

ANALYTICAL REPORT

Job Number: 280-116469-2

Job Description: Leidos RFP# 001088 - Ravenna AAP-66

For:

Leidos, Inc.

Picatinny Arsenal

356 Ninth Avenue

Suite 106

Dover, NJ 07801

Attention: Rita Schmon-Stasik



Approved for release.
Donna R Rydberg
Senior Project Manager
12/13/2018 6:39 PM

Donna R Rydberg, Senior Project Manager

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12/13/2018

Revision: 1

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

TestAmerica Laboratories, Inc.

TestAmerica Denver 4955 Yarrow Street, Arvada, CO 80002

Tel (303) 736-0100 Fax (303) 431-7171 www.testamericainc.com

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Definitions/Glossary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

Qualifiers

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
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 (Radiochemistry)
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: Leidos, Inc.

Project: Leidos RFP# 001088 - Ravenna AAP-66

Report Number: 280-116469-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

REVISED REPORT - 11/28/18

The report was revised as the analysis time for Hexavalent chromium was entered as before the collection time. The data was fixed and is correct in this report.

RECEIPT

The samples were received on 11/2/2018 at 9:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 6 coolers at receipt time were 1.1° C, 1.6° C, 1.8° C, 2.1° C, 4.6° C and 4.8° C.

This report only contains the results for the Hexavalent Chromium samples performed at the TestAmerica North Canton Laboratory. All other data will be found under SDG 280-116469-1.

HEXAVALENT CHROMIUM

Samples SCLmw-002-181002-GW (280-116469-2) and SCLmw-002-181001-GW (280-116469-3) were analyzed for hexavalent chromium in accordance with EPA SW-846 Method 7196A. The samples were analyzed on 11/01/2018.

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

Detection Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

Client Sample ID: SCLmw-002-181002-GW

Lab Sample ID: 280-116469-2

No Detections.

Client Sample ID: SCLmw-002-181001-GW

Lab Sample ID: 280-116469-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Hexavalent chromium	0.0044	J	0.020	0.0030	mg/L	1		7196A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Client Sample Results

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

General Chemistry

Client Sample ID: SCLmw-002-181002-GW

Date Collected: 11/01/18 10:45

Date Received: 11/02/18 09:05

Lab Sample ID: 280-116469-2

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac
Hexavalent chromium	ND		0.020	0.0030	mg/L		11/01/18 17:00	1

Client Sample ID: SCLmw-002-181001-GW

Date Collected: 11/01/18 10:45

Date Received: 11/02/18 09:05

Lab Sample ID: 280-116469-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac
Hexavalent chromium	0.0044	J	0.020	0.0030	mg/L		11/01/18 17:00	1

Default Detection Limits

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

General Chemistry

Analyte	RL	MDL	Units	Method
Hexavalent chromium	0.020	0.0030	mg/L	7196A

QC Sample Results

Client: Leidos, Inc.
 Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 240-353105/3
Matrix: Water
Analysis Batch: 353105

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac
Hexavalent chromium	ND		0.020	0.0030	mg/L		11/01/18 09:42	1

Lab Sample ID: LCS 240-353105/4
Matrix: Water
Analysis Batch: 353105

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hexavalent chromium	0.250	0.260		mg/L		104	80 - 123

Lab Sample ID: 280-116469-3 MS
Matrix: Water
Analysis Batch: 353105

Client Sample ID: SCLmw-002-181001-GW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hexavalent chromium	0.0044	J	0.250	0.0977		mg/L		37	31 - 151

Lab Sample ID: 280-116469-3 MSD
Matrix: Water
Analysis Batch: 353105

Client Sample ID: SCLmw-002-181001-GW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hexavalent chromium	0.0044	J	0.250	0.100		mg/L		38	31 - 151	3	20

QC Association Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

General Chemistry

Analysis Batch: 353105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116469-2	SCLmw-002-181002-GW	Total/NA	Water	7196A	
280-116469-3	SCLmw-002-181001-GW	Total/NA	Water	7196A	
MB 240-353105/3	Method Blank	Total/NA	Water	7196A	
LCS 240-353105/4	Lab Control Sample	Total/NA	Water	7196A	
280-116469-3 MS	SCLmw-002-181001-GW	Total/NA	Water	7196A	
280-116469-3 MSD	SCLmw-002-181001-GW	Total/NA	Water	7196A	

