

ANALYTICAL REPORT

Job Number: 240-107417-1

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
2/25/2019 2:20 PM

Donna R Rydberg, Senior Project Manager

4955 Yarrow Street, Arvada, CO, 80002

(303)736-0192

donna.rydberg@testamericainc.com

02/25/2019

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 Canton 4101 Shuffel Street NW, North Canton, OH 44720

Tel (330) 497-9396 Fax (330) 497-0772 www.testamericainc.com

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Definitions/Glossary

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

TestAmerica Job ID: 240-107417-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
U	Undetected at the Limit of Detection.

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: 240-107417-1

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 2/25/19

This revised report contains both sets of data for Hexavalent chromium for sample SCLmw-002-190101-GW (240-107417-1) so the client can see that the MS/MSD failures were due to matrix issues. Once the sample was run at a 10X dilution the MS/MSD did come in control.

RECEIPT

The samples were received on 1/29/2019 at 4:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

Due to a laboratory error sample SCLmw-002-190102-GW listed on the COC was not logged in as a separate sample. The login staff mistook this sample as the MS sample for SCLmw-002-190101-GW. This was a human error mistake. The client was notified that this sample did not get logged or analyzed.

HEXAVALENT CHROMIUM

Samples SCLmw-002-190101-GW (240-107417-1), SCLmw-003-190101-GW (240-107417-2) and SCLmw-001-190101-GW (240-107417-3) were analyzed for hexavalent chromium in accordance with EPA SW-846 Method 7196A. The samples were analyzed on 01/28/2019.

Hexavalent chromium failed the recovery criteria low in the MS and MSD performed on sample SCLmw-002-190101-GW (240-107417-1) in batch 240-365839. The sample, MS and MSD aliquots were all taken from the parent sample container. The samples were rerun at a dilution and confirmed matrix interference. The associated LCS was in control and provides evidence that operating procedures were in control. Data was reported and flagged.

No additional 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: 240-107417-1

Client Sample ID: SCLmw-002-190101-GW

Lab Sample ID: 240-107417-1

No Detections.

Client Sample ID: SCLmw-003-190101-GW

Lab Sample ID: 240-107417-2

No Detections.

Client Sample ID: SCLmw-001-190101-GW

Lab Sample ID: 240-107417-3

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

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

TestAmerica Job ID: 240-107417-1

General Chemistry

Client Sample ID: SCLmw-002-190101-GW

Date Collected: 01/28/19 10:45

Date Received: 01/29/19 16:45

Lab Sample ID: 240-107417-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac
Hexavalent chromium	ND	F1	0.020	0.0030	mg/L		01/28/19 17:18	1

Client Sample ID: SCLmw-003-190101-GW

Date Collected: 01/28/19 10:51

Date Received: 01/29/19 16:45

Lab Sample ID: 240-107417-2

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac
Hexavalent chromium	ND		0.020	0.0030	mg/L		01/28/19 17:28	1

Client Sample ID: SCLmw-001-190101-GW

Date Collected: 01/28/19 10:55

Date Received: 01/29/19 16:45

Lab Sample ID: 240-107417-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac
Hexavalent chromium	ND		0.020	0.0030	mg/L		01/28/19 17:17	1

General Chemistry - RA

Client Sample ID: SCLmw-002-190101-GW

Date Collected: 01/28/19 10:45

Date Received: 01/29/19 16:45

Lab Sample ID: 240-107417-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac
Hexavalent chromium	ND		0.20	0.030	mg/L		01/28/19 17:22	10

Default Detection Limits

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

TestAmerica Job ID: 240-107417-1

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: 240-107417-1

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 240-365839/3
Matrix: Water
Analysis Batch: 365839

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac
Hexavalent chromium	0.010	U	0.020	0.010	0.0030 mg/L		01/28/19 17:14	1

Lab Sample ID: LCS 240-365839/4
Matrix: Water
Analysis Batch: 365839

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	0.245		mg/L		98	80 - 123

Lab Sample ID: 240-107417-1 MS
Matrix: Water
Analysis Batch: 365839

Client Sample ID: SCLmw-002-190101-GW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hexavalent chromium	ND	F1	0.250	ND	F1	mg/L		0	31 - 151

Lab Sample ID: 240-107417-1 MSD
Matrix: Water
Analysis Batch: 365839

Client Sample ID: SCLmw-002-190101-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	ND	F1	0.250	ND	F1	mg/L		0	31 - 151	NC	20

