Brunner Island, LLC
REGULATORY DELIVERABLE
SUBMITTAL COVER SHEET

Date:	January 13, 2023	**Transmittal No.:**	BI-47-2023-01-13-v.1 (Part A)
DOCUMENT DESCRIPTION:		Quarterly Groundwater Report: 4th Quarter 2022--Basin 5, Disposal Area 8 and Pyrite Tomb Area Report - 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):			
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December 9, 2022

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

RE: **Quarterly Groundwater Report: 4th Quarter 2022**
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 14Rs (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: Marcia Thiess (w/atts.) – Brunner Island, LLC
Tom Weissinger (w/atts.) – Talen Energy Supply, LLC
Ed Much (w/atts.) – Talen Energy Supply, LLC
Citizens (w/atts.)

Groundwater Monitoring Report – Fourth Quarter 2022
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.

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 2022, Brunner samplers collected seven field blanks (all groundwater field blanks) and eight duplicate samples. The duplicate samples were collected from seven groundwater wells (including MW-4-7A, MW-8-3A, MW-6-4, PZ-7-31, MW-7-4, EQ-2, GC-1N) and one surface water monitoring point (MP-B4). These field blanks and duplicates were analyzed by the laboratory along with the routinely collected groundwater samples. For the seven field blanks, four water quality parameters were detected above respective limits of quantification (fluoride, iron, lead, and molybdenum) for a total of six 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 eight duplicates, a total of 459 paired analyses were performed with 24 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 1,170 mg/L exceeded the Secondary Drinking Water Standard of 500 mg/L, and TDS exhibits a slightly increasing trend.
- Sulfate concentration of 628 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 262 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 308 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 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 leachate 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/leachate 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 (5.39 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 1,040 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 637 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.
- Boron concentrations are elevated and variable (ranging from about 1,000 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 839 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 1,630 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 201 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 762 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 347 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 1,340 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 exhibit relatively stable trends, and concentrations are below respective Secondary Drinking Water Standards of 250 mg/L and 500 mg/L.
   - Aluminum typically fluctuates below the limit of quantification, but this quarter, the total concentration fluctuated upward, exceeding the Secondary Drinking Water Standard of 200 µg/L.
   - Manganese (dissolved) concentration of 472 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 330 µg/L exceeded the Act 2 residential Statewide Health Standard of 40 µg/L. However, concentrations exhibit a fairly stable trend.
   - Strontium concentrations had evidenced 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 a 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 (5.47 S.U.) remains below the Secondary Drinking Water Standard range of 6.5 to 8.5 S.U. The historical pH range for this well is approximately 4.5 to 6.0. Buffering capacity is typically minimal.
   - 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.
   - 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, except for nickel which is fluctuating around the standard.
   - 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 4,470 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 increasing trends (current concentrations of 746 and 678 µg/L for MW-8-5A and MW-8-5B, respectively). These increasing TDS trends are likely related to similar increasing trends for calcium, magnesium, and specific conductivity in both wells.
   - Sulfate concentrations demonstrate slight increasing/stable long-term trends in MW-8-5A and MW-8-5B with current concentrations of 319 mg/L and 285 mg/L, respectively, compared to the Secondary Drinking Water Standard of 250 mg/L. Sulfate concentrations in these two wells appear to be stabilizing since 2015.
   - Arsenic (dissolved) concentrations in MW-8-5A and MW-8-5B are elevated (current concentrations of 127 µg/L and 259 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 slight decreasing 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 223 µg/L and 198 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 432 and 442 µg/L for MW-8-5A and MW-8-5B respectively). Manganese exhibits a stable 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 372 and 385 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 are fluctuating around/slightly above Secondary Drinking Water Standards. Sulfate and total dissolved solids concentrations have been stable/decreasing since 2015 with a prominent drop occurring during 2018 and are now only slightly above the respective standards. These trends appear to be related to trends for calcium, magnesium, specific conductivity, and strontium (which have also generally decreased since early 2018 following long-term increasing trends). 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.
- 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 Act 2 residential Statewide Health Standard of 2.9 µg/L, which was lowered in 2016 along with the analytical limit of quantification.

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 2022 were as follows:

- Iron (dissolved) concentration of 0.66 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 1,550 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 387 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 333 to 689 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 93.5 to 301 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 (MW-8-8B) to 1,130 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 238 to 340 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 156 (MW-8-9C) to 426 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 1,160 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 with no defined trends yet. 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 (6.00 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 638 mg/L exceeded the Secondary Drinking Water Standard of 500 mg/L.
   - Sulfate concentration of 374 mg/L exceeded the Secondary Drinking Water Standard of 250 mg/L.
   - Aluminum (total) concentration of 254 µg/L exceeded the Secondary Drinking Water Standard of 200 µg/L.
   - Lithium (total) concentration of 352 µg/L exceeded the Act 2 residential Statewide Health Standard of 69 µg/L.
   - Manganese (total) concentration of 4,890 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 148 µg/L exceeded the Act 2 residential Statewide Health Standard of 40 µg/L.

ATTACHMENTS

1. Summary Table of Groundwater Monitoring Results
2. Pyrite Tomb Standpipe Monitoring Results
3. Site Plan – Overall Map – Brunner Island SES
4. Site Plan – Brunner Island Basin 5
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			10/18/2022	10/14/2022	10/17/2022	10/17/2022	10/17/2022	10/14/2022	10/14/2022	10/14/2022	10/15/2022	10/15/2022			10/15/2022	10/15/2022	10/17/2022	10/17/2022	10/18/2022	10/14/2022	10/20/2022
Field Parameters (monitored quarterly)																					
Well Depth	FT		38.60	26.33	22.30	26.60	46.80	21.75	39.10	59.10	37.30	56.95			52.20	60.55	69.90	90.10	21.25	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	643.00	85.00	19.00	35.00	33.00
Well Purge Volume	L		3.00	3.10	3.50	3.00	3.10	3.50	3.00	3.00	3.00	3.00			3.20	3.20	3.00	3.00	3.00	4.00	2.40
Depth to Water	FT		25.14	12.24	7.35	9.84	12.58	13.15	23.55	18.20	17.05	16.92			24.63	23.80	23.20	23.03	14.03	26.55	19.03
Water Surface Elevation	FT		267.57	268.40	264.15	257.54	255.13	257.04	261.49	266.68	259.42	259.35			259.57	259.84	261.14	261.65	257.74	261.46	286.77
Temperature, field	°C		13.18	17.24	13.81	13.81	14.27	14.01	13.19	13.82	12.62	13.84			14.59	16.18	14.72	15.69	14.60	15.84	12.10
pH, field	S.U.	6.5 - 8.5 S	**5.39**	6.75	6.57	**6.29**	6.67	**5.47**	6.81	6.94	**6.27**	7.25			7.26	7.67	7.30	7.31	**6.00**	6.89	6.85
pH, lab	S.U.	6.5 - 8.5 S	**5.58**	6.90	6.97	6.70	6.98	**5.96**	7.19	7.36	6.93	7.55			7.09	7.65	7.32	7.39	**6.23**	6.84	7.06
Specific Conductance, field	umhos/cm		1,427.00	1,140.00	661.00	1,311.00	1,005.00	915.00	1,126.00	1,025.00	1,037.00	883.00			1,744.00	1,306.00	1,471.00	827.00	923.00	1,556.00	213.00
Specific Conductance, lab	umhos/cm		1,440.00	1,150.00	665.00	1,290.00	1,000.00	908.00	1,120.00	1,020.00	1,030.00	881.00			1,760.00	1,310.00	1,470.00	824.00	933.00	1,560.00	223.00
Turbidity, field	NTU		3.47	0.73	0.83	0.49	0.38	0.48	0.17	0.24	0.22	0.20			0.45	2.58	0.34	0.40	1.06	0.80	2.84
Dissolved Oxygen, field	mg/L		0.52	0.74	0.51	0.27	0.57	0.52	0.48	0.39	0.71	1.15			0.35	6.46	0.89	0.67	3.06	0.23	3.13
Redox, field	mV		327.00	44.00	66.10	-70.40	3.40	109.00	-34.00	-12.00	12.00	4.00			198.80	281.30	-13.00	-75.00	271.00	177.00	153.00
Non-Metals (monitored quarterly)																					
Alkalinity, total as CaCO3	mg/L		21.20	191.00	133.00	240.00	251.00	51.80	260.00	227.00	150.00	106.00			233.00	181.00	264.00	244.00	73.60	232.00	45.60
Total Organic Carbon	mg/L		< 0.5	0.56	0.60	0.98	0.62	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5			0.192 ND	< 0.5	< 0.5	< 0.5	0.69	0.62	0.192 ND
Total Dissolved Solids	mg/L	500 S	**1,040.00**	**762.00**	392.00	**796.00**	**613.00**	**644.00**	**746.00**	**678.00**	**707.00**	**572.00**			**1,160.00**	**901.00**	**941.00**	**503.00**	**638.00**	**1,170.00**	133.00
Chemical Oxygen Demand	mg/L		5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND			5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND	5.3 ND
Bicarbonate	mg/L		21.20	191.00	133.00	240.00	251.00	51.80	260.00	227.00	150.00	106.00			233.00	181.00	264.00	244.00	73.60	232.00	45.60
Chloride, total as Cl	mg/L	250 S	7.93	43.30	26.90	130.00	64.50	23.80	19.40	17.70	45.30	98.60			**267.00**	68.70	141.00	19.40	5.59	13.50	8.48
Fluoride, total as F	mg/L	2 S, 4 M	0.48	0.30	1.11	0.40	0.50	0.22	0.98	0.77	< 0.2	< 0.2			0.65	0.77	0.50	0.88	0.46	< 0.2	< 0.2
Ammonia, as N	mg/L		< 0.2	< 0.2	< 0.2	0.28	0.066 ND	0.066 ND	0.42	0.26	0.066 ND	0.066 ND			0.44	0.066 ND	0.32	0.35	0.066 ND	0.22	0.066 ND
Nitrate, as N	mg/L	10 M	1.19	0.0218 ND	< 0.5	0.0218 ND	1.29	0.68	0.0218 ND	0.0218 ND	0.0218 ND	< 0.5			8.19	0.90	0.0218 ND	0.0218 ND	2.24	0.0218 ND	3.87
Sulfate, as SO4	mg/L	250 S	**637.00**	**347.00**	147.00	243.00	171.00	**355.00**	**319.00**	**285.00**	**322.00**	184.00			**283.00**	**426.00**	**301.00**	156.00	**374.00**	**628.00**	24.50
Metals (monitored quarterly)																					
Aluminum, total	ug/L	200 S	**1,120.00**	< 100	**300.00**	< 100	26.8 ND	**206.00**	< 100	< 100	26.8 ND	26.8 ND							**254.00**	< 100	26.8 ND
Aluminum, dissolved	ug/L	200 S	**693.00**	< 100	< 100	< 100	< 100	109.00	< 100	< 100	< 100	< 100								< 100	26.8 ND
Antimony, total	ug/L	6 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	0.39 ND
Antimony, dissolved	ug/L	6 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
Arsenic, total	µg/L	10 M	4.47	0.55 ND	0.55 ND	**19.70**	7.03	0.55 ND	**134.00**	**238.00**	< 1	1.64			**535.00**	**379.00**	**677.00**	**329.00**	< 1	0.55 ND	1.31
Arsenic, dissolved	µg/L	10 M	4.47	0.55 ND	0.55 ND	**18.10**	6.34	0.55 ND	**127.00**	**259.00**	0.55 ND	1.65			**529.00**	**351.00**	**689.00**	**333.00**		0.55 ND	0.55 ND
Barium, total	µg/L	2,000 M	17.50	24.70	35.10	66.40	69.90	14.40	44.80	66.20	22.70	43.10							25.30	17.90	224.00
Barium, dissolved	µg/L	2,000 M	16.90	23.70	35.80	68.90	73.80	13.40	43.70	72.70	22.60	43.30								17.70	219.00
Beryllium, total	ug/L	4 M	< 1	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	< 1	0.19 ND	0.19 ND	0.19 ND	0.19 ND	0.19	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	1,740.00	< 100	493.00	464.00	388.00	220.00	827.00	809.00	394.00	261.00							1,100.00	1,720.00	145.00
Boron, dissolved	µg/L	6,000 A	1,580.00	< 100	486.00	454.00	335.00	232.00	940.00	963.00	395.00	272.00								1,780.00	137.00
Cadmium, total	µg/L	5 M	1.30	0.15 ND	< 1	0.15 ND	< 1	< 1	< 1	< 1	0.15 ND	0.15 ND							1.02	0.15 ND	0.15 ND
Cadmium, dissolved	µg/L	5 M	1.02	0.15 ND	< 1	0.15 ND	< 1	< 1	< 1	< 1	0.15 ND	0.15 ND								0.15 ND	0.15 ND
Calcium, total	mg/L		177.00	191.00	110.00	203.00	177.00	124.00	200.00	178.00	169.00	146.00							122.00	288.00	31.60
Calcium, dissolved	mg/L		176.00	196.00	103.00	192.00	169.00	126.00	204.00	190.00	163.00	149.00								281.00	22.60
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							1.42	0.41 ND	< 1
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	6.60	0.39 ND	0.39 ND	0.39 ND	0.39 ND	< 1	1.65	< 1	0.39 ND	0.39 ND							< 1	0.39 ND	3.02
Copper, dissolved	µg/L	1,000 S, 1,300 M	8.48	< 1	1.95	< 1	1.39	< 1	< 1	0.39 ND	0.39 ND	< 1								< 1	0.39 ND
Iron, total	mg/L	0.3 S	**0.43**	0.23	0.20	**7.31**	**0.30**	0.0122 ND	0.0122 ND	0.0122 ND	0.0122 ND	0.0122 ND							0.13	0.0122 ND	0.0122 ND
Iron, dissolved	mg/L	0.3 S	< 0.02	0.23	< 0.02	**6.41**	0.22	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02								< 0.02	< 0.02
Lead, total	µg/L	5 A, 15 M	0.23 ND	0.23 ND	< 1	0.23 ND	0.23 ND	0.23 ND	0.23 ND	0.23 ND	0.23 ND	0.23 ND							0.23 ND	0.23 ND	1.01
Lead, dissolved	µg/L	5 A, 15 M	0.23 ND	0.23 ND	< 1	0.23 ND	0.23 ND	0.23 ND	0.23 ND	0.23 ND	0.23 ND	0.23 ND								0.23 ND	0.23 ND
Lithium, total	µg/L	69 A	**770.00**	0.79 ND	19.80	19.10	23.20	7.59	**195.00**	**158.00**	10.20	9.18			**268.00**	**220.00**	**212.00**	**141.00**	**352.00**	**231.00**	10.40
Lithium, dissolved	µg/L	69 A	**839.00**	1.07	17.00	12.90	17.90	7.85	**223.00**	**198.00**	11.60	10.20			**301.00**	**246.00**	**236.00**	**93.50**		**262.00**	3.63
Magnesium, total	mg/L		14.00	26.90	16.90	36.10	30.80	36.90	35.20	29.90	38.70	24.60							25.70	42.30	4.73
Magnesium, dissolved	mg/L		13.20	30.50	15.80	34.10	26.60	40.70	40.60	35.70	39.00	26.10								44.00	4.24
Manganese, total	µg/L	50 S, 300 A	**1,910.00**	**1,190.00**	**534.00**	**9,040.00**	**1,790.00**	**4,160.00**	**369.00**	**365.00**	**218.00**	< 20			**996.00**	< 20	**1,180.00**	**788.00**	**4,890.00**	**230.00**	1.77 ND
Manganese, dissolved	µg/L	50 S, 300 A	**1,630.00**	**1,340.00**	**472.00**	**8,540.00**	**1,560.00**	**4,470.00**	**432.00**	**442.00**	**177.00**	6.39 ND			**1,130.00**	6.39 ND	**1,050.00**	**755.00**		**308.00**	6.39 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			10/18/2022	10/14/2022	10/17/2022	10/17/2022	10/17/2022	10/14/2022	10/14/2022	10/14/2022	10/15/2022	10/15/2022			10/15/2022	10/15/2022	10/17/2022	10/17/2022	10/18/2022	10/14/2022	10/20/2022
Molybdenum, total	µg/L	40 A	189.00	1.36	256.00	73.00	118.00	< 1	362.00	342.00	13.80	28.40			347.00	249.00	245.00	244.00	148.00	25.50	11.80
Molybdenum, dissolved	µg/L	40 A	201.00	1.28	330.00	81.10	133.00	1.21	372.00	385.00	22.00	32.10			340.00	278.00	270.00	238.00		26.40	1.99
Nickel, total	ug/L	100 A	44.10	< 1	1.63	2.72	< 1	37.20	< 1	< 1	< 1	0.28 ND							30.80	1.41	1.90
Nickel, dissolved	ug/L	100 A	49.60	< 1	1.43	2.53	1.13	41.70	0.28 ND	< 1	< 1	0.28 ND								1.82	0.28 ND
Potassium, total	mg/L		85.50	8.79	6.06	3.31	1.94	1.28	3.97	3.83	2.52	2.13							32.50	4.29	< 1
Potassium, dissolved	mg/L		86.40	9.99	5.63	3.08	1.61	1.40	4.62	4.65	2.55	2.36								4.50	< 1
Selenium, total	µg/L	50 M	21.00	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	16.60
Selenium, dissolved	µg/L	50 M	20.20	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	17.40
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		46.20	27.00	15.00	27.60	9.47	15.00	11.10	9.78	16.70	6.90							30.10	67.50	8.02
Sodium, dissolved	mg/L		48.20	30.20	14.40	27.30	8.24	16.80	12.70	11.50	17.10	7.79								63.20	7.99
Strontium, total	µg/L	4,000 A	1,040.00	1,100.00	535.00	882.00	448.00	258.00	685.00	819.00	247.00	218.00							718.00	353.00	45.00
Strontium, dissolved	µg/L	4,000 A	1,010.00	1,200.00	502.00	845.00	377.00	279.00	775.00	959.00	255.00	232.00								383.00	43.00
Titanium, total	µg/L		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5							< 5	1.45 ND	9.37
Titanium, dissolved	µg/L		< 5	1.45 ND	< 5	< 5	< 5	< 5	1.45 ND	1.45 ND	1.45 ND	1.45 ND								1.45 ND	< 5
Vanadium, total	µg/L	2.9 A	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	< 5							2.35 ND	2.35 ND	2.35 ND
Vanadium, dissolved	µg/L	2.9 A	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	2.35 ND	< 5								2.35 ND	2.35 ND
Zinc, total	µg/L	2,000 A, 5,000 S	97.30	2.24 ND	2.24 ND	< 5	< 5	34.70	2.24 ND	2.24 ND	< 5	2.24 ND							33.30	2.24 ND	14.20
Zinc, dissolved	µg/L	2,000 A, 5,000 S	94.30	5.25	< 5	< 5	6.46	35.40	2.24 ND	2.24 ND	7.33	2.24								< 5	2.24 ND

