

RECEIVED OCTOBER 1, 2008

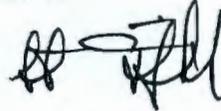
Fluor Hanford
 WSCF Analytical Lab
 P.O. Box 1000
 Richland, WA 99352
 Telephone 373-7495
 Telefax 372-0456

FLUOR**Memorandum**

M4W41-SLF-08-1111

To: H. Hampt E6-35 Date: September 30, 2008

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



cc: w/Attachments

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

Subject: FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20081887

Reference: 1) Letter of Instruction for Analytical Services for the Groundwater Performance Assessment Project and Analytical Laboratory Transition Plan, FH-0602422, September 19, 2006

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

This transmittal contains the following information for sample delivery group WSCF20081887:

- Cover Sheet (Attachment 1)
- Narrative (Attachment 2)
- Issue Resolution Form (Attachment 3)
- Analytical Results (Attachment 4)
- Sample Receipt Information (Attachment 5)

SLF/grf

Attachments 5

RECEIVED
 FEB 03 2009

EDMC

M4W41-SLF-08-1111

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20081887
Data Deliverable Date: 26-sep-2008
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix
I08-053	B1WDN6 B1WDN7	W08P004269 W08P004270	WATER WATER
I08-055	B1WFP1	W08P004267	WATER
S08-008	B1WMV2	W08P004271	WATER

M4W41-SLF-08-1111

ATTACHMENT 2

NARRATIVE

Consisting of 5 pages
Including cover page

Introduction

Four groundwater samples were received at the WSCF Laboratory on August 29, 2008. With the exception of SVOC analyses, 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. Sample# B1 WDN7 was shipped to an offsite laboratory for analysis.

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A copy of proposed Issue Resolution Form (IRF) documenting missed hold time for diesel analysis is included as Attachment 3. A Data Summary Report (Attachment 4) 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 5. Also included in Attachment 5, are copies of the COCs used for offsite shipment of SVOC samples.

It should be noted that the attached chain of custody was stamped “ICED” by the WSCF Laboratory Sample Custodian during sample receiving, indicating the presence of ice in the sample container.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report*, pages 16 through 18, for a complete listing of approved analytical methods.

Inorganic Comments

Ammonia – The hold time requirement for this analysis was 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 page 24 for QC details.

All QC controls are within the established limits.

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 25 through 26 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# B1WKK3 (SDG# 20081891).

- Fluoride – Duplicate Relative Percent Difference (RPD) exceeded established laboratory limits. No flags issued.
- Sulfate – Matrix Spike and Matrix Spike Duplicate recoveries were less than established laboratory limits. Affected sample results 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 27 for QC details. Analytical note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1WKW5 (SDG# 20081862).

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 28 through 34 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.
- Matrix Spikes and Matrix Spike Duplicates were analyzed on samples B1W2F4 (SDG# 20081860) and B1WDN7 of this SDG.
- Batch QC performed on sample# B1W2F4
 - Calcium, Magnesium and Sodium sample concentrations exceeded spiking levels by a factor of 4. Spike recoveries are not valid. Check standard was analyzed to ensure linearity, because the sample results were greater than the calibration standard.
 - Potassium – Laboratory Control Sample recovery exceeded established laboratory limits. Affected sample result was X flagged.
 - Silver – Matrix Spike and Matrix Spike Duplicate recoveries were less than established laboratory limits. Affected sample result was N flagged.
 - Ending CCV recovery was high @ 111%.
 - All other QC controls are within the established limits.

- Batch QC performed on sample# B1WDN7
 - o Calcium, Magnesium and Sodium sample concentrations exceeded spiking levels by a factor of 4. Spike recoveries are not valid. Check standard was analyzed to ensure linearity, because the sample results were greater than the calibration standard.
 - o 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 35 through 36 for QC details. Analytical Note(s):

- Matrix Spikes and Matrix Spike Duplicates were analyzed on samples B1WDN1 (SDG# 20081849) and B1WDN7 of this SDG.

All QC controls are within the established limits.

Organic Comments

Alcohol/Glycols - The hold time requirement for this analysis was 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 page 42 for QC details. Analytical Note(s):

- Duplicate, Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1WDW6 (SDG# 20081849).

All QC controls are within the established limits.

Semi-VOA – Sample# B1WDN7 was shipped to an offsite laboratory for analysis.

TPHD-WA – The hold time requirements for this analysis were not met. See comment below. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 43 for QC details. Analytical Note(s):

- Missed Hold Time – A copy of proposed Issue Resolution Form (IRF) documenting missed hold time is included as Attachment 3.
- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1WXW5 (SDG# 20081912).

All QC controls are within the established limits.

TPHG-WA – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See page 44 for QC details. Analytical Note(s):

- Duplicate, Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1WDN1 (SDG# 20081849)

All QC controls are within the established limits.

VOA – 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 the GRP Letter of Instruction. See pages 45 through 47 for QC details. Analytical Note(s):

- Matrix Spike and Matrix Spike Duplicate were analyzed on sample# B1WMV1 (SDG# 20081862).
- Sample results that were less than the lowest calibration standard, however greater than the method detection limit, were J flagged.
- Acetone and Methylene Chloride contamination detected in the Blank was evaluated and affected sample results were B flagged.

All other QC controls are within the established limits.

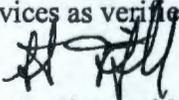
Radiochemistry Comments

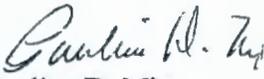
Rad Chem – There are no hold times associated with WSCF's radiochemical methods. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 50 through 52 for QC details. Analytical Note(s):

- Strontium-89/90 and 85 (tracer) – Duplicate QC was sample# B1WPW4 (SDG# 20081801).
- Technetium-99 – Duplicate and Matrix Spike were analyzed on sample# B1WDW7 (SDG# 20081849).
- Tritium – Duplicate and Matrix Spike were analyzed on sample# B1VML2 (SDG# 20081862).

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


Pauline D. Mix
WSCF Client Services

M4W41-SLF-08-1111

ATTACHMENT 3

ISSUE RESOLUTION FORM

Consisting of 2 pages
Including cover page

ISSUE RESOLUTION FORM

PNNL TRACKING NUMBER: 08-XXX

DRAFT

Date : **9-30-2008** SAF No. **108-053**

SDG: **WSCF20081887** LOGIN No.: TEST: **@TPHD-WA (Diesel)**

Sample No.(s) **B1WDN7**

W08P004270

Submitted By: **M Stauffer** Submitted To: **H Hampt**
Phone No. **373-7493** Phone No. **376-4319**
Fax No. **372-0456** Fax No

<u>ISSUE</u>	<u>PROPOSED RESOLUTION</u>
<p>Missed holding time for TPHD-WA (diesel).</p> <p>Sample was collected in the field and submitted to the WSCF Laboratory on August 29, 2008 for analysis. Due to a Laboratory error, the sample was not prepped within the 7-day regulatory hold time requirement.</p> <p>Sample was successfully prepped and analyzed on September 9, 2008.</p> <p>All QC controls were within established laboratory limits.</p>	<p>Accept the TPHD-WA result and document missed holding time in the case narrative.</p>

GRP COMMENTS

Signature and Date

M4W41-SLF-08-1111

ATTACHMENT 4

ANALYTICAL RESULTS

**Consisting of 42 pages
Including cover page**

**WSCF
ANALYTICAL RESULTS REPORT**

for

**GPAP
Richland, WA 99352**

Attention: Steve Trent E6-35

Analytical: ~~Handwritten signature~~ S. Fitzgerald 9/30/08
Client Services: PD; P.D. Mix 9/30/2008

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

This information is intended for the use of the addressee only. If the reader of this report is not the intended recipient or is not authorized by the recipient to receive the report, you are hereby notified that any dissemination, distribution or copying of this report is strictly prohibited. If you have received this report in error, please notify WSCF Laboratory immediately by telephone at (509) 373-7020 or (509) 531-8004. Information designation of this report is the responsibility of the customer.

Report#: WSCF20081887
Report Date: 30-sep-2008
Report WGPP/ver. 5.2
GPAP

Department: Inorganic

W13q Worklist/Batch/QC Report for Group# WSCF20081887

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37836	2	38267	42636	BLANK		Anions by Ion Chromatography
37836	13	38267	42636	BLANK		Anions by Ion Chromatography
37836	3	38267	42636	LCS		Anions by Ion Chromatography
37836	8	38267	42636	SAMPLE	W08P004267	Anions by Ion Chromatography
37836	9	38267	42636	SAMPLE	W08P004270	Anions by Ion Chromatography
37836	5	38267	42636	DUP	W08P004275	Anions by Ion Chromatography
37836	6	38267	42636	MS	W08P004275	Anions by Ion Chromatography
37836	7	38267	42636	MSD	W08P004275	Anions by Ion Chromatography
37836	7	38267	42636	SPK-RPD	W08P004275	Anions by Ion Chromatography
37883	1	38309	42731	BLANK		Cyanide by Midi/Spectrophotom
37883	2	38309	42731	LCS		Cyanide by Midi/Spectrophotom
37883	4	38309	42731	MS	W08P004262	Cyanide by Midi/Spectrophotom
37883	5	38309	42731	MSD	W08P004262	Cyanide by Midi/Spectrophotom
37883	5	38309	42731	SPK-RPD	W08P004262	Cyanide by Midi/Spectrophotom
37883	7	38309	42731	SAMPLE	W08P004270	Cyanide by Midi/Spectrophotom
37946	1	38273	42802	BLANK		ICP Metals Analysis, Grd H20 P
37946	2	38273	42802	LCS		ICP Metals Analysis, Grd H20 P
37946	4	38273	42802	MS	W08P004239	ICP Metals Analysis, Grd H20 P
37946	5	38273	42802	MSD	W08P004239	ICP Metals Analysis, Grd H20 P
37946	5	38273	42802	SPK-RPD	W08P004239	ICP Metals Analysis, Grd H20 P
37946	23	38273	42802	SAMPLE	W08P004269	ICP Metals Analysis, Grd H20 P
37978	1	38333	42808	BLANK		ICP Metals Analysis, Grd H20 P
37978	2	38333	42808	LCS		ICP Metals Analysis, Grd H20 P
37978	4	38333	42808	MS	W08P004270	ICP Metals Analysis, Grd H20 P
37978	5	38333	42808	MSD	W08P004270	ICP Metals Analysis, Grd H20 P
37978	3	38333	42808	SAMPLE	W08P004270	ICP Metals Analysis, Grd H20 P
37978	5	38333	42808	SPK-RPD	W08P004270	ICP Metals Analysis, Grd H20 P
37987	3	38411	42822	BLANK		Ammonia (N) by IC
37987	11	38411	42822	BLANK		Ammonia (N) by IC
37987	1	38411	42822	LCS		Ammonia (N) by IC
37987	5	38411	42822	DUP	W08P004270	Ammonia (N) by IC
37987	6	38411	42822	MS	W08P004270	Ammonia (N) by IC
37987	7	38411	42822	MSD	W08P004270	Ammonia (N) by IC
37987	4	38411	42822	SAMPLE	W08P004270	Ammonia (N) by IC
37987	7	38411	42822	SPK-RPD	W08P004270	Ammonia (N) by IC
38030	1	38452	42858	BLANK		ICP-200.8 MS All possible meta
38030	2	38452	42858	BLANK		ICP-200.8 MS All possible meta
38030	3	38452	42858	LCS		ICP-200.8 MS All possible meta
38030	4	38452	42858	LCS		ICP-200.8 MS All possible meta
38030	6	38452	42858	MS	W08P004214	ICP-200.8 MS All possible meta
38030	7	38452	42858	MSD	W08P004214	ICP-200.8 MS All possible meta
38030	7	38452	42858	SPK-RPD	W08P004214	ICP-200.8 MS All possible meta
38030	54	38452	42858	SAMPLE	W08P004269	ICP-200.8 MS All possible meta
38030	9	38452	42858	MS	W08P004270	ICP-200.8 MS All possible meta
38030	10	38452	42858	MSD	W08P004270	ICP-200.8 MS All possible meta
38030	8	38452	42858	SAMPLE	W08P004270	ICP-200.8 MS All possible meta
38030	10	38452	42858	SPK-RPD	W08P004270	ICP-200.8 MS All possible meta

