TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Richland
2800 George Washington Way
Richland, WA 99352
Tel: (509)375-3131

TestAmerica Job ID: 300-3550-1
TestAmerica Sample Delivery Group: WC1288
Client Project/Site: F16-042

For:
CH2M Hill Plateau Remediation Company
PO BOX 1600
Mail Stop R3-50
Richland, Washington 99352

Attn: CPP Sample Management

Authorized for release by:
8/16/2016 12:45:42 PM
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Designee for

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LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this package. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a desingee as verified by the attached signature.

The laboratory is accredited to EPA 7196A in Solid and Chemical Materials, per Washington State Department of Ecology this is approved for non-discharge water samples. The sample/ sample duplicate RPD agreement is not applicable if one or both results are less than five times the MDL.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Chain of Custody 5
Detection Summary 6
Client Sample Results 7
QC Sample Results 8
QC Association Summary 10
Lab Chronicle 11
Method Summary 13
Sample Summary 14
Receipt Checklists 15

Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
D	The reported value is from a dilution.
U	Analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Job ID: 300-3550-1

Laboratory: TestAmerica Richland

Narrative

Job Narrative
300-3550-1

Comments
This job is associated to SDG W07558 for rad analysis.

Receipt
The sample was received on 7/22/2016 8:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 10.0º C.

HPLC/IC
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F16-042-109	PAGE 1 OF 1

COLLECTOR: Ed Kauer CHPRC	COMPANY CONTACT: TODAK, D	TELEPHONE NO.: 376-6427	PROJECT COORDINATOR: TODAK, D	PRICE CODE: 7H; AIR QUALITY: ☐; DATA TURNAROUND: 30 Days / 30 Days
SAMPLING LOCATION: C9402, POST DEVELOPMENT	PROJECT DESIGNATION: 100-NR-2 Drilling - Water		SAF NO.: F16-042	
ICE CHEST NO.: N/A	FIELD LOGBOOK NO.: HNF-N-645 5 - 9	ACTUAL SAMPLE DEPTH: 71.92 ft	COA: 304070	METHOD OF SHIPMENT: GOVERNMENT VEHICLE; ORIGINAL
SHIPPED TO: TestAmerica Incorporated, Richland	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 are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. NA

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C	HNO3 to pH <2
HOLDING TIME	48 Hours	6 Months
TYPE OF CONTAINER	P	G/P
NO. OF CONTAINER(S)	1	1
VOLUME	500mL	1L
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

#3550
WC1288

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B35YH5	WATER	JUL 21 2016	1456	✓	✓

300-3550 COC

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Ed Kauer CHPRC	DATE/TIME: JUL 21 2016 1605	RECEIVED BY/STORED IN: SSU #1	DATE/TIME: JUL 21 2016 1605
RELINQUISHED BY/REMOVED FROM: SSU #1	DATE/TIME: JUL 22 2016 0700	RECEIVED BY/STORED IN: Janelle Zunker CHPRC	DATE/TIME: JUL 22 2016 0700
RELINQUISHED BY/REMOVED FROM: Janelle Zunker CHPRC	DATE/TIME: JUL 22 2016 0850	RECEIVED BY/STORED IN: Tim Armstrong TMCL	DATE/TIME: JUL 22 2016 0850
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
(1) 300.0_ANIONS_IC: COMMON {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate}; 300.0_ANIONS_IC: COMMON (Add-on) {Phosphorus in phosphate};
(2) ALPHA_GPC: COMMON {Gross alpha}; BETA_GPC: COMMON {Gross beta};

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

PRINTED ON 6/8/2016 FSR ID = FSR33108 TRVL NUM = TRVL-16-168 A-6003-618 (REV 2)

Detection Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Client Sample ID: B35YH5 — Lab Sample ID: 300-3550-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	74	D	0.40	0.20	mg/L	2		300.0	Total/NA
Nitrate as N	14	D	1.4	0.70	mg/L	50		300.0	Total/NA
Fluoride	0.30	D	0.10	0.050	mg/L	2		300.0	Total/NA
Sulfate	99	D	13	6.3	mg/L	50		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Client Sample ID: B35YH5

Date Collected: 07/21/16 14:56
Date Received: 07/22/16 08:50

Lab Sample ID: 300-3550-1

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**74**	**D**	0.40	0.20	mg/L			07/22/16 19:56	2
Nitrate as N	**14**	**D**	1.4	0.70	mg/L			07/22/16 23:13	50
Fluoride	**0.30**	**D**	0.10	0.050	mg/L			07/22/16 19:56	2
Nitrite as N	0.038	U D	0.076	0.038	mg/L			07/22/16 19:56	2
Orthophosphate as P	0.082	U D	0.16	0.082	mg/L			07/22/16 19:56	2
Sulfate	**99**	**D**	13	6.3	mg/L			07/22/16 23:13	50

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 300-5004/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5004

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.014	U	0.028	0.014	mg/L			07/22/16 18:41	1
Nitrite as N	0.019	U	0.038	0.019	mg/L			07/22/16 18:41	1
Orthophosphate as P	0.041	U	0.082	0.041	mg/L			07/22/16 18:41	1

Lab Sample ID: LCS 300-5004/6 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5004

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.26	2.36		mg/L		104	80 - 120
Nitrite as N	3.04	3.21		mg/L		105	80 - 120
Orthophosphate as P	6.53	6.79		mg/L		104	80 - 120

