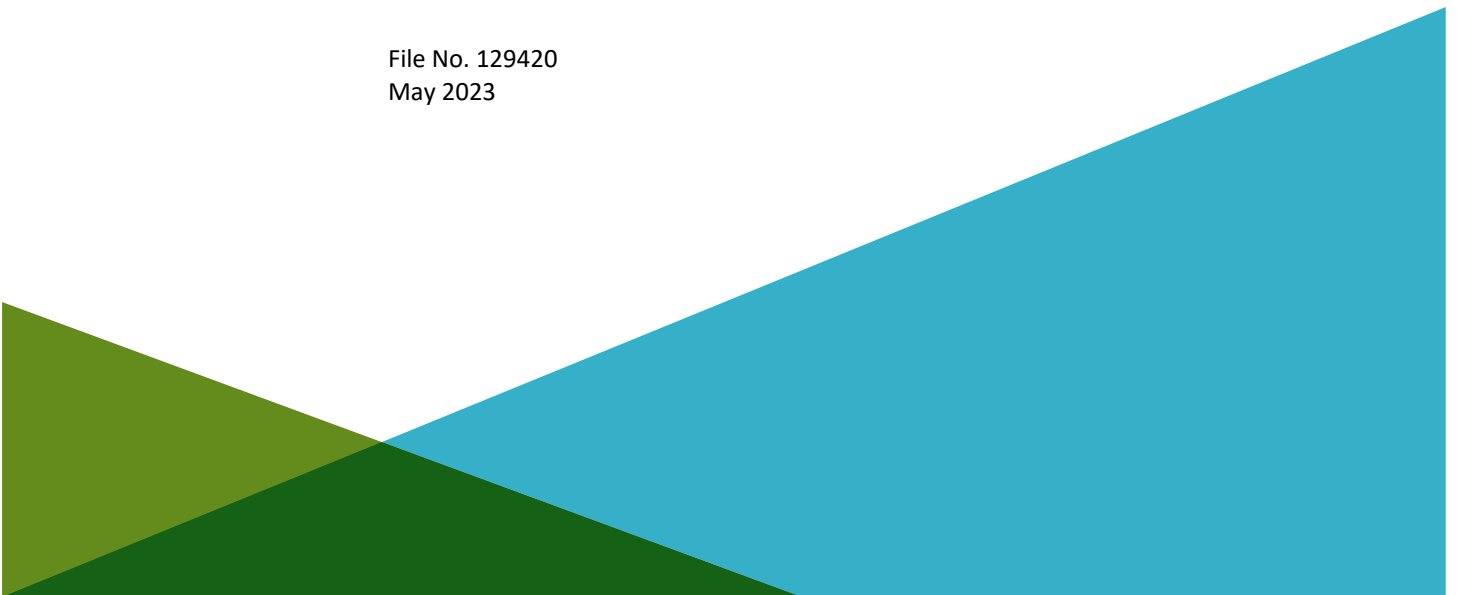


2018 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT ADDENDUM  
SEDIMENTATION POND  
A.B. BROWN GENERATING STATION  
POSEY COUNTY, INDIANA

by  
Haley & Aldrich, Inc.  
Greenville, South Carolina

for  
Southern Indiana Gas and Electric Company  
Evansville, Indiana

File No. 129420  
May 2023





HALEY & ALDRICH, INC.  
400 Augusta Street  
Suite 100  
Greenville, SC 29601  
864.214.8750

15 May 2023  
File No. 129420

**SUBJECT:** 2018 Annual Groundwater Monitoring and Corrective Action Report Addendum  
Southern Indiana Gas and Electric Company  
Sedimentation Pond  
A.B. Brown Generating Station; Posey County, Indiana

The Sedimentation Pond at A.B. Brown Generating Station is subject to the groundwater monitoring and corrective action requirements described under 40 CFR § 257.90 through § 257.98 (Rule). An *Annual Groundwater Monitoring and Corrective Action Report* (Annual Groundwater Report) documenting the activities in 2018 for the Sedimentation Pond was completed and placed in the facilities operating record on 31 January 2019, as required by the Rule. The Annual Groundwater Report contained the specific information listed in § 257.90(e).

This addendum has been prepared to supplement the operating record in recognition of comments issued by the United States Environmental Protection Agency (U.S. EPA) on 11 January 2022, to various utilities regarding their respective Part A extension applications, and U.S. EPA's "proposed finding that GWMCA reports are incomplete and lack clarity of visual representation of data" in the proposed conditional approval for the A.B. Brown Generating Station that was released on 5 October 2022. Those comments, proposed findings, and U.S. EPA clarifications were understood to be U.S. EPA's expectations regarding the contents of the facility's Annual Groundwater Report. In addition to the information listed in § 257.90(e), the U.S. EPA indicated in their comments that annual reports should contain:

- water level gauging data for each sampling event, including groundwater elevation data, a determination of groundwater flow direction(s) and rate(s), and updated potentiometric surface map(s);
- laboratory analytical reports to verify that groundwater sampling and analysis requirements outlined in § 257.93 are being met; and finally,
- statistical analyses, including detailed discussion of the statistical analyses (e.g., statistical method applied, confidence levels, and normality test results).

While this information is not specifically referred to in the in 257.90(e) of the Rule for inclusion in the annual reports, it has been routinely collected and maintained in Southern Indiana Gas and Electric Company's files, and is being provided in the attachments to this addendum as follows:

#### **Attachment 1 – Groundwater Gauging Data**

- Summary of groundwater gauging data

### **Attachment 2 – Updated Potentiometric Surface Map Containing Most Recent Groundwater Elevation Data**

- Water table configuration map – June 2018
- Water table configuration map – August 2018

Water table maps include groundwater flow direction arrows and groundwater velocity calculations.

### **Attachment 3 – Laboratory Analytical Reports**

- Laboratory data packages

Includes supporting information, such as, case narrative, sample and method summary, analytical results, quality control, and chain-of-custody documentation.

### **Attachment 4 – Statistical Analyses**

- Statistical Evaluation of the November 2017 *Groundwater Assessment*

Includes a discussion of the statistical analysis utilized along with a table summarizing the statistical outputs (e.g., frequency of detection, maximum detection, variance, standard deviation, coefficient of variance, outlier tests, trends, upper and lower confidence limits, and comparison against Groundwater Protection Standards), and supporting backup.

**ATTACHMENT 1**  
**Groundwater Gauging Data**



**VECTREN - AB BROWN STATION**

Groundwater Sampling Event

Gauging Date: June 4, 2018

ATC Project No. 170LF00368

<b>WELL ID</b>	<b>Date</b>	<b>DTW FROM TOC</b>
CCR-AP-1R	6/4/2018	16.60
CCR-AP-2R	6/4/2018	43.00
CCR-AP-3R	6/4/2018	40.45
CCR-AP-4R	6/4/2018	34.35
CCR-AP-5	6/4/2018	36.78
CCR-AP-6	6/4/2018	19.45
CCR-AP-7R	6/4/2018	35.04
CCR-LF-1	6/4/2018	9.05
CCR-LF-2	6/4/2018	26.88
CCR-LF-3	6/4/2018	29.55
CCR-LF-4	6/4/2018	48.23
CCR-LF-5	6/4/2018	21.35
CCR-LF-6	6/4/2018	7.70
CCR-SP-1	6/4/2018	11.88
CCR-SP-2	6/4/2018	13.58
CCR-SP-3	6/4/2018	7.65
CCR-BK-1	6/4/2018	Dry
CCR-BK-2	6/4/2018	15.57

DTW= Depth to Water

TOC= Top of Casing

**VECTREN - AB BROWN STATION**

Groundwater Sampling Event

Gauging Date: August 20, 2018

ATC Project No. 170LF00577

<b>WELL ID</b>	<b>GAUGE DATE</b>	<b>DTW FROM TOC</b>
CCR-AP-1R	8/20/2018	17.40
CCR-AP-2R	8/20/2018	44.60
CCR-AP-3R	8/20/2018	40.60
CCR-AP-4R	8/20/2018	35.70
CCR-AP-5	8/20/2018	36.75
CCR-AP-6	8/20/2018	18.10
CCR-AP-7R	8/20/2018	35.41
CCR-LF-1	8/20/2018	10.65
CCR-LF-2	8/20/2018	26.97
CCR-LF-3	8/20/2018	29.43
CCR-LF-4	8/20/2018	48.09
CCR-LF-5	8/20/2018	21.95
CCR-LF-6	8/20/2018	7.90
CCR-SP-1	8/20/2018	13.65
CCR-SP-2	8/20/2018	15.15
CCR-SP-3	8/20/2018	9.48
CCR-BK-1R	8/20/2018	61.80 (below pump)
CCR-BK-2	8/20/2018	21.25

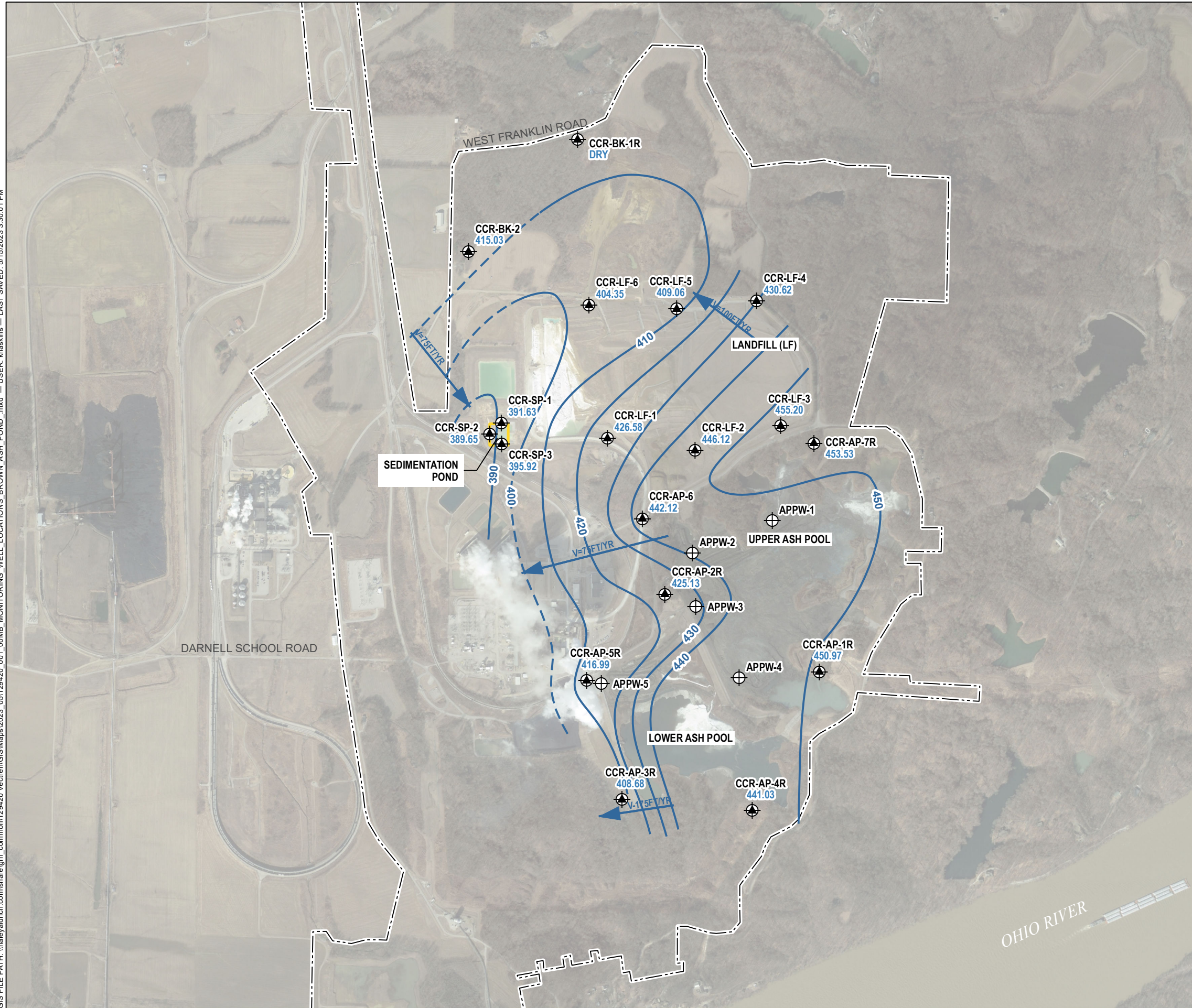
DTW= Depth to Water

TOC= Top of Casing

**ATTACHMENT 2**

**Updated Potentiometric Surface Map Containing Most  
Recent Groundwater Elevation Data**





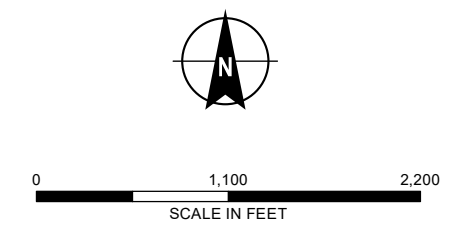
**LEGEND**

- CCR MONITORING WELL
- CCR PIEZOMETER WELL
- GROUNDWATER ELEVATION CONTOUR, 10-FT INTERVAL, DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION
- APPROXIMATE UNIT BOUNDARY
- PROPERTY BOUNDARY

**NOTES**

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. CCR REGULATED UNITS INCLUDE THE ASH POND, LANDFILL, AND SEDIMENTATION POND.
3. GROUNDWATER ELEVATIONS WERE MEASURED 4 JUNE 2018.
4. APPROXIMATE GROUNDWATER FLOW RATE CALCULATED USING  

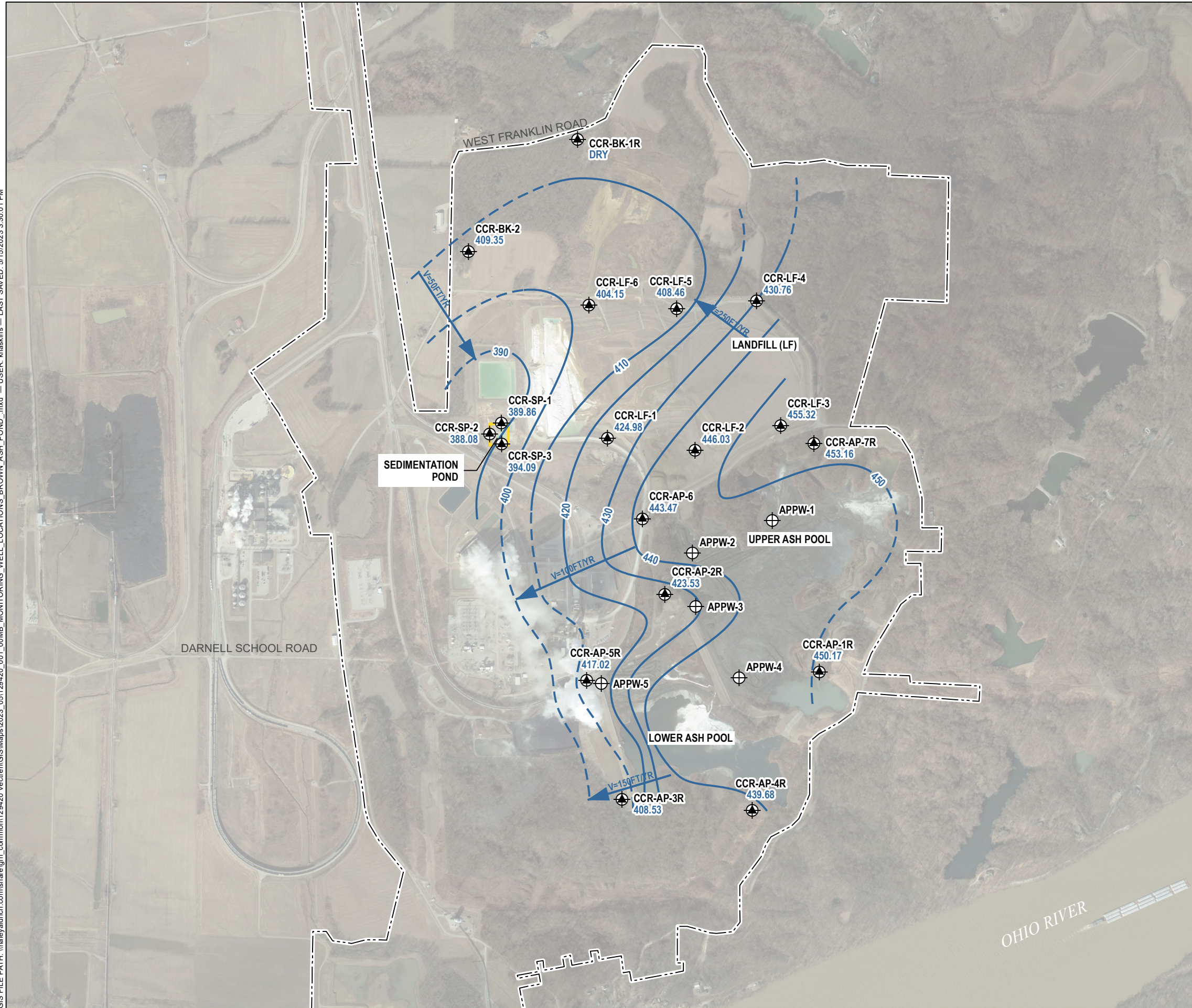
$$V = \frac{k(i)}{n_e}$$
 WHERE:  
 V = GROUNDWATER FLOW VELOCITY (FT/YR)  
 k = HORIZONTAL HYDRAULIC CONDUCTIVITY (FT/DAY)  
 i = HORIZONTAL GROUNDWATER GRADIENT (FT/FT)  
 n<sub>e</sub> = ASSUMED EFFECTIVE POROSITY
5. AERIAL IMAGERY SOURCE: GOOGLE, 2018



**HALEY ALDRICH** SOUTHERN INDIANA GAS AND ELECTRIC COMPANY  
 A.B. BROWN GENERATING STATION  
 MOUNT VERNON, INDIANA

**SHALLOW GROUNDWATER ELEVATION CONTOURS - JUNE 2018**

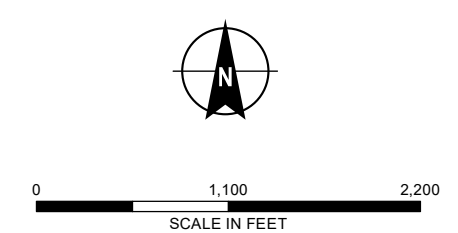




**LEGEND**

- CCR MONITORING WELL
- CCR PIEZOMETER WELL
- GROUNDWATER ELEVATION CONTOUR, 10-FT INTERVAL, DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION
- APPROXIMATE UNIT BOUNDARY
- PROPERTY BOUNDARY

- NOTES**
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
  2. CCR REGULATED UNITS INCLUDE THE ASH POND, LANDFILL, AND SEDIMENTATION POND.
  3. GROUNDWATER ELEVATIONS WERE MEASURED 20 AUGUST 2018.
  4. APPROXIMATE GROUNDWATER FLOW RATE CALCULATED USING  $V = \frac{k(i)}{n_e}$
- WHERE:  
 V = GROUNDWATER FLOW VELOCITY (FT/YR)  
 k = HORIZONTAL HYDRAULIC CONDUCTIVITY (FT/DAY)  
 i = HORIZONTAL GROUNDWATER GRADIENT (FT/FT)  
 n<sub>e</sub> = ASSUMED EFFECTIVE POROSITY
5. AERIAL IMAGERY SOURCE: GOOGLE, 2018



**HALEY ALDRICH** SOUTHERN INDIANA GAS AND ELECTRIC COMPANY  
 A.B. BROWN GENERATING STATION  
 MOUNT VERNON, INDIANA

**SHALLOW GROUNDWATER ELEVATION CONTOURS - AUGUST 2018**



**ATTACHMENT 3**  
**Laboratory Analytical Reports**

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Pittsburgh

301 Alpha Drive

RIDC Park

Pittsburgh, PA 15238

Tel: (412)963-7058

TestAmerica Job ID: 180-78475-1

Client Project/Site: CCR Groundwater Monitoring AB Brown

Revision: 1

For:

Vectren Corporation

PO BOX 209

Evansville, Indiana 47702

Attn: Lisa Messinger



Authorized for release by:

7/24/2018 4:00:04 PM

Veronica Bortot, Senior Project Manager

(412)963-2435

[veronica.bortot@testamericainc.com](mailto:veronica.bortot@testamericainc.com)

### LINKS

Review your project  
results through

Total Access

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Job ID: 180-78475-1**

**Laboratory: TestAmerica Pittsburgh**

## Narrative

### Job Narrative 180-78475-1

**REVISED** : to correct the list of analytes that were initially reported on 7/16. Appendix IV list of analytes were to be reported

#### Comments

No additional comments.

#### Receipt

The samples were received on 6/7/2018 3:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 2.6° C, 3.5° C, 4.4° C and 5.2° C.

#### Receipt Exceptions

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. There are no collection times listed on the COC for the following samples; however they are on the labels.

