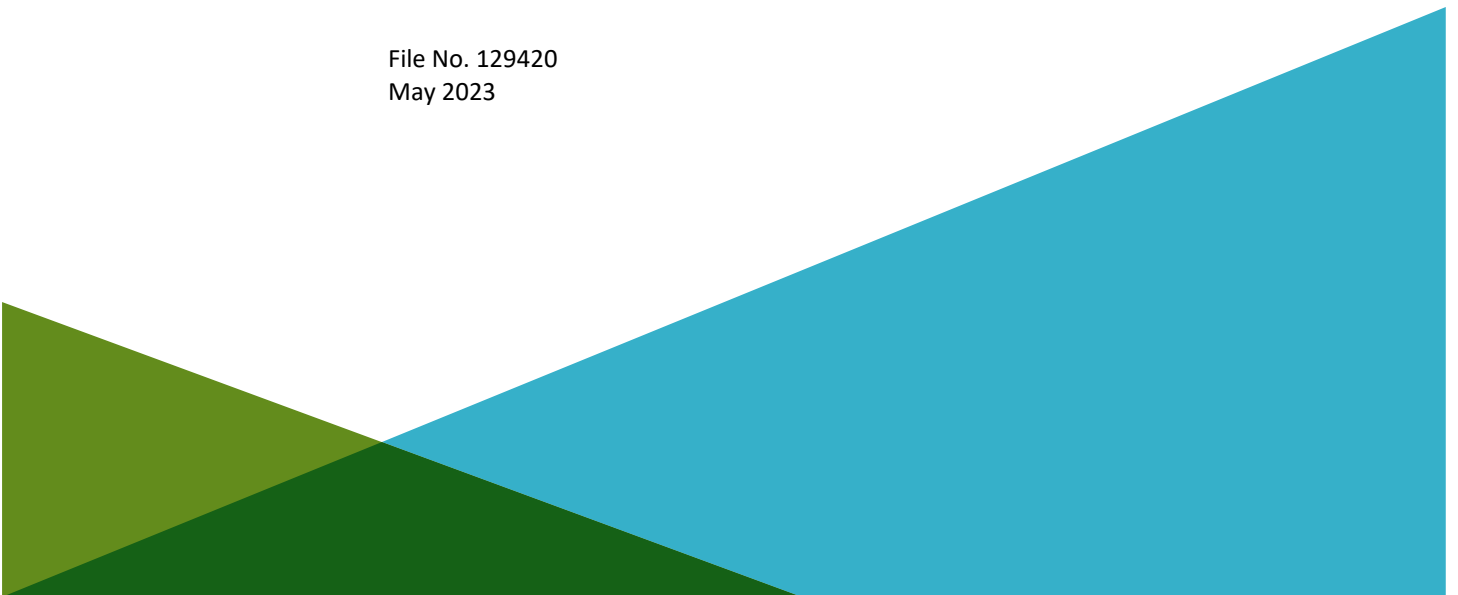


2019 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT ADDENDUM  
ASH POND  
A.B. BROWN GENERATING STATION  
POSEY COUNTY, INDIANA

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

23 May 2023  
File No. 129420

**SUBJECT:** 2019 Annual Groundwater Monitoring and Corrective Action Report Addendum  
Southern Indiana Gas and Electric Company  
Ash Pond  
A.B. Brown Generating Station; Posey County, Indiana

The Ash 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 2019 for the Ash Pond was completed and placed in the facilities operating record on 31 January 2020, 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 2019
- Water table configuration map – October 2019

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 June and August 2018 *Groundwater Assessment Monitoring*
- Statistical evaluation of the May 2019 *Semi-annual 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 14, 2019

ATC Project No. 170LF00738

<b>WELL ID</b>	<b>DTW FROM TOC</b>
CCR-AP-1R	14.64
CCR-AP-2R	36.10
CCR-AP-2I	25.95
CCR-AP-3R	33.77
CCR-AP-3I	22.61
CCR-AP-4R	30.84
CCR-AP-5	34.93
CCR-AP-6	13.25
CCR-AP-7R	32.41
CCR-AP-8	4.02
CCR-AP-9	10.81
CCR-AP-10	35.05
CCR-LF-1	6.99
CCR-LF-2	24.97
CCR-LF-3	27.37
CCR-LF-4	45.28
CCR-LF-5	18.72
CCR-LF-6	7.88
CCR-SP-1	10.23
CCR-SP-2	12.99
CCR-SP-3	5.89
CCR-BK-1R	dry to top of pump
CCR-BK-2	12.98

DTW= Depth to Water

TOC= Top of Casing

**VECTREN - AB BROWN STATION**  
 CCR Groundwater Sampling Event  
 Gauging Dates: October 14 and October 17, 2019\*  
 ATC Project No. 170LF00739

WELL ID	DATE	TIME	DTW FROM TOC
<b>Ash Pond Wells</b>			
CCR-AP-1R	10/14/2019	12:45	18.42
CCR-AP-2R	10/14/2019	17:10	42.11
CCR-AP-2I	10/14/2019	17:05	39.30
CCR-AP-3R	10/14/2019	16:25	39.30
CCR-AP-3I	10/14/2019	16:30	23.33
CCR-AP-4R	10/14/2019	16:00	35.62
CCR-AP-5	10/14/2019	16:35	37.80
CCR-AP-6	10/14/2019	14:10	16.87
CCR-AP-7R	10/14/2019	14:20	35.15
CCR-AP-8	10/14/2019	14:30	5.86
CCR-AP-9	10/14/2019	13:45	8.82
CCR-AP-10	10/14/2019	16:10	38.68
<b>Landfill Wells</b>			
CCR-LF-1	10/14/2019	10:25	9.97
CCR-LF-2	10/14/2019	10:30	26.87
CCR-LF-3	10/14/2019	10:35	29.00
CCR-LF-4	10/14/2019	14:00	47.30
CCR-LF-5	10/14/2019	10:00	22.09
CCR-LF-6	10/14/2019	11:35	8.03
<b>Sedimentation Pond Wells</b>			
CCR-SP-1	10/14/2019	10:55	14.66
CCR-SP-2	10/17/2019	9:05	16.00
CCR-SP-3	10/14/2019	11:00	14.98
<b>Background Wells</b>			
CCR-BK-1R	10/14/2019	13:16	60.50
CCR-BK-2	10/14/2019	12:23	23.40

DTW= Depth to Water

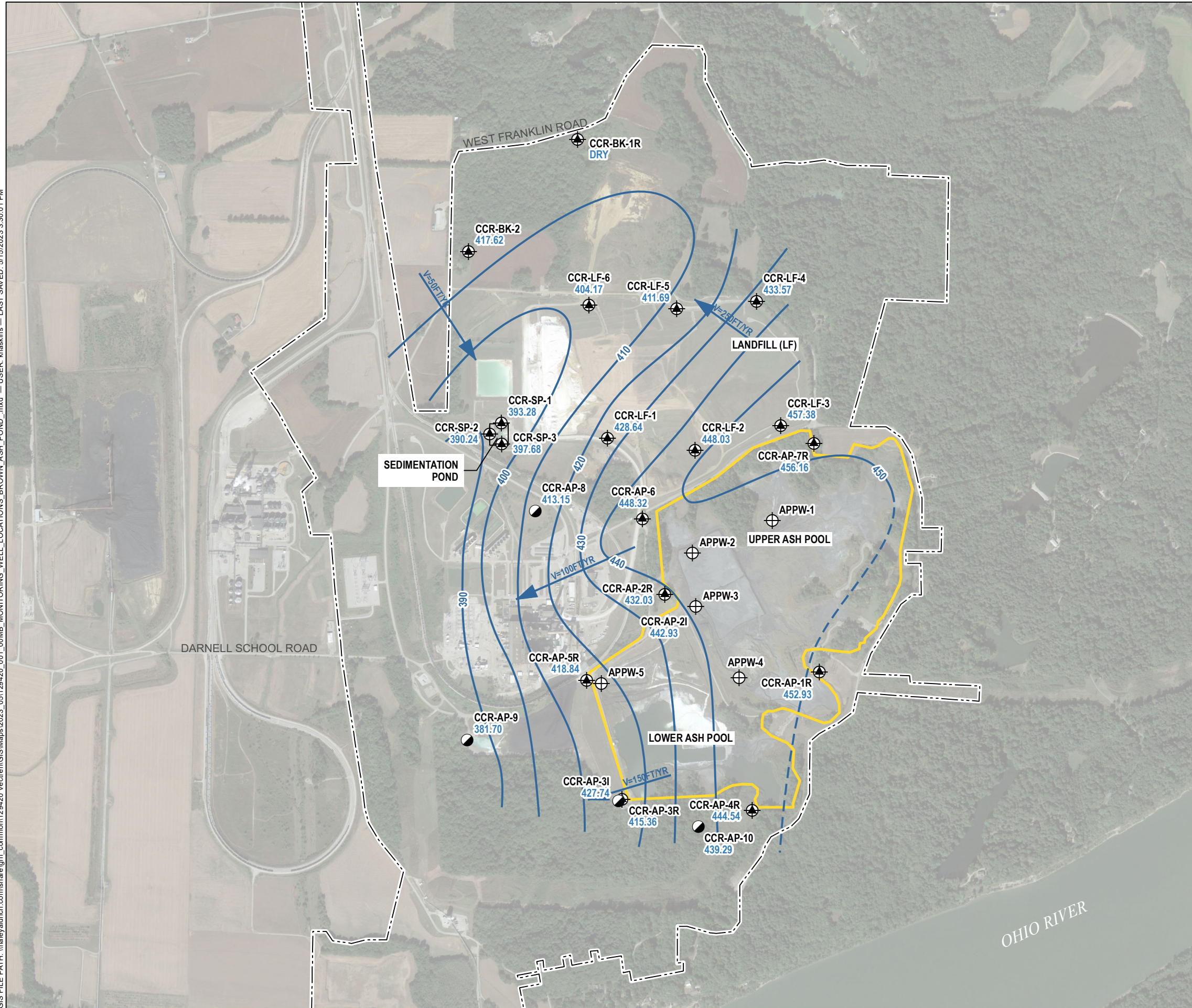
TOC= Top of Casing

\*CCR-SP-2 was not located until October 17, 2019; it had been covered by washout from adjacent road.

**ATTACHMENT 2**

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

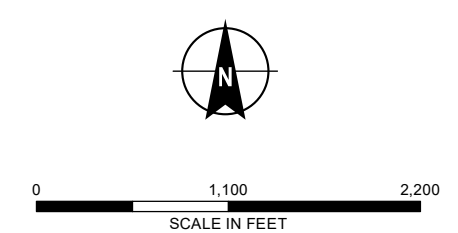
GIS FILE PATH: \\haleyaldrich.com\share\grn\_common\129420\_Vectrent\GIS\Maps\2023\_05\129420\_001\_001\ME\_MONITORING\_WELL\_LOCATIONS\_BROWN\_ASH\_POND.mxd — USER: khaskins — LAST SAVED: 5/15/2023 3:30:01 PM



**LEGEND**

- GROUNDWATER ELEVATION CONTOUR, 10-FT INTERVAL, DASHED WHERE INFERRED
- ← GROUNDWATER FLOW DIRECTION
- APPROXIMATE UNIT BOUNDARY
- SEDIMENTATION POND
- 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 14 JUNE 2019.
  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, 2019

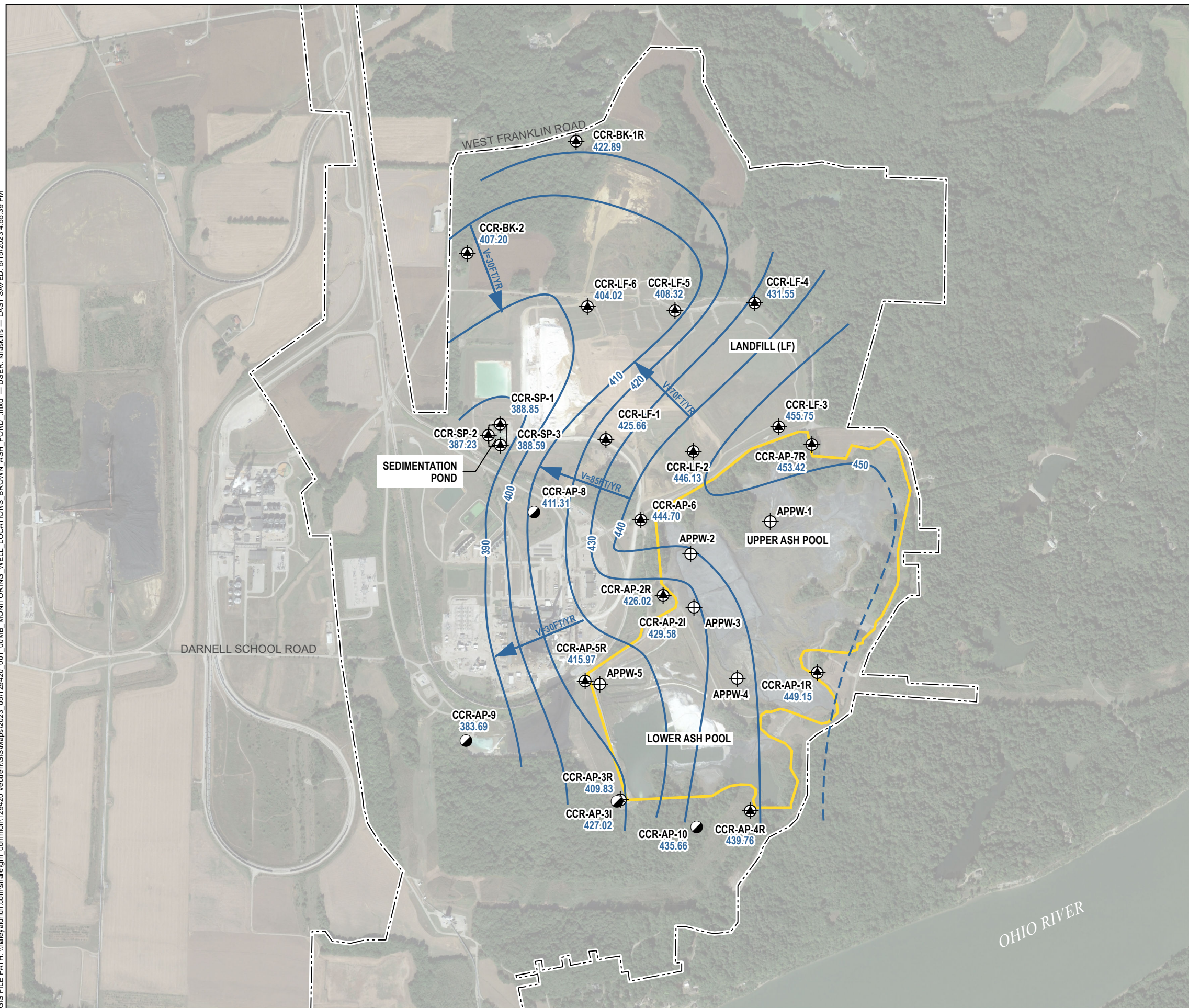


**HALEY ALDRICH** SOUTHERN INDIANA GAS AND ELECTRIC COMPANY  
A.B. BROWN GENERATING STATION  
MOUNT VERNON, INDIANA

**SHALLOW GROUNDWATER ELEVATION CONTOURS - JUNE 2019**



GIS FILE PATH: \\haleyaldrich.com\share\grn\_common\129420\_Vectrent\GIS\Maps\2023\_08\129420\_001\_001\ME\_MONITORING\_WELL\_LOCATIONS\_BROWN\_ASH\_POND.mxd — USER: khaskins — LAST SAVED: 5/15/2023 4:56:39 PM

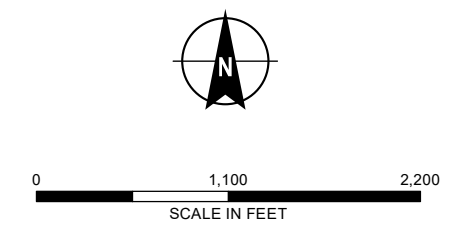


**LEGEND**

- CCR MONITORING WELL
- NATURE AND EXTENT MONITORING WELL
- CCR PIEZOMETER
- GROUNDWATER ELEVATION CONTOUR, 10-FT INTERVAL, DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION
- APPROXIMATE UNIT BOUNDARY
- SEDIMENTATION POND
- 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 14 OCTOBER 2019.
  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, 2019



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

**SHALLOW GROUNDWATER ELEVATION CONTOURS - OCTOBER 2019**

NOVEMBER 2019

FIGURE 2

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

## ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh  
301 Alpha Drive  
RIDC Park  
Pittsburgh, PA 15238  
Tel: (412)963-7058

Laboratory Job ID: 180-90467-1

Client Project/Site: CCR Groundwater AB Brown

**For:**

Vectren Corporation  
PO BOX 209  
Evansville, Indiana 47702

Attn: Accounts Payable



Authorized for release by:  
8/28/2019 3:42:08 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



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Case Narrative . . . . .	3
Definitions/Glossary . . . . .	6
Certification Summary . . . . .	7
Sample Summary . . . . .	9
Method Summary . . . . .	10
Lab Chronicle . . . . .	11
Client Sample Results . . . . .	23
QC Sample Results . . . . .	44
QC Association Summary . . . . .	53
Chain of Custody . . . . .	59
Receipt Checklists . . . . .	67

# Case Narrative

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

Job ID: 180-90467-1

## Job ID: 180-90467-1

### Laboratory: Eurofins TestAmerica, Pittsburgh

#### Narrative

#### Job Narrative 180-90467-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 5/23/2019 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.7° C, 3.4° C, 3.6° C and 4.3° C.

#### GC Semi VOA

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

#### RAD

Method(s) 903.0, 9315: Ra-226 Prep Batch 160-430235

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-LF-3 (180-90467-3), CCR-LF-5 (180-90467-5), CCR-LF-6 (180-90467-6), CCR-BK-1R (180-90467-7), CCR-AP-3R (180-90467-9), CCR-AP-4R (180-90467-10), CCR-AP-5 (180-90467-11), CCR-AP-6 (180-90467-12), (LCS 160-430235/1-A), (MB 160-430235/23-A), (500-162824-E-1-A) and (500-162824-C-1-A DU)

Method(s) 903.0, 9315: Ra-226 Prep Batch 160-433443

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-LF-1 (180-90467-1), CCR-LF-2 (180-90467-2), CCR-LF-2 (180-90467-2[DU]), CCR-LF-4 (180-90467-4), CCR-BK-2 (180-90467-8), CCR-AP-7R (180-90467-13), (LCS 160-433443/1-A) and (MB 160-433443/23-A)

Method(s) 9315: Ra-226 Prep Batch 160-430329

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

FIELD BLANK 1 (180-90467-14), FIELD BLANK 2 (180-90467-15), BLIND DUPLICATE 1 (180-90467-16), BLIND DUPLICATE 2 (180-90467-17), (LCS 160-430329/1-A), (LCS 160-430329/2-A) and (MB 160-430329/23-A)

Method(s) 904.0, 9320: Ra-228 Prep Batch 160-430397

The Ra-228 recovery in the LCS was slightly low (72) outside QC limits (75%-125%) indicating a potential slight low bias to the sample results. The barium recovery in the LCS (107%) and the Replicate Error Ratio (RER) were within limits demonstrating acceptable method performance.

CCR-LF-3 (180-90467-3), CCR-LF-5 (180-90467-5), CCR-LF-6 (180-90467-6), CCR-BK-1R (180-90467-7), CCR-AP-3R (180-90467-9), CCR-AP-4R (180-90467-10), CCR-AP-5 (180-90467-11), CCR-AP-6 (180-90467-12), (LCS 160-430397/1-A), (MB 160-430397/23-A), (500-162824-E-1-B) and (500-162824-C-1-B DU)

# Case Narrative

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

Job ID: 180-90467-1

## Job ID: 180-90467-1 (Continued)

### Laboratory: Eurofins TestAmerica, Pittsburgh (Continued)

Method(s) 904.0, 9320: Ra-228 Prep Batch 160-430397

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-LF-3 (180-90467-3), CCR-LF-5 (180-90467-5), CCR-LF-6 (180-90467-6), CCR-BK-1R (180-90467-7), CCR-AP-3R (180-90467-9), CCR-AP-4R (180-90467-10), CCR-AP-5 (180-90467-11), CCR-AP-6 (180-90467-12), (LCS 160-430397/1-A), (MB 160-430397/23-A), (500-162824-E-1-B) and (500-162824-C-1-B DU)

Method(s) 904.0, 9320: Ra-228 Prep Batch 160-433455

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-LF-1 (180-90467-1), CCR-LF-2 (180-90467-2), CCR-LF-2 (180-90467-2[DU]), CCR-LF-4 (180-90467-4), CCR-BK-2 (180-90467-8), CCR-AP-7R (180-90467-13), (LCS 160-433455/1-A) and (MB 160-433455/23-A)

Method(s) 9320: Ra-228 Prep Batch 160-430398

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

FIELD BLANK 1 (180-90467-14), FIELD BLANK 2 (180-90467-15), BLIND DUPLICATE 1 (180-90467-16), BLIND DUPLICATE 2 (180-90467-17), (LCS 160-430398/1-A), (LCSD 160-430398/2-A) and (MB 160-430398/23-A)

Method(s) PrecSep\_0: Radium 228 Prep Batch 160-430398:

Insufficient sample volume was available to perform a sample duplicate for the following samples: FIELD BLANK 1 (180-90467-14), FIELD BLANK 2 (180-90467-15), BLIND DUPLICATE 1 (180-90467-16) and BLIND DUPLICATE 2 (180-90467-17). 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 160-430329:

Insufficient sample volume was available to perform a sample duplicate for the following samples: FIELD BLANK 1 (180-90467-14), FIELD BLANK 2 (180-90467-15), BLIND DUPLICATE 1 (180-90467-16) and BLIND DUPLICATE 2 (180-90467-17). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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

### Metals

Method(s) 6020A: The continuing calibration verification (CCV) associated with batch 180-280271 recovered above the upper control limit for beryllium. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 6020A: The following samples were diluted due to high concentration of sodium in the sample matrix: CCR-LF-2

# Case Narrative

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

Job ID: 180-90467-1

---

## Job ID: 180-90467-1 (Continued)

---

### Laboratory: Eurofins TestAmerica, Pittsburgh (Continued)

(180-90467-2), CCR-LF-2 (180-90467-2[MS]), CCR-LF-2 (180-90467-2[MSD]), CCR-LF-4 (180-90467-4), CCR-LF-5 (180-90467-5), CCR-AP-3R (180-90467-9), CCR-AP-5 (180-90467-11), CCR-AP-6 (180-90467-12), CCR-AP-7R (180-90467-13), BLIND DUPLICATE 1 (180-90467-16), BLIND DUPLICATE 2 (180-90467-17), (180-90467-E-2-A PDS ^10) and (180-90467-E-2-A SD ^50). Elevated reporting limits (RLs) are provided.

Method(s) 6020A: The post digestion spike % recovery for multiple analytes associated with batch 180-280395 was outside of control limits. The following sample is impacted: CCR-LF-2 (180-90467-2).

Method(s) 6020A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 180-280038 and analytical batch 180-280395 were outside control limits for barium. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

### General Chemistry

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 AB Brown

Job ID: 180-90467-1

## 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
^	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.
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### 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
*	LCS or LCSD is outside acceptance limits.
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 AB Brown

Job ID: 180-90467-1

## Laboratory: Eurofins TestAmerica, Pittsburgh

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State Program	88-0690	06-27-20
California	State	2891	04-30-20
California	State Program	2891	04-30-20
Connecticut	State	PH-0688	09-30-20
Connecticut	State Program	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Illinois	NELAP	200005	06-30-20
Kansas	NELAP	E-10350	01-31-20
Kansas	NELAP	E-10350	03-31-20
Kentucky (UST)	State Program	162013	04-30-20
Kentucky (WW)	State Program	KY98043	12-31-19
Louisiana	NELAP	04041	06-30-20
Minnesota	NELAP	042-999-482	12-31-19
Nevada	State Program	PA00164	07-31-20
New Hampshire	NELAP	2030	04-04-20
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	03-31-20
New York	NELAP	11182	04-01-20
North Carolina (WW/SW)	State Program	434	12-31-19
North Dakota	State Program	R-227	04-30-20
Oregon	NELAP	PA-2151	02-06-20
Oregon	NELAP	PA-2151	02-06-20
Pennsylvania	NELAP	02-00416	04-30-20
Pennsylvania	NELAP	02-00416	06-04-19
Rhode Island	State Program	LAO00362	12-30-19
South Carolina	State Program	89014	04-30-20
Texas	NELAP	T104704528-15-2	03-31-20
US Fish & Wildlife	Federal	LE94312A-1	07-31-19
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
Utah	NELAP	PA001462015-4	05-31-20
Virginia	NELAP	460189	09-14-19
Virginia	NELAP	10043	09-14-19
West Virginia DEP	State	142	01-31-20
West Virginia DEP	State Program	142	01-31-20
Wisconsin	State	998027800	08-31-19
Wisconsin	State Program	998027800	08-31-19

# Accreditation/Certification Summary

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

Job ID: 180-90467-1

## Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	DoD	L2305	04-06-22
ANAB	DOE	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
Arizona	State Program	AZ0813	12-08-19
California	State	2886	06-30-20
California	State Program	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Connecticut	State Program	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
Florida	NELAP	E87689	06-30-20
Hawaii	State Program	NA	06-30-20
Illinois	NELAP	200023	11-30-19
Illinois	NELAP	004553	11-30-19
Iowa	State Program	373	12-01-20
Kansas	NELAP	E-10236	10-31-19
Kentucky (DW)	State	KY90125	12-31-19
Kentucky (DW)	State Program	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	NELAP	LA011	12-31-19
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
Maryland	State Program	310	09-30-20
Michigan	State Program	9005	06-30-20
Missouri	State	780	06-30-22
Missouri	State Program	780	06-30-20
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	03-31-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
North Dakota	State Program	R207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-19
Oklahoma	State Program	9997	08-31-19 *
Pennsylvania	NELAP	68-00540	02-28-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State Program	85002001	06-30-20
Texas	NELAP	T104704193-19-14	07-31-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	Federal	058448	07-31-20
USDA	Federal	P330-17-0028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	460230	06-14-20
Virginia	NELAP	10310	06-14-20
Washington	State Program	C592	08-30-19
West Virginia DEP	State Program	381	08-31-19 *

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

Eurofins TestAmerica, Pittsburgh

# Sample Summary

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

Job ID: 180-90467-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-90467-1	CCR-LF-1	Water	05/20/19 15:00	05/23/19 09:00	
180-90467-2	CCR-LF-2	Water	05/22/19 13:20	05/23/19 09:00	
180-90467-3	CCR-LF-3	Water	05/20/19 13:35	05/23/19 09:00	
180-90467-4	CCR-LF-4	Water	05/21/19 13:05	05/23/19 09:00	
180-90467-5	CCR-LF-5	Water	05/20/19 11:55	05/23/19 09:00	
180-90467-6	CCR-LF-6	Water	05/20/19 12:45	05/23/19 09:00	
180-90467-7	CCR-BK-1R	Water	05/21/19 11:35	05/23/19 09:00	
180-90467-8	CCR-BK-2	Water	05/21/19 10:40	05/23/19 09:00	
180-90467-9	CCR-AP-3R	Water	05/22/19 14:15	05/23/19 09:00	
180-90467-10	CCR-AP-4R	Water	05/22/19 15:20	05/23/19 09:00	
180-90467-11	CCR-AP-5	Water	05/22/19 11:30	05/23/19 09:00	
180-90467-12	CCR-AP-6	Water	05/21/19 14:40	05/23/19 09:00	
180-90467-13	CCR-AP-7R	Water	05/21/19 16:00	05/23/19 09:00	
180-90467-14	FIELD BLANK 1	Water	05/20/19 15:15	05/23/19 09:00	
180-90467-15	FIELD BLANK 2	Water	05/21/19 14:50	05/23/19 09:00	
180-90467-16	BLIND DUPLICATE 1	Water	05/20/19 00:00	05/23/19 09:00	
180-90467-17	BLIND DUPLICATE 2	Water	05/22/19 00:00	05/23/19 09:00	

# Method Summary

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

Job ID: 180-90467-1

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

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

# Lab Chronicle

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-1**

**Date Collected: 05/20/19 15:00**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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: CHIC2100A		1			280113	05/30/19 09:10	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		10			280113	05/30/19 09:25	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 16:18	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280395	05/31/19 16:47	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 15:46	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:27	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	279723	05/24/19 14:29	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.41 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			439859	08/19/19 14:05	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.41 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			439946	08/19/19 09:06	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			440111	08/21/19 08:50	SMP	TAL SL

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

**Lab Sample ID: 180-90467-2**

**Date Collected: 05/22/19 13:20**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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		25			280114	05/30/19 08:18	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		250			280114	05/30/19 08:34	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 16:21	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			280395	05/31/19 16:50	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 15:50	KAK	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-2**

**Date Collected: 05/22/19 13:20**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			279863	05/28/19 14:21	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	5 mL	100 mL	279771	05/25/19 11:14	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.49 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCORANGE		1			439901	08/19/19 16:00	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.49 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			439946	08/19/19 09:06	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			440111	08/21/19 08:50	SMP	TAL SL

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

**Lab Sample ID: 180-90467-3**

**Date Collected: 05/20/19 13:35**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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: CHIC2100A		2.5			280113	05/30/19 10:43	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		25			280113	05/30/19 10:58	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 16:38	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280395	05/31/19 17:18	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 15:54	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:29	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	50 mL	100 mL	279723	05/24/19 14:29	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.17 mL	1.0 g	430235	05/30/19 10:35	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			439426	08/13/19 21:11	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.17 mL	1.0 g	430397	05/31/19 10:52	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCBLUE		1			435974	07/23/19 14:32	AMJ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			440111	08/21/19 08:50	SMP	TAL SL

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90467-1

**Client Sample ID: CCR-LF-4**

**Lab Sample ID: 180-90467-4**

**Date Collected: 05/21/19 13:05**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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: CHIC2100A		10			280113	05/30/19 15:50	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		100			280113	05/30/19 16:05	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 16:41	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			280395	05/31/19 17:21	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 15:55	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:31	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	10 mL	100 mL	279730	05/24/19 15:09	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.56 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCORANGE		1			439901	08/19/19 16:01	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.56 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			439946	08/19/19 09:06	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			440111	08/21/19 08:50	SMP	TAL SL

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

**Lab Sample ID: 180-90467-5**

**Date Collected: 05/20/19 11:55**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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: CHIC2100A		5			280113	05/30/19 12:15	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		50			280113	05/30/19 12:30	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 16:44	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			280395	05/31/19 17:24	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 15:56	KAK	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-5**

**Date Collected: 05/20/19 11:55**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			279863	05/28/19 14:32	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	25 mL	100 mL	279723	05/24/19 14:29	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.27 mL	1.0 g	430235	05/30/19 10:35	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCPURPLE		1	1.0 mL	1.0 mL	439394	08/13/19 21:09	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.27 mL	1.0 g	430397	05/31/19 10:52	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCBLUE		1			435974	07/23/19 14:32	AMJ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			440111	08/21/19 08:50	SMP	TAL SL

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

**Lab Sample ID: 180-90467-6**

**Date Collected: 05/20/19 12:45**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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: CHIC2100A		1			280113	05/30/19 09:40	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		10			280113	05/30/19 09:55	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 16:55	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280395	05/31/19 17:28	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 15:57	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:34	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	279723	05/24/19 14:29	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.03 mL	1.0 g	430235	05/30/19 10:35	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCPURPLE		1			439394	08/13/19 21:09	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.03 mL	1.0 g	430397	05/31/19 10:52	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCBLUE		1			435974	07/23/19 14:33	AMJ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			440111	08/21/19 08:50	SMP	TAL SL

Eurofins TestAmerica, Pittsburgh



# Lab Chronicle

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-7**

**Date Collected: 05/21/19 11:35**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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			280114	05/30/19 11:40	MJH	TAL PIT
		Instrument ID: CHICS2100B								
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			280271	05/30/19 16:58	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			280395	05/31/19 17:31	RSK	TAL PIT
		Instrument ID: A								
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280376	05/31/19 15:59	KAK	TAL PIT
		Instrument ID: HGY								
Total/NA	Analysis	EPA 9040C		1			279863	05/28/19 14:36	RJP	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	279730	05/24/19 15:09	AVS	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			1000.45 mL	1.0 g	430235	05/30/19 10:35	ORM	TAL SL
Total/NA	Analysis	9315		1			439426	08/13/19 22:59	CDR	TAL SL
		Instrument ID: GFPCBLUE								
Total/NA	Prep	PrecSep_0			1000.45 mL	1.0 g	430397	05/31/19 10:52	ORM	TAL SL
Total/NA	Analysis	9320		1			435974	07/23/19 14:33	AMJ	TAL SL
		Instrument ID: GFPCBLUE								
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:50	SMP	TAL SL
		Instrument ID: NOEQUIP								

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

**Lab Sample ID: 180-90467-8**

**Date Collected: 05/21/19 10:40**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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			280114	05/30/19 11:24	MJH	TAL PIT
		Instrument ID: CHICS2100B								
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			280271	05/30/19 17:01	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			280395	05/31/19 17:34	RSK	TAL PIT
		Instrument ID: A								
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280376	05/31/19 16:00	KAK	TAL PIT
		Instrument ID: HGY								
Total/NA	Analysis	EPA 9040C		1			279863	05/28/19 14:38	RJP	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	279730	05/24/19 15:09	AVS	TAL PIT
		Instrument ID: NOEQUIP								

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90467-1

## Client Sample ID: CCR-BK-2

## Lab Sample ID: 180-90467-8

Date Collected: 05/21/19 10:40

Matrix: Water

Date Received: 05/23/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000.31 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	9315		1			439859	08/19/19 16:02	CDR	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Prep	PrecSep_0			1000.31 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	9320		1			439946	08/19/19 09:06	CDR	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:50	SMP	TAL SL
Instrument ID: NOEQUIP										

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

## Lab Sample ID: 180-90467-9

Date Collected: 05/22/19 14:15

Matrix: Water

Date Received: 05/23/19 09:00

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			280113	05/30/19 15:19	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total/NA	Analysis	EPA 9056A		50			280113	05/30/19 15:35	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			280271	05/30/19 17:05	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			280395	05/31/19 17:45	RSK	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280376	05/31/19 16:01	KAK	TAL PIT
Instrument ID: HGY										
Total/NA	Analysis	EPA 9040C		1			279863	05/28/19 14:40	RJP	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	20 mL	100 mL	279771	05/25/19 11:14	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.21 mL	1.0 g	430235	05/30/19 10:35	ORM	TAL SL
Total/NA	Analysis	9315		1			439426	08/13/19 23:00	CDR	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Prep	PrecSep_0			1000.21 mL	1.0 g	430397	05/31/19 10:52	ORM	TAL SL
Total/NA	Analysis	9320		1			435974	07/23/19 14:33	AMJ	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:50	SMP	TAL SL
Instrument ID: NOEQUIP										

# Lab Chronicle

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-10**

**Date Collected: 05/22/19 15:20**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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: CHIC2100A		1			280113	05/30/19 10:11	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 17:08	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280395	05/31/19 17:55	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 16:06	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:43	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	279771	05/25/19 11:14	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.00 mL	1.0 g	430235	05/30/19 10:35	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			439426	08/13/19 23:00	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.00 mL	1.0 g	430397	05/31/19 10:52	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCBLUE		1			435974	07/23/19 14:33	AMJ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			440111	08/21/19 08:50	SMP	TAL SL

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

**Lab Sample ID: 180-90467-11**

**Date Collected: 05/22/19 11:30**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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: CHIC2100A		5			280113	05/30/19 12:45	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		50			280113	05/30/19 13:01	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 17:11	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			280395	05/31/19 17:58	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 16:07	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:47	RJP	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-11**

**Date Collected: 05/22/19 11:30**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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	25 mL	100 mL	279771	05/25/19 11:14	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.23 mL	1.0 g	430235	05/30/19 10:35	ORM	TAL SL
Total/NA	Analysis	9315		1			439426	08/13/19 23:00	CDR	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Prep	PrecSep_0			1000.23 mL	1.0 g	430397	05/31/19 10:52	ORM	TAL SL
Total/NA	Analysis	9320		1			435974	07/23/19 14:33	AMJ	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:50	SMP	TAL SL
Instrument ID: NOEQUIP										

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

**Lab Sample ID: 180-90467-12**

**Date Collected: 05/21/19 14:40**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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			280113	05/30/19 11:44	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total/NA	Analysis	EPA 9056A		25			280113	05/30/19 11:59	MJH	TAL PIT
Instrument ID: CHIC2100A										
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			280271	05/30/19 17:15	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			280395	05/31/19 18:02	RSK	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280376	05/31/19 16:08	KAK	TAL PIT
Instrument ID: HGY										
Total/NA	Analysis	EPA 9040C		1			279863	05/28/19 14:49	RJP	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	279730	05/24/19 15:09	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.54 mL	1.0 g	430235	05/30/19 10:35	ORM	TAL SL
Total/NA	Analysis	9315		1			439521	08/14/19 06:57	KLS	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Prep	PrecSep_0			1000.54 mL	1.0 g	430397	05/31/19 10:52	ORM	TAL SL
Total/NA	Analysis	9320		1			435974	07/23/19 14:33	AMJ	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:50	SMP	TAL SL
Instrument ID: NOEQUIP										

# Lab Chronicle

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-13**

**Date Collected: 05/21/19 16:00**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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: CHIC2100A		5			280113	05/30/19 13:16	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		50			280113	05/30/19 13:31	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 17:18	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			280395	05/31/19 18:05	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 16:09	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:51	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	25 mL	100 mL	279730	05/24/19 15:09	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.71 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			439859	08/19/19 16:02	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.71 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1	1.0 mL	1.0 mL	439946	08/19/19 09:07	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			440111	08/21/19 08:50	SMP	TAL SL

**Client Sample ID: FIELD BLANK 1**

**Lab Sample ID: 180-90467-14**

**Date Collected: 05/20/19 15:15**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

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			280114	05/30/19 07:46	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 17:21	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280395	05/31/19 18:08	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 16:11	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:53	RJP	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90467-1

## Client Sample ID: FIELD BLANK 1

Lab Sample ID: 180-90467-14

Date Collected: 05/20/19 15:15

Matrix: Water

Date Received: 05/23/19 09:00

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	279723	05/24/19 14:29	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.84 mL	1.0 g	430329	05/31/19 08:57	EJQ	TAL SL
Total/NA	Analysis	9315		1			440197	08/22/19 12:21	KLS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Prep	PrecSep_0			1000.84 mL	1.0 g	430398	05/31/19 10:52	EJQ	TAL SL
Total/NA	Analysis	9320		1			440196	08/22/19 09:04	KLS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Analysis	Ra226_Ra228		1			441084	08/28/19 12:52	SMP	TAL SL
Instrument ID: NOEQUIP										

## Client Sample ID: FIELD BLANK 2

Lab Sample ID: 180-90467-15

Date Collected: 05/21/19 14:50

Matrix: Water

Date Received: 05/23/19 09:00

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	1 mL	1.0 mL	280114	05/30/19 08:02	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			280271	05/30/19 17:25	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			280395	05/31/19 18:12	RSK	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280376	05/31/19 16:12	KAK	TAL PIT
Instrument ID: HGY										
Total/NA	Analysis	EPA 9040C		1			279863	05/28/19 14:54	RJP	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	279723	05/24/19 14:29	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.76 mL	1.0 g	430329	05/31/19 08:57	EJQ	TAL SL
Total/NA	Analysis	9315		1			440198	08/22/19 12:23	KLS	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Prep	PrecSep_0			1000.76 mL	1.0 g	430398	05/31/19 10:52	EJQ	TAL SL
Total/NA	Analysis	9320		1			440196	08/22/19 09:04	KLS	TAL SL
Instrument ID: GFPCORANGE										
Total/NA	Analysis	Ra226_Ra228		1			441084	08/28/19 12:52	SMP	TAL SL
Instrument ID: NOEQUIP										

# Lab Chronicle

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

Job ID: 180-90467-1

## Client Sample ID: BLIND DUPLICATE 1

Lab Sample ID: 180-90467-16

Date Collected: 05/20/19 00:00

Matrix: Water

Date Received: 05/23/19 09:00

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: CHIC2100A		5			280113	05/30/19 13:47	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		50			280113	05/30/19 14:02	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 17:35	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			280395	05/31/19 18:15	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 16:13	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			279863	05/28/19 14:56	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	25 mL	100 mL	279723	05/24/19 14:29	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.46 mL	1.0 g	430329	05/31/19 08:57	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			440198	08/22/19 12:23	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.46 mL	1.0 g	430398	05/31/19 10:52	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCORANGE		1			440196	08/22/19 09:05	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			441084	08/28/19 12:52	SMP	TAL SL

## Client Sample ID: BLIND DUPLICATE 2

Lab Sample ID: 180-90467-17

Date Collected: 05/22/19 00:00

Matrix: Water

Date Received: 05/23/19 09:00

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: CHIC2100A		5			280113	05/30/19 14:48	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		50			280113	05/30/19 15:03	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			280271	05/30/19 17:39	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280038	05/29/19 11:24	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			280395	05/31/19 18:19	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280150	05/30/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			280376	05/31/19 16:14	KAK	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90467-1

**Client Sample ID: BLIND DUPLICATE 2**

**Lab Sample ID: 180-90467-17**

**Date Collected: 05/22/19 00:00**

**Matrix: Water**

**Date Received: 05/23/19 09:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			279863	05/28/19 14:58	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	25 mL	100 mL	279771	05/25/19 11:14	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.74 mL	1.0 g	430329	05/31/19 08:57	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			440198	08/22/19 12:23	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.74 mL	1.0 g	430398	05/31/19 10:52	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCORANGE		1			440196	08/22/19 09:05	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			441084	08/28/19 12:52	SMP	TAL SL

**Laboratory References:**

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058  
 TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

**Analyst References:**

Lab: TAL PIT

Batch Type: Prep

JJZ = Joseph Zubrow  
 NAM = Nicole Marfisi

Batch Type: Analysis

AVS = Abbey Smith  
 KAK = Kayla Kalamasz  
 MJH = Matthew Hartman  
 RJP = Rockwell Pokrant  
 RSK = Robert Kurtz

Lab: TAL SL

Batch Type: Prep

EJQ = Erin Quinn  
 ORM = Octavia Moore

Batch Type: Analysis

AMJ = Ashay Jefferson  
 CDR = Conrad Reuscher  
 KLS = Kody Saulters  
 SMP = Siobhan Perry



# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-1**

Date Collected: 05/20/19 15:00

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23		1.0	0.71	mg/L			05/30/19 09:10	1
Fluoride	0.21		0.10	0.026	mg/L			05/30/19 09:10	1
Sulfate	1100		10	3.8	mg/L			05/30/19 09:25	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00039	J	0.0010	0.00032	mg/L		05/29/19 11:24	05/31/19 16:47	1
Boron	0.034	J	0.080	0.030	mg/L		05/29/19 11:24	05/31/19 16:47	1
Barium	0.029		0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 16:18	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 16:18	1
Calcium	290		0.50	0.12	mg/L		05/29/19 11:24	05/30/19 16:18	1
Cadmium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:18	1
Cobalt	0.00020	J	0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 16:18	1
Chromium	ND		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 16:18	1
Molybdenum	0.00090	J	0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 16:18	1
Lead	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:18	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 16:18	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 16:18	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:18	1
Lithium	5.9		5.0	3.1	ug/L		05/29/19 11:24	05/30/19 16:18	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 15:46	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1900		10	10	mg/L			05/24/19 14:29	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1	0.1	SU			05/28/19 14:27	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.000	U	0.172	0.172	1.00	0.355	pCi/L	07/02/19 12:58	08/19/19 14:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.1		40 - 110					07/02/19 12:58	08/19/19 14:05	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.466		0.277	0.281	1.00	0.422	pCi/L	07/02/19 14:27	08/19/19 09:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.1		40 - 110					07/02/19 14:27	08/19/19 09:06	1
Y Carrier	86.4		40 - 110					07/02/19 14:27	08/19/19 09:06	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-1**

Date Collected: 05/20/19 15:00

Matrix: Water

Date Received: 05/23/19 09:00

**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	0.466		0.326	0.329	5.00	0.422	pCi/L		08/21/19 08:50	1

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

**Lab Sample ID: 180-90467-2**

Date Collected: 05/22/19 13:20

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	390		25	18	mg/L			05/30/19 08:18	25
Fluoride	ND		2.5	0.66	mg/L			05/30/19 08:18	25
Sulfate	15000		250	95	mg/L			05/30/19 08:34	250

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 16:50	10
Boron	5.4		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 16:50	10
Barium	ND	F2 F1	0.10	0.015	mg/L		05/29/19 11:24	05/31/19 16:50	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 16:21	1
Calcium	420		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 16:50	10
Cadmium	0.0044	J	0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 16:50	10
Cobalt	0.0098		0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 16:50	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 16:50	10
Molybdenum	ND		0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 16:50	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 16:50	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 16:50	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 16:50	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 16:50	10
Lithium	ND		50	31	ug/L		05/29/19 11:24	05/31/19 16:50	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 15:50	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	21000		200	200	mg/L			05/25/19 11:14	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1	0.1	SU			05/28/19 14:21	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.593		0.290	0.295	1.00	0.360	pCi/L	07/02/19 12:58	08/19/19 16:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.1		40 - 110					07/02/19 12:58	08/19/19 16:00	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

## Client Sample ID: CCR-LF-2

## Lab Sample ID: 180-90467-2

Date Collected: 05/22/19 13:20

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.31		0.418	0.469	1.00	0.465	pCi/L	07/02/19 14:27	08/19/19 09:06	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	88.1		40 - 110					07/02/19 14:27	08/19/19 09:06	1
Y Carrier	85.2		40 - 110					07/02/19 14:27	08/19/19 09:06	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	2.90		0.509	0.554	5.00	0.465	pCi/L		08/21/19 08:50	1

## Client Sample ID: CCR-LF-3

## Lab Sample ID: 180-90467-3

Date Collected: 05/20/19 13:35

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	98		2.5	1.8	mg/L			05/30/19 10:43	2.5
Fluoride	0.34		0.25	0.066	mg/L			05/30/19 10:43	2.5
Sulfate	1600		25	9.5	mg/L			05/30/19 10:58	25

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00037	J	0.0010	0.00032	mg/L		05/29/19 11:24	05/31/19 17:18	1
Boron	0.13		0.080	0.030	mg/L		05/29/19 11:24	05/31/19 17:18	1
Barium	0.019		0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 16:38	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 16:38	1
Calcium	350		0.50	0.12	mg/L		05/29/19 11:24	05/30/19 16:38	1
Cadmium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:38	1
Cobalt	0.00028	J	0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 16:38	1
Chromium	0.0025		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 16:38	1
Molybdenum	0.0056		0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 16:38	1
Lead	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:38	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 16:38	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 16:38	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:38	1
Lithium	7.4		5.0	3.1	ug/L		05/29/19 11:24	05/30/19 16:38	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 15:54	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2800		20	20	mg/L			05/24/19 14:29	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			05/28/19 14:29	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-3**

Date Collected: 05/20/19 13:35

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.196		0.0937	0.0954	1.00	0.118	pCi/L	05/30/19 10:35	08/13/19 21:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.7		40 - 110					05/30/19 10:35	08/13/19 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	0.105	U *	0.333	0.333	1.00	0.578	pCi/L	05/31/19 10:52	07/23/19 14:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.7		40 - 110					05/31/19 10:52	07/23/19 14:32	1
Y Carrier	68.0		40 - 110					05/31/19 10:52	07/23/19 14:32	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	0.301	U	0.346	0.346	5.00	0.578	pCi/L		08/21/19 08:50	1

**Client Sample ID: CCR-LF-4**

**Lab Sample ID: 180-90467-4**

Date Collected: 05/21/19 13:05

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120		10	7.1	mg/L			05/30/19 15:50	10
Fluoride	0.34	J	1.0	0.26	mg/L			05/30/19 15:50	10
Sulfate	7900		100	38	mg/L			05/30/19 16:05	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.017		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 17:21	10
Boron	ND		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 17:21	10
Barium	ND		0.10	0.015	mg/L		05/29/19 11:24	05/31/19 17:21	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 16:41	1
Calcium	370		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 17:21	10
Cadmium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:21	10
Cobalt	0.0014	J	0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 17:21	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 17:21	10
Molybdenum	0.021	J	0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 17:21	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:21	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 17:21	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 17:21	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:21	10
Lithium	74		50	31	ug/L		05/29/19 11:24	05/31/19 17:21	10

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

**Client Sample ID: CCR-LF-4**

**Lab Sample ID: 180-90467-4**

Date Collected: 05/21/19 13:05

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 15:55	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10000		100	100	mg/L			05/24/19 15:09	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1	0.1	SU			05/28/19 14:31	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.61		0.422	0.446	1.00	0.353	pCi/L	07/02/19 12:58	08/19/19 16:01	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	81.9		40 - 110	07/02/19 12:58	08/19/19 16:01	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.50		0.386	0.410	1.00	0.472	pCi/L	07/02/19 14:27	08/19/19 09:06	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	81.9		40 - 110	07/02/19 14:27	08/19/19 09:06	1
Y Carrier	80.4		40 - 110	07/02/19 14:27	08/19/19 09:06	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	3.11		0.572	0.606	5.00	0.472	pCi/L		08/21/19 08:50	1

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

**Lab Sample ID: 180-90467-5**

Date Collected: 05/20/19 11:55

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	460		5.0	3.6	mg/L			05/30/19 12:15	5
Fluoride	0.34	J	0.50	0.13	mg/L			05/30/19 12:15	5
Sulfate	3000		50	19	mg/L			05/30/19 12:30	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 17:24	10
Boron	1.9		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 17:24	10
Barium	0.023	J	0.10	0.015	mg/L		05/29/19 11:24	05/31/19 17:24	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 16:44	1
Calcium	430		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 17:24	10
Cadmium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:24	10