Lab Chronicle

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

Client Sample ID: SCLmw-002-181002-GW

Lab Sample ID: 280-116469-2

Date Collected: 11/01/18 10:45

Matrix: Water

Date Received: 11/02/18 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	50 mL	50 mL	353105	11/01/18 17:00	BLW	TAL CAN

Client Sample ID: SCLmw-002-181001-GW

Lab Sample ID: 280-116469-3

Date Collected: 11/01/18 10:45

Matrix: Water

Date Received: 11/02/18 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	50 mL	50 mL	353105	11/01/18 17:00	BLW	TAL CAN

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Leidos, Inc.
 Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

Laboratory: TestAmerica Denver

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

Method	Method Description	Protocol	Laboratory
7196A	Chromium, Hexavalent	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116469-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-116469-2	SCLmw-002-181002-GW	Water	11/01/18 10:45	11/02/18 09:05
280-116469-3	SCLmw-002-181001-GW	Water	11/01/18 10:45	11/02/18 09:05

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Canton Job No.: 280-116469-2

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
WCCHROME50PM2 00023	03/11/19	09/11/18	DIWATER, Lot 052014	1000 mL	WCKDICHROME62_00003	0.1414 g	Hexavalent chromium	49.9764 mg/L
.WCKDICHROME62_00003	06/06/19		Fisher, Lot 140919		(Purchased Reagent)		Hexavalent chromium	0.35344 g/g
WCCHROME50PPM 00025	03/11/19	09/11/18	DIWATER, Lot 052014	1000 mL	WCKDICHROME62_00004	0.1414 g	Hexavalent chromium	49.9764 mg/L
.WCKDICHROME62_00004	09/07/21		Fisher, Lot 126893		(Purchased Reagent)		Hexavalent chromium	0.35344 g/g

Reagent

WCKDICHROME62_00003



1 Reagent Lane
 Fair Lawn, NJ 07410
 201.796.7100 tel
 201.796.1329 fax

Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by SAI Global Certificate Number CERT - 0064970

This is to certify that units of the above mentioned lot number were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	P188	Quality Test / Release Date 2/25/2014	
Lot Number	140919		
Description	POTASSIUM DICHROMATE, A.C.S.		
Country of Origin	United States	* Suggested Retest Date	Feb-2019
Chemical Origin	Inorganic-non animal		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	FINE ORANGE-RED CRYSTALS
ASSAY	%	>= 99	99.9
CALCIUM	%	<= 0.003	0.0010
CHLORIDE	%	<= 0.001	<0.0010
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
INSOLUBLE MATTER	%	<= 0.005	0.002
IRON (Fe)	%	<= 0.001	0.0010
LOSS ON DRYING @ 105 C	%	<= 0.05	0.02
SODIUM (Na)	%	<= 0.02	0.001
SULFATE (SO4)	%	<= 0.005	0.002



Edgar E. Hara

Lab Manager Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.
 *Based on suggested storage condition.

Reagent

WCKDICHROME62_00004



1 Reagent Lane
 Fair Lawn, NJ 07410
 201.796.7100 tel
 201.796.1329 fax

Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by DNV Certificate number CERT-08052-2006-AQ-HOU-ANAB

This is to certify that units of the above mentioned lot number were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	P188	Mfg. Date	11/16/2012
Lot Number	126893		
Description	POTASSIUM DICHROMATE, A.C.S.		
Country of Origin	United States	Recommended Retest Date	Nov-2017
Chemical Origin	Inorganic-non animal		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	Fine, orange-red powder
ASSAY	%	>= 99	99.8
CALCIUM	%	<= 0.003	<0.0010
CHLORIDE	%	<= 0.001	<0.0010
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
INSOLUBLE MATTER	%	<= 0.005	0.004
IRON (Fe)	%	<= 0.001	0.0010
LOSS ON DRYING @ 105 C	%	<= 0.05	0.03
SODIUM (Na)	%	<= 0.02	0.005
SULFATE (SO4)	%	<= 0.005	0.003