Lab Sample ID: 300-3549-A-1 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5004

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	0.088	D	0.609	0.602	D	mg/L		84	75 - 125

Lab Sample ID: 300-3549-A-1 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5004

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	7.0	D	2.26	9.34	D	mg/L		105	75 - 125
Orthophosphate as P	0.41	U D	6.53	5.63	D	mg/L		86	75 - 125

Lab Sample ID: 300-3549-A-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5004

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrite as N	0.088	D	0.0877	D	mg/L		0.3	20

Lab Sample ID: 300-3549-A-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5004

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrate as N	7.0	D	6.85	D	mg/L		2	20
Orthophosphate as P	0.41	U D	0.41	U D	mg/L		NC	20

Lab Sample ID: MB 300-5005/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5005

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.10	U	0.20	0.10	mg/L			07/22/16 18:41	1

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 300-5005/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5005

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.025	U	0.050	0.025	mg/L			07/22/16 18:41	1
Sulfate	0.13	U	0.25	0.13	mg/L			07/22/16 18:41	1

Lab Sample ID: LCS 300-5005/6 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5005

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	16.0	16.5		mg/L		103	80 - 120
Fluoride	4.00	4.14		mg/L		103	80 - 120
Sulfate	20.0	20.8		mg/L		104	80 - 120

Lab Sample ID: 300-3549-A-1 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5005

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	29	D	3.20	31.4	D	mg/L		76	75 - 125
Fluoride	0.18	D	0.800	0.899	D	mg/L		90	75 - 125

Lab Sample ID: 300-3549-A-1 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5005

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	99	D	20.0	119	D	mg/L		103	75 - 125

Lab Sample ID: 300-3549-A-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5005

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	29	D	28.9	D	mg/L		0	20
Fluoride	0.18	D	0.178	D	mg/L		0.2	20

Lab Sample ID: 300-3549-A-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 5005

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfate	99	D	96.6	D	mg/L		2	20

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

HPLC/IC

Analysis Batch: 5004

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-3550-1	B35YH5	Total/NA	Water	300.0	
300-3550-1	B35YH5	Total/NA	Water	300.0	
MB 300-5004/5	Method Blank	Total/NA	Water	300.0	
LCS 300-5004/6	Lab Control Sample	Total/NA	Water	300.0	
300-3549-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
300-3549-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
300-3549-A-1 DU	Duplicate	Total/NA	Water	300.0	
300-3549-A-1 DU	Duplicate	Total/NA	Water	300.0	

Analysis Batch: 5005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-3550-1	B35YH5	Total/NA	Water	300.0	
300-3550-1	B35YH5	Total/NA	Water	300.0	
MB 300-5005/5	Method Blank	Total/NA	Water	300.0	
LCS 300-5005/6	Lab Control Sample	Total/NA	Water	300.0	
300-3549-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
300-3549-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
300-3549-A-1 DU	Duplicate	Total/NA	Water	300.0	
300-3549-A-1 DU	Duplicate	Total/NA	Water	300.0	

Lab Chronicle

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Client Sample ID: B35YH5 — Lab Sample ID: 300-3550-1

Date Collected: 07/21/16 14:56 — **Matrix: Water**
Date Received: 07/22/16 08:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2			5004	07/22/16 19:56	RLC	TAL RCH
Total/NA	Analysis	300.0		2			5005	07/22/16 19:56	RLC	TAL RCH
Total/NA	Analysis	300.0		50			5004	07/22/16 23:13	RLC	TAL RCH
Total/NA	Analysis	300.0		50			5005	07/22/16 23:13	RLC	TAL RCH

Client Sample ID: Method Blank — Lab Sample ID: MB 300-5004/5

Date Collected: N/A — **Matrix: Water**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			5004	07/22/16 18:41	RLC	TAL RCH

Client Sample ID: Method Blank — Lab Sample ID: MB 300-5005/5

Date Collected: N/A — **Matrix: Water**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			5005	07/22/16 18:41	RLC	TAL RCH

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 300-5004/6

Date Collected: N/A — **Matrix: Water**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			5004	07/22/16 18:56	RLC	TAL RCH

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 300-5005/6

Date Collected: N/A — **Matrix: Water**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			5005	07/22/16 18:56	RLC	TAL RCH

Client Sample ID: Matrix Spike — Lab Sample ID: 300-3549-A-1 MS

Date Collected: 07/21/16 13:13 — **Matrix: Water**
Date Received: 07/22/16 08:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		2			5004	07/22/16 19:26	RLC	TAL RCH
Total/NA	Analysis	300.0		2			5005	07/22/16 19:26	RLC	TAL RCH
Total/NA	Analysis	300.0		10			5004	07/22/16 22:42	RLC	TAL RCH

Lab Chronicle

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Client Sample ID: Matrix Spike

Lab Sample ID: 300-3549-A-1 MS

Date Collected: 07/21/16 13:13

Matrix: Water

Date Received: 07/22/16 08:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			5005	07/22/16 22:42	RLC	TAL RCH

Laboratory References:

TAL RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131

Method Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL RCH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Laboratory References:

TAL RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131

Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F16-042

TestAmerica Job ID: 300-3550-1
SDG: WC1288

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
300-3550-1	B35YH5	Water	07/21/16 14:56	07/22/16 08:50

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 300-3550-1
SDG Number: WC1288

Login Number: 3550
List Number: 1
Creator: Bock, Julie A

List Source: TestAmerica Richland

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	