REVIEW COMMENT RECORD (RCR)

1. Date	05/09/2012
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
Data Validation Report for CH2M Hill Plateau Remediation Company: VSR12-010, Area AA Zone 2 Impacted Area Verification Samples, Project 100-K Area AA	Area AA Zone 2 Impacted Area	D. L. Klages	100-K Soil Remediation	(509)942-3947

17. Comment Submittal Approval	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date: ____ Organization Manager (optional) (print and sign): ____	Deanna L. Klages Reviewer/Point of Contact (print and sign) 05/09/2012 Date Deanna L. Klages Author/Originator (print and sign)	Deanna L. Klages Reviewer/Point of Contact (print and sign) 05/09/2012 Date Deanna L. Klages 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	No issues noted beyond the comments already made by Scot Fitzgerald.					

CHPRC - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
5/7/12	RCR-VSR12-010
3. Project No. 100K Area	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
VSR12-010, Area AA Zone 2 Impacted Area Verification Samples Project 100K Area AA	SGRP	SL Huggins	SGRP QA	MO-2216E/A101 373-3630

17. Comment Submittal Approval	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
5/7/12 Date; SL Huggins Organization Manager (optional) (print and sign)	Date; Reviewer/Point of Contact (print and sign); Author/Originator (print and sign)	5/7/12 Date; Reviewer/Point of Contact (print and sign); SL Huggins 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	No comments.					

CHPRC - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
05/07/2012	
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
VSR12-010		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) 05/07/2012 Date Author/Originator (print and sign)	Scot Fitzgerald Reviewer/Point of Contact (print and sign) 5/14/2012 Date 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	Pages 5,9,36 - no discussion of failed MS/MSD		Add discussion of failed spike. Evaluate flagging B2L5C6with J as opposed to J+.			closed SLF

ANALYTICAL QUALITY ASSOCIATES, INC.
616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Data Validation Report for CH2M Hill
Plateau Remediation Company

VSR12-010
Area AA Zone 2 Impacted Area Verification Samples
Project 100K Area AA

Chemical & Radiochemical Validation - Level C

Validation Performed By: _____ **Date: 05-03-12**
Kenneth Salaz

Validation reviewed by: _____ **Date: 05-04-12**
Marcia Hilchey

TABLE OF CONTENTS

Inorganics

Memorandum 3
Appendix 1 – Glossary of Data Reporting Qualifiers 7
Appendix 2 – Summary of Data Qualification 9
Appendix 3 – Annotated Laboratory Reports 11
Appendix 4 – Laboratory Narrative and Chain-of-Custody Documentation 24
Appendix 5 – Data Validation Supporting Documentation 34
Appendix 6 – Additional Documentation Requested By Client 42

General Chemistry

Memorandum 57
Appendix 1 – Glossary of Data Reporting Qualifiers 61
Appendix 2 – Summary of Data Qualification 63
Appendix 3 – Annotated Laboratory Reports 65
Appendix 4 – Laboratory Narrative and Chain-of-Custody Documentation 72
Appendix 5 – Data Validation Supporting Documentation 82
Appendix 6 – Additional Documentation Requested By Client 89

Date: 3 May 2012
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: Area AA Zone 2 Impacted Area Verification Samples
Subject: Inorganics - Sample Data Group (SDG) WSCF120484

INTRODUCTION

This memorandum presents the results of data validation for SDG WSCF120484 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
B2L5C4	4/15/12	Soil	C	200.8
B2L5C5	4/15/12	Soil	C	200.8
B2L5C6	4/15/12	Soil	C	200.8
B2L5C7	4/15/12	Soil	C	200.8
B2L5C8	4/15/12	Soil	C	200.8
B2L5C9	4/15/12	Soil	C	200.8

Data validation was conducted in accordance with the CHPRC validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan, DOE/RL-96-22, Rev. 5 (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 requirement for ICP metals are analysis within 180 days of sample collection, and the holding time requirement for mercury is analysis within 28 days of sample collection. There were no specific preservation required for the inorganic soil sample analysis.

The samples were analyzed within the prescribed holding times.

- **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 with the following exception. In the method blank for batch 198897, Cu was detected but < the RL. However, the associated sample results were all much > the RL and should not be qualified.

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 with the following exceptions. In equipment blank B2L5C9, Mn, Ba, Co, Cu, V, Zn, Pb, Mo, Sr, and U were detected.

- **Accuracy**

Accuracy is evaluated by reviewing matrix spike sample results, and laboratory control sample results. According to the SAP, the matrix spike sample accuracy limits are 70% to 130% and the laboratory control sample accuracy limits are ones specified by the DV procedure. 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 with the following exceptions. For batch 199005, the MS recovery was < the QC acceptance limit but >30%, and the MSD recovery was > the QC acceptance limit. The associated sample result was a detect and should be qualified as an estimate and flagged "J," based on professional judgment.

Laboratory Control Samples (LCSs)

All LCS recoveries were acceptable with the following exception. For batch 199005, the LCS recovery for Mn was > the QC acceptance limit but <150%. The associated result of sample B2L5C6 was a detect and should be qualified as an estimate and flagged "J+." However, this batch also had MS/MSD recovery outliers with conflicting bias. Therefore, the result should be flagged "J," based on professional judgment.

- **Precision**

Precision is evaluated by reviewing MS/MSD 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) limit is 30%. The limits for reported analytes not listed in the SAP are specified by the DV procedure. When duplicate RPDs exceed the limits and associated results are <5X the reporting limit (RL) with absolute differences <2X the RL, no precision infraction occurred.

MS/MSD Samples

All MS/MSD RPD values were acceptable.

Field Duplicate Samples

All field duplicate results were acceptable.

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 with associated non-detected sample results were below the CRDLs.

- **Completeness**

SDG WSCF120484 was 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

A minor deficiency leading to qualification of Mn sample results as estimated was due to LCS, MS, and MSD recoveries outside the QC acceptance limits. 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-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, September 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

Inorganic Data Qualification Summary			
SDG: WSCF120484	Reviewer: AQA	Project: Area AA Zone 2 Impacted Area Verification Samples	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
Mn	J	B2L5C6	High LCS, low MS, and high MSD recoveries

Comments: None

Appendix 3

Annotated Laboratory Reports

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484001
SAF# F11-096
Sample ID B2L5C4

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
~~**Anions by IC**~~										~~**04/17/12**~~
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<1.1		mg/kg	1	1.1	3.7	04/18/12
Chloride	16887-00-6	LA-533-410	B	3.92		mg/kg	1	2.9	21	04/18/12
Nitrite-N	NO2-N	LA-533-410	U	<0.98		mg/kg	1	0.98	5.0	04/18/12
Nitrate-N	NO3-N	LA-533-410	B	1.39		mg/kg	1	0.94	5.0	04/18/12
Sulfate	14808-79-8	LA-533-410	B	9.58		mg/kg	1	5.6	53	04/18/12
Cr(VI) Prep										**04/18/12**
~~**Cr(VI)**~~										
~~Hexavalent chromium~~	~~18540-29-9~~	~~LA-265-403~~	~~UN~~	~~<0.10~~		~~ug/g~~	~~1~~	~~0.10~~	~~0.50~~	~~04/19/12~~
ICPMS Prep										**04/23/12**
ICP-MS										
Manganese	7439-96-5	LA-505-412		449		mg/kg	1	0.11	1.1	04/24/12
Nickel	7440-02-0	LA-505-412		11.8		mg/kg	1	0.11	1.1	04/24/12
Silver	7440-22-4	LA-505-412	U	<0.053		mg/kg	1	0.053	0.53	04/24/12
Antimony	7440-36-0	LA-505-412	U	<0.32		mg/kg	1	0.32	3.2	04/24/12
Barium	7440-39-3	LA-505-412		78.7		mg/kg	1	0.21	2.1	04/24/12
Beryllium	7440-41-7	LA-505-412	B	0.376		mg/kg	1	0.11	1.1	04/24/12
Cadmium	7440-43-9	LA-505-412	B	0.0794		mg/kg	1	0.053	0.53	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484001
SAF# F11-096
Sample ID B2L5C4

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Chromium	7440-47-3	LA-505-412		7.15		mg/kg	1	0.11	1.1	04/24/12
Cobalt	7440-48-4	LA-505-412		11.5		mg/kg	1	0.053	0.27	04/24/12
Copper	7440-50-8	LA-505-412		20.0		mg/kg	1	0.11	1.1	04/24/12
Vanadium	7440-62-2	LA-505-412		54.5		mg/kg	1	0.21	2.1	04/24/12
Zinc	7440-66-6	LA-505-412		51.0		mg/kg	1	1.1	11	04/24/12
Lead	7439-92-1	LA-505-412		6.74		mg/kg	1	0.053	0.53	04/24/12
Mercury	7439-97-6	LA-505-412	U	<0.053		mg/kg	1	0.053	0.21	04/24/12
Molybdenum	7439-98-7	LA-505-412	B	0.480		mg/kg	1	0.053	0.53	04/24/12
Strontium	7440-24-6	LA-505-412		35.1		mg/kg	1	0.11	1.1	04/24/12
Tin	7440-31-5	LA-505-412		0.559		mg/kg	1	0.053	0.53	04/24/12
Uranium	7440-61-1	LA-505-412		0.583		mg/kg	1	0.053	0.27	04/24/12
Arsenic	7440-38-2	LA-505-412		3.44		mg/kg	1	0.21	2.1	04/24/12
Selenium	7782-49-2	LA-505-412	B	0.307		mg/kg	0.5	0.27	2.7	04/24/12
Boron	7440-42-8	LA-505-412	B	0.963		mg/kg	1	0.53	5.3	04/24/12

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DF = Dilution Factor
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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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484015
SAF# F11-096
Sample ID B2L5C5

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
~~**Anions by IC**~~										~~**04/19/12**~~
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<1.1		mg/kg	1	1.1	3.7	04/19/12
Chloride	16887-00-6	LA-533-410	U	<3.0		mg/kg	1	3.0	21	04/19/12
Nitrite-N	NO2-N	LA-533-410	U	<0.99		mg/kg	1	0.99	5.0	04/19/12
Nitrate-N	NO3-N	LA-533-410	U	<0.96		mg/kg	1	0.96	5.1	04/19/12
Sulfate	14808-79-8	LA-533-410	B	7.81		mg/kg	1	5.7	54	04/19/12
Cr(VI) Prep										**04/18/12**
~~**Cr(VI)**~~										
~~Hexavalent chromium~~	~~18540-29-9~~	~~LA-265-403~~	~~UN~~	~~<0.10~~		~~ug/g~~	~~1~~	~~0.10~~	~~0.51~~	~~04/19/12~~
ICPMS Prep										**04/23/12**
ICP-MS										
Manganese	7439-96-5	LA-505-412		481		mg/kg	1	0.11	1.1	04/24/12
Nickel	7440-02-0	LA-505-412		12.2		mg/kg	1	0.11	1.1	04/24/12
Silver	7440-22-4	LA-505-412	U	<0.054		mg/kg	1	0.054	0.54	04/24/12
Antimony	7440-36-0	LA-505-412	U	<0.32		mg/kg	1	0.32	3.2	04/24/12
Barium	7440-39-3	LA-505-412		80.5		mg/kg	1	0.22	2.2	04/24/12
Beryllium	7440-41-7	LA-505-412	B	0.332		mg/kg	1	0.11	1.1	04/24/12
Cadmium	7440-43-9	LA-505-412	B	0.0948		mg/kg	1	0.054	0.54	04/24/12

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B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484015
SAF# F11-096
Sample ID B2L5C5

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Chromium	7440-47-3	LA-505-412		7.17		mg/kg	1	0.11	1.1	04/24/12
Cobalt	7440-48-4	LA-505-412		13.0		mg/kg	1	0.054	0.27	04/24/12
Copper	7440-50-8	LA-505-412		21.2		mg/kg	1	0.11	1.1	04/24/12
Vanadium	7440-62-2	LA-505-412		62.8		mg/kg	1	0.22	2.2	04/24/12
Zinc	7440-66-6	LA-505-412		58.4		mg/kg	1	1.1	11	04/24/12
Lead	7439-92-1	LA-505-412		7.17		mg/kg	1	0.054	0.54	04/24/12
Mercury	7439-97-6	LA-505-412	U	<0.054		mg/kg	1	0.054	0.22	04/24/12
Molybdenum	7439-98-7	LA-505-412	B	0.461		mg/kg	1	0.054	0.54	04/24/12
Strontium	7440-24-6	LA-505-412		37.8		mg/kg	1	0.11	1.1	04/24/12
Tin	7440-31-5	LA-505-412		0.572		mg/kg	1	0.054	0.54	04/24/12
Uranium	7440-61-1	LA-505-412		0.594		mg/kg	1	0.054	0.27	04/24/12
Arsenic	7440-38-2	LA-505-412		3.51		mg/kg	1	0.22	2.2	04/24/12
Selenium	7782-49-2	LA-505-412	B	0.335		mg/kg	0.5	0.27	2.7	04/24/12
Boron	7440-42-8	LA-505-412	B	0.762		mg/kg	1	0.54	5.4	04/24/12

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E - Analyte is an estimate, see comment section.
N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

KS
05/03/12

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484013
SAF# F11-096
Sample ID B2L5C7