Method: 7196A - Chromium, Hexavalent - RA

Lab Sample ID: 240-107417-1 MS
Matrix: Water
Analysis Batch: 365839

Client Sample ID: SCLmw-002-190101-GW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hexavalent chromium - RA	ND		2.50	1.47		mg/L		59	31 - 151

Lab Sample ID: 240-107417-1 MSD
Matrix: Water
Analysis Batch: 365839

Client Sample ID: SCLmw-002-190101-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 - RA	ND		2.50	1.48		mg/L		59	31 - 151	1	20

QC Association Summary

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

TestAmerica Job ID: 240-107417-1

General Chemistry

Analysis Batch: 365839

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-107417-1	SCLmw-002-190101-GW	Total/NA	Water	7196A	
240-107417-1 - RA	SCLmw-002-190101-GW	Total/NA	Water	7196A	
240-107417-2	SCLmw-003-190101-GW	Total/NA	Water	7196A	
240-107417-3	SCLmw-001-190101-GW	Total/NA	Water	7196A	
MB 240-365839/3	Method Blank	Total/NA	Water	7196A	
LCS 240-365839/4	Lab Control Sample	Total/NA	Water	7196A	
240-107417-1 MS	SCLmw-002-190101-GW	Total/NA	Water	7196A	
240-107417-1 MS - RA	SCLmw-002-190101-GW	Total/NA	Water	7196A	
240-107417-1 MSD	SCLmw-002-190101-GW	Total/NA	Water	7196A	
240-107417-1 MSD - RA	SCLmw-002-190101-GW	Total/NA	Water	7196A	

Lab Chronicle

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

TestAmerica Job ID: 240-107417-1

Client Sample ID: SCLmw-002-190101-GW

Lab Sample ID: 240-107417-1

Date Collected: 01/28/19 10:45

Matrix: Water

Date Received: 01/29/19 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	365839	01/28/19 17:18	JWW	TAL CAN
Total/NA	Analysis	7196A	RA	10	365839	01/28/19 17:22	JWW	TAL CAN

Client Sample ID: SCLmw-003-190101-GW

Lab Sample ID: 240-107417-2

Date Collected: 01/28/19 10:51

Matrix: Water

Date Received: 01/29/19 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	365839	01/28/19 17:28	JWW	TAL CAN

Client Sample ID: SCLmw-001-190101-GW

Lab Sample ID: 240-107417-3

Date Collected: 01/28/19 10:55

Matrix: Water

Date Received: 01/29/19 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	365839	01/28/19 17:17	JWW	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: 240-107417-1

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	04-30-19
Kentucky (UST)	State Program	4	58	02-23-19 *
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
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	02-23-20
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	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

Laboratory: TestAmerica Denver

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

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

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

Method Summary

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

TestAmerica Job ID: 240-107417-1

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: 240-107417-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-107417-1	SCLmw-002-190101-GW	Water	01/28/19 10:45	01/29/19 16:45
240-107417-2	SCLmw-003-190101-GW	Water	01/28/19 10:51	01/29/19 16:45
240-107417-3	SCLmw-001-190101-GW	Water	01/28/19 10:55	01/29/19 16:45

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Canton Job No.: 240-107417-1

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: 240-107417-1

SDG No.: _____

Project: Leidos RFP# 001088 - Ravenna AAP-66

Client Sample ID	Lab Sample ID
<u>SCLmw-002-190101-GW</u>	<u>240-107417-1</u>
<u>SCLmw-002-190101-GW</u>	<u>240-107417-1 RA</u>
<u>SCLmw-003-190101-GW</u>	<u>240-107417-2</u>
<u>SCLmw-001-190101-GW</u>	<u>240-107417-3</u>

Comments:

1B-IN
 INORGANIC ANALYSIS DATA SHEET
 GENERAL CHEMISTRY

Client Sample ID: SCLmw-002-190101-GW

Lab Sample ID: 240-107417-1

Lab Name: TestAmerica Canton

Job No.: 240-107417-1

SDG ID.: _____

Matrix: Water

Date Sampled: 01/28/2019 10:45

Reporting Basis: WET

Date Received: 01/29/2019 16:45

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Hexavalent chromium	ND	0.020	0.0030	mg/L		F1	1	7196A
18540-29-9	Hexavalent chromium	ND	0.20	0.030	mg/L			10	7196A