Department: Organic

W13q Worklist/Batch/QC Report for Group# WSCF20081887

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
			42814	BLANK		VOA Ground Water Protection
			42814	LCS		VOA Ground Water Protection
			42814	MS	W08P004246	VOA Ground Water Protection
			42814	MSD	W08P004246	VOA Ground Water Protection
			42814	SPK-RPD	W08P004246	VOA Ground Water Protection
			42814	SAMPLE	W08P004270	VOA Ground Water Protection
			42814	SAMPLE	W08P004271	VOA Ground Water Protection
38142	1	38563	42988	BLANK		NWTPH-GX TPH Gasoline Range
38142	2	38563	42988	LCS		NWTPH-GX TPH Gasoline Range
38142	4	38563	42988	DUP	W08P004214	NWTPH-GX TPH Gasoline Range
38142	5	38563	42988	MS	W08P004214	NWTPH-GX TPH Gasoline Range
38142	6	38563	42988	MSD	W08P004214	NWTPH-GX TPH Gasoline Range
38142	6	38563	42988	SPK-RPD	W08P004214	NWTPH-GX TPH Gasoline Range
38142	7	38563	42988	SAMPLE	W08P004270	NWTPH-GX TPH Gasoline Range
38144	1	38564	42991	BLANK		Alcohols, Glycols - 8015
38144	2	38564	42991	LCS		Alcohols, Glycols - 8015
38144	4	38564	42991	DUP	W08P004211	Alcohols, Glycols - 8015
38144	5	38564	42991	MS	W08P004211	Alcohols, Glycols - 8015
38144	6	38564	42991	MSD	W08P004211	Alcohols, Glycols - 8015
38144	6	38564	42991	SPK-RPD	W08P004211	Alcohols, Glycols - 8015
38144	9	38564	42991	SAMPLE	W08P004270	Alcohols, Glycols - 8015
			43072	BLANK		NWTPH-D TPH Diesel Range (Wa)
			43072	LCS		NWTPH-D TPH Diesel Range (Wa)
			43072	SAMPLE	W08P004270	NWTPH-D TPH Diesel Range (Wa)
			43072	SURR	W08P004270	NWTPH-D TPH Diesel Range (Wa)
			43072	MS	W08P004329	NWTPH-D TPH Diesel Range (Wa)
			43072	MSD	W08P004329	NWTPH-D TPH Diesel Range (Wa)
			43072	SPK-RPD	W08P004329	NWTPH-D TPH Diesel Range (Wa)

W13q Worklist/Batch/QC Report for Group# WSCF20081887

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37951	1	38375	42807	BLANK		TC99 by Liquid Scin.
37951	4	38375	42807	LCS		TC99 by Liquid Scin.
37951	3	38375	42807	DUP	W08P004212	TC99 by Liquid Scin.
37951	2	38375	42807	MS	W08P004212	TC99 by Liquid Scin.
37951	18	38375	42807	SAMPLE	W08P004270	TC99 by Liquid Scin.
37998	1	38419	42915	BLANK		Strontium 89/90
37998	2	38419	42915	LCS		Strontium 89/90
37998	3	38419	42915	DUP	W08P004155	Strontium 89/90
37998	12	38419	42915	SAMPLE	W08P004270	Strontium 89/90
37998	13	38419	42915	SURR	W08P004270	Strontium 89/90
37953	1	38377	42975	BLANK		Tritium by Liq Sct column prep
37953	2	38377	42975	LCS		Tritium by Liq Sct column prep
37953	4	38377	42975	DUP	W08P004252	Tritium by Liq Sct column prep
37953	3	38377	42975	MS	W08P004252	Tritium by Liq Sct column prep
37953	10	38377	42975	SAMPLE	W08P004270	Tritium by Liq Sct column prep

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-503-401	LA-503-401: ANALYSIS OF CATIONS BY ION CHROMATOGRAPHY EPA-600/4-86-024 300.7 Dissolved Sodium, Ammonium, Potassium, and Calcium in Wet Deposition by Chemical HEIS 300.7_CATIONS_IC Determination of Ammonium by Ion Chromatography
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>.

Report Date: 30-sep-2008

Report#: WSCF20081887

Report WGPPM/5.2

16 of 59

Page 3

WSCF

METHOD REFERENCES REPORT

Department: Organic

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-523-443	LA-523-443: GAS CHROMATOGRAPH ANALYSIS OF GASOLINE RANGE TOTAL PETROLEUM HYDROCA
HEIS WTPH_GASOLINE	Total Petroleum Hydrocarbons, Gasoline
WDOE TPH NWTPH-G	Volatile Petroleum Products Method for Soil and Water
LA-523-455	LA-523-455: VOLATILE SAMPLE ANALYSIS BY SW-846
EPA SW-846 8000B	DETERMINATIVE CHROMATOGRAPHIC SEPARATIONS
EPA SW-846 8260B	VOLATILE ORGANIC COMPOUNDS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)
HEIS 8260_VOA_GCMS	Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
LA-523-493	NWTPH-Diesel and/or Gasoline
HEIS WTPH DIESEL (HEIS)	Total Petroleum Hydrocarbons in Diesel
WDOE TPHD	Total Petroleum Hydrocarbons in Diesel
Organics	Organics - Alcohols, Glycols
EPA SW-846 8015B	Nonhalogenated Organics Using GC/FID

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>.

Report Date: 30-sep-2008

Report#: WSCF20081887

Report WGPPM/5.2

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_GPC	Protactinium 89/90
LA-508-421	LA-508-421: OPERATION OF THE TRI-CARB MODEL 2500TR LIQUID SCINTILLATION ANALYZER
HEIS ALPHA_LSC	A/B Liquid Scintillation
HEIS BETA_LSC	A/B Liquid Scintillation
HEIS TC99_3MDSK_LSC	TC99 by Liquid Scintillation
HEIS TRITIUM_EIE_LSC	Tritium Liquid Scintillation

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>.

Report Date: 30-sep-2008

Report #: WSCF20081887

Report WGPPM/5.2

Page 2

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-055

Sample # W08P004267

Client ID: B1WFP1 PNNL-GPP
WSCF

Matrix: WATER

Group #: WSCF20081887

Department: Inorganic

Sampled: 08/29/08

Received: 08/29/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Anions by Ion Chromatography											
Fluoride	16984-48-8	LA-533-410	DU	< 0.0464	mg/L			2.00	0.048		08/29/08
Chloride	16887-00-6	LA-533-410	D	24.1	mg/L			2.00	0.094		08/29/08
Nitrogen in Nitrite	NO2-N	LA-533-410	DU	< 0.0256	mg/L			2.00	0.026		08/29/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	6.78	mg/L			2.00	0.024		08/29/08
Sulfate	14808-79-8	LA-533-410	DN	128	mg/L			10.00	1.3		08/29/08

MDL=Minimum Detection Limit

RQ=Result Qualifier

TP Err=Total Propagated Error

DF=Dilution Factor

* - Indicates results that have NOT been validated;

B - The Analyte detected in both the BLANK and the SAMPLE.(org)

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.(org)

+ - Indicates more than six qualifier symbols

B - The analyte < the RDL but > = the IDL/MDL (inorg)

J - Analyte < lowest calibration but > = MDL.(org)

U - Analyzed for but not detected above limiting criteria(inorg)

X - Other flags/notes described in the comments/narrative(inorg)

Report WGPP/ver. 5.2

GPAP

19 of 59

WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: I08-053
Sample # W08P004269
Client ID: B1WDN6

PNNL-GPP
WSCF

Matrix: WATER

Group #: WSCF20081887
Department: Inorganic
Sampled: 08/29/08
Received: 08/29/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
ICP Metals Analysis, Grd H20 P Prep											
ICP Metals Analysis, Grd H20 P											
Aluminum	7429-90-5	LA-505-411	B	81.9	ug/L			1.00	52		09/10/08
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		09/10/08
Magnesium	7439-95-4	LA-505-411		1.81e +04	ug/L			1.00	50		09/10/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
Potassium	7440-09-7	LA-505-411	X	5.99e +03	ug/L			1.00	1.7e +02		09/10/08
Silver	7440-22-4	LA-505-411	NU	< 5.00	ug/L			1.00	5.0		09/10/08
Sodium	7440-23-5	LA-505-411		1.88e +04	ug/L			1.00	51		09/10/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		09/10/08
Barium	7440-39-3	LA-505-411		51.0	ug/L			1.00	4.0		09/10/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		09/10/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		09/10/08
Vanadium	7440-62-2	LA-505-411	B	26.4	ug/L			1.00	12		09/10/08
Zinc	7440-66-6	LA-505-411	U	< 9.00	ug/L			1.00	9.0		09/10/08
Calcium	7440-70-2	LA-505-411		5.70e +04	ug/L			1.00	73		09/10/08
Lithium	7439-93-2	LA-505-411	B	6.40	ug/L			1.00	4.0		09/10/08
Strontium	7440-24-6	LA-505-411		325	ug/L			1.00	4.0		09/10/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
ICP-200.8 MS All possible meta Prep											
ICP-200.8 MS All possible meta											
Lead	7439-92-1	LA-505-412	U	< 0.100	ug/L			1.00	0.100		09/15/08

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

B - The Analyte detected in both the BLANK and the SAMPLE.(org)
 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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)
 J - Analyte < lowest calibration but > = MDL.(org)
 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

Report WGPP/ver. 5.2

GPAP

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: I08-053
Sample # W08P004269
Client ID: B1WDN6

Group #: WSCF20081887
Department: Inorganic
Sampled: 08/29/08
Received: 08/29/08

PNNL-GPP
WSCF

Matrix: WATER

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Mercury	7439-97-6	LA-505-412	U	< 0.0500	ug/L			1.00	0.0500		09/15/08
Arsenic	7440-38-2	LA-505-412		2.48	ug/L			1.00	0.400		09/15/08

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

B - The Analyte detected in both the BLANK and the SAMPLE.(org)
 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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)
 J - Analyte < lowest calibration but > = MDL.(org)
 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

Report WGPP/ver. 5.2
 GPAP

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: I08-053
Sample # W08P004270
Client ID: B1WDN7