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**04/19/12**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<1.1		mg/kg	1	1.1	3.7	04/19/12
Chloride	16887-00-6	LA-533-410	B	4.92		mg/kg	1	3.0	21	04/19/12
Nitrite-N	NO2-N	LA-533-410	U	<0.99		mg/kg	1	0.99	5.1	04/19/12
Nitrate-N	NO3-N	LA-533-410	B	2.60		mg/kg	1	0.96	5.1	04/19/12
Sulfate	14808-79-8	LA-533-410	B	7.99		mg/kg	1	5.7	54	04/19/12
Cr(VI) Prep										**04/18/12**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	UN	<0.10		ug/g	1	0.10	0.51	04/19/12
ICPMS Prep										**04/23/12**
ICP-MS										
Manganese	7439-96-5	LA-505-412		345		mg/kg	1	0.10	1.0	04/24/12
Nickel	7440-02-0	LA-505-412		8.80		mg/kg	1	0.10	1.0	04/24/12
Silver	7440-22-4	LA-505-412	U	<0.051		mg/kg	1	0.051	0.51	04/24/12
Antimony	7440-36-0	LA-505-412	U	<0.31		mg/kg	1	0.31	3.1	04/24/12
Barium	7440-39-3	LA-505-412		61.3		mg/kg	1	0.21	2.1	04/24/12
Beryllium	7440-41-7	LA-505-412	B	0.261		mg/kg	1	0.10	1.0	04/24/12
Cadmium	7440-43-9	LA-505-412	B	0.0579		mg/kg	1	0.051	0.51	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

KS
05/03/12

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484013
SAF# F11-096
Sample ID B2L5C7

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Chromium	7440-47-3	LA-505-412		6.96		mg/kg	1	0.10	1.0	04/24/12
Cobalt	7440-48-4	LA-505-412		7.63		mg/kg	1	0.051	0.26	04/24/12
Copper	7440-50-8	LA-505-412		14.7		mg/kg	1	0.10	1.0	04/24/12
Vanadium	7440-62-2	LA-505-412		34.8		mg/kg	1	0.21	2.1	04/24/12
Zinc	7440-66-6	LA-505-412		35.9		mg/kg	1	1.0	10	04/24/12
Lead	7439-92-1	LA-505-412		5.14		mg/kg	1	0.051	0.51	04/24/12
Mercury	7439-97-6	LA-505-412	U	<0.051		mg/kg	1	0.051	0.21	04/24/12
Molybdenum	7439-98-7	LA-505-412	B	0.244		mg/kg	1	0.051	0.51	04/24/12
Strontium	7440-24-6	LA-505-412		31.4		mg/kg	1	0.10	1.0	04/24/12
Tin	7440-31-5	LA-505-412	B	0.328		mg/kg	1	0.051	0.51	04/24/12
Uranium	7440-61-1	LA-505-412		0.438		mg/kg	1	0.051	0.26	04/24/12
Arsenic	7440-38-2	LA-505-412		2.78		mg/kg	1	0.21	2.1	04/24/12
Selenium	7782-49-2	LA-505-412	U	<0.26		mg/kg	0.5	0.26	2.6	04/24/12
Boron	7440-42-8	LA-505-412	B	0.825		mg/kg	1	0.51	5.1	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484016
SAF# F11-096
Sample ID B2L5C8

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**04/19/12**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<1.1		mg/kg	1	1.1	3.7	04/19/12
Chloride	16887-00-6	LA-533-410	B	3.09		mg/kg	1	3.0	21	04/19/12
Nitrite-N	NO2-N	LA-533-410	U	<0.99		mg/kg	1	0.99	5.0	04/19/12
Nitrate-N	NO3-N	LA-533-410	B	1.01		mg/kg	1	0.96	5.1	04/19/12
Sulfate	14808-79-8	LA-533-410	B	6.87		mg/kg	1	5.7	54	04/19/12
Cr(VI) Prep										**04/18/12**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	UN	<0.10		ug/g	1	0.10	0.51	04/19/12
ICPMS Prep										**04/23/12**
ICP-MS										
Manganese	7439-96-5	LA-505-412		403		mg/kg	1	0.11	1.1	04/24/12
Nickel	7440-02-0	LA-505-412		10.3		mg/kg	1	0.11	1.1	04/24/12
Silver	7440-22-4	LA-505-412	U	<0.055		mg/kg	1	0.055	0.55	04/24/12
Antimony	7440-36-0	LA-505-412	U	<0.33		mg/kg	1	0.33	3.3	04/24/12
Barium	7440-39-3	LA-505-412		73.1		mg/kg	1	0.22	2.2	04/24/12
Beryllium	7440-41-7	LA-505-412	B	0.227		mg/kg	1	0.11	1.1	04/24/12
Cadmium	7440-43-9	LA-505-412	B	0.0784		mg/kg	1	0.055	0.55	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

KS
05/03/12

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484016
SAF# F11-096
Sample ID B2L5C8

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Chromium	7440-47-3	LA-505-412		5.98		mg/kg	1	0.11	1.1	04/24/12
Cobalt	7440-48-4	LA-505-412		10.7		mg/kg	1	0.055	0.27	04/24/12
Copper	7440-50-8	LA-505-412		18.3		mg/kg	1	0.11	1.1	04/24/12
Vanadium	7440-62-2	LA-505-412		48.9		mg/kg	1	0.22	2.2	04/24/12
Zinc	7440-66-6	LA-505-412		46.9		mg/kg	1	1.1	11	04/24/12
Lead	7439-92-1	LA-505-412		6.38		mg/kg	1	0.055	0.55	04/24/12
Mercury	7439-97-6	LA-505-412	U	<0.055		mg/kg	1	0.055	0.22	04/24/12
Molybdenum	7439-98-7	LA-505-412	B	0.370		mg/kg	1	0.055	0.55	04/24/12
Strontium	7440-24-6	LA-505-412		31.0		mg/kg	1	0.11	1.1	04/24/12
Tin	7440-31-5	LA-505-412		0.694		mg/kg	1	0.055	0.55	04/24/12
Uranium	7440-61-1	LA-505-412		0.488		mg/kg	1	0.055	0.27	04/24/12
Arsenic	7440-38-2	LA-505-412		2.89		mg/kg	1	0.22	2.2	04/24/12
Selenium	7782-49-2	LA-505-412	B	0.309		mg/kg	0.5	0.27	2.7	04/24/12
Boron	7440-42-8	LA-505-412	B	0.673		mg/kg	1	0.55	5.5	04/24/12

MDL = Minimum Detection Limit
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TP Err = Total Propagated Error
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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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484003
SAF# F11-096
Sample ID B2L5C9

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**04/17/12**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<1.1		mg/kg	1	1.1	3.6	04/18/12
Chloride	16887-00-6	LA-533-410	U	<2.9		mg/kg	1	2.9	20	04/18/12
Nitrite-N	NO2-N	LA-533-410	U	<0.95		mg/kg	1	0.95	4.9	04/18/12
Nitrate-N	NO3-N	LA-533-410	U	<0.92		mg/kg	1	0.92	4.9	04/18/12
Sulfate	14808-79-8	LA-533-410	U	<5.4		mg/kg	1	5.4	52	04/18/12
Cr(VI) Prep										**04/18/12**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	UN	<0.098		ug/g	1	0.098	0.49	04/19/12
ICPMS Prep										**04/23/12**
ICP-MS										
Manganese	7439-96-5	LA-505-412		6.60		mg/kg	1	0.11	1.1	04/24/12
Nickel	7440-02-0	LA-505-412	U	<0.11		mg/kg	1	0.11	1.1	04/24/12
Silver	7440-22-4	LA-505-412	U	<0.053		mg/kg	1	0.053	0.53	04/24/12
Antimony	7440-36-0	LA-505-412	U	<0.32		mg/kg	1	0.32	3.2	04/24/12
Barium	7440-39-3	LA-505-412		2.75		mg/kg	1	0.21	2.1	04/24/12
Beryllium	7440-41-7	LA-505-412	U	<0.11		mg/kg	1	0.11	1.1	04/24/12
Cadmium	7440-43-9	LA-505-412	U	<0.053		mg/kg	1	0.053	0.53	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

KS
05/03/12

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484003
SAF# F11-096
Sample ID B2L5C9

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Chromium	7440-47-3	LA-505-412	U	<0.11		mg/kg	1	0.11	1.1	04/24/12
Cobalt	7440-48-4	LA-505-412	B	0.0906		mg/kg	1	0.053	0.27	04/24/12
Copper	7440-50-8	LA-505-412	BC	0.146		mg/kg	1	0.11	1.1	04/24/12
Vanadium	7440-62-2	LA-505-412	B	0.210		mg/kg	1	0.21	2.1	04/24/12
Zinc	7440-66-6	LA-505-412	B	1.26		mg/kg	1	1.1	11	04/24/12
Lead	7439-92-1	LA-505-412		0.562		mg/kg	1	0.053	0.53	04/24/12
Mercury	7439-97-6	LA-505-412	U	<0.053		mg/kg	1	0.053	0.21	04/24/12
Molybdenum	7439-98-7	LA-505-412	B	0.185		mg/kg	1	0.053	0.53	04/24/12
Strontium	7440-24-6	LA-505-412	B	0.590		mg/kg	1	0.11	1.1	04/24/12
Tin	7440-31-5	LA-505-412	U	<0.053		mg/kg	1	0.053	0.53	04/24/12
Uranium	7440-61-1	LA-505-412	B	0.0970		mg/kg	1	0.053	0.27	04/24/12
Arsenic	7440-38-2	LA-505-412	U	<0.21		mg/kg	1	0.21	2.1	04/24/12
Selenium	7782-49-2	LA-505-412	U	<0.27		mg/kg	0.5	0.27	2.7	04/24/12
Boron	7440-42-8	LA-505-412	U	<0.53		mg/kg	1	0.53	5.3	04/24/12

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

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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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484024
SAF# F11-096
Sample ID B2L5C6

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ		Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC											**04/19/12**
Anions by IC											
Fluoride	16984-48-8	LA-533-410	U		<1.1		mg/kg	1	1.1	3.7	04/19/12
Chloride	16887-00-6	LA-533-410	U		<3.0		mg/kg	1	3.0	21	04/19/12
Nitrite-N	NO2-N	LA-533-410	U		<0.99		mg/kg	1	0.99	5.1	04/19/12
Nitrate-N	NO3-N	LA-533-410	B		1.27		mg/kg	1	0.96	5.1	04/19/12
Sulfate	14808-79-8	LA-533-410	B		12.2		mg/kg	1	5.7	54	04/19/12
Cr(VI) Prep											**04/25/12**
Cr(VI)											
Hexavalent chromium	18540-29-9	LA-265-403	U		<0.10		ug/g	1	0.10	0.51	04/26/12
ICPMS Prep											**04/24/12**
ICP-MS											
Manganese	7439-96-5	LA-505-412	NX	J	410		mg/kg	1	0.11	1.1	04/25/12
Nickel	7440-02-0	LA-505-412			10.6		mg/kg	1	0.11	1.1	04/25/12
Silver	7440-22-4	LA-505-412	U		<0.053		mg/kg	1	0.053	0.53	04/25/12
Antimony	7440-36-0	LA-505-412	U		<0.32		mg/kg	1	0.32	3.2	04/25/12
Barium	7440-39-3	LA-505-412			72.4		mg/kg	1	0.21	2.1	04/25/12
Beryllium	7440-41-7	LA-505-412	B		0.321		mg/kg	1	0.11	1.1	04/25/12
Cadmium	7440-43-9	LA-505-412	B		0.101		mg/kg	1	0.053	0.53	04/25/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484024
SAF# F11-096
Sample ID B2L5C6

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Chromium	7440-47-3	LA-505-412		8.32		mg/kg	1	0.11	1.1	04/25/12
Cobalt	7440-48-4	LA-505-412		11.1		mg/kg	1	0.053	0.27	04/25/12
Copper	7440-50-8	LA-505-412		19.3		mg/kg	1	0.11	1.1	04/25/12
Vanadium	7440-62-2	LA-505-412		77.0		mg/kg	1	0.21	2.1	04/25/12
Zinc	7440-66-6	LA-505-412		56.8		mg/kg	1	1.1	11	04/25/12
Lead	7439-92-1	LA-505-412		6.00		mg/kg	1	0.053	0.53	04/25/12
Mercury	7439-97-6	LA-505-412	U	<0.053		mg/kg	1	0.053	0.21	04/25/12
Molybdenum	7439-98-7	LA-505-412		0.542		mg/kg	1	0.053	0.53	04/25/12
Strontium	7440-24-6	LA-505-412		31.6		mg/kg	1	0.11	1.1	04/25/12
Tin	7440-31-5	LA-505-412		0.544		mg/kg	1	0.053	0.53	04/25/12
Uranium	7440-61-1	LA-505-412		0.647		mg/kg	1	0.053	0.27	04/25/12
Arsenic	7440-38-2	LA-505-412		3.35		mg/kg	1	0.21	2.1	04/25/12
Selenium	7782-49-2	LA-505-412	B	0.322		mg/kg	0.5	0.27	2.7	04/25/12
Boron	7440-42-8	LA-505-412	B	1.32		mg/kg	1	0.53	5.3	04/25/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Attachment 2
Narrative
WSCF120484

Introduction

Samples were received at the WSCF laboratory as referenced on the WSCF SAF Number Cross Reference table included in the final report. 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 not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U 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.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* 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 applicable QC controls are within the established limits.

Narrative

Attachment 2
Narrative
WSCF120484

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):

- Batch QC 198920
  - Matrix Spike recovery is outside established laboratory limits. Affected sample results in this batch were "N" flagged.
- Batch QC 199412
  - Duplicate Relative Percent Difference (RPD) does not apply to results near or below the minimum detectable level. No flags issued.
  - All other applicable QC controls are within the established limits.

