

# Fifth Annual Groundwater Monitoring and Corrective Action Report

Richmond Power and Light  
Whitewater Valley Station Impoundment  
Richmond, Indiana

GAI Project Number: C151119.25, Task 004  
December 2023



Prepared by: GAI Consultants, Inc.  
Pittsburgh Office  
385 East Waterfront Drive  
Homestead, Pennsylvania 15120-5005

Prepared for: Richmond Power and Light  
2000 US Highway 27 South  
Richmond, Indiana 47374-7436

# Fifth Annual Groundwater Monitoring and Corrective Action Report

Richmond Power and Light  
Whitewater Valley Station Impoundment  
Richmond, Indiana

GAI Project Number: C151119.25, Task 004

December 2023

Prepared for:  
Richmond Power and Light  
2000 US Highway 27 South  
Richmond, Indiana 47374-7436

Prepared by:  
GAI Consultants, Inc.  
Pittsburgh Office  
385 E. Waterfront Drive  
Homestead, Pennsylvania 15120-5005

Report Authors:

---

A. Edward Sciulli, PG, PMP  
Senior Hydrology Manager

---

John R. Klamut, PE  
Senior Project Manager

# Table of Contents

1.0 Introduction..... 1

2.0 Impoundment..... 2

    2.1 Groundwater Monitoring Network ..... 2

    2.2 Data Collection ..... 3

    2.3 Monitoring Program Transitions ..... 3

    2.4 Corrective Actions ..... 3

    2.5 2023-2024 Projected Activities ..... 4

Table 1 Groundwater Analytical Assessment Monitoring Data - CCR Appendix III Constituents

Table 2 Groundwater Analytical Assessment Monitoring Data - CCR Appendix IV Constituents

Table 3 Groundwater Protection Standards Development

Table 4 Groundwater Protection Standard and Lower Confidence Level Comparison

Figure 1 Site Location Map

Figure 2 Groundwater Monitoring System Location Map

Figure 3 Potentiometric Surface Map-Soil 4/3/2023

## 1.0 Introduction

Title 40 Code of Federal Regulations (CFR) §257.90 mandates that existing Coal Combustion Residual (CCR) landfills and surface impoundments, also known as CCR units, be subject to groundwater monitoring and corrective action requirements as further detailed in §257.90 through §257.98. These requirements are part of the overall CCR Rule (Rule) which was published in the Federal Register on April 17, 2015 and which became effective on October 19, 2015. Specific obligations for Owners and Operators of existing CCR units regarding the preparation of “Annual Groundwater Monitoring and Corrective Action Reports (Annual Report)” are outlined in §257.90(e)(1-5). The Richmond Power and Light (RPL) inactive surface impoundment (Impoundment) was initially addressed under Section §257.100, which allowed for an exemption from many of the Rule requirements and compliance deadlines.

The Rule was amended on August 5, 2016 and the amendment became effective on October 4, 2016. Section §257.100 was amended by removing the exemptions for inactive CCR surface impoundments. The amendment changed the status of inactive CCR impoundments such that they were treated as other CCR units. They were therefore given an extension of the compliance deadlines of 547 days. As a result, the first Annual Report for the Impoundment was placed within the facility’s operating record in August 2019. The second, third, and fourth Annual Reports were placed within the facility’s operating record in July 2020, August 2021, and August 2022, respectively.

The Annual Report must provide information to address the following aspects for the preceding calendar year:

- ▶ document the status of the groundwater monitoring and corrective action program for the respective CCR units;
- ▶ summarize key actions completed;
- ▶ describe any problems encountered and actions taken to resolve the problems; and
- ▶ offer a projection of key activities for the upcoming year.

At a minimum, the Annual Report must contain the following information to the extent applicable and available:

- ▶ a map, aerial image, or diagram showing the CCR unit and all background/upgradient and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program;
- ▶ identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;
- ▶ in addition to all the monitoring data obtained under §257.90 through §257.98, a summary including the number of groundwater samples that were collected for analysis for each background/upgradient and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring (DM) or assessment monitoring (AM) programs;
- ▶ a narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from DM to AM in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and
- ▶ any other information required to be included as specified in §257.90 through §257.98.

The RPL Whitewater Valley Station (Station), is a coal-fired power plant located in Richmond, Wayne County, Indiana (see Figure 1). The Rule applies to this facility because the Station is in operation and has an inactive CCR Surface Impoundment. The CCR unit has a dedicated groundwater monitoring system that was originally installed to comply with Indiana Department of Environmental Management (IDEM) recommendations and was subsequently evaluated and modified (as needed) for use under the CCR program.

In summary, this fifth Annual Report has been prepared to comply with the requirements of §257.90(e), addressing the Whitewater Valley Station's CCR Unit with respect to the groundwater monitoring and corrective actions undertaken from July 2022 through July 2023. This fifth Annual Report and all subsequent reports thereto will be placed in the Station's operating record per §257.105(h)(1), noticed to the State Director per §257.106(h)(1), and posted to the publicly accessible internet site per §257.107(h)(1).

## 2.0 Impoundment

### 2.1 Groundwater Monitoring Network

The CCR groundwater monitoring system for the Impoundment is a subset of the larger site groundwater monitoring system established during original interactions with IDEM regarding the groundwater characterization and monitoring for the site. That larger site system, which is shown on Figure 2, is composed of:

- eight monitoring well (MW) pairs (shallow and deep wells designated as S and D) at locations A through H;
  - ▶ there is a third well at location G, a shallow well designated as MW-GSR, which was installed in place of MW-GS (which was found to have insufficient water for monitoring purposes).
  - ▶ it was determined during the characterization that the deep wells in each well pair would only be used as piezometers.
- seven single, shallow monitoring wells at locations IS through OS;
- two older, shallow wells designated as MW-1 and MW-2 (used only as piezometers);
- nine staff gauges and/or piezometers associated with the groundwater MWs:
  - ▶ five staff gauges (A-1, A-2, A-3, A-4, and P-4) to monitor pond levels; and
  - ▶ four piezometers (PZ-1703, PZ-1704, PZ-1705, and PZ-1706).

Piezometers PZ-1701 and PZ-1702 have been abandoned.

The monitoring wells at locations A through H were installed in 2016. The monitoring wells at locations IS and JS were installed in March 2018. The monitoring wells at locations KS through OS were installed in July 2020.

The CCR groundwater monitoring system is comprised of six wells within the larger site groundwater monitoring system, including one upgradient well (MW-AS) and four downgradient wells (MW-BS, MW-CS, MW-DS, and MW-JS). Note that MW-FS and MW-GSR were previously used as background wells but have since been discontinued as background wells based off IDEM's comments that background wells should be unaffected by facility operations. The screened intervals of the wells monitor the uppermost aquifer on site, a soil aquifer composed of a continuous confined, sand or sand and gravel layer located within or at the base of the glacial till which blankets the site. Figure 3 shows a potentiometric map of the uppermost aquifer based upon water level readings taken during the last round of AM samples in April 2023.

