REVIEW COMMENT RECORD (RCR)	1. Date 04/22/2011	2. Review No.
	3. Project No.	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
VSR11-040, Data Validation Report for CHPRC - Project 200 Area RI/FS, Chemical and Radiochemical Validation - Level C	S&GRP Sample Data Groups (SDGs); WSCF90839, WSCF90871, WSCF91371, H4033 and H4048	JA Edwards	Environmental Quality Assurance (EQA)	2420 Stevens Rm. 345 376-4324

17. Comment Submittal Approval	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date / Organization Manager (optional) (print and sign)	JA Edwards (signature) Reviewer/Point of Contact (print and sign)	JA Edwards (signature) Reviewer/Point of Contact (print and sign)
	04/22/2011 Date	04/22/2011 Date
	Author/Originator (print and sign)	Author/Originator (print and sign)

12. Item	13a. Comments	13b. Basis	13c. Recommendation	14. Reviewer Concurrence Required (Y or N)	15. Disposition (provide justification if **NOT** accepted)	16. Status
1	There were no issues found in this review	N/A	No additional items found	N	N/A	Closed

Documents:

GRP-GD-002, Rev. 0, Change 0, *Data Validation for Radiochemical Analyses*, August 2010
GRP-GD-003, Rev. 0, Change 0, *Data Validation for Chemical Analyses*, August 2010
DOE/RL-2008-57, Rev. 1, *Sampling and Analysis Plan for the First Set of Remedial Action Wells in the 200-ZP-1 Groundwater Operable Unit*, August 2009
LA-523-455, *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry*
LA-533-410: Anion Analysis By Ion Chromatography, E-5, 06/15/10
LA-344-406: Total Organic Carbon (TOC) Based on SW-846, C-5, 12/2/10
LA-508-481: Gamma Energy Analysis Using Procount Software

CHPRC - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
04/24/2011	
3. Project No.	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
VSR11-040		Scot Fitzgerald	Analytical Support Group	2753/373-7495

17. Comment Submittal Approval	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date: ____ Organization Manager (optional) (print and sign): ____	Scot Fitzgerald — Reviewer/Point of Contact (print and sign)	Scot Fitzgerald — Reviewer/Point of Contact (print and sign)
	Date: 04/24/2011	Date: 04/24/2011
	Author/Originator (print and sign): ____	Author/Originator (print and sign): ____

12. Item	13a. Comments	13b. Basis	13c. Recommendation	14. Reviewer Concurrence Required (Y or N)	15. Disposition (provide justification if **NOT** accepted)	16. Status
	No issues noted.					

ANALYTICAL QUALITY ASSOCIATES, INC.
616 Maxine NE
Albuquerque, NM 87123
505-299-5201
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Data Validation Report for CH2M Hill Plateau Remediation Company

VSR11-040
Project 200 Area SGRP

Chemical & Radiochemical Validation - Level C

Validation Performed By: Eyda Hergenreder **Date:** 4-14-2011

Validation Reviewed By: Carl Schlosser **Date:** 4-20-2011

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Date: 14 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: 200 Area SGRP
Subject: Volatile Organics - Sample Data Groups (SDGs) WSCF90839, WSCF90871 and WSCF91370

INTRODUCTION

This memorandum presents the results of data validation for SDGs WSCF90839, WSCF90871 and WSCF91370 prepared by WSCF Analytical Laboratories. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B21CH4	08/05/09	Water	C	8260B
B21FV0	08/13/09	Water	C	8260B
B21FV1	08/13/09	Water	C	8260B
B21FN0	10/20/09	Water	C	8260B
B21FM9	10/20/09	Water	C	8260B

Data validation was conducted in accordance with the CHPRC validation statement of work and the Sampling and Analysis Plan for the First Set of Remedial Action Wells in the 200-ZP-1 Groundwater Operable Unit, DOE/RL-2008-57, Rev. 1 (SAP). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirements for volatile organics are analysis within 14 days of sample collection. Sample preservation requires chilling to 4 degrees Celsius and acid preservation with hydrochloric or sulfuric acid to pH <2.

The samples were analyzed within the prescribed holding time and properly preserved.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable.

Trip Blanks

No trip blanks were submitted for validation.

Field Blanks

No field blanks were submitted for validation.

Equipment Blanks

All equipment blank results were acceptable.

- **Accuracy**

Accuracy is evaluated by reviewing surrogate results, matrix spike sample results, and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 80% to 120%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Surrogates

All surrogate recoveries were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable with the following exceptions.

For all SDGs, the only 8260B MS/MSD analytes reported were 1,1-dichloroethene, benzene, chlorobenzene, toluene and trichloroethene. Reported analytes not represented in the MS/MSDs were cis-1,3-dichloropropene, trans-1,3-dichloropropene, methyl isobutyl ketone, 2-hexanone, acetone, carbon disulfide, bromodichloromethane and methyl ethyl ketone. All sample results for these non-represented analytes were non-detects and should be qualified as estimates and flagged "UJ."

For SDG WSCF90839, the MS and MSD recoveries for 1,1-dichloroethene were below the lower acceptance limit. All reported analytes represented by 1,1-dichloroethene were non-

detects and should be qualified as estimates and flagged "UJ." See the table in Appendix 2 for a listing of all affected sample results.

For SDG WSCF90871, the MS and MSD recoveries for 1,1-dichloroethene and benzene were below the lower acceptance limits. The chloroform results for samples B21FV0 and B21FV1 were detects and should be qualified as estimates and flagged "J." The 1,1-dichloroethene and benzene results for samples B21FV0 and B21FV1 were non-detects and should be qualified as estimates and flagged "UJ."

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exceptions.

For all SDGs, the only 8260B LCS analytes reported were 1,1-dichloroethene, benzene, chlorobenzene, toluene and trichloroethene. Reported analytes not represented in the LCSs were cis-1,3-dichloropropene, trans-1,3-dichloropropene, methyl isobutyl ketone, 2-hexanone, acetone, carbon disulfide, bromodichloromethane and methyl ethyl ketone. All sample results for these non-represented analytes were non-detects and should be qualified as estimates and flagged “UJ.”

For SDG WSCF90871, the LCS recovery for benzene was below the lower acceptance limit. The benzene results for samples B21FV0 and B21FV1 were non-detects and should be qualified as estimates and flagged “UJ.”

- **Precision**

Precision is evaluated by reviewing MS/MSD results, field duplicate sample results, field split sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference (RPD) limits are ±20%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

MS/MSD Samples

All MS/MSD RPD values were acceptable.

Field Duplicate Samples

All field duplicate results were acceptable.

For SDG WSCF90871, the field duplicate sample associated with primary sample B21FV1 was not selected for validation; therefore field duplicate precision could not be assessed for these samples.

Field Split Samples

No field splits were submitted for validation.

- **Detection Limits**

Reported MDLs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs.

- **Completeness**

SDGs WSCF90839, WSCF90871 and WSCF91370 were submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Minor deficiencies leading to qualification of sample results as estimates were due to low MS/MSD recoveries, low LCS recovery and non-represented QC data for multiple analytes. See the table in Appendix 2 for a listing of all affected sample results.

REFERENCES

GRP-GD-003, Rev. 0, Change 0, *Data Validation for Chemical Analyses*, August 2010.

DOE/RL-2008-57, Rev. 1, *Sampling and Analysis Plan for the First Set of Remedial Action Wells in the 200-ZP-1 Groundwater Operable Unit*, August 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the CHPRC statement of work are as follows:

- **U** — The constituent was analyzed for, but was not detected. The data should be considered usable for decision-making purposes.

- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the RL. The data should be considered usable for decision-making purposes.

- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J+** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J-** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **N** — The analysis indicates the presence of an analyte that has been tentatively identified.

- **NJ** — The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

- **NJ+** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation.

- **NJ-** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation.

- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2

Summary of Data Qualification

Volatile Organics Data Qualification Summary			
SDGs: WSCF90839, WSCF90871, WSCF91370	Reviewer: AQA	Project: 200 Area SGRP	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
1,1-dichloroethene 1,1-dichloroethane 1,2-dichloroethane total-1,2-dichloroethene chloroform bromomethane chloromethane chloroethane vinyl chloride methylene chloride bromoform 1,2-dichloropropane	UJ	B21CH4	Low MS/MSD recoveries
cis-1,3-dichloropropene trans-1,3-dichloropropene methyl isobutyl ketone 2-hexanone acetone carbon disulfide bromodichloromethane methyl ethyl ketone	UJ	B21CH4, B21FN0, B21FM9	Non-represented MS/MSD and LCS data
chloroform	J	B21FV0, B21FV1	Low MS/MSD recoveries
1,1-dichloroethene	UJ	B21FV0, B21FV1	Low MS/MSD recoveries
benzene	UJ	B21FV0, B21FV1	Low MS/MSD recoveries and low LCS recovery

Comments: None

Appendix 3

Annotated Laboratory Reports

WSCF Analytical Results Report

REVISION 1

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90839

Sample # 90839001
SAF# F09-044
Sample ID B21CH4

Matrix WATER
Sampled 08/05/09
Received 08/05/09

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep											**08/11/09**
SW-846 8260B											
1,1-Dichloroethene	75-35-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Trichloroethene	79-01-6		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Benzene	71-43-2		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Toluene	108-88-3		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Chlorobenzene	108-90-7		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
1,1-Dichloroethane	75-34-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Ethylbenzene	100-41-4		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Styrene	100-42-5		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
cis-1,3-Dichloropropene	10061-01-5	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
trans-1,3-Dichloropropene	10061-02-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
1,2-Dichloroethane	107-06-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Methyl isobutyl ketone	108-10-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Dibromochloromethane	124-48-1		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Tetrachloroethene	127-18-4		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Total Xylenes	1330-20-7		LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Total 1,2-Dichloroethene	540-59-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumptive compound based on MS Library search.

T - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
T - MS and/or MSD sample recovery outside control limits.

REVISED90839 -

WSCF Analytical Results Report

REVISION 1

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90839

Sample # 90839001
SAF# F09-044
Sample ID B21CH4

Matrix WATER
Sampled 08/05/09
Received 08/05/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon tetrachloride	56-23-5	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
2-Hexanone	591-78-6 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Acetone	67-64-1 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Chloroform	67-66-3 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
1,1,1-Trichloroethane	71-55-6	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Bromomethane	74-83-9 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Chloromethane	74-87-3 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Chloroethane	75-00-3 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Vinyl chloride	75-01-4 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Methylene chloride	75-09-2 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Carbon disulfide	75-15-0 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Bromoform	75-25-2 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Bromodichloromethane	75-27-4 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
1,2-Dichloropropane	78-87-5 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
Methyl ethyl ketone	78-93-3 UJ	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
1,1,2-Trichloroethane	79-00-5	LA-523-455	U	<1		ug/L	1	1	5	08/11/09
1,1,2,2-Tetrachloroethane	79-34-5	LA-523-455	U	<1		ug/L	1	1	5	08/11/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumptive compound based on MS Library search.

T - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
T - MS and/or MSD sample recovery outside control limits.

REVISED90839 -

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90871
Project Number F09-043

Sample # 90871001
SAF# F09-043
Sample ID B21FV0

Matrix WATER
Sampled 08/13/09
Received 08/13/09

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep											**08/13/09**
SW-846 8260B											
1,1-Dichloroethene	75-35-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Trichloroethene	79-01-6		LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Benzene	71-43-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Toluene	108-88-3		LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Chlorobenzene	108-90-7		LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Carbon tetrachloride	56-23-5		LA-523-455		25		ug/L	1	1	5	08/14/09
Chloroform	67-66-3	J	LA-523-455		7.2		ug/L	1	1	5	08/14/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumptive compound based on MS Library search.

T - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90871
Project Number F09-043

Sample # 90871002
SAF# F09-043
Sample ID B21FV1

Matrix WATER
Sampled 08/13/09
Received 08/13/09

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep											**08/13/09**
SW-846 8260B											
1,1-Dichloroethene	75-35-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Trichloroethene	79-01-6		LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Benzene	71-43-2	UJ	LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Toluene	108-88-3		LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Chlorobenzene	108-90-7		LA-523-455	U	<1		ug/L	1	1	5	08/14/09
Carbon tetrachloride	56-23-5		LA-523-455		26		ug/L	1	1	5	08/14/09
Chloroform	67-66-3	J	LA-523-455		7.0		ug/L	1	1	5	08/14/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumptive compound based on MS Library search.

T - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

Sample # 91370001
SAF# F09-043
Sample ID B21FN0

Matrix WATER
Sampled 10/20/09
Received 10/20/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep										**10/21/09**
SW-846 8260B										
1,1-Dichloroethene	75-35-4	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Trichloroethene	79-01-6	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Benzene	71-43-2	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Toluene	108-88-3	LA-523-455	J	1.2		ug/L	1	1	5	10/21/09
Chlorobenzene	108-90-7	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,1-Dichloroethane	75-34-3	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Ethylbenzene	100-41-4	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Styrene	100-42-5	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
cis-1,3-Dichloropropene	10061-01-5 UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
trans-1,3-Dichloropropene	10061-02-6 UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,2-Dichloroethane	107-06-2	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Methyl isobutyl ketone	108-10-1 UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Dibromochloromethane	124-48-1	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Tetrachloroethene	127-18-4	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Total Xylenes	1330-20-7	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Total 1,2-Dichloroethene	540-59-0	LA-523-455	U	<1		ug/L	1	1	5	10/21/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumptive compound based on MS Library search.

T - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

Sample # 91370001
SAF# F09-043
Sample ID B21FN0

Matrix WATER
Sampled 10/20/09
Received 10/20/09

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon tetrachloride	56-23-5		LA-523-455		300		ug/L	1	5	20	10/23/09
2-Hexanone	591-78-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Acetone	67-64-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Chloroform	67-66-3		LA-523-455		42		ug/L	1	1	5	10/21/09
1,1,1-Trichloroethane	71-55-6		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Bromomethane	74-83-9		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Chloromethane	74-87-3		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Chloroethane	75-00-3		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Vinyl chloride	75-01-4		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Methylene chloride	75-09-2		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Carbon disulfide	75-15-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Bromoform	75-25-2		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Bromodichloromethane	75-27-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,2-Dichloropropane	78-87-5		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Methyl ethyl ketone	78-93-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,1,2-Trichloroethane	79-00-5		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,1,2,2-Tetrachloroethane	79-34-5		LA-523-455	U	<1		ug/L	1	1	5	10/21/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumptive compound based on MS Library search.

T - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

Sample # 91370002
SAF# F09-043
Sample ID B21FM9

Matrix WATER
Sampled 10/20/09
Received 10/20/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
8260 Prep										**10/21/09**
SW-846 8260B										
1,1-Dichloroethene	75-35-4	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Trichloroethene	79-01-6	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Benzene	71-43-2	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Toluene	108-88-3	LA-523-455	J	1.3		ug/L	1	1	5	10/21/09
Chlorobenzene	108-90-7	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,1-Dichloroethane	75-34-3	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Ethylbenzene	100-41-4	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Styrene	100-42-5	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
cis-1,3-Dichloropropene	10061-01-5 UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
trans-1,3-Dichloropropene	10061-02-6 UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,2-Dichloroethane	107-06-2	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Methyl isobutyl ketone	108-10-1 UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Dibromochloromethane	124-48-1	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Tetrachloroethene	127-18-4	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Total Xylenes	1330-20-7	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Total 1,2-Dichloroethene	540-59-0	LA-523-455	U	<1		ug/L	1	1	5	10/21/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumptive compound based on MS Library search.

T - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

Sample # 91370002
SAF# F09-043
Sample ID B21FM9

Matrix WATER
Sampled 10/20/09
Received 10/20/09

Test Performed	CAS #		Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon tetrachloride	56-23-5		LA-523-455		330		ug/L	1	5	20	10/23/09
2-Hexanone	591-78-6	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Acetone	67-64-1	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Chloroform	67-66-3		LA-523-455		42		ug/L	1	1	5	10/21/09
1,1,1-Trichloroethane	71-55-6		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Bromomethane	74-83-9		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Chloromethane	74-87-3		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Chloroethane	75-00-3		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Vinyl chloride	75-01-4		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Methylene chloride	75-09-2		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Carbon disulfide	75-15-0	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Bromoform	75-25-2		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Bromodichloromethane	75-27-4	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,2-Dichloropropane	78-87-5		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
Methyl ethyl ketone	78-93-3	UJ	LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,1,2-Trichloroethane	79-00-5		LA-523-455	U	<1		ug/L	1	1	5	10/21/09
1,1,2,2-Tetrachloroethane	79-34-5		LA-523-455	U	<1		ug/L	1	1	5	10/21/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
D - Analyte was reported at a secondary diltution factor.
E - The calibration exceeds the calibration range (GC/MS).
J - Analyte < lowest calibration but >= MDL.
N - Presumptive compound based on MS Library search.

T - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Attachment 2
Narrative, Rev.1
WSCF90839

P&D Correction – Case Narrative Replaces The Prior Submittal in its Entirety

Introduction

One (1) S&GRP sample was received at the WSCF Laboratory on August 5, 2009. The 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. Additionally, a copy of the completed P&D # WSCF90839 is included with this case narrative.

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,* pages for a complete listing of approved analytical methods.

Inorganic Comments

Total Organic Carbon – 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. Analytical Note(s):

All QC controls are within the established limits.

Attachment 2
Narrative, Rev.1
WSCF90839

Organic Comments

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. Analytical Note(s):

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Duplicate Relative Percent Differences (RPD) did not meet the established laboratory limits. The RPD criterion does not apply to results near or below the minimum detectable activity. No flags issued.

All 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 electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

Attachment 2
Narrative, Rev.1
WSCF90839

Problem and Discrepancy Report

WSCF

SDG WSCF90839

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1. The data package has the following issues:

a) Narrative, Pg. 7 of report, this page is for another SDG. Please remove.

Resolution: *Provide correction.*

Lab Response: **Narrative has been updated.**

b) Narrative, introduction, sample received date should be August 5, 2009.

Resolution: *Provide correction.*

Lab Response: **Narrative has been revised with the correct date.**

Please correct the issues and resubmit the hard copy data package.

3

CH2MHill Plateau Remediation Company — **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** — F09-044-001 — PAGE 1 OF 1

COLLECTOR: White, Bates + Helms	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL
PRICE CODE: 7N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: C7024 (299-W14-74); EB-EW4-001-EB	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - QC	SAF NO.: F09-044	
ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH: N/A	COA: 302022ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A	

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

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

90839

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HCl or H2SO4 to pH <2/Cool~4C	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2
TYPE OF CONTAINER	aGs*	aGs*	G/P
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	250mL	500mL
SAMPLE ANALYSIS	VOA - 8260B (TCL);	TOC - 9060 (Total organic carbon)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B21CH4 001	WATER	8-5-09	0810	✓	✓	✓

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Jubal Helms / Jubal Helms	8/5/09 0830	TA Filazian / Jeremy	8/5/09 0830

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

ORIGINAL

ICED

Attachment 2
Narrative
WSCF90871

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on August 13, 2009. The 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,* pages for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All QC controls are within the established limits.

Hexavalent Chromium – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All QC controls are within the established limits.

Narrative

Attachment 2
Narrative
WSCF90871

Organic Comments

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. Analytical Note(s):

- The additional chemicals are a part of the QC and spike controls and cannot be removed from the report menu.

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. 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. Analytical Note(s):

All 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 electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F09-043-150	PAGE 1 OF 1
COLLECTOR: WEBB	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 1A	DATA TURNAROUND
SAMPLING LOCATION: C7029 (259-W1Z-4); EW19-002	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F09-043	AIR QUALITY: ☐	24 Hours / 15 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-585-8	ACTUAL SAMPLE DEPTH: 330'	COA: 302022ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: Waste Sampling & Characterization 90871	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

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

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

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool<4C	Cool<4C	HNO3 to pH <2(ULTREX)	HCl to pH <2/Cool<4C					
TYPE OF CONTAINER	aG	P	Nalgene	aGs*					
NO. OF CONTAINER(S)	1	1	1	3					
VOLUME	500mL	500mL	500mL	40mL					
SAMPLE ANALYSIS	Chromium Hex - 7196,	IC Anions - 300.0 (Nitrogen in Nitrate)	Tc-99 by ICPMS (Technetium-99)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS					

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B21FV0 001	WATER	8-13-09	0935	X	X	X	X					

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: DW WEBB/DW Webb	DATE/TIME: 8-13-09/1055	RECEIVED BY/STORED IN: TA Frazier	DATE/TIME: 8-13-09/1055	** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. (1)VOLATILE ORGANICS BY FIELD GC (Carbon tetrachloride, Chloroform, Trichloroethene)
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	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

ORIGINAL

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Saturday, August 15, 2009 1:06:58 AM
Page 2 of 3

ChemWare

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F09-043-151	PAGE 1 OF 1
COLLECTOR: WEBB	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 1A	DATA TURNAROUND
SAMPLING LOCATION: C7029 (299-W12-4); EW19-002D	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F09-043	AIR QUALITY: ☐	24 Hours / 15 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-585-8	ACTUAL SAMPLE DEPTH: 330'	COA: 302022ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

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

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

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)	HCl to pH <2/Cool~4C				
TYPE OF CONTAINER	aG	P	Nalgene	aGa*				
NO. OF CONTAINER(S)	1	1	1	3				
VOLUME	500mL	500mL	500mL	40mL				
SAMPLE ANALYSIS	Chromium Hex - 7196;	IC Anions - 300.0 (Nitrogen in Nitrate)	Tc-99 by ICPMS (Technetium-99)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS				

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B21FV1 002	WATER	8-13-09	0935	X	X	X	X					

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: DW WEBB/DW Webb — DATE/TIME: 8-13-09/1055	RECEIVED BY/STORED IN: TA Frazier — DATE/TIME: 8-13-09/1055	
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	

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC (Carbon tetrachloride, Chloroform, Trichloroethene)

ORIGINAL

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Saturday, August 15, 2009 1:06:58 AM
Page 3 of 3

ChemWare

Attachment 2
Narrative
WSCF91370

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on October 20, 2009. The 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 wet chemical 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,* pages for a complete listing of approved analytical methods.

Inorganic Comments

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. Analytical Note(s):

- Uranium – Matrix Spike RPD is outside established limits. No flags assigned.

All other QC controls are within the established limits.

Narrative

Attachment 2
Narrative
WSCF91370

Organic Comments

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. Analytical Note(s):

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Matrix Spikes apply only to Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All 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 electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company — **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** — F09-043-123 — PAGE 1 OF 1

COLLECTOR: CROW/NORCEK	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL
PRICE CODE: 7N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: 7026 (299-W11-93); EW8-002D	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO.: F09-043	
ICE CHEST NO.: —	FIELD LOGBOOK NO.: HNF-N-385 8	ACTUAL SAMPLE DEPTH: 320'	COA: 302022ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A	

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

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

91370

SPECIAL HANDLING AND/OR STORAGE: ~~RADIOACTIVE TR-TCH-B21FN~~ CS 8/27/09

PRESERVATION	HCl or H2SO4 to pH <2/Cool<4C	HNO3 to pH <2/Cool<4C	None
TYPE OF CONTAINER	aGt*	C/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)

ICED

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B21FN0 001	WATER	10/20/9	0830	\	\	\

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J Mueller	10/20/9 1000	[illegible]	10/2/09 1000

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Chromium} ICP/MS - 200.8 (Add-on) {Uranium}

ORIGINAL

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

A-6003-618(01/06)

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company — **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** — F09-043-122 — PAGE 1 OF 1

COLLECTOR: CROWE / MOKLER	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL
PRICE CODE: 7N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY:	
SAMPLING LOCATION: C7026 (299-W11-93); EW8-D02	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO.: F09-043	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-585 8	ACTUAL SAMPLE DEPTH: 320'	COA: 302022E510
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A	

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

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

SPECIAL HANDLING AND/OR STORAGE: ~~RADIOACTIVE FILE TO: B21FM4~~ KS 8/27/09

PRESERVATION	HCl or H2SO4 to pH <2/Cool=4C	HNO3 to pH <2/Cool=4C	None
TYPE OF CONTAINER	AGs*	G/P	G
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	500mL	250mL
SAMPLE ANALYSIS	VOA - 8260B (TCL);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Tritium - Ion Ex (Tritium)

ICED

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B21FM9 002	WATER	10/20/9	0830	\	\	\

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	10/20/9 0001	[signature]	10/20/09 0001

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP/MS - 200.8 (TAL) {Chromium} ICP/MS - 200.8 (Add-on) {Uranium}

ORIGINAL

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

A-6003-618(01/06)

Appendix 5

Data Validation Supporting Documentation

Appendix A - Chemical Data Validation Checklist

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 200 Area SGRP			DATA PACKAGE: VSR11-040		
VALIDATOR: Eyda Hergenreder		LAB: WSCF		DATE: 04-14-2011	
			SDG: WSCF90839, WSCF90871, WSCF91370		
ANALYSES PERFORMED					
SW-846 8260 X		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX Water samples

SDG WSCF90839: B21CH4

SDG WSCF90871: B21FV0, B21FV1

SDG WSCF91370: B21FN0, B21FM9

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present?.....(Yes) No N/A

Comments: None

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: None

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments:

SDG WSCF90839: 1,1-dichloroethene MS/MSD %R = 77%/79%

SDG WSCF90871: 1,1-dichloroethene MS/MSD %R = 78%/77%
benzene MS/MSD %R = 77%/78%, LCS %R = 76%

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD RPD values acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:
SDG WSCF90871: The field duplicate sample associated with primary duplicate sample B21FV1 was not selected for validation.