1B-IN
 INORGANIC ANALYSIS DATA SHEET
 GENERAL CHEMISTRY

Client Sample ID: SCLmw-003-190101-GW

Lab Sample ID: 240-107417-2

Lab Name: TestAmerica Canton

Job No.: 240-107417-1

SDG ID.: _____

Matrix: Water

Date Sampled: 01/28/2019 10:51

Reporting Basis: WET

Date Received: 01/29/2019 16:45

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-001-190101-GW

Lab Sample ID: 240-107417-3

Lab Name: TestAmerica Canton

Job No.: 240-107417-1

SDG ID.: _____

Matrix: Water

Date Sampled: 01/28/2019 10:55

Reporting Basis: WET

Date Received: 01/29/2019 16:45

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

2-IN
 CALIBRATION QUALITY CONTROL
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-107417-1
 SDG No.: _____
 Analyst: JWW Batch Start Date: 01/11/2019
 Reporting Units: mg/L Analytical Batch No.: 363793

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
7	ICV	18:28	Hexavalent chromium	0.246	0.250	98	90-110		WCCHROME50PM2_0002 3
8	ICB	18:29	Hexavalent chromium	0.010				U	

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.: 240-107417-1
 SDG No.: _____
 Analyst: JWW Batch Start Date: 01/28/2019
 Reporting Units: mg/L Analytical Batch No.: 365839

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	CCV	17:12	Hexavalent chromium	0.239	0.250	96	90-110		WCCHROME50PPM_00025
2	CCB	17:13	Hexavalent chromium	0.010				U	
12	CCV	17:25	Hexavalent chromium	0.240	0.250	96	90-110		WCCHROME50PPM_00025
13	CCB	17:27	Hexavalent chromium	0.010				U	
15	CCV	17:29	Hexavalent chromium	0.239	0.250	96	90-110		WCCHROME50PPM_00025
16	CCB	17:30	Hexavalent chromium	0.010				U	

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.: 240-107417-1

SDG No.: _____

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 365839 Date: 01/28/2019 17:14							
7196A	MB 240-365839/3	Hexavalent chromium	0.010	U	mg/L	0.020	1

5-IN
 MATRIX SPIKE SAMPLE RECOVERY
 GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-107417-1

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 365839 Date: 01/28/2019 17:19											
7196A	240-107417-1	Hexavalent chromium	ND		mg/L						F1
7196A	240-107417-1	Hexavalent chromium	ND		mg/L	0.250	0	31-151			F1
MS											
Batch ID: 365839 Date: 01/28/2019 17:23											
7196A	240-107417-1	Hexavalent chromium	ND		mg/L						
7196A	240-107417-1	Hexavalent chromium	1.47		mg/L	2.50	59	31-151			
MS RA											

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.: 240-107417-1

SDG No.: _____

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 365839 Date: 01/28/2019 17:20											
7196A	240-107417-1	Hexavalent chromium	ND		mg/L	0.250	0	31-151	NC	20	F1
MSD											
Batch ID: 365839 Date: 01/28/2019 17:24											
7196A	240-107417-1	Hexavalent chromium	1.48		mg/L	2.50	59	31-151	1	20	
MSD RA											

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.: 240-107417-1
 SDG No.: _____
 Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 365839			Date: 01/28/2019 17:15			LCS Source: WCCHROME50PM2_00023					
7196A	LCS 240-365839/4	Hexavalent chromium	0.245		mg/L	0.250	98	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: 240-107417-1

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: 240-107417-1
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.: 240-107417-1

SDG No.: _____

Instrument ID: OSCAR

Analysis Method: 7196A

Start Date: 01/11/2019 18:19

End Date: 01/11/2019 18:38

Lab Sample Id	D/F	T y p e	Time	Analytes																										
				C r 6																										
IC 240-363793/1	1		18:19	X																										
IC 240-363793/2	1		18:20	X																										
IC 240-363793/3	1		18:22	X																										
IC 240-363793/4	1		18:23	X																										
IC 240-363793/5	1		18:25	X																										
IC 240-363793/6	1		18:26	X																										
ICV 240-363793/7	1		18:28	X																										
ICB 240-363793/8	1		18:29	X																										
ZZZZZZ			18:31																											
ZZZZZZ			18:32																											
ZZZZZZ			18:34																											
ZZZZZZ			18:35																											
CCV 240-363793/13			18:37																											
CCB 240-363793/14			18:38																											