Off-site downgradient monitoring wells (KS, LS, MS, NS, and OS) were installed as part of ongoing groundwater characterization to delineate the extent of the identified release from the CCR unit.

## 2.2 Data Collection

Per the requirements of §257.95, AM sampling began in September 2019. A summary of each AM sampling event and the parameters analyzed is provided below. The results from all nine AM samplings for the Appendix III and Appendix IV parameters are summarized in the attached Tables 1 and 2, respectively.

| Sample Event     | Sample Date    | Parameters analyzed <sup>1</sup>            |
|------------------|----------------|---|
| AM1              | September 2019 | App III and App IV                          |
| AM2              | December 2019  | App III and select App IV (detected in AM1) |
| AM3              | March 2020     | App III and select App IV (detected in AM2) |
| AM4              | September 2020 | App III and App IV                          |
| AM5              | March 2021     | App III and select App IV (detected in AM4) |
| AM6              | September 2021 | App III and select App IV (detected in AM5) |
| AM7 <sup>3</sup> | March 2022     | App III and App IV                          |
| AM8              | September 2022 | App III and App IV                          |
| AM9              | April 2023     | App III and App IV                          |

1. App III and App IV – all CCR Rule Appendix III and Appendix IV parameters were analyzed.
2. Select App IV – CCR Rule Appendix IV parameters that were detected during the previous AM sampling.
3. Due to uncharacteristically high radium-226, radium-228, and total radium results at wells MW-ES, MW-KS, MW-LS, MW-MS, and MW-OS, resamples were collected in June 2022 for those parameters.

Groundwater Protection Standards (GPSs) were determined for the Appendix IV parameters for samples collected in September 2022 and April 2023 and are summarized in Table 3. During the December 2022 and July 2023 reviews of the eighth and ninth AM sampling events, Lower Confidence Limits (LCLs) were determined. The LCLs were compared to the GPSs and assessment monitoring results, as shown in Table 4. It was determined that there were statistically significant levels (SSLs) of total lithium in downgradient wells MW-BS, MW-CS, and MW-DS; and total molybdenum in downgradient monitoring well MW-BS.

## 2.3 Monitoring Program Transitions

The Impoundment has been transitioned into the Assessment of Corrective Measures (ACMs), based upon the May 2020 review of the March 2020 AM sampling results.

## 2.4 Corrective Actions

Completed ACM 2022-2023 activities included the following:

- Semi-Annual Progress Reports describing the progress in selecting and designing a remedy based on the ACM were placed into the operating record in November 2022 and July 2023, as required by §257.97(a).

- Site investigations occurred in December 2021. Investigations consisted of drilling borings along the perimeter of the impoundment and through the interior to determine parameters such as depth and extent of CCR material, depth and extent of clay material, and permeability of material underlying the CCR.
- Submission of an Impoundment Closure Plan to IDEM.

## **2.5 2023-2024 Projected Activities**

Projected key activities for the upcoming year include the following:

- Semi-Annual Progress Reports detailing progress in selecting and designing corrective measure(s).
- Submission of a Final Selection Report detailing the selected corrective measure remedy.
- Semi-annual groundwater sampling events to be initiated in September 2023 and March 2024.

## TABLES



**Table 1**  
**Groundwater Analytical Assessment Monitoring Data - CCR Appendix III Constituents**

| Well  | Parameter: |                     | Boron, Total | Calcium, Total | Chloride | Fluoride            | pH   | Sulfate | Total Dissolved Solids |
|-------|------------|---------------------|--------------|----------------|----------|---------------------|------|---------|------------------------|
|       | Date       | Unit <sup>1</sup> : | mg/L         | mg/L           | mg/L     | mg/L                | s.u. | mg/L    | mg/L                   |
| MW-AS | 9/16/2019  |                     | 0.206        | 93.9           | 112      | 0.12                | 7.3  | 78.4    | 568                    |
|       | 12/3/2019  |                     | 0.213        | 95.9           | 116      | 0.13                | 7.4  | 71.2    | 548                    |
|       | 3/17/2020  |                     | 0.199        | 91.2           | 113      | 0.1                 | 7.7  | 77.3    | 522                    |
|       | 9/16/2020  |                     | 0.186        | 101            | 148      | 0.1                 | 7.6  | 72      | 602                    |
|       | 3/16/2021  |                     | 0.195        | 103            | 138      | 0.1                 | 7.4  | 82.6    | 624                    |
|       | 9/8/2021   |                     | 0.202        | 105            | 145      | 0.13                | 7.2  | 83.9    | 629                    |
|       | 3/15/2022  |                     | 0.239        | 118            | 142      | < 0.10 <sup>2</sup> | 7.5  | 87.8    | 654                    |
|       | 9/27/2022  |                     | 0.254        | 110            | 187      | 0.12                | 7.4  | 78.1    | 664                    |
|       | 4/4/2023   |                     | 0.201        | 111            | 172      | < 0.10              | 7.4  | 78.6    | 606                    |
| MW-BS | 9/16/2019  |                     | 4.4          | 400            | 224      | 0.25                | 7.4  | 1,300   | 2,430                  |
|       | 12/3/2019  |                     | 4.12         | 393            | 191      | 0.23                | 7.4  | 1,180   | 2,280                  |
|       | 3/18/2020  |                     | 4.38         | 371            | 212      | 0.27                | 7.7  | 1,210   | 2,180                  |
|       | 9/16/2020  |                     | 4            | 356            | 197      | 0.23                | 7.6  | 1,200   | 2,120                  |
|       | 3/16/2021  |                     | 4.01         | 333            | 188      | 0.24                | 7.5  | 1,140   | 2,150                  |
|       | 9/8/2021   |                     | 4.11         | 365            | 188      | 0.25                | 7.4  | 1,030   | 2,060                  |
|       | 3/16/2022  |                     | 4.35         | 345            | 162      | 0.23                | 7.5  | 1,010   | 2,070                  |
|       | 9/27/2022  |                     | 4.2          | 320            | 171      | 0.3                 | 7.4  | 1,050   | 1,990                  |
|       | 4/5/2023   |                     | 4.87         | 347            | 183      | 0.20                | 7.6  | 1,070   | 1,960                  |
| MW-CS | 9/16/2019  |                     | 2.23         | 275            | 97.4     | 0.37                | 7.2  | 838     | 1,600                  |
|       | 12/4/2019  |                     | 2.35         | 248            | 90.2     | 0.2                 | 7.3  | 640     | 1,460                  |
|       | 3/18/2020  |                     | 2.08         | 271            | 107      | 0.33                | 7.6  | 843     | 1,670                  |
|       | 9/16/2020  |                     | 2.73         | 261            | 93.3     | 0.36                | 7.5  | 772     | 1,530                  |
|       | 3/16/2021  |                     | 2.73         | 261            | 89.6     | 0.34                | 7.4  | 738     | 1,550                  |
|       | 9/8/2021   |                     | 2.82         | 260            | 73.8     | 0.39                | 7.3  | 675     | 1,430                  |
|       | 3/16/2022  |                     | 2.4          | 249            | 51.4     | 0.32                | 7.3  | 519     | 1,290                  |
|       | 9/27/2022  |                     | 2.99         | 257            | 75.2     | 0.42                | 7.6  | 666     | 1,370                  |
|       | 4/4/2023   |                     | 2.87         | 262            | 67.1     | 0.31                | 7.6  | 597     | 1,360                  |
| MW-DS | 9/16/2019  |                     | 7.46         | 432            | 173      | 0.11                | 7.0  | 1,100   | 2,320                  |
|       | 12/4/2019  |                     | 7.15         | 417            | 178      | < 0.10              | 7.3  | 1,110   | 2,310                  |
|       | 3/17/2020  |                     | 6.3          | 365            | 137      | < 0.10              | 7.4  | 960     | 1,960                  |
|       | 9/17/2020  |                     | 6.75         | 387            | 149      | 0.11                | 7.6  | 1,020   | 2,190                  |
|       | 3/17/2021  |                     | 5.57         | 379            | 144      | < 0.10              | 7.6  | 1,000   | 2,050                  |
|       | 9/9/2021   |                     | 6.06         | 409            | 168      | 0.11                | 7.2  | 1,360   | 2,120                  |
|       | 3/16/2022  |                     | 5.03         | 344            | 131      | < 0.10              | 7.7  | 809     | 1,860                  |
|       | 9/27/2022  |                     | 5.69         | 407            | 170      | 0.12                | 7.5  | 1,040   | 2,070                  |
|       | 4/4/2023   |                     | 5.28         | 390            | 172      | < 0.10              | 7.8  | 1,020   | 1,980                  |