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Internal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: None

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: None

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A

GPC check performed?..... Yes No N/A

GPC check recoveries acceptable?..... Yes No N/A

GPC calibration performed?..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired?..... Yes No N/A

Analytical batch QC given similar cleanup?..... Yes No N/A

Transcription/Calculation Errors?..... Yes No N/A

Comments:

Comments (attach additional sheets as necessary): None

Appendix 6

Additional Documentation Requested By Client

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90839

QC Batch 55539
Associated Samples 90839001

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #12896**							
1,1-Dichloroethene	75-35-4		<1	ug/L					U	08/11/09
Trichloroethene	79-01-6		<1	ug/L					U	08/11/09
Benzene	71-43-2		<1	ug/L					U	08/11/09
Toluene	108-88-3		<1	ug/L					U	08/11/09
Chlorobenzene	108-90-7		<1	ug/L					U	08/11/09
1,1-Dichloroethane	75-34-3		<1	ug/L					U	08/11/09
Ethylbenzene	100-41-4		<1	ug/L					U	08/11/09
Styrene	100-42-5		<1	ug/L					U	08/11/09
cis-1,3-Dichloropropene	10061-01-5		<1	ug/L					U	08/11/09
trans-1,3-Dichloropropene	10061-02-6		<1	ug/L					U	08/11/09
1,2-Dichloroethane	107-06-2		<1	ug/L					U	08/11/09
Methyl isobutyl ketone	108-10-1		<1	ug/L					U	08/11/09
Dibromochloromethane	124-48-1		<1	ug/L					U	08/11/09
Tetrachloroethene	127-18-4		<1	ug/L					U	08/11/09
Total Xylenes	1330-20-7		<1	ug/L					U	08/11/09
Total 1,2-Dichloroethene	540-59-0		<1	ug/L					U	08/11/09
Carbon tetrachloride	56-23-5		<1	ug/L					U	08/11/09

REVISED90839 -

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90839

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
2-Hexanone	591-78-6		<1	ug/L					U	08/11/09
Acetone	67-64-1		<1	ug/L					U	08/11/09
Chloroform	67-66-3		<1	ug/L					U	08/11/09
1,1,1-Trichloroethane	71-55-6		<1	ug/L					U	08/11/09
Bromomethane	74-83-9		<1	ug/L					U	08/11/09
Chloromethane	74-87-3		<1	ug/L					U	08/11/09
Chloroethane	75-00-3		<1	ug/L					U	08/11/09
Vinyl chloride	75-01-4		<1	ug/L					U	08/11/09
Methylene chloride	75-09-2		<1	ug/L					U	08/11/09
Carbon disulfide	75-15-0		<1	ug/L					U	08/11/09
Bromoform	75-25-2		<1	ug/L					U	08/11/09
Bromodichloromethane	75-27-4		<1	ug/L					U	08/11/09
1,2-Dichloropropane	78-87-5		<1	ug/L					U	08/11/09
Methyl ethyl ketone	78-93-3		<1	ug/L					U	08/11/09
1,1,2-Trichloroethane	79-00-5		<1	ug/L					U	08/11/09
1,1,2,2-Tetrachloroethane	79-34-5		<1	ug/L					U	08/11/09
LCS			**QC Sample #12897**							
1,1-Dichloroethene	75-35-4		21	ug/L	83	75 - 125				08/11/09
Trichloroethene	79-01-6		22	ug/L	88.9	75 - 125				08/11/09
Benzene	71-43-2		20	ug/L	80.7	75 - 125				08/11/09
Toluene	108-88-3		22	ug/L	86.9	75 - 125				08/11/09
Chlorobenzene	108-90-7		24	ug/L	95.6	75 - 125				08/11/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90839

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MS			**QC Sample #12898**							
			Original 90839001							
1,1-Dichloroethene	75-35-4	<1	19	ug/L	77	75 - 125				08/11/09
Trichloroethene	79-01-6	<1	22	ug/L	86.2	75 - 125				08/11/09
Benzene	71-43-2	<1	20	ug/L	80.5	75 - 125				08/11/09
Toluene	108-88-3	<1	22	ug/L	86.5	75 - 125				08/11/09
Chlorobenzene	108-90-7	<1	24	ug/L	97.4	75 - 125				08/11/09
MSD			**QC Sample #12899**							
			Original 90839001						**Paired 12898**	
1,1-Dichloroethene	75-35-4	<1	20	ug/L	78.7	75 - 125	2.20	20		08/11/09
Trichloroethene	79-01-6	<1	21	ug/L	84.3	75 - 125	2.20	20		08/11/09
Benzene	71-43-2	<1	20	ug/L	79.6	75 - 125	1.10	20		08/11/09
Toluene	108-88-3	<1	21	ug/L	84.5	75 - 125	2.30	20		08/11/09
Chlorobenzene	108-90-7	<1	24	ug/L	95.4	75 - 125	2.10	20		08/11/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90839

QC Batch 55539
Associated Samples 90839001

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #12896**							
1,2-Dichloroethane-d4	17060-07-0				82.9	75 - 125				08/11/09
Toluene-d8	2037-26-5				90	75 - 125				08/11/09
4-Bromofluorobenzene	460-00-4				96.6	75 - 125				08/11/09
LCS			**QC Sample #12897**							
1,2-Dichloroethane-d4	17060-07-0				84.4	75 - 125				08/11/09
Toluene-d8	2037-26-5				90.6	75 - 125				08/11/09
4-Bromofluorobenzene	460-00-4				96	75 - 125				08/11/09
MS			**QC Sample #12898**							
			Original 90839001							
1,2-Dichloroethane-d4	17060-07-0				83.8	75 - 125				08/11/09
Toluene-d8	2037-26-5				93.6	75 - 125				08/11/09
4-Bromofluorobenzene	460-00-4				92.8	75 - 125				08/11/09
MSD			**QC Sample #12899**							
			Original 90839001					**Paired**	**12898**	
1,2-Dichloroethane-d4	17060-07-0				86.3	75 - 125	2.90	20		08/11/09
Toluene-d8	2037-26-5				93.5	75 - 125	0.10	20		08/11/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90839

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
4-Bromofluorobenzene	460-00-4				94.2	75 - 125	1.50	20		08/11/09
SAMPLE			**Sample #90839001**							
1,2-Dichloroethane-d4	17060-07-0				84.3	75 - 125				08/11/09
Toluene-d8	2037-26-5				93.8	75 - 125				08/11/09
4-Bromofluorobenzene	460-00-4				93.3	75 - 125				08/11/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90871
Project Number F09-043

QC Batch 56334
Associated Samples 90871001, 90871002

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #13087**							
1,1-Dichloroethene	75-35-4		<1	ug/L					U	08/13/09
Trichloroethene	79-01-6		<1	ug/L					U	08/13/09
Benzene	71-43-2		<1	ug/L					U	08/13/09
Toluene	108-88-3		<1	ug/L					U	08/13/09
Chlorobenzene	108-90-7		<1	ug/L					U	08/13/09
Carbon tetrachloride	56-23-5		<1	ug/L					U	08/13/09
Chloroform	67-66-3		<1	ug/L					U	08/13/09
LCS			**QC Sample #13088**							
1,1-Dichloroethene	75-35-4		20	ug/L	80.3	75 - 125				08/13/09
Trichloroethene	79-01-6		21	ug/L	85.1	75 - 125				08/13/09
Benzene	71-43-2		19	ug/L	76	75 - 125				08/13/09
Toluene	108-88-3		21	ug/L	83.5	75 - 125				08/13/09
Chlorobenzene	108-90-7		24	ug/L	94.7	75 - 125				08/13/09
MS			**QC Sample #13089**							
			Original 90851005							
1,1-Dichloroethene	75-35-4		20	ug/L	78	75 - 125				08/13/09
Trichloroethene	79-01-6		21	ug/L	84.5	75 - 125				08/13/09
Benzene	71-43-2		19	ug/L	76.5	75 - 125				08/13/09
Toluene	108-88-3		21	ug/L	83.6	75 - 125				08/13/09
Chlorobenzene	108-90-7		24	ug/L	94.3	75 - 125				08/13/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90871
Project Number F09-043

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MSD			**QC Sample #13090**							
			Original	**90851005**					**Paired**	**13089**
1,1-Dichloroethene	75-35-4		19	ug/L	76.8	75 - 125	1.60	20		08/13/09
Trichloroethene	79-01-6		21	ug/L	85.4	75 - 125	1.10	20		08/13/09
Benzene	71-43-2		20	ug/L	78.3	75 - 125	2.30	20		08/13/09
Toluene	108-88-3		21	ug/L	84.7	75 - 125	1.30	20		08/13/09
Chlorobenzene	108-90-7		24	ug/L	96.9	75 - 125	2.70	20		08/13/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90871
Project Number F09-043

QC Batch 56334
Associated Samples 90871001, 90871002

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #13087**							
1,2-Dichloroethane-d4	17060-07-0				84.7	75 - 125				08/13/09
Toluene-d8	2037-26-5				91.8	75 - 125				08/13/09
4-Bromofluorobenzene	460-00-4				93.5	75 - 125				08/13/09
LCS			**QC Sample #13088**							
1,2-Dichloroethane-d4	17060-07-0				84.8	75 - 125				08/13/09
Toluene-d8	2037-26-5				92.6	75 - 125				08/13/09
4-Bromofluorobenzene	460-00-4				93.9	75 - 125				08/13/09
MS			**QC Sample #13089**							
			Original	**90851005**						
1,2-Dichloroethane-d4	17060-07-0				85	75 - 125				08/13/09
Toluene-d8	2037-26-5				93.1	75 - 125				08/13/09
4-Bromofluorobenzene	460-00-4				93.3	75 - 125				08/13/09
MSD			**QC Sample #13090**							
			Original	**90851005**					**Paired**	**13089**
1,2-Dichloroethane-d4	17060-07-0				85.6	75 - 125	0.70	20		08/13/09
Toluene-d8	2037-26-5				93	75 - 125	0.10	20		08/13/09
4-Bromofluorobenzene	460-00-4				92	75 - 125	1.40	20		08/13/09
SAMPLE			**Sample #90871001**							
1,2-Dichloroethane-d4	17060-07-0				87	75 - 125				08/14/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF90871
Project Number F09-043

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Toluene-d8	2037-26-5				94.8	75 - 125				08/14/09
4-Bromofluorobenzene	460-00-4				93.1	75 - 125				08/14/09
SAMPLE			**Sample #90871002**							
1,2-Dichloroethane-d4	17060-07-0				88	75 - 125				08/14/09
Toluene-d8	2037-26-5				95.2	75 - 125				08/14/09
4-Bromofluorobenzene	460-00-4				92.9	75 - 125				08/14/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

QC Batch 67450
Associated Samples 91370001, 91370002

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #17526**						
1,1-Dichloroethene	75-35-4		<1	ug/L				U	10/21/09
Trichloroethene	79-01-6		<1	ug/L				U	10/21/09
Benzene	71-43-2		<1	ug/L				U	10/21/09
Toluene	108-88-3		<1	ug/L				U	10/21/09
Chlorobenzene	108-90-7		<1	ug/L				U	10/21/09
1,1-Dichloroethane	75-34-3		<1	ug/L				U	10/21/09
Ethylbenzene	100-41-4		<1	ug/L				U	10/21/09
Styrene	100-42-5		<1	ug/L				U	10/21/09
cis-1,3-Dichloropropene	10061-01-5		<1	ug/L				U	10/21/09
trans-1,3-Dichloroprope	10061-02-6		<1	ug/L				U	10/21/09
1,2-Dichloroethane	107-06-2		<1	ug/L				U	10/21/09
Methyl isobutyl ketone	108-10-1		<1	ug/L				U	10/21/09
Dibromochloromethane	124-48-1		<1	ug/L				U	10/21/09
Tetrachloroethene	127-18-4		<1	ug/L				U	10/21/09
Total Xylenes	1330-20-7		<1	ug/L				U	10/21/09
Total	540-59-0		<1	ug/L				U	10/21/09
Carbon tetrachloride	56-23-5		<1	ug/L				U	10/21/09
2-Hexanone	591-78-6		<1	ug/L				U	10/21/09
Acetone	67-64-1		<1	ug/L				U	10/21/09
Chloroform	67-66-3		<1	ug/L				U	10/21/09
1,1,1-Trichloroethane	71-55-6		<1	ug/L				U	10/21/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Bromomethane	74-83-9		<1	ug/L					U	10/21/09
Chloromethane	74-87-3		<1	ug/L					U	10/21/09
Chloroethane	75-00-3		<1	ug/L					U	10/21/09
Vinyl chloride	75-01-4		<1	ug/L					U	10/21/09
Methylene chloride	75-09-2		<1	ug/L					U	10/21/09
Carbon disulfide	75-15-0		<1	ug/L					U	10/21/09
Bromoform	75-25-2		<1	ug/L					U	10/21/09
Bromodichloromethane	75-27-4		<1	ug/L					U	10/21/09
1,2-Dichloropropane	78-87-5		<1	ug/L					U	10/21/09
Methyl ethyl ketone	78-93-3		<1	ug/L					U	10/21/09
1,1,2-Trichloroethane	79-00-5		<1	ug/L					U	10/21/09
1,1,2,2-Tetrachloroetha	79-34-5		<1	ug/L					U	10/21/09
LCS			**QC Sample #17527**							
1,1-Dichloroethene	75-35-4		26	ug/L	103.3	75 - 125				10/21/09
Trichloroethene	79-01-6		25	ug/L	98.2	75 - 125				10/21/09
Benzene	71-43-2		26	ug/L	102.5	75 - 125				10/21/09
Toluene	108-88-3		30	ug/L	120.2	75 - 125				10/21/09
Chlorobenzene	108-90-7		28	ug/L	110.9	75 - 125				10/21/09
MS			**QC Sample #17528**							
			Original 91365001							
1,1-Dichloroethene	75-35-4		22	ug/L	87	75 - 125				10/21/09
Trichloroethene	79-01-6		23	ug/L	92	75 - 125				10/21/09
Benzene	71-43-2		24	ug/L	96.1	75 - 125				10/21/09
Toluene	108-88-3		28	ug/L	111.1	75 - 125				10/21/09
Chlorobenzene	108-90-7		27	ug/L	106.2	75 - 125				10/21/09
MSD			**QC Sample #17529**							
			Original 91365001					**Paired 17528**		

