Brunner Island, LLC
REGULATORY DELIVERABLE
SUBMITTAL COVER SHEET

Date:	November 29, 2023	**Transmittal No.:**	BI-47-2023-11-29-v.1 (Part A)
DOCUMENT DESCRIPTION:		Quarterly Groundwater Report: 4th Quarter 2023--Basin 5, Disposal Area 8, and Pyrite Tomb Area, Brunner Island, LLC	
CONSENT DECREE REFERENCE:		Paragraph No.:	**47**
BRIEF DESCRIPTION OF OUTLINED REQUIREMENT:		Brunner shall promptly provide Citizens with all deliverables required under this Consent Decree, as well as quarterly groundwater monitoring data from Ash Basins 5 and 6 and Disposal Area 8.	
RECIPIENT(S):			
NAME:		**ORGANIZATION:**	
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November 28, 2023

Mr. Kurt Fritz
Pennsylvania Department of Environmental Protection
Waste Management Program
909 Elmerton Ave.
Harrisburg, Pennsylvania 17110

RE: **Quarterly Groundwater Report: 4th Quarter 2023**
Basin 5, Disposal Area 8, and Pyrite Tomb Area
Brunner Island, LLC

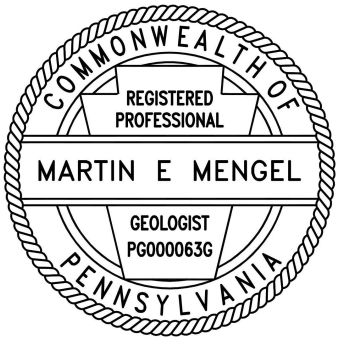
Dear Mr. Fritz:

Please accept this letter and attachments as the quarterly report for Basin 5 at the Brunner Island Steam Electric Station.

Note that a data table (water depth and pH) and associated trend plots for pyrite tomb standpipe monitoring have been added to this Basin 5 report, beginning with the second quarter 2017 groundwater report.

The analytical results are provided on Form 14R (enclosed) in accordance with the Basin 5 closure plan approved by the PADEP in December 2000. A summary table of results, an Excel spreadsheet file, and maps showing well locations are also enclosed.

Please call or email me with any questions. Thank you.



Sincerely,

M. E. Mengel

Martin E. Mengel, PG/CHMM

Attachments: report, data table, pyrite tomb standpipe monitoring results, maps, LandLinks EDD, trend plots, 14Rs, and statistics summary

Cc: Kathleen Locke (w/atts.) – Brunner Island, LLC
Tom Weissinger (w/atts.) – Talen Energy Supply, LLC
Megan Toomey (w/atts.) – Talen Energy Supply, LLC
Citizens (w/atts.)

Groundwater Monitoring Report – Fourth Quarter 2023
Brunner Island, LLC - Basin 5
Brunner Island Steam Electric Station

BACKGROUND

The Brunner Island Steam Electric Station (Brunner Island SES) is located in York Haven, York County, Pennsylvania and is owned and operated by Brunner Island, LLC (Brunner). An overall Brunner Island SES map and a basin specific map are attached (Attachments 3 and 4).

The PADEP issued Residual Waste Permit # 301337 on December 28, 2000, approving the Basin 5 closure plan. The residual waste permit expired on December 27, 2007 and was not renewed by the PADEP. Brunner believes that Mandatory Abatement Trigger Levels (MATLs) no longer apply to Basin 5, as a result of the permit expiration, and therefore, Brunner no longer uses MATLs as the primary data screening tool for Basin 5 groundwater results.

Disposal Area 8 (a Class 2 residual waste landfill) was constructed on top of Basin 5. Construction was completed and disposal into the landfill began in late 2008. The permitted area for the landfill encompasses approximately 20 acres, however, currently only 9 acres have been constructed and are actively utilized. The existing groundwater monitoring network for Basin 5 was chosen and approved by the PADEP to serve as the monitoring network for Area 8 as well.

In accordance with Brunner's PADEP-approved *Workplan – Groundwater Risk Evaluation – Ash Basin 4 and Pyrite Tomb* dated September 29, 2016, a downgradient monitoring well MW-PT-1 was installed in January 2017 to help assess potential impacts from the pyrite tomb. Additionally, pH and liquid depth monitoring data and associated trend plots for water within the pyrite tomb standpipe have been added to this Basin 5 report, beginning with the second quarter of 2017.

In accordance with the closure/ post closure use plan, construction of the rail extension on Basin 5 was completed in 2013. As a result, moderate subsurface disturbance has occurred in the area.

Groundwater monitoring in the vicinity of Basin 5 is currently conducted quarterly as required in accordance with the approved Basin 5 closure plan. This groundwater monitoring generally includes sampling wells upgradient and downgradient of Basin 5 for indicator parameters of fly ash such as arsenic, boron, lithium, selenium, strontium, and total dissolved solids. Other parameters are routinely monitored in the vicinity of Basin 5 in accordance with permit requirements and are listed on the attached summary table of quarterly groundwater monitoring results (Attachment 1). Brunner reviews current and historical data (approximately the past 10 years) to identify trends and to compare data with Pennsylvania Act 2 residential Statewide Health Standards for used aquifers and/or EPA National Drinking Water Standards.

In late 2022, nine recovery wells were installed and pump-tested in the area of the pyrite tomb and bottom ash process area outside the berm. Capture zones were determined to be sufficient as shown in the *Recovery Well Installation and Pumping Test Report* (rev. 1/23/2023). It is predicted that the recovery well system would be operational in mid-December 2023.

GROUNDWATER MONITORING PROGRAM

Monitoring Locations – Basin 5

Downgradient and upgradient monitoring wells for Basin 5 are listed below and shown on the attached Site Plan of Basin 5 (Attachment 4).

- Background monitoring well – MW-19
- Upgradient monitoring well – MW-4-7A
- Downgradient monitoring wells – MW-4-10, MW-8-1N, MW-8-2, MW-8-3A, MW-8-3B, MW-8-4, MW-8-5A, MW-8-5B, MW-8-10A, MW-8-10B, MW-8-10C, MW-8-12C, MW-8-8A, MW-8-8B, MW-8-9B, MW-8-9C, and MW-PT-1
- Pyrite tomb standpipe (lab analytical concluded in 2017; field pH and water elevation monitoring to continue)

Monitoring Schedule

For all the monitoring wells listed above, except MW-8-10C and MW-8-12C, quarterly sampling of field parameters, non-metals, and metals are performed. For MW-8-10C and MW-8-12C, these parameters are only required to be sampled annually during the second calendar quarter. All the monitoring parameters are listed on the attached Summary Table of Basin 5 Groundwater Monitoring Results (Attachment 1). For MW-8-8A, MW-8-8B, MW-8-9B, and MW-8-9C, the only metals analyzed are arsenic, lithium, manganese, and molybdenum (all other Basin 5 field parameters and non-metals are also analyzed). Additionally, for quality assurance/quality control (QA/QC), field blanks and duplicates are routinely collected during each sampling event.

QA/QC Results

For the site-wide monitoring event conducted at Brunner Island SES for the fourth quarter of 2023, Brunner samplers collected seven field blanks (all groundwater field blanks) and seven duplicate samples. The duplicate samples were collected from seven groundwater wells (including MW-4-7A, MW-8-3A, MW-6-4, MW-7-4, PZ-7-32, EQ-2, and GC-2). These field blanks and duplicates were analyzed by the laboratory along with the routinely collected groundwater samples. For the seven field blanks, two water quality parameters were detected above respective limits of quantification (iron and molybdenum) for a total of three analyses. In Brunner's opinion, analysis of the field blanks indicated no significant evidence of sample contamination related to field sampling procedures or sample containers. For the seven duplicates, a total of 421 paired analyses were performed with two paired analyses exceeding Brunner's acceptable level of less than 20% relative percent difference (RPD) between duplicates. Based on these QA/QC results, Brunner believes that the laboratory precision is reasonable, and the monitoring results are acceptable for reporting to the PADEP.

GROUNDWATER MONITORING RESULTS

The groundwater sampling results for this quarter are summarized on Attachment 1, Summary Table of Basin 5 Groundwater Monitoring Results. Upgradient and downgradient wells are indicated in the headings at the top of this table. Any groundwater concentrations that exceeded

the listed regulatory standards are indicated in red text color. Groundwater monitoring results are also reported on the 14R forms for each well (Attachment 5).

Below are the findings for each Basin 5 monitoring well:

Upgradient Monitoring Well (MW-4-7A)

Upgradient monitoring well MW-4-7A is located near the northwest corner of Basin 5 and serves as an upgradient well to the basin. Key results for this quarter and trends for MW-4-7A are as follows:

- pH is consistently near neutral.
- Total dissolved solids concentration of 1,140 mg/L exceeded the Secondary Drinking Water Standard of 500 mg/L, and TDS exhibits a slightly increasing trend.
- Sulfate concentration of 610 mg/L exceeded the Secondary Drinking Water Standard of 250 mg/L, and sulfate exhibits a slightly increasing trend.
- Boron concentrations have been relatively stable since 2012 and are far below the Act 2 residential Statewide Health Standard of 6,000 µg/L, although concentrations at MW-4-7A have fluctuated upward slightly since the fourth quarter of 2018.
- Calcium concentrations historically exhibit a stable long-term trend, but concentrations have exhibited increased variability since the fourth quarter of 2018.
- Lithium (dissolved) concentration of 97.3 µg/L exceeded the Act 2 residential Statewide Health Standard of 69 µg/L. Lithium concentrations at MW-4-7A have exhibited an increasing trend since 2011, and now exceed the Act 2 standard (with increased variability since the first quarter of 2020).
- Manganese (dissolved) concentration of 292 µg/L exceeded the Secondary Drinking Water Standard of 50 µg/L but did not exceed the Act 2 residential Statewide Health Standard of 300 µg/L. Manganese concentrations are seasonally variable (within a fairly stable range) at MW-4-7A with peak concentrations typically exceeding the Secondary Drinking Water Standard and occasionally exceeding the Act 2 standard.
- Sodium concentrations demonstrate a gradual long-term increasing trend but appear to be stabilizing at about 60 mg/L. Sodium has also exhibited recent increased variability (similar to boron and calcium). There are no EPA drinking water or PA Act 2 standards for sodium.

Downgradient Monitoring Wells

1. **MW-4-10 -** Monitoring well MW-4-10 is located on the dike between Basin 4 and Basin 5 and would be expected to be more representative of basin pore water than the groundwater surrounding the basin. Relatively significant ash-related impact would be expected and is observed, as compared to monitoring wells which are not bounded by ash on both sides. The general area around MW-4-10 has periodically experienced earth disturbance related to wastewater treatment plant construction. This disturbance has apparently impacted

groundwater/pore water quality in MW-4-10. Key results for this quarter and trends for MW-4-10 are as follows:

- Beginning in mid-2018, substantial upward fluctuations (beyond respective historical ranges in many cases) for numerous parameters (including total dissolved solids, sulfate, boron, calcium, specific conductance, and strontium) correlated to increased groundwater elevations. Except for calcium and strontium, these parameters have returned to pre-2018 concentrations.
- Field pH (5.86 S.U.) is below the Secondary Drinking Water Standard range of 6.5 to 8.5 S.U. The historical pH range for this well is approximately 4 to 6.5.
- Total dissolved solids concentration of 889 mg/L exceeded the Secondary Drinking Water Standard of 500 mg/L. Total dissolved solids exhibit a decreasing trend since 2019. As noted above, following a period of increased concentrations, total dissolved solids have returned to pre-2018 concentrations.
- Sulfate concentration of 554 mg/L exceeded the Secondary Drinking Water Standard of 250 mg/L. Sulfate concentrations exhibit a decreasing trend since 2019. As noted above, following a period of increased concentrations, sulfate has returned to pre-2018 concentrations.
- Concentrations of aluminum, arsenic, beryllium, cadmium, fluoride, nickel, and zinc have exhibited similar elevated and variable concentration trends for the past few years, with noticeable peaks in 2011, 2014, 2016, and 2018, resulting in some exceedances of respective regulatory standards. Elevated concentrations of these metals are likely related to low pH occurrences when groundwater elevations are high. Since 2022, aluminum concentrations have been more consistently elevated, fluctuating around the Secondary Drinking Water Standard of 200 µg/L.
- Boron concentrations are elevated and variable (ranging from about 1,500 to 3,500 µg/L) relative to the other Basin 5 wells but meet the Act 2 residential Statewide Health Standard of 6,000 µg/L. Boron exhibits a general decreasing trend since 2012 (except for upward fluctuations from mid-2018 to 2022 as noted above).
- Iron is present at low concentrations, and typically is below the Secondary Drinking Water Standard. Iron (total) occasionally exceeds the standard.
- Lithium (dissolved) concentration of 589 µg/L exceeded the Act 2 residential Statewide Health Standard of 69 µg/L. Lithium concentrations at MW-4-10 are the most elevated of all Basin 5 wells but exhibit a slightly decreasing trend since 2012.
- Manganese (dissolved) concentration of 1,080 µg/L exceeded the Secondary Drinking Water Standard of 50 µg/L and the Act 2 residential Statewide Health Standard of 300 µg/L. Manganese concentrations are elevated and variable but exhibit a relatively stable long-term trend.

- Molybdenum (dissolved) concentration of 301 µg/L exceeded the Act 2 residential Statewide Health Standard of 40 µg/L. Molybdenum concentrations at MW-4-10 are the most elevated and variable of the Basin 5 wells, but the long-term trend is decreasing.
- Potassium and sodium concentrations are elevated relative to the other Basin 5 wells. Potassium demonstrates an increasing trend, while sodium demonstrates a decreasing trend. There are no EPA drinking water or PA Act 2 standards for potassium and sodium.
- Selenium is variable and demonstrates a long-term increasing trend, similar to the increasing trend at background well MW-19, but more variable since 2014. Concentrations have been below the Act 2 residential Statewide Health Standard of 50 µg/L, except for the fourth quarter of 2018.

2. **MW-8-1N** - MW-8-1 was decommissioned on March 27, 2013, shortly after first quarter 2013 sampling was conducted, to accommodate the footprint of the railroad extension project. MW-8-1 was replaced by MW-8-1N (as installed on September 17, 2013) and quarterly sampling was initiated in the third quarter of 2013. Key results for this quarter and trends for MW-8-1N are as follows:
   - pH is near neutral, but slightly acidic, sometimes below the Secondary Drinking Water Standard range of 6.5 to 8.5 S.U.
   - Total dissolved solids concentration of 845 mg/L exceeded the Secondary Drinking Water Standard of 500 mg/L. Total dissolved solids concentrations increased after the well was installed (in 2013) until the second quarter of 2015. Since then, concentrations have generally decreased. Specific conductance exhibits a similar trend. These trends for TDS and specific conductance are likely related to similar trends for calcium, magnesium, sodium, strontium, and sulfate at MW-8-1N.
   - Sulfate concentration of 357 mg/L exceeded the Secondary Drinking Water Standard of 250 mg/L. Like total dissolved solids, sulfate concentrations had increased until the second quarter of 2015, but concentrations have since decreased and are now below 400 mg/L.
   - Boron concentrations are well below the Act 2 residential Statewide Health Standard of 6,000 mg/L and are the lowest of all Basin 5 wells.
   - Calcium and magnesium concentrations were elevated (compared to most other Basin 5 wells) from 2015 to 2018, but recent concentrations have decreased similar to the trend for total dissolved solids (discussed above). There are no EPA drinking water or PA Act 2 standards for these parameters.
   - Chloride and sodium concentrations have historically been elevated and variable compared to the other Basin 5 wells, but chloride has always been below the Secondary Drinking Water Standard of 250 mg/L. Since 2014 and 2015 respectively, chloride and sodium concentrations have decreased significantly (with variability) and are now comparable to concentrations at several other Basin 5 wells.

- Iron concentrations are elevated and variable relative to most Basin 5 wells, typically exceeding the Secondary Drinking Water Standard of 0.3 mg/L.
- Manganese (dissolved) concentration of 1,510 µg/L exceeded the Secondary Drinking Water Standard of 50 µg/L and the Act 2 residential Statewide Health Standard of 300 µg/L. Manganese concentrations are elevated but exhibit a long-term stable trend with some variability.
- Strontium is usually the most elevated of all the Basin 5 wells (except for recent upward fluctuations at MW-4-10) and exhibits a relatively stable trend since 2015. Strontium concentrations are below the Act 2 residential Statewide Health Standard of 4,000 µg/L.

3. **MW-8-2** - Key results for this quarter and trends for MW-8-2 are as follows:
   - pH is stable and near neutral, but is occasionally below the Secondary Drinking Water range of 6.5 to 8.5 S.U.
   - Sulfate and total dissolved solids had exhibited long-term stable trends below the respective Secondary Drinking Water Standards of 250 mg/L and 500 mg/L. However, concentrations have fluctuated upward since the first quarter of 2023, resulting in total dissolved solids exceeding the standard.
   - Manganese (dissolved) concentration of 727 µg/L exceeded the Secondary Drinking Water Standard of 50 µg/L and the Act 2 residential Statewide Health Standard of 300 µg/L. Concentrations exhibit a long-term stable trend with some variability.
   - Molybdenum (dissolved) concentration of 243 µg/L exceeded the Act 2 residential Statewide Health Standard of 40 µg/L. However, concentrations exhibit a fairly stable trend.
   - Strontium concentrations exhibits a slight long-term increasing trend but are below the Act 2 residential Statewide Health Standard of 4,000 µg/L.

4. **MW-8-3A and MW-8-3B** - Key results for this quarter and trends for MW-8-3A and MW-8-3B are as follows:
   - pH is stable and near neutral at both wells, but slightly lower at MW-8-3A. pH at MW-8-3A is sometimes slightly below the Secondary Drinking Water Standard range of 6.5 to 8.5 S.U.
   - Total dissolved solids concentrations at both wells exhibit increasing long-term trends with some variability. Concentrations are higher and more variable at MW-8-3A. The total dissolved solids concentration at MW-8-3A typically exceeds the Secondary Drinking Water Standard of 500 mg/L, while concentrations at MW-8-3B typically fluctuate around the standard.
   - Sulfate concentrations in both wells exhibit relatively stable long-term trends with some variability. Sulfate concentrations at MW-8-3A typically fluctuate around the Secondary Drinking Water Standard of 250 mg/L, while concentrations at MW-8-3B are typically below the standard.

- Arsenic (dissolved) concentrations at both wells exhibit stable long-term trends with seasonal variability. Peak concentrations exceed the Primary Drinking Water Standard of 10 µg/L (not since 2011 at MW-8-3B). Dissolved arsenic concentrations at MW-8-3A typically range from 3 to 20 µg/L over the past 10 years. Since 2019, total arsenic at MW-8-3A exhibits increased variability. At MW-8-3B, arsenic concentrations exhibit a decreasing trend since approximately 2019. Brunner believes that relatively permeable material is associated with relic stream channels existing beneath Basin 5, potentially accounting for arsenic detections at wells MW-8-3A and MW-8-3B.
- Iron concentrations at MW-8-3A are variable and exceed the Secondary Drinking Water Standard of 0.3 mg/L (possibly due to impacts from historical pyritic material handling). Iron is present in MW-8-3B, but at much lower concentrations than at MW-8-3A, suggesting possibly more impact in the upper part of the water-bearing zone (and/or possibly a higher iron concentration related to the high turbidity within MW-8-3A groundwater). Peak iron concentrations in MW-8-3B exceed the standard.
- Manganese concentrations in both wells exceed the Secondary Drinking Water Standard of 50 µg/L and the Act 2 residential Statewide Health Standard of 300 µg/L but exhibit long-term stable trends with some variability. Since 2019, manganese at MW-8-3A exhibits increased variability.
- Molybdenum concentrations in both wells normally exceed the Act 2 residential Statewide Health Standard of 40 µg/L but exhibit long-term stable/slight decreasing trends.

5. **MW-8-4** - Key results for this quarter and trends for MW-8-4 are as follows:
   - Field pH at MW-8-4 is typically below the Secondary Drinking Water Standard range of 6.5 to 8.5 S.U., but exhibits an increasing trend.
   - Sulfate and total dissolved solids concentrations are elevated and variable at MW-8-4 and exceed Secondary Drinking Water Standards, but exhibit decreasing long-term trends. As a result of the decreasing long-term trends, sulfate and total dissolved solids concentrations fluctuate around the respective standards.
   - Aluminum concentrations are elevated and variable relative to most other Basin 5 wells, sometimes exceeding the Secondary Drinking Water Standard of 200 µg/L.
   - Beryllium, cadmium, nickel, and zinc concentrations had been variable and elevated relative to other Basin 5 wells. However, since 2012, concentrations have generally decreased and have been less variable. These parameters now meet respective regulatory standards.
   - Chloride concentrations are seasonally variable but remain well below the Secondary Drinking Water Standard of 250 mg/L. Peak chloride concentrations have decreased since 2015.
   - Manganese concentrations remain elevated at 6,320 µg/L compared to the Secondary Drinking Water Standard of 50 µg/L and the Act 2 residential Statewide Health Standard of 300 µg/L. Manganese concentrations at MW-8-4 are the most elevated and variable of all

the Basin 5 wells, but concentrations exhibit a long-term downward trend with decreasing variability.

6. **MW-8-5A and MW-8-5B** - These wells are located at the northwestern corner of Basin 5. Key results for this quarter and trends for MW-8-5A and MW-8-5B are as follows:
   - pH is stable and near neutral at both wells.
   - Total dissolved solids concentrations are elevated in excess of the Secondary Drinking Water Standard in both wells, with stable long-term trends (current concentrations of 735 and 736 µg/L for MW-8-5A and MW-8-5B, respectively).
   - Sulfate concentrations demonstrate stable long-term trends in MW-8-5A and MW-8-5B with current concentrations of 297 mg/L and 307 mg/L, respectively, compared to the Secondary Drinking Water Standard of 250 mg/L.
   - Arsenic (dissolved) concentrations in MW-8-5A and MW-8-5B are elevated (current concentrations of 120 µg/L and 216 µg/L, respectively) in excess of the Primary Drinking Water Standard of 10 µg/L. Arsenic concentrations at MW-8-5B exhibit a slight decreasing trend, but concentrations have exhibited increased variability since 2019. Concentrations at MW-8-5A exhibit a stable long-term trend.

     Note: PPL's groundwater consultant, Ish Inc., confirmed that Basin 5 is the source of arsenic identified in MW-8-5A and MW-8-5B. As part of the assessment conducted to investigate the elevated arsenic in MW 8-5 area, Ish Inc. established that arsenic attenuates quickly and is not elevated in the new point of compliance wells MW-8-10A and MW 8-10B.
   - Lithium concentrations exceed the Act 2 residential Statewide Health Standard of 69 µg/L but demonstrate fairly stable long-term trends at both wells (current concentrations of 197 µg/L and 159 µg/L for MW-8-5A and MW-8-5B, respectively), but concentrations have exhibited increased variability since the fourth quarter of 2019.
   - Manganese concentrations exceed the Secondary Drinking Water Standard of 50 µg/L and the Act 2 residential Statewide Health Standard of 300 µg/L in both wells (current concentrations of 453 and 447 µg/L for MW-8-5A and MW-8-5B respectively). Manganese exhibits a slight increasing trend at MW-8-5A and a slight decreasing trend at MW-8-5B.
   - Molybdenum concentrations exceed the Act 2 residential Statewide Health Standard of 40 µg/L in both wells (current concentrations of 301 and 272 µg/L for MW-8-5A and MW-8-5B respectively) but exhibit slightly decreasing long-term concentration trends with increased variability since the third quarter of 2019.
   - Strontium concentrations exhibit increasing trends in both wells. Strontium concentrations are below the Act 2 residential Statewide Health Standard of 4,000 µg/L.

7. **MW-8-10A, MW-8-10B, and MW-8-10C** - Monitoring wells MW-8-10A, MW-8-10B, and MW-8-10C were added to the monitoring program as part of Area 8 monitoring system located within Basin 5. These wells also serve as the point of compliance wells, downgradient of MW-

8-5A and MW-8-5B. MW-8-10A and MW-8-10B are sampled quarterly while MW-8-10C is sampled annually during the second calendar quarter. Most importantly, arsenic concentrations in MW-8-10A, MW-8-10B, and MW-8-10C continue to meet the Primary Drinking Water Standard of 10 µg/L and exhibit stable/decreasing trends. Other key results and trends for these wells for this quarter are as follows:

- MW-8-10B demonstrates typically slightly alkaline pH and overall better and more stable water quality than MW-8-10A and MW-8-10C. pH at MW-8-10C is also slightly alkaline.
- pH at MW-8-10A is near neutral, but lower than pH at MW-8-10B and MW-8-10C. pH at MW-8-10A is sometimes slightly below the Secondary Drinking Water Standard range of 6.5 to 8.5 S.U.
- Sulfate and total dissolved solids concentrations at MW-8-10A exceed the Secondary Drinking Water Standards, and exhibit an increasing trend since 2021 (after previously fluctuating around the respective standards since 2018). These trends appear to be related to similar trends for calcium, magnesium, specific conductivity, and strontium. At MW-8-10B, total dissolved solids concentrations are fairly stable and fluctuate around the 500 mg/L standard. Sulfate concentrations at MW-8-10B are below the 250 mg/L standard and exhibit a slight decreasing trend.
- Iron concentrations at MW-8-10C are variable and occasionally exceed the Secondary Drinking Water Standard of 0.3 mg/L. During the second quarter of 2023, dissolved iron at MW-8-10C fluctuated upward beyond the historical range of variability, exceeding the Secondary Drinking Water Standard of 0.3 mg/L.
- Manganese concentrations at MW-8-10A are elevated and seasonally variable, exceeding the Secondary Drinking Water Standard of 50 µg/L and historically had exceeded the Act 2 residential Statewide Health Standard of 300 µg/L. However, peak manganese concentrations at MW-8-10A have decreased significantly since 2018 (below the Act 2 standard). Manganese concentrations at MW-8-10C normally exceed both standards but are less variable than at MW-8-10A.
- Molybdenum concentrations at MW-8-10C exceed the Act 2 residential Statewide Health Standard of 40 µg/L, while concentrations at MW-8-10A and MW-8-10B sometimes exceed the standard. Similar to manganese, peak molybdenum concentrations at MW-8-10A have decreased significantly since 2018 and have not exceeded the standard since the first quarter of 2018.
- Vanadium concentrations at MW-8-10B fluctuate around the limit of quantification, but are well below the Act 2 residential Statewide Health Standard of 170 µg/L, which was increased in 2023.
- During the second quarter of 2023, at MW-8-10C, several dissolved metals fluctuated below the historical range of variability including barium, boron, calcium, iron, magnesium, and strontium; and iron fluctuated above the historical range of variability.

8. **MW-8-12C** - Sampling is required at MW-8-12C annually in the second calendar quarter. Key results and trends for the second quarter of 2023 were as follows:
   - Iron (dissolved) concentration of 0.59 mg/L exceeded the Secondary Drinking Water Standard of 0.3 mg/L. Iron concentrations have generally decreased with variability since 2016.
   - Manganese (dissolved) concentration of 1,610 µg/L exceeded the Secondary Drinking Water Standard of 50 µg/L and the Act 2 residential Statewide Health Standard of 300 µg/L.
   - Molybdenum (dissolved) concentration of 414 µg/L exceeded the Act 2 residential Statewide Health Standard of 40 µg/L. Molybdenum concentrations have fluctuated between approximately 150 and 450 µg/L over the past ten years.
   - Several parameters fluctuated downward during the second quarter of 2019 at MW-8-12C including boron, calcium, iron, magnesium, manganese, molybdenum, potassium, specific conductivity, sulfate, total dissolved solids, and total organic carbon. Barium and strontium fluctuated upward. Since the second quarter of 2020, each of these parameters returned to concentrations consistent with respective historical trends.

9. **MW-8-8A, MW-8-8B, MW-8-9B, and MW-8-9C** – These wells were added to the sampling schedule beginning with the third quarter of 2022. For these wells, the only metals analyzed are arsenic, lithium, manganese, and molybdenum (all other Basin 5 field parameters and non-metals are also analyzed). Key results for this quarter are as follows:
   - Arsenic (dissolved) concentrations at these wells ranged from 354 to 676 µg/L, exceeding the Primary Drinking Water Standard of 10 µg/L for each of these wells. Generally arsenic concentration decreases with depth at the locations of paired wells; for example, the concentration is lower at MW-8-9C, which has a deeper screened depth, than at MW-8-9B.
   - Lithium (dissolved) concentrations at these wells ranged from 132 to 249 µg/L, exceeding the Act 2 residential Statewide Health Standard of 69 µg/L for each of these wells.
   - Manganese (dissolved) concentrations at these wells ranged from non-detect to 1,300 µg/L, exceeding the Act 2 residential Statewide Health Standard of 300 µg/L for three of these wells.
   - Molybdenum (dissolved) concentrations at these wells ranged from 190 to 295 µg/L, exceeding the Act 2 residential Statewide Health Standard of 40 µg/L for each of these wells.
   - Sulfate concentrations at these wells ranged from 150 to 302 mg/L, exceeding the Secondary Water Standard of 250 mg/L for three of these wells.
   - Total dissolved solids concentrations at these wells ranged from 503 to 1,170 mg/L, exceeding the Secondary Drinking Water Standard of 500 mg/L for each of these wells.

Pyrite Tomb Monitoring

1. **Pyrite Tomb Standpipe –** The pyrite tomb is monitored at least monthly for water depth and field pH, and quarterly reporting (via this quarterly groundwater report) began in the 2nd

quarter of 2017. Brunner planned to collect two additional (last) samples from the pyrite tomb standpipe during the 3rd and 4th quarters of 2017 for laboratory analysis (as previously). However, on both quarterly sampling occasions, the standpipe contained too little water to sample (lack of water is a favorable condition). A summary table of the field monitoring results for 2017 thru current is provided in Attachment 2. Trend plots for the field parameters (pH, water depths, water elevations) are provided with the electronic submission of this report.

2. **MW-PT-1 –** Downgradient monitoring well MW-PT-1 was installed in January 2017 to help assess the Pyrite Tomb area. This well is located outside of the Basin 5 berm material in native alluvial sediments. Since monitoring of MW-PT-1 commenced, many parameters have exhibited significant variability. Analytical results for the pyrite tomb monitoring well MW-PT-1 are included on Attachment 1, *Summary Table of Basin 5 Groundwater Monitoring Results*, and trend plots for these parameters (as applicable) are provided with the electronic submission of this report. Key results for this quarter are as follows:

   - pH (6.39 S.U.) was below the Secondary Drinking Water Standard range of 6.5 to 8.5 S.U. Lower pH and alkalinity values at MW-PT-1 appear to correlate with higher groundwater elevations.
   - Total dissolved solids concentration of 553 mg/L exceeded the Secondary Drinking Water Standard of 500 mg/L.
   - Since 2022, nitrate concentrations at MW-PT-1 have been more variable, occasionally exceeding the Primary Drinking Water Standard of 10 mg/L.
   - Sulfate concentration of 304 mg/L exceeded the Secondary Drinking Water Standard of 250 mg/L.
   - Aluminum (total) concentration of 372 µg/L exceeded the Secondary Drinking Water Standard of 200 µg/L.
   - Lithium (total) concentration of 186 µg/L exceeded the Act 2 residential Statewide Health Standard of 69 µg/L.
   - Manganese (total) concentration of 4,250 µg/L exceeded the Secondary Drinking Water Standard of 50 µg/L and Act 2 residential Statewide Health Standard of 300 µg/L.
   - Molybdenum (total) concentration of 61.2 µg/L exceeded the Act 2 residential Statewide Health Standard of 40 µg/L.

ATTACHMENTS

1. Summary Table of Groundwater Monitoring Results
2. Site Plan – Overall map – Brunner Island SES
3. Site Plan – Brunner Island Basin 5
4. Pyrite Tomb Standpipe Monitoring Results
5. PADEP Form 14Rs
6. Statistics Summary
7. Trend Plots

Brunner Island, LLC

Basin No. 5 Groundwater Monitoring Results

PARAMETER	UNITS	REGULATORY CRITERIA LIMIT	GROUNDWATER MONITORING WELLS																		
			Downgradient																Pyrite Tomb Monitoring	Upgradient	
Location ID			MW-4-10	MW-8-1N	MW-8-2	MW-8-3A	MW-8-3B	MW-8-4	MW-8-5A	MW-8-5B	MW-8-10A	MW-8-10B	MW-8-10C	MW-8-12C	MW-8-8A	MW-8-8B	MW-8-9B	MW-8-9C	MW-PT-1	MW-4-7A	MW-19
Sampling Date			10/17/2023	10/12/2023	10/12/2023	10/12/2023	10/12/2023	10/13/2023	10/13/2023	10/13/2023	10/14/2023	10/14/2023			10/13/2023	10/13/2023	10/14/2023	10/14/2023	10/16/2023	10/13/2023	10/11/2023
Field Parameters (monitored quarterly)																					
Well Depth	FT		38.68	26.33	22.40	26.60	46.80	21.70	39.10	59.14	37.30	56.98			52.18	60.52	69.90	90.10	21.24	39.89	45.40
Sampling Depth	FT		34.00	23.00	15.00	20.00	40.00	18.00	33.00	52.00	32.00	52.00			46.00	54.00	64.00	85.00	19.00	35.00	33.00
Well Purge Volume	L		3.20	3.15	3.75	3.05	3.20	3.00	3.00	3.00	3.00	3.00			3.10	3.00	300.00	3.00	3.00	3.10	2.10
Depth to Water	FT		25.88	13.06	9.00	10.13	12.43	13.11	23.80	18.95	17.10	17.02			24.86	24.06	23.97	23.69	10.70	26.80	19.42
Water Surface Elevation	FT		266.83	267.58	262.50	257.25	255.28	257.08	261.24	265.93	259.37	259.25			259.34	259.58	260.37	260.99	261.07	261.21	286.38
Temperature, field	°C		13.63	17.10	13.82	13.57	13.73	13.40	12.80	13.52	13.94	31.81			14.70	15.14	14.51	14.53	14.01	15.37	13.20
pH, field	S.U.	6.5 - 8.5 S	**5.86**	6.75	6.99	6.78	7.18	7.00	7.44	7.53	6.72	7.58			7.18	7.51	7.23	7.25	**6.39**	6.91	6.98
pH, lab	S.U.	6.5 - 8.5 S	**5.97**	6.90	6.89	6.62	6.99	**6.00**	7.22	7.24	6.61	7.47			7.10	7.48	7.27	7.31	**5.66**	7.04	**6.48**
Specific Conductance, field	umhos/cm		1,266.00	1,250.00	834.00	1,304.00	1,011.00	669.00	1,108.00	1,078.00	1,181.00	929.00			1,733.00	1,387.00	1,400.00	800.00	832.00	1,512.00	226.00
Specific Conductance, lab	umhos/cm		1,300.00	1,260.00	821.00	1,270.00	986.00	656.00	1,100.00	1,070.00	1,170.00	916.00			1,760.00	1,400.00	1,410.00	807.00	825.00	1,510.00	235.00
Turbidity, field	NTU		0.93	3.74	0.44	0.56	0.33	0.70	0.12	0.28	0.20	0.49			1.32	0.44	0.55	0.96	1.35	0.44	2.02
Dissolved Oxygen, field	mg/L		1.89	0.89	1.20	0.82	0.38	0.53	0.43	0.46	0.53	0.88			0.53	2.66	1.63	1.06	0.83	0.70	1.79
Redox, field	mV		202.90	25.60	59.40	-14.60	23.60	192.00	64.00	56.00	127.00	92.00			155.10	196.60	-67.70	-122.90	158.00	154.90	212.00
Non-Metals (monitored quarterly)																					
Alkalinity, total as CaCO3	mg/L		48.60	205.00	157.00	241.00	257.00	60.40	264.00	230.00	157.00	108.00			236.00	218.00	285.00	245.00	62.60	235.00	63.40
Total Organic Carbon	mg/L		< 0.5	< 0.5	0.64	< 0.5	< 0.5	0.76	< 0.5	< 0.5	< 0.5	0.192 ND			0.192 ND	< 0.5	0.192 ND	< 0.5	1.37	0.67	0.192 ND
Total Dissolved Solids	mg/L	500 S	**889.00**	**845.00**	**514.00**	**792.00**	**598.00**	461.00	**735.00**	**736.00**	**872.00**	**679.00**			**1,170.00**	**921.00**	**914.00**	**503.00**	**553.00**	**1,140.00**	135.00
Chemical Oxygen Demand	mg/L		5.3 ND	< 20	< 20	< 20	< 20	< 20	5.3 ND	5.3 ND	5.3 ND	5.3 ND			< 20	5.3 ND	< 20	5.3 ND	5.3 ND	5.3 ND	5.3 ND
Bicarbonate	mg/L		48.60	205.00	157.00	241.00	257.00	60.40	264.00	230.00	157.00	108.00			236.00	218.00	285.00	245.00	62.60	235.00	63.40
Chloride, total as Cl	mg/L	250 S	8.50	79.30	34.20	130.00	72.40	13.60	21.10	25.20	63.40	116.00			**284.00**	145.00	115.00	19.90	5.97	12.90	9.22
Fluoride, total as F	mg/L	2 S, 4 M	< 0.2	0.23	0.91	0.33	0.37	0.32	0.91	0.69	< 0.2	< 0.2			0.57	0.75	0.35	0.77	0.29	< 0.2	0.0281 ND
Ammonia, as N	mg/L		0.066 ND	< 0.2	< 0.2	0.26	0.066 ND	0.066 ND	0.37	0.22	0.066 ND	0.066 ND			0.38	0.066 ND	0.34	0.35	0.066 ND	< 0.2	0.066 ND
Nitrate, as N	mg/L	10 M	1.15	0.0218 ND	0.0218 ND	0.0218 ND	0.0218 ND	0.0218 ND	0.0218 ND	0.0218 ND	0.0218 ND	0.0218 ND			0.0218 ND	0.76	0.0218 ND	0.0218 ND	7.01	0.0218 ND	3.84
Sulfate, as SO4	mg/L	250 S	**554.00**	**357.00**	207.00	240.00	159.00	**252.00**	**297.00**	**307.00**	**374.00**	175.00			**256.00**	**294.00**	**302.00**	150.00	**304.00**	**610.00**	23.40
Metals (monitored quarterly)																					
Aluminum, total	ug/L	200 S	161.00	< 100	< 100	< 100	< 100	**318.00**	< 100	< 100	< 100	< 100							**372.00**	< 100	< 100
Aluminum, dissolved	ug/L	200 S	137.00	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100								< 100	< 100
Antimony, total	ug/L	6 M	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND							2.18 ND	2.18 ND	2.18 ND
Antimony, dissolved	ug/L	6 M	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND	2.18 ND								2.18 ND	2.18 ND
Arsenic, total	µg/L	10 M	0.55 ND	0.55 ND	0.55 ND	**21.80**	7.09	0.55 ND	**120.00**	**231.00**	1.03	1.70			**517.00**	**429.00**	**714.00**	**370.00**	< 1	0.55 ND	< 1
Arsenic, dissolved	µg/L	10 M	0.55 ND	0.55 ND	0.55 ND	**21.10**	6.72	0.55 ND	**120.00**	**216.00**	0.55 ND	1.50			**497.00**	**404.00**	**676.00**	**354.00**		0.55 ND	0.55 ND
Barium, total	µg/L	2,000 M	12.80	30.10	45.90	71.80	71.80	17.90	42.10	69.30	25.90	45.60							29.90	15.70	332.00
Barium, dissolved	µg/L	2,000 M	12.60	27.10	44.70	72.30	75.80	17.80	42.30	69.30	24.70	47.70								18.10	333.00
Beryllium, total	ug/L	4 M	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND							< 1	0.19 ND	0.19 ND
Beryllium, dissolved	ug/L	4 M	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19 ND								0.19 ND	0.19 ND
Boron, total	µg/L	6,000 A	1,750.00	< 100	570.00	525.00	380.00	266.00	919.00	895.00	497.00	274.00							708.00	1,710.00	< 100
Boron, dissolved	µg/L	6,000 A	1,660.00	< 100	505.00	489.00	363.00	268.00	961.00	993.00	515.00	287.00								1,910.00	< 100
Cadmium, total	µg/L	5 M	< 1	0.15 ND	< 1	0.15 ND	0.15 ND	< 1	< 1	< 1	0.15 ND	0.15 ND							1.01	0.15 ND	0.15 ND
Cadmium, dissolved	µg/L	5 M	< 1	0.15 ND	< 1	0.15 ND	0.15 ND	< 1	< 1	< 1	0.15 ND	0.15 ND								0.15 ND	0.15 ND
Calcium, total	mg/L		142.00	209.00	130.00	197.00	160.00	76.30	173.00	174.00	168.00	134.00							102.00	250.00	28.30
Calcium, dissolved	mg/L		135.00	191.00	124.00	189.00	163.00	77.20	181.00	180.00	173.00	137.00								262.00	27.20
Chromium, total	µg/L	100 M	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND							1.39	0.41 ND	0.41 ND
Chromium, dissolved	µg/L	100 M	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND	0.41 ND								0.41 ND	0.41 ND
Copper, total	µg/L	1,000 S, 1,300 M	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND							0.39 ND	0.39 ND	< 1
Copper, dissolved	µg/L	1,000 S, 1,300 M	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND	0.39 ND								0.39 ND	0.39 ND
Iron, total	mg/L	0.3 S	0.04	**0.55**	0.03	**7.73**	**0.32**	0.0122 ND	0.0122 ND	0.0122 ND	0.0122 ND	0.02							0.12	0.0122 ND	0.11
Iron, dissolved	mg/L	0.3 S	< 0.02	0.19	0.03	**7.00**	0.26	0.001 ND	< 0.02	< 0.02	< 0.02	< 0.02								< 0.02	< 0.02
Lead, total	µg/L	5 A, 15 M	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND							0.08 ND	0.08 ND	0.08 ND
Lead, dissolved	µg/L	5 A, 15 M	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND	0.08 ND								0.08 ND	< 1
Lithium, total	µg/L	69 A	**614.00**	1.26	23.10	21.40	25.90	11.40	**196.00**	**164.00**	12.90	11.80			**244.00**	**254.00**	**205.00**	**145.00**	**186.00**	**227.00**	3.85
Lithium, dissolved	µg/L	69 A	**589.00**	1.09	20.60	20.10	24.80	13.80	**197.00**	**159.00**	15.60	14.30			**249.00**	**248.00**	**193.00**	**132.00**		**97.30**	2.98
Magnesium, total	mg/L		13.20	33.90	21.50	35.40	28.50	24.60	34.80	30.30	40.30	23.50							23.80	38.30	4.08
Magnesium, dissolved	mg/L		12.70	31.60	20.60	33.40	28.30	25.90	36.60	33.30	41.70	24.30								42.20	3.80
Manganese, total	µg/L	50 S, 300 A	**1,150.00**	**1,660.00**	**787.00**	**9,190.00**	**1,830.00**	**6,840.00**	**408.00**	**409.00**	**425.00**	21.00			**1,080.00**	5.31 ND	**1,270.00**	**899.00**	**4,250.00**	**158.00**	5.31 ND
Manganese, dissolved	µg/L	50 S, 300 A	**1,080.00**	**1,510.00**	**727.00**	**8,680.00**	**1,760.00**	**6,320.00**	**453.00**	**447.00**	**445.00**	27.00			**1,110.00**	5.31 ND	**1,300.00**	**919.00**		**292.00**	5.31 ND
Mercury, total	µg/L	2 M	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND							0.72 ND	0.72 ND	0.72 ND
Mercury, dissolved	µg/L	2 M	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND	0.72 ND								0.72 ND	0.72 ND

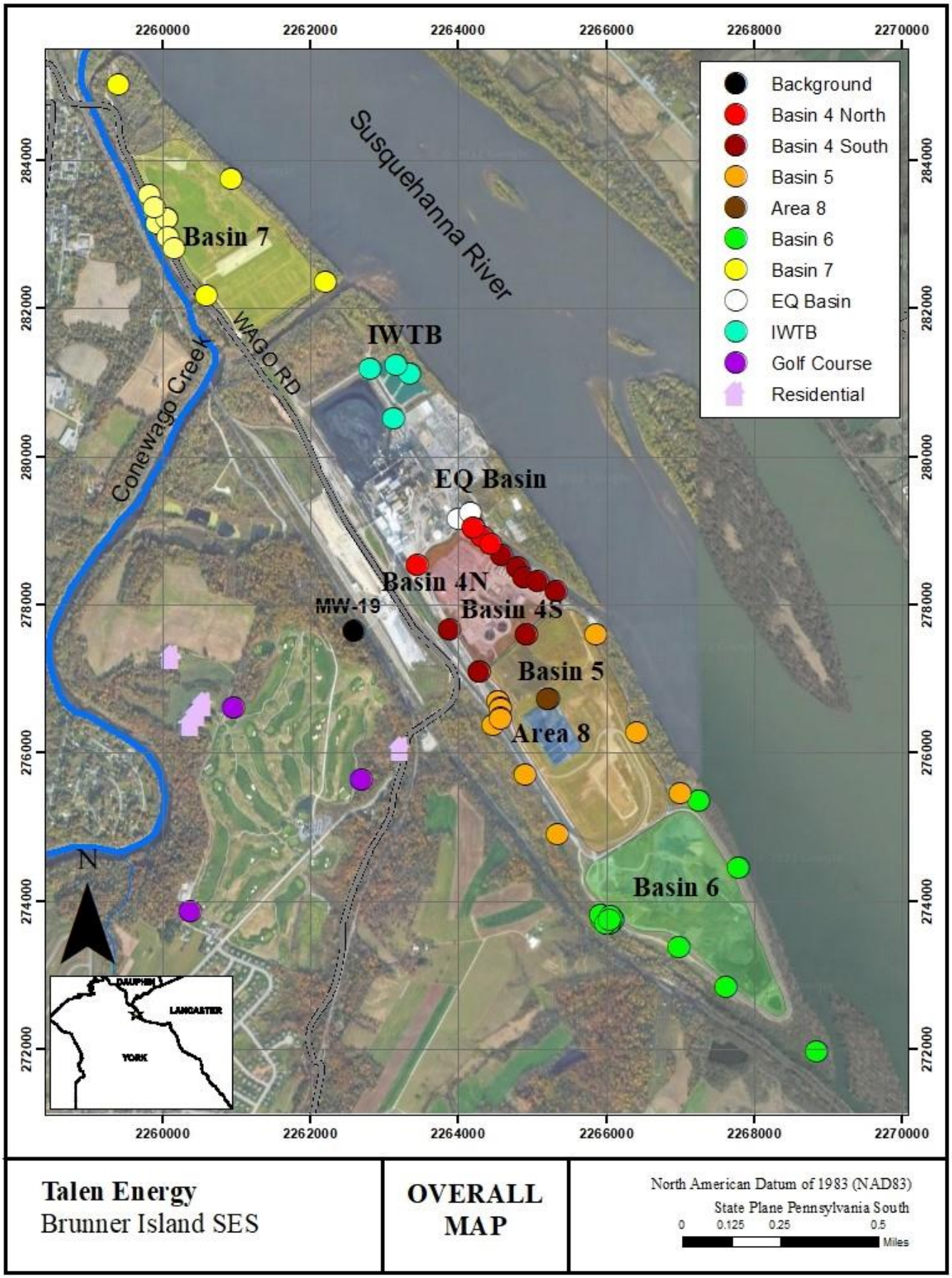
Brunner Island, LLC

Basin No. 5 Groundwater Monitoring Results

PARAMETER	UNITS	REGULATORY CRITERIA LIMIT	GROUNDWATER MONITORING WELLS																		
			Downgradient																Pyrite Tomb Monitoring	Upgradient	
Location ID			MW-4-10	MW-8-1N	MW-8-2	MW-8-3A	MW-8-3B	MW-8-4	MW-8-5A	MW-8-5B	MW-8-10A	MW-8-10B	MW-8-10C	MW-8-12C	MW-8-8A	MW-8-8B	MW-8-9B	MW-8-9C	MW-PT-1	MW-4-7A	MW-19
Sampling Date			10/17/2023	10/12/2023	10/12/2023	10/12/2023	10/12/2023	10/13/2023	10/13/2023	10/13/2023	10/14/2023	10/14/2023			10/13/2023	10/13/2023	10/14/2023	10/14/2023	10/16/2023	10/13/2023	10/11/2023
Molybdenum, total	µg/L	40 A	317.00	0.78 ND	244.00	71.10	92.80	0.78 ND	320.00	290.00	24.00	23.30			283.00	250.00	200.00	234.00	61.20	20.40	0.78 ND
Molybdenum, dissolved	µg/L	40 A	301.00	0.78 ND	243.00	71.90	97.50	0.78 ND	301.00	272.00	24.60	23.70			295.00	245.00	190.00	214.00		22.10	0.78 ND
Nickel, total	ug/L	100 A	17.70	1.29	1.71	2.47	< 1	46.20	< 1	< 1	1.04	0.28 ND							43.70	1.51	0.28 ND
Nickel, dissolved	ug/L	100 A	16.20	< 1	1.52	2.29	< 1	46.40	< 1	< 1	1.02	0.28 ND								1.85	0.28 ND
Potassium, total	mg/L		106.00	12.10	7.44	3.71	1.99	1.59	4.32	4.38	2.83	2.39							21.50	4.68	< 1
Potassium, dissolved	mg/L		97.80	11.00	6.51	3.38	1.91	1.65	4.57	4.47	2.97	2.52								4.92	< 1
Selenium, total	µg/L	50 M	16.60	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND							0.63 ND	0.63 ND	22.00
Selenium, dissolved	µg/L	50 M	16.30	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND	0.63 ND								0.63 ND	20.90
Silver, total	µg/L	100 A	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND							0.13 ND	0.13 ND	0.13 ND
Silver, dissolved	µg/L	100 A	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND	0.13 ND								0.13 ND	0.13 ND
Sodium, total	mg/L		60.00	37.50	18.80	35.40	9.78	12.10	11.80	11.10	21.60	7.58							18.40	59.20	8.16
Sodium, dissolved	mg/L		56.10	34.00	16.90	33.10	9.33	12.20	12.80	11.60	22.20	8.10								63.20	7.42
Strontium, total	µg/L	4,000 A	1,310.00	1,610.00	838.00	1,060.00	484.00	231.00	798.00	975.00	355.00	295.00							631.00	377.00	53.00
Strontium, dissolved	µg/L	4,000 A	1,250.00	1,440.00	712.00	963.00	447.00	240.00	844.00	1,030.00	370.00	315.00								429.00	51.00
Titanium, total	µg/L		0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND							0.7 ND	0.7 ND	0.7 ND
Titanium, dissolved	µg/L		0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND	0.7 ND								0.7 ND	0.7 ND
Vanadium, total	µg/L	170 A	0.53 ND	0.53 ND	0.53 ND	0.53 ND	< 5	0.53 ND	< 5	< 5	0.53 ND	< 5							0.53 ND	< 5	< 5
Vanadium, dissolved	µg/L	170 A	0.53 ND	0.53 ND	0.53 ND	0.53 ND	< 5	0.53 ND	< 5	< 5	0.53 ND	< 5								< 5	0.53 ND
Zinc, total	µg/L	2,000 A, 5,000 S	30.00	< 5	< 5	< 5	< 5	35.70	< 5	< 5	7.31	< 5							58.00	< 5	< 5
Zinc, dissolved	µg/L	2,000 A, 5,000 S	25.40	< 5	< 5	< 5	< 5	33.20	< 5	1.12 ND	6.90	1.12 ND								< 5	< 5

Notes:

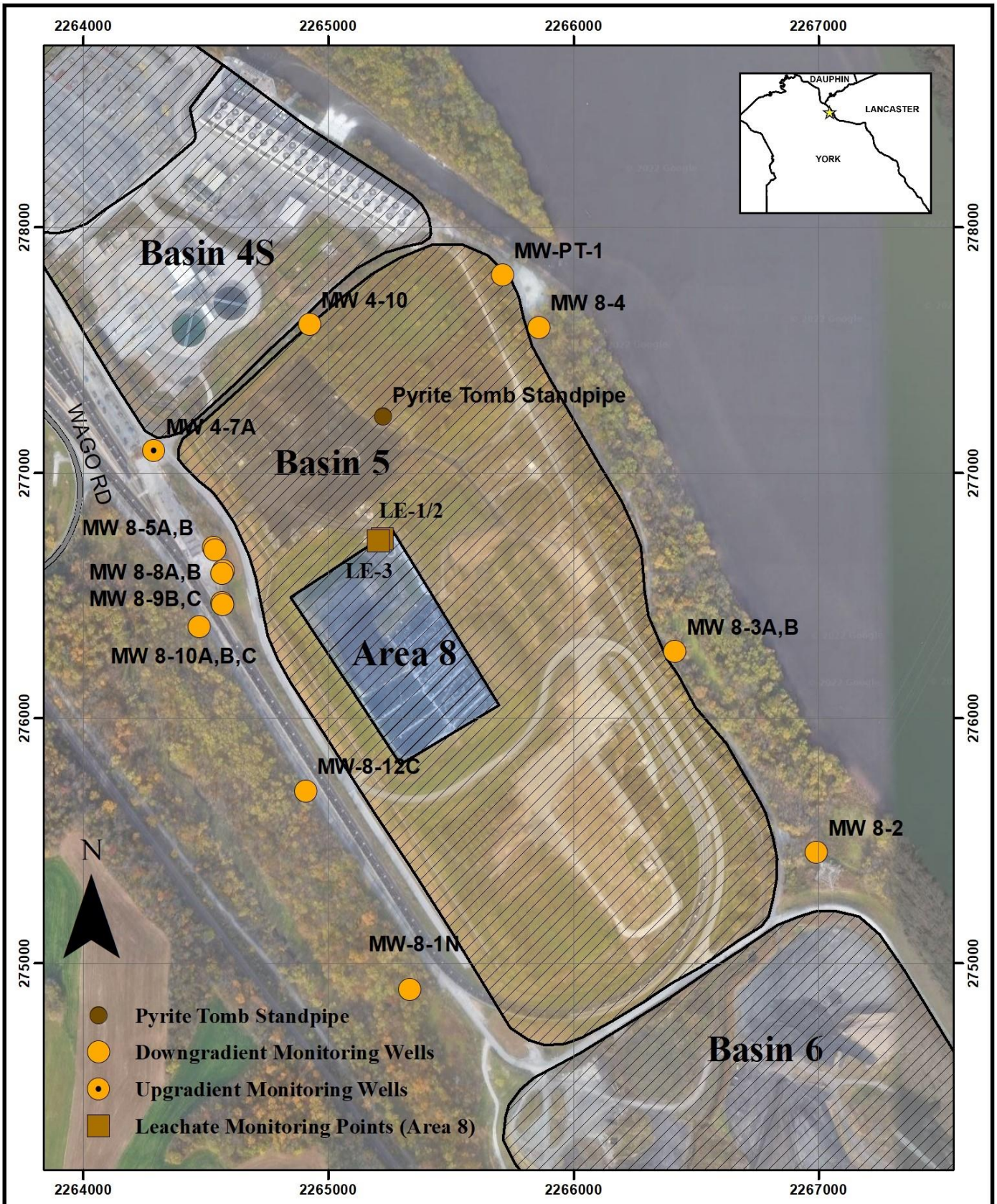
1. Regulatory qualifier codes: M = EPA Primary Drinking Water MCL/TT, S = EPA Secondary Drinking Water MCL, and A = Pennsylvania Act 2 residential Statewide Health Standard for used aquifers.
2. MW-19 was sampled for additional parameters (Ga, Ge, Rb, Y) pursuant to Basin No. 7 sampling requirements.
3. MW-4-7A, MW-4-10, and MW-19 are additionally sampled for organic parameters during the second and third calendar quarters pursuant to Basin No. 4 South sampling requirements.
4. MW-8-10C and MW-8-12C are sampled anually during the second calendar quarter.