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-5**

Date Collected: 05/20/19 11:55

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 17:24	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 17:24	10
Molybdenum	ND		0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 17:24	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:24	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 17:24	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 17:24	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:24	10
Lithium	ND		50	31	ug/L		05/29/19 11:24	05/31/19 17:24	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 15:56	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>5400</b>		40	40	mg/L			05/24/19 14:29	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH</b>	<b>7.2</b>	<b>HF</b>	0.1	0.1	SU			05/28/19 14:32	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0326	U	0.0577	0.0578	1.00	0.101	pCi/L	05/30/19 10:35	08/13/19 21:09	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.3		40 - 110	05/30/19 10:35	08/13/19 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	0.0605	U *	0.273	0.273	1.00	0.480	pCi/L	05/31/19 10:52	07/23/19 14:32	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.3		40 - 110	05/31/19 10:52	07/23/19 14:32	1
Y Carrier	74.0		40 - 110	05/31/19 10:52	07/23/19 14:32	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	0.0931	U	0.279	0.279	5.00	0.480	pCi/L		08/21/19 08:50	1

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

**Lab Sample ID: 180-90467-6**

Date Collected: 05/20/19 12:45

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>35</b>		1.0	0.71	mg/L			05/30/19 09:40	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-6**

Date Collected: 05/20/19 12:45

Matrix: Water

Date Received: 05/23/19 09:00

**Method: EPA 9056A - Anions, Ion Chromatography (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.34		0.10	0.026	mg/L			05/30/19 09:40	1
Sulfate	730		10	3.8	mg/L			05/30/19 09:55	10

**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		05/29/19 11:24	05/31/19 17:28	1
Boron	0.73		0.080	0.030	mg/L		05/29/19 11:24	05/31/19 17:28	1
Barium	0.016		0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 16:55	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 16:55	1
Calcium	260		0.50	0.12	mg/L		05/29/19 11:24	05/30/19 16:55	1
Cadmium	0.00019	J	0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:55	1
Cobalt	0.00027	J	0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 16:55	1
Chromium	ND		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 16:55	1
Molybdenum	0.00061	J	0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 16:55	1
Lead	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:55	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 16:55	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 16:55	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:55	1
Lithium	19		5.0	3.1	ug/L		05/29/19 11:24	05/30/19 16:55	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 15:57	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		10	10	mg/L			05/24/19 14:29	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1	0.1	SU			05/28/19 14:34	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.144		0.0785	0.0796	1.00	0.103	pCi/L	05/30/19 10:35	08/13/19 21:09	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110	05/30/19 10:35	08/13/19 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	0.129	U*	0.290	0.290	1.00	0.498	pCi/L	05/31/19 10:52	07/23/19 14:33	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110	05/31/19 10:52	07/23/19 14:33	1
Y Carrier	75.9		40 - 110	05/31/19 10:52	07/23/19 14:33	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-6**

Date Collected: 05/20/19 12:45

Matrix: Water

Date Received: 05/23/19 09:00

**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	0.273	U	0.300	0.301	5.00	0.498	pCi/L		08/21/19 08:50	1

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

**Lab Sample ID: 180-90467-7**

Date Collected: 05/21/19 11:35

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.3		1.0	0.71	mg/L			05/30/19 11:40	1
Fluoride	0.23		0.10	0.026	mg/L			05/30/19 11:40	1
Sulfate	23		1.0	0.38	mg/L			05/30/19 11:40	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00034	J	0.0010	0.00032	mg/L		05/29/19 11:24	05/31/19 17:31	1
Boron	ND		0.080	0.030	mg/L		05/29/19 11:24	05/31/19 17:31	1
Barium	0.027		0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 16:58	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 16:58	1
Calcium	37		0.50	0.12	mg/L		05/29/19 11:24	05/30/19 16:58	1
Cadmium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:58	1
Cobalt	0.00012	J	0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 16:58	1
Chromium	ND		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 16:58	1
Molybdenum	0.00063	J	0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 16:58	1
Lead	0.00016	J	0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:58	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 16:58	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 16:58	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 16:58	1
Lithium	6.5		5.0	3.1	ug/L		05/29/19 11:24	05/30/19 16:58	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 15:59	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	230		10	10	mg/L			05/24/19 15:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			05/28/19 14:36	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		0.104	0.108	1.00	0.103	pCi/L	05/30/19 10:35	08/13/19 22:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.3		40 - 110					05/30/19 10:35	08/13/19 22:59	1

Eurofins TestAmerica, Pittsburgh



# Client Sample Results

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

Job ID: 180-90467-1

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

## Lab Sample ID: 180-90467-7

Date Collected: 05/21/19 11:35

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0733	U*	0.235	0.235	1.00	0.439	pCi/L	05/31/19 10:52	07/23/19 14:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.3		40 - 110					05/31/19 10:52	07/23/19 14:33	1
Y Carrier	80.0		40 - 110					05/31/19 10:52	07/23/19 14:33	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	0.263	U	0.257	0.259	5.00	0.439	pCi/L		08/21/19 08:50	1

## Client Sample ID: CCR-BK-2

## Lab Sample ID: 180-90467-8

Date Collected: 05/21/19 10:40

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.6		1.0	0.71	mg/L			05/30/19 11:24	1
Fluoride	0.12		0.10	0.026	mg/L			05/30/19 11:24	1
Sulfate	60		1.0	0.38	mg/L			05/30/19 11:24	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00041	J	0.0010	0.00032	mg/L		05/29/19 11:24	05/31/19 17:34	1
Boron	0.58		0.080	0.030	mg/L		05/29/19 11:24	05/31/19 17:34	1
Barium	0.045		0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 17:01	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:01	1
Calcium	71		0.50	0.12	mg/L		05/29/19 11:24	05/30/19 17:01	1
Cadmium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:01	1
Cobalt	0.00050		0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 17:01	1
Chromium	0.0087		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 17:01	1
Molybdenum	0.0025	J	0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 17:01	1
Lead	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:01	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 17:01	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 17:01	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:01	1
Lithium	9.5		5.0	3.1	ug/L		05/29/19 11:24	05/30/19 17:01	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:00	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	440		10	10	mg/L			05/24/19 15:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1	0.1	SU			05/28/19 14:38	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-8**

Date Collected: 05/21/19 10:40

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0109	U	0.184	0.184	1.00	0.373	pCi/L	07/02/19 12:58	08/19/19 16:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.2		40 - 110					07/02/19 12:58	08/19/19 16:02	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0733	U	0.246	0.246	1.00	0.428	pCi/L	07/02/19 14:27	08/19/19 09:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.2		40 - 110					07/02/19 14:27	08/19/19 09:06	1
Y Carrier	86.4		40 - 110					07/02/19 14:27	08/19/19 09:06	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	0.0623	U	0.307	0.307	5.00	0.428	pCi/L		08/21/19 08:50	1

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

**Lab Sample ID: 180-90467-9**

Date Collected: 05/22/19 14:15

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	620		5.0	3.6	mg/L			05/30/19 15:19	5
Fluoride	1.3		0.50	0.13	mg/L			05/30/19 15:19	5
Sulfate	3100		50	19	mg/L			05/30/19 15:35	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 17:45	10
Boron	11		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 17:45	10
Barium	0.16		0.10	0.015	mg/L		05/29/19 11:24	05/31/19 17:45	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:05	1
Calcium	260		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 17:45	10
Cadmium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:45	10
Cobalt	0.0017	J	0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 17:45	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 17:45	10
Molybdenum	0.89		0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 17:45	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:45	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 17:45	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 17:45	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:45	10
Lithium	62		50	31	ug/L		05/29/19 11:24	05/31/19 17:45	10

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-9**

Date Collected: 05/22/19 14:15

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:01	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5800		50	50	mg/L			05/25/19 11:14	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1	0.1	SU			05/28/19 14:40	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.283		0.0966	0.0999	1.00	0.0962	pCi/L	05/30/19 10:35	08/13/19 23:00	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110	05/30/19 10:35	08/13/19 23:00	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.163	U *	0.283	0.283	1.00	0.480	pCi/L	05/31/19 10:52	07/23/19 14:33	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110	05/31/19 10:52	07/23/19 14:33	1
Y Carrier	76.6		40 - 110	05/31/19 10:52	07/23/19 14:33	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	U	0.299	0.300	5.00	0.480	pCi/L		08/21/19 08:50	1

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

**Lab Sample ID: 180-90467-10**

Date Collected: 05/22/19 15:20

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	40		1.0	0.71	mg/L			05/30/19 10:11	1
Fluoride	0.41		0.10	0.026	mg/L			05/30/19 10:11	1
Sulfate	99		1.0	0.38	mg/L			05/30/19 10:11	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00038	J	0.0010	0.00032	mg/L		05/29/19 11:24	05/31/19 17:55	1
Boron	0.045	J	0.080	0.030	mg/L		05/29/19 11:24	05/31/19 17:55	1
Barium	0.094		0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 17:08	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:08	1
Calcium	190		0.50	0.12	mg/L		05/29/19 11:24	05/30/19 17:08	1
Cadmium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:08	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-10**

Date Collected: 05/22/19 15:20

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.00017	J	0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 17:08	1
Chromium	0.0035		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 17:08	1
Molybdenum	0.0014	J	0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 17:08	1
Lead	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:08	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 17:08	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 17:08	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:08	1
Lithium	6.7		5.0	3.1	ug/L		05/29/19 11:24	05/30/19 17:08	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:06	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	950		10	10	mg/L			05/25/19 11:14	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			05/28/19 14:43	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0797	U	0.0788	0.0791	1.00	0.125	pCi/L	05/30/19 10:35	08/13/19 23:00	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>	<i>88.1</i>		<i>40 - 110</i>					<i>05/30/19 10:35</i>	<i>08/13/19 23:00</i>	<i>1</i>

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.412	U *	0.359	0.361	1.00	0.574	pCi/L	05/31/19 10:52	07/23/19 14:33	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>	<i>88.1</i>		<i>40 - 110</i>					<i>05/31/19 10:52</i>	<i>07/23/19 14:33</i>	<i>1</i>
<i>Y Carrier</i>	<i>71.8</i>		<i>40 - 110</i>					<i>05/31/19 10:52</i>	<i>07/23/19 14:33</i>	<i>1</i>

**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	U	0.368	0.370	5.00	0.574	pCi/L		08/21/19 08:50	1

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

**Lab Sample ID: 180-90467-11**

Date Collected: 05/22/19 11:30

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	410		5.0	3.6	mg/L			05/30/19 12:45	5

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-11**

Date Collected: 05/22/19 11:30

Matrix: Water

Date Received: 05/23/19 09:00

### Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.31	J	0.50	0.13	mg/L			05/30/19 12:45	5
Sulfate	3100		50	19	mg/L			05/30/19 13:01	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 17:58	10
Boron	11		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 17:58	10
Barium	0.018	J	0.10	0.015	mg/L		05/29/19 11:24	05/31/19 17:58	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:11	1
Calcium	410		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 17:58	10
Cadmium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:58	10
Cobalt	ND		0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 17:58	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 17:58	10
Molybdenum	0.059		0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 17:58	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:58	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 17:58	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 17:58	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 17:58	10
Lithium	ND		50	31	ug/L		05/29/19 11:24	05/31/19 17:58	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:07	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5000		40	40	mg/L			05/25/19 11:14	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			05/28/19 14:47	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0606	U	0.0575	0.0578	1.00	0.0887	pCi/L	05/30/19 10:35	08/13/19 23:00	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.6		40 - 110	05/30/19 10:35	08/13/19 23:00	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0634	U*	0.257	0.257	1.00	0.476	pCi/L	05/31/19 10:52	07/23/19 14:33	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.6		40 - 110	05/31/19 10:52	07/23/19 14:33	1
Y Carrier	76.3		40 - 110	05/31/19 10:52	07/23/19 14:33	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

## Client Sample ID: CCR-AP-5

## Lab Sample ID: 180-90467-11

Date Collected: 05/22/19 11:30

Matrix: Water

Date Received: 05/23/19 09:00

### 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	-0.00280	U	0.263	0.263	5.00	0.476	pCi/L		08/21/19 08:50	1

## Client Sample ID: CCR-AP-6

## Lab Sample ID: 180-90467-12

Date Collected: 05/21/19 14:40

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	230		2.5	1.8	mg/L			05/30/19 11:44	2.5
Fluoride	0.17	J	0.25	0.066	mg/L			05/30/19 11:44	2.5
Sulfate	1200		25	9.5	mg/L			05/30/19 11:59	25

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 18:02	10
Boron	2.9		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 18:02	10
Barium	ND		0.10	0.015	mg/L		05/29/19 11:24	05/31/19 18:02	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:15	1
Calcium	320		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 18:02	10
Cadmium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:02	10
Cobalt	0.0013	J	0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 18:02	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 18:02	10
Molybdenum	0.0067	J	0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 18:02	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:02	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 18:02	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 18:02	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:02	10
Lithium	34	J	50	31	ug/L		05/29/19 11:24	05/31/19 18:02	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:08	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2400		20	20	mg/L			05/24/19 15:09	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1	0.1	SU			05/28/19 14:49	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0195	U	0.0642	0.0643	1.00	0.119	pCi/L	05/30/19 10:35	08/14/19 06:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.5		40 - 110					05/30/19 10:35	08/14/19 06:57	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-12**

Date Collected: 05/21/19 14:40

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.237	U*	0.233	0.234	1.00	0.377	pCi/L	05/31/19 10:52	07/23/19 14:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.5		40 - 110					05/31/19 10:52	07/23/19 14:33	1
Y Carrier	87.9		40 - 110					05/31/19 10:52	07/23/19 14:33	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	0.257	U	0.242	0.243	5.00	0.377	pCi/L		08/21/19 08:50	1

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

**Lab Sample ID: 180-90467-13**

Date Collected: 05/21/19 16:00

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	500		5.0	3.6	mg/L			05/30/19 13:16	5
Fluoride	0.17	J	0.50	0.13	mg/L			05/30/19 13:16	5
Sulfate	2600		50	19	mg/L			05/30/19 13:31	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 18:05	10
Boron	5.6		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 18:05	10
Barium	0.029	J	0.10	0.015	mg/L		05/29/19 11:24	05/31/19 18:05	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:18	1
Calcium	410		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 18:05	10
Cadmium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:05	10
Cobalt	ND		0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 18:05	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 18:05	10
Molybdenum	ND		0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 18:05	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:05	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 18:05	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 18:05	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:05	10
Lithium	ND		50	31	ug/L		05/29/19 11:24	05/31/19 18:05	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:09	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4200		40	40	mg/L			05/24/19 15:09	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1	0.1	SU			05/28/19 14:51	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-13**

Date Collected: 05/21/19 16:00

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0773	U	0.198	0.198	1.00	0.416	pCi/L	07/02/19 12:58	08/19/19 16:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.1		40 - 110					07/02/19 12:58	08/19/19 16:02	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.307	U	0.258	0.260	1.00	0.412	pCi/L	07/02/19 14:27	08/19/19 09:07	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.1		40 - 110					07/02/19 14:27	08/19/19 09:07	1
Y Carrier	85.6		40 - 110					07/02/19 14:27	08/19/19 09:07	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	0.229	U	0.325	0.327	5.00	0.416	pCi/L		08/21/19 08:50	1

**Client Sample ID: FIELD BLANK 1**

**Lab Sample ID: 180-90467-14**

Date Collected: 05/20/19 15:15

Matrix: Water

Date Received: 05/23/19 09:00

**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			05/30/19 07:46	1
Fluoride	0.051	J	0.10	0.026	mg/L			05/30/19 07:46	1
Sulfate	ND		1.0	0.38	mg/L			05/30/19 07:46	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		05/29/19 11:24	05/31/19 18:08	1
Boron	ND		0.080	0.030	mg/L		05/29/19 11:24	05/31/19 18:08	1
Barium	ND		0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 17:21	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:21	1
Calcium	0.13	J	0.50	0.12	mg/L		05/29/19 11:24	05/30/19 17:21	1
Cadmium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:21	1
Cobalt	ND		0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 17:21	1
Chromium	ND		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 17:21	1
Molybdenum	ND		0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 17:21	1
Lead	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:21	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 17:21	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 17:21	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:21	1
Lithium	4.5	J	5.0	3.1	ug/L		05/29/19 11:24	05/30/19 17:21	1

Eurofins TestAmerica, Pittsburgh



# Client Sample Results

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

Job ID: 180-90467-1

## Client Sample ID: FIELD BLANK 1

Lab Sample ID: 180-90467-14

Date Collected: 05/20/19 15:15

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:11	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			05/24/19 14:29	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.9	HF	0.1	0.1	SU			05/28/19 14:53	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.119	U	0.142	0.142	1.00	0.343	pCi/L	05/31/19 08:57	08/22/19 12:21	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	05/31/19 08:57	08/22/19 12:21	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.137	U	0.199	0.199	1.00	0.334	pCi/L	05/31/19 10:52	08/22/19 09:04	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	05/31/19 10:52	08/22/19 09:04	1
Y Carrier	87.5		40 - 110	05/31/19 10:52	08/22/19 09:04	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	0.0176	U	0.244	0.244	5.00	0.343	pCi/L		08/28/19 12:52	1

## Client Sample ID: FIELD BLANK 2

Lab Sample ID: 180-90467-15

Date Collected: 05/21/19 14:50

Matrix: Water

Date Received: 05/23/19 09:00

### 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			05/30/19 08:02	1
Fluoride	0.17		0.10	0.026	mg/L			05/30/19 08:02	1
Sulfate	ND		1.0	0.38	mg/L			05/30/19 08:02	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		05/29/19 11:24	05/31/19 18:12	1
Boron	ND		0.080	0.030	mg/L		05/29/19 11:24	05/31/19 18:12	1
Barium	0.0041	J	0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 17:25	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:25	1
Calcium	ND		0.50	0.12	mg/L		05/29/19 11:24	05/30/19 17:25	1
Cadmium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:25	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

## Client Sample ID: FIELD BLANK 2

## Lab Sample ID: 180-90467-15

Date Collected: 05/21/19 14:50

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 17:25	1
Chromium	ND		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 17:25	1
Molybdenum	ND		0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 17:25	1
Lead	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:25	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 17:25	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 17:25	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 17:25	1
Lithium	4.7	J	5.0	3.1	ug/L		05/29/19 11:24	05/30/19 17:25	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:12	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			05/24/19 14:29	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.0	HF	0.1	0.1	SU			05/28/19 14:54	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0733	U	0.160	0.160	1.00	0.356	pCi/L	05/31/19 08:57	08/22/19 12:23	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.9		40 - 110	05/31/19 08:57	08/22/19 12:23	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0649	U	0.251	0.251	1.00	0.435	pCi/L	05/31/19 10:52	08/22/19 09:04	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.9		40 - 110	05/31/19 10:52	08/22/19 09:04	1
Y Carrier	87.5		40 - 110	05/31/19 10:52	08/22/19 09:04	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	-0.00841	U	0.298	0.298	5.00	0.435	pCi/L		08/28/19 12:52	1

## Client Sample ID: BLIND DUPLICATE 1

## Lab Sample ID: 180-90467-16

Date Collected: 05/20/19 00:00

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	450		5.0	3.6	mg/L			05/30/19 13:47	5

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

**Client Sample ID: BLIND DUPLICATE 1**

**Lab Sample ID: 180-90467-16**

Date Collected: 05/20/19 00:00

Matrix: Water

Date Received: 05/23/19 09:00

**Method: EPA 9056A - Anions, Ion Chromatography (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.30	J	0.50	0.13	mg/L			05/30/19 13:47	5
Sulfate	3000		50	19	mg/L			05/30/19 14:02	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 18:15	10
Boron	2.0		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 18:15	10
Barium	0.023	J	0.10	0.015	mg/L		05/29/19 11:24	05/31/19 18:15	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:35	1
Calcium	430		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 18:15	10
Cadmium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:15	10
Cobalt	ND		0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 18:15	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 18:15	10
Molybdenum	ND		0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 18:15	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:15	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 18:15	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 18:15	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:15	10
Lithium	ND		50	31	ug/L		05/29/19 11:24	05/31/19 18:15	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:13	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5200		40	40	mg/L			05/24/19 14:29	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1	0.1	SU			05/28/19 14:56	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00860	U	0.216	0.216	1.00	0.417	pCi/L	05/31/19 08:57	08/22/19 12:23	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.7		40 - 110	05/31/19 08:57	08/22/19 12:23	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.292	U	0.264	0.266	1.00	0.426	pCi/L	05/31/19 10:52	08/22/19 09:05	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.7		40 - 110	05/31/19 10:52	08/22/19 09:05	1
Y Carrier	84.1		40 - 110	05/31/19 10:52	08/22/19 09:05	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

## Client Sample ID: BLIND DUPLICATE 1

Lab Sample ID: 180-90467-16

Date Collected: 05/20/19 00:00

Matrix: Water

Date Received: 05/23/19 09:00

### 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	0.301	U	0.341	0.343	5.00	0.426	pCi/L		08/28/19 12:52	1

## Client Sample ID: BLIND DUPLICATE 2

Lab Sample ID: 180-90467-17

Date Collected: 05/22/19 00:00

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	390		5.0	3.6	mg/L			05/30/19 14:48	5
Fluoride	0.31	J	0.50	0.13	mg/L			05/30/19 14:48	5
Sulfate	2900		50	19	mg/L			05/30/19 15:03	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010	0.0032	mg/L		05/29/19 11:24	05/31/19 18:19	10
Boron	11		0.80	0.30	mg/L		05/29/19 11:24	05/31/19 18:19	10
Barium	0.020	J	0.10	0.015	mg/L		05/29/19 11:24	05/31/19 18:19	10
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 17:39	1
Calcium	420		5.0	1.2	mg/L		05/29/19 11:24	05/31/19 18:19	10
Cadmium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:19	10
Cobalt	ND		0.0050	0.00075	mg/L		05/29/19 11:24	05/31/19 18:19	10
Chromium	ND		0.020	0.015	mg/L		05/29/19 11:24	05/31/19 18:19	10
Molybdenum	0.053		0.050	0.0061	mg/L		05/29/19 11:24	05/31/19 18:19	10
Lead	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:19	10
Antimony	ND		0.020	0.0038	mg/L		05/29/19 11:24	05/31/19 18:19	10
Selenium	ND		0.050	0.026	mg/L		05/29/19 11:24	05/31/19 18:19	10
Thallium	ND		0.010	0.0013	mg/L		05/29/19 11:24	05/31/19 18:19	10
Lithium	ND		50	31	ug/L		05/29/19 11:24	05/31/19 18:19	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 16:14	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4900		40	40	mg/L			05/25/19 11:14	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			05/28/19 14:58	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.153	U	0.196	0.196	1.00	0.325	pCi/L	05/31/19 08:57	08/22/19 12:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.3		40 - 110					05/31/19 08:57	08/22/19 12:23	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90467-1

**Client Sample ID: BLIND DUPLICATE 2**

**Lab Sample ID: 180-90467-17**

Date Collected: 05/22/19 00:00

Matrix: Water

Date Received: 05/23/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.254	U	0.269	0.270	1.00	0.441	pCi/L	05/31/19 10:52	08/22/19 09:05	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	98.3		40 - 110					05/31/19 10:52	08/22/19 09:05	1
Y Carrier	86.0		40 - 110					05/31/19 10:52	08/22/19 09:05	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	0.406	U	0.333	0.334	5.00	0.441	pCi/L		08/28/19 12:52	1

# QC Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: MB 180-280113/6**  
**Matrix: Water**  
**Analysis Batch: 280113**

**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			05/30/19 05:10	1
Fluoride	ND		0.10	0.026	mg/L			05/30/19 05:10	1
Sulfate	ND		1.0	0.38	mg/L			05/30/19 05:10	1

**Lab Sample ID: LCS 180-280113/5**  
**Matrix: Water**  
**Analysis Batch: 280113**

**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	25.4		mg/L		101	80 - 120
Fluoride	1.25	1.30		mg/L		104	80 - 120
Sulfate	25.0	25.4		mg/L		102	80 - 120

**Lab Sample ID: MB 180-280114/6**  
**Matrix: Water**  
**Analysis Batch: 280114**

**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			05/30/19 05:16	1
Fluoride	ND		0.10	0.026	mg/L			05/30/19 05:16	1
Sulfate	ND		1.0	0.38	mg/L			05/30/19 05:16	1

**Lab Sample ID: LCS 180-280114/5**  
**Matrix: Water**  
**Analysis Batch: 280114**

**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	24.7		mg/L		99	80 - 120
Fluoride	1.25	1.22		mg/L		98	80 - 120
Sulfate	25.0	25.1		mg/L		100	80 - 120

**Lab Sample ID: 180-90467-2 MS**  
**Matrix: Water**  
**Analysis Batch: 280114**

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	360		6250	6510		mg/L		98	80 - 120
Fluoride	ND		313	306		mg/L		98	80 - 120
Sulfate	15000		6250	21500		mg/L		98	80 - 120

**Lab Sample ID: 180-90467-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 280114**

**Client Sample ID: CCR-LF-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	360		6250	6310		mg/L		95	80 - 120	3	15
Fluoride	ND		313	295		mg/L		95	80 - 120	3	15
Sulfate	15000		6250	21200		mg/L		93	80 - 120	2	15

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: MB 180-280038/1-A**  
**Matrix: Water**  
**Analysis Batch: 280271**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280038**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		0.010	0.0015	mg/L		05/29/19 11:24	05/30/19 15:57	1
Beryllium	ND	^	0.0010	0.00016	mg/L		05/29/19 11:24	05/30/19 15:57	1
Calcium	ND		0.50	0.12	mg/L		05/29/19 11:24	05/30/19 15:57	1
Cadmium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 15:57	1
Cobalt	ND		0.00050	0.000075	mg/L		05/29/19 11:24	05/30/19 15:57	1
Chromium	ND		0.0020	0.0015	mg/L		05/29/19 11:24	05/30/19 15:57	1
Molybdenum	ND		0.0050	0.00061	mg/L		05/29/19 11:24	05/30/19 15:57	1
Lead	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 15:57	1
Antimony	ND		0.0020	0.00038	mg/L		05/29/19 11:24	05/30/19 15:57	1
Selenium	ND		0.0050	0.0026	mg/L		05/29/19 11:24	05/30/19 15:57	1
Thallium	ND		0.0010	0.00013	mg/L		05/29/19 11:24	05/30/19 15:57	1
Lithium	ND		5.0	3.1	ug/L		05/29/19 11:24	05/30/19 15:57	1

**Lab Sample ID: LCS 180-280038/2-A**  
**Matrix: Water**  
**Analysis Batch: 280271**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280038**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Barium	1.00	1.04		mg/L		104	80 - 120
Calcium	25.0	28.3		mg/L		113	80 - 120
Cadmium	0.500	0.517		mg/L		103	80 - 120
Cobalt	0.500	0.517		mg/L		103	80 - 120
Chromium	0.500	0.514		mg/L		103	80 - 120
Molybdenum	0.500	0.516		mg/L		103	80 - 120
Lead	0.500	0.497		mg/L		99	80 - 120
Antimony	0.250	0.266		mg/L		106	80 - 120
Selenium	1.00	1.04		mg/L		104	80 - 120
Thallium	1.00	1.01		mg/L		101	80 - 120
Lithium	500	470		ug/L		94	80 - 120

**Lab Sample ID: LCS 180-280038/2-A**  
**Matrix: Water**  
**Analysis Batch: 280395**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280038**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	1.00	0.925		mg/L		93	80 - 120
Boron	1.25	1.22		mg/L		98	80 - 120

**Lab Sample ID: 180-90467-2 MS**  
**Matrix: Water**  
**Analysis Batch: 280271**

**Client Sample ID: CCR-LF-2**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280038**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Beryllium	ND	^	0.500	0.467	^	mg/L		93	75 - 125

# QC Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: 180-90467-2 MS**  
**Matrix: Water**  
**Analysis Batch: 280395**

**Client Sample ID: CCR-LF-2**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280038**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	Limits	%Rec.
	Result	Qualifier	Added	Result	Qualifier					
Arsenic	ND		1.00	1.04		mg/L		104	75 - 125	
Boron	5.4		1.25	6.59	4	mg/L		95	75 - 125	
Barium	ND	F2 F1	1.00	0.407	F1	mg/L		41	75 - 125	
Calcium	420		25.0	442	4	mg/L		92	75 - 125	
Cadmium	0.0044	J	0.500	0.515		mg/L		102	75 - 125	
Cobalt	0.0098		0.500	0.516		mg/L		101	75 - 125	
Chromium	ND		0.500	0.500		mg/L		100	75 - 125	
Molybdenum	ND		0.500	0.544		mg/L		109	75 - 125	
Lead	ND		0.500	0.422		mg/L		84	75 - 125	
Antimony	ND		0.250	0.273		mg/L		109	75 - 125	
Selenium	ND		1.00	0.977		mg/L		98	75 - 125	
Thallium	ND		1.00	1.03		mg/L		103	75 - 125	
Lithium	ND		500	520		ug/L		104	75 - 125	

**Lab Sample ID: 180-90467-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 280271**

**Client Sample ID: CCR-LF-2**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280038**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
Beryllium	ND	^	0.500	0.486	^	mg/L		97	75 - 125	4	20

**Lab Sample ID: 180-90467-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 280395**

**Client Sample ID: CCR-LF-2**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280038**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
Arsenic	ND		1.00	1.03		mg/L		103	75 - 125	1	20
Boron	5.4		1.25	6.66	4	mg/L		100	75 - 125	1	20
Barium	ND	F2 F1	1.00	0.530	F2 F1	mg/L		53	75 - 125	26	20
Calcium	420		25.0	454	4	mg/L		141	75 - 125	3	20
Cadmium	0.0044	J	0.500	0.518		mg/L		103	75 - 125	1	20
Cobalt	0.0098		0.500	0.512		mg/L		100	75 - 125	1	20
Chromium	ND		0.500	0.496		mg/L		99	75 - 125	1	20
Molybdenum	ND		0.500	0.533		mg/L		107	75 - 125	2	20
Lead	ND		0.500	0.430		mg/L		86	75 - 125	2	20
Antimony	ND		0.250	0.271		mg/L		109	75 - 125	1	20
Selenium	ND		1.00	0.971		mg/L		97	75 - 125	1	20
Thallium	ND		1.00	1.00		mg/L		100	75 - 125	3	20
Lithium	ND		500	519		ug/L		104	75 - 125	0	20

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

**Lab Sample ID: MB 180-280150/1-A**  
**Matrix: Water**  
**Analysis Batch: 280376**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 280150**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	ND		0.00020	0.00010	mg/L		05/30/19 09:31	05/31/19 15:43	1

Eurofins TestAmerica, Pittsburgh



# QC Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: LCS 180-280150/2-A**  
**Matrix: Water**  
**Analysis Batch: 280376**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 280150**  
**%Rec.**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.00250	0.00243		mg/L	-	97	80 - 120

**Lab Sample ID: 180-90467-2 MS**  
**Matrix: Water**  
**Analysis Batch: 280376**

**Client Sample ID: CCR-LF-2**  
**Prep Type: Total/NA**  
**Prep Batch: 280150**  
**%Rec.**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		0.00100	0.000847		mg/L	-	85	75 - 125

**Lab Sample ID: 180-90467-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 280376**

**Client Sample ID: CCR-LF-2**  
**Prep Type: Total/NA**  
**Prep Batch: 280150**  
**%Rec.**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		0.00100	0.000896		mg/L	-	90	75 - 125	6	20

## Method: EPA 9040C - pH

**Lab Sample ID: LCS 180-279863/1**  
**Matrix: Water**  
**Analysis Batch: 279863**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
pH	7.00	7.0		SU	-	100	99 - 101

**Lab Sample ID: 180-90467-2 DU**  
**Matrix: Water**  
**Analysis Batch: 279863**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
pH	6.8	HF	6.8	HF	SU	-	0.7	2

**Lab Sample ID: 180-90467-10 DU**  
**Matrix: Water**  
**Analysis Batch: 279863**

**Client Sample ID: CCR-AP-4R**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
pH	7.4	HF	7.4		SU	-	0.1	2

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 180-279723/2**  
**Matrix: Water**  
**Analysis Batch: 279723**

**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	-		05/24/19 14:29	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90467-1

## Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 180-279723/1  
 Matrix: Water  
 Analysis Batch: 279723

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	201	208		mg/L		103	80 - 120

Lab Sample ID: MB 180-279730/2  
 Matrix: Water  
 Analysis Batch: 279730

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			05/24/19 15:09	1

Lab Sample ID: LCS 180-279730/1  
 Matrix: Water  
 Analysis Batch: 279730

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	201	200		mg/L		100	80 - 120

Lab Sample ID: MB 180-279771/2  
 Matrix: Water  
 Analysis Batch: 279771

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			05/25/19 11:14	1

Lab Sample ID: LCS 180-279771/1  
 Matrix: Water  
 Analysis Batch: 279771

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	201	184		mg/L		92	80 - 120

Lab Sample ID: 180-90467-2 DU  
 Matrix: Water  
 Analysis Batch: 279771

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	21000		22700		mg/L		9	10

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

Lab Sample ID: MB 160-430235/23-A  
 Matrix: Water  
 Analysis Batch: 439426

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 430235

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.005455	U	0.0525	0.0525	1.00	0.107	pCi/L	05/30/19 10:35	08/13/19 23:00	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.9		40 - 110	05/30/19 10:35	08/13/19 23:00	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: LCS 160-430235/1-A**  
**Matrix: Water**  
**Analysis Batch: 439308**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 430235**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-226	11.4	8.579		0.902	1.00	0.103	pCi/L	76	75 - 125	
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>LCS Limits</b>							
Ba Carrier	95.2		40 - 110							

**Lab Sample ID: MB 160-430329/23-A**  
**Matrix: Water**  
**Analysis Batch: 440198**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 430329**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.06585	U	0.179	0.180	1.00	0.381	pCi/L	05/31/19 08:57	08/22/19 16:28	1
<b>Carrier</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>							
Ba Carrier	96.3		40 - 110							
								<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
								05/31/19 08:57	08/22/19 16:28	1

**Lab Sample ID: LCS 160-430329/1-A**  
**Matrix: Water**  
**Analysis Batch: 440197**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 430329**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-226	11.4	10.61		1.34	1.00	0.340	pCi/L	93	75 - 125	
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>LCS Limits</b>							
Ba Carrier	105		40 - 110							

**Lab Sample ID: LCSD 160-430329/2-A**  
**Matrix: Water**  
**Analysis Batch: 440197**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 430329**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit	
Radium-226	11.4	10.34		1.33	1.00	0.343	pCi/L	91	75 - 125	0.10	1	
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>LCSD Limits</b>									
Ba Carrier	96.9		40 - 110									

**Lab Sample ID: MB 160-433443/23-A**  
**Matrix: Water**  
**Analysis Batch: 439859**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433443**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.1063	U	0.122	0.122	1.00	0.318	pCi/L	07/02/19 12:58	08/19/19 18:00	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90467-1

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

Lab Sample ID: MB 160-433443/23-A  
 Matrix: Water  
 Analysis Batch: 439859

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 433443

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.7		40 - 110	07/02/19 12:58	08/19/19 18:00	1

Lab Sample ID: LCS 160-433443/1-A  
 Matrix: Water  
 Analysis Batch: 439859

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 433443

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.36		1.34	1.00	0.411	pCi/L	91	75 - 125

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	92.7		40 - 110

Lab Sample ID: 180-90467-2 DU  
 Matrix: Water  
 Analysis Batch: 439901

Client Sample ID: CCR-LF-2  
 Prep Type: Total/NA  
 Prep Batch: 433443

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-226	0.593		0.4458		0.256	1.00	0.322	pCi/L	0.27	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	86.7		40 - 110

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

Lab Sample ID: MB 160-430397/23-A  
 Matrix: Water  
 Analysis Batch: 435974

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 430397

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.03968	U	0.302	0.302	1.00	0.553	pCi/L	05/31/19 10:52	07/23/19 14:34	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.9		40 - 110	05/31/19 10:52	07/23/19 14:34	1
Y Carrier	62.8		40 - 110	05/31/19 10:52	07/23/19 14:34	1

Lab Sample ID: LCS 160-430397/1-A  
 Matrix: Water  
 Analysis Batch: 436112

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 430397

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.00	6.483	*	0.923	1.00	0.554	pCi/L	72	75 - 125

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: LCS 160-430397/1-A**  
**Matrix: Water**  
**Analysis Batch: 436112**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 430397**

Carrier	LCS		Limits
	%Yield	Qualifier	
Ba Carrier	95.2		40 - 110
Y Carrier	65.8		40 - 110

**Lab Sample ID: MB 160-430398/23-A**  
**Matrix: Water**  
**Analysis Batch: 440197**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 430398**

Analyte	MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.1328	U	0.223	0.223	1.00	0.376	pCi/L	05/31/19 10:52	08/22/19 09:10	1

Carrier	MB		Limits	Prepared	Analyzed	Dil Fac
	%Yield	Qualifier				
Ba Carrier	96.3		40 - 110	05/31/19 10:52	08/22/19 09:10	1
Y Carrier	87.9		40 - 110	05/31/19 10:52	08/22/19 09:10	1

**Lab Sample ID: LCS 160-430398/1-A**  
**Matrix: Water**  
**Analysis Batch: 440196**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 430398**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits

Carrier	LCS		Limits
	%Yield	Qualifier	
Ba Carrier	105		40 - 110
Y Carrier	86.7		40 - 110

**Lab Sample ID: LCSD 160-430398/2-A**  
**Matrix: Water**  
**Analysis Batch: 440196**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 430398**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit

Carrier	LCSD		Limits
	%Yield	Qualifier	
Ba Carrier	96.9		40 - 110
Y Carrier	85.2		40 - 110

**Lab Sample ID: MB 160-433455/23-A**  
**Matrix: Water**  
**Analysis Batch: 439909**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433455**

Analyte	MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.4270		0.265	0.267	1.00	0.403	pCi/L	07/02/19 14:27	08/19/19 09:13	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90467-1

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

**Lab Sample ID: MB 160-433455/23-A**  
**Matrix: Water**  
**Analysis Batch: 439909**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433455**

Carrier	MB MB		Limits
	%Yield	Qualifier	
Ba Carrier	92.7		40 - 110
Y Carrier	84.9		40 - 110

Prepared	Analyzed	Dil Fac
07/02/19 14:27	08/19/19 09:13	1
07/02/19 14:27	08/19/19 09:13	1

**Lab Sample ID: LCS 160-433455/1-A**  
**Matrix: Water**  
**Analysis Batch: 439946**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 433455**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-228	8.92	10.43		1.19	1.00	0.411	pCi/L	117	75 - 125	

Carrier	LCS LCS		Limits
	%Yield	Qualifier	
Ba Carrier	92.7		40 - 110
Y Carrier	86.7		40 - 110

**Lab Sample ID: 180-90467-2 DU**  
**Matrix: Water**  
**Analysis Batch: 439946**

**Client Sample ID: CCR-LF-2**  
**Prep Type: Total/NA**  
**Prep Batch: 433455**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	
									RER	Limit
Radium-228	2.31		2.285		0.460	1.00	0.438	pCi/L	0.03	1

Carrier	DU DU		Limits
	%Yield	Qualifier	
Ba Carrier	86.7		40 - 110
Y Carrier	84.9		40 - 110

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

**Lab Sample ID: 180-90467-2 DU**  
**Matrix: Water**  
**Analysis Batch: 440111**

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

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	
									RER	Limit
Combined Radium 226 + 228	2.90		2.731		0.526	5.00	0.438	pCi/L	0.16	

# QC Association Summary

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

Job ID: 180-90467-1

## HPLC/IC

### Analysis Batch: 280113

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total/NA	Water	EPA 9056A	
180-90467-1	CCR-LF-1	Total/NA	Water	EPA 9056A	
180-90467-3	CCR-LF-3	Total/NA	Water	EPA 9056A	
180-90467-3	CCR-LF-3	Total/NA	Water	EPA 9056A	
180-90467-4	CCR-LF-4	Total/NA	Water	EPA 9056A	
180-90467-4	CCR-LF-4	Total/NA	Water	EPA 9056A	
180-90467-5	CCR-LF-5	Total/NA	Water	EPA 9056A	
180-90467-5	CCR-LF-5	Total/NA	Water	EPA 9056A	
180-90467-6	CCR-LF-6	Total/NA	Water	EPA 9056A	
180-90467-6	CCR-LF-6	Total/NA	Water	EPA 9056A	
180-90467-9	CCR-AP-3R	Total/NA	Water	EPA 9056A	
180-90467-9	CCR-AP-3R	Total/NA	Water	EPA 9056A	
180-90467-10	CCR-AP-4R	Total/NA	Water	EPA 9056A	
180-90467-11	CCR-AP-5	Total/NA	Water	EPA 9056A	
180-90467-11	CCR-AP-5	Total/NA	Water	EPA 9056A	
180-90467-12	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-90467-12	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-90467-13	CCR-AP-7R	Total/NA	Water	EPA 9056A	
180-90467-13	CCR-AP-7R	Total/NA	Water	EPA 9056A	
180-90467-16	BLIND DUPLICATE 1	Total/NA	Water	EPA 9056A	
180-90467-16	BLIND DUPLICATE 1	Total/NA	Water	EPA 9056A	
180-90467-17	BLIND DUPLICATE 2	Total/NA	Water	EPA 9056A	
180-90467-17	BLIND DUPLICATE 2	Total/NA	Water	EPA 9056A	
MB 180-280113/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-280113/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

### Analysis Batch: 280114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-2	CCR-LF-2	Total/NA	Water	EPA 9056A	
180-90467-2	CCR-LF-2	Total/NA	Water	EPA 9056A	
180-90467-7	CCR-BK-1R	Total/NA	Water	EPA 9056A	
180-90467-8	CCR-BK-2	Total/NA	Water	EPA 9056A	
180-90467-14	FIELD BLANK 1	Total/NA	Water	EPA 9056A	
180-90467-15	FIELD BLANK 2	Total/NA	Water	EPA 9056A	
MB 180-280114/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-280114/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-90467-2 MS	CCR-LF-2	Total/NA	Water	EPA 9056A	
180-90467-2 MSD	CCR-LF-2	Total/NA	Water	EPA 9056A	

## Metals

### Prep Batch: 280038

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total Recoverable	Water	3005A	
180-90467-2	CCR-LF-2	Total Recoverable	Water	3005A	
180-90467-3	CCR-LF-3	Total Recoverable	Water	3005A	
180-90467-4	CCR-LF-4	Total Recoverable	Water	3005A	
180-90467-5	CCR-LF-5	Total Recoverable	Water	3005A	
180-90467-6	CCR-LF-6	Total Recoverable	Water	3005A	
180-90467-7	CCR-BK-1R	Total Recoverable	Water	3005A	
180-90467-8	CCR-BK-2	Total Recoverable	Water	3005A	

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-90467-1

## Metals (Continued)

### Prep Batch: 280038 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-9	CCR-AP-3R	Total Recoverable	Water	3005A	
180-90467-10	CCR-AP-4R	Total Recoverable	Water	3005A	
180-90467-11	CCR-AP-5	Total Recoverable	Water	3005A	
180-90467-12	CCR-AP-6	Total Recoverable	Water	3005A	
180-90467-13	CCR-AP-7R	Total Recoverable	Water	3005A	
180-90467-14	FIELD BLANK 1	Total Recoverable	Water	3005A	
180-90467-15	FIELD BLANK 2	Total Recoverable	Water	3005A	
180-90467-16	BLIND DUPLICATE 1	Total Recoverable	Water	3005A	
180-90467-17	BLIND DUPLICATE 2	Total Recoverable	Water	3005A	
MB 180-280038/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-280038/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-90467-2 MS	CCR-LF-2	Total Recoverable	Water	3005A	
180-90467-2 MSD	CCR-LF-2	Total Recoverable	Water	3005A	

### Prep Batch: 280150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total/NA	Water	7470A	
180-90467-2	CCR-LF-2	Total/NA	Water	7470A	
180-90467-3	CCR-LF-3	Total/NA	Water	7470A	
180-90467-4	CCR-LF-4	Total/NA	Water	7470A	
180-90467-5	CCR-LF-5	Total/NA	Water	7470A	
180-90467-6	CCR-LF-6	Total/NA	Water	7470A	
180-90467-7	CCR-BK-1R	Total/NA	Water	7470A	
180-90467-8	CCR-BK-2	Total/NA	Water	7470A	
180-90467-9	CCR-AP-3R	Total/NA	Water	7470A	
180-90467-10	CCR-AP-4R	Total/NA	Water	7470A	
180-90467-11	CCR-AP-5	Total/NA	Water	7470A	
180-90467-12	CCR-AP-6	Total/NA	Water	7470A	
180-90467-13	CCR-AP-7R	Total/NA	Water	7470A	
180-90467-14	FIELD BLANK 1	Total/NA	Water	7470A	
180-90467-15	FIELD BLANK 2	Total/NA	Water	7470A	
180-90467-16	BLIND DUPLICATE 1	Total/NA	Water	7470A	
180-90467-17	BLIND DUPLICATE 2	Total/NA	Water	7470A	
MB 180-280150/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-280150/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-90467-2 MS	CCR-LF-2	Total/NA	Water	7470A	
180-90467-2 MSD	CCR-LF-2	Total/NA	Water	7470A	

### Analysis Batch: 280271

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total Recoverable	Water	EPA 6020A	280038
180-90467-2	CCR-LF-2	Total Recoverable	Water	EPA 6020A	280038
180-90467-3	CCR-LF-3	Total Recoverable	Water	EPA 6020A	280038
180-90467-4	CCR-LF-4	Total Recoverable	Water	EPA 6020A	280038
180-90467-5	CCR-LF-5	Total Recoverable	Water	EPA 6020A	280038
180-90467-6	CCR-LF-6	Total Recoverable	Water	EPA 6020A	280038
180-90467-7	CCR-BK-1R	Total Recoverable	Water	EPA 6020A	280038
180-90467-8	CCR-BK-2	Total Recoverable	Water	EPA 6020A	280038
180-90467-9	CCR-AP-3R	Total Recoverable	Water	EPA 6020A	280038
180-90467-10	CCR-AP-4R	Total Recoverable	Water	EPA 6020A	280038
180-90467-11	CCR-AP-5	Total Recoverable	Water	EPA 6020A	280038

Eurofins TestAmerica, Pittsburgh



# QC Association Summary

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

Job ID: 180-90467-1

## Metals (Continued)

### Analysis Batch: 280271 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-12	CCR-AP-6	Total Recoverable	Water	EPA 6020A	280038
180-90467-13	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	280038
180-90467-14	FIELD BLANK 1	Total Recoverable	Water	EPA 6020A	280038
180-90467-15	FIELD BLANK 2	Total Recoverable	Water	EPA 6020A	280038
180-90467-16	BLIND DUPLICATE 1	Total Recoverable	Water	EPA 6020A	280038
180-90467-17	BLIND DUPLICATE 2	Total Recoverable	Water	EPA 6020A	280038
MB 180-280038/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	280038
LCS 180-280038/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280038
180-90467-2 MS	CCR-LF-2	Total Recoverable	Water	EPA 6020A	280038
180-90467-2 MSD	CCR-LF-2	Total Recoverable	Water	EPA 6020A	280038

### Analysis Batch: 280376

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total/NA	Water	EPA 7470A	280150
180-90467-2	CCR-LF-2	Total/NA	Water	EPA 7470A	280150
180-90467-3	CCR-LF-3	Total/NA	Water	EPA 7470A	280150
180-90467-4	CCR-LF-4	Total/NA	Water	EPA 7470A	280150
180-90467-5	CCR-LF-5	Total/NA	Water	EPA 7470A	280150
180-90467-6	CCR-LF-6	Total/NA	Water	EPA 7470A	280150
180-90467-7	CCR-BK-1R	Total/NA	Water	EPA 7470A	280150
180-90467-8	CCR-BK-2	Total/NA	Water	EPA 7470A	280150
180-90467-9	CCR-AP-3R	Total/NA	Water	EPA 7470A	280150
180-90467-10	CCR-AP-4R	Total/NA	Water	EPA 7470A	280150
180-90467-11	CCR-AP-5	Total/NA	Water	EPA 7470A	280150
180-90467-12	CCR-AP-6	Total/NA	Water	EPA 7470A	280150
180-90467-13	CCR-AP-7R	Total/NA	Water	EPA 7470A	280150
180-90467-14	FIELD BLANK 1	Total/NA	Water	EPA 7470A	280150
180-90467-15	FIELD BLANK 2	Total/NA	Water	EPA 7470A	280150
180-90467-16	BLIND DUPLICATE 1	Total/NA	Water	EPA 7470A	280150
180-90467-17	BLIND DUPLICATE 2	Total/NA	Water	EPA 7470A	280150
MB 180-280150/1-A	Method Blank	Total/NA	Water	EPA 7470A	280150
LCS 180-280150/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	280150
180-90467-2 MS	CCR-LF-2	Total/NA	Water	EPA 7470A	280150
180-90467-2 MSD	CCR-LF-2	Total/NA	Water	EPA 7470A	280150

### Analysis Batch: 280395

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total Recoverable	Water	EPA 6020A	280038
180-90467-2	CCR-LF-2	Total Recoverable	Water	EPA 6020A	280038
180-90467-3	CCR-LF-3	Total Recoverable	Water	EPA 6020A	280038
180-90467-4	CCR-LF-4	Total Recoverable	Water	EPA 6020A	280038
180-90467-5	CCR-LF-5	Total Recoverable	Water	EPA 6020A	280038
180-90467-6	CCR-LF-6	Total Recoverable	Water	EPA 6020A	280038
180-90467-7	CCR-BK-1R	Total Recoverable	Water	EPA 6020A	280038
180-90467-8	CCR-BK-2	Total Recoverable	Water	EPA 6020A	280038
180-90467-9	CCR-AP-3R	Total Recoverable	Water	EPA 6020A	280038
180-90467-10	CCR-AP-4R	Total Recoverable	Water	EPA 6020A	280038
180-90467-11	CCR-AP-5	Total Recoverable	Water	EPA 6020A	280038
180-90467-12	CCR-AP-6	Total Recoverable	Water	EPA 6020A	280038
180-90467-13	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	280038
180-90467-14	FIELD BLANK 1	Total Recoverable	Water	EPA 6020A	280038

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-90467-1

## Metals (Continued)

### Analysis Batch: 280395 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-15	FIELD BLANK 2	Total Recoverable	Water	EPA 6020A	280038
180-90467-16	BLIND DUPLICATE 1	Total Recoverable	Water	EPA 6020A	280038
180-90467-17	BLIND DUPLICATE 2	Total Recoverable	Water	EPA 6020A	280038
LCS 180-280038/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280038
180-90467-2 MS	CCR-LF-2	Total Recoverable	Water	EPA 6020A	280038
180-90467-2 MSD	CCR-LF-2	Total Recoverable	Water	EPA 6020A	280038