Edgar E. Hara

Lab Manager Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job Number: 280-116469-2

SDG No.: _____

Project: Leidos RFP# 001088 - Ravenna AAP-66

Client Sample ID	Lab Sample ID
<u>SCLmw-002-181002-GW</u>	<u>280-116469-2</u>
<u>SCLmw-002-181001-GW</u>	<u>280-116469-3</u>

Comments:

1B-IN
 INORGANIC ANALYSIS DATA SHEET
 GENERAL CHEMISTRY

Client Sample ID: SCLmw-002-181002-GW

Lab Sample ID: 280-116469-2

Lab Name: TestAmerica Canton

Job No.: 280-116469-2

SDG ID.: _____

Matrix: Water

Date Sampled: 11/01/2018 10:45

Reporting Basis: WET

Date Received: 11/02/2018 09:05

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Hexavalent chromium	ND	0.020	0.0030	mg/L			1	7196A

1B-IN
 INORGANIC ANALYSIS DATA SHEET
 GENERAL CHEMISTRY

Client Sample ID: SCLmw-002-181001-GW

Lab Sample ID: 280-116469-3

Lab Name: TestAmerica Canton

Job No.: 280-116469-2

SDG ID.: _____

Matrix: Water

Date Sampled: 11/01/2018 10:45

Reporting Basis: WET

Date Received: 11/02/2018 09:05

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Hexavalent chromium	0.0044	0.020	0.0030	mg/L	J		1	7196A

2-IN
 CALIBRATION QUALITY CONTROL
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116469-2
 SDG No.: _____
 Analyst: MMM Batch Start Date: 10/11/2018
 Reporting Units: mg/L Analytical Batch No.: 349697

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
7	ICV	17:26	Hexavalent chromium	0.269	0.250	108	90-110		WCCHROME50PM2_0002
8	ICB	17:27	Hexavalent chromium	ND					3

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

2-IN
 CALIBRATION QUALITY CONTROL
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116469-2
 SDG No.: _____
 Analyst: BLW Batch Start Date: 11/01/2018
 Reporting Units: mg/L Analytical Batch No.: 353105

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	CCV	09:41	Hexavalent chromium	0.265	0.250	106	90-110		WCCHROME50PPM_00025
2	CCB	09:41	Hexavalent chromium	ND					
8	CCV	09:47	Hexavalent chromium	0.265	0.250	106	90-110		WCCHROME50PPM_00025
9	CCB	09:48	Hexavalent chromium	ND					
16	CCV	12:54	Hexavalent chromium	0.259	0.250	103	90-110		WCCHROME50PPM_00025
17	CCB	12:55	Hexavalent chromium	ND					
22	CCV	17:00	Hexavalent chromium	0.246	0.250	99	90-110		WCCHROME50PPM_00025
23	CCB	17:00	Hexavalent chromium	ND					

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton

Job No.: 280-116469-2

SDG No.: _____

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 353105 Date: 11/01/2018 09:42							
7196A	MB 240-353105/3	Hexavalent chromium	ND		mg/L	0.020	1

5-IN
 MATRIX SPIKE SAMPLE RECOVERY
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116469-2

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 353105 Date: 11/01/2018 17:00											
7196A	280-116469-3	Hexavalent chromium	0.0044	J	mg/L						
7196A	280-116469-3	Hexavalent chromium	0.0977		mg/L	0.250	37	31-151			
	MS										

Calculations are performed before rounding to avoid round-off errors in calculated results.

5-IN
 MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116469-2

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 353105 Date: 11/01/2018 17:00											
7196A	280-116469-3	Hexavalent chromium	0.100		mg/L	0.250	38	31-151	3	20	
	MSD										

Calculations are performed before rounding to avoid round-off errors in calculated results.