Talen Energy
Brunner Island SES

OVERALL MAP

North American Datum of 1983 (NAD83)
State Plane Pennsylvania South
0 0.125 0.25 0.5
Miles



Talen Energy
Brunner Island SES
Basin No. 5

SITE MAP

North American Datum of 1983 (NAD83)
State Plane Pennsylvania South
0 250 500 1,000
Feet

Pyrite Tomb Standpipe Monitoring Results

	Pyrite Tomb Standpipe			
Date	Water Depth (ft)	Water Surface Elevation (ft)	pH (S.U.)	Comments
1/3/2017	25.85	269.60	7.61	
1/12/2017	26.00	269.45	7.54	
1/18/2017	29.03	266.42	8.88	Standpipe cleanout 1/17/2017
1/25/2017	28.79	266.66	7.84	Sampled the tomb (with bailer)
1/31/2017	28.79	266.66	8.25	
2/7/2017	28.78	266.67	7.97	
2/13/2017	28.85	266.60	7.41	
3/6/2017	28.70	266.75	7.11	
4/4/2017	28.62	266.83	7.49	
4/15/2017	28.57	266.88	7.11	
4/20/2017	30.71	264.74	7.70	
5/9/2017	29.08	266.37	7.77	
6/22/2017	27.72	267.73	7.43	Purged 24.5 gal.
6/23/2017	30.92	264.53	7.97	Sampled the tomb after recharging (17.5 hours)
8/3/2017	28.41	267.04	7.53	
9/1/2017	28.18	267.27	7.15	
9/21/2017	30.80	264.65	N/A	Sample attempted, but not enough water in standpipe.
9/28/2017	30.70	264.75	N/A	Sample attempted again, but not enough water in standpipe.
10/2/2017	30.65	264.80	7.18	
12/5/2017	30.21	265.24	7.48	
12/14/2017	N/A	N/A	N/A	Sample attempted again, but not enough water in standpipe.
Lab analytical attempts discontinued in 2018; Attempts to purge water continuing quarterly.				
1/25/2018	N/A	N/A	N/A	Water elevation not high enough to record depth to water.
2/19/2018	30.57	264.88	6.94	
3/4/2018	30.33	265.12	6.48	Purged 5.25 Liters
4/12/2018	31.20	264.25	7.24	
5/14/2018	31.16	264.29	6.96	Purged 1.7 liters. Wouldn't purge further.
5/29/2018	31.24	264.21	N/A	Not enough water in tomb to get a pH reading
6/7/2018	31.32	264.13	N/A	Not enough water in tomb to get a pH reading
7/7/2018	29.40	266.05	7.38	
8/2/2018	28.64	266.81	7.42	
8/13/2018	27.93	267.52	N/A	
9/13/2018	23.56	271.89	7.76	Pumped tomb down to 31.43'. Purged 35.25 L.
10/5/2018	22.22	273.23	7.69	
11/5/2018	22.15	273.30	8.2	Purged 52.5 L.
12/10/2018	19.55	275.90	7.95	
1/10/19	19.75	275.70	7.62	

Pyrite Tomb Standpipe Monitoring Results

	Pyrite Tomb Standpipe			
Date	Water Depth (ft)	Water Surface Elevation (ft)	pH (S.U.)	Comments
2/22/19	19.22	276.23	7.46	Purged 20 L. Water level was not dropping.
3/13/19	18.80	276.65	7.43	
4/2/2019	18.18	277.27	7.4	
5/16/2019	18.20	277.25	8.22	
6/18/2019	18.55	276.90	7.28	Purged 45 L. Water level was not dropping.
7/23/2019	18.58	276.87	7.35	
8/13/2019	19.00	276.45	7.39	Water level did not drop after 7 hours of pumping. Purged 91 L.
9/5/2019	19.71	275.74	7.24	
10/1/2019	20.32	275.13	7.43	
11/19/2019	21.14	274.31	7.88	Purged 42.5 L. Temp = 13.45^{o}C, SpC = 2465 µmhos/cm, Redox = -85.5 mV, DO = 2.01 mg/L, Turb = 1.00 NTU.
12/19/2019	21.65	273.80	7.39	
1/16/2020	21.47	273.98	7.42	
2/24/2020	21.11	274.34	7.66	Purged 53.5 L. Water level did not drop during purge.
3/11/2020	21.21	274.24	7.07	
4/1/2020	21.37	274.08	6.85	
5/28/2020	21.20	274.25	6.88	Purged 24 L.
6/1/2020	21.38	274.07	7.45	
7/17/2020	22.05	273.40	7.17	
8/20/2020	22.66	272.79	7.12	
9/30/2020	23.44	272.01	6.92	Purged 36 L on 10/6/2020. Did not drop.
10/13/2020	23.63	271.82	7.18	
11/5/2020	24.06	271.39	7.05	Purged 24 L. Temp = 14.7^{o}C, Recharge rate = 0.00165 L/min
12/22/2020	24.67	270.78	7.23	
1/12/2021	24.67	270.78	7.22	Temp = 13.1°C
2/25/2021	24.82	270.63	7.42	Temp = 12.8°C
3/10/2021	24.75	270.70	7.11	Temp = 13.9°C
4/30/2021	23.90	271.55	7.31	Purged 27 L. Temp = 14.1°C
5/4/2021	23.88	271.57	7.22	
6/10/2021	24.16	271.29	7.54	Temp = 15.0°C
7/28/2021	25.53	269.92	7.06	Purged 20 L. Temp = 15.0°C
8/16/2021	24.63	270.82	7.32	Temp = 15.5°C
9/22/2021	24.48	270.97	7.02	
10/23/2021	23.75	271.10	6.82	Purged 84 L
11/30/2021	23.86	271.59	7.28	Temp = 11.6°C
12/1/2021	23.80	271.65	7.31	
1/29/2022	24.52	270.93	7.62	Purged 66 L
2/2/2022	24.54	270.91	7.62	Temp = 12.6°C

Pyrite Tomb Standpipe Monitoring Results

	Pyrite Tomb Standpipe			
Date	Water Depth (ft)	Water Surface Elevation (ft)	pH (S.U.)	Comments
3/23/2022	24.71	270.74	6.97	Temp = 12.5°C
4/25/2022	24.65	270.80	7.29	Purged 30 L. Temp = 13.7°C
5/12/2022	24.73	290.72	7.09	
6/18/2022	23.96	271.49	7.08	Temp = 14.5°C
7/27/2022	24.35	271.10	6.87	Purged 40 L. Temp = 16.1°C
8/3/2022	24.60	270.85	6.58	
9/29/2022	24.90	270.55	6.30	
10/24/2022	25.10	270.35	6.96	Purged 104 L
11/28/2022	25.70	269.75	7.82	
12/21/2022	25.74	269.71	7.19	
1/28/2023	25.80	269.65	7.42	Purged 57 L
2/1/2023	26.05	269.40	7.96	
3/29/2023	25.85	269.60	7.07	
4/26/2023	25.83	269.62	7.55	Purged 12.6 L
5/11/2023	26.00	269.45	7.70	
6/20/2023	25.84	269.61	7.68	
7/29/2023	24.88	270.57	7.34	Purged 18 L. Temp = 16.6°C
8/26/2023	25.97	269.48	7.39	Temp = 14.8°C
9/14/2023	25.98	269.47	7.42	
10/21/2023	26.05	269.40	7.47	Purged 64 L. Temp = 12.8°C
11/7/2023	26.33	269.12	7.64	Temp = 14.2°C

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-19 ☒ Well ☐ Spring ☐ Stream ☐ Other

☒ Upgradient/Upstream ☐ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 26.55 " Longitude: 76 ° 41 ' 55.87 "

Depth to Water Level: 19.42 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.60 ft. Elevation of Water Level: 286.38 ft./MSL

Sampling Depth: 33.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 45.40 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 2.1 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/11/2023 Sample Collection Time: 10:58AM

Sample Collector's Name: NL

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001199-001 Final Lab Analysis Completion Date: 10/31/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-19
Sample Date	10/11/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.066 ND	SM 4500-NH3 F
Bicarbonate (mg/l)	63.4	SM 2320
Calcium, total (mg/l)	28.3	EPA 200.7
Calcium, dissolved (mg/l)	27.2	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	9.22	EPA 300.0
Fluoride, total as F (mg/l)	0.028 ND	EPA 300.0
Iron, total (µg/l)	105	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	4.08	EPA 200.7
Magnesium, dissolved (mg/l)	3.8	EPA 200.7
Manganese, total (µg/l)	5.31 ND	EPA 200.7
Manganese, dissolved (µg/l)	5.31 ND	EPA 200.7
Nitrate, as N (mg/l)	3.84	EPA 300.0
pH, field (su)	6.98	SM 4500-H+B
pH, lab (su)	6.48 H	SM 4500-H+B
Potassium, total (mg/l)	1 <	EPA 200.7
Potassium, dissolved (mg/l)	1 <	EPA 200.7
Sodium, total (mg/l)	8.16	EPA 200.7
Sodium, dissolved (mg/l)	7.42	EPA 200.7
Specific Conductance, field (umhos/cm)	226	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	235	SM 2510 B
Sulfate, as SO4 (mg/l)	23.4	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	63.4	SM 2320 B
Total Dissolved Solids (mg/l)	135	SM 2540 C
Total Organic Carbon (mg/l)	0.192 ND	SM 5310 C
Turbidity, field (n.t.u.)	2.02	Field Meter
Dissolved O2, field (mg/l)	1.79	Field Meter
Redox, field (mv)	212	Field Meter
Temperature, field (°c)	13.2	Field Meter
Acidity, total as CaCO3 (mg/l)	-44.5	SM 2310 B

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-19
Sample Date	10/11/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-19
Sample Date	10/11/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	1 <	EPA 200.8
Arsenic, dissolved (µg/l)	0.55 ND	EPA 200.8
Barium, total (µg/l)	332	EPA 200.8
Barium, dissolved (µg/l)	333	EPA 200.8
Cadmium, total (µg/l)	0.15 ND	EPA 200.8
Cadmium, dissolved (µg/l)	0.15 ND	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	1 <	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	1 <	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	22	EPA 200.8
Selenium, dissolved (µg/l)	20.9	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	100 <	EPA 200.7
Boron, dissolved (µg/l)	100 <	EPA 200.7
Lithium, total (µg/l)	3.85	EPA 200.8
Lithium, dissolved (µg/l)	2.98	EPA 200.8
Molybdenum, total (µg/l)	0.78 ND	EPA 200.8
Molybdenum, dissolved (µg/l)	0.78 ND	EPA 200.8
Strontium, total (µg/l)	53	EPA 200.7
Strontium, dissolved (µg/l)	51	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-19
Sample Date	10/11/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)	7.29	EPA 200.8
Gallium, dissolved (µg/l)	8.03	EPA 200.8
Germanium, total (µg/l)	1 ND	EPA 200.8
Germanium, dissolved (µg/l)	1 ND	EPA 200.8
Nickel, total (µg/l)	0.28 ND	EPA 200.8
Nickel, dissolved (µg/l)	0.28 ND	EPA 200.8
Rubidium, total (µg/l)	1 ND	EPA 200.8
Rubidium, dissolved (µg/l)	1 ND	EPA 200.8
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	5 <	EPA 200.8
Vanadium, dissolved (µg/l)	0.53 ND	EPA 200.8
Yittrium, total (µg/l)	1 ND	EPA 200.8
Yittrium, dissolved (µg/l)	1 ND	EPA 200.8

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-4-10 ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 25.84 " Longitude: 76 ° 41 ' 25.83 "

Depth to Water Level: 25.88 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.26 ft. Elevation of Water Level: 266.83 ft./MSL

Sampling Depth: 34.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 38.60 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3.2 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/17/2023 Sample Collection Time: 10:32AM

Sample Collector's Name: AF

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001192-006 Final Lab Analysis Completion Date: 11/02/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-4-10
Sample Date	10/17/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.066 ND	SM 4500-NH3 F
Bicarbonate (mg/l)	48.6	SM 2320
Calcium, total (mg/l)	142	EPA 200.7
Calcium, dissolved (mg/l)	135	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	8.5	EPA 300.0
Fluoride, total as F (mg/l)	0.2 <	EPA 300.0
Iron, total (µg/l)	37	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	13.2	EPA 200.7
Magnesium, dissolved (mg/l)	12.7	EPA 200.7
Manganese, total (µg/l)	1,150	EPA 200.7
Manganese, dissolved (µg/l)	1,080	EPA 200.7
Nitrate, as N (mg/l)	1.15	EPA 300.0
pH, field (su)	5.86	SM 4500-H+B
pH, lab (su)	5.97 H	SM 4500-H+B
Potassium, total (mg/l)	106	EPA 200.7
Potassium, dissolved (mg/l)	97.8	EPA 200.7
Sodium, total (mg/l)	60	EPA 200.7
Sodium, dissolved (mg/l)	56.1	EPA 200.7
Specific Conductance, field (umhos/cm)	1,266	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,300	SM 2510 B
Sulfate, as SO4 (mg/l)	554	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	48.6	SM 2320 B
Total Dissolved Solids (mg/l)	889	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.93	Field Meter
Dissolved O2, field (mg/l)	1.89	Field Meter
Redox, field (mv)	202.9	Field Meter
Temperature, field (°c)	13.63	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-4-10
Sample Date	10/17/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-4-10
Sample Date	10/17/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	0.55 ND	EPA 200.8
Arsenic, dissolved (µg/l)	0.55 ND	EPA 200.8
Barium, total (µg/l)	12.8	EPA 200.8
Barium, dissolved (µg/l)	12.6	EPA 200.8
Cadmium, total (µg/l)	1 <	EPA 200.8
Cadmium, dissolved (µg/l)	1 <	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	16.6	EPA 200.8
Selenium, dissolved (µg/l)	16.3	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	30	EPA 200.8
Zinc, dissolved (µg/l)	25.4	EPA 200.8
Boron, total (µg/l)	1,750	EPA 200.7
Boron, dissolved (µg/l)	1,660	EPA 200.7
Lithium, total (µg/l)	614	EPA 200.8
Lithium, dissolved (µg/l)	589	EPA 200.8
Molybdenum, total (µg/l)	317	EPA 200.8
Molybdenum, dissolved (µg/l)	301	EPA 200.8
Strontium, total (µg/l)	1,310	EPA 200.7
Strontium, dissolved (µg/l)	1,250	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-4-10
Sample Date	10/17/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	161	EPA 200.7
Aluminum, dissolved (µg/l)	137	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	17.7	EPA 200.8
Nickel, dissolved (µg/l)	16.2	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	0.53 ND	EPA 200.8
Vanadium, dissolved (µg/l)	0.53 ND	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
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FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-4-7A ☒ Well ☐ Spring ☐ Stream ☐ Other

☒ Upgradient/Upstream ☐ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 20.84 " Longitude: 76 ° 41 ' 34.11 "

Depth to Water Level: 26.8 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.23 ft. Elevation of Water Level: 261.21 ft./MSL

Sampling Depth: 35.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 39.90 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3.1 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/13/2023 Sample Collection Time: 8:08AM

Sample Collector's Name: AF

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001192-002 Final Lab Analysis Completion Date: 11/02/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-4-7A
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.2 <	SM 4500-NH3 F
Bicarbonate (mg/l)	235	SM 2320
Calcium, total (mg/l)	250	EPA 200.7
Calcium, dissolved (mg/l)	262	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	12.9	EPA 300.0
Fluoride, total as F (mg/l)	0.2 <	EPA 300.0
Iron, total (µg/l)	12.2 ND	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	38.3	EPA 200.7
Magnesium, dissolved (mg/l)	42.2	EPA 200.7
Manganese, total (µg/l)	158	EPA 200.7
Manganese, dissolved (µg/l)	292	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.91	SM 4500-H+B
pH, lab (su)	7.04 H	SM 4500-H+B
Potassium, total (mg/l)	4.68	EPA 200.7
Potassium, dissolved (mg/l)	4.92	EPA 200.7
Sodium, total (mg/l)	59.2	EPA 200.7
Sodium, dissolved (mg/l)	63.2	EPA 200.7
Specific Conductance, field (umhos/cm)	1,512	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,510	SM 2510 B
Sulfate, as SO4 (mg/l)	610	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	235	SM 2320 B
Total Dissolved Solids (mg/l)	1,140	SM 2540 C
Total Organic Carbon (mg/l)	0.665	SM 5310 C
Turbidity, field (n.t.u.)	0.44	Field Meter
Dissolved O2, field (mg/l)	0.7	Field Meter
Redox, field (mv)	154.9	Field Meter
Temperature, field (°c)	15.37	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-4-7A
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-4-7A
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	0.55 ND	EPA 200.8
Arsenic, dissolved (µg/l)	0.55 ND	EPA 200.8
Barium, total (µg/l)	15.7	EPA 200.8
Barium, dissolved (µg/l)	18.1	EPA 200.8
Cadmium, total (µg/l)	0.15 ND	EPA 200.8
Cadmium, dissolved (µg/l)	0.15 ND	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	1,710	EPA 200.7
Boron, dissolved (µg/l)	1,910	EPA 200.7
Lithium, total (µg/l)	227	EPA 200.8
Lithium, dissolved (µg/l)	195	EPA 200.8
Molybdenum, total (µg/l)	20.4	EPA 200.8
Molybdenum, dissolved (µg/l)	22.1	EPA 200.8
Strontium, total (µg/l)	377	EPA 200.7
Strontium, dissolved (µg/l)	429	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-4-7A
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	1.51	EPA 200.8
Nickel, dissolved (µg/l)	1.85	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	5 <	EPA 200.8
Vanadium, dissolved (µg/l)	5 <	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-10A ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 13.72 " Longitude: 76 ° 41 ' 31.84 "

Depth to Water Level: 17.1 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.62 ft. Elevation of Water Level: 259.37 ft./MSL

Sampling Depth: 32.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 37.30 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/14/2023 Sample Collection Time: 10:13AM

Sample Collector's Name: JO

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-013 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-10A
Sample Date	10/14/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.066 ND	SM 4500-NH3 F
Bicarbonate (mg/l)	157	SM 2320
Calcium, total (mg/l)	168	EPA 200.7
Calcium, dissolved (mg/l)	173	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	63.4	EPA 300.0
Fluoride, total as F (mg/l)	0.2 <	EPA 300.0
Iron, total (µg/l)	12.2 ND	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	40.3	EPA 200.7
Magnesium, dissolved (mg/l)	41.7	EPA 200.7
Manganese, total (µg/l)	425	EPA 200.7
Manganese, dissolved (µg/l)	445	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.72	SM 4500-H+B
pH, lab (su)	6.61 H	SM 4500-H+B
Potassium, total (mg/l)	2.83	EPA 200.7
Potassium, dissolved (mg/l)	2.97	EPA 200.7
Sodium, total (mg/l)	21.6	EPA 200.7
Sodium, dissolved (mg/l)	22.2	EPA 200.7
Specific Conductance, field (umhos/cm)	1,181	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,170	SM 2510 B
Sulfate, as SO4 (mg/l)	374	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	157	SM 2320 B
Total Dissolved Solids (mg/l)	872	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.2	Field Meter
Dissolved O2, field (mg/l)	0.53	Field Meter
Redox, field (mv)	127	Field Meter
Temperature, field (°c)	13.94	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-10A
Sample Date	10/14/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-10A
Sample Date	10/14/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	1.03	EPA 200.8
Arsenic, dissolved (µg/l)	0.55 ND	EPA 200.8
Barium, total (µg/l)	25.9	EPA 200.8
Barium, dissolved (µg/l)	24.7	EPA 200.8
Cadmium, total (µg/l)	0.15 ND	EPA 200.8
Cadmium, dissolved (µg/l)	0.15 ND	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	7.31	EPA 200.8
Zinc, dissolved (µg/l)	6.9	EPA 200.8
Boron, total (µg/l)	497	EPA 200.7
Boron, dissolved (µg/l)	515	EPA 200.7
Lithium, total (µg/l)	12.9	EPA 200.8
Lithium, dissolved (µg/l)	15.6	EPA 200.8
Molybdenum, total (µg/l)	24	EPA 200.8
Molybdenum, dissolved (µg/l)	24.6	EPA 200.8
Strontium, total (µg/l)	355	EPA 200.7
Strontium, dissolved (µg/l)	370	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-10A
Sample Date	10/14/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	1.04	EPA 200.8
Nickel, dissolved (µg/l)	1.02	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	0.53 ND	EPA 200.8
Vanadium, dissolved (µg/l)	0.53 ND	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-10B ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 13.72 " Longitude: 76 ° 41 ' 31.84 "

Depth to Water Level: 17.02 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.44 ft. Elevation of Water Level: 259.25 ft./MSL

Sampling Depth: 52.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 57.00 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/14/2023 Sample Collection Time: 12:07PM

Sample Collector's Name: JO

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-014 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-10B
Sample Date	10/14/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.066 ND	SM 4500-NH3 F
Bicarbonate (mg/l)	108	SM 2320
Calcium, total (mg/l)	134	EPA 200.7
Calcium, dissolved (mg/l)	137	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	116	EPA 300.0
Fluoride, total as F (mg/l)	0.2 <	EPA 300.0
Iron, total (µg/l)	22	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	23.5	EPA 200.7
Magnesium, dissolved (mg/l)	24.3	EPA 200.7
Manganese, total (µg/l)	21	EPA 200.7
Manganese, dissolved (µg/l)	27	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.58	SM 4500-H+B
pH, lab (su)	7.47 H	SM 4500-H+B
Potassium, total (mg/l)	2.39	EPA 200.7
Potassium, dissolved (mg/l)	2.52	EPA 200.7
Sodium, total (mg/l)	7.58	EPA 200.7
Sodium, dissolved (mg/l)	8.1	EPA 200.7
Specific Conductance, field (umhos/cm)	929	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	916	SM 2510 B
Sulfate, as SO4 (mg/l)	175	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	108	SM 2320 B
Total Dissolved Solids (mg/l)	679	SM 2540 C
Total Organic Carbon (mg/l)	0.192 ND	SM 5310 C
Turbidity, field (n.t.u.)	0.49	Field Meter
Dissolved O2, field (mg/l)	0.88	Field Meter
Redox, field (mv)	92	Field Meter
Temperature, field (°c)	31.81	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-10B
Sample Date	10/14/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-10B
Sample Date	10/14/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	1.7	EPA 200.8
Arsenic, dissolved (µg/l)	1.5	EPA 200.8
Barium, total (µg/l)	45.6	EPA 200.8
Barium, dissolved (µg/l)	47.7	EPA 200.8
Cadmium, total (µg/l)	0.15 ND	EPA 200.8
Cadmium, dissolved (µg/l)	0.15 ND	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	1.12 ND	EPA 200.8
Boron, total (µg/l)	274	EPA 200.7
Boron, dissolved (µg/l)	287	EPA 200.7
Lithium, total (µg/l)	11.8	EPA 200.8
Lithium, dissolved (µg/l)	14.3	EPA 200.8
Molybdenum, total (µg/l)	23.3	EPA 200.8
Molybdenum, dissolved (µg/l)	23.7	EPA 200.8
Strontium, total (µg/l)	295	EPA 200.7
Strontium, dissolved (µg/l)	315	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-10B
Sample Date	10/14/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	0.28 ND	EPA 200.8
Nickel, dissolved (µg/l)	0.28 ND	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	5 <	EPA 200.8
Vanadium, dissolved (µg/l)	5 <	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-1N ☒ Well ☐ Spring ☐ Stream ☐ Other

☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 4 ' 59.01 " Longitude: 76 ° 41 ' 21.00 "

Depth to Water Level: 13.06 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.95 ft. Elevation of Water Level: 267.58 ft./MSL

Sampling Depth: 23.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 26.30 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3.15 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/12/2023 Sample Collection Time: 8:45AM

Sample Collector's Name: AF

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-001 Final Lab Analysis Completion Date: 10/26/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-1N
Sample Date	10/12/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.2 <	SM 4500-NH3 F
Bicarbonate (mg/l)	205	SM 2320
Calcium, total (mg/l)	209	EPA 200.7
Calcium, dissolved (mg/l)	191	EPA 200.7
Chemical Oxygen Demand (mg/l)	20 <	SM 5220 D
Chloride, total as Cl (mg/l)	79.3	EPA 300.0
Fluoride, total as F (mg/l)	0.23	EPA 300.0
Iron, total (µg/l)	550	EPA 200.7
Iron, dissolved (µg/l)	187	EPA 200.7
Magnesium, total (mg/l)	33.9	EPA 200.7
Magnesium, dissolved (mg/l)	31.6	EPA 200.7
Manganese, total (µg/l)	1,660	EPA 200.7
Manganese, dissolved (µg/l)	1,510	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.75	SM 4500-H+B
pH, lab (su)	6.9 H	SM 4500-H+B
Potassium, total (mg/l)	12.1	EPA 200.7
Potassium, dissolved (mg/l)	11	EPA 200.7
Sodium, total (mg/l)	37.5	EPA 200.7
Sodium, dissolved (mg/l)	34	EPA 200.7
Specific Conductance, field (umhos/cm)	1,250	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,260	SM 2510 B
Sulfate, as SO4 (mg/l)	357	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	205	SM 2320 B
Total Dissolved Solids (mg/l)	845	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	3.74	Field Meter
Dissolved O2, field (mg/l)	0.89	Field Meter
Redox, field (mv)	25.6	Field Meter
Temperature, field (°c)	17.1	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-1N
Sample Date	10/12/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-1N
Sample Date	10/12/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	0.55 ND	EPA 200.8
Arsenic, dissolved (µg/l)	0.55 ND	EPA 200.8
Barium, total (µg/l)	30.1	EPA 200.8
Barium, dissolved (µg/l)	27.1	EPA 200.8
Cadmium, total (µg/l)	0.15 ND	EPA 200.8
Cadmium, dissolved (µg/l)	0.15 ND	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	100 <	EPA 200.7
Boron, dissolved (µg/l)	100 <	EPA 200.7
Lithium, total (µg/l)	1.26	EPA 200.8
Lithium, dissolved (µg/l)	1.09	EPA 200.8
Molybdenum, total (µg/l)	0.78 ND	EPA 200.8
Molybdenum, dissolved (µg/l)	0.78 ND	EPA 200.8
Strontium, total (µg/l)	1,610	EPA 200.7
Strontium, dissolved (µg/l)	1,440	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-1N
Sample Date	10/12/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	1.29	EPA 200.8
Nickel, dissolved (µg/l)	1 <	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	0.53 ND	EPA 200.8
Vanadium, dissolved (µg/l)	0.53 ND	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-2 ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 4.33 " Longitude: 76 ° 40 ' 59.57 "

Depth to Water Level: 9 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.00 ft. Elevation of Water Level: 262.5 ft./MSL

Sampling Depth: 15.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 22.30 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3.75 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/12/2023 Sample Collection Time: 8:38AM

Sample Collector's Name: AMC

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-002 Final Lab Analysis Completion Date: 10/26/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-2
Sample Date	10/12/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.2 <	SM 4500-NH3 F
Bicarbonate (mg/l)	157	SM 2320
Calcium, total (mg/l)	130	EPA 200.7
Calcium, dissolved (mg/l)	124	EPA 200.7
Chemical Oxygen Demand (mg/l)	20 <	SM 5220 D
Chloride, total as Cl (mg/l)	34.2	EPA 300.0
Fluoride, total as F (mg/l)	0.91	EPA 300.0
Iron, total (µg/l)	32	EPA 200.7
Iron, dissolved (µg/l)	25	EPA 200.7
Magnesium, total (mg/l)	21.5	EPA 200.7
Magnesium, dissolved (mg/l)	20.6	EPA 200.7
Manganese, total (µg/l)	787	EPA 200.7
Manganese, dissolved (µg/l)	727	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.99	SM 4500-H+B
pH, lab (su)	6.89 H	SM 4500-H+B
Potassium, total (mg/l)	7.44	EPA 200.7
Potassium, dissolved (mg/l)	6.51	EPA 200.7
Sodium, total (mg/l)	18.8	EPA 200.7
Sodium, dissolved (mg/l)	16.9	EPA 200.7
Specific Conductance, field (umhos/cm)	834	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	821	SM 2510 B
Sulfate, as SO4 (mg/l)	207	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	157	SM 2320 B
Total Dissolved Solids (mg/l)	514	SM 2540 C
Total Organic Carbon (mg/l)	0.635	SM 5310 C
Turbidity, field (n.t.u.)	0.44	Field Meter
Dissolved O2, field (mg/l)	1.2	Field Meter
Redox, field (mv)	59.4	Field Meter
Temperature, field (°c)	13.82	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-2
Sample Date	10/12/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-2
Sample Date	10/12/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	0.55 ND	EPA 200.8
Arsenic, dissolved (µg/l)	0.55 ND	EPA 200.8
Barium, total (µg/l)	45.9	EPA 200.8
Barium, dissolved (µg/l)	44.7	EPA 200.8
Cadmium, total (µg/l)	1 <	EPA 200.8
Cadmium, dissolved (µg/l)	1 <	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	570	EPA 200.7
Boron, dissolved (µg/l)	505	EPA 200.7
Lithium, total (µg/l)	23.1	EPA 200.8
Lithium, dissolved (µg/l)	20.6	EPA 200.8
Molybdenum, total (µg/l)	244	EPA 200.8
Molybdenum, dissolved (µg/l)	243	EPA 200.8
Strontium, total (µg/l)	838	EPA 200.7
Strontium, dissolved (µg/l)	712	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-2
Sample Date	10/12/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	1.71	EPA 200.8
Nickel, dissolved (µg/l)	1.52	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	0.53 ND	EPA 200.8
Vanadium, dissolved (µg/l)	0.53 ND	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-3A ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 12.49 " Longitude: 76 ° 41 ' 6.87 "

Depth to Water Level: 10.13 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.72 ft. Elevation of Water Level: 257.25 ft./MSL

Sampling Depth: 20.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 26.90 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3.05 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/12/2023 Sample Collection Time: 10:46AM

Sample Collector's Name: AMC

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-003 Final Lab Analysis Completion Date: 10/26/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-3A
Sample Date	10/12/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.26	SM 4500-NH3 F
Bicarbonate (mg/l)	241	SM 2320
Calcium, total (mg/l)	197	EPA 200.7
Calcium, dissolved (mg/l)	189	EPA 200.7
Chemical Oxygen Demand (mg/l)	20 <	SM 5220 D
Chloride, total as Cl (mg/l)	130	EPA 300.0
Fluoride, total as F (mg/l)	0.33	EPA 300.0
Iron, total (µg/l)	7,730	EPA 200.7
Iron, dissolved (µg/l)	7,000	EPA 200.7
Magnesium, total (mg/l)	35.4	EPA 200.7
Magnesium, dissolved (mg/l)	33.4	EPA 200.7
Manganese, total (µg/l)	9,190	EPA 200.7
Manganese, dissolved (µg/l)	8,680	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.78	SM 4500-H+B
pH, lab (su)	6.62 H	SM 4500-H+B
Potassium, total (mg/l)	3.71	EPA 200.7
Potassium, dissolved (mg/l)	3.38	EPA 200.7
Sodium, total (mg/l)	35.4	EPA 200.7
Sodium, dissolved (mg/l)	33.1	EPA 200.7
Specific Conductance, field (umhos/cm)	1,304	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,270	SM 2510 B
Sulfate, as SO4 (mg/l)	240	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	241	SM 2320 B
Total Dissolved Solids (mg/l)	792	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.56	Field Meter
Dissolved O2, field (mg/l)	0.82	Field Meter
Redox, field (mv)	-14.6	Field Meter
Temperature, field (°c)	13.57	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-3A
Sample Date	10/12/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-3A
Sample Date	10/12/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	21.8	EPA 200.8
Arsenic, dissolved (µg/l)	21.1	EPA 200.8
Barium, total (µg/l)	71.8	EPA 200.8
Barium, dissolved (µg/l)	72.3	EPA 200.8
Cadmium, total (µg/l)	0.15 ND	EPA 200.8
Cadmium, dissolved (µg/l)	0.15 ND	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	525	EPA 200.7
Boron, dissolved (µg/l)	489	EPA 200.7
Lithium, total (µg/l)	21.4	EPA 200.8
Lithium, dissolved (µg/l)	20.1	EPA 200.8
Molybdenum, total (µg/l)	71.1	EPA 200.8
Molybdenum, dissolved (µg/l)	71.9	EPA 200.8
Strontium, total (µg/l)	1,060	EPA 200.7
Strontium, dissolved (µg/l)	963	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-3A
Sample Date	10/12/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	2.47	EPA 200.8
Nickel, dissolved (µg/l)	2.29	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	0.53 ND	EPA 200.8
Vanadium, dissolved (µg/l)	0.53 ND	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-3B ☒ Well ☐ Spring ☐ Stream ☐ Other

☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 12.49 " Longitude: 76 ° 41 ' 6.87 "

Depth to Water Level: 12.43 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.90 ft. Elevation of Water Level: 255.28 ft./MSL

Sampling Depth: 40.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 47.00 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3.2 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/12/2023 Sample Collection Time: 12:50PM

Sample Collector's Name: AMC

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-005 Final Lab Analysis Completion Date: 10/26/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-3B
Sample Date	10/12/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.066 ND	SM 4500-NH3 F
Bicarbonate (mg/l)	257	SM 2320
Calcium, total (mg/l)	160	EPA 200.7
Calcium, dissolved (mg/l)	163	EPA 200.7
Chemical Oxygen Demand (mg/l)	20 <	SM 5220 D
Chloride, total as Cl (mg/l)	72.4	EPA 300.0
Fluoride, total as F (mg/l)	0.37	EPA 300.0
Iron, total (µg/l)	322	EPA 200.7
Iron, dissolved (µg/l)	264	EPA 200.7
Magnesium, total (mg/l)	28.5	EPA 200.7
Magnesium, dissolved (mg/l)	28.3	EPA 200.7
Manganese, total (µg/l)	1,830	EPA 200.7
Manganese, dissolved (µg/l)	1,760	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.18	SM 4500-H+B
pH, lab (su)	6.99 H	SM 4500-H+B
Potassium, total (mg/l)	1.99	EPA 200.7
Potassium, dissolved (mg/l)	1.91	EPA 200.7
Sodium, total (mg/l)	9.78	EPA 200.7
Sodium, dissolved (mg/l)	9.33	EPA 200.7
Specific Conductance, field (umhos/cm)	1,011	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	986	SM 2510 B
Sulfate, as SO4 (mg/l)	159	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	257	SM 2320 B
Total Dissolved Solids (mg/l)	598	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.33	Field Meter
Dissolved O2, field (mg/l)	0.38	Field Meter
Redox, field (mv)	23.6	Field Meter
Temperature, field (°c)	13.73	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-3B
Sample Date	10/12/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-3B
Sample Date	10/12/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	7.09	EPA 200.8
Arsenic, dissolved (µg/l)	6.72	EPA 200.8
Barium, total (µg/l)	71.8	EPA 200.8
Barium, dissolved (µg/l)	75.8	EPA 200.8
Cadmium, total (µg/l)	0.15 ND	EPA 200.8
Cadmium, dissolved (µg/l)	0.15 ND	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	380	EPA 200.7
Boron, dissolved (µg/l)	363	EPA 200.7
Lithium, total (µg/l)	25.9	EPA 200.8
Lithium, dissolved (µg/l)	24.8	EPA 200.8
Molybdenum, total (µg/l)	92.8	EPA 200.8
Molybdenum, dissolved (µg/l)	97.5	EPA 200.8
Strontium, total (µg/l)	484	EPA 200.7
Strontium, dissolved (µg/l)	447	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-3B
Sample Date	10/12/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	1 <	EPA 200.8
Nickel, dissolved (µg/l)	1 <	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	5 <	EPA 200.8
Vanadium, dissolved (µg/l)	5 <	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-4 ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 25.61 " Longitude: 76 ° 41 ' 13.82 "

Depth to Water Level: 13.11 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.81 ft. Elevation of Water Level: 257.08 ft./MSL

Sampling Depth: 18.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 21.70 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/13/2023 Sample Collection Time: 8:08AM

Sample Collector's Name: JO

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-006 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-4
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.066 ND	SM 4500-NH3 F
Bicarbonate (mg/l)	60.4	SM 2320
Calcium, total (mg/l)	76.3	EPA 200.7
Calcium, dissolved (mg/l)	77.2	EPA 200.7
Chemical Oxygen Demand (mg/l)	20 <	SM 5220 D
Chloride, total as Cl (mg/l)	13.6	EPA 300.0
Fluoride, total as F (mg/l)	0.32	EPA 300.0
Iron, total (µg/l)	12.2 ND	EPA 200.7
Iron, dissolved (µg/l)	1.02 ND	EPA 200.7
Magnesium, total (mg/l)	24.6	EPA 200.7
Magnesium, dissolved (mg/l)	25.9	EPA 200.7
Manganese, total (µg/l)	6,840	EPA 200.7
Manganese, dissolved (µg/l)	6,320	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7	SM 4500-H+B
pH, lab (su)	6 H	SM 4500-H+B
Potassium, total (mg/l)	1.59	EPA 200.7
Potassium, dissolved (mg/l)	1.65	EPA 200.7
Sodium, total (mg/l)	12.1	EPA 200.7
Sodium, dissolved (mg/l)	12.2	EPA 200.7
Specific Conductance, field (umhos/cm)	669	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	656	SM 2510 B
Sulfate, as SO4 (mg/l)	252	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	60.4	SM 2320 B
Total Dissolved Solids (mg/l)	461	SM 2540 C
Total Organic Carbon (mg/l)	0.759	SM 5310 C
Turbidity, field (n.t.u.)	0.7	Field Meter
Dissolved O2, field (mg/l)	0.53	Field Meter
Redox, field (mv)	192	Field Meter
Temperature, field (°c)	13.4	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-4
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-4
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	0.55 ND	EPA 200.8
Arsenic, dissolved (µg/l)	0.55 ND	EPA 200.8
Barium, total (µg/l)	17.9	EPA 200.8
Barium, dissolved (µg/l)	17.8	EPA 200.8
Cadmium, total (µg/l)	1 <	EPA 200.8
Cadmium, dissolved (µg/l)	1 <	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	35.7	EPA 200.8
Zinc, dissolved (µg/l)	33.2	EPA 200.8
Boron, total (µg/l)	266	EPA 200.7
Boron, dissolved (µg/l)	268	EPA 200.7
Lithium, total (µg/l)	11.4	EPA 200.8
Lithium, dissolved (µg/l)	13.8	EPA 200.8
Molybdenum, total (µg/l)	0.78 ND	EPA 200.8
Molybdenum, dissolved (µg/l)	0.78 ND	EPA 200.8
Strontium, total (µg/l)	231	EPA 200.7
Strontium, dissolved (µg/l)	240	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-4
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	318	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	46.2	EPA 200.8
Nickel, dissolved (µg/l)	46.4	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	0.53 ND	EPA 200.8
Vanadium, dissolved (µg/l)	0.53 ND	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-5A ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 16.91 " Longitude: 76 ° 41 ' 31.04 "

Depth to Water Level: 23.8 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.97 ft. Elevation of Water Level: 261.24 ft./MSL

Sampling Depth: 33.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 39.20 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/13/2023 Sample Collection Time: 10:13AM

Sample Collector's Name: JO

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-007 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-5A
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.372	SM 4500-NH3 F
Bicarbonate (mg/l)	264	SM 2320
Calcium, total (mg/l)	173	EPA 200.7
Calcium, dissolved (mg/l)	181	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	21.1	EPA 300.0
Fluoride, total as F (mg/l)	0.91	EPA 300.0
Iron, total (µg/l)	12.2 ND	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	34.8	EPA 200.7
Magnesium, dissolved (mg/l)	36.6	EPA 200.7
Manganese, total (µg/l)	408	EPA 200.7
Manganese, dissolved (µg/l)	453	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.44	SM 4500-H+B
pH, lab (su)	7.22 H	SM 4500-H+B
Potassium, total (mg/l)	4.32	EPA 200.7
Potassium, dissolved (mg/l)	4.57	EPA 200.7
Sodium, total (mg/l)	11.8	EPA 200.7
Sodium, dissolved (mg/l)	12.8	EPA 200.7
Specific Conductance, field (umhos/cm)	1,108	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,100	SM 2510 B
Sulfate, as SO4 (mg/l)	297	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	264	SM 2320 B
Total Dissolved Solids (mg/l)	735	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.12	Field Meter
Dissolved O2, field (mg/l)	0.43	Field Meter
Redox, field (mv)	64	Field Meter
Temperature, field (°c)	12.8	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-5A
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-5A
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	120	EPA 200.8
Arsenic, dissolved (µg/l)	120	EPA 200.8
Barium, total (µg/l)	42.1	EPA 200.8
Barium, dissolved (µg/l)	42.3	EPA 200.8
Cadmium, total (µg/l)	1 <	EPA 200.8
Cadmium, dissolved (µg/l)	1 <	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	919	EPA 200.7
Boron, dissolved (µg/l)	961	EPA 200.7
Lithium, total (µg/l)	196	EPA 200.8
Lithium, dissolved (µg/l)	197	EPA 200.8
Molybdenum, total (µg/l)	320	EPA 200.8
Molybdenum, dissolved (µg/l)	301	EPA 200.8
Strontium, total (µg/l)	798	EPA 200.7
Strontium, dissolved (µg/l)	844	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-5A
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	1 <	EPA 200.8
Nickel, dissolved (µg/l)	1 <	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	5 <	EPA 200.8
Vanadium, dissolved (µg/l)	5 <	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-5B ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 16.81 " Longitude: 76 ° 41 ' 30.96 "

Depth to Water Level: 18.95 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.54 ft. Elevation of Water Level: 265.93 ft./MSL

Sampling Depth: 52.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 59.60 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/13/2023 Sample Collection Time: 12:13PM

Sample Collector's Name: JO

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-008 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-5B
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.222	SM 4500-NH3 F
Bicarbonate (mg/l)	230	SM 2320
Calcium, total (mg/l)	174	EPA 200.7
Calcium, dissolved (mg/l)	180	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	25.2	EPA 300.0
Fluoride, total as F (mg/l)	0.69	EPA 300.0
Iron, total (µg/l)	12.2 ND	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	30.3	EPA 200.7
Magnesium, dissolved (mg/l)	33.3	EPA 200.7
Manganese, total (µg/l)	409	EPA 200.7
Manganese, dissolved (µg/l)	447	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.53	SM 4500-H+B
pH, lab (su)	7.24 H	SM 4500-H+B
Potassium, total (mg/l)	4.38	EPA 200.7
Potassium, dissolved (mg/l)	4.47	EPA 200.7
Sodium, total (mg/l)	11.1	EPA 200.7
Sodium, dissolved (mg/l)	11.6	EPA 200.7
Specific Conductance, field (umhos/cm)	1,078	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,070	SM 2510 B
Sulfate, as SO4 (mg/l)	307	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	230	SM 2320 B
Total Dissolved Solids (mg/l)	736	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.28	Field Meter
Dissolved O2, field (mg/l)	0.46	Field Meter
Redox, field (mv)	56	Field Meter
Temperature, field (°c)	13.52	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-5B
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-5B
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	231	EPA 200.8
Arsenic, dissolved (µg/l)	216	EPA 200.8
Barium, total (µg/l)	69.3	EPA 200.8
Barium, dissolved (µg/l)	69.3	EPA 200.8
Cadmium, total (µg/l)	1 <	EPA 200.8
Cadmium, dissolved (µg/l)	1 <	EPA 200.8
Chromium, total (µg/l)	0.41 ND	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)	0.08 ND	EPA 200.8
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)	0.72 ND	EPA 200.8
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)	0.63 ND	EPA 200.8
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)	0.13 ND	EPA 200.8
Zinc, total (µg/l)	5 <	EPA 200.8
Zinc, dissolved (µg/l)	1.12 ND	EPA 200.8
Boron, total (µg/l)	895	EPA 200.7
Boron, dissolved (µg/l)	993	EPA 200.7
Lithium, total (µg/l)	164	EPA 200.8
Lithium, dissolved (µg/l)	159	EPA 200.8
Molybdenum, total (µg/l)	290	EPA 200.8
Molybdenum, dissolved (µg/l)	272	EPA 200.8
Strontium, total (µg/l)	975	EPA 200.7
Strontium, dissolved (µg/l)	1,030	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-5B
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	100 <	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)	2.18 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19 ND	EPA 200.8
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	1 <	EPA 200.8
Nickel, dissolved (µg/l)	1 <	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)	0.7 ND	EPA 200.8
Vanadium, total (µg/l)	5 <	EPA 200.8
Vanadium, dissolved (µg/l)	5 <	EPA 200.8
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee: Brunner Island, LLC - Basin No. 5

Site Name: Basin No. 5

Facility ID (as issued by DEP): 301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-8A ☒ Well ☐ Spring ☐ Stream ☐ Other

☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 15.96 " Longitude: 76 ° 41 ' 30.54 "

Depth to Water Level: 24.86 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.11 ft. Elevation of Water Level: 259.34 ft./MSL

Sampling Depth: 46.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 52.60 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3.1 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/13/2023 Sample Collection Time: 9:55AM

Sample Collector's Name: AF

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-009 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments: _____

I.D. No.	301309
Monitoring Point No.	MW-8-8A
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.375	SM 4500-NH3 F
Bicarbonate (mg/l)	236	SM 2320
Calcium, total (mg/l)		
Calcium, dissolved (mg/l)		
Chemical Oxygen Demand (mg/l)	20 <	SM 5220 D
Chloride, total as Cl (mg/l)	284	EPA 300.0
Fluoride, total as F (mg/l)	0.57	EPA 300.0
Iron, total (µg/l)		
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)		
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	1,080	EPA 200.7
Manganese, dissolved (µg/l)	1,110	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.18	SM 4500-H+B
pH, lab (su)	7.1 H	SM 4500-H+B
Potassium, total (mg/l)		
Potassium, dissolved (mg/l)		
Sodium, total (mg/l)		
Sodium, dissolved (mg/l)		
Specific Conductance, field (umhos/cm)	1,733	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,760	SM 2510 B
Sulfate, as SO4 (mg/l)	256	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	236	SM 2320 B
Total Dissolved Solids (mg/l)	1,170	SM 2540 C
Total Organic Carbon (mg/l)	0.192 ND	SM 5310 C
Turbidity, field (n.t.u.)	1.32	Field Meter
Dissolved O2, field (mg/l)	0.53	Field Meter
Redox, field (mv)	155.1	Field Meter
Temperature, field (°c)	14.7	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-8A
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-8A
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	517	EPA 200.8
Arsenic, dissolved (µg/l)	497	EPA 200.8
Barium, total (µg/l)		
Barium, dissolved (µg/l)		
Cadmium, total (µg/l)		
Cadmium, dissolved (µg/l)		
Chromium, total (µg/l)		
Chromium, dissolved (µg/l)		
Copper, total (µg/l)		
Copper, dissolved (µg/l)		
Lead, total (µg/l)		
Lead, dissolved (µg/l)		
Mercury, total (µg/l)		
Mercury, dissolved (µg/l)		
Selenium, total (µg/l)		
Selenium, dissolved (µg/l)		
Silver, total (µg/l)		
Silver, dissolved (µg/l)		
Zinc, total (µg/l)		
Zinc, dissolved (µg/l)		
Boron, total (µg/l)		
Boron, dissolved (µg/l)		
Lithium, total (µg/l)	244	EPA 200.8
Lithium, dissolved (µg/l)	249	EPA 200.8
Molybdenum, total (µg/l)	283	EPA 200.8
Molybdenum, dissolved (µg/l)	295	EPA 200.8
Strontium, total (µg/l)		
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-8A
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)		
Aluminum, dissolved (µg/l)		
Antimony, total (µg/l)		
Antimony, dissolved (µg/l)		
Beryllium, total (µg/l)		
Beryllium, dissolved (µg/l)		
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)		
Nickel, dissolved (µg/l)		
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)		
Titanium, dissolved (µg/l)		
Vanadium, total (µg/l)		
Vanadium, dissolved (µg/l)		
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee: Brunner Island, LLC - Basin No. 5

Site Name: Basin No. 5

Facility ID (as issued by DEP): 301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-8B ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 15.87 " Longitude: 76 ° 41 ' 30.60 "

Depth to Water Level: 24.06 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.02 ft. Elevation of Water Level: 259.58 ft./MSL

Sampling Depth: 54.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 60.60 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/13/2023 Sample Collection Time: 12:11PM

Sample Collector's Name: AF

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-010 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments: _____

I.D. No.	301309
Monitoring Point No.	MW-8-8B
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.066 ND	SM 4500-NH3 F
Bicarbonate (mg/l)	218	SM 2320
Calcium, total (mg/l)		
Calcium, dissolved (mg/l)		
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	145	EPA 300.0
Fluoride, total as F (mg/l)	0.75	EPA 300.0
Iron, total (µg/l)		
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)		
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	5.31 ND	EPA 200.7
Manganese, dissolved (µg/l)	5.31 ND	EPA 200.7
Nitrate, as N (mg/l)	0.76	EPA 300.0
pH, field (su)	7.51	SM 4500-H+B
pH, lab (su)	7.48 H	SM 4500-H+B
Potassium, total (mg/l)		
Potassium, dissolved (mg/l)		
Sodium, total (mg/l)		
Sodium, dissolved (mg/l)		
Specific Conductance, field (umhos/cm)	1,387	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,400	SM 2510 B
Sulfate, as SO4 (mg/l)	294	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	218	SM 2320 B
Total Dissolved Solids (mg/l)	921	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.44	Field Meter
Dissolved O2, field (mg/l)	2.66	Field Meter
Redox, field (mv)	196.6	Field Meter
Temperature, field (°c)	15.14	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-8B
Sample Date	10/13/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-8B
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	429	EPA 200.8
Arsenic, dissolved (µg/l)	404	EPA 200.8
Barium, total (µg/l)		
Barium, dissolved (µg/l)		
Cadmium, total (µg/l)		
Cadmium, dissolved (µg/l)		
Chromium, total (µg/l)		
Chromium, dissolved (µg/l)		
Copper, total (µg/l)		
Copper, dissolved (µg/l)		
Lead, total (µg/l)		
Lead, dissolved (µg/l)		
Mercury, total (µg/l)		
Mercury, dissolved (µg/l)		
Selenium, total (µg/l)		
Selenium, dissolved (µg/l)		
Silver, total (µg/l)		
Silver, dissolved (µg/l)		
Zinc, total (µg/l)		
Zinc, dissolved (µg/l)		
Boron, total (µg/l)		
Boron, dissolved (µg/l)		
Lithium, total (µg/l)	254	EPA 200.8
Lithium, dissolved (µg/l)	248	EPA 200.8
Molybdenum, total (µg/l)	250	EPA 200.8
Molybdenum, dissolved (µg/l)	245	EPA 200.8
Strontium, total (µg/l)		
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-8B
Sample Date	10/13/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)		
Aluminum, dissolved (µg/l)		
Antimony, total (µg/l)		
Antimony, dissolved (µg/l)		
Beryllium, total (µg/l)		
Beryllium, dissolved (µg/l)		
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)		
Nickel, dissolved (µg/l)		
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)		
Titanium, dissolved (µg/l)		
Vanadium, total (µg/l)		
Vanadium, dissolved (µg/l)		
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee: Brunner Island, LLC - Basin No. 5

Site Name: Basin No. 5

Facility ID (as issued by DEP): 301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-9B ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 14.68 " Longitude: 76 ° 41 ' 30.61 "

Depth to Water Level: 23.97 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.82 ft. Elevation of Water Level: 260.37 ft./MSL

Sampling Depth: 64.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 68.25 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 300 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/14/2023 Sample Collection Time: 10:42AM

Sample Collector's Name: af

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-011 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-8-9B
Sample Date	10/14/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.335	SM 4500-NH3 F
Bicarbonate (mg/l)	285	SM 2320
Calcium, total (mg/l)		
Calcium, dissolved (mg/l)		
Chemical Oxygen Demand (mg/l)	20 <	SM 5220 D
Chloride, total as Cl (mg/l)	115	EPA 300.0
Fluoride, total as F (mg/l)	0.35	EPA 300.0
Iron, total (µg/l)		
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)		
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	1,270	EPA 200.7
Manganese, dissolved (µg/l)	1,300	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.23	SM 4500-H+B
pH, lab (su)	7.27 H	SM 4500-H+B
Potassium, total (mg/l)		
Potassium, dissolved (mg/l)		
Sodium, total (mg/l)		
Sodium, dissolved (mg/l)		
Specific Conductance, field (umhos/cm)	1,400	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,410	SM 2510 B
Sulfate, as SO4 (mg/l)	302	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	285	SM 2320 B
Total Dissolved Solids (mg/l)	914	SM 2540 C
Total Organic Carbon (mg/l)	0.192 ND	SM 5310 C
Turbidity, field (n.t.u.)	0.55	Field Meter
Dissolved O2, field (mg/l)	1.63	Field Meter
Redox, field (mv)	-67.7	Field Meter
Temperature, field (°c)	14.51	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-9B
Sample Date	10/14/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-9B
Sample Date	10/14/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	714	EPA 200.8
Arsenic, dissolved (µg/l)	676	EPA 200.8
Barium, total (µg/l)		
Barium, dissolved (µg/l)		
Cadmium, total (µg/l)		
Cadmium, dissolved (µg/l)		
Chromium, total (µg/l)		
Chromium, dissolved (µg/l)		
Copper, total (µg/l)		
Copper, dissolved (µg/l)		
Lead, total (µg/l)		
Lead, dissolved (µg/l)		
Mercury, total (µg/l)		
Mercury, dissolved (µg/l)		
Selenium, total (µg/l)		
Selenium, dissolved (µg/l)		
Silver, total (µg/l)		
Silver, dissolved (µg/l)		
Zinc, total (µg/l)		
Zinc, dissolved (µg/l)		
Boron, total (µg/l)		
Boron, dissolved (µg/l)		
Lithium, total (µg/l)	205	EPA 200.8
Lithium, dissolved (µg/l)	193	EPA 200.8
Molybdenum, total (µg/l)	200	EPA 200.8
Molybdenum, dissolved (µg/l)	190	EPA 200.8
Strontium, total (µg/l)		
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-9B
Sample Date	10/14/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)		
Aluminum, dissolved (µg/l)		
Antimony, total (µg/l)		
Antimony, dissolved (µg/l)		
Beryllium, total (µg/l)		
Beryllium, dissolved (µg/l)		
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)		
Nickel, dissolved (µg/l)		
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)		
Titanium, dissolved (µg/l)		
Vanadium, total (µg/l)		
Vanadium, dissolved (µg/l)		
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee: Brunner Island, LLC - Basin No. 5

Site Name: Basin No. 5

Facility ID (as issued by DEP): 301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-8-9C ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 5 ' 14.60 " Longitude: 76 ° 41 ' 30.60 "

Depth to Water Level: 23.69 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.69 ft. Elevation of Water Level: 260.99 ft./MSL

Sampling Depth: 85.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: 88.10 ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/14/2023 Sample Collection Time: 9:11AM

Sample Collector's Name: AMC

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001195-012 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments: _____

I.D. No.	301309
Monitoring Point No.	MW-8-9C
Sample Date	10/14/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.35	SM 4500-NH3 F
Bicarbonate (mg/l)	245	SM 2320
Calcium, total (mg/l)		
Calcium, dissolved (mg/l)		
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	19.9	EPA 300.0
Fluoride, total as F (mg/l)	0.77	EPA 300.0
Iron, total (µg/l)		
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)		
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	899	EPA 200.7
Manganese, dissolved (µg/l)	919	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.25	SM 4500-H+B
pH, lab (su)	7.31 H	SM 4500-H+B
Potassium, total (mg/l)		
Potassium, dissolved (mg/l)		
Sodium, total (mg/l)		
Sodium, dissolved (mg/l)		
Specific Conductance, field (umhos/cm)	800	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	807	SM 2510 B
Sulfate, as SO4 (mg/l)	150	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	245	SM 2320 B
Total Dissolved Solids (mg/l)	503	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.96	Field Meter
Dissolved O2, field (mg/l)	1.06	Field Meter
Redox, field (mv)	-122.9	Field Meter
Temperature, field (°c)	14.53	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-9C
Sample Date	10/14/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-9C
Sample Date	10/14/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	370	EPA 200.8
Arsenic, dissolved (µg/l)	354	EPA 200.8
Barium, total (µg/l)		
Barium, dissolved (µg/l)		
Cadmium, total (µg/l)		
Cadmium, dissolved (µg/l)		
Chromium, total (µg/l)		
Chromium, dissolved (µg/l)		
Copper, total (µg/l)		
Copper, dissolved (µg/l)		
Lead, total (µg/l)		
Lead, dissolved (µg/l)		
Mercury, total (µg/l)		
Mercury, dissolved (µg/l)		
Selenium, total (µg/l)		
Selenium, dissolved (µg/l)		
Silver, total (µg/l)		
Silver, dissolved (µg/l)		
Zinc, total (µg/l)		
Zinc, dissolved (µg/l)		
Boron, total (µg/l)		
Boron, dissolved (µg/l)		
Lithium, total (µg/l)	145	EPA 200.8
Lithium, dissolved (µg/l)	132	EPA 200.8
Molybdenum, total (µg/l)	234	EPA 200.8
Molybdenum, dissolved (µg/l)	214	EPA 200.8
Strontium, total (µg/l)		
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-8-9C
Sample Date	10/14/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)		
Aluminum, dissolved (µg/l)		
Antimony, total (µg/l)		
Antimony, dissolved (µg/l)		
Beryllium, total (µg/l)		
Beryllium, dissolved (µg/l)		
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)		
Nickel, dissolved (µg/l)		
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)		
Titanium, dissolved (µg/l)		
Vanadium, total (µg/l)		
Vanadium, dissolved (µg/l)		
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/20/2023
DEP USE ONLY
Date Received

FORM 14R
RESIDUAL WASTE LANDFILLS AND DISPOSAL IMPOUNDMENTS
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 14R, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General References: Section 288.254, 289.264

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Brunner Island, LLC - Basin No. 5
Site Name:	Basin No. 5
Facility ID (as issued by DEP):	301309

SECTION B. FACILITY INFORMATION

Monitoring wells must be designed and constructed in accordance with Department standards. **INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S").**

Monitoring Point Number: MW-PT-1 ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☑ Downgradient/Downstream

Location: County York Municipality: East Manchester Township

Sampling Point: Latitude: 40 ° 55 ' 26.53 " Longitude: 76 ° 40 ' 28.05 "

Depth to Water Level: 10.7 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.04 ft. Elevation of Water Level: 261.066 ft./MSL

Sampling Depth: 19.00 ft. Volume of Water Column: _____ gal.

Total Well Depth: _____ ft. Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 3 L

Sample Field Filtered (must be 0.45 micron)? ☒ Yes ☐ No

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/16/2023 Sample Collection Time: 1:13PM

Sample Collector's Name: JO

Sample Collector's Affiliation: Talen Generation, LLC

Laboratory(ies) Performing Analysis: Hawk Mtn Labs, Inc.

Were any holding times exceeded? ☐ Yes ☒ No. If yes, please explain in comments field.

Lab Certification Number(s): 40-417

Lab Sample Number(s): 231001196-001 Final Lab Analysis Completion Date: 10/27/2023

Name/Affiliation of Person who Filled out Form Martin Mengel / Talen Energy Supply, LLC

Comments:

I.D. No.	301309
Monitoring Point No.	MW-PT-1
Sample Date	10/16/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Ammonia, as N (mg/l)	0.066 ND	SM 4500-NH3 F
Bicarbonate (mg/l)	62.6	SM 2320
Calcium, total (mg/l)	102	EPA 200.7
Calcium, dissolved (mg/l)		
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	5.97	EPA 300.0
Fluoride, total as F (mg/l)	0.29	EPA 300.0
Iron, total (µg/l)	119	EPA 200.7
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)	23.8	EPA 200.7
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	4,250	EPA 200.7
Manganese, dissolved (µg/l)		
Nitrate, as N (mg/l)	7.01	EPA 300.0
pH, field (su)	6.39	SM 4500-H+B
pH, lab (su)	5.66 H	SM 4500-H+B
Potassium, total (mg/l)	21.5	EPA 200.7
Potassium, dissolved (mg/l)		
Sodium, total (mg/l)	18.4	EPA 200.7
Sodium, dissolved (mg/l)		
Specific Conductance, field (umhos/cm)	832	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	825	SM 2510 B
Sulfate, as SO4 (mg/l)	304	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	62.6	SM 2320 B
Total Dissolved Solids (mg/l)	553	SM 2540 C
Total Organic Carbon (mg/l)	1.37	SM 5310 C
Turbidity, field (n.t.u.)	1.35	Field Meter
Dissolved O2, field (mg/l)	0.83	Field Meter
Redox, field (mv)	158	Field Meter
Temperature, field (°c)	14.01	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-PT-1
Sample Date	10/16/2023

FORM 14 R

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

1-A. Organics (Enter all data in ug/l)

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Benzene (µg/l)		
1,2-Dibromoethane (µg/l)		
1,1-Dichloroethane (µg/l)		
1,1-Dichloroethene (µg/l)		
1,2-Dichloroethane (µg/l)		
cis-1,2-Dichloroethene (µg/l)		
trans-1,2-Dichloroethene (µg/l)		
Ethylbenzene (µg/l)		
Methylene Chloride (µg/l)		
Tetrachloroethene (µg/l)		
Toluene (µg/l)		
1,1,1-Trichloroethane (µg/l)		
Trichloroethene (µg/l)		
Vinyl chloride (µg/l)		
Xylenes (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-PT-1
Sample Date	10/16/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Arsenic, total (µg/l)	1 <	EPA 200.8
Arsenic, dissolved (µg/l)		
Barium, total (µg/l)	29.9	EPA 200.8
Barium, dissolved (µg/l)		
Cadmium, total (µg/l)	1.01	EPA 200.8
Cadmium, dissolved (µg/l)		
Chromium, total (µg/l)	1.39	EPA 200.8
Chromium, dissolved (µg/l)		
Copper, total (µg/l)	0.39 ND	EPA 200.8
Copper, dissolved (µg/l)		
Lead, total (µg/l)	0.08 ND	EPA 200.8
Lead, dissolved (µg/l)		
Mercury, total (µg/l)	0.72 ND	EPA 200.8
Mercury, dissolved (µg/l)		
Selenium, total (µg/l)	0.63 ND	EPA 200.8
Selenium, dissolved (µg/l)		
Silver, total (µg/l)	0.13 ND	EPA 200.8
Silver, dissolved (µg/l)		
Zinc, total (µg/l)	58	EPA 200.8
Zinc, dissolved (µg/l)		
Boron, total (µg/l)	708	EPA 200.7
Boron, dissolved (µg/l)		
Lithium, total (µg/l)	186	EPA 200.8
Lithium, dissolved (µg/l)		
Molybdenum, total (µg/l)	61.2	EPA 200.8
Molybdenum, dissolved (µg/l)		
Strontium, total (µg/l)	631	EPA 200.7
Strontium, dissolved (µg/l)		

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I.D. No.	301309
Monitoring Point No.	MW-PT-1
Sample Date	10/16/2023

FORM 14 R

ANNUAL WATER QUALITY ANALYSES

2-A. **Metals (Enter all data in ug/l) If initial background analyses of four consecutive analyses show essentially identical (within 5%) dissolved and total analyses, dissolved analyses may not be required, subject to written DEP approval.**

ANALYTE	VALUE (T)	ANALYSIS METHOD NUMBER
Aluminum, total (µg/l)	372	EPA 200.7
Aluminum, dissolved (µg/l)		
Antimony, total (µg/l)	2.18 ND	EPA 200.8
Antimony, dissolved (µg/l)		
Beryllium, total (µg/l)	1 <	EPA 200.8
Beryllium, dissolved (µg/l)		
Cobalt, total (µg/l)		
Cobalt, dissolved (µg/l)		
Gallium, total (µg/l)		
Gallium, dissolved (µg/l)		
Germanium, total (µg/l)		
Germanium, dissolved (µg/l)		
Nickel, total (µg/l)	43.7	EPA 200.8
Nickel, dissolved (µg/l)		
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	0.7 ND	EPA 200.8
Titanium, dissolved (µg/l)		
Vanadium, total (µg/l)	0.53 ND	EPA 200.8
Vanadium, dissolved (µg/l)		
Yittrium, total (µg/l)		
Yittrium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

Attachment – Statistics Summary

Statistical Analysis

Temporal trends of selected parameters were analyzed using a Theil-Sen estimator, a robust linear regression method. The Theil-Sen estimator is insensitive to outlying spikes in data, making it advantageous over the traditional least squares method of linear regression in identifying significant temporal trends. To comply with proposed RCRA Subtitle D regulations, a nonparametric analysis of variants (ANOVA) of the data is also utilized. The nonparametric ANOVA analysis is a method for comparing medians of two or more groups. In this case, it is utilized to determine if parameter concentrations in downgradient wells are significantly greater than or less than parameter concentrations in the upgradient wells.

An Excel workbook was developed to evaluate historical groundwater monitoring data from Talen sites with the aforementioned statistical tools. This Excel application was used to perform statistical analyses of each site-related groundwater parameter at all monitoring locations for each basin/area of the site. The Excel workbook includes a worksheet containing a summary table of the statistical analyses results for all groundwater parameters and monitoring locations along with other supporting worksheets containing raw data and more detailed statistical information. The most pronounced parameter trends and regulatory exceedances are highlighted on the summary table.