## General Chemistry

### Analysis Batch: 279723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total/NA	Water	SM 2540C	
180-90467-3	CCR-LF-3	Total/NA	Water	SM 2540C	
180-90467-5	CCR-LF-5	Total/NA	Water	SM 2540C	
180-90467-6	CCR-LF-6	Total/NA	Water	SM 2540C	
180-90467-14	FIELD BLANK 1	Total/NA	Water	SM 2540C	
180-90467-15	FIELD BLANK 2	Total/NA	Water	SM 2540C	
180-90467-16	BLIND DUPLICATE 1	Total/NA	Water	SM 2540C	
MB 180-279723/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-279723/1	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 279730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-4	CCR-LF-4	Total/NA	Water	SM 2540C	
180-90467-7	CCR-BK-1R	Total/NA	Water	SM 2540C	
180-90467-8	CCR-BK-2	Total/NA	Water	SM 2540C	
180-90467-12	CCR-AP-6	Total/NA	Water	SM 2540C	
180-90467-13	CCR-AP-7R	Total/NA	Water	SM 2540C	
MB 180-279730/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-279730/1	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 279771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-2	CCR-LF-2	Total/NA	Water	SM 2540C	
180-90467-9	CCR-AP-3R	Total/NA	Water	SM 2540C	
180-90467-10	CCR-AP-4R	Total/NA	Water	SM 2540C	
180-90467-11	CCR-AP-5	Total/NA	Water	SM 2540C	
180-90467-17	BLIND DUPLICATE 2	Total/NA	Water	SM 2540C	
MB 180-279771/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-279771/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-90467-2 DU	CCR-LF-2	Total/NA	Water	SM 2540C	

### Analysis Batch: 279863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total/NA	Water	EPA 9040C	
180-90467-2	CCR-LF-2	Total/NA	Water	EPA 9040C	
180-90467-3	CCR-LF-3	Total/NA	Water	EPA 9040C	
180-90467-4	CCR-LF-4	Total/NA	Water	EPA 9040C	
180-90467-5	CCR-LF-5	Total/NA	Water	EPA 9040C	
180-90467-6	CCR-LF-6	Total/NA	Water	EPA 9040C	
180-90467-7	CCR-BK-1R	Total/NA	Water	EPA 9040C	

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-90467-1

## General Chemistry (Continued)

### Analysis Batch: 279863 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-8	CCR-BK-2	Total/NA	Water	EPA 9040C	
180-90467-9	CCR-AP-3R	Total/NA	Water	EPA 9040C	
180-90467-10	CCR-AP-4R	Total/NA	Water	EPA 9040C	
180-90467-11	CCR-AP-5	Total/NA	Water	EPA 9040C	
180-90467-12	CCR-AP-6	Total/NA	Water	EPA 9040C	
180-90467-13	CCR-AP-7R	Total/NA	Water	EPA 9040C	
180-90467-14	FIELD BLANK 1	Total/NA	Water	EPA 9040C	
180-90467-15	FIELD BLANK 2	Total/NA	Water	EPA 9040C	
180-90467-16	BLIND DUPLICATE 1	Total/NA	Water	EPA 9040C	
180-90467-17	BLIND DUPLICATE 2	Total/NA	Water	EPA 9040C	
LCS 180-279863/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-90467-2 DU	CCR-LF-2	Total/NA	Water	EPA 9040C	
180-90467-10 DU	CCR-AP-4R	Total/NA	Water	EPA 9040C	

## Rad

### Prep Batch: 430235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-3	CCR-LF-3	Total/NA	Water	PrecSep-21	
180-90467-5	CCR-LF-5	Total/NA	Water	PrecSep-21	
180-90467-6	CCR-LF-6	Total/NA	Water	PrecSep-21	
180-90467-7	CCR-BK-1R	Total/NA	Water	PrecSep-21	
180-90467-9	CCR-AP-3R	Total/NA	Water	PrecSep-21	
180-90467-10	CCR-AP-4R	Total/NA	Water	PrecSep-21	
180-90467-11	CCR-AP-5	Total/NA	Water	PrecSep-21	
180-90467-12	CCR-AP-6	Total/NA	Water	PrecSep-21	
MB 160-430235/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-430235/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 430329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-14	FIELD BLANK 1	Total/NA	Water	PrecSep-21	
180-90467-15	FIELD BLANK 2	Total/NA	Water	PrecSep-21	
180-90467-16	BLIND DUPLICATE 1	Total/NA	Water	PrecSep-21	
180-90467-17	BLIND DUPLICATE 2	Total/NA	Water	PrecSep-21	
MB 160-430329/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-430329/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-430329/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 430397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-3	CCR-LF-3	Total/NA	Water	PrecSep_0	
180-90467-5	CCR-LF-5	Total/NA	Water	PrecSep_0	
180-90467-6	CCR-LF-6	Total/NA	Water	PrecSep_0	
180-90467-7	CCR-BK-1R	Total/NA	Water	PrecSep_0	
180-90467-9	CCR-AP-3R	Total/NA	Water	PrecSep_0	
180-90467-10	CCR-AP-4R	Total/NA	Water	PrecSep_0	
180-90467-11	CCR-AP-5	Total/NA	Water	PrecSep_0	
180-90467-12	CCR-AP-6	Total/NA	Water	PrecSep_0	
MB 160-430397/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-430397/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-90467-1

## Rad

### Prep Batch: 430398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-14	FIELD BLANK 1	Total/NA	Water	PrecSep_0	
180-90467-15	FIELD BLANK 2	Total/NA	Water	PrecSep_0	
180-90467-16	BLIND DUPLICATE 1	Total/NA	Water	PrecSep_0	
180-90467-17	BLIND DUPLICATE 2	Total/NA	Water	PrecSep_0	
MB 160-430398/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-430398/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-430398/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

### Prep Batch: 433443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total/NA	Water	PrecSep-21	
180-90467-2	CCR-LF-2	Total/NA	Water	PrecSep-21	
180-90467-4	CCR-LF-4	Total/NA	Water	PrecSep-21	
180-90467-8	CCR-BK-2	Total/NA	Water	PrecSep-21	
180-90467-13	CCR-AP-7R	Total/NA	Water	PrecSep-21	
MB 160-433443/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-433443/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
180-90467-2 DU	CCR-LF-2	Total/NA	Water	PrecSep-21	

### Prep Batch: 433455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90467-1	CCR-LF-1	Total/NA	Water	PrecSep_0	
180-90467-2	CCR-LF-2	Total/NA	Water	PrecSep_0	
180-90467-4	CCR-LF-4	Total/NA	Water	PrecSep_0	
180-90467-8	CCR-BK-2	Total/NA	Water	PrecSep_0	
180-90467-13	CCR-AP-7R	Total/NA	Water	PrecSep_0	
MB 160-433455/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-433455/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
180-90467-2 DU	CCR-LF-2	Total/NA	Water	PrecSep_0	

**Chain of Custody Record**

<b>Client Information</b>		Lab PIV: Bortot, Veronica		Carrier Tracking No(s):	
Client Contact: Angela Cashon Scheller		E-Mail: veronica.bortot@testamericainc.com		COC No: 180-49738-8017.1	
Company: Vectren Corporation		Address: PO BOX 209		Page: Page 1 of 1	
City: Evansville		State, Zip: IN, 47702		Job #:	
Phone: 864-214-8750(Tel)		Email: aacscheller@vectren.com		Preservation Codes:	
Project Name: CCR Groundwater Monitoring - AB Brown		Project #: 18016014		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Site: AB Brown		SSOW#:		Other:	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested	Total Number of Containers	Special Instructions/Note:
CCR-AP-2L CCR-AP-6	5-21-19	1440	G	Water	X	X	9315_Ra226, 9320_Ra228	5	Appendix III & Appendix IV analytes needed: No Sb, Ve, Tl
CCR-AP-3L CCR-AP-7R	5-21-19	1600	G	Water			9404C, 9056A_ORGFM_28D		
CCR-AP-8 Field Blank 1	5-20-19	1515	G	Water			6020A, 7470A		
CCR-AP-9 Field Blank 2	5-21-19	1450	G	Water			2540C, Calcd - TDS		
CCR-AP-10 Blind Duplicate 1	5-20-19	-	G	Water					
CCR-AP- Blind Duplicate 2	5-22-19	-	G	Water					
MSMSD	5-22-19	1320	G	Water					

**Possible Hazard Identification**  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Radiological  
 Deliverable Requested: I, II, III, IV, Other (specify)

**Empty Kit Relinquished by:** \_\_\_\_\_ Date: \_\_\_\_\_  
**Relinquished by:** Jacob Winsett Date: 5-22-19/1830 Company: ATC  
**Relinquished by:** \_\_\_\_\_ Date: \_\_\_\_\_ Company: \_\_\_\_\_  
**Relinquished by:** \_\_\_\_\_ Date: \_\_\_\_\_ Company: \_\_\_\_\_

**Sample Disposal (A fee may be assessed if samples are retained longer than 30 days):**  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_  
 Special Instructions/QC Requirements: \_\_\_\_\_

**Received by:** \_\_\_\_\_ Date/Time: \_\_\_\_\_  
**Received by:** Judy Watson Date/Time: 5-23-19 Company: APITTT  
**Received by:** \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Cooler Temperature(s) °C and Other Remarks: \_\_\_\_\_



**Chain of Custody Record**

<b>Client Information</b>		Sampler: <i>Jacob Winseth</i>		Lab PM: <i>Bortol, Veronica</i>		Carrier Tracking No(s):		COC No: 180-49738-8017.1	
Client Contact: <i>Angela Casbon Scheller</i>		Phone: <i>(812) 208-9422</i>		E-Mail: <i>veronica.bortol@testamericainc.com</i>				Page: Page 1 of 1	
Company: <i>Vectren Corporation</i>		Address: <i>PO BOX 209</i>		City: <i>Evansville</i>		State: <i>IN</i>		Zip: <i>47702</i>	
Phone: <i>864-214-8750(Tel)</i>		PO #: <i>Standard</i>		Purchase Order Requested		WO #:		Preservation Codes:	
Email: <i>acscheller@vectren.com</i>		Project #: <i>18016014</i>		Project Name: <i>CCR Groundwater Monitoring - AB Brown</i>		Site:		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:	
<b>Sample Identification</b>		<b>Sample Date</b>		<b>Sample Time</b>		<b>Sample Type (C=Comp, G=grab)</b>		<b>Matrix (W=water, S=solid, O=soil, BT=Tissue, A=Air)</b>	
CCR-AP-21		5-20-19		1500		G		Water	
CCR-AP-31		5-22-19		1320				Water	
CCR-AP-8		5-20-19		1335				Water	
CCR-AP-9		5-21-19		1305				Water	
CCR-AP-10		5-20-19		1155				Water	
CCR-AP-11		5-20-19		1245				Water	
CCR-BK-1R		5-21-19		1135					
CCR-BK-2		5-21-19		1040					
CCR-AP-3R		5-22-19		1415					
CCR-AP-4R		5-22-19		1520					
CCR-AP-5		5-22-19		1130					
<b>Possible Hazard Identification</b>		<input checked="" type="checkbox"/> Non-Hazard		<input type="checkbox"/> Flammable		<input checked="" type="checkbox"/> Skin Irritant		<input type="checkbox"/> Radiological	
Deliverable Requested: I, II, III, (IV) Other (specify)		<input type="checkbox"/> Poison B		<input type="checkbox"/> Unknown		<input type="checkbox"/> Radiological			
<b>Analysis Requested</b>		Form MS/MSD (Yes or No)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Total Number of containers	
		9315_Ra226_9320_Ra228		X		X		5	
		9040C_9056A_ORGFM_28D		X		X			
		620A_7470A		X		X			
		2540C_Calcd - TDS		X		X			
								Special Instructions/Note: Appendix III & Appendix IV analytes needed; No Sb, Ve, Tl	
<b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>		<input type="checkbox"/> Return To Client		<input type="checkbox"/> Disposal By Lab		<input type="checkbox"/> Archive For		Months	
Special Instructions/QC Requirements:		Time:		Date:		Method of Shipment:			
Relinquished by: <i>Jacob Winseth</i>		Date/Time: <i>5-22-19/1830</i>		Company: <i>ATC</i>		Received by: <i>Fedex</i>		Date/Time: <i>5-23-19</i>	
Relinquished by:		Date/Time:		Company:		Received by: <i>Juhlu Water</i>		Date/Time: <i>900</i>	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:					



ORIGIN ID:EVVA (812) 477-1176  
BRIAN KLEEMAN

1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

C  
BIL

100

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

PITTSBURGH PA 15238

(412) 963-7058  
INV. PN# 170LF00732  
PO:

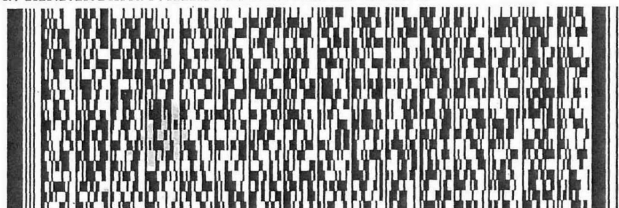
REF: PN# 170LF00732

DEPT:



555J1D66G123AD

FedEx Ship Manager - Print Your Label(s)



FedEx Express



415101501070100

THU - 23 MAY 3:00P

STANDARD OVERNIGHT

4 of 4

MPS# 7752 9010 3838

0263

Mstr# 7752 9010 3415

0201

15238

PA-US

PIT

NA AGCA

Uncorrected temp  
Thermometer ID

4.3 °C

10

CF 0 Initials

TJ

PT-WI-SR-001 effective 11/8/18



5/22/2019

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

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

ORIGIN ID:EVVA (812) 477-1176  
 BRIAN KLEEMAN

1149 WEDEKING AVENUE  
 BUILDING D, SUITE 2  
 EVANSVILLE, IN 47715  
 UNITED STATES US

SHIP DATE: 22MAY19  
 ACTWGT: 45.00 LB  
 CAD: 106997842/INET4100  
 DIMS: 18x13x10 IN

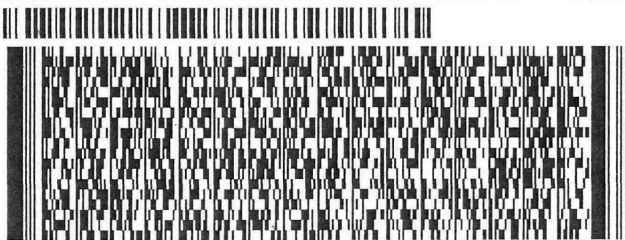
BILL SENDER

TO **VERONICA BORTOT**  
**TESTAMERICA**  
**301 ALPHA DRIVE**

**PITTSBURGH PA 15238**

(412) 963-7058 REF: PN# 170LF00732  
 INV: PN# 170LF00732  
 PO: DEPT:

565.11/DC66C/23AD



FedEx Ship Manager - Print Your Label(s)

THU - 23 MAY 3:00P  
 STANDARD OVERNIGHT

1 of 4  
 TRK# 7752 9010 3415  
 0201  
 ## MASTER ##

**NA AGCA**

15238  
 PA-US PIT

Uncorrected temp 17 °C  
 Thermometer ID 12

CF 0 Initials B

PT-WI-SR-001 effective 11/8/18



5/22/2019



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

ORIGIN ID:EVVA (812) 477-1176  
 BRIAN KLEEMAN

1149 WEDEKING AVENUE  
 BUILDING D, SUITE 2  
 EVANSVILLE, IN 47715  
 UNITED STATES US

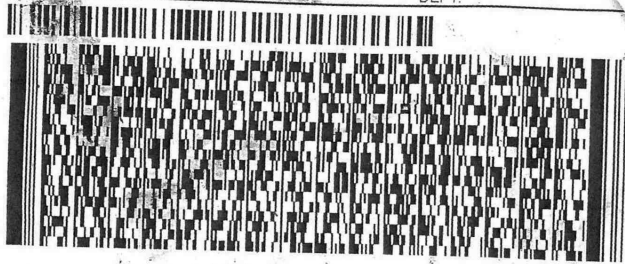
TO **VERONICA BORTOT**  
**TESTAMERICA**  
**301 ALPHA DRIVE**

**PITTSBURGH PA 15238**

(412) 963-7058  
 INV. PN# 170LF00732

REF: PN# 170LF00732

DEPT:



3 of 4

THU - 23 MAY 3:00P  
 STANDARD OVERNIGHT

MPS# 0263 **7752 9010 3194**

Mstr# 7752 9010 3415

0201

**NA AGCA**

15238  
 PA-US PIT



Uncorrected temp  
 Thermometer ID

CF 0 Initials B

PT-WI-SR-001 effective 11/8/18

Printer - Print Your Label(s)

ORIGIN ID:EVVA (812) 477-1176  
BRIAN KLEEMAN

1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

SHIP DATE: 22MAY19  
ACTWGT: 45.00 LB  
CAD: 106997842/INET4100  
DIMS: 18x13x10 IN

BILL SENDER

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

PITTSBURGH PA 15238

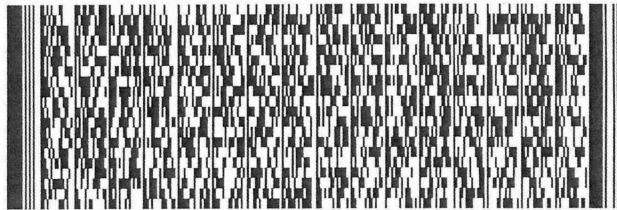
(412) 963-7058  
INV: PN# 170LF00732  
PO:

REF: PN# 170LF00732

DEPT:

565J1/D66C/23AD

FedEx Ship Manager - Print Your Label(s)



2 of 4

THU - 23 MAY 3:00P  
STANDARD OVERNIGHT

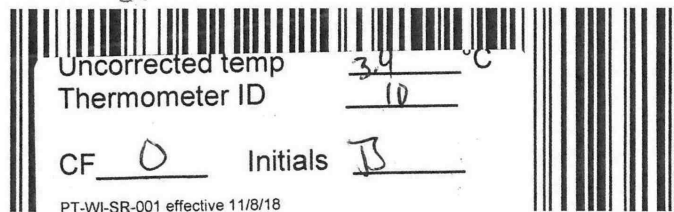
MPS# 0263 7752 9010 3323

Mstr# 7752 9010 3415

0201

NA AGCA

15238  
PA-US PIT



Uncorrected temp 3.4 °C  
Thermometer ID 10  
CF 0 Initials JB

PT-WI-SR-001 effective 11/8/18

5/22/2019

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

**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
Client Contact: Shipping/Receiving		Phone:	Bortol, Veronica	180-363768.1	180-363768.1
Company: TestAmerica Laboratories, Inc.		E-Mail:	veronica.bortol@testamericainc.com	State of Origin: Indiana	Page: Page 1 of 2
Address: 13715 Rider Trail North,		Accreditations Required (See note):	Job #: 180-90467-1		
City: Earth City	Due Date Requested: 6/5/2019	<b>Analysis Requested</b>			
State, Zip: MO, 63045	TAT Requested (days):	Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2OHS Q - Na2SO3 R - Na2S2O3 S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate U - Acetone J - DI Water K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:			
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:	Total Number of Containers			
Email:	WO #:	180-90467 Chain of Custody			
Project Name: CCR Groundwater AB Brown	Project #: 18016014	Special Instructions/Note:			
Site:	SSOW#:				
<b>Sample Identification - Client ID (Lab ID)</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Type (C=Comp, G=grab) (B1-Tissue, A=Air)</b>	<b>Matrix (W=water, S=solid, O=waste/oil)</b>	<b>Preservation Code:</b>
CCR-LF-1 (180-90467-1)	5/20/19	15:00 Eastern		Water	
CCR-LF-2 (180-90467-2)	5/22/19	13:20 Eastern		Water	
CCR-LF-2 (180-90467-2DU)	5/22/19	13:20 Eastern	DU	Water	
CCR-LF-3 (180-90467-3)	5/20/19	13:35 Eastern		Water	
CCR-LF-4 (180-90467-4)	5/21/19	13:05 Eastern		Water	
CCR-LF-5 (180-90467-5)	5/20/19	11:55 Eastern		Water	
CCR-LF-6 (180-90467-6)	5/20/19	12:45 Eastern		Water	
CCR-BK-1R (180-90467-7)	5/21/19	11:35 Eastern		Water	
CCR-BK-2 (180-90467-8)	5/21/19	10:40 Eastern		Water	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon 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.					
<b>Possible Hazard Identification</b>					
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)					
<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Special Instructions/QC Requirements:					
Method of Shipment:					
Empty Kit Relinquished by:		Time:			
Relinquished by: <i>S. Samardes</i>		Date/Time: 5/24/19 1715	Received by: <i>Veronica Bortol</i>		
Relinquished by:		Date/Time:	Date/Time: 5.25.19/0835		
Relinquished by:		Date/Time:	Date/Time:		
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks:			



**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Lab Pkt: Bortol, Veronica	Carrier Tracking No(s):	COC No: 180-363768.2
Shipping/Receiving		E-Mail: veronica.bortol@testamericainc.com	State of Origin: Indiana	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		
Address: 13715 Rider Trail North, Earth City State, Zip: MO, 63045		Job #: 180-90467-1		
Phone: 314-298-8566(Tel) 314-298-8757(Fax)		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA L - EDA Z - other (specify)		
Email:		Other:		
Project Name: CCR Groundwater AB Brown		Analysis Requested		
Site: 18016014		Total Number of Containers		
SSOW#:		Special Instructions/Note:		
<b>Sample Identification - Client ID (Lab ID)</b>				
Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastefall, BT=tissue, A=Ab)	Preservation Code
5/22/19	14:15 Eastern		Water	
5/22/19	15:20 Eastern		Water	
5/22/19	11:30 Eastern		Water	
5/21/19	14:40 Eastern		Water	
5/21/19	16:00 Eastern		Water	
5/20/19	15:15 Eastern		Water	
5/21/19	14:50 Eastern		Water	
5/20/19	Eastern		Water	
5/22/19	Eastern		Water	
CCR-AP-3R (180-90467-9)				
CCR-AP-4R (180-90467-10)				
CCR-AP-5 (180-90467-11)				
CCR-AP-6 (180-90467-12)				
CCR-AP-7R (180-90467-13)				
FIELD BLANK 1 (180-90467-14)				
FIELD BLANK 2 (180-90467-15)				
BLIND DUPLICATE 1 (180-90467-16)				
BLIND DUPLICATE 2 (180-90467-17)				
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, I				
<b>Possible Hazard Identification</b>				
Unconfirmed				
Deliverable Requested: I, II, III, IV, Other (specify)				
Primary Deliverable Rank: 2				
Empty Kit Relinquished by:				
Relinquished by: <i>[Signature]</i>				
Relinquished by: <i>[Signature]</i>				
Relinquished by:				
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No				
Custody Seal No.:				
Date/Time: 5/24/19 17:15				
Date/Time: 5/25/19 08:35				
Date/Time:				
Date/Time:				
Date/Time:				
Company: <i>[Signature]</i>				
Company:				
Company:				
Cooler Temperature(s) °C and Other Remarks:				



## Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-90467-1

**Login Number: 90467**

**List Source: Eurofins TestAmerica, Pittsburgh**

**List Number: 1**

**Creator: Watson, Debbie**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
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: 180-90467-1

**Login Number: 90467**

**List Number: 2**

**Creator: Press, Nicholas B**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 05/25/19 11:27 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	19.0
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").	N/A	
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: 180-90467-1

**Login Number: 90467**  
**List Number: 3**  
**Creator: Press, Nicholas B**

**List Source: Eurofins TestAmerica, St. Louis**  
**List Creation: 05/25/19 11:29 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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	19.0
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 <6mm (1/4").	N/A	
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: 180-90467-1

**Login Number: 90467**  
**List Number: 4**  
**Creator: Hellm, Michael**

**List Source: Eurofins TestAmerica, St. Louis**  
**List Creation: 06/28/19 04:52 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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18.0
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	





## ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh  
301 Alpha Drive  
RIDC Park  
Pittsburgh, PA 15238  
Tel: (412)963-7058

Laboratory Job ID: 180-90606-1

Client Project/Site: CCR Groundwater Monitoring AB Brown

**For:**

Vectren Corporation  
PO BOX 209  
Evansville, Indiana 47702

Attn: Accounts Payable



Authorized for release by:  
8/14/2019 2:43:51 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



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Case Narrative . . . . .	3
Definitions/Glossary . . . . .	5
Certification Summary . . . . .	6
Sample Summary . . . . .	8
Method Summary . . . . .	9
Lab Chronicle . . . . .	10
Client Sample Results . . . . .	16
QC Sample Results . . . . .	25
QC Association Summary . . . . .	30
Chain of Custody . . . . .	33
Receipt Checklists . . . . .	40

# Case Narrative

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

Job ID: 180-90606-1

## Job ID: 180-90606-1

### Laboratory: Eurofins TestAmerica, Pittsburgh

#### Narrative

#### Job Narrative 180-90606-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 5/29/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 5 coolers at receipt time were 1.8° C, 2.1° C, 2.3° C, 2.5° C and 2.8° C.

#### Anions

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

#### Metals

Method(s) 6020A: The following sample was diluted to bring the concentration of boron within the calibration range: CCR-AP-2R (180-90606-5). Elevated reporting limits (RLs) are provided.

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

#### General Chemistry

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

#### RAD

Method(s) 903.0, 9315: Ra-226 Prep Batch 160-431020

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-SP-1 (180-90606-1), CCR-SP-2 (180-90606-2), CCR-SP-3 (180-90606-3), (LCS 160-431020/1-A), (MB 160-431020/23-A), (600-184470-C-19-A), (600-184470-D-19-A MS) and (600-184470-C-19-B MSD)

Method(s) 903.0, 9315: Ra-226 Prep Batch 160-431125

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-AP-1R (180-90606-4), CCR-AP-2R (180-90606-5), BLIND DUPLICATE 3 (180-90606-6), FIELD BLANK 3 (180-90606-7), (LCS 160-431125/1-A), (MB 160-431125/23-A), (180-90609-B-7-A) and (180-90609-I-7-A DU)

Method(s) 904.0, 9320: Ra-228 Prep Batch 160-431030

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-SP-1 (180-90606-1), CCR-SP-2 (180-90606-2), CCR-SP-3 (180-90606-3), (LCS 160-431030/1-A), (MB 160-431030/23-A), (600-184470-C-19-C), (600-184470-D-19-B MS) and (600-184470-C-19-D MSD)

Method(s) 904.0, 9320: Ra-228 Prep Batch 160-431128

# Case Narrative

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

Job ID: 180-90606-1

---

## Job ID: 180-90606-1 (Continued)

---

### Laboratory: Eurofins TestAmerica, Pittsburgh (Continued)

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-AP-1R (180-90606-4), CCR-AP-2R (180-90606-5), BLIND DUPLICATE 3 (180-90606-6), FIELD BLANK 3 (180-90606-7), (LCS 160-431128/1-A), (MB 160-431128/23-A), (180-90609-B-7-B) and (180-90609-I-7-B DU)

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

# Definitions/Glossary

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

Job ID: 180-90606-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### 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

Job ID: 180-90606-1

## Laboratory: Eurofins 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	06-27-20
California	State		2891	04-30-20
California	State Program	9	2891	04-30-20
Connecticut	State		PH-0688	09-30-20
Connecticut	State Program	1	PH-0688	09-30-20
Florida	NELAP	4	E871008	06-30-20
Illinois	NELAP	5	200005	06-30-20
Kansas	NELAP	7	E-10350	01-31-20
Kansas	NELAP		E-10350	03-31-20
Kentucky (UST)	State Program	4	162013	04-30-20
Kentucky (WW)	State		KY98043	12-31-19
Kentucky (WW)	State Program	4	KY98043	12-31-19
Louisiana	NELAP	6	04041	06-30-20
Minnesota	NELAP	5	042-999-482	12-31-19
Nevada	State Program	9	PA00164	07-31-20
New Hampshire	NELAP	1	2030	04-04-20
New Jersey	NELAP	2	PA005	06-30-20
New York	NELAP	2	11182	03-31-20
New York	NELAP		11182	04-01-20
North Carolina (WW/SW)	State Program	4	434	12-31-19
North Dakota	State Program	8	R-227	04-30-20
Oregon	NELAP	10	PA-2151	02-06-20
Oregon	NELAP		PA-2151	02-06-20
Pennsylvania	NELAP	3	02-00416	04-30-20
Pennsylvania	NELAP		02-00416	04-30-20
Rhode Island	State Program	1	LAO00362	12-30-19
South Carolina	State Program	4	89014	04-30-20
Texas	NELAP	6	T104704528-15-2	03-31-20
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
US Fish & Wildlife	US Federal Programs		058448	07-31-20
USDA	Federal		P-Soil-01	06-26-22
Utah	NELAP	8	PA001462015-4	05-31-20
Utah	NELAP		PA001462019-8	05-31-20
Virginia	NELAP	3	460189	09-14-19
Virginia	NELAP		10043	09-14-19
West Virginia DEP	State		142	01-31-20
West Virginia DEP	State Program	3	142	01-31-20
Wisconsin	State		998027800	08-31-19
Wisconsin	State Program	5	998027800	08-31-19

# Accreditation/Certification Summary

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

Job ID: 180-90606-1

## Laboratory: Eurofins 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
ANAB	Dept. of Defense ELAP		L2305	04-06-22
ANAB	DoD		L2305	04-06-22
ANAB	DOE		L2305.01	04-06-22
Arizona	State		AZ0813	12-08-19
Arizona	State Program	9	AZ0813	12-08-19
California	State		2886	06-30-20
California	State Program	9	2886	06-30-20
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-20
Florida	NELAP		E87689	06-30-20
Hawaii	State Program	9	NA	06-30-20
Illinois	NELAP	5	200023	11-30-19
Illinois	NELAP		004553	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State		KY90125	12-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-20
Louisiana (DW)	NELAP	6	LA011	12-31-19
Louisiana (DW)	State		LA011	12-31-19
Maryland	State		310	09-30-20
Maryland	State Program	3	310	09-30-20
Michigan	State Program	5	9005	06-30-20
Missouri	State		780	06-30-22
Missouri	State Program	7	780	06-30-20
New Jersey	NELAP	2	MO002	06-30-20
New Jersey	NELAP		MO002	06-30-20
New York	NELAP	2	11616	03-31-20
New York	NELAP		11616	04-01-20
North Dakota	State Program	8	R207	06-30-20
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State		9997	08-31-19
Oklahoma	State Program	6	9997	08-31-19 *
Pennsylvania	NELAP	3	68-00540	02-28-20
Pennsylvania	NELAP		68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-20
Texas	NELAP	6	T104704193-19-14	07-31-20
Texas	NELAP		T104704193-19-13	07-31-20
US Fish & Wildlife	Federal		058448	07-31-20
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542019-11	07-31-20
Virginia	NELAP	3	460230	06-14-20
Virginia	NELAP		10310	06-14-20
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19 *

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

Eurofins TestAmerica, Pittsburgh

# Sample Summary

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

Job ID: 180-90606-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-90606-1	CCR-SP-1	Water	05/24/19 11:30	05/29/19 09:30	
180-90606-2	CCR-SP-2	Water	05/24/19 12:30	05/29/19 09:30	
180-90606-3	CCR-SP-3	Water	05/24/19 13:50	05/29/19 09:30	
180-90606-4	CCR-AP-1R	Water	05/24/19 10:30	05/29/19 09:30	
180-90606-5	CCR-AP-2R	Water	05/24/19 09:40	05/29/19 09:30	
180-90606-6	BLIND DUPLICATE 3	Water	05/24/19 00:00	05/29/19 09:30	
180-90606-7	FIELD BLANK 3	Water	05/24/19 14:00	05/29/19 09:30	



# Method Summary

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

Job ID: 180-90606-1

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

TAL SL = Eurofins 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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-1**

**Date Collected: 05/24/19 11:30**

**Matrix: Water**

**Date Received: 05/29/19 09:30**

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: CHIC2100A		1			280440	06/03/19 10:05	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		10			280440	06/03/19 10:20	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281140	06/07/19 17:45	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281159	06/08/19 11:56	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			280561	06/03/19 16:44	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			280283	05/31/19 14:31	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	50 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.32 mL	1.0 g	431020	06/06/19 06:46	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			434025	07/08/19 05:37	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.32 mL	1.0 g	431030	06/06/19 07:23	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCBLUE		1			433323	07/01/19 09:55	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			439354	08/13/19 08:59	SMP	TAL SL

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

**Lab Sample ID: 180-90606-2**

**Date Collected: 05/24/19 12:30**

**Matrix: Water**

**Date Received: 05/29/19 09:30**

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: CHIC2100A		1			280440	06/03/19 07:40	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		5			280440	06/03/19 07:55	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281140	06/07/19 17:54	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281159	06/08/19 12:06	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			280561	06/03/19 16:45	KAK	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-2**

**Date Collected: 05/24/19 12:30**

**Matrix: Water**

**Date Received: 05/29/19 09:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			280283	05/31/19 14:33	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.39 mL	1.0 g	431020	06/06/19 06:46	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			434025	07/08/19 05:37	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.39 mL	1.0 g	431030	06/06/19 07:23	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCBLUE		1			433323	07/01/19 09:56	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			439354	08/13/19 08:59	SMP	TAL SL

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

**Lab Sample ID: 180-90606-3**

**Date Collected: 05/24/19 13:50**

**Matrix: Water**

**Date Received: 05/29/19 09:30**

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: CHIC2100A		1			280440	06/03/19 07:25	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281140	06/07/19 17:57	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281159	06/08/19 12:09	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			280561	06/03/19 16:45	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			280283	05/31/19 14:34	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.75 mL	1.0 g	431020	06/06/19 06:46	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			434025	07/08/19 05:38	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.75 mL	1.0 g	431030	06/06/19 07:23	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPROTEAN		1			433358	07/01/19 09:59	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			439354	08/13/19 08:59	SMP	TAL SL

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-4**

**Date Collected: 05/24/19 10:30**

**Matrix: Water**

**Date Received: 05/29/19 09:30**

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: CHIC2100A		1			280440	06/03/19 10:35	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		10			280440	06/03/19 10:50	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281140	06/07/19 18:00	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281159	06/08/19 12:12	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			280561	06/03/19 16:46	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			280283	05/31/19 14:37	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.19 mL	1.0 g	431125	06/07/19 07:24	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			439048	08/09/19 15:21	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.19 mL	1.0 g	431128	06/07/19 08:17	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCORANGE		1			435710	07/19/19 12:26	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			439354	08/13/19 08:59	SMP	TAL SL

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

**Lab Sample ID: 180-90606-5**

**Date Collected: 05/24/19 09:40**

**Matrix: Water**

**Date Received: 05/29/19 09:30**

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: CHIC2100A		2.5			280440	06/03/19 12:07	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		25			280440	06/03/19 12:22	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281140	06/07/19 18:03	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281159	06/08/19 12:15	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			281393	06/11/19 09:02	RSK	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-5**

**Date Collected: 05/24/19 09:40**

**Matrix: Water**

**Date Received: 05/29/19 09:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			280561	06/03/19 16:47	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			280283	05/31/19 14:40	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	25 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.86 mL	1.0 g	431125	06/07/19 07:24	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCORANGE		1			439047	08/09/19 17:23	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.86 mL	1.0 g	431128	06/07/19 08:17	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCORANGE		1			435710	07/19/19 12:26	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			439354	08/13/19 08:59	SMP	TAL SL

**Client Sample ID: BLIND DUPLICATE 3**

**Lab Sample ID: 180-90606-6**

**Date Collected: 05/24/19 00:00**

**Matrix: Water**

**Date Received: 05/29/19 09:30**

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: CHIC2100A		1			280440	06/03/19 11:06	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHIC2100A		5			280440	06/03/19 11:21	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281140	06/07/19 18:06	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281159	06/08/19 12:18	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			280561	06/03/19 16:48	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			280283	05/31/19 14:42	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			999.98 mL	1.0 g	431125	06/07/19 07:24	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCORANGE		1			439047	08/09/19 17:23	CDR	TAL SL
Total/NA	Prep	PrecSep_0			999.98 mL	1.0 g	431128	06/07/19 08:17	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCORANGE		1			435710	07/19/19 12:26	CDR	TAL SL

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-90606-1

## Client Sample ID: BLIND DUPLICATE 3

Lab Sample ID: 180-90606-6

Date Collected: 05/24/19 00:00

Matrix: Water

Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Ra226_Ra228		1			439354	08/13/19 08:59	SMP	TAL SL

## Client Sample ID: FIELD BLANK 3

Lab Sample ID: 180-90606-7

Date Collected: 05/24/19 14:00

Matrix: Water

Date Received: 05/29/19 09:30

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: CHIC2100A		1			280440	06/03/19 08:17	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281140	06/07/19 18:09	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			281159	06/08/19 12:22	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGZ		1			280561	06/03/19 16:49	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			280283	05/31/19 14:43	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.48 mL	1.0 g	431125	06/07/19 07:24	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCORANGE		1			439047	08/09/19 17:24	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.48 mL	1.0 g	431128	06/07/19 08:17	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCORANGE		1			435710	07/19/19 12:26	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			439354	08/13/19 08:59	SMP	TAL SL

### Laboratory References:

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

TAL SL = Eurofins 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

Job ID: 180-90606-1

## Analyst References:

Lab: TAL PIT

Batch Type: Prep

JJZ = Joseph Zubrow

NAM = Nicole Marfisi

Batch Type: Analysis

AVS = Abbey Smith

KAK = Kayla Kalamasz

MJH = Matthew Hartman

RJP = Rockwell Pokrant

RSK = Robert Kurtz

Lab: TAL SL

Batch Type: Prep

EJQ = Erin Quinn

Batch Type: Analysis

CDR = Conrad Reuscher

SMP = Siobhan Perry

1

2

3

4

5

6

7

8

9

10

11

12

13

# Client Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-1**

Date Collected: 05/24/19 11:30

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		1.0	0.71	mg/L			06/03/19 10:05	1
Fluoride	0.20		0.10	0.026	mg/L			06/03/19 10:05	1
Sulfate	1000		10	3.8	mg/L			06/03/19 10:20	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0036		0.0010	0.00032	mg/L		06/03/19 12:59	06/07/19 17:45	1
Boron	0.34		0.080	0.030	mg/L		06/03/19 12:59	06/08/19 11:56	1
Barium	0.089	B	0.010	0.0015	mg/L		06/03/19 12:59	06/07/19 17:45	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 12:59	06/08/19 11:56	1
Calcium	270		0.50	0.12	mg/L		06/03/19 12:59	06/07/19 17:45	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:45	1
Cobalt	0.0078		0.00050	0.000075	mg/L		06/03/19 12:59	06/07/19 17:45	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 12:59	06/07/19 17:45	1
Molybdenum	0.0012	J	0.0050	0.00061	mg/L		06/03/19 12:59	06/07/19 17:45	1
Lead	0.00020	J	0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:45	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 12:59	06/07/19 17:45	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 12:59	06/07/19 17:45	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:45	1
Lithium	5.9		5.0	3.1	ug/L		06/03/19 12:59	06/08/19 11:56	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:44	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2000		20	20	mg/L			05/30/19 14:24	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.0	HF	0.1	0.1	SU			05/31/19 14:31	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.149		0.0912	0.0922	1.00	0.120	pCi/L	06/06/19 06:46	07/08/19 05:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		40 - 110					06/06/19 06:46	07/08/19 05:37	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.335	U	0.320	0.321	1.00	0.518	pCi/L	06/06/19 07:23	07/01/19 09:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		40 - 110					06/06/19 07:23	07/01/19 09:55	1
Y Carrier	86.7		40 - 110					06/06/19 07:23	07/01/19 09:55	1

Eurofins TestAmerica, Pittsburgh



# Client Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-1**

Date Collected: 05/24/19 11:30

Matrix: Water

Date Received: 05/29/19 09:30

**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	U	0.333	0.334	5.00	0.518	pCi/L		08/13/19 08:59	1

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

**Lab Sample ID: 180-90606-2**

Date Collected: 05/24/19 12:30

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	66		1.0	0.71	mg/L			06/03/19 07:40	1
Fluoride	0.32		0.10	0.026	mg/L			06/03/19 07:40	1
Sulfate	330		5.0	1.9	mg/L			06/03/19 07:55	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0014		0.0010	0.00032	mg/L		06/03/19 12:59	06/07/19 17:54	1
Boron	0.15		0.080	0.030	mg/L		06/03/19 12:59	06/08/19 12:06	1
Barium	0.12	B	0.010	0.0015	mg/L		06/03/19 12:59	06/07/19 17:54	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 12:59	06/08/19 12:06	1
Calcium	160		0.50	0.12	mg/L		06/03/19 12:59	06/07/19 17:54	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:54	1
Cobalt	0.0021		0.00050	0.000075	mg/L		06/03/19 12:59	06/07/19 17:54	1
Chromium	0.0020		0.0020	0.0015	mg/L		06/03/19 12:59	06/07/19 17:54	1
Molybdenum	0.0014	J	0.0050	0.00061	mg/L		06/03/19 12:59	06/07/19 17:54	1
Lead	0.00086	J	0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:54	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 12:59	06/07/19 17:54	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 12:59	06/07/19 17:54	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:54	1
Lithium	7.0		5.0	3.1	ug/L		06/03/19 12:59	06/08/19 12:06	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:45	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1100		10	10	mg/L			05/30/19 14:24	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			05/31/19 14:33	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.258		0.119	0.121	1.00	0.136	pCi/L	06/06/19 06:46	07/08/19 05:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					06/06/19 06:46	07/08/19 05:37	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90606-1

## Client Sample ID: CCR-SP-2

## Lab Sample ID: 180-90606-2

Date Collected: 05/24/19 12:30

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.320	U	0.272	0.273	1.00	0.432	pCi/L	06/06/19 07:23	07/01/19 09:56	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	89.8		40 - 110					06/06/19 07:23	07/01/19 09:56	1
Y Carrier	80.7		40 - 110					06/06/19 07:23	07/01/19 09:56	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	0.578		0.297	0.299	5.00	0.432	pCi/L		08/13/19 08:59	1

## Client Sample ID: CCR-SP-3

## Lab Sample ID: 180-90606-3

Date Collected: 05/24/19 13:50

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23		1.0	0.71	mg/L			06/03/19 07:25	1
Fluoride	0.25		0.10	0.026	mg/L			06/03/19 07:25	1
Sulfate	36		1.0	0.38	mg/L			06/03/19 07:25	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0017		0.0010	0.00032	mg/L		06/03/19 12:59	06/07/19 17:57	1
Boron	ND		0.080	0.030	mg/L		06/03/19 12:59	06/08/19 12:09	1
Barium	0.057	B	0.010	0.0015	mg/L		06/03/19 12:59	06/07/19 17:57	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 12:59	06/08/19 12:09	1
Calcium	93		0.50	0.12	mg/L		06/03/19 12:59	06/07/19 17:57	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:57	1
Cobalt	0.00026	J	0.00050	0.000075	mg/L		06/03/19 12:59	06/07/19 17:57	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 12:59	06/07/19 17:57	1
Molybdenum	0.0016	J	0.0050	0.00061	mg/L		06/03/19 12:59	06/07/19 17:57	1
Lead	0.00015	J	0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:57	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 12:59	06/07/19 17:57	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 12:59	06/07/19 17:57	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:57	1
Lithium	4.0	J	5.0	3.1	ug/L		06/03/19 12:59	06/08/19 12:09	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:45	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	580		10	10	mg/L			05/30/19 14:24	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1	0.1	SU			05/31/19 14:34	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-3**

Date Collected: 05/24/19 13:50

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0325	U	0.0464	0.0465	1.00	0.121	pCi/L	06/06/19 06:46	07/08/19 05:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					06/06/19 06:46	07/08/19 05:38	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.174	U	0.344	0.345	1.00	0.583	pCi/L	06/06/19 07:23	07/01/19 09:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					06/06/19 07:23	07/01/19 09:59	1
Y Carrier	78.5		40 - 110					06/06/19 07:23	07/01/19 09:59	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	0.141	U	0.347	0.348	5.00	0.583	pCi/L		08/13/19 08:59	1

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

**Lab Sample ID: 180-90606-4**

Date Collected: 05/24/19 10:30

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	69		1.0	0.71	mg/L			06/03/19 10:35	1
Fluoride	0.57		0.10	0.026	mg/L			06/03/19 10:35	1
Sulfate	530		10	3.8	mg/L			06/03/19 10:50	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00047	J	0.0010	0.00032	mg/L		06/03/19 13:03	06/07/19 18:00	1
Boron	4.5		0.080	0.030	mg/L		06/03/19 13:03	06/08/19 12:12	1
Barium	0.025	B	0.010	0.0015	mg/L		06/03/19 13:03	06/07/19 18:00	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 13:03	06/08/19 12:12	1
Calcium	68		0.50	0.12	mg/L		06/03/19 13:03	06/07/19 18:00	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:00	1
Cobalt	0.00021	J	0.00050	0.000075	mg/L		06/03/19 13:03	06/07/19 18:00	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 13:03	06/07/19 18:00	1
Molybdenum	0.0042	J	0.0050	0.00061	mg/L		06/03/19 13:03	06/07/19 18:00	1
Lead	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:00	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 13:03	06/07/19 18:00	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 13:03	06/07/19 18:00	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:00	1
Lithium	3.6	J	5.0	3.1	ug/L		06/03/19 13:03	06/08/19 12:12	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-4**

Date Collected: 05/24/19 10:30

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:46	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		10	10	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1	0.1	SU			05/31/19 14:37	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0879	U	0.0693	0.0697	1.00	0.101	pCi/L	06/07/19 07:24	08/09/19 15:21	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	91.0		40 - 110	06/07/19 07:24	08/09/19 15:21	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0354	U	0.241	0.241	1.00	0.444	pCi/L	06/07/19 08:17	07/19/19 12:26	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	91.0		40 - 110	06/07/19 08:17	07/19/19 12:26	1
Y Carrier	77.4		40 - 110	06/07/19 08:17	07/19/19 12:26	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	0.0526	U	0.251	0.251	5.00	0.444	pCi/L		08/13/19 08:59	1

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

**Lab Sample ID: 180-90606-5**

Date Collected: 05/24/19 09:40

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	530		25	18	mg/L			06/03/19 12:22	25
Fluoride	0.47		0.25	0.066	mg/L			06/03/19 12:07	2.5
Sulfate	2600		25	9.5	mg/L			06/03/19 12:22	25

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00053	J	0.0010	0.00032	mg/L		06/03/19 13:03	06/07/19 18:03	1
Boron	11		0.80	0.30	mg/L		06/03/19 13:03	06/11/19 09:02	10
Barium	0.042	B	0.010	0.0015	mg/L		06/03/19 13:03	06/07/19 18:03	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 13:03	06/08/19 12:15	1
Calcium	300		0.50	0.12	mg/L		06/03/19 13:03	06/07/19 18:03	1
Cadmium	0.00059	J	0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:03	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: 180-90606-5**

Date Collected: 05/24/19 09:40

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Cobalt</b>	<b>0.0026</b>		0.00050	0.000075	mg/L		06/03/19 13:03	06/07/19 18:03	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 13:03	06/07/19 18:03	1
<b>Molybdenum</b>	<b>1.9</b>		0.0050	0.00061	mg/L		06/03/19 13:03	06/07/19 18:03	1
<b>Lead</b>	<b>0.00016</b>	<b>J</b>	0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:03	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 13:03	06/07/19 18:03	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 13:03	06/07/19 18:03	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:03	1
<b>Lithium</b>	<b>33</b>		5.0	3.1	ug/L		06/03/19 13:03	06/08/19 12:15	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:47	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>4100</b>		40	40	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH</b>	<b>7.3</b>	<b>HF</b>	0.1	0.1	SU			05/31/19 14:40	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>0.264</b>		0.0996	0.102	1.00	0.103	pCi/L	06/07/19 07:24	08/09/19 17:23	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	88.1		40 - 110					06/07/19 07:24	08/09/19 17:23	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>0.448</b>		0.288	0.291	1.00	0.439	pCi/L	06/07/19 08:17	07/19/19 12:26	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	88.1		40 - 110					06/07/19 08:17	07/19/19 12:26	1
Y Carrier	78.9		40 - 110					06/07/19 08:17	07/19/19 12:26	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
<b>Combined Radium 226 + 228</b>	<b>0.713</b>		0.305	0.308	5.00	0.439	pCi/L		08/13/19 08:59	1

**Client Sample ID: BLIND DUPLICATE 3**

**Lab Sample ID: 180-90606-6**

Date Collected: 05/24/19 00:00

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>65</b>		1.0	0.71	mg/L			06/03/19 11:06	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90606-1

**Client Sample ID: BLIND DUPLICATE 3**

**Lab Sample ID: 180-90606-6**

Date Collected: 05/24/19 00:00

Matrix: Water

Date Received: 05/29/19 09:30

**Method: EPA 9056A - Anions, Ion Chromatography (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.29		0.10	0.026	mg/L			06/03/19 11:06	1
Sulfate	320		5.0	1.9	mg/L			06/03/19 11:21	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0021		0.0010	0.00032	mg/L		06/03/19 13:03	06/07/19 18:06	1
Boron	0.26		0.080	0.030	mg/L		06/03/19 13:03	06/08/19 12:18	1
Barium	0.13	B	0.010	0.0015	mg/L		06/03/19 13:03	06/07/19 18:06	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 13:03	06/08/19 12:18	1
Calcium	170		0.50	0.12	mg/L		06/03/19 13:03	06/07/19 18:06	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:06	1
Cobalt	0.0025		0.00050	0.000075	mg/L		06/03/19 13:03	06/07/19 18:06	1
Chromium	0.0025		0.0020	0.0015	mg/L		06/03/19 13:03	06/07/19 18:06	1
Molybdenum	0.0017	J	0.0050	0.00061	mg/L		06/03/19 13:03	06/07/19 18:06	1
Lead	0.0015		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:06	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 13:03	06/07/19 18:06	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 13:03	06/07/19 18:06	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:06	1
Lithium	9.7		5.0	3.1	ug/L		06/03/19 13:03	06/08/19 12:18	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:48	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1000		10	10	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1	0.1	SU			05/31/19 14:42	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.121		0.0792	0.0799	1.00	0.110	pCi/L	06/07/19 07:24	08/09/19 17:23	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	86.7		40 - 110	06/07/19 07:24	08/09/19 17:23	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.188	U	0.323	0.324	1.00	0.546	pCi/L	06/07/19 08:17	07/19/19 12:26	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	86.7		40 - 110	06/07/19 08:17	07/19/19 12:26	1
Y Carrier	81.9		40 - 110	06/07/19 08:17	07/19/19 12:26	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90606-1