Table 1 (Continued)

| Well               | Parameter: |                     | Boron, Total | Calcium, Total | Chloride | Fluoride | pH   | Sulfate | Total Dissolved Solids |
|--------------------|------------|---------------------|--------------|----------------|----------|----------|------|---------|------------------------|
|                    | Date       | Unit <sup>1</sup> : | mg/L         | mg/L           | mg/L     | mg/L     | s.u. | mg/L    | mg/L                   |
| MW-JS <sup>1</sup> | 9/17/2019  |                     | 1.44         | 226            | 49.3     | 0.18     | 7.0  | 351     | 1,060                  |
|                    | 12/3/2019  |                     | 0.844        | 152            | 14.3     | 0.15     | 7.1  | 80.9    | 561                    |
|                    | 3/17/2020  |                     | 0.837        | 159            | 8.7      | 0.12     | 7.6  | 62.1    | 493                    |
|                    | 9/17/2020  |                     | 1.64         | 344            | 234      | 0.19     | 7.3  | 714     | 1,740                  |
|                    | 3/17/2021  |                     | 0.763        | 158            | 34       | 0.12     | 7.1  | 100     | 498                    |
|                    | 9/8/2021   |                     | 1.62         | 504            | 555      | 0.16     | 7.0  | 1,060   | 3,480                  |
|                    | 3/16/2022  |                     | 1.17         | 408            | 676      | < 0.10   | 7.1  | 1,020   | 2,530                  |
|                    | 9/27/2022  |                     | 1.7          | 393            | 721      | 0.22     | 7.0  | 1,260   | 2,820                  |
|                    | 4/5/2023   |                     | 0.441        | 93.8           | 123      | 0.11     | 7.4  | 211     | 806                    |

Notes:

- <sup>1</sup>mg/L - milligrams per liter; and s.u. - standard units.
- <sup>2</sup>< - Represents non-detect. Values are shown at the laboratory reporting limit.
- <sup>3</sup>Well was installed on March 23, 2018.