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116469-2

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 353105 Date: 11/01/2018 09:43			LCS Source: WCCHROME50PM2_00023								
7196A	LCS 240-353105/4	Hexavalent chromium	0.260		mg/L	0.250	104	80-123			

Calculations are performed before rounding to avoid round-off errors in calculated results.

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton

Job Number: 280-116469-2

SDG Number: _____

Matrix: Water

Instrument ID: OSCAR

Method: 7196A

MDL Date: 04/25/2017 11:21

Analyte	Wavelength/ Mass	RL (mg/L)	MDL (mg/L)
Hexavalent chromium		0.02	0.003

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job Number: 280-116469-2
SDG Number: _____
Matrix: Water Instrument ID: OSCAR
Method: 7196A XMDL Date: 04/25/2017 11:21

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Hexavalent chromium		0.02	0.003

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116469-2

SDG No.: _____

Instrument ID: OSCAR Analysis Method: 7196A

Start Date: 10/11/2018 17:20 End Date: 10/11/2018 17:34

Lab Sample Id	D/F	Type	Time	Analytes																											
				C	r	6																									
IC 240-349697/1	1		17:20	X																											
IC 240-349697/2	1		17:21	X																											
IC 240-349697/3	1		17:22	X																											
IC 240-349697/4	1		17:23	X																											
IC 240-349697/5	1		17:24	X																											
IC 240-349697/6	1		17:25	X																											
ICV 240-349697/7	1		17:26	X																											
ICB 240-349697/8	1		17:27	X																											
ZZZZZZ			17:28																												
ZZZZZZ			17:29																												
ZZZZZZ			17:30																												
ZZZZZZ			17:31																												
ZZZZZZ			17:32																												
CCV 240-349697/14			17:33																												
CCB 240-349697/15			17:34																												

Prep Types: _____
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13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 280-116469-2

SDG No.: _____

Instrument ID: OSCAR Analysis Method: 7196A

Start Date: 11/01/2018 09:41 End Date: 11/01/2018 17:00

Lab Sample Id	D/F	Type	Time	C r 6	Analytes																			
CCV 240-353105/1	1		09:41	X																				
CCB 240-353105/2	1		09:41	X																				
MB 240-353105/3	1	T	09:42	X																				
ZZZZZZ			09:42																					
ZZZZZZ			09:42																					
ZZZZZZ			09:42																					
ZZZZZZ			09:42																					
ZZZZZZ			09:42																					
ZZZZZZ			09:42																					
ZZZZZZ			09:42																					
LCS 240-353105/4	1	T	09:43	X																				
ZZZZZZ			09:44																					
ZZZZZZ			09:45																					
ZZZZZZ			09:47																					
CCV 240-353105/8	1		09:47	X																				
CCB 240-353105/9	1		09:48	X																				
ZZZZZZ			11:45																					
CCV 240-353105/11			11:46																					
CCB 240-353105/12			11:46																					
ZZZZZZ			12:51																					
ZZZZZZ			12:52																					
ZZZZZZ			12:53																					
CCV 240-353105/16	1		12:54	X																				
CCB 240-353105/17	1		12:55	X																				
280-116469-3	1	T	17:00	X																				
280-116469-3 MS	1	T	17:00	X																				
280-116469-3 MSD	1	T	17:00	X																				
280-116469-2	1	T	17:00	X																				
CCV 240-353105/22	1		17:00	X																				
CCB 240-353105/23	1		17:00	X																				

Prep Types: _____
T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Canton Job No.: 280-116469-2

SDG No.: _____

Batch Number: 349697 Batch Start Date: 10/11/18 17:20 Batch Analyst: Moser, Morgan

Batch Method: 7196A Batch End Date: 10/11/18 17:35

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	UnCorResp	WCCHROME50PM2 00023	WCCHROME50PPM 00025	
IC 240-349697/1		7196A		50 mL	50 mL	0 Absorbance			
IC 240-349697/2		7196A		50 mL	50 mL	0.004 Absorbance		0.005 mL	
IC 240-349697/3		7196A		50 mL	50 mL	0.008 Absorbance		0.01 mL	
IC 240-349697/4		7196A		50 mL	50 mL	0.084 Absorbance		0.1 mL	
IC 240-349697/5		7196A		50 mL	50 mL	0.191 Absorbance		0.25 mL	
IC 240-349697/6		7196A		50 mL	50 mL	0.369 Absorbance		0.5 mL	
ICV 240-349697/7		7196A		50 mL	50 mL	0.202 Absorbance	0.25 mL		
ICB 240-349697/8		7196A		50 mL	50 mL	0 Absorbance			