## Client Sample ID: BLIND DUPLICATE 3

Lab Sample ID: 180-90606-6

Date Collected: 05/24/19 00:00

Matrix: Water

Date Received: 05/29/19 09:30

### 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	0.309	U	0.333	0.334	5.00	0.546	pCi/L		08/13/19 08:59	1

## Client Sample ID: FIELD BLANK 3

Lab Sample ID: 180-90606-7

Date Collected: 05/24/19 14:00

Matrix: Water

Date Received: 05/29/19 09:30

### 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			06/03/19 08:17	1
Fluoride	0.18		0.10	0.026	mg/L			06/03/19 08:17	1
Sulfate	ND		1.0	0.38	mg/L			06/03/19 08:17	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		06/03/19 13:03	06/07/19 18:09	1
Boron	0.069	J	0.080	0.030	mg/L		06/03/19 13:03	06/08/19 12:22	1
Barium	0.0085	J B	0.010	0.0015	mg/L		06/03/19 13:03	06/07/19 18:09	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 13:03	06/08/19 12:22	1
Calcium	0.14	J	0.50	0.12	mg/L		06/03/19 13:03	06/07/19 18:09	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:09	1
Cobalt	ND		0.00050	0.000075	mg/L		06/03/19 13:03	06/07/19 18:09	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 13:03	06/07/19 18:09	1
Molybdenum	ND		0.0050	0.00061	mg/L		06/03/19 13:03	06/07/19 18:09	1
Lead	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:09	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 13:03	06/07/19 18:09	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 13:03	06/07/19 18:09	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:09	1
Lithium	ND		5.0	3.1	ug/L		06/03/19 13:03	06/08/19 12:22	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:49	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			05/30/19 14:24	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.5	HF	0.1	0.1	SU			05/31/19 14:43	1

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Radium-226	0.0430	U	0.0657	0.0658	1.00	0.113	pCi/L	06/07/19 07:24	08/09/19 17:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.0		40 - 110					06/07/19 07:24	08/09/19 17:24	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-90606-1

**Client Sample ID: FIELD BLANK 3**

**Lab Sample ID: 180-90606-7**

Date Collected: 05/24/19 14:00

Matrix: Water

Date Received: 05/29/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0227	U	0.466	0.466	1.00	0.838	pCi/L	06/07/19 08:17	07/19/19 12:26	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	91.0		40 - 110					06/07/19 08:17	07/19/19 12:26	1
Y Carrier	45.6		40 - 110					06/07/19 08:17	07/19/19 12:26	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	0.0204	U	0.471	0.471	5.00	0.838	pCi/L		08/13/19 08:59	1





# QC Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: MB 180-280440/6**  
**Matrix: Water**  
**Analysis Batch: 280440**

**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			06/03/19 05:02	1
Fluoride	ND		0.10	0.026	mg/L			06/03/19 05:02	1
Sulfate	ND		1.0	0.38	mg/L			06/03/19 05:02	1

**Lab Sample ID: LCS 180-280440/5**  
**Matrix: Water**  
**Analysis Batch: 280440**

**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	25.0		mg/L		100	80 - 120
Fluoride	1.25	1.28		mg/L		102	80 - 120
Sulfate	25.0	24.5		mg/L		98	80 - 120

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

**Lab Sample ID: MB 180-280522/1-A**  
**Matrix: Water**  
**Analysis Batch: 281140**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280522**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		06/03/19 12:59	06/07/19 16:42	1
Barium	0.00154	J	0.010	0.0015	mg/L		06/03/19 12:59	06/07/19 16:42	1
Calcium	ND		0.50	0.12	mg/L		06/03/19 12:59	06/07/19 16:42	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 16:42	1
Cobalt	ND		0.00050	0.000075	mg/L		06/03/19 12:59	06/07/19 16:42	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 12:59	06/07/19 16:42	1
Molybdenum	ND		0.0050	0.00061	mg/L		06/03/19 12:59	06/07/19 16:42	1
Lead	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 16:42	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 12:59	06/07/19 16:42	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 12:59	06/07/19 16:42	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 16:42	1

**Lab Sample ID: MB 180-280522/1-A**  
**Matrix: Water**  
**Analysis Batch: 281159**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280522**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.080	0.030	mg/L		06/03/19 12:59	06/08/19 10:49	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 12:59	06/08/19 10:49	1
Lithium	ND		5.0	3.1	ug/L		06/03/19 12:59	06/08/19 10:49	1

**Lab Sample ID: LCS 180-279554/2-C**  
**Matrix: Water**  
**Analysis Batch: 281140**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280522**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.936		mg/L		94	80 - 120
Barium	1.00	1.03		mg/L		103	80 - 120
Calcium	25.0	25.0		mg/L		100	80 - 120
Cadmium	0.500	0.505		mg/L		101	80 - 120

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: LCS 180-279554/2-C**  
**Matrix: Water**  
**Analysis Batch: 281140**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280522**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	0.500	0.469		mg/L		94	80 - 120
Chromium	0.500	0.507		mg/L		101	80 - 120
Molybdenum	0.500	0.501		mg/L		100	80 - 120
Lead	0.500	0.503		mg/L		101	80 - 120
Antimony	0.250	0.259		mg/L		103	80 - 120
Selenium	1.00	0.928		mg/L		93	80 - 120
Thallium	1.00	1.00		mg/L		100	80 - 120

**Lab Sample ID: LCS 180-279554/2-C**  
**Matrix: Water**  
**Analysis Batch: 281159**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280522**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.25	1.23		mg/L		98	80 - 120
Beryllium	0.500	0.478		mg/L		96	80 - 120
Lithium	500	478		ug/L		96	80 - 120

**Lab Sample ID: LCS 180-280522/2-A**  
**Matrix: Water**  
**Analysis Batch: 281140**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280522**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.998		mg/L		100	80 - 120
Barium	1.00	1.05		mg/L		105	80 - 120
Calcium	25.0	26.9		mg/L		108	80 - 120
Cadmium	0.500	0.534		mg/L		107	80 - 120
Cobalt	0.500	0.499		mg/L		100	80 - 120
Chromium	0.500	0.540		mg/L		108	80 - 120
Molybdenum	0.500	0.537		mg/L		107	80 - 120
Lead	0.500	0.538		mg/L		108	80 - 120
Antimony	0.250	0.274		mg/L		110	80 - 120
Selenium	1.00	0.992		mg/L		99	80 - 120
Thallium	1.00	1.06		mg/L		106	80 - 120

**Lab Sample ID: LCS 180-280522/2-A**  
**Matrix: Water**  
**Analysis Batch: 281159**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 280522**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.25	1.29		mg/L		103	80 - 120
Beryllium	0.500	0.514		mg/L		103	80 - 120
Lithium	500	505		ug/L		101	80 - 120

# QC Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: MB 180-280477/1-A**  
**Matrix: Water**  
**Analysis Batch: 280561**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 280477**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:13	1

**Lab Sample ID: LCS 180-280477/2-A**  
**Matrix: Water**  
**Analysis Batch: 280561**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 280477**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00250	0.00245		mg/L		98	80 - 120

## Method: EPA 9040C - pH

**Lab Sample ID: LCS 180-280283/1**  
**Matrix: Water**  
**Analysis Batch: 280283**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	99 - 101

**Lab Sample ID: 180-90606-4 DU**  
**Matrix: Water**  
**Analysis Batch: 280283**

**Client Sample ID: CCR-AP-1R**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.5	HF	7.5		SU		0.5	2

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 180-280217/2**  
**Matrix: Water**  
**Analysis Batch: 280217**

**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			05/30/19 14:24	1

**Lab Sample ID: LCS 180-280217/1**  
**Matrix: Water**  
**Analysis Batch: 280217**

**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	201	222		mg/L		110	80 - 120

**Lab Sample ID: 180-90606-3 DU**  
**Matrix: Water**  
**Analysis Batch: 280217**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	580		568		mg/L		1	10

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90606-1

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

**Lab Sample ID: MB 160-431020/23-A**  
**Matrix: Water**  
**Analysis Batch: 434025**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 431020**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.04950	U	0.0811	0.0812	1.00	0.140	pCi/L	06/06/19 06:46	07/08/19 05:38	1
Carrier	MB		Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.7		40 - 110					06/06/19 06:46	07/08/19 05:38	1

**Lab Sample ID: LCS 160-431020/1-A**  
**Matrix: Water**  
**Analysis Batch: 433742**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 431020**

Analyte	LCS		Spike	LCS	Total	RL	MDC	Unit	%Rec	%Rec. Limits
	%Yield	LCS Qualifier	Added	Result	Uncert. (2σ+/-)					
Radium-226	99.2		11.4	10.35	1.13	1.00	0.131	pCi/L	91	75 - 125
Carrier	LCS		Limits							
Ba Carrier	99.2		40 - 110							

**Lab Sample ID: MB 160-431125/23-A**  
**Matrix: Water**  
**Analysis Batch: 439116**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 431125**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.03539	U	0.0538	0.0539	1.00	0.0926	pCi/L	06/07/19 07:24	08/10/19 14:51	1
Carrier	MB		Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					06/07/19 07:24	08/10/19 14:51	1

**Lab Sample ID: LCS 160-431125/1-A**  
**Matrix: Water**  
**Analysis Batch: 439048**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 431125**

Analyte	LCS		Spike	LCS	Total	RL	MDC	Unit	%Rec	%Rec. Limits
	%Yield	LCS Qualifier	Added	Result	Uncert. (2σ+/-)					
Radium-226	91.2		11.4	9.581	1.01	1.00	0.0926	pCi/L	84	75 - 125
Carrier	LCS		Limits							
Ba Carrier	91.2		40 - 110							

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

**Lab Sample ID: MB 160-431030/23-A**  
**Matrix: Water**  
**Analysis Batch: 433358**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 431030**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	-0.1723	U	0.224	0.225	1.00	0.430	pCi/L	06/06/19 07:23	07/01/19 09:59	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-90606-1

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

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.7		40 - 110	06/06/19 07:23	07/01/19 09:59	1
Y Carrier	86.7		40 - 110	06/06/19 07:23	07/01/19 09:59	1

Lab Sample ID: LCS 160-431030/1-A  
 Matrix: Water  
 Analysis Batch: 433226

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 431030

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.07	10.95		1.33	1.00	0.540	pCi/L	121	75 - 125

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	99.2		40 - 110
Y Carrier	59.4		40 - 110

Lab Sample ID: MB 160-431128/23-A  
 Matrix: Water  
 Analysis Batch: 435708

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 431128

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.08967	U	0.295	0.295	1.00	0.540	pCi/L	06/07/19 08:17	07/19/19 12:31	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	06/07/19 08:17	07/19/19 12:31	1
Y Carrier	66.2		40 - 110	06/07/19 08:17	07/19/19 12:31	1

Lab Sample ID: LCS 160-431128/1-A  
 Matrix: Water  
 Analysis Batch: 435710

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 431128

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.01	10.71		1.28	1.00	0.494	pCi/L	119	75 - 125

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	91.2		40 - 110
Y Carrier	75.1		40 - 110

# QC Association Summary

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

Job ID: 180-90606-1

## HPLC/IC

### Analysis Batch: 280440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	EPA 9056A	
180-90606-1	CCR-SP-1	Total/NA	Water	EPA 9056A	
180-90606-2	CCR-SP-2	Total/NA	Water	EPA 9056A	
180-90606-2	CCR-SP-2	Total/NA	Water	EPA 9056A	
180-90606-3	CCR-SP-3	Total/NA	Water	EPA 9056A	
180-90606-4	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-90606-4	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-90606-5	CCR-AP-2R	Total/NA	Water	EPA 9056A	
180-90606-5	CCR-AP-2R	Total/NA	Water	EPA 9056A	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	EPA 9056A	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	EPA 9056A	
180-90606-7	FIELD BLANK 3	Total/NA	Water	EPA 9056A	
MB 180-280440/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-280440/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

## Metals

### Filtration Batch: 279554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-279554/2-C	Lab Control Sample	Total Recoverable	Water	Filtration	

### Prep Batch: 280477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	7470A	
180-90606-2	CCR-SP-2	Total/NA	Water	7470A	
180-90606-3	CCR-SP-3	Total/NA	Water	7470A	
180-90606-4	CCR-AP-1R	Total/NA	Water	7470A	
180-90606-5	CCR-AP-2R	Total/NA	Water	7470A	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	7470A	
180-90606-7	FIELD BLANK 3	Total/NA	Water	7470A	
MB 180-280477/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-280477/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Prep Batch: 280522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total Recoverable	Water	3005A	
180-90606-2	CCR-SP-2	Total Recoverable	Water	3005A	
180-90606-3	CCR-SP-3	Total Recoverable	Water	3005A	
180-90606-4	CCR-AP-1R	Total Recoverable	Water	3005A	
180-90606-5	CCR-AP-2R	Total Recoverable	Water	3005A	
180-90606-6	BLIND DUPLICATE 3	Total Recoverable	Water	3005A	
180-90606-7	FIELD BLANK 3	Total Recoverable	Water	3005A	
MB 180-280522/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-279554/2-C	Lab Control Sample	Total Recoverable	Water	3005A	279554
LCS 180-280522/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 280561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	EPA 7470A	280477
180-90606-2	CCR-SP-2	Total/NA	Water	EPA 7470A	280477
180-90606-3	CCR-SP-3	Total/NA	Water	EPA 7470A	280477

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-90606-1

## Metals (Continued)

### Analysis Batch: 280561 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-4	CCR-AP-1R	Total/NA	Water	EPA 7470A	280477
180-90606-5	CCR-AP-2R	Total/NA	Water	EPA 7470A	280477
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	EPA 7470A	280477
180-90606-7	FIELD BLANK 3	Total/NA	Water	EPA 7470A	280477
MB 180-280477/1-A	Method Blank	Total/NA	Water	EPA 7470A	280477
LCS 180-280477/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	280477

### Analysis Batch: 281140

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total Recoverable	Water	EPA 6020A	280522
180-90606-2	CCR-SP-2	Total Recoverable	Water	EPA 6020A	280522
180-90606-3	CCR-SP-3	Total Recoverable	Water	EPA 6020A	280522
180-90606-4	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	280522
180-90606-5	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	280522
180-90606-6	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	280522
180-90606-7	FIELD BLANK 3	Total Recoverable	Water	EPA 6020A	280522
MB 180-280522/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	280522
LCS 180-279554/2-C	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280522
LCS 180-280522/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280522

### Analysis Batch: 281159

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total Recoverable	Water	EPA 6020A	280522
180-90606-2	CCR-SP-2	Total Recoverable	Water	EPA 6020A	280522
180-90606-3	CCR-SP-3	Total Recoverable	Water	EPA 6020A	280522
180-90606-4	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	280522
180-90606-5	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	280522
180-90606-6	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	280522
180-90606-7	FIELD BLANK 3	Total Recoverable	Water	EPA 6020A	280522
MB 180-280522/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	280522
LCS 180-279554/2-C	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280522
LCS 180-280522/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280522

### Analysis Batch: 281393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-5	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	280522

## General Chemistry

### Analysis Batch: 280217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	SM 2540C	
180-90606-2	CCR-SP-2	Total/NA	Water	SM 2540C	
180-90606-3	CCR-SP-3	Total/NA	Water	SM 2540C	
180-90606-4	CCR-AP-1R	Total/NA	Water	SM 2540C	
180-90606-5	CCR-AP-2R	Total/NA	Water	SM 2540C	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	SM 2540C	
180-90606-7	FIELD BLANK 3	Total/NA	Water	SM 2540C	
MB 180-280217/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-280217/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-90606-3 DU	CCR-SP-3	Total/NA	Water	SM 2540C	

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-90606-1

## General Chemistry

### Analysis Batch: 280283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	EPA 9040C	
180-90606-2	CCR-SP-2	Total/NA	Water	EPA 9040C	
180-90606-3	CCR-SP-3	Total/NA	Water	EPA 9040C	
180-90606-4	CCR-AP-1R	Total/NA	Water	EPA 9040C	
180-90606-5	CCR-AP-2R	Total/NA	Water	EPA 9040C	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	EPA 9040C	
180-90606-7	FIELD BLANK 3	Total/NA	Water	EPA 9040C	
LCS 180-280283/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-90606-4 DU	CCR-AP-1R	Total/NA	Water	EPA 9040C	

## Rad

### Prep Batch: 431020

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	PrecSep-21	
180-90606-2	CCR-SP-2	Total/NA	Water	PrecSep-21	
180-90606-3	CCR-SP-3	Total/NA	Water	PrecSep-21	
MB 160-431020/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-431020/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 431030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	PrecSep_0	
180-90606-2	CCR-SP-2	Total/NA	Water	PrecSep_0	
180-90606-3	CCR-SP-3	Total/NA	Water	PrecSep_0	
MB 160-431030/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-431030/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

### Prep Batch: 431125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-4	CCR-AP-1R	Total/NA	Water	PrecSep-21	
180-90606-5	CCR-AP-2R	Total/NA	Water	PrecSep-21	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	PrecSep-21	
180-90606-7	FIELD BLANK 3	Total/NA	Water	PrecSep-21	
MB 160-431125/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-431125/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 431128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-4	CCR-AP-1R	Total/NA	Water	PrecSep_0	
180-90606-5	CCR-AP-2R	Total/NA	Water	PrecSep_0	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	PrecSep_0	
180-90606-7	FIELD BLANK 3	Total/NA	Water	PrecSep_0	
MB 160-431128/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-431128/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	




# Chain of Custody Record

<b>Client Information</b>		Carrier Tracking No(s):		COC No: 180-49738-8017.1	
Client Contact: Angela Casbon Scheller		Lab PM: Bortot, Veronica		Page: Page 1 of 1	
Company: Vectren Corporation		E-Mail: veronica.bortot@testamericainc.com		Job #:	
Address: PO BOX 209		Due Date Requested:		Total Number of Containers	
City: Evansville		TAT Requested (days):		Analysis Requested	
State, Zip: IN, 47702		PO #: Purchase Order Requested		Preservation Codes:	
Phone: 864-214-8750(Tel)		WO #:		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:	
Email: acscheller@Vectren.com		Project #: 18016014		Special Instructions/Note:	
Site: AB Brown		SSOW#:		Appendix III & Appendix IV analytes needed; No Sb, Vc, Tl	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastelol, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C_Calc'd - TDS	6020A, 7470A	9040C, 9056A_ORGFM_28D	9315_Ra226, 9320_Ra228	D	N	X	Y
CCR-AP-21 - CCR-SP-1	5-24-19	1130	G	Water		X					X			
CCR-AP-31 - CCR-SP-2		1230		Water		X								
CCR-AP-8 - CCR-SP-3		1350		Water		X								
CCR-AP-9 - CCR-AP-1R		1030		Water		X								
CCR-AP-10 - CCR-AP-2R		0940		Water		X								
CCR-AP- - Blind Duplicate 3		-		Water		X								
CCR-AP- - Field Blank 3		1900	L	L		X								



180-90606 Chain of Custody

**Possible Hazard Identification**  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Radiological  
 Deliverable Requested: I, II, III, IV, Other (specify)

**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:

Empty Kit Relinquished by:		Date:	
Relinquished by: Jacob Wissett	Company: ATC	Date/Time: 5-28-19 / 1930	Method of Shipment: Fedex
Relinquished by:	Company:	Date/Time:	Date/Time:
Relinquished by:	Company:	Date/Time:	Date/Time:
Custody Seals Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>	Custody Seal No.:	Company: FAPIT	Date/Time: 5-29-19
		Company:	Date/Time: 9:30



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

ORIGIN ID:EVVA (812) 477-1176  
 BRIAN KLEEMAN  
 1149 WEDEKING AVENUE  
 BUILDING D, SUITE 2  
 EVANSVILLE, IN 47715  
 UNITED STATES US

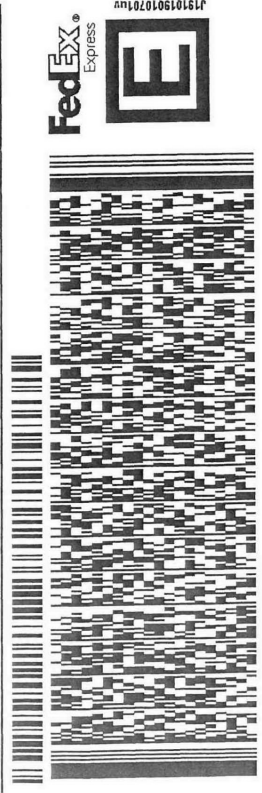
TO VERONICA BORTOT  
 TESTAMERICA  
 301 ALPHA DRIVE

SHIP DATE: 28MAY19  
 ACTWGT: 50.00 LB  
 CAD: 106997842JINET4100  
 DIMS: 18x13x10 IN  
 BILL SENDER

565J1/D66C/23AD

PITTSBURGH PA 15238  
 (412) 963-7058  
 INV: 170LF00739 + 170LF00738  
 PO: REF: 170LF00739 + 170LF00738

DEPT:



4 of 5  
 MPS# 7753 2860 3324  
 0263  
 Mstr# 7753 2860 3302  
 NA AGCA  
 PA-US  
 15238  
 PIT  
 WED - 29 MAY 10:30A  
 PRIORITY OVERNIGHT



PT-WI-SR-001 effective 11/8/18

**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

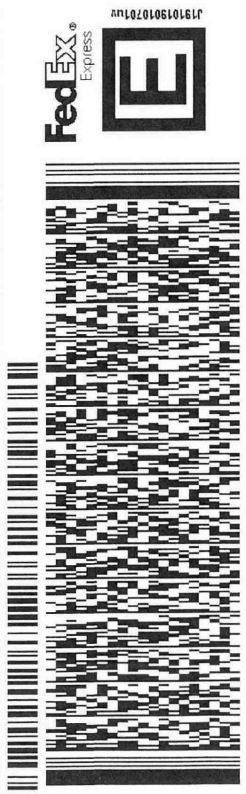
SHIP DATE: 28MAY19  
ACTWGT: 50.00 LB  
CAD: 106997842JINET4100  
DIMS: 18x13x10 IN  
BILL SENDER

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

565J1/D66C/23AD

PITTSBURGH PA 15238

(412) 963-7058 REF: 170LF00739 + 170LF00738  
INV: 170LF00739 + 170LF00738 DEPT:



WED - 29 MAY 10:30A  
PRIORITY OVERNIGHT

1 of 5  
TRK# 7753 2860 3302  
0201  
## MASTER ##

NA AGCA 15238  
PIT  
JS  
23/10



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.

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

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

ORIGIN ID:EVWA (812) 477-1176  
 BRIAN KLEEMAN  
 1149 WEDEKING AVENUE  
 BUILDING D, SUITE 2  
 EVANSVILLE, IN 47715  
 UNITED STATES US

TO VERONICA BORTOT  
 TESTAMERICA  
 301 ALPHA DRIVE

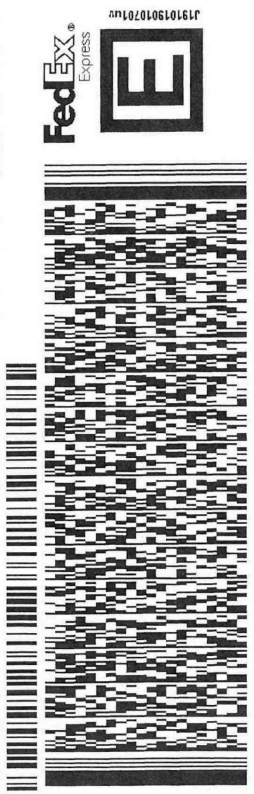
SHIP DATE: 28MAY19  
 ACTWGT: 50.00 LB  
 CAD: 106997842/INET4100  
 DIMS: 18x13x10 IN  
 BILL SENDER

665J1/D66C/23AD

PITTSBURGH PA 15238  
 (412) 963-7058  
 INV: 170LF00739 + 170LF00738  
 PO:

REF: 170LF00739 + 170LF00738

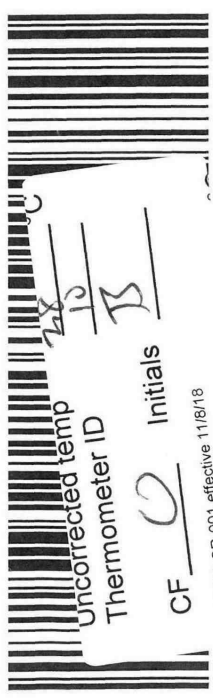
DEPT:



3 of 5  
 WED - 29 MAY 10:30A  
 PRIORITY OVERNIGHT  
 15238  
 PIT  
 PA-US

MPS# 7753 2860 3405  
 0263  
 Mstr# 7753 2860 3302

NA AGCA



**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.

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

SHIP DATE: 28MAY19  
ACT WGT: 50.00 LB  
CAD: 106997842/INET4100  
DIMS: 18x13x10 IN  
BILL SENDER

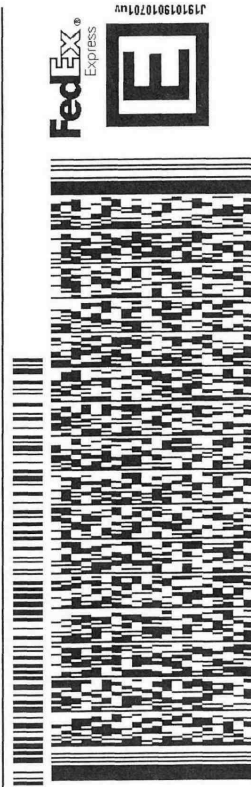
ORIGIN ID: EVVA (812) 477-1176  
BRIAN KLEEMAN  
1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

565J1/D66C/23AD

PITTSBURGH PA 15238

(412) 963-7058 REF: 170LF00739 + 170LF00738  
INV: 170LF00739 + 170LF00738 DEPT:

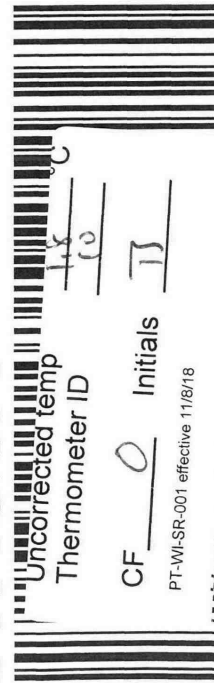


WED - 29 MAY 10:30A  
PRIORITY OVERNIGHT

MPS# 7753 2860 2832  
0263  
Mistr# 7753 2860 3302 0201

15238  
PIT  
PA-US

NA AGCA



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  
SHIP DATE: 28MAY19  
ACTWGT: 50.00 LB  
CAD: 106997842/INET4100  
DIMS: 18x13x10 IN  
BILL SENDER

1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

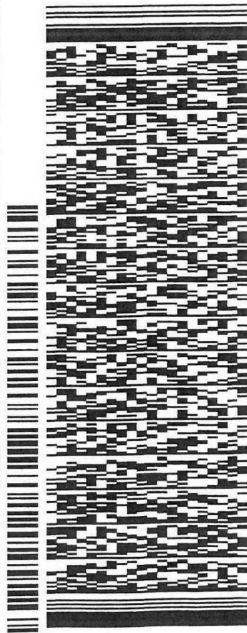
565J1/D66C/23AD

PITTSBURGH PA 15238

(412) 963-7058 REF: 170LF00739 + 170LF00738

INV: 170LF00739 + 170LF00738

PO: DEPT:



J191019010701uv

WED - 29 MAY 10:30A

PRIORITY OVERNIGHT

5 of 5

MPS# 7753 2860 3482

0263

Mstr# 7753 2860 3302

0201

15238  
PA-US  
PIT

NA AGCA



Uncorrected temp 21.1

Thermometer ID 10

CF 0 Initials JS

PT-WI-SR-001 effective 11/8/18

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.

# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Sampler: Lab PM: Bortol, Veronica		Carrier Tracking No(s): COC No: 180-364426.1						
Client Contact: Shipping/Receiving		Phone: E-Mail: veronica.bortol@testamericainc.com		Page: Page 1 of 1						
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-90606-1						
Address: 13715 Rider Trail North,		Due Date Requested: 6/10/2019		Preservation Codes:						
City: Earth City		TAT Requested (days):		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:						
State, Zip: MO, 63045		PO #:		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)						
Phone: 314-298-8566(Tel) 314-298-8757(Fax)		WO #:		Total Number of Containers						
Email:		Project #: 18016014		Analysis Requested						
Site: CCR Groundwater Monitoring FB Cully		SSOW#:		9315_Ra226/PreSep_21 Standard Target List 9320_Ra228/PreSep_0 Standard Target List Ra226Ra228_GFPc						
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Orwasteoil, 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_GFPc	Special Instructions/Note:
CCR-SP-1 (180-90606-1)	5/24/19	11:30 Eastern	Water	Water	X	X	X	X	X	2
CCR-SP-2 (180-90606-2)	5/24/19	12:30 Eastern	Water	Water	X	X	X	X	X	2
CCR-SP-3 (180-90606-3)	5/24/19	13:50 Eastern	Water	Water	X	X	X	X	X	2
CCR-AP-1R (180-90606-4)	5/24/19	10:30 Eastern	Water	Water	X	X	X	X	X	2
CCR-AP-2R (180-90606-5)	5/24/19	09:40 Eastern	Water	Water	X	X	X	X	X	2
BLIND DUPLICATE 3 (180-90606-6)	5/24/19	Eastern	Water	Water	X	X	X	X	X	2
FIELD BLANK 3 (180-90606-7)	5/24/19	14:00 Eastern	Water	Water	X	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/test/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: 5/24/19 1700  
 Relinquished by: SA Pt Michael Hurn  
 Received by: SA Pt Michael Hurn  
 Date/Time: 5-1-19 8:50  
 Company: Company  
 Company: Company  
 Company: Company

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Custody Seals Intact: \_\_\_\_\_  
 Δ Yes Δ No  
 Cooler Temperature(s) °C and Other Remarks: \_\_\_\_\_



## Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-90606-1

**Login Number: 90606**

**List Source: Eurofins TestAmerica, Pittsburgh**

**List Number: 1**

**Creator: Watson, Debbie**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
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: 180-90606-1

**Login Number: 90606**  
**List Number: 2**  
**Creator: Hellm, Michael**

**List Source: Eurofins TestAmerica, St. Louis**  
**List Creation: 06/01/19 11:11 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.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	22.0
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	



## ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh  
301 Alpha Drive  
RIDC Park  
Pittsburgh, PA 15238  
Tel: (412)963-7058

Laboratory Job ID: 180-91430-1

Client Project/Site: CCR Groundwater Monitoring AB Brown

**For:**

Vectren Corporation  
PO BOX 209  
Evansville, Indiana 47702

Attn: Accounts Payable



Authorized for release by:  
8/20/2019 3:48:21 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



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Case Narrative . . . . .	3
Definitions/Glossary . . . . .	4
Certification Summary . . . . .	5
Sample Summary . . . . .	6
Method Summary . . . . .	7
Lab Chronicle . . . . .	8
Client Sample Results . . . . .	13
QC Sample Results . . . . .	18
QC Association Summary . . . . .	23
Subcontract Data . . . . .	26
Chain of Custody . . . . .	62
Receipt Checklists . . . . .	63

# Case Narrative

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

Job ID: 180-91430-1

---

## Job ID: 180-91430-1

---

Laboratory: Eurofins TestAmerica, Pittsburgh

### Narrative

---

#### Job Narrative 180-91430-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 6/18/2019 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.3° C and 4.7° C.

#### Receipt Exceptions

As per the client. The QC should be on sample 1 not sample 2 as per the COC. Container labels match the sample collection time of sample 1 as well.

CCR-AP-2I (180-91430-1), CCR-AP-2I (180-91430-1[DU]), CCR-AP-2I (180-91430-1[MS]) and CCR-AP-2I (180-91430-1[MSD])

#### GC Semi VOA

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

#### Metals

Method(s) 6020A: The following samples were diluted due to the nature of the sample matrix: CCR-AP-9 (180-91430-4) and BLIND DUPLICATE (180-91430-6). Elevated reporting limits (RLs) are provided.

Method(s) 6020A: The following samples were diluted due to the nature of the sample matrix: CCR-AP-9 (180-91430-4) and BLIND DUPLICATE (180-91430-6). Elevated reporting limits (RLs) are provided.

Method(s) 6020A: The following samples were diluted to bring the concentration of target analytes within the calibration range: CCR-AP-9 (180-91430-4), CCR-AP-10 (180-91430-5) and BLIND DUPLICATE (180-91430-6). Elevated reporting limits (RLs) are provided.

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

#### General Chemistry

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

#### Subcontract Work

Method General Subcontract Method: This method was subcontracted to ALS Laboratory Group - Fort Collins, CO. The subcontract laboratory certification is different from that of the facility issuing the final report.

# Definitions/Glossary

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

Job ID: 180-91430-1

## 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
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

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

## 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

Job ID: 180-91430-1

## Laboratory: Eurofins 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		19-033-0	06-27-20
Arkansas DEQ	State Program	6	88-0690	06-27-20
California	State		2891	04-30-20
California	State Program	9	2891	04-30-20
Connecticut	State		PH-0688	09-30-20
Connecticut	State Program	1	PH-0688	09-30-20
Florida	NELAP	4	E871008	06-30-20
Florida	NELAP		E871008	06-30-20
Illinois	NELAP	5	200005	06-30-20
Illinois	NELAP		004375	06-30-20
Kansas	NELAP	7	E-10350	01-31-20
Kansas	NELAP		E-10350	03-31-20
Kentucky (UST)	State Program	4	162013	04-30-20
Kentucky (WW)	State		KY98043	12-31-19
Kentucky (WW)	State Program	4	KY98043	12-31-19
Louisiana	NELAP	6	04041	06-30-20
Minnesota	NELAP	5	042-999-482	12-31-19
Nevada	State Program	9	PA00164	07-31-20
New Hampshire	NELAP	1	2030	04-04-20
New Jersey	NELAP	2	PA005	06-30-20
New Jersey	NELAP		PA005	06-30-20
New York	NELAP	2	11182	03-31-20
New York	NELAP		11182	04-01-20
North Carolina (WW/SW)	State Program	4	434	12-31-19
North Dakota	State Program	8	R-227	04-30-20
Oregon	NELAP	10	PA-2151	02-06-20
Oregon	NELAP		PA-2151	02-06-20
Pennsylvania	NELAP	3	02-00416	04-30-20
Pennsylvania	NELAP		02-00416	04-30-20
Rhode Island	State		LAO00362	12-30-19
Rhode Island	State Program	1	LAO00362	12-30-19
South Carolina	State Program	4	89014	04-30-20
Texas	NELAP	6	T104704528-15-2	03-31-20
Texas	NELAP		T104704528	03-31-20
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
US Fish & Wildlife	US Federal Programs		058448	07-31-20
USDA	Federal		P-Soil-01	06-26-22
USDA	US Federal Programs		P330-16-00211	06-26-22
Utah	NELAP	8	PA001462015-4	05-31-20
Utah	NELAP		PA001462019-8	05-31-20
Virginia	NELAP	3	460189	09-14-19
Virginia	NELAP		10043	09-14-19
West Virginia DEP	State		142	01-31-20
West Virginia DEP	State Program	3	142	01-31-20
Wisconsin	State		998027800	08-31-19
Wisconsin	State Program	5	998027800	08-31-19

# Sample Summary

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

Job ID: 180-91430-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-91430-1	CCR-AP-2I	Water	06/14/19 14:30	06/18/19 09:00	
180-91430-2	CCR-AP-3I	Water	06/14/19 17:10	06/18/19 09:00	
180-91430-3	CCR-AP-8	Water	06/17/19 14:00	06/18/19 09:00	
180-91430-4	CCR-AP-9	Water	06/17/19 12:15	06/18/19 09:00	
180-91430-5	CCR-AP-10	Water	06/17/19 17:00	06/18/19 09:00	
180-91430-6	BLIND DUPLICATE	Water	06/17/19 00:00	06/18/19 09:00	
180-91430-7	FIELD BLANK	Water	06/17/19 16:30	06/18/19 09:00	

# Method Summary

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

Job ID: 180-91430-1

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
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT

#### Protocol References:

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.

#### Laboratory References:

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



# Lab Chronicle

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

Job ID: 180-91430-1

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

**Lab Sample ID: 180-91430-1**

**Date Collected: 06/14/19 14:30**

**Matrix: Water**

**Date Received: 06/18/19 09:00**

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: CHICS2000		1			282686	06/24/19 18:25	CMR	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		10			282686	06/24/19 18:42	CMR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283423	06/28/19 17:12	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283468	06/29/19 15:26	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283712	07/02/19 10:11	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	282700	06/24/19 10:16	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			282947	06/25/19 16:14	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			282220	06/19/19 14:31	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	282372	06/20/19 10:15	AVS	TAL PIT

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

**Lab Sample ID: 180-91430-2**

**Date Collected: 06/14/19 17:10**

**Matrix: Water**

**Date Received: 06/18/19 09:00**

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: CHICS2000		1			282686	06/24/19 19:33	CMR	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		10			282686	06/24/19 19:50	CMR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283423	06/28/19 17:29	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283468	06/29/19 15:43	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283712	07/02/19 10:34	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	282700	06/24/19 10:16	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			282947	06/25/19 16:18	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			282220	06/19/19 14:33	RJP	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-91430-1

## Client Sample ID: CCR-AP-3I

Date Collected: 06/14/19 17:10

Date Received: 06/18/19 09:00

## Lab Sample ID: 180-91430-2

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	SM 2540C		1	100 mL	100 mL	282372	06/20/19 10:15	AVS	TAL PIT

## Client Sample ID: CCR-AP-8

Date Collected: 06/17/19 14:00

Date Received: 06/18/19 09:00

## Lab Sample ID: 180-91430-3

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: CHICS2000		1			282686	06/24/19 20:40	CMR	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		10			282686	06/24/19 20:57	CMR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283423	06/28/19 17:32	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283468	06/29/19 15:46	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283712	07/02/19 10:38	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	282700	06/24/19 10:16	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			282947	06/25/19 16:23	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			282220	06/19/19 14:35	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	282383	06/20/19 10:52	AVS	TAL PIT

## Client Sample ID: CCR-AP-9

Date Collected: 06/17/19 12:15

Date Received: 06/18/19 09:00

## Lab Sample ID: 180-91430-4

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: CHICS2000		10			282686	06/24/19 21:48	CMR	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		100			282686	06/24/19 22:05	CMR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			283468	06/29/19 15:50	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			283712	07/02/19 10:41	RSK	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-91430-1

## Client Sample ID: CCR-AP-9

## Lab Sample ID: 180-91430-4

Date Collected: 06/17/19 12:15

Matrix: Water

Date Received: 06/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	282700	06/24/19 10:16	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			282947	06/25/19 16:24	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			282220	06/19/19 14:36	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	20 mL	100 mL	282383	06/20/19 10:52	AVS	TAL PIT

## Client Sample ID: CCR-AP-10

## Lab Sample ID: 180-91430-5

Date Collected: 06/17/19 17:00

Matrix: Water

Date Received: 06/18/19 09:00

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: CHICS2000		5			282686	06/24/19 21:14	CMR	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		50			282686	06/24/19 21:31	CMR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283423	06/28/19 17:35	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			283468	06/29/19 15:53	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			283712	07/02/19 10:44	RSK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	282700	06/24/19 10:16	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A Instrument ID: HGY		1			282947	06/25/19 16:25	KAK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			282220	06/19/19 14:38	RJP	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	25 mL	100 mL	282383	06/20/19 10:52	AVS	TAL PIT

## Client Sample ID: BLIND DUPLICATE

## Lab Sample ID: 180-91430-6

Date Collected: 06/17/19 00:00

Matrix: Water

Date Received: 06/18/19 09:00

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: CHICS2000		10			282686	06/24/19 22:22	CMR	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		100			282686	06/24/19 22:39	CMR	TAL PIT

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-91430-1

## Client Sample ID: BLIND DUPLICATE

Lab Sample ID: 180-91430-6

Date Collected: 06/17/19 00:00

Matrix: Water

Date Received: 06/18/19 09:00

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	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			283468	06/29/19 16:03	WTR	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			283712	07/02/19 10:48	RSK	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	282700	06/24/19 10:16	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			282947	06/25/19 16:26	KAK	TAL PIT
Instrument ID: HGY										
Total/NA	Analysis	EPA 9040C		1			282220	06/19/19 14:41	RJP	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	20 mL	100 mL	282383	06/20/19 10:52	AVS	TAL PIT
Instrument ID: NOEQUIP										

## Client Sample ID: FIELD BLANK

Lab Sample ID: 180-91430-7

Date Collected: 06/17/19 16:30

Matrix: Water

Date Received: 06/18/19 09:00

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			282686	06/24/19 22:56	CMR	TAL PIT
Instrument ID: CHICS2000										
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			283423	06/28/19 17:39	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			283468	06/29/19 16:07	WTR	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	282347	06/20/19 09:08	RJR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			283712	07/02/19 10:51	RSK	TAL PIT
Instrument ID: A										
Total/NA	Prep	7470A			50 mL	50 mL	282700	06/24/19 10:16	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			282947	06/25/19 16:27	KAK	TAL PIT
Instrument ID: HGY										
Total/NA	Analysis	EPA 9040C		1			282220	06/19/19 14:45	RJP	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	282383	06/20/19 10:52	AVS	TAL PIT
Instrument ID: NOEQUIP										

**Laboratory References:**

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

# Lab Chronicle

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

Job ID: 180-91430-1

## Analyst References:

Lab: TAL PIT

Batch Type: Prep

JJZ = Joseph Zubrow

RJR = Ron Rosenbaum

Batch Type: Analysis

AVS = Abbey Smith

CMR = Carl Reagle

KAK = Kayla Kalamasz

RJP = Rockwell Pokrant

RSK = Robert Kurtz

WTR = Bill Reinheimer

1

2

3

4

5

6

7

8

9

10

11

12

13

14

# Client Sample Results

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

Job ID: 180-91430-1

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

**Lab Sample ID: 180-91430-1**

Date Collected: 06/14/19 14:30

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	110		10	7.1	mg/L			06/24/19 18:42	10
Fluoride	0.83		0.10	0.026	mg/L			06/24/19 18:25	1
Sulfate	23		1.0	0.38	mg/L			06/24/19 18:25	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0022		0.0010	0.00032	mg/L		06/20/19 09:08	06/28/19 17:12	1
Boron	2.1	B	0.080	0.030	mg/L		06/20/19 09:08	07/02/19 10:11	1
Barium	0.11		0.010	0.0015	mg/L		06/20/19 09:08	06/28/19 17:12	1
Beryllium	ND		0.0010	0.00016	mg/L		06/20/19 09:08	06/28/19 17:12	1
Calcium	19	B	0.50	0.12	mg/L		06/20/19 09:08	06/28/19 17:12	1
Cadmium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:12	1
Cobalt	0.00043	J B	0.00050	0.000075	mg/L		06/20/19 09:08	06/28/19 17:12	1
Chromium	0.0040		0.0020	0.0015	mg/L		06/20/19 09:08	06/28/19 17:12	1
Molybdenum	0.0092		0.0050	0.00061	mg/L		06/20/19 09:08	06/28/19 17:12	1
Lead	0.00042	J B	0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:12	1
Antimony	0.00053	J	0.0020	0.00038	mg/L		06/20/19 09:08	06/28/19 17:12	1
Selenium	ND		0.0050	0.0026	mg/L		06/20/19 09:08	06/28/19 17:12	1
Thallium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:12	1
Lithium	24		5.0	3.1	ug/L		06/20/19 09:08	06/29/19 15:26	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/24/19 10:16	06/25/19 16:14	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	710		10	10	mg/L			06/20/19 10:15	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.6	HF	0.1	0.1	SU			06/19/19 14:31	1

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

**Lab Sample ID: 180-91430-2**

Date Collected: 06/14/19 17:10

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	150		10	7.1	mg/L			06/24/19 19:50	10
Fluoride	1.1		0.10	0.026	mg/L			06/24/19 19:33	1
Sulfate	16		1.0	0.38	mg/L			06/24/19 19:33	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0018		0.0010	0.00032	mg/L		06/20/19 09:08	06/28/19 17:29	1
Boron	2.2	B	0.080	0.030	mg/L		06/20/19 09:08	07/02/19 10:34	1
Barium	0.17		0.010	0.0015	mg/L		06/20/19 09:08	06/28/19 17:29	1
Beryllium	0.00026	J	0.0010	0.00016	mg/L		06/20/19 09:08	06/28/19 17:29	1
Calcium	16	B	0.50	0.12	mg/L		06/20/19 09:08	06/28/19 17:29	1
Cadmium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:29	1
Cobalt	0.0013	B	0.00050	0.000075	mg/L		06/20/19 09:08	06/28/19 17:29	1
Chromium	0.0046		0.0020	0.0015	mg/L		06/20/19 09:08	06/28/19 17:29	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-91430-1

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

**Lab Sample ID: 180-91430-2**

Date Collected: 06/14/19 17:10

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	0.0061		0.0050	0.00061	mg/L		06/20/19 09:08	06/28/19 17:29	1
Lead	0.0011	B	0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:29	1
Antimony	0.00045	J	0.0020	0.00038	mg/L		06/20/19 09:08	06/28/19 17:29	1
Selenium	ND		0.0050	0.0026	mg/L		06/20/19 09:08	06/28/19 17:29	1
Thallium	0.00013	J	0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:29	1
Lithium	25		5.0	3.1	ug/L		06/20/19 09:08	06/29/19 15:43	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/24/19 10:16	06/25/19 16:18	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	700		10	10	mg/L			06/20/19 10:15	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.1	HF	0.1	0.1	SU			06/19/19 14:33	1

**Client Sample ID: CCR-AP-8**

**Lab Sample ID: 180-91430-3**

Date Collected: 06/17/19 14:00

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	41		1.0	0.71	mg/L			06/24/19 20:40	1
Fluoride	0.29		0.10	0.026	mg/L			06/24/19 20:40	1
Sulfate	210		10	3.8	mg/L			06/24/19 20:57	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0013		0.0010	0.00032	mg/L		06/20/19 09:08	06/28/19 17:32	1
Boron	0.12	B	0.080	0.030	mg/L		06/20/19 09:08	07/02/19 10:38	1
Barium	0.066		0.010	0.0015	mg/L		06/20/19 09:08	06/28/19 17:32	1
Beryllium	ND		0.0010	0.00016	mg/L		06/20/19 09:08	06/28/19 17:32	1
Calcium	140	B	0.50	0.12	mg/L		06/20/19 09:08	06/28/19 17:32	1
Cadmium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:32	1
Cobalt	0.0046	B	0.00050	0.000075	mg/L		06/20/19 09:08	06/28/19 17:32	1
Chromium	0.0039		0.0020	0.0015	mg/L		06/20/19 09:08	06/28/19 17:32	1
Molybdenum	0.0010	J	0.0050	0.00061	mg/L		06/20/19 09:08	06/28/19 17:32	1
Lead	0.00054	J B	0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:32	1
Antimony	ND		0.0020	0.00038	mg/L		06/20/19 09:08	06/28/19 17:32	1
Selenium	ND		0.0050	0.0026	mg/L		06/20/19 09:08	06/28/19 17:32	1
Thallium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:32	1
Lithium	11		5.0	3.1	ug/L		06/20/19 09:08	06/29/19 15:46	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/24/19 10:16	06/25/19 16:23	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	810		10	10	mg/L			06/20/19 10:52	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-91430-1

## Client Sample ID: CCR-AP-8

## Lab Sample ID: 180-91430-3

Date Collected: 06/17/19 14:00

Matrix: Water

Date Received: 06/18/19 09:00

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			06/19/19 14:35	1

## Client Sample ID: CCR-AP-9

## Lab Sample ID: 180-91430-4

Date Collected: 06/17/19 12:15

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	870		100	71	mg/L			06/24/19 22:05	100
Fluoride	0.33	J	1.0	0.26	mg/L			06/24/19 21:48	10
Sulfate	4400		100	38	mg/L			06/24/19 22:05	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.023		0.010	0.0032	mg/L		06/20/19 09:08	06/29/19 15:50	10
Boron	9.5	B	0.80	0.30	mg/L		06/20/19 09:08	07/02/19 10:41	10
Barium	0.086	J	0.10	0.015	mg/L		06/20/19 09:08	06/29/19 15:50	10
Beryllium	ND		0.010	0.0016	mg/L		06/20/19 09:08	06/29/19 15:50	10
Calcium	470		5.0	1.2	mg/L		06/20/19 09:08	06/29/19 15:50	10
Cadmium	ND		0.010	0.0013	mg/L		06/20/19 09:08	06/29/19 15:50	10
Cobalt	0.0012	J	0.0050	0.00075	mg/L		06/20/19 09:08	06/29/19 15:50	10
Chromium	ND		0.020	0.015	mg/L		06/20/19 09:08	06/29/19 15:50	10
Molybdenum	0.021	J	0.050	0.0061	mg/L		06/20/19 09:08	06/29/19 15:50	10
Lead	ND		0.010	0.0013	mg/L		06/20/19 09:08	06/29/19 15:50	10
Antimony	ND		0.020	0.0038	mg/L		06/20/19 09:08	06/29/19 15:50	10
Selenium	ND		0.050	0.026	mg/L		06/20/19 09:08	06/29/19 15:50	10
Thallium	ND		0.010	0.0013	mg/L		06/20/19 09:08	06/29/19 15:50	10
Lithium	ND		50	31	ug/L		06/20/19 09:08	06/29/19 15:50	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/24/19 10:16	06/25/19 16:24	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	6900		50	50	mg/L			06/20/19 10:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1	0.1	SU			06/19/19 14:36	1

## Client Sample ID: CCR-AP-10

## Lab Sample ID: 180-91430-5

Date Collected: 06/17/19 17:00

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	250		5.0	3.6	mg/L			06/24/19 21:14	5
Fluoride	0.45	J	0.50	0.13	mg/L			06/24/19 21:14	5
Sulfate	2000		50	19	mg/L			06/24/19 21:31	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0011		0.0010	0.00032	mg/L		06/20/19 09:08	06/28/19 17:35	1