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.

Pyrite Tomb Standpipe Monitoring Results

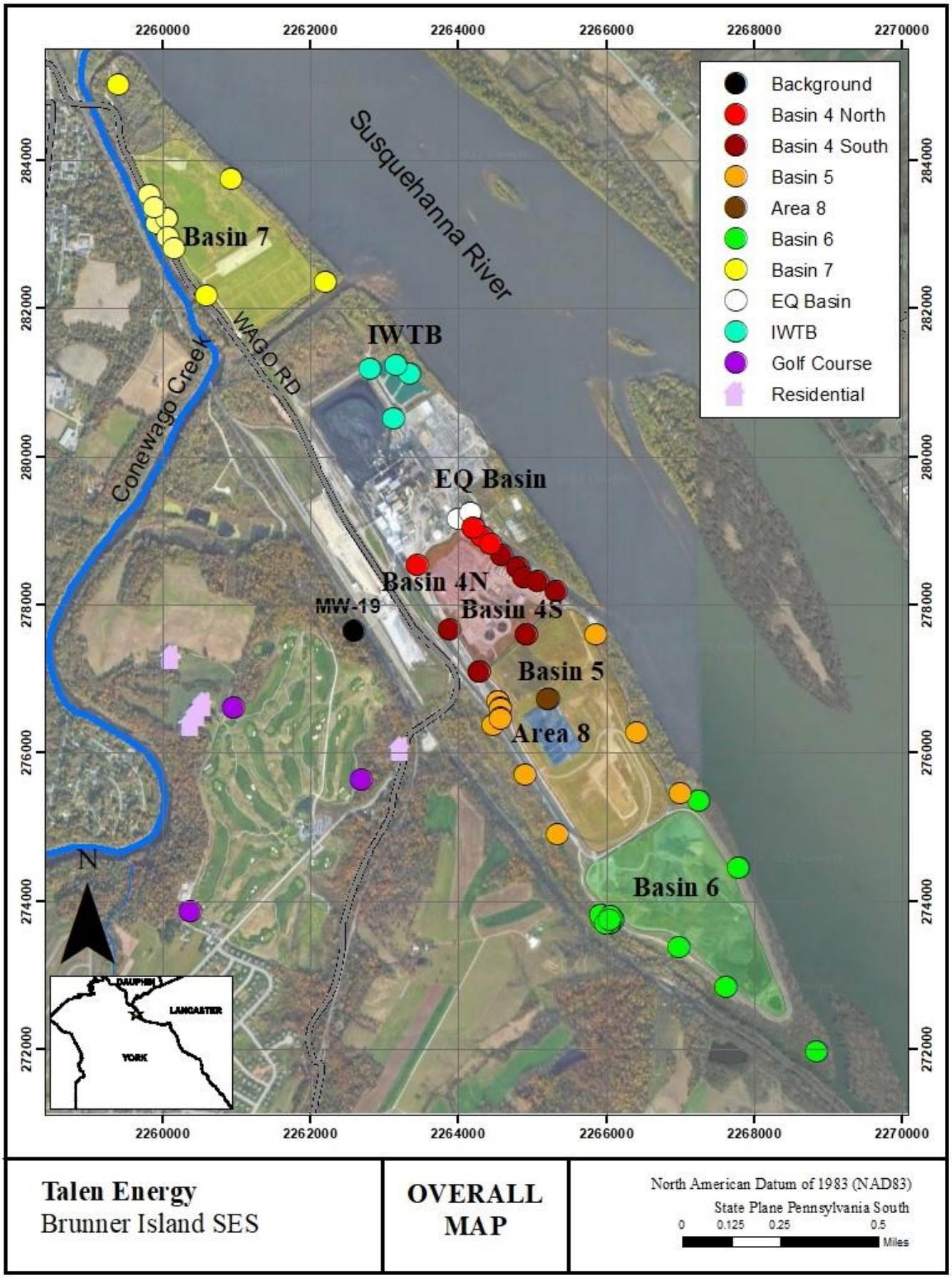
	Pyrite Tomb Standpipe			
Date	Water Depth (ft)	Water Surface Elevation (ft)	pH (S.U.)	Comments
1/3/2017	25.85	269.60	7.61	
1/12/2017	26.00	269.45	7.54	
1/18/2017	29.03	266.42	8.88	Standpipe cleanout 1/17/2017
1/25/2017	28.79	266.66	7.84	Sampled the tomb (with bailer)
1/31/2017	28.79	266.66	8.25	
2/7/2017	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	

Pyrite Tomb Standpipe Monitoring Results

	Pyrite Tomb Standpipe			
Date	Water Depth (ft)	Water Surface Elevation (ft)	pH (S.U.)	Comments
1/10/19	19.75	275.70	7.62	
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

Pyrite Tomb Standpipe Monitoring Results

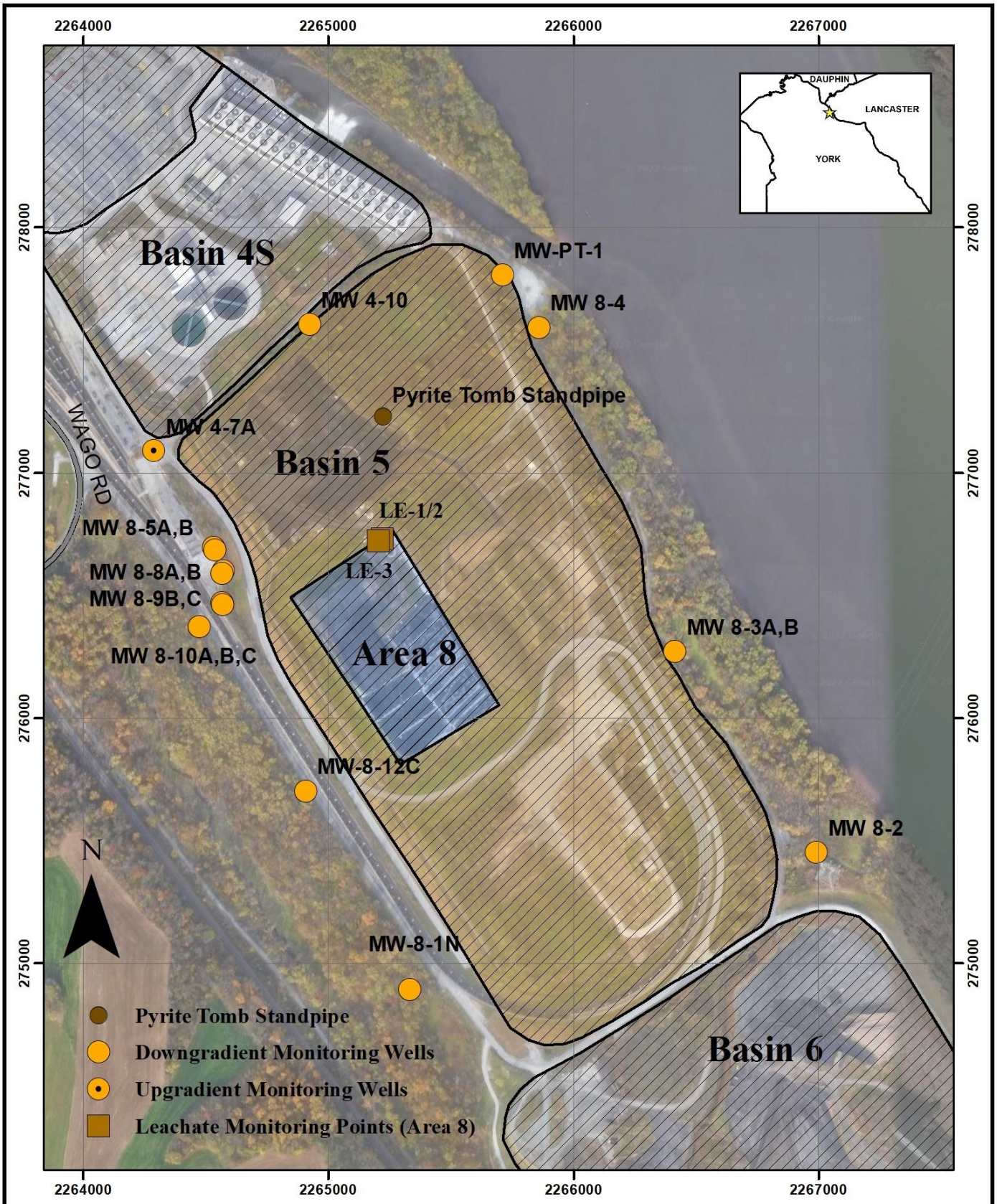
	Pyrite Tomb Standpipe			
Date	Water Depth (ft)	Water Surface Elevation (ft)	pH (S.U.)	Comments
2/2/2022	24.54	270.91	7.62	Temp = 12.6°C
3/23/2022	24.71	270.74	6.97	Temp = 12.5°C
4/25/2022	24.65	270.80	7.29	Purged 30 L. Temp = 13.7°C
5/12/2022	24.73	290.72	7.09	
6/18/2022	23.96	271.49	7.08	Temp = 14.5°C
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	