Group #: WSCF20081887
Department: Inorganic
Sampled: 08/29/08
Received: 08/29/08

PNNL-GPP
WSCF

Matrix: WATER

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Anions by Ion Chromatography											
Fluoride	16984-48-8	LA-533-410	BD	0.122	mg/L			2.00	0.046		08/29/08
Chloride	16887-00-6	LA-533-410	D	26.3	mg/L			2.00	0.094		08/29/08
Nitrogen in Nitrite	NO2-N	LA-533-410	DU	< 0.0256	mg/L			2.00	0.026		08/29/08
Nitrogen in Nitrate	NO3-N	LA-533-410	D	12.9	mg/L			10.00	0.12		08/29/08
Sulfate	14808-79-8	LA-533-410	DN	35.8	mg/L			2.00	0.26		08/29/08
Cyanide											
Cyanide	57-12-5	LA-895-402	U	< 4.00	ug/L			1.00	4.0		09/08/08
ICP Metals Analysis, Grd H2O P Prep											
ICP Metals Analysis, Grd H2O P											
Aluminum	7429-90-5	LA-505-411	B	73.5	ug/L			1.00	52		09/10/08
Iron	7439-89-6	LA-505-411	U	< 25.0	ug/L			1.00	25		09/10/08
Magnesium	7439-95-4	LA-505-411		1.67e+04	ug/L			1.00	50		09/10/08
Manganese	7439-96-5	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
Nickel	7440-02-0	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
Potassium	7440-09-7	LA-505-411		5.17e+03	ug/L			1.00	1.7e+02		09/10/08
Silver	7440-22-4	LA-505-411	U	< 5.00	ug/L			1.00	5.0		09/10/08
Sodium	7440-23-5	LA-505-411		1.69e+04	ug/L			1.00	51		09/10/08
Antimony	7440-36-0	LA-505-411	U	< 56.0	ug/L			1.00	56		09/10/08
Barium	7440-39-3	LA-505-411		52.4	ug/L			1.00	4.0		09/10/08
Cadmium	7440-43-9	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
Chromium	7440-47-3	LA-505-411	U	< 13.0	ug/L			1.00	13		09/10/08
Cobalt	7440-48-4	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
Copper	7440-50-8	LA-505-411	U	< 6.00	ug/L			1.00	6.0		09/10/08
Vanadium	7440-62-2	LA-505-411	B	21.5	ug/L			1.00	12		09/10/08

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

B - The Analyte detected in both the BLANK and the SAMPLE.(org)
 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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)
 J - Analyte < lowest calibration but > = MDL.(org)
 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

Report WGPP/ver. 5.2
 GPAP

22 of 59

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: I08-053
Sample # W08P004270
Client ID: B1WDN7

Group #: WSCF20081887
Department: Inorganic
Sampled: 08/29/08
Received: 08/29/08

PNNL-GPP
WSCF

Matrix: WATER

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Zinc	7440-66-8	LA-505-411	B	12.4	ug/L			1.00	9.0		09/10/08
Calcium	7440-70-2	LA-505-411		5.12e+04	ug/L			1.00	73		09/10/08
Lithium	7439-93-2	LA-505-411	B	6.10	ug/L			1.00	4.0		09/10/08
Strontium	7440-24-6	LA-505-411		332	ug/L			1.00	4.0		09/10/08
Beryllium	7440-41-7	LA-505-411	U	< 4.00	ug/L			1.00	4.0		09/10/08
ICP-200.8 MS All possible meta Prep											
ICP-200.8 MS All possible meta											
Lead	7439-92-1	LA-505-412	U	< 0.100	ug/L			1.00	0.100		09/15/08
Mercury	7439-97-8	LA-505-412	U	< 0.0500	ug/L			1.00	0.0500		09/15/08
Uranium	7440-61-1	LA-505-412		1.32	ug/L			1.00	0.0500		09/15/08
Arsenic	7440-38-2	LA-505-412		2.29	ug/L			1.00	0.400		09/15/08
Nitrogen in ammonium											
Nitrogen in ammonium	NH4-N	LA-503-401	U	< 9.32e-03	mg/L			1.00	9.3e-03		09/12/08

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

B - The Analyte detected in both the BLANK and the SAMPLE.(org)
 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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)
 J - Analyte < lowest calibration but > = MDL.(org)
 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

Report WGPP/ver. 5.2
 GPAP

23 of 59

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887

Matrix: WATER

Test: Ammonia (N) by IC

Sample Date: 08/29/08

Receive Date: 08/29/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004270											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Ammonia (N) by IC	7664-41-7	<9.32e-3		RPD			n/a	20.000	U	09/12/08
MS	Ammonia (N) by IC	7664-41-7	0.4938	99.157	% Recov	80.000	120.000				09/12/08
MSD	Ammonia (N) by IC	7664-41-7	0.5005	100.502	% Recov	80.000	120.000				09/12/08
SPK-RPD	Ammonia (N) by IC	7664-41-7	100.502		RPD			1.347	20.000		09/12/08
BATCH QC											
BLANK	Ammonia (N) by IC	7664-41-7	<9.32e-3	n/a	mg/L	0.000	0.002			U	09/12/08
BLANK	Ammonia (N) by IC	7664-41-7	<9.32e-3	n/a	mg/L	0.000	0.002			U	09/12/08
LCS	Ammonia (N) by IC	7664-41-7	109.7054	109.705	% Recov	80.000	120.000				09/12/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: Anions by Ion Chromatography

Sample Date: 08/29/08
 Receive Date: 08/29/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004275											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Chloride	16887-00-6	6.8458		RPD			1.646	20.000		08/29/08
DUP	Fluoride	16984-48-8	7.74e-2		RPD			57.524	20.000		08/29/08
DUP	Nitrogen in Nitrite	NO2-N	<2.56e-2		RPD			n/a	20.000	U	08/29/08
DUP	Nitrogen in Nitrate	NO3-N	3.2974		RPD			1.851	20.000		08/29/08
DUP	Sulfate	14808-79-8	43.2765		RPD			1.332	20.000		08/29/08
MS	Chloride	16887-00-6	0.97665	98.156	% Recov	80.000	120.000				08/29/08
MS	Fluoride	16984-48-8	0.4438	90.020	% Recov	80.000	120.000				08/29/08
MS	Nitrogen in Nitrite	NO2-N	0.4254	86.463	% Recov	80.000	120.000				08/29/08
MS	Nitrogen in Nitrate	NO3-N	0.40565	90.953	% Recov	80.000	120.000				08/29/08
MS	Sulfate	14808-79-8	1.426	72.755	% Recov	80.000	120.000				08/29/08
MSD	Chloride	16887-00-6	0.9697	97.457	% Recov	80.000	120.000				08/29/08
MSD	Fluoride	16984-48-8	0.4735	96.045	% Recov	80.000	120.000				08/29/08
MSD	Nitrogen in Nitrite	NO2-N	0.42695	86.778	% Recov	80.000	120.000				08/29/08
MSD	Nitrogen in Nitrate	NO3-N	0.40835	91.558	% Recov	80.000	120.000				08/29/08
MSD	Sulfate	14808-79-8	1.5175	77.423	% Recov	80.000	120.000				08/29/08
SPK-RPD	Chloride	16887-00-6	97.457		RPD			0.715	20.000		08/29/08
SPK-RPD	Fluoride	16984-48-8	96.045		RPD			6.476	20.000		08/29/08
SPK-RPD	Nitrogen in Nitrite	NO2-N	86.778		RPD			0.364	20.000		08/29/08
SPK-RPD	Nitrogen in Nitrate	NO3-N	91.558		RPD			0.663	20.000		08/29/08
SPK-RPD	Sulfate	14808-79-8	77.423		RPD			6.217	20.000		08/29/08
BATCH QC											
BLANK	Chloride	16887-00-6	<4.69e-2	n/a	mg/L	0.000	0.030			U	08/29/08
BLANK	Chloride	16887-00-6	<4.69e-2	n/a	mg/L	0.000	0.030			U	08/29/08
BLANK	Fluoride	16984-48-8	<2.32e-2	n/a	mg/L	0.000	0.030			U	08/29/08
BLANK	Fluoride	16984-48-8	<2.32e-2	n/a	mg/L	0.000	0.030			U	08/29/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 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	Nitrogen in Nitrite	NO2-N	<1.28e-2	n/a	mg/L	0.000	0.020			U	08/29/08
BLANK	Nitrogen in Nitrite	NO2-N	<1.28e-2	n/a	mg/L	0.000	0.020			U	08/29/08
BLANK	Nitrogen in Nitrate	NO3-N	<1.21e-2	n/a	mg/L	0.000	0.040			U	08/29/08
BLANK	Nitrogen in Nitrate	NO3-N	<1.21e-2	n/a	mg/L	0.000	0.040			U	08/29/08
BLANK	Sulfate	14808-79-8	<0.132	n/a	mg/L	0.000	0.200			U	08/29/08
BLANK	Sulfate	14808-79-8	<0.132	n/a	mg/L	0.000	0.200			U	08/29/08
LCS	Chloride	16887-00-6	198.8106	98.911	% Recov	80.000	120.000				08/29/08
LCS	Fluoride	16984-48-8	101.8512	102.260	% Recov	80.000	120.000				08/29/08
LCS	Nitrogen in Nitrite	NO2-N	95.4036	95.979	% Recov	80.000	120.000				08/29/08
LCS	Nitrogen in Nitrate	NO3-N	93.6815	103.975	% Recov	80.000	120.000				08/29/08
LCS	Sulfate	14808-79-8	399.051	100.770	% Recov	80.000	120.000				08/29/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: Cyanide by Midi/Spectrophotom

Sample Date: 08/27/08
 Receive Date: 08/27/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004262											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Cyanide by Midi/Spectrophotom	57-12-5	41.4	103.500	% Recov	75.000	125.000				09/08/08
MSD	Cyanide by Midi/Spectrophotom	57-12-5	41.4	103.500	% Recov	75.000	125.000				09/08/08
SPK-RPD	Cyanide by Midi/Spectrophotom	57-12-5	103.500		RPD			0.000	20.000		09/08/08
BATCH QC											
BLANK	Cyanide by Midi/Spectrophotom	57-12-5	< 4	n/a	ug/L	-4.000	4.000			U	09/08/08
LCS	Cyanide by Midi/Spectrophotom	57-12-5	48.7	97.400	% Recov	85.000	115.000				09/08/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP Metals Analysis, Grd H2O P