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. The tests are not checked on the COC for samples Blind Duplicate 3 and Field Blank 3 : however containers were received which were the same as the remaining samples and thus the same tests were chosen.

#### Anions

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

#### RAD

Method(s) PrecSep\_0: Radium 228 Prep Batch 160-371238:

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: CCR-SP-1 (180-78475-1), CCR-SP-2 (180-78475-2), CCR-SP-3 (180-78475-3), BLIND DUPLICATE 3 (180-78475-4), FIELD BLANK 3 (180-78475-5), CCR-LF-5 (180-78475-6), CCR-LF-6 (180-78475-7), CCR-AP-1R (180-78475-8), CCR-AP-2R (180-78475-9), CCR-AP-3R (180-78475-10), CCR-AP-4R (180-78475-11), CCR-AP-5 (180-78475-12), CCR-AP-7R (180-78475-13) and BLIND DUPLICATE 1 (180-78475-14). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep\_0: Radium 228 Prep Batch 160-371238:

Sample aliquot reduced due to potential matrix interference. Sample was yellow, opaque, and contained sediment.  
CCR-SP-2 (180-78475-2)

Method(s) PrecSep-21: Radium 226 Prep Batch 160-371234:

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: CCR-SP-1 (180-78475-1), CCR-SP-2 (180-78475-2), CCR-SP-3 (180-78475-3), BLIND DUPLICATE 3 (180-78475-4), FIELD BLANK 3 (180-78475-5), CCR-LF-5 (180-78475-6), CCR-LF-6 (180-78475-7), CCR-AP-1R (180-78475-8), CCR-AP-2R (180-78475-9), CCR-AP-3R (180-78475-10), CCR-AP-4R (180-78475-11), CCR-AP-5 (180-78475-12), CCR-AP-7R (180-78475-13) and BLIND DUPLICATE 1 (180-78475-14). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep-21: Radium 226 Prep Batch 160-371234:

Sample aliquot reduced due to potential matrix interference. Sample was yellow, opaque, and contained sediment.  
CCR-SP-2 (180-78475-2)

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

# Case Narrative

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

---

## Job ID: 180-78475-1 (Continued)

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### Laboratory: TestAmerica Pittsburgh (Continued)

#### Metals

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

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# Definitions/Glossary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Qualifiers

### HPLC/IC

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.

### Metals

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.

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## 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)

# Accreditation/Certification Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Laboratory: TestAmerica Pittsburgh

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
Arkansas DEQ	State Program	6	88-0690	06-27-19
California	State Program	9	2891	04-30-19
Connecticut	State Program	1	PH-0688	09-30-18
Florida	NELAP	4	E871008	06-30-19
Illinois	NELAP	5	200005	06-30-19
Kansas	NELAP	7	E-10350	01-31-19
Louisiana	NELAP	6	04041	06-30-19
Nevada	State Program	9	PA00164	07-31-18
New Hampshire	NELAP	1	2030	04-04-19
New Jersey	NELAP	2	PA005	06-30-19
New York	NELAP	2	11182	03-31-19
North Carolina (WW/SW)	State Program	4	434	12-31-18
Oregon	NELAP	10	PA-2151	01-28-19
Pennsylvania	NELAP	3	02-00416	04-30-19
South Carolina	State Program	4	89014	04-30-18 *
Texas	NELAP	6	T104704528-15-2	03-31-19
US Fish & Wildlife	Federal		LE94312A-1	07-31-18
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-19
Virginia	NELAP	3	460189	09-14-18
West Virginia DEP	State Program	3	142	01-31-19
Wisconsin	State Program	5	998027800	08-31-18

## Laboratory: TestAmerica St. Louis

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
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18 *
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-18 *
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-18 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *

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

TestAmerica Pittsburgh

# Accreditation/Certification Summary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Laboratory: TestAmerica St. Louis (Continued)

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
Texas	NELAP	6	T104704193-17-11	07-31-18 *
US Fish & Wildlife	Federal		058448	07-31-18
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18
West Virginia DEP	State Program	3	381	08-31-18 *

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

TestAmerica Pittsburgh

# Sample Summary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-78475-1	CCR-SP-1	Water	06/05/18 10:30	06/07/18 15:10
180-78475-2	CCR-SP-2	Water	06/05/18 13:45	06/07/18 15:10
180-78475-3	CCR-SP-3	Water	06/05/18 16:00	06/07/18 15:10
180-78475-4	BLIND DUPLICATE 3	Water	06/05/18 00:00	06/07/18 15:10
180-78475-5	FIELD BLANK 3	Water	06/05/18 00:00	06/07/18 15:10
180-78475-6	CCR-LF-5	Water	06/05/18 13:09	06/07/18 15:10
180-78475-7	CCR-LF-6	Water	06/05/18 14:33	06/07/18 15:10
180-78475-8	CCR-AP-1R	Water	06/06/18 13:45	06/07/18 15:10
180-78475-9	CCR-AP-2R	Water	06/06/18 17:45	06/07/18 15:10
180-78475-10	CCR-AP-3R	Water	06/06/18 11:00	06/07/18 15:10
180-78475-11	CCR-AP-4R	Water	06/06/18 12:30	06/07/18 15:10
180-78475-12	CCR-AP-5	Water	06/06/18 15:30	06/07/18 15:10
180-78475-13	CCR-AP-7R	Water	06/06/18 18:45	06/07/18 15:10
180-78475-14	BLIND DUPLICATE 1	Water	06/06/18 00:00	06/07/18 15:10

# Method Summary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

None = None

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

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-SP-1**

**Date Collected: 06/05/18 10:30**

**Date Received: 06/07/18 15:10**

**Lab Sample ID: 180-78475-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			249212	07/02/18 09:14	MJH	TAL PIT
		Instrument ID: CHIC2100A								
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 15:31	WTR	TAL PIT
		Instrument ID: A								
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:15	RJR	TAL PIT
		Instrument ID: HGZ								
Total/NA	Prep	PrecSep-21			1000.26 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:09	ALS	TAL SL
		Instrument ID: GFPCORANGE								
Total/NA	Prep	PrecSep_0			1000.26 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:26	ALS	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
		Instrument ID: NOEQUIP								

**Client Sample ID: CCR-SP-2**

**Date Collected: 06/05/18 13:45**

**Date Received: 06/07/18 15:10**

**Lab Sample ID: 180-78475-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			249212	07/02/18 07:42	MJH	TAL PIT
		Instrument ID: CHIC2100A								
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 15:34	WTR	TAL PIT
		Instrument ID: A								
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:16	RJR	TAL PIT
		Instrument ID: HGZ								
Total/NA	Prep	PrecSep-21			749.94 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:09	ALS	TAL SL
		Instrument ID: GFPCORANGE								
Total/NA	Prep	PrecSep_0			749.94 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:26	ALS	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
		Instrument ID: NOEQUIP								

TestAmerica Pittsburgh



# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-SP-3**

**Lab Sample ID: 180-78475-3**

**Date Collected: 06/05/18 16:00**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			249212	07/02/18 06:35	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 15:37	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:19	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			999.81 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			999.81 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:26	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

**Client Sample ID: BLIND DUPLICATE 3**

**Lab Sample ID: 180-78475-4**

**Date Collected: 06/05/18 00:00**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			249212	07/02/18 09:45	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 15:40	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:19	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			999.96 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			999.96 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:26	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: FIELD BLANK 3**

**Lab Sample ID: 180-78475-5**

**Date Collected: 06/05/18 00:00**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			249212	07/02/18 06:19	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 15:43	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:20	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			999.95 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			999.95 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:27	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

**Client Sample ID: CCR-LF-5**

**Lab Sample ID: 180-78475-6**

**Date Collected: 06/05/18 13:09**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		5			249212	07/02/18 12:54	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 15:46	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:21	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.27 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			1000.27 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:27	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-LF-6**

**Lab Sample ID: 180-78475-7**

**Date Collected: 06/05/18 14:33**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			249212	07/02/18 10:16	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 15:49	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:22	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.43 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			1000.43 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:27	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

**Client Sample ID: CCR-AP-1R**

**Lab Sample ID: 180-78475-8**

**Date Collected: 06/06/18 13:45**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			249212	07/02/18 10:48	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 15:52	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:23	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.13 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			1000.13 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:27	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-2R**

**Lab Sample ID: 180-78475-9**

**Date Collected: 06/06/18 17:45**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		5			249212	07/02/18 13:26	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 16:01	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:24	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.19 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			1000.19 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:28	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

**Client Sample ID: CCR-AP-3R**

**Lab Sample ID: 180-78475-10**

**Date Collected: 06/06/18 11:00**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		5			249212	07/02/18 13:58	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 16:03	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:25	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.73 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			1000.73 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:28	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-4R**

**Lab Sample ID: 180-78475-11**

**Date Collected: 06/06/18 12:30**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			249212	07/02/18 08:13	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 16:06	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:26	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.03 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376324	07/17/18 21:10	ALS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Prep	PrecSep_0			1000.03 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:28	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

**Client Sample ID: CCR-AP-5**

**Lab Sample ID: 180-78475-12**

**Date Collected: 06/06/18 15:30**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			249212	07/02/18 11:19	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 16:09	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:27	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.25 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376328	07/17/18 21:11	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Prep	PrecSep_0			1000.25 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:28	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-7R**

**Lab Sample ID: 180-78475-13**

**Date Collected: 06/06/18 18:45**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			249212	07/02/18 12:23	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 16:12	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:30	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.25 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376328	07/17/18 21:11	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Prep	PrecSep_0			1000.25 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:28	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

**Client Sample ID: BLIND DUPLICATE 1**

**Lab Sample ID: 180-78475-14**

**Date Collected: 06/06/18 00:00**

**Matrix: Water**

**Date Received: 06/07/18 15:10**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		5			249212	07/02/18 14:29	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	248970	06/28/18 17:50	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			249857	07/07/18 16:15	WTR	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	249407	07/03/18 06:00	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			249532	07/03/18 12:31	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Prep	PrecSep-21			1000.26 mL	1.0 g	371234	06/19/18 12:59	JLC	TAL SL
Total/NA	Analysis	9315		1			376328	07/17/18 21:12	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Prep	PrecSep_0			1000.26 mL	1.0 g	371238	06/19/18 13:35	JLC	TAL SL
Total/NA	Analysis	9320		1			376328	07/17/18 15:28	ALS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			376538	07/19/18 10:40	ALS	TAL SL
Instrument ID: NOEQUIP										

**Laboratory References:**

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Analyst References:

Lab: TAL PIT

Batch Type: Prep

NAM = Nicole Marfisi

RJR = Ron Rosenbaum

Batch Type: Analysis

MJH = Matthew Hartman

RJR = Ron Rosenbaum

WTR = Bill Reinheimer

Lab: TAL SL

Batch Type: Prep

JLC = Jessica Chapman

Batch Type: Analysis

ALS = Aaron Schroder

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# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-SP-1**

**Lab Sample ID: 180-78475-1**

Date Collected: 06/05/18 10:30

Matrix: Water

Date Received: 06/07/18 15:10

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.21		0.10	0.026	mg/L			07/02/18 09:14	1

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0046		0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 15:31	1
Barium	0.081		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 15:31	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 15:31	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 15:31	1
Cobalt	0.0071		0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 15:31	1
Chromium	0.0011	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 15:31	1
Molybdenum	0.0013	J	0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 15:31	1
Lead	0.000097	J	0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 15:31	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 15:31	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 15:31	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 15:31	1
Lithium	0.0051		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 15:31	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:15	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0465	U	0.146	0.146	1.00	0.280	pCi/L	06/19/18 12:59	07/17/18 21:09	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	93.5		40 - 110					06/19/18 12:59	07/17/18 21:09	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.208	U	0.235	0.236	1.00	0.448	pCi/L	06/19/18 13:35	07/17/18 15:26	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	93.5		40 - 110					06/19/18 13:35	07/17/18 15:26	1
<i>Y Carrier</i>	91.6		40 - 110					06/19/18 13:35	07/17/18 15:26	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.161	U	0.277	0.278	5.00	0.448	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh



# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-SP-2**

**Lab Sample ID: 180-78475-2**

Date Collected: 06/05/18 13:45

Matrix: Water

Date Received: 06/07/18 15:10

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.37		0.10	0.026	mg/L			07/02/18 07:42	1

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00071	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 15:34	1
Barium	0.13		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 15:34	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 15:34	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 15:34	1
Cobalt	0.00065		0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 15:34	1
Chromium	0.0014	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 15:34	1
Molybdenum	0.0012	J	0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 15:34	1
Lead	0.00019	J	0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 15:34	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 15:34	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 15:34	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 15:34	1
Lithium	0.0069		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 15:34	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:16	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.461		0.293	0.296	1.00	0.385	pCi/L	06/19/18 12:59	07/17/18 21:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		40 - 110					06/19/18 12:59	07/17/18 21:09	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.118	U	0.282	0.282	1.00	0.487	pCi/L	06/19/18 13:35	07/17/18 15:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		40 - 110					06/19/18 13:35	07/17/18 15:26	1
Y Carrier	90.5		40 - 110					06/19/18 13:35	07/17/18 15:26	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.579		0.407	0.409	5.00	0.487	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-SP-3**

**Lab Sample ID: 180-78475-3**

Date Collected: 06/05/18 16:00

Matrix: Water

Date Received: 06/07/18 15:10

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.30		0.10	0.026	mg/L			07/02/18 06:35	1

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0048		0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 15:37	1
Barium	0.067		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 15:37	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 15:37	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 15:37	1
Cobalt	0.00079		0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 15:37	1
Chromium	0.0013	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 15:37	1
Molybdenum	0.0027	J	0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 15:37	1
Lead	0.00020	J	0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 15:37	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 15:37	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 15:37	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 15:37	1
Lithium	0.0031	J	0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 15:37	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:19	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.168	U	0.153	0.154	1.00	0.221	pCi/L	06/19/18 12:59	07/17/18 21:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.5		40 - 110					06/19/18 12:59	07/17/18 21:10	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0474	U	0.190	0.190	1.00	0.352	pCi/L	06/19/18 13:35	07/17/18 15:26	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.5		40 - 110					06/19/18 13:35	07/17/18 15:26	1
Y Carrier	90.8		40 - 110					06/19/18 13:35	07/17/18 15:26	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.121	U	0.244	0.245	5.00	0.352	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: BLIND DUPLICATE 3**

**Lab Sample ID: 180-78475-4**

Date Collected: 06/05/18 00:00

Matrix: Water

Date Received: 06/07/18 15:10

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.22		0.10	0.026	mg/L			07/02/18 09:45	1

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0039		0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 15:40	1
Barium	0.083		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 15:40	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 15:40	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 15:40	1
Cobalt	0.0066		0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 15:40	1
Chromium	0.0012	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 15:40	1
Molybdenum	0.0011	J	0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 15:40	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 15:40	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 15:40	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 15:40	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 15:40	1
Lithium	0.0053		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 15:40	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:19	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0918	U	0.165	0.165	1.00	0.293	pCi/L	06/19/18 12:59	07/17/18 21:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	93.2		40 - 110					06/19/18 12:59	07/17/18 21:10	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.196	U	0.205	0.206	1.00	0.334	pCi/L	06/19/18 13:35	07/17/18 15:26	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	93.2		40 - 110					06/19/18 13:35	07/17/18 15:26	1
Y Carrier	91.6		40 - 110					06/19/18 13:35	07/17/18 15:26	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.288	U	0.263	0.264	5.00	0.334	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Client Sample ID: FIELD BLANK 3

## Lab Sample ID: 180-78475-5

Date Collected: 06/05/18 00:00

Matrix: Water

Date Received: 06/07/18 15:10

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.10	0.026	mg/L			07/02/18 06:19	1

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00033	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 15:43	1
Barium	0.0011	J	0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 15:43	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 15:43	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 15:43	1
Cobalt	ND		0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 15:43	1
Chromium	0.0011	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 15:43	1
Molybdenum	ND		0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 15:43	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 15:43	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 15:43	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 15:43	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 15:43	1
Lithium	ND		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 15:43	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:20	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.123	U	0.149	0.149	1.00	0.243	pCi/L	06/19/18 12:59	07/17/18 21:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.7		40 - 110					06/19/18 12:59	07/17/18 21:10	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0565	U	0.178	0.179	1.00	0.333	pCi/L	06/19/18 13:35	07/17/18 15:27	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.7		40 - 110					06/19/18 13:35	07/17/18 15:27	1
Y Carrier	93.1		40 - 110					06/19/18 13:35	07/17/18 15:27	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0662	U	0.232	0.233	5.00	0.333	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-LF-5**

**Lab Sample ID: 180-78475-6**

Date Collected: 06/05/18 13:09

Matrix: Water

Date Received: 06/07/18 15:10

**Method: EPA 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.13	mg/L			07/02/18 12:54	5

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00065	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 15:46	1
Barium	0.026		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 15:46	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 15:46	1
Cadmium	0.00021	J	0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 15:46	1
Cobalt	0.00019	J	0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 15:46	1
Chromium	0.0017	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 15:46	1
Molybdenum	0.00069	J	0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 15:46	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 15:46	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 15:46	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 15:46	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 15:46	1
Lithium	0.019		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 15:46	1

**Method: EPA 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000086	J	0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:21	1

**Method: 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.162	U	0.161	0.162	1.00	0.245	pCi/L	06/19/18 12:59	07/17/18 21:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.8		40 - 110					06/19/18 12:59	07/17/18 21:10	1

**Method: 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0364	U	0.186	0.186	1.00	0.329	pCi/L	06/19/18 13:35	07/17/18 15:27	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.8		40 - 110					06/19/18 13:35	07/17/18 15:27	1
Y Carrier	92.7		40 - 110					06/19/18 13:35	07/17/18 15:27	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.198	U	0.246	0.247	5.00	0.329	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-LF-6**

**Lab Sample ID: 180-78475-7**

Date Collected: 06/05/18 14:33

Matrix: Water

Date Received: 06/07/18 15:10

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.51		0.10	0.026	mg/L			07/02/18 10:16	1

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00060	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 15:49	1
Barium	0.024		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 15:49	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 15:49	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 15:49	1
Cobalt	0.00021	J	0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 15:49	1
Chromium	0.0014	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 15:49	1
Molybdenum	0.0012	J	0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 15:49	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 15:49	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 15:49	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 15:49	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 15:49	1
Lithium	0.014		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 15:49	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:22	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.169	U	0.169	0.169	1.00	0.260	pCi/L	06/19/18 12:59	07/17/18 21:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	98.8		40 - 110					06/19/18 12:59	07/17/18 21:10	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0736	U	0.174	0.174	1.00	0.302	pCi/L	06/19/18 13:35	07/17/18 15:27	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	98.8		40 - 110					06/19/18 13:35	07/17/18 15:27	1
Y Carrier	92.3		40 - 110					06/19/18 13:35	07/17/18 15:27	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.242	U	0.243	0.243	5.00	0.302	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-1R**

**Lab Sample ID: 180-78475-8**

Date Collected: 06/06/18 13:45

Matrix: Water

Date Received: 06/07/18 15:10

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.49		0.25	0.066	mg/L			07/02/18 10:48	2.5

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00066	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 15:52	1
Barium	0.015		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 15:52	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 15:52	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 15:52	1
Cobalt	0.00021	J	0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 15:52	1
Chromium	0.0010	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 15:52	1
Molybdenum	0.0028	J	0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 15:52	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 15:52	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 15:52	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 15:52	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 15:52	1
Lithium	ND		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 15:52	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000085	J	0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:23	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.360		0.206	0.209	1.00	0.251	pCi/L	06/19/18 12:59	07/17/18 21:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.1		40 - 110					06/19/18 12:59	07/17/18 21:10	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0870	U	0.210	0.210	1.00	0.361	pCi/L	06/19/18 13:35	07/17/18 15:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.1		40 - 110					06/19/18 13:35	07/17/18 15:27	1
Y Carrier	91.6		40 - 110					06/19/18 13:35	07/17/18 15:27	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.447		0.294	0.296	5.00	0.361	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-2R**

**Lab Sample ID: 180-78475-9**

Date Collected: 06/06/18 17:45

Matrix: Water

Date Received: 06/07/18 15:10

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.49	J	0.50	0.13	mg/L			07/02/18 13:26	5

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00091	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 16:01	1
Barium	0.043		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 16:01	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 16:01	1
Cadmium	0.00045	J	0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 16:01	1
Cobalt	0.0022		0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 16:01	1
Chromium	0.0017	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 16:01	1
Molybdenum	1.9		0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 16:01	1
Lead	0.00022	J	0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 16:01	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 16:01	1
Selenium	0.00083	J	0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 16:01	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 16:01	1
Lithium	0.044		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 16:01	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:24	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.139	U	0.149	0.150	1.00	0.233	pCi/L	06/19/18 12:59	07/17/18 21:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.1		40 - 110					06/19/18 12:59	07/17/18 21:10	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.393		0.223	0.226	1.00	0.334	pCi/L	06/19/18 13:35	07/17/18 15:28	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.1		40 - 110					06/19/18 13:35	07/17/18 15:28	1
Y Carrier	91.2		40 - 110					06/19/18 13:35	07/17/18 15:28	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.532		0.268	0.271	5.00	0.334	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh



# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-3R**

**Lab Sample ID: 180-78475-10**

Date Collected: 06/06/18 11:00

Matrix: Water

Date Received: 06/07/18 15:10

**Method: EPA 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.6		0.50	0.13	mg/L			07/02/18 13:58	5

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00064	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 16:03	1
Barium	0.016		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 16:03	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 16:03	1
Cadmium	0.00025	J	0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 16:03	1
Cobalt	0.00016	J	0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 16:03	1
Chromium	0.0014	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 16:03	1
Molybdenum	1.0		0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 16:03	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 16:03	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 16:03	1
Selenium	0.011		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 16:03	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 16:03	1
Lithium	0.076		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 16:03	1

**Method: EPA 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:25	1

**Method: 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.136	U	0.152	0.153	1.00	0.243	pCi/L	06/19/18 12:59	07/17/18 21:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	106		40 - 110					06/19/18 12:59	07/17/18 21:10	1

**Method: 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.223	U	0.177	0.179	1.00	0.278	pCi/L	06/19/18 13:35	07/17/18 15:28	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	106		40 - 110					06/19/18 13:35	07/17/18 15:28	1
Y Carrier	94.2		40 - 110					06/19/18 13:35	07/17/18 15:28	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.359		0.233	0.235	5.00	0.278	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-4R**

**Lab Sample ID: 180-78475-11**

Date Collected: 06/06/18 12:30

Matrix: Water

Date Received: 06/07/18 15:10

**Method: EPA 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.43		0.10	0.026	mg/L			07/02/18 08:13	1

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00061	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 16:06	1
Barium	0.098		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 16:06	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 16:06	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 16:06	1
Cobalt	0.00013	J	0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 16:06	1
Chromium	0.0036		0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 16:06	1
Molybdenum	0.0016	J	0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 16:06	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 16:06	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 16:06	1
Selenium	0.0014	J	0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 16:06	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 16:06	1
Lithium	ND		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 16:06	1

**Method: EPA 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:26	1

**Method: 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.216	U	0.172	0.173	1.00	0.239	pCi/L	06/19/18 12:59	07/17/18 21:10	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	98.5		40 - 110					06/19/18 12:59	07/17/18 21:10	1

**Method: 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.354		0.222	0.224	1.00	0.337	pCi/L	06/19/18 13:35	07/17/18 15:28	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	98.5		40 - 110					06/19/18 13:35	07/17/18 15:28	1
Y Carrier	91.6		40 - 110					06/19/18 13:35	07/17/18 15:28	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.569		0.281	0.283	5.00	0.337	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-5**

**Lab Sample ID: 180-78475-12**

Date Collected: 06/06/18 15:30

Matrix: Water

Date Received: 06/07/18 15:10

**Method: EPA 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.40		0.25	0.066	mg/L			07/02/18 11:19	2.5

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00050	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 16:09	1
Barium	0.016		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 16:09	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 16:09	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 16:09	1
Cobalt	0.00012	J	0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 16:09	1
Chromium	0.0012	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 16:09	1
Molybdenum	0.054		0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 16:09	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 16:09	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 16:09	1
Selenium	0.00085	J	0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 16:09	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 16:09	1
Lithium	0.013		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 16:09	1

**Method: EPA 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:27	1

**Method: 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.234		0.171	0.173	1.00	0.230	pCi/L	06/19/18 12:59	07/17/18 21:11	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.8		40 - 110					06/19/18 12:59	07/17/18 21:11	1

**Method: 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.225	U	0.221	0.222	1.00	0.359	pCi/L	06/19/18 13:35	07/17/18 15:28	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.8		40 - 110					06/19/18 13:35	07/17/18 15:28	1
Y Carrier	95.7		40 - 110					06/19/18 13:35	07/17/18 15:28	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.459		0.279	0.281	5.00	0.359	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: CCR-AP-7R**

**Lab Sample ID: 180-78475-13**

Date Collected: 06/06/18 18:45

Matrix: Water

Date Received: 06/07/18 15:10

**Method: EPA 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.15	J	0.25	0.066	mg/L			07/02/18 12:23	2.5

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00083	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 16:12	1
Barium	0.032		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 16:12	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 16:12	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 16:12	1
Cobalt	0.00037	J	0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 16:12	1
Chromium	0.0016	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 16:12	1
Molybdenum	ND		0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 16:12	1
Lead	0.00013	J	0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 16:12	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 16:12	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 16:12	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 16:12	1
Lithium	0.020		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 16:12	1

**Method: EPA 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:30	1

**Method: 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.186	U	0.168	0.169	1.00	0.252	pCi/L	06/19/18 12:59	07/17/18 21:11	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	104		40 - 110					06/19/18 12:59	07/17/18 21:11	1

**Method: 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0364	U	0.199	0.199	1.00	0.350	pCi/L	06/19/18 13:35	07/17/18 15:28	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	104		40 - 110					06/19/18 13:35	07/17/18 15:28	1
Y Carrier	95.3		40 - 110					06/19/18 13:35	07/17/18 15:28	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.222	U	0.260	0.261	5.00	0.350	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

**Client Sample ID: BLIND DUPLICATE 1**

**Lab Sample ID: 180-78475-14**

Date Collected: 06/06/18 00:00

Matrix: Water

Date Received: 06/07/18 15:10

**Method: EPA 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.5		0.50	0.13	mg/L			07/02/18 14:29	5

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00058	J	0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 16:15	1
Barium	0.015		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 16:15	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 16:15	1
Cadmium	0.00023	J	0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 16:15	1
Cobalt	0.00015	J	0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 16:15	1
Chromium	0.0013	J	0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 16:15	1
Molybdenum	0.99		0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 16:15	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 16:15	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 16:15	1
Selenium	0.010		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 16:15	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 16:15	1
Lithium	0.073		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 16:15	1

**Method: EPA 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:31	1

**Method: 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.336		0.199	0.201	1.00	0.251	pCi/L	06/19/18 12:59	07/17/18 21:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					06/19/18 12:59	07/17/18 21:12	1

**Method: 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.125	U	0.191	0.191	1.00	0.321	pCi/L	06/19/18 13:35	07/17/18 15:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					06/19/18 13:35	07/17/18 15:28	1
Y Carrier	95.3		40 - 110					06/19/18 13:35	07/17/18 15:28	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.461		0.276	0.277	5.00	0.321	pCi/L		07/19/18 10:40	1

TestAmerica Pittsburgh

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Method: EPA 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 180-249212/6**  
**Matrix: Water**  
**Analysis Batch: 249212**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.10	0.026	mg/L			07/02/18 05:27	1

**Lab Sample ID: LCS 180-249212/5**  
**Matrix: Water**  
**Analysis Batch: 249212**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	26.4		mg/L		106	80 - 120
Fluoride	1.25	1.34		mg/L		107	80 - 120
Sulfate	25.0	26.4		mg/L		106	80 - 120

**Lab Sample ID: 180-78475-3 MS**  
**Matrix: Water**  
**Analysis Batch: 249212**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	12		25.0	37.7		mg/L		103	80 - 120
Fluoride	0.30		1.25	1.57		mg/L		101	80 - 120
Sulfate	13		25.0	38.2		mg/L		102	80 - 120

**Lab Sample ID: 180-78475-3 MSD**  
**Matrix: Water**  
**Analysis Batch: 249212**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	12		25.0	37.8		mg/L		103	80 - 120	0	15
Fluoride	0.30		1.25	1.56		mg/L		101	80 - 120	0	15
Sulfate	13		25.0	38.4		mg/L		103	80 - 120	0	15

## Method: EPA 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 180-248970/1-A**  
**Matrix: Water**  
**Analysis Batch: 249857**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 248970**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		06/28/18 17:50	07/07/18 14:37	1
Barium	ND		0.010	0.00037	mg/L		06/28/18 17:50	07/07/18 14:37	1
Beryllium	ND		0.0010	0.000057	mg/L		06/28/18 17:50	07/07/18 14:37	1
Cadmium	ND		0.0010	0.00013	mg/L		06/28/18 17:50	07/07/18 14:37	1
Cobalt	ND		0.00050	0.000075	mg/L		06/28/18 17:50	07/07/18 14:37	1
Chromium	ND		0.0020	0.00063	mg/L		06/28/18 17:50	07/07/18 14:37	1
Molybdenum	ND		0.0050	0.00047	mg/L		06/28/18 17:50	07/07/18 14:37	1
Lead	ND		0.0010	0.000094	mg/L		06/28/18 17:50	07/07/18 14:37	1
Antimony	ND		0.0020	0.0011	mg/L		06/28/18 17:50	07/07/18 14:37	1
Selenium	ND		0.0050	0.00081	mg/L		06/28/18 17:50	07/07/18 14:37	1
Thallium	ND		0.0010	0.000063	mg/L		06/28/18 17:50	07/07/18 14:37	1
Lithium	ND		0.0050	0.0026	mg/L		06/28/18 17:50	07/07/18 14:37	1

TestAmerica Pittsburgh

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 180-248970/2-A**  
**Matrix: Water**  
**Analysis Batch: 249857**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 248970**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	0.0400	0.0417		mg/L		104	80 - 120
Barium	2.00	2.18		mg/L		109	80 - 120
Beryllium	0.0500	0.0464		mg/L		93	80 - 120
Calcium	50.0	52.0		mg/L		104	80 - 120
Cadmium	0.0500	0.0568		mg/L		114	80 - 120
Cobalt	0.500	0.458		mg/L		92	80 - 120
Chromium	0.200	0.199		mg/L		99	80 - 120
Molybdenum	1.00	1.02		mg/L		102	80 - 120
Lead	0.0200	0.0215		mg/L		107	80 - 120
Antimony	0.500	0.549		mg/L		110	80 - 120
Selenium	0.0100	0.0104		mg/L		104	80 - 120
Thallium	0.0500	0.0554		mg/L		111	80 - 120
Lithium	0.0500	0.0484		mg/L		97	80 - 120

**Lab Sample ID: LCS 180-248970/2-A**  
**Matrix: Water**  
**Analysis Batch: 249960**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 248970**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Boron	1.00	1.03		mg/L		103	80 - 120

## Method: EPA 7470A - Mercury (CVAA)

**Lab Sample ID: MB 180-249407/1-A**  
**Matrix: Water**  
**Analysis Batch: 249532**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 249407**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		07/03/18 06:00	07/03/18 12:13	1

**Lab Sample ID: LCS 180-249407/2-A**  
**Matrix: Water**  
**Analysis Batch: 249532**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 249407**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.00250	0.00232		mg/L		93	80 - 120

## Method: 9315 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-371234/23-A**  
**Matrix: Water**  
**Analysis Batch: 376328**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 371234**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1807	U	0.162	0.163	1.00	0.241	pCi/L	06/19/18 12:59	07/17/18 21:12	1

TestAmerica Pittsburgh

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Method: 9315 - Radium-226 (GFPC) (Continued)

**Lab Sample ID: MB 160-371234/23-A**  
**Matrix: Water**  
**Analysis Batch: 376328**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 371234**

Carrier	<i>MB</i> %Yield	<i>MB</i> Qualifier	Limits
Ba Carrier	102		40 - 110

Prepared	Analyzed	Dil Fac
06/19/18 12:59	07/17/18 21:12	1

**Lab Sample ID: LCS 160-371234/1-A**  
**Matrix: Water**  
**Analysis Batch: 376324**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 371234**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.8	10.39		1.34	1.00	0.210	pCi/L	88	68 - 137

Carrier	<i>LCS</i> %Yield	<i>LCS</i> Qualifier	Limits
Ba Carrier	96.2		40 - 110

**Lab Sample ID: LCSD 160-371234/2-A**  
**Matrix: Water**  
**Analysis Batch: 376324**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 371234**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.8	10.17		1.29	1.00	0.278	pCi/L	86	68 - 137	0.08	1

Carrier	<i>LCSD</i> %Yield	<i>LCSD</i> Qualifier	Limits
Ba Carrier	106		40 - 110

## Method: 9320 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-371238/23-A**  
**Matrix: Water**  
**Analysis Batch: 376323**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 371238**

Analyte	<i>MB</i> Result	<i>MB</i> Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2369	U	0.240	0.241	1.00	0.391	pCi/L	06/19/18 13:35	07/17/18 15:16	1

Carrier	<i>MB</i> %Yield	<i>MB</i> Qualifier	Limits
Ba Carrier	102		40 - 110
Y Carrier	90.1		40 - 110

Prepared	Analyzed	Dil Fac
06/19/18 13:35	07/17/18 15:16	1
06/19/18 13:35	07/17/18 15:16	1

**Lab Sample ID: LCS 160-371238/1-A**  
**Matrix: Water**  
**Analysis Batch: 376328**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 371238**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	8.14	8.469		0.993	1.00	0.334	pCi/L	104	56 - 140

TestAmerica Pittsburgh



# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Method: 9320 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-371238/1-A**  
**Matrix: Water**  
**Analysis Batch: 376328**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 371238**

	LCS	LCS	
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>
Ba Carrier	96.2		40 - 110
Y Carrier	92.3		40 - 110

**Lab Sample ID: LCSD 160-371238/2-A**  
**Matrix: Water**  
**Analysis Batch: 376328**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 371238**

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qual</i>	<i>Total Uncert. (2σ+/-)</i>	<i>RL</i>	<i>MDC</i>	<i>Unit</i>	<i>%Rec</i>	<i>%Rec.</i>		<i>RER</i>	<i>RER Limit</i>
									<i>Limits</i>	<i>RER</i>		
Radium-228	8.14	8.860		1.03	1.00	0.411	pCi/L	109	56 - 140	0.19	1	

	LCSD	LCSD	
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>
Ba Carrier	106		40 - 110
Y Carrier	90.5		40 - 110

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# QC Association Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## HPLC/IC

### Analysis Batch: 249212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-78475-1	CCR-SP-1	Total/NA	Water	EPA 9056A	
180-78475-2	CCR-SP-2	Total/NA	Water	EPA 9056A	
180-78475-3	CCR-SP-3	Total/NA	Water	EPA 9056A	
180-78475-4	BLIND DUPLICATE 3	Total/NA	Water	EPA 9056A	
180-78475-5	FIELD BLANK 3	Total/NA	Water	EPA 9056A	
180-78475-6	CCR-LF-5	Total/NA	Water	EPA 9056A	
180-78475-7	CCR-LF-6	Total/NA	Water	EPA 9056A	
180-78475-8	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-78475-9	CCR-AP-2R	Total/NA	Water	EPA 9056A	
180-78475-10	CCR-AP-3R	Total/NA	Water	EPA 9056A	
180-78475-11	CCR-AP-4R	Total/NA	Water	EPA 9056A	
180-78475-12	CCR-AP-5	Total/NA	Water	EPA 9056A	
180-78475-13	CCR-AP-7R	Total/NA	Water	EPA 9056A	
180-78475-14	BLIND DUPLICATE 1	Total/NA	Water	EPA 9056A	
MB 180-249212/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-249212/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-78475-3 MS	CCR-SP-3	Total/NA	Water	EPA 9056A	
180-78475-3 MSD	CCR-SP-3	Total/NA	Water	EPA 9056A	

## Metals

### Prep Batch: 248970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-78475-1	CCR-SP-1	Total Recoverable	Water	3005A	
180-78475-2	CCR-SP-2	Total Recoverable	Water	3005A	
180-78475-3	CCR-SP-3	Total Recoverable	Water	3005A	
180-78475-4	BLIND DUPLICATE 3	Total Recoverable	Water	3005A	
180-78475-5	FIELD BLANK 3	Total Recoverable	Water	3005A	
180-78475-6	CCR-LF-5	Total Recoverable	Water	3005A	
180-78475-7	CCR-LF-6	Total Recoverable	Water	3005A	
180-78475-8	CCR-AP-1R	Total Recoverable	Water	3005A	
180-78475-9	CCR-AP-2R	Total Recoverable	Water	3005A	
180-78475-10	CCR-AP-3R	Total Recoverable	Water	3005A	
180-78475-11	CCR-AP-4R	Total Recoverable	Water	3005A	
180-78475-12	CCR-AP-5	Total Recoverable	Water	3005A	
180-78475-13	CCR-AP-7R	Total Recoverable	Water	3005A	
180-78475-14	BLIND DUPLICATE 1	Total Recoverable	Water	3005A	
MB 180-248970/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-248970/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Prep Batch: 249407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-78475-1	CCR-SP-1	Total/NA	Water	7470A	
180-78475-2	CCR-SP-2	Total/NA	Water	7470A	
180-78475-3	CCR-SP-3	Total/NA	Water	7470A	
180-78475-4	BLIND DUPLICATE 3	Total/NA	Water	7470A	
180-78475-5	FIELD BLANK 3	Total/NA	Water	7470A	
180-78475-6	CCR-LF-5	Total/NA	Water	7470A	
180-78475-7	CCR-LF-6	Total/NA	Water	7470A	
180-78475-8	CCR-AP-1R	Total/NA	Water	7470A	

TestAmerica Pittsburgh

# QC Association Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Metals (Continued)

### Prep Batch: 249407 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-78475-9	CCR-AP-2R	Total/NA	Water	7470A	
180-78475-10	CCR-AP-3R	Total/NA	Water	7470A	
180-78475-11	CCR-AP-4R	Total/NA	Water	7470A	
180-78475-12	CCR-AP-5	Total/NA	Water	7470A	
180-78475-13	CCR-AP-7R	Total/NA	Water	7470A	
180-78475-14	BLIND DUPLICATE 1	Total/NA	Water	7470A	
MB 180-249407/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-249407/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 249532

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-78475-1	CCR-SP-1	Total/NA	Water	EPA 7470A	249407
180-78475-2	CCR-SP-2	Total/NA	Water	EPA 7470A	249407
180-78475-3	CCR-SP-3	Total/NA	Water	EPA 7470A	249407
180-78475-4	BLIND DUPLICATE 3	Total/NA	Water	EPA 7470A	249407
180-78475-5	FIELD BLANK 3	Total/NA	Water	EPA 7470A	249407
180-78475-6	CCR-LF-5	Total/NA	Water	EPA 7470A	249407
180-78475-7	CCR-LF-6	Total/NA	Water	EPA 7470A	249407
180-78475-8	CCR-AP-1R	Total/NA	Water	EPA 7470A	249407
180-78475-9	CCR-AP-2R	Total/NA	Water	EPA 7470A	249407
180-78475-10	CCR-AP-3R	Total/NA	Water	EPA 7470A	249407
180-78475-11	CCR-AP-4R	Total/NA	Water	EPA 7470A	249407
180-78475-12	CCR-AP-5	Total/NA	Water	EPA 7470A	249407
180-78475-13	CCR-AP-7R	Total/NA	Water	EPA 7470A	249407
180-78475-14	BLIND DUPLICATE 1	Total/NA	Water	EPA 7470A	249407
MB 180-249407/1-A	Method Blank	Total/NA	Water	EPA 7470A	249407
LCS 180-249407/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	249407

### Analysis Batch: 249857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-78475-1	CCR-SP-1	Total Recoverable	Water	EPA 6020A	248970
180-78475-2	CCR-SP-2	Total Recoverable	Water	EPA 6020A	248970
180-78475-3	CCR-SP-3	Total Recoverable	Water	EPA 6020A	248970
180-78475-4	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	248970
180-78475-5	FIELD BLANK 3	Total Recoverable	Water	EPA 6020A	248970
180-78475-6	CCR-LF-5	Total Recoverable	Water	EPA 6020A	248970
180-78475-7	CCR-LF-6	Total Recoverable	Water	EPA 6020A	248970
180-78475-8	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	248970
180-78475-9	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	248970
180-78475-10	CCR-AP-3R	Total Recoverable	Water	EPA 6020A	248970
180-78475-11	CCR-AP-4R	Total Recoverable	Water	EPA 6020A	248970
180-78475-12	CCR-AP-5	Total Recoverable	Water	EPA 6020A	248970
180-78475-13	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	248970
180-78475-14	BLIND DUPLICATE 1	Total Recoverable	Water	EPA 6020A	248970
MB 180-248970/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	248970
LCS 180-248970/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	248970

### Analysis Batch: 249960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-248970/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	248970
LCS 180-248970/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	248970