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

2540-PM-BWM0373 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
12/01/2022
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: 19.03 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.60 ft. Elevation of Water Level: 286.77 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: 2.4 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/20/2022 Sample Collection Time: 9:07AM

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): 221001214-001 Final Lab Analysis Completion Date: 11/23/2022

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	10/20/2022

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)	45.6	SM 2320
Calcium, total (mg/l)	31.6	EPA 200.7
Calcium, dissolved (mg/l)	22.6	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	8.48	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)	4.73	EPA 200.7
Magnesium, dissolved (mg/l)	4.24	EPA 200.7
Manganese, total (µg/l)	1.77 ND	EPA 200.7
Manganese, dissolved (µg/l)	6.39 ND	EPA 200.7
Nitrate, as N (mg/l)	3.87	EPA 300.0
pH, field (su)	6.85	SM 4500-H+B
pH, lab (su)	7.06 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)	8.02	EPA 200.7
Sodium, dissolved (mg/l)	7.99	EPA 200.7
Specific Conductance, field (umhos/cm)	213	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	223	SM 2510 B
Sulfate, as SO4 (mg/l)	24.5	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	45.6	SM 2320 B
Total Dissolved Solids (mg/l)	133	SM 2540 C
Total Organic Carbon (mg/l)	0.192 ND	SM 5310 C
Turbidity, field (n.t.u.)	2.84	Field Meter
Dissolved O2, field (mg/l)	3.13	Field Meter
Redox, field (mv)	153	Field Meter
Temperature, field (°c)	12.1	Field Meter
Acidity, total as CaCO3 (mg/l)	-33	SM 2310 B

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-19
Sample Date	10/20/2022

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	10/20/2022

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)	1.31	EPA 200.8
Arsenic, dissolved (µg/l)	0.55 ND	EPA 200.8
Barium, total (µg/l)	224	EPA 200.8
Barium, dissolved (µg/l)	219	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)	1 <	EPA 200.8
Chromium, dissolved (µg/l)	0.41 ND	EPA 200.8
Copper, total (µg/l)	3.02	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	1.01	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	17.4	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)	14.2	EPA 200.8
Zinc, dissolved (µg/l)	2.24 ND	EPA 200.8
Boron, total (µg/l)	145	EPA 200.7
Boron, dissolved (µg/l)	137	EPA 200.7
Lithium, total (µg/l)	10.4	EPA 200.8
Lithium, dissolved (µg/l)	3.63	EPA 200.8
Molybdenum, total (µg/l)	11.8	EPA 200.8
Molybdenum, dissolved (µg/l)	1.99	EPA 200.8
Strontium, total (µg/l)	45	EPA 200.7
Strontium, dissolved (µg/l)	43	EPA 200.7

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-19
Sample Date	10/20/2022

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)	26.8 ND	EPA 200.7
Aluminum, dissolved (µg/l)	26.8 ND	EPA 200.7
Antimony, total (µg/l)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	5.06	EPA 200.8
Gallium, dissolved (µg/l)	1 ND	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)	1.9	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)	9.37	EPA 200.8
Titanium, dissolved (µg/l)	5 <	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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: 25.14 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.26 ft. Elevation of Water Level: 267.57 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 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/18/2022 Sample Collection Time: 1:17PM

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): 221001207-006 Final Lab Analysis Completion Date: 11/23/2022

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	10/18/2022

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)	21.2	SM 2320
Calcium, total (mg/l)	177	EPA 200.7
Calcium, dissolved (mg/l)	176	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	7.93	EPA 300.0
Fluoride, total as F (mg/l)	0.48	EPA 300.0
Iron, total (µg/l)	427	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	14	EPA 200.7
Magnesium, dissolved (mg/l)	13.2	EPA 200.7
Manganese, total (µg/l)	1,910	EPA 200.7
Manganese, dissolved (µg/l)	1,630	EPA 200.7
Nitrate, as N (mg/l)	1.19	EPA 300.0
pH, field (su)	5.39	SM 4500-H+B
pH, lab (su)	5.58 H	SM 4500-H+B
Potassium, total (mg/l)	85.5	EPA 200.7
Potassium, dissolved (mg/l)	86.4	EPA 200.7
Sodium, total (mg/l)	46.2	EPA 200.7
Sodium, dissolved (mg/l)	48.2	EPA 200.7
Specific Conductance, field (umhos/cm)	1,427	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,440	SM 2510 B
Sulfate, as SO4 (mg/l)	637	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	21.2	SM 2320 B
Total Dissolved Solids (mg/l)	1,040	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	3.47	Field Meter
Dissolved O2, field (mg/l)	0.52	Field Meter
Redox, field (mv)	327	Field Meter
Temperature, field (°c)	13.18	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	10/18/2022

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	10/18/2022

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)	4.47	EPA 200.8
Arsenic, dissolved (µg/l)	4.47	EPA 200.8
Barium, total (µg/l)	17.5	EPA 200.8
Barium, dissolved (µg/l)	16.9	EPA 200.8
Cadmium, total (µg/l)	1.3	EPA 200.8
Cadmium, dissolved (µg/l)	1.02	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)	6.6	EPA 200.8
Copper, dissolved (µg/l)	8.48	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	21	EPA 200.8
Selenium, dissolved (µg/l)	20.2	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)	97.3	EPA 200.8
Zinc, dissolved (µg/l)	94.3	EPA 200.8
Boron, total (µg/l)	1,740	EPA 200.7
Boron, dissolved (µg/l)	1,580	EPA 200.7
Lithium, total (µg/l)	770	EPA 200.8
Lithium, dissolved (µg/l)	839	EPA 200.8
Molybdenum, total (µg/l)	189	EPA 200.8
Molybdenum, dissolved (µg/l)	201	EPA 200.8
Strontium, total (µg/l)	1,040	EPA 200.7
Strontium, dissolved (µg/l)	1,010	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	10/18/2022

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)	1,120	EPA 200.7
Aluminum, dissolved (µg/l)	693	EPA 200.7
Antimony, total (µg/l)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 ND	EPA 200.8
Beryllium, total (µg/l)	1 <	EPA 200.8
Beryllium, dissolved (µg/l)	1 <	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)	44.1	EPA 200.8
Nickel, dissolved (µg/l)	49.6	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	5 <	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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-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: 26.55 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.23 ft. Elevation of Water Level: 261.46 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: 4 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/14/2022 Sample Collection Time: 1:48PM

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): 221001207-002 Final Lab Analysis Completion Date: 11/17/2022

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	10/14/2022

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)	0.223	SM 4500-NH3 F
Bicarbonate (mg/l)	232	SM 2320
Calcium, total (mg/l)	288	EPA 200.7
Calcium, dissolved (mg/l)	281	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	13.5	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)	42.3	EPA 200.7
Magnesium, dissolved (mg/l)	44	EPA 200.7
Manganese, total (µg/l)	230	EPA 200.7
Manganese, dissolved (µg/l)	308	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.89	SM 4500-H+B
pH, lab (su)	6.84 H	SM 4500-H+B
Potassium, total (mg/l)	4.29	EPA 200.7
Potassium, dissolved (mg/l)	4.5	EPA 200.7
Sodium, total (mg/l)	67.5	EPA 200.7
Sodium, dissolved (mg/l)	63.2	EPA 200.7
Specific Conductance, field (umhos/cm)	1,556	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,560	SM 2510 B
Sulfate, as SO4 (mg/l)	628	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	232	SM 2320 B
Total Dissolved Solids (mg/l)	1,170	SM 2540 C
Total Organic Carbon (mg/l)	0.615	SM 5310 C
Turbidity, field (n.t.u.)	0.8	Field Meter
Dissolved O2, field (mg/l)	0.23	Field Meter
Redox, field (mv)	177	Field Meter
Temperature, field (°c)	15.84	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	10/14/2022

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	10/14/2022

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)	17.7	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)	1 <	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	2.24 ND	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	1,720	EPA 200.7
Boron, dissolved (µg/l)	1,780	EPA 200.7
Lithium, total (µg/l)	231	EPA 200.8
Lithium, dissolved (µg/l)	262	EPA 200.8
Molybdenum, total (µg/l)	25.5	EPA 200.8
Molybdenum, dissolved (µg/l)	26.4	EPA 200.8
Strontium, total (µg/l)	353	EPA 200.7
Strontium, dissolved (µg/l)	383	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	10/14/2022

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)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	1.41	EPA 200.8
Nickel, dissolved (µg/l)	1.82	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	1.45 ND	EPA 200.8
Titanium, dissolved (µg/l)	1.45 ND	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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: 17.05 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.62 ft. Elevation of Water Level: 259.42 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): 10/15/2022 Sample Collection Time: 8:52AM

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): 221001210-013 Final Lab Analysis Completion Date: 11/22/2022

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	10/15/2022

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)	150	SM 2320
Calcium, total (mg/l)	169	EPA 200.7
Calcium, dissolved (mg/l)	163	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	45.3	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)	38.7	EPA 200.7
Magnesium, dissolved (mg/l)	39	EPA 200.7
Manganese, total (µg/l)	218	EPA 200.7
Manganese, dissolved (µg/l)	177	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.27	SM 4500-H+B
pH, lab (su)	6.93 H	SM 4500-H+B
Potassium, total (mg/l)	2.52	EPA 200.7
Potassium, dissolved (mg/l)	2.55	EPA 200.7
Sodium, total (mg/l)	16.7	EPA 200.7
Sodium, dissolved (mg/l)	17.1	EPA 200.7
Specific Conductance, field (umhos/cm)	1,037	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,030	SM 2510 B
Sulfate, as SO4 (mg/l)	322	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	150	SM 2320 B
Total Dissolved Solids (mg/l)	707	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.22	Field Meter
Dissolved O2, field (mg/l)	0.71	Field Meter
Redox, field (mv)	12	Field Meter
Temperature, field (°c)	12.62	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	10/15/2022

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	10/15/2022

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)	22.7	EPA 200.8
Barium, dissolved (µg/l)	22.6	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)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	7.33	EPA 200.8
Boron, total (µg/l)	394	EPA 200.7
Boron, dissolved (µg/l)	395	EPA 200.7
Lithium, total (µg/l)	10.2	EPA 200.8
Lithium, dissolved (µg/l)	11.6	EPA 200.8
Molybdenum, total (µg/l)	13.8	EPA 200.8
Molybdenum, dissolved (µg/l)	22	EPA 200.8
Strontium, total (µg/l)	247	EPA 200.7
Strontium, dissolved (µg/l)	255	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	10/15/2022

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)	26.8 ND	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	1.45 ND	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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: 16.92 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.44 ft. Elevation of Water Level: 259.35 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): 10/15/2022 Sample Collection Time: 11:59AM

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): 221001210-014 Final Lab Analysis Completion Date: 11/22/2022

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	10/15/2022

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)	106	SM 2320
Calcium, total (mg/l)	146	EPA 200.7
Calcium, dissolved (mg/l)	149	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	98.6	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)	24.6	EPA 200.7
Magnesium, dissolved (mg/l)	26.1	EPA 200.7
Manganese, total (µg/l)	20 <	EPA 200.7
Manganese, dissolved (µg/l)	6.39 ND	EPA 200.7
Nitrate, as N (mg/l)	0.5 <	EPA 300.0
pH, field (su)	7.25	SM 4500-H+B
pH, lab (su)	7.55 H	SM 4500-H+B
Potassium, total (mg/l)	2.13	EPA 200.7
Potassium, dissolved (mg/l)	2.36	EPA 200.7
Sodium, total (mg/l)	6.9	EPA 200.7
Sodium, dissolved (mg/l)	7.79	EPA 200.7
Specific Conductance, field (umhos/cm)	883	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	881	SM 2510 B
Sulfate, as SO4 (mg/l)	184	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	106	SM 2320 B
Total Dissolved Solids (mg/l)	572	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)	1.15	Field Meter
Redox, field (mv)	4	Field Meter
Temperature, field (°c)	13.84	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	10/15/2022