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
1,1-Dichloroethene	75-35-4		21	ug/L	85.2	75 - 125	2.10	20		10/21/09
Trichloroethene	79-01-6		23	ug/L	92.3	75 - 125	0.30	20		10/21/09
Benzene	71-43-2		24	ug/L	95.7	75 - 125	0.40	20		10/21/09
Toluene	108-88-3		28	ug/L	110.9	75 - 125	0.20	20		10/21/09
Chlorobenzene	108-90-7		27	ug/L	107.1	75 - 125	0.80	20		10/21/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

QC Batch 67450
Associated Samples 91370001, 91370002

Test SW-846 8260B Volatiles, separate prep

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #17526**							
1,2-Dichloroethane-d4	17060-07-0				108.6	75 - 125				10/21/09
Toluene-d8	2037-26-5				105.4	75 - 125				10/21/09
4-Bromofluorobenzene	460-00-4				107.1	75 - 125				10/21/09
LCS			**QC Sample #17527**							
1,2-Dichloroethane-d4	17060-07-0				111.1	75 - 125				10/21/09
Toluene-d8	2037-26-5				106.5	75 - 125				10/21/09
4-Bromofluorobenzene	460-00-4				106.9	75 - 125				10/21/09
MS			**QC Sample #17528**							
			Original 91365001							
1,2-Dichloroethane-d4	17060-07-0				109.4	75 - 125				10/21/09
Toluene-d8	2037-26-5				107.6	75 - 125				10/21/09
4-Bromofluorobenzene	460-00-4				106	75 - 125				10/21/09
MSD			**QC Sample #17529**							
			Original 91365001						**Paired 17528**	
1,2-Dichloroethane-d4	17060-07-0				110.3	75 - 125	0.80	20		10/21/09
Toluene-d8	2037-26-5				106.9	75 - 125	0.70	20		10/21/09
4-Bromofluorobenzene	460-00-4				104.5	75 - 125	1.40	20		10/21/09
SAMPLE			**Sample #91370001**							
1,2-Dichloroethane-d4	17060-07-0				111.3	75 - 125				10/21/09

Quality Control Report

Attention Michael Neely
Department Organic, Volatiles

Group # WSCF91370

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Toluene-d8	2037-26-5				107.8	75 - 125				10/21/09
4-Bromofluorobenzene	460-00-4				104.2	75 - 125				10/21/09
SAMPLE			**Sample #91370002**							
1,2-Dichloroethane-d4	17060-07-0				111.9	75 - 125				10/21/09
Toluene-d8	2037-26-5				108.4	75 - 125				10/21/09
4-Bromofluorobenzene	460-00-4				105.5	75 - 125				10/21/09

Date: 14 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: 200 Area SGRP
Subject: General Chemistry - Sample Data Groups (SDGs) WSCF90839, WSCF90871 and WSCF91246

INTRODUCTION

This memorandum presents the results of data validation for SDGs WSCF90839, WSCF90871 and WSCF91246 prepared by WSCF Analytical Laboratories. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B21CH4	08/05/09	Water	C	SW846 9060
B21FV0	08/13/09	Water	C	300.0
B21FV1	08/13/09	Water	C	300.0
B21TK0	10/07/09	Water	C	300.0
B21TJ9	10/07/09	Water	C	300.0

Data validation was conducted in accordance with the CHPRC validation statement of work and the Sampling and Analysis Plan for the First Set of Remedial Action Wells in the 200-ZP-1 Groundwater Operable Unit, DOE/RL-2008-57, Rev. 1 (SAP). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The holding time requirements for anions is analysis within 48 hours of sample collection and the holding time requirement for TOC is analysis within 28 days of sample collection.

Sample preservation requires chilling to 4 degrees Celsius. In addition, TOC are brought to pH<2 with sulfuric acid or hydrochloric acid.

The samples were analyzed within the prescribed holding times and properly preserved.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable.

Trip Blanks

No trip blanks were submitted for validation.

Field Blanks

No field blanks were submitted for validation.

Equipment Blanks

All equipment blank results were acceptable.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike sample results and laboratory control sample results. According to the SAP, the matrix spike and laboratory control sample accuracy limits are 80% to 120%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

All MS/MSD recoveries were acceptable.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable.

- **Precision**

Precision is evaluated by reviewing MS/MSD results, laboratory duplicate sample results, field duplicate sample results, and field split sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference (RPD) limits are ±20%. The RPD limits for reported analytes not listed in the SAP are specified by the DV procedure. When duplicate RPDs exceed the limits and have associated results <5X the reporting limits with differences <1X the reporting limits no precision infraction occurred.

MS/MSD Samples

All MS/MSD RPD values were acceptable.

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable.

Field Duplicate Samples

For SDG WSCF90871, the field duplicate sample associated with primary sample B21FV1 was not selected for validation; therefore field duplicate precision could not be assessed.

Field Split Samples

No field splits were submitted for validation.

- **Detection Limits**

Reported MDLs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDLs were below the CRDLs.

- **Completeness**

SDG WSCF908939, WSCF90871 and WSCF91246 were submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

GRP-GD-003, Rev. 0, Change 0, *Data Validation for Chemical Analyses*, August 2010.

DOE/RL-2008-57, Rev. 1, *Sampling and Analysis Plan for the First Set of Remedial Action Wells in the 200-ZP-1 Groundwater Operable Unit*, August 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the CHPRC statement of work are as follows:

- **U** — The constituent was analyzed for, but was not detected. The data should be considered usable for decision-making purposes.

- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the RL. The data should be considered usable for decision-making purposes.

- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J+** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J-** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **N** — The analysis indicates the presence of an analyte that has been tentatively identified.

- **NJ** — The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

- **NJ+** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation.

- **NJ-** — The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation.

- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2

Summary of Data Qualification

General Chemistry Data Qualification Summary			
SDGs: WSCF90839, WSCF90871 WSCF91246	Reviewer: AQA	Project: 200 Area SGRP	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
TOC and Anions	None	N/A	N/A

Comments: None

Appendix 3

Annotated Laboratory Reports

WSCF Analytical Results Report

REVISION 1

Attention Michael Neely
Department Wet Chemistry

Group # WSCF90839

Sample # 90839001
SAF# F09-044
Sample ID B21CH4

Matrix WATER
Sampled 08/05/09
Received 08/05/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
TOC										**08/12/09**
TOC										
Total Organic Carbon	TOC	LA-344-406	U	<0.30		mg/L	1	0.30	1.0	08/12/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL.
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
N - MS and/or MSD sample recovery outside control limits.
U - Analyzed for but not detected above limiting criteria.

N - Spike Recovery is Outside Control Limits.
X,Y or Z - See comment detail and/or narrative.

REVISED90839 -

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF90871
Project Number F09-043

Sample # 90871001
SAF# F09-043
Sample ID B21FV0

Matrix WATER
Sampled 08/13/09
Received 08/13/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**08/13/09**
Anions by IC										
Nitrate-N	NO3-N	LA-533-410		1.14		ug/mL	1	0.031	0.10	08/13/09
Cr(VI)										**08/13/09**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	B	0.00360		mg/L	1	0.0020	0.0050	08/13/09

Hexavalent Cr not selected for validation

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD sample recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF90871
Project Number F09-043

Sample # 90871002
SAF# F09-043
Sample ID B21FV1

Matrix WATER
Sampled 08/13/09
Received 08/13/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**08/13/09**
Anions by IC										
Nitrate-N	NO3-N	LA-533-410		1.14		ug/mL	1	0.031	0.10	08/13/09
Cr(VI)										**08/13/09**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	B	0.00370		mg/L	1	0.0020	0.0050	08/13/09

Hexavalent Cr not selected for validation

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD sample recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF91246

Sample # 91246001
SAF# F09-043
Sample ID B21TK0

Matrix WATER
Sampled 10/07/09
Received 10/07/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**10/07/09**
Anions by IC										
Nitrate-N	NO3-N	LA-533-410		2.07		ug/mL	1	0.031	0.10	10/07/09
Cr(VI)										**10/07/09**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	U	<0.0020		mg/L	1	0.0020	0.0050	10/07/09

Hexavalent Cr not selected for validation

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD sample recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

WSCF Analytical Results Report

Attention Michael Neely
Department Inorganic

Group # WSCF91246

Sample # 91246002
SAF# F09-043
Sample ID B21TJ9

Matrix WATER
Sampled 10/07/09
Received 10/07/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**10/07/09**
Anions by IC										
Nitrate-N	NO3-N	LA-533-410		2.07		ug/mL	1	0.031	0.10	10/07/09
Cr(VI)										**10/07/09**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	U	<0.0020		mg/L	1	0.0020	0.0050	10/07/09

Hexavalent Cr not selected for validation

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL. (Inorganic)
C - Analyte was found in the Associated Blank. (Inorganic)
D - Analyte was reported at a secondary diltution factor.
E - Analyte is an estimate, see comment section.
N - MS and/or MSD sample recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Attachment 2
Narrative, Rev.1
WSCF90839

P&D Correction – Case Narrative Replaces The Prior Submittal in its Entirety

Introduction

One (1) S&GRP sample was received at the WSCF Laboratory on August 5, 2009. The 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. Additionally, a copy of the completed P&D # WSCF90839 is included with this case narrative.

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,* pages for a complete listing of approved analytical methods.

Inorganic Comments

Total Organic Carbon – 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. Analytical Note(s):

All QC controls are within the established limits.

Attachment 2
Narrative, Rev.1
WSCF90839

Organic Comments

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. Analytical Note(s):

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Duplicate Relative Percent Differences (RPD) did not meet the established laboratory limits. The RPD criterion does not apply to results near or below the minimum detectable activity. No flags issued.

All 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 electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

Attachment 2
Narrative, Rev.1
WSCF90839

Problem and Discrepancy Report

WSCF

SDG WSCF90839

---

1. The data package has the following issues:

a) Narrative, Pg. 7 of report, this page is for another SDG. Please remove.

Resolution: *Provide correction.*

Lab Response: **Narrative has been updated.**

b) Narrative, introduction, sample received date should be August 5, 2009.

Resolution: *Provide correction.*

Lab Response: **Narrative has been revised with the correct date.**

Please correct the issues and resubmit the hard copy data package.

3

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F09-044-001	PAGE 1 OF 1
COLLECTOR White, Bates + Helms	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL	PRICE CODE 7N	DATA TURNAROUND
SAMPLING LOCATION C7024 (299-W14-74); EB-EW4-001-EB	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - QC		SAF NO. F09-044	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH N/A	COA 302022ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

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

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

90839

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HCl or H2SO4 to pH <2/Cool~4C	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2
TYPE OF CONTAINER	aGs*	aGs*	G/P
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	250mL	500mL
SAMPLE ANALYSIS	VOA - 8260B (TCL);	TOC - 9060 (Total organic carbon)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B21CH4 001	WATER	8-5-09	0810	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Jubal Helms / Jubal Helms	8/5/09 0830	TA Filazian / Jeremos	8/5/09 0830
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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

☐ ORIGINAL

ICED

Attachment 2
Narrative
WSCF90871

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on August 13, 2009. The 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,* pages for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All QC controls are within the established limits.

Hexavalent Chromium – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All QC controls are within the established limits.