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Up MW-19															Down MW-4-10																Up MW-4-7A															
				Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison			Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison			Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison		
Iron, dissolved	mg/l	0.3	61.37	NC		NC	0.0	4.8	41	34	0	0		0.1	06/10/14	0.01	> Up n		NC		NC	0.0	4.1	41	29	0	0		0.1	09/08/14	0.35	n		NC		NC	0.0	2.3	41	37	0	0		0.1	04/18/22	0.00	> Up n	
Arsenic, dissolved	µg/l	10	61.04	NC		NC	0.7	6.9	41	32	0	0		2.0	12/10/13	0.00	> Up n		NC		NC	1.3	13.2	41	28	0	1	08/14/18	10.2	08/14/18	0.47	n		NC		NC	0.4	4.1	41	40	0	0		0.6	03/03/14	0.00	< Up n	
Manganese, dissolved	µg/l	300	21.76	NC		NC	3.3	1.1	41	41	0	0		20.0	08/16/19	0.00	< Up n		-24.7	↓	0.03	2305.6	768.5	41	0	0	41	10/17/23	7220.0	06/05/14	0.00	> Up n		36.1	↑	0.16	208.6	69.5	41	0	0	7	10/14/22	559.0	11/05/20	0.00	> Up n	
Molybdenum, dissolved	µg/l	40	16.81	NC		NC	1.2	2.9	41	35	0	0		4.0	12/10/13	0.00	< Up n		-53.4	↓	0.01	557.6	1394.0	41	0	0	40	10/17/23	1360.0	02/12/18	0.00	> Up n		18.1	↑	0.09	21.3	53.3	41	0	0	0		29.9	07/24/21	0.00	> Up n	
Aluminum, dissolved	µg/l	200	6.40	NC		NC	26.1	13.0	41	41	0	0		100.0	10/11/23	NC			NC		NC	2140.4	1070.2	41	25	0	10	07/26/23	28800.0	08/14/18	0.00	> Up n		NC		NC	69.5	34.7	41	41	0	0		100.0	10/13/23	NC		
Nickel, dissolved	µg/l	100	6.10	NC		NC	1.1	1.1	41	36	0	0		5.0	08/16/18	0.00	< Up n		37.4	↑	0.20	36.3	36.3	41	1	0	3	08/14/18	175.0	06/07/16	0.00	> Up n		NC		NC	3.1	3.1	41	24	0	0		17.2	11/11/19	0.31	n	
Cadmium, dissolved	µg/l	5	5.11	NC		NC	0.1	1.9	41	41	0	0		0.2	12/10/13	NC			45.6	↑	0.02	1.0	20.2	41	9	0	0		2.4	08/14/18	0.00	> Up n		NC		NC	0.1	2.3	41	41	0	0		0.2	11/05/18	NC		
Potassium, dissolved	mg/l	--	5.10	57.0	↑	0.00	0.8	NA	41	18	0	0		1.0	10/11/23	0.00	< Up n		37.7	↑	0.00	103.4	NA	41	0	0	0		139.0	01/27/22	0.00	> Up n		10.5	↑	0.03	3.9	NA	41	0	0	0		4.9	10/13/23	0.00	> Up n	
Zinc, dissolved	µg/l	2000	3.87	NC		NC	5.3	0.3	41	30	0	0		20.0	12/10/13	0.48	n		1.0	↔	0.47	71.9	3.6	41	0	0	0		488.0	08/14/18	0.00	> Up n		NC		NC	5.3	0.3	41	36	0	0		20.0	12/02/13	0.07	n	
Fluoride, total as F	mg/l	2	3.68	NC		NC	0.0	1.8	41	37	0	0		0.2	01/18/23	0.00	< Up n		NC		NC	0.2	9.0	41	31	0	0		1.8	08/14/18	0.01	> Up n		0.0	↔	0.40	0.2	9.0	41	10	0	0		0.3	06/04/14	0.30	n	
Strontium, dissolved	µg/l	4000	2.87	-6.6	↔	0.01	49.8	1.2	41	0	0	0		59.3	03/12/15	0.00	< Up n		92.1	↑	0.00	1228.6	30.7	41	0	0	0		2190.0	08/25/19	0.00	> Up n		17.8	↑	0.00	354.0	8.8	41	0	0	0		430.0	11/05/20	0.00	> Up n	
Chloride, total as Cl	mg/l	250	2.32	12.0	↑	0.00	8.4	3.4	41	0	0	0		9.9	08/26/20	0.00	< Up n		-63.9	↓	0.00	11.4	4.6	41	0	0	0		22.6	12/11/13	0.06	n		-32.7	↓	0.00	16.7	6.7	41	0	0	0		19.9	06/06/17	0.00	> Up n	
Beryllium, dissolved	µg/l	4	1.96	NC		NC	0.1	3.6	41	41	0	0		0.5	06/10/14	NC			NC		NC	0.7	16.8	41	36	0	2	08/14/18	5.4	06/05/14	0.00	> Up n		NC		NC	0.1	3.3	41	41	0	0		0.2	12/02/13	NC		
Lithium, dissolved	µg/l	83	1.61	-30.7	↓	0.00	3.6	4.3	41	1	0	0		10.0	12/10/13	0.00	< Up n		-23.7	↓	0.01	1027.5	1237.9	41	0	0	41	10/17/23	1380.0	03/08/17	0.00	> Up n		268.5	↑	0.00	154.1	185.7	41	0	0	37	10/13/23	330.0	07/21/23	0.00	> Up n	
Silver, dissolved	µg/l	100	1.43	NC		NC	0.2	0.2	41	41	0	0		2.0	12/10/13	NC			NC		NC	0.4	0.4	41	41	0	0		10.0	12/11/13	NC			NC		NC	0.4	0.4	41	41	0	0		10.0	12/02/13	NC		
Ammonia, as N	mg/l	--	1.29	NC		NC	0.0	NA	41	41	0	0		0.2	01/26/22	0.00	< Up n		25.6	↑	0.08	0.3	NA	41	11	0	0		0.9	05/19/20	0.01	> Up n		-6.2	↔	0.15	0.2	NA	41	10	0	0		0.7	06/06/16	0.00	> Up n	
Magnesium, dissolved	mg/l	--	1.24	-10.9	↓	0.00	4.6	NA	41	0	0	0		5.7	03/12/15	0.00	< Up n		12.2	↑	0.16	15.4	NA	41	0	0	0		27.2	08/14/18	0.49	n		17.0	↑	0.00	39.5	NA	41	0	0	0		53.8	11/05/20	0.00	> Up n	
Total Organic Carbon	mg/l	--	1.20	NC		NC	0.2	NA	41	38	0	0		1.1	07/19/22	0.00	< Up n		-7.4	↔	0.25	0.7	NA	41	6	0	0		2.2	07/20/22	0.15	n		23.5	↑	0.07	1.2	NA	41	0	0	0		3.1	07/19/22	0.00	> Up n	
Titanium, dissolved	µg/l	--	1.19	NC		NC	0.8	NA	41	40	0	0		6.1	01/26/22	0.15	n		NC		NC	2.0	NA	41	41	0	0		5.0	07/26/23	0.24	n		NC		NC	2.3	NA	41	41	0	0		5.0	07/21/23	0.24	n	
Copper, dissolved	µg/l	1000	1.19	NC		NC	1.4	0.1	41	39	0	0		5.0	11/12/18	0.00	< Up n		0.0	↔	0.23	5.6	0.6	41	20	0	0		32.2	06/05/14	0.00	> Up n		NC		NC	1.6	0.2	41	34	0	0		5.0	02/11/19	0.01	> Up n	
Vanadium, dissolved	µg/l	170	1.16	NC		NC	1.4	0.8	41	41	0	0		2.3	01/18/23	0.00	< Up n		NC		NC	1.3	0.8	41	41	0	0		2.3	01/26/23	0.00	< Up n		NC		NC	1.6	1.0	41	32	0	0		5.0	10/13/23	0.00	> Up n	
Chemical Oxygen Demand	mg/l	--	1.11	NC		NC	2.6	NA	41	40	0	0		25.4	01/26/22	0.15	n		NC		NC	2.5	NA	41	40	0	0		20.7	05/19/20	0.31	n		NC		NC	7.4	NA	41	41	0	0		20.0	04/18/22	0.24	n	
Specific Conductance, field	umhos/cm	--	1.10	0.0	↔	0.47	225.3	NA	41	0	0	0		267.0	10/13/21	0.00	< Up n		10.7	↑	0.04	1523.6	NA	41	0	0	0		1953.0	05/07/19	0.00	> Up n		18.8	↑	0.00	1468.5	NA	41	0	0	0		1643.0	11/05/20	0.00	> Up n	
Chromium, dissolved	µg/l	100	1.04	NC		NC	0.8	0.8	41	41	0	0		2.0	12/10/13	NC			NC		NC	0.8	0.8	41	41	0	0		2.0	12/11/13	NC			NC		NC	0.8	0.8	41	41	0	0		2.0	12/02/13	NC		
Total Dissolved Solids	mg/l	500	1.03	-9.4	↔	0.01	142.3	28.5	41	0	0	0		173.0	08/16/19	0.00	< Up n		10.8	↑	0.13	1143.1	228.6	41	0	0	41	10/17/23	1670.0	05/07/19	0.00	> Up n		20.2	↑	0.00	1152.5	230.5	41	0	0	41	10/13/23	1300.0	11/05/20	0.00	> Up n	
Calcium, dissolved	mg/l	--	1.02	-7.0	↔	0.05	26.6	NA	41	0	0	0		32.0	08/26/20	0.00	< Up n		95.6	↑	0.00	154.7	NA	41	0	0	0		328.0	08/25/19	0.12	n		20.8	↑	0.00	234.9	NA	41	0	0	0		340.0	08/21/19	0.00	> Up n	
Antimony, dissolved	µg/l	6	1.00	NC		NC	0.4	6.7	1	1	0	0		0.4	02/19/19	NC			NC		NC	0.4	6.7	1	1	0	0		0.4	02/19/19	NC			NC		NC	0.4	6.7	1	1	0	0		0.4	02/11/19	NC		
pH, field	s.u.	6.5-8.5	0.99	3.6	↔	0.08	6.6	88.2	41	0	0	12	10/13/21	7.2	08/26/20	0.01	< Up n		7.4	↔	0.01	5.5	197.7	41	0	0	41	10/17/23	6.4	04/21/22	0.00	< Up n		-3.0	↔	0.01	6.9	64.1	41	0	0	1	05/12/15	7.2	12/07/15	0.00	> Up n	
Mercury, dissolved	µg/l	2	0.97	NC		NC	0.3	16.4	41	41	0	0		0.7	10/11/23	0.00	< Up n		NC		NC	0.3	16.4	41	41	0	0		0.7	10/17/23	0.00	< Up n		NC		NC	0.3	17.2	41	40	0	0		0.7	10/13/23	0.00	> Up n	
Sulfate, as SO4	mg/l	250	0.95	-16.2	↓	0.06	26.3	10.5	41	0	0	0		49.2	05/20/20	0.00	< Up n		12.9	↑	0.04	710.0	284.0	41	0	0	41	10/17/23	1040.0	05/07/19	0.00	> Up n		25.8	↑	0.00	590.4	236.2	41	0	0	41	10/13/23	718.0	01/27/21	0.00	> Up n	
Lead, dissolved	µg/l	5	0.90	NC		NC	0.2	4.4	41	41	0	0		1.0	10/11/23	NC			NC		NC	0.3	6.3	41	39	0	0		1.1	06/05/14	0.08	n		NC		NC	0.2	4.9	41	41	0	0		1.0	01/21/23	NC		
Boron, dissolved	µg/l	6000	0.79	285.9	↑	0.00	57.9	1.0	41	14	0	0		144.0	11/11/20	0.00	< Up n		-26.6	↓	0.00	2210.2	36.8	41	0	0	0		3400.0	02/19/19	0.00	> Up n		26.5	↑	0.00	1589.8	26.5	41	0	0	0		1990.0	11/05/18	0.00	> Up n	
Sodium, dissolved	mg/l	--	0.62	-9.5	↔	0.00	8.7	NA	41	0	0	0		9.7	02/19/19	0.00	< Up n		-56.0	↓	0.00	91.6	NA	41	0	0	0		135.0	03/08/17	0.00	> Up n		7.7	↔	0.02	59.0	NA	41	0	0	0		81.2	08/21/19	0.00	> Up n	
Barium, dissolved	µg/l	2000	0.32	-11.5	↓	0.04	247.1	12.4	41	0	0	0		333.0	10/11/23	0.00	> Up n		20.9	↑	0.03	13.0	0.7	41	0	0	0		18.6	11/05/20	0.00	< Up n		-15.1	↓	0.00	20.7	1.0	41	0	0	0		23.9	01/24/22	0.00	< Up n	
Selenium, dissolved	µg/l	50	0.24	112.2	↑	0.00	14.1	28.2	41	0	0	0		22.4	04/20/22	0.00	> Up p		86.2	↑	0.01	15.8	31.7	41	0	0	1	11/07/18	55.6	11/07/18	0.00	> Up n		NC		NC	0.7	1.5	41	39	0	0		5.0	07/19/22	0.00	< Up n	
Nitrate, as N	mg/l	10	0.10	-14.6	↓	0.00	4.2	42.4	41	0	0	0		8.8	06/05/17	0.00	> Up n		-19.4	↓	0.22	1.0	9.8	41	12	0	0		3.5	07/20/22	0.07	n		NC		NC	0.1	0.5	41	38	0	0		0.7	06/04/14	0.00	< Up n	

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Down MW-8-10A														Down MW-8-10B														Down MW-8-10C													
				Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison		Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison		Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	mg/l	0.3	61.37	NC		NC	0.0	5.3	41	33	0	0		0.1	06/05/14	0.02	> Up n	NC		NC	0.0	4.5	41	36	0	0		0.1	06/05/14	0.00	> Up n	248.2	↑	0.18	0.3	110.2	11	2	0	4	04/15/23	1.4	04/15/23	0.00	> Up n
Arsenic, dissolved	µg/l	10	61.04	NC		NC	0.5	5.2	41	41	0	0		0.6	10/14/23	0.00	< Up n	-27.1	↓	0.00	1.5	15.3	41	6	0	0		2.0	05/12/15	0.00	> Up n	-42.2	↓	0.20	0.8	8.5	11	5	0	0		1.8	06/08/16	0.01	> Up n
Manganese, dissolved	µg/l	300	21.76	-96.9	↓	0.00	478.2	159.4	41	6	0	13	10/14/23	1950.0	12/07/16	0.00	> Up n	NC		NC	3.6	1.2	41	28	0	0		27.0	10/14/23	0.00	< Up n	455.4	↑	0.11	329.8	109.9	11	2	0	8	04/15/23	826.0	04/15/23	0.00	> Up n
Molybdenum, dissolved	µg/l	40	16.81	-61.1	↓	0.00	31.3	78.2	41	0	0	10	02/13/18	78.7	12/07/16	0.00	> Up n	-23.8	↓	0.00	33.8	84.5	41	0	0	2	08/11/19	41.2	08/11/19	0.00	> Up n	-13.1	↓	0.11	53.9	134.7	11	0	0	10	04/16/22	67.0	04/24/21	0.00	> Up n
Aluminum, dissolved	µg/l	200	6.40	NC		NC	66.0	33.0	41	41	0	0		100.0	10/14/23	NC		NC		NC	61.8	30.9	41	41	0	0		100.0	10/14/23	NC		NC		NC	35.5	17.7	11	11	0	0		100.0	04/24/21	NC	
Nickel, dissolved	µg/l	100	6.10	NC		NC	1.0	1.0	41	35	0	0		9.2	11/11/19	0.00	< Up n	NC		NC	0.8	0.8	41	37	0	0		8.2	11/11/19	0.00	< Up n	NC		NC	0.5	0.5	11	10	0	0		2.8	04/15/23	0.00	< Up n
Cadmium, dissolved	µg/l	5	5.11	NC		NC	0.2	3.5	41	41	0	0		1.0	10/16/21	NC		NC		NC	0.1	2.4	41	41	0	0		1.0	08/24/20	NC		NC		NC	0.1	2.2	11	11	0	0		0.2	05/08/19	NC	
Potassium, dissolved	mg/l	--	5.10	-4.2	↔	0.29	2.4	NA	41	0	0	0		3.0	10/14/23	0.47	n	16.1	↑	0.01	2.3	NA	41	0	0	0		3.4	06/05/14	0.47	n	-71.5	↓	0.00	3.0	NA	11	1	0	0		6.8	05/12/15	0.22	n
Zinc, dissolved	µg/l	2000	3.87	-34.4	↓	0.00	6.8	0.3	41	15	0	0		29.1	11/11/19	0.00	> Up n	NC		NC	2.4	0.1	41	35	0	0		31.0	11/11/19	0.00	< Up n	NC		NC	3.9	0.2	11	11	0	0		5.0	04/15/23	0.03	< Up n
Fluoride, total as F	mg/l	2	3.68	NC		NC	0.2	7.7	41	25	0	0		0.2	10/14/23	0.00	> Up n	NC		NC	0.1	6.3	41	23	0	0		0.2	10/14/23	0.00	> Up n	42.6	↑	0.07	0.1	6.3	11	3	0	0		0.2	04/15/23	0.06	n
Strontium, dissolved	µg/l	4000	2.87	-31.9	↓	0.00	294.0	7.3	41	0	0	0		417.0	12/07/16	0.02	> Up n	43.9	↑	0.00	250.2	6.3	41	0	0	0		362.0	05/19/20	0.31	n	17.9	↑	0.02	205.6	5.1	11	0	0	0		240.0	04/24/21	0.50	n
Chloride, total as Cl	mg/l	250	2.32	97.5	↑	0.00	36.8	14.7	41	0	0	0		63.4	10/14/23	0.00	> Up n	1240.7	↑	0.00	53.9	21.6	41	0	0	0		116.0	10/14/23	0.00	> Up n	86.6	↑	0.00	11.4	4.6	11	0	0	0		14.3	04/24/21	0.17	n
Beryllium, dissolved	µg/l	4	1.96	NC		NC	0.1	3.3	41	41	0	0		0.2	12/11/13	NC		NC		NC	0.1	3.6	41	41	0	0		0.5	09/14/16	NC		NC		NC	0.2	4.2	11	11	0	0		0.5	05/08/19	NC	
Lithium, dissolved	µg/l	83	1.61	-34.2	↓	0.00	13.4	16.1	41	1	0	0		19.3	12/07/16	0.42	n	1.8	↔	0.46	14.3	17.2	41	1	0	0		31.6	06/05/14	0.37	n	-76.3	↓	0.00	14.0	16.9	11	0	0	0		35.5	05/12/15	0.30	n
Silver, dissolved	µg/l	100	1.43	NC		NC	0.4	0.4	41	41	0	0		10.0	12/11/13	NC		NC		NC	0.4	0.4	41	41	0	0		10.0	12/11/13	NC		NC		NC	0.2	0.2	11	11	0	0		1.0	06/09/14	NC	
Ammonia, as N	mg/l	--	1.29	NC		NC	0.1	NA	41	29	0	0		0.4	02/02/20	0.00	< Up n	NC		NC	0.1	NA	41	41	0	0		0.2	11/05/20	0.00	< Up n	NC		NC	0.0	NA	11	11	0	0		0.1	04/15/23	0.00	< Up n
Magnesium, dissolved	mg/l	--	1.24	-14.5	↓	0.01	37.6	NA	41	0	0	0		44.1	09/16/15	0.00	> Up n	26.8	↑	0.00	21.5	NA	41	0	0	0		26.1	10/15/22	0.47	n	23.6	↑	0.14	17.0	NA	11	0	0	0		20.7	04/24/21	0.50	n
Total Organic Carbon	mg/l	--	1.20	0.0	↔	0.48	0.6	NA	41	16	0	0		3.2	07/16/22	0.01	< Up n	NC		NC	0.3	NA	41	35	0	0		1.4	07/16/22	0.00	< Up n	NC		NC	0.6	NA	11	8	0	0		0.8	05/08/19	0.00	< Up n
Titanium, dissolved	µg/l	--	1.19	NC		NC	2.1	NA	39	39	0	0		5.0	07/22/23	0.25	n	NC		NC	2.2	NA	39	39	0	0		5.0	07/22/23	0.25	n	NC		NC	1.9	NA	10	10	0	0		5.0	04/15/23	0.36	n
Copper, dissolved	µg/l	1000	1.19	NC		NC	1.6	0.2	41	37	0	0		5.0	05/08/19	0.00	> Up n	NC		NC	1.1	0.1	41	37	0	0		5.0	03/07/17	0.00	< Up n	NC		NC	1.7	0.2	11	9	0	0		14.2	06/09/14	0.27	n
Vanadium, dissolved	µg/l	170	1.16	NC		NC	1.4	0.8	41	41	0	0		2.3	01/21/23	0.00	< Up n	NC		NC	4.2	2.5	41	32	0	0		5.0	10/14/23	0.24	n	NC		NC	1.2	0.7	11	11	0	0		2.3	04/16/22	0.00	< Up n
Chemical Oxygen Demand	mg/l	--	1.11	NC		NC	6.0	NA	41	41	0	0		20.0	07/16/22	0.24	n	NC		NC	6.3	NA	41	41	0	0		20.0	07/23/21	0.24	n	NC		NC	7.3	NA	11	11	0	0		20.0	04/24/21	0.36	n
Specific Conductance, field	umhos/cm	--	1.10	0.9	↔	0.47	990.6	NA	41	0	0	0		1181.0	10/14/23	0.50	n	40.7	↑	0.00	763.0	NA	41	0	0	0		929.0	10/14/23	0.50	n	15.5	↑	0.00	517.1	NA	11	0	0	0		553.0	04/24/21	0.49	n
Chromium, dissolved	µg/l	100	1.04	NC		NC	0.8	0.8	41	41	0	0		2.0	12/11/13	NC		NC		NC	0.8	0.8	41	41	0	0		2.0	12/11/13	NC		NC		NC	1.1	1.1	11	11	0	0		5.0	05/12/15	NC	
Total Dissolved Solids	mg/l	500	1.03	-9.8	↔	0.17	735.7	147.1	41	0	0	41	10/14/23	949.0	09/19/17	0.49	n	29.3	↑	0.00	519.9	104.0	41	0	0	23	10/14/23	731.0	07/22/23	0.50	n	11.0	↑	0.01	344.3	68.9	11	0	0	0		363.0	04/16/22	0.49	n
Calcium, dissolved	mg/l	--	1.02	-7.6	↔	0.13	146.0	NA	41	0	0	0		173.0	10/14/23	0.47	n	22.8	↑	0.00	115.6	NA	41	0	0	0		149.0	10/15/22	0.46	n	9.4	↔	0.18	59.5	NA	11	0	0	0		69.1	04/24/21	0.50	n
Antimony, dissolved	µg/l	6	1.00	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	s.u.	6.5-8.5	0.99	1.3	↔	0.18	6.5	99.5	41	0	0	23	07/22/23	7.1	02/02/20	0.00	< Up n	-1.8	↔	0.11	7.4	11.1	41	0	0	0		7.8	09/09/14	0.00	> Up n	-6.0	↔	0.02	7.2	25.9	11	0	0	0		7.6	06/09/14	0.00	> Up n
Mercury, dissolved	µg/l	2	0.97	NC		NC	0.3	16.4	41	41	0	0		0.7	10/14/23	0.00	< Up n	NC		NC	0.3	16.4	41	40	0	0		0.7	10/14/23	0.00	< Up n	NC		NC	0.3	13.8	11	11	0	0		0.7	04/15/23	0.00	< Up n
Sulfate, as SO4	mg/l	250	0.95	-22.2	↓	0.00	338.5	135.4	41	0	0	39	10/14/23	421.0	05/12/15	0.49	n	-16.2	↓	0.00	189.1	75.6	41	0	0	0		213.0	05/12/15	0.47	n	0.0	↔	0.38	118.7	47.5	11	0	0	0		125.0	06/08/16	0.48	n
Lead, dissolved	µg/l	5	0.90	NC		NC	0.2	4.5	41	41	0	0		1.0	02/02/20	NC		NC		NC	0.2	4.8	41	41	0	0		1.0	07/22/23	NC		NC		NC	0.1	2.7	11	11	0	0		0.2	04/16/22	NC	
Boron, dissolved	µg/l	6000	0.79	-30.1	↓	0.00	415.7	6.9	41	0	0	0		530.0	12/09/14	0.50	n	-14.9	↓	0.00	275.0	4.6	41	0	0	0		327.0	06/05/14	0.47	n	-1.3	↔	0.50	453.9	7.6	11	0	0	0		573.0	06/09/14	0.49	n
Sodium, dissolved	mg/l	--	0.62	48.2	↑	0.00	13.2	NA	41	0	0	0		22.2	10/14/23	0.47	n	14.6	↑	0.00	7.0	NA	41	0	0	0		8.2	02/13/19	0.00	< Up n	-22.4	↓	0.02	15.4	NA	11	0	0	0		21.2	05/12/15	0.46	n
Barium, dissolved	µg/l	2000	0.32	-47.3	↓	0.00	26.7	1.3	41	0	0	0		45.3	12/09/14	0.04	< Up n	14.2	↑	0.00	42.0	2.1	41	0	0	0		48.2	07/22/23	0.48	n	-6.3	↔	0.27	67.4	3.4	11	0	0	0		83.8	04/24/21	0.31	n
Selenium, dissolved	µg/l	50	0.24	NC		NC	0.4	0.9	41	41	0	0		5.0	10/16/21	0.00	< Up n	NC		NC	0.6	1.1	41	41	0	0		5.0	10/16/21	0.00	< Up n	NC		NC	0.3	0.6	11	11	0	0		0.6	04/24/21	0.00	< Up n
Nitrate, as N	mg/l	10	0.10	NC		NC	0.1	0.7	41	39	0	0		1.3	08/15/18	0.00	< Up n	NC		NC	0.1	1.3	41	41	0	0		0.5	07/22/23	0.00	< Up n	NC		NC	0.1	0.6	11	11	0	0		0.1	06/09/14	0.00	< Up n

Brunner Island - Basin 5 - Statistics Summary

4th Quarter 2023

Down — MW-8-12C

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Trend (%)		p	$\bar{x}$	$\bar{x}$ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	mg/l	0.3	61.37	-52.2	↓	0.00	0.8	269.7	11	0	0	10	04/18/23	1.2	06/10/14	0.00	> Up n
Arsenic, dissolved	µg/l	10	61.04	191.2	↑	0.20	1.1	10.7	11	3	0	0		2.0	06/10/14	0.01	> Up n
Manganese, dissolved	µg/l	300	21.76	6.8	↔	0.09	1412.5	470.8	11	0	0	10	04/18/23	1730.0	04/24/21	0.00	> Up n
Molybdenum, dissolved	µg/l	40	16.81	2.7	↔	0.35	365.1	912.7	11	0	0	11	04/18/23	520.0	04/24/21	0.00	> Up n
Aluminum, dissolved	µg/l	200	6.40	NC		NC	70.6	35.3	11	11	0	0		100.0	04/18/23	NC	
Nickel, dissolved	µg/l	100	6.10	NC		NC	3.3	3.3	11	7	0	0		5.0	05/09/18	0.19	n
Cadmium, dissolved	µg/l	5	5.11	NC		NC	0.5	9.9	11	8	0	0		1.0	04/18/23	0.00	> Up n
Potassium, dissolved	mg/l	--	5.10	-81.2	↓	0.00	7.4	NA	11	0	0	0		12.4	05/11/15	0.00	> Up n
Zinc, dissolved	µg/l	2000	3.87	NC		NC	2.1	0.1	11	10	0	0		12.8	06/10/14	0.17	n
Fluoride, total as F	mg/l	2	3.68	23.5	↑	0.35	0.2	7.8	11	1	0	0		0.3	05/20/20	0.48	n
Strontium, dissolved	µg/l	4000	2.87	-5.0	↔	0.18	307.7	7.7	11	0	0	0		424.0	05/08/19	0.30	n
Chloride, total as Cl	mg/l	250	2.32	-7.5	↔	0.12	8.6	3.4	11	0	0	0		9.1	06/10/14	0.01	< Up n
Beryllium, dissolved	µg/l	4	1.96	NC		NC	0.2	4.2	11	11	0	0		0.5	06/10/14	NC	
Lithium, dissolved	µg/l	83	1.61	-77.3	↓	0.01	16.1	19.4	11	0	0	0		28.7	06/08/16	0.48	n
Silver, dissolved	µg/l	100	1.43	NC		NC	0.4	0.4	11	10	0	0		2.2	06/10/14	0.00	> Up n
Ammonia, as N	mg/l	--	1.29	NC		NC	0.1	NA	11	6	0	0		0.2	05/20/20	0.01	< Up n
Magnesium, dissolved	mg/l	--	1.24	4.9	↔	0.22	18.1	NA	11	0	0	0		20.0	04/24/21	0.49	n
Total Organic Carbon	mg/l	--	1.20	5.5	↔	0.38	1.3	NA	11	1	0	0		2.2	06/03/22	0.00	> Up n
Titanium, dissolved	µg/l	--	1.19	NC		NC	1.6	NA	10	9	0	0		5.0	04/18/23	0.02	> Up n
Copper, dissolved	µg/l	1000	1.19	NC		NC	0.8	0.1	11	11	0	0		1.0	06/03/22	0.00	< Up n
Vanadium, dissolved	µg/l	170	1.16	NC		NC	1.2	0.7	11	11	0	0		2.3	06/03/22	0.00	< Up n
Chemical Oxygen Demand	mg/l	--	1.11	NC		NC	8.7	NA	11	11	0	0		20.0	06/03/22	0.36	n
Specific Conductance, field	umhos/cm	--	1.10	2.1	↔	0.14	624.5	NA	11	0	0	0		663.0	04/18/23	0.50	n
Chromium, dissolved	µg/l	100	1.04	NC		NC	0.8	0.8	11	11	0	0		1.0	05/08/19	NC	
Total Dissolved Solids	mg/l	500	1.03	-2.7	↔	0.32	421.2	84.2	11	0	0	0		452.0	05/20/20	0.50	n
Calcium, dissolved	mg/l	--	1.02	2.3	↔	0.38	92.6	NA	11	0	0	0		109.0	04/24/21	0.50	n
Antimony, dissolved	µg/l	6	1.00	NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	s.u.	6.5-8.5	0.99	-3.3	↔	0.08	7.1	37.4	11	0	0	0		7.4	09/09/14	0.00	> Up n
Mercury, dissolved	µg/l	2	0.97	NC		NC	0.3	14.2	11	10	0	0		0.7	04/18/23	0.01	< Up n
Sulfate, as SO4	mg/l	250	0.95	-10.7	↓	0.04	133.8	53.5	11	0	0	0		152.0	06/08/16	0.50	n
Lead, dissolved	µg/l	5	0.90	NC		NC	0.1	2.7	11	11	0	0		0.2	06/03/22	NC	
Boron, dissolved	µg/l	6000	0.79	-13.8	↓	0.01	1141.4	19.0	11	0	0	0		1330.0	06/10/14	0.50	n
Sodium, dissolved	mg/l	--	0.62	-21.1	↓	0.00	9.8	NA	11	0	0	0		10.9	05/11/15	0.14	n
Barium, dissolved	µg/l	2000	0.32	-14.5	↓	0.06	75.8	3.8	11	0	0	0		137.0	05/08/19	0.50	n
Selenium, dissolved	µg/l	50	0.24	NC		NC	0.3	0.6	11	11	0	0		0.6	06/03/22	0.00	< Up n
Nitrate, as N	mg/l	10	0.10	NC		NC	0.1	1.0	11	10	0	0		1.0	06/05/17	0.00	< Up n

Down — MW-8-1N

PARAMETER	Trend (%)		p	$\bar{x}$	$\bar{x}$ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	-66.3	↓	0.01	0.7	224.1	41	0	0	25	04/15/23	5.4	09/15/16	0.00	> Up n
Arsenic, dissolved	NC		NC	0.5	5.1	41	41	0	0		0.6	10/12/23	0.00	< Up n
Manganese, dissolved	-34.6	↓	0.00	1724.6	574.9	41	0	0	41	10/12/23	3210.0	09/15/16	0.00	> Up n
Molybdenum, dissolved	NC		NC	1.5	3.7	41	34	0	0		5.0	11/08/18	0.00	< Up n
Aluminum, dissolved	NC		NC	69.6	34.8	41	41	0	0		100.0	10/12/23	NC	
Nickel, dissolved	NC		NC	1.5	1.5	41	36	0	0		15.8	11/03/19	0.00	> Up n
Cadmium, dissolved	NC		NC	0.2	3.5	41	41	0	0		0.2	05/12/19	NC	
Potassium, dissolved	18.8	↑	0.03	7.8	NA	41	0	0	0		12.1	09/15/16	0.00	> Up n
Zinc, dissolved	NC		NC	2.5	0.1	41	38	0	0		7.1	01/22/22	0.01	< Up n
Fluoride, total as F	0.0	↔	0.38	0.2	11.5	41	12	0	0		0.4	12/05/13	0.00	> Up n
Strontium, dissolved	25.6	↑	0.00	1096.0	27.4	41	0	0	0		1440.0	10/12/23	0.00	> Up n
Chloride, total as Cl	-74.1	↓	0.00	66.3	26.5	41	0	0	0		209.0	03/06/14	0.00	> Up n
Beryllium, dissolved	NC		NC	0.1	3.3	41	41	0	0		0.2	12/05/13	NC	
Lithium, dissolved	-74.7	↓	0.00	1.9	2.3	41	12	0	0		4.8	09/15/16	0.00	< Up n
Silver, dissolved	NC		NC	0.2	0.2	41	41	0	0		2.0	12/05/13	NC	
Ammonia, as N	-42.7	↓	0.00	0.2	NA	41	16	0	0		1.1	02/02/20	0.02	> Up n
Magnesium, dissolved	-27.0	↓	0.00	34.4	NA	41	0	0	0		48.4	05/13/15	0.02	> Up n
Total Organic Carbon	-11.6	↓	0.13	1.1	NA	41	1	0	0		4.4	07/16/22	0.00	> Up n
Titanium, dissolved	NC		NC	1.4	NA	39	39	0	0		5.0	08/25/20	0.25	n
Copper, dissolved	NC		NC	1.2	0.1	41	37	0	0		5.0	05/12/19	0.00	< Up n
Vanadium, dissolved	NC		NC	1.3	0.8	41	41	0	0		2.3	01/18/23	0.00	< Up n
Chemical Oxygen Demand	NC		NC	8.4	NA	41	41	0	0		20.0	10/12/23	0.24	n
Specific Conductance, field	-36.2	↓	0.00	1325.0	NA	41	0	0	0		1886.0	05/13/15	0.01	> Up n
Chromium, dissolved	NC		NC	0.8	0.8	41	41	0	0		2.0	12/05/13	NC	
Total Dissolved Solids	-44.7	↓	0.00	971.0	194.2	41	0	0	41	10/12/23	1520.0	09/15/16	0.01	> Up n
Calcium, dissolved	-25.6	↓	0.00	202.6	NA	41	0	0	0		299.0	09/15/16	0.02	> Up n
Antimony, dissolved	NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	2.0	↔	0.04	6.6	88.5	41	0	0	10	04/15/23	6.9	01/18/23	0.00	< Up n
Mercury, dissolved	NC		NC	0.3	17.0	41	41	0	0		0.7	10/12/23	0.00	> Up n
Sulfate, as SO4	-48.6	↓	0.00	436.4	174.6	41	0	0	40	10/12/23	702.0	09/15/16	0.06	n
Lead, dissolved	NC		NC	0.2	4.1	41	41	0	0		1.0	12/05/13	NC	
Boron, dissolved	32.8	↑	0.01	74.4	1.2	41	18	0	0		100.0	10/12/23	0.00	< Up n
Sodium, dissolved	-88.8	↓	0.00	42.4	NA	41	0	0	0		92.4	09/17/15	0.01	> Up n
Barium, dissolved	-27.4	↓	0.01	23.8	1.2	41	0	0	0		43.0	03/06/14	0.00	< Up n
Selenium, dissolved	NC		NC	0.5	1.0	41	35	0	0		5.0	08/11/19	0.01	< Up p
Nitrate, as N	NC		NC	0.3	3.2	41	36	0	0		5.4	06/02/14	0.00	< Up n

Down — MW-8-2

PARAMETER	Trend (%)		p	$\bar{x}$	$\bar{x}$ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	NC		NC	0.0	1.3	41	38	0	0		0.1	01/25/21	0.00	< Up n
Arsenic, dissolved	NC		NC	0.1	1.2	41	40	0	0		1.0	08/24/20	0.00	< Up n
Manganese, dissolved	37.2	↑	0.00	374.9	125.0	41	0	0	31	10/12/23	727.0	10/12/23	0.00	> Up n
Molybdenum, dissolved	-13.1	↓	0.01	293.1	732.8	41	0	0	41	10/12/23	420.0	07/20/23	0.00	> Up n
Aluminum, dissolved	NC		NC	55.8	27.9	41	41	0	0		100.0	10/12/23	NC	
Nickel, dissolved	NC		NC	1.9	1.9	41	24	0	0		7.4	11/04/19	0.41	n
Cadmium, dissolved	NC		NC	0.6	11.3	41	28	0	0		1.1	08/24/20	0.00	> Up n
Potassium, dissolved	15.7	↑	0.00	5.2	NA	41	0	0	0		6.5	10/12/23	0.00	> Up n
Zinc, dissolved	NC		NC	2.9	0.1	41	33	0	0		6.7	09/08/14	0.00	< Up n
Fluoride, total as F	-7.1	↔	0.09	1.0	47.9	41	0	0	0		1.1	09/08/14	0.00	> Up n
Strontium, dissolved	30.1	↑	0.00	476.4	11.9	41	0	0	0		712.0	10/12/23	0.00	> Up n
Chloride, total as Cl	0.9	↔	0.42	27.6	11.0	41	0	0	0		34.2	10/12/23	0.00	> Up n
Beryllium, dissolved	NC		NC	0.1	3.3	41	41	0	0		0.2	12/02/13	NC	
Lithium, dissolved	-10.4	↓	0.07	21.0	25.3	41	0	0	0		26.0	09/14/15	0.49	n
Silver, dissolved	NC		NC	0.4	0.4	41	41	0	0		10.0	12/02/13	NC	
Ammonia, as N	19.1	↑	0.15	0.1	NA	41	16	0	0		0.3	02/03/20	0.16	n
Magnesium, dissolved	20.8	↑	0.00	14.4	NA	41	0	0	0		20.6	10/12/23	0.47	n
Total Organic Carbon	7.1	↔	0.06	0.8	NA	41	5	0	0		3.7	07/18/22	0.35	n
Titanium, dissolved	NC		NC	1.6	NA	39	39	0	0		5.0	10/17/22	0.25	n
Copper, dissolved	NC		NC	0.8	0.1	41	33	0	0		6.0	07/20/23	0.05	n
Vanadium, dissolved	NC		NC	1.4	0.8	41	40	0	0		2.3	01/20/23	0.00	< Up n
Chemical Oxygen Demand	NC		NC	6.8	NA	41	41	0	0		20.0	10/12/23	0.24	n
Specific Conductance, field	9.7	↔	0.05	605.1	NA	41	0	0	0		953.0	07/18/22	0.49	n
Chromium, dissolved	NC		NC	0.8	0.8	41	41	0	0		2.0	12/02/13	NC	
Total Dissolved Solids	6.4	↔	0.05	380.8	76.2	41	0	0	2	10/12/23	560.0	07/20/23	0.48	n
Calcium, dissolved	10.7	↑	0.11	84.6	NA	41	0	0	0		124.0	10/12/23	0.49	n
Antimony, dissolved	NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	-0.7	↔	0.38	6.7	81.5	41	0	0	7	07/20/23	7.0	12/07/15	0.18	n
Mercury, dissolved	NC		NC	0.3	16.5	41	41	0	0		0.7	10/12/23	0.00	< Up n
Sulfate, as SO4	-5.8	↔	0.16	138.3	55.3	41	0	0	0		207.0	10/12/23	0.47	n
Lead, dissolved	NC		NC	0.2	4.7	41	41	0	0		1.0	10/17/22	NC	
Boron, dissolved	-8.3	↔	0.05	456.4	7.6	41	0	0	0		581.0	09/08/14	0.49	n
Sodium, dissolved	9.3	↔	0.01	14.0	NA	41	0	0	0		16.9	10/12/23	0.44	n
Barium, dissolved	-4.1	↔	0.28	29.8	1.5	41	0	0	0		44.7	10/12/23	0.49	n
Selenium, dissolved	NC		NC	0.9	1.8	41	41	0	0		5.0	04/19/22	0.00	< Up n
Nitrate, as N	NC		NC	0.1	0.6	41	38	0	0		1.2	03/03/14	0.00	< Up n

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Down MW-8-3A														Down MW-8-3B														Down MW-8-4													
				Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison		Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison		Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	mg/l	0.3	61.37	-17.1	↓	0.19	5.6	1870.8	41	0	0	40	10/12/23	11.0	06/06/17	0.00	> Up n	-52.6	↓	0.03	0.3	113.7	41	5	0	20	01/24/22	0.9	09/19/16	0.00	> Up n	NC		NC	0.0	1.2	41	40	0	0		0.1	04/18/22	0.00	< Up n
Arsenic, dissolved	µg/l	10	61.04	31.9	↑	0.16	10.5	105.2	41	1	0	24	10/12/23	21.1	10/12/23	0.00	> Up n	-31.6	↓	0.04	5.7	57.1	41	0	0	0		9.8	11/08/18	0.00	> Up n	NC		NC	0.8	8.0	41	30	0	0		3.8	09/16/14	0.37	n
Manganese, dissolved	µg/l	300	21.76	31.3	↑	0.04	6429.5	2143.2	41	0	0	41	10/12/23	9120.0	10/14/21	0.00	> Up n	7.5	↔	0.32	1313.9	438.0	41	0	0	40	10/12/23	2000.0	07/18/22	0.00	> Up n	-69.5	↓	0.00	12474.4	4158.1	41	0	0	41	10/13/23	31600.0	09/16/14	0.00	> Up n
Molybdenum, dissolved	µg/l	40	16.81	3.1	↔	0.38	63.2	157.9	41	0	0	35	10/12/23	94.6	11/04/19	0.00	> Up n	-4.9	↔	0.24	143.1	357.8	41	0	0	41	10/12/23	177.0	07/20/23	0.00	> Up n	NC		NC	1.1	2.9	41	33	0	0		11.1	04/17/23	0.00	< Up n
Aluminum, dissolved	µg/l	200	6.40	NC		NC	67.7	33.8	41	41	0	0		100.0	10/12/23	NC		NC		NC	63.9	32.0	41	41	0	0		100.0	10/12/23	NC		-72.3	↓	0.00	894.0	447.0	41	5	0	17	07/19/22	6260.0	09/16/14	0.00	> Up n
Nickel, dissolved	µg/l	100	6.10	NC		NC	3.0	3.0	41	24	0	0		11.7	11/04/19	0.31	n	NC		NC	1.0	1.0	41	36	0	0		9.8	11/04/19	0.00	< Up n	-66.9	↓	0.00	100.8	100.8	41	0	0	14	07/19/22	237.0	09/24/15	0.00	> Up n
Cadmium, dissolved	µg/l	5	5.11	NC		NC	0.1	2.7	41	41	0	0		1.0	08/24/20	NC		NC		NC	0.4	8.1	41	41	0	0		1.0	01/20/23	NC		-59.1	↓	0.00	2.1	42.6	41	8	0	3	09/22/16	6.1	09/24/15	0.00	> Up n
Potassium, dissolved	mg/l	--	5.10	31.2	↑	0.00	2.9	NA	41	0	0	0		3.5	01/20/23	0.43	n	12.4	↑	0.00	1.7	NA	41	0	0	0		2.0	07/18/22	0.47	n	-34.5	↓	0.00	1.9	NA	41	0	0	0		3.6	09/24/15	0.48	n
Zinc, dissolved	µg/l	2000	3.87	NC		NC	5.1	0.3	41	33	0	0		20.0	12/12/13	0.22	n	NC		NC	5.3	0.3	41	34	0	0		20.0	12/12/13	0.17	n	-82.5	↓	0.00	140.4	7.0	41	0	0	0		467.0	09/24/15	0.00	> Up n
Fluoride, total as F	mg/l	2	3.68	-6.2	↔	0.17	0.4	21.1	41	0	0	0		0.7	02/03/20	0.00	> Up n	-14.2	↓	0.04	0.5	23.7	41	2	0	0		0.9	05/13/15	0.00	> Up n	-23.6	↓	0.24	0.3	17.3	41	7	0	0		0.9	09/16/14	0.00	> Up n
Strontium, dissolved	µg/l	4000	2.87	55.1	↑	0.00	788.8	19.7	41	0	0	0		1040.0	04/14/23	0.00	> Up n	20.5	↑	0.00	369.9	9.2	41	0	0	0		447.0	10/12/23	0.00	> Up n	-53.0	↓	0.00	369.5	9.2	41	0	0	0		661.0	09/16/14	0.00	> Up n
Chloride, total as Cl	mg/l	250	2.32	605.3	↑	0.00	42.6	17.1	41	1	0	0		140.0	01/24/22	0.44	n	1898.1	↑	0.00	21.3	8.5	41	0	0	0		92.4	11/06/20	0.07	n	-56.0	↓	0.00	31.2	12.5	41	0	0	0		82.5	09/24/15	0.00	> Up n
Beryllium, dissolved	µg/l	4	1.96	NC		NC	0.1	3.6	41	41	0	0		0.5	08/22/18	NC		NC		NC	0.1	3.3	41	41	0	0		0.2	12/12/13	NC		NC		NC	1.1	28.5	41	25	0	3	09/22/16	5.0	09/24/15	0.00	> Up n
Lithium, dissolved	µg/l	83	1.61	7.7	↔	0.21	16.3	19.7	41	0	0	0		22.0	07/20/23	0.49	n	-8.4	↔	0.03	25.6	30.9	41	0	0	0		35.8	01/24/22	0.47	n	-48.4	↓	0.00	17.3	20.8	41	1	0	0		37.0	09/24/15	0.41	n
Silver, dissolved	µg/l	100	1.43	NC		NC	0.4	0.4	41	41	0	0		10.0	12/12/13	NC		NC		NC	1.2	1.2	41	40	0	0		34.3	09/21/15	0.08	n	NC		NC	0.4	0.4	41	41	0	0		10.0	12/12/13	NC	
Ammonia, as N	mg/l	--	1.29	8.6	↔	0.27	0.2	NA	41	8	0	0		0.4	08/24/20	0.00	> Up n	NC		NC	0.0	NA	41	26	0	0		0.3	02/03/20	0.00	< Up n	NC		NC	0.0	NA	41	31	0	0		0.3	05/20/20	0.00	< Up n
Magnesium, dissolved	mg/l	--	1.24	39.8	↑	0.00	30.9	NA	41	0	0	0		39.3	01/24/22	0.34	n	27.2	↑	0.00	23.9	NA	41	0	0	0		30.5	01/24/22	0.49	n	-51.3	↓	0.00	46.5	NA	41	0	0	0		65.4	09/16/14	0.00	> Up n
Total Organic Carbon	mg/l	--	1.20	-25.7	↓	0.04	1.6	NA	41	2	0	0		4.2	07/18/22	0.00	> Up n	-1.0	↔	0.47	0.8	NA	41	7	0	0		2.8	07/18/22	0.26	n	-1.5	↔	0.41	0.8	NA	41	7	0	0		2.6	07/19/22	0.39	n
Titanium, dissolved	µg/l	--	1.19	NC		NC	2.4	NA	39	39	0	0		5.0	07/20/23	0.25	n	NC		NC	2.2	NA	39	39	0	0		5.0	07/20/23	0.25	n	NC		NC	1.1	NA	39	35	0	0		5.6	01/22/22	0.00	> Up n
Copper, dissolved	µg/l	1000	1.19	NC		NC	1.1	0.1	41	35	0	0		4.0	12/12/13	0.01	< Up n	NC		NC	0.7	0.1	41	35	0	0		6.1	03/07/17	0.02	< Up n	NC		NC	3.7	0.4	41	21	0	0		16.7	09/24/15	0.00	> Up n
Vanadium, dissolved	µg/l	170	1.16	NC		NC	1.3	0.8	41	41	0	0		2.3	01/20/23	0.00	< Up n	NC		NC	1.5	0.9	41	35	0	0		5.0	10/12/23	0.00	> Up n	NC		NC	1.3	0.8	41	41	0	0		2.3	01/19/23	0.00	< Up n
Chemical Oxygen Demand	mg/l	--	1.11	NC		NC	2.5	NA	41	40	0	0		22.1	07/18/22	0.31	n	NC		NC	5.8	NA	41	41	0	0		20.0	10/12/23	0.24	n	NC		NC	2.9	NA	41	39	0	0		21.2	07/23/21	0.11	n
Specific Conductance, field	umhos/cm	--	1.10	74.7	↑	0.00	968.9	NA	41	0	0	0		1315.0	07/18/22	0.41	n	35.2	↑	0.00	782.7	NA	41	0	0	0		1011.0	10/12/23	0.50	n	-42.0	↓	0.00	1075.3	NA	41	0	0	0		1588.0	09/16/14	0.34	n
Chromium, dissolved	µg/l	100	1.04	NC		NC	0.8	0.8	41	41	0	0		2.0	12/12/13	NC		NC		NC	0.8	0.8	41	41	0	0		2.0	12/12/13	NC		NC		NC	0.8	0.8	41	41	0	0		2.0	12/12/13	NC	
Total Dissolved Solids	mg/l	500	1.03	52.2	↑	0.00	695.6	139.1	41	0	0	41	10/12/23	886.0	07/18/22	0.50	n	23.4	↑	0.00	517.1	103.4	41	0	0	25	10/12/23	631.0	07/20/23	0.49	n	-48.3	↓	0.00	861.9	172.4	41	0	0	38	07/20/23	1340.0	09/16/14	0.14	n
Calcium, dissolved	mg/l	--	1.02	60.1	↑	0.00	152.0	NA	41	0	0	0		198.0	04/26/21	0.49	n	34.0	↑	0.00	128.3	NA	41	0	0	0		169.0	10/17/22	0.47	n	-44.5	↓	0.00	132.4	NA	41	0	0	0		195.0	09/16/14	0.48	n
Antimony, dissolved	µg/l	6	1.00	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	s.u.	6.5-8.5	0.99	-1.1	↔	0.28	6.4	106.8	41	0	0	26	04/14/23	6.8	04/18/22	0.00	< Up n	0.4	↔	0.36	6.9	62.8	41	0	0	0		7.2	11/08/18	0.00	> Up n	11.8	↑	0.00	5.5	204.6	41	0	0	40	07/20/23	7.0	10/13/23	0.00	< Up n
Mercury, dissolved	µg/l	2	0.97	NC		NC	0.3	16.7	41	41	0	0		0.7	10/12/23	0.00	< Up n	NC		NC	0.3	16.6	41	41	0	0		0.7	10/12/23	0.00	< Up n	NC		NC	0.3	16.5	41	41	0	0		0.7	10/13/23	0.00	< Up n
Sulfate, as SO4	mg/l	250	0.95	20.5	↑	0.02	251.8	100.7	41	0	0	21	07/20/23	331.0	05/06/19	0.49	n	12.5	↑	0.03	151.6	60.6	41	0	0	1	05/13/15	281.0	05/13/15	0.48	n	-53.3	↓	0.00	491.0	196.4	41	0	0	40	10/13/23	730.0	09/16/14	0.01	> Up n
Lead, dissolved	µg/l	5	0.90	NC		NC	0.2	3.7	41	41	0	0		1.0	12/12/13	NC		NC		NC	0.2	3.9	41	41	0	0		1.0	11/04/19	NC		NC		NC	0.2	4.3	41	41	0	0		1.0	12/12/13	NC	
Boron, dissolved	µg/l	6000	0.79	3.6	↔	0.27	411.6	6.9	41	0	0	0		489.0	10/12/23	0.50	n	0.7	↔	0.42	345.9	5.8	41	0	0	0		406.0	11/06/20	0.48	n	-32.4	↓	0.00	293.9	4.9	41	0	0	0		493.0	09/24/15	0.49	n
Sodium, dissolved	mg/l	--	0.62	752.5	↑	0.00	13.1	NA	41	0	0	0		36.9	04/14/23	0.00	< Up n	41.9	↑	0.00	6.9	NA	41	0	0	0		9.3	10/12/23	0.00	< Up n	-51.6	↓	0.00	21.1	NA	41	0	0	0		45.6	09/24/15	0.49	n
Barium, dissolved	µg/l	2000	0.32	30.0	↑	0.09	46.4	2.3	41	0	0	0		72.3	10/12/23	0.49	n	33.5	↑	0.00	56.5	2.8	41	0	0	0		76.7	11/06/20	0.50	n	13.6	↑	0.01	14.2	0.7	41	0	0	0		18.7	01/22/22	0.00	< Up n
Selenium, dissolved	µg/l	50	0.24	NC		NC	0.5	1.0	41	41	0	0		5.0	08/12/19	0.00	< Up n	NC		NC	0.4	0.9	41	41	0	0		5.0	08/12/19	0.00	< Up n	NC		NC	1.1	2.3	41	24	0	0		5.0	07/19/22	0.01	< Up p
Nitrate, as N	mg/l	10	0.10	NC		NC	0.1	1.0	41	38	0	0		2.4	07/18/22	0.00	< Up n	NC		NC	0.1	1.2	41	36	0	0		2.2	07/18/22	0.00	< Up n	NC		NC	0.6	6.4	41	27	0	1	09/16/14	12.2	09/16/14	0.00	< Up n

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Down MW-8-5A															Down MW-8-5B															Down MW-8-8A													
				Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison			Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison			Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	mg/l	0.3	61.37	NC		NC	0.0	6.0	41	35	0	0		0.1	06/04/14	0.00	> Up n		NC		NC	0.0	2.2	41	35	0	0		0.1	01/22/22	0.00	> Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Arsenic, dissolved	µg/l	10	61.04	-8.3	↔	0.05	122.1	1220.8	41	0	0	41	10/13/23	150.0	04/14/23	0.00	> Up n		-15.9	↓	0.00	256.5	2565.4	41	0	0	41	10/13/23	372.0	07/23/21	0.00	> Up n		-4.6	↔	0.35	467.5	4675.0	6	0	0	6	10/13/23	529.0	10/15/22	0.00	> Up n
Manganese, dissolved	µg/l	300	21.76	23.0	↑	0.00	412.1	137.4	41	0	0	41	10/13/23	496.0	01/22/22	0.00	> Up n		-9.9	↔	0.07	413.4	137.8	41	0	0	41	10/13/23	529.0	12/04/14	0.00	> Up n		20.2	↑	0.35	939.7	313.2	6	0	0	6	10/13/23	1130.0	10/15/22	0.00	> Up n
Molybdenum, dissolved	µg/l	40	16.81	-9.5	↔	0.03	380.8	952.0	41	0	0	41	10/13/23	529.0	07/20/23	0.00	> Up n		-6.2	↔	0.20	342.6	856.5	41	0	0	41	10/13/23	487.0	07/20/23	0.00	> Up n		-2.2	↔	0.50	319.2	797.9	6	0	0	6	10/13/23	359.0	07/21/23	0.00	> Up n
Aluminum, dissolved	µg/l	200	6.40	NC		NC	69.5	34.7	41	41	0	0		100.0	10/13/23	NC			NC		NC	73.2	36.6	41	41	0	0		100.0	10/13/23	NC			NC		NC	NC	NC	0	0	0	0		NC		NC	
Nickel, dissolved	µg/l	100	6.10	NC		NC	1.5	1.5	41	36	0	0		14.7	08/25/20	0.00	> Up n		NC		NC	1.3	1.3	41	37	0	0		13.8	08/25/20	0.00	< Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Cadmium, dissolved	µg/l	5	5.11	NC		NC	0.5	10.8	41	30	0	0		1.0	10/13/23	0.01	> Up n		NC		NC	0.5	10.7	41	34	0	0		1.0	10/13/23	0.30	n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Potassium, dissolved	mg/l	--	5.10	15.6	↑	0.00	4.2	NA	41	0	0	0		4.7	04/15/22	0.00	> Up n		20.1	↑	0.00	3.9	NA	41	0	0	0		4.7	10/14/22	0.00	> Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Zinc, dissolved	µg/l	2000	3.87	NC		NC	2.5	0.1	41	36	0	0		8.8	08/14/19	0.06	n		NC		NC	1.4	0.1	41	38	0	0		6.0	03/10/15	0.01	< Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Fluoride, total as F	mg/l	2	3.68	-1.5	↔	0.34	0.9	45.4	41	0	0	0		1.1	05/20/20	0.00	> Up n		-8.6	↔	0.08	0.7	35.4	41	0	0	0		0.8	06/04/14	0.00	> Up n		-13.3	↓	0.35	0.7	36.4	6	0	0	0		1.0	04/17/23	0.00	> Up n
Strontium, dissolved	µg/l	4000	2.87	19.9	↑	0.00	730.6	18.3	41	0	0	0		844.0	10/13/23	0.00	> Up n		17.7	↑	0.00	847.0	21.2	41	0	0	0		1030.0	10/13/23	0.00	> Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Chloride, total as Cl	mg/l	250	2.32	45.2	↑	0.01	22.0	8.8	41	0	0	0		33.0	02/13/19	0.00	> Up n		67.6	↑	0.00	16.6	6.7	41	0	0	0		25.2	10/13/23	0.00	> Up n		34.2	↑	0.23	213.7	85.5	6	0	0	2	10/13/23	284.0	10/13/23	0.00	> Up n
Beryllium, dissolved	µg/l	4	1.96	NC		NC	0.1	3.6	41	41	0	0		0.5	09/15/14	NC			NC		NC	0.1	3.3	41	41	0	0		0.2	12/02/13	NC			NC		NC	NC	NC	0	0	0	0		NC		NC	
Lithium, dissolved	µg/l	83	1.61	11.6	↑	0.05	197.9	238.4	41	0	0	41	10/13/23	307.0	04/14/23	0.00	> Up n		12.2	↑	0.07	156.2	188.2	41	0	0	41	10/13/23	229.0	04/14/23	0.00	> Up n		2.1	↔	0.35	245.8	296.2	6	0	0	6	10/13/23	301.0	10/15/22	0.00	> Up n
Silver, dissolved	µg/l	100	1.43	NC		NC	0.4	0.4	41	41	0	0		10.0	12/02/13	NC			NC		NC	0.4	0.4	41	41	0	0		10.0	12/02/13	NC			NC		NC	NC	NC	0	0	0	0		NC		NC	
Ammonia, as N	mg/l	--	1.29	-1.6	↔	0.42	0.4	NA	41	0	0	0		0.6	11/06/19	0.00	> Up n		-18.1	↓	0.01	0.3	NA	41	3	0	0		1.2	08/25/20	0.00	> Up n		14.8	↑	0.35	0.3	NA	6	0	0	0		0.4	10/15/22	0.00	> Up n
Magnesium, dissolved	mg/l	--	1.24	3.6	↔	0.15	37.8	NA	41	0	0	0		42.8	01/22/22	0.00	> Up n		7.9	↔	0.02	31.3	NA	41	0	0	0		36.1	11/05/20	0.47	n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Total Organic Carbon	mg/l	--	1.20	0.0	↔	0.50	0.7	NA	41	12	0	0		4.7	07/16/22	0.04	> Up n		0.0	↔	0.39	0.7	NA	41	12	0	0		4.0	07/16/22	0.02	< Up n		NC		NC	0.6	NA	6	5	0	0		2.5	07/19/22	0.08	n
Titanium, dissolved	µg/l	--	1.19	NC		NC	1.9	NA	39	39	0	0		5.0	04/14/23	0.25	n		NC		NC	2.0	NA	39	39	0	0		5.0	07/20/23	0.25	n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Copper, dissolved	µg/l	1000	1.19	NC		NC	1.6	0.2	41	29	0	0		10.4	03/07/17	0.45	n		NC		NC	1.7	0.2	41	36	0	0		5.0	05/07/19	0.00	> Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Vanadium, dissolved	µg/l	170	1.16	NC		NC	3.3	1.9	41	32	0	0		5.0	10/13/23	0.07	n		NC		NC	1.5	0.9	41	38	0	0		5.0	10/13/23	0.00	< Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Chemical Oxygen Demand	mg/l	--	1.11	NC		NC	4.7	NA	41	41	0	0		20.0	10/15/21	0.24	n		NC		NC	4.8	NA	41	41	0	0		20.0	07/23/21	0.24	n		NC		NC	8.0	NA	6	5	0	0		21.3	07/19/22	0.01	> Up n
Specific Conductance, field	umhos/cm	--	1.10	16.1	↑	0.00	1051.6	NA	41	0	0	0		1143.0	01/22/22	0.49	n		16.0	↑	0.00	955.0	NA	41	0	0	0		1078.0	10/13/23	0.50	n		9.3	↔	0.35	1559.2	NA	6	0	0	0		1744.0	10/15/22	0.00	> Up n
Chromium, dissolved	µg/l	100	1.04	NC		NC	0.8	0.8	41	39	0	0		2.0	12/02/13	0.10	n		NC		NC	0.8	0.8	41	41	0	0		2.0	12/02/13	NC			NC		NC	NC	NC	0	0	0	0		NC		NC	
Total Dissolved Solids	mg/l	500	1.03	7.5	↔	0.01	756.1	151.2	41	0	0	41	10/13/23	828.0	09/12/17	0.49	n		7.1	↔	0.01	675.4	135.1	41	0	0	41	10/13/23	754.0	07/23/21	0.49	n		9.9	↔	0.35	988.3	197.7	6	0	0	6	10/13/23	1170.0	10/13/23	0.19	n
Calcium, dissolved	mg/l	--	1.02	13.0	↑	0.00	169.8	NA	41	0	0	0		204.0	10/14/22	0.46	n		17.3	↑	0.00	156.4	NA	41	0	0	0		193.0	07/23/21	0.45	n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Antimony, dissolved	µg/l	6	1.00	NC		NC	NC	NC	0	0	0	0		NC		NC			NC		NC	NC	NC	0	0	0	0		NC		NC			NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	s.u.	6.5-8.5	0.99	-2.7	↔	0.07	7.0	51.4	41	0	0	1	02/13/19	7.4	10/13/23	0.00	> Up n		-2.4	↔	0.12	7.1	36.8	41	0	0	0		7.6	12/02/13	0.00	> Up n		3.6	↔	0.35	7.0	45.2	6	0	0	0		7.3	10/15/22	0.00	> Up n
Mercury, dissolved	µg/l	2	0.97	NC		NC	0.3	17.2	41	41	0	0		0.7	10/13/23	0.00	> Up n		NC		NC	0.4	17.7	41	28	0	0		0.7	10/13/23	0.00	> Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Sulfate, as SO4	mg/l	250	0.95	9.1	↔	0.01	304.2	121.7	41	0	0	41	10/13/23	340.0	05/11/15	0.48	n		11.3	↑	0.02	269.0	107.6	41	0	0	32	10/13/23	325.0	07/23/21	0.48	n		-5.7	↔	0.23	251.7	100.7	6	0	0	3	10/13/23	283.0	10/15/22	0.50	n
Lead, dissolved	µg/l	5	0.90	NC		NC	0.2	3.6	41	41	0	0		1.0	12/02/13	NC			NC		NC	0.2	4.7	41	41	0	0		1.0	12/02/13	NC			NC		NC	NC	NC	0	0	0	0		NC		NC	
Boron, dissolved	µg/l	6000	0.79	-2.5	↔	0.26	874.0	14.6	41	0	0	0		965.0	04/15/22	0.49	n		-3.0	↔	0.30	829.3	13.8	41	0	0	0		993.0	10/13/23	0.49	n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Sodium, dissolved	mg/l	--	0.62	92.4	↑	0.00	10.0	NA	41	0	0	0		13.6	07/16/22	0.00	< Up n		55.9	↑	0.00	8.8	NA	41	0	0	0		11.6	10/13/23	0.00	< Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Barium, dissolved	µg/l	2000	0.32	-2.3	↔	0.19	44.0	2.2	41	0	0	0		50.0	05/11/15	0.48	n		-3.0	↔	0.18	67.3	3.4	41	0	0	0		80.6	12/04/14	0.50	n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Selenium, dissolved	µg/l	50	0.24	NC		NC	0.4	0.7	41	41	0	0		0.8	12/02/13	0.00	< Up n		NC		NC	0.3	0.7	41	41	0	0		0.8	12/02/13	0.00	< Up n		NC		NC	NC	NC	0	0	0	0		NC		NC	
Nitrate, as N	mg/l	10	0.10	NC		NC	0.0	0.5	41	39	0	0		0.9	06/14/16	0.00	< Up n		NC		NC	0.0	0.3	41	40	0	0		0.6	07/20/23	0.00	< Up n		NC		NC	1.4	13.8	6	5	0	0		8.2	10/15/22	0.09	n

