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: 300-1669-1
TestAmerica Sample Delivery Group: WC0625
Client Project/Site: CHPRC Chemical Hanford

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

Attn: CPP Sample Management

Authorized for release by:
12/2/2015 2:15:12 PM
Steven Campbell, Quality Assurance Assistant
steven.campbell@testamericainc.com

Designee for

Whitney Ritari, Project Manager I
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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 elss than five times the MDL.

Table of Contents

Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company
Project/Site: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
U	Analyzed for but not detected.
N	MS, MSD: Spike recovery is outside acceptance limits.
D	The reported value is from a dilution.
B	Estimated result. Result is less than the RL, but greater than MDL

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: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Job ID: 300-1669-1

Laboratory: TestAmerica Richland

Narrative

Job Narrative
300-1669-1

Comments
No additional comments.

Receipt
The sample was received on 11/19/2015 2:55 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9º C.

HPLC/IC
Method 300.0: The matrix spike (MS) recoveries for analytical batch 300-2069 were outside control limits for Orthophosphate as P and Nitrate as N. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recoveries were within acceptance limits.

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

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W15-009-087 Page 1 of 1

Collector	J.R. Aguilar/CHPRC	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	W15-009	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	300071
Project Title	RCRA, SEPTEMBER 2015	**Logbook No.**	HNF-N-506 80 / 36	**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	AEA	**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
B327D2	N	W	11-19-15	1041	1x500-mL P	300.0_ANIONS_IC: COMMON; 300.0_ANIONS_IC: GW 01	48 Hours	Cool <=6C

#1669
W68625

300-1669 COC

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
J.R. Aguilar/CHPRC			NOV 19 2015 1130	DON BROTHERTON / CHPRC			NOV 19 2015 1130
DON BROTHERTON / CHPRC			NOV 19 2015 1455	J. Bock, TARL			NOV 19 2015 1455

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 11/16/2015 FSR ID = FSR2697 A-6004-842 (REV 2)

Detection Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Client Sample ID: B327D2 — Lab Sample ID: 300-1669-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	12	D	0.40	0.20	mg/L	2		300.0	Total/NA
Nitrate as N	32	D	0.56	0.28	mg/L	20		300.0	Total/NA
Fluoride	0.079	B D	0.10	0.050	mg/L	2		300.0	Total/NA
Sulfate	46	D	0.50	0.25	mg/L	2		300.0	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Client Sample ID: B327D2
Date Collected: 11/19/15 10:41
Date Received: 11/19/15 14:55

Lab Sample ID: 300-1669-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**12**	**D**	0.40	0.20	mg/L			11/19/15 18:44	2
Nitrate as N	**32**	**D**	0.56	0.28	mg/L			11/19/15 20:00	20
Fluoride	**0.079**	**B D**	0.10	0.050	mg/L			11/19/15 18:44	2
Nitrite as N	0.038	U	0.076	0.038	mg/L			11/19/15 18:44	2
Orthophosphate as P	0.082	U N	0.16	0.082	mg/L			11/19/15 18:44	2
Sulfate	**46**	**D**	0.50	0.25	mg/L			11/19/15 18:44	2

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 300-2069/5
Matrix: Water
Analysis Batch: 2069

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			11/19/15 13:59	1
Nitrite as N	0.019	U	0.038	0.019	mg/L			11/19/15 13:59	1
Orthophosphate as P	0.041	U	0.082	0.041	mg/L			11/19/15 13:59	1

Lab Sample ID: LCS 300-2069/6
Matrix: Water
Analysis Batch: 2069

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	2.43		mg/L		107	80 - 120
Nitrite as N	3.04	3.29		mg/L		108	80 - 120
Orthophosphate as P	6.53	7.03		mg/L		108	80 - 120

Lab Sample ID: 300-1669-1 MS
Matrix: Water
Analysis Batch: 2069

Client Sample ID: B327D2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as N	0.038	U	0.609	0.590	D	mg/L		97	75 - 125
Orthophosphate as P	0.082	U N	1.31	0.598	N D	mg/L		46	75 - 125

Lab Sample ID: 300-1669-1 MS
Matrix: Water
Analysis Batch: 2069

Client Sample ID: B327D2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	32	D	4.52	38.0	D	mg/L		126	75 - 125

Lab Sample ID: 300-1669-1 DU
Matrix: Water
Analysis Batch: 2069

Client Sample ID: B327D2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrite as N	0.038	U	0.038	U	mg/L		NC	20
Orthophosphate as P	0.082	U N	0.082	U	mg/L		NC	20

Lab Sample ID: 300-1669-1 DU
Matrix: Water
Analysis Batch: 2069

Client Sample ID: B327D2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Nitrate as N	32	D	33.4	D	mg/L		3	20

