TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 240-89062-1

Job Description: Ravenna, OH

For:
Cardno TEC, Inc
2496 Old Ivy Road
Suite 300
Charlottesville, VA 22903

Attention: Mr. Peter Chapman

Approved for release.
Patrick J McEntee
Manager of Project Management
12/9/2017 7:58 AM

Patrick J McEntee, Manager of Project Management
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12/09/2017

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.

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Table of Contents

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	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: Cardno TEC, Inc

Project: Ravenna, OH

Report Number: 240-89062-1

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.

RECEIPT

The samples were received on 12/7/2017 4:31 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.3º C.

Hexavalent chromium analysis was performed by TestAmerica Canton. TestAmerica Canton is not hold DoD accreditation; therefore, method EPA SW-846 Method 7196A is reported with standard data qualifiers applied.

HEXAVALENT CHROMIUM

Samples LL1mw-089-120717-GW (240-89062-1) and LL2mw-272-120717-GW (240-89062-2) were analyzed for hexavalent chromium in accordance with EPA SW-846 Method 7196A. The samples were analyzed on 12/07/2017.

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

Detection Summary

Client: Cardno TEC, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-89062-1

Client Sample ID: LL1mw-089-120717-GW — Lab Sample ID: 240-89062-1

No Detections.

Client Sample ID: LL2mw-272-120717-GW — Lab Sample ID: 240-89062-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: LL1mw-089-120717-GW

Lab Sample ID: 240-89062-1

Date Collected: 12/07/17 12:15

Matrix: Water

Date Received: 12/07/17 16:31

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexavalent chromium	ND		20	3.0	ug/L			12/07/17 17:12	1

Client Sample ID: LL2mw-272-120717-GW

Lab Sample ID: 240-89062-2

Date Collected: 12/07/17 11:25

Matrix: Water

Date Received: 12/07/17 16:31

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexavalent chromium	ND		20	3.0	ug/L			12/07/17 17:15	1

Default Detection Limits

Client: Cardno TEC, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-89062-1

General Chemistry

Analyte	RL	MDL	Units	Method
Hexavalent chromium	20	3.0	ug/L	7196A

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 240-306711/3
Matrix: Water
Analysis Batch: 306711

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexavalent chromium	ND		20	3.0	ug/L			12/07/17 12:11	1

Lab Sample ID: LCS 240-306711/4
Matrix: Water
Analysis Batch: 306711

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hexavalent chromium			250	245		ug/L		98	80 - 123		

Lab Sample ID: 240-89062-2 MS
Matrix: Water
Analysis Batch: 306711

Client Sample ID: LL2mw-272-120717-GW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hexavalent chromium	ND		250	98.4		ug/L		39	31 - 151		

Lab Sample ID: 240-89062-2 MSD
Matrix: Water
Analysis Batch: 306711

Client Sample ID: LL2mw-272-120717-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		250	89.2		ug/L		36	31 - 151	10	20

QC Association Summary

Client: Cardno TEC, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-89062-1

General Chemistry

Analysis Batch: 306711

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-89062-1	LL1mw-089-120717-GW	Total/NA	Water	7196A	
240-89062-2	LL2mw-272-120717-GW	Total/NA	Water	7196A	
MB 240-306711/3	Method Blank	Total/NA	Water	7196A	
LCS 240-306711/4	Lab Control Sample	Total/NA	Water	7196A	
240-89062-2 MS	LL2mw-272-120717-GW	Total/NA	Water	7196A	
240-89062-2 MSD	LL2mw-272-120717-GW	Total/NA	Water	7196A	

Lab Chronicle

Client: Cardno TEC, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-89062-1

Client Sample ID: LL1mw-089-120717-GW

Lab Sample ID: 240-89062-1

Date Collected: 12/07/17 12:15

Matrix: Water

Date Received: 12/07/17 16:31

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	306711	12/07/17 17:12	JWW	TAL CAN

Client Sample ID: LL2mw-272-120717-GW

Lab Sample ID: 240-89062-2

Date Collected: 12/07/17 11:25

Matrix: Water

Date Received: 12/07/17 16:31

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7196A		1	306711	12/07/17 17:15	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: Cardno TEC, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-89062-1

Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Ohio VAP	State Program	5	CL0024	09-06-19