TestAmerica Pittsburgh

# QC Association Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-78475-1

## Rad

### Prep Batch: 371234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-78475-1	CCR-SP-1	Total/NA	Water	PrecSep-21	
180-78475-2	CCR-SP-2	Total/NA	Water	PrecSep-21	
180-78475-3	CCR-SP-3	Total/NA	Water	PrecSep-21	
180-78475-4	BLIND DUPLICATE 3	Total/NA	Water	PrecSep-21	
180-78475-5	FIELD BLANK 3	Total/NA	Water	PrecSep-21	
180-78475-6	CCR-LF-5	Total/NA	Water	PrecSep-21	
180-78475-7	CCR-LF-6	Total/NA	Water	PrecSep-21	
180-78475-8	CCR-AP-1R	Total/NA	Water	PrecSep-21	
180-78475-9	CCR-AP-2R	Total/NA	Water	PrecSep-21	
180-78475-10	CCR-AP-3R	Total/NA	Water	PrecSep-21	
180-78475-11	CCR-AP-4R	Total/NA	Water	PrecSep-21	
180-78475-12	CCR-AP-5	Total/NA	Water	PrecSep-21	
180-78475-13	CCR-AP-7R	Total/NA	Water	PrecSep-21	
180-78475-14	BLIND DUPLICATE 1	Total/NA	Water	PrecSep-21	
MB 160-371234/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-371234/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-371234/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 371238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-78475-1	CCR-SP-1	Total/NA	Water	PrecSep_0	
180-78475-2	CCR-SP-2	Total/NA	Water	PrecSep_0	
180-78475-3	CCR-SP-3	Total/NA	Water	PrecSep_0	
180-78475-4	BLIND DUPLICATE 3	Total/NA	Water	PrecSep_0	
180-78475-5	FIELD BLANK 3	Total/NA	Water	PrecSep_0	
180-78475-6	CCR-LF-5	Total/NA	Water	PrecSep_0	
180-78475-7	CCR-LF-6	Total/NA	Water	PrecSep_0	
180-78475-8	CCR-AP-1R	Total/NA	Water	PrecSep_0	
180-78475-9	CCR-AP-2R	Total/NA	Water	PrecSep_0	
180-78475-10	CCR-AP-3R	Total/NA	Water	PrecSep_0	
180-78475-11	CCR-AP-4R	Total/NA	Water	PrecSep_0	
180-78475-12	CCR-AP-5	Total/NA	Water	PrecSep_0	
180-78475-13	CCR-AP-7R	Total/NA	Water	PrecSep_0	
180-78475-14	BLIND DUPLICATE 1	Total/NA	Water	PrecSep_0	
MB 160-371238/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-371238/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-371238/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	



# Chain of Custody Record

<b>Client Information</b> Client Contact: Lisa Messinger Phone: (812) 228-9422 Company: Vectren Corporation Address: PO BOX 209 City: Evansville State, Zip: IN, 47702 Phone: Email: lmessinger@vectren.com Project Name: CCR Groundwater Monitoring Site: AB Brown		Lab PM: Bortol, Veronica E-Mail: veronica.bortol@testamericainc.com Carrier Tracking No(s): Job #: 170LF00368							
Due Date Requested: TAT Requested (days): PO #: Purchase Order Requested WO #:		Analysis Requested Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice M - Hexane N - None O - AsNaO2 P - Na2O/S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone							
Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Special Instructions/Note: 180-78475 Chain of Custody COLUMBUS 240507							
Sample Identification	Sample Date	Sample Time	Sample Type (C-comp, G-grab)	Matrix (Water, Soil, Over-sat)	Preservation Code	Field Filtered	MS/MSD	Analysis	Special Instructions/Note
CCR-SP-1	6/5/18	1030	G	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
CCR-SP-2		1345	G	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
CCR-SP-3		1400	G	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<del>CCR-SP-4</del>				Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<del>CCR-SP-5</del>				Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<del>CCR-SP-6</del>				Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Blank Duplicate 3			X	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Field Blank 3			X	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
				Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
				Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Non-Hazard  Flammable  Skin Irritant  
 Deliverable Requested: I, II, III, IV, Other (specify) \_\_\_\_\_  
 Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: Jacob Winsett Date/Time: 6/6/18 1930 Company: ATC  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Custody Seals Intact:  Yes  No  
 Custody Seal No.: \_\_\_\_\_  
 Cooler Temperature(s) °C and Other Remarks:



**Chain of Custody Record**

155603  
6/6/18

<b>Regulatory Program:</b> <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other:		<b>Project Manager:</b>	
<b>Client Contact</b> Company Name: <u>Veronica Vectren</u> Address: <u>PO Box 209</u> City/State/Zip: <u>Evansville</u> Phone: _____ Fax: _____		<b>Site Contact:</b> <u>Allen Rose</u> Lab Contact: <u>Veronica Vectren</u> Carrier: _____	
<b>Project Name:</b> <u>CCR Groundwater Monitoring</u> Site: <u>CCR - LF-5</u> P.O.# <u>Private Order Requested</u>		<b>Date:</b> <u>6/6/18</u> <b>COC No.:</b> _____ of _____ COCs	
<b>Analysis Turnaround Time</b> <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below _____ <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		<b>For Lab Use Only:</b> Walk-in Client: _____ Lab Sampling: _____ Job / SDG No.: <u>170LF00368</u>	
<b>Sample Identification</b> <u>CCR-LF-5</u> <u>CCR-LF-6</u> <u>CCR-LF-7</u>		<b>Sample Specific Notes:</b>	
<b>Sample Date</b> 6/5 6	<b>Sample Time</b> 1309 1433	<b>Sample Type</b> (G=Comp, G=Grab) G G	<b>Matrix</b> W L
<b>Filtered Sample (Y/N)</b> Y Y		<b>Perform MS/MSD (Y/N)</b> Y Y	
<b>Preservation Used:</b> 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____			
<b>Possible Hazard Identification:</b> Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.			
<input type="checkbox"/> Non-Hazardous <input type="checkbox"/> Flammable <input checked="" type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown			
<b>Special Instructions/QC Requirements &amp; Comments:</b> <u>Appendix III or IV -&gt; see Verontca</u>			
<b>Custody Seals Intact:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No		<b>Cooler Temp. (°C):</b> Obs'd: _____ Corr'd: _____ Therm ID No.: _____	
<b>Relinquished by:</b> <u>Jacob Wirsitt</u>		<b>Received by:</b> <u>Polina Witsch</u>	
<b>Relinquished by:</b> _____		<b>Received by:</b> _____	
<b>Relinquished by:</b> _____		<b>Received by:</b> _____	
<b>Relinquished by:</b> _____		<b>Received by:</b> _____	



Company Name: <u>Veronica Debra</u> Address: <u>PO Box 209</u> City/State/Zip: <u>Evonns, IL</u> Phone: _____ Fax: _____		Client Contact Project Name: <u>CCR Groundwater monitoring</u> Site: <u>AP-1 to AP-5</u> PO # <u>Purchase Order Requested</u>		Regulatory Program: <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other: _____		Project Manager: Tel/Fax: _____ Analysis Turnaround Time <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT If different from Below <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Site Contact: <u>Alex Rose</u> Lab Contact: <u>Veronica Debra</u> Date: <u>5/24/18</u> Carrier: _____		COC No: _____ of _____ COCs Sampler: _____ For Lab Use Only: Walk-in Client: _____ Lab Sampling: _____ Job / SDG No.: <u>170L500368</u>	
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Other	Company	Date/Time	
CCR-AP-1R	6/6/18		G	W		Y					
CCR-AP-2R							X	9315-Ra228		6-7-18	
CCR-AP-3R							X	840C-Calc-TDS			
CCR-AP-4R							X	6020A, 7476A			
CCR-AP-5							X	ORSEM-28D			
CCR-AP-7R							X	9040C, 9056A			
Blind Duplicate 1	6/6/18		X	X						15/10	
Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH, 6= Other Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.											
Special Instructions/QC Requirements & Comments: <u>Appendix III or IV see Veronica</u>											
Relinquished by: <u>Jacob Wissett</u> Date/Time: _____ Relinquished by: _____ Date/Time: _____ Relinquished by: _____ Date/Time: _____											
Relinquished by: _____ Date/Time: _____ Relinquished by: _____ Date/Time: _____ Relinquished by: _____ Date/Time: _____											





SHIP DATE: 06 JUN 18  
ACTWT: 50.00 LB MAN  
CAD: /POS1904  
DIMS: 24x14x13 IN  
BILL SENDER

VERONICA BERTOT  
TEST AMERICA  
301 ALPHA DR

PITTSBURGH PA 15234 15238

(812) 228-9422 REF: DEPT: PO1



THU - 07 JUN 3:00P  
STANDARD OVERNIGHT

THU - 07 JUN AA 14  
STANDARD OVERNIGHT

15238  
PA-US  
PIT

65 AGCA

Uncorrected temp 2.6 °C  
Thermometer ID 9  
CF 0 Initials B

PT-WI-SR-001 effective 7/26/13

IF THIS SHIPMENT IS DELAYED IN TRANSIT,  
STORE REFRIGERATED (2° TO 5° / 36° TO 47° F)

Part # 156297433

SHIP DATE: 06 JUN 18  
ACTWT: 50.00 LB MAN  
CAD: /POS1904  
DIMS: 24x14x13 IN  
BILL SENDER

VERONICA BERTOT  
TEST AMERICA  
301 ALPHA DR

PITTSBURGH PA 15234 15238

(812) 228-9422 REF: DEPT: PO1



THU - 07 JUN 3:00P  
STANDARD OVERNIGHT

THU - 07 JUN AA 14  
STANDARD OVERNIGHT

15238  
PA-US  
PIT

65 AGCA

Uncorrected temp 2.6 °C  
Thermometer ID 9  
CF 0 Initials B

PT-WI-SR-001 effective 7/26/13

Part # 156297433

SHIP DATE: 06 JUN 18  
ACTWT: 50.00 LB MAN  
CAD: /POS1904  
DIMS: 24x14x13 IN  
BILL SENDER

ORIGIN ID: EVOA (317) 849-4990  
ATC GROUP SERVICES  
7986 CENTERPOTANT DR STE 100  
INDIANAPOLIS IN 462569381

TO VERONICA BERTOT  
TEST AMERICA  
301 ALPHA DR

PITTSBURGH PA 15234 15238

(812) 228-9422 REF: DEPT: PO1



THU - 07 JUN 3:00P  
STANDARD OVERNIGHT

FRI - 08 JUN AA  
STANDARD OVERNIGHT

15238  
PA-US

65 AGCA

Uncorrected temp 4.9 °C  
Thermometer ID 9  
CF 0 Initials B

PT-WI-SR-001 effective 7/26/13

- 1
- 2
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- 10
- 11
- 12
- 13



SHIP DATE: 06 JUN 18  
ACTWGT: 50.00 LB MAN  
CAD: POS1804  
DIMS: 24x14x13 IN  
BILL SENDER

ORIGIN ID: EVVA  
ATC GROUP SERVICE  
7988 CENTERPOINT DK  
INDIANAPOLIS, IN 462  
UNITED STATES US

TO: VERONICA BERTOT  
TEST AMERICA  
301 ALPHA DR

PITTSBURGH PA ~~15234~~  
(812) 228-9422  
REF: 15238



THU - 07 JUN 3:00P  
STANDARD OVERNIGHT

4 of 4  
MPS# 7813 0607 0955  
Mstr# 8007 0823 2470

FRI - 08 JUN AA T  
STANDARD OVERNIGHT

65 AGCA  
MPS# 7813 0607 0955  
Mstr# 8007 0823 2470

15238  
PA-US  
PIT

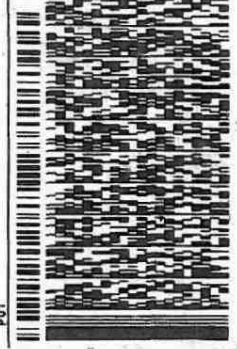
Uncorrected temp 51.2 °C  
Thermometer ID 9  
CF 0 Initials TB

PT-WI-SR-001 effective 7/26/13  
FID 106442 07JUN18 P11A

GIN ID: EVVA (317) 849-4990  
GROUP SERVICES  
7988 CENTERPOINT DR STE 100  
INDIANAPOLIS, IN 462563981  
UNITED STATES US

TO: VERONICA BERTOT  
TEST AMERICA  
301 ALPHA DR

PITTSBURGH PA ~~15234~~  
(812) 228-9422  
REF: 15238



3 of 4  
MPS# 7813 0607 0944  
Mstr# 8007 0823 2470

THU - 07 JUN 3:00P  
STANDARD OVERNIGHT

FedEx 3 of 4  
MPS# 7813 0607 0944  
Mstr# 8007 0823 2470

FRI - 08 JUN AA  
STANDARD OVERNIGHT

65 AGCA

Uncorrected temp 31.5 °C  
Thermometer ID 9  
CF 0 Initials TB

PT-WI-SR-001 effective 7/26/13

- 1
- 2
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- 11
- 12
- 13

# Chain of Custody Record



THE LEADER IN ENVIRONMENTAL TESTING

**TestAmerica Pittsburgh**  
 301 Alpha Drive RIDC Park  
 Pittsburgh, PA 15238  
 Phone (412) 963-7058 Fax (412) 963-2468

**Client Information (Sub Contract Lab)**

Client Contact: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Shipping/Receiving: \_\_\_\_\_  
 Company: TestAmerica Laboratories, Inc.  
 Address: 13715 Rider Trail North, Due Date Requested: 7/10/2018  
 City: Earth City, MO, 63045 TAT Requested (days):  
 State, Zip: MO, 63045  
 Phone: 314-298-8566(Tel) 314-298-8757(Fax) PO #:  
 Email: \_\_\_\_\_ WO #:  
 Project Name: CCR Groundwater Monitoring Project #: 18018014  
 Site: \_\_\_\_\_ SSO#:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix (W=Water, S=Soil, O=Other)	Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Analysis Requested	Total Number of containers	Special Instructions/Note:
					Preservation Code:	Matrix	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List			
CCR-SP-1 (180-78475-1)	6/5/18	10:30	Water	Water	X	X	X	X		2	
CCR-SP-2 (180-78475-2)	6/5/18	13:45	Water	Water	X	X	X	X		2	
CCR-SP-3 (180-78475-3)	6/5/18	16:00	Water	Water	X	X	X	X		2	
BLIND DUPLICATE 3 (180-78475-4)	6/5/18		Water	Water	X	X	X	X		2	
FIELD BLANK 3 (180-78475-5)	6/5/18		Water	Water	X	X	X	X		2	
CCR-LF-5 (180-78475-6)	6/5/18	13:09	Water	Water	X	X	X	X		2	
CCR-LF-6 (180-78475-7)	6/5/18	14:33	Water	Water	X	X	X	X		2	
CCR-AP-1R (180-78475-8)	6/6/18	13:45	Water	Water	X	X	X	X		2	
CCR-AP-2R (180-78475-9)	6/6/18	17:45	Water	Water	X	X	X	X		2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

**Possible Hazard Identification**  
 Unconfirmed  
 Deliverable Requested: I, II, III, IV, Other (specify) \_\_\_\_\_  
 Primary Deliverable Rank: 2  
 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months

Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: 6/18/18 17:00 Company: TR Pitt  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

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

Received by: \_\_\_\_\_ Date/Time: 6-18-18 09:55 Company: TR Pitt  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_



### TestAmerica Pittsburgh

301 Alpha Drive RIDC Park  
 Pittsburgh, PA 15238  
 Phone (412) 963-7058 Fax (412) 963-2468

## Chain of Custody Record



Client Information (Sub Contract Lab)		Sampler:	Lab P/N:	Carrier Tracking No(s):		COC No:				
Client Contact:	Phone:		Bortol, Veronica	State of Origin:		180-330569.2				
Shipping/Receiving	E-Mail:		veronica.bortol@testamericainc.com	Indiana		Page 2 of 2				
Company:	Accreditations Required (See note):					Job #:				
TestAmerica Laboratories, Inc.						180-78475-1				
Address:	Due Date Requested:					Preservation Codes:				
13715 Rider Trail North,	7/10/2018					A - HCl M - Hexane B - NaOH N - None C - Zn Acetate O - As2O2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4.5 L - EDA X - other (specify) Z - other (specify)				
City:	TAT Requested (days):					Other:				
Earth City										
State Zip:	PO #:									
MO, 63045	WO #:									
Phone:	Project #:									
314-298-8566(Tel) 314-298-8757(Fax)	18016014									
Email:	SSOWN#:									
Project Name:	Field Filtered Sample (Yes or No)			Total Number of containers						
CCR Groundwater Monitoring	Perform MS/MSD (Yes or No)			Special Instructions/Note:						
Site:	9315_Ra226/PrecSep_21 Standard Target List									
	9320_Ra228/PrecSep_0 Standard Target List									
	Ra226Ra228_GFPC									
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Seawater, Urine, Blood, Urine, etc.)	Preservation Code:	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested	Total Number of containers	Special Instructions/Note:
CCR-AP-3R (180-78475-10)	6/6/18	11:00 Eastern		Water		X	X		2	
CCR-AP-4R (180-78475-11)	6/6/18	12:30 Eastern		Water		X	X		2	
CCR-AP-5 (180-78475-12)	6/6/18	15:30 Eastern		Water		X	X		2	
CCR-AP-7R (180-78475-13)	6/6/18	18:45 Eastern		Water		X	X		2	
BLIND DUPLICATE 1 (180-78475-14)	6/6/18	Eastern		Water		X	X		2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratorers. This sample shipment is forwarded under chain-of-custody.

**Possible Hazard Identification**  
 Unconfirmed  
 Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2  
 Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: 6/18/18 1700 Company: ST O'Y Company: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Custody Seals Intact: \_\_\_\_\_ Custody Seal No.: \_\_\_\_\_  
 Δ Yes Δ No

**Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)**  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months  
 Special Instructions/QC Requirements:  
 Received by: \_\_\_\_\_ Date/Time: 6-9-18 0935 Company: TAST  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Cooler Temperature(s) °C and Other Remarks:

## Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-78475-1

**Login Number: 78475**

**List Number: 1**

**Creator: Watson, Debbie**

**List Source: TestAmerica Pittsburgh**

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.	False	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-78475-1

**Login Number: 78475**  
**List Number: 2**  
**Creator: Press, Nicholas B**

**List Source: TestAmerica St. Louis**  
**List Creation: 06/09/18 10:25 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18
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?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Pittsburgh

301 Alpha Drive

RIDC Park

Pittsburgh, PA 15238

Tel: (412)963-7058

TestAmerica Job ID: 180-81267-1

Client Project/Site: CCR Groundwater Monitoring AB Brown

For:

Vectren Corporation

PO BOX 209

Evansville, Indiana 47702

Attn: Accounts Payable



Authorized for release by:

10/11/2018 1:24:12 PM

Veronica Bortot, Senior Project Manager

(412)963-2435

[veronica.bortot@testamericainc.com](mailto:veronica.bortot@testamericainc.com)

### LINKS

Review your project  
results through

TotalAccess

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

PA Lab ID: 02-00416

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# Case Narrative

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Job ID: 180-81267-1**

**Laboratory: TestAmerica Pittsburgh**

## Narrative

### Job Narrative 180-81267-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 8/25/2018 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.6° C and 3.5° C.

#### GC Semi VOA

Method(s) 300.0, 9056A: The matrix spike/matrix spike duplicate (MS/MSD) recoveries for analytical batch 180-255765 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 300.0, 9056A: Due to an autosampler issue these samples were injected before the CCV which precedes them in the sequence. Both samples and CCV look to be acceptable so the data is reported.

CCR-AP-6 (180-81267-2) and (180-81267-D-6 MSD)

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

#### Metals

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

#### General Chemistry

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

#### RAD

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

# Definitions/Glossary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Qualifiers

### HPLC/IC

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.
F1	MS and/or MSD Recovery is outside acceptance limits.

