

RECEIVED JULY 16, 2008

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**FLUOR****Memorandum**

M4W41-SLF-08-701

To: H. Hampt E6-35 Date: July 16, 2008

From: S. L. Fitzgerald, Manager WSCF Analytical Lab *Markham Stauffer for SLF*

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 WSCF20081418

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 WSCF20081418:

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

SLF/grf

Attachments 4

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ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

## WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20081418  
Data Deliverable Date: 24-jul-2008  
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix
I08-047	B1W1T2	W08P003451	WATER
	B1W1V6	W08P003442	WATER
	B1W1V9	W08P003443	WATER
	B1W1W0	W08P003444	WATER
	B1W371	W08P003450	WATER
S08-007	B1W281	W08P003440	WATER
	B1W282	W08P003441	WATER

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ATTACHMENT 2

**NARRATIVE**

Consisting of 2 pages  
Including cover page

### Introduction

Seven groundwater samples were received at the WSCF Laboratory on July 11, 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.

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*, page 9, for a complete listing of approved analytical methods.

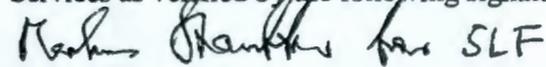
### Inorganic Comments

**Hexavalent Chromium** – 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 the GRP Letter of Instruction. See page 17 for QC details. Analytical Note(s):

- Sample results were D flagged if dilution(s) were required.

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

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ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 12 pages  
Including cover page

**WSCF**  
**ANALYTICAL RESULTS REPORT**

for

**GPAP**  
**Richland, WA 99352**

**Attention: Steve Trent E6-35**

Analytical: Markus Stauffer Markus Stauffer 7/16/08  
Client Services: P.D. Mix P.D. Mix 7/16/2008

*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#: WSCF20081418  
Report Date: 16-jul-2008  
Report WGPP/ver. 5.2  
GPAP

Page 1

Department: Inorganic

## W13q Worklist/Batch/QC Report for Group# WSCF20081418

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
37043	2	37468	41823	BLANK		Hexavalent chromium
37043	14	37468	41823	BLANK		Hexavalent chromium
37043	3	37468	41823	LCS		Hexavalent chromium
37043	5	37468	41823	DUP	W08P003440	Hexavalent chromium
37043	6	37468	41823	MS	W08P003440	Hexavalent chromium
37043	7	37468	41823	MSD	W08P003440	Hexavalent chromium
37043	4	37468	41823	SAMPLE	W08P003440	Hexavalent chromium
37043	7	37468	41823	SPK-RPD	W08P003440	Hexavalent chromium
37043	8	37468	41823	SAMPLE	W08P003441	Hexavalent chromium
37043	9	37468	41823	SAMPLE	W08P003442	Hexavalent chromium
37043	10	37468	41823	SAMPLE	W08P003443	Hexavalent chromium
37043	11	37468	41823	SAMPLE	W08P003444	Hexavalent chromium
37043	12	37468	41823	SAMPLE	W08P003450	Hexavalent chromium
37043	13	37468	41823	SAMPLE	W08P003451	Hexavalent chromium

# WSCF

## METHOD REFERENCES REPORT

Department: Inorganic

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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.

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<b>LA-265-403</b>	<b>LA-265-403: Hexavalent Chromium analysis by Spectrophotometer</b>
<b>EPA SW-846 7196A</b>	<b>HEXAVALENT CHROMIUM</b>
<b>HEIS 7196_CR6</b>	<b>Hexavalent Chromium</b>

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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: 16-jul-2008  
Report#: WSCF20081418  
Report WGPPM/5.2

# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: S08-007

Sample # W08P003440

Client ID: B1W281

GPP-PNNL TRENT

WSCF

Matrix: WATER

Group #: WSCF20081418

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		8.40e-03	mg/L			1.00	2.0e-03		07/11/08

**MDL = Minimum Detection Limit**

D - Analyte was identified at a secondary dilution factor (inorg)

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

\* - 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: S08-007

Sample # W08P003441

Client ID: B1W282

GPP-PNNL TRENT

Matrix: WATER

WSCF

Group #: WSCF20081418

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
Hexavalent Chromium	18540-29-9	LA-265-403		0.0494	mg/L			1.00	2.0e-03		07/11/08

**MDL = Minimum Detection Limit**

D - Analyte was identified at a secondary dilution factor (inorg)

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

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# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003442

Client ID: B1W1V6

GPP-PNNL TRENT  
WSCF

Matrix: WATER

Group #: WSCF20081418

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		0.107	mg/L			1.00	2.0e-03		07/11/08