Eurofins TestAmerica, Pittsburgh



# Client Sample Results

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

Job ID: 180-91430-1

**Client Sample ID: CCR-AP-10**

**Lab Sample ID: 180-91430-5**

Date Collected: 06/17/19 17:00

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	7.5	B	0.80	0.30	mg/L		06/20/19 09:08	07/02/19 10:44	10
Barium	0.019		0.010	0.0015	mg/L		06/20/19 09:08	06/28/19 17:35	1
Beryllium	0.00021	J	0.0010	0.00016	mg/L		06/20/19 09:08	06/28/19 17:35	1
Calcium	230	B	0.50	0.12	mg/L		06/20/19 09:08	06/28/19 17:35	1
Cadmium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:35	1
Cobalt	0.0016	B	0.00050	0.000075	mg/L		06/20/19 09:08	06/28/19 17:35	1
Chromium	0.0038		0.0020	0.0015	mg/L		06/20/19 09:08	06/28/19 17:35	1
Molybdenum	0.0039	J	0.0050	0.00061	mg/L		06/20/19 09:08	06/28/19 17:35	1
Lead	0.00068	J B	0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:35	1
Antimony	ND		0.0020	0.00038	mg/L		06/20/19 09:08	06/28/19 17:35	1
Selenium	0.015		0.0050	0.0026	mg/L		06/20/19 09:08	06/28/19 17:35	1
Thallium	0.00013	J	0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:35	1
Lithium	5.9		5.0	3.1	ug/L		06/20/19 09:08	06/29/19 15:53	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/24/19 10:16	06/25/19 16:25	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3400		40	40	mg/L			06/20/19 10:52	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			06/19/19 14:38	1

**Client Sample ID: BLIND DUPLICATE**

**Lab Sample ID: 180-91430-6**

Date Collected: 06/17/19 00:00

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	820		100	71	mg/L			06/24/19 22:39	100
Fluoride	0.33	J	1.0	0.26	mg/L			06/24/19 22:22	10
Sulfate	4200		100	38	mg/L			06/24/19 22:39	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.023		0.010	0.0032	mg/L		06/20/19 09:08	06/29/19 16:03	10
Boron	9.0	B	0.80	0.30	mg/L		06/20/19 09:08	07/02/19 10:48	10
Barium	0.074	J	0.10	0.015	mg/L		06/20/19 09:08	06/29/19 16:03	10
Beryllium	ND		0.010	0.0016	mg/L		06/20/19 09:08	06/29/19 16:03	10
Calcium	490		5.0	1.2	mg/L		06/20/19 09:08	06/29/19 16:03	10
Cadmium	ND		0.010	0.0013	mg/L		06/20/19 09:08	06/29/19 16:03	10
Cobalt	0.0017	J	0.00050	0.000075	mg/L		06/20/19 09:08	06/29/19 16:03	10
Chromium	ND		0.020	0.015	mg/L		06/20/19 09:08	06/29/19 16:03	10
Molybdenum	0.021	J	0.050	0.0061	mg/L		06/20/19 09:08	06/29/19 16:03	10
Lead	0.0014	J	0.010	0.0013	mg/L		06/20/19 09:08	06/29/19 16:03	10
Antimony	ND		0.020	0.0038	mg/L		06/20/19 09:08	06/29/19 16:03	10
Selenium	ND		0.050	0.026	mg/L		06/20/19 09:08	06/29/19 16:03	10
Thallium	ND		0.010	0.0013	mg/L		06/20/19 09:08	06/29/19 16:03	10
Lithium	ND		50	31	ug/L		06/20/19 09:08	06/29/19 16:03	10

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-91430-1

## Client Sample ID: BLIND DUPLICATE

Lab Sample ID: 180-91430-6

Date Collected: 06/17/19 00:00

Matrix: Water

Date Received: 06/18/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/24/19 10:16	06/25/19 16:26	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	7300		50	50	mg/L			06/20/19 10:52	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1	0.1	SU			06/19/19 14:41	1

## Client Sample ID: FIELD BLANK

Lab Sample ID: 180-91430-7

Date Collected: 06/17/19 16:30

Matrix: Water

Date Received: 06/18/19 09:00

### 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			06/24/19 22:56	1
Fluoride	0.082	J	0.10	0.026	mg/L			06/24/19 22:56	1
Sulfate	ND		1.0	0.38	mg/L			06/24/19 22:56	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		06/20/19 09:08	06/28/19 17:39	1
Boron	0.035	J B	0.080	0.030	mg/L		06/20/19 09:08	07/02/19 10:51	1
Barium	ND		0.010	0.0015	mg/L		06/20/19 09:08	06/28/19 17:39	1
Beryllium	ND		0.0010	0.00016	mg/L		06/20/19 09:08	06/28/19 17:39	1
Calcium	ND		0.50	0.12	mg/L		06/20/19 09:08	06/28/19 17:39	1
Cadmium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:39	1
Cobalt	ND		0.00050	0.000075	mg/L		06/20/19 09:08	06/28/19 17:39	1
Chromium	0.0026		0.0020	0.0015	mg/L		06/20/19 09:08	06/28/19 17:39	1
Molybdenum	ND		0.0050	0.00061	mg/L		06/20/19 09:08	06/28/19 17:39	1
Lead	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:39	1
Antimony	ND		0.0020	0.00038	mg/L		06/20/19 09:08	06/28/19 17:39	1
Selenium	ND		0.0050	0.0026	mg/L		06/20/19 09:08	06/28/19 17:39	1
Thallium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 17:39	1
Lithium	ND		5.0	3.1	ug/L		06/20/19 09:08	06/29/19 16:07	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/24/19 10:16	06/25/19 16:27	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			06/20/19 10:52	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.9	HF	0.1	0.1	SU			06/19/19 14:45	1

# QC Sample Results

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

Job ID: 180-91430-1

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

**Lab Sample ID: MB 180-282686/6**  
**Matrix: Water**  
**Analysis Batch: 282686**

**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			06/24/19 10:31	1
Fluoride	ND		0.10	0.026	mg/L			06/24/19 10:31	1
Sulfate	ND		1.0	0.38	mg/L			06/24/19 10:31	1

**Lab Sample ID: LCS 180-282686/5**  
**Matrix: Water**  
**Analysis Batch: 282686**

**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	28.0		mg/L		112	80 - 120
Fluoride	1.25	1.25		mg/L		100	80 - 120
Sulfate	25.0	22.0		mg/L		88	80 - 120

**Lab Sample ID: 180-91430-1 MS**  
**Matrix: Water**  
**Analysis Batch: 282686**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	110		250	400		mg/L		117	80 - 120
Fluoride	1.0		12.5	13.5		mg/L		100	80 - 120
Sulfate	23		250	254		mg/L		92	80 - 120

**Lab Sample ID: 180-91430-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 282686**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	110		250	401		mg/L		117	80 - 120	0	15
Fluoride	1.0		12.5	13.6		mg/L		101	80 - 120	1	15
Sulfate	23		250	254		mg/L		93	80 - 120	0	15

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

**Lab Sample ID: MB 180-282347/1-A**  
**Matrix: Water**  
**Analysis Batch: 283423**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		06/20/19 09:08	06/28/19 16:18	1
Barium	ND		0.010	0.0015	mg/L		06/20/19 09:08	06/28/19 16:18	1
Beryllium	ND		0.0010	0.00016	mg/L		06/20/19 09:08	06/28/19 16:18	1
Calcium	0.125	J	0.50	0.12	mg/L		06/20/19 09:08	06/28/19 16:18	1
Cadmium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 16:18	1
Cobalt	0.0000790	J	0.00050	0.000075	mg/L		06/20/19 09:08	06/28/19 16:18	1
Chromium	ND		0.0020	0.0015	mg/L		06/20/19 09:08	06/28/19 16:18	1
Molybdenum	ND		0.0050	0.00061	mg/L		06/20/19 09:08	06/28/19 16:18	1
Lead	0.000138	J	0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 16:18	1
Antimony	ND		0.0020	0.00038	mg/L		06/20/19 09:08	06/28/19 16:18	1
Selenium	ND		0.0050	0.0026	mg/L		06/20/19 09:08	06/28/19 16:18	1
Thallium	ND		0.0010	0.00013	mg/L		06/20/19 09:08	06/28/19 16:18	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-91430-1

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

**Lab Sample ID: MB 180-282347/1-A**  
**Matrix: Water**  
**Analysis Batch: 283423**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		5.0	3.1	ug/L		06/20/19 09:08	06/28/19 16:18	1

**Lab Sample ID: MB 180-282347/1-A**  
**Matrix: Water**  
**Analysis Batch: 283468**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0371	J	0.080	0.030	mg/L		06/20/19 09:08	06/29/19 14:32	1

**Lab Sample ID: MB 180-282347/1-A**  
**Matrix: Water**  
**Analysis Batch: 283712**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0505	J	0.080	0.030	mg/L		06/20/19 09:08	07/02/19 09:30	1

**Lab Sample ID: LCS 180-282347/2-A**  
**Matrix: Water**  
**Analysis Batch: 283423**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	1.00	0.939		mg/L		94	80 - 120
Barium	1.00	1.03		mg/L		103	80 - 120
Beryllium	0.500	0.533		mg/L		107	80 - 120
Calcium	25.0	26.7		mg/L		107	80 - 120
Cadmium	0.500	0.516		mg/L		103	80 - 120
Cobalt	0.500	0.555		mg/L		111	80 - 120
Chromium	0.500	0.543		mg/L		109	80 - 120
Molybdenum	0.500	0.522		mg/L		104	80 - 120
Lead	0.500	0.513		mg/L		103	80 - 120
Antimony	0.250	0.270		mg/L		108	80 - 120
Selenium	1.00	0.976		mg/L		98	80 - 120
Thallium	1.00	1.03		mg/L		103	80 - 120
Lithium	500	470		ug/L		94	80 - 120

**Lab Sample ID: LCS 180-282347/2-A**  
**Matrix: Water**  
**Analysis Batch: 283712**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Boron	1.25	1.18		mg/L		94	80 - 120

**Lab Sample ID: 180-91430-1 MS**  
**Matrix: Water**  
**Analysis Batch: 283423**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	0.0022		1.00	0.970		mg/L		97	75 - 125
Barium	0.11		1.00	1.17		mg/L		106	75 - 125
Beryllium	ND		0.500	0.528		mg/L		106	75 - 125

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-91430-1

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

**Lab Sample ID: 180-91430-1 MS**  
**Matrix: Water**  
**Analysis Batch: 283423**

**Client Sample ID: CCR-AP-2I**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	Limits
	Result	Qualifier		Result	Qualifier					
Calcium	19	B	25.0	44.6		mg/L		104		75 - 125
Cadmium	ND		0.500	0.517		mg/L		103		75 - 125
Cobalt	0.00043	J B	0.500	0.546		mg/L		109		75 - 125
Chromium	0.0040		0.500	0.533		mg/L		106		75 - 125
Molybdenum	0.0092		0.500	0.543		mg/L		107		75 - 125
Lead	0.00042	J B	0.500	0.513		mg/L		102		75 - 125
Antimony	0.00053	J	0.250	0.276		mg/L		110		75 - 125
Selenium	ND		1.00	0.979		mg/L		98		75 - 125
Thallium	ND		1.00	1.03		mg/L		103		75 - 125

**Lab Sample ID: 180-91430-1 MS**  
**Matrix: Water**  
**Analysis Batch: 283468**

**Client Sample ID: CCR-AP-2I**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	Limits
	Result	Qualifier		Result	Qualifier					
Lithium	24		500	499		ug/L		95		75 - 125

**Lab Sample ID: 180-91430-1 MS**  
**Matrix: Water**  
**Analysis Batch: 283712**

**Client Sample ID: CCR-AP-2I**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	Limits
	Result	Qualifier		Result	Qualifier					
Boron	2.1	B	1.25	3.32		mg/L		100		75 - 125

**Lab Sample ID: 180-91430-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 283423**

**Client Sample ID: CCR-AP-2I**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier							
Arsenic	0.0022		1.00	0.989		mg/L		99		75 - 125	2	20
Barium	0.11		1.00	1.19		mg/L		108		75 - 125	2	20
Beryllium	ND		0.500	0.545		mg/L		109		75 - 125	3	20
Calcium	19	B	25.0	46.3		mg/L		111		75 - 125	4	20
Cadmium	ND		0.500	0.529		mg/L		106		75 - 125	2	20
Cobalt	0.00043	J B	0.500	0.559		mg/L		112		75 - 125	2	20
Chromium	0.0040		0.500	0.549		mg/L		109		75 - 125	3	20
Molybdenum	0.0092		0.500	0.553		mg/L		109		75 - 125	2	20
Lead	0.00042	J B	0.500	0.527		mg/L		105		75 - 125	3	20
Antimony	0.00053	J	0.250	0.283		mg/L		113		75 - 125	3	20
Selenium	ND		1.00	1.00		mg/L		100		75 - 125	3	20
Thallium	ND		1.00	1.06		mg/L		106		75 - 125	3	20

**Lab Sample ID: 180-91430-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 283468**

**Client Sample ID: CCR-AP-2I**  
**Prep Type: Total Recoverable**  
**Prep Batch: 282347**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier							
Lithium	24		500	509		ug/L		97		75 - 125	2	20

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-91430-1

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

Lab Sample ID: 180-91430-1 MSD  
 Matrix: Water  
 Analysis Batch: 283712

Client Sample ID: CCR-AP-21  
 Prep Type: Total Recoverable  
 Prep Batch: 282347

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	2.1	B	1.25	3.55		mg/L		118	75 - 125	7	20

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

Lab Sample ID: MB 180-282700/1-A  
 Matrix: Water  
 Analysis Batch: 282947

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 282700

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/24/19 10:16	06/25/19 16:07	1

Lab Sample ID: LCS 180-282700/2-A  
 Matrix: Water  
 Analysis Batch: 282947

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 282700

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00250	0.00242		mg/L		97	80 - 120

Lab Sample ID: 180-91430-1 MS  
 Matrix: Water  
 Analysis Batch: 282947

Client Sample ID: CCR-AP-21  
 Prep Type: Total/NA  
 Prep Batch: 282700

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		0.00100	0.000954		mg/L		95	75 - 125

Lab Sample ID: 180-91430-1 MSD  
 Matrix: Water  
 Analysis Batch: 282947

Client Sample ID: CCR-AP-21  
 Prep Type: Total/NA  
 Prep Batch: 282700

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		0.00100	0.000942		mg/L		94	75 - 125	1	20

## Method: EPA 9040C - pH

Lab Sample ID: LCS 180-282220/1  
 Matrix: Water  
 Analysis Batch: 282220

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: 180-91430-6 DU  
 Matrix: Water  
 Analysis Batch: 282220

Client Sample ID: BLIND DUPLICATE  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.8	HF	6.8		SU		0.1	2

# QC Sample Results

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

Job ID: 180-91430-1

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 180-282372/2**  
**Matrix: Water**  
**Analysis Batch: 282372**

**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			06/20/19 10:15	1

**Lab Sample ID: LCS 180-282372/1**  
**Matrix: Water**  
**Analysis Batch: 282372**

**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	201	190		mg/L		95	80 - 120

**Lab Sample ID: 180-91430-1 DU**  
**Matrix: Water**  
**Analysis Batch: 282372**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	710		717		mg/L		1	10

**Lab Sample ID: MB 180-282383/2**  
**Matrix: Water**  
**Analysis Batch: 282383**

**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			06/20/19 10:52	1

**Lab Sample ID: LCS 180-282383/1**  
**Matrix: Water**  
**Analysis Batch: 282383**

**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	201	168		mg/L		84	80 - 120

# QC Association Summary

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

Job ID: 180-91430-1

## HPLC/IC

### Analysis Batch: 282686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total/NA	Water	EPA 9056A	
180-91430-1	CCR-AP-2I	Total/NA	Water	EPA 9056A	
180-91430-2	CCR-AP-3I	Total/NA	Water	EPA 9056A	
180-91430-2	CCR-AP-3I	Total/NA	Water	EPA 9056A	
180-91430-3	CCR-AP-8	Total/NA	Water	EPA 9056A	
180-91430-3	CCR-AP-8	Total/NA	Water	EPA 9056A	
180-91430-4	CCR-AP-9	Total/NA	Water	EPA 9056A	
180-91430-4	CCR-AP-9	Total/NA	Water	EPA 9056A	
180-91430-5	CCR-AP-10	Total/NA	Water	EPA 9056A	
180-91430-5	CCR-AP-10	Total/NA	Water	EPA 9056A	
180-91430-6	BLIND DUPLICATE	Total/NA	Water	EPA 9056A	
180-91430-6	BLIND DUPLICATE	Total/NA	Water	EPA 9056A	
180-91430-7	FIELD BLANK	Total/NA	Water	EPA 9056A	
MB 180-282686/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-282686/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-91430-1 MS	CCR-AP-2I	Total/NA	Water	EPA 9056A	
180-91430-1 MSD	CCR-AP-2I	Total/NA	Water	EPA 9056A	

## Metals

### Prep Batch: 282347

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total Recoverable	Water	3005A	
180-91430-2	CCR-AP-3I	Total Recoverable	Water	3005A	
180-91430-3	CCR-AP-8	Total Recoverable	Water	3005A	
180-91430-4	CCR-AP-9	Total Recoverable	Water	3005A	
180-91430-5	CCR-AP-10	Total Recoverable	Water	3005A	
180-91430-6	BLIND DUPLICATE	Total Recoverable	Water	3005A	
180-91430-7	FIELD BLANK	Total Recoverable	Water	3005A	
MB 180-282347/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-282347/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-91430-1 MS	CCR-AP-2I	Total Recoverable	Water	3005A	
180-91430-1 MSD	CCR-AP-2I	Total Recoverable	Water	3005A	

### Prep Batch: 282700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total/NA	Water	7470A	
180-91430-2	CCR-AP-3I	Total/NA	Water	7470A	
180-91430-3	CCR-AP-8	Total/NA	Water	7470A	
180-91430-4	CCR-AP-9	Total/NA	Water	7470A	
180-91430-5	CCR-AP-10	Total/NA	Water	7470A	
180-91430-6	BLIND DUPLICATE	Total/NA	Water	7470A	
180-91430-7	FIELD BLANK	Total/NA	Water	7470A	
MB 180-282700/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-282700/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-91430-1 MS	CCR-AP-2I	Total/NA	Water	7470A	
180-91430-1 MSD	CCR-AP-2I	Total/NA	Water	7470A	

### Analysis Batch: 282947

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total/NA	Water	EPA 7470A	282700

Eurofins TestAmerica, Pittsburgh



# QC Association Summary

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

Job ID: 180-91430-1

## Metals (Continued)

### Analysis Batch: 282947 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-2	CCR-AP-3I	Total/NA	Water	EPA 7470A	282700
180-91430-3	CCR-AP-8	Total/NA	Water	EPA 7470A	282700
180-91430-4	CCR-AP-9	Total/NA	Water	EPA 7470A	282700
180-91430-5	CCR-AP-10	Total/NA	Water	EPA 7470A	282700
180-91430-6	BLIND DUPLICATE	Total/NA	Water	EPA 7470A	282700
180-91430-7	FIELD BLANK	Total/NA	Water	EPA 7470A	282700
MB 180-282700/1-A	Method Blank	Total/NA	Water	EPA 7470A	282700
LCS 180-282700/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	282700
180-91430-1 MS	CCR-AP-2I	Total/NA	Water	EPA 7470A	282700
180-91430-1 MSD	CCR-AP-2I	Total/NA	Water	EPA 7470A	282700

### Analysis Batch: 283423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347
180-91430-2	CCR-AP-3I	Total Recoverable	Water	EPA 6020A	282347
180-91430-3	CCR-AP-8	Total Recoverable	Water	EPA 6020A	282347
180-91430-5	CCR-AP-10	Total Recoverable	Water	EPA 6020A	282347
180-91430-7	FIELD BLANK	Total Recoverable	Water	EPA 6020A	282347
MB 180-282347/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	282347
LCS 180-282347/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	282347
180-91430-1 MS	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347
180-91430-1 MSD	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347

### Analysis Batch: 283468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347
180-91430-2	CCR-AP-3I	Total Recoverable	Water	EPA 6020A	282347
180-91430-3	CCR-AP-8	Total Recoverable	Water	EPA 6020A	282347
180-91430-4	CCR-AP-9	Total Recoverable	Water	EPA 6020A	282347
180-91430-5	CCR-AP-10	Total Recoverable	Water	EPA 6020A	282347
180-91430-6	BLIND DUPLICATE	Total Recoverable	Water	EPA 6020A	282347
180-91430-7	FIELD BLANK	Total Recoverable	Water	EPA 6020A	282347
MB 180-282347/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	282347
180-91430-1 MS	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347
180-91430-1 MSD	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347

### Analysis Batch: 283712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347
180-91430-2	CCR-AP-3I	Total Recoverable	Water	EPA 6020A	282347
180-91430-3	CCR-AP-8	Total Recoverable	Water	EPA 6020A	282347
180-91430-4	CCR-AP-9	Total Recoverable	Water	EPA 6020A	282347
180-91430-5	CCR-AP-10	Total Recoverable	Water	EPA 6020A	282347
180-91430-6	BLIND DUPLICATE	Total Recoverable	Water	EPA 6020A	282347
180-91430-7	FIELD BLANK	Total Recoverable	Water	EPA 6020A	282347
MB 180-282347/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	282347
LCS 180-282347/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	282347
180-91430-1 MS	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347
180-91430-1 MSD	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	282347

# QC Association Summary

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

Job ID: 180-91430-1

## General Chemistry

### Analysis Batch: 282220

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total/NA	Water	EPA 9040C	
180-91430-2	CCR-AP-3I	Total/NA	Water	EPA 9040C	
180-91430-3	CCR-AP-8	Total/NA	Water	EPA 9040C	
180-91430-4	CCR-AP-9	Total/NA	Water	EPA 9040C	
180-91430-5	CCR-AP-10	Total/NA	Water	EPA 9040C	
180-91430-6	BLIND DUPLICATE	Total/NA	Water	EPA 9040C	
180-91430-7	FIELD BLANK	Total/NA	Water	EPA 9040C	
LCS 180-282220/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-91430-6 DU	BLIND DUPLICATE	Total/NA	Water	EPA 9040C	

### Analysis Batch: 282372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-1	CCR-AP-2I	Total/NA	Water	SM 2540C	
180-91430-2	CCR-AP-3I	Total/NA	Water	SM 2540C	
MB 180-282372/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-282372/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-91430-1 DU	CCR-AP-2I	Total/NA	Water	SM 2540C	

### Analysis Batch: 282383

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-91430-3	CCR-AP-8	Total/NA	Water	SM 2540C	
180-91430-4	CCR-AP-9	Total/NA	Water	SM 2540C	
180-91430-5	CCR-AP-10	Total/NA	Water	SM 2540C	
180-91430-6	BLIND DUPLICATE	Total/NA	Water	SM 2540C	
180-91430-7	FIELD BLANK	Total/NA	Water	SM 2540C	
MB 180-282383/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-282383/1	Lab Control Sample	Total/NA	Water	SM 2540C	



# Radium-228

## Case Narrative

---

### **Eurofins TestAmerica, Pittsburgh**

CCR Groundwater Monitoring AB Brown – 18016014

Work Order Number: 1906640

1. This report consists of the analytical results for eight water samples received by ALS on 06/26/2019.
2. These samples were prepared according to the current revision of SOP 749.
3. The samples were analyzed for the presence of  $^{228}\text{Ra}$  by low background gas flow proportional counting of  $^{228}\text{Ac}$ , which is the ingrown progeny of  $^{228}\text{Ra}$ , according to the current revision of SOP 724. The analyses were completed on 08/01/2019.
4. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
5. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
6. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for RA190729-1MB and -1LCSD fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. These samples are identified with a "Y1" flag on the final reports.
7. No anomalous situations were noted during the preparation and analysis of these samples. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Pik Yee Yuen  
Pik Yee Yuen  
Radiochemistry Primary Data Reviewer

8/2/19  
Date

Monika Lee  
Radiochemistry Final Data Reviewer

8/7/19  
Date

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

**OrderNum:** 1906640

**Client Name:** Eurofins TestAmerica, Pittsburgh

**Client Project Name:** CCR Groundwater Monitoring AB Brown

**Client Project Number:** 18016014

**Client PO Number:**

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CCR-AP-2I (180-91430-1)	1906640-1		WATER	14-Jun-19	14:30
CCR-AP-2I (180-91430-1DU)	1906640-2		WATER	14-Jun-19	14:30
CCR-AP-3I (180-91430-2)	1906640-3		WATER	14-Jun-19	17:10
CCR-AP-8 (180-91430-3)	1906640-4		WATER	17-Jun-19	14:00
CCR-AP-9 (180-91430-4)	1906640-5		WATER	17-Jun-19	12:15
CCR-AP-10 (180-91430-5)	1906640-6		WATER	17-Jun-19	17:00
BLIND DUPLICATE (180-91430-6)	1906640-7		WATER	17-Jun-19	
FIELD BLANK (180-91430-7)	1906640-8		WATER	17-Jun-19	16:30

# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>			Sampler:		Lab PM:		Carrier Tracking No(s):		COC No:	
ALS Laboratory Group			Bortot, Veronica		Bortot, Veronica		180-366890.1		180-366890.1	
225 Commerce Drive,			E-Mail:		E-Mail:		State of Origin:		Page:	
Fort Collins			veronica.bortot@testamericainc.com		veronica.bortot@testamericainc.com		Indiana		Page 1 of 1	
State, Zip:			Accreditations Required (See note):		Accreditations Required (See note):		Job #:		Job #:	
CO, 80524							180-91430-1		180-91430-1	
PO #:										
WO #:										
Project #:										
CCR Groundwater Monitoring AB Brown			18016014		18016014					
Site:			SSOW#:		SSOW#:					
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Solid, Other)	Preservation Code:	Field Filtered Sample (Yes or No)	SUB (General Subcontract Method)	Total Number of Containers	Special Instructions/Note:	
CCR-AP-21 (180-91430-1)	6/14/19	14:30 Eastern	Water	Water	X	X	X	2		
CCR-AP-21 (180-91430-1DU)	6/14/19	14:30 Eastern	DU	Water	X	X	X	4		
CCR-AP-31 (180-91430-2)	6/14/19	17:10 Eastern	Water	Water	X	X	X	2		
CCR-AP-8 (180-91430-3)	6/17/19	14:00 Eastern	Water	Water	X	X	X	2		
CCR-AP-9 (180-91430-4)	6/17/19	12:15 Eastern	Water	Water	X	X	X	2		
CCR-AP-10 (180-91430-5)	6/17/19	17:00 Eastern	Water	Water	X	X	X	2		
BLIND DUPLICATE (180-91430-6)	6/17/19	Eastern	Water	Water	X	X	X	2		
FIELD BLANK (180-91430-7)	6/17/19	16:30 Eastern	Water	Water	X	X	X	2		
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon 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/test/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.										
<b>Possible Hazard Identification</b>										
Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:										
Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____ Relinquished by: _____ Date/Time: 6/25/19 17:20 Company: TAT Company Relinquished by: _____ Date/Time: _____ Company: _____ Relinquished by: _____ Date/Time: _____ Company: _____ Custody Seals Intact: _____ Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: _____ Δ Yes Δ No										



ALS Environmental - Fort Collins  
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Eurofins Workorder No: 1906640  
Project Manager: MMH Initials: Em Date: 06-26-19

1. Are airbills / shipping documents present and/or removable?		DROP OFF	<input checked="" type="radio"/> YES	NO			
2. Are custody seals on <b>shipping</b> containers intact?		NONE	<input checked="" type="radio"/> YES	NO *			
3. Are custody seals on <b>sample</b> containers intact?		NONE	<input checked="" type="radio"/> YES	NO *			
4. Is there a COC (chain-of-custody) present?			<input checked="" type="radio"/> YES	NO *			
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			<input checked="" type="radio"/> YES	NO *			
6. Are short-hold samples present?			YES	<input checked="" type="radio"/> NO			
7. Are all samples within holding times for the requested analyses?			<input checked="" type="radio"/> YES	NO *			
8. Were all sample containers received intact? (not broken or leaking)			<input checked="" type="radio"/> YES	NO *			
9. Is there sufficient sample for the requested analyses?			<input checked="" type="radio"/> YES	NO *			
10. Are all samples in the proper containers for the requested analyses?			<input checked="" type="radio"/> YES	NO *			
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		N/A	<input checked="" type="radio"/> YES	NO *			
12. Are all aqueous non-preserved samples pH 4-9?		<input checked="" type="radio"/> N/A	YES	NO *			
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		<input checked="" type="radio"/> N/A	YES	NO			
14. Were the samples shipped on ice?			YES	<input checked="" type="radio"/> NO			
15. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*:	#1	#3	#4	<input checked="" type="radio"/> RAD ONLY	YES	NO
Cooler #: <u>1</u>							
Temperature (°C): <u>Amb.</u>							
No. of custody seals on cooler: <u>1</u>							
External µR/hr reading: <u>9</u>							
Background µR/hr reading: <u>10</u>							
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)							

DOT Survey/ Acceptance Information

\* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: Em  
If applicable, was the client contacted? YES / NO /  NA Contact: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Project Manager Signature / Date: [Signature] 6-27-19



**Do Not Lift Using This Tag**

**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

Ship Date: 25Jun19  
 Track Num: 481871332036  
 Project ID:

**Recipient Address:**  
 ALS LABORATORY GROUP  
 SHIPPING/RECEIVING  
 225 COMMERCE DRIVE  
 FORT COLLINS  
 CO  
 80524

ORIGIN ID:AGCA (412) 963-7058  
 EUROFINS TESTAMERICA PITTSBURGH  
 301 ALPHA DRIVE  
 PITTSBURGH, PA 152381330  
 UNITED STATES US

SHIP DATE: 25JUN19  
 ACTWGT: 34.00 LB MAN  
 CAD: 741733/CAFE3211  
 BILL SENDER

TO SHIPPING/RECEIVING  
 ALS LABORATORY GROUP  
 225 COMMERCE DRIVE  
 FORT COLLINS CO 80524  
 (412) 963-7058  
 PO: NO

9-1  
 Amb



551C1/P210/104C

1906640

TRK# 4818  
 0201

NA  
 RT 617  
 ST 9

5  
 10:30  
 2036  
 06:26

26 JUN 10:30A  
 PRIORITY OVERNIGHT

80524  
 CO-US DEN

broken



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Lab ID: RA190729-1MB	Sample Matrix: WATER	Prep Batch: RA190729-1	Final Aliquot: 997 ml
	Prep SOP: SOP749 Rev 6	QCBatchID: RA190729-1-2	Result Units: pCi/l
	Date Collected: 29-Jul-19	Run ID: RA190729-1A	File Name: RAC0801
	Date Prepared: 29-Jul-19	Count Time: 150 minutes	
	Date Analyzed: 01-Aug-19		

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	-0.18 +/- 0.31	0.73	1	NA	Y1,U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33830	34070	ug	101	40 - 110 %	Y1

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

#### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Lab ID: RA190729-1LCS

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2

Final Aliquot: 997 ml  
Result Units: pCi/l

Date Collected: 29-Jul-19

Run ID: RA190729-1A

File Name: RAC0801

Date Prepared: 29-Jul-19

Count Time: 150 minutes

Date Analyzed: 01-Aug-19

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	13.5 +/- 3.2	0.7	14.06	96.1	70 - 130	P

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIIUM	33790	33410	ug	98.9	40 - 110 %	

## Comments:

### Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS Recovery within control limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

### Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins  
Work Order Number: 1906640  
Client Name: Eurofins TestAmerica, Pittsburgh  
ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Lab ID: RA190729-1LCSD	Sample Matrix: WATER Prep SOP: SOP749 Rev 6 Date Collected: 29-Jul-19 Date Prepared: 29-Jul-19 Date Analyzed: 01-Aug-19	Prep Batch: RA190729-1 QCBatchID: RA190729-1-2 Run ID: RA190729-1A Count Time: 150 minutes	Final Aliquot: 997 ml Result Units: pCi/l File Name: RAC0801
------------------------	---	---	--

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	13.4 +/- 3.2	0.7	14.06	95.2	70 - 130	P,Y1

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIIUM	33790	33850	ug	100	40 - 110 %	Y1

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.  
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.  
Y2 - Chemical Yield outside default limits.  
L - LCS Recovery below lower control limit.  
H - LCS Recovery above upper control limit.  
P - LCS Recovery within control limits.  
M - The requested MDC was not met.  
M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

#### Abbreviations:

TPU - Total Propagated Uncertainty  
MDC - Minimum Detectable Concentration

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	
Lab ID:	RA190729-1LCSD

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 29-Jul-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Analyte	Sample				Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags			
15262-20-1	Ra-228	13.5 +/- 3.2	0.7	P	13.4 +/- 3.2	0.7	P,Y1	0.0272	2.13	

### Comments:

#### Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.  
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.  
Y2 - Chemical Yield outside default limits.  
W - DER is greater than Warning Limit of 1.42  
D - DER is greater than Control Limit of 2.13  
LT - Result is less than Request MDC, greater than sample specific MDC  
M - Requested MDC not met.  
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.  
L - LCS Recovery below lower control limit.  
H - LCS Recovery above upper control limit.  
P - LCS, Matrix Spike Recovery within control limits.  
N - Matrix Spike Recovery outside control limits

#### Abbreviations:

TPU - Total Propagated Uncertainty  
DER - Duplicate Error Ratio  
BDL - Below Detection Limit  
NR - Not Reported

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-2I (180-91430-1)
Lab ID:	1906640-1

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 14-Jun-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes  
Report Basis: Unfiltered

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.73	1	NA	U
15262-20-1	Ra-228	0.53 +/- 0.37	0.73	1	NA	U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33900	33030	ug	97.5	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-2I (180-91430-1D)
Lab ID:	1906640-2

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 14-Jun-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes  
Report Basis: Unfiltered

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.75	1	NA	U
15262-20-1	Ra-228	0.42 +/- 0.37	0.75	1	NA	U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33890	31550	ug	93.1	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-3I (180-91430-2)
Lab ID:	1906640-3

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 14-Jun-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes  
Report Basis: Unfiltered

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.75	1	NA	U
15262-20-1	Ra-228	0.56 +/- 0.39	0.75	1	NA	U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33940	31710	ug	93.4	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-8 (180-91430-3)
Lab ID:	1906640-4

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 17-Jun-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes  
Report Basis: Unfiltered

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.83	1	NA	U
15262-20-1	Ra-228	0.67 +/- 0.44	0.83	1	NA	U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33870	29320	ug	86.5	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA1906640-1



# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-9 (180-91430-4)
Lab ID:	1906640-5

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 17-Jun-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes  
Report Basis: Unfiltered

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	1.34	0.74	1	NA	
15262-20-1	Ra-228	0.76 +/- 0.41	0.74	1	NA	

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33880	33230	ug	98.1	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-10 (180-91430-5)
Lab ID:	1906640-6

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 17-Jun-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes  
Report Basis: Unfiltered

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.7	1	NA	U
15262-20-1	Ra-228	0.66 +/- 0.38	0.70	1	NA	U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33820	32910	ug	97.3	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	BLIND DUPLICATE (180-91)
Lab ID:	1906640-7

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 17-Jun-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes  
Report Basis: Unfiltered

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.72	1	NA	U
15262-20-1	Ra-228	0.63 +/- 0.38	0.72	1	NA	U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33860	33340	ug	98.5	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA1906640-1

# Radium-228 Analysis by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	FIELD BLANK (180-91430-
Lab ID:	1906640-8

Sample Matrix: WATER  
Prep SOP: SOP749 Rev 6  
Date Collected: 17-Jun-19  
Date Prepared: 29-Jul-19  
Date Analyzed: 01-Aug-19

Prep Batch: RA190729-1  
QCBatchID: RA190729-1-2  
Run ID: RA190729-1A  
Count Time: 150 minutes  
Report Basis: Unfiltered

Final Aliquot: 997 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RAC0801

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.73	1	NA	U
15262-20-1	Ra-228	0.39 +/- 0.36	0.73	1	NA	U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	33830	33030	ug	97.6	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA1906640-1



# Radium-226

## Case Narrative

---

### **Eurofins TestAmerica, Pittsburgh**

CCR Groundwater Monitoring AB Brown – 18016014

Work Order Number: 1906640

1. This report consists of the analytical results for eight water samples received by ALS on 06/26/2019.
2. These samples were prepared according to the current revision of SOP 712.
3. These samples were analyzed for the presence of  $^{226}\text{Ra}$  according to the current revision of SOP 724. The analyses were completed on 07/26/2019.
4. This test is a screen for  $^{226}\text{Ra}$  and could show high bias in sample results if other alpha emitting isotopes of radium are contained in the samples (esp.  $^{224}\text{Ra}$  and  $^{223}\text{Ra}$ ). The potential for this interference has been reduced by allowing the interfering nuclides to decay for at least 14 days.
5. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
6. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
7. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.
8. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Pik Yee Yuen  
Pik Yee Yuen  
Radiochemistry Primary Data Reviewer

8/1/19  
Date

Annika Lee  
Radiochemistry Final Data Reviewer

8/7/19  
Date

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

**OrderNum:** 1906640

**Client Name:** Eurofins TestAmerica, Pittsburgh

**Client Project Name:** CCR Groundwater Monitoring AB Brown

**Client Project Number:** 18016014

**Client PO Number:**

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CCR-AP-2I (180-91430-1)	1906640-1		WATER	14-Jun-19	14:30
CCR-AP-2I (180-91430-1DU)	1906640-2		WATER	14-Jun-19	14:30
CCR-AP-3I (180-91430-2)	1906640-3		WATER	14-Jun-19	17:10
CCR-AP-8 (180-91430-3)	1906640-4		WATER	17-Jun-19	14:00
CCR-AP-9 (180-91430-4)	1906640-5		WATER	17-Jun-19	12:15
CCR-AP-10 (180-91430-5)	1906640-6		WATER	17-Jun-19	17:00
BLIND DUPLICATE (180-91430-6)	1906640-7		WATER	17-Jun-19	
FIELD BLANK (180-91430-7)	1906640-8		WATER	17-Jun-19	16:30

**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Sampler:		Lab PM:		Carrier Tracking No(s):		COC No:			
Client Contact: ALS Laboratory Group		Phone:		Bortot, Veronica		180-366890.1		180-366890.1			
Shipping/Receiving		Address:		E-Mail:		State of Origin:		Page:			
225 Commerce Drive,		Fort Collins		veronica.bortot@testamericainc.com		Indiana		Page 1 of 1			
City:		State, Zip:		Accreditations Required (See note):		Job #:		180-91430-1			
CO, 80524		PO #:		Analysis Requested		Preservation Codes:		M - Hexane N - None O - AsNBO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA Y - EDA Z - other (specify) Other:			
Email:		WO #:		Due Date Requested:		Field Filtered Sample (Yes or No)		SUB (General Subcontract Method)		Total Number of Containers	
Project Name:		Project #:		6/28/2019		X		X		X	
CCR Groundwater Monitoring AB Brown		18016014		TAT Requested (days):		X		X		X	
Site:		SSOW#:		14		X		X		X	
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Solid, Overstabil)	Preservation Code:	Field Filtered Sample (Yes or No)	SUB (General Subcontract Method)	Total Number of Containers	Special Instructions/Note:		
CCR-AP-21 (180-91430-1)	6/14/19	14:30 Eastern	Water	Water		X	X	2			
CCR-AP-21 (180-91430-1DU)	6/14/19	14:30 Eastern	DU	Water		X	X	4			
CCR-AP-31 (180-91430-2)	6/14/19	17:10 Eastern	Water	Water		X	X	2			
CCR-AP-8 (180-91430-3)	6/17/19	14:00 Eastern	Water	Water		X	X	2			
CCR-AP-9 (180-91430-4)	6/17/19	12:15 Eastern	Water	Water		X	X	2			
CCR-AP-10 (180-91430-5)	6/17/19	17:00 Eastern	Water	Water		X	X	2			
BLIND DUPLICATE (180-91430-6)	6/17/19	Eastern	Water	Water		X	X	2			
FIELD BLANK (180-91430-7)	6/17/19	16:30 Eastern	Water	Water		X	X	2			

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon 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/test/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: 6/25/19 17:20 Company: TAT  
 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:

**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: 6.26.19 1030 Company: ALS  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_





ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Eurofins Workorder No: 1906640
Project Manager: MMH Initials: EM Date: 06-26-19

Form with 15 numbered questions regarding sample receipt conditions, including airbills, custody seals, COC, and cooler temperatures. Includes a table for IR gun usage and a section for DOT Survey/ Acceptance Information.

\* Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Horizontal lines for providing details for NO responses to specific questions.

All client bottle ID's vs ALS lab ID's double-checked by: EM

If applicable, was the client contacted? YES / NO / NA Contact: Date/Time:

Project Manager Signature / Date: [Signature] 6-27-19



**Do Not Lift Using This Tag**

**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

Ship Date: 25Jun19  
 Track Num: 481871332036  
 Project ID:

**Recipient Address:**  
 ALS LABORATORY GROUP  
 SHIPPING/RECEIVING  
 225 COMMERCE DRIVE  
 FORT COLLINS  
 CO  
 80524

ORIGIN ID:AGCA (412) 963-7058  
 EUROFINS TESTAMERICA PITTSBURGH  
 301 ALPHA DRIVE  
 PITTSBURGH, PA 152381330  
 UNITED STATES US

SHIP DATE: 25JUN19  
 ACTWGT: 34.00 LB MAN  
 CAD: 741733/CAFE3211  
 BILL SENDER

TO **SHIPPING/RECEIVING**  
**ALS LABORATORY GROUP**  
**225 COMMERCE DRIVE**  
**FORT COLLINS CO 80524**  
 (412) 963-7058 REF: 8180-52587  
 PO: NO

9-1  
 Amb



1906640

TRK# 4818  
 0201

**NA 617**  
 RT 9  
 ST 9

5 10:30  
 A 2036  
 06:26

**26 JUN 10:30A**  
**PRIORITY OVERNIGHT**

**80524**  
 CO-US DEN

broken



# Radium-226 by GFPC

PAI 724 Rev 13

## Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Lab ID: TR190703-1MB

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19  
Date Collected: 03-Jul-19  
Date Prepared: 03-Jul-19  
Date Analyzed: 26-Jul-19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2  
Run ID: TR190703-1A  
Count Time: 60 minutes

Final Aliquot: 995 ml  
Result Units: pCi/l  
File Name: RDA0726C

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.074 +/- 0.076	0.143	1	NA	U

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16500	15700	ug	95.1	40 - 110 %	

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC.  
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.  
Y2 - Chemical Yield outside default limits.

### Abbreviations:

TPU - Total Propagated Uncertainty  
MDC - Sample specific Minimum Detectable Concentration  
BDL - Below Detection Limit

M - Requested MDC not met.  
B - Analyte concentration greater than MDC.  
B3 - Analyte concentration greater than MDC but less than Requested MDC.  
DL - Decision Level

Data Package ID: TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Lab ID: TR190703-1LCS

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2

Final Aliquot: 995 ml  
Result Units: pCi/l

Date Collected: 03-Jul-19

Run ID: TR190703-1A

File Name: RDA0726D

Date Prepared: 03-Jul-19

Count Time: 30 minutes

Date Analyzed: 26-Jul-19

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	51 +/- 13	0	47.86	106	75 - 125	P

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16500	15860	ug	96.1	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS Recovery within control limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

#### Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration

Data Package ID: TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Lab ID: TR190703-1LCSD

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2

Final Aliquot: 995 ml  
Result Units: pCi/l

Date Collected: 03-Jul-19

Run ID: TR190703-1A

File Name: RDA0726D

Date Prepared: 03-Jul-19

Count Time: 30 minutes

Date Analyzed: 26-Jul-19

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	52 +/- 13	0	47.86	109	75 - 125	P

## Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIIUM	16500	15550	ug	94.2	40 - 110 %	

## Comments:

### Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS Recovery within control limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

### Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration

Data Package ID: TR1906640-1

# Radium-226 by GFPC

## PAI 724 Rev 13

### Duplicate Sample Results (DER)

**Lab Name:** ALS -- Fort Collins  
**Work Order Number:** 1906640  
**Client Name:** Eurofins TestAmerica, Pittsburgh  
**ClientProject ID:** CCR Groundwater Monitoring AB Brown 18016014

<b>Field ID:</b> <input type="text"/>	<b>Sample Matrix:</b> WATER	<b>Prep Batch:</b> TR190703-1	<b>Final Aliquot:</b> 995 ml
<b>Lab ID:</b> TR190703-1LCSD	<b>Prep SOP:</b> PAI 712 Rev 19	<b>QC Batch ID:</b> TR190703-1-2	<b>Prep Basis:</b> Unfiltered
	<b>Date Collected:</b> 03-Jul-19	<b>Run ID:</b> TR190703-1A	<b>Moisture(%):</b> NA
	<b>Date Prepared:</b> 03-Jul-19	<b>Count Time:</b> 30 minutes	<b>Result Units:</b> pCi/l
	<b>Date Analyzed:</b> 26-Jul-19		<b>File Name:</b> RDA0726D

CASNO	Analyte	Sample				Duplicate				DER	DER Lim
		Result +/-	2 s TPU	MDC	Flags	Result +/-	2 s TPU	MDC	Flags		
13982-63-3	Ra-226	51 +/-	13	0	P	52 +/-	13	0	P	0.0758	2.13

#### Comments:

**Duplicate Qualifiers/Flags:**

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- D - DER is greater than Control Limit of 2.13
- LT - Result is less than Request MDC, greater than sample specific MDC
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits

**Abbreviations:**

- TPU - Total Propagated Uncertainty
- DER - Duplicate Error Ratio
- BDL - Below Detection Limit
- NR - Not Reported

**Data Package ID:** TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID: CCR-AP-2I (180-91430-1)	Sample Matrix: WATER	Prep Batch: TR190703-1	Final Aliquot: 995 ml
Lab ID: 1906640-1	Prep SOP: PAI 712 Rev 19	QCBatchID: TR190703-1-2	Prep Basis: Unfiltered
	Date Collected: 14-Jun-19	Run ID: TR190703-1A	Moisture(%): NA
	Date Prepared: 03-Jul-19	Count Time: 30 minutes	Result Units: pCi/l
	Date Analyzed: 26-Jul-19	Report Basis: Unfiltered	File Name: RDA0726B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.07 +/- 0.11	0.22	1	NA	U

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16610	15390	ug	92.6	40 - 110 %	

### Comments:

**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

**Abbreviations:**

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-2I (180-91430-1D)
Lab ID:	1906640-2

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19  
Date Collected: 14-Jun-19  
Date Prepared: 03-Jul-19  
Date Analyzed: 26-Jul-19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2  
Run ID: TR190703-1A  
Count Time: 30 minutes  
Report Basis: Unfiltered

Final Aliquot: 995 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RDA0726B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.68 +/- 0.31	0.24	1	NA	

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16620	15510	ug	93.4	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

#### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: TR1906640-1



# Radium-226 by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-3I (180-91430-2)
Lab ID:	1906640-3

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19  
Date Collected: 14-Jun-19  
Date Prepared: 03-Jul-19  
Date Analyzed: 26-Jul-19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2  
Run ID: TR190703-1A  
Count Time: 30 minutes  
Report Basis: Unfiltered

Final Aliquot: 995 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RDA0726B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.43 +/- 0.25	0.32	1	NA	

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16660	15920	ug	95.6	40 - 110 %	

### Comments:

**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

**Abbreviations:**

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-8 (180-91430-3)
Lab ID:	1906640-4

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19  
Date Collected: 17-Jun-19  
Date Prepared: 03-Jul-19  
Date Analyzed: 26-Jul-19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2  
Run ID: TR190703-1A  
Count Time: 30 minutes  
Report Basis: Unfiltered

Final Aliquot: 995 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RDA0726B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.35 +/- 0.23	0.32	1	NA	

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16570	15240	ug	92.0	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

#### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID: CCR-AP-9 (180-91430-4)	Sample Matrix: WATER	Prep Batch: TR190703-1	Final Aliquot: 498 ml
Lab ID: 1906640-5	Prep SOP: PAI 712 Rev 19	QCBatchID: TR190703-1-2	Prep Basis: Unfiltered
	Date Collected: 17-Jun-19	Run ID: TR190703-1A	Moisture(%): NA
	Date Prepared: 03-Jul-19	Count Time: 30 minutes	Result Units: pCi/l
	Date Analyzed: 26-Jul-19	Report Basis: Unfiltered	File Name: RDA0726B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.58 +/- 0.38	0.50	1	NA	

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16530	16220	ug	98.1	40 - 110 %	

### Comments:

**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

**Abbreviations:**

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	CCR-AP-10 (180-91430-5)
Lab ID:	1906640-6

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19  
Date Collected: 17-Jun-19  
Date Prepared: 03-Jul-19  
Date Analyzed: 26-Jul-19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2  
Run ID: TR190703-1A  
Count Time: 30 minutes  
Report Basis: Unfiltered

Final Aliquot: 498 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RDA0726B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.32 +/- 0.27	0.38	1	NA	U

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16510	15790	ug	95.6	40 - 110 %	

### Comments:

**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

**Abbreviations:**

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	BLIND DUPLICATE (180-91)
Lab ID:	1906640-7

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19  
Date Collected: 17-Jun-19  
Date Prepared: 03-Jul-19  
Date Analyzed: 26-Jul-19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2  
Run ID: TR190703-1A  
Count Time: 30 minutes  
Report Basis: Unfiltered

Final Aliquot: 498 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RDA0726B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.61 +/- 0.38	0.45	1	NA	

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16530	15970	ug	96.6	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

#### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: TR1906640-1

# Radium-226 by GFPC

PAI 724 Rev 13

## Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1906640

Client Name: Eurofins TestAmerica, Pittsburgh

ClientProject ID: CCR Groundwater Monitoring AB Brown 18016014

Field ID:	FIELD BLANK (180-91430-
Lab ID:	1906640-8

Sample Matrix: WATER  
Prep SOP: PAI 712 Rev 19  
Date Collected: 17-Jun-19  
Date Prepared: 03-Jul-19  
Date Analyzed: 26-Jul-19

Prep Batch: TR190703-1  
QCBatchID: TR190703-1-2  
Run ID: TR190703-1A  
Count Time: 30 minutes  
Report Basis: Unfiltered

Final Aliquot: 995 ml  
Prep Basis: Unfiltered  
Moisture(%): NA  
Result Units: pCi/l  
File Name: RDA0726D

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.054 +/- 0.097	0.215	1	NA	U

### Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	16500	16050	ug	97.3	40 - 110 %	

### Comments:

**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

**Abbreviations:**

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: TR1906640-1

THE LEADER IN ENVIRONMENTAL TESTING  
 TestAmerica Laboratories, Inc.  
 TAL-8210 (0713)

Regulatory Program:  DW  NPDES  RCRA  Other:

Company Name: Vectren Corp  
 Address: 8511 Wilbaca Rd  
 City/State/Zip: MA Verona TN, 37070  
 Phone: (37) 513-4082  
 Fax: \_\_\_\_\_  
 Project Name: CCR Groundwater Monitoring  
 Site: Ab Brown  
 P O # \_\_\_\_\_

Client Contact  
 Project Manager: Veronica Bectot  
 Tel/Fax: \_\_\_\_\_  
 Analysis Turnaround Time  
 CALENDAR DAYS  WORKING DAYS  
 TAT if different from Below \_\_\_\_\_  
 2 weeks  
 1 week  
 2 days  
 1 day

Site Contact: Bianca Bectot Date: 6-17-19  
 Lab Contact: Veronica Bectot Carrier: \_\_\_\_\_

Sampler: Jacob Winsett  
 For Lab Use Only:  
 Walk-in Client: \_\_\_\_\_  
 Lab Sampling: \_\_\_\_\_  
 Job / SDG No.: \_\_\_\_\_

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Perform MS/MSD (Y/N)		Sample Specific Notes:
						Filtered Sample (Y/N)	Performs MS/MSD (Y/N)	
CCR-AP-2I	6-14		G	W	5			
CCR-AP-3I	6-17	1710						
CCR-AP-8	6-17	1400						
CCR-AP-9	6-17	1215						
CCR-AP-10	6-14	1700						
MSMSD	6-17	1710			10			
Blind Duplicate	6-17				5			
Field Blank	6-17	1630			1			



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other 14

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.  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

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 & Comments:  
LV IV QA/QC, See Veronica

Custody Seal No.: \_\_\_\_\_  
 Relinquished by: Jacob Winsett Date/Time: 6-17/1900  
 Relinquished by: Jacob Winsett Date/Time: 6-18/19 9:07  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

## Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-91430-1

**Login Number: 91430**

**List Source: Eurofins TestAmerica, Pittsburgh**

**List Number: 1**

**Creator: Say, Thomas C**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (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	





## ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh  
301 Alpha Drive  
RIDC Park  
Pittsburgh, PA 15238  
Tel: (412)963-7058

Laboratory Job ID: 180-97392-1

Client Project/Site: CCR Groundwater Monitoring AB Brown

**For:**

Vectren Corporation  
PO BOX 209  
Evansville, Indiana 47702

Attn: Accounts Payable



Authorized for release by:  
12/16/2019 1:12:35 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

# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Case Narrative . . . . .	3
Definitions/Glossary . . . . .	5
Certification Summary . . . . .	6
Sample Summary . . . . .	8
Method Summary . . . . .	9
Lab Chronicle . . . . .	10
Client Sample Results . . . . .	12
QC Sample Results . . . . .	15
QC Association Summary . . . . .	19
Chain of Custody . . . . .	21
Receipt Checklists . . . . .	26



# Case Narrative

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

Job ID: 180-97392-1

**Job ID: 180-97392-1**

**Laboratory: Eurofins TestAmerica, Pittsburgh**

## Narrative

### Job Narrative 180-97392-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/17/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.3° C, 1.8° C and 2.7° C.