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

- Batch QC 198897
  - Copper – Detected in the Blank and evaluated. Affected sample results in this batch were "C" Flagged.
  - Manganese – Exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.
- Batch QC 199005
  - Manganese – Matrix Spike and/or Matrix Spike Duplicate recoveries are outside established laboratory limits. Affected sample results in this batch were "N" flagged.
  - Sample Issue Resolution Form SDR12-241 regarding Manganese LCS failure is attached to this report.
  - All other applicable 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
WSCF120484

SAMPLE ISSUE RESOLUTION

SIR NUM	SDR12-241
REV NUM	0
DATE INITIATED	4/26/2012

SAMPLE EVENT INFORMATION

SAF NUM(S)	F12-022, F11-096
OPERABLE UNIT(S)	100-KR-2
PROJECT(S)	100K Area AA, 100 K
SAMPLE EVENT TITLE(S)	100-K-102, Area AA Sampling
LABORATORY	Waste Sampling & Characterization

SAMPLING INFORMATION

NUMBER OF SAMPLES	18
SAMPLE NUMBERS	B2L347, B2L361, B2L384, B2L385, B2L386, B2L388, B2L389, B2L391, B2L392, B2L394, B2L395, B2L396, B2L397, B2L398, B2L399, B2L3B1, B2L3B4, B2L5C6
SAMPLE MATRIX	
COLLECTION DATE	4/15/2012 - 4/15/2012
SDG NUM	WSCF120485, WSCF120484

ISSUE BACKGROUND

CLASS	Laboratory Issue
TYPE	Quality Control Failure
DESCRIPTION	The 200.8 Manganese LCS was slightly high at 124.4% with control limits of 75-121%. The MS (60.3%) and MSD (136.0%) were outside the control limits of 70-130%. The blank was non-detect.

DISPOSITION

DESCRIPTION	PROPOSED DISPOSITION: Report the data as-is and note the QC failures in the case narrative.
JUSTIFICATION	ACCEPTED DISPOSITION: Accept the proposed resolution.

SUBMITTED BY: Marisol Avila/WSCF DATE: 4/26/12

ACCEPTED BY: Jennifer Hammons DATE: 4/30/12
Steve Trent/CHPRC DATE: 4/30/12

A-6003-640 (03/30)

PAGE 1 of 1

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-096-290	PAGE 1 OF 1
COLLECTOR: FM Hall CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C
SAMPLING LOCATION: Area AA Zone 2 Sample 19	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A	

DATA TURNAROUND: 15 Days / 15 Days

ORIGINAL

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)

120484

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION			Cool~4C	Cool~4C	Cool~4C
HOLDING TIME			6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER			G/P	G/P	G/P
NO. OF CONTAINER(S)			1	1	1
VOLUME			120mL	60mL	60mL
SAMPLE ANALYSIS			SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - 7196	SEE ITEM (2) IN SPECIAL INSTRUCTIONS
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C4	SOIL	4-15-12	0811	✓	✓	✓

12-05

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall CHPRC	DATE/TIME: APR 15 2012	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0814	RECEIVED BY/STORED IN: C Johnson	DATE/TIME: APR 16 2012 0814
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 CACN for all analytical work at WSCF laboratory is 402581ES20.LJ** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-096-291	PAGE 1 OF 1
COLLECTOR: FM Hall, CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C
SAMPLING LOCATION: Area AA Zone 2 Sampe 20	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A	

DATA TURNAROUND: 15 Days / 15 Days

ORIGINAL

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	Cool~4C
HOLDING TIME				6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER				G/P	G/P	G/P
NO. OF CONTAINER(S)				1	1	1
VOLUME				120mL	60mL	60mL
SAMPLE ANALYSIS				SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - 7196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C5	SOIL	4.15.12	0817	✓	✓	✓

12-05

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall, CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: KC Patterson, CHPRC	DATE/TIME: APR 16 2012 0840
RELINQUISHED BY/REMOVED FROM: KC Patterson, CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: C Johnson	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-096-292	PAGE 1 OF 1
COLLECTOR: FM Hall CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C	DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: Area AA Zone 2 Sample 21	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
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	Cool~4C
HOLDING TIME	6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	120mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - 7196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C6 24	SOIL	4.15.12	0824	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: C Johnson	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-096-293	PAGE 1 OF 1
COLLECTOR: FM Hall, CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C	DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: Area AA Zone 2 Sample 22	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
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	Cool~4C
HOLDING TIME				6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER				G/P	G/P	G/P
NO. OF CONTAINER(S)				1	1	1
VOLUME				120mL	60mL	60mL
SAMPLE ANALYSIS				SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - /196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C7 13	SOIL	4.15.12	0831	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall, CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson, CHPRC	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson, CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: C. Johnson	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003 618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-096-294	PAGE 1 OF 1
COLLECTOR: FM Hall CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C / DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: Area AA Zone 2 Sample 23	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY:
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE / ORIGINAL
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	Cool~4C
HOLDING TIME	6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	120mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - /196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C8 16	SOIL	4.15.12	0817	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: C Johnson	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-096-295	PAGE 1 OF 1
COLLECTOR: FM Hall, CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C	DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: Area AA Zone 2 Sample 24	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: (N/A)	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
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	Cool-4C
HOLDING TIME	6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	120mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - 7196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C9 3	SOIL	4 15 12	0801	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall, CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson, CHPRC	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson, CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN:	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20. ☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: Area AA Zone 2 Impacted Area Verification Samples			DATA PACKAGE: VSR12-010		
VALIDATOR: Ken Salaz		LAB: WSCF		DATE: 5/03/12	
			SDG: WSCF120484		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide	EPA 200.8 X	
SAMPLES/MATRIX Soil Samples					
B2L5C4, B2L5C5, B2L5C6, B2L5C7, B2L5C8, B2L5C9					

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

ICP interference checks 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:
Batch 198897 MB: Cu 0.102 ug/L
EB Sample B2L5C9: Mn 6.60 mg/kg; Ba 2.75 mg/kg;Co 0.0906 mg/kg; Cu 0.146 mg/kg; V 0.210 mg/kg; Zn 1.26 mg/kg; Pb 0.562 mg/kg; Mo 0.185 mg/kg; Sr 0.590 mg/kg; U 0.0970 mg/kg

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

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 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:

Batch 199005 LCS %R=124%

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:_ None

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values 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. 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

Comments (attach additional sheets as necessary):

Appendix 6

Additional Documentation Requested By Client

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
198869	198872	1	BLANK	73412	BLANK		Anions by Ion Chromatography (Solid)
198869	198872	3	LCS	73413	LCS		Anions by Ion Chromatography (Solid)
198869	198872	4	MS	73414	B2L393(120484010MS)	120484010	Anions by Ion Chromatography (Solid)
198869	198872	5	MSD	73415	B2L393(120484010MSD)	120484010	Anions by Ion Chromatography (Solid)
198869	198872	6	DUP	73416	B2L393(120484010DUP)	120484010	Anions by Ion Chromatography (Solid)
198869	198872	8	SAMPLE	120484001	B2L5C4		Anions by Ion Chromatography (Solid)
198869	198872	9	SAMPLE	120484002	B2L3B5		Anions by Ion Chromatography (Solid)
198869	198872	10	SAMPLE	120484003	B2L5C9		Anions by Ion Chromatography (Solid)
198869	198872	11	SAMPLE	120484004	B2L365		Anions by Ion Chromatography (Solid)
198869	198872	12	SAMPLE	120484005	B2L364		Anions by Ion Chromatography (Solid)
198869	198872	13	SAMPLE	120484006	B2L363		Anions by Ion Chromatography (Solid)
198869	198872	14	SAMPLE	120484007	B2L362		Anions by Ion Chromatography (Solid)
198869	198872	15	SAMPLE	120484008	B2L359		Anions by Ion Chromatography (Solid)
198869	198872	16	SAMPLE	120484009	B2L358		Anions by Ion Chromatography (Solid)
198869	198872	17	SAMPLE	120484010	B2L393		Anions by Ion Chromatography (Solid)
198897	198919	4	BLANK	73486	BLANK		ICP-2008 MS All possible metal
198897	198919	5	LCS	73487	LCS		ICP-2008 MS All possible metal
198897	198919	6	SAMPLE	120484001	B2L5C4		ICP-2008 MS All possible metal
198897	198919	7	MS	73488	B2L5C4(120484001MS)	120484001	ICP-2008 MS All possible metal
198897	198919	8	MSD	73489	B2L5C4(120484001MSD)	120484001	ICP-2008 MS All possible metal
198897	198919	9	SAMPLE	120484002	B2L3B5		ICP-2008 MS All possible metal
198897	198919	10	SAMPLE	120484003	B2L5C9		ICP-2008 MS All possible metal
198897	198919	11	SAMPLE	120484004	B2L365		ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
198897	198919	12	SAMPLE	120484005	B2L364		ICP-2008 MS All possible metal
198897	198919	13	SAMPLE	120484006	B2L363		ICP-2008 MS All possible metal
198897	198919	14	SAMPLE	120484007	B2L362		ICP-2008 MS All possible metal
198897	198919	15	SAMPLE	120484008	B2L359		ICP-2008 MS All possible metal
198897	198919	16	SAMPLE	120484009	B2L358		ICP-2008 MS All possible metal
198897	198919	17	SAMPLE	120484010	B2L393		ICP-2008 MS All possible metal
198897	198919	20	SAMPLE	120484011	B2L3B0		ICP-2008 MS All possible metal
198897	198919	21	SAMPLE	120484012	B2L3B2		ICP-2008 MS All possible metal
198897	198919	22	SAMPLE	120484013	B2L5C7		ICP-2008 MS All possible metal
198897	198919	23	SAMPLE	120484014	B2L3B7		ICP-2008 MS All possible metal
198897	198919	24	SAMPLE	120484015	B2L5C5		ICP-2008 MS All possible metal
198897	198919	25	SAMPLE	120484016	B2L5C8		ICP-2008 MS All possible metal
198897	198919	26	SAMPLE	120484017	B2L387		ICP-2008 MS All possible metal
198897	198919	27	SAMPLE	120484018	B2L357		ICP-2008 MS All possible metal
198897	198919	28	SAMPLE	120484019	B2L390		ICP-2008 MS All possible metal
198897	198919	29	SAMPLE	120484020	B2L360		ICP-2008 MS All possible metal
198897	199108	1	LCS	73487	LCS		ICP-2008 MS All possible metal
198897	199108	2	BLANK	73486	BLANK		ICP-2008 MS All possible metal
198897	199108	10	SAMPLE	120484020	B2L360		ICP-2008 MS All possible metal
198897	199108	11	SAMPLE	120484019	B2L390		ICP-2008 MS All possible metal
198897	199108	12	SAMPLE	120484018	B2L357		ICP-2008 MS All possible metal
198897	199108	13	SAMPLE	120484017	B2L387		ICP-2008 MS All possible metal
198897	199108	14	SAMPLE	120484016	B2L5C8		ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
198897	199108	15	SAMPLE	120484015	B2L5C5		ICP-2008 MS All possible metal
198897	199108	16	SAMPLE	120484014	B2L3B7		ICP-2008 MS All possible metal
198897	199108	17	SAMPLE	120484010	B2L393		ICP-2008 MS All possible metal
198897	199108	18	SAMPLE	120484013	B2L5C7		ICP-2008 MS All possible metal
198897	199108	19	SAMPLE	120484009	B2L358		ICP-2008 MS All possible metal
198897	199108	20	SAMPLE	120484012	B2L3B2		ICP-2008 MS All possible metal
198897	199108	21	SAMPLE	120484008	B2L359		ICP-2008 MS All possible metal
198897	199108	22	SAMPLE	120484011	B2L3B0		ICP-2008 MS All possible metal
198897	199108	23	SAMPLE	120484007	B2L362		ICP-2008 MS All possible metal
198897	199108	24	SAMPLE	120484006	B2L363		ICP-2008 MS All possible metal
198897	199108	25	SAMPLE	120484001	B2L5C4		ICP-2008 MS All possible metal
198897	199108	26	SAMPLE	120484005	B2L364		ICP-2008 MS All possible metal
198897	199108	27	SAMPLE	120484004	B2L365		ICP-2008 MS All possible metal
198897	199108	28	SAMPLE	120484003	B2L5C9		ICP-2008 MS All possible metal
198897	199108	29	SAMPLE	120484002	B2L3B5		ICP-2008 MS All possible metal
198897	199108	30	MSD	73489	B2L5C4(120484001MSD)	120484001	ICP-2008 MS All possible metal
198897	199108	31	MS	73488	B2L5C4(120484001MS)	120484001	ICP-2008 MS All possible metal
198920	199037	1	BLANK	73278	BLANK		Hexavalent chromium
198920	199037	4	LCS	73279	LCS		Hexavalent chromium
198920	199037	5	DUP	73280	B2L5C4(120484001DUP)	120484001	Hexavalent chromium
198920	199037	6	MS	73281	B2L5C4(120484001MS)	120484001	Hexavalent chromium
198920	199037	7	IMS	73283	B2L5C4(120484001IMS)	120484001	Hexavalent chromium
198920	199037	8	PSTSPK	73282	PSTSPK		Hexavalent chromium