### Metals

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.
B	Compound was found in the blank and sample.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## 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)

# Accreditation/Certification Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Laboratory: TestAmerica Pittsburgh

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
Arkansas DEQ	State Program	6	88-0690	06-27-19
California	State Program	9	2891	04-30-19
Connecticut	State Program	1	PH-0688	09-30-18
Florida	NELAP	4	E871008	06-30-19
Illinois	NELAP	5	200005	06-30-19
Kansas	NELAP	7	E-10350	01-31-19
Louisiana	NELAP	6	04041	06-30-19
Nevada	State Program	9	PA00164	07-31-19
New Hampshire	NELAP	1	2030	04-04-19
New Jersey	NELAP	2	PA005	06-30-19
New York	NELAP	2	11182	03-31-19
North Carolina (WW/SW)	State Program	4	434	12-31-18
Oregon	NELAP	10	PA-2151	01-28-19
Pennsylvania	NELAP	3	02-00416	04-30-19
South Carolina	State Program	4	89014	04-30-19
Texas	NELAP	6	T104704528-15-2	03-31-19
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-19
Virginia	NELAP	3	460189	09-14-19
West Virginia DEP	State Program	3	142	01-31-19
Wisconsin	State Program	5	998027800	08-31-19

## Laboratory: TestAmerica St. Louis

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
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-19

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

TestAmerica Pittsburgh

# Accreditation/Certification Summary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Laboratory: TestAmerica St. Louis (Continued)

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
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	10-31-18 *

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

TestAmerica Pittsburgh



# Sample Summary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-81267-1	CCR-AP-1R	Water	08/22/18 13:55	08/25/18 09:25
180-81267-2	CCR-AP-6	Water	08/22/18 14:55	08/25/18 09:25
180-81267-3	CCR-AP-7R	Water	08/22/18 12:00	08/25/18 09:25
180-81267-4	CCR-LF-1	Water	08/22/18 17:30	08/25/18 09:25
180-81267-5	CCR-SP-1	Water	08/23/18 10:25	08/25/18 09:25
180-81267-6	CCR-SP-2	Water	08/23/18 11:35	08/25/18 09:25
180-81267-7	CCR-SP-3	Water	08/23/18 13:00	08/25/18 09:25
180-81267-8	BLIND DUPLICATE 3	Water	08/23/18 00:00	08/25/18 09:25
180-81267-9	FIELD BLANK 2	Water	08/22/18 17:00	08/25/18 09:25
180-81267-10	FIELD BLANK 3	Water	08/23/18 17:00	08/25/18 09:25



# Method Summary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
EPA 9040C	pH	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

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

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-AP-1R**  
**Date Collected: 08/22/18 13:55**  
**Date Received: 08/25/18 09:25**

**Lab Sample ID: 180-81267-1**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		1			255765	09/04/18 21:12	JBF	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		10			255765	09/04/18 21:28	JBF	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256170	09/06/18 21:23	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256259	09/07/18 13:28	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256289	09/08/18 12:22	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: M		1			256608	09/11/18 17:56	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	255321	08/29/18 07:38	KA	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			255527	08/30/18 11:53	RJR	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			255330	08/29/18 08:19	AVS	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	255279	08/28/18 15:31	RMA	TAL PIT
Total/NA	Prep	PrecSep-21			1000.05 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCORANGE		1			391266	09/26/18 07:22	MAR	TAL SL
Total/NA	Prep	PrecSep_0			1000.05 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCORANGE		1			388633	09/12/18 08:46	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			391721	09/28/18 10:58	RTM	TAL SL

**Client Sample ID: CCR-AP-6**  
**Date Collected: 08/22/18 14:55**  
**Date Received: 08/25/18 09:25**

**Lab Sample ID: 180-81267-2**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		2.5			255765	09/04/18 22:31	JBF	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		25			255765	09/04/18 23:19	JBF	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256170	09/06/18 21:26	RSK	TAL PIT

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-AP-6**

**Lab Sample ID: 180-81267-2**

**Date Collected: 08/22/18 14:55**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256259	09/07/18 13:31	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256289	09/08/18 12:25	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: M		1			256608	09/11/18 18:01	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	255321	08/29/18 07:38	KA	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			255527	08/30/18 11:54	RJR	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			255330	08/29/18 08:19	AVS	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	50 mL	100 mL	255279	08/28/18 15:31	RMA	TAL PIT
Total/NA	Prep	PrecSep-21			1000.32 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCORANGE		1			391266	09/26/18 07:22	MAR	TAL SL
Total/NA	Prep	PrecSep_0			1000.32 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCORANGE		1			388633	09/12/18 08:46	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			391721	09/28/18 10:58	RTM	TAL SL

**Client Sample ID: CCR-AP-7R**

**Lab Sample ID: 180-81267-3**

**Date Collected: 08/22/18 12:00**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		2.5			255765	09/04/18 23:34	JBF	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		25			255765	09/04/18 23:50	JBF	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256170	09/06/18 21:29	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256259	09/07/18 13:34	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			256289	09/08/18 12:28	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-AP-7R**

**Lab Sample ID: 180-81267-3**

**Date Collected: 08/22/18 12:00**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Analysis	EPA 6020A		1			256608	09/11/18 18:06	WTR	TAL PIT
		Instrument ID: M								
Total/NA	Prep	7470A			50 mL	50 mL	255321	08/29/18 07:38	KA	TAL PIT
Total/NA	Analysis	EPA 7470A		1			255527	08/30/18 11:55	RJR	TAL PIT
		Instrument ID: HGZ								
Total/NA	Analysis	EPA 9040C		1			255330	08/29/18 08:19	AVS	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	255279	08/28/18 15:31	RMA	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			999.88 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315		1			391266	09/26/18 07:23	MAR	TAL SL
		Instrument ID: GFPCORANGE								
Total/NA	Prep	PrecSep_0			999.88 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320		1			388633	09/12/18 08:46	CDR	TAL SL
		Instrument ID: GFPCORANGE								
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL
		Instrument ID: NOEQUIP								

**Client Sample ID: CCR-LF-1**

**Lab Sample ID: 180-81267-4**

**Date Collected: 08/22/18 17:30**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			255765	09/04/18 21:44	JBF	TAL PIT
		Instrument ID: CHICS2100B								
Total/NA	Analysis	EPA 9056A		10			255765	09/04/18 22:00	JBF	TAL PIT
		Instrument ID: CHICS2100B								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256170	09/06/18 21:32	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256259	09/07/18 13:37	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256289	09/08/18 12:31	WTR	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256608	09/11/18 18:19	WTR	TAL PIT
		Instrument ID: M								
Total/NA	Prep	7470A			50 mL	50 mL	255321	08/29/18 07:38	KA	TAL PIT
Total/NA	Analysis	EPA 7470A		1			255527	08/30/18 11:56	RJR	TAL PIT
		Instrument ID: HGZ								
Total/NA	Analysis	EPA 9040C		1			255330	08/29/18 08:19	AVS	TAL PIT
		Instrument ID: NOEQUIP								

TestAmerica Pittsburgh



# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-LF-1**

**Lab Sample ID: 180-81267-4**

**Date Collected: 08/22/18 17:30**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	255279	08/28/18 15:31	RMA	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			1000.34 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 07:24	MAR	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Prep	PrecSep_0			1000.34 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320		1			388633	09/12/18 08:47	CDR	TAL SL
		Instrument ID: GFPCORANGE								
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL
		Instrument ID: NOEQUIP								

**Client Sample ID: CCR-SP-1**

**Lab Sample ID: 180-81267-5**

**Date Collected: 08/23/18 10:25**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			255765	09/05/18 00:06	JBF	TAL PIT
		Instrument ID: CHICS2100B								
Total/NA	Analysis	EPA 9056A		25			255765	09/05/18 00:22	JBF	TAL PIT
		Instrument ID: CHICS2100B								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256170	09/06/18 21:35	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256259	09/07/18 13:40	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256289	09/08/18 12:34	WTR	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256608	09/11/18 18:24	WTR	TAL PIT
		Instrument ID: M								
Total/NA	Analysis	EPA 9040C		1			255330	08/29/18 08:19	AVS	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	255525	08/30/18 12:10	RMA	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			1000.20 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 07:24	MAR	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Prep	PrecSep_0			1000.20 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320		1			388766	09/12/18 08:50	CDR	TAL SL
		Instrument ID: GFPCPROTEAN								
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL
		Instrument ID: NOEQUIP								

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-SP-2**

**Lab Sample ID: 180-81267-6**

**Date Collected: 08/23/18 11:35**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		5			255765	09/04/18 18:50	JBF	TAL PIT
Instrument ID: CHICS2100B										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256170	09/06/18 21:37	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256259	09/07/18 13:43	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256289	09/08/18 12:37	WTR	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:17	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256608	09/11/18 18:29	WTR	TAL PIT
Instrument ID: M										
Total/NA	Analysis	EPA 9040C		1			255330	08/29/18 08:19	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	255525	08/30/18 12:10	RMA	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.41 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 07:24	MAR	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Prep	PrecSep_0			1000.41 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320		1			388766	09/12/18 08:50	CDR	TAL SL
Instrument ID: GFPCPROTEAN										
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL
Instrument ID: NOEQUIP										

**Client Sample ID: CCR-SP-3**

**Lab Sample ID: 180-81267-7**

**Date Collected: 08/23/18 13:00**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			255765	09/04/18 20:09	JBF	TAL PIT
Instrument ID: CHICS2100B										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256170	09/06/18 21:40	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256259	09/07/18 13:46	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256289	09/08/18 12:40	WTR	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-SP-3**

**Lab Sample ID: 180-81267-7**

**Date Collected: 08/23/18 13:00**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Analysis	EPA 6020A		1			256608	09/11/18 18:33	WTR	TAL PIT
		Instrument ID: M								
Total/NA	Analysis	EPA 9040C		1			255330	08/29/18 08:19	AVS	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	255525	08/30/18 12:10	RMA	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			1000.15 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 07:24	MAR	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Prep	PrecSep_0			1000.15 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320		1			388766	09/12/18 08:50	CDR	TAL SL
		Instrument ID: GFPCPROTEAN								
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL
		Instrument ID: NOEQUIP								

**Client Sample ID: BLIND DUPLICATE 3**

**Lab Sample ID: 180-81267-8**

**Date Collected: 08/23/18 00:00**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			255765	09/05/18 00:38	JBF	TAL PIT
		Instrument ID: CHICS2100B								
Total/NA	Analysis	EPA 9056A		25			255765	09/05/18 00:53	JBF	TAL PIT
		Instrument ID: CHICS2100B								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256170	09/06/18 22:01	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256259	09/07/18 14:06	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256289	09/08/18 13:00	WTR	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256608	09/11/18 18:56	WTR	TAL PIT
		Instrument ID: M								
Total/NA	Prep	7470A			50 mL	50 mL	255321	08/29/18 07:38	KA	TAL PIT
Total/NA	Analysis	EPA 7470A		1			255527	08/30/18 11:57	RJR	TAL PIT
		Instrument ID: HGZ								
Total/NA	Analysis	EPA 9040C		1			255330	08/29/18 08:19	AVS	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	255529	08/30/18 12:17	RMA	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			1000.35 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Client Sample ID: BLIND DUPLICATE 3

## Lab Sample ID: 180-81267-8

Date Collected: 08/23/18 00:00

Matrix: Water

Date Received: 08/25/18 09:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9315		1			391268	09/26/18 07:24	MAR	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Prep	PrecSep_0			1000.35 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320		1			388766	09/12/18 08:50	CDR	TAL SL
		Instrument ID: GFPCPROTEAN								
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL
		Instrument ID: NOEQUIP								

## Client Sample ID: FIELD BLANK 2

## Lab Sample ID: 180-81267-9

Date Collected: 08/22/18 17:00

Matrix: Water

Date Received: 08/25/18 09:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			255765	09/04/18 22:15	JBF	TAL PIT
		Instrument ID: CHICS2100B								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256170	09/06/18 22:04	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256259	09/07/18 14:09	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256608	09/11/18 19:01	WTR	TAL PIT
		Instrument ID: M								
Total/NA	Prep	7470A			50 mL	50 mL	255321	08/29/18 07:38	KA	TAL PIT
Total/NA	Analysis	EPA 7470A		1			255527	08/30/18 12:00	RJR	TAL PIT
		Instrument ID: HGZ								
Total/NA	Analysis	EPA 9040C		1			255330	08/29/18 08:19	AVS	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	255279	08/28/18 15:31	RMA	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			1000.30 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 07:24	MAR	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Prep	PrecSep_0			1000.30 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320		1			388766	09/12/18 08:50	CDR	TAL SL
		Instrument ID: GFPCPROTEAN								
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL
		Instrument ID: NOEQUIP								

TestAmerica Pittsburgh

# Lab Chronicle

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: FIELD BLANK 3**

**Lab Sample ID: 180-81267-10**

**Date Collected: 08/23/18 17:00**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			255765	09/05/18 01:09	JBF	TAL PIT
Instrument ID: CHICS2100B										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256170	09/06/18 22:07	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256259	09/07/18 14:12	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	255379	08/29/18 12:19	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			256608	09/11/18 19:15	WTR	TAL PIT
Instrument ID: M										
Total/NA	Prep	7470A			50 mL	50 mL	255321	08/29/18 07:38	KA	TAL PIT
Total/NA	Analysis	EPA 7470A		1			255527	08/30/18 12:01	RJR	TAL PIT
Instrument ID: HGZ										
Total/NA	Analysis	EPA 9040C		1			255330	08/29/18 08:19	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	255529	08/30/18 12:17	RMA	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.10 mL	1.0 g	386243	08/30/18 13:09	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 07:25	MAR	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Prep	PrecSep_0			1000.10 mL	1.0 g	386250	08/30/18 13:49	JLC	TAL SL
Total/NA	Analysis	9320		1			388766	09/12/18 08:50	CDR	TAL SL
Instrument ID: GFPCPROTEAN										
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL
Instrument ID: NOEQUIP										

**Laboratory References:**

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



# Lab Chronicle

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Analyst References:

Lab: TAL PIT

Batch Type: Prep

KA = Kayla Kalamasz

NAM = Nicole Marfisi

Batch Type: Analysis

AVS = Abbey Smith

JBF = Joshua Fritsch

RJR = Ron Rosenbaum

RMA = Rachel Aguiar

RSK = Robert Kurtz

WTR = Bill Reinheimer

Lab: TAL SL

Batch Type: Prep

JLC = Jessica Chapman

Batch Type: Analysis

CDR = Conrad Reuscher

MAR = Morgan Reichert

RTM = Rachel Mueller

1

2

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# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-AP-1R**

**Lab Sample ID: 180-81267-1**

Date Collected: 08/22/18 13:55

Matrix: Water

Date Received: 08/25/18 09:25

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	110		1.0	0.71	mg/L			09/04/18 21:12	1
Fluoride	0.20		0.10	0.026	mg/L			09/04/18 21:12	1
Sulfate	900		10	3.8	mg/L			09/04/18 21:28	10

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00099	J	0.0010	0.00032	mg/L		08/29/18 12:17	09/06/18 21:23	1
Boron	0.57		0.080	0.030	mg/L		08/29/18 12:17	09/11/18 17:56	1
Barium	0.020		0.010	0.00037	mg/L		08/29/18 12:17	09/06/18 21:23	1
Calcium	280		0.50	0.12	mg/L		08/29/18 12:17	09/06/18 21:23	1
Cadmium	ND		0.0010	0.00013	mg/L		08/29/18 12:17	09/06/18 21:23	1
Cobalt	0.0014		0.00050	0.000075	mg/L		08/29/18 12:17	09/06/18 21:23	1
Chromium	0.0023		0.0020	0.00063	mg/L		08/29/18 12:17	09/07/18 13:28	1
Molybdenum	0.0074		0.0050	0.00047	mg/L		08/29/18 12:17	09/06/18 21:23	1
Lead	0.00015	J	0.0010	0.000094	mg/L		08/29/18 12:17	09/06/18 21:23	1
Selenium	ND		0.0050	0.00081	mg/L		08/29/18 12:17	09/06/18 21:23	1
Lithium	0.032	B	0.0050	0.0026	mg/L		08/29/18 12:17	09/08/18 12:22	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		08/29/18 07:38	08/30/18 11:53	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1800		10	10	mg/L			08/28/18 15:31	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1	0.1	SU			08/29/18 08:19	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.180		0.0746	0.0764	1.00	0.0739	pCi/L	08/30/18 13:09	09/26/18 07:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					08/30/18 13:09	09/26/18 07:22	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.192	U	0.270	0.271	1.00	0.450	pCi/L	08/30/18 13:49	09/12/18 08:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					08/30/18 13:49	09/12/18 08:46	1
Y Carrier	79.3		40 - 110					08/30/18 13:49	09/12/18 08:46	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Client Sample ID: CCR-AP-1R

Date Collected: 08/22/18 13:55

Date Received: 08/25/18 09:25

## Lab Sample ID: 180-81267-1

Matrix: Water

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Combined Radium 226 + 228	0.372	U	0.280	0.282	5.00	0.450	pCi/L		09/28/18 10:58	1

## Client Sample ID: CCR-AP-6

Date Collected: 08/22/18 14:55

Date Received: 08/25/18 09:25

## Lab Sample ID: 180-81267-2

Matrix: Water

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	160		2.5	1.8	mg/L			09/04/18 22:31	2.5
Fluoride	0.44		0.25	0.066	mg/L			09/04/18 22:31	2.5
Sulfate	1100		25	9.5	mg/L			09/04/18 23:19	25

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00046	J	0.0010	0.00032	mg/L		08/29/18 12:17	09/06/18 21:26	1
Boron	6.0		0.080	0.030	mg/L		08/29/18 12:17	09/11/18 18:01	1
Barium	0.015		0.010	0.00037	mg/L		08/29/18 12:17	09/06/18 21:26	1
Calcium	120		0.50	0.12	mg/L		08/29/18 12:17	09/06/18 21:26	1
Cadmium	ND		0.0010	0.00013	mg/L		08/29/18 12:17	09/06/18 21:26	1
Cobalt	0.00017	J	0.00050	0.000075	mg/L		08/29/18 12:17	09/06/18 21:26	1
Chromium	0.0020		0.0020	0.00063	mg/L		08/29/18 12:17	09/07/18 13:31	1
Molybdenum	0.0032	J	0.0050	0.00047	mg/L		08/29/18 12:17	09/06/18 21:26	1
Lead	ND		0.0010	0.000094	mg/L		08/29/18 12:17	09/06/18 21:26	1
Selenium	ND		0.0050	0.00081	mg/L		08/29/18 12:17	09/06/18 21:26	1
Lithium	0.0050	B	0.0050	0.0026	mg/L		08/29/18 12:17	09/08/18 12:25	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		08/29/18 07:38	08/30/18 11:54	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2500		20	20	mg/L			08/28/18 15:31	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			08/29/18 08:19	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Radium-226	0.438		0.113	0.119	1.00	0.0874	pCi/L	08/30/18 13:09	09/26/18 07:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.1		40 - 110					08/30/18 13:09	09/26/18 07:22	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Client Sample ID: CCR-AP-6

Date Collected: 08/22/18 14:55

Date Received: 08/25/18 09:25

## Lab Sample ID: 180-81267-2

Matrix: Water

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.420		0.262	0.265	1.00	0.404	pCi/L	08/30/18 13:49	09/12/18 08:46	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.1		40 - 110					08/30/18 13:49	09/12/18 08:46	1
Y Carrier	81.5		40 - 110					08/30/18 13:49	09/12/18 08:46	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.858		0.285	0.290	5.00	0.404	pCi/L		09/28/18 10:58	1

## Client Sample ID: CCR-AP-7R

Date Collected: 08/22/18 12:00

Date Received: 08/25/18 09:25

## Lab Sample ID: 180-81267-3

Matrix: Water

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	320		2.5	1.8	mg/L			09/04/18 23:34	2.5
Fluoride	0.19	J	0.25	0.066	mg/L			09/04/18 23:34	2.5
Sulfate	2600		25	9.5	mg/L			09/04/18 23:50	25

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00077	J	0.0010	0.00032	mg/L		08/29/18 12:17	09/06/18 21:29	1
Boron	3.4		0.080	0.030	mg/L		08/29/18 12:17	09/11/18 18:06	1
Barium	0.031		0.010	0.00037	mg/L		08/29/18 12:17	09/06/18 21:29	1
Calcium	330		0.50	0.12	mg/L		08/29/18 12:17	09/06/18 21:29	1
Cadmium	ND		0.0010	0.00013	mg/L		08/29/18 12:17	09/06/18 21:29	1
Cobalt	0.00049	J	0.00050	0.000075	mg/L		08/29/18 12:17	09/06/18 21:29	1
Chromium	0.0033		0.0020	0.00063	mg/L		08/29/18 12:17	09/07/18 13:34	1
Molybdenum	ND		0.0050	0.00047	mg/L		08/29/18 12:17	09/06/18 21:29	1
Lead	0.00031	J	0.0010	0.000094	mg/L		08/29/18 12:17	09/06/18 21:29	1
Selenium	0.00099	J	0.0050	0.00081	mg/L		08/29/18 12:17	09/06/18 21:29	1
Lithium	0.019	B	0.0050	0.0026	mg/L		08/29/18 12:17	09/08/18 12:28	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		08/29/18 07:38	08/30/18 11:55	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4500		40	40	mg/L			08/28/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1	0.1	SU			08/29/18 08:19	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-AP-7R**

**Lab Sample ID: 180-81267-3**

Date Collected: 08/22/18 12:00

Matrix: Water

Date Received: 08/25/18 09:25

**Method: 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.325		0.101	0.105	1.00	0.0884	pCi/L	08/30/18 13:09	09/26/18 07:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					08/30/18 13:09	09/26/18 07:23	1

**Method: 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.410		0.250	0.253	1.00	0.382	pCi/L	08/30/18 13:49	09/12/18 08:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					08/30/18 13:49	09/12/18 08:46	1
Y Carrier	82.2		40 - 110					08/30/18 13:49	09/12/18 08:46	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.735		0.270	0.274	5.00	0.382	pCi/L		09/28/18 10:58	1

**Client Sample ID: CCR-LF-1**

**Lab Sample ID: 180-81267-4**

Date Collected: 08/22/18 17:30

Matrix: Water

Date Received: 08/25/18 09:25

**Method: EPA 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	19		1.0	0.71	mg/L			09/04/18 21:44	1
Fluoride	0.26		0.10	0.026	mg/L			09/04/18 21:44	1
Sulfate	1200		10	3.8	mg/L			09/04/18 22:00	10