#### GC Semi VOA

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

#### RAD

Method 9315: Radium-226 Prep Batch 160-451213

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-BK-1R (180-97392-1), CCR-BK-2 (180-97392-2), (LCS 160-451213/1-A), (LCSD 160-451213/2-A) and (MB 160-451213/23-A)

Method 9320: Radium-228 Prep Batch 160-447520

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

CCR-BK-1R (180-97392-1), CCR-BK-2 (180-97392-2), (LCS 160-447520/1-A), (LCSD 160-447520/2-A) and (MB 160-447520/23-A)

Method PrecSep\_0: Radium 228 Prep Batch 160-447520:

Insufficient sample volume was available to perform a sample duplicate for the following samples: CCR-BK-1R (180-97392-1) and CCR-BK-2 (180-97392-2). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-447516:

Insufficient sample volume was available to perform a sample duplicate for the following samples: CCR-BK-1R (180-97392-1) and CCR-BK-2 (180-97392-2). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-451213:

The following samples were prepared at a reduced aliquot due to insufficient volume for re-prep: CCR-BK-1R (180-97392-1) and CCR-BK-2 (180-97392-2). Samples 240-120605-2, and 3 had light yellow discoloration.

Method PrecSep-21: Radium 226 Prep Batch 160-451213:

# Case Narrative

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

Job ID: 180-97392-1

---

## Job ID: 180-97392-1 (Continued)

---

### Laboratory: Eurofins TestAmerica, Pittsburgh (Continued)

Insufficient sample volume was available to perform a sample duplicate for the following samples: CCR-BK-1R (180-97392-1) and CCR-BK-2 (180-97392-2). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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.

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

# Definitions/Glossary

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

Job ID: 180-97392-1

## 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.

### 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

Job ID: 180-97392-1

## Laboratory: Eurofins TestAmerica, Pittsburgh

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
California	State	2891	04-30-20
Connecticut	State	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Georgia	State	PA 02-00416	04-30-20
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	03-31-20
Kentucky (UST)	State	162013	04-30-20
Kentucky (WW)	State	KY98043	12-31-19
Louisiana	NELAP	04041	06-30-20
Minnesota	NELAP	042-999-482	12-31-19
Nevada	State	PA00164	07-31-20
New Hampshire	NELAP	2030	04-04-20
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	04-01-20
North Carolina (WW/SW)	State	434	12-31-19
North Dakota	State	R-227	04-30-20
Oregon	NELAP	PA-2151	02-06-20
Pennsylvania	NELAP	02-00416	04-30-20
Rhode Island	State	LAO00362	12-30-19
South Carolina	State	89014	04-30-20
Texas	NELAP	T104704528	03-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-20
Virginia	NELAP	10043	09-15-20
West Virginia DEP	State	142	01-31-20
Wisconsin	State	998027800	08-31-20



# Accreditation/Certification Summary

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

Job ID: 180-97392-1

## Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	12-31-19

# Sample Summary

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

Job ID: 180-97392-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-97392-1	CCR-BK-1R	Water	10/14/19 15:30	10/17/19 09:30	
180-97392-2	CCR-BK-2	Water	10/14/19 13:10	10/17/19 09:30	

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



# Method Summary

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

Job ID: 180-97392-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	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
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 = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = Eurofins 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

Job ID: 180-97392-1

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

**Lab Sample ID: 180-97392-1**

**Date Collected: 10/14/19 15:30**

**Matrix: Water**

**Date Received: 10/17/19 09:30**

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			297483	11/09/19 07:04	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295834	10/23/19 14:08	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			296189	10/25/19 19:53	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			297150	11/05/19 18:30	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	295368	10/18/19 11:42	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			500.59 mL	1.0 g	451213	11/19/19 18:01	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			453945	12/11/19 07:04	AJD	TAL SL
Total/NA	Prep	PrecSep_0			1000.90 mL	1.0 g	447520	10/24/19 07:55	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCBLUE		1			449238	11/06/19 18:48	AJD	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			454196	12/13/19 09:38	SMP	TAL SL

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

**Lab Sample ID: 180-97392-2**

**Date Collected: 10/14/19 13:10**

**Matrix: Water**

**Date Received: 10/17/19 09:30**

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			297483	11/09/19 07:20	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295834	10/23/19 14:08	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			296189	10/25/19 19:57	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			297150	11/05/19 18:35	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	295368	10/18/19 11:42	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			500.67 mL	1.0 g	451213	11/19/19 18:01	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			453945	12/11/19 07:04	AJD	TAL SL
Total/NA	Prep	PrecSep_0			1000.38 mL	1.0 g	447520	10/24/19 07:55	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCBLUE		1			449238	11/06/19 18:48	AJD	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			454196	12/13/19 09:38	SMP	TAL SL

**Laboratory References:**

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

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

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-97392-1

## Analyst References:

Lab: TAL PIT

Batch Type: Prep

KEM = Kimberly Mahoney

Batch Type: Analysis

AVS = Abbey Smith

MJH = Matthew Hartman

PM = Paloma Hoelzle

RSK = Robert Kurtz

Lab: TAL SL

Batch Type: Prep

EJQ = Erin Quinn

ORM = Octavia Moore

Batch Type: Analysis

AJD = Audra DeMariano

SMP = Siobhan Perry

1

2

3

4

5

6

7

8

9

10

11

12

13

# Client Sample Results

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

Job ID: 180-97392-1

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

**Lab Sample ID: 180-97392-1**

Date Collected: 10/14/19 15:30

Matrix: Water

Date Received: 10/17/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.4		1.0	0.32	mg/L			11/09/19 07:04	1
Fluoride	0.20		0.10	0.026	mg/L			11/09/19 07:04	1
Sulfate	22		1.0	0.38	mg/L			11/09/19 07:04	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00036	J	0.0010	0.00032	mg/L		10/23/19 14:08	10/25/19 19:53	1
Boron	0.056	J	0.080	0.039	mg/L		10/23/19 14:08	10/25/19 19:53	1
Barium	0.036		0.010	0.0016	mg/L		10/23/19 14:08	10/25/19 19:53	1
Beryllium	ND		0.0010	0.00018	mg/L		10/23/19 14:08	10/25/19 19:53	1
Calcium	34		0.50	0.13	mg/L		10/23/19 14:08	10/25/19 19:53	1
Cadmium	ND		0.0010	0.00013	mg/L		10/23/19 14:08	10/25/19 19:53	1
Cobalt	0.00017	J	0.00050	0.000075	mg/L		10/23/19 14:08	10/25/19 19:53	1
Chromium	ND		0.0020	0.0015	mg/L		10/23/19 14:08	10/25/19 19:53	1
Molybdenum	0.00075	J	0.0050	0.00061	mg/L		10/23/19 14:08	10/25/19 19:53	1
Lead	0.00023	J	0.0010	0.00013	mg/L		10/23/19 14:08	10/25/19 19:53	1
Antimony	ND		0.0020	0.00038	mg/L		10/23/19 14:08	10/25/19 19:53	1
Selenium	ND		0.0050	0.0015	mg/L		10/23/19 14:08	10/25/19 19:53	1
Thallium	ND		0.0010	0.00015	mg/L		10/23/19 14:08	10/25/19 19:53	1
Lithium	ND		5.0	3.4	ug/L		10/23/19 14:08	10/25/19 19:53	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	210		10	10	mg/L			10/18/19 11:42	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			11/05/19 18:30	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0729	U	0.182	0.182	1.00	0.330	pCi/L	11/19/19 18:01	12/11/19 07:04	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	78.2		40 - 110					11/19/19 18:01	12/11/19 07:04	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.147	U	0.233	0.233	1.00	0.392	pCi/L	10/24/19 07:55	11/06/19 18:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.2		40 - 110					10/24/19 07:55	11/06/19 18:48	1
Y Carrier	89.0		40 - 110					10/24/19 07:55	11/06/19 18:48	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97392-1

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

**Lab Sample ID: 180-97392-1**

Date Collected: 10/14/19 15:30

Matrix: Water

Date Received: 10/17/19 09:30

**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	0.220	U	0.296	0.296	5.00	0.392	pCi/L		12/13/19 09:38	1

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

**Lab Sample ID: 180-97392-2**

Date Collected: 10/14/19 13:10

Matrix: Water

Date Received: 10/17/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17		1.0	0.32	mg/L			11/09/19 07:20	1
Fluoride	0.070	J	0.10	0.026	mg/L			11/09/19 07:20	1
Sulfate	20		1.0	0.38	mg/L			11/09/19 07:20	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		10/23/19 14:08	10/25/19 19:57	1
Boron	0.051	J	0.080	0.039	mg/L		10/23/19 14:08	10/25/19 19:57	1
Barium	0.032		0.010	0.0016	mg/L		10/23/19 14:08	10/25/19 19:57	1
Beryllium	ND		0.0010	0.00018	mg/L		10/23/19 14:08	10/25/19 19:57	1
Calcium	35		0.50	0.13	mg/L		10/23/19 14:08	10/25/19 19:57	1
Cadmium	ND		0.0010	0.00013	mg/L		10/23/19 14:08	10/25/19 19:57	1
Cobalt	0.00011	J	0.00050	0.000075	mg/L		10/23/19 14:08	10/25/19 19:57	1
Chromium	ND		0.0020	0.0015	mg/L		10/23/19 14:08	10/25/19 19:57	1
Molybdenum	ND		0.0050	0.00061	mg/L		10/23/19 14:08	10/25/19 19:57	1
Lead	ND		0.0010	0.00013	mg/L		10/23/19 14:08	10/25/19 19:57	1
Antimony	ND		0.0020	0.00038	mg/L		10/23/19 14:08	10/25/19 19:57	1
Selenium	ND		0.0050	0.0015	mg/L		10/23/19 14:08	10/25/19 19:57	1
Thallium	ND		0.0010	0.00015	mg/L		10/23/19 14:08	10/25/19 19:57	1
Lithium	ND		5.0	3.4	ug/L		10/23/19 14:08	10/25/19 19:57	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	230		10	10	mg/L			10/18/19 11:42	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.0	HF	0.1	0.1	SU			11/05/19 18:35	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0644	U	0.0990	0.0992	1.00	0.236	pCi/L	11/19/19 18:01	12/11/19 07:04	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.1		40 - 110					11/19/19 18:01	12/11/19 07:04	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97392-1

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

**Lab Sample ID: 180-97392-2**

Date Collected: 10/14/19 13:10

Matrix: Water

Date Received: 10/17/19 09:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.323	U	0.290	0.292	1.00	0.468	pCi/L	10/24/19 07:55	11/06/19 18:48	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	101		40 - 110					10/24/19 07:55	11/06/19 18:48	1
Y Carrier	82.6		40 - 110					10/24/19 07:55	11/06/19 18:48	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	0.259	U	0.306	0.308	5.00	0.468	pCi/L		12/13/19 09:38	1



# QC Sample Results

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

Job ID: 180-97392-1

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

**Lab Sample ID: MB 180-297483/45**  
**Matrix: Water**  
**Analysis Batch: 297483**

**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	0.32	mg/L			11/08/19 20:46	1
Fluoride	ND		0.10	0.026	mg/L			11/08/19 20:46	1
Sulfate	ND		1.0	0.38	mg/L			11/08/19 20:46	1

**Lab Sample ID: MB 180-297483/6**  
**Matrix: Water**  
**Analysis Batch: 297483**

**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	0.32	mg/L			11/08/19 10:09	1
Fluoride	ND		0.10	0.026	mg/L			11/08/19 10:09	1
Sulfate	ND		1.0	0.38	mg/L			11/08/19 10:09	1

**Lab Sample ID: LCS 180-297483/44**  
**Matrix: Water**  
**Analysis Batch: 297483**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.4		mg/L		95	80 - 120
Fluoride	2.50	2.37		mg/L		95	80 - 120
Sulfate	50.0	47.9		mg/L		96	80 - 120

**Lab Sample ID: LCS 180-297483/5**  
**Matrix: Water**  
**Analysis Batch: 297483**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.2		mg/L		94	80 - 120
Fluoride	2.50	2.26		mg/L		90	80 - 120
Sulfate	50.0	47.9		mg/L		96	80 - 120

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

**Lab Sample ID: MB 180-295834/1-A**  
**Matrix: Water**  
**Analysis Batch: 296189**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 295834**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		10/23/19 14:08	10/25/19 18:07	1
Boron	ND		0.080	0.039	mg/L		10/23/19 14:08	10/25/19 18:07	1
Barium	ND		0.010	0.0016	mg/L		10/23/19 14:08	10/25/19 18:07	1
Beryllium	ND		0.0010	0.00018	mg/L		10/23/19 14:08	10/25/19 18:07	1
Calcium	ND		0.50	0.13	mg/L		10/23/19 14:08	10/25/19 18:07	1
Cadmium	ND		0.0010	0.00013	mg/L		10/23/19 14:08	10/25/19 18:07	1
Cobalt	ND		0.00050	0.000075	mg/L		10/23/19 14:08	10/25/19 18:07	1
Chromium	ND		0.0020	0.0015	mg/L		10/23/19 14:08	10/25/19 18:07	1
Molybdenum	ND		0.0050	0.00061	mg/L		10/23/19 14:08	10/25/19 18:07	1
Lead	ND		0.0010	0.00013	mg/L		10/23/19 14:08	10/25/19 18:07	1
Antimony	ND		0.0020	0.00038	mg/L		10/23/19 14:08	10/25/19 18:07	1
Selenium	ND		0.0050	0.0015	mg/L		10/23/19 14:08	10/25/19 18:07	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-97392-1

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

Lab Sample ID: MB 180-295834/1-A  
 Matrix: Water  
 Analysis Batch: 296189

Client Sample ID: Method Blank  
 Prep Type: Total Recoverable  
 Prep Batch: 295834

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		0.0010	0.00015	mg/L		10/23/19 14:08	10/25/19 18:07	1
Lithium	ND		5.0	3.4	ug/L		10/23/19 14:08	10/25/19 18:07	1

Lab Sample ID: LCS 180-295834/2-A  
 Matrix: Water  
 Analysis Batch: 296189

Client Sample ID: Lab Control Sample  
 Prep Type: Total Recoverable  
 Prep Batch: 295834

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.874		mg/L		87	80 - 120
Boron	1.25	1.21		mg/L		97	80 - 120
Barium	1.00	0.914		mg/L		91	80 - 120
Beryllium	0.500	0.447		mg/L		89	80 - 120
Calcium	25.0	24.7		mg/L		99	80 - 120
Cadmium	0.500	0.437		mg/L		87	80 - 120
Cobalt	0.500	0.425		mg/L		85	80 - 120
Chromium	0.500	0.423		mg/L		85	80 - 120
Molybdenum	0.500	0.444		mg/L		89	80 - 120
Lead	0.500	0.440		mg/L		88	80 - 120
Antimony	0.250	0.258		mg/L		103	80 - 120
Selenium	1.00	0.835		mg/L		83	80 - 120
Thallium	1.00	0.917		mg/L		92	80 - 120
Lithium	500	441		ug/L		88	80 - 120

## Method: EPA 9040C - pH

Lab Sample ID: LCS 180-297150/1  
 Matrix: Water  
 Analysis Batch: 297150

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	99 - 101

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-295368/2  
 Matrix: Water  
 Analysis Batch: 295368

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			10/18/19 11:42	1

Lab Sample ID: LCS 180-295368/1  
 Matrix: Water  
 Analysis Batch: 295368

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	188	208		mg/L		111	80 - 120

Eurofins TestAmerica, Pittsburgh



# QC Sample Results

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

Job ID: 180-97392-1

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

**Lab Sample ID: MB 160-451213/23-A**  
**Matrix: Water**  
**Analysis Batch: 453945**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 451213**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.007399	U	0.124	0.124	1.00	0.245	pCi/L	11/19/19 18:01	12/11/19 08:53	1
Carrier	MB	MB	Limits			Prepared	Analyzed	Dil Fac		
	%Yield	Qualifier								
Ba Carrier	79.7		40 - 110			11/19/19 18:01	12/11/19 08:53	1		

**Lab Sample ID: LCS 160-451213/1-A**  
**Matrix: Water**  
**Analysis Batch: 453945**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 451213**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	22.7	24.79		2.59	1.00	0.293	pCi/L	109	75 - 125
Carrier	LCS	LCS	Limits			Prepared	Analyzed	Dil Fac	
	%Yield	Qualifier							
Ba Carrier	71.6		40 - 110						

**Lab Sample ID: LCSD 160-451213/2-A**  
**Matrix: Water**  
**Analysis Batch: 453945**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 451213**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
				Uncert. (2σ+/-)							
Radium-226	22.7	24.10		2.47	1.00	0.280	pCi/L	106	75 - 125	0.13	1
Carrier	LCSD	LCSD	Limits			Prepared	Analyzed	Dil Fac			
	%Yield	Qualifier									
Ba Carrier	82.4		40 - 110								

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

**Lab Sample ID: MB 160-447520/23-A**  
**Matrix: Water**  
**Analysis Batch: 449305**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 447520**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.09098	U	0.245	0.245	1.00	0.421	pCi/L	10/24/19 07:55	11/06/19 18:50	1
Carrier	MB	MB	Limits			Prepared	Analyzed	Dil Fac		
	%Yield	Qualifier								
Ba Carrier	104		40 - 110			10/24/19 07:55	11/06/19 18:50	1		
Y Carrier	89.0		40 - 110			10/24/19 07:55	11/06/19 18:50	1		

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-97392-1

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

**Lab Sample ID: LCS 160-447520/1-A**  
**Matrix: Water**  
**Analysis Batch: 449235**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 447520**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-228	9.42	9.798		1.20	1.00	0.537	pCi/L	104	75 - 125	
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>							
Ba Carrier	88.4		40 - 110							
Y Carrier	74.8		40 - 110							

**Lab Sample ID: LCSD 160-447520/2-A**  
**Matrix: Water**  
**Analysis Batch: 449235**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 447520**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	9.42	8.280		1.04	1.00	0.488	pCi/L	88	75 - 125	0.68	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Ba Carrier	85.3		40 - 110								
Y Carrier	83.7		40 - 110								

# QC Association Summary

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

Job ID: 180-97392-1

## HPLC/IC

### Analysis Batch: 297483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97392-1	CCR-BK-1R	Total/NA	Water	EPA 9056A	
180-97392-2	CCR-BK-2	Total/NA	Water	EPA 9056A	
MB 180-297483/45	Method Blank	Total/NA	Water	EPA 9056A	
MB 180-297483/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-297483/44	Lab Control Sample	Total/NA	Water	EPA 9056A	
LCS 180-297483/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

## Metals

### Prep Batch: 295834

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97392-1	CCR-BK-1R	Total Recoverable	Water	3005A	
180-97392-2	CCR-BK-2	Total Recoverable	Water	3005A	
MB 180-295834/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-295834/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 296189

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97392-1	CCR-BK-1R	Total Recoverable	Water	EPA 6020A	295834
180-97392-2	CCR-BK-2	Total Recoverable	Water	EPA 6020A	295834
MB 180-295834/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	295834
LCS 180-295834/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	295834

## General Chemistry

### Analysis Batch: 295368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97392-1	CCR-BK-1R	Total/NA	Water	SM 2540C	
180-97392-2	CCR-BK-2	Total/NA	Water	SM 2540C	
MB 180-295368/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-295368/1	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 297150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97392-1	CCR-BK-1R	Total/NA	Water	EPA 9040C	
180-97392-2	CCR-BK-2	Total/NA	Water	EPA 9040C	
LCS 180-297150/1	Lab Control Sample	Total/NA	Water	EPA 9040C	

## Rad

### Prep Batch: 447520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97392-1	CCR-BK-1R	Total/NA	Water	PrecSep_0	
180-97392-2	CCR-BK-2	Total/NA	Water	PrecSep_0	
MB 160-447520/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-447520/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-447520/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

### Prep Batch: 451213

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97392-1	CCR-BK-1R	Total/NA	Water	PrecSep-21	
180-97392-2	CCR-BK-2	Total/NA	Water	PrecSep-21	

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-97392-1

## Rad (Continued)

### Prep Batch: 451213 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 160-451213/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-451213/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-451213/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

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

# Chain of Custody Record

<b>Client Information</b> Client Contact: Angela Casbon Scheller Company: Vectren Corporation Address: PO BOX 209 City: Evansville State, Zip: IN, 47702 Phone: 864-214-8750(Tel) Email: acscheller@vectren.com Project Name: CCR Groundwater Monitoring - AB Brown Site: <i>Ab Brown</i>		Sampler: <i>Jacob Wmsett</i> Phone: <i>(317) 671-3730</i> Lab PM: Bortot, Veronica E-Mail: veronica.bortot@testamericainc.com Carrier Tracking No(s): COC No: 180-49738-8017.1 Page: Page 1 of 1 Job #:	
Due Date Requested: TAT Requested (days): <i>Standard</i> PO #: <i>Standard</i> Purchase Order Requested WO #:		Analysis Requested Total Number of Containers:	
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: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA Z - other (specify)		Special Instructions/Note: Appendix III & Appendix IV Do not export Mercury	
Sample Identification GCR-AP-21 GCR-AP-31 GCR-AP-40 GCR-AP-19 GCR-AP-10 GCR-AP-		Sample Date Sample Time Sample Type (C=comp, G=grab) Matrix (W=water, S=solid, O=water/oil, BT=Tissue, A=Air) Preservation Code: Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) 9315_Ra226_9320_Ra228 9040C_9056A_ORGM_28D 6020A_7470A 2540C_Calcd - TDS	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		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	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: <i>Jacob Wmsett</i> Date/Time: <i>10/16/19 1900</i>		Received by: <i>Fogel</i> Date/Time: <i>10-17-19</i>	
Relinquished by: <i>Jacob Wmsett</i> Date/Time:		Received by: <i>Walter Watson</i> Date/Time: <i>9.30</i>	
Relinquished by:		Received by:	
Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	



SHIP DATE: 16OCT19  
ACTWGT: 48.00 LB  
CAD: 106997842/INET4160  
DIMS: 24x15x16 IN  
BILL SENDER

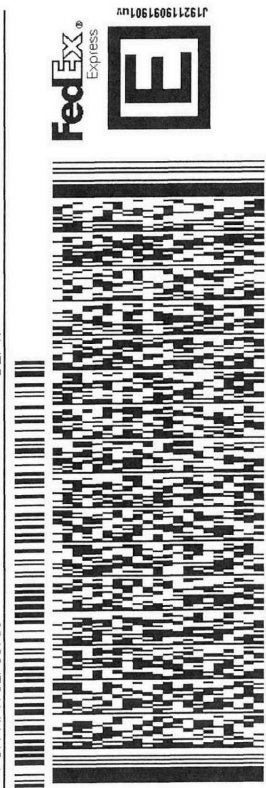
ORIGIN ID: EVVA (812) 477-1176  
BRIAN KLEEMAN  
1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

567J32A3C05A2

PITTSBURGH PA 15238

(412) 963-7058 REF: PN: 170LF00739  
INV: PN: 170LF00739 DEPT:  
PO: PN: 170LF00739



THU - 17 OCT 3:00P  
STANDARD OVERNIGHT

MPS# 7767 3934 7856  
0263  
Mstr# 7767 3934 8304  
0201

15238  
PIT  
PA-US

Thermometer ID  
Uncorrected temp  
Thermometer ID  
Initials  
CF  
PT-WI-SR-001 effective 11/8/18

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

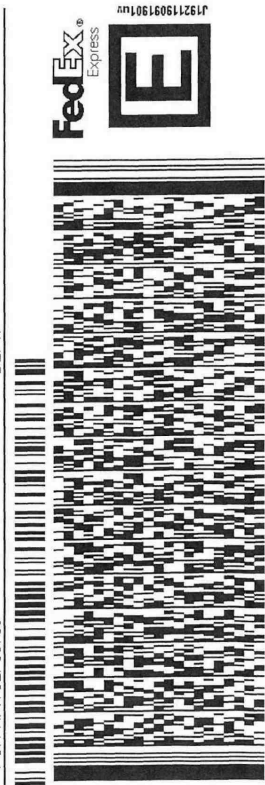
TO VERONICA BORTOT  
 TESTAMERICA  
 301 ALPHA DRIVE

SHIP DATE: 16OCT19  
 ACTWGT: 48.00 LB  
 CAD: 106997842/INET4160  
 DIMS: 24x15x16 IN  
 BILL SENDER

567J32A3C05A2

PITTSBURGH PA 15238

(412) 963-7058 REF-PN: 170LF00739  
 INV-PN: 170LF00739  
 PO-PN: 170LF00739 DEPT:



3 of 3  
 MPS# 7767 3934 7878  
 Mstr# 7767 3934 8304  
 THU - 17 OCT 3:00P  
 STANDARD OVERNIGHT  
 15238  
 PA-US  
 PIT

NA AGCA

Uncorrected temp 27 °C  
 Thermometer ID CF 0 Initials JS  
 PT-WI-SR-001 effective 11/8/18

**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.

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.

After printing this label:



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

ORIGIN ID: EWVA (812) 477-1176  
 BRIAN KLEEMAN  
 1149 WEDEKING AVENUE  
 BUILDING D, SUITE 2  
 EVANSVILLE, IN 47715  
 UNITED STATES US

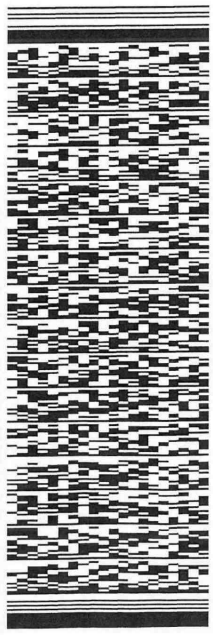
SHIP DATE: 16OCT19  
 ACTWGT: 48.00 LB  
 CAD: 106997842/INET4160  
 DIMS: 24x15x16 IN  
 BILL SENDER

TO **VERONICA BORTOT**  
**TESTAMERICA**  
**301 ALPHA DRIVE**

**PITTSBURGH PA 15238**

(412) 963-7058 REF: PN: 170LF00739  
 INV. PN: 170LF00739  
 PO. PN: 170LF00739

567J3/2A3C05A2



**THU - 17 OCT 3:00P**  
**STANDARD OVERNIGHT**

1 of 3  
 TRK# **7767 3934 8304**  
 0201  
 ## MASTER ##

**NA AGCA** PA-US **15238** PIT



Uncorrected temp 11.5 °C  
 Thermometer ID 10

CF 0 Initials D

PT-WI-SR-001 effective 11/8/18

**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.



# Chain of Custody Record

**Eurofins 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: Shipping/Receiving  
 Company: TestAmerica Laboratories, Inc.  
 Address: 13715 Rider Trail North,  
 City: Earth City  
 State, Zip: MO, 63045  
 Phone: 314-298-8566(Tel) 314-298-8757(Fax)  
 Email:  
 Project Name: CCR Groundwater Monitoring AB Brown  
 Site:

Lab PM: Bortol, Veronica  
 E-Mail: veronica.bortol@testamericainc.com  
 State of Origin: Indiana  
 State of Origin: Indiana  
 Accreditations Required (See note):  
 Due Date Requested: 10/29/2019  
 TAT Requested (days):  
 PO #:  
 WO #:  
 Project #: 18016014  
 SOW#:

Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=other)	Preservation Code: (B=TBIM, A=Al)	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_GFPc	Total Number of Containers	Special Instructions/Notes:
10/14/19	15:30 Eastern	Water	Water		X	X	X	X		2	
10/14/19	13:10 Eastern	Water	Water		X	X	X	X		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  
 Special Instructions/QC Requirements:  
 Primary Deliverable Rank: 2  
 Date/Time: 10/15/19 12:00  
 Relinquished by: [Signature]  
 Relinquished by: [Signature]  
 Relinquished by: [Signature]  
 Custody Seals Intact:  Yes  No  
 Custody Seal No.:  
 Cooler Temperature(s) °C and Other Remarks:



Ver: 01/16/2019

## Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-97392-1

**Login Number: 97392**

**List Source: Eurofins TestAmerica, Pittsburgh**

**List Number: 1**

**Creator: Watson, Debbie**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
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: 180-97392-1

**Login Number: 97392**  
**List Number: 2**  
**Creator: Hellm, Michael**

**List Source: Eurofins TestAmerica, St. Louis**  
**List Creation: 10/19/19 11:49 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.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	22.0
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	



## ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh  
301 Alpha Drive  
RIDC Park  
Pittsburgh, PA 15238  
Tel: (412)963-7058

Laboratory Job ID: 180-97535-1

Client Project/Site: CCR Groundwater Monitoring AB Brown

**For:**

Vectren Corporation  
PO BOX 209  
Evansville, Indiana 47702

Attn: Accounts Payable



Authorized for release by:  
11/25/2019 10:02:02 AM

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



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Case Narrative . . . . .	3
Definitions/Glossary . . . . .	4
Certification Summary . . . . .	5
Sample Summary . . . . .	7
Method Summary . . . . .	8
Lab Chronicle . . . . .	9
Client Sample Results . . . . .	16
QC Sample Results . . . . .	28
QC Association Summary . . . . .	33
Chain of Custody . . . . .	36
Receipt Checklists . . . . .	41

# Case Narrative

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

Job ID: 180-97535-1

---

## Job ID: 180-97535-1

---

Laboratory: Eurofins TestAmerica, Pittsburgh

---

### Narrative

#### Job Narrative 180-97535-1

#### Receipt

The samples were received on 10/19/2019 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.5° C and 3.2° C.

#### Receipt Exceptions

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): CCR-AP-5 (180-97535-6). The container labels list a sample id of CCR-AP-19, while the COC lists CCR-AP-5. The id on the COC was used.

#### Anions

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

#### Radiological 226/228

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-1R (180-97535-1), CCR-AP-2R (180-97535-2), CCR-AP-3R (180-97535-3), CCR-AP-3I (180-97535-4), CCR-AP-4R (180-97535-5), CCR-AP-5 (180-97535-6), CCR-AP-6 (180-97535-7), CCR-AP-7R (180-97535-8), CCR-AP-10 (180-97535-9), BLIND DUPLICATE 1 (180-97535-10), (LCS 160-447335/1-A), (MB 160-447335/19-A), (160-36065-E-1-A) and (160-36065-B-1-A DU)

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

#### Metals

Method 6020A: The following samples were diluted due to the nature of the sample matrix: CCR-AP-1R (180-97535-1), CCR-AP-2R (180-97535-2), CCR-AP-3R (180-97535-3), CCR-AP-5 (180-97535-6), CCR-AP-6 (180-97535-7), CCR-AP-7R (180-97535-8), CCR-AP-10 (180-97535-9) and BLIND DUPLICATE 1 (180-97535-10). Elevated reporting limits (RLs) are provided.

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

#### General Chemistry

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

Job ID: 180-97535-1

## 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
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### 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

Job ID: 180-97535-1

## Laboratory: Eurofins TestAmerica, Pittsburgh

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
California	State	2891	04-30-20
Connecticut	State	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Georgia	State	PA 02-00416	04-30-20
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	03-31-20
Kentucky (UST)	State	162013	04-30-20
Kentucky (WW)	State	KY98043	12-31-19
Louisiana	NELAP	04041	06-30-20
Minnesota	NELAP	042-999-482	12-31-19
Nevada	State	PA00164	07-31-20
New Hampshire	NELAP	2030	04-04-20
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	04-01-20
North Carolina (WW/SW)	State	434	12-31-19
North Dakota	State	R-227	04-30-20
Oregon	NELAP	PA-2151	02-06-20
Pennsylvania	NELAP	02-00416	04-30-20
Rhode Island	State	LAO00362	12-30-19
South Carolina	State	89014	04-30-20
Texas	NELAP	T104704528	03-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-20
Virginia	NELAP	10043	09-15-20
West Virginia DEP	State	142	01-31-20
Wisconsin	State	998027800	08-31-20



# Accreditation/Certification Summary

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

Job ID: 180-97535-1

## Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-19
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	12-01-19

# Sample Summary

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

Job ID: 180-97535-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-97535-1	CCR-AP-1R	Water	10/16/19 10:45	10/19/19 09:00	
180-97535-2	CCR-AP-2R	Water	10/17/19 11:45	10/19/19 09:00	
180-97535-3	CCR-AP-3R	Water	10/17/19 12:40	10/19/19 09:00	
180-97535-4	CCR-AP-3I	Water	10/18/19 14:30	10/19/19 09:00	
180-97535-5	CCR-AP-4R	Water	10/17/19 15:00	10/19/19 09:00	
180-97535-6	CCR-AP-5	Water	10/17/19 13:30	10/19/19 09:00	
180-97535-7	CCR-AP-6	Water	10/16/19 14:45	10/19/19 09:00	
180-97535-8	CCR-AP-7R	Water	10/16/19 12:50	10/19/19 09:00	
180-97535-9	CCR-AP-10	Water	10/18/19 11:20	10/19/19 09:00	
180-97535-10	BLIND DUPLICATE 1	Water	10/16/19 00:00	10/19/19 09:00	



# Method Summary

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

Job ID: 180-97535-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	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
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 = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = Eurofins 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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-1**

**Date Collected: 10/16/19 10:45**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

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			297483	11/08/19 17:53	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		10			297483	11/08/19 18:08	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			296502	10/26/19 15:07	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		5			296652	10/30/19 10:42	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			296706	10/31/19 16:14	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	295664	10/22/19 12:03	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.77 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			450354	11/14/19 16:51	CJQ	TAL SL
Total/NA	Prep	PrecSep_0			1000.77 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			448714	11/04/19 09:05	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			450918	11/18/19 09:43	SMP	TAL SL

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

**Lab Sample ID: 180-97535-2**

**Date Collected: 10/17/19 11:45**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

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		5			297717	11/11/19 01:31	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		50			297717	11/11/19 01:46	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			296502	10/26/19 15:11	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			296652	10/30/19 10:45	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			296706	10/31/19 16:17	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	25 mL	100 mL	295664	10/22/19 12:03	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.36 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			450354	11/14/19 16:51	CJQ	TAL SL

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-97535-1

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

Date Collected: 10/17/19 11:45

Date Received: 10/19/19 09:00

## Lab Sample ID: 180-97535-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			1000.36 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320		1			448714	11/04/19 09:05	KLS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			450918	11/18/19 09:43	SMP	TAL SL
Instrument ID: NOEQUIP										

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

Date Collected: 10/17/19 12:40

Date Received: 10/19/19 09:00

## Lab Sample ID: 180-97535-3

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		5			297717	11/11/19 02:02	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total/NA	Analysis	EPA 9056A		50			297717	11/11/19 02:18	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296502	10/26/19 15:14	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			296652	10/30/19 10:48	RSK	TAL PIT
Instrument ID: A										
Total/NA	Analysis	EPA 9040C		1			296706	10/31/19 16:19	PM	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	20 mL	100 mL	295664	10/22/19 12:03	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.50 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315		1			450354	11/14/19 16:51	CJQ	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Prep	PrecSep_0			1000.50 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320		1			448714	11/04/19 09:05	KLS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			450918	11/18/19 09:43	SMP	TAL SL
Instrument ID: NOEQUIP										

## Client Sample ID: CCR-AP-3I

Date Collected: 10/18/19 14:30

Date Received: 10/19/19 09:00

## Lab Sample ID: 180-97535-4

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			297483	11/08/19 23:40	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296502	10/26/19 15:17	RSK	TAL PIT
Instrument ID: A										

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-4**

**Date Collected: 10/18/19 14:30**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

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	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296652	10/30/19 10:52	RSK	TAL PIT
		Instrument ID: A								
Total/NA	Analysis	EPA 9040C		1			296706	10/31/19 16:20	PM	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	295667	10/22/19 12:31	AVS	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			1000.25 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315		1			450354	11/14/19 16:51	CJQ	TAL SL
		Instrument ID: GFPCBLUE								
Total/NA	Prep	PrecSep_0			1000.25 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320		1			448714	11/04/19 09:06	KLS	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Analysis	Ra226_Ra228		1			450918	11/18/19 09:43	SMP	TAL SL
		Instrument ID: NOEQUIP								

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

**Lab Sample ID: 180-97535-5**

**Date Collected: 10/17/19 15:00**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

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			297483	11/09/19 00:12	MJH	TAL PIT
		Instrument ID: CHICS2100B								
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296502	10/26/19 15:21	RSK	TAL PIT
		Instrument ID: A								
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296652	10/30/19 10:55	RSK	TAL PIT
		Instrument ID: A								
Total/NA	Analysis	EPA 9040C		1			296706	10/31/19 16:22	PM	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	295664	10/22/19 12:03	AVS	TAL PIT
		Instrument ID: NOEQUIP								
Total/NA	Prep	PrecSep-21			1000.16 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315		1			450354	11/14/19 16:51	CJQ	TAL SL
		Instrument ID: GFPCBLUE								
Total/NA	Prep	PrecSep_0			1000.16 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320		1			448714	11/04/19 09:06	KLS	TAL SL
		Instrument ID: GFPCPURPLE								
Total/NA	Analysis	Ra226_Ra228		1			450918	11/18/19 09:43	SMP	TAL SL
		Instrument ID: NOEQUIP								

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-6**

**Date Collected: 10/17/19 13:30**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

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		5			297483	11/09/19 00:44	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		50			298011	11/13/19 17:46	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			296502	10/26/19 15:24	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		10			296652	10/30/19 10:58	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			296706	10/31/19 16:23	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	25 mL	100 mL	295664	10/22/19 12:03	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.51 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			450354	11/14/19 16:51	CJQ	TAL SL
Total/NA	Prep	PrecSep_0			1000.51 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			448714	11/04/19 09:06	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			450918	11/18/19 09:43	SMP	TAL SL

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

**Lab Sample ID: 180-97535-7**

**Date Collected: 10/16/19 14:45**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

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			297483	11/08/19 18:24	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2100B		25			297483	11/08/19 18:40	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			296502	10/26/19 15:27	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		5			296652	10/30/19 11:02	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			296706	10/31/19 16:25	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	50 mL	100 mL	295664	10/22/19 12:03	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.36 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			450354	11/14/19 16:51	CJQ	TAL SL

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-97535-1

## Client Sample ID: CCR-AP-6

Date Collected: 10/16/19 14:45

Date Received: 10/19/19 09:00

## Lab Sample ID: 180-97535-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			1000.36 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320		1			448714	11/04/19 09:06	KLS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			450918	11/18/19 09:43	SMP	TAL SL
Instrument ID: NOEQUIP										

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

Date Collected: 10/16/19 12:50

Date Received: 10/19/19 09:00

## Lab Sample ID: 180-97535-8

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		5			297483	11/08/19 18:56	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total/NA	Analysis	EPA 9056A		50			297483	11/08/19 19:12	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296502	10/26/19 15:30	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			296652	10/30/19 11:05	RSK	TAL PIT
Instrument ID: A										
Total/NA	Analysis	EPA 9040C		1			296706	10/31/19 16:26	PM	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	295664	10/22/19 12:03	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.68 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315		1			450352	11/14/19 16:52	CJQ	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Prep	PrecSep_0			1000.68 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320		1			448714	11/04/19 09:06	KLS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			450918	11/18/19 09:43	SMP	TAL SL
Instrument ID: NOEQUIP										

## Client Sample ID: CCR-AP-10

Date Collected: 10/18/19 11:20

Date Received: 10/19/19 09:00

## Lab Sample ID: 180-97535-9

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		2.5			297483	11/09/19 01:15	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total/NA	Analysis	EPA 9056A		25			297483	11/09/19 01:31	MJH	TAL PIT
Instrument ID: CHICS2100B										

Eurofins TestAmerica, Pittsburgh



# Lab Chronicle

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

Job ID: 180-97535-1

**Client Sample ID: CCR-AP-10**

**Lab Sample ID: 180-97535-9**

**Date Collected: 10/18/19 11:20**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

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	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296502	10/26/19 15:40	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		5			296652	10/30/19 11:15	RSK	TAL PIT
Instrument ID: A										
Total/NA	Analysis	EPA 9040C		1			296706	10/31/19 16:31	PM	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	295667	10/22/19 12:31	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.69 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315		1			450352	11/14/19 18:48	CJQ	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Prep	PrecSep_0			1000.69 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320		1			448714	11/04/19 09:06	KLS	TAL SL
Instrument ID: GFPCPURPLE										
Total/NA	Analysis	Ra226_Ra228		1			450918	11/18/19 09:43	SMP	TAL SL
Instrument ID: NOEQUIP										

**Client Sample ID: BLIND DUPLICATE 1**

**Lab Sample ID: 180-97535-10**

**Date Collected: 10/16/19 00:00**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

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			297483	11/08/19 19:59	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total/NA	Analysis	EPA 9056A		25			297483	11/08/19 20:15	MJH	TAL PIT
Instrument ID: CHICS2100B										
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296502	10/26/19 15:44	RSK	TAL PIT
Instrument ID: A										
Total Recoverable	Prep	3005A			50 mL	50 mL	295968	10/24/19 11:51	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		5			296652	10/30/19 11:19	RSK	TAL PIT
Instrument ID: A										
Total/NA	Analysis	EPA 9040C		1			296706	10/31/19 16:28	PM	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	295664	10/22/19 12:03	AVS	TAL PIT
Instrument ID: NOEQUIP										
Total/NA	Prep	PrecSep-21			1000.73 mL	1.0 g	447335	10/23/19 07:09	EJQ	TAL SL
Total/NA	Analysis	9315		1			450354	11/14/19 18:50	CJQ	TAL SL
Instrument ID: GFPCBLUE										
Total/NA	Prep	PrecSep_0			1000.73 mL	1.0 g	447415	10/23/19 08:24	EJQ	TAL SL
Total/NA	Analysis	9320		1			448714	11/04/19 09:06	KLS	TAL SL
Instrument ID: GFPCPURPLE										

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-97535-1

**Client Sample ID: BLIND DUPLICATE 1**

**Lab Sample ID: 180-97535-10**

**Date Collected: 10/16/19 00:00**

**Matrix: Water**

**Date Received: 10/19/19 09:00**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Ra226_Ra228		1			450918	11/18/19 09:43	SMP	TAL SL

## Laboratory References:

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

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

## Analyst References:

Lab: TAL PIT

Batch Type: Prep

KEM = Kimberly Mahoney

Batch Type: Analysis

AVS = Abbey Smith

MJH = Matthew Hartman

PM = Paloma Hoelzle

RSK = Robert Kurtz

Lab: TAL SL

Batch Type: Prep

EJQ = Erin Quinn

Batch Type: Analysis

CJQ = Caleb Quinn

KLS = Kody Saulters

SMP = Siobhan Perry

# Client Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-1**

Date Collected: 10/16/19 10:45

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	55		1.0	0.32	mg/L			11/08/19 17:53	1
Fluoride	0.37		0.10	0.026	mg/L			11/08/19 17:53	1
Sulfate	410		10	3.8	mg/L			11/08/19 18:08	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:07	1
Arsenic	0.00038	J	0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:07	1
Barium	0.027	B	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:07	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:07	1
Boron	4.6		0.40	0.19	mg/L		10/24/19 11:51	10/30/19 10:42	5
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:07	1
Calcium	61		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:07	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:07	1
Cobalt	0.00020	J	0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:07	1
Lead	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:07	1
Lithium	ND		25	17	ug/L		10/24/19 11:51	10/30/19 10:42	5
Molybdenum	0.0047	J	0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:07	1
Selenium	ND		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:07	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:07	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1300		10	10	mg/L			10/22/19 12:03	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1	0.1	SU			10/31/19 16:14	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0796	U	0.0753	0.0757	1.00	0.117	pCi/L	10/23/19 07:09	11/14/19 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.3		40 - 110					10/23/19 07:09	11/14/19 16:51	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0814	U	0.239	0.239	1.00	0.413	pCi/L	10/23/19 08:24	11/04/19 09:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.3		40 - 110					10/23/19 08:24	11/04/19 09:05	1
Y Carrier	87.5		40 - 110					10/23/19 08:24	11/04/19 09:05	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

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

Lab Sample ID: 180-97535-1

Date Collected: 10/16/19 10:45

Matrix: Water

Date Received: 10/19/19 09:00

### 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	0.161	U	0.251	0.251	5.00	0.413	pCi/L		11/18/19 09:43	1

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

Lab Sample ID: 180-97535-2

Date Collected: 10/17/19 11:45

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	440		5.0	1.6	mg/L			11/11/19 01:31	5
Fluoride	0.30	J	0.50	0.13	mg/L			11/11/19 01:31	5
Sulfate	2500		50	19	mg/L			11/11/19 01:46	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:11	1
Arsenic	0.00058	J	0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:11	1
Barium	0.023	B	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:11	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:11	1
Boron	11		0.80	0.39	mg/L		10/24/19 11:51	10/30/19 10:45	10
Cadmium	0.00039	J	0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:11	1
Calcium	280		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:11	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:11	1
Cobalt	0.0026		0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:11	1
Lead	0.00015	J	0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:11	1
Lithium	50		50	34	ug/L		10/24/19 11:51	10/30/19 10:45	10
Molybdenum	1.7		0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:11	1
Selenium	ND		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:11	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:11	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4400		40	40	mg/L			10/22/19 12:03	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			10/31/19 16:17	1

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Radium-226	-0.0236	U	0.0528	0.0528	1.00	0.114	pCi/L	10/23/19 07:09	11/14/19 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					10/23/19 07:09	11/14/19 16:51	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-2**

Date Collected: 10/17/19 11:45

Matrix: Water

Date Received: 10/19/19 09:00

**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>0.518</b>		0.265	0.269	1.00	0.396	pCi/L	10/23/19 08:24	11/04/19 09:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					10/23/19 08:24	11/04/19 09:05	1
Y Carrier	83.4		40 - 110					10/23/19 08:24	11/04/19 09:05	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>0.494</b>		0.270	0.274	5.00	0.396	pCi/L		11/18/19 09:43	1

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

**Lab Sample ID: 180-97535-3**

Date Collected: 10/17/19 12:40

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>670</b>		5.0	1.6	mg/L			11/11/19 02:02	5
<b>Fluoride</b>	<b>0.79</b>		0.50	0.13	mg/L			11/11/19 02:02	5
<b>Sulfate</b>	<b>3700</b>		50	19	mg/L			11/11/19 02:18	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:14	1
<b>Arsenic</b>	<b>0.00035</b>	<b>J</b>	0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:14	1
<b>Barium</b>	<b>0.016</b>	<b>B</b>	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:14	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:14	1
<b>Boron</b>	<b>14</b>		0.80	0.39	mg/L		10/24/19 11:51	10/30/19 10:48	10
<b>Cadmium</b>	<b>0.00025</b>	<b>J</b>	0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:14	1
<b>Calcium</b>	<b>280</b>		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:14	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:14	1
<b>Cobalt</b>	<b>0.0019</b>		0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:14	1
<b>Lead</b>	<b>0.00013</b>	<b>J</b>	0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:14	1
<b>Lithium</b>	<b>100</b>		50	34	ug/L		10/24/19 11:51	10/30/19 10:48	10
<b>Molybdenum</b>	<b>0.90</b>		0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:14	1
<b>Selenium</b>	<b>0.0074</b>		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:14	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:14	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>5100</b>		50	50	mg/L			10/22/19 12:03	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH</b>	<b>7.5</b>	<b>HF</b>	0.1	0.1	SU			10/31/19 16:19	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-3**