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Down MW-8-8B														Down MW-8-9B														Down MW-8-9C													
				Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison		Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison		Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	mg/l	0.3	61.37	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Arsenic, dissolved	µg/l	10	61.04	49.3	↑	0.09	346.0	3460.0	6	0	0	6	10/13/23	439.0	07/21/23	0.00	> Up n	-7.1	↔	0.35	676.2	6761.7	6	0	0	6	10/14/23	751.0	07/18/22	0.00	> Up n	42.2	↑	0.07	312.0	3120.0	6	0	0	6	10/14/23	375.0	07/21/23	0.00	> Up n
Manganese, dissolved	µg/l	300	21.76	NC		NC	17.4	5.8	6	5	0	0		78.0	04/17/23	0.04	< Up n	-3.7	↔	0.50	1365.0	455.0	6	0	0	6	10/14/23	1700.0	01/20/23	0.00	> Up n	28.8	↑	0.07	829.5	276.5	6	0	0	6	10/14/23	919.0	10/14/23	0.00	> Up n
Molybdenum, dissolved	µg/l	40	16.81	11.3	↑	0.23	286.7	716.7	6	0	0	6	10/13/23	443.0	07/21/23	0.00	> Up n	-22.1	↓	0.35	242.7	606.7	6	0	0	6	10/14/23	319.0	07/21/23	0.00	> Up n	89.9	↑	0.13	251.0	627.5	6	0	0	6	10/14/23	389.0	07/21/23	0.00	> Up n
Aluminum, dissolved	µg/l	200	6.40	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Nickel, dissolved	µg/l	100	6.10	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Cadmium, dissolved	µg/l	5	5.11	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Potassium, dissolved	mg/l	--	5.10	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Zinc, dissolved	µg/l	2000	3.87	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Fluoride, total as F	mg/l	2	3.68	-4.1	↔	0.35	0.9	43.5	6	0	0	0		1.3	04/17/23	0.00	> Up n	-20.7	↓	0.23	0.4	18.5	6	1	0	0		0.5	10/17/22	0.00	> Up n	0.0	↔	0.50	0.8	41.9	6	0	0	0		1.0	04/17/23	0.00	> Up n
Strontium, dissolved	µg/l	4000	2.87	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Chloride, total as Cl	mg/l	250	2.32	144.5	↑	0.00	102.2	40.9	6	0	0	0		145.0	10/13/23	0.00	> Up n	-32.4	↓	0.04	142.8	57.1	6	0	0	0		170.0	01/20/23	0.00	> Up n	8.2	↔	0.28	18.6	7.4	6	0	0	0		19.9	10/14/23	0.00	> Up n
Beryllium, dissolved	µg/l	4	1.96	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Lithium, dissolved	µg/l	83	1.61	38.6	↑	0.13	257.7	310.4	6	0	0	6	10/13/23	372.0	07/21/23	0.00	> Up n	-7.8	↔	0.42	243.2	293.0	6	0	0	6	10/14/23	300.0	07/21/23	0.00	> Up n	40.5	↑	0.50	144.9	174.6	6	0	0	6	10/14/23	204.0	07/21/23	0.01	> Up n
Silver, dissolved	µg/l	100	1.43	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Ammonia, as N	mg/l	--	1.29	NC		NC	0.1	NA	6	6	0	0		0.1	10/13/23	0.01	< Up n	-20.5	↓	0.35	0.3	NA	6	0	0	0		0.4	07/18/22	0.00	> Up n	-8.9	↔	0.23	0.4	NA	6	0	0	0		0.4	04/17/23	0.00	> Up n
Magnesium, dissolved	mg/l	--	1.24	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Total Organic Carbon	mg/l	--	1.20	NC		NC	0.5	NA	6	5	0	0		2.2	07/19/22	0.08	n	NC		NC	0.6	NA	6	5	0	0		2.5	07/18/22	0.08	n	-0.3	↔	0.27	1.0	NA	6	3	0	0		2.7	07/18/22	0.36	n
Titanium, dissolved	µg/l	--	1.19	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Copper, dissolved	µg/l	1000	1.19	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Vanadium, dissolved	µg/l	170	1.16	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Chemical Oxygen Demand	mg/l	--	1.11	NC		NC	5.3	NA	6	6	0	0		5.3	10/13/23	0.39	n	NC		NC	10.2	NA	6	6	0	0		20.0	10/14/23	0.39	n	NC		NC	5.3	NA	6	6	0	0		5.3	10/14/23	0.39	n
Specific Conductance, field	umhos/cm	--	1.10	7.4	↔	0.03	1352.0	NA	6	0	0	0		1392.0	07/21/23	0.27	n	-14.2	↓	0.13	1546.8	NA	6	0	0	0		1670.0	01/20/23	0.00	> Up n	-3.4	↔	0.01	822.5	NA	6	0	0	0		839.0	07/18/22	0.50	n
Chromium, dissolved	µg/l	100	1.04	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Total Dissolved Solids	mg/l	500	1.03	0.8	↔	0.50	923.5	184.7	6	0	0	6	10/13/23	1030.0	07/19/22	0.46	n	-8.6	↔	0.23	980.2	196.0	6	0	0	6	10/14/23	1050.0	07/18/22	0.43	n	0.0	↔	0.50	509.2	101.8	6	0	0	4	10/14/23	552.0	07/21/23	0.50	n
Calcium, dissolved	mg/l	--	1.02	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Antimony, dissolved	µg/l	6	1.00	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	s.u.	6.5-8.5	0.99	0.7	↔	0.28	7.5	0.2	6	0	0	0		7.7	10/15/22	0.00	> Up n	0.7	↔	0.35	7.1	36.5	6	0	0	0		7.3	10/17/22	0.00	> Up n	4.4	↔	0.23	7.0	45.7	6	0	0	0		7.3	10/17/22	0.01	> Up n
Mercury, dissolved	µg/l	2	0.97	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Sulfate, as SO4	mg/l	250	0.95	-35.3	↓	0.02	367.8	147.1	6	0	0	6	10/13/23	435.0	01/20/23	0.50	n	-8.6	↔	0.23	318.0	127.2	6	0	0	6	10/14/23	335.0	01/20/23	0.50	n	-3.2	↔	0.28	154.3	61.7	6	0	0	0		157.0	01/21/23	0.50	n
Lead, dissolved	µg/l	5	0.90	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Boron, dissolved	µg/l	6000	0.79	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Sodium, dissolved	mg/l	--	0.62	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Barium, dissolved	µg/l	2000	0.32	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Selenium, dissolved	µg/l	50	0.24	NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC		NC		NC	NC	NC	0	0	0	0		NC		NC	
Nitrate, as N	mg/l	10	0.10	-18.9	↓	0.13	0.9	9.2	6	0	0	0		1.1	04/17/23	0.50	n	NC		NC	0.1	1.0	6	6	0	0		0.5	07/18/22	0.01	< Up n	NC		NC	0.1	1.0	6	6	0	0		0.5	07/21/23	0.01	< Up n

Notes:

1. Upgradient vs downgradient represents the ratio of average concentration in all downgradient wells to average concentration of all upgradient wells (i.e. how many times greater is the concentration in downgradient v
2. Rows are sorted according to "Upgradient vs. Downgradient" ratio. Parameters with higher downgradient concentrations are on top (orange formatting indicates greater downgradient concentrations; blue formatting ir
3. Sub-headings for each location are as follows:

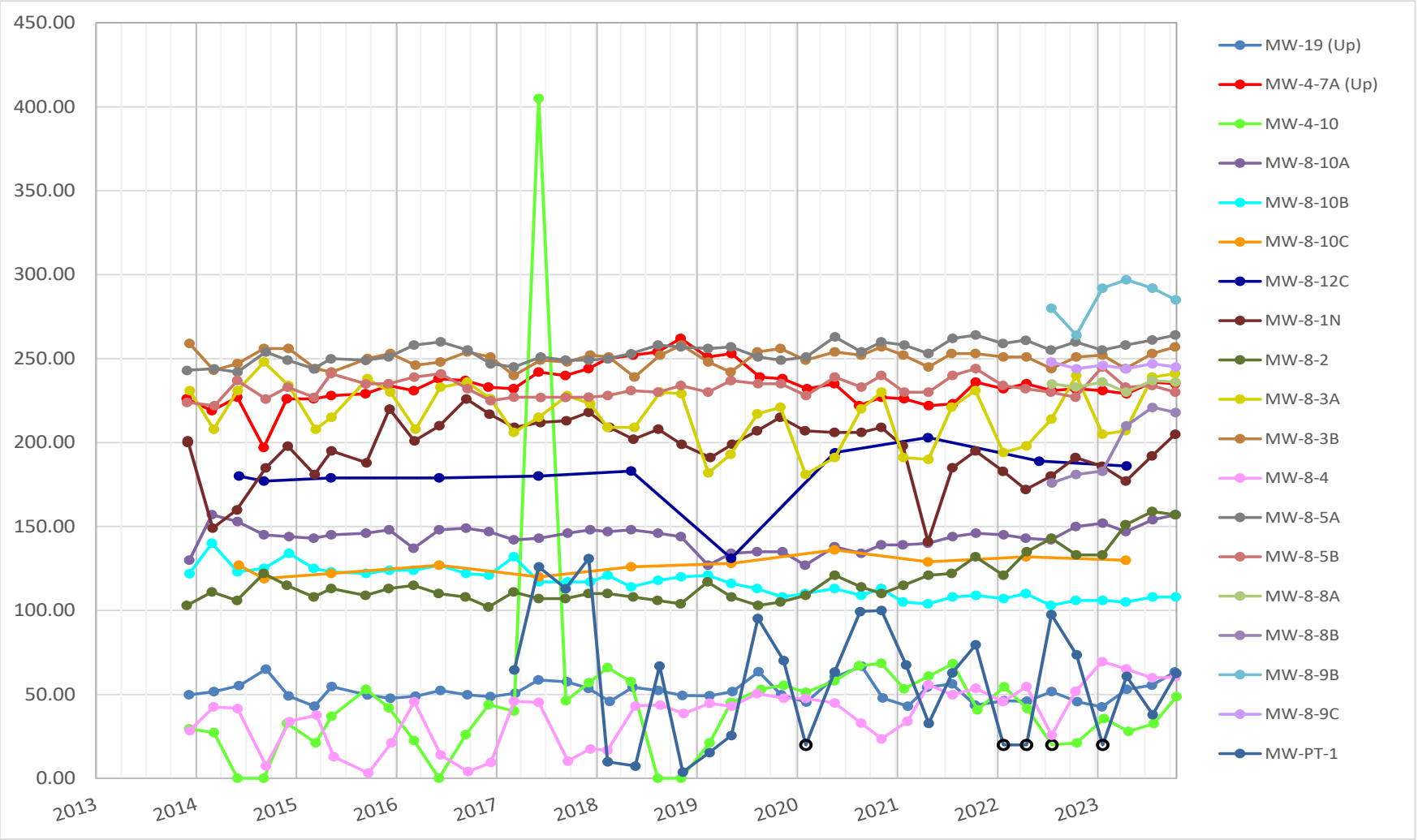
Trend (%):	Percent increase/decrease in concentration of the Theil-Sen trendline over 10-year period (red arrow = increse; blue arrow = decrease; arrow size is proportional to increase/decrease).
p:	p-value of Theil-Sen trend.
$\bar{x}$:	Mean measured concentration over time frame.
$\bar{x}$ (%):	Proportion of $\bar{x}$ to applicable standard (red formatting indicates $\bar{x}$ is 1000% of the standard; orange formatting indicates $\bar{x}$ is 100% of the standard; gradation of orange and red are proportional
n:	Number of samples over time frame.
ND:	Number of "non-detect" samples over time frame. For concentrations between LOD and LOQ (reported as "< LOQ"), the LOQ is treated as an additional detection limit in the analysis.
J:	Number of samples with estimated concentrations (J-values). Currently concentrations between LOD and LOQ are reported as "< LOQ" instead of estimated values.
>:	Number of exceedances over time frame; date of most recent exceedance.
Max:	Maximum measured concentration over time frame; date of maximum concentration.
p (comparison):	p-value of two-group comparison analysis (comparison to upgradient wells).
	Analysis test results based on either: p = parametric (t-test) or n = nonparametric (Wilcoxon test); determined based on number of detections and Shapiro-Wilk (S-W) normality test results.
	If p-value of normality test for either group is < 0.05 then defaults to nonparametric comparison (Wilcoxon test).
	If p (comparison) < 0.05 then: < Up means data are statistically less than upgradient data; > Up means data are statistically greater than upgradient data.

4. "NC" refers to not calculated (when there is insufficient data to run statistical analysis).

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Alkalinity, total as CaCO3 [mg/l]

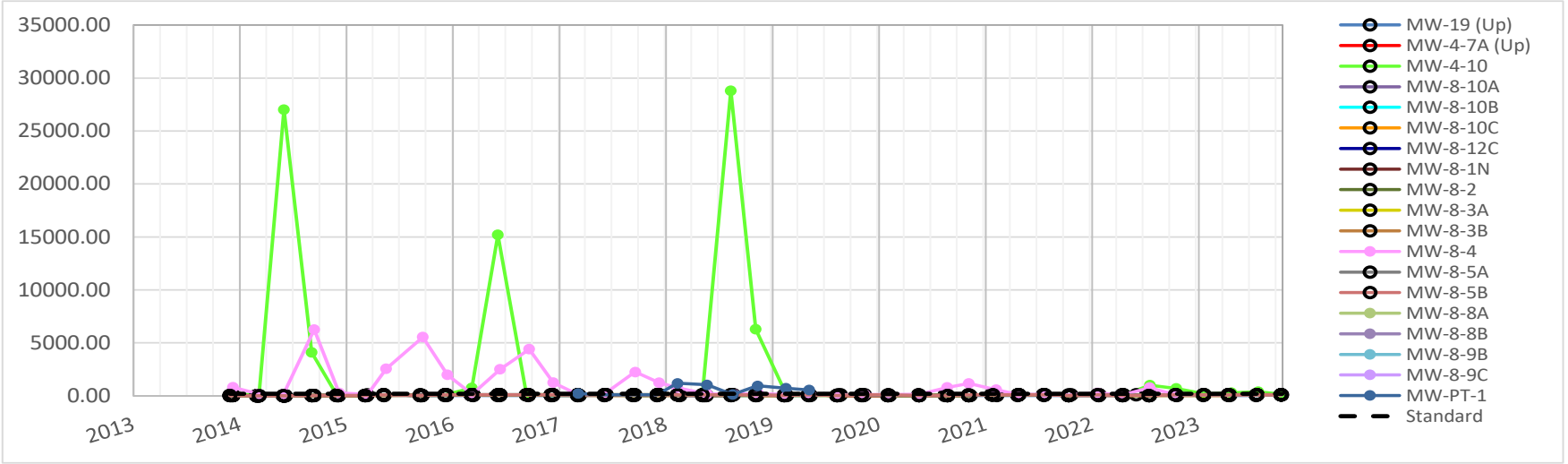


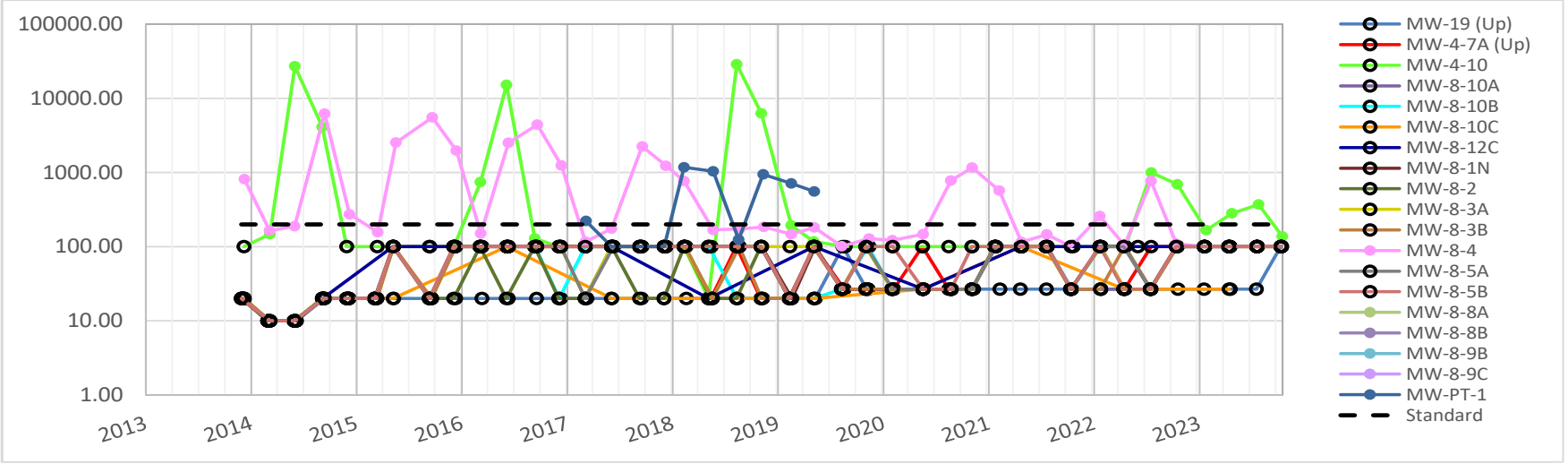
NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Aluminum, dissolved [µg/l]

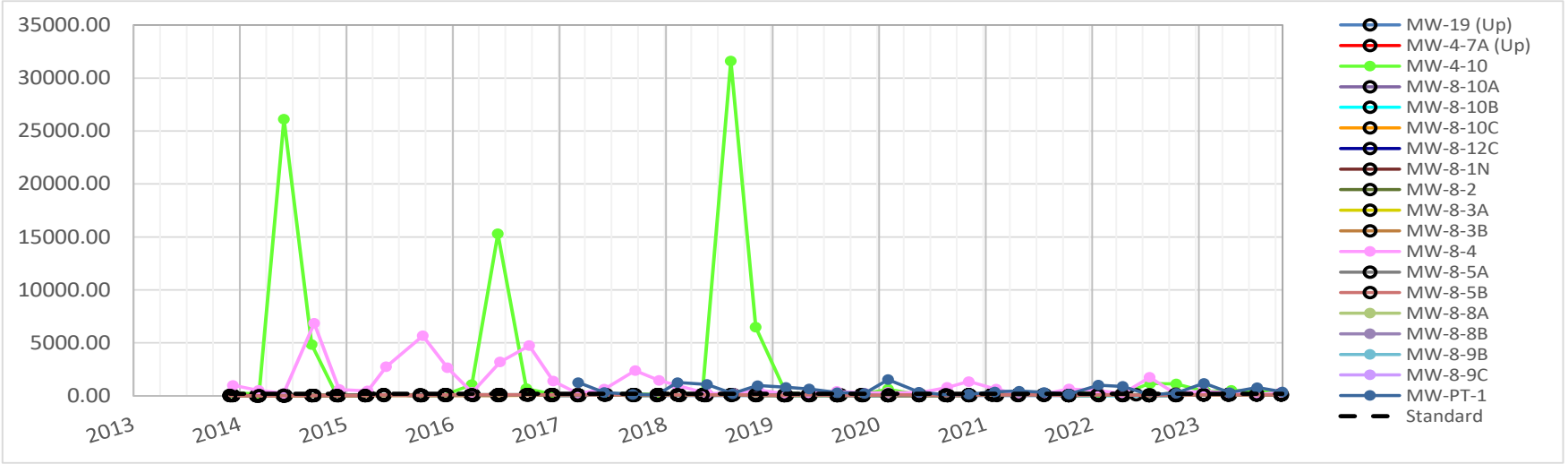


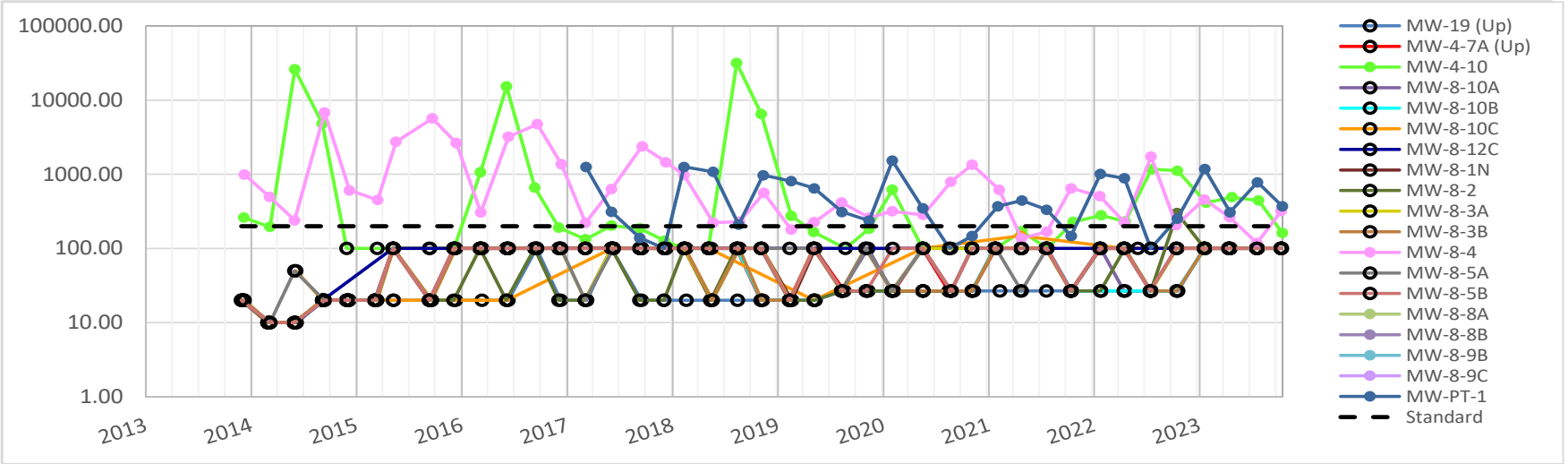


Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Aluminum, total [µg/l]

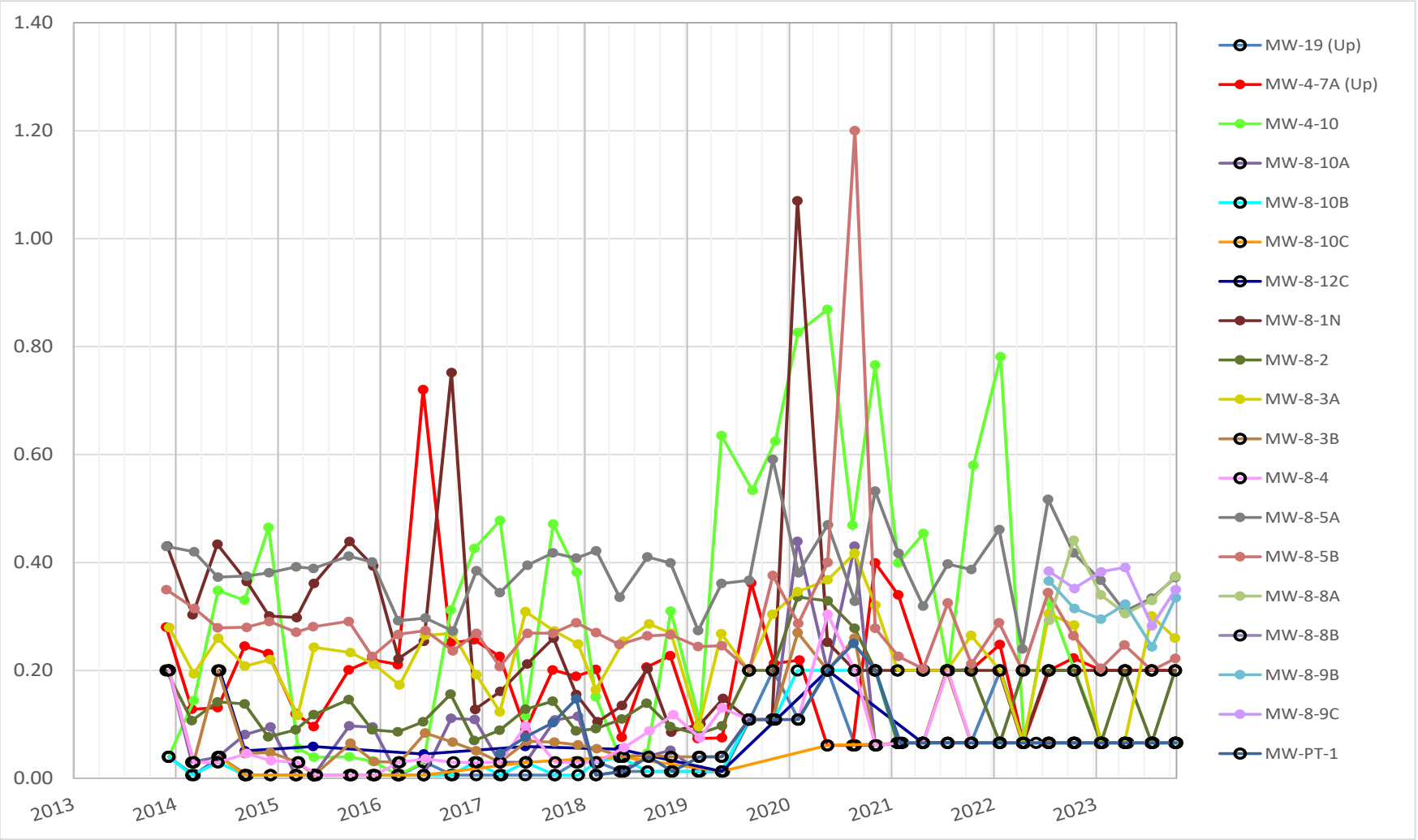




Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Ammonia, as N [mg/l]

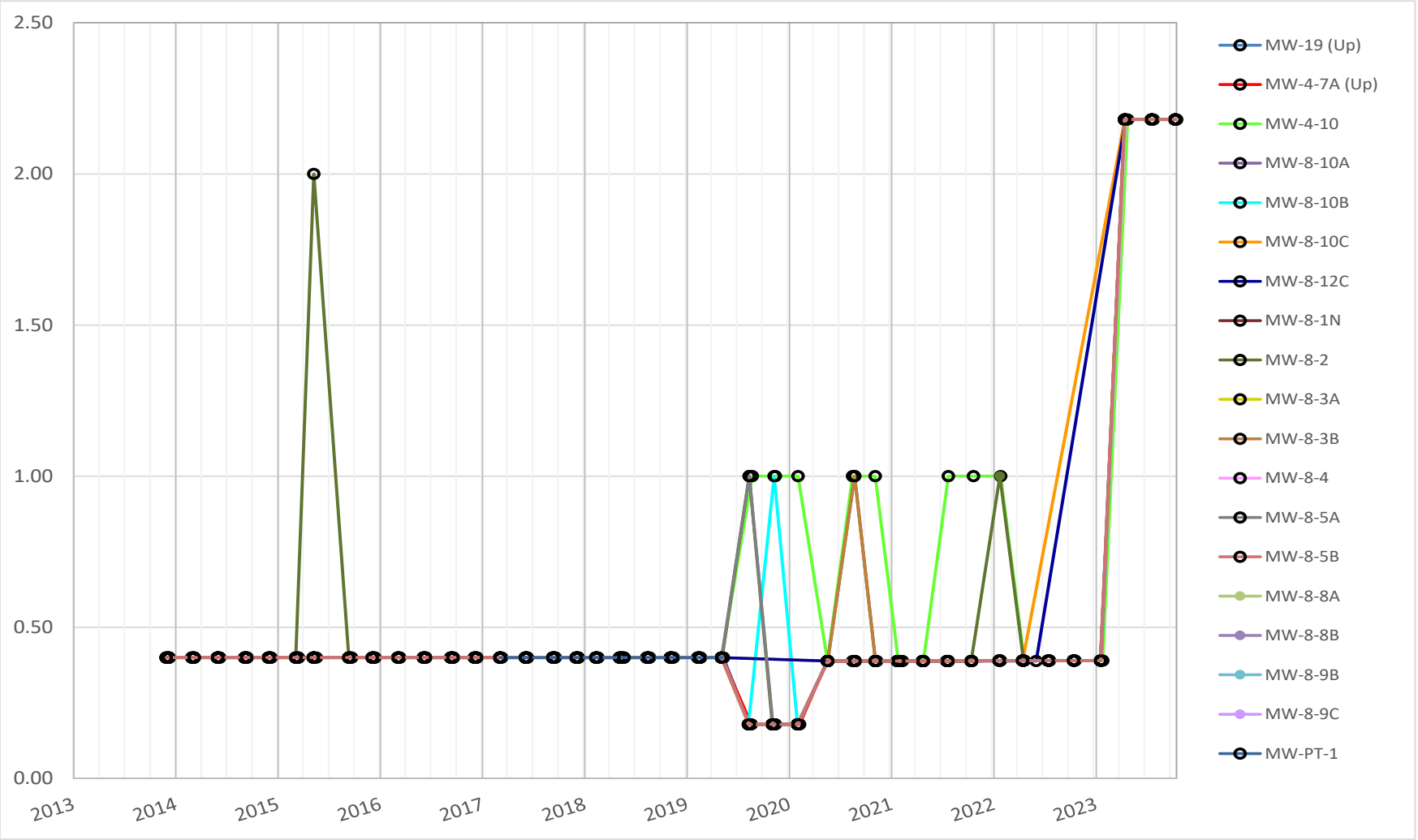


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Antimony, dissolved [µg/l]

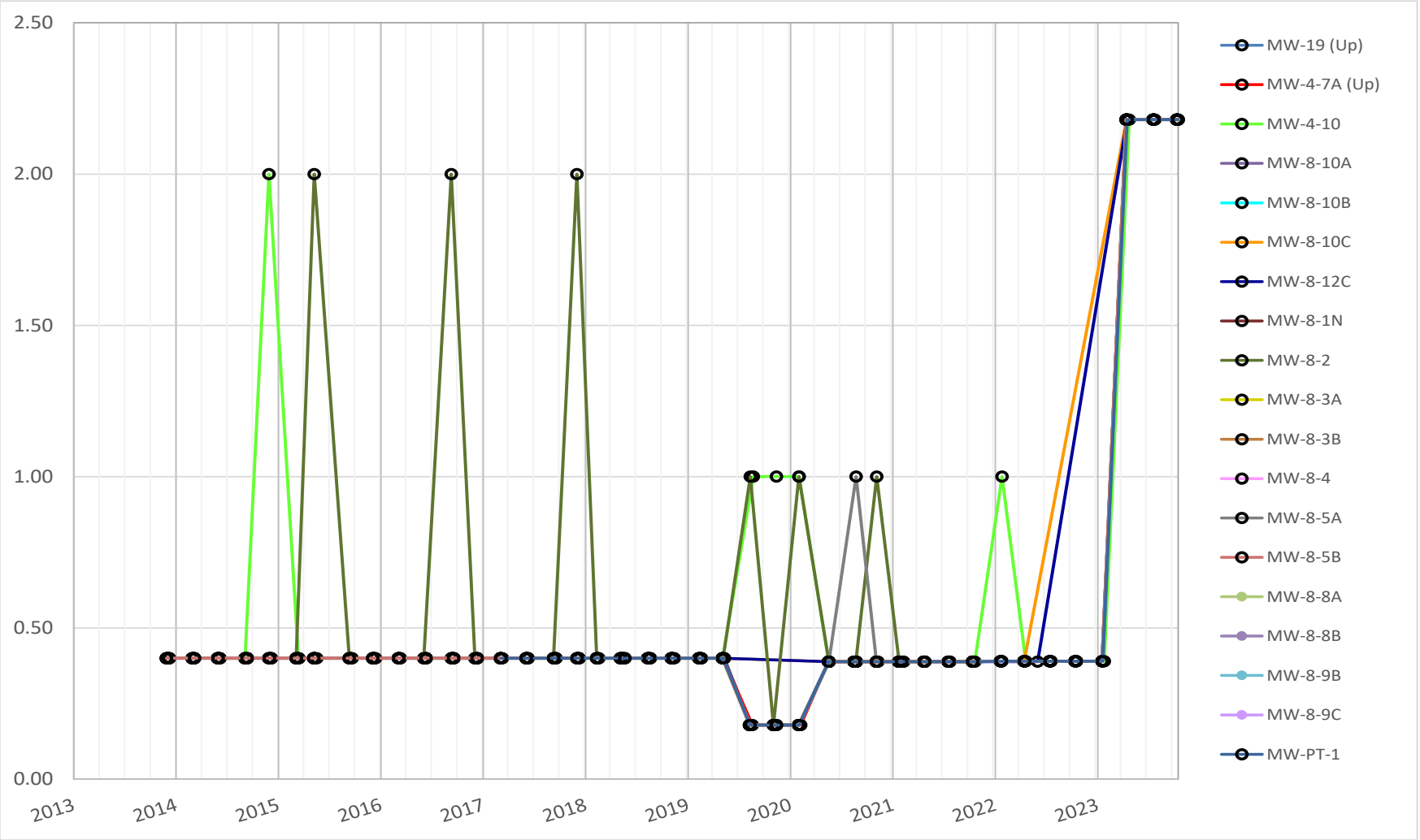


NOTE: Data does not exceed standard of 6 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Antimony, total [µg/l]

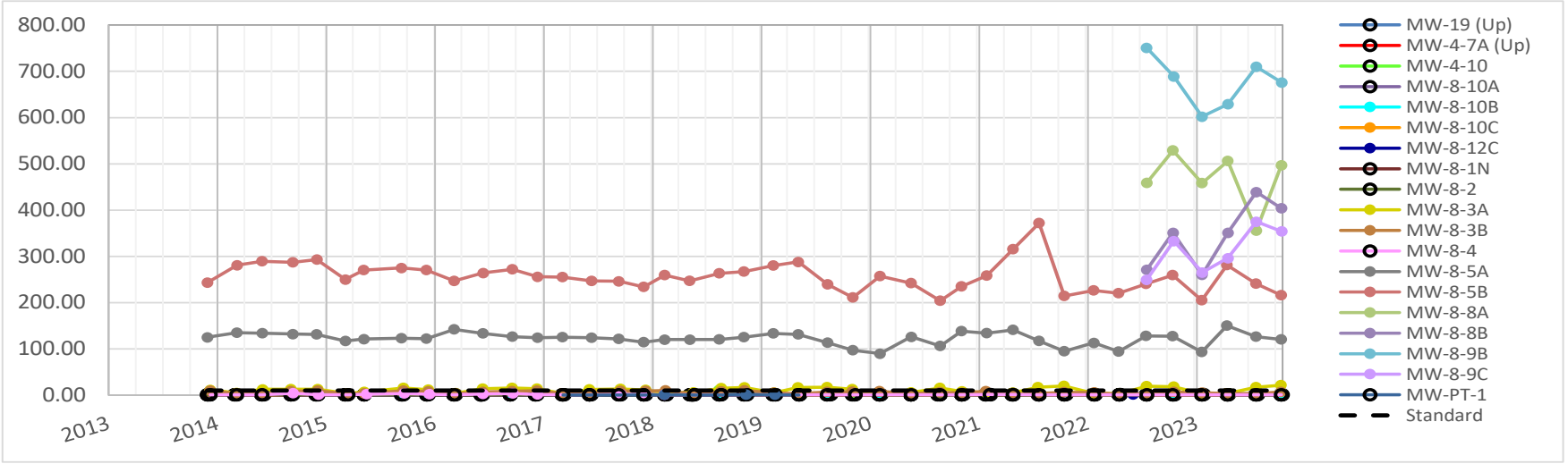


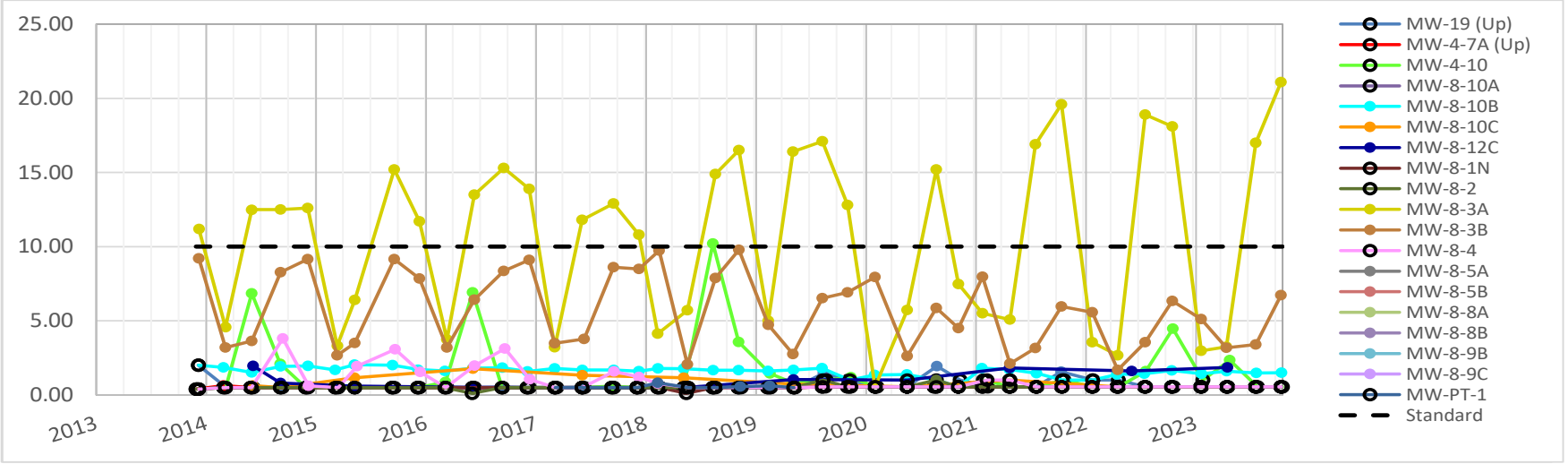
NOTE: Data does not exceed standard of 6 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Arsenic, dissolved [µg/l]

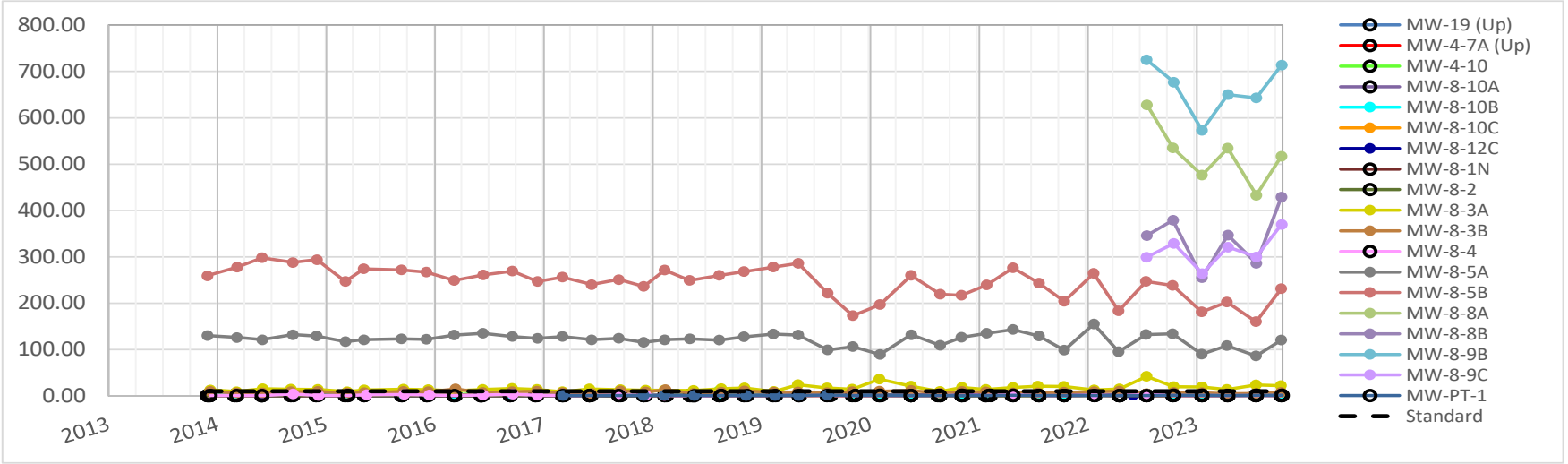


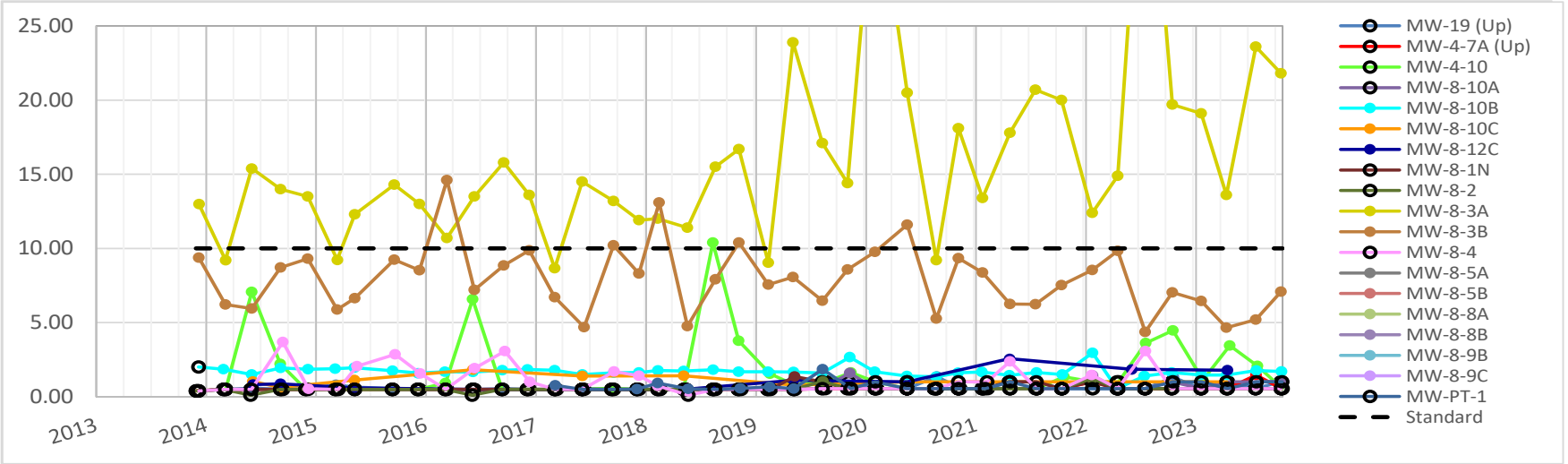


Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Arsenic, total [µg/l]

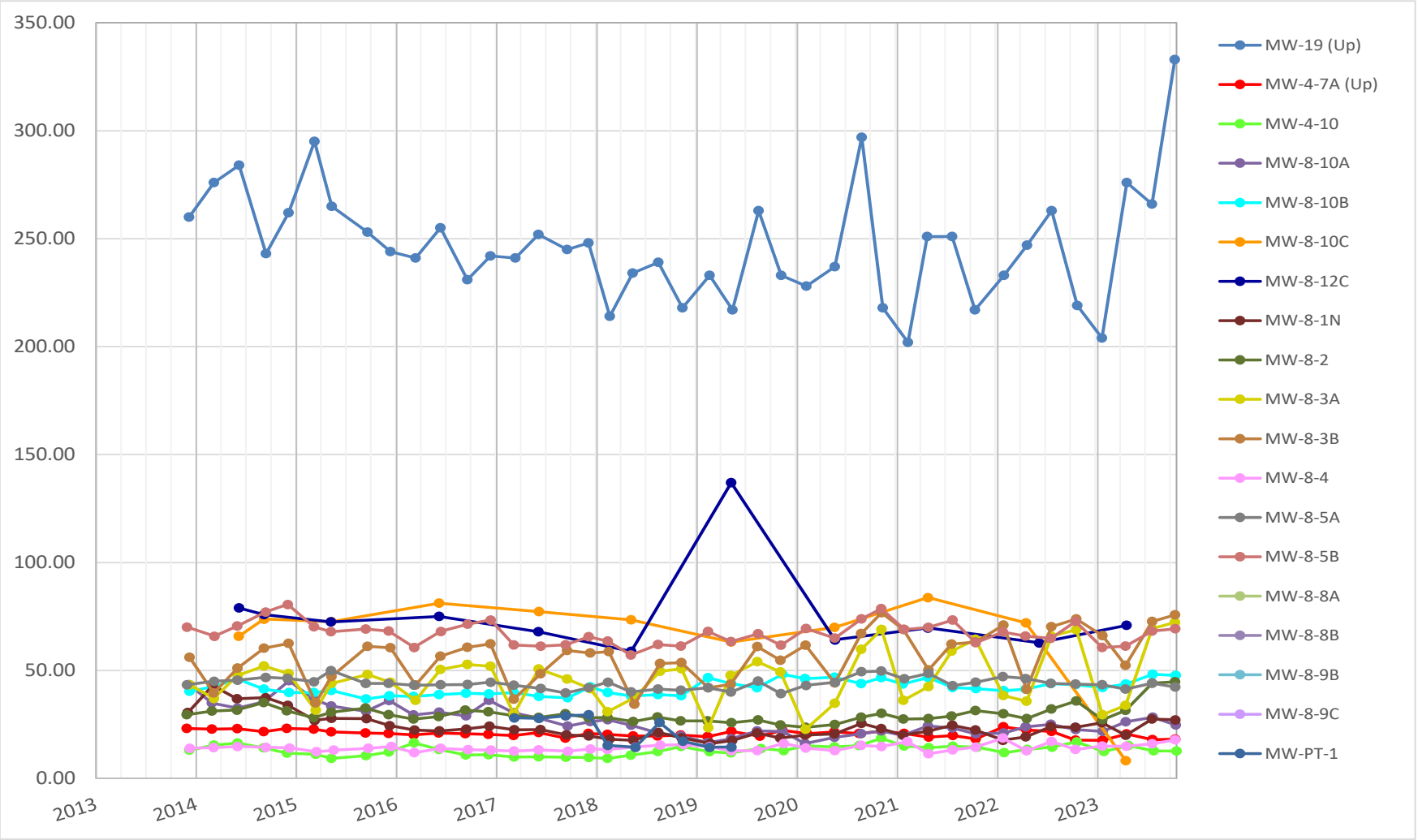




Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

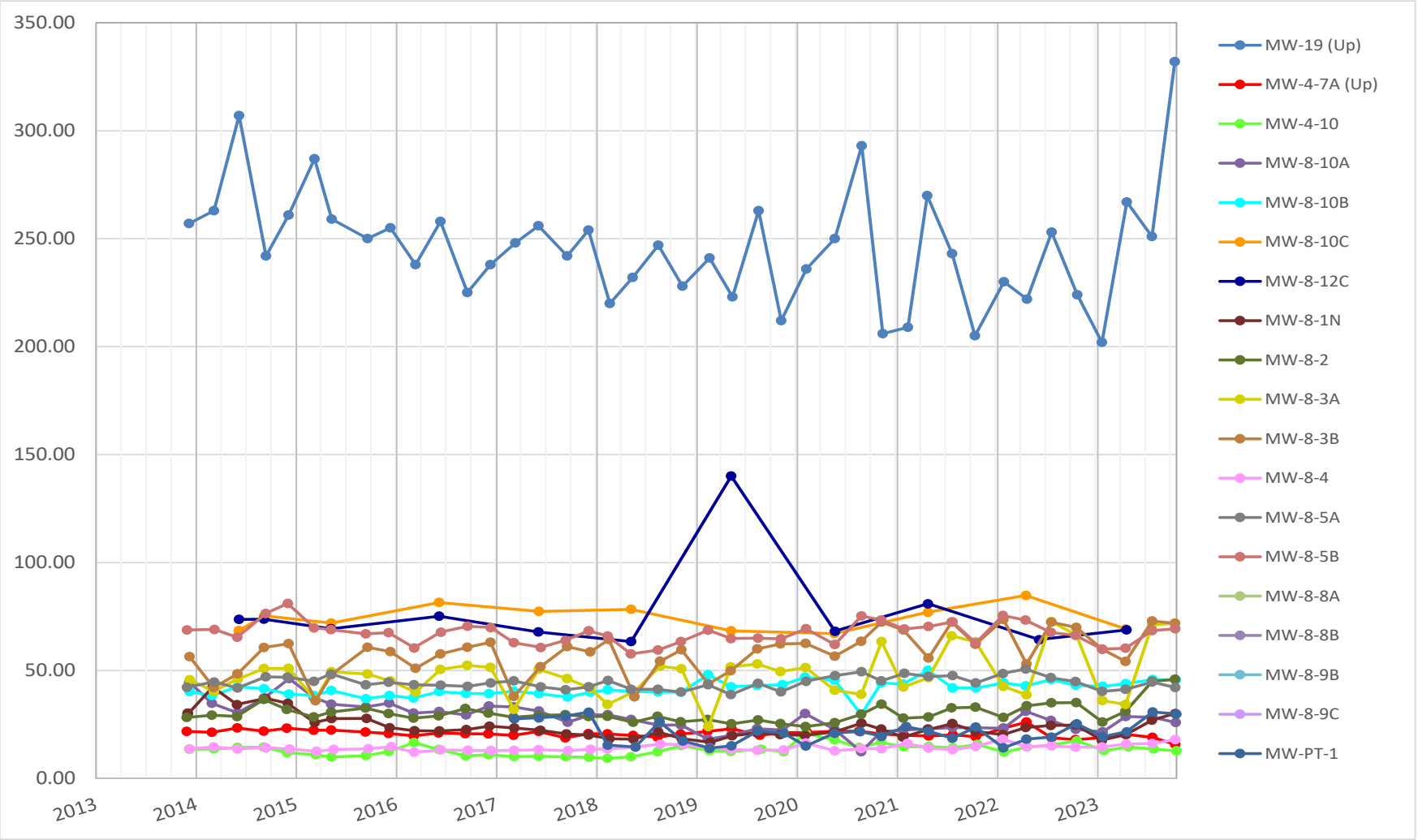
Barium, dissolved [µg/l]



NOTE: Data does not exceed standard of 2000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

Barium, total [µg/l]

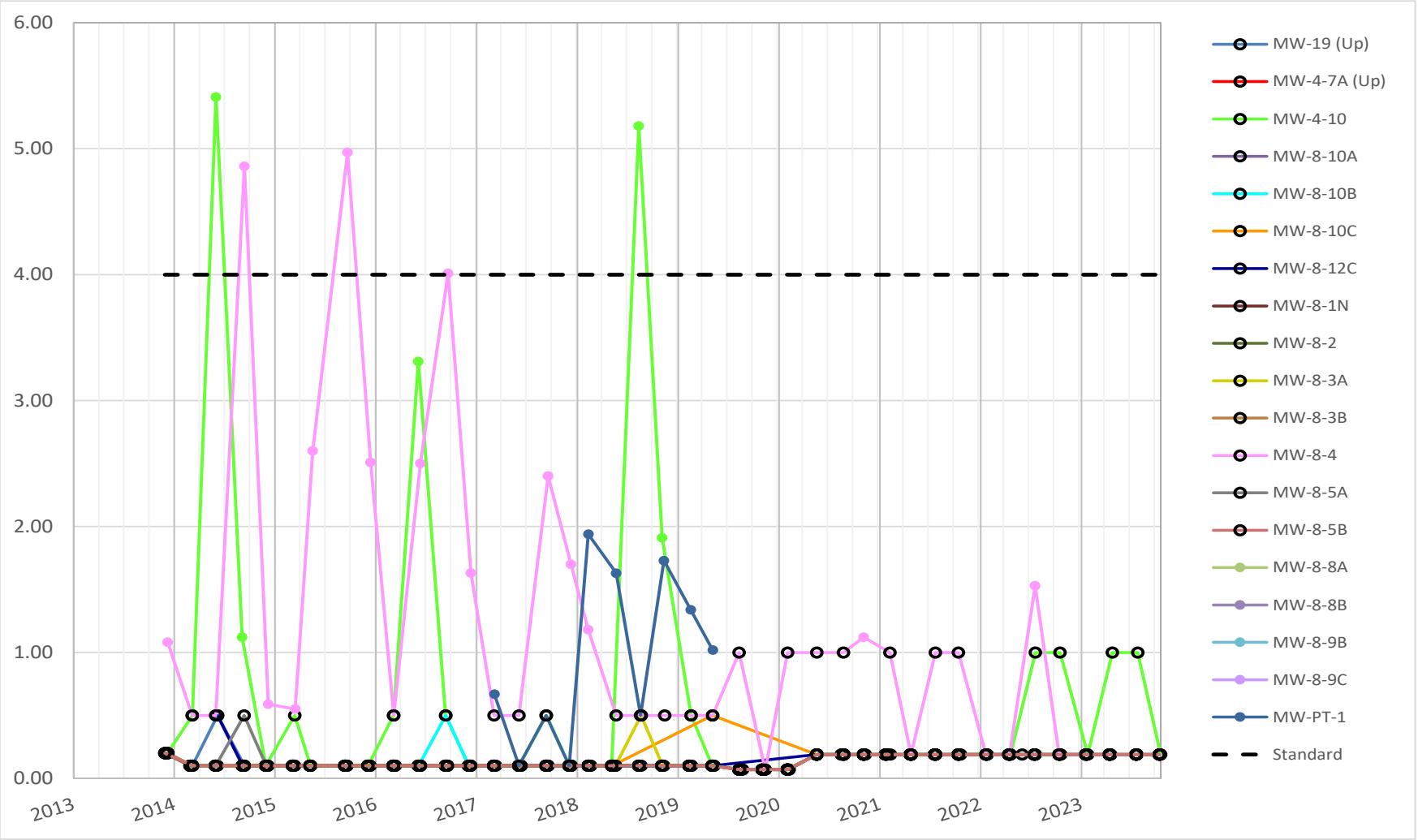


NOTE: Data does not exceed standard of 2000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

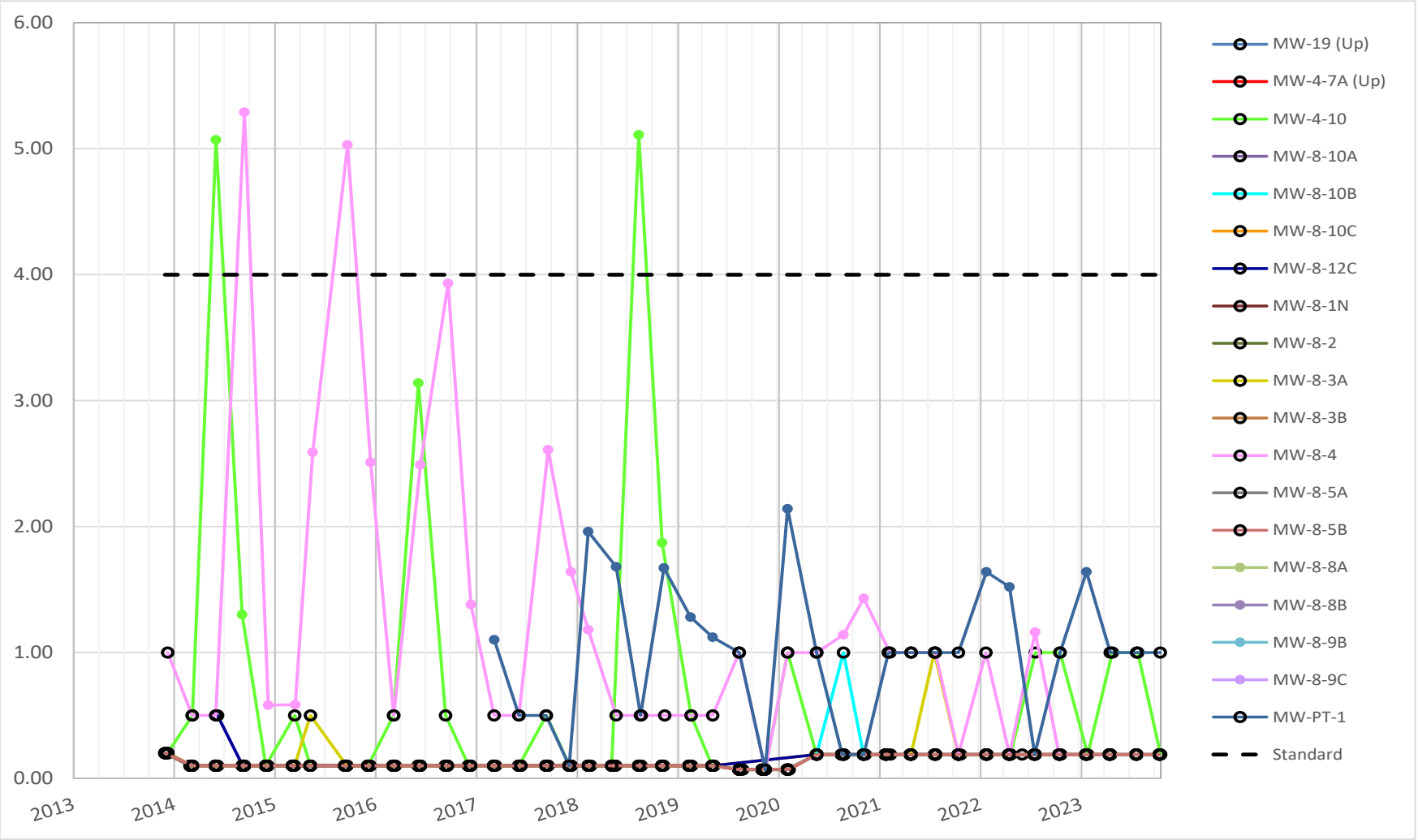
Beryllium, dissolved [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

