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**FLUOR**<sup>®</sup>

M4W41-SLF-09-209

July 15, 2009

Mr. M. A. Neely, Manager  
Analytical Services  
CH2M HILL Plateau Remediation Contract  
PO Box 1600 MSIN R3-60  
Richland, WA 99352

Dear Mike:

FINAL RESULTS FOR SAMPLE DELIVERY GROUP WSCF20090660 – SAF NUMBER F09-047

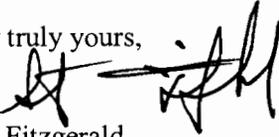
Reference: (1) Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3,  
'FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER'

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

This letter contains the following attachments for sample delivery group WSCF20090660:

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

Very truly yours,



S. L. Fitzgerald  
WSCF Analytical Lab

SLF/grf

Attachments 4

cc: w/Attachments  
A. J. Kopriva S3-30  
H. K. Meznarich S3-30  
J. E. Trechter S3-30  
S. J. Trent R3-50  
File/LB

M4W41-SLF-09-209

ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

# WSCF SAF NUMBER CROSS REFERENCE

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Group#: WSCF20090660  
Data Deliverable Date: 17-jul-2009  
Data Deliverable: Cover Sheet

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SAF#	Sample ID	WSCF#	Matrix
F09-047	B215V1	W09GR00473	SOIL
	B215V2	W09GR00474	SOIL
	B215V3	W09GR00475	SOIL
	B215V4	W09GR00476	SOIL

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M4W41-SLF-09-209

ATTACHMENT 2

**NARRATIVE**

Consisting of 3 pages  
Including cover page

## **Introduction**

Four (4) S&GRP samples were received at the WSCF Laboratory on July 9, 2009. Samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

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 transport container.

The following generic data qualifiers (i.e., B, D, and J) may be applicable to this report, as appropriate

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wetchem analyses), as appropriate.
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.

## **Analytical Methodology for Requested Analyses**

Refer to *WSCF Method References Report*, page 10, for a complete listing of approved analytical methods.

## **Radiochemistry Comments**

**Rad Chem** – A Duplicate, Matrix Spike (*Matrix Spikes apply only to Neptunium, Technetium & Tritium and Matrix Spike Duplicate applies to Neptunium*), Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 20 through 21 for QC details.  
Analytical Note(s):

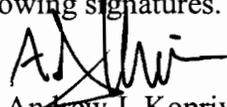
- Sr-89/90 (sample B215V1) – Duplicate Relative Percent Difference (RPD) did not meet the established laboratory limits. The RPD was only slightly greater than the established limit of 20% at 24%. The data was reviewed by the chemist and approved.

All other QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by the following signatures.



Scot L. Fitzgerald  
WSCF Analytical Laboratory Manager



Andrew J. Kopriva  
WSCF Client Services

M4W41-SLF-09-209

ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 15 pages  
Including cover page

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

for  
**Groundwater Remediation Program**

**Richland, WA 99354**

**Attention: Steve Trent**

Analytical: ~~SAH~~ S. Fitzgerald 7-15-09  
Client Services: ~~AWA~~ A. Kopriwa 7-15-09

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

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Contract#: MOA-FH-CHPRC-2008  
Report#: WSCF20090660  
Report Date: 15-jul-2009  
Report WGPP/ver. 5.2  
*Groundwater Remediation Program*

## W13q Worklist/Batch/QC Report for Group# WSCF20090660

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
39763	1	40187	44754	BLANK		Strontium 89/90
39763	2	40187	44754	LCS		Strontium 89/90
39763	3	40187	44754	DUP	W09GR00473	Strontium 89/90
39763	4	40187	44754	SAMPLE	W09GR00473	Strontium 89/90
39763	5	40187	44754	SURR	W09GR00473	Strontium 89/90
39763	6	40187	44754	SAMPLE	W09GR00474	Strontium 89/90
39763	7	40187	44754	SURR	W09GR00474	Strontium 89/90
39763	8	40187	44754	SAMPLE	W09GR00475	Strontium 89/90
39763	9	40187	44754	SURR	W09GR00475	Strontium 89/90
39763	10	40187	44754	SAMPLE	W09GR00476	Strontium 89/90
39763	11	40187	44754	SURR	W09GR00476	Strontium 89/90
39758	1	40182	44755	BLANK		Gamma Energy Analysis-grd H2O
39758	2	40182	44755	LCS		Gamma Energy Analysis-grd H2O
39758	3	40182	44755	DUP	W09GR00473	Gamma Energy Analysis-grd H2O
39758	4	40182	44755	SAMPLE	W09GR00473	Gamma Energy Analysis-grd H2O
39758	5	40182	44755	SAMPLE	W09GR00474	Gamma Energy Analysis-grd H2O
39758	6	40182	44755	SAMPLE	W09GR00475	Gamma Energy Analysis-grd H2O
39758	7	40182	44755	SAMPLE	W09GR00476	Gamma Energy Analysis-grd H2O