Laboratory: TestAmerica Denver

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
A2LA	DoD ELAP		2907.01	10-31-19 *
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	04-05-18
Arkansas DEQ	State Program	6	88-0687	06-01-18
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-18
Illinois	NELAP	5	200017	04-30-18
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-18
Louisiana	NELAP	6	02096	06-30-18
Maine	State Program	1	CO0002	03-03-19
Nevada	State Program	9	CO0026	07-31-18
New Hampshire	NELAP	1	205310	04-28-18
New Jersey	NELAP	2	CO004	06-30-18
New York	NELAP	2	11964	04-01-18
North Dakota	State Program	8	R-034	01-09-18
Oklahoma	State Program	6	8614	08-31-18
Pennsylvania	NELAP	3	68-00664	07-31-18
Texas	NELAP	6	T104704183-17-14	09-30-18
USDA	Federal		P330-16-00397	12-15-19
Utah	NELAP	8	CO00026	07-31-18
Virginia	NELAP	3	460232	06-14-18
Washington	State Program	10	C583	08-03-18
West Virginia DEP	State Program	3	354	11-30-17 *
Wisconsin	State Program	5	999615430	08-31-18
Wyoming (UST)	A2LA	8	2907.01	10-31-19

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

Method Summary

Client: Cardno TEC, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-89062-1

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: Cardno TEC, Inc
Project/Site: Ravenna, OH

TestAmerica Job ID: 240-89062-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-89062-1	LL1mw-089-120717-GW	Water	12/07/17 12:15	12/07/17 16:31
240-89062-2	LL2mw-272-120717-GW	Water	12/07/17 11:25	12/07/17 16:31

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
WCCHROME50PM2_00021	03/08/18	09/08/17	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_00022	03/08/18	09/08/17	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

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job Number: 240-89062-1

SDG No.:

Project: Ravenna, OH

Client Sample ID	Lab Sample ID
LL1mw-089-120717-GW	240-89062-1
LL2mw-272-120717-GW	240-89062-2

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: LL1mw-089-120717-GW
Lab Sample ID: 240-89062-1
Lab Name: TestAmerica Canton
Job No.: 240-89062-1
SDG ID.:
Matrix: Water
Date Sampled: 12/07/2017 12:15
Reporting Basis: WET
Date Received: 12/07/2017 16:31

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Hexavalent chromium	ND	20	3.0	ug/L			1	7196A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: LL2mw-272-120717-GW
Lab Sample ID: 240-89062-2
Lab Name: TestAmerica Canton
Job No.: 240-89062-1
SDG ID.:
Matrix: Water
Date Sampled: 12/07/2017 11:25
Reporting Basis: WET
Date Received: 12/07/2017 16:31

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Hexavalent chromium	ND	20	3.0	ug/L			1	7196A

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Analyst: BLW Batch Start Date: 11/08/2017

Reporting Units: mg/L Analytical Batch No.: 302588

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
7	ICV	09:37	Hexavalent chromium	0.269	0.250	108	90-110		WCCHROME50PM2_00021

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

FORM II-IN

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Analyst: JWW Batch Start Date: 12/07/2017

Reporting Units: mg/L Analytical Batch No.: 306711

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
1	CCV	12:10	Hexavalent chromium	0.258	0.250	103	90-110		WCCHROME50PPM_00022
2	CCB	12:10	Hexavalent chromium	ND					
13	CCV	12:21	Hexavalent chromium	0.258	0.250	103	90-110		WCCHROME50PPM_00022
16	CCV	12:24	Hexavalent chromium	0.258	0.250	103	90-110		WCCHROME50PPM_00022
17	CCB	12:25	Hexavalent chromium	ND					
22	CCV	17:25	Hexavalent chromium	0.224	0.250	90	90-110		WCCHROME50PPM_00022
23	CCB	17:30	Hexavalent chromium	ND					

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

FORM II-IN

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 306711 Date: 12/07/2017 12:11							
7196A	MB 240-306711/3	Hexavalent chromium	ND		ug/L	20	1

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 306711 Date: 12/07/2017 17:18											
7196A	240-89062-2	Hexavalent chromium	ND		ug/L						
7196A	240-89062-2 MS	Hexavalent chromium	98.4		ug/L	250	39	31-151			

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

FORM V-IN

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 306711 Date: 12/07/2017 17:22											
7196A	240-89062-2 MSD	Hexavalent chromium	89.2		ug/L	250	36	31-151	10	20	

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

FORM V-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 306711	Date: 12/07/2017 12:12										
						LCS Source: WCCHROME50PM2_00021					
7196A	LCS 240-306711/4	Hexavalent chromium	245		ug/L	250	98	80-123			