**MDL = Minimum Detection Limit**

D - Analyte was identified at a secondary dilution factor (Inorg)

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

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# WSCF ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003443

Client ID: B1W1V9

GPP-PNNL TRENT  
WSCF

Matrix: WATER

Group #: WSCF20081418

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		0.0174	mg/L			1.00	2.0e-03		07/11/08

**MDL = Minimum Detection Limit**    D - Analyte was identified at a secondary dilution factor(Inorg)

**RQ = Result Qualifier**

**TP Err = Total Propagated Error**

**DF = Dilution Factor**

\* - 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:** I08-047  
**Sample #** W08P003444  
**Client ID:** B1W1W0

**Group #:** WSCF20081418  
**Department:** Inorganic  
**Sampled:** 07/11/08  
**Received:** 07/11/08

GPP-PNNL TRENT  
WSCF

**Matrix:** WATER

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403		0.0186	mg/L			1.00	2.0e-03		07/11/08

**MDL = Minimum Detection Limit**    D - Analyte was identified at a secondary dilution factor (inorg)  
**RQ = Result Qualifier**  
**TP Err = Total Propagated Error**  
**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

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# WSCF

## ANALYTICAL RESULTS REPORT

Attention: Steve Trent E6-35

SAF Number: I08-047

Sample # W08P003450

Client ID: B1W371

GPP-PNNL TRENT

WSCF

Matrix: WATER

Group #: WSCF20081418

Department: Inorganic

Sampled: 07/11/08

Received: 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	D	1.43	mg/L			9.30	0.019		07/11/08

**MDL=Minimum Detection Limit**

D - Analyte was identified at a secondary dilution factor(inorg)

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

\* - Indicates results that have NOT been validated;

+ - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2

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# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent E6-35

**SAF Number:** I08-047

**Sample #** W08P003451

**Client ID:** B1W1T2 GPP-PNNL TRENT

WSCF

**Matrix:** WATER

**Group #:** WSCF20081418

**Department:** Inorganic

**Sampled:** 07/11/08

**Received:** 07/11/08

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Hexavalent Chromium</b>											
Hexavalent Chromium	18540-29-9	LA-265-403	D	1.44	mg/L			9.30	0.019		07/11/08

**MDL=Minimum Detection Limit**

D - Analyte was identified at a secondary dilution factor(Inorg)

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

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

Report WGPP/ver. 5.2

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# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Inorganic

SDG Number: WSCF20081418  
 Matrix: WATER  
 Test: Hexavalent chromium

Sample Date: 07/11/08  
 Receive Date: 07/11/08

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W08P003440</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Hexavalent chromium	18540-29-9	0.0097		RPD			14.385	15.000		07/11/08
MS	Hexavalent chromium	18540-29-9	0.0552	102.985	% Recov	85.000	115.000				07/11/08
MSD	Hexavalent chromium	18540-29-9	0.0552	102.985	% Recov	85.000	115.000				07/11/08
SPK-RPD	Hexavalent chromium	18540-29-9	102.985		RPD			0.000	20.000		07/11/08
<b>BATCH QC</b>											
BLANK	Hexavalent chromium	18540-29-9	<0.002	n/a	mg/L	0.000	2.000			U	07/11/08
BLANK	Hexavalent chromium	18540-29-9	<0.002	n/a	mg/L	0.000	2.000			U	07/11/08
LCS	Hexavalent chromium	18540-29-9	0.0494	98.016	% Recov	80.000	120.000				07/11/08

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ATTACHMENT 4

**SAMPLE RECEIPT INFORMATION**

Consisting of 9 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  
✓TS  
7/14/08

ACKNOWLEDGMENT OF SAMPLES RECEIVED

GPAP

Richland, WA 99352  
Attn: Steve Trent E6-35

Customer Code: PNNL-GPP  
PO#: 122543  
Group#: 20081418



The following samples were received from you on 07/11/08. 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
W08P003440	B1W281	GPP-PNNL CR+6	TRENT Water	07/11/0
W08P003441	B1W282	GPP-PNNL CR+6	TRENT Water	07/11/0
W08P003442	B1W1V6	GPP-PNNL CR+6	TRENT Water	07/11/0
W08P003443	B1W1V9	GPP-PNNL CR+6	TRENT Water	07/11/0
W08P003444	B1W1W0	GPP-PNNL CR+6	TRENT Water	07/11/0
W08P003450	B1W371	GPP-PNNL CR+6	TRENT Water	07/11/0
W08P003451	B1W1T2	GPP-PNNL CR+6	TRENT Water	07/11/0

Test Acronym Description

Test Acronym	Description
CR+6	Hexavalent chromium