Date Collected: 10/17/19 12:40

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0190	U	0.0630	0.0631	1.00	0.132	pCi/L	10/23/19 07:09	11/14/19 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.7		40 - 110					10/23/19 07:09	11/14/19 16:51	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.437		0.250	0.253	1.00	0.378	pCi/L	10/23/19 08:24	11/04/19 09:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.7		40 - 110					10/23/19 08:24	11/04/19 09:05	1
Y Carrier	83.4		40 - 110					10/23/19 08:24	11/04/19 09:05	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	0.418		0.258	0.261	5.00	0.378	pCi/L		11/18/19 09:43	1

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

**Lab Sample ID: 180-97535-4**

Date Collected: 10/18/19 14:30

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		1.0	0.32	mg/L			11/08/19 23:40	1
Fluoride	1.2		0.10	0.026	mg/L			11/08/19 23:40	1
Sulfate	14		1.0	0.38	mg/L			11/08/19 23:40	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:17	1
Arsenic	0.0016		0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:17	1
Barium	0.17	B	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:17	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:17	1
Boron	2.3		0.080	0.039	mg/L		10/24/19 11:51	10/30/19 10:52	1
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:17	1
Calcium	18		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:17	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:17	1
Cobalt	0.00059		0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:17	1
Lead	0.00072	J	0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:17	1
Lithium	26		5.0	3.4	ug/L		10/24/19 11:51	10/30/19 10:52	1
Molybdenum	0.0043	J	0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:17	1
Selenium	ND		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:17	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:17	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-4**

Date Collected: 10/18/19 14:30

Matrix: Water

Date Received: 10/19/19 09:00

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	720		10	10	mg/L			10/22/19 12:31	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.1	HF	0.1	0.1	SU			10/31/19 16:20	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.397		0.131	0.135	1.00	0.141	pCi/L	10/23/19 07:09	11/14/19 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.1		40 - 110					10/23/19 07:09	11/14/19 16:51	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.357	U	0.249	0.251	1.00	0.387	pCi/L	10/23/19 08:24	11/04/19 09:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.1		40 - 110					10/23/19 08:24	11/04/19 09:06	1
Y Carrier	86.7		40 - 110					10/23/19 08:24	11/04/19 09:06	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	0.753		0.281	0.285	5.00	0.387	pCi/L		11/18/19 09:43	1

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

**Lab Sample ID: 180-97535-5**

Date Collected: 10/17/19 15:00

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	41		1.0	0.32	mg/L			11/09/19 00:12	1
Fluoride	0.10		0.10	0.026	mg/L			11/09/19 00:12	1
Sulfate	94		1.0	0.38	mg/L			11/09/19 00:12	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:21	1
Arsenic	ND		0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:21	1
Barium	0.10	B	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:21	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:21	1
Boron	0.14		0.080	0.039	mg/L		10/24/19 11:51	10/30/19 10:55	1
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:21	1
Calcium	180		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:21	1
Chromium	0.0025		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:21	1
Cobalt	0.00024	J	0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:21	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-5**

Date Collected: 10/17/19 15:00

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Lead</b>	<b>0.00013</b>	<b>J</b>	0.0010	0.00013	mg/L	-	10/24/19 11:51	10/26/19 15:21	1
Lithium	ND		5.0	3.4	ug/L	-	10/24/19 11:51	10/30/19 10:55	1
<b>Molybdenum</b>	<b>0.0013</b>	<b>J</b>	0.0050	0.00061	mg/L	-	10/24/19 11:51	10/26/19 15:21	1
Selenium	ND		0.0050	0.0015	mg/L	-	10/24/19 11:51	10/26/19 15:21	1
Thallium	ND		0.0010	0.00015	mg/L	-	10/24/19 11:51	10/26/19 15:21	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>940</b>		10	10	mg/L	-		10/22/19 12:03	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH</b>	<b>7.3</b>	<b>HF</b>	0.1	0.1	SU	-		10/31/19 16:22	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.132	U	0.0929	0.0937	1.00	0.136	pCi/L	10/23/19 07:09	11/14/19 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.6		40 - 110					10/23/19 07:09	11/14/19 16:51	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.251	U	0.243	0.244	1.00	0.393	pCi/L	10/23/19 08:24	11/04/19 09:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.6		40 - 110					10/23/19 08:24	11/04/19 09:06	1
Y Carrier	85.6		40 - 110					10/23/19 08:24	11/04/19 09:06	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	0.382	U	0.260	0.261	5.00	0.393	pCi/L		11/18/19 09:43	1

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

**Lab Sample ID: 180-97535-6**

Date Collected: 10/17/19 13:30

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>380</b>		5.0	1.6	mg/L	-		11/09/19 00:44	5
<b>Fluoride</b>	<b>0.23</b>	<b>J</b>	0.50	0.13	mg/L	-		11/09/19 00:44	5
<b>Sulfate</b>	<b>2900</b>		50	19	mg/L	-		11/13/19 17:46	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L	-	10/24/19 11:51	10/26/19 15:24	1
Arsenic	ND		0.0010	0.00032	mg/L	-	10/24/19 11:51	10/26/19 15:24	1

Eurofins TestAmerica, Pittsburgh



# Client Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-6**

Date Collected: 10/17/19 13:30

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Barium</b>	<b>0.019</b>	<b>B</b>	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:24	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:24	1
<b>Boron</b>	<b>12</b>		0.80	0.39	mg/L		10/24/19 11:51	10/30/19 10:58	10
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:24	1
<b>Calcium</b>	<b>390</b>		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:24	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:24	1
<b>Cobalt</b>	<b>0.00034</b>	<b>J</b>	0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:24	1
Lead	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:24	1
Lithium	ND		50	34	ug/L		10/24/19 11:51	10/30/19 10:58	10
<b>Molybdenum</b>	<b>0.058</b>		0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:24	1
Selenium	ND		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:24	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:24	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>4800</b>		40	40	mg/L			10/22/19 12:03	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH</b>	<b>7.3</b>	<b>HF</b>	0.1	0.1	SU			10/31/19 16:23	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0430	U	0.0751	0.0752	1.00	0.130	pCi/L	10/23/19 07:09	11/14/19 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.8		40 - 110					10/23/19 07:09	11/14/19 16:51	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>0.468</b>		0.260	0.264	1.00	0.394	pCi/L	10/23/19 08:24	11/04/19 09:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.8		40 - 110					10/23/19 08:24	11/04/19 09:06	1
Y Carrier	84.9		40 - 110					10/23/19 08:24	11/04/19 09:06	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>0.511</b>		0.271	0.275	5.00	0.394	pCi/L		11/18/19 09:43	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-7**

Date Collected: 10/16/19 14:45

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	220		2.5	0.80	mg/L			11/08/19 18:24	2.5
Fluoride	0.14	J	0.25	0.066	mg/L			11/08/19 18:24	2.5
Sulfate	1200		25	9.5	mg/L			11/08/19 18:40	25

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:27	1
Arsenic	0.00049	J	0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:27	1
Barium	0.014	B	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:27	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:27	1
Boron	3.2		0.40	0.19	mg/L		10/24/19 11:51	10/30/19 11:02	5
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:27	1
Calcium	300		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:27	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:27	1
Cobalt	0.0011		0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:27	1
Lead	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:27	1
Lithium	42		25	17	ug/L		10/24/19 11:51	10/30/19 11:02	5
Molybdenum	0.0064		0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:27	1
Selenium	ND		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:27	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:27	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2400		20	20	mg/L			10/22/19 12:03	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1	0.1	SU			10/31/19 16:25	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.116	U	0.0908	0.0914	1.00	0.135	pCi/L	10/23/19 07:09	11/14/19 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110					10/23/19 07:09	11/14/19 16:51	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0619	U	0.234	0.234	1.00	0.429	pCi/L	10/23/19 08:24	11/04/19 09:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110					10/23/19 08:24	11/04/19 09:06	1
Y Carrier	86.0		40 - 110					10/23/19 08:24	11/04/19 09:06	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

## Client Sample ID: CCR-AP-6

## Lab Sample ID: 180-97535-7

Date Collected: 10/16/19 14:45

Matrix: Water

Date Received: 10/19/19 09:00

### 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	0.0546	U	0.251	0.251	5.00	0.429	pCi/L		11/18/19 09:43	1

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

## Lab Sample ID: 180-97535-8

Date Collected: 10/16/19 12:50

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	250		5.0	1.6	mg/L			11/08/19 18:56	5
Fluoride	0.16	J	0.50	0.13	mg/L			11/08/19 18:56	5
Sulfate	3100		50	19	mg/L			11/08/19 19:12	50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:30	1
Arsenic	0.00046	J	0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:30	1
Barium	0.028	B	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:30	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:30	1
Boron	3.6		0.80	0.39	mg/L		10/24/19 11:51	10/30/19 11:05	10
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:30	1
Calcium	370		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:30	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:30	1
Cobalt	0.00052		0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:30	1
Lead	0.00016	J	0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:30	1
Lithium	34	J	50	34	ug/L		10/24/19 11:51	10/30/19 11:05	10
Molybdenum	ND		0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:30	1
Selenium	ND		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:30	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:30	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	4500		40	40	mg/L			10/22/19 12:03	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1	0.1	SU			10/31/19 16:26	1

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Radium-226	0.104	U	0.0823	0.0828	1.00	0.124	pCi/L	10/23/19 07:09	11/14/19 16:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.0		40 - 110					10/23/19 07:09	11/14/19 16:52	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: 180-97535-8**

Date Collected: 10/16/19 12:50

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0730	U	0.233	0.233	1.00	0.404	pCi/L	10/23/19 08:24	11/04/19 09:06	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	94.0		40 - 110					10/23/19 08:24	11/04/19 09:06	1
Y Carrier	84.5		40 - 110					10/23/19 08:24	11/04/19 09:06	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	0.177	U	0.247	0.247	5.00	0.404	pCi/L		11/18/19 09:43	1

**Client Sample ID: CCR-AP-10**

**Lab Sample ID: 180-97535-9**

Date Collected: 10/18/19 11:20

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	220		2.5	0.80	mg/L			11/09/19 01:15	2.5
Fluoride	0.24	J	0.25	0.066	mg/L			11/09/19 01:15	2.5
Sulfate	2000		25	9.5	mg/L			11/09/19 01:31	25

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:40	1
Arsenic	0.00054	J	0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:40	1
Barium	0.016	B	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:40	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:40	1
Boron	7.4		0.40	0.19	mg/L		10/24/19 11:51	10/30/19 11:15	5
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:40	1
Calcium	220		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:40	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:40	1
Cobalt	0.0011		0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:40	1
Lead	0.00031	J	0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:40	1
Lithium	ND		25	17	ug/L		10/24/19 11:51	10/30/19 11:15	5
Molybdenum	0.0028	J	0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:40	1
Selenium	0.014		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:40	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:40	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3300		40	40	mg/L			10/22/19 12:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			10/31/19 16:31	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

**Client Sample ID: CCR-AP-10**

**Lab Sample ID: 180-97535-9**

Date Collected: 10/18/19 11:20

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0667	U	0.0735	0.0737	1.00	0.119	pCi/L	10/23/19 07:09	11/14/19 18:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					10/23/19 07:09	11/14/19 18:48	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.490		0.237	0.241	1.00	0.344	pCi/L	10/23/19 08:24	11/04/19 09:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					10/23/19 08:24	11/04/19 09:06	1
Y Carrier	86.4		40 - 110					10/23/19 08:24	11/04/19 09:06	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	0.556		0.248	0.252	5.00	0.344	pCi/L		11/18/19 09:43	1

**Client Sample ID: BLIND DUPLICATE 1**

**Lab Sample ID: 180-97535-10**

Date Collected: 10/16/19 00:00

Matrix: Water

Date Received: 10/19/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210		2.5	0.80	mg/L			11/08/19 19:59	2.5
Fluoride	0.14	J	0.25	0.066	mg/L			11/08/19 19:59	2.5
Sulfate	1200		25	9.5	mg/L			11/08/19 20:15	25

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 15:44	1
Arsenic	0.00043	J	0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 15:44	1
Barium	0.015	B	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 15:44	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 15:44	1
Boron	3.0		0.40	0.19	mg/L		10/24/19 11:51	10/30/19 11:19	5
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:44	1
Calcium	310		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 15:44	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 15:44	1
Cobalt	0.0010		0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 15:44	1
Lead	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 15:44	1
Lithium	40		25	17	ug/L		10/24/19 11:51	10/30/19 11:19	5
Molybdenum	0.0061		0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 15:44	1
Selenium	ND		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 15:44	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 15:44	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97535-1

**Client Sample ID: BLIND DUPLICATE 1**

**Lab Sample ID: 180-97535-10**

Date Collected: 10/16/19 00:00

Matrix: Water

Date Received: 10/19/19 09:00

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>2300</b>		20	20	mg/L			10/22/19 12:03	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>pH</b>	<b>7.2</b>	<b>HF</b>	0.1	0.1	SU			10/31/19 16:28	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>0.129</b>		0.0874	0.0881	1.00	0.126	pCi/L	10/23/19 07:09	11/14/19 18:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
<i>Ba Carrier</i>	91.6		40 - 110					10/23/19 07:09	11/14/19 18:50	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.166	U	0.233	0.233	1.00	0.389	pCi/L	10/23/19 08:24	11/04/19 09:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
<i>Ba Carrier</i>	91.6		40 - 110					10/23/19 08:24	11/04/19 09:06	1
<i>Y Carrier</i>	87.9		40 - 110					10/23/19 08:24	11/04/19 09:06	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	0.294	U	0.249	0.249	5.00	0.389	pCi/L		11/18/19 09:43	1

# QC Sample Results

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

Job ID: 180-97535-1

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

**Lab Sample ID: MB 180-297483/45**  
**Matrix: Water**  
**Analysis Batch: 297483**

**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	0.32	mg/L			11/08/19 20:46	1
Fluoride	ND		0.10	0.026	mg/L			11/08/19 20:46	1
Sulfate	ND		1.0	0.38	mg/L			11/08/19 20:46	1

**Lab Sample ID: MB 180-297483/6**  
**Matrix: Water**  
**Analysis Batch: 297483**

**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	0.32	mg/L			11/08/19 10:09	1
Fluoride	ND		0.10	0.026	mg/L			11/08/19 10:09	1
Sulfate	ND		1.0	0.38	mg/L			11/08/19 10:09	1

**Lab Sample ID: LCS 180-297483/44**  
**Matrix: Water**  
**Analysis Batch: 297483**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.4		mg/L		95	80 - 120
Fluoride	2.50	2.37		mg/L		95	80 - 120
Sulfate	50.0	47.9		mg/L		96	80 - 120

**Lab Sample ID: LCS 180-297483/5**  
**Matrix: Water**  
**Analysis Batch: 297483**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.2		mg/L		94	80 - 120
Fluoride	2.50	2.26		mg/L		90	80 - 120
Sulfate	50.0	47.9		mg/L		96	80 - 120

**Lab Sample ID: MB 180-297717/44**  
**Matrix: Water**  
**Analysis Batch: 297717**

**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	0.32	mg/L			11/10/19 22:53	1
Fluoride	ND		0.10	0.026	mg/L			11/10/19 22:53	1
Sulfate	ND		1.0	0.38	mg/L			11/10/19 22:53	1

**Lab Sample ID: LCS 180-297717/43**  
**Matrix: Water**  
**Analysis Batch: 297717**

**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	25.8		mg/L		103	80 - 120
Fluoride	1.25	1.22		mg/L		98	80 - 120
Sulfate	25.0	25.8		mg/L		103	80 - 120

# QC Sample Results

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

Job ID: 180-97535-1

## Method: EPA 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MB 180-298011/6**  
**Matrix: Water**  
**Analysis Batch: 298011**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		1.0	0.38	mg/L			11/13/19 07:30	1

**Lab Sample ID: LCS 180-298011/5**  
**Matrix: Water**  
**Analysis Batch: 298011**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	50.0	48.9		mg/L		98	80 - 120

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

**Lab Sample ID: MB 180-295968/1-A**  
**Matrix: Water**  
**Analysis Batch: 296502**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 295968**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/24/19 11:51	10/26/19 14:21	1
Arsenic	ND		0.0010	0.00032	mg/L		10/24/19 11:51	10/26/19 14:21	1
Barium	0.00174	J	0.010	0.0016	mg/L		10/24/19 11:51	10/26/19 14:21	1
Beryllium	ND		0.0010	0.00018	mg/L		10/24/19 11:51	10/26/19 14:21	1
Cadmium	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 14:21	1
Calcium	ND		0.50	0.13	mg/L		10/24/19 11:51	10/26/19 14:21	1
Chromium	ND		0.0020	0.0015	mg/L		10/24/19 11:51	10/26/19 14:21	1
Cobalt	ND		0.00050	0.000075	mg/L		10/24/19 11:51	10/26/19 14:21	1
Lead	ND		0.0010	0.00013	mg/L		10/24/19 11:51	10/26/19 14:21	1
Molybdenum	ND		0.0050	0.00061	mg/L		10/24/19 11:51	10/26/19 14:21	1
Selenium	ND		0.0050	0.0015	mg/L		10/24/19 11:51	10/26/19 14:21	1
Thallium	ND		0.0010	0.00015	mg/L		10/24/19 11:51	10/26/19 14:21	1

**Lab Sample ID: MB 180-295968/1-A**  
**Matrix: Water**  
**Analysis Batch: 296652**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 295968**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.080	0.039	mg/L		10/24/19 11:51	10/30/19 09:54	1
Lithium	ND		5.0	3.4	ug/L		10/24/19 11:51	10/30/19 09:54	1

**Lab Sample ID: LCS 180-295968/2-A**  
**Matrix: Water**  
**Analysis Batch: 296502**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 295968**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.250	0.255		mg/L		102	80 - 120
Arsenic	1.00	0.855		mg/L		86	80 - 120
Barium	1.00	1.05		mg/L		105	80 - 120
Beryllium	0.500	0.526		mg/L		105	80 - 120
Cadmium	0.500	0.507		mg/L		101	80 - 120
Calcium	25.0	26.4		mg/L		105	80 - 120
Chromium	0.500	0.488		mg/L		98	80 - 120
Cobalt	0.500	0.499		mg/L		100	80 - 120

Eurofins TestAmerica, Pittsburgh



# QC Sample Results

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

Job ID: 180-97535-1

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

Lab Sample ID: LCS 180-295968/2-A  
 Matrix: Water  
 Analysis Batch: 296502

Client Sample ID: Lab Control Sample  
 Prep Type: Total Recoverable  
 Prep Batch: 295968

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	0.500	0.497		mg/L		99	80 - 120
Molybdenum	0.500	0.508		mg/L		102	80 - 120
Selenium	1.00	0.974		mg/L		97	80 - 120
Thallium	1.00	1.02		mg/L		102	80 - 120

Lab Sample ID: LCS 180-295968/2-A  
 Matrix: Water  
 Analysis Batch: 296652

Client Sample ID: Lab Control Sample  
 Prep Type: Total Recoverable  
 Prep Batch: 295968

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.25	1.20		mg/L		96	80 - 120
Lithium	500	496		ug/L		99	80 - 120

## Method: EPA 9040C - pH

Lab Sample ID: LCS 180-296706/1  
 Matrix: Water  
 Analysis Batch: 296706

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: 180-97535-1 DU  
 Matrix: Water  
 Analysis Batch: 296706

Client Sample ID: CCR-AP-1R  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.3	HF	7.4		SU		0.1	2

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-295664/2  
 Matrix: Water  
 Analysis Batch: 295664

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			10/22/19 12:03	1

Lab Sample ID: LCS 180-295664/1  
 Matrix: Water  
 Analysis Batch: 295664

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	188	198		mg/L		105	80 - 120

Lab Sample ID: MB 180-295667/2  
 Matrix: Water  
 Analysis Batch: 295667

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			10/22/19 12:31	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-97535-1

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: LCS 180-295667/1  
 Matrix: Water  
 Analysis Batch: 295667

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	188	194		mg/L		103	80 - 120

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

Lab Sample ID: MB 160-447335/19-A  
 Matrix: Water  
 Analysis Batch: 450354

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 447335

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03473	U	0.0514	0.0515	1.00	0.0881	pCi/L	10/23/19 07:09	11/14/19 18:51	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					10/23/19 07:09	11/14/19 18:51	1

Lab Sample ID: LCS 160-447335/1-A  
 Matrix: Water  
 Analysis Batch: 450354

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 447335

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.94		1.13	1.00	0.0961	pCi/L	96	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	90.4		40 - 110						

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

Lab Sample ID: MB 160-447415/19-A  
 Matrix: Water  
 Analysis Batch: 448717

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 447415

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.1036	U	0.227	0.227	1.00	0.419	pCi/L	10/23/19 08:24	11/04/19 09:10	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					10/23/19 08:24	11/04/19 09:10	1
Y Carrier	84.1		40 - 110					10/23/19 08:24	11/04/19 09:10	1

Lab Sample ID: LCS 160-447415/1-A  
 Matrix: Water  
 Analysis Batch: 448714

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 447415

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.43	10.32		1.18	1.00	0.427	pCi/L	109	75 - 125

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-97535-1

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

Lab Sample ID: LCS 160-447415/1-A  
Matrix: Water  
Analysis Batch: 448714

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 447415

<i>Carrier</i>	<i>LCS</i> <i>%Yield</i>	<i>LCS</i> <i>Qualifier</i>	<i>Limits</i>
Ba Carrier	90.4		40 - 110
Y Carrier	87.5		40 - 110

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

# QC Association Summary

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

Job ID: 180-97535-1

## HPLC/IC

### Analysis Batch: 297483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-1	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-97535-1	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-97535-4	CCR-AP-3I	Total/NA	Water	EPA 9056A	
180-97535-5	CCR-AP-4R	Total/NA	Water	EPA 9056A	
180-97535-6	CCR-AP-5	Total/NA	Water	EPA 9056A	
180-97535-7	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-97535-7	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-97535-8	CCR-AP-7R	Total/NA	Water	EPA 9056A	
180-97535-8	CCR-AP-7R	Total/NA	Water	EPA 9056A	
180-97535-9	CCR-AP-10	Total/NA	Water	EPA 9056A	
180-97535-9	CCR-AP-10	Total/NA	Water	EPA 9056A	
180-97535-10	BLIND DUPLICATE 1	Total/NA	Water	EPA 9056A	
180-97535-10	BLIND DUPLICATE 1	Total/NA	Water	EPA 9056A	
MB 180-297483/45	Method Blank	Total/NA	Water	EPA 9056A	
MB 180-297483/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-297483/44	Lab Control Sample	Total/NA	Water	EPA 9056A	
LCS 180-297483/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

### Analysis Batch: 297717

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-2	CCR-AP-2R	Total/NA	Water	EPA 9056A	
180-97535-2	CCR-AP-2R	Total/NA	Water	EPA 9056A	
180-97535-3	CCR-AP-3R	Total/NA	Water	EPA 9056A	
180-97535-3	CCR-AP-3R	Total/NA	Water	EPA 9056A	
MB 180-297717/44	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-297717/43	Lab Control Sample	Total/NA	Water	EPA 9056A	

### Analysis Batch: 298011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-6	CCR-AP-5	Total/NA	Water	EPA 9056A	
MB 180-298011/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-298011/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

## Metals

### Prep Batch: 295968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-1	CCR-AP-1R	Total Recoverable	Water	3005A	
180-97535-2	CCR-AP-2R	Total Recoverable	Water	3005A	
180-97535-3	CCR-AP-3R	Total Recoverable	Water	3005A	
180-97535-4	CCR-AP-3I	Total Recoverable	Water	3005A	
180-97535-5	CCR-AP-4R	Total Recoverable	Water	3005A	
180-97535-6	CCR-AP-5	Total Recoverable	Water	3005A	
180-97535-7	CCR-AP-6	Total Recoverable	Water	3005A	
180-97535-8	CCR-AP-7R	Total Recoverable	Water	3005A	
180-97535-9	CCR-AP-10	Total Recoverable	Water	3005A	
180-97535-10	BLIND DUPLICATE 1	Total Recoverable	Water	3005A	
MB 180-295968/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-295968/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

# QC Association Summary

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

Job ID: 180-97535-1

## Metals

### Analysis Batch: 296502

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-1	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	295968
180-97535-2	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	295968
180-97535-3	CCR-AP-3R	Total Recoverable	Water	EPA 6020A	295968
180-97535-4	CCR-AP-3I	Total Recoverable	Water	EPA 6020A	295968
180-97535-5	CCR-AP-4R	Total Recoverable	Water	EPA 6020A	295968
180-97535-6	CCR-AP-5	Total Recoverable	Water	EPA 6020A	295968
180-97535-7	CCR-AP-6	Total Recoverable	Water	EPA 6020A	295968
180-97535-8	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	295968
180-97535-9	CCR-AP-10	Total Recoverable	Water	EPA 6020A	295968
180-97535-10	BLIND DUPLICATE 1	Total Recoverable	Water	EPA 6020A	295968
MB 180-295968/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	295968
LCS 180-295968/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	295968

### Analysis Batch: 296652

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-1	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	295968
180-97535-2	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	295968
180-97535-3	CCR-AP-3R	Total Recoverable	Water	EPA 6020A	295968
180-97535-4	CCR-AP-3I	Total Recoverable	Water	EPA 6020A	295968
180-97535-5	CCR-AP-4R	Total Recoverable	Water	EPA 6020A	295968
180-97535-6	CCR-AP-5	Total Recoverable	Water	EPA 6020A	295968
180-97535-7	CCR-AP-6	Total Recoverable	Water	EPA 6020A	295968
180-97535-8	CCR-AP-7R	Total Recoverable	Water	EPA 6020A	295968
180-97535-9	CCR-AP-10	Total Recoverable	Water	EPA 6020A	295968
180-97535-10	BLIND DUPLICATE 1	Total Recoverable	Water	EPA 6020A	295968
MB 180-295968/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	295968
LCS 180-295968/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	295968

## General Chemistry

### Analysis Batch: 295664

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-1	CCR-AP-1R	Total/NA	Water	SM 2540C	
180-97535-2	CCR-AP-2R	Total/NA	Water	SM 2540C	
180-97535-3	CCR-AP-3R	Total/NA	Water	SM 2540C	
180-97535-5	CCR-AP-4R	Total/NA	Water	SM 2540C	
180-97535-6	CCR-AP-5	Total/NA	Water	SM 2540C	
180-97535-7	CCR-AP-6	Total/NA	Water	SM 2540C	
180-97535-8	CCR-AP-7R	Total/NA	Water	SM 2540C	
180-97535-10	BLIND DUPLICATE 1	Total/NA	Water	SM 2540C	
MB 180-295664/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-295664/1	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 295667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-4	CCR-AP-3I	Total/NA	Water	SM 2540C	
180-97535-9	CCR-AP-10	Total/NA	Water	SM 2540C	
MB 180-295667/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-295667/1	Lab Control Sample	Total/NA	Water	SM 2540C	

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-97535-1

## General Chemistry

### Analysis Batch: 296706

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-1	CCR-AP-1R	Total/NA	Water	EPA 9040C	
180-97535-2	CCR-AP-2R	Total/NA	Water	EPA 9040C	
180-97535-3	CCR-AP-3R	Total/NA	Water	EPA 9040C	
180-97535-4	CCR-AP-3I	Total/NA	Water	EPA 9040C	
180-97535-5	CCR-AP-4R	Total/NA	Water	EPA 9040C	
180-97535-6	CCR-AP-5	Total/NA	Water	EPA 9040C	
180-97535-7	CCR-AP-6	Total/NA	Water	EPA 9040C	
180-97535-8	CCR-AP-7R	Total/NA	Water	EPA 9040C	
180-97535-9	CCR-AP-10	Total/NA	Water	EPA 9040C	
180-97535-10	BLIND DUPLICATE 1	Total/NA	Water	EPA 9040C	
LCS 180-296706/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-97535-1 DU	CCR-AP-1R	Total/NA	Water	EPA 9040C	

## Rad

### Prep Batch: 447335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-1	CCR-AP-1R	Total/NA	Water	PrecSep-21	
180-97535-2	CCR-AP-2R	Total/NA	Water	PrecSep-21	
180-97535-3	CCR-AP-3R	Total/NA	Water	PrecSep-21	
180-97535-4	CCR-AP-3I	Total/NA	Water	PrecSep-21	
180-97535-5	CCR-AP-4R	Total/NA	Water	PrecSep-21	
180-97535-6	CCR-AP-5	Total/NA	Water	PrecSep-21	
180-97535-7	CCR-AP-6	Total/NA	Water	PrecSep-21	
180-97535-8	CCR-AP-7R	Total/NA	Water	PrecSep-21	
180-97535-9	CCR-AP-10	Total/NA	Water	PrecSep-21	
180-97535-10	BLIND DUPLICATE 1	Total/NA	Water	PrecSep-21	
MB 160-447335/19-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-447335/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 447415

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97535-1	CCR-AP-1R	Total/NA	Water	PrecSep_0	
180-97535-2	CCR-AP-2R	Total/NA	Water	PrecSep_0	
180-97535-3	CCR-AP-3R	Total/NA	Water	PrecSep_0	
180-97535-4	CCR-AP-3I	Total/NA	Water	PrecSep_0	
180-97535-5	CCR-AP-4R	Total/NA	Water	PrecSep_0	
180-97535-6	CCR-AP-5	Total/NA	Water	PrecSep_0	
180-97535-7	CCR-AP-6	Total/NA	Water	PrecSep_0	
180-97535-8	CCR-AP-7R	Total/NA	Water	PrecSep_0	
180-97535-9	CCR-AP-10	Total/NA	Water	PrecSep_0	
180-97535-10	BLIND DUPLICATE 1	Total/NA	Water	PrecSep_0	
MB 160-447415/19-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-447415/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

### Chain of Custody Record

<b>Client Information</b> Client Contact: <u>Angela Casbon Scheller</u> Company: <u>Vectren Corporation</u> Address: <u>PO BOX 209</u> City: <u>Evansville</u> State, Zip: <u>IN, 47702</u> Phone: <u>864-214-8750(Tel)</u> Email: <u>acscheller@vectren.com</u> Project Name: <u>CCR Groundwater Monitoring - AB Brown</u> Site: <u>AB Brown</u>		Lab PM: <u>Bortol, Veronica</u> E-Mail: <u>veronica.bortol@testamericainc.com</u> Carrier Tracking No(s): COC No: <u>180-49738-8017.1</u> Page: <u>Page 1 of 1</u> Job #:																																																																			
Due Date Requested: TAT Requested (days): <u>7</u> PO #: <u>Purchase Order Requested</u> WO #: <u></u> Project #: <u>18016014</u> SSOW#: <u></u>		<b>Analysis Requested</b> 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 9315_Ra226, 9320_Ra228 9040C, 9056A_ORGFM_28D 6020A, 7470A 2540C_Calcd - TDS																																																																			
<b>Sample Identification</b> <table border="1"> <thead> <tr> <th>Sample ID</th> <th>Sample Date</th> <th>Sample Time</th> <th>Sample Type (C=comp, G=grab)</th> <th>Matrix (W=water, S=solid, O=waste/oil)</th> <th>Preservation Code</th> </tr> </thead> <tbody> <tr> <td><del>CCR-AP-1</del> <u>CCR-AP-1R</u></td> <td><del>10/16/19</del> <u>10/16/19</u></td> <td><del>1045</del> <u>1045</u></td> <td><del>G</del> <u>G</u></td> <td><del>Water</del> <u>Water</u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-2</del> <u>CCR-AP-2R</u></td> <td><del>10/17/19</del> <u>10/17/19</u></td> <td><del>1145</del> <u>1145</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u>Water</u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-3</del> <u>CCR-AP-3R</u></td> <td><del>10/17/19</del> <u>10/17/19</u></td> <td><del>1240</del> <u>1240</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u>Water</u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-4</del> <u>CCR-AP-3F</u></td> <td><del>10/18/19</del> <u>10/18/19</u></td> <td><del>1430</del> <u>1430</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u>Water</u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-5</del> <u>CCR-AP-4R</u></td> <td><del>10/17/19</del> <u>10/17/19</u></td> <td><del>1500</del> <u>1500</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u>Water</u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-6</del> <u>CCR-AP-5</u></td> <td><del>10/17/19</del> <u>10/17/19</u></td> <td><del>1330</del> <u>1330</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u>Water</u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-7</del> <u>CCR-AP-6</u></td> <td><del>10/16/19</del> <u>10/16/19</u></td> <td><del>1445</del> <u>1445</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u>W</u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-8</del> <u>CCR-AP-7R</u></td> <td><del>10/16/19</del> <u>10/16/19</u></td> <td><del>1250</del> <u>1250</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u>I</u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-9</del> <u>CCR-AP-10</u></td> <td><del>10/18/19</del> <u>10/18/19</u></td> <td><del>1120</del> <u>1120</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u></u></td> <td><del></del> <u></u></td> </tr> <tr> <td><del>CCR-AP-10</del> <u>Blind Duplicate 1</u></td> <td><del>10/16/19</del> <u>10/16/19</u></td> <td><del>-</del> <u>-</u></td> <td><del></del> <u></u></td> <td><del>Water</del> <u></u></td> <td><del></del> <u></u></td> </tr> </tbody> </table>		Sample ID	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil)	Preservation Code	<del>CCR-AP-1</del> <u>CCR-AP-1R</u>	<del>10/16/19</del> <u>10/16/19</u>	<del>1045</del> <u>1045</u>	<del>G</del> <u>G</u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>	<del>CCR-AP-2</del> <u>CCR-AP-2R</u>	<del>10/17/19</del> <u>10/17/19</u>	<del>1145</del> <u>1145</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>	<del>CCR-AP-3</del> <u>CCR-AP-3R</u>	<del>10/17/19</del> <u>10/17/19</u>	<del>1240</del> <u>1240</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>	<del>CCR-AP-4</del> <u>CCR-AP-3F</u>	<del>10/18/19</del> <u>10/18/19</u>	<del>1430</del> <u>1430</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>	<del>CCR-AP-5</del> <u>CCR-AP-4R</u>	<del>10/17/19</del> <u>10/17/19</u>	<del>1500</del> <u>1500</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>	<del>CCR-AP-6</del> <u>CCR-AP-5</u>	<del>10/17/19</del> <u>10/17/19</u>	<del>1330</del> <u>1330</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>	<del>CCR-AP-7</del> <u>CCR-AP-6</u>	<del>10/16/19</del> <u>10/16/19</u>	<del>1445</del> <u>1445</u>	<del></del> <u></u>	<del>Water</del> <u>W</u>	<del></del> <u></u>	<del>CCR-AP-8</del> <u>CCR-AP-7R</u>	<del>10/16/19</del> <u>10/16/19</u>	<del>1250</del> <u>1250</u>	<del></del> <u></u>	<del>Water</del> <u>I</u>	<del></del> <u></u>	<del>CCR-AP-9</del> <u>CCR-AP-10</u>	<del>10/18/19</del> <u>10/18/19</u>	<del>1120</del> <u>1120</u>	<del></del> <u></u>	<del>Water</del> <u></u>	<del></del> <u></u>	<del>CCR-AP-10</del> <u>Blind Duplicate 1</u>	<del>10/16/19</del> <u>10/16/19</u>	<del>-</del> <u>-</u>	<del></del> <u></u>	<del>Water</del> <u></u>	<del></del> <u></u>	Total Number of Containers: <u>5</u> Special Instructions/Note: <u>Appendix III &amp; Appendix IV</u> <u>Analyses needed for custody</u> <u>Do Not Report: Mercury</u>	
Sample ID	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil)	Preservation Code																																																																
<del>CCR-AP-1</del> <u>CCR-AP-1R</u>	<del>10/16/19</del> <u>10/16/19</u>	<del>1045</del> <u>1045</u>	<del>G</del> <u>G</u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>																																																																
<del>CCR-AP-2</del> <u>CCR-AP-2R</u>	<del>10/17/19</del> <u>10/17/19</u>	<del>1145</del> <u>1145</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>																																																																
<del>CCR-AP-3</del> <u>CCR-AP-3R</u>	<del>10/17/19</del> <u>10/17/19</u>	<del>1240</del> <u>1240</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>																																																																
<del>CCR-AP-4</del> <u>CCR-AP-3F</u>	<del>10/18/19</del> <u>10/18/19</u>	<del>1430</del> <u>1430</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>																																																																
<del>CCR-AP-5</del> <u>CCR-AP-4R</u>	<del>10/17/19</del> <u>10/17/19</u>	<del>1500</del> <u>1500</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>																																																																
<del>CCR-AP-6</del> <u>CCR-AP-5</u>	<del>10/17/19</del> <u>10/17/19</u>	<del>1330</del> <u>1330</u>	<del></del> <u></u>	<del>Water</del> <u>Water</u>	<del></del> <u></u>																																																																
<del>CCR-AP-7</del> <u>CCR-AP-6</u>	<del>10/16/19</del> <u>10/16/19</u>	<del>1445</del> <u>1445</u>	<del></del> <u></u>	<del>Water</del> <u>W</u>	<del></del> <u></u>																																																																
<del>CCR-AP-8</del> <u>CCR-AP-7R</u>	<del>10/16/19</del> <u>10/16/19</u>	<del>1250</del> <u>1250</u>	<del></del> <u></u>	<del>Water</del> <u>I</u>	<del></del> <u></u>																																																																
<del>CCR-AP-9</del> <u>CCR-AP-10</u>	<del>10/18/19</del> <u>10/18/19</u>	<del>1120</del> <u>1120</u>	<del></del> <u></u>	<del>Water</del> <u></u>	<del></del> <u></u>																																																																
<del>CCR-AP-10</del> <u>Blind Duplicate 1</u>	<del>10/16/19</del> <u>10/16/19</u>	<del>-</del> <u>-</u>	<del></del> <u></u>	<del>Water</del> <u></u>	<del></del> <u></u>																																																																
<b>Possible Hazard Identification</b> <input 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		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																																																																			
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:																																																																			
Empty Kit Relinquished by:		Method of Shipment:																																																																			
Relinquished by: <u>Jacob Winsett</u> Relinquished by:		Received by: <u>Fad G</u> Received by: <u>Dulce Wilson</u> Received by:																																																																			
Date/Time: <u>10/18/19 1900</u> Date/Time:		Date/Time: <u>10-19-19</u> Date/Time:																																																																			
Company: <u>ATC</u> Company:		Company: <u>ATC</u> Company:																																																																			
Date/Time:		Date/Time:																																																																			
Custody Seal No.: <u>Yes</u> <input type="checkbox"/> <u>No</u> <input type="checkbox"/>		Cooler Temperature(s) °C and Other Remarks:																																																																			



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

ORIGIN ID:EVVA (812) 477-1176  
BRIAN KLEEMAN

1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

TO **VERONICA BORTOT**  
**TESTAMERICA**  
**301 ALPHA DRIVE**

SHIP DATE: 18OCT19



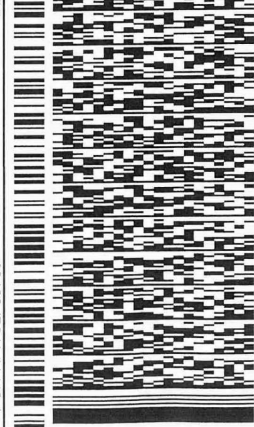
180-97535 Waybill

567J82A3C0

**PITTSBURGH PA 15238**

(412) 963-7058 REF: PN: 170LF00739  
INV: PN: 170LF00739  
PO: PN: 170LF00739

DEPT:



192119091901uv

1 of 2  
TRK# 7767 6222 3730  
0201  
## MASTER ##  
**XO AGCA** PA-US  
15238  
PIT

SATURDAY 12:00P  
PRIORITY OVERNIGHT



Uncorrected temp 4.2 °C  
Thermometer ID 10  
CF 0 Initials B  
PT-WI-SR-001 effective 11/8/18

**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 ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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.

**After printing this label:**



ORIGIN ID:EVVA  
BRIAN KLEEMAN (812) 477-1176

1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

BILL SENDER

TO **VERONICA BORTOT**  
**TESTAMERICA**  
**301 ALPHA DRIVE**

**PITTSBURGH PA 15238**

(412) 962-7058  
INV. PN: 170LF00739  
PO. PN: 170LF00739

REF. PN: 170LF00739

DEPT:



redExx  
Express



FedEx Ship Manager - Print Your Label(s)

2 of 2

**SATURDAY 12:00P**  
**PRIORITY OVERNIGHT**

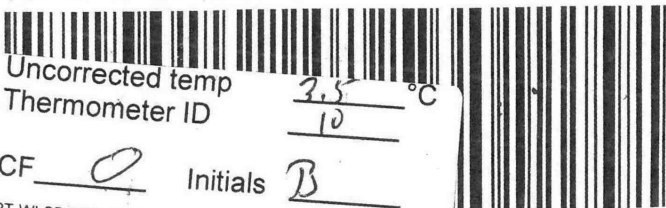
MPS# **7767 6222 3111**

0263 Mstr# **7767 6222 3730**

0201

**X0 AGCA**

**15238**  
PA-US **PIT**



Uncorrected temp  
Thermometer ID 3.5 °C  
10

CF 0 Initials B

PT-WI-SR-001 effective 11/8/18

11/2019

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

**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
Client Contact: Shipping/Receiving		Phone:	Bortot, Veronica		180-376794.1
Company: TestAmerica Laboratories, Inc.		E-Mail:	veronica.bortot@testamericainc.com	State of Origin:	Page 1 of 2
Address: 13715 Rider Trail North,		Accreditations Required (See note):		Indiana	Job #: 180-97535-1
City: Earth City		Due Date Requested: 10/31/2019	<b>Analysis Requested</b>		
State, Zip: MO, 63045		TAT Requested (days):			
Phone: 314-298-8566(Tel) 314-298-8757(Fax)		PO #:			
Email:		WO #:			
Project Name: CCR Groundwater Monitoring AB Brown		Project #: 18016014			
Site:		SSOW #:			
<b>Sample Identification - Client ID (Lab ID)</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Type (C=Comp, G=grab)</b>	<b>Matrix (W=water, S=solid, O=oil, BT=Tissue, A=Air)</b>	<b>Preservation Code:</b>
CCR-AP-1R (180-97535-1)	10/16/19	10:45 Eastern		Water	
CCR-AP-2R (180-97535-2)	10/17/19	11:45 Eastern		Water	
CCR-AP-3R (180-97535-3)	10/17/19	12:40 Eastern		Water	
CCR-AP-3I (180-97535-4)	10/18/19	14:30 Eastern		Water	
CCR-AP-4R (180-97535-5)	10/17/19	15:00 Eastern		Water	
CCR-AP-5 (180-97535-6)	10/17/19	13:30 Eastern		Water	
CCR-AP-6 (180-97535-7)	10/16/19	14:45 Eastern		Water	
CCR-AP-7R (180-97535-8)	10/16/19	12:50 Eastern		Water	
CCR-AP-10 (180-97535-9)	10/18/19	11:20 Eastern		Water	
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte &amp; 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/test/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.</p>					
<b>Possible Hazard Identification</b>					
Unconfirmed					
Deliverable Requested: I, II, III, IV, Other (specify)					
Primary Deliverable Rank: 2					
Empty Kit Relinquished by:					
Relinquished by:					
Relinquished by:					
Relinquished by:					
Custody Seals Intact: Δ Yes Δ No					
Custody Seal No.:					
Cooler Temperature(s) °C and Other Remarks:					
<p><b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b></p> <p><input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Month/s</p> <p>Special Instructions/QC Requirements:</p>					
<p>Method of Shipment:</p> <p>Received by: <i>[Signature]</i> Date/Time: 10/21/19 17:00 PT Company: [Blank]</p> <p>Received by: <i>[Signature]</i> Date/Time: 10/21/19 09:05 Company: TASSR</p> <p>Received by: <i>[Signature]</i> Date/Time: _____ Company: _____</p>					



<b>Client Information (Sub Contract Lab)</b>		Lab PM: Bortol, Veronica		Carrier Tracking No(s): 180-376794.2						
Client Contact: Shipping/Receiving		E-Mail: veronica.bortol@testamericainc.com		Page: Page 2 of 2						
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-97535-1						
Address: 13715 Rider Trail North,		Due Date Requested: 10/31/2019		Preservation Codes:						
City: Earth City		TAT Requested (days):		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:						
State, Zip: MO, 63045		PO #:		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)						
Phone: 314-298-8566(Tel) 314-298-8757(Fax)		WO #:		Total Number of containers: 2						
Email:		Project #: 18016014		Special Instructions/Note:						
Project Name: CCR Groundwater Monitoring AB Brown		SSOW#:								
Site:										
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastewat, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315 Ra226/PreSep_21 Standard Target List	9320 Ra226/PreSep_0 Standard Target List	Ra226Ra228_GFPc	Analysis Requested
BLIND DUPLICATE 1 (180-37535-10)	10/16/19	Eastern		Water	X	X	X	X	X	

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. I

**Possible Hazard Identification**  
Unconfirmed  
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Empty Kit Relinquished by: [Signature] Date: 10/21/19 17:00  
Relinquished by: [Signature] Date: 10/21/19 07:05  
Relinquished by: [Signature] Date: [ ]  
Custody Seals Intact: [ ]  
Custody Seal No.: [ ]

Special Instructions/QC Requirements: [ ] Return To Client [ ] Disposal By Lab [ ] Archive For [ ] Months

Method of Shipment: [ ]  
Received by: [Signature] Date/Time: 10/21/19 07:05 Company: TA572  
Received by: [Signature] Date/Time: [ ] Company: [ ]  
Received by: [Signature] Date/Time: [ ] Company: [ ]  
Cooler Temperature(s) °C and Other Remarks: [ ]

## Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-97535-1

**Login Number: 97535**

**List Source: Eurofins TestAmerica, Pittsburgh**

**List Number: 1**

**Creator: Watson, Debbie**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
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: 180-97535-1

**Login Number: 97535**  
**List Number: 2**  
**Creator: Harris, Lorin C**

**List Source: Eurofins TestAmerica, St. Louis**  
**List Creation: 10/22/19 01:50 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.	True	
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	
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").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh  
301 Alpha Drive  
RIDC Park  
Pittsburgh, PA 15238  
Tel: (412)963-7058

Laboratory Job ID: 180-97725-1

Client Project/Site: CCR Groundwater Monitoring AB Brown

**For:**

Vectren Corporation  
PO BOX 209  
Evansville, Indiana 47702

Attn: Accounts Payable



Authorized for release by:  
11/25/2019 10:03:57 AM

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



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Case Narrative . . . . .	3
Definitions/Glossary . . . . .	4
Certification Summary . . . . .	5
Sample Summary . . . . .	7
Method Summary . . . . .	8
Lab Chronicle . . . . .	9
Client Sample Results . . . . .	12
QC Sample Results . . . . .	17
QC Association Summary . . . . .	23
Chain of Custody . . . . .	25
Receipt Checklists . . . . .	29

# Case Narrative

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

Job ID: 180-97725-1

---

## Job ID: 180-97725-1

---

Laboratory: Eurofins TestAmerica, Pittsburgh

---

### Narrative

---

#### Job Narrative 180-97725-1

#### Receipt

The samples were received on 10/24/2019 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.9° C and 2.6° C.

#### Anions

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

#### Radiological 226/228

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-2I (180-97725-1), CCR-AP-2I (180-97725-1[DU]), CCR-AP-8 (180-97725-2), CCR-AP-9 (180-97725-3), FIELD BLANK 1 (180-97725-4), (LCS 160-448093/1-A) and (MB 160-448093/21-A)

Radium 226: The Method Blank (MB) exhibited a negative result greater in magnitude than the 3 sigma TPU. This occurrence was evaluated and determined to be random in nature. Sporadic occurrences such as this are statistically expected. No further action is required.

The following samples had matrix observations: CCR-AP-9 (180-97725-3). Sample 180-97725-A-3 had cloudy yellow discoloration.

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

#### Metals

Method 6020A: The laboratory control sample (LCS) for preparation batch 180-296514 and analytical batch 180-297217 recovered outside control limits for the following analytes: beryllium. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data has been reported.

Method 6020A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 180-296514 and analytical batch 180-297217 were outside control limits for calcium, iron, and potassium. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 6020A: The matrix spike / matrix spike duplicate / sample duplicate (MS/MSD/DUP) precision for preparation batch 180-296514 and analytical batch 180-297217 was outside control limits for iron. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision was within acceptance limits.

Method 6020A: The continuing calibration verification (CCV) associated with batch 180-297217 recovered above the upper control limit for Beryllium. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: CCR-AP-2I (180-97725-1), CCR-AP-2I (180-97725-1[MS]), CCR-AP-2I (180-97725-1[MSD]), CCR-AP-8 (180-97725-2), CCR-AP-9 (180-97725-3), FIELD BLANK 1 (180-97725-4), (LCS 180-296514/2-A), (180-97725-E-1-A PDS) and (180-97725-E-1-A SD ^5).