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	10/15/2022

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)	1.64	EPA 200.8
Arsenic, dissolved (µg/l)	1.65	EPA 200.8
Barium, total (µg/l)	43.1	EPA 200.8
Barium, dissolved (µg/l)	43.3	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)	1 <	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	2.24 ND	EPA 200.8
Zinc, dissolved (µg/l)	2.24	EPA 200.8
Boron, total (µg/l)	261	EPA 200.7
Boron, dissolved (µg/l)	272	EPA 200.7
Lithium, total (µg/l)	9.18	EPA 200.8
Lithium, dissolved (µg/l)	10.2	EPA 200.8
Molybdenum, total (µg/l)	28.4	EPA 200.8
Molybdenum, dissolved (µg/l)	32.1	EPA 200.8
Strontium, total (µg/l)	218	EPA 200.7
Strontium, dissolved (µg/l)	232	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	10/15/2022

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)	26.8 ND	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	1.45 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
12/01/2022
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: 12.24 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.95 ft. Elevation of Water Level: 268.4 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: 3.1 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/14/2022 Sample Collection Time: 12:23PM

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): 221001210-001 Final Lab Analysis Completion Date: 11/12/2022

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	10/14/2022

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)	191	SM 2320
Calcium, total (mg/l)	191	EPA 200.7
Calcium, dissolved (mg/l)	196	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	43.3	EPA 300.0
Fluoride, total as F (mg/l)	0.3	EPA 300.0
Iron, total (µg/l)	233	EPA 200.7
Iron, dissolved (µg/l)	232	EPA 200.7
Magnesium, total (mg/l)	26.9	EPA 200.7
Magnesium, dissolved (mg/l)	30.5	EPA 200.7
Manganese, total (µg/l)	1,190	EPA 200.7
Manganese, dissolved (µg/l)	1,340	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)	8.79	EPA 200.7
Potassium, dissolved (mg/l)	9.99	EPA 200.7
Sodium, total (mg/l)	27	EPA 200.7
Sodium, dissolved (mg/l)	30.2	EPA 200.7
Specific Conductance, field (umhos/cm)	1,140	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,150	SM 2510 B
Sulfate, as SO4 (mg/l)	347	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	191	SM 2320 B
Total Dissolved Solids (mg/l)	762	SM 2540 C
Total Organic Carbon (mg/l)	0.557	SM 5310 C
Turbidity, field (n.t.u.)	0.73	Field Meter
Dissolved O2, field (mg/l)	0.74	Field Meter
Redox, field (mv)	44	Field Meter
Temperature, field (°c)	17.24	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	10/14/2022

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	10/14/2022

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)	24.7	EPA 200.8
Barium, dissolved (µg/l)	23.7	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)	1 <	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	2.24 ND	EPA 200.8
Zinc, dissolved (µg/l)	5.25	EPA 200.8
Boron, total (µg/l)	100 <	EPA 200.7
Boron, dissolved (µg/l)	100 <	EPA 200.7
Lithium, total (µg/l)	0.79 ND	EPA 200.8
Lithium, dissolved (µg/l)	1.07	EPA 200.8
Molybdenum, total (µg/l)	1.36	EPA 200.8
Molybdenum, dissolved (µg/l)	1.28	EPA 200.8
Strontium, total (µg/l)	1,100	EPA 200.7
Strontium, dissolved (µg/l)	1,200	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	10/14/2022

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)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	1.45 ND	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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: 7.35 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.00 ft. Elevation of Water Level: 264.15 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: 3.5 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/17/2022 Sample Collection Time: 8:07AM

Sample Collector's Name: ST

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): 221001210-002 Final Lab Analysis Completion Date: 11/28/2022

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	10/17/2022

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)	133	SM 2320
Calcium, total (mg/l)	110	EPA 200.7
Calcium, dissolved (mg/l)	103	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	26.9	EPA 300.0
Fluoride, total as F (mg/l)	1.11	EPA 300.0
Iron, total (µg/l)	197	EPA 200.7
Iron, dissolved (µg/l)	20 <	EPA 200.7
Magnesium, total (mg/l)	16.9	EPA 200.7
Magnesium, dissolved (mg/l)	15.8	EPA 200.7
Manganese, total (µg/l)	534	EPA 200.7
Manganese, dissolved (µg/l)	472	EPA 200.7
Nitrate, as N (mg/l)	0.5 <	EPA 300.0
pH, field (su)	6.57	SM 4500-H+B
pH, lab (su)	6.97 H	SM 4500-H+B
Potassium, total (mg/l)	6.059	EPA 200.7
Potassium, dissolved (mg/l)	5.63	EPA 200.7
Sodium, total (mg/l)	15	EPA 200.7
Sodium, dissolved (mg/l)	14.4	EPA 200.7
Specific Conductance, field (umhos/cm)	661	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	665	SM 2510 B
Sulfate, as SO4 (mg/l)	147	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	133	SM 2320 B
Total Dissolved Solids (mg/l)	392	SM 2540 C
Total Organic Carbon (mg/l)	0.601	SM 5310 C
Turbidity, field (n.t.u.)	0.83	Field Meter
Dissolved O2, field (mg/l)	0.51	Field Meter
Redox, field (mv)	66.1	Field Meter
Temperature, field (°c)	13.81	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-8-2
Sample Date	10/17/2022

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	10/17/2022

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)	35.1	EPA 200.8
Barium, dissolved (µg/l)	35.8	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)	1.95	EPA 200.8
Lead, total (µg/l)	1 <	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)	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)	2.24 ND	EPA 200.8
Zinc, dissolved (µg/l)	5 <	EPA 200.8
Boron, total (µg/l)	493	EPA 200.7
Boron, dissolved (µg/l)	486	EPA 200.7
Lithium, total (µg/l)	19.8	EPA 200.8
Lithium, dissolved (µg/l)	17	EPA 200.8
Molybdenum, total (µg/l)	256	EPA 200.8
Molybdenum, dissolved (µg/l)	330	EPA 200.8
Strontium, total (µg/l)	535	EPA 200.7
Strontium, dissolved (µg/l)	502	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	10/17/2022

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)	300	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	1.63	EPA 200.8
Nickel, dissolved (µg/l)	1.43	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	5 <	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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: 9.84 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.72 ft. Elevation of Water Level: 257.54 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 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/17/2022 Sample Collection Time: 9:54AM

Sample Collector's Name: ST

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): 221001210-003 Final Lab Analysis Completion Date: 11/22/2022

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	10/17/2022

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)	0.284	SM 4500-NH3 F
Bicarbonate (mg/l)	240	SM 2320
Calcium, total (mg/l)	203	EPA 200.7
Calcium, dissolved (mg/l)	192	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	130	EPA 300.0
Fluoride, total as F (mg/l)	0.4	EPA 300.0
Iron, total (µg/l)	7,310	EPA 200.7
Iron, dissolved (µg/l)	6,410	EPA 200.7
Magnesium, total (mg/l)	36.1	EPA 200.7
Magnesium, dissolved (mg/l)	34.1	EPA 200.7
Manganese, total (µg/l)	9,040	EPA 200.7
Manganese, dissolved (µg/l)	8,540	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.29	SM 4500-H+B
pH, lab (su)	6.7 H	SM 4500-H+B
Potassium, total (mg/l)	3.31	EPA 200.7
Potassium, dissolved (mg/l)	3.08	EPA 200.7
Sodium, total (mg/l)	27.6	EPA 200.7
Sodium, dissolved (mg/l)	27.3	EPA 200.7
Specific Conductance, field (umhos/cm)	1,311	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,290	SM 2510 B
Sulfate, as SO4 (mg/l)	243	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	240	SM 2320 B
Total Dissolved Solids (mg/l)	796	SM 2540 C
Total Organic Carbon (mg/l)	0.98	SM 5310 C
Turbidity, field (n.t.u.)	0.49	Field Meter
Dissolved O2, field (mg/l)	0.27	Field Meter
Redox, field (mv)	-70.4	Field Meter
Temperature, field (°c)	13.81	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-8-3A
Sample Date	10/17/2022

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	10/17/2022

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)	19.7	EPA 200.8
Arsenic, dissolved (µg/l)	18.1	EPA 200.8
Barium, total (µg/l)	66.4	EPA 200.8
Barium, dissolved (µg/l)	68.9	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)	1 <	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	464	EPA 200.7
Boron, dissolved (µg/l)	454	EPA 200.7
Lithium, total (µg/l)	19.1	EPA 200.8
Lithium, dissolved (µg/l)	12.9	EPA 200.8
Molybdenum, total (µg/l)	73	EPA 200.8
Molybdenum, dissolved (µg/l)	81.1	EPA 200.8
Strontium, total (µg/l)	882	EPA 200.7
Strontium, dissolved (µg/l)	845	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	10/17/2022

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)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	2.72	EPA 200.8
Nickel, dissolved (µg/l)	2.53	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	5 <	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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: 12.58 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.90 ft. Elevation of Water Level: 255.13 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: 3.1 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/17/2022 Sample Collection Time: 11:44AM

Sample Collector's Name: ST

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): 221001210-005 Final Lab Analysis Completion Date: 11/23/2022

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	10/17/2022

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)	251	SM 2320
Calcium, total (mg/l)	177	EPA 200.7
Calcium, dissolved (mg/l)	169	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	64.5	EPA 300.0
Fluoride, total as F (mg/l)	0.5	EPA 300.0
Iron, total (µg/l)	301	EPA 200.7
Iron, dissolved (µg/l)	222	EPA 200.7
Magnesium, total (mg/l)	30.8	EPA 200.7
Magnesium, dissolved (mg/l)	26.6	EPA 200.7
Manganese, total (µg/l)	1,790	EPA 200.7
Manganese, dissolved (µg/l)	1,560	EPA 200.7
Nitrate, as N (mg/l)	1.29	EPA 300.0
pH, field (su)	6.67	SM 4500-H+B
pH, lab (su)	6.98 H	SM 4500-H+B
Potassium, total (mg/l)	1.94	EPA 200.7
Potassium, dissolved (mg/l)	1.61	EPA 200.7
Sodium, total (mg/l)	9.47	EPA 200.7
Sodium, dissolved (mg/l)	8.24	EPA 200.7
Specific Conductance, field (umhos/cm)	1,005	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,000	SM 2510 B
Sulfate, as SO4 (mg/l)	171	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	251	SM 2320 B
Total Dissolved Solids (mg/l)	613	SM 2540 C
Total Organic Carbon (mg/l)	0.624	SM 5310 C
Turbidity, field (n.t.u.)	0.38	Field Meter
Dissolved O2, field (mg/l)	0.57	Field Meter
Redox, field (mv)	3.4	Field Meter
Temperature, field (°c)	14.27	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	10/17/2022

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	10/17/2022

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)	7.03	EPA 200.8
Arsenic, dissolved (µg/l)	6.34	EPA 200.8
Barium, total (µg/l)	69.9	EPA 200.8
Barium, dissolved (µg/l)	73.8	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)	1.39	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	6.46	EPA 200.8
Boron, total (µg/l)	388	EPA 200.7
Boron, dissolved (µg/l)	335	EPA 200.7
Lithium, total (µg/l)	23.2	EPA 200.8
Lithium, dissolved (µg/l)	17.9	EPA 200.8
Molybdenum, total (µg/l)	118	EPA 200.8
Molybdenum, dissolved (µg/l)	133	EPA 200.8
Strontium, total (µg/l)	448	EPA 200.7
Strontium, dissolved (µg/l)	377	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	10/17/2022

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)	26.8 ND	EPA 200.7
Aluminum, dissolved (µg/l)	100 <	EPA 200.7
Antimony, total (µg/l)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	1.13	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	5 <	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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: 13.15 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.81 ft. Elevation of Water Level: 257.04 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: 3.5 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/14/2022 Sample Collection Time: 8:10AM

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): 221001210-006 Final Lab Analysis Completion Date: 11/12/2022

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	10/14/2022

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)	51.8	SM 2320
Calcium, total (mg/l)	124	EPA 200.7
Calcium, dissolved (mg/l)	126	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	23.8	EPA 300.0
Fluoride, total as F (mg/l)	0.22	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)	36.9	EPA 200.7
Magnesium, dissolved (mg/l)	40.7	EPA 200.7
Manganese, total (µg/l)	4,160	EPA 200.7
Manganese, dissolved (µg/l)	4,470	EPA 200.7
Nitrate, as N (mg/l)	0.68	EPA 300.0
pH, field (su)	5.47	SM 4500-H+B
pH, lab (su)	5.96 H	SM 4500-H+B
Potassium, total (mg/l)	1.28	EPA 200.7
Potassium, dissolved (mg/l)	1.4	EPA 200.7
Sodium, total (mg/l)	15	EPA 200.7
Sodium, dissolved (mg/l)	16.8	EPA 200.7
Specific Conductance, field (umhos/cm)	915	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	908	SM 2510 B
Sulfate, as SO4 (mg/l)	355	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	51.8	SM 2320 B
Total Dissolved Solids (mg/l)	644	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.48	Field Meter
Dissolved O2, field (mg/l)	0.52	Field Meter
Redox, field (mv)	109	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-8-4
Sample Date	10/14/2022