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

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job Number: 240-89062-1

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: 240-89062-1

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.: 240-89062-1

SDG No.:

Instrument ID: OSCAR Analysis Method: 7196A

Start Date: 11/08/2017 09:37 End Date: 11/09/2017 09:42

Lab Sample Id	D/F	Type	Time	Analytes																								
				Cr6																								
IC 240-302588/1	1		09:37	X																								
IC 240-302588/2	1		09:37	X																								
IC 240-302588/3	1		09:37	X																								
IC 240-302588/4	1		09:37	X																								
IC 240-302588/5	1		09:37	X																								
IC 240-302588/6	1		09:37	X																								
ICV 240-302588/7	1		09:37	X																								
ICB 240-302588/8			09:38																									
ZZZZZZ			09:39																									
ZZZZZZ			09:40																									
ZZZZZZ			09:41																									
ZZZZZZ			09:42																									
ZZZZZZ			09:43																									
ZZZZZZ			09:44																									
ZZZZZZ			09:45																									
ZZZZZZ			09:46																									
ZZZZZZ			09:47																									
CCV 240-302588/18			09:48																									
CCB 240-302588/19			09:37																									
ZZZZZZ			09:49																									
ZZZZZZ			09:50																									
ZZZZZZ			09:51																									
ZZZZZZ			09:52																									
ZZZZZZ			09:53																									
ZZZZZZ			09:54																									
ZZZZZZ			09:55																									
ZZZZZZ			09:56																									
ZZZZZZ			09:57																									
CCV 240-302588/29			09:58																									
CCB 240-302588/30			09:59																									
ZZZZZZ			10:00																									
ZZZZZZ			10:01																									
ZZZZZZ			10:02																									
ZZZZZZ			10:03																									
ZZZZZZ			10:04																									
CCV 240-302588/36			10:05																									
CCB 240-302588/37			10:06																									
ZZZZZZ			11:40																									
ZZZZZZ			11:41																									
ZZZZZZ			11:42																									
CCV 240-302588/41			11:43																									

FORM XIII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Instrument ID: OSCAR Analysis Method: 7196A

Start Date: 11/08/2017 09:37 End Date: 11/09/2017 09:42

Lab Sample Id	D/F	Type	Time	Analytes																								
				Cr6																								
CCB 240-302588/42			11:44																									
ZZZZZZ			11:45																									
ZZZZZZ			11:46																									
ZZZZZZ			11:47																									
ZZZZZZ			11:48																									
ZZZZZZ			11:49																									
CCV 240-302588/48			11:50																									
CCB 240-302588/49			11:51																									
ZZZZZZ			11:43																									

Prep Types:
=

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Instrument ID: OSCAR Analysis Method: 7196A

Start Date: 12/07/2017 12:10 End Date: 12/07/2017 17:30

Lab Sample Id	D/F	Type	Time	Analytes																								
				Cr6																								
CCV 240-306711/1	1		12:10	X																								
CCB 240-306711/2	1		12:10	X																								
MB 240-306711/3	1	T	12:11	X																								
LCS 240-306711/4	1	T	12:12	X																								
ZZZZZZ			12:13																									
ZZZZZZ			12:14																									
ZZZZZZ			12:15																									
ZZZZZZ			12:16																									
ZZZZZZ			12:17																									
ZZZZZZ			12:18																									
ZZZZZZ			12:19																									
ZZZZZZ			12:20																									
CCV 240-306711/13	1		12:21	X																								
CCV 240-306711/14			12:22																									
ZZZZZZ			12:23																									
CCV 240-306711/16	1		12:24	X																								
CCB 240-306711/17	1		12:25	X																								
240-89062-1	1	T	17:12	X																								
240-89062-2	1	T	17:15	X																								
240-89062-2 MS	1	T	17:18	X																								
240-89062-2 MSD	1	T	17:22	X																								
CCV 240-306711/22	1		17:25	X																								
CCB 240-306711/23	1		17:30	X																								

Prep Types:
T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Canton Job No.: 240-89062-1

SDG No.:

Batch Number: 302588 Batch Start Date: 11/08/17 09:37 Batch Analyst: Woodward, Bruce