# 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\_GeTontium 89/90
- LA-508-481** LA-508-481: GAMMA ENERGY ANALYSIS USING PROCOUNT SOFTWARE  
HEIS GAMMA\_GS Gamma Emmission Spectrometry

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

Report Date: 15-jul-2009  
Report #: WSCF20090660  
Report WGPPM/5.2

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F09-047  
**Sample #** W09GR00473  
**Client ID:** B215V1

**GPP** TRENT  
**WSCF**

**Matrix:** SOIL

**Group #:** WSCF20090660  
**Department:** Radiochemistry  
**Sampled:** 07/09/09  
**Received:** 07/09/09

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gamma Energy Analysis-grd H2O</b>											
Cesium-137	10045-97-3	LA-508-481		151	pCi/g	+ -24.7	pCi/g	1.00	0.12		07/13/09
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415		28.0	pCi/g	+ -4.48	pCi/g	1.00	0.95		07/13/09
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		88.9	Percent			1.00	0.0		07/13/09

**MDL = Minimum Detection Limit** U - Analyzed for but not detected above limiting criteria(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

Groundwater Remediation Program

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F09-047  
**Sample #** W09GR00474  
**Client ID:** B215V2

**GPP** TRENT  
**WSCF**  
**Matrix:** SOIL

**Group #:** WSCF20090660  
**Department:** Radiochemistry  
**Sampled:** 07/09/09  
**Received:** 07/09/09

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gamma Energy Analysis-grd H2O</b>											
Cesium-137	10045-97-3	LA-508-481		221	pCi/g	+ -35.8	pCi/g	1.00	0.14		07/13/09
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415		39.0	pCi/g	+ -5.46	pCi/g	1.00	0.88		07/13/09
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		95.6	Percent			1.00	0.0		07/13/09

**MDL = Minimum Detection Limit** U - Analyzed for but not detected above limiting criteria(inorg)

**RQ = Result Qualifier**

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**DF = Dilution Factor**

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

Report WGPP/ver. 5.2

Groundwater Remediation Program

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F09-047  
**Sample #** W09GR00475  
**Client ID:** B215V3

**Group #:** WSCF20090660  
**Department:** Radiochemistry  
**Sampled:** 07/09/09  
**Received:** 07/09/09

**GPP** TRENT      **Matrix:** SOIL  
**WSCF**

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gamma Energy Analysis-grd H2O</b>											
Cesium-137	10045-97-3	LA-508-481		0.0244	pCi/g	+ -9.21e-03	pCi/g	1.00	0.010		07/14/09
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-1.70	pCi/g	+ -1.80	pCi/g	1.00	0.84		07/13/09
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		100	Percent			1.00	0.0		07/13/09

**MDL = Minimum Detection Limit**      U - Analyzed for but not detected above limiting criteria(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

Groundwater Remediation Program

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F09-047  
**Sample #:** W09GR00476  
**Client ID:** B215V4

**GPP:** TRENT  
**WSCF:** SOIL  
**Matrix:** SOIL

**Group #:** WSCF20090660  
**Department:** Radiochemistry  
**Sampled:** 07/09/09  
**Received:** 07/09/09

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
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**Gamma Energy Analysis-grd H2O**

Cesium-137	10045-97-3	LA-508-481		0.0842	pCi/g	+ -0.0187	pCi/g	1.00	0.016		07/14/09
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-0.220	pCi/g	+ -1.90	pCi/g	1.00	0.98		07/13/09
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		85.9	Percent			1.00	0.0		07/13/09