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0015		0.0010	0.00032	mg/L		08/29/18 12:17	09/06/18 21:32	1
Boron	0.040	J	0.080	0.030	mg/L		08/29/18 12:17	09/11/18 18:19	1
Barium	0.088		0.010	0.00037	mg/L		08/29/18 12:17	09/06/18 21:32	1
Calcium	270		0.50	0.12	mg/L		08/29/18 12:17	09/06/18 21:32	1
Cadmium	ND		0.0010	0.00013	mg/L		08/29/18 12:17	09/06/18 21:32	1
Cobalt	0.00068		0.00050	0.000075	mg/L		08/29/18 12:17	09/06/18 21:32	1
Chromium	0.0062		0.0020	0.00063	mg/L		08/29/18 12:17	09/07/18 13:37	1
Molybdenum	0.0012	J	0.0050	0.00047	mg/L		08/29/18 12:17	09/06/18 21:32	1
Lead	0.0011		0.0010	0.000094	mg/L		08/29/18 12:17	09/06/18 21:32	1
Selenium	ND		0.0050	0.00081	mg/L		08/29/18 12:17	09/06/18 21:32	1
Lithium	0.0080	B	0.0050	0.0026	mg/L		08/29/18 12:17	09/08/18 12:31	1

**Method: EPA 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		08/29/18 07:38	08/30/18 11:56	1

TestAmerica Pittsburgh



# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-LF-1**

**Lab Sample ID: 180-81267-4**

Date Collected: 08/22/18 17:30

Matrix: Water

Date Received: 08/25/18 09:25

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2000		10	10	mg/L			08/28/18 15:31	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1	0.1	SU			08/29/18 08:19	1

## Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.776		0.136	0.153	1.00	0.0716	pCi/L	08/30/18 13:09	09/26/18 07:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110					08/30/18 13:09	09/26/18 07:24	1

## Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.281	U	0.212	0.213	1.00	0.334	pCi/L	08/30/18 13:49	09/12/18 08:47	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110					08/30/18 13:49	09/12/18 08:47	1
Y Carrier	91.2		40 - 110					08/30/18 13:49	09/12/18 08:47	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.06		0.252	0.262	5.00	0.334	pCi/L		09/28/18 10:58	1

**Client Sample ID: CCR-SP-1**

**Lab Sample ID: 180-81267-5**

Date Collected: 08/23/18 10:25

Matrix: Water

Date Received: 08/25/18 09:25

## Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		2.5	1.8	mg/L			09/05/18 00:06	2.5
Fluoride	0.78		0.25	0.066	mg/L			09/05/18 00:06	2.5
Sulfate	1200		25	9.5	mg/L			09/05/18 00:22	25

## Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0045		0.0010	0.00032	mg/L		08/29/18 12:17	09/06/18 21:35	1
Boron	0.14		0.080	0.030	mg/L		08/29/18 12:17	09/11/18 18:24	1
Barium	0.066		0.010	0.00037	mg/L		08/29/18 12:17	09/06/18 21:35	1
Calcium	290		0.50	0.12	mg/L		08/29/18 12:17	09/06/18 21:35	1
Cobalt	0.0072		0.00050	0.000075	mg/L		08/29/18 12:17	09/06/18 21:35	1
Chromium	0.0017	J	0.0020	0.00063	mg/L		08/29/18 12:17	09/07/18 13:40	1
Molybdenum	0.0011	J	0.0050	0.00047	mg/L		08/29/18 12:17	09/06/18 21:35	1
Lead	ND		0.0010	0.000094	mg/L		08/29/18 12:17	09/06/18 21:35	1
Lithium	0.0064	B	0.0050	0.0026	mg/L		08/29/18 12:17	09/08/18 12:34	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-SP-1**

**Lab Sample ID: 180-81267-5**

Date Collected: 08/23/18 10:25

Matrix: Water

Date Received: 08/25/18 09:25

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2300		20	20	mg/L			08/30/18 12:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1	0.1	SU			08/29/18 08:19	1

## Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.195		0.0781	0.0801	1.00	0.0775	pCi/L	08/30/18 13:09	09/26/18 07:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.3		40 - 110					08/30/18 13:09	09/26/18 07:24	1

## Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.542		0.328	0.332	1.00	0.506	pCi/L	08/30/18 13:49	09/12/18 08:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.3		40 - 110					08/30/18 13:49	09/12/18 08:50	1
Y Carrier	74.0		40 - 110					08/30/18 13:49	09/12/18 08:50	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.737		0.337	0.342	5.00	0.506	pCi/L		09/28/18 10:58	1

**Client Sample ID: CCR-SP-2**

**Lab Sample ID: 180-81267-6**

Date Collected: 08/23/18 11:35

Matrix: Water

Date Received: 08/25/18 09:25

## Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	70		5.0	3.6	mg/L			09/04/18 18:50	5
Fluoride	0.32	J	0.50	0.13	mg/L			09/04/18 18:50	5
Sulfate	380	F1	5.0	1.9	mg/L			09/04/18 18:50	5

## Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00064	J	0.0010	0.00032	mg/L		08/29/18 12:17	09/06/18 21:37	1
Boron	0.18		0.080	0.030	mg/L		08/29/18 12:17	09/11/18 18:29	1
Barium	0.12		0.010	0.00037	mg/L		08/29/18 12:17	09/06/18 21:37	1
Calcium	160		0.50	0.12	mg/L		08/29/18 12:17	09/06/18 21:37	1
Cobalt	0.00072		0.00050	0.000075	mg/L		08/29/18 12:17	09/06/18 21:37	1
Chromium	0.0021		0.0020	0.00063	mg/L		08/29/18 12:17	09/07/18 13:43	1
Molybdenum	0.0012	J	0.0050	0.00047	mg/L		08/29/18 12:17	09/06/18 21:37	1
Lead	0.00026	J	0.0010	0.000094	mg/L		08/29/18 12:17	09/06/18 21:37	1
Lithium	0.0073	B	0.0050	0.0026	mg/L		08/29/18 12:17	09/08/18 12:37	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-SP-2**

**Lab Sample ID: 180-81267-6**

Date Collected: 08/23/18 11:35

Matrix: Water

Date Received: 08/25/18 09:25

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1100		10	10	mg/L			08/30/18 12:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1	0.1	SU			08/29/18 08:19	1

## Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.243		0.0833	0.0861	1.00	0.0612	pCi/L	08/30/18 13:09	09/26/18 07:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					08/30/18 13:09	09/26/18 07:24	1

## Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.18		0.344	0.361	1.00	0.452	pCi/L	08/30/18 13:49	09/12/18 08:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					08/30/18 13:49	09/12/18 08:50	1
Y Carrier	78.1		40 - 110					08/30/18 13:49	09/12/18 08:50	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.42		0.354	0.371	5.00	0.452	pCi/L		09/28/18 10:58	1

**Client Sample ID: CCR-SP-3**

**Lab Sample ID: 180-81267-7**

Date Collected: 08/23/18 13:00

Matrix: Water

Date Received: 08/25/18 09:25

## Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.4		1.0	0.71	mg/L			09/04/18 20:09	1
Fluoride	0.25		0.10	0.026	mg/L			09/04/18 20:09	1
Sulfate	9.9		1.0	0.38	mg/L			09/04/18 20:09	1

## Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0039		0.0010	0.00032	mg/L		08/29/18 12:19	09/06/18 21:40	1
Boron	ND		0.080	0.030	mg/L		08/29/18 12:19	09/11/18 18:33	1
Barium	0.068		0.010	0.00037	mg/L		08/29/18 12:19	09/06/18 21:40	1
Calcium	83		0.50	0.12	mg/L		08/29/18 12:19	09/06/18 21:40	1
Cobalt	0.00046	J	0.00050	0.000075	mg/L		08/29/18 12:19	09/06/18 21:40	1
Chromium	0.0022		0.0020	0.00063	mg/L		08/29/18 12:19	09/07/18 13:46	1
Molybdenum	0.0027	J	0.0050	0.00047	mg/L		08/29/18 12:19	09/06/18 21:40	1
Lead	0.00012	J	0.0010	0.000094	mg/L		08/29/18 12:19	09/06/18 21:40	1
Lithium	0.0034	J B	0.0050	0.0026	mg/L		08/29/18 12:19	09/08/18 12:40	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: CCR-SP-3**

**Lab Sample ID: 180-81267-7**

Date Collected: 08/23/18 13:00

Matrix: Water

Date Received: 08/25/18 09:25

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	390		10	10	mg/L			08/30/18 12:10	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1	0.1	SU			08/29/18 08:19	1

## Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.197		0.0795	0.0815	1.00	0.0779	pCi/L	08/30/18 13:09	09/26/18 07:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.8		40 - 110					08/30/18 13:09	09/26/18 07:24	1

## Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.285	U	0.252	0.253	1.00	0.405	pCi/L	08/30/18 13:49	09/12/18 08:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.8		40 - 110					08/30/18 13:49	09/12/18 08:50	1
Y Carrier	86.0		40 - 110					08/30/18 13:49	09/12/18 08:50	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.483		0.264	0.266	5.00	0.405	pCi/L		09/28/18 10:58	1

**Client Sample ID: BLIND DUPLICATE 3**

**Lab Sample ID: 180-81267-8**

Date Collected: 08/23/18 00:00

Matrix: Water

Date Received: 08/25/18 09:25

## Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	150		2.5	1.8	mg/L			09/05/18 00:38	2.5
Fluoride	0.37		0.25	0.066	mg/L			09/05/18 00:38	2.5
Sulfate	1100		25	9.5	mg/L			09/05/18 00:53	25

## Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0046		0.0010	0.00032	mg/L		08/29/18 12:19	09/06/18 22:01	1
Boron	0.16		0.080	0.030	mg/L		08/29/18 12:19	09/11/18 18:56	1
Barium	0.071		0.010	0.00037	mg/L		08/29/18 12:19	09/06/18 22:01	1
Calcium	310		0.50	0.12	mg/L		08/29/18 12:19	09/06/18 22:01	1
Cadmium	ND		0.0010	0.00013	mg/L		08/29/18 12:19	09/06/18 22:01	1
Cobalt	0.0073		0.00050	0.000075	mg/L		08/29/18 12:19	09/06/18 22:01	1
Chromium	0.0026		0.0020	0.00063	mg/L		08/29/18 12:19	09/07/18 14:06	1
Molybdenum	0.0015	J	0.0050	0.00047	mg/L		08/29/18 12:19	09/06/18 22:01	1
Lead	0.000099	J	0.0010	0.000094	mg/L		08/29/18 12:19	09/06/18 22:01	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: BLIND DUPLICATE 3**

**Lab Sample ID: 180-81267-8**

Date Collected: 08/23/18 00:00

Matrix: Water

Date Received: 08/25/18 09:25

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		0.0050	0.00081	mg/L		08/29/18 12:19	09/06/18 22:01	1
Lithium	0.0070	B	0.0050	0.0026	mg/L		08/29/18 12:19	09/08/18 13:00	1

**Method: EPA 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		08/29/18 07:38	08/30/18 11:57	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2300		20	20	mg/L			08/30/18 12:17	1
pH	6.8	HF	0.1	0.1	SU			08/29/18 08:19	1

**Method: 9315 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.226		0.0820	0.0845	1.00	0.0762	pCi/L	08/30/18 13:09	09/26/18 07:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					08/30/18 13:09	09/26/18 07:24	1

**Method: 9320 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.246	U	0.243	0.244	1.00	0.394	pCi/L	08/30/18 13:49	09/12/18 08:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					08/30/18 13:49	09/12/18 08:50	1
Y Carrier	81.1		40 - 110					08/30/18 13:49	09/12/18 08:50	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.472		0.256	0.258	5.00	0.394	pCi/L		09/28/18 10:58	1

**Client Sample ID: FIELD BLANK 2**

**Lab Sample ID: 180-81267-9**

Date Collected: 08/22/18 17:00

Matrix: Water

Date Received: 08/25/18 09:25

**Method: EPA 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			09/04/18 22:15	1
Fluoride	0.028	J	0.10	0.026	mg/L			09/04/18 22:15	1
Sulfate	0.75	J	1.0	0.38	mg/L			09/04/18 22:15	1

**Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		08/29/18 12:19	09/06/18 22:04	1

TestAmerica Pittsburgh



# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: FIELD BLANK 2**

**Lab Sample ID: 180-81267-9**

Date Collected: 08/22/18 17:00

Matrix: Water

Date Received: 08/25/18 09:25

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.080	0.030	mg/L		08/29/18 12:19	09/11/18 19:01	1
Barium	ND		0.010	0.00037	mg/L		08/29/18 12:19	09/06/18 22:04	1
Calcium	ND		0.50	0.12	mg/L		08/29/18 12:19	09/06/18 22:04	1
Cadmium	ND		0.0010	0.00013	mg/L		08/29/18 12:19	09/06/18 22:04	1
Cobalt	ND		0.00050	0.000075	mg/L		08/29/18 12:19	09/06/18 22:04	1
<b>Chromium</b>	<b>0.0013</b>	<b>J</b>	0.0020	0.00063	mg/L		08/29/18 12:19	09/07/18 14:09	1
Molybdenum	ND		0.0050	0.00047	mg/L		08/29/18 12:19	09/06/18 22:04	1
Lead	ND		0.0010	0.000094	mg/L		08/29/18 12:19	09/06/18 22:04	1
Selenium	ND		0.0050	0.00081	mg/L		08/29/18 12:19	09/06/18 22:04	1
Lithium	ND	^	0.0050	0.0026	mg/L		08/29/18 12:19	09/07/18 14:09	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		08/29/18 07:38	08/30/18 12:00	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/28/18 15:31	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH</b>	<b>6.4</b>	<b>HF</b>	0.1	0.1	SU			08/29/18 08:19	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.184</b>		0.0730	0.0748	1.00	0.0696	pCi/L	08/30/18 13:09	09/26/18 07:24	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110	08/30/18 13:09	09/26/18 07:24	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>0.531</b>		0.236	0.241	1.00	0.335	pCi/L	08/30/18 13:49	09/12/18 08:50	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110	08/30/18 13:49	09/12/18 08:50	1
Y Carrier	86.7		40 - 110	08/30/18 13:49	09/12/18 08:50	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.716</b>		0.247	0.252	5.00	0.335	pCi/L		09/28/18 10:58	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Client Sample ID: FIELD BLANK 3

## Lab Sample ID: 180-81267-10

Date Collected: 08/23/18 17:00

Matrix: Water

Date Received: 08/25/18 09:25

### Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			09/05/18 01:09	1
Fluoride	0.13		0.10	0.026	mg/L			09/05/18 01:09	1
Sulfate	0.63	J	1.0	0.38	mg/L			09/05/18 01:09	1

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		08/29/18 12:19	09/06/18 22:07	1
Boron	ND		0.080	0.030	mg/L		08/29/18 12:19	09/11/18 19:15	1
Barium	0.0011	J	0.010	0.00037	mg/L		08/29/18 12:19	09/06/18 22:07	1
Calcium	ND		0.50	0.12	mg/L		08/29/18 12:19	09/06/18 22:07	1
Cadmium	ND		0.0010	0.00013	mg/L		08/29/18 12:19	09/06/18 22:07	1
Cobalt	ND		0.00050	0.000075	mg/L		08/29/18 12:19	09/06/18 22:07	1
Chromium	0.0016	J	0.0020	0.00063	mg/L		08/29/18 12:19	09/07/18 14:12	1
Molybdenum	ND		0.0050	0.00047	mg/L		08/29/18 12:19	09/06/18 22:07	1
Lead	ND		0.0010	0.000094	mg/L		08/29/18 12:19	09/06/18 22:07	1
Selenium	ND		0.0050	0.00081	mg/L		08/29/18 12:19	09/06/18 22:07	1
Lithium	ND	^	0.0050	0.0026	mg/L		08/29/18 12:19	09/07/18 14:12	1

### Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000065	mg/L		08/29/18 07:38	08/30/18 12:01	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/30/18 12:17	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.7	HF	0.1	0.1	SU			08/29/18 08:19	1

### Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.198		0.0749	0.0770	1.00	0.0685	pCi/L	08/30/18 13:09	09/26/18 07:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					08/30/18 13:09	09/26/18 07:25	1

### Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.294	U	0.219	0.221	1.00	0.344	pCi/L	08/30/18 13:49	09/12/18 08:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					08/30/18 13:49	09/12/18 08:50	1
Y Carrier	84.5		40 - 110					08/30/18 13:49	09/12/18 08:50	1

TestAmerica Pittsburgh

# Client Sample Results

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

**Client Sample ID: FIELD BLANK 3**

**Lab Sample ID: 180-81267-10**

**Date Collected: 08/23/18 17:00**

**Matrix: Water**

**Date Received: 08/25/18 09:25**

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.492		0.231	0.234	5.00	0.344	pCi/L		09/28/18 10:58	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Method: EPA 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 180-255765/39**  
**Matrix: Water**  
**Analysis Batch: 255765**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			09/04/18 16:59	1
Fluoride	ND		0.10	0.026	mg/L			09/04/18 16:59	1
Sulfate	ND		1.0	0.38	mg/L			09/04/18 16:59	1

**Lab Sample ID: LCS 180-255765/40**  
**Matrix: Water**  
**Analysis Batch: 255765**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	26.6		mg/L		107	80 - 120
Fluoride	1.25	1.14		mg/L		91	80 - 120
Sulfate	25.0	26.4		mg/L		106	80 - 120

**Lab Sample ID: 180-81267-6 MS**  
**Matrix: Water**  
**Analysis Batch: 255765**

**Client Sample ID: CCR-SP-2**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	70		125	181		mg/L		89	80 - 120
Fluoride	0.32	J	6.25	5.71		mg/L		86	80 - 120
Sulfate	380	F1	125	453	F1	mg/L		62	80 - 120

**Lab Sample ID: 180-81267-6 MSD**  
**Matrix: Water**  
**Analysis Batch: 255765**

**Client Sample ID: CCR-SP-2**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	70		125	181		mg/L		89	80 - 120	0	15
Fluoride	0.32	J	6.25	5.39		mg/L		81	80 - 120	6	15
Sulfate	380	F1	125	453	F1	mg/L		62	80 - 120	0	15

## Method: EPA 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 180-255379/1-A**  
**Matrix: Water**  
**Analysis Batch: 256170**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		08/29/18 12:17	09/06/18 20:27	1
Barium	ND		0.010	0.00037	mg/L		08/29/18 12:17	09/06/18 20:27	1
Calcium	ND		0.50	0.12	mg/L		08/29/18 12:17	09/06/18 20:27	1
Cadmium	ND		0.0010	0.00013	mg/L		08/29/18 12:17	09/06/18 20:27	1
Cobalt	ND		0.00050	0.000075	mg/L		08/29/18 12:17	09/06/18 20:27	1
Molybdenum	ND		0.0050	0.00047	mg/L		08/29/18 12:17	09/06/18 20:27	1
Lead	ND		0.0010	0.000094	mg/L		08/29/18 12:17	09/06/18 20:27	1
Selenium	ND		0.0050	0.00081	mg/L		08/29/18 12:17	09/06/18 20:27	1
Lithium	0.00276	J	0.0050	0.0026	mg/L		08/29/18 12:17	09/06/18 20:27	1

TestAmerica Pittsburgh

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: MB 180-255379/1-A**  
**Matrix: Water**  
**Analysis Batch: 256259**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.010	0.00037	mg/L		08/29/18 12:17	09/07/18 12:26	1
Lithium	ND		0.0050	0.0026	mg/L		08/29/18 12:17	09/07/18 12:26	1

**Lab Sample ID: MB 180-255379/1-A**  
**Matrix: Water**  
**Analysis Batch: 256608**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.080	0.030	mg/L		08/29/18 12:17	09/11/18 17:33	1

**Lab Sample ID: LCS 180-255379/2-A**  
**Matrix: Water**  
**Analysis Batch: 256170**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	0.0400	0.0373		mg/L		93	80 - 120
Barium	2.00	2.17		mg/L		108	80 - 120
Calcium	50.0	51.3		mg/L		103	80 - 120
Cadmium	0.0500	0.0571		mg/L		114	80 - 120
Cobalt	0.500	0.454		mg/L		91	80 - 120
Molybdenum	1.00	1.03		mg/L		103	80 - 120
Lead	0.0200	0.0219		mg/L		110	80 - 120
Selenium	0.0100	0.0118		mg/L		118	80 - 120

**Lab Sample ID: LCS 180-255379/2-A**  
**Matrix: Water**  
**Analysis Batch: 256259**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Chromium	0.200	0.193		mg/L		97	80 - 120
Lithium	0.0500	0.0506		mg/L		101	80 - 120

**Lab Sample ID: LCS 180-255379/2-A**  
**Matrix: Water**  
**Analysis Batch: 256608**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Boron	1.00	0.910		mg/L		91	80 - 120

**Lab Sample ID: 180-81267-7 MS**  
**Matrix: Water**  
**Analysis Batch: 256170**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	0.0039		0.0400	0.0414		mg/L		94	75 - 125
Barium	0.068		2.00	2.25		mg/L		109	75 - 125
Calcium	83		50.0	136		mg/L		105	75 - 125
Cadmium	ND		0.0500	0.0572		mg/L		114	75 - 125
Cobalt	0.00046	J	0.500	0.458		mg/L		91	75 - 125