Batch Method: 7196A Batch End Date: 11/08/17 12:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	UnCorResp	WCCHROME50PM2 00021	WCCHROME50PPM 00022	
IC 240-302588/1		7196A		50 mL	50 mL	0 Absorbance			
IC 240-302588/2		7196A		50 mL	50 mL	0.010 Absorbance		0.005 mL	
IC 240-302588/3		7196A		50 mL	50 mL	0.012 Absorbance		0.01 mL	
IC 240-302588/4		7196A		50 mL	50 mL	0.091 Absorbance		0.1 mL	
IC 240-302588/5		7196A		50 mL	50 mL	0.207 Absorbance		0.25 mL	
IC 240-302588/6		7196A		50 mL	50 mL	0.381 Absorbance		0.5 mL	
ICV 240-302588/7		7196A		50 mL	50 mL	0.212 Absorbance	0.25 mL		

Batch Notes	
Acid Used for pH Adjustment ID	3294428
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3325146
Pipette ID	E11,F1

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.: 240-89062-1

SDG No.:

Batch Number: 306711 Batch Start Date: 12/07/17 12:10 Batch Analyst: Weimer, Joshua W

Batch Method: 7196A Batch End Date: 12/07/17 17:35

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	ColorBlk	UnCorResp	WCCHROME50PM2 00021	WCCHROME50PPM 00022
CCV 240-306711/1		7196A		50 mL	50 mL		0.204 Absorbance		0.25 mL
CCB 240-306711/2		7196A		50 mL	50 mL		0 Absorbance		
MB 240-306711/3		7196A		50 mL	50 mL		0 Absorbance		
LCS 240-306711/4		7196A		50 mL	50 mL		0.194 Absorbance	0.25 mL	
CCV 240-306711/13		7196A		50 mL	50 mL		0.204 Absorbance		0.25 mL
CCV 240-306711/16		7196A		50 mL	50 mL		0.204 Absorbance		0.25 mL
CCB 240-306711/17		7196A		50 mL	50 mL		0 Absorbance		
240-89062-A-1	LL1mw-089-120717 -GW	7196A	T	50 mL	50 mL	0 Absorbance	0 Absorbance		
240-89062-A-2	LL2mw-272-120717 -GW	7196A	T	50 mL	50 mL	0.009 Absorbance	0.009 Absorbance		
240-89062-A-2 MS	LL2mw-272-120717 -GW	7196A	T	50 mL	50 mL		0.082 Absorbance	0.25 mL	
240-89062-A-2 MSD	LL2mw-272-120717 -GW	7196A	T	50 mL	50 mL		0.075 Absorbance	0.25 mL	
CCV 240-306711/22		7196A		50 mL	50 mL		0.178 Absorbance		0.25 mL
CCB 240-306711/23		7196A		50 mL	50 mL		0 Absorbance		

Batch Notes	
Acid Used for pH Adjustment ID	3294428
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID	3376470
Pipette ID	E8

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.

Shipping and Receiving Documents

Cr(VI) Chain 2.0123

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: EB Busby	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No:
Client Contact: Elizabeth Busby	Phone: 303 941 6689	E-Mail: patrick.mcentee@testamericainc.com		Page:
Company: Cardno TEC, Inc				Job #:

Address: 1658 Cole Boulevard Suite 190	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Golden	TAT Requested (days): 20 Business Days		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: CO 80401			
Phone: 303-273-0231	PO #: 91979		
Email: Elizabeth.Busby@cardno-gs.com	WO #: 076003.009.007		
Project Name: Ravenna, OH -	Project #: 28014271		
Site:	SSOW#:		Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	7196A Hex. Chromium	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
LL1mw-089-120717-GW	12.7.17	1215	G	W			X	1	
LL2mw-272-120717-GW	↓	1125	↓	↓		Y	X	3	

240-89062 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ☐ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	EB Busby	12/7/17 1530	Cardno	Trib	12/7/17 1535	TA-DE
2		12/7/17 1631	TA-DE		12/7/17 1631	TA
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

12/09/2017

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 89062
Canton Facility

Client Cardno.TEC Site Name _____ Cooler unpacked by:

Cooler Received on 12/7/17 Opened on 12/7/17

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 **-0.3** °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.3 °C

IR GUN #36 (CF **+0.3**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

~~IR GUN # 627 (CF **-1.3**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C~~

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	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# **HC730269**
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 _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

17. 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)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Sample Receipt Checklist

Client: Cardno TEC, Inc

Job Number: 240-89062-1

Login Number: 89062
List Number: 1
Creator: Martin, Elizabeth

List Source: TestAmerica Canton

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.	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	Preservation labels on samples match COC
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.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	