**MDL = Minimum Detection Limit** U - Analyzed for but not detected above limiting criteria(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

Groundwater Remediation Program

# WSCF TENTATIVELY IDENTIFIED PEAK REPORT

**Attention:**  
**Project Number**

Steve Trent  
F09-047 : F09-047

**Group #:** WSCF20090660  
**Department:** Radiochemistry

Sample #	Client ID	ATTENTION	Project Number	Group #:	Department:	RT	RQ	Result	Units
Sample #	Client ID	Test Name	Peak Name	CAS#	RT	RQ	Result	Units	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		Bi-212		0.74	pCi/g	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		Bi-212 Count Error		37	%	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		Bi-214		0.84	pCi/g	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		Bi-214 Count Error		18	%	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		K-40		15	pCi/g	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		K-40 Count Error		14	%	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		PB-212		0.68	pCi/g	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		PB-212 Count Error		31	%	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		PB-214		0.62	pCi/g	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		PB-214 Count Error		48	%	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		RA-226		0.77	pCi/g	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		RA-226 Count Error		33	%	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		RA-228		0.72	pCi/g	
W09GR00473	B215V1	TRENT	Gamma Energy Analysis-grd H2O		RA-228 Count Error		25	%	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		AC-228		0.81	pCi/g	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		AC-228 Count Error		22	%	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		Bi-214		0.81	pCi/g	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		Bi-214 Count Error		20	%	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		K-40		15	pCi/g	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		K-40 Count Error		14	%	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		PB-212		0.87	pCi/g	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		PB-212 Count Error		35	%	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		PB-214		0.89	pCi/g	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		PB-214 Count Error		41	%	
W09GR00474	B215V2	TRENT	Gamma Energy Analysis-grd H2O		RA-226		0.67	pCi/g	

**RQ=Result Qualifier**

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*Groundwater Remediation Program*

WGPE v 5.2 Report#: WSCF20090660 Report Date: 15-Jul-2009

# WSCF

## TENTATIVELY IDENTIFIED PEAK REPORT

**Attention:** Steve Trent  
**Project Number:** F09-047 :F09-047

**Group #:** WSCF20090660  
**Department:** Radiochemistry

Sample #	Client ID	GPP	TRENT	Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W09GR00474	B215V2	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-226 Count Error			44		%
W09GR00474	B215V2	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-228			0.81		pCi/g
W09GR00474	B215V2	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-228 Count Error			22		%
W09GR00474	B215V2	GPP	TRENT	Gamma Energy Analysis-grd H2O	TL-208			0.23		pCi/g
W09GR00474	B215V2	GPP	TRENT	Gamma Energy Analysis-grd H2O	TL-208 Count Error			50		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	AC-228			0.69		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	AC-228 Count Error			18		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	Bi-212			0.47		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	Bi-212 Count Error			20		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	Bi-214			0.60		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	Bi-214 Count Error			11		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	CS-134			0.031		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	CS-134 Count Error			32		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	K-40			14		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	K-40 Count Error			13		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	PB-212			0.74		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	PB-212 Count Error			9.4		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	PB-214			1.0		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	PB-214 Count Error			21		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-226			0.47		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-226 Count Error			17		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-228			0.67		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-228 Count Error			17		%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	SN-126			0.13		pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	SN-126 Count Error			29		%

**RQ=Result Qualifier**

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*Groundwater Remediation Program*

WGPE v 5.2 Report#: WSCF20090660 Report Date: 15-Jul-2009

# WSCF

## TENTATIVELY IDENTIFIED PEAK REPORT

**Attention:** Steve Trent  
**Project Number:** F09-047

F09-047 :F09-047

**Group #:** WSCF20090660  
**Department:** Radiochemistry

Sample #	Client ID	GPP	TRENT	Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	TH-234				0.66	pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	TH-234 Count Error				34	%
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	TL-208				0.23	pCi/g
W09GR00475	B215V3	GPP	TRENT	Gamma Energy Analysis-grd H2O	TL-208 Count Error				14	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	AC-228				0.75	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	AC-228 Count Error				22	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	BI-212				0.66	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	BI-212 Count Error				21	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	BI-214				0.78	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	BI-214 Count Error				13	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	CS-134				0.059	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	CS-134 Count Error				29	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	K-40				16	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	K-40 Count Error				13	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	PB-212				0.98	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	PB-212 Count Error				12	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	PB-214				1.1	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	PB-214 Count Error				25	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-226				0.64	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-226 Count Error				16	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-228				0.86	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	RA-228 Count Error				17	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	SN-126				0.19	pCi/g
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	SN-126 Count Error				21	%
W09GR00476	B215V4	GPP	TRENT	Gamma Energy Analysis-grd H2O	TH-234				1.0	pCi/g