Narrative

Attachment 2
Narrative
WSCF90871

Organic Comments

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. Analytical Note(s):

- The additional chemicals are a part of the QC and spike controls and cannot be removed from the report menu.

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. 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. Analytical Note(s):

All 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 electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F09-043-150	PAGE 1 OF 1
COLLECTOR: WEBB	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 1A	DATA TURNAROUND
SAMPLING LOCATION: C7029 (259-W1Z-4); EW19-002	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F09-043	AIR QUALITY: ☐	24 Hours / 15 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-585-8	ACTUAL SAMPLE DEPTH: 330'	COA: 302022ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: Waste Sampling & Characterization 90871	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

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

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

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool<4C	Cool<4C	HNO3 to pH <2(ULTREX)	HCl to pH <2/Cool<4C
TYPE OF CONTAINER	aG	P	Nalgene	aGs*
NO. OF CONTAINER(S)	1	1	1	3
VOLUME	500mL	500mL	500mL	40mL
SAMPLE ANALYSIS	Chromium Hex - 7196,	IC Anions - 300.0 (Nitrogen in Nitrate)	Tc-99 by ICPMS (Technetium-99)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B21FV0 001	WATER	8-13-09	0935	X	X	X	X

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: DW WEBB/DW Webb	DATE/TIME: 8-13-09/1055	RECEIVED BY/STORED IN: TA Freezer	DATE/TIME: 8-13-09/1055
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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC (Carbon tetrachloride, Chloroform, Trichloroethene)

ORIGINAL

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ChemWare

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F09-043-151	PAGE 1 OF 1
COLLECTOR: WEBB	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 1A	DATA TURNAROUND
SAMPLING LOCATION: C7029 (299-W12-4); EW19-002D	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F09-043	AIR QUALITY: ☐	24 Hours / 15 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-585-8	ACTUAL SAMPLE DEPTH: 330'	COA: 302022ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

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

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

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)	HCl to pH <2/Cool~4C				
TYPE OF CONTAINER	aG	P	Nalgene	aGa*				
NO. OF CONTAINER(S)	1	1	1	3				
VOLUME	500mL	500mL	500mL	40mL				
SAMPLE ANALYSIS	Chromium Hex - 7196;	IC Anions - 300.0 (Nitrogen in Nitrate)	Tc-99 by ICPMS (Technetium-99)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS				

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B21FV1 002	WATER	8-13-09	0935	X	X	X	X					

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: DW WEBB/DW Webb	DATE/TIME: 8-13-09/1055	RECEIVED BY/STORED IN: TA Frazier	DATE/TIME: 8-13-09/1055
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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)VOLATILE ORGANICS BY FIELD GC (Carbon tetrachloride, Chloroform, Trichloroethene)

ORIGINAL

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ChemWare

Attachment 2
Narrative
WSCF91246

Introduction

Two (2) S&GRP samples were received at the WSCF Laboratory on October 7, 2009. The 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,* pages for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All QC controls are within the established limits.

Hexavalent Chromium – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All QC controls are within the established limits.

Narrative

Attachment 2
Narrative
WSCF91246

ICP-MS Metals – The hold time requirements for this analysis were met. A blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

All QC controls are within the established limits.

Organic Comments

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. Analytical Note(s):

All 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 electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

CH2MHill Plateau Remediation Company — **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** — F09-043-245 — PAGE 1 OF 1

COLLECTOR: Helms / Bates	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL
PRICE CODE: 1A	DATA TURNAROUND: 24 Hours / 15 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: C7494 (299-W14-21); EW15-00SD	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO.: F09-043	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-585-9	ACTUAL SAMPLE DEPTH: 372	COA: 302022ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: Waste Sampling & Characterization 91246	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A	

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

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

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C	Cool~4C	HNO3 to pH <2(UI TREX)	HCl to pH <2/Cool~4C
TYPE OF CONTAINER	aG	P	Nalgene	aGx*
NO. OF CONTAINER(S)	1	1	1	3
VOLUME	500mL	500mL	500mL	40ml
SAMPLE ANALYSIS	Chromium, Hex - 7196	IC Anions - 300.0 (Nitrogen in Nitrate)	Tc-99 by ICPMS (Technetium-99)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B21TK0 001	WATER	10/7/09	1040	✓	✓	✓	✓

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates	10/7/09 1140	T A Frazier	10/7/09 1140

SPECIAL INSTRUCTIONS

** All requests for Tc-99, Nitrate, and CCL4 by Field GC will require a 24 hour turnaround time. ☐** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem.☐** The 200 Area S&GRP Cha
(1)VOLATILE ORGANICS BY FIELD GC (Carbon tetrachloride, Chloroform, Trichloroethene)

ORIGINAL

ICED

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

A-6003-618(01/06)

ChemWare

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Chain of Custody

CH2MHill Plateau Remediation Company — **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** — F09-043-244 — PAGE 1 OF 1

COLLECTOR Helms / Bates	**COMPANY CONTACT** DYEKMAN, DL	**TELEPHONE NO.** 373-2530	**PROJECT COORDINATOR** DYEKMAN, DL
PRICE CODE 1A	**DATA TURNAROUND** 24 Hours / 15 Days		
SAMPLING LOCATION C7494 (299-W14-21); EW15-005	**PROJECT DESIGNATION** ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	**SAF NO.** F09-043	**AIR QUALITY** ☐
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-N-585-9	**ACTUAL SAMPLE DEPTH** 372	**COA** 302022ES10
METHOD OF SHIPMENT GOVERNMENT VEHICLE			
SHIPPED TO Waste Sampling & Characterization	**OFFSITE PROPERTY NO.** N/A	**BILL OF LADING/AIR BILL NO.** N/A	

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

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

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C	Cool~4C	HNO3 to pH <2(ULTREX)	HCl to pH <2/Cool~4C
TYPE OF CONTAINER	aG	P	Nalgene	aGs*
NO. OF CONTAINER(S)	1	1	1	3
VOLUME	500mL	500mL	500mL	40ml
SAMPLE ANALYSIS	Chromium Hex 7196;	IC Anions - 300.0 (Nitrogen in Nitrate)	Tc 99 by ICPMS (Technetium 99)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**
B21TJ9	WATER	10/7/09	1040

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dale Bates / Dale Bates	10/7/09 1140	T A Frazier / [signature]	10/7/09 1140

SPECIAL INSTRUCTIONS

** All requests for Tc-99, Nitrate, and CCL4 by Field GC will require a 24 hour turnaround time. ☐** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem.☐** The 200 Area S&GRP Cha

(1)VOLATILE ORGANICS BY FIELD GC (Carbon tetrachloride, Chloroform, Trichloroethene)

ORIGINAL ICED

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

A 6003 618(01/06)

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Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200 Area SGRP			DATA PACKAGE: VSR11-040		
VALIDATOR: Eyda Hergenreder		LAB: WSCF		DATE: 04-14-2011	
			SDG: WSCF90839, WSCF90871, WSCF91246		
ANALYSES PERFORMED					
Anions/IC X	TOC X	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate	Cyanide	

SAMPLES/MATRIX Water samples

SDG WSCF90839: B21CH4

SDG WSCF90871: B21FV0, B21FV1

SDG WSCF91246: B21TK0, B21TJ9

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present?.....(Yes) No N/A

Comments: None

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: None

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike standards NIST traceable? (Levels D, E) ..... Yes No N/A

Spike standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: None

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?.....Yes No N/A

Duplicate results acceptable?.....Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E)..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:
SDG WSCF90871: The field duplicate sample associated with primary sample B21FV1 was not included for validation.

6. HOLDING TIMES (all levels)

Samples properly preserved? .....Yes No N/A

Sample holding times acceptable? .....Yes No N/A

Comments: None

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?.....Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E)..... Yes No N/A

Detection limits meet RDL?.....Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: None

Appendix 6

Additional Documentation Requested By Client

REVISION 1

Quality Control Report

Attention Michael Neely
Department Wet Chemistry

Group # WSCF90839

QC Batch 56039
Associated Samples 90839001

Test Total Organic Carbon

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #13005**							
Total Organic Carbon	TOC		<0.045	mg/L					U	08/12/09
LCS			**QC Sample #13006**							
Total Organic Carbon	TOC		2.06	mg/L	102.8	80 - 120				08/12/09
MS			**QC Sample #13007**							
			Original 90836008							
Total Organic Carbon	TOC		2.16	mg/L	108	75 - 125				08/12/09
MSD			**QC Sample #13008**							
			Original 90836008					**Paired**	**13007**	
Total Organic Carbon	TOC		2.12	mg/L	106.2	75 - 125	1.70	20		08/12/09

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF90871
Project Number F09-043

QC Batch 56535
Associated Samples 90871001, 90871002

Test Anions by Ion Chromatography (Water)

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #13111**							
Nitrate-N	NO3-N		<0.031	ug/mL					U	08/13/09
LCS			**QC Sample #13112**							
Nitrate-N	NO3-N		0.893	ug/mL	101.3	90 - 110				08/13/09
DUP			**QC Sample #13113**							
			Original	**90874001**						
Nitrate-N	NO3-N		<0.062	ug/mL			0.00	20	UD	08/13/09
MS			**QC Sample #13114**							
			Original	**90874001**						
Nitrate-N	NO3-N		0.908	ug/mL	102	80 - 120			D	08/13/09
MSD			**QC Sample #13115**							
			Original	**90874001**				**Paired**	**13114**	
Nitrate-N	NO3-N		0.942	ug/mL	105.9	80 - 120	3.80	20	D	08/13/09

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF91246

QC Batch 65652
Associated Samples 91246001, 91246002

Test Anions by Ion Chromatography (Water)

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #16647**							
Nitrate-N	NO3-N		<0.031	ug/mL					U	10/07/09
LCS			**QC Sample #16648**							
Nitrate-N	NO3-N		0.862	ug/mL	97.8	90 - 110				10/07/09
DUP			**QC Sample #16649**							
			Original 91242023							
Nitrate-N	NO3-N		2.36	ug/mL			0.80	20	D	10/07/09
MS			**QC Sample #16650**							
			Original 91242023							
Nitrate-N	NO3-N		0.882	ug/mL	99.1	80 - 120			D	10/07/09
MSD			**QC Sample #16651**							
			Original 91242023					**Paired**	**16650**	
Nitrate-N	NO3-N		0.863	ug/mL	97	80 - 120	2.10	20	D	10/07/09

Date: 14 April 2011
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: 200 Area SGRP
Subject: Radiochemical - Sample Data Groups (SDGs) WSCF90839, H4033 and H4048

INTRODUCTION

This memorandum presents the results of data validation for SDG WSCF90839 prepared by WSCF Analytical Laboratories and SDGs H4033 and H4048 prepared by Eberline Services. A list of samples validated along with the analytical methods is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analytical Methods
B21CH4	08/05/09	Water	C	Gamma
B21CK4	08/12/09	Water	C	I-129
B21CK5	08/14/09	Water	C	I-129
B21CK6	08/17/09	Water	C	I-129
B21F47	08/17/09	Water	C	I-129
B21F48	08/18/09	Water	C	I-129
B21F49	08/18/09	Water	C	I-129
B21FW9	08/12/09	Water	C	I-129
B21FX0	08/13/09	Water	C	I-129
B21FX1	08/13/09	Water	C	I-129
B21F61	09/01/09	Water	C	I-129
B21F62	09/08/09	Water	C	I-129
B21F65	09/10/09	Water	C	I-129
B21N68	09/18/09	Water	C	I-129
B21N69	09/22/09	Water	C	I-129
B21TK7	09/22/09	Water	C	I-129

Data validation was conducted in accordance with the CHPRC validation statement of work and the Sampling and Analysis Plan for the First Set of Remedial Action Wells in the 200-ZP-1 Groundwater Operable Unit, DOE/RL-2008-57, Rev. 1 (SAP). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested By Client

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preservation**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 180 days. Sample preservation for water samples for all analyses except I-129 requires acid preservation with nitric acid to pH <2.

The samples were analyzed within the prescribed holding time and properly preserved.

- **Blanks**

The blank data results are reviewed to assess the extent of contamination introduced through sampling, sample preparation, and analysis.

Laboratory Blanks

All laboratory blank results were acceptable.

Trip Blanks

No trip blanks were submitted for validation.

Field Blanks

No field blanks were submitted for validation.

Equipment Blanks

All equipment blank results were acceptable.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike results, laboratory control sample results, and chemical recovery factors. Chemical recovery factors are determined through use of a carrier or tracer and provide assessment of the chemical separation process that is affected by the laboratory procedure, sample matrix, and/or interference. Chemical recovery factors are used to correct sample concentration, uncertainty, and MDC results. According to the SAP, the laboratory control sample accuracy limits are 80% to 120%. The limits for reported analytes not listed in the SAP are specified by the DV procedure.

Matrix Spike (MS) Samples

MS analyses are not required for the methods performed.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable.

Carrier/Tracer Recovery Factors

All carrier/tracer recovery factors were acceptable.