Sample Date: 08/27/08
 Receive Date: 08/27/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004239											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Silver	7440-22-4	172.5	17.250	% Recov	75.000	125.000				09/10/08
MS	Barium	7440-39-3	503	100.600	% Recov	75.000	125.000				09/10/08
MS	Beryllium	7440-41-7	528.3	105.660	% Recov	75.000	125.000				09/10/08
MS	Calcium	7440-70-2	-1630	-163.000	% Recov	75.000	125.000				09/10/08
MS	Cadmium	7440-43-9	1068.7	106.870	% Recov	75.000	125.000				09/10/08
MS	Cobalt	7440-48-4	1010.5	101.050	% Recov	75.000	125.000				09/10/08
MS	Chromium	7440-47-3	1032	103.200	% Recov	75.000	125.000				09/10/08
MS	Copper	7440-50-8	1048.7	104.870	% Recov	75.000	125.000				09/10/08
MS	Iron	7439-89-6	999.8	99.980	% Recov	75.000	125.000				09/10/08
MS	Potassium	7440-09-7	12016	120.160	% Recov	75.000	125.000				09/10/08
MS	Magnesium	7439-95-4	660	66.000	% Recov	75.000	125.000				09/10/08
MS	Manganese	7439-96-5	1047.3	104.730	% Recov	75.000	125.000				09/10/08
MS	Sodium	7440-23-5	870	87.000	% Recov	75.000	125.000				09/10/08
MS	Nickel	7440-02-0	1020	102.000	% Recov	75.000	125.000				09/10/08
MS	Antimony	7440-36-0	1029	102.900	% Recov	75.000	125.000				09/10/08
MS	Strontium	7440-24-6	540.7	108.140	% Recov	75.000	125.000				09/10/08
MS	Vanadium	7440-82-2	1011.7	101.170	% Recov	75.000	125.000				09/10/08
MS	Zinc	7440-66-6	1134	113.400	% Recov	75.000	125.000				09/10/08
MSD	Silver	7440-22-4	179.5	17.950	% Recov	75.000	125.000				09/10/08
MSD	Barium	7440-39-3	497.5	99.500	% Recov	75.000	125.000				09/10/08
MSD	Beryllium	7440-41-7	530	106.000	% Recov	75.000	125.000				09/10/08
MSD	Calcium	7440-70-2	540	54.000	% Recov	75.000	125.000				09/10/08
MSD	Cadmium	7440-43-9	1081.7	108.170	% Recov	75.000	125.000				09/10/08
MSD	Cobalt	7440-48-4	1029.5	102.950	% Recov	75.000	125.000				09/10/08
MSD	Chromium	7440-47-3	1042	104.200	% Recov	75.000	125.000				09/10/08
MSD	Copper	7440-50-8	1029.7	102.970	% Recov	75.000	125.000				09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP Metals Analysis, Grd H2O P

Sample Date: 08/27/08
 Receive Date: 08/27/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MSD	Iron	7439-89-6	1005.8	100.580	% Recov	75.000	125.000				09/10/08
MSD	Potassium	7440-09-7	11996	119.960	% Recov	75.000	125.000				09/10/08
MSD	Magnesium	7439-95-4	740	74.000	% Recov	75.000	125.000				09/10/08
MSD	Manganese	7439-96-5	1055.3	105.530	% Recov	75.000	125.000				09/10/08
MSD	Sodium	7440-23-5	1000	100.000	% Recov	75.000	125.000				09/10/08
MSD	Nickel	7440-02-0	1034	103.400	% Recov	75.000	125.000				09/10/08
MSD	Antimony	7440-36-0	1058	105.800	% Recov	75.000	125.000				09/10/08
MSD	Strontium	7440-24-6	535	107.000	% Recov	75.000	125.000				09/10/08
MSD	Vanadium	7440-62-2	1020.7	102.070	% Recov	75.000	125.000				09/10/08
MSD	Zinc	7440-66-6	1138	113.800	% Recov	75.000	125.000				09/10/08
SPK-RPD	Silver	7440-22-4	17.950		RPD			3.977	20.000		09/10/08
SPK-RPD	Barium	7440-39-3	99.500		RPD			1.099	20.000		09/10/08
SPK-RPD	Beryllium	7440-41-7	106.000		RPD			0.321	20.000		09/10/08
SPK-RPD	Calcium	7440-70-2	54.000		RPD			-398.165	20.000		09/10/08
SPK-RPD	Cadmium	7440-43-9	108.170		RPD			1.209	20.000		09/10/08
SPK-RPD	Cobalt	7440-48-4	102.950		RPD			1.863	20.000		09/10/08
SPK-RPD	Chromium	7440-47-3	104.200		RPD			0.964	20.000		09/10/08
SPK-RPD	Copper	7440-50-8	102.970		RPD			1.828	20.000		09/10/08
SPK-RPD	Iron	7439-89-6	100.580		RPD			0.598	20.000		09/10/08
SPK-RPD	Potassium	7440-09-7	119.960		RPD			0.167	20.000		09/10/08
SPK-RPD	Magnesium	7439-95-4	74.000		RPD			11.429	20.000		09/10/08
SPK-RPD	Manganese	7439-96-5	105.530		RPD			0.761	20.000		09/10/08
SPK-RPD	Sodium	7440-23-5	100.000		RPD			13.904	20.000		09/10/08
SPK-RPD	Nickel	7440-02-0	103.400		RPD			1.363	20.000		09/10/08
SPK-RPD	Antimony	7440-36-0	105.800		RPD			2.779	20.000		09/10/08
SPK-RPD	Strontium	7440-24-6	107.000		RPD			1.060	20.000		09/10/08
SPK-RPD	Vanadium	7440-62-2	102.070		RPD			0.886	20.000		09/10/08
SPK-RPD	Zinc	7440-66-6	113.800		RPD			0.352	20.000		09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP Metals Analysis, Grd H2O P

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	Silver	7440-22-4	<5	n/a	ug/L					U	09/10/08
BLANK	Aluminum	7429-90-5	<52	n/a	ug/L					U	09/10/08
BLANK	Barium	7440-39-3	<4	n/a	ug/L					U	09/10/08
BLANK	Beryllium	7440-41-7	<4	n/a	ug/L					U	09/10/08
BLANK	Calcium	7440-70-2	<73	n/a	ug/L					U	09/10/08
BLANK	Cadmium	7440-43-9	<4	n/a	ug/L					U	09/10/08
BLANK	Cobalt	7440-48-4	<4	n/a	ug/L					U	09/10/08
BLANK	Chromium	7440-47-3	<13	n/a	ug/L					U	09/10/08
BLANK	Copper	7440-50-8	<6	n/a	ug/L					U	09/10/08
BLANK	Iron	7439-89-6	<25	n/a	ug/L					U	09/10/08
BLANK	Potassium	7440-09-7	<170	n/a	ug/L					U	09/10/08
BLANK	Lithium	7439-93-2	<4	n/a	ug/L					U	09/10/08
BLANK	Magnesium	7439-95-4	<50	n/a	ug/L					U	09/10/08
BLANK	Manganese	7439-96-5	<4	n/a	ug/L					U	09/10/08
BLANK	Sodium	7440-23-5	<51	n/a	ug/L					U	09/10/08
BLANK	Nickel	7440-02-0	<4	n/a	ug/L					U	09/10/08
BLANK	Antimony	7440-36-0	<56	n/a	ug/L					U	09/10/08
BLANK	Strontium	7440-24-6	<4	n/a	ug/L					U	09/10/08
BLANK	Vanadium	7440-62-2	<12	n/a	ug/L					U	09/10/08
BLANK	Zinc	7440-66-6	<9	n/a	ug/L					U	09/10/08
LCS	Silver	7440-22-4	1041	104.100	% Recov	80.000	120.000				09/10/08
LCS	Aluminum	7429-90-5	1037	103.700	% Recov	80.000	120.000				09/10/08
LCS	Barium	7440-39-3	490.5	98.100	% Recov	80.000	120.000				09/10/08
LCS	Beryllium	7440-41-7	559.1	111.820	% Recov	80.000	120.000				09/10/08
LCS	Calcium	7440-70-2	1189	118.900	% Recov	80.000	120.000				09/10/08
LCS	Cadmium	7440-43-9	1114	111.400	% Recov	80.000	120.000				09/10/08
LCS	Cobalt	7440-48-4	1081	108.100	% Recov	80.000	120.000				09/10/08
LCS	Chromium	7440-47-3	1043	104.300	% Recov	80.000	120.000				09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP Metals Analysis, Grd H2O P

Sample Date:
 Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
LCS	Copper	7440-50-8	1057	105.700	% Recov	80.000	120.000				09/10/08
LCS	Iron	7439-89-6	1016	101.600	% Recov	80.000	120.000				09/10/08
LCS	Potassium	7440-09-7	12200	122.000	% Recov	80.000	120.000				09/10/08
LCS	Lithium	7439-93-2	543.3	108.660	% Recov	80.000	120.000				09/10/08
LCS	Magnesium	7439-95-4	1065	106.500	% Recov	80.000	120.000				09/10/08
LCS	Manganese	7439-96-5	1071	107.100	% Recov	80.000	120.000				09/10/08
LCS	Sodium	7440-23-5	1142	114.200	% Recov	80.000	120.000				09/10/08
LCS	Nickel	7440-02-0	1099	109.900	% Recov	80.000	120.000				09/10/08
LCS	Antimony	7440-36-0	1089	108.900	% Recov	80.000	120.000				09/10/08
LCS	Strontium	7440-24-6	537.8	107.560	% Recov	80.000	120.000				09/10/08
LCS	Vanadium	7440-82-2	1037	103.700	% Recov	80.000	120.000				09/10/08
LCS	Zinc	7440-66-6	1167	116.700	% Recov	80.000	120.000				09/10/08

Lab ID: W08P004270
 BATCH QC ASSOCIATED WITH SAMPLE

MS	Silver	7440-22-4	953.1	95.310	% Recov	75.000	125.000				09/10/08
MS	Aluminum	7429-90-5	929.5	92.950	% Recov	75.000	125.000				09/10/08
MS	Barium	7440-39-3	476.1	95.220	% Recov	75.000	125.000				09/10/08
MS	Beryllium	7440-41-7	516.7	103.340	% Recov	75.000	125.000				09/10/08
MS	Calcium	7440-70-2	-20	-2.000	% Recov	75.000	125.000				09/10/08
MS	Cadmium	7440-43-9	981.7	98.170	% Recov	75.000	125.000				09/10/08
MS	Cobalt	7440-48-4	977	97.700	% Recov	75.000	125.000				09/10/08
MS	Chromium	7440-47-3	963.1	96.310	% Recov	75.000	125.000				09/10/08
MS	Copper	7440-50-8	966.3	96.630	% Recov	75.000	125.000				09/10/08
MS	Iron	7439-89-6	951.1	95.110	% Recov	75.000	125.000				09/10/08
MS	Potassium	7440-09-7	10068	100.680	% Recov	75.000	125.000				09/10/08
MS	Lithium	7439-93-2	475.9	95.180	% Recov	70.000	130.000				09/10/08
MS	Magnesium	7439-95-4	90	9.000	% Recov	75.000	125.000				09/10/08
MS	Manganese	7439-96-5	984.5	98.450	% Recov	75.000	125.000				09/10/08
MS	Sodium	7440-23-5	-230	-23.000	% Recov	75.000	125.000				09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP Metals Analysis, Grd H2O P