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

#### General Chemistry

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

Job ID: 180-97725-1

## 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
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### 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.
□	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

Job ID: 180-97725-1

## Laboratory: Eurofins TestAmerica, Pittsburgh

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
California	State	2891	04-30-20
Connecticut	State	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Georgia	State	PA 02-00416	04-30-20
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	03-31-20
Kentucky (UST)	State	162013	04-30-20
Kentucky (WW)	State	KY98043	12-31-19
Louisiana	NELAP	04041	06-30-20
Minnesota	NELAP	042-999-482	12-31-19
Nevada	State	PA00164	07-31-20
New Hampshire	NELAP	2030	04-04-20
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	04-01-20
North Carolina (WW/SW)	State	434	12-31-19
North Dakota	State	R-227	04-30-20
Oregon	NELAP	PA-2151	02-06-20
Pennsylvania	NELAP	02-00416	04-30-20
Rhode Island	State	LAO00362	12-30-19
South Carolina	State	89014	04-30-20
Texas	NELAP	T104704528	03-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-20
Virginia	NELAP	10043	09-15-20
West Virginia DEP	State	142	01-31-20
Wisconsin	State	998027800	08-31-20

# Accreditation/Certification Summary

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

Job ID: 180-97725-1

## Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-19
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	12-01-19

# Sample Summary

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

Job ID: 180-97725-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-97725-1	CCR-AP-2I	Water	10/21/19 12:45	10/24/19 09:00	
180-97725-2	CCR-AP-8	Water	10/21/19 15:05	10/24/19 09:00	
180-97725-3	CCR-AP-9	Water	10/21/19 14:20	10/24/19 09:00	
180-97725-4	FIELD BLANK 1	Water	10/21/19 15:00	10/24/19 09:00	

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

# Method Summary

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

Job ID: 180-97725-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	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
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 = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = Eurofins 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

Job ID: 180-97725-1

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

**Lab Sample ID: 180-97725-1**

**Date Collected: 10/21/19 12:45**

**Matrix: Water**

**Date Received: 10/24/19 09:00**

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: CHICS2000		1			297711	11/10/19 16:16	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		10			297711	11/10/19 16:31	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	296514	10/30/19 10:29	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			297217	11/05/19 17:28	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			297284	11/06/19 18:13	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	296109	10/25/19 11:38	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.51 mL	1.0 g	448093	10/28/19 17:48	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			451139	11/19/19 10:46	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.51 mL	1.0 g	448098	10/28/19 19:00	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			449486	11/07/19 08:54	AJD	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			451582	11/22/19 08:43	SMP	TAL SL

**Client Sample ID: CCR-AP-8**

**Lab Sample ID: 180-97725-2**

**Date Collected: 10/21/19 15:05**

**Matrix: Water**

**Date Received: 10/24/19 09:00**

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: CHICS2000		1			297711	11/10/19 17:45	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		10			297711	11/10/19 18:00	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	296514	10/30/19 10:29	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			297217	11/05/19 17:45	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			297284	11/06/19 18:19	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	296152	10/25/19 15:26	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.01 mL	1.0 g	448093	10/28/19 17:48	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			451139	11/19/19 10:46	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.01 mL	1.0 g	448098	10/28/19 19:00	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			449486	11/07/19 08:55	AJD	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			451582	11/22/19 08:43	SMP	TAL SL

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-97725-1

**Client Sample ID: CCR-AP-9**

**Lab Sample ID: 180-97725-3**

**Date Collected: 10/21/19 14:20**

**Matrix: Water**

**Date Received: 10/24/19 09:00**

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: CHICS2000		10			297711	11/10/19 18:15	MJH	TAL PIT
Total/NA	Analysis	EPA 9056A Instrument ID: CHICS2000		100			297711	11/10/19 18:30	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	296514	10/30/19 10:29	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			297217	11/05/19 17:48	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			297284	11/06/19 18:22	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	20 mL	100 mL	296152	10/25/19 15:26	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.34 mL	1.0 g	448093	10/28/19 17:48	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			451139	11/19/19 10:46	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.34 mL	1.0 g	448098	10/28/19 19:00	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			449486	11/07/19 08:55	AJD	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			451582	11/22/19 08:43	SMP	TAL SL

**Client Sample ID: FIELD BLANK 1**

**Lab Sample ID: 180-97725-4**

**Date Collected: 10/21/19 15:00**

**Matrix: Water**

**Date Received: 10/24/19 09:00**

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: CHICS2000		1			297711	11/10/19 18:45	MJH	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	296514	10/30/19 10:29	KEM	TAL PIT
Total Recoverable	Analysis	EPA 6020A Instrument ID: A		1			297217	11/05/19 17:52	RSK	TAL PIT
Total/NA	Analysis	EPA 9040C Instrument ID: NOEQUIP		1			297284	11/06/19 18:25	PM	TAL PIT
Total/NA	Analysis	SM 2540C Instrument ID: NOEQUIP		1	100 mL	100 mL	296152	10/25/19 15:26	AVS	TAL PIT
Total/NA	Prep	PrecSep-21			1000.68 mL	1.0 g	448093	10/28/19 17:48	ORM	TAL SL
Total/NA	Analysis	9315 Instrument ID: GFPCBLUE		1			451139	11/19/19 10:46	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.68 mL	1.0 g	448098	10/28/19 19:00	ORM	TAL SL
Total/NA	Analysis	9320 Instrument ID: GFPCPURPLE		1			449486	11/07/19 08:55	AJD	TAL SL
Total/NA	Analysis	Ra226_Ra228 Instrument ID: NOEQUIP		1			451582	11/22/19 08:43	SMP	TAL SL

Eurofins TestAmerica, Pittsburgh

# Lab Chronicle

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

Job ID: 180-97725-1

## Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058  
TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

## Analyst References:

Lab: TAL PIT

Batch Type: Prep

KEM = Kimberly Mahoney

Batch Type: Analysis

AVS = Abbey Smith

MJH = Matthew Hartman

PM = Paloma Hoelzle

RSK = Robert Kurtz

Lab: TAL SL

Batch Type: Prep

ORM = Octavia Moore

Batch Type: Analysis

AJD = Audra DeMariano

KLS = Kody Saulters

SMP = Siobhan Perry

1

2

3

4

5

6

7

8

9

10

11

12

13



# Client Sample Results

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

Job ID: 180-97725-1

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

**Lab Sample ID: 180-97725-1**

Date Collected: 10/21/19 12:45

Matrix: Water

Date Received: 10/24/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	97		10	3.2	mg/L			11/10/19 16:31	10
Fluoride	1.1		0.10	0.026	mg/L			11/10/19 16:16	1
Sulfate	7.6		1.0	0.38	mg/L			11/10/19 16:16	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00052	J	0.0020	0.00038	mg/L		10/30/19 10:29	11/05/19 17:28	1
Arsenic	0.0019		0.0010	0.00032	mg/L		10/30/19 10:29	11/05/19 17:28	1
Barium	0.10		0.010	0.0016	mg/L		10/30/19 10:29	11/05/19 17:28	1
Beryllium	0.00027	J ^	0.0010	0.00018	mg/L		10/30/19 10:29	11/05/19 17:28	1
Boron	2.2		0.080	0.039	mg/L		10/30/19 10:29	11/05/19 17:28	1
Cadmium	0.00023	J	0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:28	1
Calcium	13	F1	0.50	0.13	mg/L		10/30/19 10:29	11/05/19 17:28	1
Chromium	0.0027		0.0020	0.0015	mg/L		10/30/19 10:29	11/05/19 17:28	1
Cobalt	0.00040	J	0.00050	0.000075	mg/L		10/30/19 10:29	11/05/19 17:28	1
Lead	0.00047	J	0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:28	1
Lithium	23		5.0	3.4	ug/L		10/30/19 10:29	11/05/19 17:28	1
Molybdenum	0.0038	J	0.0050	0.00061	mg/L		10/30/19 10:29	11/05/19 17:28	1
Selenium	ND		0.0050	0.0015	mg/L		10/30/19 10:29	11/05/19 17:28	1
Thallium	0.00048	J	0.0010	0.00015	mg/L		10/30/19 10:29	11/05/19 17:28	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	710		10	10	mg/L			10/25/19 11:38	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.0	HF	0.1	0.1	SU			11/06/19 18:13	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.349		0.116	0.120	1.00	0.126	pCi/L	10/28/19 17:48	11/19/19 10:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.0		40 - 110					10/28/19 17:48	11/19/19 10:46	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.237	U	0.248	0.249	1.00	0.405	pCi/L	10/28/19 19:00	11/07/19 08:54	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.0		40 - 110					10/28/19 19:00	11/07/19 08:54	1
Y Carrier	85.2		40 - 110					10/28/19 19:00	11/07/19 08:54	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97725-1

## Client Sample ID: CCR-AP-2I

## Lab Sample ID: 180-97725-1

Date Collected: 10/21/19 12:45

Matrix: Water

Date Received: 10/24/19 09:00

### 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	0.587		0.274	0.276	5.00	0.405	pCi/L		11/22/19 08:43	1

## Client Sample ID: CCR-AP-8

## Lab Sample ID: 180-97725-2

Date Collected: 10/21/19 15:05

Matrix: Water

Date Received: 10/24/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	52		1.0	0.32	mg/L			11/10/19 17:45	1
Fluoride	0.30		0.10	0.026	mg/L			11/10/19 17:45	1
Sulfate	500		10	3.8	mg/L			11/10/19 18:00	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/30/19 10:29	11/05/19 17:45	1
Arsenic	0.0010		0.0010	0.00032	mg/L		10/30/19 10:29	11/05/19 17:45	1
Barium	0.10		0.010	0.0016	mg/L		10/30/19 10:29	11/05/19 17:45	1
Beryllium	0.00024	J ^	0.0010	0.00018	mg/L		10/30/19 10:29	11/05/19 17:45	1
Boron	0.20		0.080	0.039	mg/L		10/30/19 10:29	11/05/19 17:45	1
Cadmium	0.00015	J	0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:45	1
Calcium	190		0.50	0.13	mg/L		10/30/19 10:29	11/05/19 17:45	1
Chromium	0.0022		0.0020	0.0015	mg/L		10/30/19 10:29	11/05/19 17:45	1
Cobalt	0.0018		0.00050	0.000075	mg/L		10/30/19 10:29	11/05/19 17:45	1
Lead	0.00018	J	0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:45	1
Lithium	13		5.0	3.4	ug/L		10/30/19 10:29	11/05/19 17:45	1
Molybdenum	0.0010	J	0.0050	0.00061	mg/L		10/30/19 10:29	11/05/19 17:45	1
Selenium	ND		0.0050	0.0015	mg/L		10/30/19 10:29	11/05/19 17:45	1
Thallium	0.00029	J	0.0010	0.00015	mg/L		10/30/19 10:29	11/05/19 17:45	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1200		10	10	mg/L			10/25/19 15:26	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			11/06/19 18:19	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.104	U	0.0870	0.0875	1.00	0.133	pCi/L	10/28/19 17:48	11/19/19 10:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.1		40 - 110					10/28/19 17:48	11/19/19 10:46	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97725-1

**Client Sample ID: CCR-AP-8**

**Lab Sample ID: 180-97725-2**

Date Collected: 10/21/19 15:05

Matrix: Water

Date Received: 10/24/19 09:00

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.127	U	0.252	0.252	1.00	0.429	pCi/L	10/28/19 19:00	11/07/19 08:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.1		40 - 110					10/28/19 19:00	11/07/19 08:55	1
Y Carrier	82.6		40 - 110					10/28/19 19:00	11/07/19 08:55	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	0.231	U	0.267	0.267	5.00	0.429	pCi/L		11/22/19 08:43	1

**Client Sample ID: CCR-AP-9**

**Lab Sample ID: 180-97725-3**

Date Collected: 10/21/19 14:20

Matrix: Water

Date Received: 10/24/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	720		10	3.2	mg/L			11/10/19 18:15	10
Fluoride	0.52	J	1.0	0.26	mg/L			11/10/19 18:15	10
Sulfate	4800		100	38	mg/L			11/10/19 18:30	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/30/19 10:29	11/05/19 17:48	1
Arsenic	0.022		0.0010	0.00032	mg/L		10/30/19 10:29	11/05/19 17:48	1
Barium	0.088		0.010	0.0016	mg/L		10/30/19 10:29	11/05/19 17:48	1
Beryllium	ND	^	0.0010	0.00018	mg/L		10/30/19 10:29	11/05/19 17:48	1
Boron	7.9		0.080	0.039	mg/L		10/30/19 10:29	11/05/19 17:48	1
Cadmium	ND		0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:48	1
Calcium	440		0.50	0.13	mg/L		10/30/19 10:29	11/05/19 17:48	1
Chromium	0.0027		0.0020	0.0015	mg/L		10/30/19 10:29	11/05/19 17:48	1
Cobalt	0.00081		0.00050	0.000075	mg/L		10/30/19 10:29	11/05/19 17:48	1
Lead	0.00065	J	0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:48	1
Lithium	32		5.0	3.4	ug/L		10/30/19 10:29	11/05/19 17:48	1
Molybdenum	0.014		0.0050	0.00061	mg/L		10/30/19 10:29	11/05/19 17:48	1
Selenium	0.0015	J	0.0050	0.0015	mg/L		10/30/19 10:29	11/05/19 17:48	1
Thallium	0.00016	J	0.0010	0.00015	mg/L		10/30/19 10:29	11/05/19 17:48	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	6600		50	50	mg/L			10/25/19 15:26	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1	0.1	SU			11/06/19 18:22	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97725-1

**Client Sample ID: CCR-AP-9**

**Lab Sample ID: 180-97725-3**

Date Collected: 10/21/19 14:20

Matrix: Water

Date Received: 10/24/19 09:00

**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>0.260</b>		0.102	0.104	1.00	0.104	pCi/L	10/28/19 17:48	11/19/19 10:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.3		40 - 110					10/28/19 17:48	11/19/19 10:46	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>0.452</b>		0.291	0.294	1.00	0.447	pCi/L	10/28/19 19:00	11/07/19 08:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.3		40 - 110					10/28/19 19:00	11/07/19 08:55	1
Y Carrier	82.6		40 - 110					10/28/19 19:00	11/07/19 08:55	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>0.713</b>		0.308	0.312	5.00	0.447	pCi/L		11/22/19 08:43	1

**Client Sample ID: FIELD BLANK 1**

**Lab Sample ID: 180-97725-4**

Date Collected: 10/21/19 15:00

Matrix: Water

Date Received: 10/24/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			11/10/19 18:45	1
<b>Fluoride</b>	<b>0.041</b>	<b>J</b>	0.10	0.026	mg/L			11/10/19 18:45	1
Sulfate	ND		1.0	0.38	mg/L			11/10/19 18:45	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00038	mg/L		10/30/19 10:29	11/05/19 17:52	1
Arsenic	ND		0.0010	0.00032	mg/L		10/30/19 10:29	11/05/19 17:52	1
Barium	ND		0.010	0.0016	mg/L		10/30/19 10:29	11/05/19 17:52	1
Beryllium	ND	^	0.0010	0.00018	mg/L		10/30/19 10:29	11/05/19 17:52	1
<b>Boron</b>	<b>0.16</b>		0.080	0.039	mg/L		10/30/19 10:29	11/05/19 17:52	1
Cadmium	ND		0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:52	1
Calcium	ND		0.50	0.13	mg/L		10/30/19 10:29	11/05/19 17:52	1
<b>Chromium</b>	<b>0.0019</b>	<b>J</b>	0.0020	0.0015	mg/L		10/30/19 10:29	11/05/19 17:52	1
Cobalt	ND		0.00050	0.000075	mg/L		10/30/19 10:29	11/05/19 17:52	1
Lead	ND		0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:52	1
Lithium	ND		5.0	3.4	ug/L		10/30/19 10:29	11/05/19 17:52	1
Molybdenum	ND		0.0050	0.00061	mg/L		10/30/19 10:29	11/05/19 17:52	1
Selenium	ND		0.0050	0.0015	mg/L		10/30/19 10:29	11/05/19 17:52	1
Thallium	ND		0.0010	0.00015	mg/L		10/30/19 10:29	11/05/19 17:52	1

Eurofins TestAmerica, Pittsburgh

# Client Sample Results

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

Job ID: 180-97725-1

**Client Sample ID: FIELD BLANK 1**

**Lab Sample ID: 180-97725-4**

Date Collected: 10/21/19 15:00

Matrix: Water

Date Received: 10/24/19 09:00

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	15		10	10	mg/L			10/25/19 15:26	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.8	HF	0.1	0.1	SU			11/06/19 18:25	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0704	U	0.0337	0.0343	1.00	0.110	pCi/L	10/28/19 17:48	11/19/19 10:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.2		40 - 110					10/28/19 17:48	11/19/19 10:46	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.133	U	0.237	0.237	1.00	0.402	pCi/L	10/28/19 19:00	11/07/19 08:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.2		40 - 110					10/28/19 19:00	11/07/19 08:55	1
Y Carrier	84.9		40 - 110					10/28/19 19:00	11/07/19 08:55	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	0.0630	U	0.239	0.239	5.00	0.402	pCi/L		11/22/19 08:43	1

# QC Sample Results

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

Job ID: 180-97725-1

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

**Lab Sample ID: MB 180-297711/6**  
**Matrix: Water**  
**Analysis Batch: 297711**

**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	0.32	mg/L			11/10/19 12:14	1
Fluoride	ND		0.10	0.026	mg/L			11/10/19 12:14	1
Sulfate	ND		1.0	0.38	mg/L			11/10/19 12:14	1

**Lab Sample ID: LCS 180-297711/5**  
**Matrix: Water**  
**Analysis Batch: 297711**

**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	26.2		mg/L		105	80 - 120
Fluoride	1.25	1.21		mg/L		97	80 - 120
Sulfate	25.0	25.7		mg/L		103	80 - 120

**Lab Sample ID: 180-97725-1 MS**  
**Matrix: Water**  
**Analysis Batch: 297711**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	97		250	362		mg/L		106	80 - 120
Fluoride	1.2		12.5	13.7		mg/L		100	80 - 120
Sulfate	11		250	269		mg/L		103	80 - 120

**Lab Sample ID: 180-97725-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 297711**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	97		250	358		mg/L		104	80 - 120	1	15
Fluoride	1.2		12.5	13.6		mg/L		100	80 - 120	1	15
Sulfate	11		250	266		mg/L		102	80 - 120	1	15

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

**Lab Sample ID: MB 180-296514/1-A**  
**Matrix: Water**  
**Analysis Batch: 297217**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 296514**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		10/30/19 10:29	11/05/19 17:08	1
Barium	ND		0.010	0.0016	mg/L		10/30/19 10:29	11/05/19 17:08	1
Beryllium	ND	^	0.0010	0.00018	mg/L		10/30/19 10:29	11/05/19 17:08	1
Boron	ND		0.080	0.039	mg/L		10/30/19 10:29	11/05/19 17:08	1
Cadmium	ND		0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:08	1
Calcium	ND		0.50	0.13	mg/L		10/30/19 10:29	11/05/19 17:08	1
Chromium	ND		0.0020	0.0015	mg/L		10/30/19 10:29	11/05/19 17:08	1
Cobalt	ND		0.00050	0.000075	mg/L		10/30/19 10:29	11/05/19 17:08	1
Lead	ND		0.0010	0.00013	mg/L		10/30/19 10:29	11/05/19 17:08	1
Antimony	ND		0.0020	0.00038	mg/L		10/30/19 10:29	11/05/19 17:08	1
Molybdenum	ND		0.0050	0.00061	mg/L		10/30/19 10:29	11/05/19 17:08	1
Selenium	ND		0.0050	0.0015	mg/L		10/30/19 10:29	11/05/19 17:08	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-97725-1

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

**Lab Sample ID: MB 180-296514/1-A**  
**Matrix: Water**  
**Analysis Batch: 297217**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 296514**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		5.0	3.4	ug/L		10/30/19 10:29	11/05/19 17:08	1
Thallium	ND		0.0010	0.00015	mg/L		10/30/19 10:29	11/05/19 17:08	1

**Lab Sample ID: LCS 180-296514/2-A**  
**Matrix: Water**  
**Analysis Batch: 297217**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 296514**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.919		mg/L		92	80 - 120
Barium	1.00	1.06		mg/L		106	80 - 120
Beryllium	0.500	0.555	^	mg/L		111	80 - 120
Boron	1.25	1.21		mg/L		97	80 - 120
Cadmium	0.500	0.484		mg/L		97	80 - 120
Calcium	25.0	25.2		mg/L		101	80 - 120
Chromium	0.500	0.510		mg/L		102	80 - 120
Cobalt	0.500	0.464		mg/L		93	80 - 120
Lead	0.500	0.488		mg/L		98	80 - 120
Antimony	0.250	0.270		mg/L		108	80 - 120
Molybdenum	0.500	0.496		mg/L		99	80 - 120
Selenium	1.00	1.00		mg/L		100	80 - 120
Lithium	500	519		ug/L		104	80 - 120
Thallium	1.00	0.947		mg/L		95	80 - 120

**Lab Sample ID: 180-97725-1 MS**  
**Matrix: Water**  
**Analysis Batch: 297217**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total Recoverable**  
**Prep Batch: 296514**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0019		1.00	0.937		mg/L		93	75 - 125
Boron	2.2		1.25	3.19		mg/L		82	75 - 125
Barium	0.10		1.00	1.15		mg/L		105	75 - 125
Beryllium	0.00027	J ^	0.500	0.496	^	mg/L		99	75 - 125
Calcium	13	F1	25.0	31.8	F1	mg/L		74	75 - 125
Cadmium	0.00023	J	0.500	0.492		mg/L		98	75 - 125
Cobalt	0.00040	J	0.500	0.482		mg/L		96	75 - 125
Chromium	0.0027		0.500	0.509		mg/L		101	75 - 125
Molybdenum	0.0038	J	0.500	0.513		mg/L		102	75 - 125
Lead	0.00047	J	0.500	0.496		mg/L		99	75 - 125
Antimony	0.00052	J	0.250	0.266		mg/L		106	75 - 125
Selenium	ND		1.00	1.01		mg/L		101	75 - 125
Thallium	0.00048	J	1.00	0.963		mg/L		96	75 - 125
Lithium	23		500	507		ug/L		97	75 - 125

**Lab Sample ID: 180-97725-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 297217**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total Recoverable**  
**Prep Batch: 296514**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.0019		1.00	0.948		mg/L		95	75 - 125	1	20

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-97725-1

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

Lab Sample ID: 180-97725-1 MSD  
 Matrix: Water  
 Analysis Batch: 297217

Client Sample ID: CCR-AP-2I  
 Prep Type: Total Recoverable  
 Prep Batch: 296514

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	2.2		1.25	3.38		mg/L		97	75 - 125	6	20
Barium	0.10		1.00	1.16		mg/L		105	75 - 125	1	20
Beryllium	0.00027	J ^	0.500	0.506	^	mg/L		101	75 - 125	2	20
Calcium	13	F1	25.0	37.4		mg/L		96	75 - 125	16	20
Cadmium	0.00023	J	0.500	0.495		mg/L		99	75 - 125	1	20
Cobalt	0.00040	J	0.500	0.483		mg/L		96	75 - 125	0	20
Chromium	0.0027		0.500	0.516		mg/L		103	75 - 125	1	20
Molybdenum	0.0038	J	0.500	0.519		mg/L		103	75 - 125	1	20
Lead	0.00047	J	0.500	0.496		mg/L		99	75 - 125	0	20
Antimony	0.00052	J	0.250	0.271		mg/L		108	75 - 125	2	20
Selenium	ND		1.00	1.01		mg/L		101	75 - 125	0	20
Thallium	0.00048	J	1.00	0.984		mg/L		98	75 - 125	2	20
Lithium	23		500	521		ug/L		100	75 - 125	3	20

## Method: EPA 9040C - pH

Lab Sample ID: LCS 180-297284/1  
 Matrix: Water  
 Analysis Batch: 297284

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.1		SU		101	99 - 101

Lab Sample ID: 180-97725-1 DU  
 Matrix: Water  
 Analysis Batch: 297284

Client Sample ID: CCR-AP-2I  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	8.0	HF	8.0	HF	SU		0	2

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-296109/2  
 Matrix: Water  
 Analysis Batch: 296109

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			10/25/19 11:38	1

Lab Sample ID: LCS 180-296109/1  
 Matrix: Water  
 Analysis Batch: 296109

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	188	194		mg/L		103	80 - 120



# QC Sample Results

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

Job ID: 180-97725-1

## Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: 180-97725-1 DU  
 Matrix: Water  
 Analysis Batch: 296109

Client Sample ID: CCR-AP-2I  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	710		694		mg/L		2	10

Lab Sample ID: MB 180-296152/2  
 Matrix: Water  
 Analysis Batch: 296152

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			10/25/19 15:26	1

Lab Sample ID: LCS 180-296152/1  
 Matrix: Water  
 Analysis Batch: 296152

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	188	176		mg/L		94	80 - 120

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

Lab Sample ID: MB 160-448093/21-A  
 Matrix: Water  
 Analysis Batch: 451139

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 448093

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.08117	U	0.0364	0.0372	1.00	0.113	pCi/L	10/28/19 17:48	11/19/19 12:35	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	106		40 - 110		10/28/19 17:48	11/19/19 12:35	1			

Lab Sample ID: LCS 160-448093/1-A  
 Matrix: Water  
 Analysis Batch: 451329

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 448093

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	8.563		0.906	1.00	0.118	pCi/L	75	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	92.8		40 - 110						

Lab Sample ID: 180-97725-1 DU  
 Matrix: Water  
 Analysis Batch: 451139

Client Sample ID: CCR-AP-2I  
 Prep Type: Total/NA  
 Prep Batch: 448093

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-226	0.349		0.1965		0.0974	1.00	0.122	pCi/L	0.70	1

Eurofins TestAmerica, Pittsburgh

# QC Sample Results

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

Job ID: 180-97725-1

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

**Lab Sample ID: 180-97725-1 DU**  
**Matrix: Water**  
**Analysis Batch: 451139**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total/NA**  
**Prep Batch: 448093**

Carrier	<i>DU</i> %Yield	<i>DU</i> Qualifier	Limits
Ba Carrier	91.6		40 - 110

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

**Lab Sample ID: MB 160-448098/21-A**  
**Matrix: Water**  
**Analysis Batch: 449487**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 448098**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1447	U	0.239	0.239	1.00	0.402	pCi/L	10/28/19 19:00	11/07/19 08:58	1

Carrier	<i>MB</i> %Yield	<i>MB</i> Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110	10/28/19 19:00	11/07/19 08:58	1
Y Carrier	84.5		40 - 110	10/28/19 19:00	11/07/19 08:58	1

**Lab Sample ID: LCS 160-448098/1-A**  
**Matrix: Water**  
**Analysis Batch: 449486**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 448098**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.42	9.125		1.07	1.00	0.419	pCi/L	97	75 - 125

Carrier	<i>LCS</i> %Yield	<i>LCS</i> Qualifier	Limits
Ba Carrier	92.8		40 - 110
Y Carrier	85.2		40 - 110

**Lab Sample ID: 180-97725-1 DU**  
**Matrix: Water**  
**Analysis Batch: 449486**

**Client Sample ID: CCR-AP-21**  
**Prep Type: Total/NA**  
**Prep Batch: 448098**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-228	0.237	U	0.2882	U	0.264	1.00	0.424	pCi/L	0.1	1

Carrier	<i>DU</i> %Yield	<i>DU</i> Qualifier	Limits
Ba Carrier	91.6		40 - 110
Y Carrier	84.9		40 - 110

# QC Sample Results

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

Job ID: 180-97725-1

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

Lab Sample ID: 180-97725-1 DU  
 Matrix: Water  
 Analysis Batch: 451582

Client Sample ID: CCR-AP-2I  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Combined Radium 226 + 228	0.587		0.4847		0.281	5.00	0.424	pCi/L	0.18	

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

# QC Association Summary

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

Job ID: 180-97725-1

## HPLC/IC

### Analysis Batch: 297711

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97725-1	CCR-AP-2I	Total/NA	Water	EPA 9056A	
180-97725-1	CCR-AP-2I	Total/NA	Water	EPA 9056A	
180-97725-2	CCR-AP-8	Total/NA	Water	EPA 9056A	
180-97725-2	CCR-AP-8	Total/NA	Water	EPA 9056A	
180-97725-3	CCR-AP-9	Total/NA	Water	EPA 9056A	
180-97725-3	CCR-AP-9	Total/NA	Water	EPA 9056A	
180-97725-4	FIELD BLANK 1	Total/NA	Water	EPA 9056A	
MB 180-297711/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-297711/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-97725-1 MS	CCR-AP-2I	Total/NA	Water	EPA 9056A	
180-97725-1 MSD	CCR-AP-2I	Total/NA	Water	EPA 9056A	

## Metals

### Prep Batch: 296514

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97725-1	CCR-AP-2I	Total Recoverable	Water	3005A	
180-97725-2	CCR-AP-8	Total Recoverable	Water	3005A	
180-97725-3	CCR-AP-9	Total Recoverable	Water	3005A	
180-97725-4	FIELD BLANK 1	Total Recoverable	Water	3005A	
MB 180-296514/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-296514/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-97725-1 MS	CCR-AP-2I	Total Recoverable	Water	3005A	
180-97725-1 MSD	CCR-AP-2I	Total Recoverable	Water	3005A	

### Analysis Batch: 297217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97725-1	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	296514
180-97725-2	CCR-AP-8	Total Recoverable	Water	EPA 6020A	296514
180-97725-3	CCR-AP-9	Total Recoverable	Water	EPA 6020A	296514
180-97725-4	FIELD BLANK 1	Total Recoverable	Water	EPA 6020A	296514
MB 180-296514/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	296514
LCS 180-296514/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	296514
180-97725-1 MS	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	296514
180-97725-1 MSD	CCR-AP-2I	Total Recoverable	Water	EPA 6020A	296514

## General Chemistry

### Analysis Batch: 296109

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97725-1	CCR-AP-2I	Total/NA	Water	SM 2540C	
MB 180-296109/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-296109/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-97725-1 DU	CCR-AP-2I	Total/NA	Water	SM 2540C	

### Analysis Batch: 296152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97725-2	CCR-AP-8	Total/NA	Water	SM 2540C	
180-97725-3	CCR-AP-9	Total/NA	Water	SM 2540C	
180-97725-4	FIELD BLANK 1	Total/NA	Water	SM 2540C	
MB 180-296152/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-296152/1	Lab Control Sample	Total/NA	Water	SM 2540C	

Eurofins TestAmerica, Pittsburgh

# QC Association Summary

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

Job ID: 180-97725-1

## General Chemistry

### Analysis Batch: 297284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97725-1	CCR-AP-2I	Total/NA	Water	EPA 9040C	
180-97725-2	CCR-AP-8	Total/NA	Water	EPA 9040C	
180-97725-3	CCR-AP-9	Total/NA	Water	EPA 9040C	
180-97725-4	FIELD BLANK 1	Total/NA	Water	EPA 9040C	
LCS 180-297284/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-97725-1 DU	CCR-AP-2I	Total/NA	Water	EPA 9040C	

## Rad

### Prep Batch: 448093

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97725-1	CCR-AP-2I	Total/NA	Water	PrecSep-21	
180-97725-2	CCR-AP-8	Total/NA	Water	PrecSep-21	
180-97725-3	CCR-AP-9	Total/NA	Water	PrecSep-21	
180-97725-4	FIELD BLANK 1	Total/NA	Water	PrecSep-21	
MB 160-448093/21-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-448093/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
180-97725-1 DU	CCR-AP-2I	Total/NA	Water	PrecSep-21	

### Prep Batch: 448098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97725-1	CCR-AP-2I	Total/NA	Water	PrecSep_0	
180-97725-2	CCR-AP-8	Total/NA	Water	PrecSep_0	
180-97725-3	CCR-AP-9	Total/NA	Water	PrecSep_0	
180-97725-4	FIELD BLANK 1	Total/NA	Water	PrecSep_0	
MB 160-448098/21-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-448098/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
180-97725-1 DU	CCR-AP-2I	Total/NA	Water	PrecSep_0	

### Chain of Custody Record

<b>Client Information</b> Client Contact: Angela Casbon Scheller Company: Vectren Corporation Address: PO BOX 209 City: Evansville State, Zip: IN, 47702 Phone: 864-214-8750(Tel) Email: acscheller@vectren.com Project Name: CCR Groundwater Monitoring - AB Brown Site: <b>AB Brown</b>		Lab PM: Bortol, Veronica E-Mail: veronica.bortol@testamericainc.com Carrier Tracking No(s): Lab No: 180-49738-8017.1 Page: Page 1 of 1 Job #:	
Due Date Requested: TAT Requested (days): <b>Standard</b> PO #: Purchase Order Requested WO #: Project #: 18016014 SOW#:		<b>Analysis Requested</b> Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> 9315_Ra226_9320_Ra228 <input checked="" type="checkbox"/> 9040C_9056A_ORGFM_28D <input checked="" type="checkbox"/> 6020A_7470A <input checked="" type="checkbox"/> 2540C_Calcd - TDS <input checked="" type="checkbox"/>	
<b>Sample Identification</b> CCR-AP-2-I CCR-AP-8 CCR-AP-9 MSMSD 2 Field Blank 1		Total Number of Containers: <input checked="" type="checkbox"/>	
Sample Date: 10/21/19 Sample Time: 1245 Sample Type (C=Comp, G=grab): <b>G</b> Matrix (W=Water, S=Solid, O=Water/Oil, BT=Tissue, A=Air): <b>Water</b>		Special Instructions/Note: Appendix III & Appendix IV Do not Report Mercury	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input checked="" type="checkbox"/> Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if so) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months 180-97725 Chain of Custody	
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: <b>Jacob Winsett</b> Relinquished by: <b>Jacob Winsett</b> Relinquished by:		Date/Time: 10/23/19 1900 Date/Time: Date/Time:	
Custody Seals Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>		Cooler Temperature(s) °C and Other Remarks:	



ORIGIN ID:EVVA (812) 477-1176  
BRIAN KLEEMAN  
1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

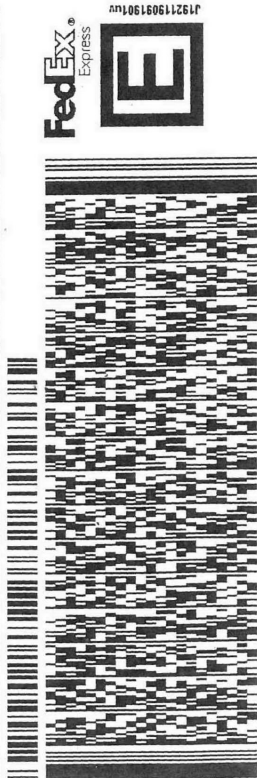
SHIP DATE: 23OCT19  
ACTWGT: 48.00 LB  
CAD: 106997842/NET14160  
DIMS: 24x16x15 IN  
BILL SENDER

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

PITTSBURGH PA 15238

(412) 963-7058 REF: PN: 170LF00739  
INV/PN: 170LF00739  
PO: PN: 170LF00739 DEPT:

567J32A3C05A2



THU - 24 OCT 3:00P

STANDARD OVERNIGHT

2 of 2

MPS# 7767 9991 8509

0263 Mstr# 7767 9991 8174

0201

15238  
PIT

PA-US

NA AGCA



Uncorrected temp

Thermometer ID

CF 0 Initials B

PT-WI-SR-001 effective 11/8/18

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.



180-97725 Waybill

ORIGIN ID:EVVA (812) 477-1176  
BRIAN KLEEMAN  
1149 WEDEKING AVENUE  
BUILDING D, SUITE 2  
EVANSVILLE, IN 47715  
UNITED STATES US

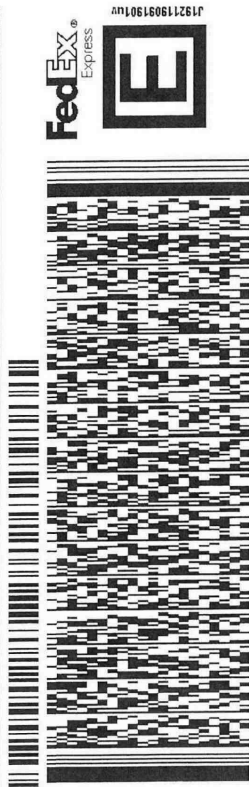
SHIP DATE: 23OCT19  
ACTWGT: 48.00 LB  
CAD: 106997842/NET14160  
DIMS: 24x16x15 IN  
BILL SENDER

TO VERONICA BORTOT  
TESTAMERICA  
301 ALPHA DRIVE

PITTSBURGH PA 15238

(412) 963-7058 REF:PN:170LF00739  
INV:PN:170LF00739  
PO:PN:170LF00739 DEPT:

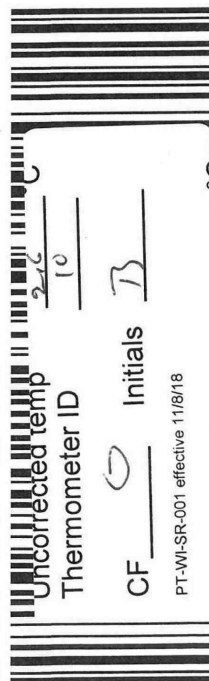
567J3/2A3C/05A2



THU - 24 OCT 3:00P  
STANDARD OVERNIGHT

1 of 2  
TRK# 7767 9991 8174  
0201  
## MASTER ##

NA AGCA 15238  
PA-US PIT



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 incidental, consequential, or special is limited to the greater of \$100 or the 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.





**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b> Client Contact: Bortot, Veronica Shipping/Receiving: veronica.bortot@testamericainc.com Company: TestAmerica Laboratories, Inc. Address: 13715 Rider Trail North, Earth City, MO, 63045 Phone: 314-298-8566(Tel) 314-298-8757(Fax) Email: [Blank] Project Name: CCR Groundwater Monitoring Site: [Blank]		Lab PM: Bortot, Veronica E-Mail: [Blank]		Carrier Tracking No(s): 180-377159-1 State of Origin: Indiana Job #: 180-97725-1	
Due Date Requested: 11/5/2019 TAT Requested (days): [Blank]		Accreditations Required (See note): [Blank]		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 Z - other (specify)	
PO #: [Blank] WO #: [Blank]		Field Filtered Sample (Yes or No)		Analysis Requested	
Project #: 18016014 SSOW#: [Blank]		Perform MS/MSD (Yes or No)		Total Number of Containers	
Sample Date		Sample Time		Sample Type (C=comp, G=grab)	
Sample Date Requested: 10/21/19		Sample Time: 12:45 Eastern		Matrix (W=water, S=solid, O=water/soil, BT=Tissue, A=Air)	
Sample Identification - Client ID (Lab ID)		Preservation Code:		Special Instructions/Note:	
CCR-AP-21 (180-97725-1)	10/21/19	12:45 Eastern	Water	X	2
CCR-AP-21 (180-97725-1DU)	10/21/19	12:45 Eastern	Water	X	4
CCR-AP-8 (180-97725-2)	10/21/19	15:05 Eastern	Water	X	2
CCR-AP-9 (180-97725-3)	10/21/19	14:20 Eastern	Water	X	2
FIELD BLANK 1 (180-97725-4)	10/21/19	15:00 Eastern	Water	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/test/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: [Signature]  
 Relinquished by: [Signature]  
 Relinquished by: [Signature]  
 Custody Seals Intact:  Yes  No  
 Cooler Temperature(s) °C and Other Remarks: [Blank]

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: [Blank]

Method of Shipment: [Blank]  
 Date/Time: 10/25/19 17:00  
 Date/Time: 10/26/19 08:30  
 Date/Time: [Blank]  
 Date/Time: [Blank]  
 Company: [Blank]  
 Company: [Blank]  
 Company: [Blank]



## Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-97725-1

**Login Number: 97725**

**List Source: Eurofins TestAmerica, Pittsburgh**

**List Number: 1**

**Creator: Watson, Debbie**

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: 180-97725-1

**Login Number: 97725**  
**List Number: 2**  
**Creator: Harris, Lorin C**

**List Source: Eurofins TestAmerica, St. Louis**  
**List Creation: 10/26/19 12:16 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.	True	
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	
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").	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

14 January 2019  
File No. 129420

TO: Southern Indiana Gas and Electric Company

FROM: Haley & Aldrich, Inc.  
Steven F. Putrich, P.E., Project Principal  
Mark Miesfeldt, P.G., Lead Hydrogeologist

SUBJECT: Summary of 2018 Appendix IV Groundwater Monitoring  
Results Pursuant to 40 CFR § 257.93 and 40 CFR § 257.95  
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 near the community of West Franklin, Indiana. SIGECO provided Haley & Aldrich, Inc. with groundwater monitoring data collected from a groundwater monitoring system that meets the requirements of 40 CFR §257.91 and 40 CFR §257.93. This memorandum documents the results of statistical tests conducted to determine if Appendix IV groundwater monitoring constituents detected in downgradient wells are at levels that exhibit a statistically significant level (SSL) above groundwater protection standards consistent with the requirements in 40 CFR § 257.95.

Collection dates of groundwater samples from the CCR Unit from June 2018 through August 2018. The data satisfy the CCR Rule requirement of collecting 2 rounds of hydrological and groundwater quality data from the groundwater monitoring network. The groundwater protection standards (GWPS) and, if necessary, the confidence interval method statistical analysis were used to evaluate SSLs as specified in the certification statement of January 14, 2019.

GWPS, pursuant to 40 CFR § 257.95(d)(2) and in accordance with Phase I, Part 1 CCR Rule Revisions dated 17 July 2018, effective 16 August 2018, were generated for each Appendix IV constituent detected during assessment monitoring. The GWPS was set at the maximum contaminant level (MCL) or risk screening level (RSL) or set at the background concentration for each analyte based on a tolerance limit procedure. Analytical results from downgradient wells were compared to each respective GWPS. If a constituent is greater than the GWPS for that Unit, pursuant to 40 CFR § 257.93 (f)(5), the confidence interval method was used to evaluate if that Appendix IV constituent was present at a statistically significant level (SSL).

Based on the comparisons outlined above indicated the following SSLs:

**Ash Pond:** Molybdenum and lithium from one or more downgradient sample(s) indicated a statistically significant level.

**Landfill:** Lithium, cobalt and arsenic from one or more downgradient sample(s) indicated a statistically significant level.

**Sedimentation Pond:** Downgradient monitoring wells did not exhibit SSLs for Appendix IV constituents.







Location Id	Frequency of Detection	Percent Non-Detects	Range of Non-Detect	Mean	50th Percentile (Median)	95th Percentile	Maximum Detect	Variance	Standard Deviation	Coefficient of Variance	CCR MCL/RSL	Report Result Unit	Detection Exceedances (Y/N)	Number of Detection Exceedances	Outlier Detected	Outlier Removed	Trend	Distribution Group*	Inter-well Analysis					Groundwater Protection Standard (Higher of MCL/RSL or Upper Tolerance Limit)	Exceedance above GWPS at Individual Well	SSL		
																			June 2018 Concentrations (mg/L)	Detect?	Upper Tolerance Limit	Upper Tolerance Limit (ug/L)	Lower Confidence Level (LCL)				SSI (Exceedance above Background at Individual Well)	
Appendix-IV: Thallium, Total (µg/L)																												
CCR-BK-1	1/10	90%	1-1	0.904	1	1	0.038	0.09254	0.3042	0.3366	2	µg/L	N	0	N	N	Stable	Non-parametric	Non-parametric			0.001	1			0.002		
CCR-BK-2	1/10	90%	1-1	0.906	1	1	0.059	0.08855	0.2976	0.3285	2	µg/L	N	0	N	N	Stable	Non-parametric	Non-parametric			0.001	1			0.002		
CCR-AP-1R	3/10	70%	1-1	0.724	1	1	0.13	0.1975	0.4445	0.6136	2	µg/L	N	0	N	N	Stable	Non-parametric	Non-parametric	0.001	N						N	No
CCR-AP-2R	2/10	80%	1-10	1.72	1	5.95	0.15	8.608	2.934	1.707	2	µg/L	N	0	Y	N	Stable	Non-parametric	Non-parametric	0.001	N						N	No
CCR-AP-3R	1/10	90%	1-10	1.81	1	5.95	0.14	8.346	2.889	1.593	2	µg/L	N	0	Y	N	Stable	Non-parametric	Non-parametric	0.001	N						N	No
CCR-AP-4R	2/10	80%	1-1	0.824	1	1	0.22	0.1397	0.3738	0.4536	2	µg/L	N	0	N	N	Stable	Non-parametric	Non-parametric	0.001	N						N	No
CCR-AP-5R	1/10	90%	1-10	1.81	1	5.95	0.076	8.37	2.893	1.601	2	µg/L	N	0	Y	N	Stable	Non-parametric	Non-parametric	0.001	N						N	No
CCR-AP-6	4/10	60%	1-1	0.638	1	1	0.18	0.2202	0.4692	0.7359	2	µg/L	N	0	N	N	Stable	Non-parametric	Non-parametric	0.001	N						N	No
CCR-AP-7R	1/10	90%	1-1	0.905	1	1	0.054	0.08949	0.2992	0.3304	2	µg/L	N	0	N	N	Stable	Non-parametric	Non-parametric	0.001	N						N	No

N/A - Not available      NT- Not tested

\* - Determined using the Shapiro-Wilks statistical test at a 1% significance level and a residual probability plot.







HALEY & ALDRICH, INC.  
400 Augusta Street  
Suite 130  
Greenville, SC 29601  
864.214.8750

21 November 2019

File No. 129420

TO: Southern Indiana Gas and Electric Company (SIGECO)

FROM: Haley & Aldrich, Inc.  
[Steven F. Putrich, P.E., Project Principal  
Mark Miesfeldt, P.G., Lead Hydrogeologist]

SUBJECT: Notification of Statistically Significant Levels of Appendix IV Constituents  
Pursuant to 40 CFR§ 257.95(g) and 40 CFR § 257.105(h)(8)  
A.B. Brown Generating Station - Ash Pond - West Franklin, Indiana

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, in Posey County near West Franklin, Indiana. Detection monitoring events occurred in 2016 and 2017. The results of the sampling events were compared to background using appropriate statistical methods to determine if Appendix III constituents were present at concentrations above background. The result of the statistical analysis identified a statistically significant increase (SSI) downgradient of the Ash Pond thereby triggering Assessment Monitoring and respective notification of the same.

During the Assessment Monitoring phase, groundwater samples were collected from the coal combustion residuals (CCR) monitoring well network. Samples were collected in June, and August 2018 and subsequently analyzed for the Appendix III and Appendix IV constituents as required by 40 CFR §257.95(b) and 40 CFR §257.95(d)(1). Concurrent with the second assessment sampling round, and as required by 40 CFR §257.95(h), groundwater protection standards (GWPS) were established for the detected Appendix IV constituents. The assessment monitoring sampling results were compared to the GWPS to determine if statistically significant levels (SSLs) of Appendix IV constituents were present downgradient of the Ash Pond. The results of this evaluation indicated that lithium and molybdenum were present in groundwater at SSLs above the GWPS.

As a result of this determination, and in accordance with 40 CFR §257.95(g)(3), a field investigation was initiated to demonstrate that a source other than the Ash Pond caused the lithium and molybdenum contamination. The field investigation included sampling and analysis of naturally occurring coal identified near monitoring well CCR-AP-2R as an alternative source of molybdenum and lithium and surface water sampling from the Coal Pile Runoff Pond and lower pool of the Ash Pond to evaluate the effluent from the coal pile runoff as an alternate source of the Appendix IV SSLs detected at CCR-AP-3R. While this investigation showed that the naturally occurring coal and the coal pile runoff were contributing sources, they did not contribute lithium and molybdenum at levels that resulted in a determination of an alternative source. Consequently, both lithium and molybdenum were carried forward into the assessment of corrective measures.

As required by 40 CFR § 257.95(b) and 40 CFR § 257.95(d)(1), semiannual groundwater sampling and analysis continued for the Ash Pond. The first round of semiannual groundwater sampling was conducted in May 2019 but due to laboratory turn-around issues associated with the radium analyses this sampling round was not completed until the end of August 2019.

For the Ash Pond, which continued in Assessment Monitoring in 2019, a statistical analysis of the August 2019 analytical results was conducted, and downgradient wells were compared to each respective GWPS. If the detected constituent was greater than the GWPS for that Unit, pursuant to 40 CFR § 257.93 (f)(5), the confidence interval method was used to evaluate if that Appendix IV constituent was present at a SSL. Based on the comparisons outlined above, the results of the statistical analyses conducted for those detected Appendix IV constituents confirm that molybdenum and lithium are present at statistically significant levels above GWPSs in one or more wells downgradient of the Ash Pond.

Y:\grn\_common\129420 Vectren\Deliverables\AB\_Brown\SSL Notification\November 2019\2019 1213\_SSL\_notification\_Ash Pond\_F.docx





A.B. Brown Generating Station

Ash Pond

Assessment Monitoring Statistical Analysis Summary

Prepared: November 21, 2019

CCR-AP-7	2/12	83%	0.005-0.05	0.00806	0.005	0.02525	0.00099	0.000177	0.01331	1.651	0.05	mg/L	N	0	1	Y	N	NA		Non-parametric	0.05			N	No	
<b>CCR Appendix-IV: Thallium, Total (mg/L)</b>																										
CCR-BK-1	1/11	91%	0.001-0.001	0.000913	0.001	0.001	0.00038	8.413E-08	0.0002901	0.3179	0.002	mg/L	N	0	0	N	N	NA		Non-parametric						
CCR-BK-2	1/11	91%	0.001-0.001	0.000914	0.001	0.001	0.00059	8.05E-08	0.0002837	0.3103	0.002	mg/L	N	0	0	N	N	NA		Non-parametric			0.001	0.002		
CCR-AP-1	3/11	73%	0.001-0.001	0.000749	0.001	0.001	0.00013	1.847E-07	0.0004298	0.5735	0.002	mg/L	N	0	0	N	N	Stable		Non-parametric	0.001				N	No
CCR-AP-2	2/11	82%	0.001-0.01	0.00165	0.001	0.0055	0.00015	0.000007794	0.002792	1.688	0.002	mg/L	N	0	1	Y	N	NA		Non-parametric	0.001				N	No
CCR-AP-3	1/11	91%	0.001-0.01	0.00256	0.001	0.01	0.00014	0.0000136	0.003688	1.442	0.002	mg/L	N	0	2	Y	N	NA		Non-parametric	0.01				Y	No
CCR-AP-4	2/11	82%	0.001-0.001	0.00084	0.001	0.001	0.00022	1.286E-07	0.0003585	0.4268	0.002	mg/L	N	0	0	Y	N	NA		Non-parametric	0.001				N	No
CCR-AP-5	1/11	91%	0.001-0.01	0.00255	0.001	0.01	0.000076	0.00001363	0.003693	1.447	0.002	mg/L	N	0	2	Y	N	NA		Non-parametric	0.01				Y	No
CCR-AP-6	4/11	64%	0.001-0.01	0.00149	0.001	0.0055	0.00018	0.000008167	0.002858	1.92	0.002	mg/L	N	0	1	Y	N	Stable		Non-parametric	0.01				Y	No
CCR-AP-7	1/11	91%	0.001-0.01	0.00173	0.001	0.0055	0.000054	0.0000076	0.002757	1.592	0.002	mg/L	N	0	1	Y	N	NA		Non-parametric	0.01				Y	No