Batch Notes	
Acid Used for pH Adjustment ID	3715210
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3830583
Phosphoric Acid ID	3521890
Pipette/Syringe/Dispenser ID	E5

Basis	Basis Description

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Canton Job No.: 280-116469-2

SDG No.: _____

Batch Number: 353105 Batch Start Date: 11/01/18 09:41 Batch Analyst: Woodward, Bruce

Batch Method: 7196A Batch End Date: 11/01/18 18:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ColorBlk	UnCorResp	WCCHROME50PM2 00023	WCCHROME50PPM 00025
CCV 240-353105/1		7196A		50 mL	50 mL		0.199 Absorbance		0.25 mL
CCB 240-353105/2		7196A		50 mL	50 mL		0 Absorbance		
MB 240-353105/3		7196A		50 mL	50 mL		0 Absorbance		
LCS 240-353105/4		7196A		50 mL	50 mL		0.195 Absorbance	0.25 mL	
CCV 240-353105/8		7196A		50 mL	50 mL		0.199 Absorbance		0.25 mL
CCB 240-353105/9		7196A		50 mL	50 mL		0 Absorbance		
CCV 240-353105/16		7196A		50 mL	50 mL		0.194 Absorbance		0.25 mL
CCB 240-353105/17		7196A		50 mL	50 mL		0 Absorbance		
280-116469-R-3	SCLmw-002-181001 -GW	7196A	T	50 mL	50 mL	0.008 Absorbance	0.014 Absorbance		
280-116469-R-3 MS	SCLmw-002-181001 -GW	7196A	T	50 mL	50 mL	0.008 Absorbance	0.083 Absorbance		0.25 mL
280-116469-F-3 MSD	SCLmw-002-181001 -GW	7196A	T	50 mL	50 mL	0.008 Absorbance	0.085 Absorbance		0.25 mL
280-116469-R-2	SCLmw-002-181002 -GW	7196A	T	50 mL	50 mL	0.003 Absorbance	0.003 Absorbance		
CCV 240-353105/22		7196A		50 mL	50 mL		0.185 Absorbance		0.25 mL
CCB 240-353105/23		7196A		50 mL	50 mL		0 Absorbance		

Batch Notes	
Acid Used for pH Adjustment ID	3715210
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3882821
Phosphoric Acid ID	3521890
Pipette/Syringe/Dispenser ID	E1