**Table 2**  
**Groundwater Analytical Assessment Monitoring Data - CCR Appendix IV Constituents**

| Well  | Parameter: |                     | Antimony,<br>Total    | Arsenic,<br>Total | Barium,<br>Total | Beryllium,<br>Total | Cadmium,<br>Total | Chromium,<br>Total | Cobalt,<br>Total | Fluoride | Lead,<br>Total | Lithium,<br>Total | Mercury,<br>Total | Molybdenum,<br>Total | Total<br>Radium <sup>1</sup> | Selenium,<br>Total | Thallium,<br>Total |
|-------|------------|---------------------|-----------------------|-------------------|------------------|---------------------|-------------------|--------------------|------------------|----------|----------------|-------------------|-------------------|----------------------|------------------------------|--------------------|--------------------|
|       | Date       | Unit <sup>2</sup> : | mg/L                  | mg/L              | mg/L             | mg/L                | mg/L              | mg/L               | mg/L             | mg/L     | mg/L           | mg/L              | mg/L              | mg/L                 | pCi/L                        | mg/L               | mg/L               |
| MW-AS | 9/16/2019  |                     | < 0.0010 <sup>3</sup> | < 0.0010          | 0.0913           | < 0.00020           | < 0.00020         | < 0.00020          | < 0.0010         | 0.12     | < 0.0010       | < 0.020           | < 0.0020          | 0.0055               | 1.83                         | < 0.0010           | < 0.0010           |
|       | 12/3/2019  |                     |                       | < 0.0010          | 0.087            |                     | < 0.00020         | < 0.00020          | < 0.0010         | 0.13     | < 0.0010       | < 0.020           |                   | 0.0055               | 0.776                        | < 0.0010           |                    |
|       | 3/17/2020  |                     |                       | 0.0010            | 0.0826           |                     | < 0.00020         | < 0.0020           | < 0.0010         | 0.10     | < 0.0010       | < 0.020           |                   | 0.005                | 0.783                        | < 0.0010           |                    |
|       | 9/16/2020  |                     | < 0.0010              | < 0.0010          | 0.0971           | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | 0.10     | < 0.0010       | < 0.020           | < 0.0020          | 0.0042               | 0.199                        | < 0.0010           | < 0.0010           |
|       | 3/16/2021  |                     | < 0.0010              | 0.0017            | 0.0886           | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | 0.10     | < 0.0010       | < 0.020           | < 0.0020          | 0.0037               | 0.693                        | < 0.0010           | < 0.0010           |
|       | 9/8/2021   |                     | < 0.0010              | < 0.0010          | 0.103            | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | 0.13     | < 0.0010       | < 0.020           | < 0.0020          | 0.004                | 0.549                        | < 0.0010           | < 0.0010           |
|       | 3/15/2022  |                     | < 0.0010              | 0.0017            | 0.103            | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | < 0.10   | < 0.0010       | < 0.020           | < 0.0020          | 0.0036               | 0.695                        | < 0.0010           | < 0.0010           |
|       | 9/27/2022  |                     | < 0.0010              | 0.0013            | 0.112            | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | 0.12     | < 0.0010       | < 0.020           | < 0.0020          | 0.0038               | 1.26                         | < 0.0010           | < 0.0010           |
| MW-BS | 4/4/2023   |                     | < 0.0010              | 0.0014            | 0.108            | < 0.00020           | < 0.00020         | < 0.0020           | 0.0013           | < 0.10   | < 0.0010       | < 0.020           | < 0.0020          | 0.0037               | 1.04                         | < 0.0010           | < 0.0010           |
|       | 9/16/2019  |                     | < 0.0010              | < 0.0010          | 0.0202           | < 0.00020           | < 0.00020         | < 0.00020          | 0.0014           | 0.25     | < 0.0010       | 0.0608            | < 0.0020          | 0.116                | 1.76                         | < 0.0010           | < 0.0010           |
|       | 12/3/2019  |                     |                       | < 0.0010          | 0.0193           |                     | < 0.00020         | < 0.00020          | 0.0012           | 0.23     | < 0.0010       | 0.0827            |                   | 0.119                | 1.04                         | < 0.0010           |                    |
|       | 3/18/2020  |                     |                       | < 0.0010          | 0.0195           |                     | < 0.00020         | < 0.0020           | 0.0013           | 0.27     | < 0.0010       | 0.0803            |                   | 0.108                | 0.564                        | < 0.0010           |                    |
|       | 9/16/2020  |                     | < 0.0010              | < 0.0010          | 0.0189           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0013           | 0.23     | < 0.0010       | 0.0842            | < 0.0020          | 0.116                | 1.62                         | < 0.0010           | < 0.0010           |
|       | 3/16/2021  |                     | < 0.0010              | < 0.0010          | 0.0173           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0013           | 0.24     | < 0.0010       | 0.0779            | < 0.0020          | 0.113                | 0.37                         | < 0.0010           | < 0.0010           |
|       | 9/8/2021   |                     | < 0.0010              | < 0.0010          | 0.0181           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0012           | 0.25     | < 0.0010       | 0.0666            | < 0.0020          | 0.116                | 0.854                        | < 0.0010           | < 0.0010           |
|       | 3/16/2022  |                     | < 0.0010              | < 0.0010          | 0.0182           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0012           | 0.23     | < 0.0010       | 0.0765            | < 0.0020          | 0.115                | 0.651                        | < 0.0010           | < 0.0010           |
| MW-CS | 9/27/2022  |                     | < 0.0010              | < 0.0010          | 0.0186           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0017           | 0.3      | < 0.0010       | 0.0885            | < 0.0020          | 0.118                | 1.05                         | < 0.0010           | < 0.0010           |
|       | 4/5/2023   |                     | < 0.0010              | < 0.0010          | 0.0198           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0012           | 0.20     | < 0.0010       | 0.0766            | < 0.0020          | 0.115                | 0.807                        | < 0.0010           | < 0.0010           |
|       | 9/16/2019  |                     | < 0.0010              | 0.0017            | 0.0248           | < 0.00020           | < 0.00020         | < 0.00020          | 0.0023           | 0.37     | < 0.0010       | 0.0432            | < 0.0020          | 0.126                | 0.937                        | < 0.0010           | < 0.0010           |
|       | 12/4/2019  |                     |                       | 0.0014            | 0.0211           |                     | < 0.00020         | < 0.00020          | 0.0014           | 0.2      | < 0.0010       | 0.0598            |                   | 0.11                 | 0.195                        | 0.0022             |                    |
|       | 3/18/2020  |                     |                       | 0.0013            | 0.0248           |                     | < 0.00020         | < 0.0020           | 0.0013           | 0.33     | < 0.0010       | 0.0505            |                   | 0.102                | 0.43                         | 0.0053             |                    |
|       | 9/16/2020  |                     | < 0.0010              | 0.0017            | 0.0244           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0014           | 0.36     | < 0.0010       | 0.0705            | < 0.0020          | 0.126                | 0.946                        | 0.0035             | < 0.0010           |
|       | 3/16/2021  |                     | < 0.0010              | 0.0015            | 0.022            | < 0.00020           | < 0.00020         | < 0.0020           | 0.0015           | 0.34     | < 0.0010       | 0.0603            | < 0.0020          | 0.108                | 0.875                        | 0.0057             | < 0.0010           |
|       | 9/8/2021   |                     | < 0.0010              | 0.0019            | 0.023            | < 0.00020           | < 0.00020         | < 0.0020           | 0.0012           | 0.39     | < 0.0010       | 0.0625            | < 0.0020          | 0.101                | 0.272                        | 0.0039             | < 0.0010           |
| MW-DS | 3/16/2022  |                     | < 0.0010              | 0.0018            | 0.0207           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0011           | 0.32     | < 0.0010       | 0.0580            | < 0.0020          | 0.0831               | 1.13                         | 0.0108             | < 0.0010           |
|       | 9/27/2022  |                     | < 0.0010              | 0.0020            | 0.0243           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0017           | 0.42     | < 0.0010       | 0.0702            | < 0.0020          | 0.1050               | 0.678                        | 0.0042             | < 0.0010           |
|       | 4/4/2023   |                     | < 0.0010              | 0.0016            | 0.0227           | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | 0.31     | < 0.0010       | 0.0593            | < 0.0020          | 0.0792               | 0.633                        | 0.0078             | < 0.0010           |
|       | 9/16/2019  |                     | < 0.0010              | < 0.0010          | 0.0306           | < 0.00020           | < 0.00020         | < 0.00020          | < 0.0010         | 0.11     | < 0.0010       | 0.0422            | < 0.0020          | 0.0091               | 1.4                          | < 0.0010           | < 0.0010           |
|       | 12/4/2019  |                     |                       | < 0.0010          | 0.0267           |                     | < 0.00020         | < 0.00020          | < 0.0010         | < 0.10   | < 0.0010       | 0.0602            |                   | 0.0083               | 0.464                        | < 0.0010           |                    |
|       | 3/17/2020  |                     |                       | < 0.0010          | 0.0233           |                     | < 0.00020         | < 0.0020           | < 0.0010         | < 0.10   | < 0.0010       | 0.0489            |                   | 0.0062               | 0.336                        | < 0.0010           |                    |
|       | 9/17/2020  |                     | < 0.0010              | < 0.0010          | 0.0302           | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | 0.11     | < 0.0010       | 0.0620            | < 0.0020          | 0.0073               | 0.567                        | < 0.0010           | < 0.0010           |
|       | 3/17/2021  |                     | < 0.0010              | < 0.0010          | 0.0206           | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | < 0.10   | < 0.0010       | 0.0454            | < 0.0020          | 0.0058               | 0.809                        | < 0.0010           | < 0.0010           |
| MW-DS | 9/9/2021   |                     | < 0.0010              | < 0.0010          | 0.0272           | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | 0.11     | < 0.0010       | 0.0431            | < 0.0020          | 0.0063               | 0.511                        | < 0.0010           | < 0.0010           |
|       | 3/16/2022  |                     | < 0.0010              | < 0.0010          | 0.0176           | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | < 0.10   | < 0.0010       | 0.0327            | < 0.0020          | 0.0071               | 1.13                         | < 0.0010           | < 0.0010           |
|       | 9/27/2022  |                     | < 0.0010              | < 0.0010          | 0.0250           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0016           | 0.12     | < 0.0010       | 0.0605            | < 0.0020          | 0.0071               | 1.06                         | < 0.0010           | < 0.0010           |
|       | 4/4/2023   |                     | < 0.0010              | < 0.0010          | 0.0228           | < 0.00020           | < 0.00020         | < 0.0020           | < 0.0010         | < 0.10   | < 0.0010       | 0.0375            | < 0.0020          | 0.0058               | 0.709                        | 0.0011             | < 0.0010           |