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	10/14/2022

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)	14.4	EPA 200.8
Barium, dissolved (µg/l)	13.4	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)	1 <	EPA 200.8
Copper, dissolved (µg/l)	1 <	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	34.7	EPA 200.8
Zinc, dissolved (µg/l)	35.4	EPA 200.8
Boron, total (µg/l)	220	EPA 200.7
Boron, dissolved (µg/l)	232	EPA 200.7
Lithium, total (µg/l)	7.59	EPA 200.8
Lithium, dissolved (µg/l)	7.85	EPA 200.8
Molybdenum, total (µg/l)	1 <	EPA 200.8
Molybdenum, dissolved (µg/l)	1.21	EPA 200.8
Strontium, total (µg/l)	258	EPA 200.7
Strontium, dissolved (µg/l)	279	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	10/14/2022

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)	206	EPA 200.7
Aluminum, dissolved (µg/l)	109	EPA 200.7
Antimony, total (µg/l)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 ND	EPA 200.8
Beryllium, total (µg/l)	0.19 ND	EPA 200.8
Beryllium, dissolved (µg/l)	0.19	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)	37.2	EPA 200.8
Nickel, dissolved (µg/l)	41.7	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	5 <	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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-8-5A ☒ 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: 23.55 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.97 ft. Elevation of Water Level: 261.49 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): 10/14/2022 Sample Collection Time: 10:40AM

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): 221001210-007 Final Lab Analysis Completion Date: 11/17/2022

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	10/14/2022

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)	0.418	SM 4500-NH3 F
Bicarbonate (mg/l)	260	SM 2320
Calcium, total (mg/l)	200	EPA 200.7
Calcium, dissolved (mg/l)	204	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	19.4	EPA 300.0
Fluoride, total as F (mg/l)	0.98	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)	35.2	EPA 200.7
Magnesium, dissolved (mg/l)	40.6	EPA 200.7
Manganese, total (µg/l)	369	EPA 200.7
Manganese, dissolved (µg/l)	432	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.81	SM 4500-H+B
pH, lab (su)	7.19 H	SM 4500-H+B
Potassium, total (mg/l)	3.97	EPA 200.7
Potassium, dissolved (mg/l)	4.62	EPA 200.7
Sodium, total (mg/l)	11.1	EPA 200.7
Sodium, dissolved (mg/l)	12.7	EPA 200.7
Specific Conductance, field (umhos/cm)	1,126	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,120	SM 2510 B
Sulfate, as SO4 (mg/l)	319	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	260	SM 2320 B
Total Dissolved Solids (mg/l)	746	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.17	Field Meter
Dissolved O2, field (mg/l)	0.48	Field Meter
Redox, field (mv)	-34	Field Meter
Temperature, field (°c)	13.19	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	10/14/2022

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	10/14/2022

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)	134	EPA 200.8
Arsenic, dissolved (µg/l)	127	EPA 200.8
Barium, total (µg/l)	44.8	EPA 200.8
Barium, dissolved (µg/l)	43.7	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)	1.65	EPA 200.8
Copper, dissolved (µg/l)	1 <	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	2.24 ND	EPA 200.8
Zinc, dissolved (µg/l)	2.24 ND	EPA 200.8
Boron, total (µg/l)	827	EPA 200.7
Boron, dissolved (µg/l)	940	EPA 200.7
Lithium, total (µg/l)	195	EPA 200.8
Lithium, dissolved (µg/l)	223	EPA 200.8
Molybdenum, total (µg/l)	362	EPA 200.8
Molybdenum, dissolved (µg/l)	372	EPA 200.8
Strontium, total (µg/l)	685	EPA 200.7
Strontium, dissolved (µg/l)	775	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	10/14/2022

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)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	0.28 ND	EPA 200.8
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	1.45 ND	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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: 18.2 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.54 ft. Elevation of Water Level: 266.68 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): 10/14/2022 Sample Collection Time: 12:57PM

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): 221001210-008 Final Lab Analysis Completion Date: 11/17/2022

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	10/14/2022

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)	0.264	SM 4500-NH3 F
Bicarbonate (mg/l)	227	SM 2320
Calcium, total (mg/l)	178	EPA 200.7
Calcium, dissolved (mg/l)	190	EPA 200.7
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	17.7	EPA 300.0
Fluoride, total as F (mg/l)	0.77	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)	29.9	EPA 200.7
Magnesium, dissolved (mg/l)	35.7	EPA 200.7
Manganese, total (µg/l)	365	EPA 200.7
Manganese, dissolved (µg/l)	442	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	6.94	SM 4500-H+B
pH, lab (su)	7.36 H	SM 4500-H+B
Potassium, total (mg/l)	3.83	EPA 200.7
Potassium, dissolved (mg/l)	4.65	EPA 200.7
Sodium, total (mg/l)	9.78	EPA 200.7
Sodium, dissolved (mg/l)	11.5	EPA 200.7
Specific Conductance, field (umhos/cm)	1,025	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,020	SM 2510 B
Sulfate, as SO4 (mg/l)	285	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	227	SM 2320 B
Total Dissolved Solids (mg/l)	678	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.24	Field Meter
Dissolved O2, field (mg/l)	0.39	Field Meter
Redox, field (mv)	-12	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-8-5B
Sample Date	10/14/2022

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	10/14/2022

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)	238	EPA 200.8
Arsenic, dissolved (µg/l)	259	EPA 200.8
Barium, total (µg/l)	66.2	EPA 200.8
Barium, dissolved (µg/l)	72.7	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)	1 <	EPA 200.8
Copper, dissolved (µg/l)	0.39 ND	EPA 200.8
Lead, total (µg/l)	0.23 ND	EPA 200.8
Lead, dissolved (µg/l)	0.23 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)	2.24 ND	EPA 200.8
Zinc, dissolved (µg/l)	2.24 ND	EPA 200.8
Boron, total (µg/l)	809	EPA 200.7
Boron, dissolved (µg/l)	963	EPA 200.7
Lithium, total (µg/l)	158	EPA 200.8
Lithium, dissolved (µg/l)	198	EPA 200.8
Molybdenum, total (µg/l)	342	EPA 200.8
Molybdenum, dissolved (µg/l)	385	EPA 200.8
Strontium, total (µg/l)	819	EPA 200.7
Strontium, dissolved (µg/l)	959	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	10/14/2022

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)	0.39 ND	EPA 200.8
Antimony, dissolved (µg/l)	0.39 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)	5 <	EPA 200.8
Titanium, dissolved (µg/l)	1.45 ND	EPA 200.8
Vanadium, total (µg/l)	2.35 ND	EPA 200.8
Vanadium, dissolved (µg/l)	2.35 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
12/01/2022
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 -

Site Name:

Facility ID (as issued by DEP):

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: 24.63 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.11 ft. Elevation of Water Level: 259.57 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: 3.2 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/15/2022 Sample Collection Time: 11:14AM

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): 221001210-009 Final Lab Analysis Completion Date: 11/17/2022

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

Comments:

I.D. No.	
Monitoring Point No.	MW-8-8A
Sample Date	10/15/2022

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)	0.441	SM 4500-NH3 F
Bicarbonate (mg/l)	233	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)	267	EPA 300.0
Fluoride, total as F (mg/l)	0.648	EPA 300.0
Iron, total (µg/l)		
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)		
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	996	EPA 200.7
Manganese, dissolved (µg/l)	1,130	EPA 200.7
Nitrate, as N (mg/l)	8.19	EPA 300.0
pH, field (su)	7.26	SM 4500-H+B
pH, lab (su)	7.09 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)	1,744	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,760	SM 2510 B
Sulfate, as SO4 (mg/l)	283	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	233	SM 2320 B
Total Dissolved Solids (mg/l)	1,160	SM 2540 C
Total Organic Carbon (mg/l)	0.192 ND	SM 5310 C
Turbidity, field (n.t.u.)	0.45	Field Meter
Dissolved O2, field (mg/l)	0.35	Field Meter
Redox, field (mv)	198.8	Field Meter
Temperature, field (°c)	14.59	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	
Monitoring Point No.	MW-8-8A
Sample Date	10/15/2022

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.

Monitoring Point No. MW-8-8A

Sample Date 10/15/2022

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)	535	EPA 200.8
Arsenic, dissolved (µg/l)	529	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)	268	EPA 200.8
Lithium, dissolved (µg/l)	301	EPA 200.8
Molybdenum, total (µg/l)	347	EPA 200.8
Molybdenum, dissolved (µg/l)	340	EPA 200.8
Strontium, total (µg/l)		
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.

Monitoring Point No. MW-8-8A

Sample Date 10/15/2022

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
12/01/2022
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 -

Site Name:

Facility ID (as issued by DEP):

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: 23.8 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.02 ft. Elevation of Water Level: 259.84 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: 3.2 L

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/15/2022 Sample Collection Time: 1:37PM

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): 221001210-010 Final Lab Analysis Completion Date: 11/17/2022

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

Comments:

I.D. No.	
Monitoring Point No.	MW-8-8B
Sample Date	10/15/2022

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)	181	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)	68.7	EPA 300.0
Fluoride, total as F (mg/l)	0.773	EPA 300.0
Iron, total (µg/l)		
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)		
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	20 <	EPA 200.7
Manganese, dissolved (µg/l)	6.39 ND	EPA 200.7
Nitrate, as N (mg/l)	0.903	EPA 300.0
pH, field (su)	7.67	SM 4500-H+B
pH, lab (su)	7.65 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)	1,306	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,310	SM 2510 B
Sulfate, as SO4 (mg/l)	426	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	181	SM 2320 B
Total Dissolved Solids (mg/l)	901	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	2.58	Field Meter
Dissolved O2, field (mg/l)	6.46	Field Meter
Redox, field (mv)	281.3	Field Meter
Temperature, field (°c)	16.18	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	
Monitoring Point No.	MW-8-8B
Sample Date	10/15/2022

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.

Monitoring Point No. MW-8-8B

Sample Date 10/15/2022

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)	379	EPA 200.8
Arsenic, dissolved (µg/l)	351	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)	220	EPA 200.8
Lithium, dissolved (µg/l)	246	EPA 200.8
Molybdenum, total (µg/l)	249	EPA 200.8
Molybdenum, dissolved (µg/l)	278	EPA 200.8
Strontium, total (µg/l)		
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.

Monitoring Point No. MW-8-8B

Sample Date 10/15/2022

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
12/01/2022
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 -

Site Name:

Facility ID (as issued by DEP):

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: 23.2 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.82 ft. Elevation of Water Level: 261.14 ft./MSL

Sampling Depth: 643.00 ft. Volume of Water Column: _____ gal.

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

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

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

Spring Flow Rate: _____ GPM

Sample Date (mm/dd/yy): 10/17/2022 Sample Collection Time: 10:36AM

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): 221001210-011 Final Lab Analysis Completion Date: 11/23/2022

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

Comments:

I.D. No.	
Monitoring Point No.	MW-8-9B
Sample Date	10/17/2022

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)	0.315	SM 4500-NH3 F
Bicarbonate (mg/l)	264	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)	141	EPA 300.0
Fluoride, total as F (mg/l)	0.5	EPA 300.0
Iron, total (µg/l)		
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)		
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	1,180	EPA 200.7
Manganese, dissolved (µg/l)	1,050	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.3	SM 4500-H+B
pH, lab (su)	7.32 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)	1,471	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	1,470	SM 2510 B
Sulfate, as SO4 (mg/l)	301	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	264	SM 2320 B
Total Dissolved Solids (mg/l)	941	SM 2540 C
Total Organic Carbon (mg/l)	0.5 <	SM 5310 C
Turbidity, field (n.t.u.)	0.34	Field Meter
Dissolved O2, field (mg/l)	0.89	Field Meter
Redox, field (mv)	-13	Field Meter
Temperature, field (°c)	14.72	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	
Monitoring Point No.	MW-8-9B
Sample Date	10/17/2022

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.