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

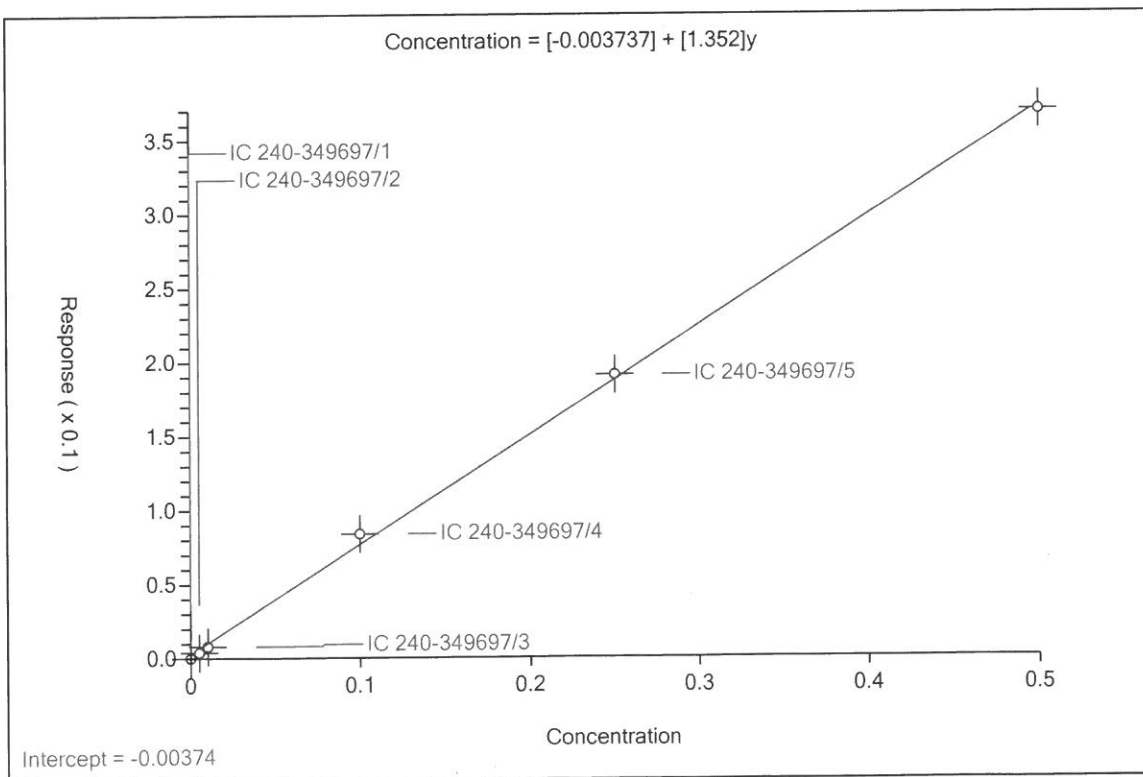
Calibration

Calib 349697-0 / Cr (VI)

Curve Type: Linear
 Weighting: None
 Origin: None
 Dependency: Concentration
 Calib Mode: ESTD
 Response Base: AREA
 RF Rounding: 0

Curve Coefficients	
Intercept:	-0.003737
Slope:	1.352
Error Coefficients	
Standard Error:	0.00659
Relative Standard Error:	42.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999 (0.999)

ID	Level	Concentration	Response	IS Amount	IS Response	RF	Used
1	IC 240-349697/1	0.0	0.0			NaN	Y
2	IC 240-349697/2	0.004998	0.004			0.800378	Y
3	IC 240-349697/3	0.009995	0.008			0.800378	Y
4	IC 240-349697/4	0.099953	0.084			0.840397	Y
5	IC 240-349697/5	0.249882	0.191			0.764361	Y
6	IC 240-349697/6	0.499764	0.369			0.738349	Y



Subcontract Data

Shipping and Receiving Documents

Chain of Custody Record



COC No.: **RVAAP-081-TA**
Date: 11/1/2018

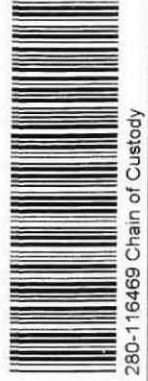
Page 1 of 1

Name Leidos
Address: 8866 Commons Blvd., Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event
Job/P.O. No.: P010216426
Sampler (Signature) _____ (Printed Name)

Laboratory Name: Test America -Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax: _____
Contact: _____