Lab Sample ID: MB 300-2070/5
Matrix: Water
Analysis Batch: 2070

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			11/19/15 13:59	1

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 300-2070/5
Matrix: Water
Analysis Batch: 2070

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.025	U	0.050	0.025	mg/L			11/19/15 13:59	1
Sulfate	0.13	U	0.25	0.13	mg/L			11/19/15 13:59	1

Lab Sample ID: LCS 300-2070/6
Matrix: Water
Analysis Batch: 2070

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	17.0		mg/L		106	80 - 120		
Fluoride			4.00	4.27		mg/L		107	80 - 120		
Sulfate			20.0	21.4		mg/L		107	80 - 120		

Lab Sample ID: 300-1669-1 MS
Matrix: Water
Analysis Batch: 2070

Client Sample ID: B327D2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	12	D	3.20	15.3	D	mg/L		104	75 - 125		
Fluoride	0.079	B D	0.800	0.837	D	mg/L		95	75 - 125		
Sulfate	46	D	4.00	49.8	D	mg/L		97	75 - 125		

Lab Sample ID: 300-1669-1 DU
Matrix: Water
Analysis Batch: 2070

Client Sample ID: B327D2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chloride	12	D		11.8	D	mg/L				2	20
Fluoride	0.079	B D		0.0782	B D	mg/L				1	20
Sulfate	46	D		45.2	D	mg/L				2	20

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

HPLC/IC

Analysis Batch: 2069

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-1669-1	B327D2	Total/NA	Water	300.0	
300-1669-1	B327D2	Total/NA	Water	300.0	
300-1669-1 DU	B327D2	Total/NA	Water	300.0	
300-1669-1 DU	B327D2	Total/NA	Water	300.0	
300-1669-1 MS	B327D2	Total/NA	Water	300.0	
300-1669-1 MS	B327D2	Total/NA	Water	300.0	
LCS 300-2069/6	Lab Control Sample	Total/NA	Water	300.0	
MB 300-2069/5	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 2070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
300-1669-1	B327D2	Total/NA	Water	300.0	
300-1669-1 DU	B327D2	Total/NA	Water	300.0	
300-1669-1 MS	B327D2	Total/NA	Water	300.0	
LCS 300-2070/6	Lab Control Sample	Total/NA	Water	300.0	
MB 300-2070/5	Method Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: CH2M Hill Plateau Remediation Company
Project/Site: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Client Sample ID: B327D2
Date Collected: 11/19/15 10:41
Date Received: 11/19/15 14:55

Lab Sample ID: 300-1669-1
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	10 mL		2069	11/19/15 18:44	CPM	TAL RCH
Total/NA	Analysis	300.0		2	10 mL		2070	11/19/15 18:44	CPM	TAL RCH
Total/NA	Analysis	300.0		20	10 mL		2069	11/19/15 20:00	CPM	TAL RCH

Client Sample ID: B327D2
Date Collected: 11/19/15 10:41
Date Received: 11/19/15 14:55

Lab Sample ID: 300-1669-1 DU
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	10 mL		2069	11/19/15 19:14	CPM	TAL RCH
Total/NA	Analysis	300.0		2	10 mL		2070	11/19/15 19:14	CPM	TAL RCH
Total/NA	Analysis	300.0		20	10 mL		2069	11/19/15 20:30	CPM	TAL RCH

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

Lab Sample ID: LCS 300-2069/6
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	10 mL		2069	11/19/15 14:14	CPM	TAL RCH

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

Lab Sample ID: LCS 300-2070/6
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	10 mL		2070	11/19/15 14:14	CPM	TAL RCH

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

Lab Sample ID: MB 300-2069/5
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	10 mL		2069	11/19/15 13:59	CPM	TAL RCH

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

Lab Sample ID: MB 300-2070/5
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	10 mL		2070	11/19/15 13:59	CPM	TAL RCH

Lab Chronicle

Client: CH2M Hill Plateau Remediation Company
Project/Site: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Client Sample ID: B327D2

Date Collected: 11/19/15 10:41
Date Received: 11/19/15 14:55

Lab Sample ID: 300-1669-1 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	10 mL		2069	11/19/15 18:59	CPM	TAL RCH
Total/NA	Analysis	300.0		2	10 mL		2070	11/19/15 18:59	CPM	TAL RCH
Total/NA	Analysis	300.0		20	10 mL		2069	11/19/15 20:15	CPM	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: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

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: CHPRC Chemical Hanford

TestAmerica Job ID: 300-1669-1
SDG: WC0625

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
300-1669-1	B327D2	Water	11/19/15 10:41	11/19/15 14:55

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 300-1669-1
SDG Number: WC0625

Login Number: 1669
List Number: 1
Creator: Friesz, Jordan D

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.	True	
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.	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.	N/A	
Residual Chlorine Checked.	N/A	