TestAmerica Pittsburgh



# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 180-81267-7 MS**  
**Matrix: Water**  
**Analysis Batch: 256170**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MS		Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	Limits
Molybdenum	0.0027	J	1.00	1.03		mg/L		102	75 - 125	
Lead	0.00012	J	0.0200	0.0219		mg/L		109	75 - 125	
Selenium	ND		0.0100	0.0129	4	mg/L		129	75 - 125	

**Lab Sample ID: 180-81267-7 MS**  
**Matrix: Water**  
**Analysis Batch: 256259**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MS		Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	Limits
Chromium	0.0022		0.200	0.219		mg/L		109	75 - 125	

**Lab Sample ID: 180-81267-7 MS**  
**Matrix: Water**  
**Analysis Batch: 256289**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MS		Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	Limits
Cadmium	ND		0.0500	0.0557		mg/L		111	75 - 125	
Selenium	ND		0.0100	0.00898		mg/L		90	75 - 125	
Lithium	0.0034	J B	0.0500	0.0516		mg/L		97	75 - 125	

**Lab Sample ID: 180-81267-7 MS**  
**Matrix: Water**  
**Analysis Batch: 256608**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MS		Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	Limits
Boron	ND		1.00	0.914		mg/L		91	75 - 125	

**Lab Sample ID: 180-81267-7 MSD**  
**Matrix: Water**  
**Analysis Batch: 256170**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	%Rec.		RPD	
	Result	Qualifier		Result	Qualifier				Limits	RPD	Limit	
Arsenic	0.0039		0.0400	0.0406		mg/L		92	75 - 125	2	20	
Barium	0.068		2.00	2.24		mg/L		109	75 - 125	0	20	
Calcium	83		50.0	133		mg/L		100	75 - 125	2	20	
Cadmium	ND		0.0500	0.0576		mg/L		115	75 - 125	1	20	
Cobalt	0.00046	J	0.500	0.442		mg/L		88	75 - 125	3	20	
Molybdenum	0.0027	J	1.00	1.03		mg/L		103	75 - 125	0	20	
Lead	0.00012	J	0.0200	0.0217		mg/L		108	75 - 125	1	20	
Selenium	ND		0.0100	0.0125	4	mg/L		125	75 - 125	3	20	

**Lab Sample ID: 180-81267-7 MSD**  
**Matrix: Water**  
**Analysis Batch: 256259**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	%Rec.		RPD	
	Result	Qualifier		Result	Qualifier				Limits	RPD	Limit	
Arsenic	0.0045		0.0400	0.0437		mg/L		98	75 - 125	1	20	
Barium	0.064		2.00	2.18		mg/L		106	75 - 125	2	20	
Calcium	86		50.0	136		mg/L		101	75 - 125	3	20	

TestAmerica Pittsburgh

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 180-81267-7 MSD**  
**Matrix: Water**  
**Analysis Batch: 256259**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier		Result	Qualifier						
Cadmium	ND		0.0500	0.0573		mg/L		115	75 - 125	1	20
Cobalt	0.00053		0.500	0.500		mg/L		100	75 - 125	2	20
Chromium	0.0022		0.200	0.218		mg/L		108	75 - 125	1	20
Molybdenum	0.0028	J	1.00	1.07		mg/L		106	75 - 125	1	20
Lead	0.00013	J	0.0200	0.0221		mg/L		110	75 - 125	1	20
Selenium	ND		0.0100	0.00822		mg/L		82	75 - 125	0	20

**Lab Sample ID: 180-81267-7 MSD**  
**Matrix: Water**  
**Analysis Batch: 256289**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier		Result	Qualifier						
Cadmium	ND		0.0500	0.0554		mg/L		111	75 - 125	1	20
Selenium	ND		0.0100	0.00857		mg/L		86	75 - 125	5	20
Lithium	0.0034	J B	0.0500	0.0509		mg/L		95	75 - 125	1	20

**Lab Sample ID: 180-81267-7 MSD**  
**Matrix: Water**  
**Analysis Batch: 256608**

**Client Sample ID: CCR-SP-3**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255379**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier		Result	Qualifier						
Boron	ND		1.00	0.921		mg/L		92	75 - 125	1	20

## Method: EPA 7470A - Mercury (CVAA)

**Lab Sample ID: MB 180-255321/1-A**  
**Matrix: Water**  
**Analysis Batch: 255527**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 255321**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	ND		0.00020	0.000065	mg/L		08/29/18 07:38	08/30/18 11:38	1

**Lab Sample ID: LCS 180-255321/2-A**  
**Matrix: Water**  
**Analysis Batch: 255527**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 255321**

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec.
Mercury	0.00250	0.00245		mg/L		98	80 - 120

## Method: EPA 9040C - pH

**Lab Sample ID: LCS 180-255330/1**  
**Matrix: Water**  
**Analysis Batch: 255330**

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

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec.
pH	7.00	7.1		SU		101	99 - 101

TestAmerica Pittsburgh

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Method: EPA 9040C - pH (Continued)

Lab Sample ID: 180-81267-4 DU  
 Matrix: Water  
 Analysis Batch: 255330

Client Sample ID: CCR-LF-1  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.9	HF	6.8		SU		0.1	2

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-255279/2  
 Matrix: Water  
 Analysis Batch: 255279

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/28/18 15:31	1

Lab Sample ID: LCS 180-255279/1  
 Matrix: Water  
 Analysis Batch: 255279

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	494	502		mg/L		102	80 - 120

Lab Sample ID: MB 180-255525/2  
 Matrix: Water  
 Analysis Batch: 255525

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/30/18 12:10	1

Lab Sample ID: LCS 180-255525/1  
 Matrix: Water  
 Analysis Batch: 255525

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	494	500		mg/L		101	80 - 120

Lab Sample ID: 180-81267-5 DU  
 Matrix: Water  
 Analysis Batch: 255525

Client Sample ID: CCR-SP-1  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	2300		2330		mg/L		1	10

Lab Sample ID: MB 180-255529/2  
 Matrix: Water  
 Analysis Batch: 255529

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/30/18 12:17	1

TestAmerica Pittsburgh

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

**Lab Sample ID: LCS 180-255529/1**  
**Matrix: Water**  
**Analysis Batch: 255529**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	494	506		mg/L		102	80 - 120

## Method: 9315 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-386243/23-A**  
**Matrix: Water**  
**Analysis Batch: 391268**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 386243**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1583		0.0707	0.0721	1.00	0.0738	pCi/L	08/30/18 13:09	09/26/18 07:25	1
<b>Carrier</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	97.9		40 - 110					08/30/18 13:09	09/26/18 07:25	1

**Lab Sample ID: LCS 160-386243/1-A**  
**Matrix: Water**  
**Analysis Batch: 391266**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 386243**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.82		1.11	1.00	0.0643	pCi/L	95	68 - 137
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Ba Carrier	106		40 - 110						

**Lab Sample ID: LCSD 160-386243/2-A**  
**Matrix: Water**  
**Analysis Batch: 391266**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 386243**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	11.44		1.16	1.00	0.0692	pCi/L	101	68 - 137	0.27	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Ba Carrier	98.5		40 - 110								

## Method: 9320 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-386250/23-A**  
**Matrix: Water**  
**Analysis Batch: 388766**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 386250**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1865	U	0.224	0.224	1.00	0.369	pCi/L	08/30/18 13:49	09/12/18 08:50	1

TestAmerica Pittsburgh

# QC Sample Results

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Method: 9320 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: MB 160-386250/23-A**  
**Matrix: Water**  
**Analysis Batch: 388766**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 386250**

Carrier	MB MB		Limits
	%Yield	Qualifier	
Ba Carrier	97.9		40 - 110
Y Carrier	85.2		40 - 110

Prepared	Analyzed	Dil Fac
08/30/18 13:49	09/12/18 08:50	1
08/30/18 13:49	09/12/18 08:50	1

**Lab Sample ID: LCS 160-386250/1-A**  
**Matrix: Water**  
**Analysis Batch: 388632**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 386250**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
									56	140
Radium-228	11.0	11.89		1.29	1.00	0.323	pCi/L	108	56 - 140	

Carrier	LCS LCS		Limits
	%Yield	Qualifier	
Ba Carrier	106		40 - 110
Y Carrier	82.6		40 - 110

**Lab Sample ID: LCSD 160-386250/2-A**  
**Matrix: Water**  
**Analysis Batch: 388632**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 386250**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER	Limit
									56	140	0.24	1
Radium-228	11.0	12.54		1.38	1.00	0.345	pCi/L	114	56 - 140	0.24	1	

Carrier	LCSD LCSD		Limits
	%Yield	Qualifier	
Ba Carrier	98.5		40 - 110
Y Carrier	80.4		40 - 110

# QC Association Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## HPLC/IC

### Analysis Batch: 255765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-81267-1	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-81267-2	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-81267-2	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-81267-3	CCR-AP-7R	Total/NA	Water	EPA 9056A	
180-81267-3	CCR-AP-7R	Total/NA	Water	EPA 9056A	
180-81267-4	CCR-LF-1	Total/NA	Water	EPA 9056A	
180-81267-4	CCR-LF-1	Total/NA	Water	EPA 9056A	
180-81267-5	CCR-SP-1	Total/NA	Water	EPA 9056A	
180-81267-5	CCR-SP-1	Total/NA	Water	EPA 9056A	
180-81267-6	CCR-SP-2	Total/NA	Water	EPA 9056A	
180-81267-7	CCR-SP-3	Total/NA	Water	EPA 9056A	
180-81267-8	BLIND DUPLICATE 3	Total/NA	Water	EPA 9056A	
180-81267-8	BLIND DUPLICATE 3	Total/NA	Water	EPA 9056A	
180-81267-9	FIELD BLANK 2	Total/NA	Water	EPA 9056A	
180-81267-10	FIELD BLANK 3	Total/NA	Water	EPA 9056A	
MB 180-255765/39	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-255765/40	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-81267-6 MS	CCR-SP-2	Total/NA	Water	EPA 9056A	
180-81267-6 MSD	CCR-SP-2	Total/NA	Water	EPA 9056A	

## Metals

### Prep Batch: 255321

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total/NA	Water	7470A	
180-81267-2	CCR-AP-6	Total/NA	Water	7470A	
180-81267-3	CCR-AP-7R	Total/NA	Water	7470A	
180-81267-4	CCR-LF-1	Total/NA	Water	7470A	
180-81267-8	BLIND DUPLICATE 3	Total/NA	Water	7470A	
180-81267-9	FIELD BLANK 2	Total/NA	Water	7470A	
180-81267-10	FIELD BLANK 3	Total/NA	Water	7470A	
MB 180-255321/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-255321/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Prep Batch: 255379

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total Recoverable	Water	3005A	
180-81267-2	CCR-AP-6	Total Recoverable	Water	3005A	
180-81267-3	CCR-AP-7R	Total Recoverable	Water	3005A	
180-81267-4	CCR-LF-1	Total Recoverable	Water	3005A	
180-81267-5	CCR-SP-1	Total Recoverable	Water	3005A	
180-81267-6	CCR-SP-2	Total Recoverable	Water	3005A	
180-81267-7	CCR-SP-3	Total Recoverable	Water	3005A	
180-81267-8	BLIND DUPLICATE 3	Total Recoverable	Water	3005A	
180-81267-9	FIELD BLANK 2	Total Recoverable	Water	3005A	
180-81267-10	FIELD BLANK 3	Total Recoverable	Water	3005A	
MB 180-255379/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-255379/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-81267-7 MS	CCR-SP-3	Total Recoverable	Water	3005A	

TestAmerica Pittsburgh



# QC Association Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Metals (Continued)

### Prep Batch: 255379 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-7 MSD	CCR-SP-3	Total Recoverable	Water	3005A	

### Analysis Batch: 255527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total/NA	Water	EPA 7470A	255321
180-81267-2	CCR-AP-6	Total/NA	Water	EPA 7470A	255321
180-81267-3	CCR-AP-7R	Total/NA	Water	EPA 7470A	255321
180-81267-4	CCR-LF-1	Total/NA	Water	EPA 7470A	255321
180-81267-8	BLIND DUPLICATE 3	Total/NA	Water	EPA 7470A	255321
180-81267-9	FIELD BLANK 2	Total/NA	Water	EPA 7470A	255321
180-81267-10	FIELD BLANK 3	Total/NA	Water	EPA 7470A	255321
MB 180-255321/1-A	Method Blank	Total/NA	Water	EPA 7470A	255321
LCS 180-255321/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	255321

### Analysis Batch: 256170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	255379
180-81267-2	CCR-AP-6	Total Recoverable	Water	EPA 6020A	255379
180-81267-3	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	255379
180-81267-4	CCR-LF-1	Total Recoverable	Water	EPA 6020A	255379
180-81267-5	CCR-SP-1	Total Recoverable	Water	EPA 6020A	255379
180-81267-6	CCR-SP-2	Total Recoverable	Water	EPA 6020A	255379
180-81267-7	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379
180-81267-8	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	255379
180-81267-9	FIELD BLANK 2	Total Recoverable	Water	EPA 6020A	255379
180-81267-10	FIELD BLANK 3	Total Recoverable	Water	EPA 6020A	255379
MB 180-255379/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	255379
LCS 180-255379/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	255379
180-81267-7 MS	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379
180-81267-7 MSD	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379

### Analysis Batch: 256259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	255379
180-81267-2	CCR-AP-6	Total Recoverable	Water	EPA 6020A	255379
180-81267-3	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	255379
180-81267-4	CCR-LF-1	Total Recoverable	Water	EPA 6020A	255379
180-81267-5	CCR-SP-1	Total Recoverable	Water	EPA 6020A	255379
180-81267-6	CCR-SP-2	Total Recoverable	Water	EPA 6020A	255379
180-81267-7	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379
180-81267-8	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	255379
180-81267-9	FIELD BLANK 2	Total Recoverable	Water	EPA 6020A	255379
180-81267-10	FIELD BLANK 3	Total Recoverable	Water	EPA 6020A	255379
MB 180-255379/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	255379
LCS 180-255379/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	255379
180-81267-7 MS	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379
180-81267-7 MSD	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379

### Analysis Batch: 256289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	255379

TestAmerica Pittsburgh

# QC Association Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Metals (Continued)

### Analysis Batch: 256289 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-2	CCR-AP-6	Total Recoverable	Water	EPA 6020A	255379
180-81267-3	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	255379
180-81267-4	CCR-LF-1	Total Recoverable	Water	EPA 6020A	255379
180-81267-5	CCR-SP-1	Total Recoverable	Water	EPA 6020A	255379
180-81267-6	CCR-SP-2	Total Recoverable	Water	EPA 6020A	255379
180-81267-7	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379
180-81267-8	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	255379
180-81267-7 MS	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379
180-81267-7 MSD	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379

### Analysis Batch: 256608

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	255379
180-81267-2	CCR-AP-6	Total Recoverable	Water	EPA 6020A	255379
180-81267-3	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	255379
180-81267-4	CCR-LF-1	Total Recoverable	Water	EPA 6020A	255379
180-81267-5	CCR-SP-1	Total Recoverable	Water	EPA 6020A	255379
180-81267-6	CCR-SP-2	Total Recoverable	Water	EPA 6020A	255379
180-81267-7	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379
180-81267-8	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	255379
180-81267-9	FIELD BLANK 2	Total Recoverable	Water	EPA 6020A	255379
180-81267-10	FIELD BLANK 3	Total Recoverable	Water	EPA 6020A	255379
MB 180-255379/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	255379
LCS 180-255379/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	255379
180-81267-7 MS	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379
180-81267-7 MSD	CCR-SP-3	Total Recoverable	Water	EPA 6020A	255379

## General Chemistry

### Analysis Batch: 255279

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total/NA	Water	SM 2540C	
180-81267-2	CCR-AP-6	Total/NA	Water	SM 2540C	
180-81267-3	CCR-AP-7R	Total/NA	Water	SM 2540C	
180-81267-4	CCR-LF-1	Total/NA	Water	SM 2540C	
180-81267-9	FIELD BLANK 2	Total/NA	Water	SM 2540C	
MB 180-255279/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-255279/1	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 255330

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total/NA	Water	EPA 9040C	
180-81267-2	CCR-AP-6	Total/NA	Water	EPA 9040C	
180-81267-3	CCR-AP-7R	Total/NA	Water	EPA 9040C	
180-81267-4	CCR-LF-1	Total/NA	Water	EPA 9040C	
180-81267-5	CCR-SP-1	Total/NA	Water	EPA 9040C	
180-81267-6	CCR-SP-2	Total/NA	Water	EPA 9040C	
180-81267-7	CCR-SP-3	Total/NA	Water	EPA 9040C	
180-81267-8	BLIND DUPLICATE 3	Total/NA	Water	EPA 9040C	
180-81267-9	FIELD BLANK 2	Total/NA	Water	EPA 9040C	

TestAmerica Pittsburgh

# QC Association Summary

Client: Vectren Corporation  
 Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## General Chemistry (Continued)

### Analysis Batch: 255330 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-10	FIELD BLANK 3	Total/NA	Water	EPA 9040C	
LCS 180-255330/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-81267-4 DU	CCR-LF-1	Total/NA	Water	EPA 9040C	

### Analysis Batch: 255525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-5	CCR-SP-1	Total/NA	Water	SM 2540C	
180-81267-6	CCR-SP-2	Total/NA	Water	SM 2540C	
180-81267-7	CCR-SP-3	Total/NA	Water	SM 2540C	
MB 180-255525/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-255525/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-81267-5 DU	CCR-SP-1	Total/NA	Water	SM 2540C	

### Analysis Batch: 255529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-8	BLIND DUPLICATE 3	Total/NA	Water	SM 2540C	
180-81267-10	FIELD BLANK 3	Total/NA	Water	SM 2540C	
MB 180-255529/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-255529/1	Lab Control Sample	Total/NA	Water	SM 2540C	

## Rad

### Prep Batch: 386243

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total/NA	Water	PrecSep-21	
180-81267-2	CCR-AP-6	Total/NA	Water	PrecSep-21	
180-81267-3	CCR-AP-7R	Total/NA	Water	PrecSep-21	
180-81267-4	CCR-LF-1	Total/NA	Water	PrecSep-21	
180-81267-5	CCR-SP-1	Total/NA	Water	PrecSep-21	
180-81267-6	CCR-SP-2	Total/NA	Water	PrecSep-21	
180-81267-7	CCR-SP-3	Total/NA	Water	PrecSep-21	
180-81267-8	BLIND DUPLICATE 3	Total/NA	Water	PrecSep-21	
180-81267-9	FIELD BLANK 2	Total/NA	Water	PrecSep-21	
180-81267-10	FIELD BLANK 3	Total/NA	Water	PrecSep-21	
MB 160-386243/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-386243/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-386243/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 386250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-81267-1	CCR-AP-1R	Total/NA	Water	PrecSep_0	
180-81267-2	CCR-AP-6	Total/NA	Water	PrecSep_0	
180-81267-3	CCR-AP-7R	Total/NA	Water	PrecSep_0	
180-81267-4	CCR-LF-1	Total/NA	Water	PrecSep_0	
180-81267-5	CCR-SP-1	Total/NA	Water	PrecSep_0	
180-81267-6	CCR-SP-2	Total/NA	Water	PrecSep_0	
180-81267-7	CCR-SP-3	Total/NA	Water	PrecSep_0	
180-81267-8	BLIND DUPLICATE 3	Total/NA	Water	PrecSep_0	
180-81267-9	FIELD BLANK 2	Total/NA	Water	PrecSep_0	
180-81267-10	FIELD BLANK 3	Total/NA	Water	PrecSep_0	

TestAmerica Pittsburgh

# QC Association Summary

Client: Vectren Corporation  
Project/Site: CCR Groundwater Monitoring AB Brown

TestAmerica Job ID: 180-81267-1

## Rad (Continued)

### Prep Batch: 386250 (Continued)


Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 160-386250/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-386250/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-386250/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13