- **Precision**

Precision is evaluated by reviewing laboratory duplicate, field duplicate, and field split sample results. These QC results provide information on the laboratory reproducibility and whether sampling activities are adequate to acquire consistent sample results. According to the SAP, the relative percent difference (RPD) limits are ±20%. The RPD limits for reported analytes not listed in the SAP are specified by the DV procedure. When duplicate RPDs exceed the limits and have associated results <5X the MDCs the precision limits are ones specified by the DV procedure.

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable.

Field Duplicate Samples

For SDG H4033, the primary sample associated with field duplicate sample B21FX1 was not submitted for validation; therefore field duplicate precision could not be assessed.

Field Split Samples

No field splits were submitted for validation.

- **Detection Limits**

Reported MDCs are compared against the contractually required detection limits (CRDLs) to ensure that laboratory detection limits meet the required criteria.

All reported sample MDCs were below the CRDLs.

- **Completeness**

SDGs WSCF90839, H4033 and H4048 were submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

GRP-GD-002, Rev. 0, Change 0, *Data Validation for Radiochemical Analyses*, August 2010.

DOE/RL-2008-57, Rev. 1, *Sampling and Analysis Plan for the First Set of Remedial Action Wells in the 200-ZP-1 Groundwater Operable Unit*, August 2009.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers that may be applied by data validators in compliance with the CHPRC statement of work are as follows:

- **U** — The constituent was analyzed for and was not detected. The data should be considered usable for decision-making purposes.

- **UJ** — The constituent was analyzed for and was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDC. The data should be considered usable for decision-making purposes.

- **J** — Indicates the constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J+** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **J-** — Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias due to a quality control deficiency identified during data validation. The data should be considered usable for decision-making purposes.

- **UR** — Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

- **R** — Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision-making purposes.

Appendix 2

Summary of Data Qualification

Radiochemical Data Qualification Summary			
SDGs: WSCF90839, H4033, H4048	Reviewer: AQA	Project: 200 Area SGRP	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
Radiochemical	None	N/A	N/A

Comments: None

Appendix 3

Annotated Laboratory Reports

WSCF Analytical Results Report

REVISION 1

Attention Michael Neely
Department Radiochemistry

Group # WSCF90839

Sample # 90839001
SAF# F09-044
Sample ID B21CH4

Matrix WATER
Sampled 08/05/09
Received 08/05/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GEA Prep										**08/05/09**
GEA										
Cesium-137	10045-97-3	LA-508-481	U	0.91	4.2	pCi/L	1	7.5		08/10/09
Cobalt-60	10198-40-0	LA-508-481	U	1.5	3.8	pCi/L	1	7.1		08/10/09
Europium-152	14683-23-9	LA-508-481	U	-21	13	pCi/L	1	21		08/10/09
Europium-154	15585-10-1	LA-508-481	U	1.6	11	pCi/L	1	19		08/10/09
Europium-155	14391-16-3	LA-508-481	U	-4.0	14	pCi/L	1	23		08/10/09

MDL = Minimum Detection
RQ = Result Qualifier
TP Err = Total Propagated
DF = Dilution Factor
+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
U - Analyzed for but not detected above limiting criteria.
N - Spike Recovery is Outside Control Limits.
X,Y or Z - See comment detail and/or narrative.

REVISED90839 -

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-001 B21CK4

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-01	Client sample id	B21CK4	
Dept sample id	7444-001	Location/Matrix	C7024(299-W14-74);EW4	WATER
Received	08/21/09	Collected/Volume	08/12/09 08:30	4.0 L
		Custody/SAF No	F09-043-047	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.291	0.38	0.874	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-002 B21CK5

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-02	Client sample id	B21CK5	
Dept sample id	7444-002	Location/Matrix	C7024(299-W14-74);EW4	WATER
Received	08/21/09	Collected/Volume	08/14/09 09:05	4.0 L
		Custody/SAF No	F09-043-048	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.339	0.40	0.904	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-003 B21CK6

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-03	Client sample id	B21CK6	
Dept sample id	7444-003	Location/Matrix	C7024(299-W14-74);EW4	WATER
Received	08/21/09	Collected/Volume	08/17/09 10:26	4.0 L
		Custody/SAF No	F09-043-049	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	0.348	0.38	0.856	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-004 B21F47

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-04	Client sample id	B21F47	
Dept sample id	7444-004	Location/Matrix	C7027(299-W12-2);EW5	WATER
Received	08/21/09	Collected/Volume	08/17/09 09:27	4.0 L
		Custody/SAF No	F09-043-088	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.593	0.43	0.984	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-005 B21F48

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-05	Client sample id	B21F48	
Dept sample id	7444-005	Location/Matrix	C7027(299-W12-2);EW5	WATER
Received	08/21/09	Collected/Volume	08/18/09 08:13	4.0 L
		Custody/SAF No	F09-043-089	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.332	0.35	0.794	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-006 B21F49

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-06	Client sample id	B21F49	
Dept sample id	7444-006	Location/Matrix	C7027(299-W12-2);EW5	WATER
Received	08/21/09	Collected/Volume	08/18/09 08:13 4.0 L	
		Custody/SAF No	F09-043-090 F09-043	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	0.130	0.35	0.806	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-007 B21FW9

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-07	Client sample id	B21FW9	
Dept sample id	7444-007	Location/Matrix	C7029(299-W12-4);EW19	WATER
Received	08/21/09	Collected/Volume	08/12/09 13:00	4.0 L
		Custody/SAF No	F09-043-182	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	0.015	0.32	0.724	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-008 B21FX0

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-08	Client sample id	B21FX0	
Dept sample id	7444-008	Location/Matrix	C7029(299-W12-4);EW19	WATER
Received	08/21/09	Collected/Volume	08/13/09 09:35	4.0 L
		Custody/SAF No	F09-043-183	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.324	0.27	0.608	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-009 B21FX1

DATA SHEET

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-09	Client sample id	B21FX1	
Dept sample id	7444-009	Location/Matrix	C7029(299-W12-4);EW19	WATER
Received	08/21/09	Collected/Volume	08/13/09 09:35 4.0 L	
		Custody/SAF No	F09-043-184 F09-043	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.280	0.37	0.844	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-001 B21F61

DATA SHEET

SDG	7470	Client/Case no	CHPRC	SDG H4048
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R909121-01	Client sample id	B21F61	
Dept sample id	7470-001	Location/Matrix	C7027(299W12-2);EW5-009	WATER
Received	09/25/09	Collected/Volume	09/01/09 13:05	3.8 L
		Custody/SAF No	F09-043-097	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.699	0.82	0.847	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/04/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-002 B21F62

DATA SHEET

SDG	7470	Client/Case no	CHPRC	SDG_H4048	
Contact	N. Joseph Verville	Contract	No. 33677		
Lab sample id	R909121-02	Client sample id	B21F62		
Dept sample id	7470-002	Location/Matrix	C7027(299W12-2);EW5-010	WATER	
Received	09/25/09	Collected/Volume	09/08/09 15:05	3.8 L	
		Custody/SAF No	F09-043-098	F09-043	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.459	0.93	0.828	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/04/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-003 B21F65

DATA SHEET

SDG	7470	Client/Case no	CHPRC	SDG_H4048
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R909121-03	Client sample id	B21F65	
Dept sample id	7470-003	Location/Matrix	C7027(299W12-2);EW5-011	WATER
Received	09/25/09	Collected/Volume	09/10/09 07:57	3.8 L
		Custody/SAF No	F09-043-195	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.536	1.2	0.973	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/04/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-004 B21N68

DATA SHEET

SDG	7470	Client/Case no	CHPRC	SDG_H4048
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R909121-04	Client sample id	B21N68	
Dept sample id	7470-004	Location/Matrix	C7028(299W12-3);EW18-001	WATER
Received	09/25/09	Collected/Volume	09/18/09 09:45	3.8 L
		Custody/SAF No	F09-043-223	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.496	1.1	0.946	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/04/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-005 B21N69

DATA SHEET

SDG	7470	Client/Case no	CHPRC	SDG_H4048
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R909121-05	Client sample id	B21N69	
Dept sample id	7470-005	Location/Matrix	C7028(299W12-3);EW18-002	WATER
Received	09/25/09	Collected/Volume	09/22/09 08:23	3.8 L
		Custody/SAF No	F09-043-224	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.382	1.1	0.972	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/04/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-006 B21TK7

DATA SHEET

SDG	7470	Client/Case no	CHPRC	SDG_H4048
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R909121-06	Client sample id	B21TK7	
Dept sample id	7470-006	Location/Matrix	C7494(299W1421);EW15-001	WATER
Received	09/25/09	Collected/Volume	09/22/09 11:46	3.8 L
		Custody/SAF No	F09-043-264	F09-043

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.508	0.82	0.851	1.00	U	I

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/04/09

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Attachment 2
Narrative, Rev.1
WSCF90839

P&D Correction – Case Narrative Replaces The Prior Submittal in its Entirety

Introduction

One (1) S&GRP sample was received at the WSCF Laboratory on August 5, 2009. The 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. Additionally, a copy of the completed P&D # WSCF90839 is included with this case narrative.

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,* pages for a complete listing of approved analytical methods.

Inorganic Comments

Total Organic Carbon – 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. Analytical Note(s):

All QC controls are within the established limits.

Attachment 2
Narrative, Rev.1
WSCF90839

Organic Comments

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. Analytical Note(s):

All QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Duplicate Relative Percent Differences (RPD) did not meet the established laboratory limits. The RPD criterion does not apply to results near or below the minimum detectable activity. No flags issued.

All 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 electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

Attachment 2
Narrative, Rev.1
WSCF90839

Problem and Discrepancy Report

WSCF

SDG WSCF90839

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1. The data package has the following issues:

a) Narrative, Pg. 7 of report, this page is for another SDG. Please remove.

Resolution: *Provide correction.*

Lab Response: **Narrative has been updated.**

b) Narrative, introduction, sample received date should be August 5, 2009.

Resolution: *Provide correction.*

Lab Response: **Narrative has been revised with the correct date.**

Please correct the issues and resubmit the hard copy data package.

3

CH2MHill Plateau Remediation Company — **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** — F09-044-001 — PAGE 1 OF 1

COLLECTOR: White, Bates + Helms	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL
PRICE CODE: 7N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: C7024 (299-W14-74); EB-EW4-001-EB	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - QC	SAF NO.: F09-044	
ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH: N/A	COA: 302022ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A	

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

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

90839

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HCl or H2SO4 to pH <2/Cool~4C	HCl or H2SO4 to pH <2/Cool~4C	HNO3 to pH <2
TYPE OF CONTAINER	aGs*	aGs*	G/P
NO. OF CONTAINER(S)	3	1	1
VOLUME	40mL	250mL	500mL
SAMPLE ANALYSIS	VOA - 8260B (TCL);	TOC - 9060 (Total organic carbon)	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B21CH4 001	WATER	8-5-09	0810	✓	✓	✓

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Jubal Helms / Jubal Helms	8/5/09 0830	TA Filazian / Jeremos	8/5/09 0830

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

ORIGINAL

ICED

1.0 GENERAL

CH2M Hill Plateau Remediation Company (CHPRC) Sample Delivery Group H4033 was composed of nine water samples designated under SAF No. F09-043 with a Project Designation of: 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water.