Prep Types: _____
=

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-107417-1

SDG No.: _____

Instrument ID: OSCAR Analysis Method: 7196A

Start Date: 01/28/2019 17:12 End Date: 01/28/2019 17:30

Lab Sample Id	D/F	T y p e	Time	Analytes																											
				C r 6																											
CCV 240-365839/1	1		17:12	X																											
CCB 240-365839/2	1		17:13	X																											
MB 240-365839/3	1	T	17:14	X																											
LCS 240-365839/4	1	T	17:15	X																											
240-107417-3	1	T	17:17	X																											
240-107417-1	1	T	17:18	X																											
240-107417-1 MS	1	T	17:19	X																											
240-107417-1 MSD	1	T	17:20	X																											
240-107417-1 RA	10	T	17:22	X																											
240-107417-1 MS RA	10	T	17:23	X																											
240-107417-1 MSD RA	10	T	17:24	X																											
CCV 240-365839/12	1		17:25	X																											
CCB 240-365839/13	1		17:27	X																											
240-107417-2	1	T	17:28	X																											
CCV 240-365839/15	1		17:29	X																											
CCB 240-365839/16	1		17:30	X																											

Prep Types: _____
T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Canton Job No.: 240-107417-1

SDG No.: _____

Batch Number: 363793 Batch Start Date: 01/11/19 18:19 Batch Analyst: Weimer, Joshua W

Batch Method: 7196A Batch End Date: 01/11/19 18:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	UnCorResp	WCCHROME50PM2 00023	WCCHROME50PPM 00025	
IC 240-363793/1		7196A		50.0 mL	50.0 mL	0 Absorbance			
IC 240-363793/2		7196A		50.0 mL	50.0 mL	0.004 Absorbance		0.005 mL	
IC 240-363793/3		7196A		50.0 mL	50.0 mL	0.008 Absorbance		0.01 mL	
IC 240-363793/4		7196A		50.0 mL	50.0 mL	0.077 Absorbance		0.1 mL	
IC 240-363793/5		7196A		50.0 mL	50.0 mL	0.184 Absorbance		0.25 mL	
IC 240-363793/6		7196A		50.0 mL	50.0 mL	0.363 Absorbance		0.5 mL	
ICV 240-363793/7		7196A		50.0 mL	50.0 mL	0.180 Absorbance	0.25 mL		
ICB 240-363793/8		7196A		50.0 mL	50.0 mL	0 Absorbance			

Batch Notes	
Acid Used for pH Adjustment ID	3715210
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3998542
Pipette/Syringe/Dispenser ID	E8

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.: 240-107417-1

SDG No.: _____

Batch Number: 365839 Batch Start Date: 01/28/19 17:12 Batch Analyst: Weimer, Joshua W

Batch Method: 7196A Batch End Date: 01/28/19 17:32

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ColorBlk	UnCorResp	WCCHROME50PM2 00023	WCCHROME50PPM 00025
CCV 240-365839/1		7196A		50.0 mL	50.0 mL		0.175 Absorbance		0.25 mL
CCB 240-365839/2		7196A		50.0 mL	50.0 mL		0.001 Absorbance		
MB 240-365839/3		7196A		50.0 mL	50.0 mL		0 Absorbance		
LCS 240-365839/4		7196A		50.0 mL	50.0 mL		0.179 Absorbance	0.25 mL	
240-107417-A-3	SCLmw-001-190101 -GW	7196A	T	50.0 mL	50.0 mL	0 Absorbance	0 Absorbance		
240-107417-A-1	SCLmw-002-190101 -GW	7196A	T	50.0 mL	50.0 mL	0 Absorbance	0 Absorbance		
240-107417-A-1 MS	SCLmw-002-190101 -GW	7196A	T	50.0 mL	50.0 mL	0 Absorbance	0.003 Absorbance	0.25 mL	
240-107417-A-1 MSD	SCLmw-002-190101 -GW	7196A	T	50.0 mL	50.0 mL	0 Absorbance	0.003 Absorbance	0.25 mL	
240-107417-A-1	SCLmw-002-190101 -GW	7196A	T	50.0 mL	50.0 mL	0 Absorbance	0 Absorbance		
240-107417-A-1 MS	SCLmw-002-190101 -GW	7196A	T	50.0 mL	50.0 mL	0 Absorbance	0.108 Absorbance	0.25 mL	
240-107417-A-1 MSD	SCLmw-002-190101 -GW	7196A	T	50.0 mL	50.0 mL	0 Absorbance	0.109 Absorbance	0.25 mL	
CCV 240-365839/12		7196A		50.0 mL	50.0 mL		0.176 Absorbance		0.25 mL
CCB 240-365839/13		7196A		50.0 mL	50.0 mL		0 Absorbance		
240-107417-A-2	SCLmw-003-190101 -GW	7196A	T	50.0 mL	50.0 mL	0 Absorbance	0 Absorbance		
CCV 240-365839/15		7196A		50.0 mL	50.0 mL		0.175 Absorbance		0.25 mL
CCB 240-365839/16		7196A		50.0 mL	50.0 mL		0 Absorbance		

