Consisting of 4 pages
Including cover page

Waste Sampling and Characterization Facility
P.O. BOX 1970 S3-30, Richland, WA 99352
PHONE: (509) 373-7004/FAX: (509) 373-7134

File
09/25/08

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Groundwater Remediation Program

Richland, WA 99354
Attn: Steve Trent

Customer Code: GPP
PO#: 123117/ES10
Group#: 20081722
Project#: F08-~~098~~ 093 9/29/08
Proj Mgr: Steve Trent E6-35
Phone: 373-5869

The following samples were received from you on 08/13/08. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Waste Sampling and Characterization Facility.

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
W08GR03325	B1WB33	TRENT @2008 @AEA-30 @AEA-32 @GEA-GPP @GPP6010 @IC-30 @SR89_90 CN-02	Solid, or handle as if solid	08/06/08
W08GR03326	B1WB34	TRENT @2008 @AEA-30 @AEA-32 @GEA-GPP @GPP6010 @IC-30 @SR89_90 CN-02	Solid, or handle as if solid	08/06/08

Test Acronym Description

Test Acronym	Description
@2008	ICP-200.8 MS All possible meta
@AEA-30	Plutonium Isotopics by AEA
@AEA-32	Uranium Isotopics by AEA
@GEA-GPP	Gamma Energy Analysis-grd H2O
@GPP6010	ICP Metals Analysis, Grd H20 P
@IC-30	Anions by Ion Chromatography
@SR89_90	Strontium 89/90
CN-02	Cyanide by Midi/Spectrophotom

Fluor Hanford Inc. 09/25/08

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F08-093-079

COLLECTOR
M. A. White / Fulton

COMPANY CONTACT
TRENT, SJ

TELEPHONE NO.
373-5869

PROJECT COORDINATOR
WIDRIG, DL

PRICE CODE 8N

DATA TURNAROUND
45 Days / 45 Days

SAMPLING LOCATION
C5722 I-002

PROJECT DESIGNATION
200-CW-1 Model Group 5 Sampling - Large Ponds and Waste Sites

SAF NO.
F08-093

AIR QUALITY ☐

ICE CHEST NO.

FIELD LOGBOOK NO.
HNF-N-585-1

ACTUAL SAMPLE DEPTH
88'-90'

COA
123117ES10

METHOD OF SHIPMENT
FEDERAL EXPRESS

SHIPPED TO
Waste Sampling & Characterization 20081722

OFFSITE PROPERTY NO.
PTR

BILL OF LADING/AIR BILL NO.
PTR

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE
Radioactive Tie to B1WB48

PRESERVATION	Cool~4C	None
TYPE OF CONTAINER	G/P	G/P
NO. OF CONTAINER(S)	1	1
VOLUME	120mL	120mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS 6010 7108 IC CN	SEE ITEM (2) IN SPECIAL INSTRUCTIONS GEA PU U SR

ICED

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B1WB33 W086R03325	SOIL	8-06-08	1031	✓	✓

02/06 02/06

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
C Fulton	8-6-08 1116	MO 509 Fridge	8-6-08 1116
MO 509 Fridge	8/13/08 0750	K Patterson	8/13/08 0750
K Patterson	8/13/08 0815		8/13/08 0815

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP Metals - 6010B (Add-On) {Arsenic, Beryllium, Bismuth, Boron, Lithium, Molybdenum, Strontium, Titanium} ICP Metals - 6010B (TAL) {Aluminum, Barium, Calcium, Iron, Maghesium, Potassium, Sodium} ICP/MS - 200.8 (Add-on) {Lead, Selenium, Thallium, Uranium} ICP/MS - 200.8 (TAL) {Antimony, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc} 200.8_HG - ICPMS {Mercury} IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in phosphate, Sulfate} Cyanide (Total) - 335.2 {Cyanide}
(2)Gamma Spectroscopy {Cesium-137, Europium-154} Americium-241 {Americium-241} Isotopic Plutonium {Plutonium-239/240} Isotopic Uranium {Uranium-238} Strontium-89,90 -- Total Sr {Total beta radiostrontium}

LABORATORY SECTION — **RECEIVED BY** — **TITLE** — **DATE/TIME**

FINAL SAMPLE DISPOSITION — **DISPOSAL METHOD** — **DISPOSED BY** — **DATE/TIME**

A-6003-618(01/06)

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F08-093-081	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8N	DATA TURNAROUND
MA White	TRENT, SJ	373-5869	WIDRIG, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C5722 I-003	200-CW-1 Model Group 5 Sampling - Large Ponds and Waste Sites		F08-093		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
	HNF-N-585-1	96'-98'	123117ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Waste Sampling & Characterization	PTR		PTR		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE
Radioactive Tie to B1WB49

PRESERVATION	Cool~4C	None
TYPE OF CONTAINER	G/P	G/P
NO. OF CONTAINER(S)	1	1
VOLUME	120mL	120mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	[redacted]									
B1WB34 3326	SOIL	8-6-08	1440	✓	✓								

ICED

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MA White MA White	8-6-08 1521	MO Sorg M. Tir	8-6-08 1521
MO Sorg Thurlow	8/8/08 0750	K. Patterson	8/8/08 0750
K Patterson	8/13/08 0815	K Peebles	8/13/08 0815

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LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)