The samples were received as stated on the chain-of-custody documents. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.2 Iodine-129, Low Level, MDA Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

"I 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 obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

N. Joseph Verville
Client Services Manager

10/7/09
Date

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-047	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
BAILEY	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION** H4033 (7444)		**SAF NO.**		
C7024 (299-W14-74); EW4-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS-095	HNF-N-585-9	305'	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR		SEE PTR 7968 7722 3027		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21CJ7

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) {Iodine-129}

Del
8-20-09

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	I-129 (Low-energy Photon) {Iodine-129}
B21CK4	WATER	8.12.09	0830	✓

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
JL BAILEY	8.12.09 0940	M6415 SSU R1	8.12.09 0940
M6415 SSU-R2	8-20-09 0800	DE Parchen CHPRC	8-20-09 0800
DE Parchen CHPRC	8-20-09 1300	Fed Ex	
Fed Ex		HF Dekatchenko	08/20/09 0930

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

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-048	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
KJ. Young	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION** H4033 (7444)		**SAF NO.**		
C7024 (299-W14-74); EW4-002	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS 095	HNF-N-585-9	315	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR		SEE PTR 7968 7722 3027		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21CJ7

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) {Iodine-129}

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	I-129 (Low-energy Photon) {Iodine-129}
B21CK5	WATER	8/14/9	0905	✓

N/A

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KJ. Young	8/14/09 1045	S.S.U #2	8/14/09 1045
SSU R#2	8-20-09 0800	Fed Ex DE Parchen CHPRC	8-20-09 0800
DE Parchen CHPRC	8-20-09 300	Fed Ex	
Fed Ex		LF-MATAWATAN	08/21/09 0930

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

☐ ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-049	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
White	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION** H4033 (7444)		**SAF NO.**		
C7024 (299-W14-74); EW4-003	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS-116	HNF-N-585-9	336'	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR		SEE PTR 47 7968 7722 3060		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21CJ8

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) (Iodine-129)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B21CK6	WATER	8-17-09	1026	✓

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MA White MA White	8-17-09 1120	MO 413 SSU-R2	8-17-09 1120
MO-413 SSU-R2	8-20-09 0738	R Crow/RCrow	8-20-09 0738
RCrow/RCrow	8-20-09 1300	Fed Ex	
Fed Ex		[illegible]	08/21/09 0930

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

☐ ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-088	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
MoKLER	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7027 (299-W12-2); EW5-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water H4033 (7444)		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS 095	HNFN-585-8	320'	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR		SEE PTR 7968 7722 3027		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21F41

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) (Iodine-129)

8-20-09

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B21F47	WATER	8/17/09	09:27	✓

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Bradshaw Bates	8/17/09 10:30	MO-413 SSU-R2	8/17/09 10:30
MO 413 SSU R2	8-20-09 0800	DE Parchen CHPRC	8-20-09 0800
DE Parchen CHPRC	8-20-09 1300	Fed Ex	
Fed Ex		R.F. NATALWATAN	08/21/09 0930

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

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-089	PAGE 1 OF 1

COLLECTOR Mokler / Brother Joe	**COMPANY CONTACT** DYEKMAN, DL	**TELEPHONE NO.** 373-2530	**PROJECT COORDINATOR** DYEKMAN, DL
SAMPLING LOCATION C7027 (299-W12-2); EW5-002	**PROJECT DESIGNATION** H4033 (7444) ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		**SAF NO.** F09-043
ICE CHEST NO. GWS 095	**FIELD LOGBOOK NO.** HWF-N-585-8	**ACTUAL SAMPLE DEPTH** 325.5'	**COA** 302022ES10
SHIPPED TO Eberline Services	**OFFSITE PROPERTY NO.** SEE PTR		**BILL OF LADING/AIR BILL NO.** SEE PTR 7968 7722 3027

PRICE CODE 7N **DATA TURNAROUND** 45 Days / 45 Days

AIR QUALITY ☐

METHOD OF SHIPMENT FEDERAL EXPRESS

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21F41

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) (Iodine-129)

N/A
DEP 8-20-09

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B21F48	WATER	8/18/09	08:13	X 8/27

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Brotherton	8/18/09 10:00	MO-413 SSU-R2	8/18/09 10:00
MO 413 SSU R2	8-20-09 0800	DE Parchen CHPRC	8-20-09 0800
DE Parchen CHPRC	8-20-09 300	Fed Ex	
Fed Ex		MF, WATSON	08/21/09 0930

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

ALTERED PER FWS 8/18/09

☐ ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-090	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
Mokler Brothers Co	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION** H4033 (7444)		**SAF NO.**		
C7027 (299-W12-2); EW5-002D	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS 095	HNF-N-585-8	325.5	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR		SEE PTR 7968 7722 3027		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21F41

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) (Iodine-129)

N/A

DWD

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B21F49	WATER	8/18/09	08:13	X 8/27

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Brothers Butler	8/18/09 10:00	MO-413-SSU-R2	8/18/09 10:00
MO 413 SSU R2	8-20-09 0800	DE Parchen CHPRC	8-20-09 0800
DE Parchen CHPRC	8-20-09 1300	Fed EX	
Fed EX		R.F. NATAWATAN	08/21/09 0930

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

FILTERED PER FWS BORAX

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-182	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
WEB	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION** H4033(7444)		**SAF NO.**		
C7029 (299-W12-4); EW19-001	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS-116	HNF ~~585~~ N-585-8	320'	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR		SEE PTR 47 7968 7722 3060		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21FW2

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) (Iodine-129)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B21FW9	WATER	8-12-09	1300	X									

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
DWW EBS/DWWell	8-12-09/1405	MO 413 SSU R2	8-12-09/1405
MO 413 SSU-R2	8-20-09 0740	R Crow/R Crow	8-20-09 0740
R Crow/R Crow	8-20-09 1300	Fed Ex	
FED EX		M. MATHAWAY	08/21/09 0930

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

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-183	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
WEBB	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7029 (299-W12-4); EW19-002	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water H4033 (7444)		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS-116	HNF-N-585-8	330'	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR		SEE PTR 47 7968 7722 3060		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21FW2

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) {Iodine-129}

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	I-129 (Low-energy Photon) {Iodine-129}
B21FX0	WATER	8-13-09	0935	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
DN WEBB/DNWebb	8-13-09	MO 413 SSU-R2	8-13-09
MO-413 SSU-R2	8-20-09 0741	R Crow/R Crow	8-20-09 0741
R Crow/R Crow	8-20-09 1300	Fed Ex	
FED EX		RF NEXTAW	08/21/09 0930

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

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-184	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
WEBB	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION** H4033 (7444)		**SAF NO.**		
C7029 (299-W12-4); EW19-002D	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS-116	HNF-N-585-8	330'	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR		SEE PTR 47 7968 7722 3060		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21FW2

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) {Iodine-129}

N/A

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B21FX1	WATER	8-13-09	0935	X								

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
DW WEBB/DW Webb	8-13-09 / 1130	MO 413 SSU-R2	8-13-09 / 1130
MO-413 SSU-R2	8-20-09 0743	R Crow/RCrow	8-20-09 0743
RCrow/RCrow	8-20-09 1300	Fed Ex	
FED EX		LE NEATAU/ATTRW	08/21/09 0930

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

☐ ORIGINAL

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

A-6003-618(01/06)

1.0 GENERAL

CH2M Hill Plateau Remediation Company (CHPRC) Sample Delivery Group H4048 was composed of six water samples designated under SAF No. F09-043 with a Project Designation of: 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water.

The samples were received as stated on the chain-of-custody documents. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Iodine-129, Low Level, MDA Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

"I 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 obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

11/03/09

N. Joseph Verville
Client Services Manager

Date

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-097	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
Webb	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7027 (299-W12-2); EW5-009	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS-063	HNF-N-585-3	~~465~~ 470 JSE	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR	H4048 (7470)	SEE PTR	7979-6122-2167	

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21F45

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) (Iodine-129)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B21F61	WATER	9-1-09	1305	✓

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9-1-09 1407	MO413 SSU-R2	9-1-09 1407
MO-413-R2	9-24-9/1000	JM Smith CHPRC [signature]	9-24-9/1000
JM Smith CHPRC [signature]	9-24-9/300	FED EX	
FED EX		[signature]	09/25/09 0930

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

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-098	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
McDeter, Rust	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7027 (299-W12-2); EW5-010	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
GWS-063	HNF-N-585-8-50	463.8	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR H4048 (7470)		SEE PTR 7979-6122-2167		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21F45

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	4000mL
SAMPLE ANALYSIS	I-129 (Low-energy Photon) (Iodine-129)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	[redacted]
B21F62	WATER	9-8-09	1505	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Steve Rust / Steve Rust Coolers	9-8-09 1545	Steve Rust / Steve Rust Coolers	9-8-09 1545
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MO-413-R2	9-24-9/1000	JM Smith CHPRC / JM Smith	9-24-9/1000
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
JM Smith CHPRC / JM Smith	9-24-9/1300	FED EX	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
FED EX		M. NATAWA	09/25/09 0900
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

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

☐ ORIGINAL

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

A-6003-618(01/06)

MO-413-R2 page 8 of 13

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-195	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
Mikler, Rusz	DYEKMAN, DL	373-2530	DYEKMAN, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7027 (299-W12-2); EW5-011	ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		F09-043		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
SML-442	HNF-N-585-8 pg 42	484.1 feet	302022ES10	FEDERAL EXPRESS	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Eberline Services	SEE PTR	H4048 (7470)	SEE PTR	7969-7350-1896	

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21F63

PRESERVATION	None													
TYPE OF CONTAINER	G/P													
NO. OF CONTAINER(S)	1													
VOLUME	4000mL													
SAMPLE ANALYSIS	I-129 (Low-energy Photon) {Iodine-129}													

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	[redacted]
B21F65	WATER	9-10-09	0757	✓

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Steve Rudd [signature] Cooter	9-10-09 0905	Steve Rudd [signature] SSU+R2	9-10-09 0904
MO-413-B2	9-24-9/1000	JM Smith CHPRC [signature]	9-24-9/1000
JM Smith CHPRC [signature]	9-24-9/1300	FED EX	
FED EX		NE-WASTON [signature]	09/25/09 0930

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

☐ ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-043-223	PAGE 1 OF 1

COLLECTOR	**COMPANY CONTACT** DYEKMAN, DL	**TELEPHONE NO.** 373-2530	**PROJECT COORDINATOR** DYEKMAN, DL
PRICE CODE 7N	**DATA TURNAROUND** 45 Days / 45 Days	**AIR QUALITY** ☐	
SAMPLING LOCATION C7028 (299-W12-3); EW18-001	**PROJECT DESIGNATION** ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	**SAF NO.** F09-043	
ICE CHEST NO. SML-442	**FIELD LOGBOOK NO.** HNF-N-585-9 p67	**ACTUAL SAMPLE DEPTH** 371 Det	**COA** 302022ES10
METHOD OF SHIPMENT FEDERAL EXPRESS			
SHIPPED TO Eberline Services	**OFFSITE PROPERTY NO.** SEE PTR H4048 (7470)	**BILL OF LADING/AIR BILL NO.** SEE PTR 7969-7350-1896	

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21N52

PRESERVATION	None												
TYPE OF CONTAINER	G/P												
NO. OF CONTAINER(S)	~~1~~ 1	DD 9-2-09											
VOLUME	~~1000mL~~ 400mL	DD 9-2-09											
SAMPLE ANALYSIS	I-129 Low Level (Iodine-129)												

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B21N68	WATER	9-18-09	0945	✓

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

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature]	9-18-09 1052	SSV-R2	9-18-09 10:50
MO-413-R2	9-24-9/1000	CHPRC [signature]	9-24-9/1000
CHPRC [signature]	9-24-9/1000	Fed Ex	
Fed Ex		[signature]	09/25/09 0930

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

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F09-043-224	PAGE 1 OF 1
COLLECTOR: J. MOKLER	COMPANY CONTACT: DYEKMAN, DL	TELEPHONE NO.: 373-2530	PROJECT COORDINATOR: DYEKMAN, DL	PRICE CODE: 7N	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: C7028 (299-W12-3); EW18-002	PROJECT DESIGNATION: ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO.: F09-043	AIR QUALITY: ☐	
ICE CHEST NO.: SML-442	FIELD LOGBOOK NO.: HNF-N-585-9	ACTUAL SAMPLE DEPTH: 332'	COA: 302022ES10	METHOD OF SHIPMENT: FEDERAL EXPRESS	
SHIPPED TO: Eberline Services	OFFSITE PROPERTY NO.: SEE PTR H4048 (7470)		BILL OF LADING/AIR BILL NO.: SEE PTR 7969-7350-1896		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21N52

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	~~1~~ 1 DD 9-2-09
VOLUME	~~1000mL~~ 4000 ml DD 9-2-09
SAMPLE ANALYSIS	I-129 Low Level (Iodine-129)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B21N69	WATER	9-22-09	0823	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
DW WELL / DW WELL	9-22-09 / 1090	MO-413 SSU-R2	9-22-09 / 1090
MO-413-R2	9-24-9 / 1000	JM Smith CHPRC	9-24-9 / 1000
JM Smith CHPRC	9-24-9 / 1300	FED EX	
FED EX		[illegible]	09/25/09 0930

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

ORIGINAL

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

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F09-043-264	PAGE 1 OF 1
COLLECTOR	COMPANY CONTACT DYEKMAN, DL	TELEPHONE NO. 373-2530	PROJECT COORDINATOR DYEKMAN, DL	PRICE CODE 7N AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C7494 (299-W14-21); EW15-001	PROJECT DESIGNATION ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F09-043		
ICE CHEST NO. GWS-063	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA 302022ES10	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. SEE PTR H4048 (7470)		BILL OF LADING/AIR BILL NO. SEE PTR 7979-6122-2167		

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

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

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B21TF7

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	~~1000mL~~ 4L KS 9/21/09
SAMPLE ANALYSIS	I-129 Low Level (Iodine-129)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B21TK7	WATER	9-22-9	1146	✓

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Jubal Helms / [signature]	9/22/09 1230	MO 413 554-R2	9/22/09 1230
MO-413-R2	9-24-9/1000	JM Smith CHPRC [signature]	9-24-9/1000
JM Smith CHPRC [signature]	9-24-9/1000	FED EX	
FED EX		[signature]	09/25/09 09:30

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

☐ ORIGINAL

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

A-6003-618(01/06)