Table 2 (Continued)

| Well               | Parameter: |                     | Antimony,<br>Total | Arsenic,<br>Total | Barium,<br>Total | Beryllium,<br>Total | Cadmium,<br>Total | Chromium,<br>Total | Cobalt,<br>Total | Fluoride | Lead,<br>Total | Lithium,<br>Total | Mercury,<br>Total | Molybdenum,<br>Total | Total<br>Radium <sup>1</sup> | Selenium,<br>Total | Thallium,<br>Total |
|--------------------|------------|---------------------|--------------------|-------------------|------------------|---------------------|-------------------|--------------------|------------------|----------|----------------|-------------------|-------------------|----------------------|------------------------------|--------------------|--------------------|
|                    | Date       | Unit <sup>2</sup> : | mg/L               | mg/L              | mg/L             | mg/L                | mg/L              | mg/L               | mg/L             | mg/L     | mg/L           | mg/L              | mg/L              | mg/L                 | pCi/L                        | mg/L               | mg/L               |
| MW-JS <sup>4</sup> | 9/17/2019  |                     | < 0.0010           | 0.0041            | 0.172            | < 0.00020           | 0.0004            | 0.004              | 0.0052           | 0.18     | 0.0028         | 0.0348            | < 0.0020          | 0.0265               | 1.33                         | 0.0015             | < 0.0010           |
|                    | 12/3/2019  |                     |                    | 0.0064            | 0.134            |                     | < 0.00020         | 0.0124             | 0.0046           | 0.15     | 0.0036         | 0.025             |                   | 0.0176               | 1.2                          | 0.0032             |                    |
|                    | 3/17/2020  |                     |                    | 0.0071            | 0.147            |                     | < 0.00020         | 0.0073             | 0.0051           | 0.12     | 0.0041         | 0.0282            |                   | 0.017                | 0.976                        | 0.0093             |                    |
|                    | 9/17/2020  |                     | < 0.0010           | 0.0052            | 0.145            | < 0.00020           | 0.00039           | 0.0039             | 0.0056           | 0.19     | 0.0024         | 0.0782            | < 0.0020          | 0.03                 | 2.05                         | 0.0012             | < 0.0010           |
|                    | 3/17/2021  |                     | < 0.0010           | 0.0016            | 0.0727           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0016           | 0.12     | < 0.0010       | 0.0258            | < 0.0020          | 0.0109               | 0.62                         | 0.0084             | < 0.0010           |
|                    | 9/8/2021   |                     | < 0.0010           | 0.0086            | 0.170            | 0.00021             | 0.00057           | 0.0067             | 0.0093           | 0.16     | 0.004          | 0.0636            | < 0.0020          | 0.0278               | 2.05                         | 0.0021             | < 0.0010           |
|                    | 3/16/2022  |                     | < 0.0010           | 0.0015            | 0.245            | < 0.00020           | 0.00062           | 0.0022             | 0.0046           | < 0.10   | < 0.0010       | 0.0392            | < 0.0020          | 0.0114               | 1.27                         | 0.0048             | < 0.0010           |
|                    | 9/27/2022  |                     | < 0.0010           | 0.0114            | 0.15             | 0.00021             | 0.00051           | 0.0070             | 0.0135           | 0.22     | 0.0053         | 0.0758            | < 0.0020          | 0.0345               | 2.11                         | 0.0020             | < 0.0010           |
|                    | 4/5/2023   |                     | < 0.0010           | < 0.0010          | 0.0650           | < 0.00020           | < 0.00020         | < 0.0020           | 0.0016           | 0.11     | < 0.0010       | < 0.020           | < 0.0020          | 0.0062               | 0.871                        | 0.0090             | < 0.0010           |

Notes:

- <sup>1</sup>
- Total Radium is Radium-226 and Radium-228 combined
- <sup>2</sup>
- mg/L - milligrams per liter; and pCi/L - Picocuries per liter.
- <sup>3</sup>
- < - Represents non-detect. Values are shown at the laboratory reporting limit.
- <sup>4</sup>
- Well was installed on March 23, 2018.

Table 3  
Groundwater Protection Standards Development

| Chemical Name     | Unit <sup>1</sup> | Samples | Detected | % Non-Detect | Transformed | Method         | Upper Tolerance Limit | Federal Limit | Federal Limit Type <sup>2</sup> | GPS <sup>3</sup> |
|-------------------|-------------------|---------|----------|--------------|-------------|----------------|-----------------------|---------------|---------------------------------|------------------|
| Antimony, Total   | mg/L              | 11      | 0        | 100          | No          | Non-Parametric | 0.001                 | 0.006         | MCL                             | 0.006            |
| Arsenic, Total    | mg/L              | 13      | 3        | 76.9         | No          | Non-Parametric | 0.0017                | 0.01          | MCL                             | 0.01             |
| Barium, Total     | mg/L              | 13      | 13       | 0.0          | No          | Parametric     | 0.134                 | 2             | MCL                             | 2                |
| Beryllium, Total  | mg/L              | 11      | 0        | 100          | No          | Non-Parametric | 0.0002                | 0.004         | MCL                             | 0.004            |
| Cadmium, Total    | mg/L              | 13      | 0        | 100          | No          | Non-Parametric | 0.0002                | 0.005         | MCL                             | 0.005            |
| Chromium, Total   | mg/L              | 13      | 0        | 100          | No          | Non-Parametric | 0.002                 | 0.1           | MCL                             | 0.1              |
| Cobalt, Total     | mg/L              | 13      | 0        | 100          | No          | Non-Parametric | 0.001                 | 0.006         | RSL                             | 0.006            |
| Fluoride          | mg/L              | 14      | 11       | 21.4         | No          | Parametric     | 0.168                 | 4             | MCL                             | 4                |
| Lead, Total       | mg/L              | 13      | 0        | 100          | No          | Non-Parametric | 0.001                 | 0.015         | RSL                             | 0.015            |
| Lithium, Total    | mg/L              | 13      | 0        | 100          | No          | Non-Parametric | 0.02                  | 0.040         | RSL                             | 0.040            |
| Mercury, Total    | mg/L              | 11      | 0        | 100          | No          | Non-Parametric | 0.002                 | 0.002         | MCL                             | 0.002            |
| Molybdenum, Total | mg/L              | 13      | 13       | 0.0          | No          | Parametric     | 0.006                 | 0.1           | RSL                             | 0.1              |
| Total Radium      | pCi/l             | 13      | 13       | 0.0          | No          | Parametric     | 2.363                 | 5             | MCL                             | 5                |
| Selenium, Total   | mg/L              | 13      | 0        | 100          | No          | Non-Parametric | 0.001                 | 0.05          | MCL                             | 0.05             |
| Thallium, Total   | mg/L              | 11      | 0        | 100          | No          | Non-Parametric | 0.001                 | 0.002         | MCL                             | 0.002            |

Notes:

- <sup>1</sup>mg/L - milligrams per liter; and pCi/L - Picocuries per liter.
- <sup>2</sup>MCL - United States Environmental Protection Agency (USEPA) Maximum Contaminant Level; and RSL - USEPA Regional Screening Level.
- <sup>3</sup>GPS is defined as the higher of the federal limit and the calculated site-specific background.