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
198920	199037	9	SAMPLE	120484001	B2L5C4		Hexavalent chromium
198920	199037	10	SAMPLE	120484002	B2L3B5		Hexavalent chromium
198920	199037	11	SAMPLE	120484003	B2L5C9		Hexavalent chromium
198920	199037	12	SAMPLE	120484004	B2L365		Hexavalent chromium
198920	199037	13	SAMPLE	120484005	B2L364		Hexavalent chromium
198920	199037	14	SAMPLE	120484006	B2L363		Hexavalent chromium
198920	199037	15	SAMPLE	120484007	B2L362		Hexavalent chromium
198920	199037	16	SAMPLE	120484008	B2L359		Hexavalent chromium
198920	199037	17	SAMPLE	120484009	B2L358		Hexavalent chromium
198920	199037	18	SAMPLE	120484010	B2L393		Hexavalent chromium
198920	199037	20	SAMPLE	120484011	B2L3B0		Hexavalent chromium
198920	199037	21	SAMPLE	120484012	B2L3B2		Hexavalent chromium
198920	199037	22	SAMPLE	120484013	B2L5C7		Hexavalent chromium
198920	199037	23	SAMPLE	120484014	B2L3B7		Hexavalent chromium
198920	199037	24	SAMPLE	120484015	B2L5C5		Hexavalent chromium
198920	199037	25	SAMPLE	120484016	B2L5C8		Hexavalent chromium
198920	199037	26	SAMPLE	120484017	B2L387		Hexavalent chromium
198920	199037	27	SAMPLE	120484018	B2L357		Hexavalent chromium
198920	199037	28	SAMPLE	120484019	B2L390		Hexavalent chromium
199005	199219	4	BLANK	73547	BLANK		ICP-2008 MS All possible metal
199005	199219	5	LCS	73548	LCS		ICP-2008 MS All possible metal
199005	199219	6	SAMPLE	120484021	B2L3B1		ICP-2008 MS All possible metal
199005	199219	7	MS	73549	B2L3B1(120484021MS)	120484021	ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
199005	199219	8	MSD	73550	B2L3B1(120484021MSD)	120484021	ICP-2008 MS All possible metal
199005	199219	9	SAMPLE	120484022	B2L361		ICP-2008 MS All possible metal
199005	199219	10	SAMPLE	120484023	B2L397		ICP-2008 MS All possible metal
199005	199219	11	SAMPLE	120484024	B2L5C6		ICP-2008 MS All possible metal
199005	199219	12	SAMPLE	120484025	B2L386		ICP-2008 MS All possible metal
199005	199219	13	SAMPLE	120484026	B2L388		ICP-2008 MS All possible metal
199005	199219	14	SAMPLE	120484027	B2L389		ICP-2008 MS All possible metal
199005	199219	15	SAMPLE	120484028	B2L394		ICP-2008 MS All possible metal
199005	199219	16	SAMPLE	120484029	B2L391		ICP-2008 MS All possible metal
199005	199219	17	SAMPLE	120484030	B2L396		ICP-2008 MS All possible metal
199005	199219	20	SAMPLE	120484031	B2L385		ICP-2008 MS All possible metal
199005	199219	21	SAMPLE	120484032	B2L3B4		ICP-2008 MS All possible metal
199005	199219	22	SAMPLE	120484033	B2L392		ICP-2008 MS All possible metal
199005	199219	23	SAMPLE	120484034	B2L384		ICP-2008 MS All possible metal
199005	199219	24	SAMPLE	120484035	B2L395		ICP-2008 MS All possible metal
199005	199219	25	SAMPLE	120484036	B2L399		ICP-2008 MS All possible metal
199005	199219	26	SAMPLE	120484037	B2L398		ICP-2008 MS All possible metal
199005	199229	1	LCS	73548	LCS		ICP-2008 MS All possible metal
199005	199229	2	BLANK	73547	BLANK		ICP-2008 MS All possible metal
199005	199229	11	SAMPLE	120484037	B2L398		ICP-2008 MS All possible metal
199005	199229	12	SAMPLE	120484036	B2L399		ICP-2008 MS All possible metal
199005	199229	13	SAMPLE	120484035	B2L395		ICP-2008 MS All possible metal
199005	199229	14	SAMPLE	120484034	B2L384		ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
199005	199229	15	SAMPLE	120484033	B2L392		ICP-2008 MS All possible metal
199005	199229	16	SAMPLE	120484032	B2L3B4		ICP-2008 MS All possible metal
199005	199229	17	SAMPLE	120484031	B2L385		ICP-2008 MS All possible metal
199005	199229	18	SAMPLE	120484030	B2L396		ICP-2008 MS All possible metal
199005	199229	19	SAMPLE	120484029	B2L391		ICP-2008 MS All possible metal
199005	199229	20	SAMPLE	120484028	B2L394		ICP-2008 MS All possible metal
199005	199229	21	SAMPLE	120484027	B2L389		ICP-2008 MS All possible metal
199005	199229	22	SAMPLE	120484026	B2L388		ICP-2008 MS All possible metal
199005	199229	23	SAMPLE	120484025	B2L386		ICP-2008 MS All possible metal
199005	199229	24	SAMPLE	120484024	B2L5C6		ICP-2008 MS All possible metal
199005	199229	25	SAMPLE	120484023	B2L397		ICP-2008 MS All possible metal
199005	199229	26	SAMPLE	120484022	B2L361		ICP-2008 MS All possible metal
199005	199229	27	MSD	73550	B2L3B1(120484021MSD)	120484021	ICP-2008 MS All possible metal
199005	199229	28	MS	73549	B2L3B1(120484021MS)	120484021	ICP-2008 MS All possible metal
199005	199229	29	SAMPLE	120484021	B2L3B1		ICP-2008 MS All possible metal
199019	199220	2	BLANK	73615	BLANK		Anions by Ion Chromatography (Solid)
199019	199220	3	LCS	73616	LCS		Anions by Ion Chromatography (Solid)
199019	199220	4	MS	73617	B2L360(120484020MS)	120484020	Anions by Ion Chromatography (Solid)
199019	199220	5	MSD	73618	B2L360(120484020MSD)	120484020	Anions by Ion Chromatography (Solid)
199019	199220	6	DUP	73619	B2L360(120484020DUP)	120484020	Anions by Ion Chromatography (Solid)
199019	199220	8	SAMPLE	120484011	B2L3B0		Anions by Ion Chromatography (Solid)
199019	199220	9	SAMPLE	120484012	B2L3B2		Anions by Ion Chromatography (Solid)
199019	199220	10	SAMPLE	120484013	B2L5C7		Anions by Ion Chromatography (Solid)

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch 199005 **Test** ICP-2008 MS All possible metal
Associated Samples 120484021, 120484022, 120484023, 120484024, 120484025, 120484026, 120484027, 120484028, 120484029, 120484030, 120484031, 120484032, 120484033, 120484034, 120484035, 120484036, 120484037

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #73547**							
Manganese	7439-96-5		<0.10	ug/L					UX	04/25/12
Nickel	7440-02-0		<0.10	ug/L					U	04/25/12
Silver	7440-22-4		<0.050	ug/L					U	04/25/12
Antimony	7440-36-0		<0.30	ug/L					U	04/25/12
Barium	7440-39-3		<0.20	ug/L					U	04/25/12
Beryllium	7440-41-7		<0.10	ug/L					U	04/25/12
Cadmium	7440-43-9		<0.050	ug/L					U	04/25/12
Chromium	7440-47-3		<0.10	ug/L					U	04/25/12
Cobalt	7440-48-4		<0.050	ug/L					U	04/25/12
Copper	7440-50-8		<0.10	ug/L					U	04/25/12
Vanadium	7440-62-2		<0.20	ug/L					U	04/25/12
Zinc	7440-66-6		<1.0	ug/L					U	04/25/12
Lead	7439-92-1		<0.050	ug/L					U	04/25/12
Mercury	7439-97-6		<0.050	ug/L					U	04/25/12
Molybdenum	7439-98-7		<0.050	ug/L					U	04/25/12
Strontium	7440-24-6		<0.10	ug/L					U	04/25/12
Tin	7440-31-5		<0.050	ug/L					U	04/25/12
Uranium	7440-61-1		<0.050	ug/L					U	04/25/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Arsenic	7440-38-2		<0.20	ug/L					U	04/25/12
Selenium	7782-49-2		<0.50	ug/L					U	04/25/12
LCS			**QC Sample #73548**							
Manganese	7439-96-5		356	mg/kg	124.4	75 - 121			X	04/25/12
Nickel	7440-02-0		64.4	mg/kg	108.9	74 - 122				04/25/12
Silver	7440-22-4		39.9	mg/kg	116	83 - 127				04/25/12
Antimony	7440-36-0		181	mg/kg	148.2	62 - 205				04/25/12
Barium	7440-39-3		192	mg/kg	113.8	78 - 118				04/25/12
Beryllium	7440-41-7		73.6	mg/kg	118	77 - 120				04/25/12
Cadmium	7440-43-9		68.8	mg/kg	111.3	76 - 129				04/25/12
Chromium	7440-47-3		77.1	mg/kg	108.1	68 - 119				04/25/12
Cobalt	7440-48-4		118	mg/kg	114.5	77 - 122				04/25/12
Copper	7440-50-8		87.7	mg/kg	108	67 - 120				04/25/12
Vanadium	7440-62-2		69.1	mg/kg	116.8	67 - 122				04/25/12
Zinc	7440-66-6		156	mg/kg	110.9	73 - 131				04/25/12
Lead	7439-92-1		103	mg/kg	111.6	79 - 124				04/25/12
Mercury	7439-97-6		4.41	mg/kg	117.1	69 - 124				04/25/12
Molybdenum	7439-98-7		52.5	mg/kg	123.3	80 - 125				04/25/12
Strontium	7440-24-6		78.0	mg/kg	107.7	78 - 119				04/25/12
Tin	7440-31-5		127	mg/kg	118.9	84 - 130				04/25/12
Uranium	7440-61-1		480	mg/kg	108.4	86 - 113				04/25/12
Arsenic	7440-38-2		108	mg/kg	116.6	79 - 125				04/25/12
Selenium	7782-49-2		88.1	mg/kg	98.5	82 - 133				04/25/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MS			**QC Sample #73549**							
			Original	**120484021**						
Manganese	7439-96-5	433	59.9	mg/kg	60.3	70 - 130			NX	04/25/12
Nickel	7440-02-0	10.1	99.2	mg/kg	99.7	70 - 130				04/25/12
Silver	7440-22-4	<0.055	108	mg/kg	108.5	70 - 130				04/25/12
Antimony	7440-36-0	<0.33	100	mg/kg	100.5	70 - 130				04/25/12
Barium	7440-39-3	60.7	110	mg/kg	110.7	70 - 130				04/25/12
Beryllium	7440-41-7	0.289	102	mg/kg	102.7	70 - 130				04/25/12
Cadmium	7440-43-9	0.0766	107	mg/kg	107.2	70 - 130				04/25/12
Chromium	7440-47-3	5.72	102	mg/kg	102.7	70 - 130				04/25/12
Cobalt	7440-48-4	12.8	104	mg/kg	105	70 - 130				04/25/12
Copper	7440-50-8	20.0	99.1	mg/kg	99.6	70 - 130				04/25/12
Vanadium	7440-62-2	86.7	89.3	mg/kg	89.8	70 - 130				04/25/12
Zinc	7440-66-6	57.1	92.2	mg/kg	92.7	70 - 130				04/25/12
Lead	7439-92-1	3.82	106	mg/kg	106.5	70 - 130				04/25/12
Mercury	7439-97-6	<0.055	2.20	mg/kg	110.5	70 - 130				04/25/12
Molybdenum	7439-98-7	0.634	109	mg/kg	109.7	70 - 130				04/25/12
Strontium	7440-24-6	27.0	109	mg/kg	109.8	70 - 130				04/25/12
Tin	7440-31-5	0.545	109	mg/kg	109.4	70 - 130				04/25/12
Uranium	7440-61-1	0.541	109	mg/kg	110	70 - 130				04/25/12
Arsenic	7440-38-2	2.53	105	mg/kg	105.2	70 - 130				04/25/12
Selenium	7782-49-2	0.334	89.4	mg/kg	89.8	70 - 130				04/25/12
MSD			**QC Sample #73550**							
			Original	**120484021**				**Paired**	**73549**	
Manganese	7439-96-5	433	142	mg/kg	136	70 - 130	15.70	30	NX	04/25/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Nickel	7440-02-0	10.1	109	mg/kg	104.5	70 - 130	8.80	30		04/25/12
Silver	7440-22-4	<0.055	119	mg/kg	113.9	70 - 130	9.70	30		04/25/12
Antimony	7440-36-0	<0.33	112	mg/kg	106.9	70 - 130	11.30	30		04/25/12
Barium	7440-39-3	60.7	126	mg/kg	120.8	70 - 130	9.00	30		04/25/12
Beryllium	7440-41-7	0.289	120	mg/kg	114.6	70 - 130	16.20	30		04/25/12
Cadmium	7440-43-9	0.0766	117	mg/kg	111.8	70 - 130	8.90	30		04/25/12
Chromium	7440-47-3	5.72	114	mg/kg	109.3	70 - 130	10.50	30		04/25/12
Cobalt	7440-48-4	12.8	114	mg/kg	108.7	70 - 130	7.40	30		04/25/12
Copper	7440-50-8	20.0	109	mg/kg	104	70 - 130	8.10	30		04/25/12
Vanadium	7440-62-2	86.7	108	mg/kg	103.3	70 - 130	10.40	30		04/25/12
Zinc	7440-66-6	57.1	106	mg/kg	101.5	70 - 130	9.00	30		04/25/12
Lead	7439-92-1	3.82	117	mg/kg	112.2	70 - 130	9.50	30		04/25/12
Mercury	7439-97-6	<0.055	2.46	mg/kg	117.5	70 - 130	11.20	30		04/25/12
Molybdenum	7439-98-7	0.634	122	mg/kg	116.2	70 - 130	10.30	30		04/25/12
Strontium	7440-24-6	27.0	124	mg/kg	118.8	70 - 130	11.20	30		04/25/12
Tin	7440-31-5	0.545	120	mg/kg	114.3	70 - 130	9.60	30		04/25/12
Uranium	7440-61-1	0.541	122	mg/kg	116.2	70 - 130	10.30	30		04/25/12
Arsenic	7440-38-2	2.53	114	mg/kg	109.5	70 - 130	8.90	30		04/25/12
Selenium	7782-49-2	0.334	97.1	mg/kg	92.8	70 - 130	8.20	30		04/25/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch 198897 **Test** ICP-2008 MS All possible metal

Associated Samples 120484001, 120484002, 120484003, 120484004, 120484005, 120484006, 120484007, 120484008, 120484009, 120484010, 120484011, 120484012, 120484013, 120484014, 120484015, 120484016, 120484017, 120484018, 120484019, 120484020