Monitoring Point No. MW-8-9B

Sample Date 10/17/2022

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)	677	EPA 200.8
Arsenic, dissolved (µg/l)	689	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)	212	EPA 200.8
Lithium, dissolved (µg/l)	236	EPA 200.8
Molybdenum, total (µg/l)	245	EPA 200.8
Molybdenum, dissolved (µg/l)	270	EPA 200.8
Strontium, total (µg/l)		
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	
Monitoring Point No.	MW-8-9B
Sample Date	10/17/2022

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
12/01/2022
DEP USE ONLY
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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 -

Site Name:

Facility ID (as issued by DEP):

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: 23.03 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 1.69 ft. Elevation of Water Level: 261.65 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): 10/17/2022 Sample Collection Time: 1:12PM

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): 221001210-012 Final Lab Analysis Completion Date: 11/23/2022

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

Comments:

I.D. No.	
Monitoring Point No.	MW-8-9C
Sample Date	10/17/2022

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)	0.352	SM 4500-NH3 F
Bicarbonate (mg/l)	244	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)	19.4	EPA 300.0
Fluoride, total as F (mg/l)	0.88	EPA 300.0
Iron, total (µg/l)		
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)		
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	788	EPA 200.7
Manganese, dissolved (µg/l)	755	EPA 200.7
Nitrate, as N (mg/l)	0.022 ND	EPA 300.0
pH, field (su)	7.31	SM 4500-H+B
pH, lab (su)	7.39 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)	827	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	824	SM 2510 B
Sulfate, as SO4 (mg/l)	156	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	244	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.)	0.4	Field Meter
Dissolved O2, field (mg/l)	0.67	Field Meter
Redox, field (mv)	-75	Field Meter
Temperature, field (°c)	15.69	Field Meter
Acidity, total as CaCO3 (mg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	
Monitoring Point No.	MW-8-9C
Sample Date	10/17/2022

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.

Monitoring Point No. MW-8-9C

Sample Date 10/17/2022

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)	329	EPA 200.8
Arsenic, dissolved (µg/l)	333	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)	141	EPA 200.8
Lithium, dissolved (µg/l)	93.5	EPA 200.8
Molybdenum, total (µg/l)	244	EPA 200.8
Molybdenum, dissolved (µg/l)	238	EPA 200.8
Strontium, total (µg/l)		
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.

Monitoring Point No. MW-8-9C

Sample Date 10/17/2022

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
12/01/2022
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: 14.03 ft. Measured from: ☐ Land Surface ☒ TOC

Casing Stick Up: 2.04 ft. Elevation of Water Level: 257.736 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): 10/18/2022 Sample Collection Time: 11:04AM

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): 221001211-001 Final Lab Analysis Completion Date: 11/23/2022

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	10/18/2022

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)	73.6	SM 2320
Calcium, total (mg/l)	122	EPA 200.7
Calcium, dissolved (mg/l)		
Chemical Oxygen Demand (mg/l)	5.3 ND	SM 5220 D
Chloride, total as Cl (mg/l)	5.59	EPA 300.0
Fluoride, total as F (mg/l)	0.46	EPA 300.0
Iron, total (µg/l)	133	EPA 200.7
Iron, dissolved (µg/l)		
Magnesium, total (mg/l)	25.7	EPA 200.7
Magnesium, dissolved (mg/l)		
Manganese, total (µg/l)	4,890	EPA 200.7
Manganese, dissolved (µg/l)		
Nitrate, as N (mg/l)	2.24	EPA 300.0
pH, field (su)	6	SM 4500-H+B
pH, lab (su)	6.23 H	SM 4500-H+B
Potassium, total (mg/l)	32.5	EPA 200.7
Potassium, dissolved (mg/l)		
Sodium, total (mg/l)	30.1	EPA 200.7
Sodium, dissolved (mg/l)		
Specific Conductance, field (umhos/cm)	923	EPA 120.1, FIELD
Specific Conductance, lab (umhos/cm)	933	SM 2510 B
Sulfate, as SO4 (mg/l)	374	EPA 300.0
Alkalinity, total as CaCO3 (mg/l)	73.6	SM 2320 B
Total Dissolved Solids (mg/l)	638	SM 2540 C
Total Organic Carbon (mg/l)	0.69	SM 5310 C
Turbidity, field (n.t.u.)	1.06	Field Meter
Dissolved O2, field (mg/l)	3.06	Field Meter
Redox, field (mv)	271	Field Meter
Temperature, field (°c)	14.6	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	10/18/2022

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	10/18/2022

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)	25.3	EPA 200.8
Barium, dissolved (µg/l)		
Cadmium, total (µg/l)	1.02	EPA 200.8
Cadmium, dissolved (µg/l)		
Chromium, total (µg/l)	1.42	EPA 200.8
Chromium, dissolved (µg/l)		
Copper, total (µg/l)	1 <	EPA 200.8
Copper, dissolved (µg/l)		
Lead, total (µg/l)	0.23 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)	33.3	EPA 200.8
Zinc, dissolved (µg/l)		
Boron, total (µg/l)	1,100	EPA 200.7
Boron, dissolved (µg/l)		
Lithium, total (µg/l)	352	EPA 200.8
Lithium, dissolved (µg/l)		
Molybdenum, total (µg/l)	148	EPA 200.8
Molybdenum, dissolved (µg/l)		
Strontium, total (µg/l)	718	EPA 200.7
Strontium, dissolved (µg/l)		

T Please indicate detection limit if analyte is not detected.

I.D. No.	301309
Monitoring Point No.	MW-PT-1
Sample Date	10/18/2022

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)	254	EPA 200.7
Aluminum, dissolved (µg/l)		
Antimony, total (µg/l)	0.39 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)	30.8	EPA 200.8
Nickel, dissolved (µg/l)		
Rubidium, total (µg/l)		
Rubidium, dissolved (µg/l)		
Titanium, total (µg/l)	5 <	EPA 200.8
Titanium, dissolved (µg/l)		
Vanadium, total (µg/l)	2.35 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		b (comparison		Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		b (comparison		Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		b (comparison	
Iron, dissolved	mg/l	0.3	66.19	NC		NC	0.0	4.7	41	34	0	0		0.1	06/10/14	0.01	> Up n	NC		NC	0.0	4.7	41	27	0	0		0.1	09/08/14	0.35	n	NC		NC	0.0	2.1	41	38	0	0		0.1	04/18/22	0.00	> Up n
Arsenic, dissolved	µg/l	10	58.32	NC		NC	0.8	7.5	41	32	0	0		2.0	12/10/13	0.00	> Up n	NC		NC	1.3	12.8	41	29	0	1	08/14/18	10.2	08/14/18	0.35	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	23.04	NC		NC	3.0	1.0	41	40	0	0		20.0	08/16/19	0.00	< Up n	-22.9	↓	0.06	2486.6	828.9	41	0	0	41	10/18/22	7220.0	06/05/14	0.00	> Up n	55.0	↑	0.10	212.7	70.9	41	0	0	8	10/14/22	559.0	11/05/20	0.00	> Up n
Molybdenum, dissolved	µg/l	40	17.06	NC		NC	1.4	3.6	41	37	0	0		4.0	12/10/13	0.00	< Up n	-35.6	↓	0.09	600.2	1500.6	41	0	0	40	10/18/22	1740.0	09/18/13	0.00	> Up n	-0.7	↔	0.47	21.2	53.0	41	1	0	0		29.9	07/24/21	0.00	> Up n
Aluminum, dissolved	µg/l	200	8.55	NC		NC	23.6	11.8	41	41	0	0		100.0	08/16/19	NC		NC		NC	2477.7	1238.9	41	26	0	10	10/18/22	28800.0	08/14/18	0.00	> Up n	NC		NC	61.6	30.8	41	41	0	0		100.0	10/14/22	NC	
Nickel, dissolved	µg/l	100	6.16	NC		NC	1.4	1.4	41	36	0	0		5.0	08/16/18	0.00	< Up n	-1.4	↔	0.48	37.6	37.6	41	3	0	4	08/14/18	175.0	06/07/16	0.00	> Up n	NC		NC	3.2	3.2	41	28	0	0		17.2	11/11/19	0.25	n
Potassium, dissolved	mg/l	--	5.16	50.6	↑	0.00	0.8	NA	41	14	0	0		1.0	10/20/22	0.00	< Up n	52.3	↑	0.00	102.6	NA	41	0	0	0		139.0	01/27/22	0.00	> Up n	-2.1	↔	0.32	3.9	NA	41	0	0	0		4.5	10/14/22	0.00	> Up n
Cadmium, dissolved	µg/l	5	4.89	NC		NC	0.1	2.0	41	41	0	0		0.2	12/10/13	NC		18.1	↑	0.12	1.0	20.5	41	8	0	0		2.4	08/14/18	0.00	> Up n	NC		NC	0.1	2.4	41	41	0	0		0.2	11/05/18	NC	
Zinc, dissolved	µg/l	2000	4.19	NC		NC	5.8	0.3	41	30	0	0		20.0	12/10/13	0.27	n	-23.1	↓	0.29	79.0	3.9	41	0	0	0		488.0	08/14/18	0.00	> Up n	NC		NC	6.1	0.3	41	36	0	0		20.0	12/02/13	0.01	> Up n
Strontium, dissolved	µg/l	4000	2.85	-7.1	↔	0.01	50.2	1.3	41	0	0	0		59.3	03/12/15	0.00	< Up n	117.1	↑	0.00	1196.1	29.9	41	0	0	0		2190.0	08/25/19	0.00	> Up n	10.6	↑	0.01	350.5	8.8	41	0	0	0		430.0	11/05/20	0.00	> Up n
Fluoride, total as F	mg/l	2	2.78	NC		NC	0.1	5.3	41	38	0	0		0.2	10/20/22	0.00	< Up n	NC		NC	0.2	9.0	41	31	0	0		1.8	08/14/18	0.02	> Up n	0.0	↔	0.46	0.2	9.3	41	7	0	0		0.3	06/04/14	0.10	n
Beryllium, dissolved	µg/l	4	2.18	NC		NC	0.1	3.6	41	41	0	0		0.5	06/10/14	NC		NC		NC	0.7	18.0	41	35	0	2	08/14/18	5.4	06/05/14	0.00	> Up n	NC		NC	0.1	3.4	41	41	0	0		0.2	12/02/13	NC	
Chloride, total as Cl	mg/l	250	2.10	7.2	↔	0.01	8.4	3.4	41	0	0	0		9.9	08/26/20	0.00	< Up n	-67.3	↓	0.00	12.7	5.1	41	0	0	0		24.7	12/03/12	0.35	n	-28.6	↓	0.00	17.3	6.9	41	0	0	0		19.9	06/06/17	0.00	> Up n
Chemical Oxygen Demand	mg/l	--	1.90	NC		NC	2.6	NA	41	40	0	0		25.4	01/26/22	0.42	n	NC		NC	2.5	NA	41	40	0	0		20.7	05/19/20	0.49	n	NC		NC	3.2	NA	41	40	0	0		53.2	06/03/13	0.07	n
Lithium, dissolved	µg/l	83	1.89	-24.5	↓	0.00	3.7	4.4	41	5	0	0		10.0	12/10/13	0.00	< Up n	-20.1	↓	0.02	1094.7	1318.9	41	0	0	41	10/18/22	1550.0	09/18/13	0.00	> Up n	303.1	↑	0.00	136.0	163.9	41	0	0	33	10/14/22	278.0	01/24/22	0.00	> Up n
Silver, dissolved	µg/l	100	1.33	NC		NC	0.4	0.4	41	41	0	0		2.0	12/10/13	NC		NC		NC	1.0	1.0	41	41	0	0		10.0	12/11/13	NC		NC		NC	1.2	1.2	41	41	0	0		10.0	12/02/13	NC	
Ammonia, as N	mg/l	--	1.32	NC		NC	0.0	NA	41	41	0	0		0.2	01/26/22	0.00	< Up n	75.5	↑	0.05	0.3	NA	41	7	0	0		1.1	06/04/13	0.00	> Up n	-15.4	↓	0.14	0.2	NA	41	8	0	0		0.7	06/06/16	0.00	> Up n
Vanadium, dissolved	µg/l	2.9	1.27	NC		NC	1.5	50.8	41	41	0	0		2.3	10/20/22	0.00	< Up n	NC		NC	1.4	48.4	41	41	0	0		2.3	10/18/22	0.00	< Up n	NC		NC	1.5	52.6	41	32	0	0		2.3	10/14/22	0.00	> Up n
Total Organic Carbon	mg/l	--	1.27	NC		NC	0.2	NA	41	38	0	0		1.1	07/19/22	0.00	< Up n	7.7	↔	0.24	0.7	NA	41	2	0	0		2.2	07/20/22	0.20	n	41.2	↑	0.00	1.2	NA	41	0	0	0		3.1	07/19/22	0.00	> Up n
Magnesium, dissolved	mg/l	--	1.25	-5.1	↔	0.09	4.6	NA	41	0	0	0		5.7	03/12/15	0.00	< Up n	8.1	↔	0.25	15.6	NA	41	0	0	0		27.2	08/14/18	0.49	n	17.3	↑	0.00	39.3	NA	41	0	0	0		53.8	11/05/20	0.00	> Up n
Copper, dissolved	µg/l	1000	1.25	NC		NC	1.8	0.2	41	39	0	0		5.0	11/12/18	0.00	< Up n	NC		NC	6.1	0.6	41	22	0	0		32.2	06/05/14	0.01	> Up n	NC		NC	1.9	0.2	41	35	0	0		5.0	02/11/19	0.00	> Up n
Specific Conductance, field	umhos/cm	--	1.10	1.3	↔	0.39	225.7	NA	41	0	0	0		267.0	10/13/21	0.00	< Up n	15.4	↑	0.01	1540.4	NA	41	0	0	0		1953.0	05/07/19	0.00	> Up n	19.8	↑	0.00	1454.7	NA	41	0	0	0		1643.0	11/05/20	0.00	> Up n
Titanium, dissolved	µg/l	--	1.06	NC		NC	1.1	NA	41	40	0	0		6.1	01/26/22	0.15	n	NC		NC	1.9	NA	41	41	0	0		5.0	10/18/22	0.24	n	NC		NC	2.1	NA	41	41	0	0		5.0	07/19/22	0.24	n
Total Dissolved Solids	mg/l	500	1.04	-2.1	↔	0.28	141.9	28.4	41	0	0	0		173.0	08/16/19	0.00	< Up n	17.9	↑	0.02	1158.3	231.7	41	0	0	41	10/18/22	1670.0	05/07/19	0.00	> Up n	22.7	↑	0.00	1144.2	228.8	41	0	0	41	10/14/22	1300.0	11/05/20	0.00	> Up n
Chromium, dissolved	µg/l	100	1.03	NC		NC	0.9	0.9	41	41	0	0		2.0	12/10/13	NC		NC		NC	0.9	0.9	41	41	0	0		2.0	12/11/13	NC		NC		NC	0.9	0.9	41	41	0	0		2.0	12/02/13	NC	
Calcium, dissolved	mg/l	--	1.02	-7.1	↔	0.04	26.8	NA	41	0	0	0		32.0	08/26/20	0.00	< Up n	125.1	↑	0.00	151.6	NA	41	0	0	0		328.0	08/25/19	0.11	n	19.5	↑	0.00	232.4	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	-0.6	↔	0.40	6.6	90.0	41	0	0	12	10/13/21	7.2	08/26/20	0.00	< Up n	9.0	↔	0.01	5.5	199.9	41	0	0	41	10/18/22	6.4	04/21/22	0.00	< Up n	-4.0	↔	0.00	6.9	62.4	41	0	0	1	05/12/15	7.2	12/07/15	0.00	> Up n
Sulfate, as SO4	mg/l	250	0.98	-12.1	↓	0.12	26.8	10.7	41	0	0	0		49.2	05/20/20	0.00	< Up n	20.6	↑	0.02	718.2	287.3	40	0	0	40	10/18/22	1040.0	05/07/19	0.00	> Up n	27.4	↑	0.00	583.8	233.5	41	0	0	41	10/14/22	718.0	01/27/21	0.00	> Up n
Lead, dissolved	µg/l	5	0.97	NC		NC	0.3	5.6	41	41	0	0		1.0	04/20/22	NC		NC		NC	0.4	8.0	41	39	0	0		1.1	06/05/14	0.00	> Up n	NC		NC	0.3	6.2	41	41	0	0		1.0	12/02/13	NC	
Mercury, dissolved	µg/l	2	0.96	NC		NC	0.3	13.1	41	41	0	0		0.7	10/20/22	0.00	< Up n	NC		NC	0.3	13.1	41	41	0	0		0.7	10/18/22	0.00	< Up n	NC		NC	0.3	14.1	41	40	0	0		0.7	10/14/22	0.00	> Up n
Boron, dissolved	µg/l	6000	0.82	365.6	↑	0.00	56.4	0.9	41	10	0	0		144.0	11/11/20	0.00	< Up n	-28.5	↓	0.00	2340.7	39.0	41	0	0	0		3540.0	06/04/13	0.00	> Up n	23.3	↑	0.00	1565.4	26.1	41	0	0	0		1990.0	11/05/18	0.00	> Up n
Sodium, dissolved	mg/l	--	0.64	-5.8	↔	0.02	8.8	NA	41	0	0	0		9.7	02/19/19	0.00	< Up n	-53.4	↓	0.00	99.4	NA	41	0	0	0		143.0	09/18/13	0.00	> Up n	8.6	↔	0.00	58.7	NA	41	0	0	0		81.2	08/21/19	0.00	> Up n
Barium, dissolved	µg/l	2000	0.32	-17.1	↓	0.00	246.8	12.3	41	0	0	0		297.0	08/26/20	0.00	> Up n	21.0	↑	0.03	13.0	0.6	41	0	0	0		18.6	11/05/20	0.00	< Up n	-15.0	↓	0.00	21.1	1.1	41	0	0	0		24.6	03/11/13	0.00	< Up n
Selenium, dissolved	µg/l	50	0.25	133.8	↑	0.00	13.1	26.2	41	0	0	0		22.4	04/20/22	0.00	> Up p	184.2	↑	0.00	14.5	29.0	41	2	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	-15.6	↓	0.00	4.3	42.8	41	0	0	0		8.8	06/05/17	0.00	> Up n	-48.5	↓	0.04	1.0	9.5	41	12	0	0		3.5	07/20/22	0.04	< Up n	NC		NC	0.1	1.2	41	37	0	0		3.0	09/18/13	0.00	< Up n