Table 4  
Groundwater Protection Standard and Lower Confidence Level Comparison

| Parameter         | GPS   | Location ID:       | LCL <sup>1</sup>    |            |                |            |                |            |                |            |
|-------------------|-------|--------------------|---------------------|------------|----------------|------------|----------------|------------|----------------|------------|
|                   |       |                    | MW-BS               |            | MW-CS          |            | MW-DS          |            | MW-JS          |            |
|                   |       | Units <sup>2</sup> | September 2022      | April 2023 | September 2022 | April 2023 | September 2022 | April 2023 | September 2022 | April 2023 |
| Antimony, Total   | 0.006 | mg/L               | 0.001               | 0.001      | 0.001          | 0.001      | 0.001          | 0.001      | 0.001          | 0.001      |
| Arsenic, Total    | 0.01  | mg/L               | 0.001               | 0.001      | 0.0013         | 0.0014     | 0.001          | 0.001      | 0.002          | 0.002      |
| Barium, Total     | 2     | mg/L               | 0.019               | 0.019      | 0.0207         | 0.0208     | 0.0244         | 0.0243     | 0.124          | 0.116      |
| Beryllium, Total  | 0.004 | mg/L               | 0.0002              | 0.0002     | 0.0002         | 0.0002     | 0.0002         | 0.0002     | 0.0002         | 0.0002     |
| Cadmium, Total    | 0.005 | mg/L               | 0.0002              | 0.0002     | 0.0002         | 0.0002     | 0.0002         | 0.0002     | 0.0002         | 0.0002     |
| Chromium, Total   | 0.1   | mg/L               | 0.002               | 0.002      | 0.002          | 0.002      | 0.002          | 0.002      | 0.0017         | 0.0028     |
| Cobalt, Total     | 0.006 | mg/L               | 0.0014              | 0.0014     | 0.0016         | 0.0016     | 0.001          | 0.001      | 0.002          | 0.0027     |
| Fluoride          | 4     | mg/L               | 0.191               | 0.1911     | 0.262          | 0.265      | 0.10           | 0.10       | 0.142          | 0.138      |
| Lead, Total       | 0.015 | mg/L               | 0.001               | 0.001      | 0.001          | 0.001      | 0.001          | 0.001      | 0.0016         | 0.0015     |
| Lithium, Total    | 0.040 | mg/L               | 0.0778 <sup>3</sup> | 0.0777     | 0.059          | 0.0586     | 0.0484         | 0.0476     | 0.029          | 0.026      |
| Mercury, Total    | 0.002 | mg/L               | 0.002               | 0.002      | 0.002          | 0.002      | 0.002          | 0.002      | 0.002          | 0.002      |
| Molybdenum, Total | 0.1   | mg/L               | 0.116               | 0.116      | 0.0983         | 0.0966     | 0.007          | 0.007      | 0.0180         | 0.0164     |
| Total Radium      | 5     | pCi/l              | 0.817               | 0.816      | 0.501          | 0.510      | 0.506          | 0.519      | 1.07           | 1.05       |
| Selenium, Total   | 0.05  | mg/L               | 0.001               | 0.001      | 0.0017         | 0.0019     | 0.001          | 0.001      | 0.0029         | 0.0033     |
| Thallium, Total   | 0.002 | mg/L               | 0.001               | 0.001      | 0.001          | 0.001      | 0.001          | 0.001      | 0.001          | 0.001      |

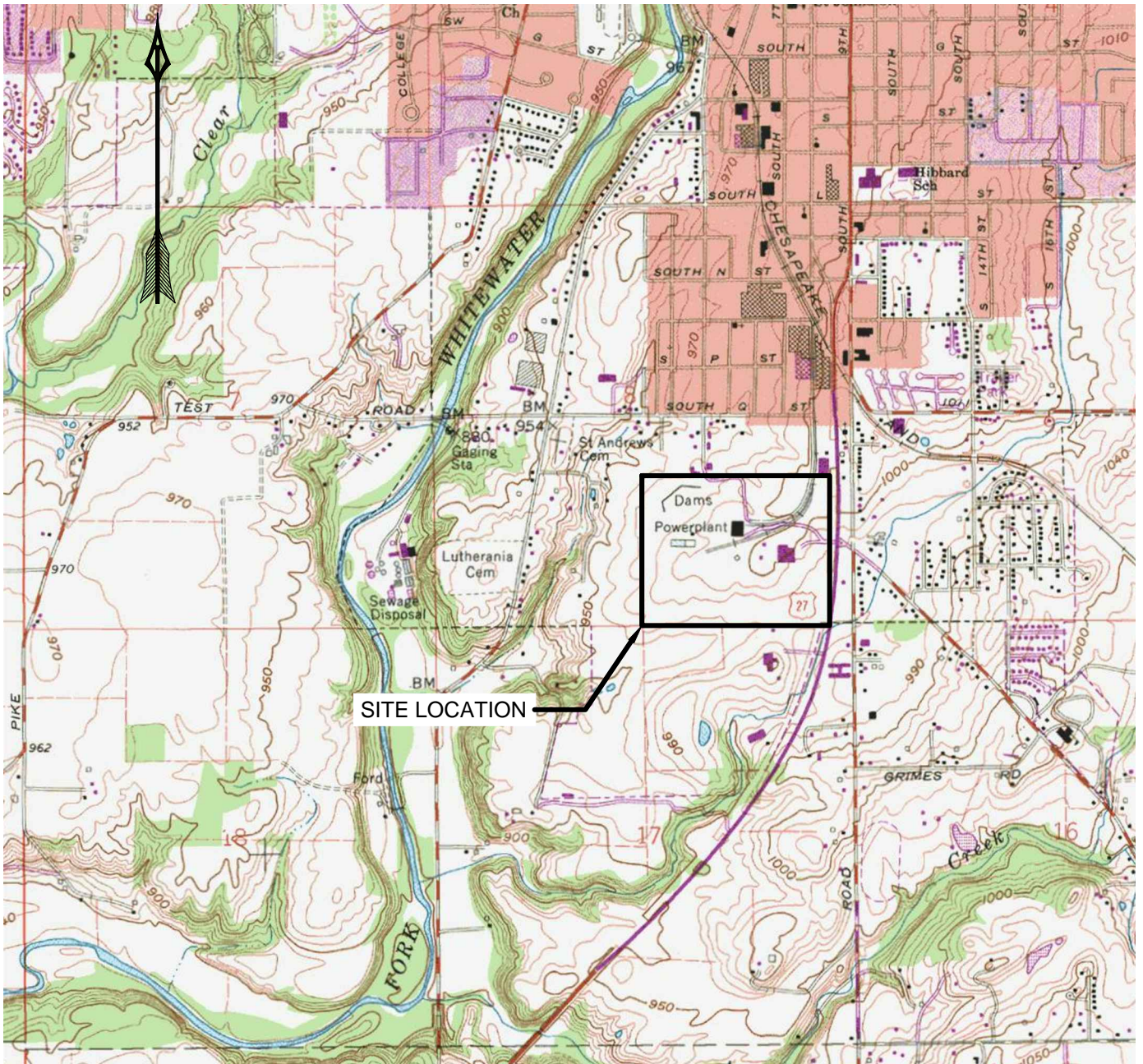
Notes:

- <sup>1</sup> LCLs were determined for samples collected during the eighth and ninth Assessment Monitoring events in September 2022 and April 2023, respectively.
- <sup>2</sup> mg/L - milligrams per liter; and pCi/L - Picocuries per liter.
- <sup>3</sup> Highlighted values indicate a SSL.

## FIGURES




GAI CAD FILE PATH: Z:\Energy\2015\C151119.04 - RPL GW IDEM Closure Nar\CAD\Production Drawings\C151119-04-002-001-A2-001.dwg



MAP REFERENCE:  
RICHMOND, IN 7.5 MINUTE  
QUADRANGLE DATED 1960  
PHOTO REVISED 1981

SCALE: 1" = 2000'



|                                  |  |                           |             |              |
|----------------------------------|--|---------------------------|-------------|--------------|
| DRAWING TITLE                    |  | GAI DRAWING NUMBER:       |             |              |
| FIGURE 1 - SITE LOCATION MAP     |  | A2-001                    |             |              |
| PROJECT                          | <br>gai consultants | GAI FILE NUMBER:          |             |              |
| WHITEWATER IDEM CLOSURE PLAN     |  | C151119-04-002-001-A2-001 |             |              |
| CLIENT                           |  | DRAWN BY:                 | CHECKED BY: | APPROVED BY: |
| RICHMOND POWER AND LIGHT COMPANY |  | MAYHOEJ                   |             |              |
| RICHMOND, INDIANA                |  | SHEET NO.:                | SCALE:      | ISSUE DATE:  |
|                                  |  | 1 OF 1                    | AS SHOWN    | 08/16/2016   |
|                                  |  | © 2016 GAI Consultants    |             |              |

This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.

ISSUING OFFICE: Pittsburgh | 385 E. Waterfront Drive, Homestead, PA 15120

PLOTTED ON: 8/17/2016 10:38:44 AM PLOTTED BY: William Harris PLOT FILE: GAI.stb



PLOTTED ON: 11/30/2023 12:56:26 PM  
 PLOTTED BY: Ed Mayhood  
 PLOT FILE: GAI.stb



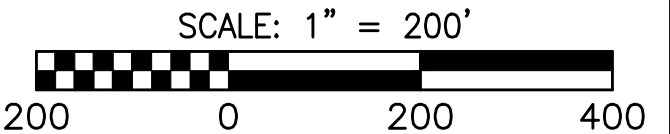
REFERENCE:  
 2012 INDIANA STATEWIDE IMAGERY AND LIDAR PROGRAM  
 1-FOOT PIXEL RESOLUTION ORTHOIMAGERY; AND  
 2-FOOT CONTOUR INTERVALS LINES DEVELOPED FROM 1.5 METER NPS  
 BARE EARTH LIDAR.

IMPOUNDMENT SURVEY PROVIDED BY BEALS-MOORE & ASSOCIATES, INC.  
 DATED JANUARY 1ST, 2013  
 50 SCALE MAPPING WITH 1 FOOT CONTOUR INTERVAL


SURVEY FOR BORING, PIEZOMETER AND STAFF GAUGE LOCATIONS AND  
 ELEVATIONS PROVIDED BY BEALS-MOORE & ASSOCIATES, INC. DATED  
 APRIL 15TH, 2016, SEPTEMBER 27, 2016, JULY 10, 2017 AND AUGUST  
 26, 2020.

LEGEND

- ▲A-2 STAFF GAUGE LOCATION
- ⊕ A-S MONITORING WELL, PIEZOMETER LOCATION
- ⊕ PZ-1701 ABANDONED MONITORING WELL, PIEZOMETER LOCATION
- APPROXIMATE LIMIT OF IMPOUNDMENT



|                 |            |         |         |         |                 |
|-----------------|------------|---------|---------|---------|-----------------|
|                 |            |         |         |         |                 |
|                 |            |         |         |         |                 |
|                 |            |         |         |         |                 |
| 2               | 11/30/2023 | MAYHOEJ | BORTZKM | BORTZKM | UPDATED IMAGERY |
| NO.:            | DATE:      | DWN:    | CHK:    | APV:    | DESCRIPTION:    |
| REVISION RECORD |            |         |         |         |                 |

|   |  |   |
|---|--|---|
| DRAWING TITLE   |  |   |
| FIGURE 2 - GROUND WATER MONITORING SYSTEM LOCATION MAP                                      |  |   |
| PROJECT   |  | CLIENT  |
| IMPOUNDMENT CLOSURE<br>WHITEWATER VALLEY STATION<br>WAYNE COUNTY<br>RICHMOND, INDIANA 47374 | <br>gai consultants | RICHMOND POWER & LIGHT<br>2000 US 27 SOUTH<br>RICHMOND, INDIANA 47374 |

|  |             |              |
|--|-------------|--------------|
| DRAWN BY:                                  | CHECKED BY: | APPROVED BY: |
| MAYHOEJ                                    | TURKARJ     | TURKARJ      |
| REVISION                                   | SCALE:      | ISSUE DATE:  |
| 2  | AS SHOWN    | 08/31/2020   |
| SHEET NO.: 1 OF 1                          |             |              |
| GAI FILE NUMBER: C151119-22-000-000-B2-003 |             |              |
| GAI DRAWING NUMBER: B2-003                 |             |              |