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #73486**							
Manganese	7439-96-5		<0.10	ug/L					U	04/24/12
Nickel	7440-02-0		<0.10	ug/L					U	04/24/12
Silver	7440-22-4		<0.050	ug/L					U	04/24/12
Antimony	7440-36-0		<0.30	ug/L					U	04/24/12
Barium	7440-39-3		<0.20	ug/L					U	04/24/12
Beryllium	7440-41-7		<0.10	ug/L					U	04/24/12
Cadmium	7440-43-9		<0.050	ug/L					U	04/24/12
Chromium	7440-47-3		<0.10	ug/L					U	04/24/12
Cobalt	7440-48-4		<0.050	ug/L					U	04/24/12
Copper	7440-50-8		0.102	ug/L					B	04/24/12
Vanadium	7440-62-2		<0.20	ug/L					U	04/24/12
Zinc	7440-66-6		<1.0	ug/L					U	04/24/12
Lead	7439-92-1		<0.050	ug/L					U	04/24/12
Mercury	7439-97-6		<0.050	ug/L					U	04/24/12
Molybdenum	7439-98-7		<0.050	ug/L					U	04/24/12
Strontium	7440-24-6		<0.10	ug/L					U	04/24/12
Tin	7440-31-5		<0.050	ug/L					U	04/24/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Uranium	7440-61-1		<0.050	ug/L					U	04/24/12
Arsenic	7440-38-2		<0.20	ug/L					U	04/24/12
Selenium	7782-49-2		<0.50	ug/L					U	04/24/12
LCS			**QC Sample #73487**							
Manganese	7439-96-5		290	mg/kg	101.6	75 - 121				04/24/12
Nickel	7440-02-0		58.8	mg/kg	99.5	74 - 122				04/24/12
Silver	7440-22-4		36.6	mg/kg	106.4	83 - 127				04/24/12
Antimony	7440-36-0		95.0	mg/kg	77.9	62 - 205				04/24/12
Barium	7440-39-3		171	mg/kg	101.4	78 - 118				04/24/12
Beryllium	7440-41-7		60.5	mg/kg	97	77 - 120				04/24/12
Cadmium	7440-43-9		63.2	mg/kg	102.2	76 - 129				04/24/12
Chromium	7440-47-3		66.7	mg/kg	93.5	68 - 119				04/24/12
Cobalt	7440-48-4		108	mg/kg	105.2	77 - 122				04/24/12
Copper	7440-50-8		80.2	mg/kg	98.8	67 - 120				04/24/12
Vanadium	7440-62-2		54.5	mg/kg	92.1	67 - 122				04/24/12
Zinc	7440-66-6		138	mg/kg	97.9	73 - 131				04/24/12
Lead	7439-92-1		95.5	mg/kg	103.4	79 - 124				04/24/12
Mercury	7439-97-6		4.06	mg/kg	107.7	69 - 124				04/24/12
Molybdenum	7439-98-7		43.9	mg/kg	102.9	80 - 125				04/24/12
Strontium	7440-24-6		67.5	mg/kg	93.3	78 - 119				04/24/12
Tin	7440-31-5		119	mg/kg	110.9	84 - 130				04/24/12
Uranium	7440-61-1		408	mg/kg	96	86 - 113				04/24/12
Arsenic	7440-38-2		96.1	mg/kg	103.7	79 - 125				04/24/12
Selenium	7782-49-2		75.6	mg/kg	84.5	82 - 133				04/24/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MS			**QC Sample #73488**							
			Original	**120484001**						
Manganese	7439-96-5	449	99.5	mg/kg	90.8	70 - 130			X	04/24/12
Nickel	7440-02-0	11.8	107	mg/kg	97.6	70 - 130				04/24/12
Silver	7440-22-4	<0.053	114	mg/kg	103.8	70 - 130				04/24/12
Antimony	7440-36-0	<0.32	92.1	mg/kg	84	70 - 130				04/24/12
Barium	7440-39-3	78.7	105	mg/kg	96.1	70 - 130				04/24/12
Beryllium	7440-41-7	0.376	109	mg/kg	99.2	70 - 130				04/24/12
Cadmium	7440-43-9	0.0794	111	mg/kg	101.4	70 - 130				04/24/12
Chromium	7440-47-3	7.15	111	mg/kg	101.6	70 - 130				04/24/12
Cobalt	7440-48-4	11.5	113	mg/kg	103	70 - 130				04/24/12
Copper	7440-50-8	20.0	105	mg/kg	95.9	70 - 130				04/24/12
Vanadium	7440-62-2	54.5	117	mg/kg	106.8	70 - 130				04/24/12
Zinc	7440-66-6	51.0	103	mg/kg	94.3	70 - 130				04/24/12
Lead	7439-92-1	6.74	111	mg/kg	101.6	70 - 130				04/24/12
Mercury	7439-97-6	<0.053	2.37	mg/kg	108	70 - 130				04/24/12
Molybdenum	7439-98-7	0.480	116	mg/kg	105.8	70 - 130				04/24/12
Strontium	7440-24-6	35.1	114	mg/kg	104	70 - 130				04/24/12
Tin	7440-31-5	0.559	117	mg/kg	106.4	70 - 130				04/24/12
Uranium	7440-61-1	0.583	115	mg/kg	105.3	70 - 130				04/24/12
Arsenic	7440-38-2	3.44	108	mg/kg	98.6	70 - 130				04/24/12
Selenium	7782-49-2	0.307	87.9	mg/kg	80.2	70 - 130				04/24/12
MSD			**QC Sample #73489**							
			Original	**120484001**				**Paired**	**73488**	
Manganese	7439-96-5	449	98.1	mg/kg	89.4	70 - 130	0.20	30	X	04/24/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Nickel	7440-02-0	11.8	107	mg/kg	97.7	70 - 130	0.00	30		04/24/12
Silver	7440-22-4	<0.053	113	mg/kg	103.3	70 - 130	0.90	30		04/24/12
Antimony	7440-36-0	<0.32	92.3	mg/kg	84	70 - 130	0.20	30		04/24/12
Barium	7440-39-3	78.7	104	mg/kg	94.6	70 - 130	1.10	30		04/24/12
Beryllium	7440-41-7	0.376	101	mg/kg	91.9	70 - 130	7.60	30		04/24/12
Cadmium	7440-43-9	0.0794	110	mg/kg	100.3	70 - 130	0.90	30		04/24/12
Chromium	7440-47-3	7.15	107	mg/kg	97.6	70 - 130	3.40	30		04/24/12
Cobalt	7440-48-4	11.5	111	mg/kg	101.3	70 - 130	1.60	30		04/24/12
Copper	7440-50-8	20.0	105	mg/kg	95.2	70 - 130	0.80	30		04/24/12
Vanadium	7440-62-2	54.5	111	mg/kg	100.8	70 - 130	3.60	30		04/24/12
Zinc	7440-66-6	51.0	102	mg/kg	93.3	70 - 130	0.70	30		04/24/12
Lead	7439-92-1	6.74	109	mg/kg	99.3	70 - 130	1.70	30		04/24/12
Mercury	7439-97-6	<0.053	2.28	mg/kg	104	70 - 130	3.90	30		04/24/12
Molybdenum	7439-98-7	0.480	115	mg/kg	104.7	70 - 130	0.90	30		04/24/12
Strontium	7440-24-6	35.1	113	mg/kg	103.1	70 - 130	0.70	30		04/24/12
Tin	7440-31-5	0.559	114	mg/kg	103.8	70 - 130	1.70	30		04/24/12
Uranium	7440-61-1	0.583	112	mg/kg	101.7	70 - 130	3.50	30		04/24/12
Arsenic	7440-38-2	3.44	108	mg/kg	98.6	70 - 130	0.90	30		04/24/12
Selenium	7782-49-2	0.307	88.8	mg/kg	80.9	70 - 130	1.00	30		04/24/12

Date: 03 May 2012
To: CH2M Hill (technical representative)
From: Analytical Quality Associates, Inc.
Project: Area AA Zone 2 Impacted Area Verification Samples
Subject: General Chemistry - Sample Data Group (SDG) WSCF120484

INTRODUCTION

This memorandum presents the results of data validation for SDG WSCF120484 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
B2L5C4	4/15/12	Soil	C	300.0 & 7196 (Cr VI)
B2L5C5	4/15/12	Soil	C	300.0 & 7196 (Cr VI)
B2L5C6	4/15/12	Soil	C	300.0 & 7196 (Cr VI)
B2L5C7	4/15/12	Soil	C	300.0 & 7196 (Cr VI)
B2L5C8	4/15/12	Soil	C	300.0 & 7196 (Cr VI)
B2L5C9	4/15/12	Soil	C	300.0 & 7196 (Cr VI)

Data validation was conducted in accordance with the CHPRC validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan, DOE/RL-96-22, Rev. 5 (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 are as follows:

- All anions – extraction within 28 days of sample collection and analysis within 48 hours of extraction
- Hexavalent chromium – extraction of soils within 30 days of sample collection and analysis within 24 hours of extraction

Sample preservation requires chilling to 4 degrees Celsius.

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 sample accuracy limits are 70% to 130% and the laboratory control sample accuracy limits are the ones specified by the DV procedure. 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 with the following exception. For Cr VI batch 198920, the MS recovery was < the lower acceptance limit. The associated sample results were all non-detects and should be qualified as estimates and flagged "UJ." See the table in Appendix 2 for a listing of the affected samples.

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) limit is 30%. The RPD limits for reported analytes not listed in the SAP are specified by the DV procedure. When duplicate RPDs exceed the limits and associated results are <5X the reporting limit (RL) with absolute differences <2X the RL, no precision infraction occurred.

MS/MSD Samples

All MS/MSD RPD values were acceptable.

Laboratory Duplicate Samples

All laboratory duplicate results were acceptable with the following exceptions. For Cr VI batch 199412, the duplicate relative percent difference was >30%. However, the parent and/or duplicate results were <5X the RL, and the absolute difference was <2X the RL. Therefore, no sample data should be qualified.

Field Duplicate Samples

All field duplicate results were acceptable.

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 with associated non-detected sample results were below the CRDLs.

CRDLs for fluoride, chloride, nitrate-N and nitrite-N were not provided in the SAP.

- **Completeness**

SDG WSCF120484 was 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 hexavalent chromium sample results as estimates were due low matrix spike recovery. 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-96-22, Rev. 5, *100 Area Remedial Action Sampling and Analysis Plan*, September 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			
SDG: WSCF120484	Reviewer: AQA	Project: Area AA Zone 2 Impacted Area Verification Samples	Page 1 of 1
Analyte(s)	**Qualifier**	**Samples Affected**	**Reason**
Cr (VI)	UJ	B2L5C4, B2L5C5, B2L5C7, B2L5C8, B2L5C9	Low MS recovery

Comments: None

Appendix 3

Annotated Laboratory Reports

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484001
SAF# F11-096
Sample ID B2L5C4

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ		Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC											**04/17/12**
Anions by IC											
Fluoride	16984-48-8	LA-533-410	U		<1.1		mg/kg	1	1.1	3.7	04/18/12
Chloride	16887-00-6	LA-533-410	B		3.92		mg/kg	1	2.9	21	04/18/12
Nitrite-N	NO2-N	LA-533-410	U		<0.98		mg/kg	1	0.98	5.0	04/18/12
Nitrate-N	NO3-N	LA-533-410	B		1.39		mg/kg	1	0.94	5.0	04/18/12
Sulfate	14808-79-8	LA-533-410	B		9.58		mg/kg	1	5.6	53	04/18/12
Cr(VI) Prep											**04/18/12**
Cr(VI)											
Hexavalent chromium	18540-29-9	LA-265-403	UN	UJ	<0.10		ug/g	1	0.10	0.50	04/19/12
~~**ICPMS Prep**~~											~~**04/23/12**~~
ICP-MS											
Manganese	7439-96-5	LA-505-412			449		mg/kg	1	0.11	1.1	04/24/12
Nickel	7440-02-0	LA-505-412			11.8		mg/kg	1	0.11	1.1	04/24/12
Silver	7440-22-4	LA-505-412	U		<0.053		mg/kg	1	0.053	0.53	04/24/12
Antimony	7440-36-0	LA-505-412	U		<0.32		mg/kg	1	0.32	3.2	04/24/12
Barium	7440-39-3	LA-505-412			78.7		mg/kg	1	0.21	2.1	04/24/12
Beryllium	7440-41-7	LA-505-412	B		0.376		mg/kg	1	0.11	1.1	04/24/12
Cadmium	7440-43-9	LA-505-412	B		0.0794		mg/kg	1	0.053	0.53	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484003
SAF# F11-096
Sample ID B2L5C9

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**04/17/12**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<1.1		mg/kg	1	1.1	3.6	04/18/12
Chloride	16887-00-6	LA-533-410	U	<2.9		mg/kg	1	2.9	20	04/18/12
Nitrite-N	NO2-N	LA-533-410	U	<0.95		mg/kg	1	0.95	4.9	04/18/12
Nitrate-N	NO3-N	LA-533-410	U	<0.92		mg/kg	1	0.92	4.9	04/18/12
Sulfate	14808-79-8	LA-533-410	U	<5.4		mg/kg	1	5.4	52	04/18/12
Cr(VI) Prep										**04/18/12**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	UN	UJ <0.098		ug/g	1	0.098	0.49	04/19/12
~~**ICPMS Prep**~~										~~**04/23/12**~~
ICP-MS										
Manganese	7439-96-5	LA-505-412		6.60		mg/kg	1	0.11	1.1	04/24/12
Nickel	7440-02-0	LA-505-412	U	<0.11		mg/kg	1	0.11	1.1	04/24/12
Silver	7440-22-4	LA-505-412	U	<0.053		mg/kg	1	0.053	0.53	04/24/12
Antimony	7440-36-0	LA-505-412	U	<0.32		mg/kg	1	0.32	3.2	04/24/12
Barium	7440-39-3	LA-505-412		2.75		mg/kg	1	0.21	2.1	04/24/12
Beryllium	7440-41-7	LA-505-412	U	<0.11		mg/kg	1	0.11	1.1	04/24/12
Cadmium	7440-43-9	LA-505-412	U	<0.053		mg/kg	1	0.053	0.53	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484015
SAF# F11-096
Sample ID B2L5C5