Brunner Island - Basin 5 - Statistics Summary

4th Quarter 2022

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Down MW-8-10A Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	mg/l	0.3	66.19	NC		NC	0.0	5.5	41	33	0	0		0.1	06/05/14	0.02	> Up n
Arsenic, dissolved	µg/l	10	58.32	NC		NC	0.5	5.0	41	41	0	0		0.6	10/15/22	0.00	< Up n
Manganese, dissolved	µg/l	300	23.04	-95.7	↓	0.00	537.9	179.3	41	5	0	13	11/06/18	1950.0	12/07/16	0.00	> Up n
Molybdenum, dissolved	µg/l	40	17.06	-65.8	↓	0.00	34.1	85.2	41	0	0	12	02/13/18	78.7	12/07/16	0.00	> Up n
Aluminum, dissolved	µg/l	200	8.55	NC		NC	58.2	29.1	41	41	0	0		100.0	10/15/22	NC	
Nickel, dissolved	µg/l	100	6.16	NC		NC	1.0	1.0	41	36	0	0		9.2	11/11/19	0.00	< Up n
Potassium, dissolved	mg/l	--	5.16	-11.9	↓	0.01	2.4	NA	41	0	0	0		2.7	07/16/22	0.48	n
Cadmium, dissolved	µg/l	5	4.89	NC		NC	0.2	3.6	41	41	0	0		1.0	10/16/21	NC	
Zinc, dissolved	µg/l	2000	4.19	-42.3	↓	0.01	6.3	0.3	41	17	0	0		29.1	11/11/19	0.00	> Up n
Strontium, dissolved	µg/l	4000	2.85	-34.8	↓	0.00	292.7	7.3	41	0	0	0		417.0	12/07/16	0.02	> Up n
Fluoride, total as F	mg/l	2	2.78	NC		NC	0.1	7.3	41	22	0	0		0.2	10/15/22	0.00	> Up n
Beryllium, dissolved	µg/l	4	2.18	NC		NC	0.1	3.4	41	41	0	0		0.2	12/11/13	NC	
Chloride, total as Cl	mg/l	250	2.10	113.3	↑	0.00	32.9	13.2	41	0	0	0		53.6	02/13/18	0.00	> Up n
Chemical Oxygen Demand	mg/l	--	1.90	NC		NC	6.2	NA	41	41	0	0		20.0	07/16/22	0.16	n
Lithium, dissolved	µg/l	83	1.89	-37.5	↓	0.00	13.3	16.0	41	1	0	0		19.3	12/07/16	0.41	n
Silver, dissolved	µg/l	100	1.33	NC		NC	1.2	1.2	41	41	0	0		10.0	12/11/13	NC	
Ammonia, as N	mg/l	--	1.32	NC		NC	0.1	NA	41	29	0	0		0.4	02/02/20	0.00	< Up n
Vanadium, dissolved	µg/l	2.9	1.27	NC		NC	1.7	57.2	41	41	0	1	09/11/13	10.0	09/11/13	0.00	> Up n
Total Organic Carbon	mg/l	--	1.27	35.6	↑	0.03	0.6	NA	41	13	0	0		3.2	07/16/22	0.01	< Up n
Magnesium, dissolved	mg/l	--	1.25	-20.9	↓	0.00	37.4	NA	41	0	0	0		44.1	09/16/15	0.00	> Up n
Copper, dissolved	µg/l	1000	1.25	NC		NC	2.3	0.2	41	37	0	0		20.0	09/11/13	0.00	> Up n
Specific Conductance, field	umhos/cm	--	1.10	-6.8	↔	0.11	973.7	NA	41	0	0	0		1132.0	02/13/18	0.50	n
Titanium, dissolved	µg/l	--	1.06	NC		NC	1.9	NA	39	39	0	0		5.0	04/16/22	0.25	n
Total Dissolved Solids	mg/l	500	1.04	-16.2	↓	0.04	729.1	145.8	41	0	0	41	10/15/22	949.0	09/19/17	0.50	n
Chromium, dissolved	µg/l	100	1.03	NC		NC	0.9	0.9	41	41	0	0		2.0	12/11/13	NC	
Calcium, dissolved	mg/l	--	1.02	-12.9	↓	0.01	144.0	NA	41	0	0	0		163.0	10/15/22	0.47	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	-0.2	↔	0.43	6.5	98.7	41	0	0	22	10/15/22	7.1	02/02/20	0.00	< Up n
Sulfate, as SO4	mg/l	250	0.98	-32.4	↓	0.00	339.9	136.0	41	0	0	39	10/15/22	421.0	05/12/15	0.50	n
Lead, dissolved	µg/l	5	0.97	NC		NC	0.3	6.2	41	41	0	0		1.0	02/02/20	NC	
Mercury, dissolved	µg/l	2	0.96	NC		NC	0.3	13.1	41	41	0	0		0.7	10/15/22	0.00	< Up n
Boron, dissolved	µg/l	6000	0.82	-38.5	↓	0.00	416.7	6.9	41	0	0	0		530.0	12/09/14	0.50	n
Sodium, dissolved	mg/l	--	0.64	31.6	↑	0.00	12.3	NA	41	0	0	0		17.1	10/15/22	0.48	n
Barium, dissolved	µg/l	2000	0.32	-54.6	↓	0.00	27.8	1.4	41	0	0	0		45.3	12/09/14	0.03	< Up n
Selenium, dissolved	µg/l	50	0.25	NC		NC	0.4	0.9	41	41	0	0		5.0	10/16/21	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

PARAMETER	Down MW-8-10B Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	NC		NC	0.0	4.7	41	36	0	0		0.1	06/05/14	0.00	> Up n
Arsenic, dissolved	-32.0	↓	0.00	1.5	15.3	41	10	0	0		2.0	05/12/15	0.00	> Up n
Manganese, dissolved	NC		NC	5.2	1.7	41	27	0	0		20.0	08/24/20	0.00	< Up n
Molybdenum, dissolved	-21.7	↓	0.00	35.1	87.7	41	0	0	5	08/11/19	43.5	03/13/13	0.00	> Up n
Aluminum, dissolved	NC		NC	54.0	27.0	41	41	0	0		100.0	10/15/22	NC	
Nickel, dissolved	NC		NC	0.8	0.8	41	37	0	0		8.2	11/11/19	0.00	< Up n
Potassium, dissolved	-0.4	↔	0.47	2.4	NA	41	0	0	0		3.8	06/03/13	0.45	n
Cadmium, dissolved	NC		NC	0.1	2.5	41	41	0	0		1.0	08/24/20	NC	
Zinc, dissolved	NC		NC	3.3	0.2	41	35	0	0		31.0	11/11/19	0.00	< Up n
Strontium, dissolved	26.5	↑	0.00	248.4	6.2	41	0	0	0		362.0	05/19/20	0.28	n
Fluoride, total as F	246.8	↑	0.00	0.1	5.9	41	19	0	0		0.2	10/15/22	0.00	> Up n
Beryllium, dissolved	NC		NC	0.1	3.6	41	41	0	0		0.5	09/14/16	NC	
Chloride, total as Cl	10693.5	↑	0.00	44.7	17.9	41	0	0	0		98.6	10/15/22	0.00	> Up n
Chemical Oxygen Demand	NC		NC	6.2	NA	41	41	0	0		20.0	07/23/21	0.16	n
Lithium, dissolved	-12.4	↓	0.14	15.1	18.2	41	1	0	0		31.6	06/05/14	0.36	n
Silver, dissolved	NC		NC	1.0	1.0	41	41	0	0		10.0	12/11/13	NC	
Ammonia, as N	NC		NC	0.0	NA	41	41	0	0		0.2	11/05/20	0.00	< Up n
Vanadium, dissolved	NC		NC	4.3	148.0	41	32	0	29	10/15/22	10.0	09/11/13	0.22	n
Total Organic Carbon	NC		NC	0.5	NA	41	34	0	0		1.4	07/16/22	0.00	< Up n
Magnesium, dissolved	24.0	↑	0.00	21.0	NA	41	0	0	0		26.1	10/15/22	0.47	n
Copper, dissolved	NC		NC	1.8	0.2	41	37	0	0		20.0	09/11/13	0.00	< Up n
Specific Conductance, field	34.1	↑	0.00	739.5	NA	41	0	0	0		883.0	10/15/22	0.49	n
Titanium, dissolved	NC		NC	2.0	NA	39	39	0	0		5.0	04/16/22	0.25	n
Total Dissolved Solids	20.3	↑	0.00	502.0	100.4	41	0	0	19	10/15/22	610.0	07/16/22	0.50	n
Chromium, dissolved	NC		NC	0.9	0.9	41	41	0	0		2.0	12/11/13	NC	
Calcium, dissolved	17.8	↑	0.00	112.7	NA	41	0	0	0		149.0	10/15/22	0.45	n
Antimony, dissolved	NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	-4.3	↔	0.00	7.4	8.2	41	0	0	0		7.8	06/03/13	0.00	> Up n
Sulfate, as SO4	-17.9	↓	0.00	193.4	77.3	41	0	0	0		231.0	11/28/12	0.48	n
Lead, dissolved	NC		NC	0.3	6.0	41	41	0	0		1.0	05/19/20	NC	
Mercury, dissolved	NC		NC	0.3	13.1	41	40	0	0		0.7	10/15/22	0.00	< Up n
Boron, dissolved	-16.2	↓	0.00	277.2	4.6	41	0	0	0		327.0	06/05/14	0.48	n
Sodium, dissolved	9.5	↔	0.00	6.9	NA	41	0	0	0		8.2	02/13/19	0.00	< Up n
Barium, dissolved	5.5	↔	0.10	41.8	2.1	41	0	0	0		48.2	11/11/19	0.48	n
Selenium, dissolved	NC		NC	0.6	1.2	41	41	0	0		5.0	10/16/21	0.00	< Up n
Nitrate, as N	NC		NC	0.1	1.2	41	41	0	0		0.5	10/15/22	0.00	< Up n