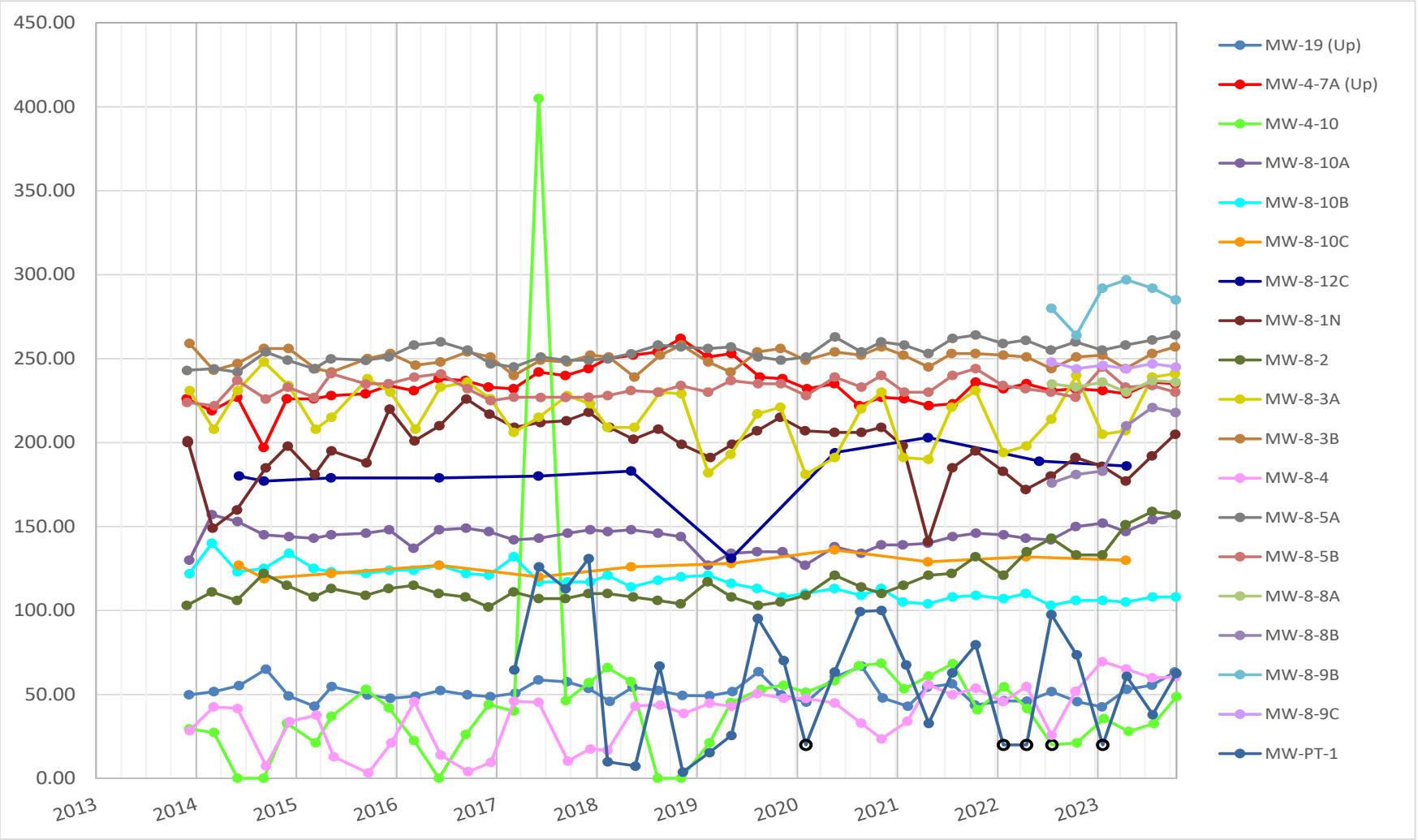
Beryllium, total [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Bicarbonate [mg/l]

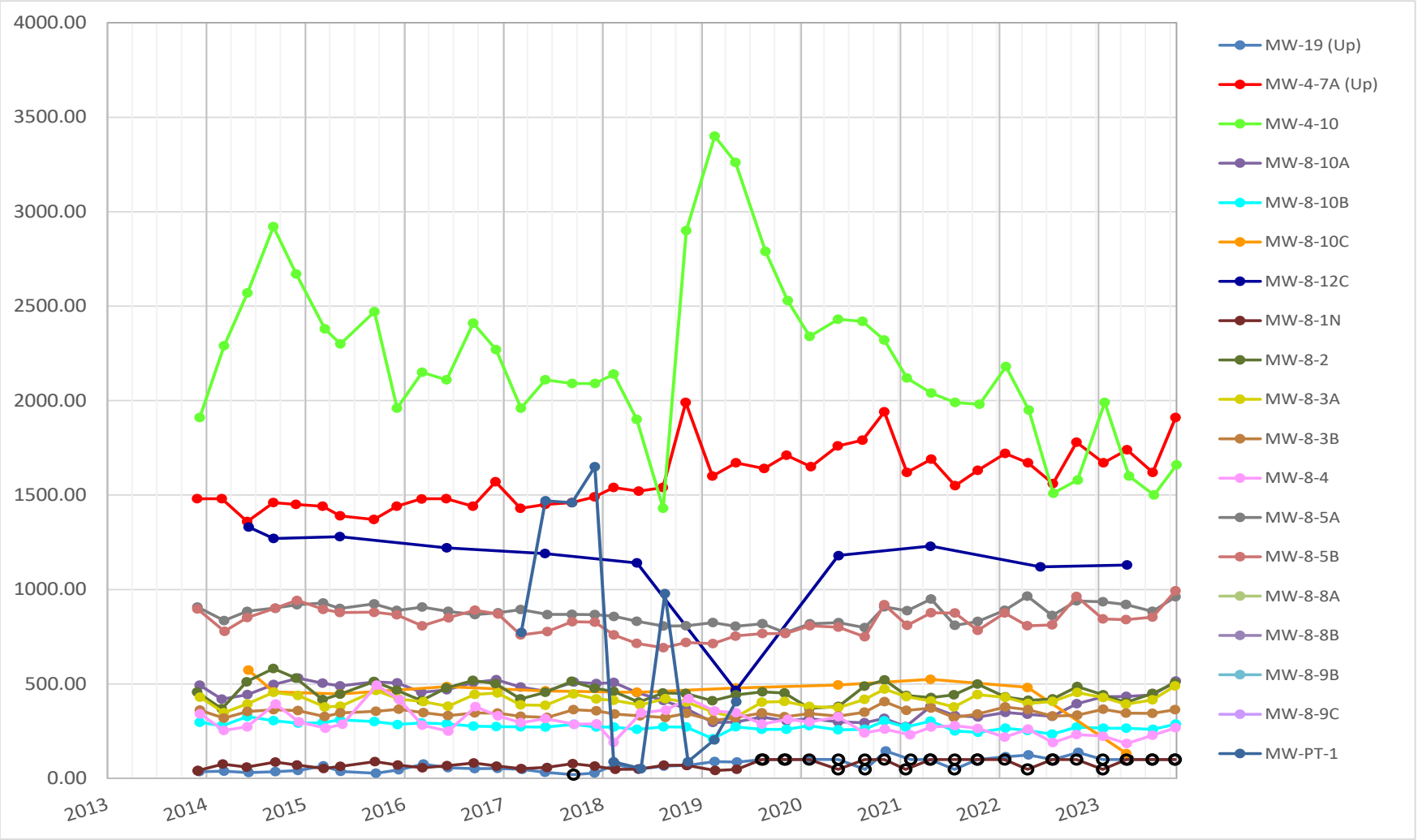


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Boron, dissolved [µg/l]

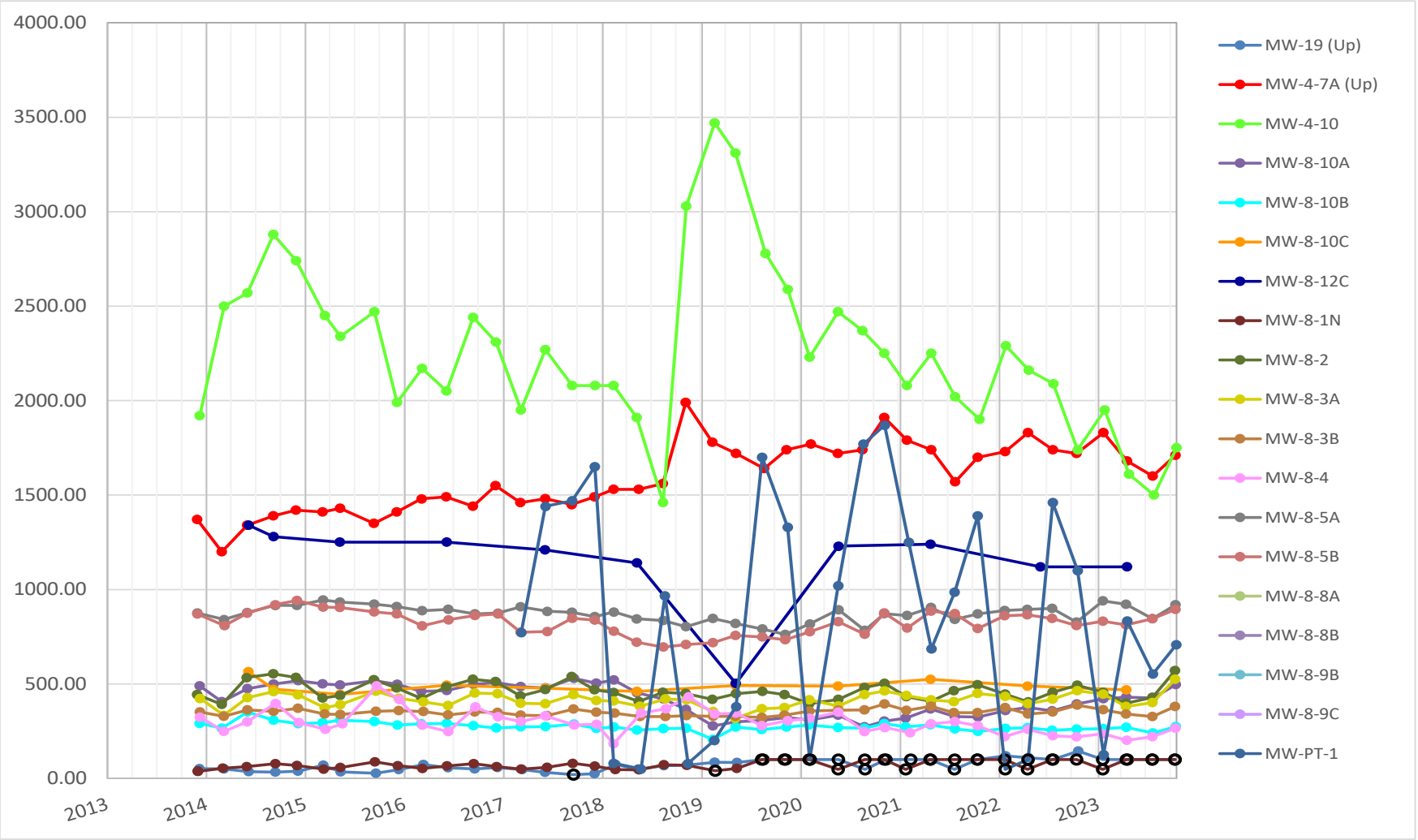


NOTE: Data does not exceed standard of 6000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Boron, total [µg/l]

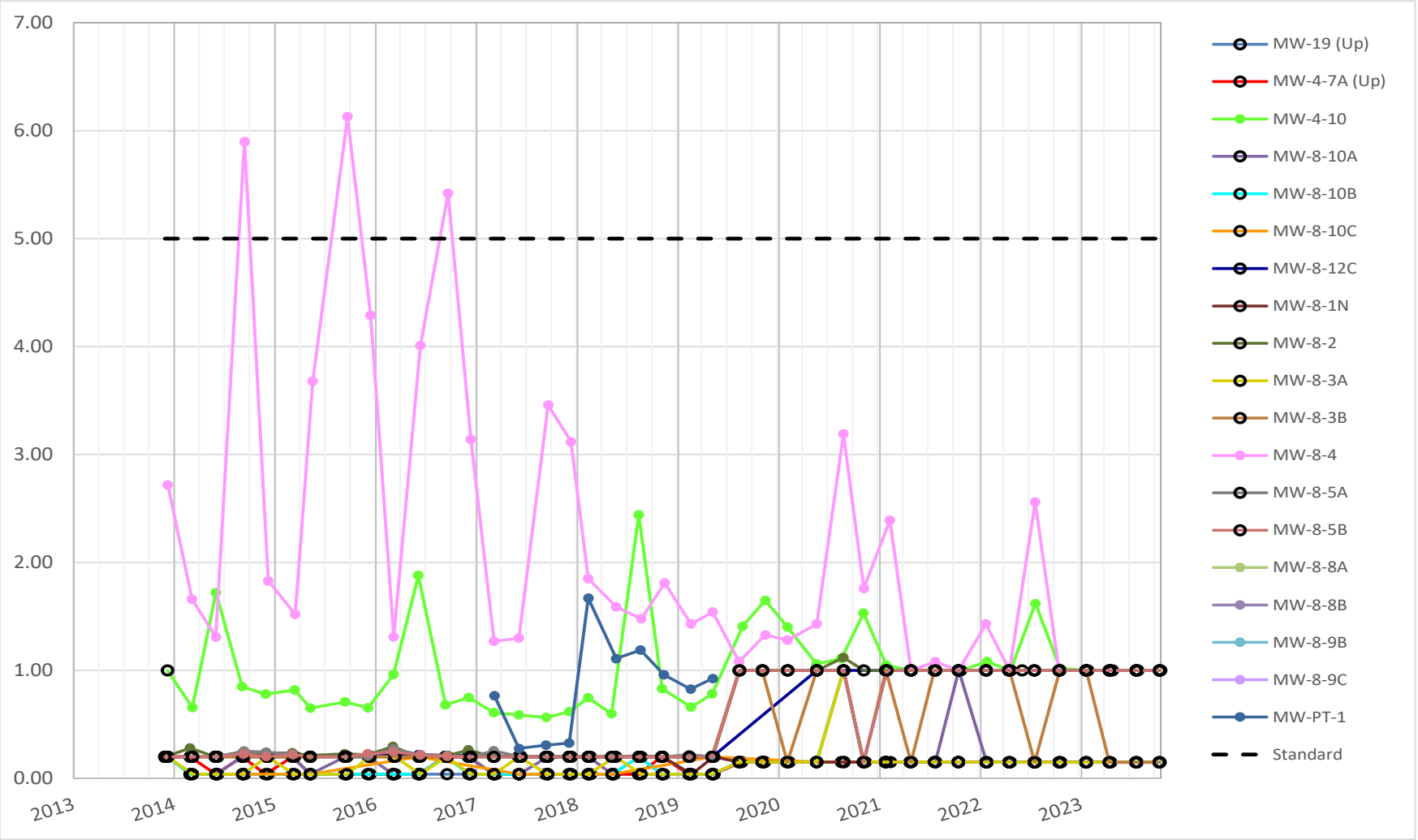


NOTE: Data does not exceed standard of 6000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

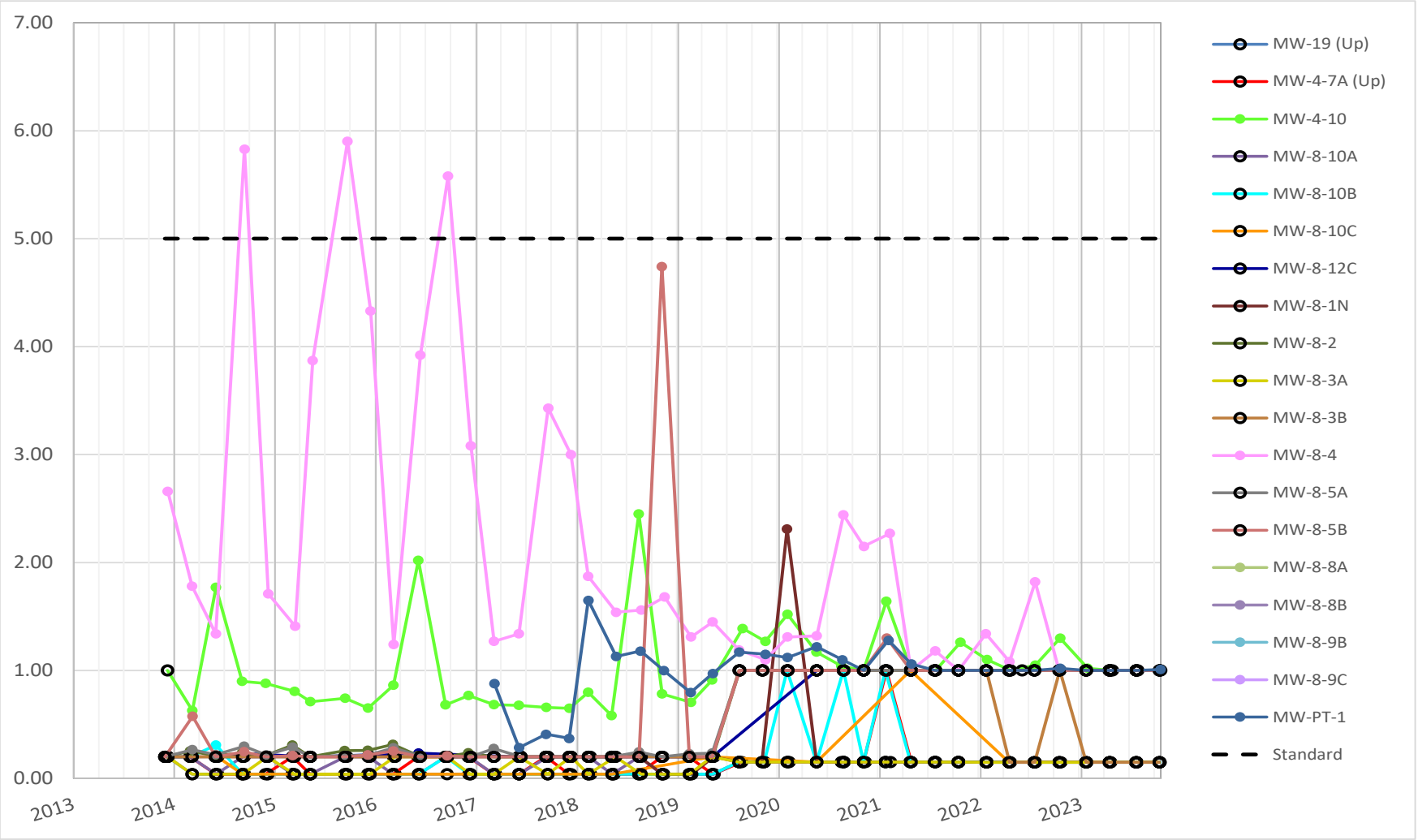
Cadmium, dissolved [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

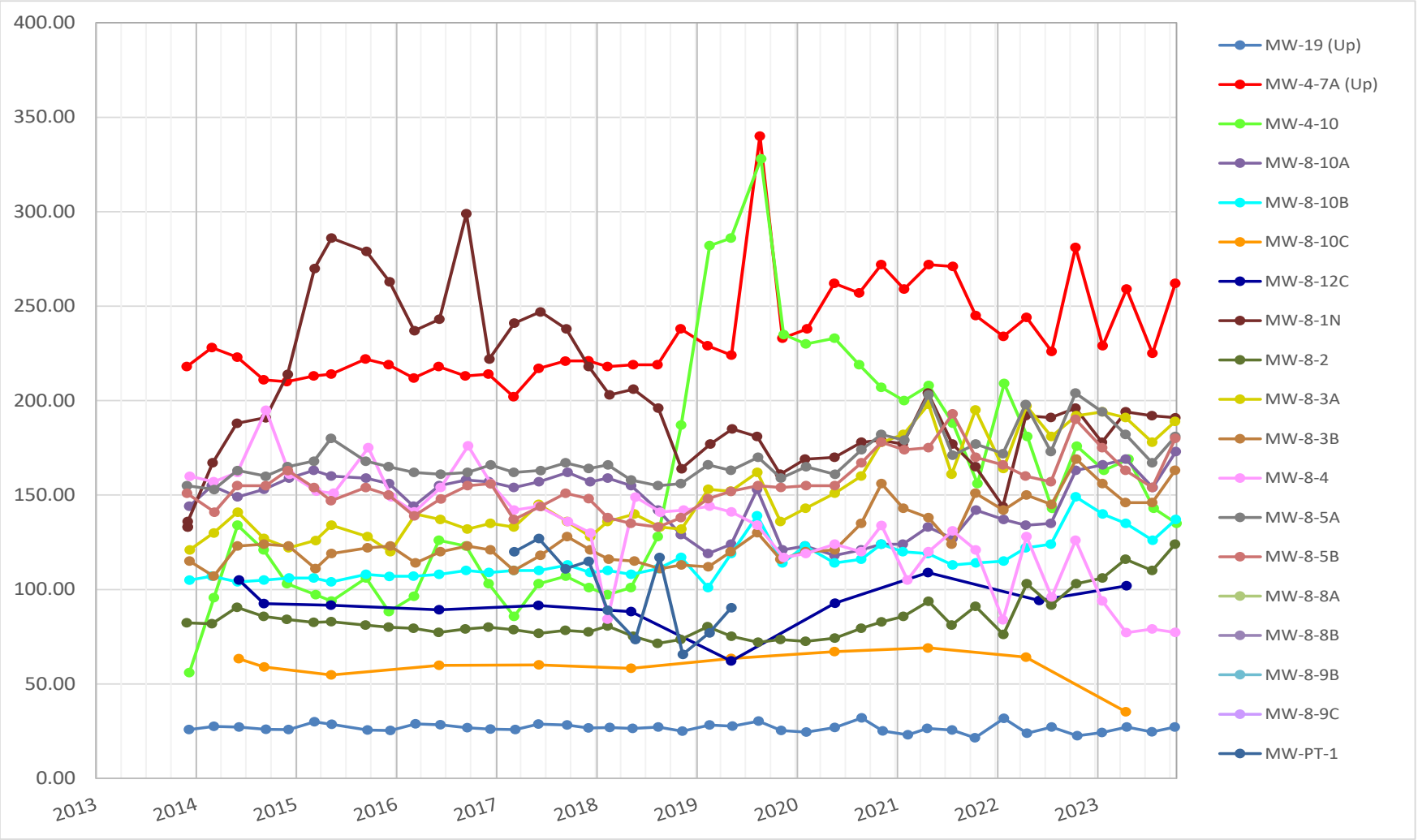
Cadmium, total [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Calcium, dissolved [mg/l]

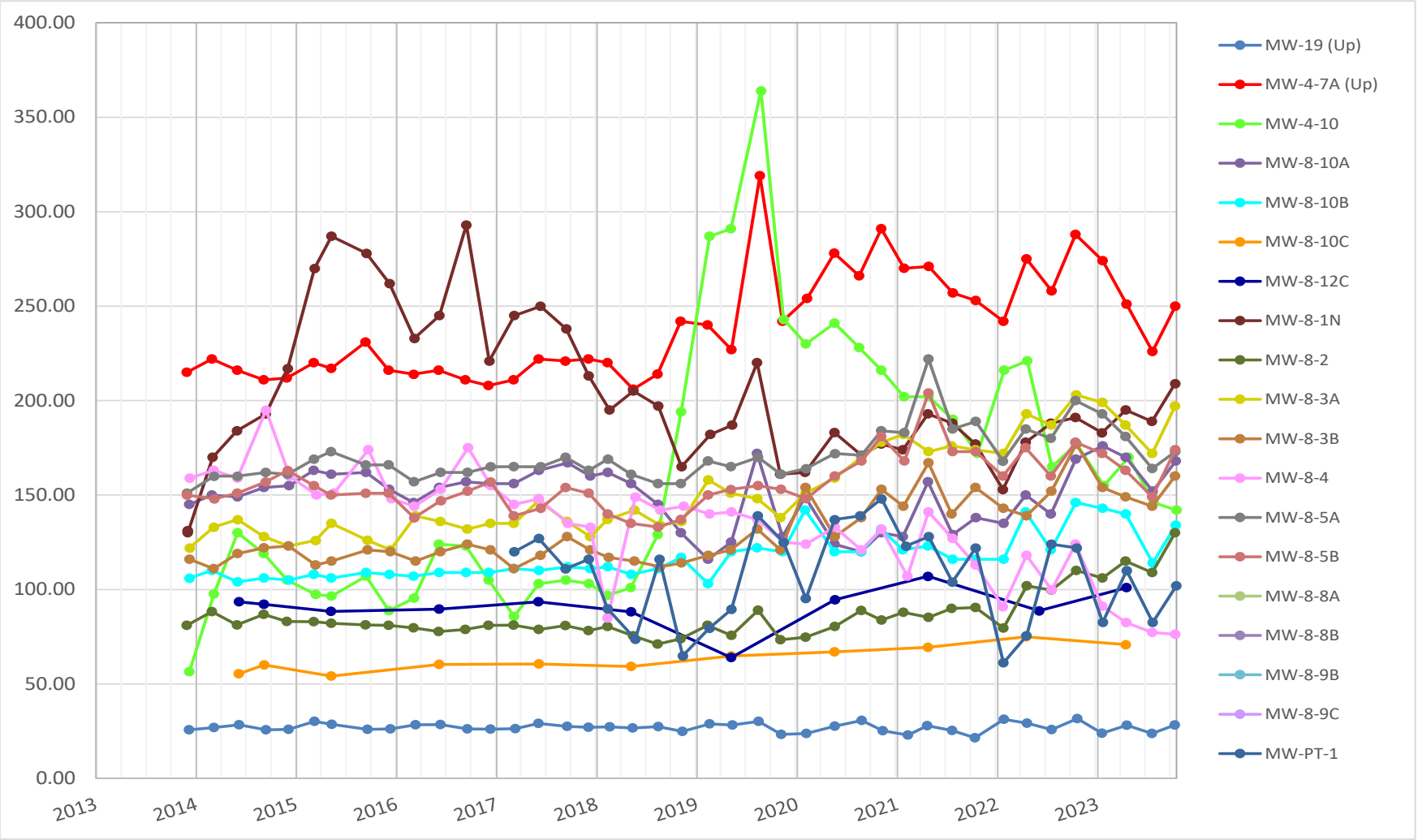


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Calcium, total [mg/l]

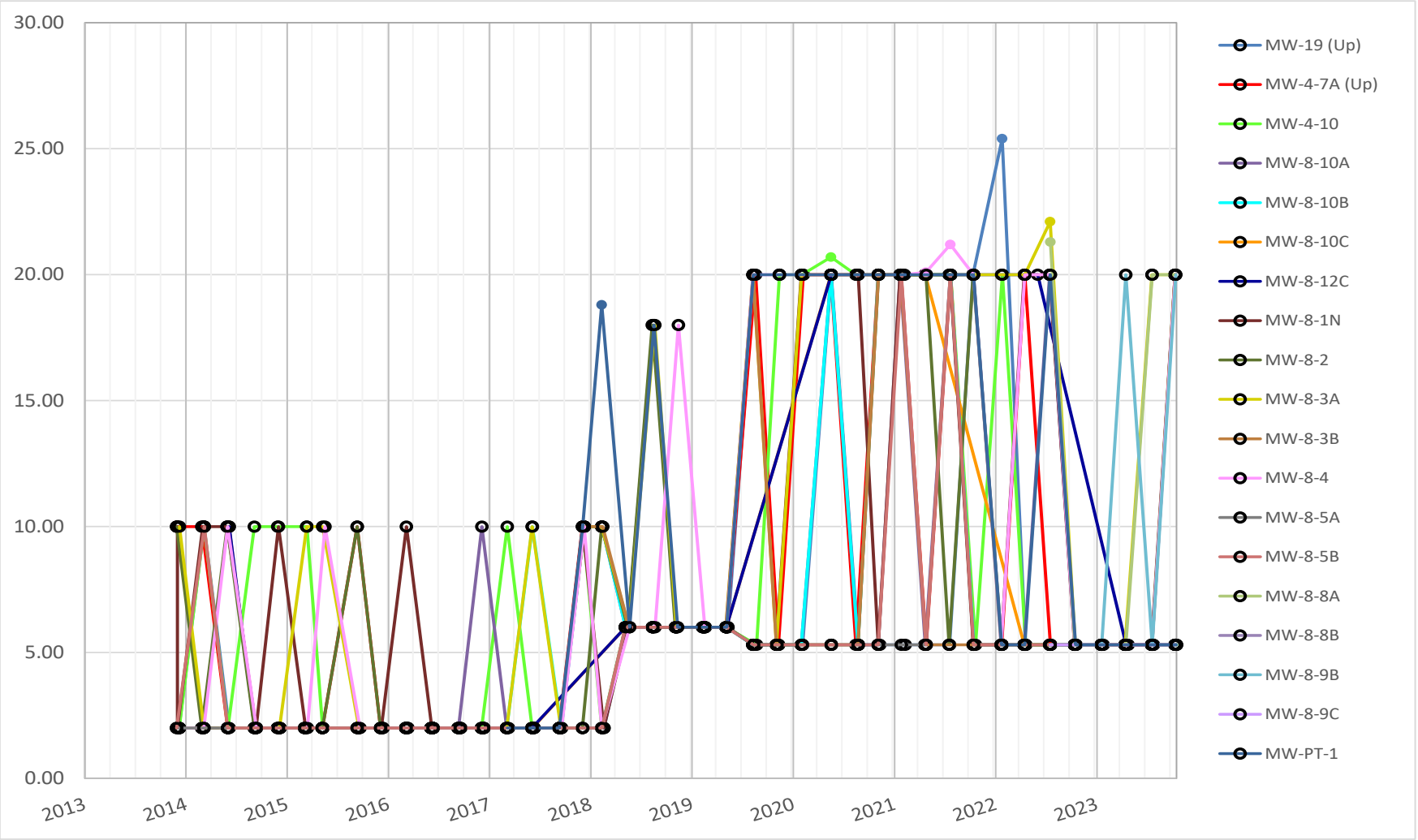


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Chemical Oxygen Demand [mg/l]

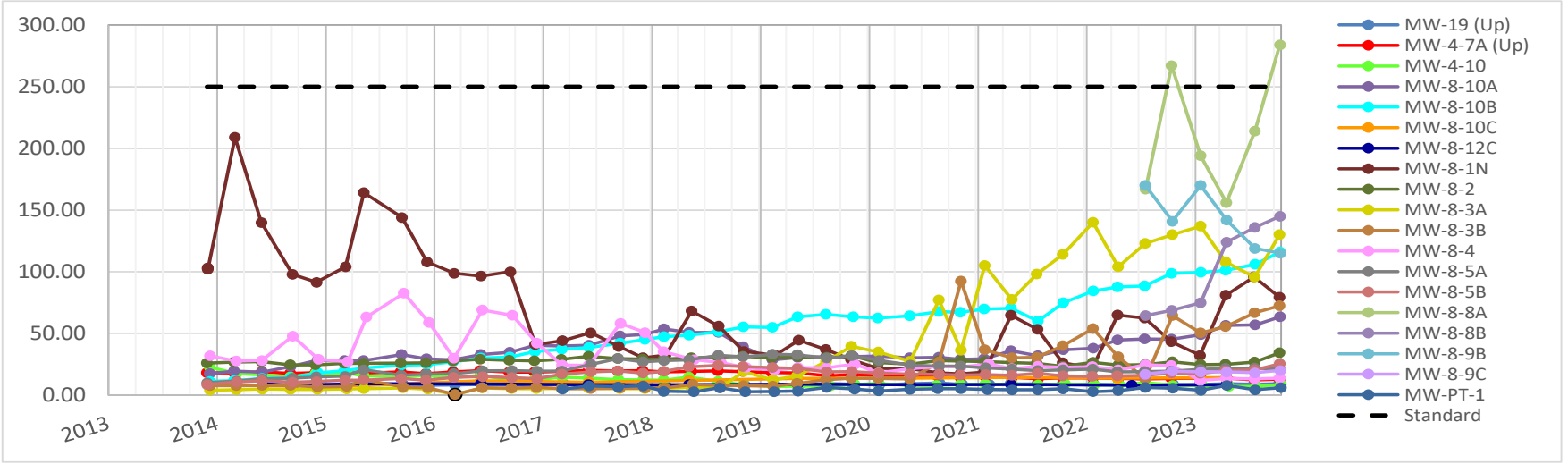


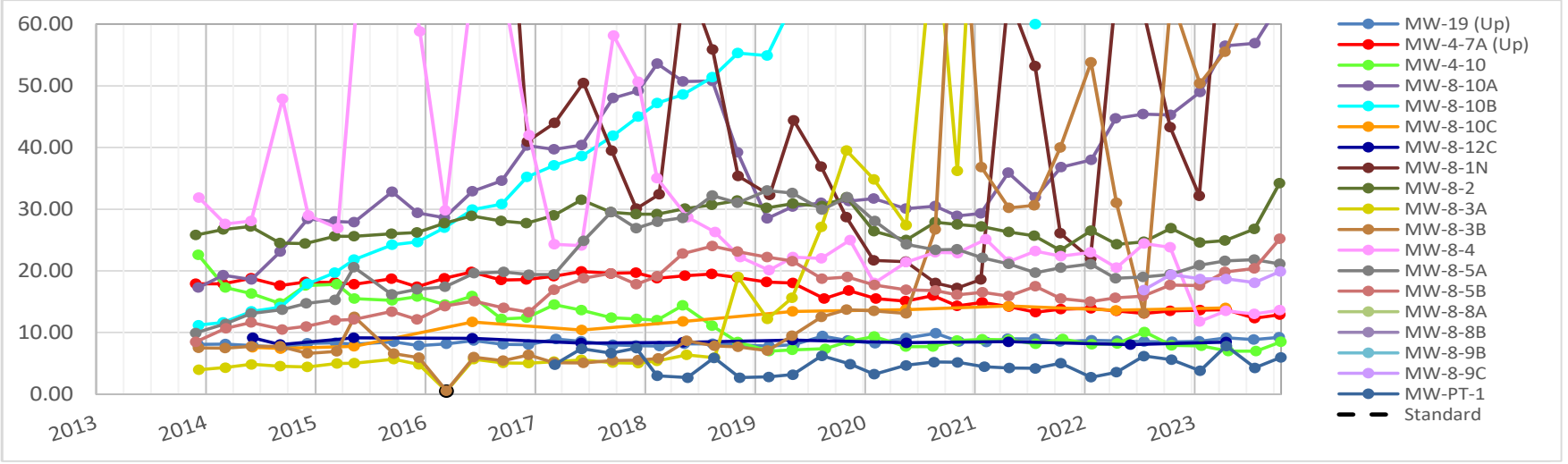
NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Chloride, total as Cl [mg/l]

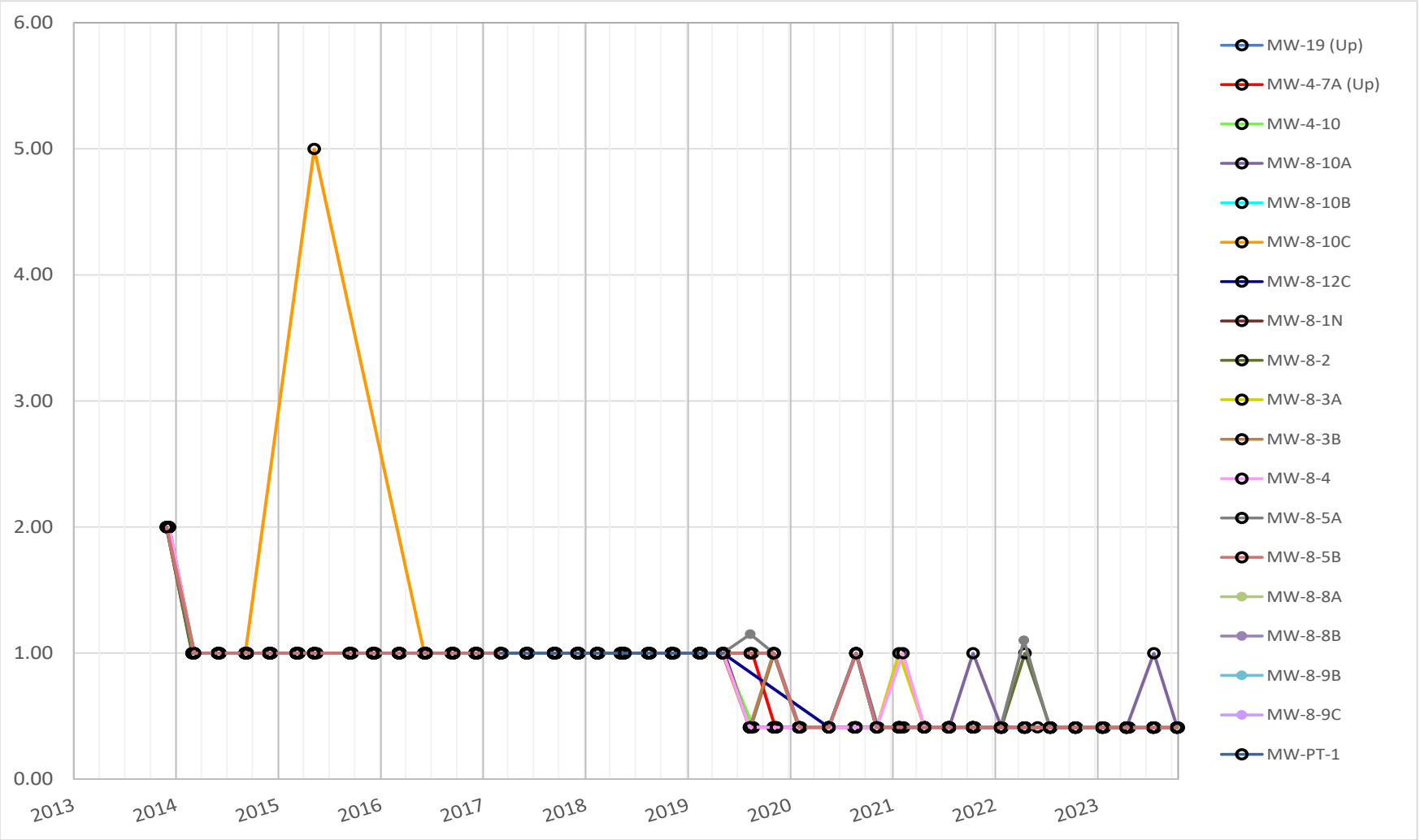




Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Chromium, dissolved [µg/l]

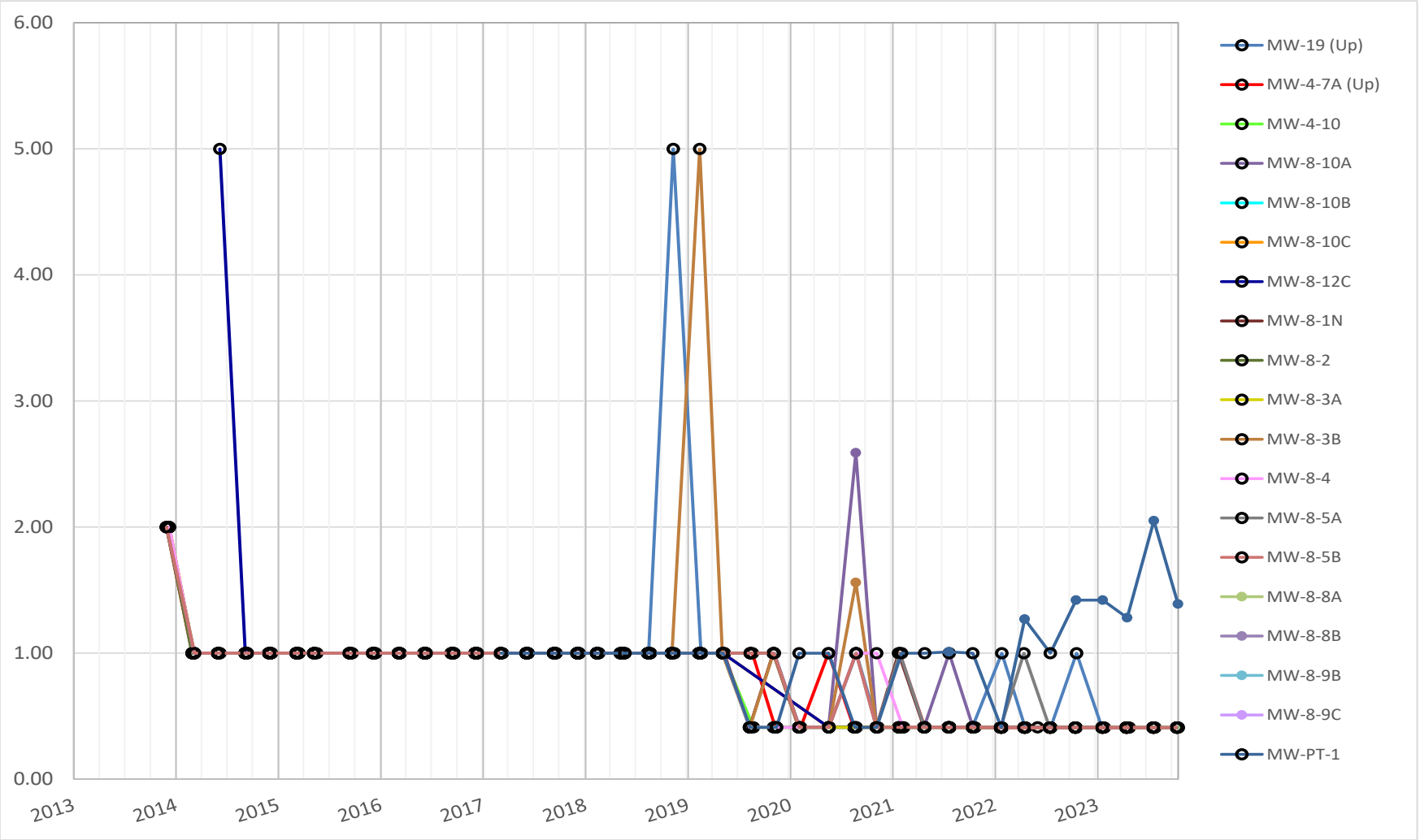


NOTE: Data does not exceed standard of 100 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Chromium, total [µg/l]

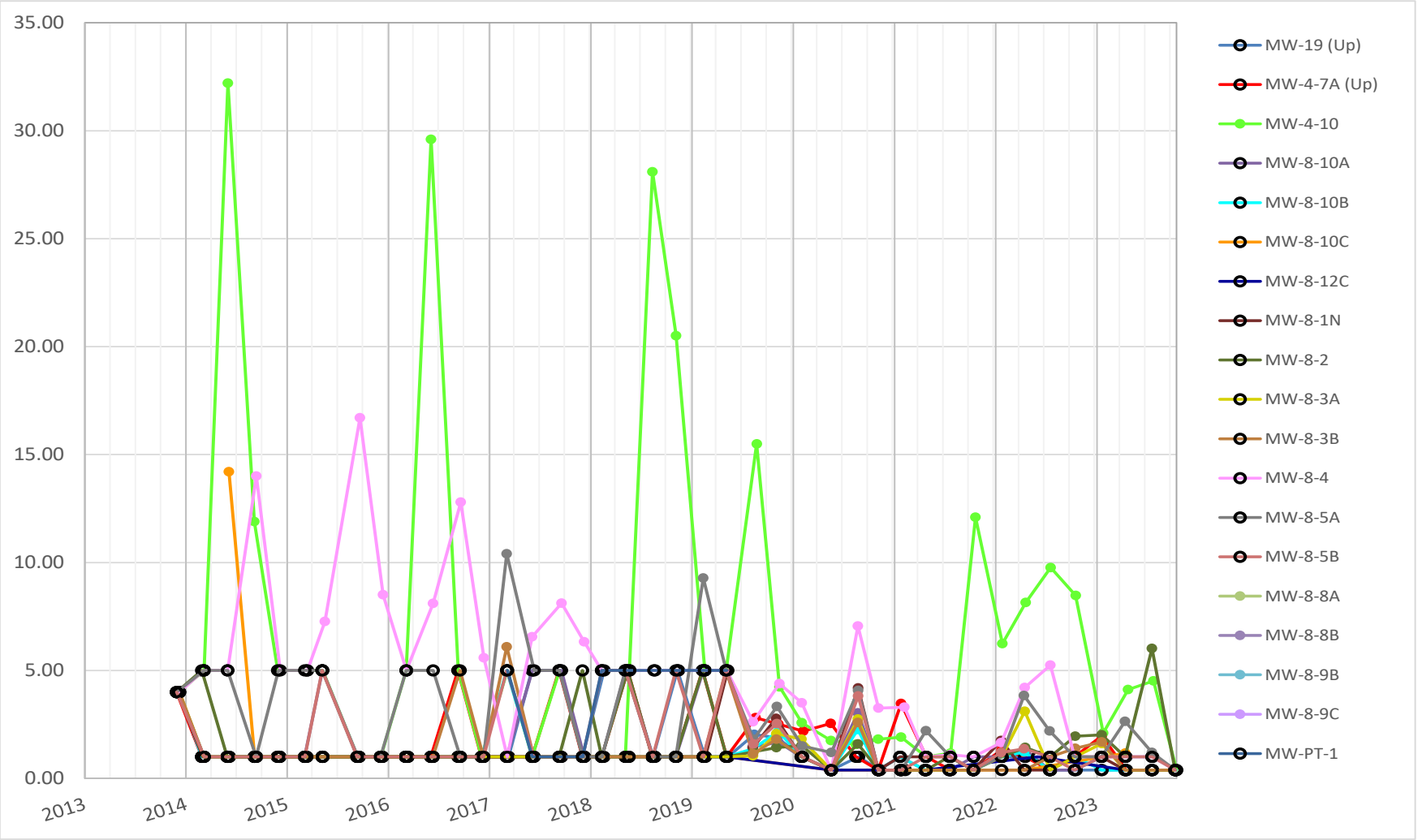


NOTE: Data does not exceed standard of 100 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Copper, dissolved [µg/l]

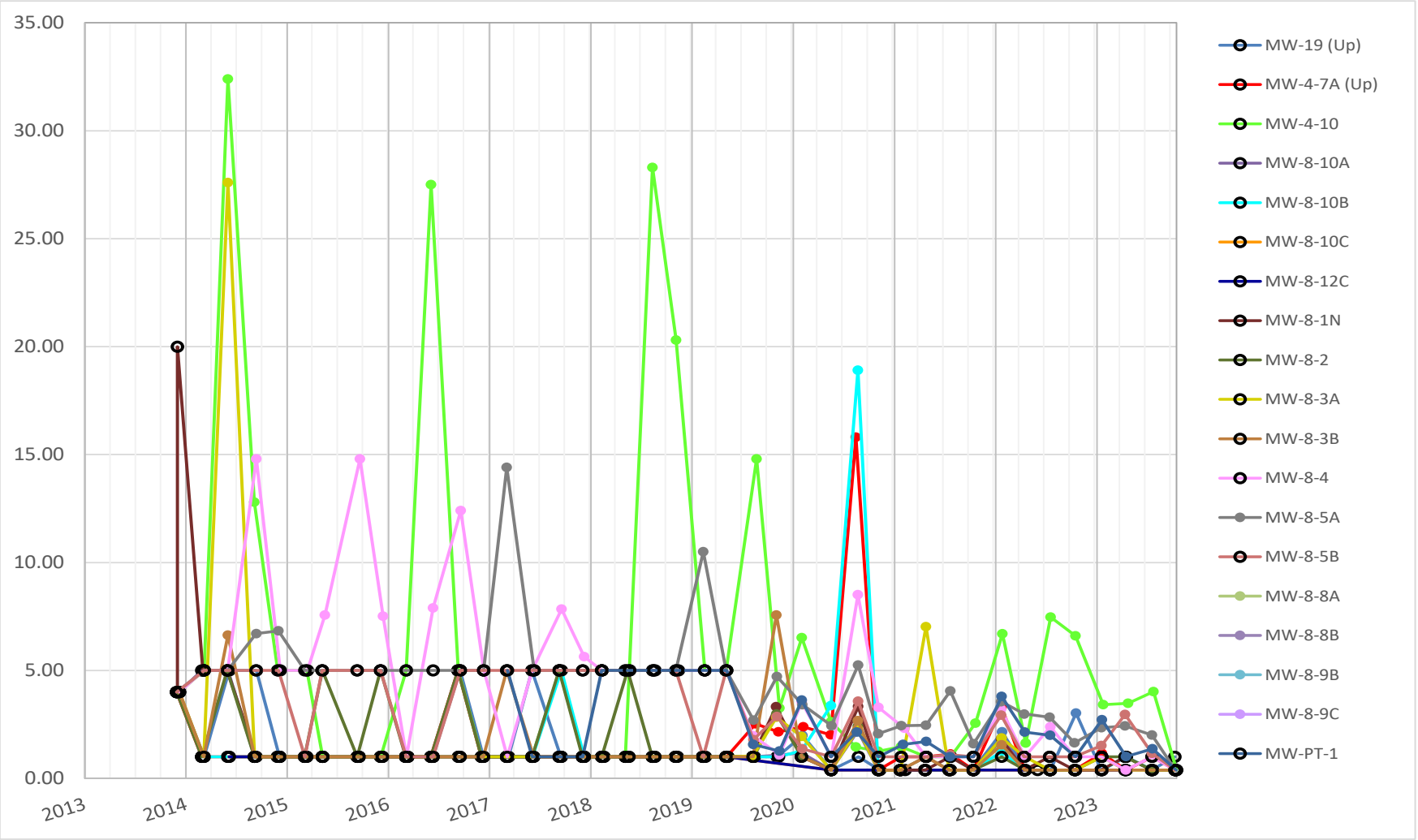


NOTE: Data does not exceed standard of 1000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Copper, total [µg/l]

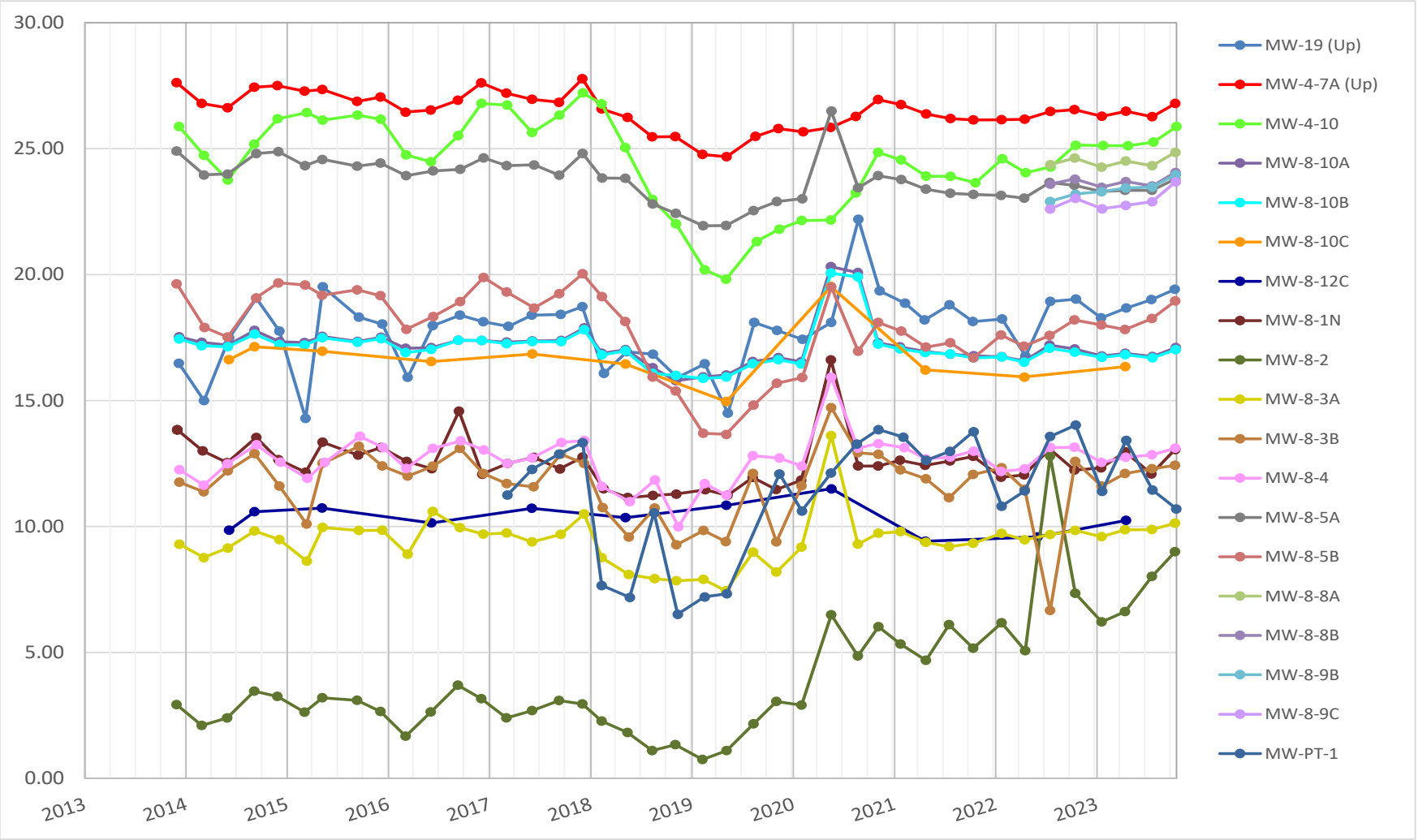


NOTE: Data does not exceed standard of 1000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Depth to Water [ft]

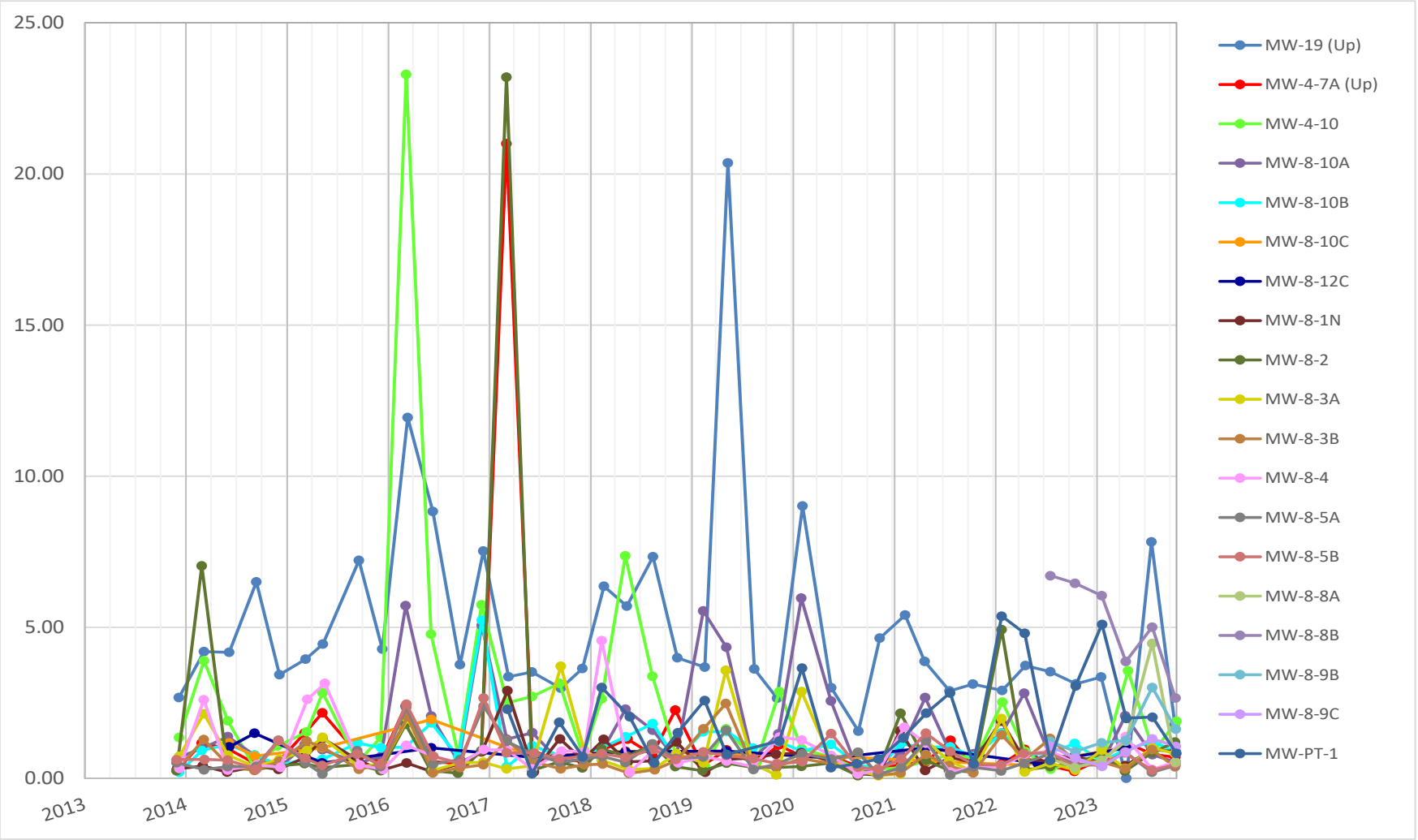


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Dissolved Oxygen, field [mg/l]

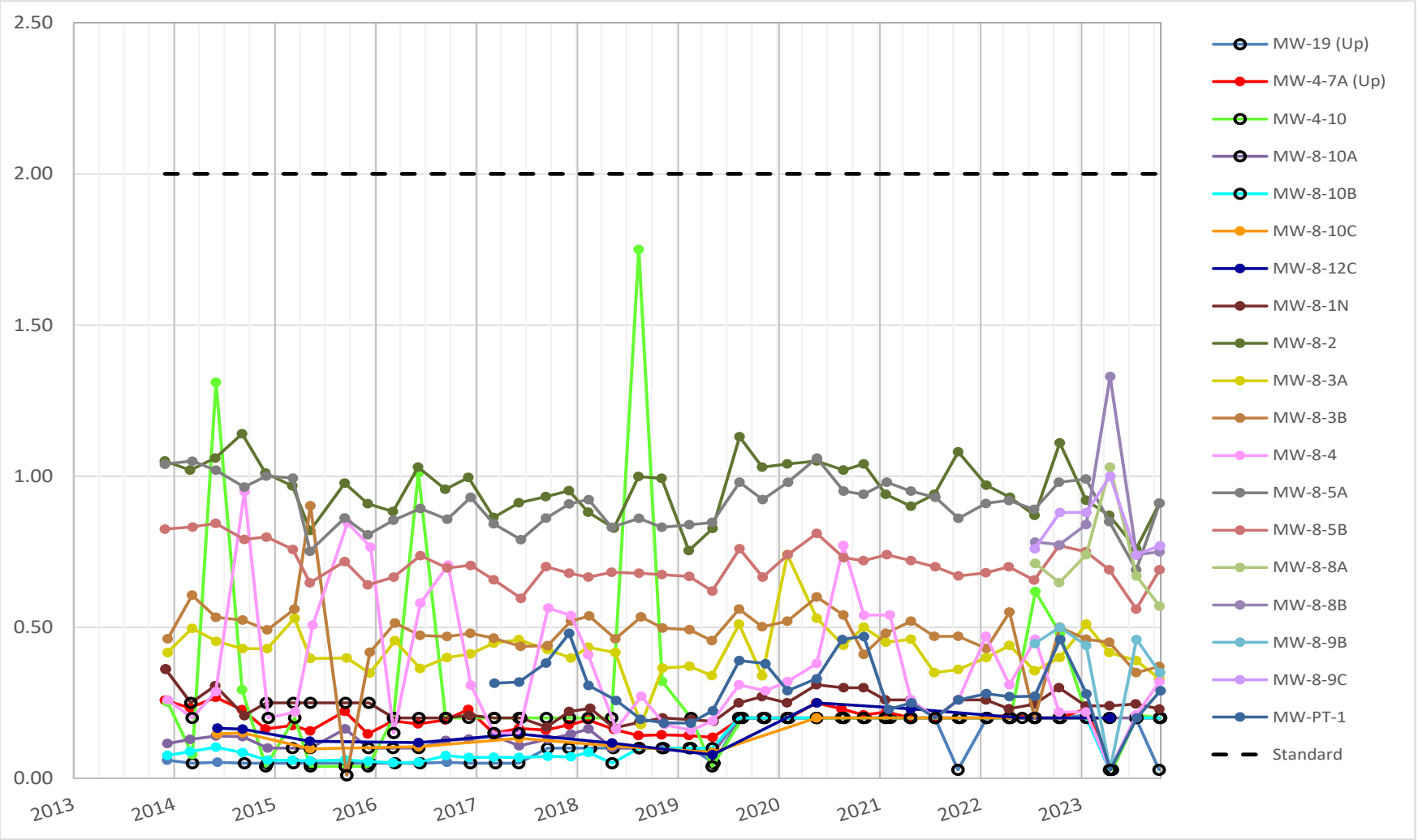


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Fluoride, total as F [mg/l]