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ		Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC											**04/19/12**
Anions by IC											
Fluoride	16984-48-8	LA-533-410	U		<1.1		mg/kg	1	1.1	3.7	04/19/12
Chloride	16887-00-6	LA-533-410	U		<3.0		mg/kg	1	3.0	21	04/19/12
Nitrite-N	NO2-N	LA-533-410	U		<0.99		mg/kg	1	0.99	5.0	04/19/12
Nitrate-N	NO3-N	LA-533-410	U		<0.96		mg/kg	1	0.96	5.1	04/19/12
Sulfate	14808-79-8	LA-533-410	B		7.81		mg/kg	1	5.7	54	04/19/12
Cr(VI) Prep											**04/18/12**
Cr(VI)											
Hexavalent chromium	18540-29-9	LA-265-403	UN	UJ	<0.10		ug/g	1	0.10	0.51	04/19/12
ICPMS Prep											**04/23/12**
ICP-MS											
Manganese	7439-96-5	LA-505-412			481		mg/kg	1	0.11	1.1	04/24/12
Nickel	7440-02-0	LA-505-412			12.2		mg/kg	1	0.11	1.1	04/24/12
Silver	7440-22-4	LA-505-412	U		<0.054		mg/kg	1	0.054	0.54	04/24/12
Antimony	7440-36-0	LA-505-412	U		<0.32		mg/kg	1	0.32	3.2	04/24/12
Barium	7440-39-3	LA-505-412			80.5		mg/kg	1	0.22	2.2	04/24/12
Beryllium	7440-41-7	LA-505-412	B		0.332		mg/kg	1	0.11	1.1	04/24/12
Cadmium	7440-43-9	LA-505-412	B		0.0948		mg/kg	1	0.054	0.54	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484013
SAF# F11-096
Sample ID B2L5C7

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ		Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC											**04/19/12**
Anions by IC											
Fluoride	16984-48-8	LA-533-410	U		<1.1		mg/kg	1	1.1	3.7	04/19/12
Chloride	16887-00-6	LA-533-410	B		4.92		mg/kg	1	3.0	21	04/19/12
Nitrite-N	NO2-N	LA-533-410	U		<0.99		mg/kg	1	0.99	5.1	04/19/12
Nitrate-N	NO3-N	LA-533-410	B		2.60		mg/kg	1	0.96	5.1	04/19/12
Sulfate	14808-79-8	LA-533-410	B		7.99		mg/kg	1	5.7	54	04/19/12
Cr(VI) Prep											**04/18/12**
Cr(VI)											
Hexavalent chromium	18540-29-9	LA-265-403	UN	UJ	<0.10		ug/g	1	0.10	0.51	04/19/12
ICPMS Prep											**04/23/12**
ICP-MS											
Manganese	7439-96-5	LA-505-412			345		mg/kg	1	0.10	1.0	04/24/12
Nickel	7440-02-0	LA-505-412			8.80		mg/kg	1	0.10	1.0	04/24/12
Silver	7440-22-4	LA-505-412	U		<0.051		mg/kg	1	0.051	0.51	04/24/12
Antimony	7440-36-0	LA-505-412	U		<0.31		mg/kg	1	0.31	3.1	04/24/12
Barium	7440-39-3	LA-505-412			61.3		mg/kg	1	0.21	2.1	04/24/12
Beryllium	7440-41-7	LA-505-412	B		0.261		mg/kg	1	0.10	1.0	04/24/12
Cadmium	7440-43-9	LA-505-412	B		0.0579		mg/kg	1	0.051	0.51	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484016
SAF# F11-096
Sample ID B2L5C8

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**04/19/12**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<1.1		mg/kg	1	1.1	3.7	04/19/12
Chloride	16887-00-6	LA-533-410	B	3.09		mg/kg	1	3.0	21	04/19/12
Nitrite-N	NO2-N	LA-533-410	U	<0.99		mg/kg	1	0.99	5.0	04/19/12
Nitrate-N	NO3-N	LA-533-410	B	1.01		mg/kg	1	0.96	5.1	04/19/12
Sulfate	14808-79-8	LA-533-410	B	6.87		mg/kg	1	5.7	54	04/19/12
Cr(VI) Prep										**04/18/12**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	UN	UJ <0.10		ug/g	1	0.10	0.51	04/19/12
~~**ICPMS Prep**~~										~~**04/23/12**~~
ICP-MS										
Manganese	7439-96-5	LA-505-412		403		mg/kg	1	0.11	1.1	04/24/12
Nickel	7440-02-0	LA-505-412		10.3		mg/kg	1	0.11	1.1	04/24/12
Silver	7440-22-4	LA-505-412	U	<0.055		mg/kg	1	0.055	0.55	04/24/12
Antimony	7440-36-0	LA-505-412	U	<0.33		mg/kg	1	0.33	3.3	04/24/12
Barium	7440-39-3	LA-505-412		73.1		mg/kg	1	0.22	2.2	04/24/12
Beryllium	7440-41-7	LA-505-412	B	0.227		mg/kg	1	0.11	1.1	04/24/12
Cadmium	7440-43-9	LA-505-412	B	0.0784		mg/kg	1	0.055	0.55	04/24/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

WSCF Analytical Results Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Sample # 120484024
SAF# F11-096
Sample ID B2L5C6

Matrix SOIL
Sampled 04/15/12
Received 04/16/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**04/19/12**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<1.1		mg/kg	1	1.1	3.7	04/19/12
Chloride	16887-00-6	LA-533-410	U	<3.0		mg/kg	1	3.0	21	04/19/12
Nitrite-N	NO2-N	LA-533-410	U	<0.99		mg/kg	1	0.99	5.1	04/19/12
Nitrate-N	NO3-N	LA-533-410	B	1.27		mg/kg	1	0.96	5.1	04/19/12
Sulfate	14808-79-8	LA-533-410	B	12.2		mg/kg	1	5.7	54	04/19/12
Cr(VI) Prep										**04/25/12**
Cr(VI)										
Hexavalent chromium	18540-29-9	LA-265-403	U	<0.10		ug/g	1	0.10	0.51	04/26/12
ICPMS Prep										**04/24/12**
ICP-MS										
Manganese	7439-96-5	LA-505-412	NX	410		mg/kg	1	0.11	1.1	04/25/12
Nickel	7440-02-0	LA-505-412		10.6		mg/kg	1	0.11	1.1	04/25/12
Silver	7440-22-4	LA-505-412	U	<0.053		mg/kg	1	0.053	0.53	04/25/12
Antimony	7440-36-0	LA-505-412	U	<0.32		mg/kg	1	0.32	3.2	04/25/12
Barium	7440-39-3	LA-505-412		72.4		mg/kg	1	0.21	2.1	04/25/12
Beryllium	7440-41-7	LA-505-412	B	0.321		mg/kg	1	0.11	1.1	04/25/12
Cadmium	7440-43-9	LA-505-412	B	0.101		mg/kg	1	0.053	0.53	04/25/12

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

B - Analyte < the PQL(or EQL)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 recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
X,Y or Z - See comment detail and/or narrative.
PQL is equivalent to Estimated Quantitation Limit (EQL)

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Attachment 2
Narrative
WSCF120484

Introduction

Samples were received at the WSCF laboratory as referenced on the WSCF SAF Number Cross Reference table included in the final report. 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 not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, D, U 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.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* 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 applicable QC controls are within the established limits.

Attachment 2
Narrative
WSCF120484

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):

- Batch QC 198920
  - Matrix Spike recovery is outside established laboratory limits. Affected sample results in this batch were "N" flagged.
- Batch QC 199412
  - Duplicate Relative Percent Difference (RPD) does not apply to results near or below the minimum detectable level. No flags issued.
  - All other applicable QC controls are within the established limits.

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

- Batch QC 198897
  - Copper – Detected in the Blank and evaluated. Affected sample results in this batch were "C" Flagged.
  - Manganese – Exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.
- Batch QC 199005
  - Manganese – Matrix Spike and/or Matrix Spike Duplicate recoveries are outside established laboratory limits. Affected sample results in this batch were "N" flagged.
  - Sample Issue Resolution Form SDR12-241 regarding Manganese LCS failure is attached to this report.
  - All other applicable 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.

Narrative

Attachment 2
Narrative
WSCF120484

SAMPLE ISSUE RESOLUTION

SIR NUM	SDR12-241
REV NUM	0
DATE INITIATED	4/26/2012

SAMPLE EVENT INFORMATION

SAF NUM(S)	F12-022, F11-096
OPERABLE UNIT(S)	100-KR-2
PROJECT(S)	100K Area AA, 100 K
SAMPLE EVENT TITLE(S)	100-K-102, Area AA Sampling
LABORATORY	Waste Sampling & Characterization

SAMPLING INFORMATION

NUMBER OF SAMPLES	18
SAMPLE NUMBERS	B2L347, B2L361, B2L384, B2L385, B2L386, B2L388, B2L389, B2L391, B2L392, B2L394, B2L395, B2L396, B2L397, B2L398, B2L399, B2L3B1, B2L3B4, B2L5C6
SAMPLE MATRIX	
COLLECTION DATE	4/15/2012 - 4/15/2012
SDG NUM	WSCF120485, WSCF120484

ISSUE BACKGROUND

CLASS	Laboratory Issue
TYPE	Quality Control Failure
DESCRIPTION	The 200.8 Manganese LCS was slightly high at 124.4% with control limits of 75-121%. The MS (60.3%) and MSD (136.0%) were outside the control limits of 70-130%. The blank was non-detect.

DISPOSITION

DESCRIPTION	PROPOSED DISPOSITION: Report the data as-is and note the QC failures in the case narrative.
JUSTIFICATION	ACCEPTED DISPOSITION: Accept the proposed resolution.

SUBMITTED BY: Marisol Avila/WSCF DATE: 4/26/12

ACCEPTED BY: Jennifer Hammons DATE: 4/30/12
Steve Trent/CHPRC DATE: 4/30/12

A-6003-640 (03/30)

PAGE 1 of 1

CH2MHill Plateau Remediation Company — **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** — F11-096-290 — PAGE 1 OF 1

COLLECTOR: FM Hall CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ
PRICE CODE: 8C	DATA TURNAROUND: 15 Days / 15 Days		
SAMPLING LOCATION: Area AA Zone 2 Sample 19	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096
AIR QUALITY: ☐			
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL		
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)

120484

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~4C	Cool~4C	Cool~4C
HOLDING TIME	6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	120mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - 7196	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C4	SOIL	4-15-12	0811	✓	✓	✓

12-05

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
FM Hall CHPRC	APR 15 2012	SSU-1	APR 15 2012
SSU-1	APR 16 2012 0810	KC Patterson CHPRC	APR 16 2012 0810
KC Patterson CHPRC	APR 16 2012 0814	C Johnson	APR 16 2012 0840

SPECIAL INSTRUCTIONS

** The CACN for all analytical work at WSCF laboratory is 402581ES20.LJ** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012 — A-6003-618 (REV 2)

Sample Receipt

Chain of Custody

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-096-291	PAGE 1 OF 1
COLLECTOR: FM Hall, CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C
SAMPLING LOCATION: Area AA Zone 2 Sampe 20	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: Waste Sampling & Characterization	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A	

DATA TURNAROUND: 15 Days / 15 Days

ORIGINAL

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	Cool~4C
HOLDING TIME				6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER				G/P	G/P	G/P
NO. OF CONTAINER(S)				1	1	1
VOLUME				120mL	60mL	60mL
SAMPLE ANALYSIS				SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - 7196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C5 15	SOIL	4.15.12	0817	✓	✓	✓

12-05

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0840
RELINQUISHED BY/REMOVED FROM: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: C Johnson	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-096-292	PAGE 1 OF 1
COLLECTOR: FM Hall CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C	DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: Area AA Zone 2 Sample 21	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
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	Cool~4C
HOLDING TIME	6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	120mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - 7196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C6 24	SOIL	4.15.12	0824	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: C Johnson	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-096-293	PAGE 1 OF 1
COLLECTOR: FM Hall, CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C	DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: Area AA Zone 2 Sample 22	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
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	Cool~4C
HOLDING TIME				6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER				G/P	G/P	G/P
NO. OF CONTAINER(S)				1	1	1
VOLUME				120mL	60mL	60mL
SAMPLE ANALYSIS				SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - /196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C7 13	SOIL	4.15.12	0831	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall	DATE/TIME: APR 15 2012 1410	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1410
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN:	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003 618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-096-294	PAGE 1 OF 1
COLLECTOR: FM Hall CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C; AIR QUALITY: ☐	DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: Area AA Zone 2 Sample 23	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096		
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: Surface	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
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	Cool~4C
HOLDING TIME	6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	120mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - /196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C8	16	SOIL	4.15.12	0817	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN: C Johnson	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20.☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-096-295	PAGE 1 OF 1
COLLECTOR: FM Hall, CHPRC	COMPANY CONTACT: TRENT, SJ	TELEPHONE NO.: 373-5869	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8C	DATA TURNAROUND: 15 Days / 15 Days
SAMPLING LOCATION: Area AA Zone 2 Sample 24	PROJECT DESIGNATION: Area AA In-Process Sampling - Soil		SAF NO.: F11-096	AIR QUALITY: ☐	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-24	ACTUAL SAMPLE DEPTH: (N/A)	COA: 302682ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
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	Cool-4C
HOLDING TIME	6 Months	30 Days	28 Days/48 Hours
TYPE OF CONTAINER	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1
VOLUME	120mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Chromium Hex - 7196;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
B2L5C9 3	SOIL	4 15 12	0801	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: FM Hall, CHPRC	DATE/TIME: APR 15 2012 1400	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: APR 15 2012 1400
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: APR 16 2012 0810	RECEIVED BY/STORED IN: KC Patterson, CHPRC	DATE/TIME: APR 16 2012 0810
RELINQUISHED BY/REMOVED FROM: KC Patterson, CHPRC	DATE/TIME: APR 16 2012 0840	RECEIVED BY/STORED IN:	DATE/TIME: APR 16 2012 0840
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 CACN for all analytical work at WSCF laboratory is 402581ES20. ☐** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Boron, Lead, Molybdenum, Selenium, Strontium, Tin, Uranium}; 200.8_HG - ICPMS {Mercury};
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate};