Sample Date: 08/29/08
 Receive Date: 08/29/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
MS	Nickel	7440-02-0	988.1	96.810	% Recov	75.000	125.000				09/10/08
MS	Antimony	7440-38-0	977.3	97.730	% Recov	75.000	125.000				09/10/08
MS	Strontium	7440-24-8	511.5	102.300	% Recov	75.000	125.000				09/10/08
MS	Vanadium	7440-62-2	955	95.500	% Recov	75.000	125.000				09/10/08
MS	Zinc	7440-66-8	985.8	98.580	% Recov	75.000	125.000				09/10/08
MSD	Silver	7440-22-4	970.5	97.050	% Recov	75.000	125.000				09/10/08
MSD	Aluminum	7429-90-5	953.5	95.350	% Recov	75.000	125.000				09/10/08
MSD	Barium	7440-39-3	474.5	94.900	% Recov	75.000	125.000				09/10/08
MSD	Beryllium	7440-41-7	519	103.800	% Recov	75.000	125.000				09/10/08
MSD	Calcium	7440-70-2	-350	-35.000	% Recov	75.000	125.000				09/10/08
MSD	Cadmium	7440-43-9	994.9	99.490	% Recov	75.000	125.000				09/10/08
MSD	Cobalt	7440-48-4	973.5	97.350	% Recov	75.000	125.000				09/10/08
MSD	Chromium	7440-47-3	968.2	96.820	% Recov	75.000	125.000				09/10/08
MSD	Copper	7440-50-8	990.7	99.070	% Recov	75.000	125.000				09/10/08
MSD	Iron	7439-89-6	953.3	95.330	% Recov	75.000	125.000				09/10/08
MSD	Potassium	7440-09-7	10828	108.280	% Recov	75.000	125.000				09/10/08
MSD	Lithium	7439-93-2	521.2	104.240	% Recov	75.000	125.000				09/10/08
MSD	Magnesium	7439-95-4	660	66.000	% Recov	75.000	125.000				09/10/08
MSD	Manganese	7439-96-5	978.7	97.870	% Recov	75.000	125.000				09/10/08
MSD	Sodium	7440-23-5	1030	103.000	% Recov	75.000	125.000				09/10/08
MSD	Nickel	7440-02-0	971	97.100	% Recov	75.000	125.000				09/10/08
MSD	Antimony	7440-38-0	994.9	99.490	% Recov	75.000	125.000				09/10/08
MSD	Strontium	7440-24-8	508.7	101.740	% Recov	75.000	125.000				09/10/08
MSD	Vanadium	7440-62-2	957.5	95.750	% Recov	75.000	125.000				09/10/08
MSD	Zinc	7440-66-8	988.8	98.860	% Recov	75.000	125.000				09/10/08
SPK-RPD	Silver	7440-22-4	97.050		RPD			1.809	20.000		09/10/08
SPK-RPD	Aluminum	7429-90-5	95.350		RPD			2.549	20.000		09/10/08
SPK-RPD	Barium	7440-39-3	94.900		RPD			0.337	20.000		09/10/08
SPK-RPD	Beryllium	7440-41-7	103.800		RPD			0.444	20.000		09/10/08
SPK-RPD	Calcium	7440-70-2	-35.000		RPD			-178.378	20.000		09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP Metals Analysis, Grd H2O P

Sample Date: 08/29/08
 Receive Date: 08/29/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
SPK-RPD	Cadmium	7440-43-9	99.490		RPD			1.336	20.000		09/10/08
SPK-RPD	Cobalt	7440-48-4	97.350		RPD			0.359	20.000		09/10/08
SPK-RPD	Chromium	7440-47-3	96.820		RPD			0.528	20.000		09/10/08
SPK-RPD	Copper	7440-50-8	99.070		RPD			2.494	20.000		09/10/08
SPK-RPD	Iron	7439-89-6	95.330		RPD			0.231	20.000		09/10/08
SPK-RPD	Potassium	7440-09-7	108.280		RPD			7.274	20.000		09/10/08
SPK-RPD	Lithium	7439-93-2	104.240		RPD			9.086	20.000		09/10/08
SPK-RPD	Magnesium	7439-95-4	66.000		RPD			152.000	20.000		09/10/08
SPK-RPD	Manganese	7439-96-5	97.870		RPD			0.591	20.000		09/10/08
SPK-RPD	Sodium	7440-23-5	103.000		RPD			315.000	20.000		09/10/08
SPK-RPD	Nickel	7440-02-0	97.100		RPD			0.299	20.000		09/10/08
SPK-RPD	Antimony	7440-36-0	99.490		RPD			1.785	20.000		09/10/08
SPK-RPD	Strontium	7440-24-6	101.740		RPD			0.549	20.000		09/10/08
SPK-RPD	Vanadium	7440-62-2	95.750		RPD			0.261	20.000		09/10/08
SPK-RPD	Zinc	7440-66-6	98.860		RPD			0.284	20.000		09/10/08

BATCH QC

BLANK	Silver	7440-22-4	<5	n/a	ug/L					U	09/10/08
BLANK	Aluminum	7429-90-5	<52	n/a	ug/L					U	09/10/08
BLANK	Barium	7440-39-3	<4	n/a	ug/L					U	09/10/08
BLANK	Beryllium	7440-41-7	<4	n/a	ug/L					U	09/10/08
BLANK	Calcium	7440-70-2	<73	n/a	ug/L					U	09/10/08
BLANK	Cadmium	7440-43-9	<4	n/a	ug/L					U	09/10/08
BLANK	Cobalt	7440-48-4	<4	n/a	ug/L					U	09/10/08
BLANK	Chromium	7440-47-3	<13	n/a	ug/L					U	09/10/08
BLANK	Copper	7440-50-8	<6	n/a	ug/L					U	09/10/08
BLANK	Iron	7439-89-6	<25	n/a	ug/L					U	09/10/08
BLANK	Potassium	7440-09-7	<170	n/a	ug/L					U	09/10/08
BLANK	Lithium	7439-93-2	<4	n/a	ug/L					U	09/10/08
BLANK	Magnesium	7439-95-4	<50	n/a	ug/L					U	09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP Metals Analysis, Grd H2O 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	Manganese	7439-96-5	<4	n/a	ug/L					U	09/10/08
BLANK	Sodium	7440-23-5	<51	n/a	ug/L					U	09/10/08
BLANK	Nickel	7440-02-0	<4	n/a	ug/L					U	09/10/08
BLANK	Antimony	7440-36-0	<58	n/a	ug/L					U	09/10/08
BLANK	Strontium	7440-24-6	<4	n/a	ug/L					U	09/10/08
BLANK	Vanadium	7440-62-2	<12	n/a	ug/L					U	09/10/08
BLANK	Zinc	7440-66-6	<9	n/a	ug/L					U	09/10/08
LCS	Silver	7440-22-4	967.4	96.740	% Recov	80.000	120.000				09/10/08
LCS	Aluminum	7429-90-5	928.1	92.810	% Recov	80.000	120.000				09/10/08
LCS	Barium	7440-39-3	472.6	94.520	% Recov	80.000	120.000				09/10/08
LCS	Beryllium	7440-41-7	532.4	106.480	% Recov	80.000	120.000				09/10/08
LCS	Calcium	7440-70-2	944.4	94.440	% Recov	80.000	120.000				09/10/08
LCS	Cadmium	7440-43-9	1006	100.600	% Recov	80.000	120.000				09/10/08
LCS	Cobalt	7440-48-4	1012	101.200	% Recov	80.000	120.000				09/10/08
LCS	Chromium	7440-47-3	981.7	98.170	% Recov	80.000	120.000				09/10/08
LCS	Copper	7440-50-8	1006	100.600	% Recov	80.000	120.000				09/10/08
LCS	Iron	7439-89-6	951.9	95.190	% Recov	80.000	120.000				09/10/08
LCS	Potassium	7440-09-7	10850	108.500	% Recov	80.000	120.000				09/10/08
LCS	Lithium	7439-93-2	471.1	94.220	% Recov	80.000	120.000				09/10/08
LCS	Magnesium	7439-95-4	979.9	97.990	% Recov	80.000	120.000				09/10/08
LCS	Manganese	7439-96-5	994.8	99.480	% Recov	80.000	120.000				09/10/08
LCS	Sodium	7440-23-5	1004	100.400	% Recov	80.000	120.000				09/10/08
LCS	Nickel	7440-02-0	1008	100.800	% Recov	80.000	120.000				09/10/08
LCS	Antimony	7440-36-0	998.2	99.820	% Recov	80.000	120.000				09/10/08
LCS	Strontium	7440-24-6	522.1	104.420	% Recov	80.000	120.000				09/10/08
LCS	Vanadium	7440-62-2	972.3	97.230	% Recov	80.000	120.000				09/10/08
LCS	Zinc	7440-66-6	1052	105.200	% Recov	80.000	120.000				09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Inorganic**

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP-200.8 MS All possible meta

Sample Date: 08/26/08
 Receive Date: 08/26/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004214											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Arsenic	7440-38-2	43.21	108.025	% Recov	70.000	130.000				09/15/08
MS	Mercury	7439-97-6	2.29	114.500	% Recov	70.000	130.000				09/15/08
MS	Lead	7439-92-1	43.24	108.100	% Recov	70.000	130.000				09/15/08
MS	Uranium	7440-61-1	39.23	98.075	% Recov	70.000	130.000				09/15/08
MSD	Arsenic	7440-38-2	42.84	107.100	% Recov	70.000	130.000				09/15/08
MSD	Mercury	7439-97-6	2.29	114.500	% Recov	70.000	130.000				09/15/08
MSD	Lead	7439-92-1	43.67	109.175	% Recov	70.000	130.000				09/15/08
MSD	Uranium	7440-61-1	39.88	99.700	% Recov	70.000	130.000				09/15/08
SPK-RPD	Arsenic	7440-38-2	107.100		RPD			0.860	20.000		09/15/08
SPK-RPD	Mercury	7439-97-6	114.500		RPD			0.000	20.000		09/15/08
SPK-RPD	Lead	7439-92-1	109.175		RPD			0.990	20.000		09/15/08
SPK-RPD	Uranium	7440-61-1	99.700		RPD			1.643	20.000		09/15/08
Lab ID: W08P004270											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	Arsenic	7440-38-2	42.79	106.975	% Recov	70.000	130.000				09/15/08
MS	Mercury	7439-97-6	2.39	119.500	% Recov	70.000	130.000				09/15/08
MS	Lead	7439-92-1	43.77	109.425	% Recov	70.000	130.000				09/15/08
MS	Uranium	7440-61-1	44.466	111.165	% Recov	70.000	130.000				09/15/08
MSD	Arsenic	7440-38-2	42.74	106.850	% Recov	70.000	130.000				09/15/08
MSD	Mercury	7439-97-6	2.38	119.000	% Recov	70.000	130.000				09/15/08
MSD	Lead	7439-92-1	43.69	109.225	% Recov	70.000	130.000				09/15/08
MSD	Uranium	7440-61-1	44.566	111.415	% Recov	70.000	130.000				09/15/08
SPK-RPD	Arsenic	7440-38-2	106.850		RPD			0.117	20.000		09/15/08
SPK-RPD	Mercury	7439-97-6	119.000		RPD			0.419	20.000		09/15/08
SPK-RPD	Lead	7439-92-1	109.225		RPD			0.183	20.000		09/15/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081887
 Matrix: WATER
 Test: ICP-200.8 MS All possible meta

Sample Date: 08/29/08
 Receive Date: 08/29/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
SPK-RPD	Uranium	7440-61-1	111.415		RPD			0.225	20.000		09/15/08
BATCH QC											
BLANK	Arsenic	7440-38-2	<0.4	n/a	ug/L					U	09/15/08
BLANK	Arsenic	7440-38-2	<0.4	n/a	ug/L					U	09/15/08
BLANK	Mercury	7439-97-6	<5e-2	n/a	ug/L					U	09/15/08
BLANK	Mercury	7439-97-6	<5e-2	n/a	ug/L					U	09/15/08
BLANK	Lead	7439-92-1	<0.1	n/a	ug/L					U	09/15/08
BLANK	Lead	7439-92-1	<0.1	n/a	ug/L					U	09/15/08
BLANK	Uranium	7440-61-1	<5e-2	n/a	ug/L					U	09/15/08
BLANK	Uranium	7440-61-1	<5e-2	n/a	ug/L					U	09/15/08
LCS	Arsenic	7440-38-2	40.11	100.275	% Recov	85.000	115.000				09/15/08
LCS	Arsenic	7440-38-2	40.2	100.500	% Recov	85.000	115.000				09/15/08
LCS	Mercury	7439-97-6	2.13	106.500	% Recov	85.000	115.000				09/15/08
LCS	Mercury	7439-97-6	2.14	107.000	% Recov	85.000	115.000				09/15/08
LCS	Lead	7439-92-1	41.12	102.800	% Recov	85.000	115.000				09/15/08
LCS	Lead	7439-92-1	41.38	103.450	% Recov	85.000	115.000				09/15/08
LCS	Uranium	7440-61-1	40.32	100.800	% Recov	85.000	115.000				09/15/08
LCS	Uranium	7440-61-1	40.35	100.875	% Recov	85.000	115.000				09/15/08