Appendix 5

Data Validation Supporting Documentation

Appendix B - Radiochemical Data Validation Checklist

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 200 Area SGRP			DATA PACKAGE: VSR11-040		
VALIDATOR: Eyda Hergenreder		LAB: WSCF, Eberline		DATE: 04-14-2011	
			SDG: WSCF90839, H4033, H4048		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy X	
Total Uranium	Radium-22	Tritium	C-14	I-129 X	

SAMPLES/MATRIX Water samples

SDG WSCF90839: B21CH4

SDG H4033: B21CK4, B21CK5, B21CK6, B21F47, B21F48, B21F49, B21FW9, B21FX0, B21FX1

SDG H4048: B21F61, B21F62, B21F65, B21N68, B21N69, B21TK7

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... (Yes) No N/A

Comments: None

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments:

3. Continuing Calibration (Levels D, E)..... ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable?..... Yes No N/A

Comments:

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable?..... Yes No N/A

Comments:

5. Blanks (Levels B, C, D, E) ☐ N/A

Method blank analyzed within required frequency? (Yes) No N/A

Method blank results acceptable? (Yes) No N/A

Analytes detected in method blank? Yes (No) N/A

Field blank(s) analyzed? (Yes) No N/A

Field blank results acceptable? (Yes) No N/A

Analytes detected in field blank(s)? Yes (No) N/A

Transcription/Calculation Errors? (Levels D, E) Yes No (N/A)

Comments: None

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ☐ N/A

LCS /BSS analyzed within required frequency? (Yes) No N/A

LCS/BSS recoveries acceptable? (Yes) No N/A

LCS/BSS traceable? (Levels D,E) Yes No (N/A)

LCS/BSS expired? (Levels D,E) Yes No (N/A)

LCS/BSS levels correct? (Levels D,E) Yes No (N/A)

Transcription/Calculation Errors? (Levels D, E) Yes No (N/A)

Comments: None

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☐ N/A

Chemical carrier added? ..... (Yes) No N/A

Chemical recovery acceptable? ..... (Yes) No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No (N/A)

Chemical carrier expired? (Levels D, E) ..... Yes No (N/A)

Transcription/Calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: None

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No (N/A)

Tracer recovery acceptable? ..... Yes No (N/A)

Tracer traceable? (Levels D, E) ..... Yes No (N/A)

Tracer expired? (Levels D, E) ..... Yes No (N/A)

Transcription/Calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: None

9. Matrix Spikes (Levels C, D, E)..... ☐ N/A

Matrix spike analyzed?..... Yes No (N/A)

Spike recoveries acceptable? ..... Yes No (N/A)

Spike source traceable? (Levels D, E) ..... Yes No (N/A)

Spike source expired? Levels D, E) ..... Yes No (N/A)

Transcription/Calculation Errors? (Levels D, E)..... Yes No (N/A)

Comments: None

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... (Yes) No N/A

RPD Values Acceptable?..... (Yes) No N/A

Transcription/Calculation Errors? (Levels D, E)..... Yes No (N/A)

Comments: None

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No (N/A)

Field duplicate RPD values acceptable? ..... Yes No (N/A)

Field split sample(s) analyzed? ..... Yes No (N/A)

Field split RPD values acceptable? ..... Yes No (N/A)

Performance audit sample(s) analyzed? ..... Yes No (N/A)

Performance audit sample results acceptable? ..... Yes No (N/A)

Comments:

SDG H4033: The primary sample associated with replicate sample B21FX1 was not submitted for validation.

12. Holding Times (All levels)

Are sample holding times acceptable? ..... (Yes) No N/A

Comments: None

13. Results and Detection Limits (All Levels) ..... ☐ N/A

Results reported for all required sample analyses? ..... (Yes) No N/A

Results supported in raw data?(Levels D, E) ..... Yes No (N/A)

Results Acceptable? (Levels D, E) ..... Yes No (N/A)

Transcription/Calculation errors? (Levels D, E) ..... Yes No (N/A)

MDA's meet required detection limits? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: None

Appendix 6

Additional Documentation Requested By Client

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF90839

QC Batch 55049
Associated Samples 90839001

Test Gamma Energy Analysis-general

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
IBLANK			**QC Sample #12633**								
Cesium-137	10045-97-3		-1.4	pCi/L						U	08/17/09
Cobalt-60	10198-40-0		-2.9	pCi/L						U	08/17/09
Europium-152	14683-23-9		-5.6	pCi/L						U	08/17/09
Europium-154	15585-10-1		-8.1	pCi/L						U	08/17/09
Europium-155	14391-16-3		-10	pCi/L						U	08/17/09
LCS			**QC Sample #12634**								
Cesium-137	10045-97-3		6600	pCi/sample	109	80 - 120					08/12/09
Cobalt-60	10198-40-0		10000	pCi/sample	102.9	80 - 120					08/12/09
DUP			**QC Sample #12635**								
			Original 90839001								
Cesium-137	10045-97-3	0.91	-0.19	pCi/L			305.60	-20 - 20	*	U	08/12/09
Cobalt-60	10198-40-0	1.5	-1.0	pCi/L			1000.00	-20 - 20	*	U	08/12/09
Europium-152	14683-23-9	-21	-6.7	pCi/L			-103.20	-20 - 20	*	U	08/12/09
Europium-154	15585-10-1	1.6	6.9	pCi/L			124.70	-20 - 20	*	U	08/12/09
Europium-155	14391-16-3	-4.0	6.0	pCi/L			1000.00	-20 - 20	*	U	08/12/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-011 Method Blank

METHOD BLANK

SDG	7444	Client/Case no	CHPRC	SDG H4033
Contact	N. Joseph Verville	Contract	No. 33677	
Lab sample id	R908094-11	Client sample id	Method Blank	
Dept sample id	7444-011	Material/Matrix		WATER
		SAF No	F09-043	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.117	0.27	0.608	1.00	U	I

QC-BLANK #70751

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-010

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7444
Contact N. Joseph Verville

Client/Case no CHPRC SDG H4033
Contract No. 33677

Lab sample id R908094-10
Dept sample id 7444-010

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No F09-043

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Iodine 129	94.6	0.94	1.16	1.00		I	116	4.6	82	76-124	80-120

QC-LCS #70750

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

7444-012 B21CK4

DUPLICATE

SDG	7444			Client/Case no	CHPRC SDG H4033
Contact	N. Joseph Verville			Contract	No. 33677
DUPLICATE		ORIGINAL			
Lab sample id	R908094-12	Lab sample id	R908094-01	Client sample id	B21CK4
Dept sample id	7444-012	Dept sample id	7444-001	Location/Matrix	C7024(299-W14-74);EW4 WATER
		Received	08/21/09	Collected/Volume	08/12/09 08:30 4.0 L
				Custody/SAF No	F09-043-047 F09-043

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	DER σ
Iodine 129	0.310	0.36	0.821	1.00	U	I	-0.291	0.38	0.874	U	-		2.3

QC-DUP#1 70752

ARRA 200-ZP-1 Remedial Action Wells Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	10/07/09

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4033

Test I Matrix WATER
SDG 7444
Contact N. Joseph Verville

LAB METHOD SUMMARY

IODINE 129 IN WATER

GAMMA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4033

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Iodine 129	
Preparation batch 7211-206						
R908094-01			7444-001	B21CK4	U	
R908094-02			7444-002	B21CK5	U	
R908094-03			7444-003	B21CK6	U	
R908094-04			7444-004	B21F47	U	
R908094-05			7444-005	B21F48	U	
R908094-06			7444-006	B21F49	U	
R908094-07			7444-007	B21FW9	U	
R908094-08			7444-008	B21FX0	U	
R908094-09			7444-009	B21FX1	U	
R908094-10			7444-010	Lab Control Sample	ok	
R908094-11			7444-011	Method Blank	U	
R908094-12			7444-012	Duplicate (R908094-01)	-	U
Nominal values and limits from method				RDLs (pCi/L)	1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7211-206			2σ prep error 19.4 % Reference Lab Notebook No. 7211 pg.206													
R908094-01			B21CK4	0.874	1.00			70		1527			51	09/08/09	10/02	XSPEC-004
R908094-02			B21CK5	0.904	1.00			70		1485			45	09/08/09	09/28	XSPEC-004
R908094-03			B21CK6	0.856	1.00			80		2006			42	09/08/09	09/28	XSPEC-002
R908094-04			B21F47	0.984	1.00			73		1224			45	09/08/09	10/01	XSPEC-004
R908094-05			B21F48	0.794	1.00			78		1452			42	09/08/09	09/29	XSPEC-004
R908094-06			B21F49	0.806	1.00			82		2362			42	09/08/09	09/29	XSPEC-002
R908094-07			B21FW9	0.724	1.00			88		3048			50	09/08/09	10/01	XSPEC-002
R908094-08			B21FX0	0.608	1.00			83		2513			51	09/08/09	10/03	XSPEC-004
R908094-09			B21FX1	0.844	1.00			82		2513			51	09/08/09	10/03	XSPEC-002
R908094-10			Lab Control Sample	1.16	1.00			98		1112				09/08/09	09/30	XSPEC-004
R908094-11			Method Blank	0.608	1.00			97		1480				09/08/09	10/05	XSPEC-004
R908094-12			Duplicate (R908094-01)	0.821	1.00			75		2886			54	09/08/09	10/05	XSPEC-002
Nominal values and limits from method				1.00	1.00			40-110		200	100		180			

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 10/07/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-008 Method Blank

METHOD BLANK

SDG	7470	Client/Case no	CHPRC	SDG H4048	
Contact	N. Joseph Verville	Contract	No. 33677		
Lab sample id	R909121-08	Client sample id	Method Blank		
Dept sample id	7470-008	Material/Matrix		WATER	
		SAF No	F09-043		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Iodine 129	15046-84-1	-0.695	1.1	0.807	1.00	U	I

QC-BLANK #71071

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/04/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-007

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7470
Contact N. Joseph Verville

Client/Case no CHPRC SDG H4048
Contract No. 33677

Lab sample id R909121-07
Dept sample id 7470-007

Client sample id Lab Control Sample
Material/Matrix WATER
SAF No F09-043

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Iodine 129	100	2.2	0.896	1.00		I	116	4.6	86	74-126	80-120

QC-LCS #71070

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/04/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

7470-009 B21F61

DUPLICATE

SDG	7470			Client/Case no	CHPRC SDG H4048
Contact	N. Joseph Verville			Contract	No. 33677
	DUPLICATE		ORIGINAL		
Lab sample id	R909121-09	Lab sample id	R909121-01	Client sample id	B21F61
Dept sample id	7470-009	Dept sample id	7470-001	Location/Matrix	C7027(299W12-2);EW5-009 WATER
		Received	09/25/09	Collected/Volume	09/01/09 13:05 3.8 L
				Custody/SAF No	F09-043-097 F09-043

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	DER σ
Iodine 129	-0.666	1.1	0.964	1.00	U	I	-0.699	0.82	0.847	U	-		0

QC-DUP#1 71072

ARRA 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	11/04/09

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4048

Test I Matrix WATER
SDG 7470
Contact N. Joseph Verville

LAB METHOD SUMMARY

IODINE 129 IN WATER

GAMMA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4048

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Iodine 129	
Preparation batch 7224-063						
R909121-01			7470-001	B21F61	U	
R909121-02			7470-002	B21F62	U	
R909121-03			7470-003	B21F65	U	
R909121-04			7470-004	B21N68	U	
R909121-05			7470-005	B21N69	U	
R909121-06			7470-006	B21TK7	U	
R909121-07			7470-007	Lab Control Sample	ok	
R909121-08			7470-008	Method Blank	U	
R909121-09			7470-009	Duplicate (R909121-01)	-	U
Nominal values and limits from method				RDLs (pCi/L)	1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7224-063			2σ prep error 19.4 % Reference Lab Notebook No. 7224 pg. 63													
R909121-01			B21F61	0.847	1.00			71		1500			48	10/08/09	10/19	GRB-222
R909121-02			B21F62	0.828	1.00			73		1500			41	10/08/09	10/19	GRB-224
R909121-03			B21F65	0.973	1.00			75		1200			34	10/08/09	10/14	GRB-227
R909121-04			B21N68	0.946	1.00			71		1200			26	10/08/09	10/14	GRB-228
R909121-05			B21N69	0.972	1.00			74		1200			22	10/08/09	10/14	GRB-230
R909121-06			B21TK7	0.851	1.00			74		1500			27	10/08/09	10/19	GRB-223
R909121-07			Lab Control Sample	0.896	1.00			92		1200				10/08/09	10/14	GRB-232
R909121-08			Method Blank	0.807	1.00			91		1500				10/08/09	10/19	GRB-221
R909121-09			Duplicate (R909121-01)	0.964	1.00			76		1200			44	10/08/09	10/15	GRB-207
Nominal values and limits from method				1.00	1.00			40-110		200	100		180			

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 11/04/09