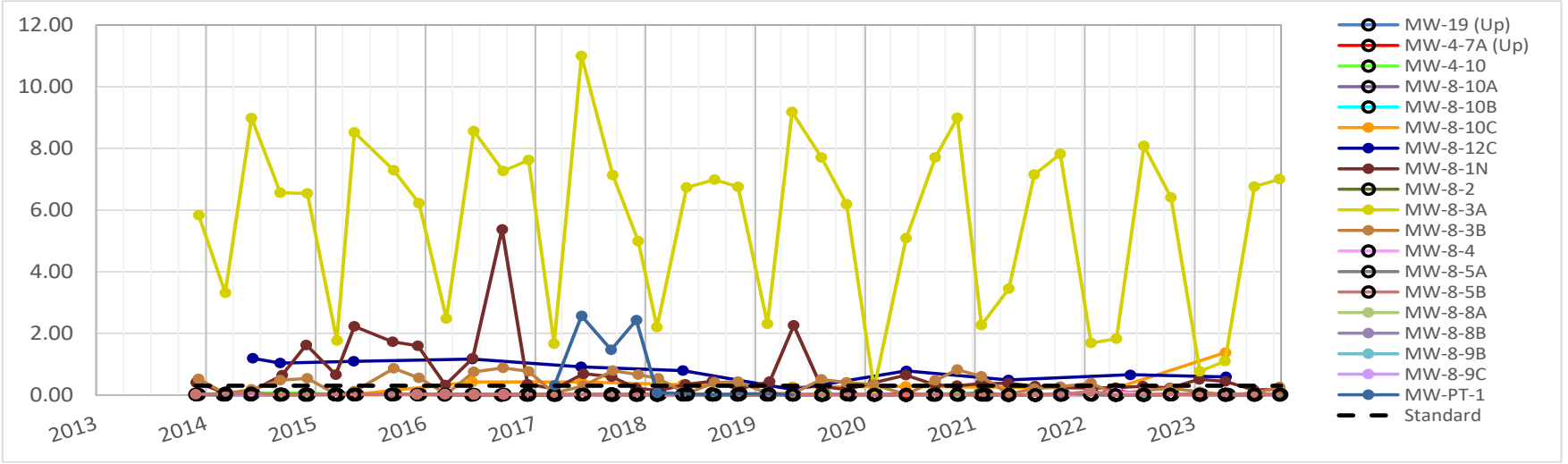


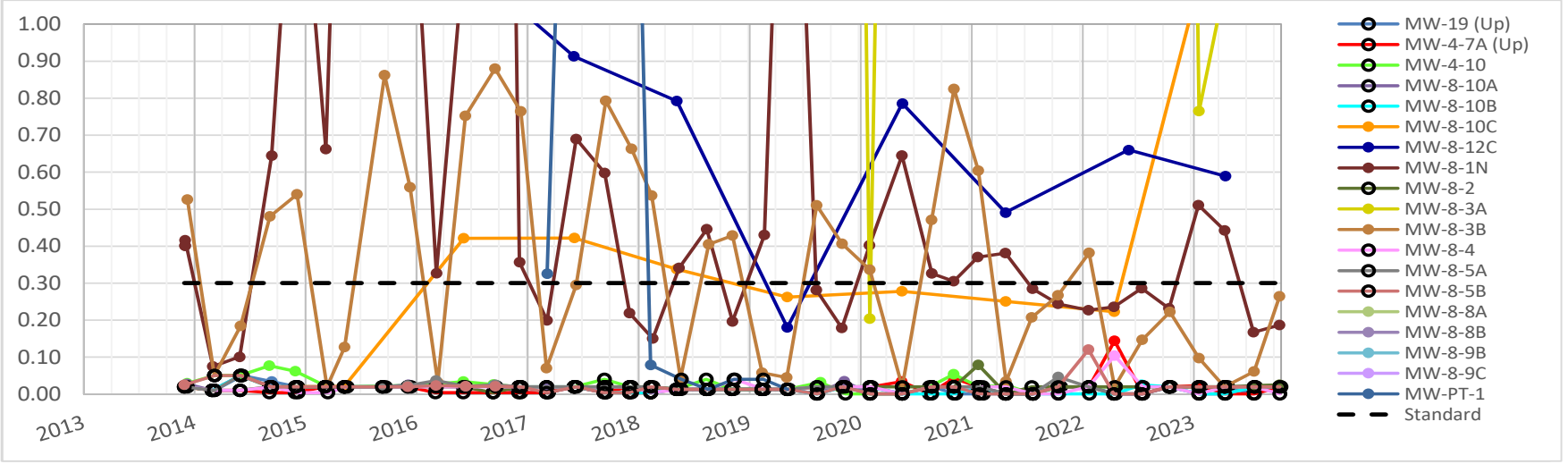
NOTE: Data does not exceed standard of 2 mg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

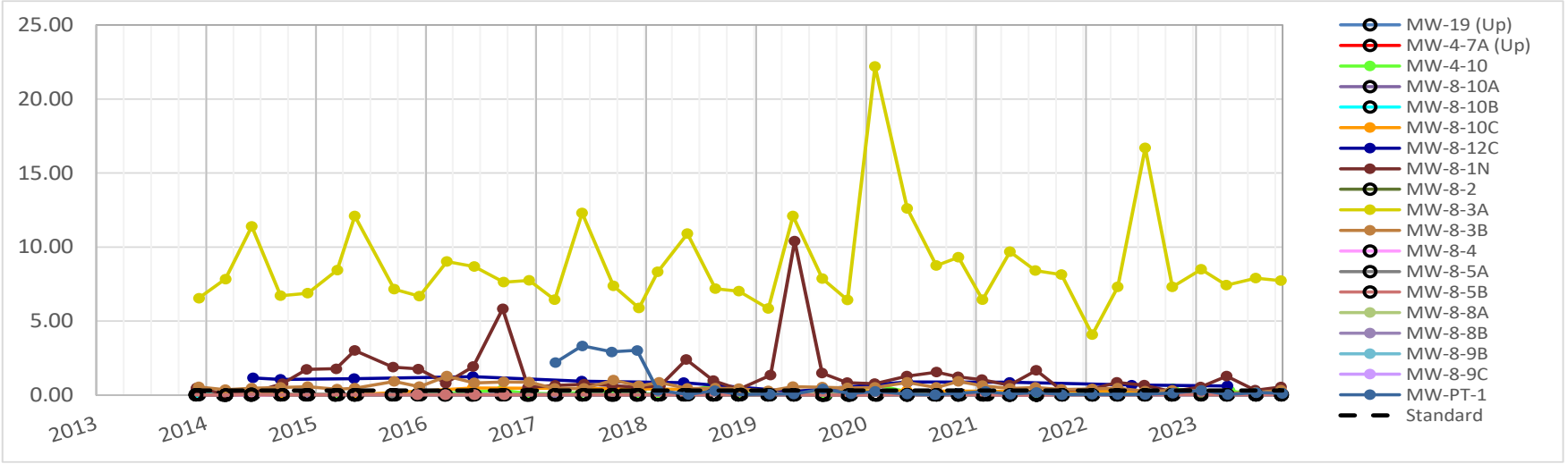
Iron, dissolved [mg/l]

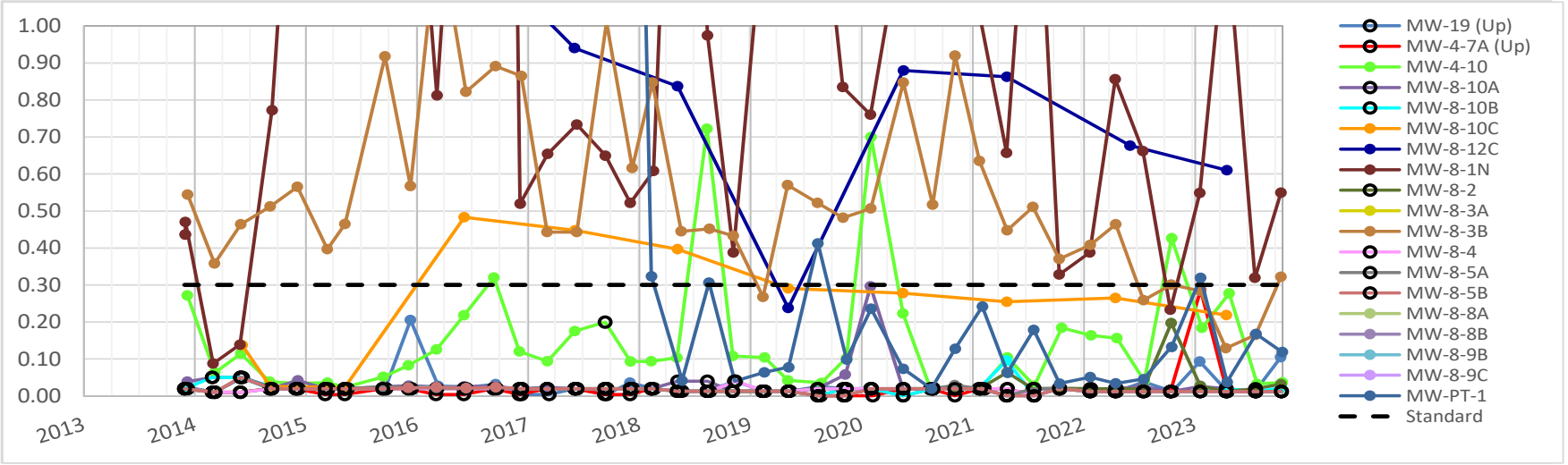




Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

Iron, total [mg/l]

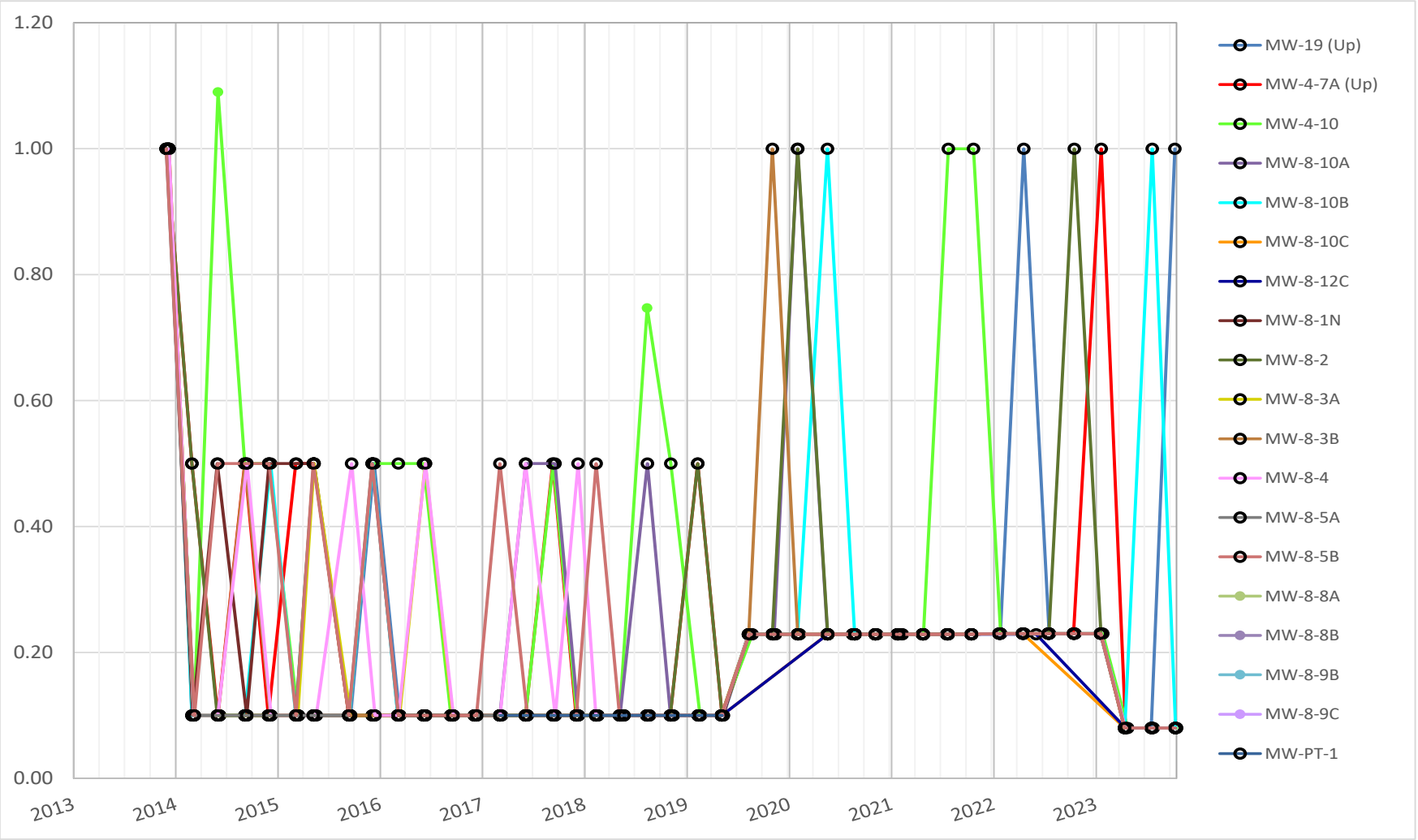




Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Lead, dissolved [µg/l]

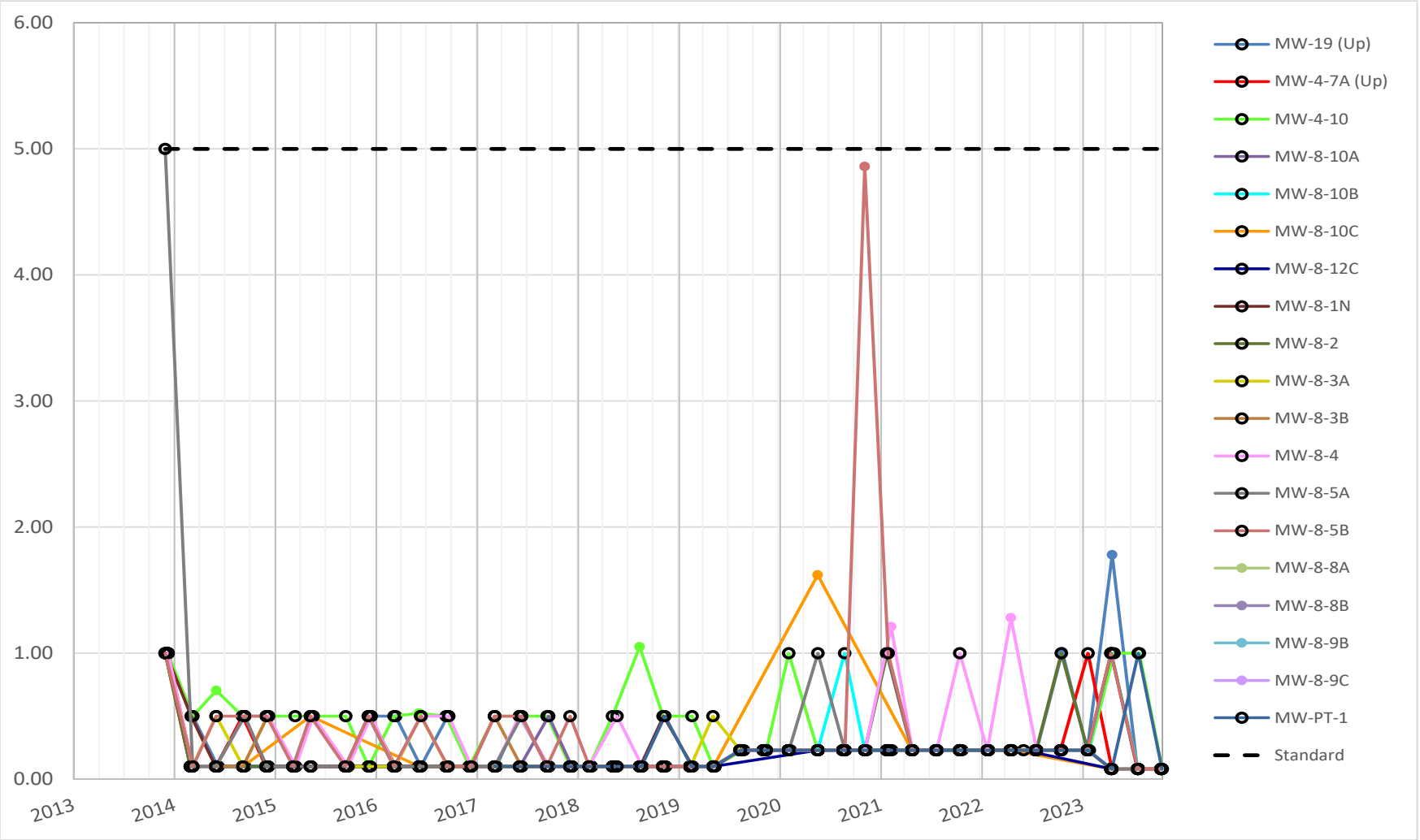


NOTE: Data does not exceed standard of 5 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

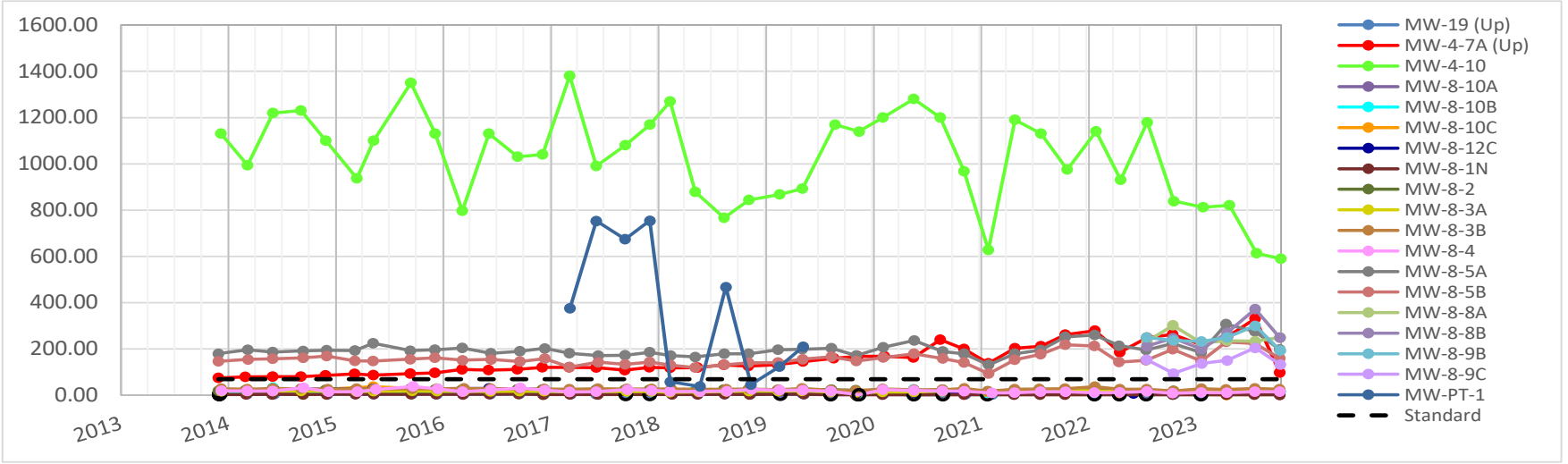
Lead, total [µg/l]

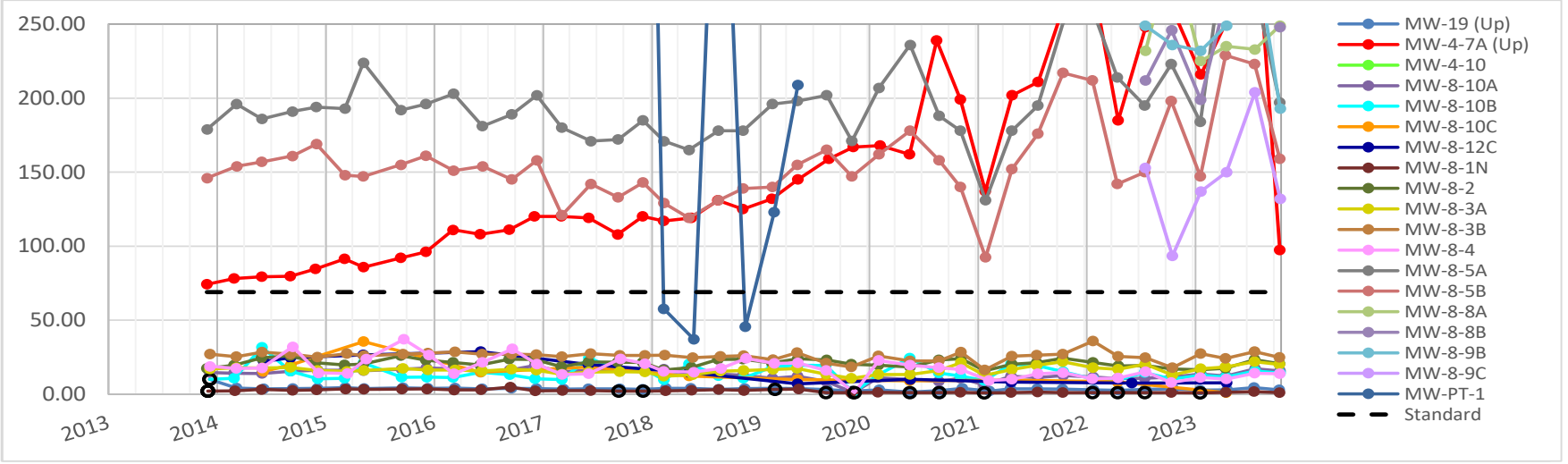


Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Lithium, dissolved [µg/l]

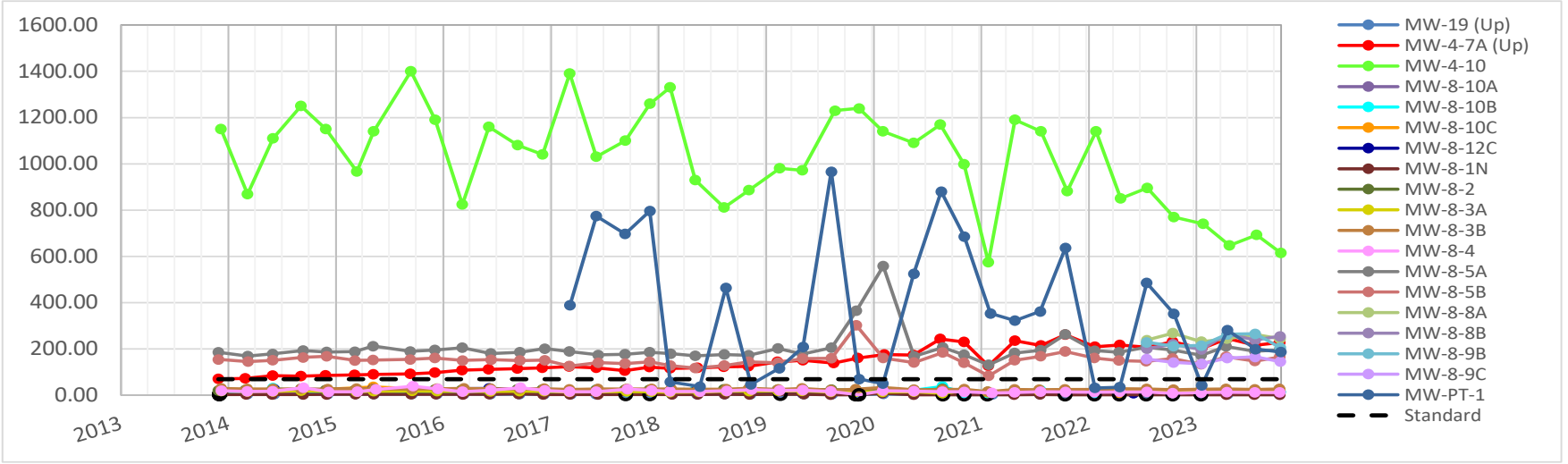


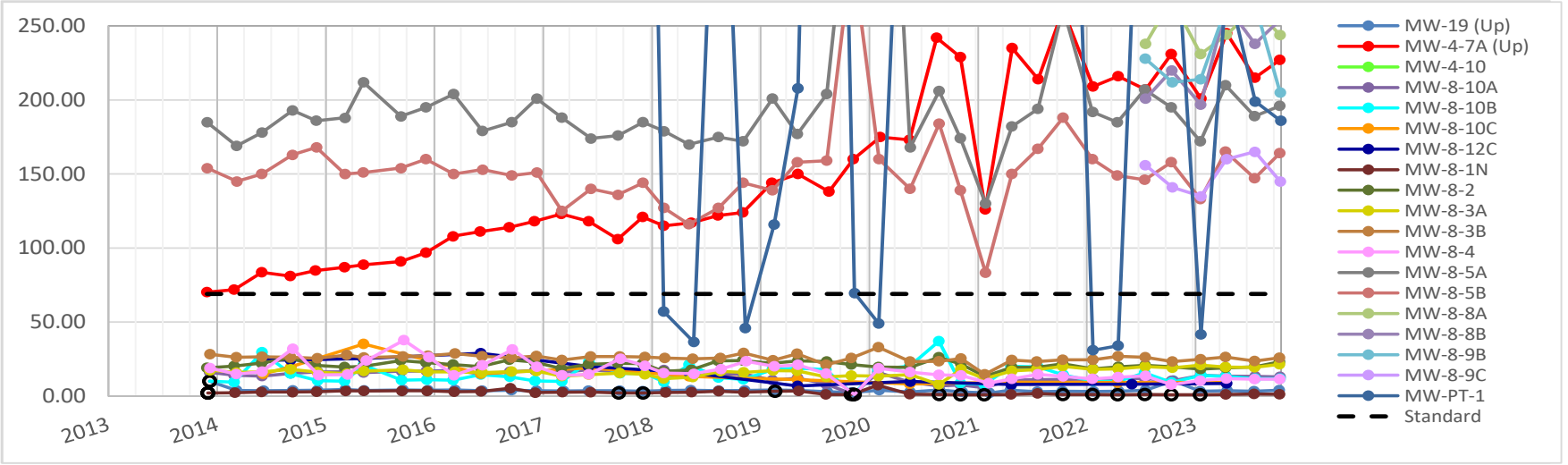


Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Lithium, total [µg/l]

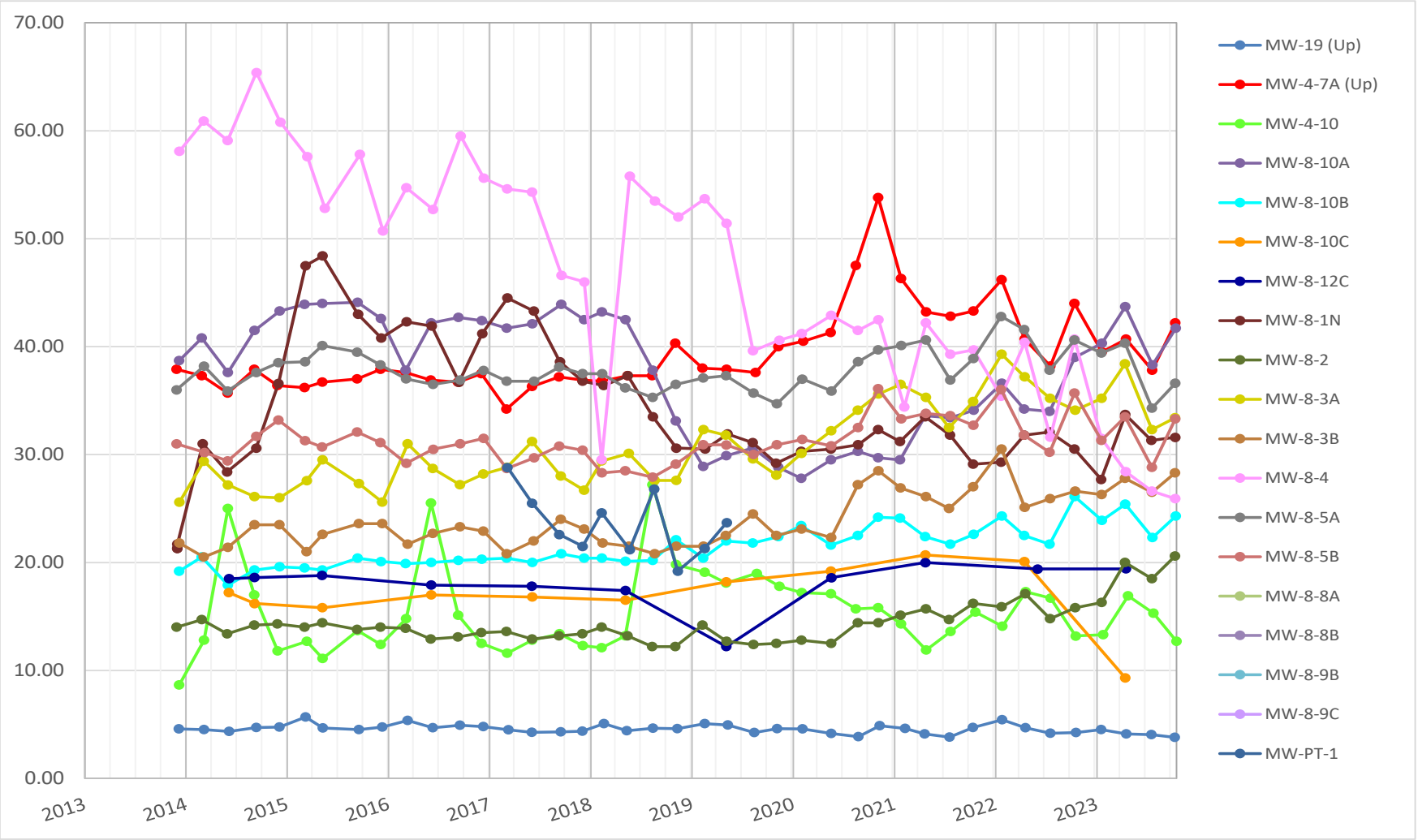




Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Magnesium, dissolved [mg/l]

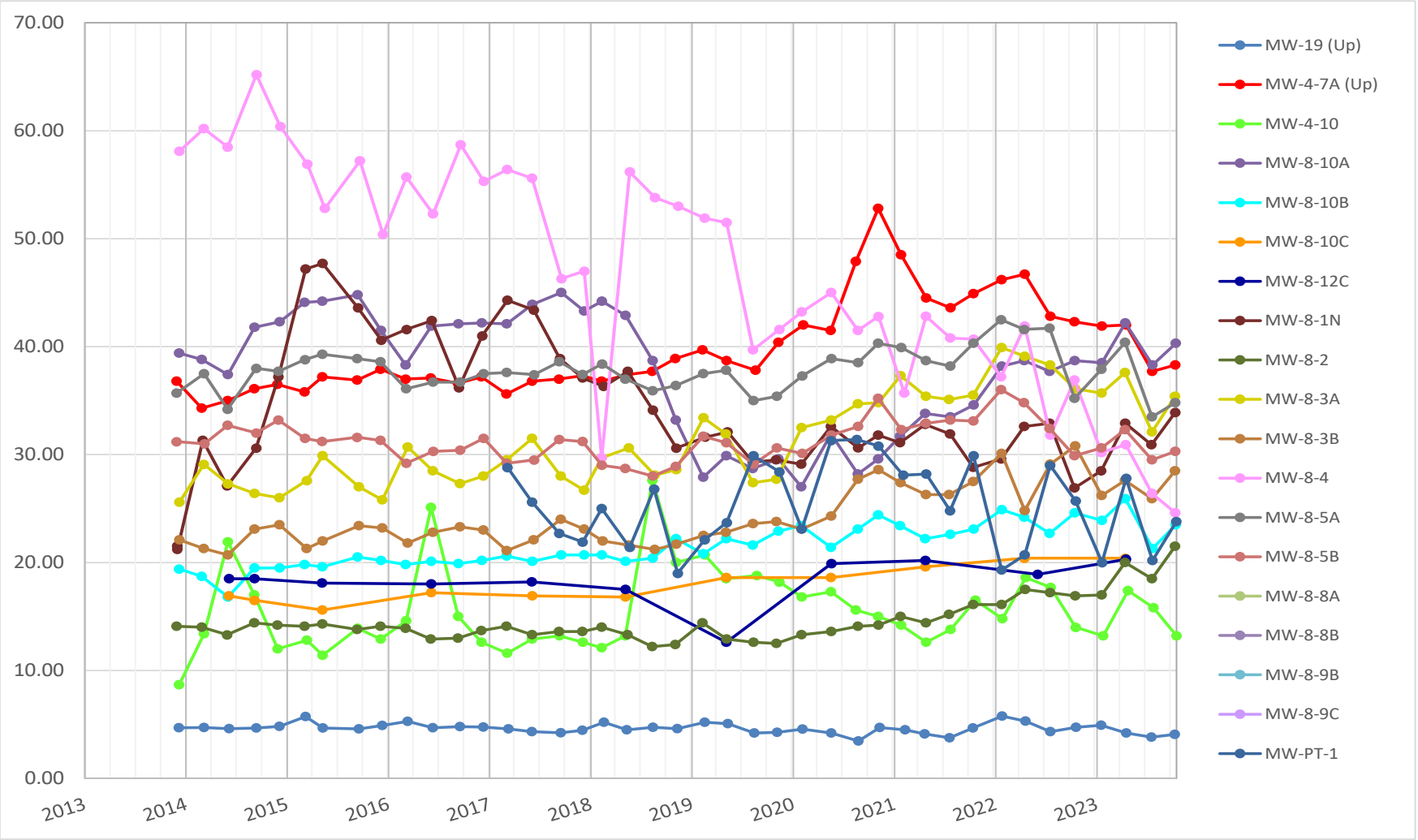


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

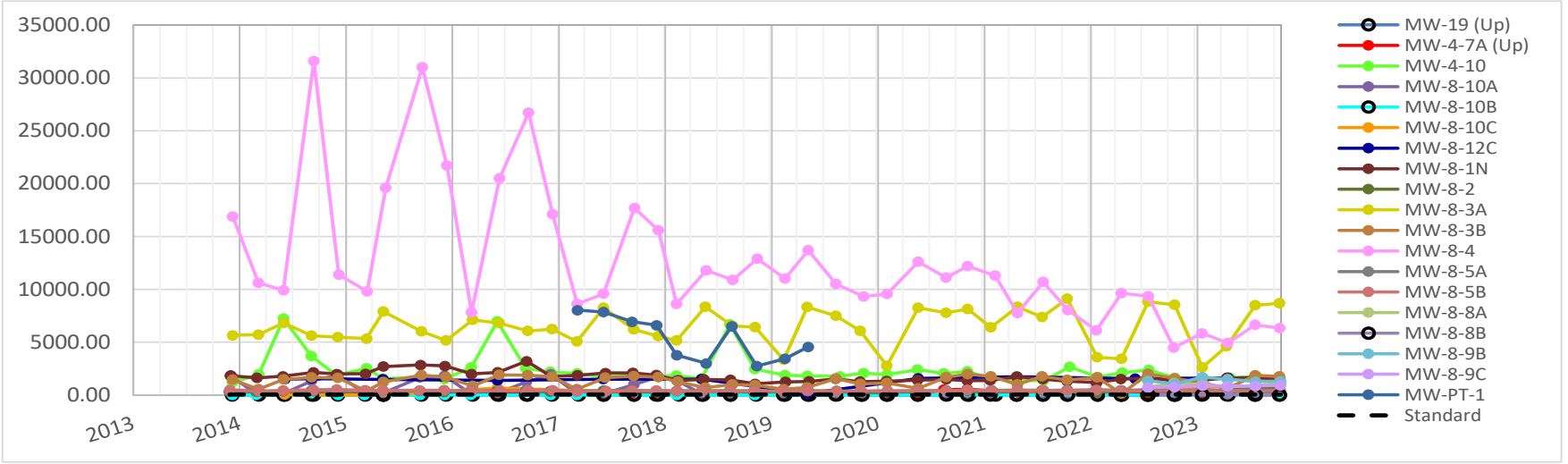
Magnesium, total [mg/l]

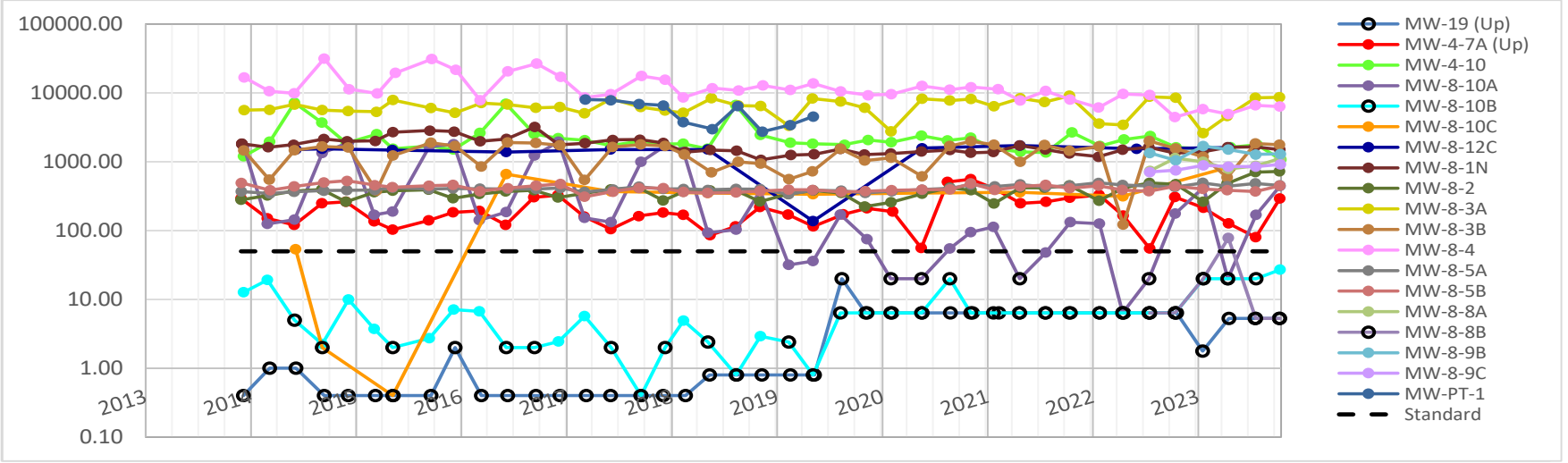


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

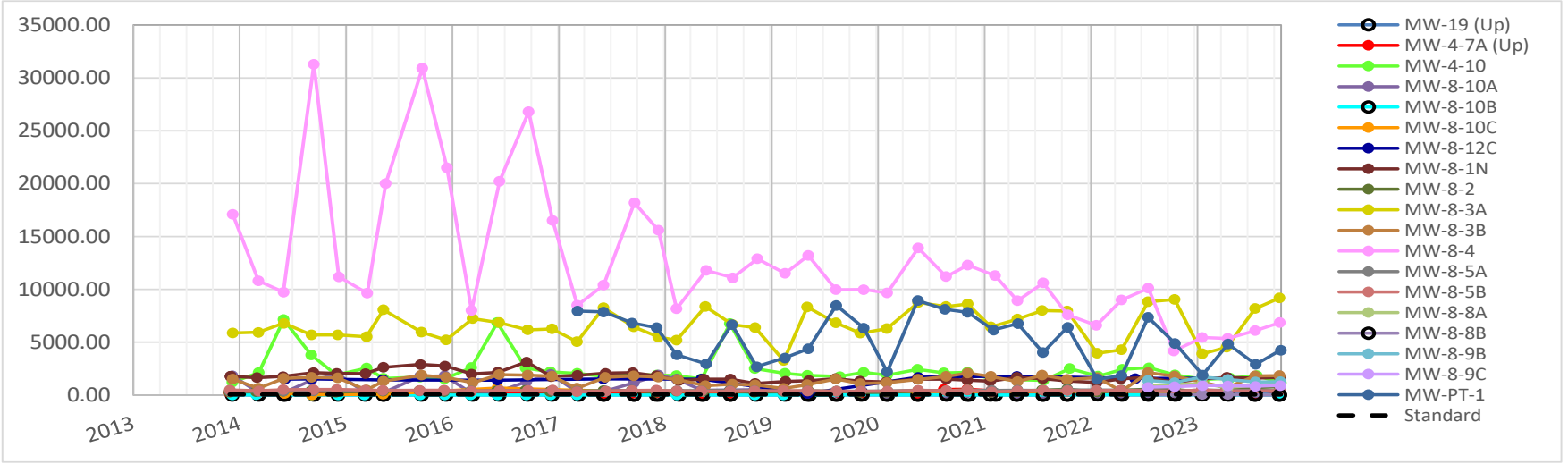
Manganese, dissolved [µg/l]

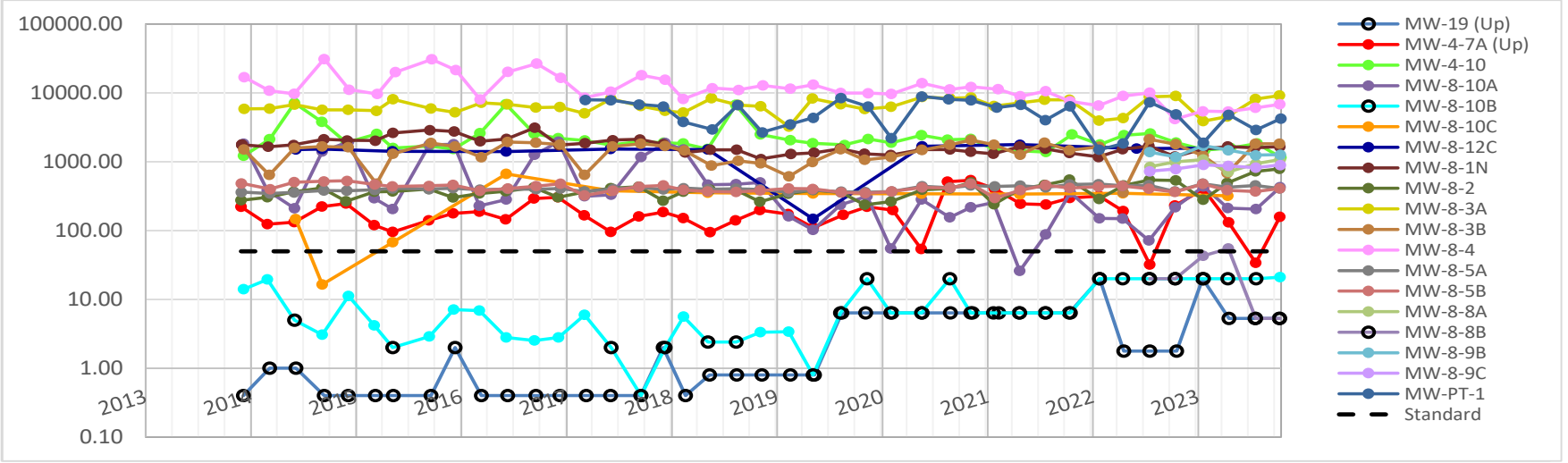




Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

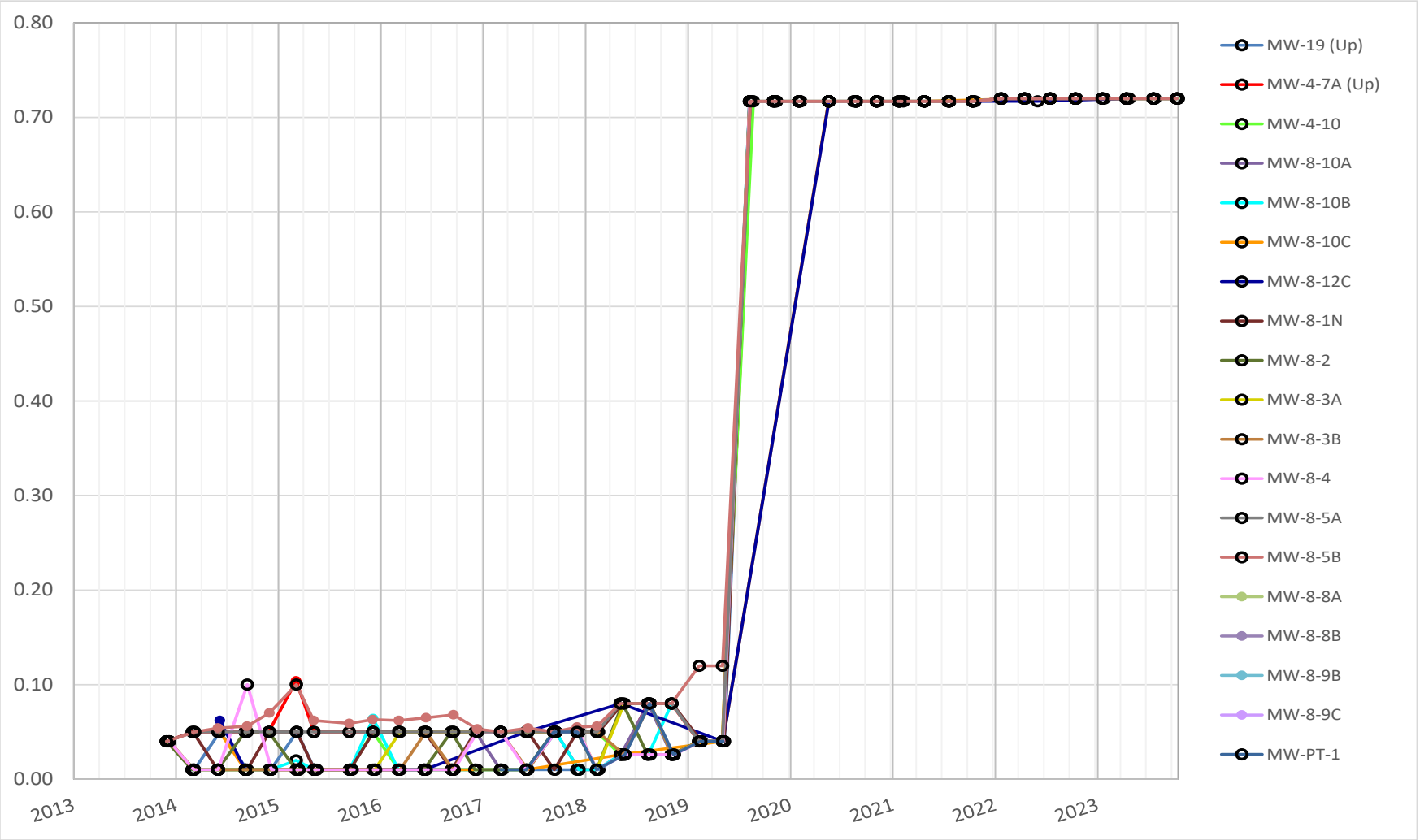
Manganese, total [µg/l]





Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

Mercury, dissolved [µg/l]

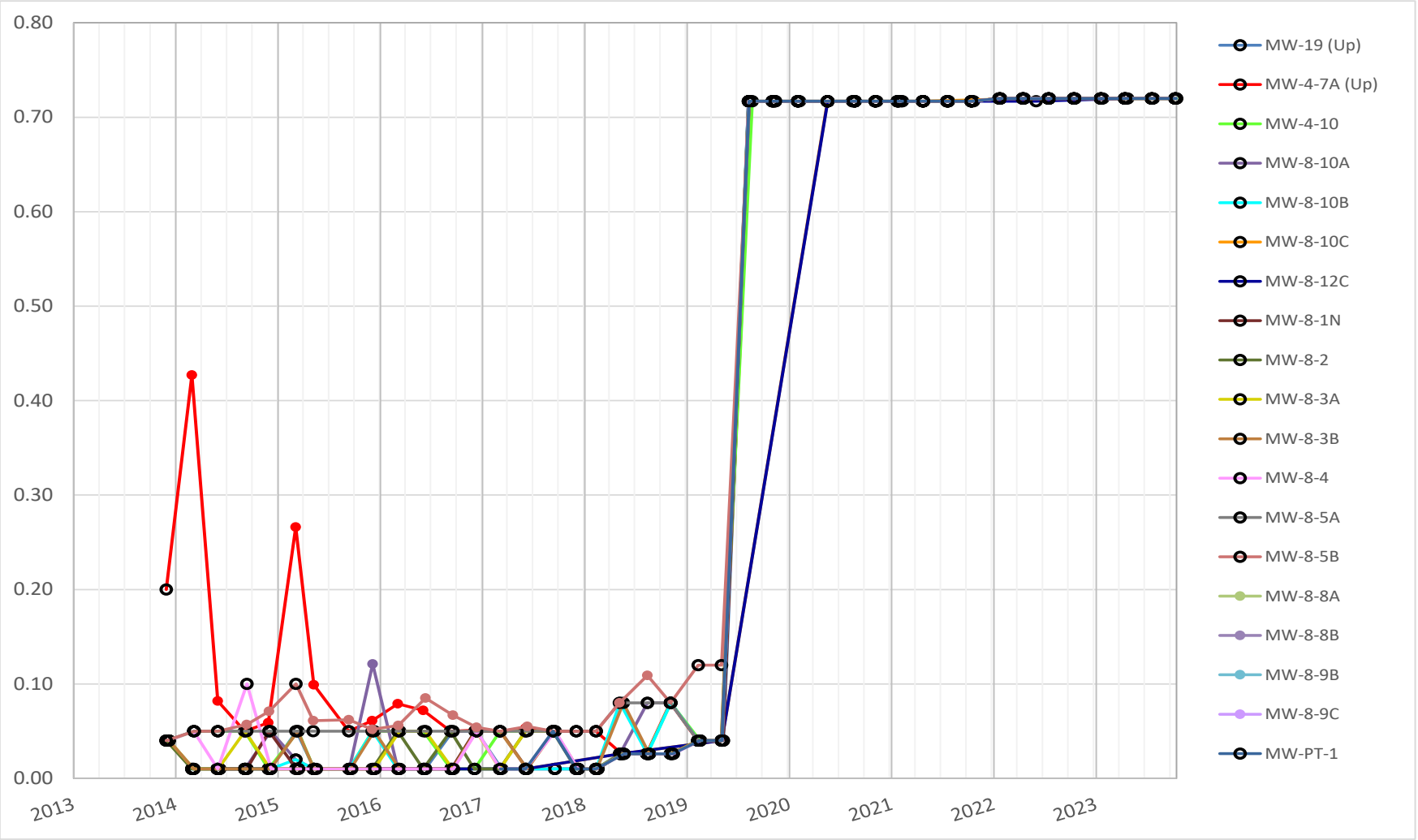


NOTE: Data does not exceed standard of 2 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

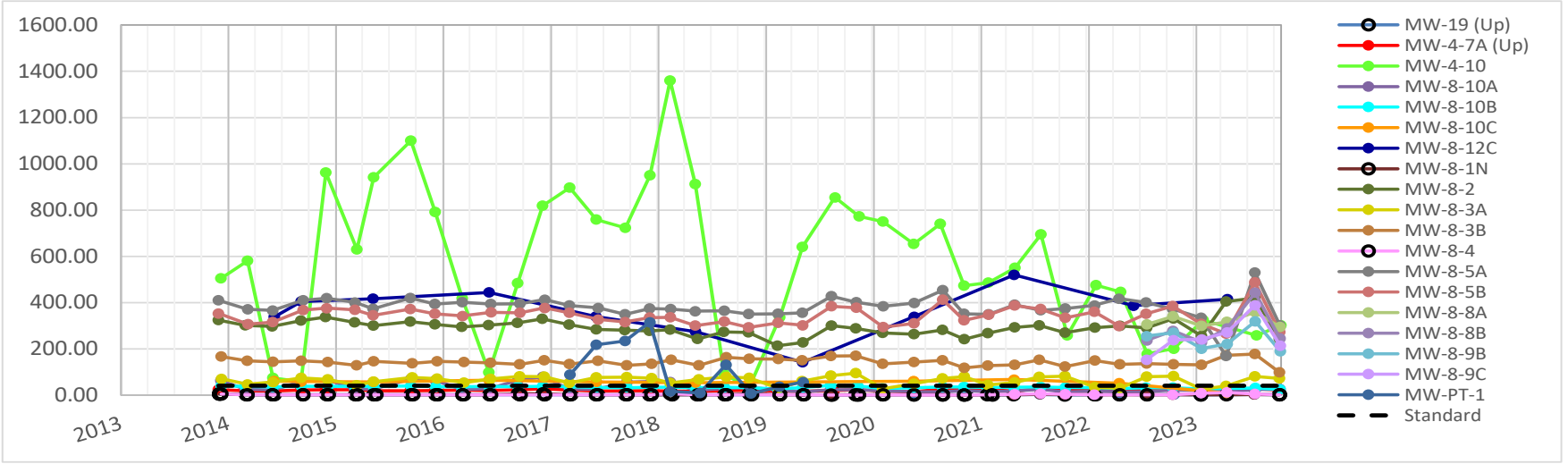
Mercury, total [µg/l]

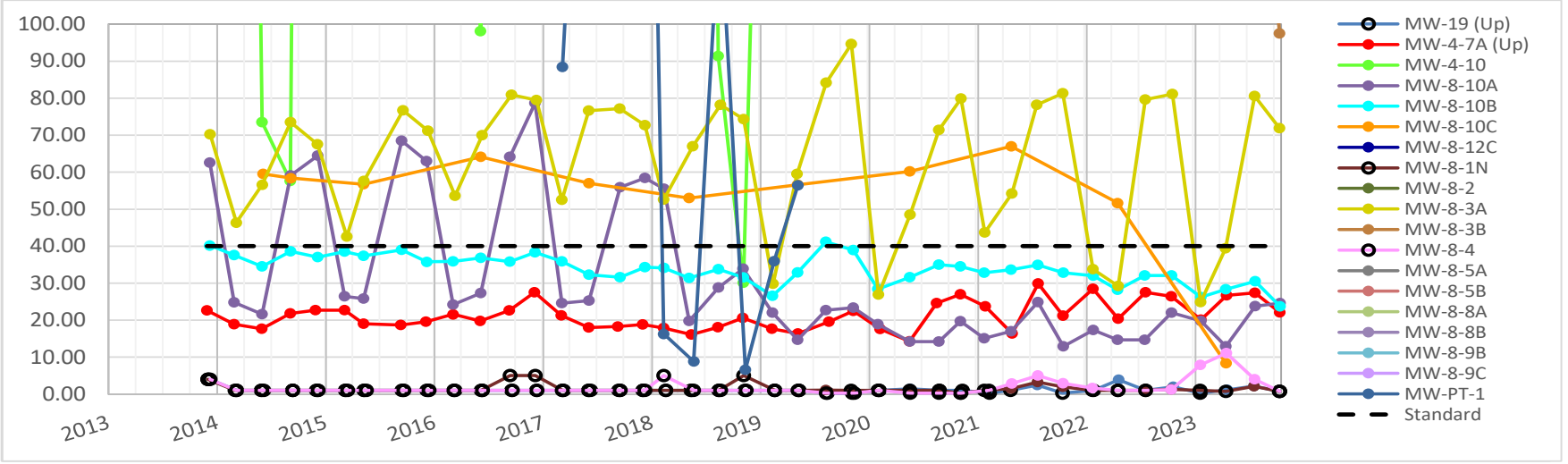


NOTE: Data does not exceed standard of 2 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

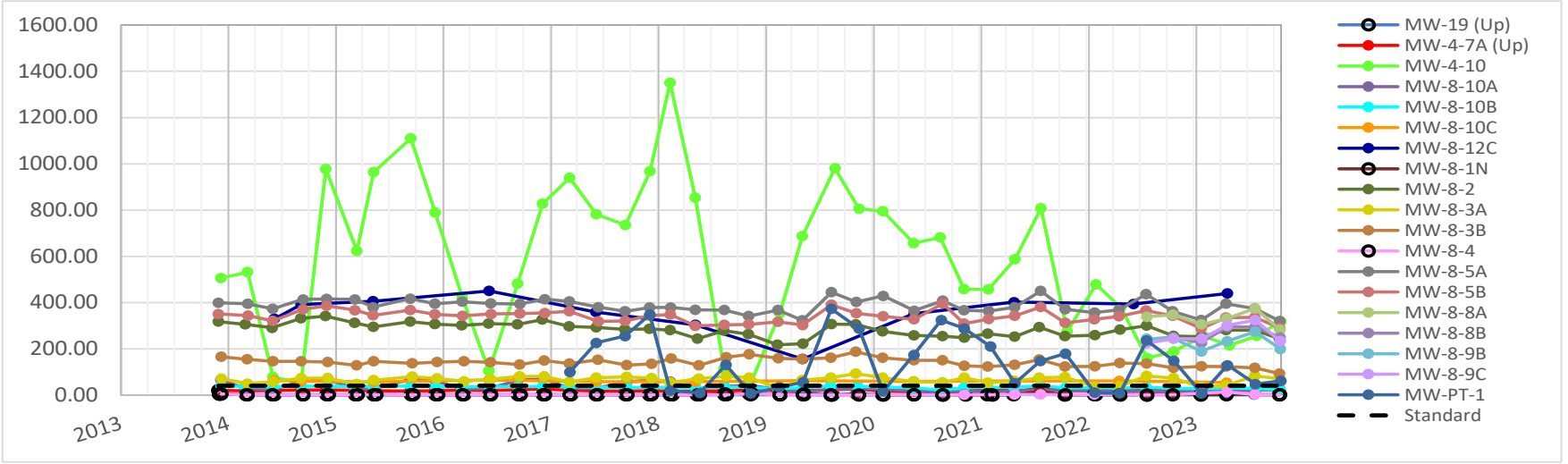
Molybdenum, dissolved [µg/l]

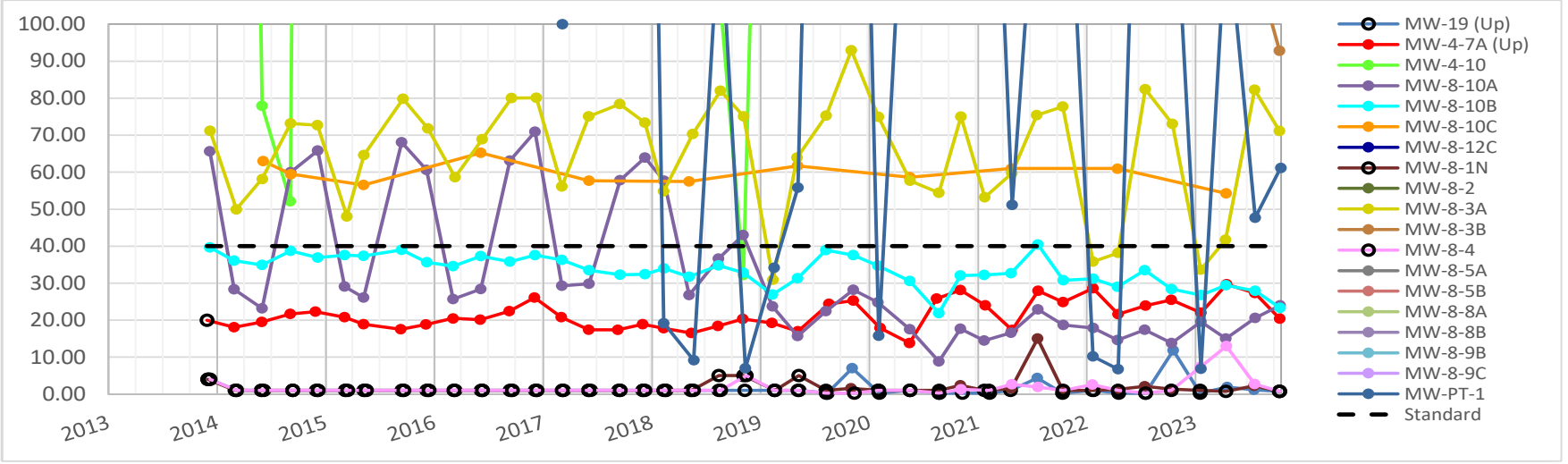




Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

Molybdenum, total [µg/l]