WSCF ANALYTICAL COMMENT REPORT

Attention: Steve Trent E6-35

Group #: WSCF20081887
Department: Inorganic

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		<p>ICP-AES: [Sample W08P4269] No zirconium is present in the LCS standard. Magnesium, sodium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check standard used to ensure magnesium, sodium, and calcium linearity because sample results are greater than the calibration standard. High potassium LCS recovery; "X" flag. Low silver spike recoveries; "N" flag. Ending zinc CCV has high recovery (111%)</p> <p>ICP-AES: [Sample W08P4270] No zirconium is present in the LCS standard. Magnesium, sodium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check standard used to ensure magnesium, sodium, and calcium linearity because sample results are greater than the calibration standard.</p> <p>ICP-AES: B flag used for samples < 5X MDL VOA: Acetone and methylene chloride in blank sample due to carryover from waste sample; flagged "B" when detected in customer sample. MS 9/29/08</p>

Lab Areas: VALGROUP - Group Validation
LOGSAMP - Login for Sample

VALTEST - Test Validation
LOGTEST - Login for Tests

TESTDATA - Test Data Entry

This report may not be reproduced, except in its entirety without the written approval of the WSCF Laboratory.

wgppc/5.2 Report#: WSCF20081887

Report Date: 30-sep-2008

Page 3

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: I08-053
Sample # W08P004270
Client ID: B1WDN7

PNNL-GPP
WSCF

Matrix: WATER

Group #: WSCF20081887
Department: Organic
Sampled: 08/29/08
Received: 08/29/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Alcohols, Glycols - 8015 Prep											
Alcohols, Glycols - 8015											
Ethyl acetate	141-78-6	Organics	U	< 5.00e+03	ug/L			1.00	5.0e+03		09/09/08
NWTPH-D TPH Diesel Range (Wa) Prep											
NWTPH-D TPH Diesel Range (Wa)											
Total Pet. Hydrocarbons Diesel	TPHDIESEL	LA-523-493	U	< 71.0	ug/L			1.00	71		09/17/08
Kerosene	TPHKEROSENE	LA-523-493	U	< 95.0	ug/L			1.00	95		09/17/08
NWTPH-GX TPH Gasoline Range Prep											
NWTPH-GX TPH Gasoline Range											
Total Pet. Hydrocarbons Gas	TPHGASOLINE	LA-523-443	U	< 50.0	ug/L			1.00	50		09/09/08
VOA Ground Water Protection											
1,1-Dichloroethene	75-35-4	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Trichloroethene	79-01-6	LA-523-455	J	2.40	ug/L			1.00	1.0		09/10/08
Benzene	71-43-2	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Toluene	108-88-3	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Chlorobenzene	108-90-7	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1,1-Dichloroethane	75-34-3	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Ethylbenzene	100-41-4	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1,2-Dichloroethane	107-06-2	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
4-Methyl-2-Pentanone	108-10-1	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Tetrachloroethane	127-18-4	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Xylenes (total)	1330-20-7	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Carbon tetrachloride	56-23-5	LA-523-455		150	ug/L			1.00	1.0		09/10/08
Acetone	67-64-1	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Chloroform	67-66-3	LA-523-455	J	2.60	ug/L			1.00	1.0		09/10/08

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

B - The Analyte detected in both the BLANK and the SAMPLE.(org)
 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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)
 J - Analyte < lowest calibration but > = MDL.(org)
 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

Report WGPP/ver. 5.2

GPAP

38 of 59

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: I08-053
Sample # W08P004270
Client ID: B1WDN7

PNNL-GPP
WSCF

Matrix: WATER

Group #: WSCF20081887
Department: Organic
Sampled: 08/29/08
Received: 08/29/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
1,1,1-Trichloroethane	71-55-6	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Vinyl chloride	75-01-4	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Methylenechloride	75-09-2	LA-523-455	B	5.70	ug/L			1.00	1.0		09/10/08
Carbon disulfide	75-15-0	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
2-Butanone	78-93-3	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1,1,2-Trichloroethane	79-00-5	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1-Butanol	71-36-3	LA-523-455	U	< 100	ug/L			1.00	1.0e + 02		09/10/08
Tetrahydrofuran	109-99-9	LA-523-455	U	< 2.00	ug/L			1.00	2.0		09/10/08
trans-1,2-Dichloroethylene	156-60-5	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
cis-1,2-Dichloroethylene	156-59-2	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Ethyl cyanide	107-12-0	LA-523-455	U	< 2.00	ug/L			1.00	2.0		09/10/08
1,4-Dichlorobenzene	106-46-7	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08

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

B - The Analyte detected in both the BLANK and the SAMPLE.(org)
 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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)
 J - Analyte < lowest calibration but > = MDL.(org)
 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

Report WGPP/ver. 5.2
 GPAP

39 of 59

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35
SAF Number: S08-008
Sample # W08P004271
Client ID: B1WMV2

Group #: WSCF20081887
Department: Organic
Sampled: 08/29/08
Received: 08/29/08

PNNL-GPP
WSCF

Matrix: WATER

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
VOA Ground Water Protection											
1,1-Dichloroethene	75-35-4	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Trichloroethene	79-01-6	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Benzene	71-43-2	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Toluene	108-88-3	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Chlorobenzene	108-90-7	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1,1-Dichloroethane	75-34-3	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Ethylbenzene	100-41-4	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1,2-Dichloroethane	107-06-2	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
4-Methyl-2-Pentanone	108-10-1	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Tetrachloroethene	127-18-4	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Xylenes (total)	1330-20-7	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Carbon tetrachloride	56-23-5	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Acetone	67-64-1	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Chloroform	67-66-3	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1,1,1-Trichloroethane	71-55-6	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Vinyl chloride	75-01-4	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
Methylenechloride	75-09-2	LA-523-455	B	7.90	ug/L			1.00	1.0		09/10/08
Carbon disulfide	75-15-0	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
2-Butanone	78-93-3	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1,1,2-Trichloroethane	79-00-5	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
1-Butanol	71-36-3	LA-523-455	U	< 100	ug/L			1.00	1.0e+02		09/10/08
Tetrahydrofuran	109-99-9	LA-523-455	U	< 2.00	ug/L			1.00	2.0		09/10/08
trans-1,2-Dichloroethylene	156-80-5	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08
cis-1,2-Dichloroethylene	156-59-2	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08

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

B - The Analyte detected in both the BLANK and the SAMPLE.(org)
 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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)
 J - Analyte < lowest calibration but > = MDL.(org)
 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

Report WGPP/ver. 5.2
 GPAP

40 of 59

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-008

Sample # W08P004271

Client ID: BIWMV2

PNNL-GPP
WSCF

Matrix: WATER

Group #: WSCF20081887

Department: Organic

Sampled: 08/29/08

Received: 08/29/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Ethyl cyanide	107-12-0	LA-523-455	U	< 2.00	ug/L			1.00	2.0		09/10/08
1,4-Dichlorobenzene	106-46-7	LA-523-455	U	< 1.00	ug/L			1.00	1.0		09/10/08

MDL=Minimum Detection Limit

RQ=Result Qualifier

TP Err=Total Propagated Error

DF=Dilution Factor

B - The Analyte detected in both the BLANK and the SAMPLE.(org)

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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)

J - Analyte < lowest calibration but > = MDL.(org)

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

Report WGPP/ver. 5.2

GPAP

41 of 59

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20081887
 Matrix: WATER
 Test: Alcohols, Glycols - 8015

Sample Date: 08/26/08
 Receive Date: 08/26/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004211											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	2-Bromoethanol	540-51-2	17700		RPD			0.567	25.000		09/08/08
DUP	Ethyl acetate	141-78-6	< 5000		RPD			n/a	25.000	U	09/08/08
MS	2-Bromoethanol	540-51-2	17200	97.727	% Recov	70.000	125.000				09/08/08
MS	Ethyl acetate	141-78-6	7300	81.111	% Recov	75.000	125.000				09/08/08
MSD	2-Bromoethanol	540-51-2	17500	99.432	% Recov	70.000	125.000				09/08/08
MSD	Ethyl acetate	141-78-6	7400	82.222	% Recov	75.000	125.000				09/08/08
SPK-RPD	2-Bromoethanol	540-51-2	99.432		RPD			1.730	20.000		09/08/08
SPK-RPD	Ethyl acetate	141-78-6	82.222		RPD			1.360	20.000		09/08/08
BATCH QC											
BLANK	2-Bromoethanol	540-51-2	18600	105.682	% Recov	75.000	125.000				09/08/08
BLANK	Ethyl acetate	141-78-6	< 5000	n/a	ug/L	0.000	5.000			U	09/08/08
LCS	2-Bromoethanol	540-51-2	18100	102.841	% Recov	70.000	130.000				09/08/08
LCS	Ethyl acetate	141-78-6	9500	105.556	% Recov	70.000	130.000				09/08/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20081887
 Matrix: WATER
 Test: NWTPH-D TPH Diesel Range (Wa)

Sample Date: 08/29/08
 Receive Date: 08/29/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004270											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	ortho-Terphenyl	Surr	84-15-1	484.81	102.000	% Recov	70.000	130.000			09/17/08
Lab ID: W08P004329											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	ortho-Terphenyl	Surr	84-15-1	478.52	100.000	% Recov	70.000	130.000			09/16/08
MS	Total Pet. Hydrocarbons Diesel		TPHDIESEL	2395.8	101.000	% Recov	75.000	125.000			09/16/08
MSD	ortho-Terphenyl	Surr	84-15-1	521.71	110.000	% Recov	70.000	130.000			09/16/08
MSD	Total Pet. Hydrocarbons Diesel		TPHDIESEL	2624.5	110.000	% Recov	75.000	125.000			09/16/08
SPK-RPD	ortho-Terphenyl	Surr	84-15-1	110.000		RPD			9.524	20.000	09/16/08
SPK-RPD	Total Pet. Hydrocarbons Diesel		TPHDIESEL	110.000		RPD			8.531	20.000	09/16/08
BATCH QC											
BLANK	Kerosene		TPHKEROSENE	< 100	n/a	ug/L				U	09/16/08
BLANK	ortho-Terphenyl	Surr	84-15-1	435.51	87.100	% Recov	70.000	130.000			09/16/08
BLANK	Total Pet. Hydrocarbons Diesel		TPHDIESEL	< 75	n/a	ug/L				U	09/16/08
LCS	ortho-Terphenyl	Surr	84-15-1	530.49	106.000	% Recov	70.000	130.000			09/16/08
LCS	Total Pet. Hydrocarbons Diesel		TPHDIESEL	2605.7	104.000	% Recov	80.000	120.000			09/16/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20081887
 Matrix: WATER
 Test: NWT PH-GX TPH Gasoline Range