**RQ = Result Qualifier**

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*Groundwater Remediation Program*

WGPE v 5.2 Report#: WSCF20090660 Report Date: 15-Jul-2009

# WSCF TENTATIVELY IDENTIFIED PEAK REPORT

**Attention:** Steve Trent  
**Project Number:** F09-047 :F09-047

**Group #:** WSCF20090660  
**Department:** Radiochemistry

Sample #	Client ID	Test Name	Peak Name	CAS#	RT	RQ	Result	Units
W09GR00476	B215V4	GPP TRENT	Gamma Energy Analysis-grd H2O				21	%
W09GR00476	B215V4	GPP TRENT	Gamma Energy Analysis-grd H2O				0.29	pCi/g
W09GR00476	B215V4	GPP TRENT	Gamma Energy Analysis-grd H2O				14	%

RQ = Result Qualifier

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*Groundwater Remediation Program*

WGPPE v 5.2 Report#: WSCF20090660 Report Date: 15-jul-2009

**WSCF**  
**ANALYTICAL COMMENT REPORT**

**Attention:** Steve Trent      **Group #:** WSCF20090660  
**Project Number:** F09-047      **Department:** Radiochemistry

Sample #	Client ID	Lab Area	Test	Comment
		VALGROUP		W09GR00473-476/Sr89/90/Batch dup is flagged for poor RPD that is only slightly outside the limit. The scientist has reviewed and approved this batch. lmh

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

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# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20090660

Matrix: SOLID

Test: Gamma Energy Analysis-grd H2O

Sample Date: 07/09/09

Receive Date: 07/09/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W09GR00473</b> <b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Cesium-137	10045-97-3	148.3		RPD			2.069	20.000		07/14/09
<b>BATCH QC</b>											
BLANK	Cesium-137	10045-97-3	U-3.515e-3	n/a	pCi/g	-10.000	1000.000				07/14/09
LCS	Cesium-137	10045-97-3	6437	106.573	% Recov	80.000	120.000				07/14/09

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20090660  
 Matrix: SOLID  
 Test: Strontium 89/90

Sample Date: 07/09/09  
 Receive Date: 07/09/09

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
<b>Lab ID: W09GR00473</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
DUP	Sr-85 Tracer by Beta Counting	SR85	102.6	102.600	% Recov	30.000	105.000				07/13/09
DUP	Strontium-89/90	SR-RAD	22		RPD			24.000	20.000		07/13/09
SURR	Sr-85 Tracer by Beta Counting	SR85	88.9	88.900	% Recov	30.000	105.000				07/13/09
<b>Lab ID: W09GR00474</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
SURR	Sr-85 Tracer by Beta Counting	SR85	95.6	95.600	% Recov	30.000	105.000				07/13/09
<b>Lab ID: W09GR00475</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
SURR	Sr-85 Tracer by Beta Counting	SR85	100.2	100.200	% Recov	30.000	105.000				07/13/09
<b>Lab ID: W09GR00476</b>											
<b>BATCH QC ASSOCIATED WITH SAMPLE</b>											
SURR	Sr-85 Tracer by Beta Counting	SR85	85.9	85.900	% Recov	30.000	105.000				07/13/09
<b>BATCH QC</b>											
BLANK	Sr-85 Tracer by Beta Counting	SR85	79.2	79.200	% Recov	30.000	105.000				07/13/09
BLANK	Strontium-89/90	10098-97-2	U-2.6E-01	n/a	pCi/g	-10.000	300.000				07/13/09
LCS	Sr-85 Tracer by Beta Counting	SR85	85.5	85.500	% Recov	30.000	105.000				07/13/09
LCS	Strontium-89/90	10098-97-2	75.4	106.347	% Recov	80.000	120.000				07/13/09