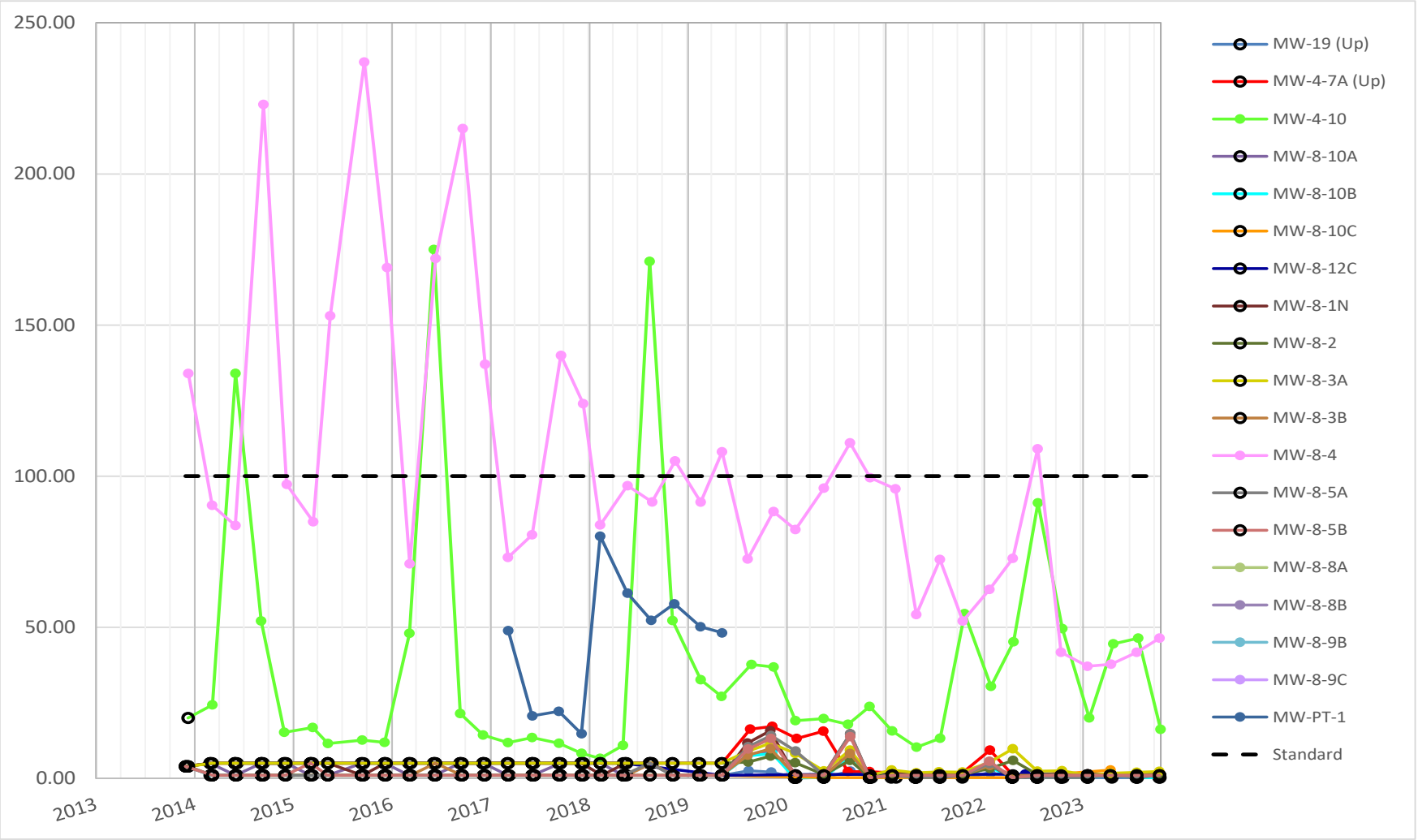




Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

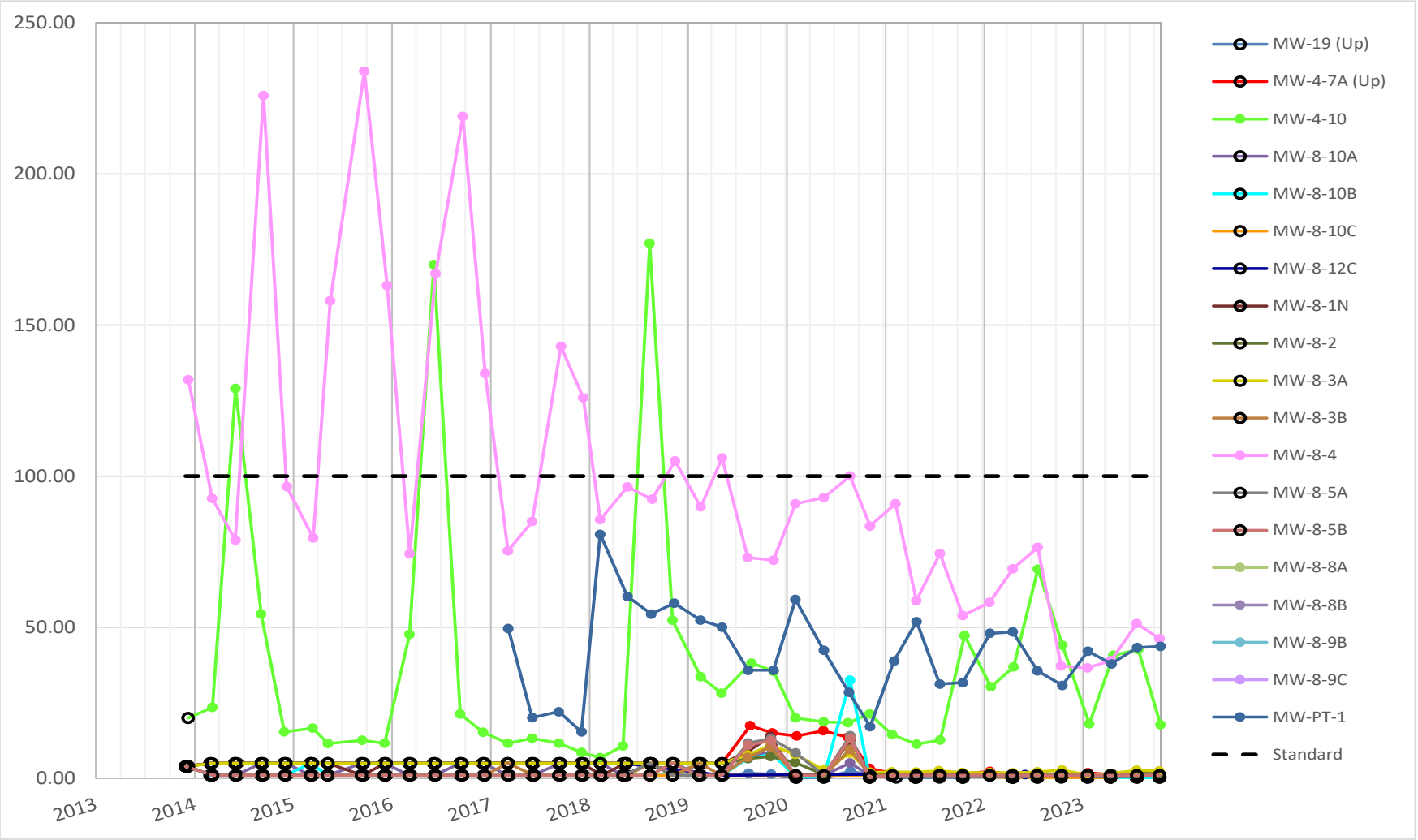
Nickel, dissolved [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

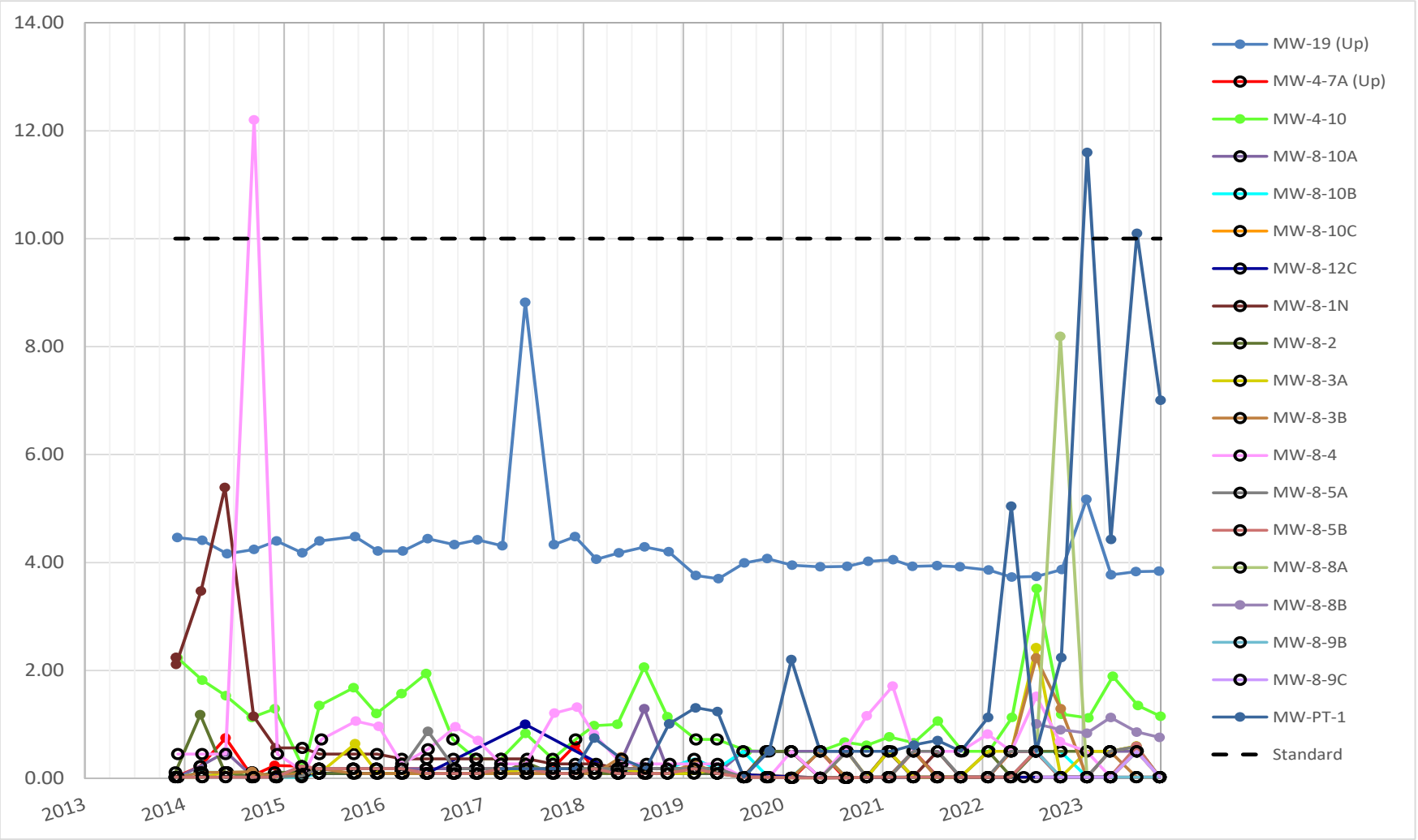
Nickel, total [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

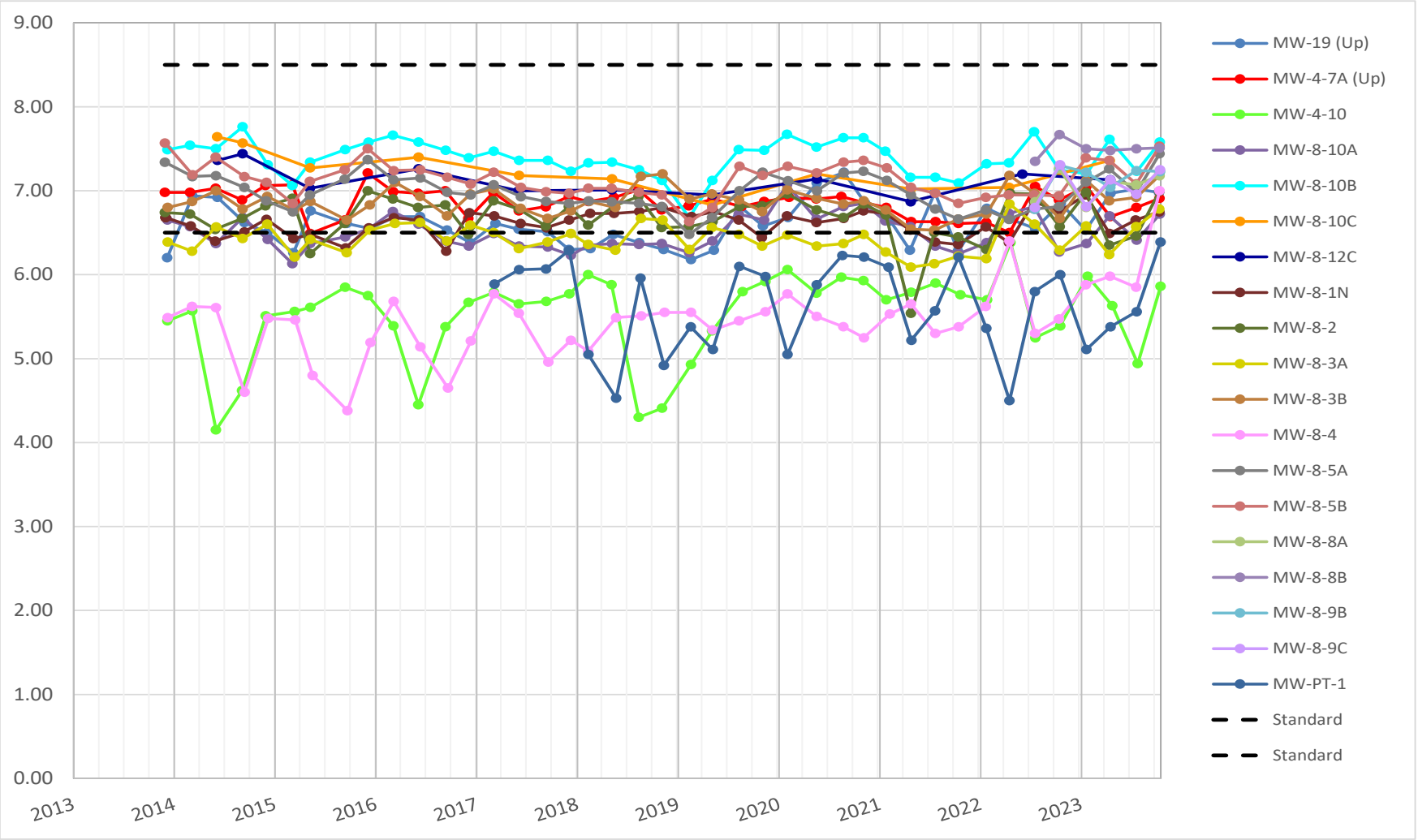
Nitrate, as N [mg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

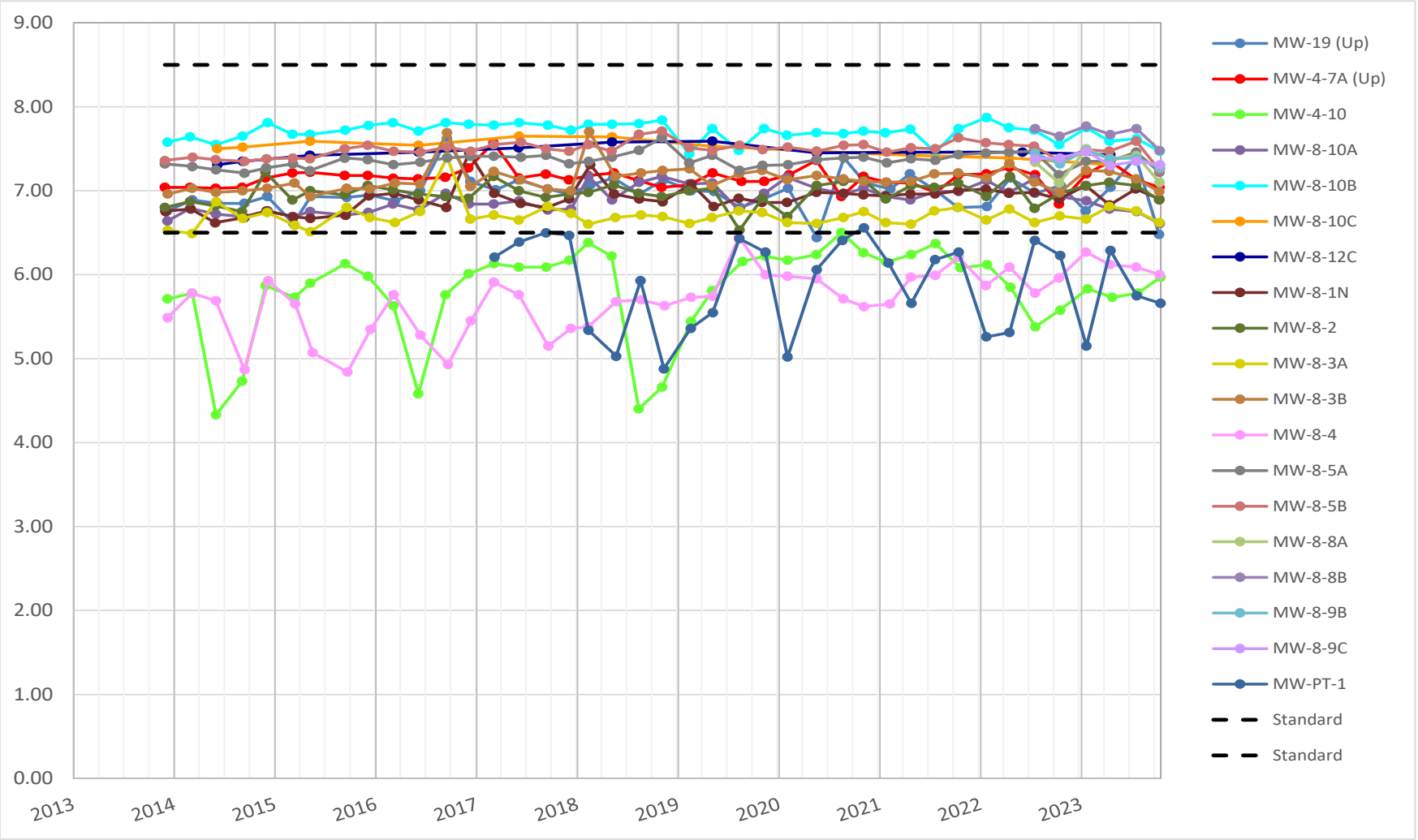
pH, field [s.u.]



Talen Energy
Brunner Island - Basin 5

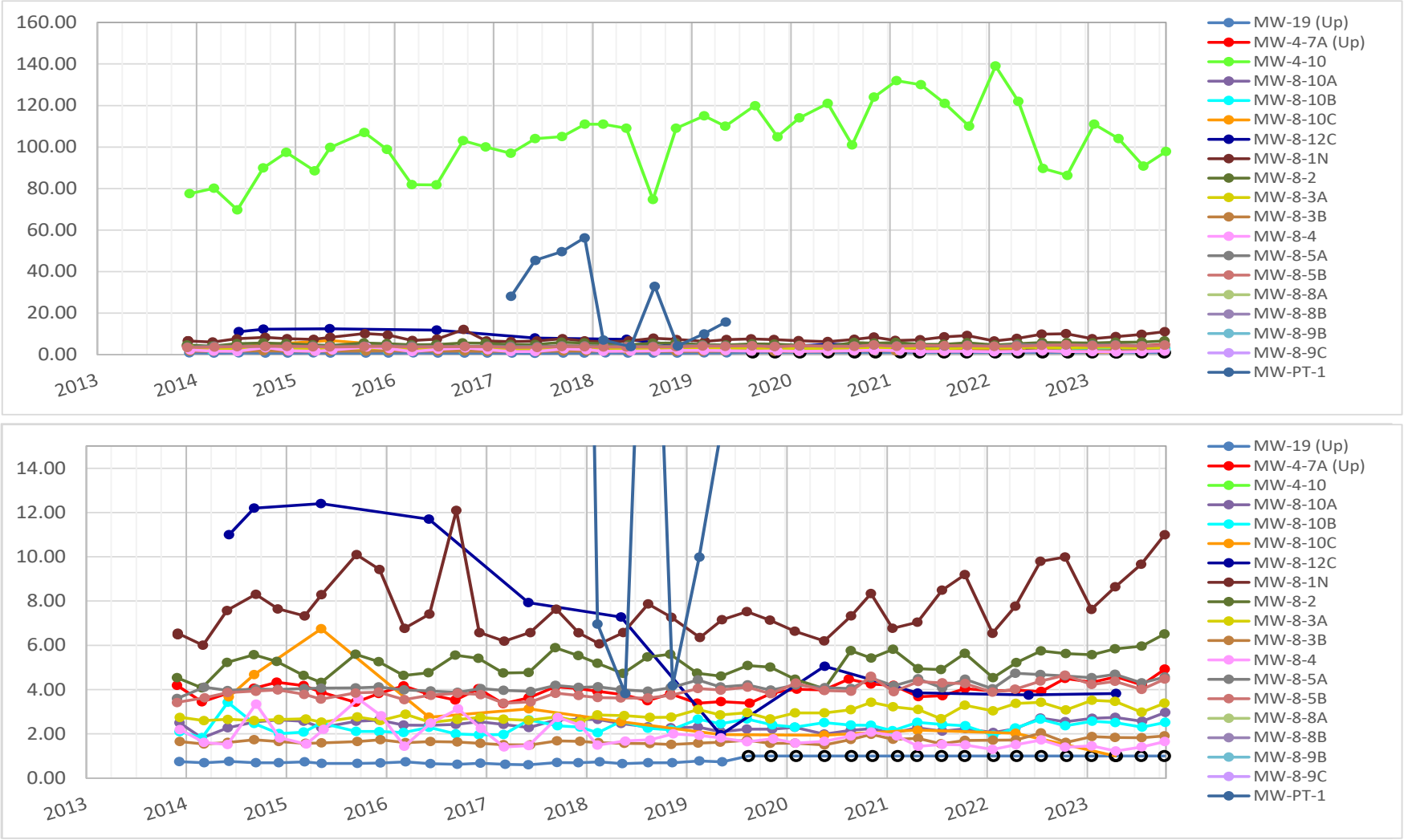
4th Quarter 2023

pH, lab [s.u.]



Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

Potassium, dissolved [mg/l]

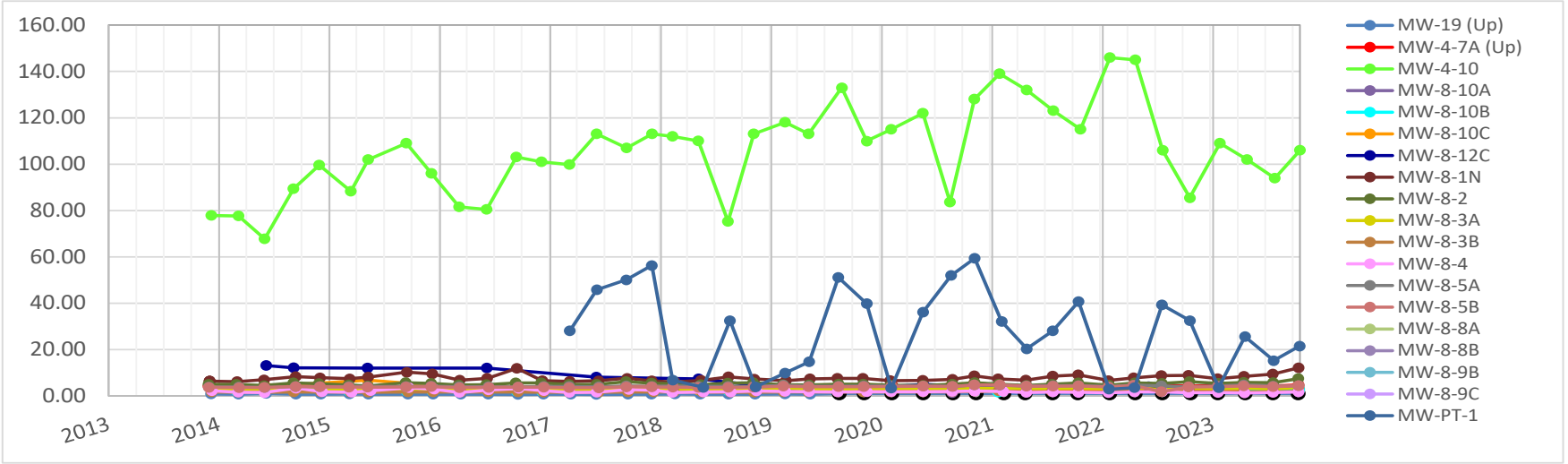


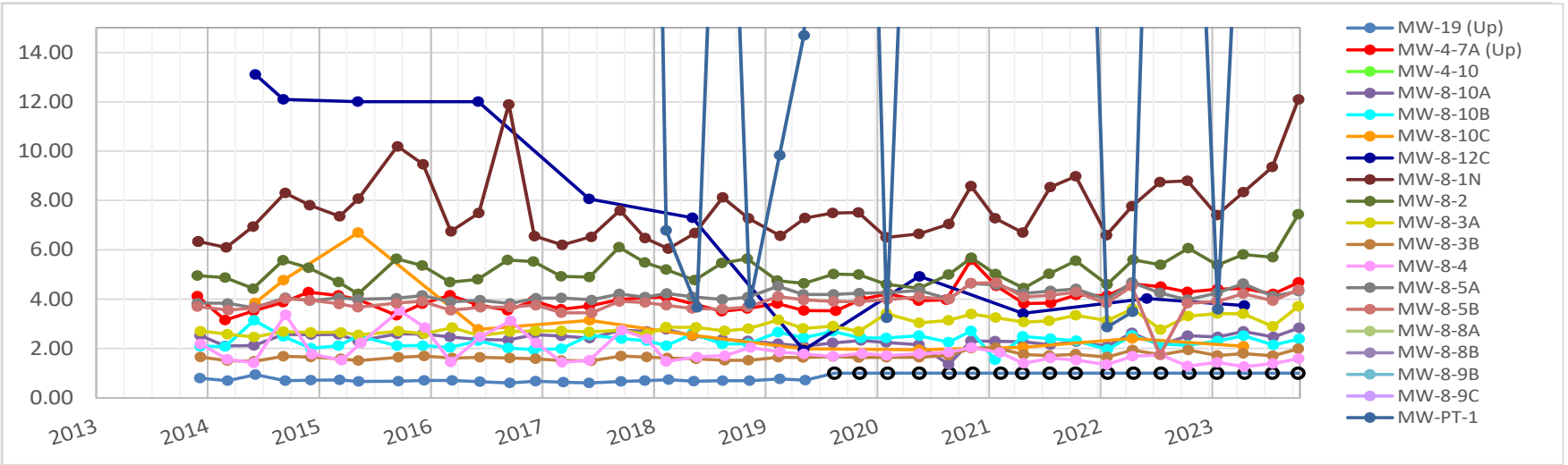
NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Potassium, total [mg/l]



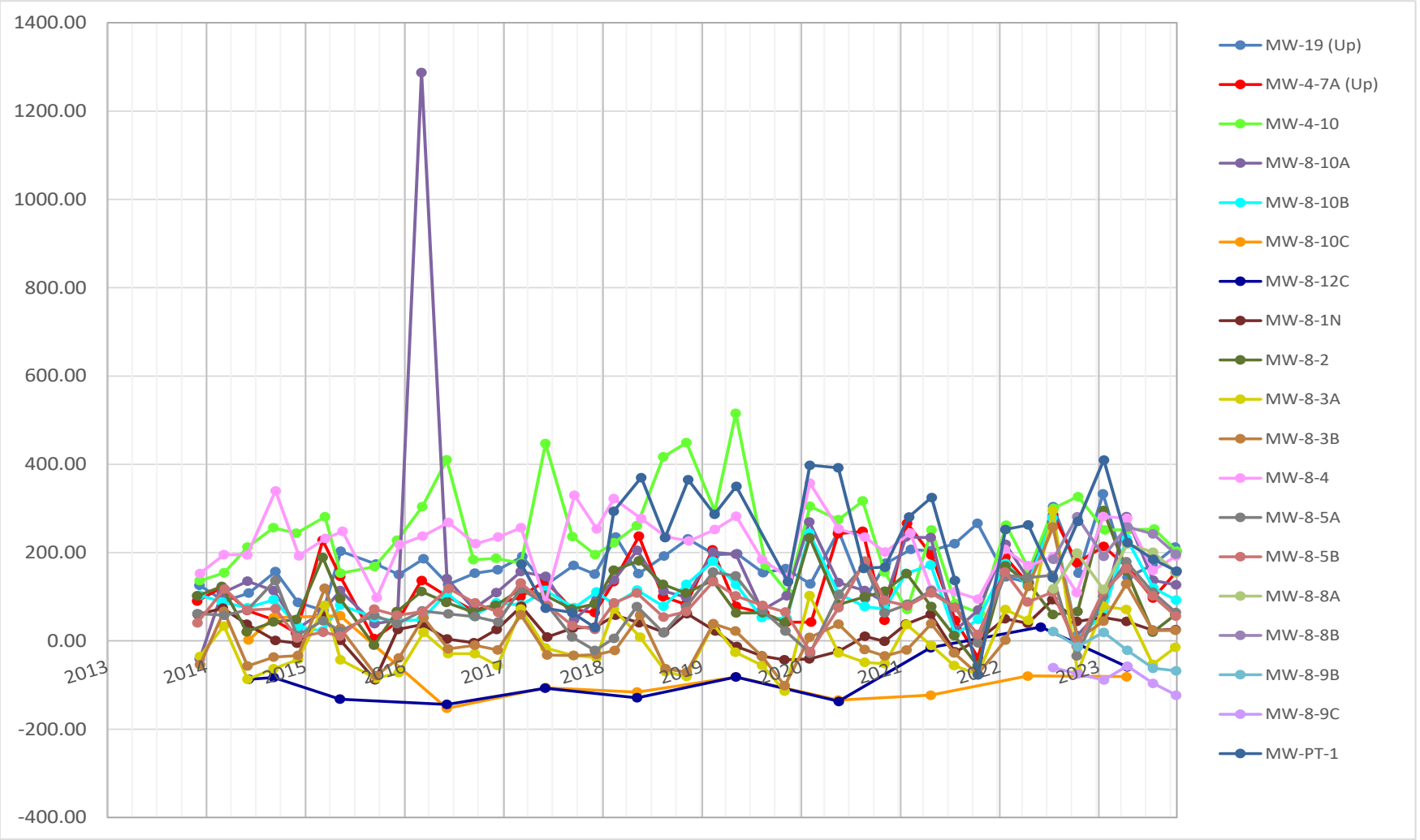


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Redox, field [mv]

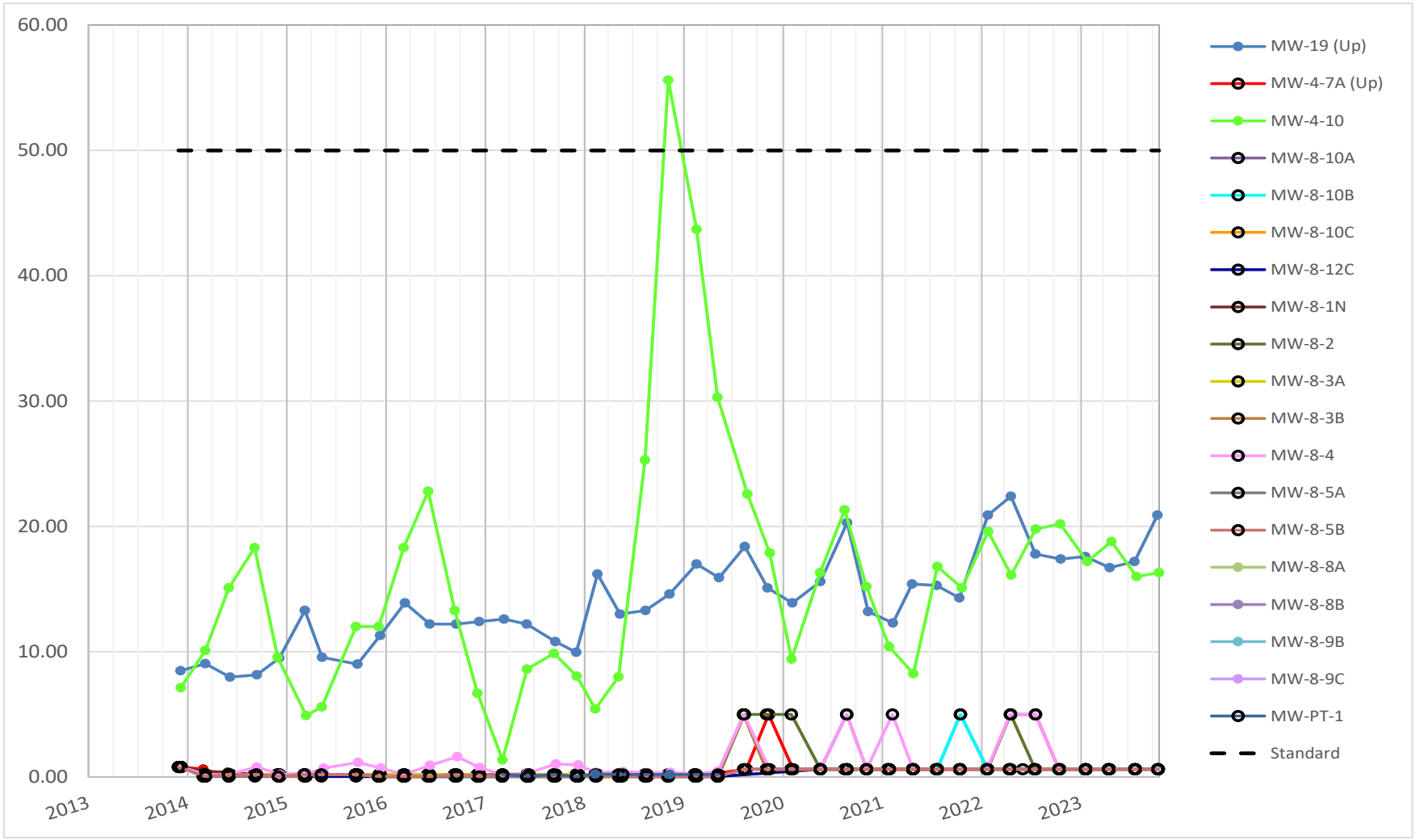


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

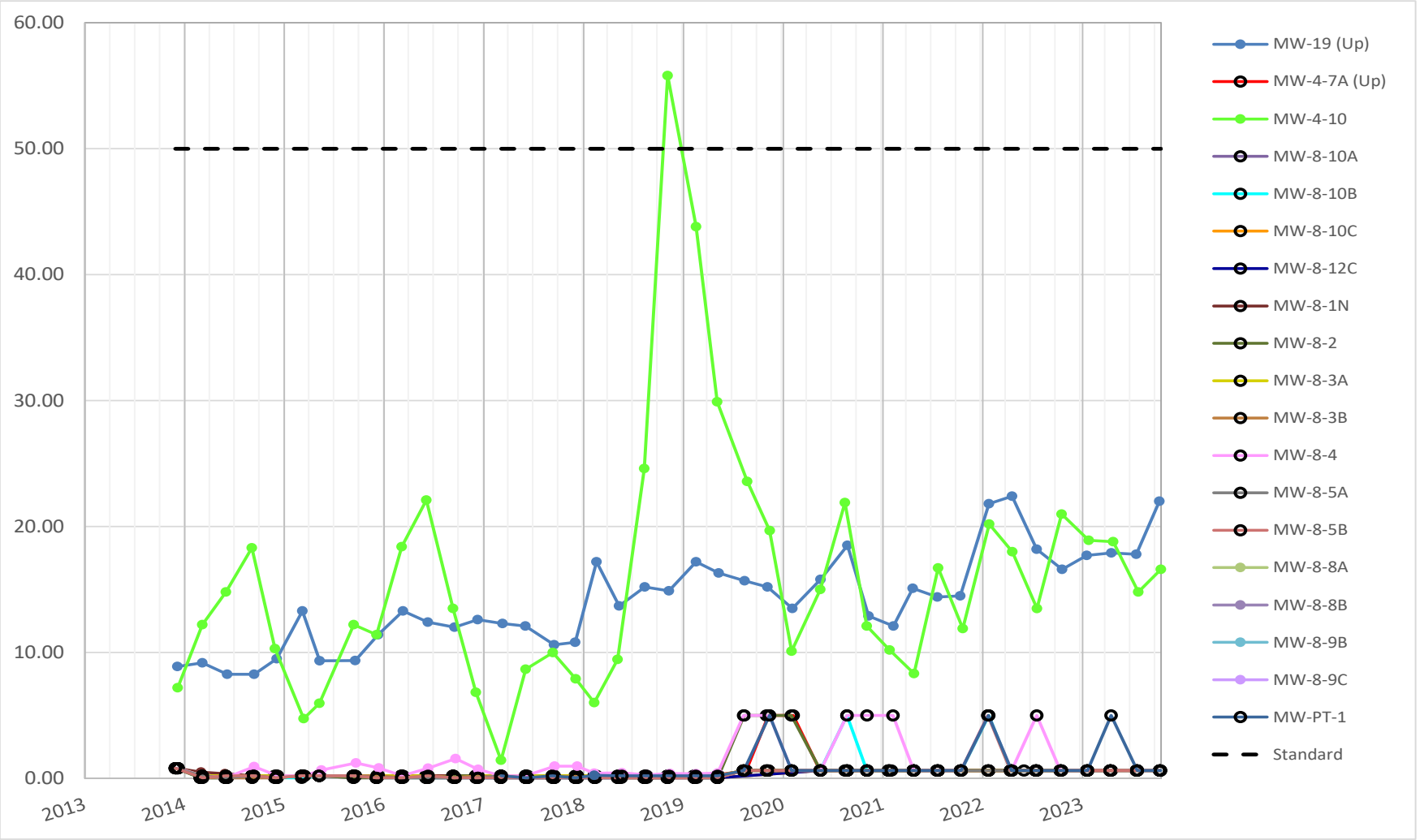
Selenium, dissolved [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

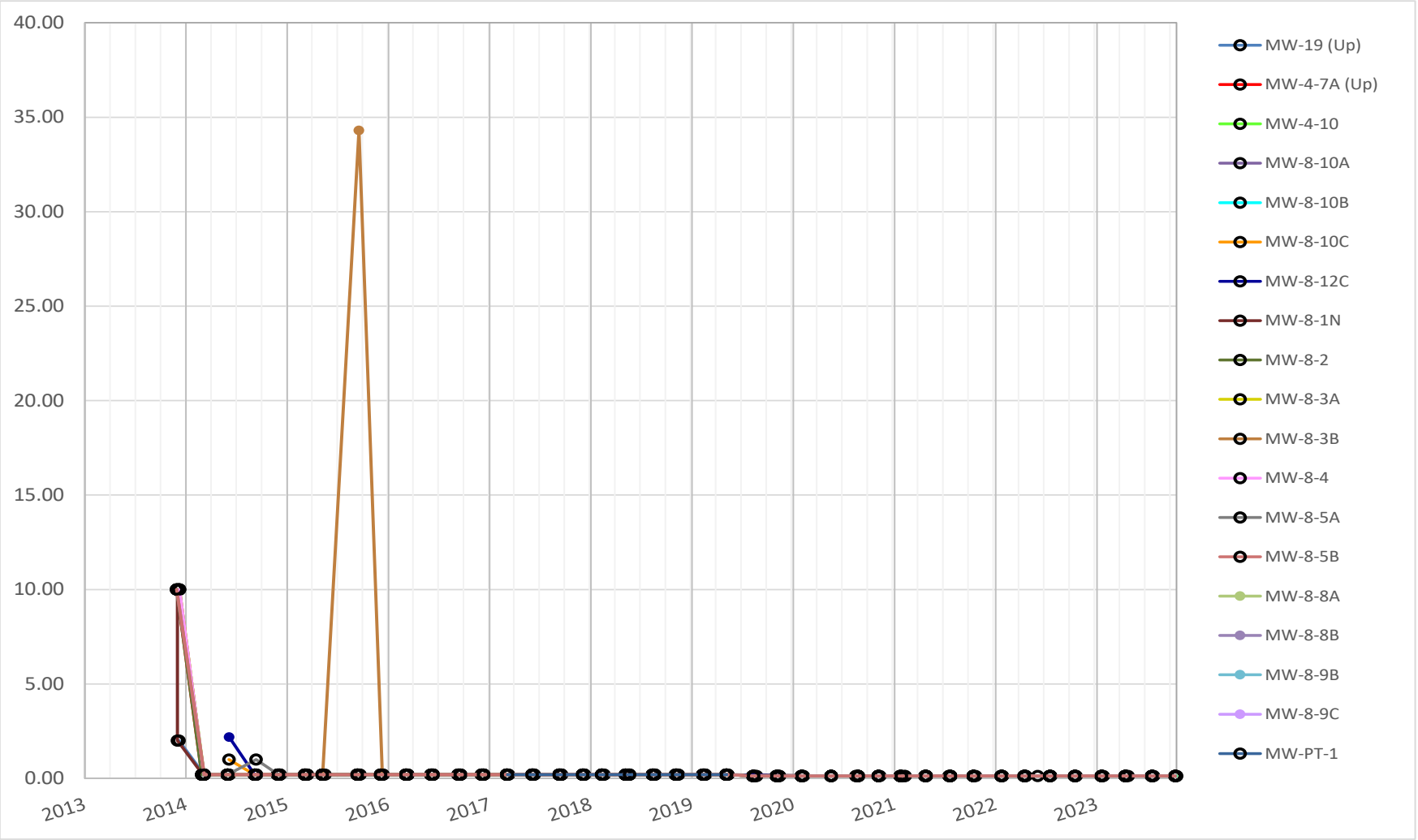
Selenium, total [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

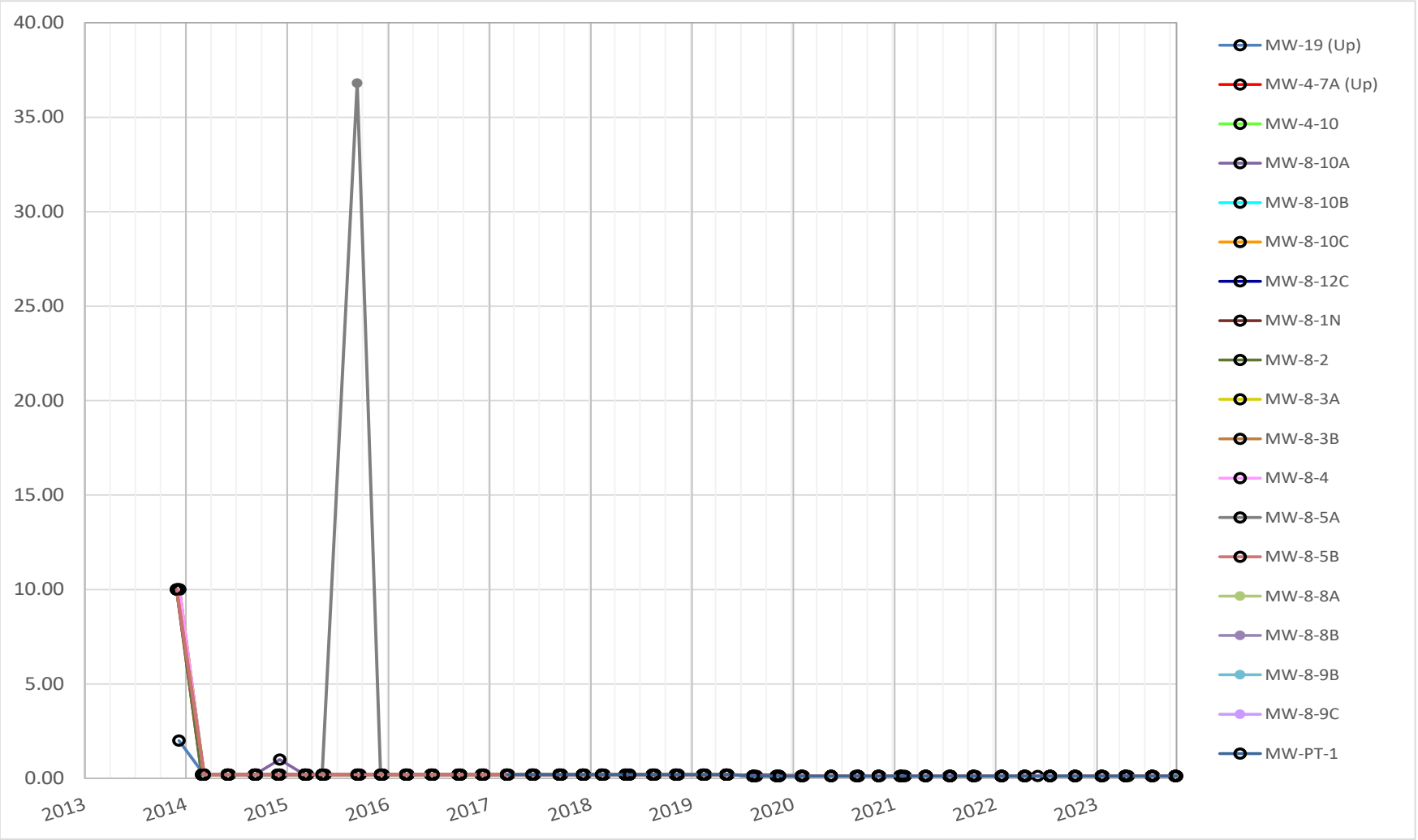
Silver, dissolved [µg/l]



NOTE: Data does not exceed standard of 100 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

Silver, total [µg/l]

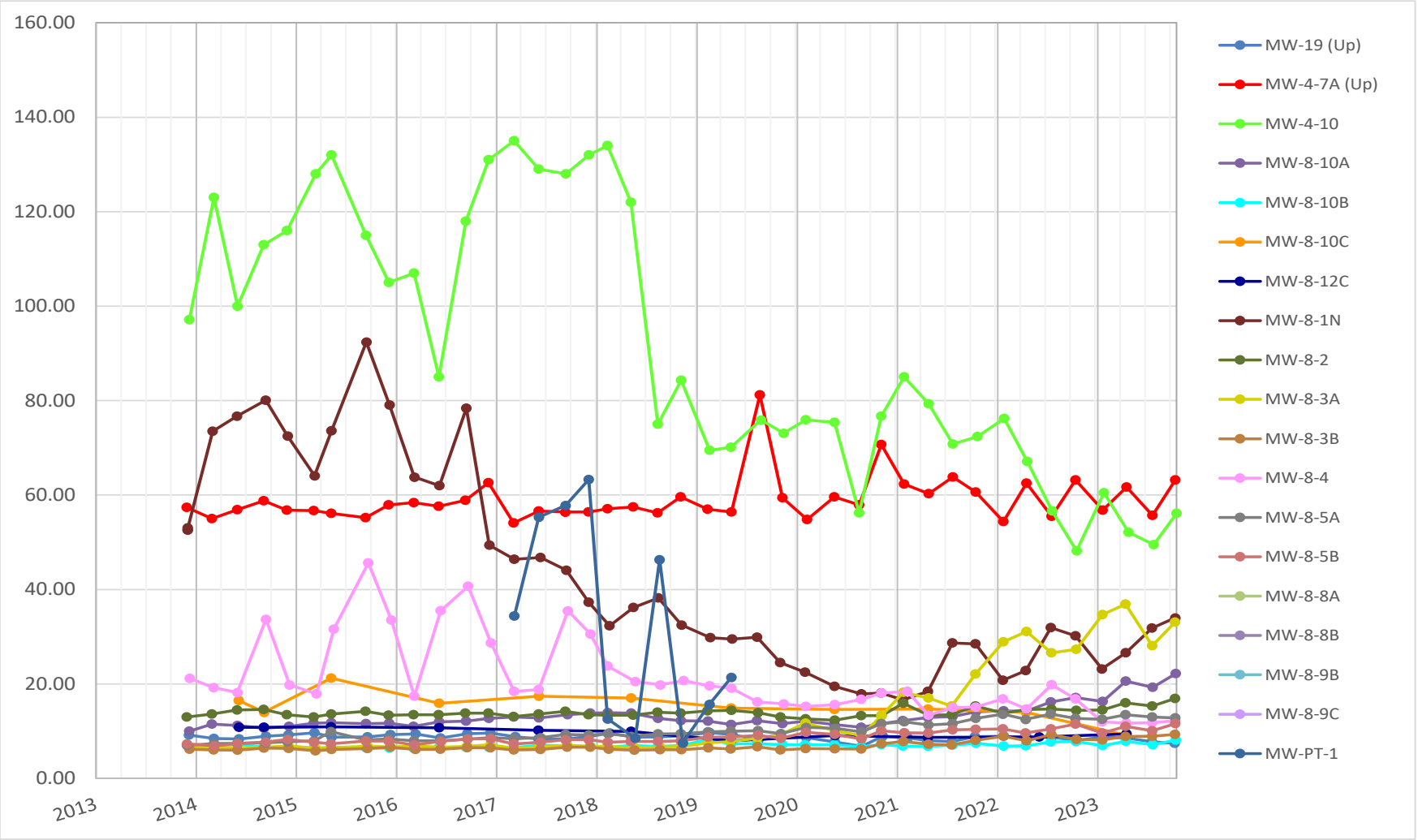


NOTE: Data does not exceed standard of 100 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Sodium, dissolved [mg/l]

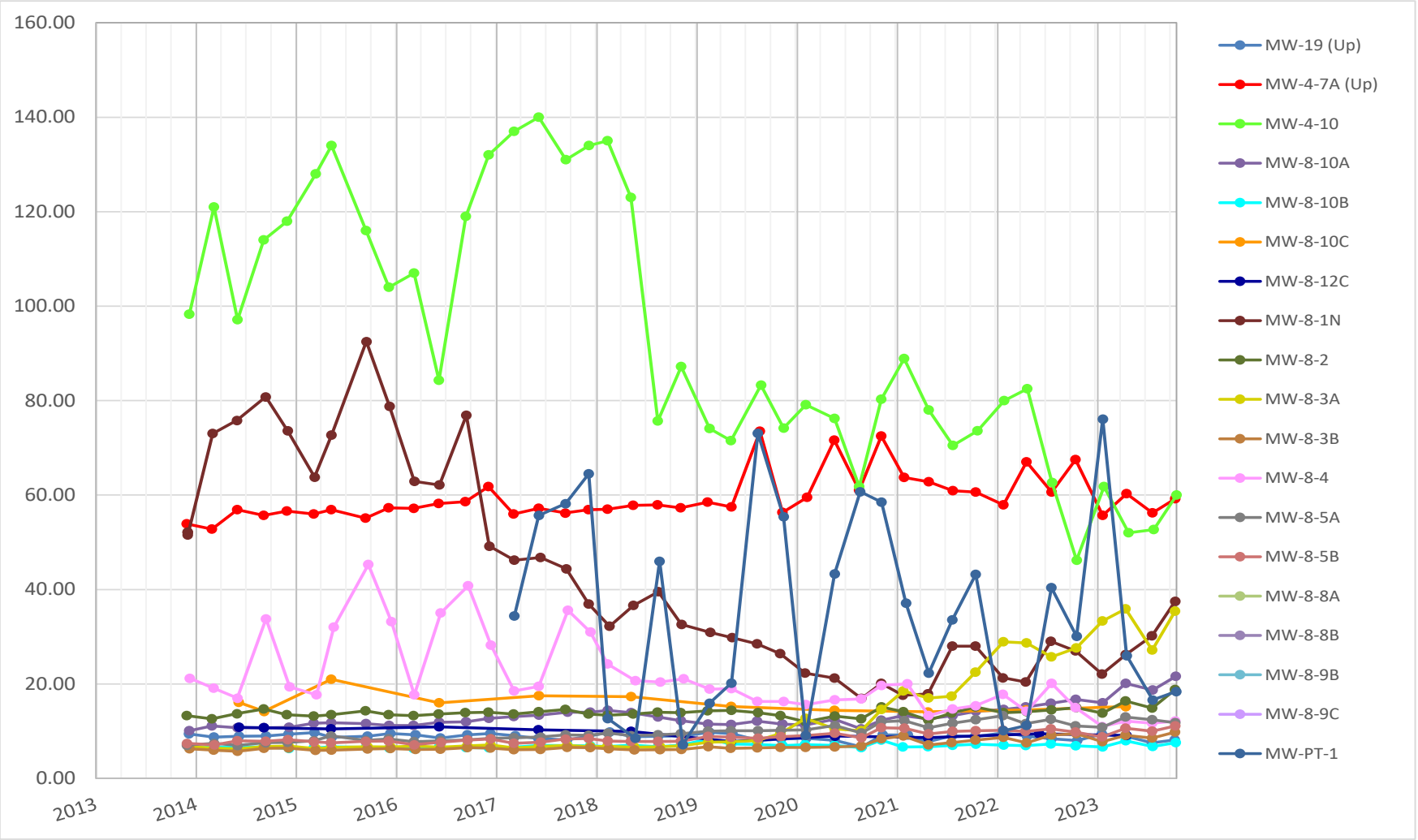


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Sodium, total [mg/l]

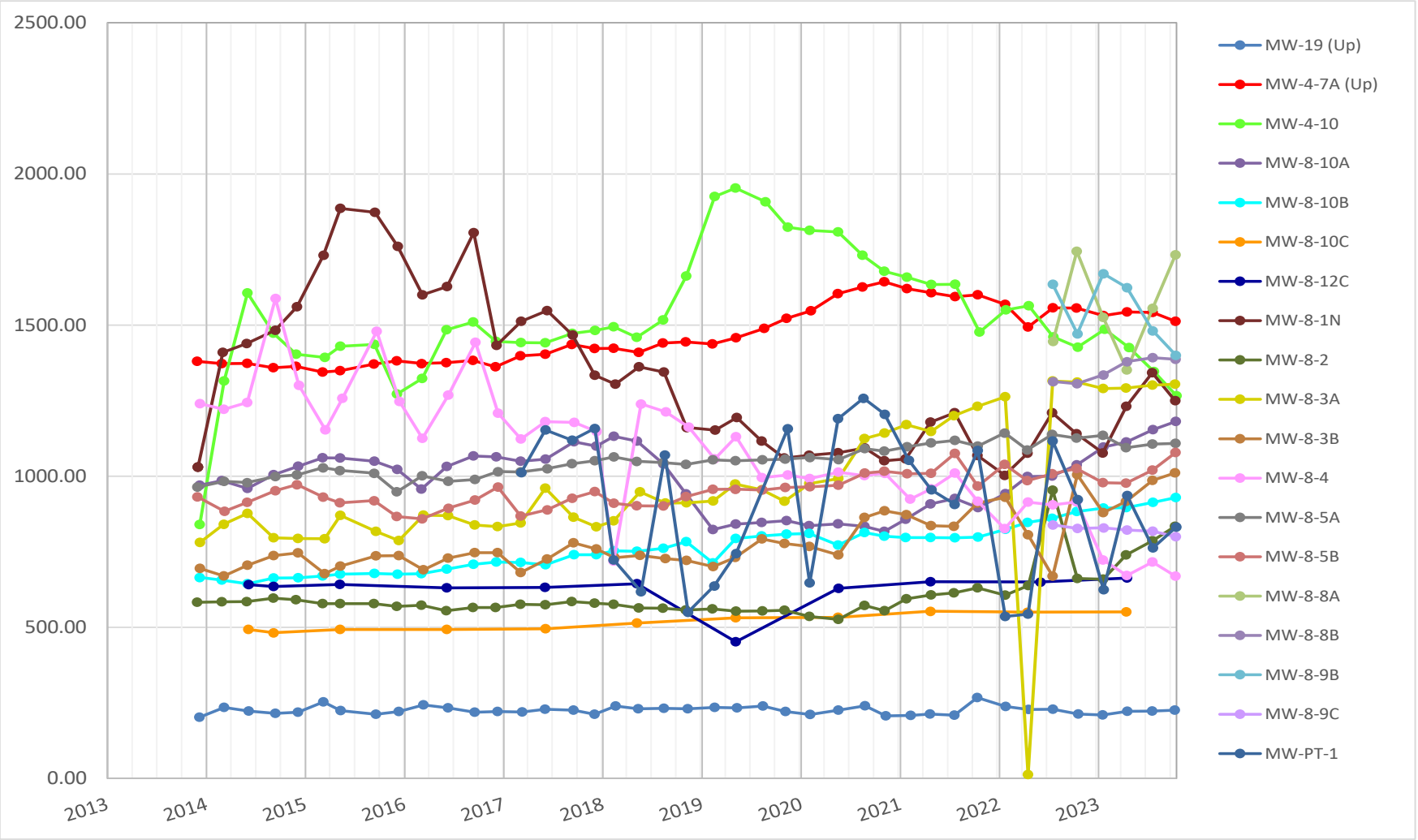


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

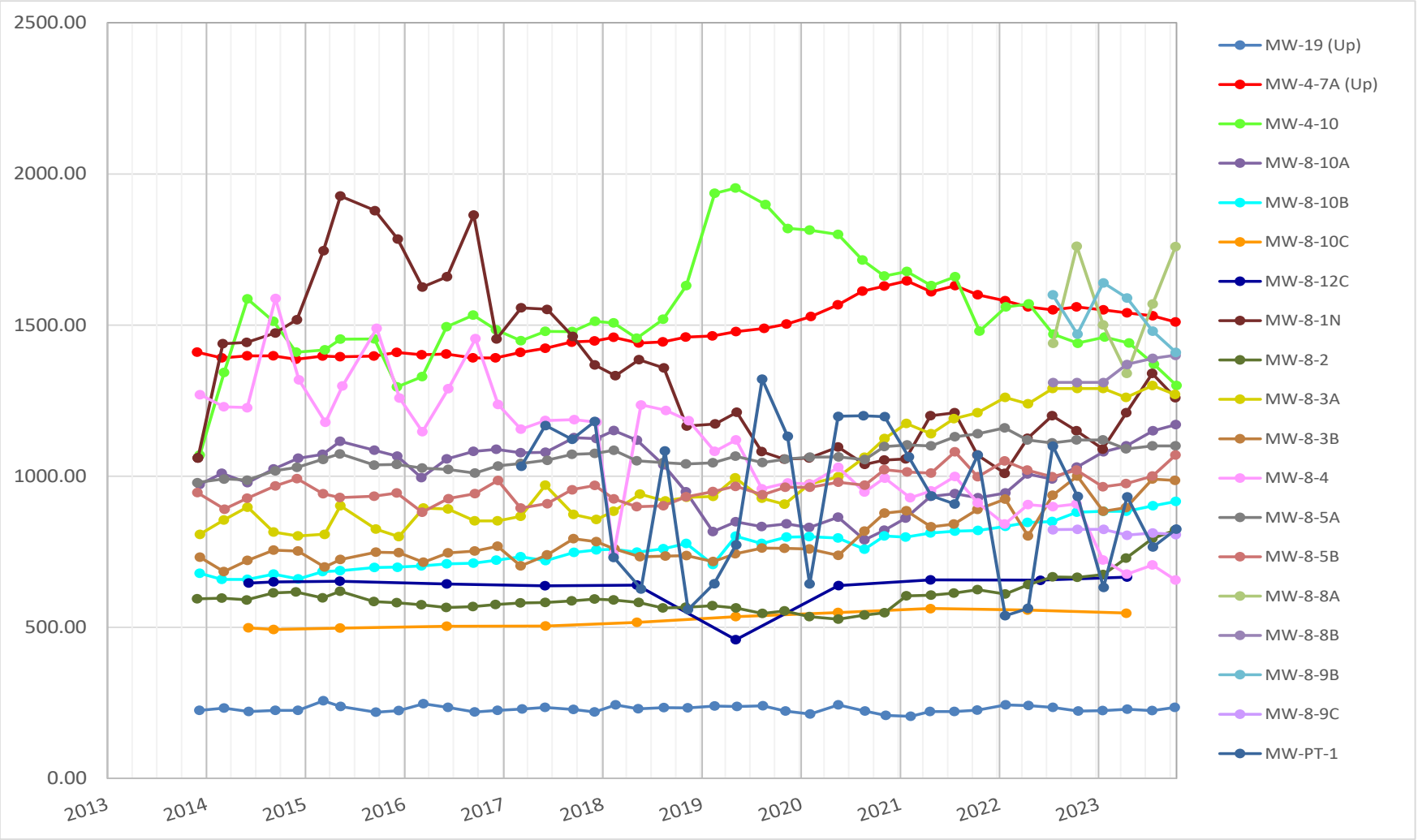
Specific Conductance, field [umhos/cm]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