Sample Date: 08/26/08
 Receive Date: 08/26/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004214											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Total Pet. Hydrocarbons Gas	TPHGASOLINE	<50		RPD			n/a	20.000	U	09/09/08
MS	Total Pet. Hydrocarbons Gas	TPHGASOLINE	2700	108.000	% Recov	75.000	125.000				09/09/08
MSD	Total Pet. Hydrocarbons Gas	TPHGASOLINE	2700	108.000	% Recov	75.000	125.000				09/09/08
SPK-RPD	Total Pet. Hydrocarbons Gas	TPHGASOLINE	108.000		RPD			0.000	20.000		09/09/08
BATCH QC											
BLANK	Total Pet. Hydrocarbons Gas	TPHGASOLINE	<50	n/a	mg/L	0.000	300.000			U	09/09/08
LCS	Total Pet. Hydrocarbons Gas	TPHGASOLINE	2500	100.000	%rec	80.000	120.000				09/09/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20081887
 Matrix: WATER
 Test: VOA Ground Water Protection

Sample Date: 08/27/08
 Receive Date: 08/27/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004246											
BATCH QC ASSOCIATED WITH SAMPLE											
MS	1,1-Dichloroethene	75-35-4	20.220	80.900	% Recov	63.000	117.000				09/10/08
MS	Benzene	71-43-2	22.960	91.800	% Recov	75.000	129.000				09/10/08
MS	4-Bromofluorobenzene(Surr)	460-00-4	47.340	94.700	% Recov	75.000	125.000				09/10/08
MS	Chlorobenzene	108-90-7	23.690	94.800	% Recov	79.000	119.000				09/10/08
MS	1,2-Dichloroethane-d4(Surr)	17060-07-0	42.450	84.900	% Recov	75.000	125.000				09/10/08
MS	Toluene-d8(Surr)	2037-26-5	44.280	88.600	% Recov	75.000	125.000				09/10/08
MS	Toluene	108-88-3	22.740	91.000	% Recov	76.000	120.000				09/10/08
MS	Trichloroethene	79-01-6	21.530	86.100	% Recov	73.000	123.000				09/10/08
MSD	1,1-Dichloroethene	75-35-4	20.850	83.400	% Recov	63.000	117.000				09/10/08
MSD	Benzene	71-43-2	22.530	90.100	% Recov	75.000	129.000				09/10/08
MSD	4-Bromofluorobenzene(Surr)	460-00-4	47.710	95.400	% Recov	75.000	125.000				09/10/08
MSD	Chlorobenzene	108-90-7	23.530	94.100	% Recov	79.000	119.000				09/10/08
MSD	1,2-Dichloroethane-d4(Surr)	17060-07-0	43.120	86.200	% Recov	75.000	125.000				09/10/08
MSD	Toluene-d8(Surr)	2037-26-5	44.540	89.100	% Recov	75.000	125.000				09/10/08
MSD	Toluene	108-88-3	22.590	90.400	% Recov	76.000	120.000				09/10/08
MSD	Trichloroethene	79-01-6	21.290	85.200	% Recov	73.000	123.000				09/10/08
SPK-RPD	1,1-Dichloroethene	75-35-4	83.400		RPD			3.043	20.000		09/10/08
SPK-RPD	Benzene	71-43-2	90.100		RPD			1.869	20.000		09/10/08
SPK-RPD	4-Bromofluorobenzene(Surr)	460-00-4	95.400		RPD			0.736	20.000		09/10/08
SPK-RPD	Chlorobenzene	108-90-7	94.100		RPD			0.741	20.000		09/10/08
SPK-RPD	1,2-Dichloroethane-d4(Surr)	17060-07-0	86.200		RPD			1.520	20.000		09/10/08
SPK-RPD	Toluene-d8(Surr)	2037-26-5	89.100		RPD			0.563	20.000		09/10/08
SPK-RPD	Toluene	108-88-3	90.400		RPD			0.662	20.000		09/10/08
SPK-RPD	Trichloroethene	79-01-6	85.200		RPD			1.051	20.000		09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20081887
 Matrix: WATER
 Test: VOA Ground Water Protection

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	1,1-Dichloroethane	75-34-3	< 1.0	n/a	ug/L					U	09/10/08
BLANK	1,1,1-Trichloroethane	71-55-6	< 1.0	n/a	ug/L					U	09/10/08
BLANK	1,1,2-Trichloroethane	79-00-5	< 1.0	n/a	ug/L					U	09/10/08
BLANK	1,1-Dichloroethene	75-35-4	< 1.0	n/a	ug/L					U	09/10/08
BLANK	1,2-Dichloroethane	107-06-2	< 1.0	n/a	ug/L					U	09/10/08
BLANK	1,4-Dichlorobenzene	106-46-7	< 1.0	n/a	ug/L					U	09/10/08
BLANK	1-Butanol	71-36-3	< 100	n/a	ug/L					U	09/10/08
BLANK	4-Methyl-2-Pentanone	108-10-1	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Acetone	67-64-1	27	27.000	ug/L						09/10/08
BLANK	Benzene	71-43-2	< 1.0	n/a	ug/L					U	09/10/08
BLANK	4-Bromofluorobenzene(Surr)	460-00-4	46.860	93.700	% Recov	75.000	125.000				09/10/08
BLANK	Carbon disulfide	75-15-0	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Carbon tetrachloride	56-23-5	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Chloroform	67-66-3	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Chlorobenzene	108-90-7	< 1.0	n/a	ug/L					U	09/10/08
BLANK	cis-1,2-Dichloroethylene	156-59-2	< 1.0	n/a	ug/L					U	09/10/08
BLANK	1,2-Dichloroethane-d4(Surr)	17060-07-0	41.860	83.700	% Recov	75.000	125.000				09/10/08
BLANK	trans-1,2-Dichloroethylene	156-60-5	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Ethylbenzene	100-41-4	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Ethyl cyanide	107-12-0	< 2.0	n/a	ug/L					U	09/10/08
BLANK	2-Butanone	78-93-3	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Methylenechloride	75-09-2	37	37.000	ug/L						09/10/08
BLANK	Tetrachloroethene	127-18-4	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Xylenes (total)	1330-20-7	< 1.0	n/a	ug/L	0.000	5.000			U	09/10/08
BLANK	Tetrahydrofuran	109-99-9	< 2.0	n/a	ug/L					U	09/10/08
BLANK	Toluene-d8(Surr)	2037-26-5	43.970	87.900	% Recov	75.000	125.000				09/10/08
BLANK	Toluene	108-88-3	< 1.0	n/a	ug/L					U	09/10/08
BLANK	Trichloroethene	79-01-6	< 1.0	n/a	ug/L					U	09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: **Organic**

SDG Number: WSCF20081887
 Matrix: WATER
 Test: VOA Ground Water Protection

Sample Date:
 Receive Date:

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
BLANK	Vinyl chloride	75-01-4	< 1.0	n/a	ug/L					U	09/10/08
LCS	1,1-Dichloroethene	75-35-4	20.330	81.300	% Recov	75.000	125.000				09/10/08
LCS	Benzene	71-43-2	23.280	93.100	% Recov	75.000	125.000				09/10/08
LCS	4-Bromofluorobenzene(Surr)	460-00-4	46.650	93.300	% Recov	75.000	125.000				09/10/08
LCS	Chlorobenzene	108-90-7	23.290	93.200	% Recov	75.000	125.000				09/10/08
LCS	1,2-Dichloroethane-d4(Surr)	17060-07-0	43.900	87.800	% Recov	75.000	125.000				09/10/08
LCS	Toluene-d8(Surr)	2037-26-5	44.550	89.100	% Recov	75.000	125.000				09/10/08
LCS	Toluene	108-88-3	22.940	91.800	% Recov	75.000	125.000				09/10/08
LCS	Trichloroethene	79-01-6	21.110	84.400	% Recov	75.000	125.000				09/10/08

WSCF

ANALYTICAL COMMENT REPORT

Attention: Steve Trent E6-35

Group #: WSCF20081887
Department: Organic

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		<p>ICP-AES: [Sample W08P4269] No zirconium is present in the LCS standard. Magnesium, sodium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check standard used to ensure magnesium, sodium, and calcium linearity because sample results are greater than the calibration standard. High potassium LCS recovery; "X" flag. Low silver spike recoveries; "N" flag. Ending zinc CCV has high recovery (111%)</p> <p>ICP-AES: [Sample W08P4270] No zirconium is present in the LCS standard. Magnesium, sodium, and calcium sample results exceed spiking level by a factor of 4 so spike recoveries are not valid. Check standard used to ensure magnesium, sodium, and calcium linearity because sample results are greater than the calibration standard.</p> <p>ICP-AES: B flag used for samples < 5X MDL VOA: Acetone and methylene chloride in blank sample due to carryover from waste sample; flagged "B" when detected in customer sample. MS 9/29/08</p>

Lab Areas: VALGROUP - Group Validation
 LOGSAMP - Login for Sample

VALTEST - Test Validation
 LOGTEST - Login for Tests

TESTDATA - Test Data Entry

This report may not be reproduced, except in its entirety without the written approval of the WSCF Laboratory.

WSCF

ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-053

Sample # W08P004270

Client ID: B1WDN7

PNNL-GPP
WSCF

Matrix: WATER

Group #: WSCF20081887

Department: Radiochemistry

Sampled: 08/29/08

Received: 08/29/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Strontium 89/90											
Strontium-89/90	SR-RAD	LA-508-415	U	-1.90	pCi/L	+ -2.30	pCi/L	1.00	0.88		09/14/08
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		94.9	Percent			1.00	0.0		09/14/08
TC99 by Liquid Scin.											
Tc-99 by Liquid Scin.	14133-78-7	LA-508-421		87.0	pCi/L	+ -18.3	pCi/L	1.00	5.5		09/10/08
Tritium by Liq Sct column prep											
Tritium	10028-17-8	LA-508-421	U	230	pCi/L	+ -143	pCi/L	1.00	2.3e+02		09/18/08

MDL=Minimum Detection Limit

RQ=Result Qualifier

TP Err=Total Propagated Error

DF=Dilution Factor

B - The Analyte detected in both the BLANK and the SAMPLE.(org)

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.(org)

B - The analyte < the RDL but > = the IDL/MDL (inorg)

J - Analyte < lowest calibration but > = MDL.(org)

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

Report WGPP/ver. 5.2

GPAP

49 of 59

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081887
 Matrix: WATER
 Test: Strontium 89/90

Sample Date: 08/20/08
 Receive Date: 08/20/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004155											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Sr-85 Tracer by Beta Counting	SR85	90	90.000	% Recov	30.000	105.000				09/14/08
DUP	Strontium-89/90	SR-RAD	U-1.9		RPD			n/a	20.000		09/14/08
Lab ID: W08P004270											
BATCH QC ASSOCIATED WITH SAMPLE											
SURR	Sr-85 Tracer by Beta Counting	SR85	94.9	94.900	% Recov	30.000	105.000				09/14/08
BATCH QC											
BLANK	Sr-85 Tracer by Beta Counting	SR85	90.0	90.000	% Recov	30.000	105.000				09/14/08
BLANK	Strontium-89/90	10098-97-2	U-1.3	n/a	pCi/L	-10.000	100.000				09/14/08
LCS	Sr-85 Tracer by Beta Counting	SR85	91.5	91.500	% Recov	30.000	105.000				09/14/08
LCS	Strontium-89/90	10098-97-2	147.0	105.885	% Recov	80.000	120.000				09/14/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081887
 Matrix: WATER
 Test: TC99 by Liquid Scin.