OBSERVATIONS, COMMENTS
SPECIAL INSTRUCTIONS

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Requested Parameters	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	SCLmw-002-181001-GW ₁	GW	NA	11/1/2018	10:45	W	Alkalinity/Sulfate/Nitrate/Nitrite (10)(A) Cyanide (8)(D) TAL Metals (7)(C) incl Phosphorus Nitrogen (4)(A) Pesticides/PCB (5)(A) Explosives (6)(A) LL PAHs (3)(A) SVOCs (2)(A) VOCs (1)(B)	21	Metals Including Phosphorus
	SCLmw-003-181002-GW	GW	NA	11/1/2018	10:45	W	Alkalinity/Sulfate/Nitrate/Nitrite (10)(A) Cyanide (8)(D) TAL Metals (7)(C) incl Phosphorus Nitrogen (4)(A) Pesticides/PCB (5)(A) Explosives (6)(A) LL PAHs (3)(A) SVOCs (2)(A) VOCs (1)(B)	21	
	SCLmw-003-181001-GWMS/D	GW	NA	11/1/2018	10:45	W	Alkalinity/Sulfate/Nitrate/Nitrite (10)(A) Cyanide (8)(D) TAL Metals (7)(C) incl Phosphorus Nitrogen (4)(A) Pesticides/PCB (5)(A) Explosives (6)(A) LL PAHs (3)(A) SVOCs (2)(A) VOCs (1)(B)	25	Extra Volume for MS/MSD
	FWGTB-181011-TB	TB	NA	11/1/2018	10:45	W	Alkalinity/Sulfate/Nitrate/Nitrite (10)(A) Cyanide (8)(D) TAL Metals (7)(C) incl Phosphorus Nitrogen (4)(A) Pesticides/PCB (5)(A) Explosives (6)(A) LL PAHs (3)(A) SVOCs (2)(A) VOCs (1)(B)	2	



Relinquished by	Date	Received by	Date	Time	Notes	Total Number of Containers	Shipment Method
<i>[Signature]</i>	11/1/18	Test America <i>[Signature]</i>	11/1/18	1600	A. Cool, 4C D. NaOH, pH>12, Cool 4C E1. Field filtered, Cool, 4C E. NaOH/Zn Acetate, pH>9, Cool 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C 1. SW 8260 2. SW 8270 3. SW 8275SIM 4. SW 8335-MOD 5. SW 8081.6062 6. SW 8330 7. SW 6010 8. SW 5012 9. SW 9034 10. SW 9056SM2320 11. SW 6880 12. EPA 353.2 13. SW 7196	69	Courier
WEATHER ADAMS <i>[Signature]</i>	11/1/18	RE <i>[Signature]</i>	11/1/18	1600			
Leidos Company		RICK ROBSON Company					
Relinquished by <i>[Signature]</i>	11/1/18	Received by <i>[Signature]</i>	11/1/18	1600			
Signature ROBISON		Signature Joseph Phouder					
Printed Name ROBISON		Printed Name TA Denver					
Company		Company					

Temperature Blank
Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record



COC No.: **RVAAP-010-TA**

Page 1 of 1 Date: **11/1/18**

Name Leidos
 Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
 Phone Number: (330) 405-5802
 Project Manager: Jed Thomas
 Project: RVAAP FWGW Sampling Event
 Job/P.O. No.: P010216426
 Sampler (Signature) *[Signature]* (Printed Name) **Gabrielle Gromotsky**

Laboratory Name: Test America -Canton
 Address: 4101 Shuffel St NW
 North Canton, OH 44720
 Phone: (330) 497-9396
 Fax:
 Contact:

OBSERVATIONS, COMMENTS
SPECIAL INSTRUCTIONS

Requested Parameters	Total Number of Containers
NOCs (1)(B)	
SVOCs (2)(A)	
Naphthalene (3)(A)	
Explosives (6)(A)	
Pesticides (5)(A)	
PCBs (4)(A)	
TAL Metals (7)(C)	
Cyanide (8)(D)	
Alkalinity/Sulfate/Nitrate/Nitrite (10)(A)	
Sulfide (9)(E)	
Perchlorate (11)(A)	
Nitrocellulose (12)(A)	
Hexavalent Chromium (13)(A)	
Temperature Blank	2

Notes:
 A. Cool, 4C
 B. HCl, pH<2, Cool, 4C
 C. HNO3, pH<2, Cool, 4C
 D. NaOH, pH>12, Cool, 4C
 E. NaOH/Zn Acetate, pH>9, Cool, 4C

1. SW 8260
 2. SW 8270
 3. SW 8270S1M
 4. SW 8082
 5. SW 8081
 6. SW 8330
 7. SW 6010
 8. SW 9012
 9. SW 9034
 10. SW 9055/SM2320
 11. SW 6660
 12. EPA 353.2
 13. SW 7195

Shipment Method: Courier

Temperature Blank
 Lab:
Leidos
 8866 Commons Drive
 Twinsburg, OH 44087
 (330) 405-5802