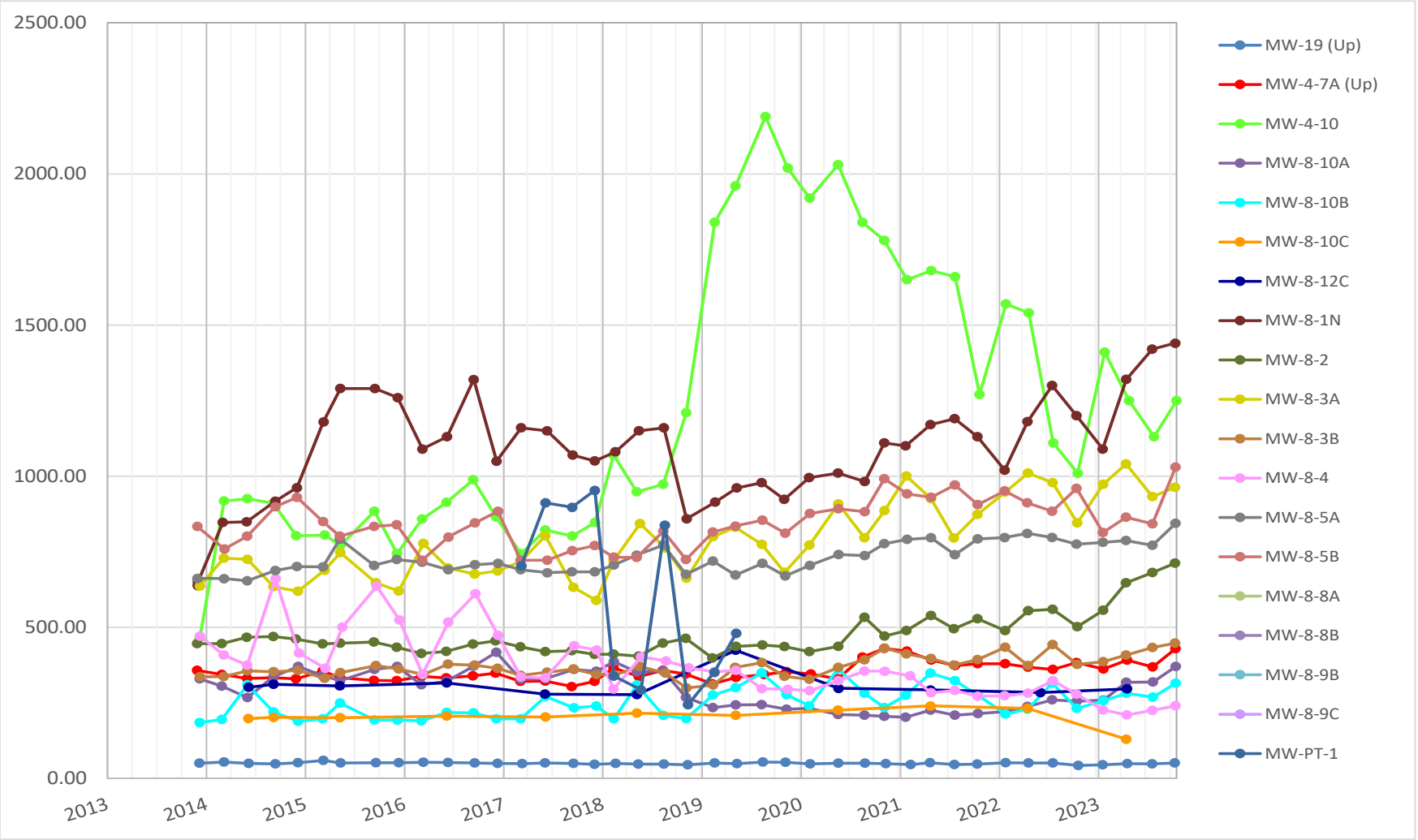
Specific Conductance, lab [umhos/cm]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

Strontium, dissolved [µg/l]

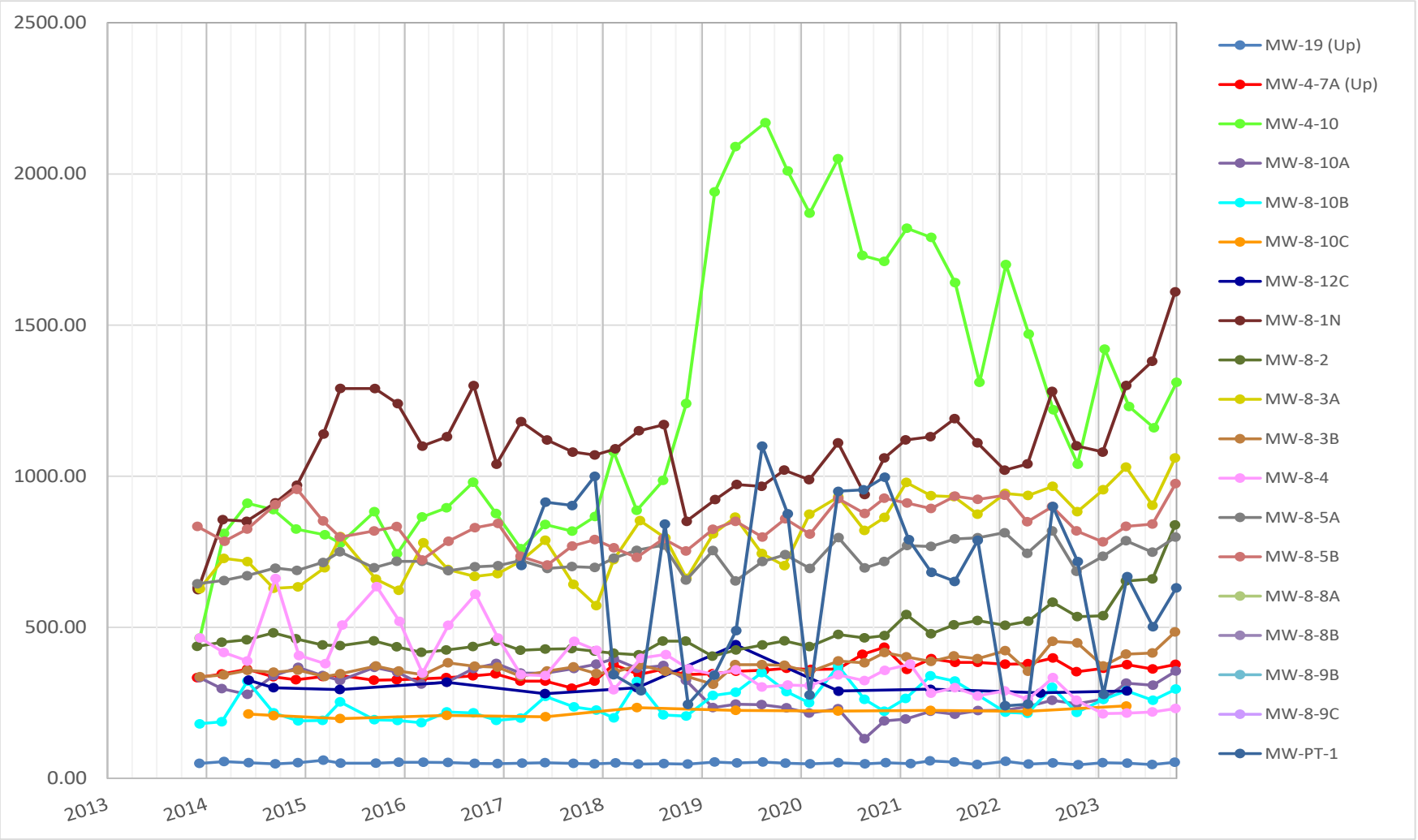


NOTE: Data does not exceed standard of 4000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Strontium, total [µg/l]

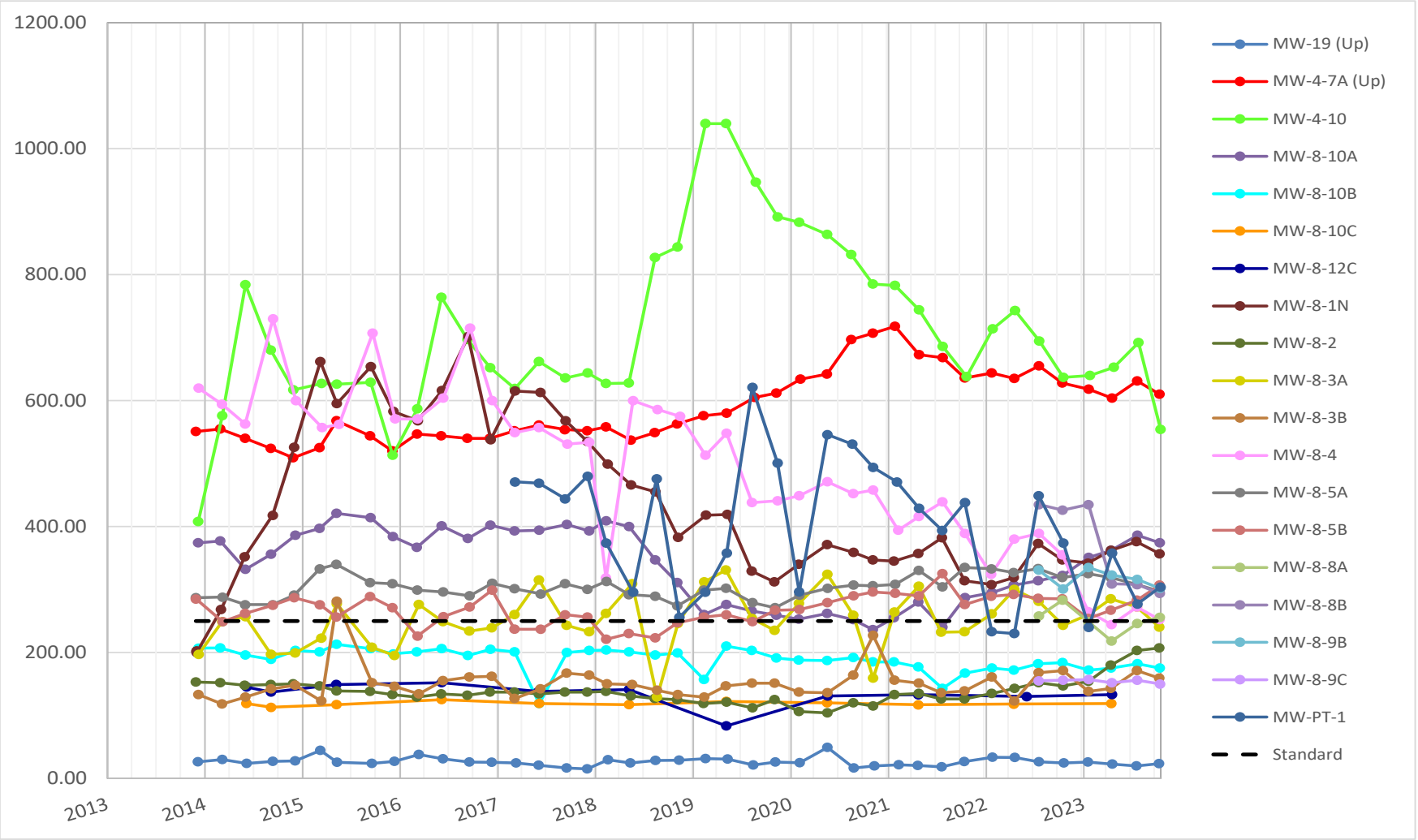


NOTE: Data does not exceed standard of 4000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

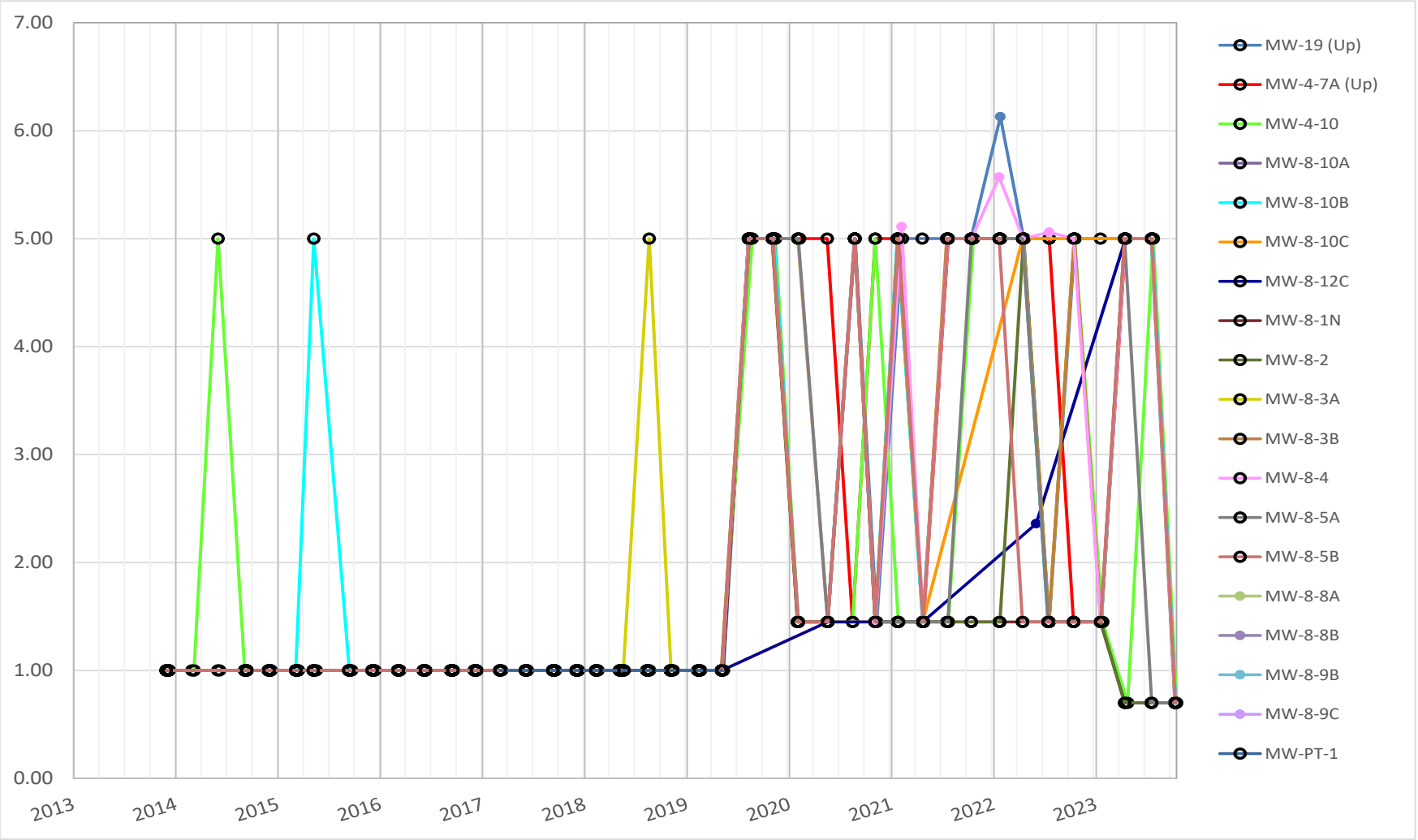
Sulfate, as SO4 [mg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Titanium, dissolved [µg/l]

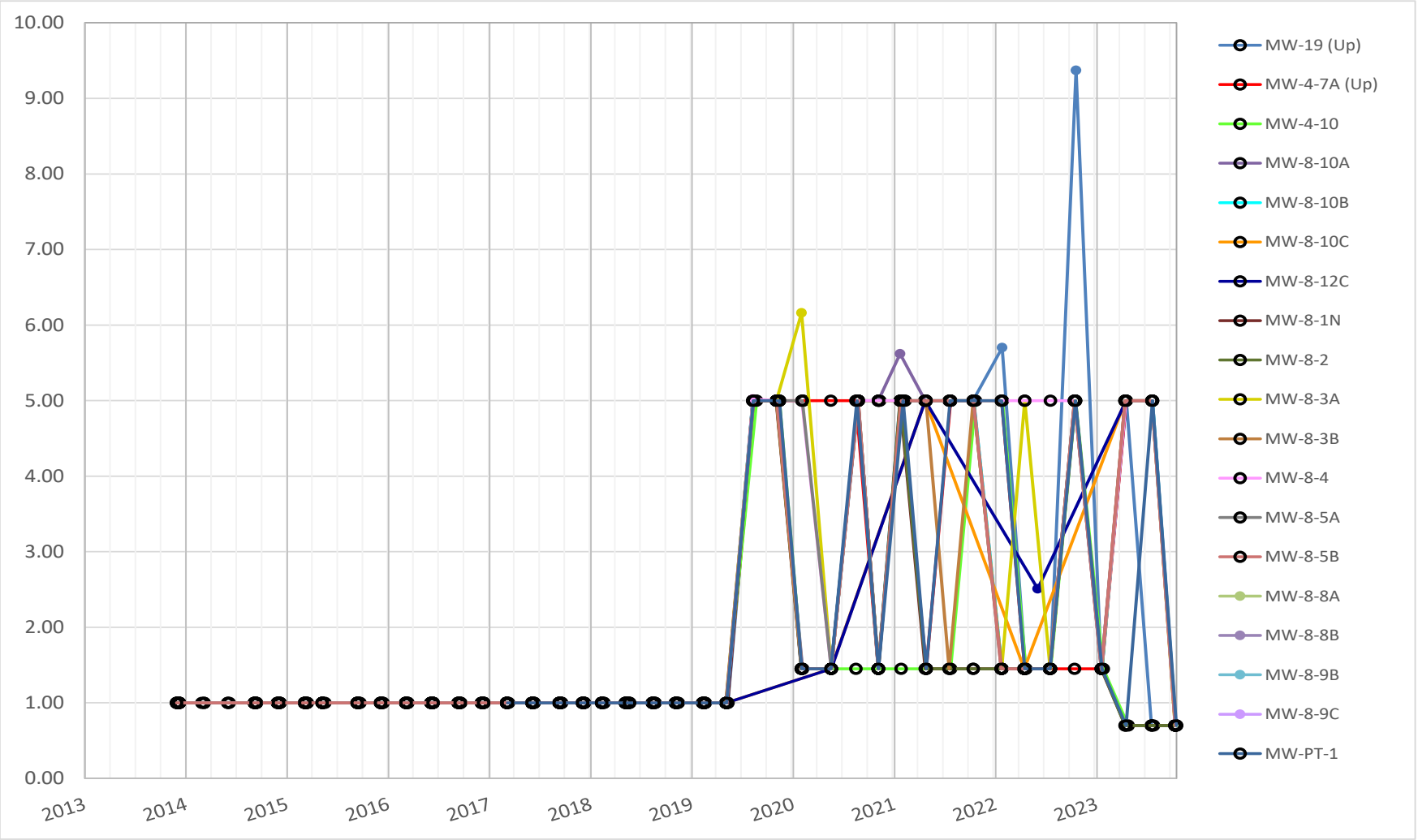


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Titanium, total [µg/l]

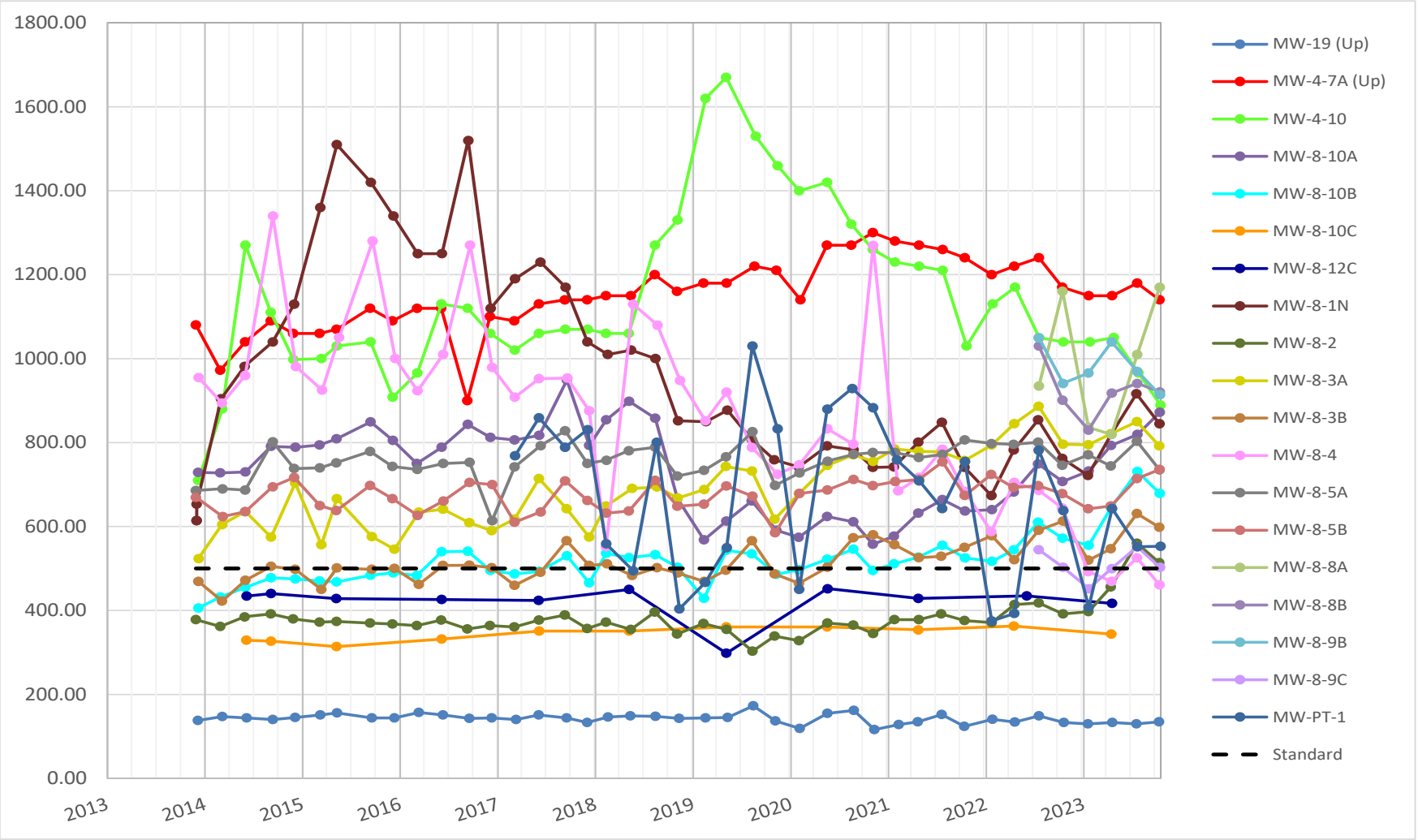


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

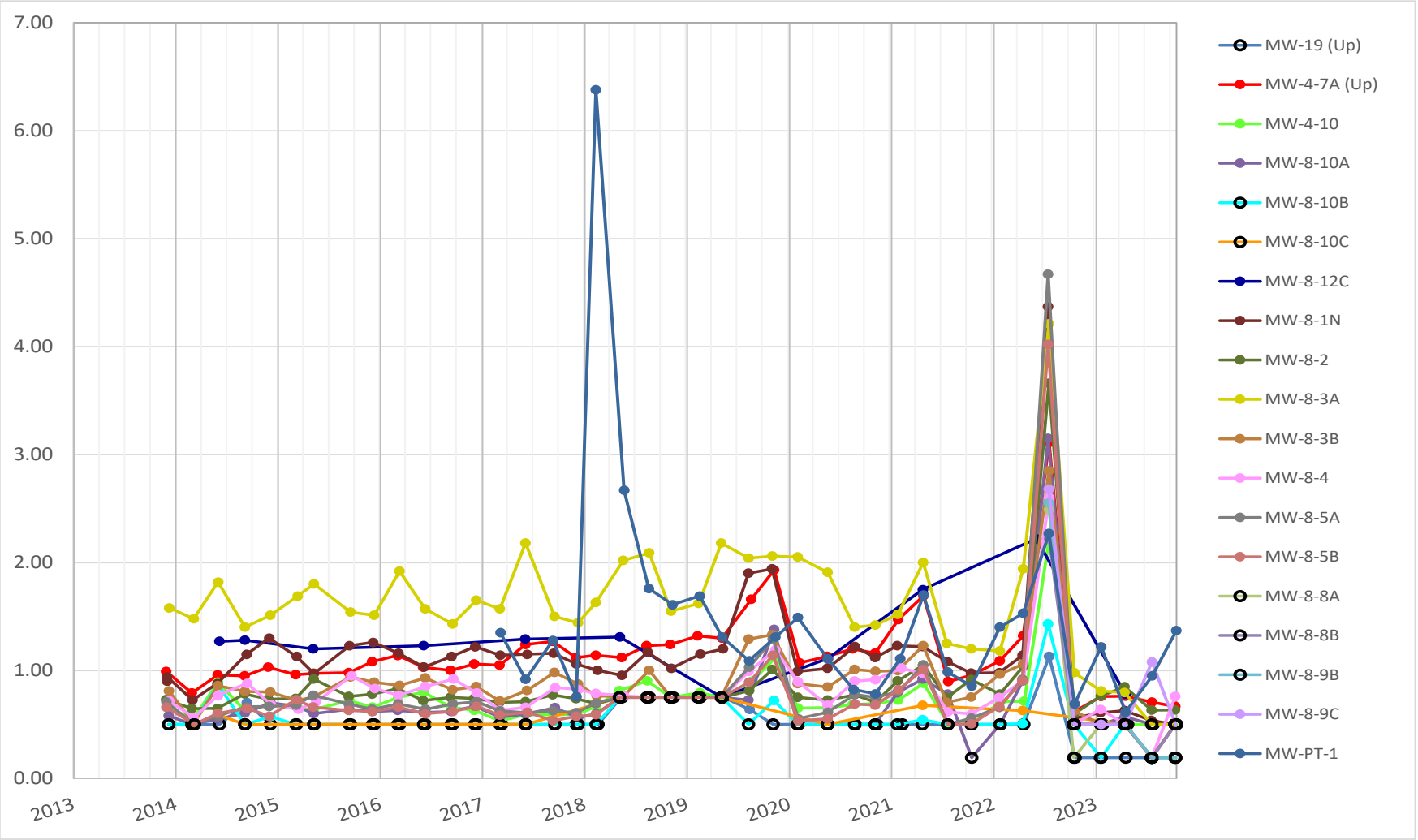
Total Dissolved Solids [mg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Total Organic Carbon [mg/l]

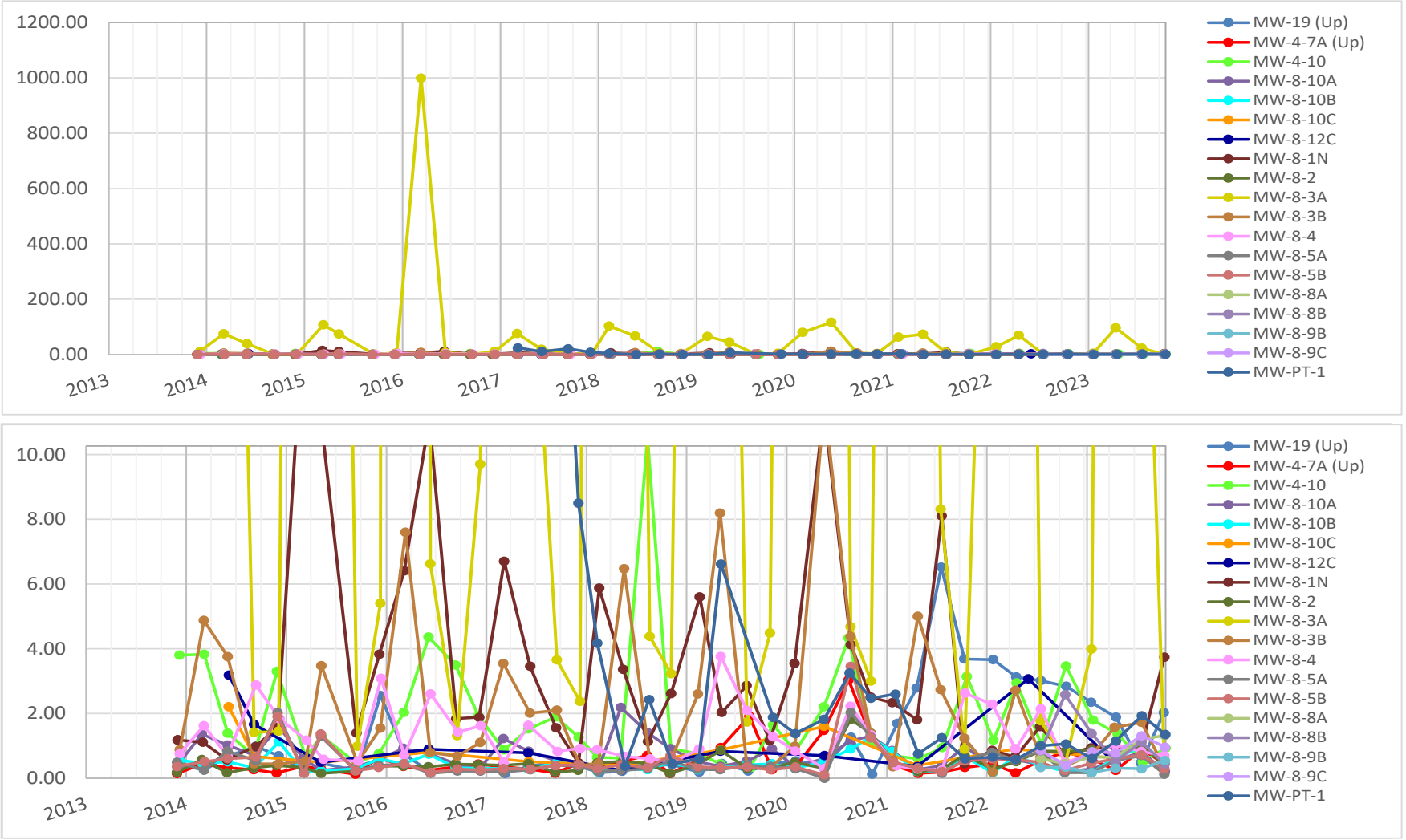


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Turbidity, field [ntu]

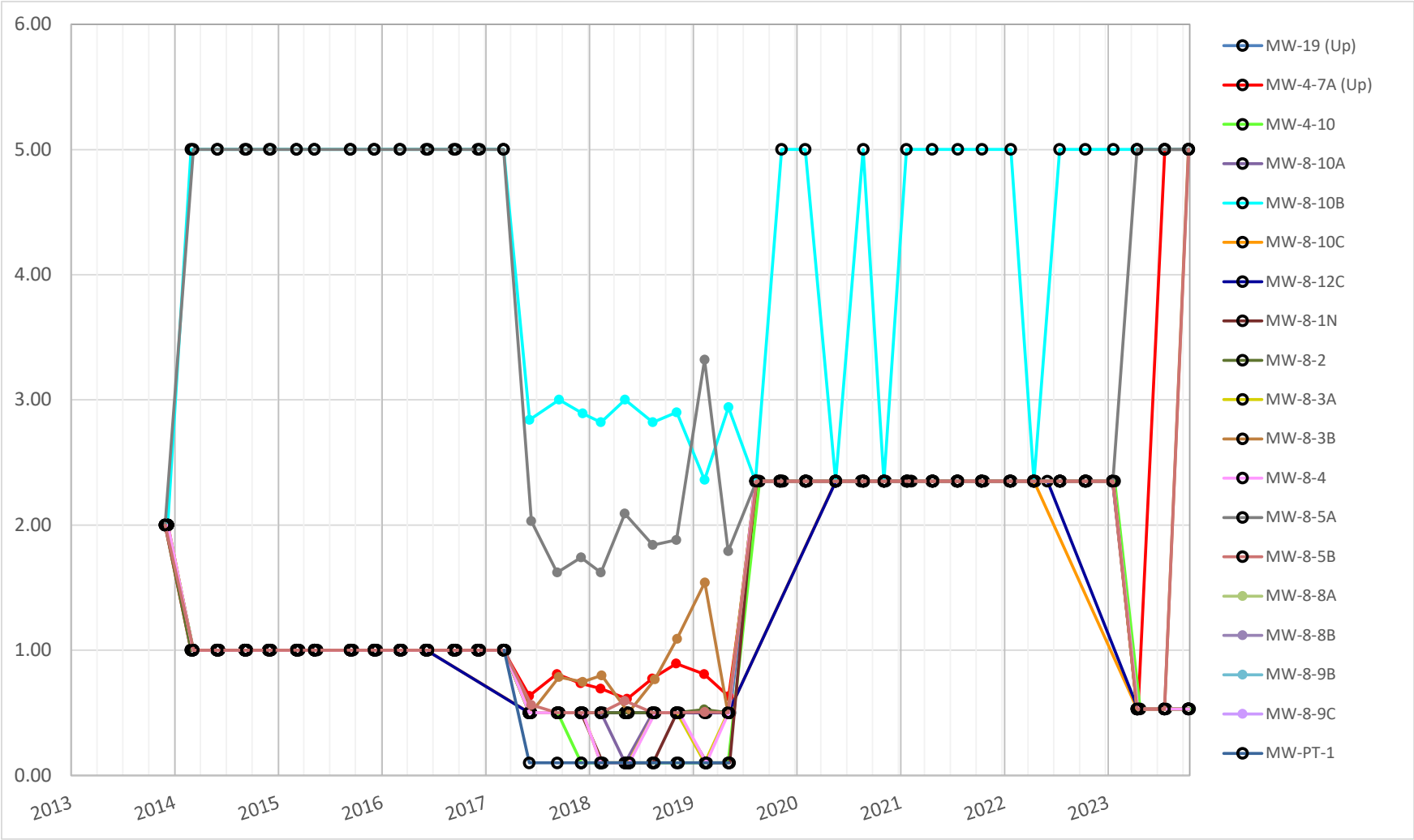


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Vanadium, dissolved [µg/l]

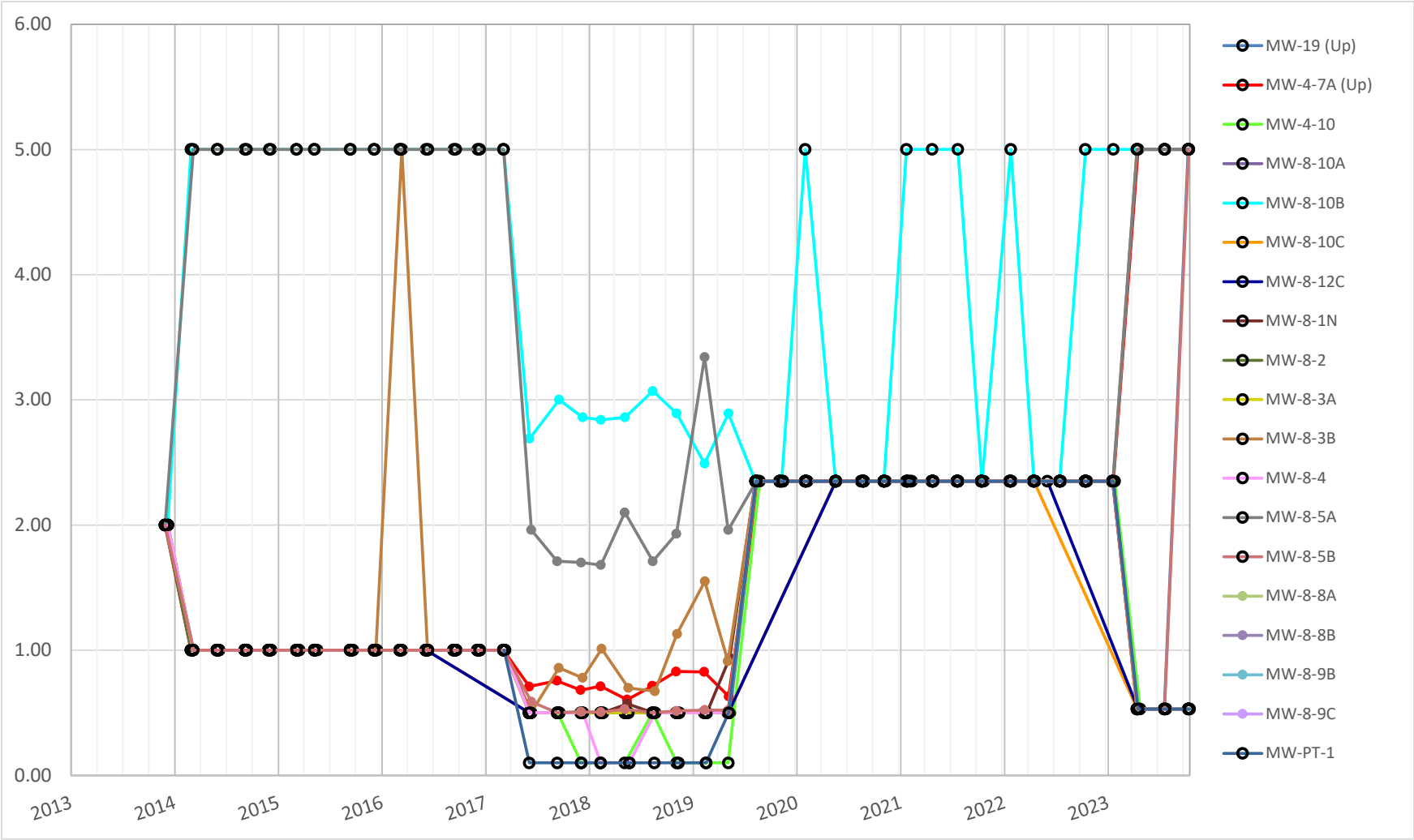


NOTE: Data does not exceed standard of 170 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

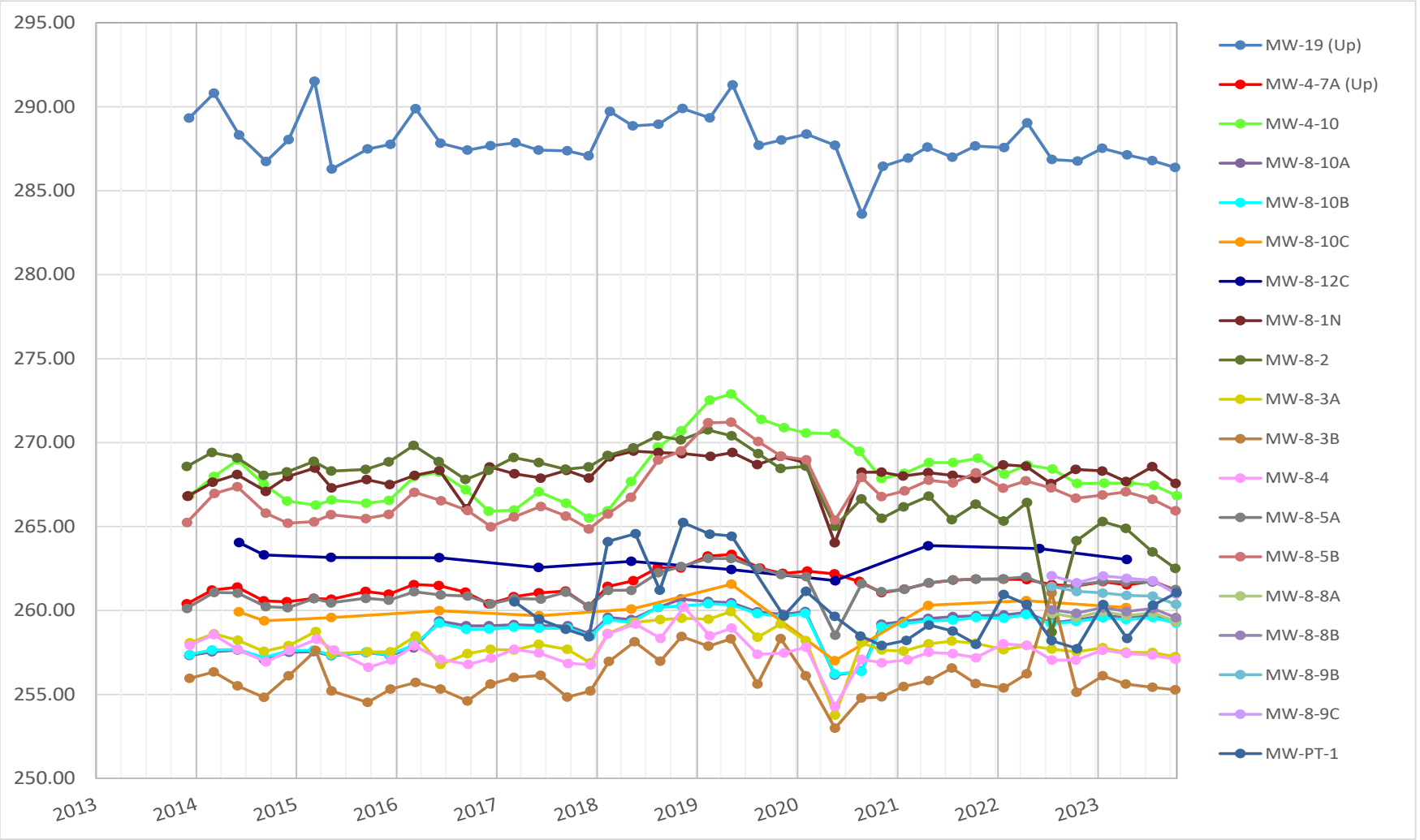
Vanadium, total [µg/l]



NOTE: Data does not exceed standard of 170 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5 4th Quarter 2023

Water Surface Elevation [ft]

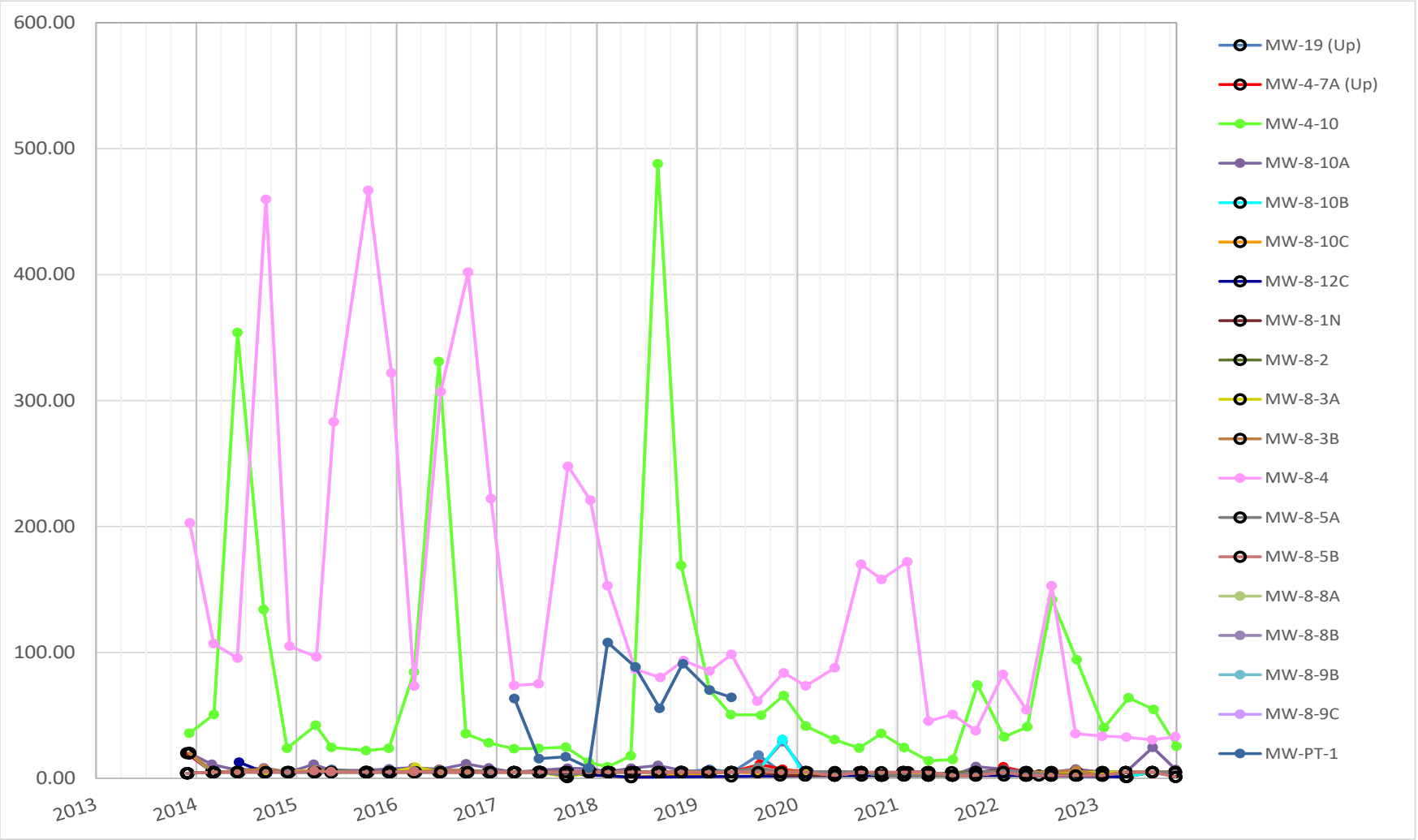


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2023

Zinc, dissolved [µg/l]

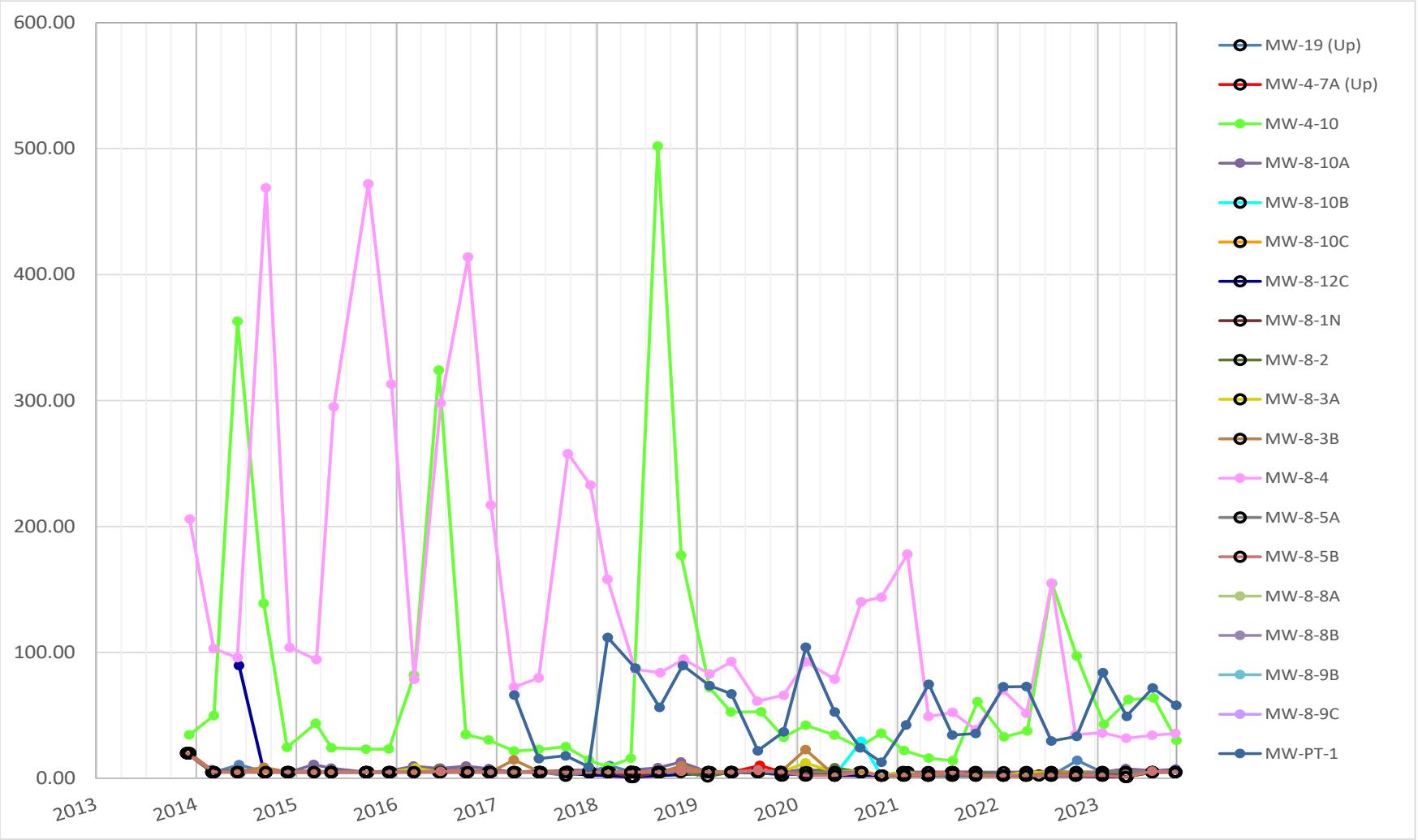


NOTE: Data does not exceed standard of 2000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

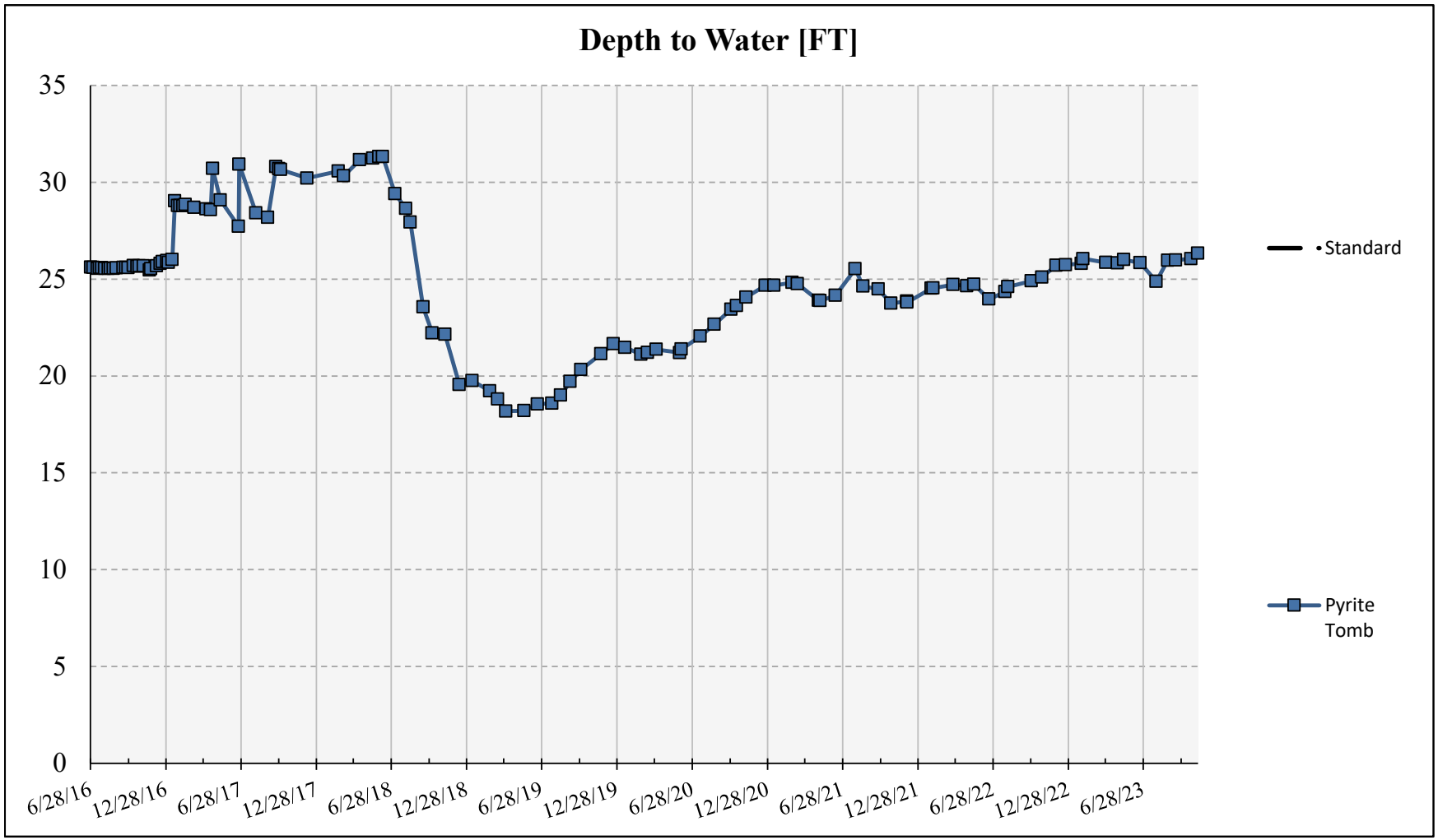
4th Quarter 2023

Zinc, total [µg/l]



NOTE: Data does not exceed standard of 2000 µg/l during this time frame

Talen Energy
Brunner Island - Pyrite Tomb Standpipe 4th Quarter 2023

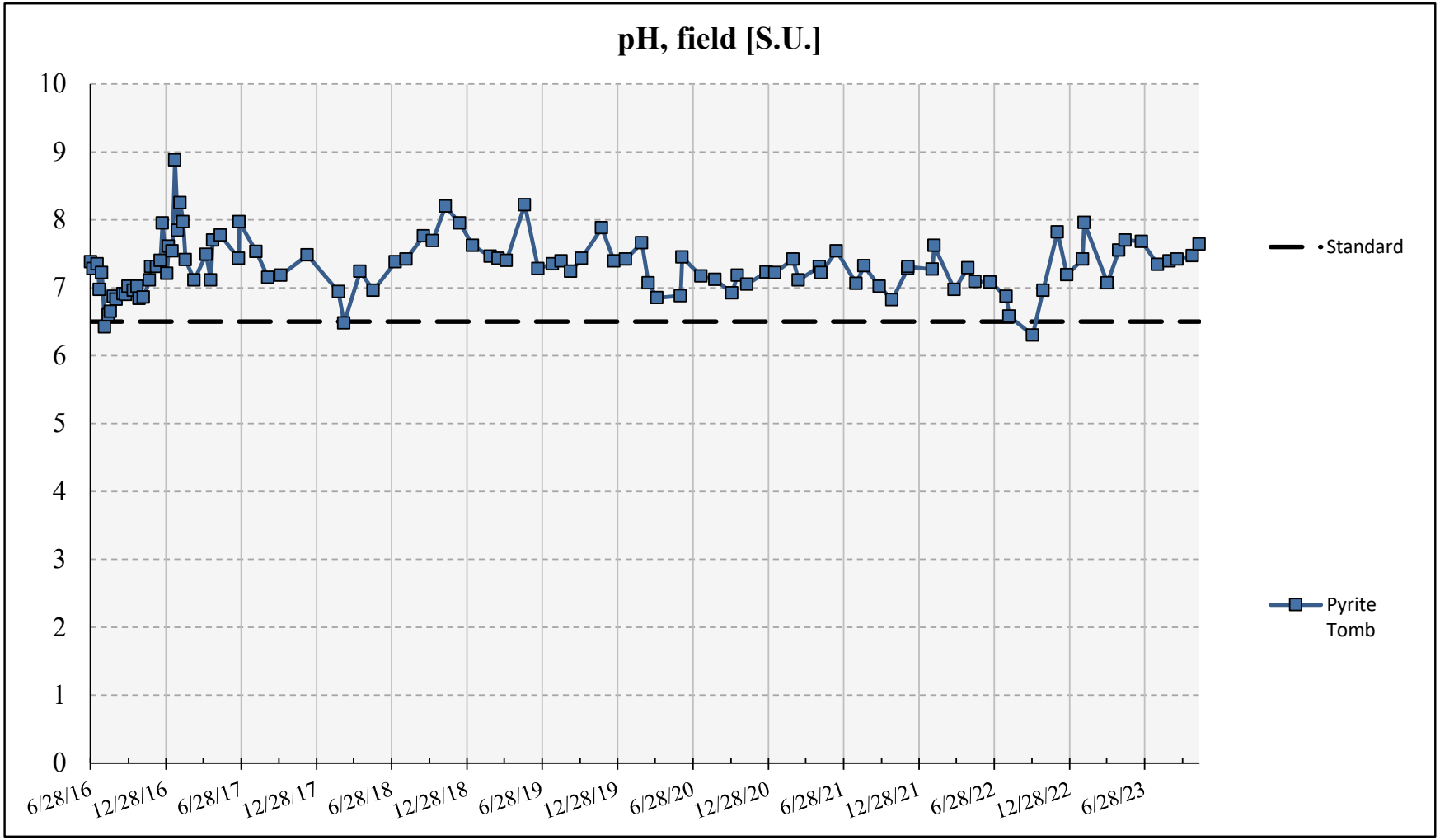


NOTE: There are no applicable standards for this parameter.

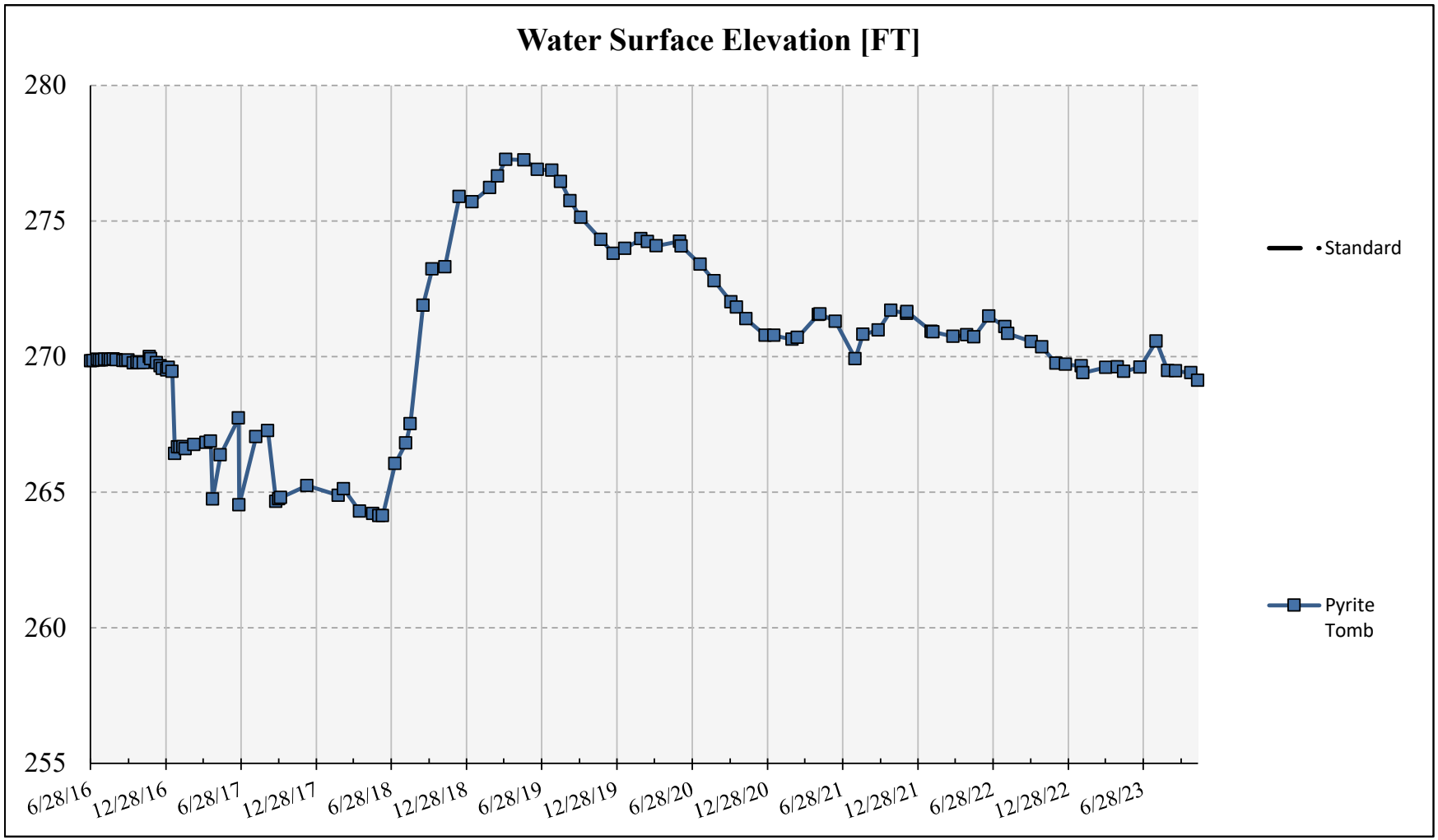
Talen Energy

Brunner Island - Pyrite Tomb Standpipe

4th Quarter 2023



Talen Energy
Brunner Island - Pyrite Tomb Standpipe 4th Quarter 2023



NOTE: There are no applicable standards for this parameter.