Lab Sample ID	Client Sample ID	Method Chain	Basis	AnalysisComment				
CCV 240-365839/1		7196A						
CCB 240-365839/2		7196A						
MB 240-365839/3		7196A						
LCS 240-365839/4		7196A						

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.: 240-107417-1

SDG No.: _____

Batch Number: 365839 Batch Start Date: 01/28/19 17:12 Batch Analyst: Weimer, Joshua W

Batch Method: 7196A Batch End Date: 01/28/19 17:32

Lab Sample ID	Client Sample ID	Method Chain	Basis	AnalysisComment					
240-107417-A-3	SCLmw-001-190101 -GW	7196A	T						
240-107417-A-1	SCLmw-002-190101 -GW	7196A	T						
240-107417-A-1 MS	SCLmw-002-190101 -GW	7196A	T	Spiked but no recovery					
240-107417-A-1 MSD	SCLmw-002-190101 -GW	7196A	T	Spiked but no recovery					
240-107417-A-1	SCLmw-002-190101 -GW	7196A	T						
240-107417-A-1 MS	SCLmw-002-190101 -GW	7196A	T						
240-107417-A-1 MSD	SCLmw-002-190101 -GW	7196A	T						
CCV 240-365839/12		7196A							
CCB 240-365839/13		7196A							
240-107417-A-2	SCLmw-003-190101 -GW	7196A	T						
CCV 240-365839/15		7196A							
CCB 240-365839/16		7196A							

Batch Notes	
Acid Used for pH Adjustment ID	3715210
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3998542
Pipette/Syringe/Dispenser ID	E13

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.