Sample Date: 08/26/08
 Receive Date: 08/26/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004212											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Tc-99 by Liquid Scin.	14133-76-7	U-0.8		RPD			n/a	20.000		09/10/08
MS	Tc-99 by Liquid Scin.	14133-76-7	660.4	103.732	% Recov	75.000	125.000				09/10/08
BATCH QC											
BLANK	Tc-99 by Liquid Scin.	14133-76-7	U2.0	n/a	pCi/L	-10.000	10.000				09/10/08
LCS	Tc-99 by Liquid Scin.	14133-76-7	166.6	104.648	% Recov	80.000	120.000				09/10/08

WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20081887
 Matrix: WATER
 Test: Tritium by Liq Sct column prep

Sample Date: 08/27/08
 Receive Date: 08/27/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
Lab ID: W08P004252											
BATCH QC ASSOCIATED WITH SAMPLE											
DUP	Tritium	10028-17-8	9.5E+03		RPD			5.405	20.000		09/18/08
MS	Tritium	10028-17-8	21380.0	95.112	% Recov	75.000	125.000				09/18/08
BATCH QC											
BLANK	Tritium	10028-17-8	U-5.1E+01	n/a	pCi/L	-10.000	1000.000				09/18/08
LCS	Tritium	10028-17-8	3160	93.323	% Recov	80.000	120.000				09/18/08

M4W41-SLF-08-1111

ATTACHMENT 5

SAMPLE RECEIPT INFORMATION

Consisting of 7 pages
Including cover page

Waste Sampling and Cha.

P.O. BOX 1970 S3-30, Ric.
PHONE: (509) 373-7004/FAX: (509) 373-7005

ACKNOWLEDGMENT OF SAMPLES RECEIVED

GPAP

Richland, WA 99352
Attn: Steve Trent E6-35

Customer Code: PNNL-GPP
PO#: 122543
Group#: 20081887

The following samples were received from you on 08/29/08. 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
W08P004267	B1WFP1	PNNL-GPP @IC-30	Water	08/29/08
W08P004269	B1WDN6	PNNL-GPP @2008 @GPP6010	Water	08/29/08
W08P004270	B1WDN7	PNNL-GPP @2008 @8015GPP @GPP6010 @H3-33 @IC-30 @SR89_90 @SVOCGPP @TC99-30 @TPHD-WA @TPHG-WA @VOA- CN-02 NH4-IC <i>POL, P.D.M. 9/24/08</i>	Water	08/29/08
W08P004271	B1WMV2	PNNL-GPP @VOA-GPP	Water	08/29/08

Test Acronym Description

Test Acronym	Description
@2008	ICP-200.8 MS All possible meta
@8015GPP	Alcohols, Glycols - 8015
@GPP6010	ICP Metals Analysis, Grd H2O P
@H3-33	Tritium by Liq Sct column prep
@IC-30	Anions by Ion Chromatography
@SR89_90	Strontium 89/90
@SVOCGPP	SW-846 8270C Semi-Vols
@TC99-30	TC99 by Liquid Scin.
@TPHD-WA	NWTPH-D TPH Diesel Range (Wa)
@TPHG-WA	NWTPH-GX TPH Gasoline Range
@VOA-GPP	VOA Ground Water Protection
CN-02	Cyanide by Midi/Spectrophotom
NH4-IC	Ammonia (N) by IC

FLUOR HANFORD

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

108-053-38

Page 1 of 2

Collector Fluor Hanford D. R. BREWINGTON	Contact/Requester Steve Trent	Telephone No. 509-373-5869	MSIN	FAX
SAF No. 108-053	Sampling Origin Hanford Site	Purchase Order/Charge Code		
Project Title 2UPL AUGUST 2008	HNF-N-506-14	Ice Chest No. 100-KR-4	Temp.	
Shipped To (Lab) Waste Sampling & Characterization	Method of Shipment Govt. Vehicle	Bill of Lading/Air Bill No.		
Protocol SURV	Priority: 30 Days PRIORITY	Offsite Property No.		

POSSIBLE SAMPLE HAZARDS/REMARKS ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)	SPECIAL INSTRUCTIONS 200 Area Generator Knowledge Information Form applies.	Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	---	---

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1WDN6 (F)	W08P0429	W	8/29/08	304	1x500-mL G/P	200.8_METALS_ICPMS: Arsenic (1); 200.8_METALS_ICPMS: Lead (1)	HNO3 to pH <2
B1WDN6 (F)		W			1x500-mL G/P	6010_METALS_ICP: List-1 + Lithium (20)	HNO3 to pH <2
B1WDN6 (F)		W			1x500-mL G/P	200.8_METALS_ICPMS: Mercury (1)	HNO3 to pH <2
B1WDN7	4270	W			4x40-mL aGs*	8260_VOA_GCMS: List-2 (25)	HCl or H2SO4 to pH <2 Cool-4C
B1WDN7		W			1x500-mL G/P	200.8_METALS_ICPMS: Arsenic (1); 200.8_METALS_ICPMS: Lead (1)	HNO3 to pH <2
B1WDN7		W			1x500-mL P	300.0_ANIONS_IC: List-1 (5)	Cool-4C
B1WDN7		W			1x500-mL G/P	6010_METALS_ICP: List-1 + Lithium (20)	HNO3 to pH <2
B1WDN7		W			1x1000-mL G/P	TC99_3MDSK_LSC: Tc-99 (1)	HCl to pH <2
B1WDN7		W			1x250-mL G	TRITIUM_EIE_LSC: Tritium (1)	None
B1WDN7		W			3x40-mL aGs*	Alcohols, Glycols, & Ketones - 8015	Cool-4C
B1WDN7		W			4x1000-mL aG	8270_SVOA_GCMS: List-1 + Cresol (14)	Cool-4C
B1WDN7		W			1x500-mL G/P	200.8_METALS_ICPMS: Uranium (1)	HNO3 to pH <2
B1WDN7		W			1x500-mL G/P	200.8_METALS_ICPMS: Mercury (1)	HNO3 to pH <2
B1WDN7		W			1x250-mL G/P	300.7_CATIONS_IC: Ammonia (1)	H2SO4 to pH <2
B1WDN7		W			1x250-mL G/P	335.2_CYANIDE: Cyanide (1)	NaOH to pH >= 12 Cool-4C
B1WDN7		W			3x1000-mL aG	TPH-Diesel Range - WTPH-D; TPH-Kerosene Range - WTPH-D	HCl to pH <2 Cool-4C

ICED

Relinquished By Fluor Hanford D. R. BREWINGTON	Print <i>D.R. Brewington</i>	Sign <i>D.R. Brewington</i>	Date/Time AUG 29 2008	1335	Received By <i>TA P... Jones</i>	Print <i>TA P... Jones</i>	Sign <i>TA P... Jones</i>	Date/Time AUG 29 2008	1335	Matrix *
Relinquished By	Date/Time	Received By	Date/Time		Relinquished By	Date/Time	Received By	Date/Time		S = Soil SF = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solid DL = Drum Liquid T = Tissue WI = Wine L = Liquid V = Vegetation X = Other
Relinquished By	Date/Time	Received By	Date/Time		Relinquished By	Date/Time	Received By	Date/Time		
Relinquished By	Date/Time	Received By	Date/Time		Relinquished By	Date/Time	Received By	Date/Time		
Relinquished By	Date/Time	Received By	Date/Time		Relinquished By	Date/Time	Received By	Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By			Date/Time		

65 of 59

FLUOR HANFORD

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

108-053-38

Page 1 of 2

Collector Fluor Hanford D. R. BREWINGTON	Contact/Requester Steve Trent	Telephone No. 509-373-5869	MSIN	FAX
SAF No. 108-053	Sampling Origin Hanford Site	Purchase Order/Charge Code		
Project Title 2UPL AUGUST 2008	HNF-N-506-14	Ice Chest No. 100-KR-4	Temp.	
Shipped To (Lab) Waste Sampling & Characterization TASC	Method of Shipment Govt. Vehicle	Bill of Lading/Air Bill No.		
Protocol SURV	9/2/08 JCS	Priority: 30 Days	PRIORITY	
Possibile Sample Hazards/Remarks		SPECIAL INSTRUCTIONS		Hold Time

*** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

SDG # 20081887

Shipped off Site

Total Activity Exemption: Yes No

Sample No.	Lab ID	Date	Time	No/Type Container	Sample Analysis	Preservative
B4WDN6 (F)	40114-35	8/29/08	1304	1x500-mL G/P	200.8_METALS_ICPMS: Arsenic (1); 200.8_METALS_ICPMS: Lead (1)	HNO3 to pH <2
B4WDN6 (F)				1x500-mL G/P	6010_METALS_ICP: List-1 + Lithium (20)	HNO3 to pH <2
B1WDN6 (F)				1x500-mL G/P	200.8_METALS_ICPMS: Mercury (1)	HNO3 to pH <2
B1WDN7	4270			4x40-mL aGs*	8260_VOA_GCMS: List-2 (25)	HCl or H2SO4 to pH <2 Cool-4C
B1WDN7				1x500-mL G/P	200.8_METALS_ICPMS: Arsenic (1); 200.8_METALS_ICPMS: Lead (1)	HNO3 to pH <2
B4WDN7				1x500-mL P	300.0_ANIONS_IC: List-1 (5)	Cool-4C
B4WDN7				1x500-mL G/P	6010_METALS_ICP: List-1 + Lithium (20)	HNO3 to pH <2
B4WDN7				1x1000-mL G/P	T099_3MDSK_LSC: Tc-99 (1)	HCl to pH <2
B4WDN7				1x250-mL G	TRITIUM_EIE_LSC: Tritium (1)	None
B1WDN7				3x40-mL aGs*	Alcohols, Glycols, & Ketones - 8015	Cool-4C
B1WDN7				4x1000-mL aG	8270_SVOA_GCMS: List-1 + Cresol (14)	Cool-4C
B4WDN7				1x500-mL G/P	200.8_METALS_ICPMS: Uranium (1)	HNO3 to pH <2
B4WDN7				1x500-mL G/P	200.8_METALS_ICPMS: Mercury (1)	HNO3 to pH <2
B4WDN7				1x250-mL G/P	300.7_CATIONS_IC: Ammonia (1)	H2SO4 to pH <2
B1WDN7				1x250-mL G/P	336.2_CYANIDE: Cyanide (1)	NaOH to pH >= 12 Cool-4C
B1WDN7				3x1000-mL aG	TPH-Diesel Range - WTPH-D: TPH-Kerosene Range - WTPH-D	HCl to pH <2 Cool-4C

ICED

Relinquished By Fluor Hanford D. R. BREWINGTON	Print D.R. Brewington	Sign <i>[Signature]</i>	Date/Time AUG 29 2008	Received By T.A. Enz...	Print T.A. Enz...	Sign <i>[Signature]</i>	Date/Time AUG 29 2008	Matrix * S = Soil DS = Drum Solid SF = Sediment DI = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By <i>[Signature]</i>	Date/Time 9/2/08	1435	Received By <i>[Signature]</i>	Date/Time 9/2/08	1435			
Relinquished By	Date/Time		Received By	Date/Time				
Relinquished By	Date/Time		Received By	Date/Time				

59 of 59

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
--------------------------	--	-------------	-----------