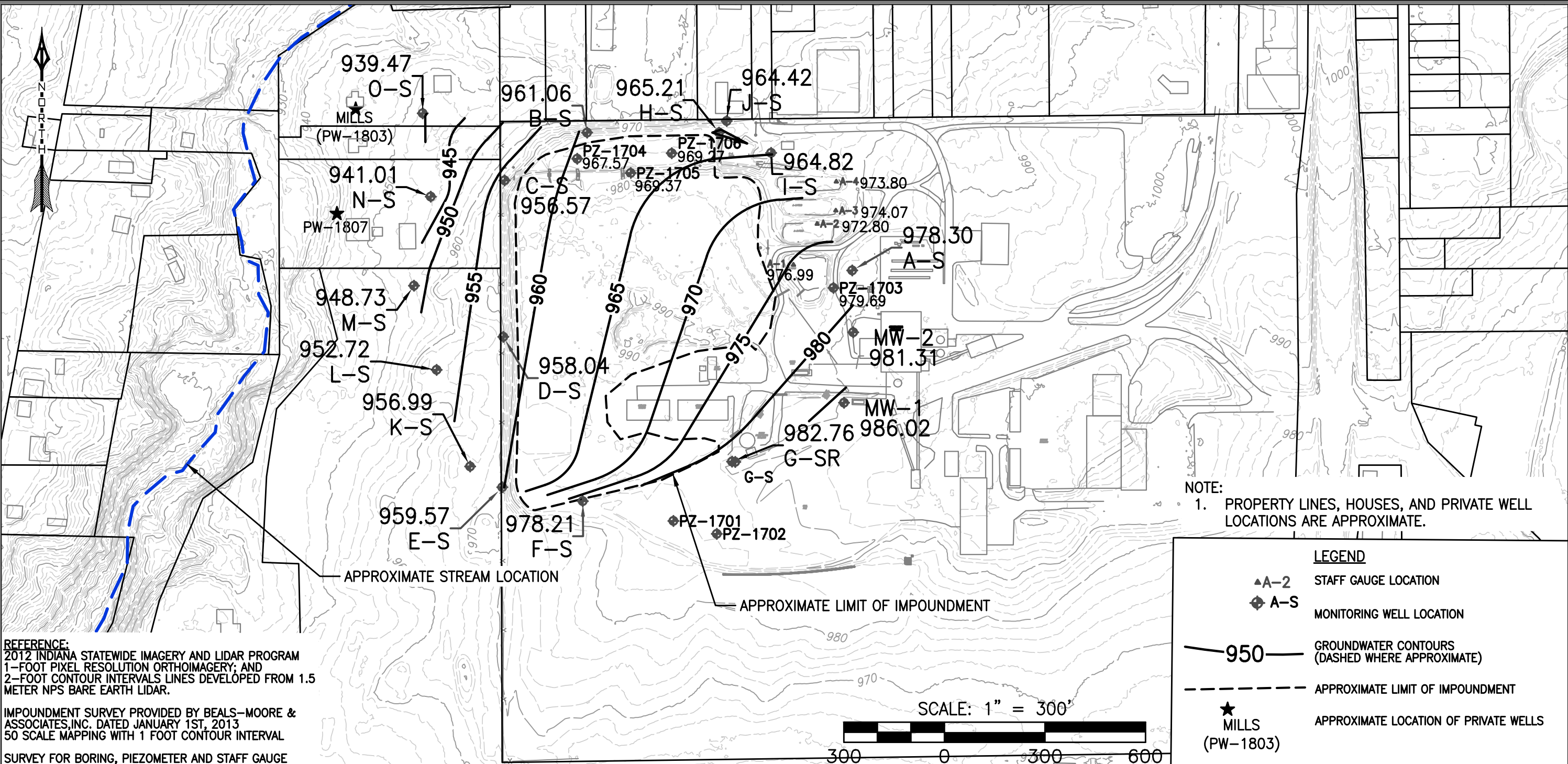
This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.

ISSUING OFFICE: Murrysville | 4200 Triangle Lane, Export, PA 15632-1358

GAI CAD FILE PATH: Z:\Energy\2015\C151119.22 - RPL 2020 GW-CCR\CAD\Production DWGs\C151119-22-000-000-B2-003.dwg

© 2020 GAI Consultants

PLOTTED ON: 8/25/2023 3:36:46 PM PLOTTED BY: Roger A. Hull PLOT FILE: GAI.stb



REFERENCE:  
 2012 INDIANA STATEWIDE IMAGERY AND LIDAR PROGRAM  
 1-FOOT PIXEL RESOLUTION ORTHOIMAGERY; AND  
 2-FOOT CONTOUR INTERVALS LINES DEVELOPED FROM 1.5  
 METER NPS BARE EARTH LIDAR.  
 IMPOUNDMENT SURVEY PROVIDED BY BEALS-MOORE &  
 ASSOCIATES, INC. DATED JANUARY 1ST, 2013  
 50 SCALE MAPPING WITH 1 FOOT CONTOUR INTERVAL  
 SURVEY FOR BORING, PIEZOMETER AND STAFF GAUGE  
 LOCATIONS AND ELEVATIONS PROVIDED BY BEALS-MOORE &  
 ASSOCIATES, INC. DATED APRIL 15TH, 2016, SEPTEMBER 27,  
 2016 AND JULY 10, 2017.

NOTE:  
 1. PROPERTY LINES, HOUSES, AND PRIVATE WELL  
 LOCATIONS ARE APPROXIMATE.

▲A-2

STAFF GAUGE LOCATION

◆A-S

MONITORING WELL LOCATION

—950—

GROUNDWATER CONTOURS  
(DASHED WHERE APPROXIMATE)

---

APPROXIMATE LIMIT OF IMPOUNDMENT

★

MILLS  
(PW-1803)

APPROXIMATE LOCATION OF PRIVATE WELLS

|                 |       |      |      |      |              |
|-----------------|-------|------|------|------|--------------|
|                 |       |      |      |      |              |
|                 |       |      |      |      |              |
|                 |       |      |      |      |              |
|                 |       |      |      |      |              |
|                 |       |      |      |      |              |
| NO.:            | DATE: | DWN: | CHK: | APV: | DESCRIPTION: |
| REVISION RECORD |       |      |      |      |              |

DRAWING TITLE

POTENTIOMETRIC SURFACE MAP - SOIL - APRIL 3, 2023

PROJECT

IMPOUNDMENT CLOSURE  
 WHITEWATER VALLEY STATION  
 WAYNE COUNTY  
 RICHMOND, INDIANA 47374

CLIENT

RICHMOND POWER & LIGHT  
 2000 US 27 SOUTH  
 RICHMOND, INDIANA 47374

|                           |             |              |
|---------------------------|-------------|--------------|
| DRAWN BY:                 | CHECKED BY: | APPROVED BY: |
| RHULL                     | HENGELM     | HENGELM      |
| REVISION                  | SCALE:      | ISSUE DATE:  |
| 0                         | AS SHOWN    | 08/03/2021   |
| SHEET NO.:                |             |              |
| 1 OF 1                    |             |              |
| GAI FILE NUMBER:          |             |              |
| C151119-22-000-000-B2-024 |             |              |
| GAI DRAWING NUMBER:       |             |              |
| B2-024                    |             |              |