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

PRINTED ON 4/10/2012

A-6003-618 (REV 2)

Appendix 5

Data Validation Supporting Documentation

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: Area AA Zone 2 Impacted Area Verification Samples			DATA PACKAGE: VSR12-010		
VALIDATOR: Ken Salaz		LAB: WSCF		DATE: 5/03/12	
			SDG: WSCF120484		
ANALYSES PERFORMED					
Anions/IC X	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI X	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX Soil Samples					
B2L5C4, B2L5C5, B2L5C6, B2L5C7, B2L5C8, B2L5C9					

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:__

Cr VI Batch 198920: MS %R=63%

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:

Cr VI batch 199412: RPD >30%, parent and/or duplicate results <5X the RL, difference<2X the RL

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

Comments (attach additional sheets as necessary):

Appendix 6

Additional Documentation Requested By Client

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
198869	198872	1	BLANK	73412	BLANK		Anions by Ion Chromatography (Solid)
198869	198872	3	LCS	73413	LCS		Anions by Ion Chromatography (Solid)
198869	198872	4	MS	73414	B2L393(120484010MS)	120484010	Anions by Ion Chromatography (Solid)
198869	198872	5	MSD	73415	B2L393(120484010MSD)	120484010	Anions by Ion Chromatography (Solid)
198869	198872	6	DUP	73416	B2L393(120484010DUP)	120484010	Anions by Ion Chromatography (Solid)
198869	198872	8	SAMPLE	120484001	B2L5C4		Anions by Ion Chromatography (Solid)
198869	198872	9	SAMPLE	120484002	B2L3B5		Anions by Ion Chromatography (Solid)
198869	198872	10	SAMPLE	120484003	B2L5C9		Anions by Ion Chromatography (Solid)
198869	198872	11	SAMPLE	120484004	B2L365		Anions by Ion Chromatography (Solid)
198869	198872	12	SAMPLE	120484005	B2L364		Anions by Ion Chromatography (Solid)
198869	198872	13	SAMPLE	120484006	B2L363		Anions by Ion Chromatography (Solid)
198869	198872	14	SAMPLE	120484007	B2L362		Anions by Ion Chromatography (Solid)
198869	198872	15	SAMPLE	120484008	B2L359		Anions by Ion Chromatography (Solid)
198869	198872	16	SAMPLE	120484009	B2L358		Anions by Ion Chromatography (Solid)
198869	198872	17	SAMPLE	120484010	B2L393		Anions by Ion Chromatography (Solid)
198897	198919	4	BLANK	73486	BLANK		ICP-2008 MS All possible metal
198897	198919	5	LCS	73487	LCS		ICP-2008 MS All possible metal
198897	198919	6	SAMPLE	120484001	B2L5C4		ICP-2008 MS All possible metal
198897	198919	7	MS	73488	B2L5C4(120484001MS)	120484001	ICP-2008 MS All possible metal
198897	198919	8	MSD	73489	B2L5C4(120484001MSD)	120484001	ICP-2008 MS All possible metal
198897	198919	9	SAMPLE	120484002	B2L3B5		ICP-2008 MS All possible metal
198897	198919	10	SAMPLE	120484003	B2L5C9		ICP-2008 MS All possible metal
198897	198919	11	SAMPLE	120484004	B2L365		ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
198897	199108	15	SAMPLE	120484015	B2L5C5		ICP-2008 MS All possible metal
198897	199108	16	SAMPLE	120484014	B2L3B7		ICP-2008 MS All possible metal
198897	199108	17	SAMPLE	120484010	B2L393		ICP-2008 MS All possible metal
198897	199108	18	SAMPLE	120484013	B2L5C7		ICP-2008 MS All possible metal
198897	199108	19	SAMPLE	120484009	B2L358		ICP-2008 MS All possible metal
198897	199108	20	SAMPLE	120484012	B2L3B2		ICP-2008 MS All possible metal
198897	199108	21	SAMPLE	120484008	B2L359		ICP-2008 MS All possible metal
198897	199108	22	SAMPLE	120484011	B2L3B0		ICP-2008 MS All possible metal
198897	199108	23	SAMPLE	120484007	B2L362		ICP-2008 MS All possible metal
198897	199108	24	SAMPLE	120484006	B2L363		ICP-2008 MS All possible metal
198897	199108	25	SAMPLE	120484001	B2L5C4		ICP-2008 MS All possible metal
198897	199108	26	SAMPLE	120484005	B2L364		ICP-2008 MS All possible metal
198897	199108	27	SAMPLE	120484004	B2L365		ICP-2008 MS All possible metal
198897	199108	28	SAMPLE	120484003	B2L5C9		ICP-2008 MS All possible metal
198897	199108	29	SAMPLE	120484002	B2L3B5		ICP-2008 MS All possible metal
198897	199108	30	MSD	73489	B2L5C4(120484001MSD)	120484001	ICP-2008 MS All possible metal
198897	199108	31	MS	73488	B2L5C4(120484001MS)	120484001	ICP-2008 MS All possible metal
198920	199037	1	BLANK	73278	BLANK		Hexavalent chromium
198920	199037	4	LCS	73279	LCS		Hexavalent chromium
198920	199037	5	DUP	73280	B2L5C4(120484001DUP)	120484001	Hexavalent chromium
198920	199037	6	MS	73281	B2L5C4(120484001MS)	120484001	Hexavalent chromium
198920	199037	7	IMS	73283	B2L5C4(120484001IMS)	120484001	Hexavalent chromium
198920	199037	8	PSTSPK	73282	PSTSPK		Hexavalent chromium

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
198920	199037	9	SAMPLE	120484001	B2L5C4		Hexavalent chromium
198920	199037	10	SAMPLE	120484002	B2L3B5		Hexavalent chromium
198920	199037	11	SAMPLE	120484003	B2L5C9		Hexavalent chromium
198920	199037	12	SAMPLE	120484004	B2L365		Hexavalent chromium
198920	199037	13	SAMPLE	120484005	B2L364		Hexavalent chromium
198920	199037	14	SAMPLE	120484006	B2L363		Hexavalent chromium
198920	199037	15	SAMPLE	120484007	B2L362		Hexavalent chromium
198920	199037	16	SAMPLE	120484008	B2L359		Hexavalent chromium
198920	199037	17	SAMPLE	120484009	B2L358		Hexavalent chromium
198920	199037	18	SAMPLE	120484010	B2L393		Hexavalent chromium
198920	199037	20	SAMPLE	120484011	B2L3B0		Hexavalent chromium
198920	199037	21	SAMPLE	120484012	B2L3B2		Hexavalent chromium
198920	199037	22	SAMPLE	120484013	B2L5C7		Hexavalent chromium
198920	199037	23	SAMPLE	120484014	B2L3B7		Hexavalent chromium
198920	199037	24	SAMPLE	120484015	B2L5C5		Hexavalent chromium
198920	199037	25	SAMPLE	120484016	B2L5C8		Hexavalent chromium
198920	199037	26	SAMPLE	120484017	B2L387		Hexavalent chromium
198920	199037	27	SAMPLE	120484018	B2L357		Hexavalent chromium
198920	199037	28	SAMPLE	120484019	B2L390		Hexavalent chromium
199005	199219	4	BLANK	73547	BLANK		ICP-2008 MS All possible metal
199005	199219	5	LCS	73548	LCS		ICP-2008 MS All possible metal
199005	199219	6	SAMPLE	120484021	B2L3B1		ICP-2008 MS All possible metal
199005	199219	7	MS	73549	B2L3B1(120484021MS)	120484021	ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
199005	199229	15	SAMPLE	120484033	B2L392		ICP-2008 MS All possible metal
199005	199229	16	SAMPLE	120484032	B2L3B4		ICP-2008 MS All possible metal
199005	199229	17	SAMPLE	120484031	B2L385		ICP-2008 MS All possible metal
199005	199229	18	SAMPLE	120484030	B2L396		ICP-2008 MS All possible metal
199005	199229	19	SAMPLE	120484029	B2L391		ICP-2008 MS All possible metal
199005	199229	20	SAMPLE	120484028	B2L394		ICP-2008 MS All possible metal
199005	199229	21	SAMPLE	120484027	B2L389		ICP-2008 MS All possible metal
199005	199229	22	SAMPLE	120484026	B2L388		ICP-2008 MS All possible metal
199005	199229	23	SAMPLE	120484025	B2L386		ICP-2008 MS All possible metal
199005	199229	24	SAMPLE	120484024	B2L5C6		ICP-2008 MS All possible metal
199005	199229	25	SAMPLE	120484023	B2L397		ICP-2008 MS All possible metal
199005	199229	26	SAMPLE	120484022	B2L361		ICP-2008 MS All possible metal
199005	199229	27	MSD	73550	B2L3B1(120484021MSD)	120484021	ICP-2008 MS All possible metal
199005	199229	28	MS	73549	B2L3B1(120484021MS)	120484021	ICP-2008 MS All possible metal
199005	199229	29	SAMPLE	120484021	B2L3B1		ICP-2008 MS All possible metal
199019	199220	2	BLANK	73615	BLANK		Anions by Ion Chromatography (Solid)
199019	199220	3	LCS	73616	LCS		Anions by Ion Chromatography (Solid)
199019	199220	4	MS	73617	B2L360(120484020MS)	120484020	Anions by Ion Chromatography (Solid)
199019	199220	5	MSD	73618	B2L360(120484020MSD)	120484020	Anions by Ion Chromatography (Solid)
199019	199220	6	DUP	73619	B2L360(120484020DUP)	120484020	Anions by Ion Chromatography (Solid)
199019	199220	8	SAMPLE	120484011	B2L3B0		Anions by Ion Chromatography (Solid)
199019	199220	9	SAMPLE	120484012	B2L3B2		Anions by Ion Chromatography (Solid)
199019	199220	10	SAMPLE	120484013	B2L5C7		Anions by Ion Chromatography (Solid)

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
199019	199220	11	SAMPLE	120484014	B2L3B7		Anions by Ion Chromatography (Solid)
199019	199220	12	SAMPLE	120484015	B2L5C5		Anions by Ion Chromatography (Solid)
199019	199220	13	SAMPLE	120484016	B2L5C8		Anions by Ion Chromatography (Solid)
199019	199220	14	SAMPLE	120484017	B2L387		Anions by Ion Chromatography (Solid)
199019	199220	15	SAMPLE	120484018	B2L357		Anions by Ion Chromatography (Solid)
199019	199220	16	SAMPLE	120484019	B2L390		Anions by Ion Chromatography (Solid)
199019	199220	17	SAMPLE	120484020	B2L360		Anions by Ion Chromatography (Solid)
199020	199221	3	BLANK	73620	BLANK		Anions by Ion Chromatography (Solid)
199020	199221	4	LCS	73621	LCS		Anions by Ion Chromatography (Solid)
199020	199221	5	MS	73622	B2L389(120484027MS)	120484027	Anions by Ion Chromatography (Solid)
199020	199221	6	MSD	73623	B2L389(120484027MSD)	120484027	Anions by Ion Chromatography (Solid)
199020	199221	7	DUP	73624	B2L389(120484027DUP)	120484027	Anions by Ion Chromatography (Solid)
199020	199221	8	SAMPLE	120484021	B2L3B1		Anions by Ion Chromatography (Solid)
199020	199221	9	SAMPLE	120484022	B2L361		Anions by Ion Chromatography (Solid)
199020	199221	10	SAMPLE	120484023	B2L397		Anions by Ion Chromatography (Solid)
199020	199221	11	SAMPLE	120484024	B2L5C6		Anions by Ion Chromatography (Solid)
199020	199221	12	SAMPLE	120484025	B2L386		Anions by Ion Chromatography (Solid)
199020	199221	13	SAMPLE	120484026	B2L388		Anions by Ion Chromatography (Solid)
199020	199221	14	SAMPLE	120484027	B2L389		Anions by Ion Chromatography (Solid)
199020	199221	15	SAMPLE	120484028	B2L394		Anions by Ion Chromatography (Solid)
199020	199221	16	SAMPLE	120484029	B2L391		Anions by Ion Chromatography (Solid)
199020	199221	17	SAMPLE	120484030	B2L396		Anions by Ion Chromatography (Solid)
199023	199226	3	BLANK	73628	BLANK		Anions by Ion Chromatography (Solid)