NOCs (1)(B)	SVOCs (2)(A)	Naphthalene (3)(A)	Explosives (6)(A)	Pesticides (5)(A)	PCBs (4)(A)	TAL Metals (7)(C)	Cyanide (8)(D)	Alkalinity/Sulfate/Nitrate/Nitrite (10)(A)	Sulfide (9)(E)	Perchlorate (11)(A)	Nitrocellulose (12)(A)	Hexavalent Chromium (13)(A)	Temperature Blank	Total Number of Containers
		2												2

Date	Time	Date	Time
11/1/18	1600	11/1/18	0905

Relinquished by	Received by
<i>[Signature]</i> HEATHER ADAMS Printed Name Leidos Company	<i>[Signature]</i> Test America Signature R = Robison Printed Name RICK ROBISON Company
<i>[Signature]</i> Signature Printed Name Company	<i>[Signature]</i> Signature Printed Name Company
<i>[Signature]</i> Signature Printed Name Company	<i>[Signature]</i> Signature Printed Name Company

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record


COC No.: **RVAAP-081-TA**
Date: 11/1/2018

Page 1 of 1



Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event
Job/P.O. No.: P010216426
Sampler (Signature) _____
(Printed Name)

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B)	SVOCs (2)(A)	LL PAHs (3)(A)	Explosives (5)(A)	Pesticides/PCB (5)(A)	Nitrogan (4)(A)	TAL Metals (7)(C) incl Phosphorus	Cyanide (8)(D)	Alkalinity/Sulfate/Nitrate/Nitrite (10)(A)	Sulfide (9)(E)	Perchlorate (11)(A)	Nitrocellulose (12)(A)	Hexavalent Chromium (13)(A1)	Temperature Blank	Total Number of Containers
	SCLmw-002-181001-GW	GW	NA	11/1/2018	10:45	W	3	2	2	2	2	2	1	1	1	1	1	2	1	21	21
	SCLmw-003-181002-GW	GW	NA	11/1/2018	10:45	W	3	2	2	2	2	2	1	1	1	1	1	2	1	21	21
	SCLmw-003-181001-GWMS/D	GW	NA	11/1/2018	10:45	W	4	2	2	2	4	2	1	2	1	1	1	2	1	25	25
	FWGTB-181011-TB	TB	NA	11/1/2018	10:45	W	2													2	2



280-116469 Chain of Custody

Relinquished by <i>[Signature]</i> Signature	Date 11/1/18	Received by <i>Test Agency</i> Signature	Date 11/1/18	Notes: A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C E. Ni(OH)2 Zn Acetate, pH<9, Cool 4C	Shipment Method: Courier
Relinquished by <i>KEATHE ADAMS</i> Printed Name	Time 1000	Received by <i>Re Robson</i> Printed Name	Time 1600	Notes: 1. SW 8260 2. SW 8270 3. SW 8270S1M 4. SW 8330-MOD 5. SW 80616082 6. SW 8330 7. SW 8010 8. SW 9012 9. SW 9034 10. SW 9056/SW2320	Temperature Blank Lab: Leidos 8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802
Relinquished by <i>J.A. Zito</i> Signature	Date 11/1/18	Received by <i>[Signature]</i> Signature	Date 11-1-18	Notes: 11. SW 6860 12. EPA 353.2 13. SW 7196	
Relinquished by <i>ROBISON</i> Printed Name	Time 1652	Received by <i>TAL</i> Printed Name	Time 1652		

TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 116469

Client LEIDOS Site Name _____ Cooler unpacked by: ROP
 Cooler Received on 11-1-18 Opened on 11-1-18
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
 COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp. 1.2 °C Corrected Cooler Temp. 2.1 °C
 IR GUN #36 (CF +0.6 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
 If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC849161
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
16. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
 VOAs
 Oil and Grease
 TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____
 Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: TB

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 280-116469-2

Login Number: 116469
List Number: 1
Creator: Rhoades, Joseph P

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is <= background as measured by a survey meter.	N/A	
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.	False	Refer to Job Narrative for details.
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	