August 31, 2016

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: 300-3779-1
TestAmerica Sample Delivery Group: WC1378
Client Project/Site: I16-027

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

Attn: CPP Sample Management

Authorized for release by:
8/31/2016 12:57:20 PM
Steven Campbell, Project Mgmt. Assistant
steven.campbell@testamericainc.com

Designee for

Whitney Ritari, Project Manager I
(509)375-3131 ext164
whitney.ritari@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.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Client: CH2M Hill Plateau Remediation Company
Project/Site: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

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)

Client: CH2M Hill Plateau Remediation Company
Project/Site: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

Job ID: 300-3779-1

Laboratory: TestAmerica Richland

Narrative

Job Narrative
300-3779-1

Comments
No additional comments.

Receipt
The sample was received on 8/16/2016 2:40 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6º 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

C.O.C. # **I16-027-102**

Page 1 of 1

Collector	Juan Aguilar /CHPRC	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	I16-027	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	300071
Project Title	100KR4, AUGUST 2016	**Logbook No.**	HNF-N-506 86 / 82	**Ice Chest No.**	N/A
Shipped To (Lab)	TestAmerica Incorporated, Richland	**Method of Shipment**	GOVERNMENT VEHICLE	**Bill of Lading/Air Bill No.**	N/A
Protocol	CERCLA	**Priority:**	30 Days **PRIORITY**	**Offsite Property No.**	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS

** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B363N4	N	W	8-16-16	0812	1x125-mL P	300.0_ANIONS_IC: COMMON	48 Hours	Cool <=6C

#3779
WC B38

300-3779 COC

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Juan Aguilar /CHPRC			AUG 16 2016 0956	Janelle Zunker CHPRC			AUG 16 2016 0956
Janelle Zunker CHPRC			AUG 16 2016 1440	J. Bock, TARL			AUG 16 2016 1440
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED ON 7/28/2016 **FSR ID = FSR26445** A-6004-842 (REV 2)

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Detection Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

Client Sample ID: B363N4 — Lab Sample ID: 300-3779-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14	D	0.40	0.20	mg/L	2		300.0	Total/NA
Nitrate as N	5.8	D	0.056	0.028	mg/L	2		300.0	Total/NA
Fluoride	0.20	D	0.10	0.050	mg/L	2		300.0	Total/NA
Sulfate	73	D	0.50	0.25	mg/L	2		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Client: CH2M Hill Plateau Remediation Company
Project/Site: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

Client Sample ID: B363N4
Date Collected: 08/16/16 08:12
Date Received: 08/16/16 14:40

Lab Sample ID: 300-3779-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**14**	**D**	0.40	0.20	mg/L			08/17/16 20:15	2
Nitrate as N	**5.8**	**D**	0.056	0.028	mg/L			08/17/16 20:15	2
Fluoride	**0.20**	**D**	0.10	0.050	mg/L			08/17/16 20:15	2
Nitrite as N	0.038	U D	0.076	0.038	mg/L			08/17/16 20:15	2
Sulfate	**73**	**D**	0.50	0.25	mg/L			08/17/16 20:15	2

Client: CH2M Hill Plateau Remediation Company
Project/Site: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 300-5333/5
Matrix: Water
Analysis Batch: 5333

Client Sample ID: Method Blank
Prep Type: Total/NA

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			08/17/16 19:45	1
Nitrite as N	0.019	U	0.038	0.019	mg/L			08/17/16 19:45	1

Lab Sample ID: LCS 300-5333/6
Matrix: Water
Analysis Batch: 5333

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.26	2.37		mg/L		105	80 - 120
Nitrite as N	3.04	3.20		mg/L		105	80 - 120

Lab Sample ID: 300-3779-1 MS
Matrix: Water
Analysis Batch: 5333

Client Sample ID: B363N4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	5.8	D	0.452	6.29	D	mg/L		103	75 - 125
Nitrite as N	0.038	U D	0.609	0.520	D	mg/L		85	75 - 125

Lab Sample ID: 300-3779-1 DU
Matrix: Water
Analysis Batch: 5333

Client Sample ID: B363N4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrate as N	5.8	D	5.91	D	mg/L		1	20
Nitrite as N	0.038	U D	0.038	U D	mg/L		NC	20