M4W41-SLF-09-209

ATTACHMENT 4

**SAMPLE RECEIPT INFORMATION**

Consisting of 6 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  
MB*

ACKNOWLEDGMENT OF SAMPLES RECEIVED

*7/17/09*

Groundwater Remediation Program

Richland, WA 99354

Attn: Steve Trent

Customer Code: GPP

PO#: 302222/ES10

Group#: 20090660

Project#: F09-047

Proj Mgr: Steve Trent

Phone: 373-5869



The following samples were received from you on 07/09/09. 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
W09GR00473	B215V1	GPP @GEA-GPP @SR89_90	TRENT Solid, or handle as if solid	07/09/09
W09GR00474	B215V2	GPP @GEA-GPP @SR89_90	TRENT Solid, or handle as if solid	07/09/09
W09GR00475	B215V3	GPP @GEA-GPP @SR89_90	TRENT Solid, or handle as if solid	07/09/09
W09GR00476	B215V4	GPP @GEA-GPP @SR89_90	TRENT Solid, or handle as if solid	07/09/09

Test Acronym Description

Test Acronym	Description
@GEA-GPP @SR89_90	Gamma Energy Analysis-grd H2O Strontium 89/90

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

COLLECTOR: *A. V. [Signature]*  
 COMPANY CONTACT: WIDRIG, DL  
 TELEPHONE NO.: 373-5869

PROJECT COORDINATOR: WIDRIG, DL  
 PRICE CODE: 8B  
 DATA TURNAROUND: 7 Days / 15 Days

SAMPLING LOCATION: BCCA SU-2-CA1  
 PROJECT DESIGNATION: BC Controlled Area Remediation - In Process Soil Sampling

ICE CHEST NO.:  
 FIELD LOGBOOK NO.: *HNF-N-585-3*  
 ACTUAL SAMPLE DEPTH: *N/A*

SAF NO.: F09-047  
 AIR QUALITY:   
 METHOD OF SHIPMENT: GOVERNMENT VEHICLE

COA: 302222ES10  
 BILL OF LADING/AIR BILL NO.: N/A

SHIPPED TO: Waste Sampling & Characterization

OFFSITE PROPERTY NO.: N/A

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SPECIAL HANDLING AND/OR STORAGE
A=Air	Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	None	None	1	500mL	20090660
DL=Drum		Square Bottle - Poly	1	120mL		
L=Liquid		G/P	1			
O=Oil						
S=Soil						

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B215V1	W096R0473 SOIL	7-9-09	1307 X X

**CHAIN OF POSSESSION**

**SPECIAL INSTRUCTIONS**  
 \*\* The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
<i>A. V. [Signature]</i>	7-9-09/1405	<i>[Signature]</i>	7-9-09/1405
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

**COLLECTOR**  
D. V. [Signature]

**COMPANY CONTACT**  
WIDRIG, DL  
373-5869

**PROJECT COORDINATOR**  
WIDRIG, DL

**PRICE CODE** 8B

**DATA TURNAROUND**  
7 Days / 15 Days

**SAFETY**  
SAF NO. F09-047

**AIR QUALITY**

**METHOD OF SHIPMENT**  
GOVERNMENT VEHICLE

**SAMPLING LOCATION**  
BCCA SU-2-CA1-D

**PROJECT DESIGNATION**  
BC Controlled Area Remediation - In Process Soil Sampling

**FIELD LOGBOOK NO.**  
HPI-2-585-3

**ACTUAL SAMPLE DEPTH**  
1.1A

**ICE CHEST NO.**

**OFFSITE PROPERTY NO.**  
N/A

**BILL OF LADING/AIR BILL NO.**  
N/A

**SHIPPED TO**

Waste Sampling & Characterization

**MATRIX\***

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

**PRESERVATION**  
None

**TYPE OF CONTAINER**  
Square Bottle - Poly

**NO. OF CONTAINER(S)**  
1

**VOLUME**  
500mL

**SPECIAL HANDLING AND/OR STORAGE**

**SAMPLE ANALYSIS**

Gamma Spectroscopy (Cesium-137)  
Strontium-89,90 - Total Sr

**SAMPLE NO.**  
B215V2

**MATRIX\***

**SAMPLE DATE**  
7-9-09

W96W3474 SOIL

X

X

X

**CHAIN OF POSSESSION**

RELINQUISHED BY/REMOVED FROM  
D. V. [Signature]