**Chain of Custody Record**

Client Information		Lab PM:		Carrier Tracking No(s):		COC No:							
Sampler: <i>Jacob Winsett</i> Phone: <i>(812) 228-9422</i>		Bortol, Veronica E-Mail: <i>veronica.bortol@testamericainc.com</i>		180-46372-8017, 1		Page: Page 1 of 3							
Client Contact: Angela Casbon-Scheiler Company: Vectren Corporation		Address: PO BOX 209 City: Evansville State, Zip: IN, 47702 Phone: 864-214-8750(Tel) Email: <i>acscheiler@vectren.com</i>		Analysis Requested		Job #							
Project Name: CCR Groundwater Monitoring - AB Brown Site: AB Brown Generating Station		Due Date Requested: TAT Requested (days): PO #: Purchase Order Requested WO #: Project #: 18015014 SSOW#:		Field Filtered Sample (Yes or No)		Preservation Codes: 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 Other:							
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Preservation Code	Matrix (W=water, S=solid, O=water/soil, BT=TISSUE, AA=AB)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315 Ra226, 9320 Ra228	9040C, 9056A, ORGFM, 280	6020A, 7470A	2540C, Caled - TDS	Total Number of Containers	Special Instructions/Note:
CCR-AP-1R	8/22/18	1355	G	G	Water	X	X	X	X	X	X	5	-Do NOT run Antimony, Beryllium and Thallium for ALL samples.
CCR-AP-2R	X	X	X	X	Water	X	X	X	X	X	X		
CCR-AP-3R	X	X	X	X	Water	X	X	X	X	X	X		
CCR-AP-4R	X	X	X	X	Water	X	X	X	X	X	X		
CCR-AP-5	X	X	X	X	Water	X	X	X	X	X	X		
CCR-AP-6	8/22/18	1455	G	G	Water	X	X	X	X	X	X	5	Do NOT run Cadmium, Mercury and Selenium for the following wells: CCR-SP-1, CCR-SP-2, CCR-SP-3
CCR-AP-7R	8/22/18	1200	G	G	Water	X	X	X	X	X	X		
CCR-LF-1	8/22/18	1730	G	G	Water	X	X	X	X	X	X	5	Analyze for App III & App IV
CCR-LF-2	X	X	X	X	Water	X	X	X	X	X	X		
CCR-LF-3	X	X	X	X	Water	X	X	X	X	X	X		
CCR-LF-4	X	X	X	X	Water	X	X	X	X	X	X		



180-81267 Chain of Custody

Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input checked="" type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III(IV), Other (specify)	
Empty Kit Relinquished by:	Date:	Method of Shipment:	Time:
Relinquished by: <i>Jacob Winsett</i>	Date/Time: <i>8/24/18 1700</i>	Company: <i>ATC</i>	Received by: <i>FedEx</i>
Relinquished by:	Date/Time:	Company:	Received by: <i>Debra Winters</i>
Relinquished by:	Date/Time:	Company:	Received by:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:	





**Chain of Custody Record**

<b>Client Information</b>		Sampler: <u>Jacob Wissett</u>	Lab PM: <u>Bortot, Veronica</u>	Carrier Tracking No(s):	
Client Contact: <u>Lisa Messinger</u>		Phone: <u>(812) 228-9422</u>	E-Mail: <u>veronica.bortot@testamericainc.com</u>	COC No: <u>180-46372-8017.2</u>	
Company: <u>Vectren Corporation</u>		Address: <u>PO BOX 209</u>	City: <u>Evansville</u>	Page: <u>Page 2 of 3</u>	
State: <u>IN</u>		City: <u>IN</u>	Zip: <u>47702</u>	Job #:	
Phone: <u>854-214-8750(Tel)</u>		PO #: <u></u>	Purchase Order Requested: <u></u>	<b>Analysis Requested</b> Total Number of containers: _____ Perform MS/MSD (Yes or No) _____ Field Filtered Sample (Yes or No) _____ 9315_Ra226, 9320_Ra228 _____ 9040C, 9056A, ORGFM_28D _____ 6020A, 7470A _____ 2540C_Calcd - TDS _____	
Email: <u>lmessinger@vectren.com</u>		Project #: <u>18016014</u>	SSOW#: <u></u>		
Project Name: <u>CCR Groundwater Monitoring - AB Brown</u>		Sample Date	Sample Time		
Site: <u>AB Brown Generating Station</u>		Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=water/OIL, BT=TOXIC, AA=AP)		
<b>Sample Identification</b>		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=water/OIL, BT=TOXIC, AA=AP)
CCR-LF-5	X	X	X	X	Water
CCR-LF-6	X	X	X	X	Water
GGR-BK-4R	X	X	X	X	Water
CCR-BK-2	X	X	X	X	Water
CCR-SP-1	X	8/23/18	1025	G	Water
CCR-SP-2	X	8/23/18	1135	G	Water
CCR-SP-3	X	8/23/18	1300	G	Water
Blind Duplicate 1	X	X	X	X	Water
Blind Duplicate 2	X	X	X	X	Water
Blind Duplicate 3	X	X	X	X	Water
Field Blank 1	X	X	X	X	Water
<b>Possible Hazard Identification</b>		<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input checked="" type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological			
Deliverable Requested: I, II, III, <input checked="" type="checkbox"/> Other (specify)		Special Instructions/QC Requirements:			
Empty Kit Relinquished by:		Method of Shipment:			
Relinquished by: <u>Jacob Wissett</u>		Date/Time: _____			
Relinquished by:		Date/Time: _____			
Relinquished by:		Date/Time: _____			
Custody Seals Intact: <u>Δ Yes Δ No</u>		Cooler Temperature(s) °C and Other Remarks:			
Custody Seal No.:		Company: <u>ATC</u>			
Relinquished by: <u>Jacob Wissett</u>		Date/Time: <u>8/24/18 1700</u>			
Relinquished by:		Date/Time: _____			
Relinquished by:		Date/Time: _____			
Custody Seals Intact: <u>Δ Yes Δ No</u>		Cooler Temperature(s) °C and Other Remarks:			
Custody Seal No.:		Company: <u>ATC</u>			
Relinquished by: <u>Jacob Wissett</u>		Date/Time: <u>8-25-18 9:25</u>			
Relinquished by:		Date/Time: _____			
Relinquished by:		Date/Time: _____			
Custody Seals Intact: <u>Δ Yes Δ No</u>		Cooler Temperature(s) °C and Other Remarks:			
Custody Seal No.:		Company: <u>JALISH</u>			





**Chain of Custody Record**

<b>Client Information</b>		Sampler: <i>Jacob Winsett</i>		Lab PM: Bortot, Veronica		Carrier Tracking No(s):		COC No: 180-46372-8017.3																																																			
Client Contact: Angela Casbon-Scheller		Phone: (617) 228-9422		E-Mail: veronica.bortot@testamericainc.com				Page: Page 3 of 3																																																			
Company: Vectren Corporation		Address: PO BOX 209		City: Evansville		State, Zip: IN, 47702		Job #:																																																			
Phone: 864-214-8750(Tel)		PO #: Purchase Order Requested		WO #:				Preservation Codes: 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 - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH4.5 Z - other (specify)																																																			
Email: acscheller@vectren.com		Project #: 18016014		SSOW#:				Other:																																																			
Site: CCR Groundwater Monitoring - AB Brown								Special Instructions/Note: -Do NOT run Antimony, Beryllium and Thallium for ALL samples.  Do NOT run Cadmium, Mercury and Selenium for the following wells: CCR-SP-1, CCR-SP-2, CCR-SP-3  Analyze for App III & App IV																																																			
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)	D	N	D	N	Total Number of Containers																																																
Field Blank 2	8/22/18	1700	G	Water	X	X	X	X	X	X	5																																																
Field Blank 3	8/23/18	1700	G	Water	X	X	X	X	X	X	5																																																
MSMSD	X	X	X	Water	X	X	X	X	X	X																																																	
<p><b>Possible Hazard Identification</b>  <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input checked="" type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological                  Deliverable Requested: I, II, III, IV, Other (specify)</p> <p>Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____</p> <p>Relinquished by: <i>Jacob Winsett</i> Company: <i>ATC</i>                  Relinquished by: _____ Date/Time: <i>8/24/18 1700</i> Company: _____                  Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Custody Seal Intact: _____ Custody Seal No.: _____                  Δ Yes Δ No</p>																																																											
<p><b>Analysis Requested</b></p> <table border="1"> <tr> <td>2540C_Calcd - TDS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>620A, 7470A</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9040C, 9056A_ORGFM, 28D</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9315_Ra226, 9320_Ra228</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>												2540C_Calcd - TDS												620A, 7470A												9040C, 9056A_ORGFM, 28D												9315_Ra226, 9320_Ra228											
2540C_Calcd - TDS																																																											
620A, 7470A																																																											
9040C, 9056A_ORGFM, 28D																																																											
9315_Ra226, 9320_Ra228																																																											
<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p> <p>Special Instructions/QC Requirements:</p> <p>Received by: <i>Sadee</i> Date/Time: _____ Company: _____                  Received by: <i>Debra V. Jones</i> Date/Time: <i>8-25-18</i> Company: <i>ATC</i>                  Received by: _____ Date/Time: _____ Company: _____                  Cooler Temperature(s) °C and Other Remarks: <i>9:25</i></p>																																																											



ORIGIN ID:EVVA (812) 477-1176  
BRIAN KLEEMAN  
1149 WEDKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

SHIP DATE: 24AUG18  
ACTWGT: 50.00 LB  
CAD: 106697842/INET4040  
DIMS: 24x12x14 IN  
BILL SENDER

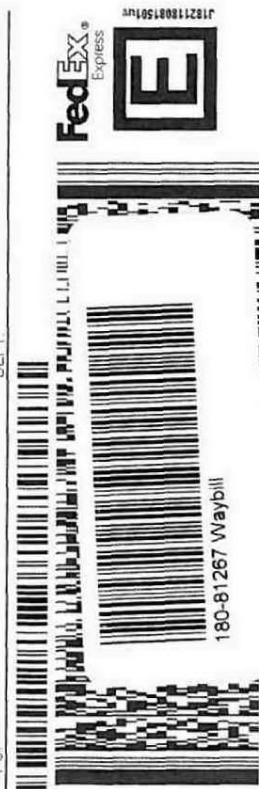
TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

PITTSBURGH PA 15238

(412) 963-7058 REF: 170LF00368 AB BROWN CCR GWS

552J1G309/DC45

INV. PO. DEPT.



2 of 2  
SATURDAY 12:00P  
PRIORITY OVERNIGHT

MPS# 7730 6204 8306

0263 Mstr# 7730 6204 8030 0201

XO AGCA 15238 PA-US PIT



Uncorrected temp 2.6 °C  
Thermometer ID 9

CF 0 Initials JS

PT-WI-SR-001 effective 7/26/13



FedEx® Saturday Delivery

14 MWI

151966 10/04 MWI

8/24/2018  
10/11/2018

After printing this label:  
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.  
2. Fold the printed page along the horizontal line.  
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.  
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.





ORIGIN ID:EVVA (812) 477-1176  
BRIAN KLEEMAN

1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

SHIP DATE: 24AUG18  
ACTWGT: 50.00 LB  
CAD: 106997842/INET4040  
DIMS: 24x12x14 IN

BILL SENDER

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

PITTSBURGH PA 15238

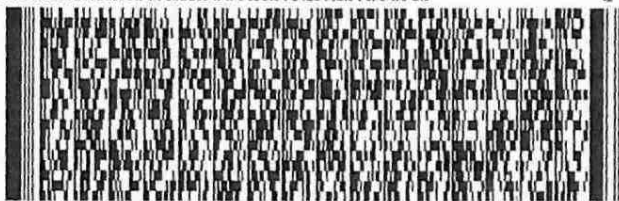
(412) 963-7058  
INV.  
PO

REF: 170LF00368 AB BROWN CCR GWS

DEPT.

552J18369JCA5

FedEx Ship Manager - Print Your Label(s)



FedEx Express



SATURDAY 12:00P

PRIORITY OVERNIGHT

1 of 2

TRK# 7730 6204 8030

0201

## MASTER ##

X0 AGCA

15238

PIT

Uncorrected temp  
Thermometer ID

3.5 °C

9

CF

0

Initials

IB

PT-WI-SR-001 effective 7/26/13

SDR

FedEx Express

S

ay Delivery

151966 10/04 MWI

FedEx Saturday Deliv

**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:							
Client Contact:		Bortol, Veronica	Bortol, Veronica		180-340005.1							
Shipping/Receiving		Phone:	E-Mail:	State of Origin:	Page:							
Company:		TestAmerica Laboratories, Inc.	veronica.bortol@testamericainc.com	Indiana	Page 1 of 2							
Address:		13715 Rider Trail North,	Accreditations Required (See note):									
City:	Earth City	Due Date Requested:	180-81267-1									
State, Zip:	MO, 63045	TAT Requested (days):	9/7/2018									
Phone:	314-298-8566(Tel) 314-298-8757(Fax)	PO #:										
Email:		WO #:										
Project Name:	CCR Groundwater Monitoring AB Brown	Project #:	18016014									
Site:		SSOW#:										
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, On-site, BT-Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PreSep_21 Standard Target List	9320_Ra228/PreSep_0 Standard Target List	Ra226Ra228_GPPC	Total Number of containers	Special Instructions/Note:
CCR-AP-1R (180-81267-1)		8/22/18	13:55 Eastern	Water	Water	X	X	X	X		2	
CCR-AP-6 (180-81267-2)		8/22/18	14:55 Eastern	Water	Water	X	X	X	X		2	
CCR-AP-7R (180-81267-3)		8/22/18	12:00 Eastern	Water	Water	X	X	X	X		2	
CCR-LF-1 (180-81267-4)		8/22/18	17:30 Eastern	Water	Water	X	X	X	X		2	
CCR-SP-1 (180-81267-5)		8/23/18	10:25 Eastern	Water	Water	X	X	X	X		2	
CCR-SP-2 (180-81267-6)		8/23/18	11:35 Eastern	Water	Water	X	X	X	X		2	
CCR-SP-3 (180-81267-7)		8/23/18	13:00 Eastern	Water	Water	X	X	X	X		2	
BLIND DUPLICATE 3 (180-81267-8)		8/23/18	Eastern	Water	Water	X	X	X	X		2	
FIELD BLANK 2 (180-81267-9)		8/22/18	17:00 Eastern	Water	Water	X	X	X	X		2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

**Possible Hazard Identification**

Unconfirmed  
Deliverable Requested: I, II, III, IV, Other (specify) \_\_\_\_\_ Primary Deliverable Rank: 2  
Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
Relinquished by: \_\_\_\_\_ Date/Time: 8/26/18 1700  
Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Custody Seals Intact: \_\_\_\_\_ Custody Seal No.: \_\_\_\_\_  
Δ Yes Δ No

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months  
Special Instructions/QC Requirements: \_\_\_\_\_

Method of Shipment: \_\_\_\_\_  
Received by: \_\_\_\_\_ Date/Time: 8-25-18 0930  
Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Cooler Temperature(s) °C and Other Remarks: \_\_\_\_\_

# Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-81267-1

**Login Number: 81267**

**List Number: 1**

**Creator: Watson, Debbie**

**List Source: TestAmerica Pittsburgh**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-81267-1

**Login Number: 81267**  
**List Number: 2**  
**Creator: Hellm, Michael**

**List Source: TestAmerica St. Louis**  
**List Creation: 08/29/18 01:51 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	21.6
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?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





**ATTACHMENT 4**  
**Statistical Analyses**



HALEY & ALDRICH, INC.  
6500 Rockside Road  
Suite 200  
Cleveland, OH 44131  
216.739.0555

## MEMORANDUM

15 January 2018  
File No. 129420-000

TO: Southern Indiana Gas and Electric Company

FROM: Haley & Aldrich, Inc.

SUBJECT: Summary Appendix III Groundwater Monitoring Results Pursuant to 40 CFR § 257.93 and 40 CFR § 257.94, A.B. Brown Generating Station

The Southern Indiana Gas and Electric Company (SIGECO) is implementing the 17 April 2015 U.S. Environmental Protection Agency (U.S. EPA) Federal Coal Combustion Residuals (CCR) Rule (40 CFR § 257 and 261) for the A.B. Brown Generating Station, located in Posey County, Indiana. SIGECO provided Haley & Aldrich with groundwater monitoring data collected from a groundwater monitoring system that meets the requirements of 40 CFR §257.91. This memorandum documents the results of statistical tests conducted to determine if Appendix III groundwater monitoring constituents detected in downgradient wells are at levels that exhibit a statistically significant increase above background or upgradient wells consistent with the requirements in 40 CFR § 257.94.

Collection dates of groundwater samples from the CCR Unit span from June 2016 through November 2017. The data satisfy the CCR Rule requirement of collecting a minimum of 8 rounds of hydrological and groundwater quality data from upgradient wells. The Upper Tolerance Limit (UTL) statistical analysis was used as specified in the certification statement of October 17, 2017. The UTL is an accepted method under the CCR Rule, and is the upper endpoint of a tolerance interval that is designed to contain a pre-specified proportion (e.g. 95 percent) of the background dataset.

Data from the most recent sample event from the down-gradient monitoring wells for each of the three units were compared to the UTL calculated from the background data. Based on these comparisons, the following results are indicated:

**Ash Pond:** boron, calcium, chloride, fluoride, sulfate, and total dissolved solids from one or more downgradient sample(s) indicated a statistically significant increase above background;

**Landfill:** boron, calcium, chloride, fluoride, sulfate, and total dissolved solids from one or more downgradient sample(s) indicated a statistically significant increase above background; and

**Sedimentation Pond:** boron, calcium, chloride, fluoride, sulfate, and total dissolved solids from one or more downgradient sample(s) indicated a statistically significant increase above background.

**Table 1: Statistical Determination of Background Water Quality  
Vectren A.B. Brown**

Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (pH units)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
<b>Background</b>							
<b>CCR-BK-1/1R</b>							
8/11/2016	ND	36	2.1	0.35	7.4	24	220
10/27/2016	ND	41	2.4	0.35	7.5	26	210
11/7/2016	ND	38	1.5	0.32	7	21	220
12/6/2016	ND	36	2.3	0.35	6.9	26	200
2/7/2017	ND	34	2.3	0.3	7.2	27	230
4/7/2017	0.019	35	2.7	0.38	7.2	28	250
6/6/2017	0.026	34	2.1	0.3	7.1	25	270
9/28/2017	0.015	35	2.2	0.35	7.1	25	210
11/16/2017	0.041	39	2.6	0.3	7.8	26	210
<b>CCR-BK-2</b>							
6/8/2016	0.018	53	12	0.2	7.09	61	360
8/10/2016	ND	39	17	0.14	7.1	30	260
10/27/2016	ND	46	17	0.16	6.8	28	350
12/6/2016	ND	36	19	0.2	6.7	26	260
2/10/2017	ND	34	12	0.14	8.5	25	230
4/5/2017	ND	45	19	0.16	7.2	29	240
6/6/2017	0.021	37	14	0.13	7	27	270
9/27/2017	0.018	37	19	0.13	6.8	24	320
11/16/2017	0.02	35	19	0.13	7.3	23	250
Data Distribution	Non-Parametric	Non-Parametric	Non-Parametric	Non-Parametric	Non-Parametric	Non-Parametric	Parametric
95% Upper Tolerance Limit	0.08	53	19	0.38	8.5	61	338
Minimum Detection	0.015	34	1.5	0.13	6.7	21	200
Maximum Detection	0.041	53	19	0.38	8.5	61	360
Maximum Reporting Limit	0.08	NA	NA	NA	NA	NA	NA
Mean Detection	0.022	38	9.3	0.24	7.2	28	253
Frequency of Detection	44%	100%	100%	100%	100%	100%	100%

**ABBREVIATIONS AND NOTES:**

CCR: Coal Combustion Residuals  
mg/L: milligram per liter  
NA: Not Applicable  
ND: Not Detected

**Table 2: Comparison of Downgradient Wells to Background Water Quality  
Vectren A.B. Brown**

	Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (pH units)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
<b>Ash Pond</b>								
CCR-AP-1/1R	11/14/2017	7.6	270	430	0.2	7.8	2100	4200
CCR-AP-2/2R	11/15/2017	12	350	760	0.27	7.5	3900	6000
CCR-AP-3/3R	11/15/2017	13	420	980	0.72	7.5	5300	8000
CCR-AP-4/4R	11/14/2017	0.15	110	22	0.41	7.7	140	650
CCR-AP-5	11/15/2017	11	310	360	0.32	8	3100	4800
CCR-AP-6	11/16/2017	0.59	240	100	0.21	7.4	880	1700
CCR-AP-7/7R	11/14/2017	2.8	320	280	0.094	7.2	2400	3900
<b>Landfill</b>								
CCR-LF-1	11/16/2017	0.12	260	16	0.27	7.5	1100	1800
CCR-LF-2	11/14/2017	5	380	350	ND	7.2	15000	21000
CCR-LF-3	11/14/2017	0.039	200	70	0.18	7.7	1100	1900
CCR-LF-4	11/16/2017	0.22	440	130	ND	7.5	8600	11000
CCR-LF-5	11/14/2017	0.86	430	270	0.12	7.5	2700	4300
CCR-LF-6	11/14/2017	0.59	210	50	0.42	7.6	720	1400
<b>Sedimentation Pond</b>								
CCR-SP-1	11/15/2017	0.033	150	74	0.28	7.4	220	820
CCR-SP-2	11/15/2017	0.24	180	73	0.31	7.4	460	1100
CCR-SP-3	11/15/2017	0.019	86	4.1	0.41	7.6	0.63	370

**ABBREVIATIONS AND NOTES:**

CCR: Coal Combustion Residuals

mg/L: milligram per liter

ND: Not Detected

Shaded cells indicate and exceedance of the 95% Upper Tolerance Limit.