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
199023	199226	4	LCS	73629	LCS		Anions by Ion Chromatography (Solid)
199023	199226	5	MS	73630	B2L398(120484037MS)	120484037	Anions by Ion Chromatography (Solid)
199023	199226	6	MSD	73631	B2L398(120484037MSD)	120484037	Anions by Ion Chromatography (Solid)
199023	199226	7	DUP	73632	B2L398(120484037DUP)	120484037	Anions by Ion Chromatography (Solid)
199023	199226	8	SAMPLE	120484031	B2L385		Anions by Ion Chromatography (Solid)
199023	199226	9	SAMPLE	120484032	B2L3B4		Anions by Ion Chromatography (Solid)
199023	199226	10	SAMPLE	120484033	B2L392		Anions by Ion Chromatography (Solid)
199023	199226	11	SAMPLE	120484034	B2L384		Anions by Ion Chromatography (Solid)
199023	199226	12	SAMPLE	120484035	B2L395		Anions by Ion Chromatography (Solid)
199023	199226	13	SAMPLE	120484036	B2L399		Anions by Ion Chromatography (Solid)
199023	199226	14	SAMPLE	120484037	B2L398		Anions by Ion Chromatography (Solid)
199412	199413	1	BLANK	73821	BLANK		Hexavalent chromium
199412	199413	4	LCS	73822	LCS		Hexavalent chromium
199412	199413	5	DUP	73823	B2L360(120484020DUP)	120484020	Hexavalent chromium
199412	199413	6	MS	73824	B2L360(120484020MS)	120484020	Hexavalent chromium
199412	199413	7	PSTSPK	73825	PSTSPK		Hexavalent chromium
199412	199413	8	IMS	73826	B2L360(120484020IMS)	120484020	Hexavalent chromium
199412	199413	9	SAMPLE	120484020	B2L360		Hexavalent chromium
199412	199413	10	SAMPLE	120484021	B2L3B1		Hexavalent chromium
199412	199413	11	SAMPLE	120484022	B2L361		Hexavalent chromium
199412	199413	12	SAMPLE	120484023	B2L397		Hexavalent chromium
199412	199413	13	SAMPLE	120484024	B2L5C6		Hexavalent chromium
199412	199413	14	SAMPLE	120484025	B2L386		Hexavalent chromium

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
199412	199413	15	SAMPLE	120484026	B2L388		Hexavalent chromium
199412	199413	16	SAMPLE	120484027	B2L389		Hexavalent chromium
199412	199413	17	SAMPLE	120484028	B2L394		Hexavalent chromium
199412	199413	18	SAMPLE	120484029	B2L391		Hexavalent chromium
199412	199413	20	SAMPLE	120484030	B2L396		Hexavalent chromium
199412	199413	21	SAMPLE	120484031	B2L385		Hexavalent chromium
199412	199413	22	SAMPLE	120484032	B2L3B4		Hexavalent chromium
199412	199413	23	SAMPLE	120484033	B2L392		Hexavalent chromium
199412	199413	24	SAMPLE	120484034	B2L384		Hexavalent chromium
199412	199413	25	SAMPLE	120484035	B2L395		Hexavalent chromium
199412	199413	26	SAMPLE	120484036	B2L399		Hexavalent chromium
199412	199413	27	SAMPLE	120484037	B2L398		Hexavalent chromium

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch 198869 **Test** Anions by Ion Chromatography (Solid)
Associated Samples 120484001, 120484002, 120484003, 120484004, 120484005, 120484006, 120484007, 120484008, 120484009, 120484010

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #73412**							
Fluoride	16984-48-8		<0.023	ug/mL					U	04/18/12
Chloride	16887-00-6		<0.058	ug/mL					U	04/18/12
Nitrite-N	NO2-N		<0.019	ug/mL					U	04/18/12
Nitrate-N	NO3-N		<0.019	ug/mL					U	04/18/12
Sulfate	14808-79-8		<0.11	ug/mL					U	04/18/12
LCS			**QC Sample #73413**							
Fluoride	16984-48-8		0.940	ug/mL	95	90 - 110				04/18/12
Chloride	16887-00-6		1.83	ug/mL	92.3	90 - 110				04/18/12
Nitrite-N	NO2-N		0.991	ug/mL	101.3	90 - 110				04/18/12
Nitrate-N	NO3-N		0.894	ug/mL	101	90 - 110				04/18/12
Sulfate	14808-79-8		3.78	ug/mL	96.3	90 - 110				04/18/12
MS			**QC Sample #73414**							
			Original 120484010							
Fluoride	16984-48-8	<1.1	20.6	mg/kg	82.1	80 - 120				04/18/12
Chloride	16887-00-6	<3.0	48.7	mg/kg	97	80 - 120				04/18/12
Nitrite-N	NO2-N	<0.98	24.3	mg/kg	98	80 - 120				04/18/12
Nitrate-N	NO3-N	<0.95	22.9	mg/kg	101.8	80 - 120				04/18/12
Sulfate	14808-79-8	14.9	88.7	mg/kg	89.1	80 - 120				04/18/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MSD			**QC Sample #73415**							
			Original	**120484010**					**Paired**	**73414**
Fluoride	16984-48-8	<1.1	21.0	mg/kg	84	80 - 120	1.90	30		04/18/12
Chloride	16887-00-6	<3.0	45.4	mg/kg	91	80 - 120	7.00	30		04/18/12
Nitrite-N	NO2-N	<0.98	24.0	mg/kg	97.4	80 - 120	1.20	30		04/18/12
Nitrate-N	NO3-N	<0.95	22.5	mg/kg	100.8	80 - 120	1.80	30		04/18/12
Sulfate	14808-79-8	14.9	90.1	mg/kg	91.2	80 - 120	1.90	30		04/18/12
DUP			**QC Sample #73416**							
			Original	**120484010**						
Fluoride	16984-48-8	<1.1	<1.1	mg/kg			0.00	30	U	04/18/12
Chloride	16887-00-6	<3.0	<2.9	mg/kg			3.00	30	U	04/18/12
Nitrite-N	NO2-N	<0.98	<0.97	mg/kg			0.00	30	U	04/18/12
Nitrate-N	NO3-N	<0.95	<0.94	mg/kg			1.70	30	U	04/18/12
Sulfate	14808-79-8	14.9	13.8	mg/kg			8.60	30	B	04/18/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch 199019 **Test** Anions by Ion Chromatography (Solid)
Associated Samples 120484011, 120484012, 120484013, 120484014, 120484015, 120484016, 120484017, 120484018, 120484019, 120484020

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #73615**							
Fluoride	16984-48-8		<0.023	ug/mL					U	04/19/12
Chloride	16887-00-6		<0.058	ug/mL					U	04/19/12
Nitrite-N	NO2-N		<0.019	ug/mL					U	04/19/12
Nitrate-N	NO3-N		<0.019	ug/mL					U	04/19/12
Sulfate	14808-79-8		<0.11	ug/mL					U	04/19/12
LCS			**QC Sample #73616**							
Fluoride	16984-48-8		0.915	ug/mL	92.4	90 - 110				04/19/12
Chloride	16887-00-6		1.82	ug/mL	91.7	90 - 110				04/19/12
Nitrite-N	NO2-N		0.962	ug/mL	98.3	90 - 110				04/19/12
Nitrate-N	NO3-N		0.878	ug/mL	99.1	90 - 110				04/19/12
Sulfate	14808-79-8		3.67	ug/mL	93.5	90 - 110				04/19/12
MS			**QC Sample #73617**							
			Original 120484020							
Fluoride	16984-48-8	<1.1	20.6	mg/kg	82.7	80 - 120				04/19/12
Chloride	16887-00-6	<3.0	42.1	mg/kg	84.5	80 - 120				04/19/12
Nitrite-N	NO2-N	<0.98	23.5	mg/kg	95.6	80 - 120				04/19/12
Nitrate-N	NO3-N	<0.95	22.7	mg/kg	101.9	80 - 120				04/19/12
Sulfate	14808-79-8	75.9	81.9	mg/kg	83	80 - 120				04/19/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MSD			**QC Sample #73618**							
			Original	**120484020**					**Paired**	**73617**
Fluoride	16984-48-8	<1.1	21.1	mg/kg	84	80 - 120	2.40	30		04/19/12
Chloride	16887-00-6	<3.0	43.9	mg/kg	87.4	80 - 120	4.20	30		04/19/12
Nitrite-N	NO2-N	<0.98	24.1	mg/kg	96.8	80 - 120	2.50	30		04/19/12
Nitrate-N	NO3-N	<0.95	23.1	mg/kg	102.6	80 - 120	1.70	30		04/19/12
Sulfate	14808-79-8	75.9	84.1	mg/kg	84.5	80 - 120	1.30	30		04/19/12
DUP			**QC Sample #73619**							
			Original	**120484020**						
Fluoride	16984-48-8	<1.1	<1.1	mg/kg			1.80	30	U	04/19/12
Chloride	16887-00-6	<3.0	<3.0	mg/kg			8.90	30	U	04/19/12
Nitrite-N	NO2-N	<0.98	<0.99	mg/kg			0.00	30	U	04/19/12
Nitrate-N	NO3-N	<0.95	<0.95	mg/kg			4.20	30	U	04/19/12
Sulfate	14808-79-8	75.9	77.7	mg/kg			2.30	30		04/19/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch 199020 **Test** Anions by Ion Chromatography (Solid)
Associated Samples 120484021, 120484022, 120484023, 120484024, 120484025, 120484026, 120484027, 120484028, 120484029, 120484030

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #73620**							
Fluoride	16984-48-8		<0.023	ug/mL					U	04/19/12
Chloride	16887-00-6		<0.058	ug/mL					U	04/19/12
Nitrite-N	NO2-N		<0.019	ug/mL					U	04/19/12
Nitrate-N	NO3-N		<0.019	ug/mL					U	04/19/12
Sulfate	14808-79-8		<0.11	ug/mL					U	04/19/12
LCS			**QC Sample #73621**							
Fluoride	16984-48-8		0.927	ug/mL	93.6	90 - 110				04/19/12
Chloride	16887-00-6		1.83	ug/mL	92.6	90 - 110				04/19/12
Nitrite-N	NO2-N		0.983	ug/mL	100.5	90 - 110				04/19/12
Nitrate-N	NO3-N		0.899	ug/mL	101.5	90 - 110				04/19/12
Sulfate	14808-79-8		3.70	ug/mL	94.4	90 - 110				04/19/12
MS			**QC Sample #73622**							
			Original	**120484027**						
Fluoride	16984-48-8	<1.1	21.5	mg/kg	85.2	80 - 120				04/19/12
Chloride	16887-00-6	<3.0	44.8	mg/kg	88.7	80 - 120				04/19/12
Nitrite-N	NO2-N	<0.98	24.2	mg/kg	97.1	80 - 120				04/19/12
Nitrate-N	NO3-N	<0.95	22.4	mg/kg	99.4	80 - 120				04/19/12
Sulfate	14808-79-8	<5.6	92.9	mg/kg	92.9	80 - 120				04/19/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MSD			**QC Sample #73623**							
			Original	**120484027**					**Paired** **73622**	
Fluoride	16984-48-8	<1.1	20.9	mg/kg	83.8	80 - 120	2.80	30		04/19/12
Chloride	16887-00-6	<3.0	49.3	mg/kg	98.6	80 - 120	9.60	30		04/19/12
Nitrite-N	NO2-N	<0.98	24.0	mg/kg	97.1	80 - 120	0.80	30		04/19/12
Nitrate-N	NO3-N	<0.95	22.8	mg/kg	102.2	80 - 120	1.80	30		04/19/12
Sulfate	14808-79-8	<5.6	93.5	mg/kg	94.5	80 - 120	0.60	30		04/19/12
DUP			**QC Sample #73624**							
			Original	**120484027**						
Fluoride	16984-48-8	<1.1	<1.1	mg/kg			0.00	30	U	04/19/12
Chloride	16887-00-6	<3.0	<2.9	mg/kg			12.40	30	U	04/19/12
Nitrite-N	NO2-N	<0.98	<0.97	mg/kg			0.00	30	U	04/19/12
Nitrate-N	NO3-N	<0.95	<0.94	mg/kg			10.00	30	U	04/19/12
Sulfate	14808-79-8	<5.6	<5.6	mg/kg			0.00	30	U	04/19/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch 198920 **Test** Hexavalent chromium
Associated Samples 120484001, 120484002, 120484003, 120484004, 120484005, 120484006, 120484007, 120484008, 120484009, 120484010, 120484011, 120484012, 120484013, 120484014, 120484015, 120484016, 120484017, 120484018, 120484019

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
BLANK			**QC Sample #73278**								
Hexavalent chromium	18540-29-9		<0.096	ug/g						U	04/19/12
LCS			**QC Sample #73279**								
Hexavalent chromium	18540-29-9		3.85	ug/g	99.2	80 - 120					04/19/12
DUP			**QC Sample #73280**								
			Original 120484001								
Hexavalent chromium	18540-29-9	<0.10	<0.10	ug/g			70.10	30	*	UXN	04/19/12
MS			**QC Sample #73281**								
			Original 120484001								
Hexavalent chromium	18540-29-9	<0.10	2.43	ug/g	63.2	75 - 125				N	04/19/12
PSTSPK			**QC Sample #73282**								
Hexavalent chromium	18540-29-9		0.0428	ug/g	85.6	85 - 115					04/19/12
IMS			**QC Sample #73283**								
			Original 120484001								
Hexavalent chromium	18540-29-9	<0.10	285	ug/g	80.7	75 - 125					04/19/12

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF120484

QC Batch 199412 **Test** Hexavalent chromium
Associated Samples 120484020, 120484021, 120484022, 120484023, 120484024, 120484025, 120484026, 120484027, 120484028, 120484029, 120484030, 120484031, 120484032, 120484033, 120484034, 120484035, 120484036, 120484037

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
BLANK			**QC Sample #73821**								
Hexavalent chromium	18540-29-9		<0.096	ug/g						U	04/26/12
LCS			**QC Sample #73822**								
Hexavalent chromium	18540-29-9		3.72	ug/g	96.3	80 - 120					04/26/12
DUP			**QC Sample #73823**								
			Original 120484020								
Hexavalent chromium	18540-29-9	0.220	0.116	ug/g			62.60	30	*	BX	04/26/12
MS			**QC Sample #73824**								
			Original 120484020								
Hexavalent chromium	18540-29-9	0.220	3.41	ug/g	88.4	75 - 125					04/26/12
PSTSPK			**QC Sample #73825**								
Hexavalent chromium	18540-29-9		0.0467	ug/g	93.4	85 - 115					04/26/12
IMS			**QC Sample #73826**								
			Original 120484020								
Hexavalent chromium	18540-29-9	0.220	286	ug/g	89.8	75 - 125					04/26/12