DATE/TIME  
7-9-09/1405

RECEIVED BY/STORED IN  
[Signature]

DATE/TIME  
7-9-09/1405

RELINQUISHED BY/REMOVED FROM

RECEIVED BY/STORED IN

**LABORATORY SECTION**

**TITLE**

**FINAL SAMPLE DISPOSITION**

**DISPOSED BY**

COLLECTOR  
*D. L. [Signature]*

COMPANY CONTACT  
WIDRIG, DL

TELEPHONE NO.  
373-5869

PROJECT COORDINATOR  
WIDRIG, DL

PRICE CODE  
8B

DATA TURNAROUND  
7 Days / 15 Days

SAMPLING LOCATION  
BCCA SU-2-CAZ

PROJECT DESIGNATION  
BC Controlled Area Remediation - In Process Soil Sampling

SAF NO.  
F09-047

AIR QUALITY

METHOD OF SHIPMENT  
GOVERNMENT VEHICLE

ICE CHEST NO.

FIELD LOGBOOK NO.  
*HAF-A-585-3*

COA  
302222ES10

ACTUAL SAMPLE DEPTH  
*N/A*

SHIPPED TO

BILL OF LADING/AIR BILL NO.  
N/A

Waste Sampling & Characterization

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

PRESERVATION  
None

TYPE OF CONTAINER  
Square Bottle - Poly

NO. OF CONTAINER(S)  
1

VOLUME  
500mL

SAMPLE ANALYSIS  
Gamma Spectrometry (Cesium-137)

SPECIAL HANDLING AND/OR STORAGE  
None

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

SAMPLE NO.  
B215V3

MATRIX\*  
SOIL

SAMPLE DATE  
*7-9-09*

SAMPLE TIME  
*1313*

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

RELINQUISHED BY/REMOVED FROM  
*D. L. [Signature]*

RECEIVED BY/STORED IN  
*Victor [Signature]*

\*\* The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

RELINQUISHED BY/REMOVED FROM

RECEIVED BY/STORED IN

LABORATORY SECTION

TITLE

FINAL SAMPLE DISPOSITION

DISPOSED BY

DATE/TIME

DATE/TIME

**COLLECTOR** *D. L. [Signature]*

**SAMPLING LOCATION**  
 BCCA SU-2-CA3

**ICE CHEST NO.**

**COMPANY CONTACT**  
 WIDRIG, DL

**TELEPHONE NO.**  
 373-5869

**PROJECT COORDINATOR**  
 WDRIG, DL

**PRICE CODE** 8B

**DATA TURNAROUND**  
 7 Days / 15 Days

**PROJECT DESIGNATION**  
 BC Controlled Area Remediation - In Process Soil Sampling

**SAF NO.**  
 F09-047

**AIR QUALITY**

**METHOD OF SHIPMENT**  
 GOVERNMENT VEHICLE

**FIELD LOGBOOK NO.**  
*3111 10585*

**ACTUAL SAMPLE DEPTH**  
*N/A*

**COA**  
 302222ES10

**BILL OF LADING/AIR BILL NO.**  
 N/A

**SHIPPED TO**  
 Waste Sampling & Characterization

**MATRIX\***

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

**PRESERVATION**  
 None

**TYPE OF CONTAINER**  
 Square Bottle - Poly

**NO. OF CONTAINER(S)**  
 1

**VOLUME**  
 500mL

**SAMPLE ANALYSIS**  
 Gamma Spectroscopy (Cesium-137), Strontium-89,90 - Total Sr;

**SPECIAL HANDLING AND/OR STORAGE**

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B215V4	Waste Characterization SOIL	7-9-09	1318

**CHAIN OF POSSESSION**

**SPECIAL INSTRUCTIONS**  
 \*\* The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
<i>D. L. [Signature]</i>	7-9-09/1405	<i>[Signature]</i>	7-9-09/1405
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

**LABORATORY SECTION** RECEIVED BY

**FINAL SAMPLE DISPOSITION** DISPOSAL METHOD

27 of 27