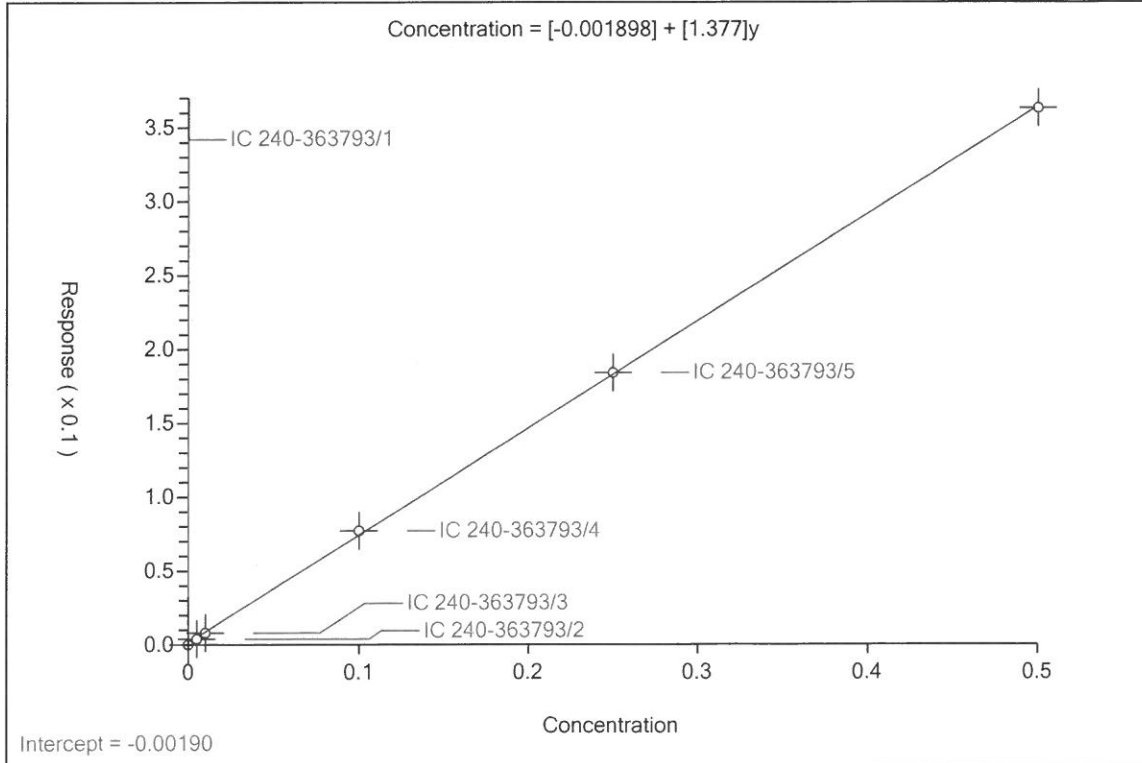
Calibration

Calib 363793-0 / Cr (VI)

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

Curve Coefficients	
Intercept:	-0.001898
Slope:	1.377
Error Coefficients	
Standard Error:	0.00272
Relative Standard Error:	17.0
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	1.000 (1.000)

ID	Level	Concentration	Response	IS Amount	IS Response	RF	Used
1	IC 240-363793/1	0.0	0.0			NaN	Y
2	IC 240-363793/2	0.004998	0.004			0.800378	Y
3	IC 240-363793/3	0.009995	0.008			0.800378	Y
4	IC 240-363793/4	0.099953	0.077			0.770364	Y
5	IC 240-363793/5	0.249882	0.184			0.736348	Y
6	IC 240-363793/6	0.499764	0.363			0.726343	Y



Shipping and Receiving Documents

Chain of Custody Record



COC No.: **RVAAP-084-TA**

Page 1 of 1 Date: 1/28/2019

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 January 2019
 Job/P.O. No.: P010216426
 Sampler (Signature) *[Signature]* (Printed Name)

[Signature]
 HEATHER ADAMS

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Requested Parameters													OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS					
							VOCs (1)(B)	SVOCs (2)(A)	LL PAHs (3)(A)	Explosives (6)(A)	Pesticides/PCB (5)(A)	Nitrogen (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-002-190101-GW	GW	NA	1/28/2019	1045	W	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	21	Metals Incl Phosphorus; Cr6 stays at CANTON
	SCLmw-002-190102-GW	GW	NA	1/28/2019	1045	W	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	21	Metals Incl Phosphorus; Cr6 stays at CANTON
	SCLmw-002-190101-GWMSD	GW	NA	1/28/2019	1045	W	4	4	4	4	4	4	4	4	4	4	1	1	1	1	1	1	1	39	Xtra Vol for MS/MSD; metals+P; Cr6 @CANTON
	FWGTB-190102	TB	NA	1/28/2019	1045	W	2																	2	Trip Blank
	SCLmw-003-190101-GW	GW	NA	1/28/2019	1051	W	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	21	Metals Incl Phosphorus; Cr6 stays at CANTON
	SCLmw-001-190101-GW	GW	NA	1/28/2019	1055	W	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	21	Metals Incl Phosphorus; Cr6 stays at CANTON



* Hexavalent Cr analysis performed at Canton


Relinquished by <i>[Signature]</i> HEATHER ADAMS Leidos Company	Date 1/20/19	Received by <i>[Signature]</i> RECEIVED Company	Date 1/28/19	Notes: A. Cool, 4C D. NaOH, pH>12, Cool, 4C E. NaOH/Zn Acetate, pH>9, Cool, 4C	Shipment Method: Courier
Relinquished by <i>[Signature]</i> RECEIVED Company	Date 1/28/19	Received by <i>[Signature]</i> RECEIVED Company	Date 1/28/19	Notes: 1. SW 8250 2. SW 8270 3. SW 8270SIM 4. SW 8330-MOD 5. SW 8081/8082 6. SW 8330 7. SW 8010 8. SW 9012 9. SW 9034 10. SW 9056/9M2320 11. SW 8960 12. EPA 353.2 13. SW 7196	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

Client Leidos Site Name _____ Cooler unpacked by: DS
 Cooler Received on 01/28/19 Opened on 01/28/19
 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 F DS
 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 -0.2 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #36 (CF +0°C) Observed Cooler Temp. 2.4 °C Corrected Cooler Temp. 2.4 °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# HC854592
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Yes  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: NS

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): _____