Lab Sample ID: MB 300-5334/5
Matrix: Water
Analysis Batch: 5334

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.10	U	0.20	0.10	mg/L			08/17/16 19:45	1
Fluoride	0.025	U	0.050	0.025	mg/L			08/17/16 19:45	1
Sulfate	0.13	U	0.25	0.13	mg/L			08/17/16 19:45	1

Lab Sample ID: LCS 300-5334/6
Matrix: Water
Analysis Batch: 5334

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	16.0	16.7		mg/L		104	80 - 120
Fluoride	4.00	4.19		mg/L		105	80 - 120
Sulfate	20.0	20.9		mg/L		104	80 - 120

Client: CH2M Hill Plateau Remediation Company
Project/Site: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 300-3779-1 MS
Matrix: Water
Analysis Batch: 5334

Client Sample ID: B363N4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	14	D	3.20	17.3	D	mg/L		102	75 - 125
Fluoride	0.20	D	0.800	0.932	D	mg/L		91	75 - 125
Sulfate	73	D	4.00	77.4	D	mg/L		103	75 - 125

Lab Sample ID: 300-3779-1 DU
Matrix: Water
Analysis Batch: 5334

Client Sample ID: B363N4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	14	D	14.2	D	mg/L		2	20
Fluoride	0.20	D	0.204	D	mg/L		0.8	20
Sulfate	73	D	74.4	D	mg/L		1	20

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

HPLC/IC

Analysis Batch: 5333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-3779-1	B363N4	Total/NA	Water	300.0	
MB 300-5333/5	Method Blank	Total/NA	Water	300.0	
LCS 300-5333/6	Lab Control Sample	Total/NA	Water	300.0	
300-3779-1 MS	B363N4	Total/NA	Water	300.0	
300-3779-1 DU	B363N4	Total/NA	Water	300.0	

Analysis Batch: 5334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-3779-1	B363N4	Total/NA	Water	300.0	
MB 300-5334/5	Method Blank	Total/NA	Water	300.0	
LCS 300-5334/6	Lab Control Sample	Total/NA	Water	300.0	
300-3779-1 MS	B363N4	Total/NA	Water	300.0	
300-3779-1 DU	B363N4	Total/NA	Water	300.0	

Lab Chronicle

Client: CH2M Hill Plateau Remediation Company
Project/Site: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

Client Sample ID: B363N4
Date Collected: 08/16/16 08:12
Date Received: 08/16/16 14:40

Lab Sample ID: 300-3779-1
Matrix: Water

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			5333	08/17/16 20:15	RLC	TAL RCH
Total/NA	Analysis	300.0		2			5334	08/17/16 20:15	RLC	TAL RCH

Client Sample ID: Method Blank
Date Collected: N/A
Date Received: N/A

Lab Sample ID: MB 300-5333/5
Matrix: Water

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			5333	08/17/16 19:45	RLC	TAL RCH

Client Sample ID: Method Blank
Date Collected: N/A
Date Received: N/A

Lab Sample ID: MB 300-5334/5
Matrix: Water

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			5334	08/17/16 19:45	RLC	TAL RCH

Client Sample ID: Lab Control Sample
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCS 300-5333/6
Matrix: Water

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			5333	08/17/16 20:00	RLC	TAL RCH

Client Sample ID: Lab Control Sample
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCS 300-5334/6
Matrix: Water

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			5334	08/17/16 20:00	RLC	TAL RCH

Client Sample ID: B363N4
Date Collected: 08/16/16 08:12
Date Received: 08/16/16 14:40

Lab Sample ID: 300-3779-1 MS
Matrix: Water

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			5333	08/17/16 20:30	RLC	TAL RCH
Total/NA	Analysis	300.0		2			5334	08/17/16 20:30	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: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

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: I16-027

TestAmerica Job ID: 300-3779-1
SDG: WC1378

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
300-3779-1	B363N4	Water	08/16/16 08:12	08/16/16 14:40

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 300-3779-1
SDG Number: WC1378

Login Number: 3779
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.	N/A	
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	