PARAMETER	Down MW-8-10C Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	-16.8	↓	0.50	0.2	78.5	11	2	0	4	05/09/18	0.4	06/07/17	0.00	> Up n
Arsenic, dissolved	-58.7	↓	0.11	1.0	10.3	11	5	0	0		2.0	06/03/13	0.01	> Up n
Manganese, dissolved	10.0	↔	0.27	284.9	95.0	11	2	0	8	04/16/22	658.0	06/08/16	0.00	> Up n
Molybdenum, dissolved	-8.7	↔	0.18	58.9	147.3	11	0	0	11	04/16/22	67.0	04/24/21	0.00	> Up n
Aluminum, dissolved	NC		NC	34.9	17.4	11	11	0	0		100.0	04/24/21	NC	
Nickel, dissolved	NC		NC	1.1	1.1	11	11	0	0		4.0	06/03/13	0.00	< Up n
Potassium, dissolved	-48.5	↓	0.02	3.1	NA	11	0	0	0		6.8	05/12/15	0.15	n
Cadmium, dissolved	NC		NC	0.1	2.3	11	11	0	0		0.2	05/08/19	NC	
Zinc, dissolved	NC		NC	3.8	0.2	11	11	0	0		5.0	05/08/19	0.01	< Up n
Strontium, dissolved	20.6	↑	0.00	211.4	5.3	11	0	0	0		240.0	04/24/21	0.50	n
Fluoride, total as F	45.0	↑	0.17	0.1	6.4	11	2	0	0		0.2	04/16/22	0.08	n
Beryllium, dissolved	NC		NC	0.2	4.2	11	11	0	0		0.5	05/08/19	NC	
Chloride, total as Cl	98.1	↑	0.00	10.8	4.3	11	0	0	0		14.3	04/24/21	0.04	< Up n
Chemical Oxygen Demand	NC		NC	7.8	NA	11	11	0	0		20.0	04/24/21	0.30	n
Lithium, dissolved	-52.8	↓	0.01	14.7	17.8	11	1	0	0		35.5	05/12/15	0.37	n
Silver, dissolved	NC		NC	1.1	1.1	11	11	0	0		10.0	06/03/13	NC	
Ammonia, as N	NC		NC	0.0	NA	11	11	0	0		0.1	04/16/22	0.00	< Up n
Vanadium, dissolved	NC		NC	1.3	45.6	11	11	0	0		2.3	04/16/22	0.01	< Up n
Total Organic Carbon	NC		NC	0.6	NA	11	7	0	0		0.8	05/08/19	0.01	< Up n
Magnesium, dissolved	26.8	↑	0.01	17.7	NA	11	0	0	0		20.7	04/24/21	0.50	n
Copper, dissolved	NC		NC	1.6	0.2	11	10	0	0		14.2	06/09/14	0.03	< Up n
Specific Conductance, field	16.8	↑	0.00	510.0	NA	11	0	0	0		553.0	04/24/21	0.49	n
Titanium, dissolved	NC		NC	1.5	NA	10	10	0	0		5.0	04/16/22	0.36	n
Total Dissolved Solids	13.5	↑	0.00	342.5	68.5	11	0	0	0		363.0	04/16/22	0.49	n
Chromium, dissolved	NC		NC	1.3	1.3	11	11	0	0		5.0	05/12/15	NC	
Calcium, dissolved	12.7	↑	0.02	61.6	NA	11	0	0	0		69.1	04/24/21	0.50	n
Antimony, dissolved	NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	-9.1	↔	0.00	7.3	23.4	11	0	0	0		7.6	06/09/14	0.00	> Up n
Sulfate, as SO4	0.0	↔	0.41	119.0	47.6	11	0	0	0		125.0	06/08/16	0.48	n
Lead, dissolved	NC		NC	0.2	4.3	11	11	0	0		1.0	06/03/13	NC	
Mercury, dissolved	NC		NC	0.2	10.7	11	11	0	0		0.7	04/16/22	0.00	< Up n
Boron, dissolved	5.1	↔	0.22	484.3	8.1	11	0	0	0		573.0	06/09/14	0.50	n
Sodium, dissolved	-15.8	↓	0.09	16.0	NA	11	0	0	0		21.2	05/12/15	0.50	n
Barium, dissolved	8.7	↔	0.27	72.6	3.6	11	0	0	0		83.8	04/24/21	0.50	n
Selenium, dissolved	NC		NC	0.3	0.7	11	11	0	0		0.8	06/03/13	0.00	< Up n
Nitrate, as 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 2022**

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Down MW-8-12C														Down MW-8-1N														Down MW-8-2													
				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	66.19	-50.7	↓	0.01	0.8	280.2	11	0	0	10	06/03/22	1.2	06/10/14	0.00	> Up n	-68.7	↓	0.01	0.8	258.8	38	0	0	24	04/24/21	5.4	09/15/16	0.00	> Up n	NC		NC	0.0	1.0	41	40	0	0		0.1	01/25/21	0.00	< Up n
Arsenic, dissolved	µg/l	10	58.32	179.3	↑	0.16	0.9	9.1	11	4	0	0		2.0	06/10/14	0.05	> Up n	NC		NC	0.5	5.0	38	38	0	0		0.6	10/14/22	0.00	< Up n	NC		NC	0.1	1.2	41	40	0	0		1.0	08/24/20	0.00	< Up n
Manganese, dissolved	µg/l	300	23.04	1.7	↔	0.41	1407.9	469.3	11	0	0	10	06/03/22	1730.0	04/24/21	0.00	> Up n	-41.4	↓	0.00	1757.1	585.7	38	0	0	38	10/14/22	3210.0	09/15/16	0.00	> Up n	21.0	↑	0.02	354.7	118.2	41	0	0	31	10/17/22	492.0	07/18/22	0.00	> Up n
Molybdenum, dissolved	µg/l	40	17.06	28.8	↑	0.24	351.0	877.5	11	0	0	11	06/03/22	520.0	04/24/21	0.00	> Up n	NC		NC	1.6	3.9	38	32	0	0		5.0	11/08/18	0.00	< Up n	-16.0	↓	0.00	292.5	731.3	41	0	0	41	10/17/22	342.0	11/26/12	0.00	> Up n
Aluminum, dissolved	µg/l	200	8.55	NC		NC	63.3	31.7	11	11	0	0		100.0	06/03/22	NC		NC		NC	65.1	32.6	38	38	0	0		100.0	10/14/22	NC		NC		NC	48.0	24.0	41	41	0	0		100.0	10/17/22	NC	
Nickel, dissolved	µg/l	100	6.16	NC		NC	3.5	3.5	11	8	0	0		5.0	05/09/18	0.11	n	NC		NC	1.6	1.6	38	33	0	0		15.8	11/03/19	0.00	> Up n	NC		NC	2.0	2.0	41	28	0	0		7.4	11/04/19	0.36	n
Potassium, dissolved	mg/l	--	5.16	-75.7	↓	0.01	7.9	NA	11	0	0	0		12.4	05/11/15	0.00	> Up n	2.5	↔	0.39	7.7	NA	38	0	0	0		12.1	09/15/16	0.00	> Up n	11.3	↑	0.03	5.1	NA	41	0	0	0		5.9	09/11/17	0.00	> Up n
Cadmium, dissolved	µg/l	5	4.89	NC		NC	0.4	8.4	11	8	0	0		1.0	06/03/22	0.00	> Up n	NC		NC	0.2	3.6	38	38	0	0		0.2	05/12/19	NC		NC		NC	0.5	9.7	41	28	0	0		1.1	08/24/20	0.00	> Up n
Zinc, dissolved	µg/l	2000	4.19	NC		NC	2.1	0.1	11	10	0	0		12.8	06/10/14	0.09	n	NC		NC	4.9	0.2	38	35	0	0		20.0	09/30/13	0.00	< Up n	NC		NC	5.6	0.3	41	33	0	0		20.0	09/18/13	0.00	< Up n
Strontium, dissolved	µg/l	4000	2.85	-6.3	↔	0.18	308.5	7.7	11	0	0	0		424.0	05/08/19	0.30	n	18.9	↑	0.02	1064.5	26.6	38	0	0	0		1320.0	09/15/16	0.00	> Up n	13.3	↑	0.01	455.6	11.4	41	0	0	0		559.0	07/18/22	0.00	> Up n
Fluoride, total as F	mg/l	2	2.78	27.6	↑	0.44	0.2	7.6	11	1	0	0		0.3	05/20/20	0.40	n	0.0	↔	0.22	0.2	11.3	38	12	0	0		0.4	12/05/13	0.00	> Up n	-5.6	↔	0.12	1.0	48.8	41	0	0	0		1.1	09/08/14	0.00	> Up n
Beryllium, dissolved	µg/l	4	2.18	NC		NC	0.2	4.2	11	11	0	0		0.5	06/10/14	NC		NC		NC	0.1	3.2	38	38	0	0		0.2	12/05/13	NC		NC		NC	0.1	3.4	41	41	0	0		0.2	12/02/13	NC	
Chloride, total as Cl	mg/l	250	2.10	-12.4	↓	0.03	8.8	3.5	11	0	0	0		11.4	06/05/13	0.04	< Up n	-94.7	↓	0.00	67.5	27.0	38	0	0	0		209.0	03/06/14	0.00	> Up n	3.6	↔	0.23	27.5	11.0	41	0	0	0		31.9	11/04/19	0.00	> Up n
Chemical Oxygen Demand	mg/l	--	1.90	NC		NC	9.1	NA	11	11	0	0		20.0	06/03/22	0.30	n	NC		NC	8.2	NA	38	38	0	0		20.0	07/16/22	0.17	n	NC		NC	6.5	NA	41	41	0	0		20.0	10/14/21	0.16	n
Lithium, dissolved	µg/l	83	1.89	-74.1	↓	0.02	16.8	20.2	11	0	0	0		28.7	06/08/16	0.47	n	-71.0	↓	0.00	2.0	2.4	38	12	0	0		4.8	09/15/16	0.00	< Up n	-1.5	↔	0.38	21.0	25.3	41	0	0	0		26.0	09/14/15	0.49	n
Silver, dissolved	µg/l	100	1.33	NC		NC	1.3	1.3	11	10	0	0		10.0	06/05/13	0.00	> Up n	NC		NC	0.5	0.5	38	38	0	0		10.0	09/30/13	NC		NC		NC	1.0	1.0	41	41	0	0		10.0	12/02/13	NC	
Ammonia, as N	mg/l	--	1.32	NC		NC	0.1	NA	11	6	0	0		0.2	05/20/20	0.02	< Up n	-60.3	↓	0.00	0.3	NA	38	12	0	0		1.1	02/02/20	0.01	> Up n	0.0	↔	0.39	0.1	NA	41	16	0	0		0.3	02/03/20	0.15	n
Vanadium, dissolved	µg/l	2.9	1.27	NC		NC	1.3	45.6	11	11	0	0		2.3	06/03/22	0.01	< Up n	NC		NC	1.4	47.5	38	38	0	0		2.3	10/14/22	0.00	< Up n	NC		NC	1.7	57.5	41	40	0	1	11/26/12	10.0	11/26/12	0.00	> Up n
Total Organic Carbon	mg/l	--	1.27	7.3	↔	0.20	1.3	NA	11	1	0	0		2.2	06/03/22	0.00	> Up n	8.4	↔	0.19	1.2	NA	38	0	0	0		4.4	07/16/22	0.00	> Up n	19.9	↑	0.00	0.8	NA	41	5	0	0		3.7	07/18/22	0.19	n
Magnesium, dissolved	mg/l	--	1.25	0.0	↔	0.47	18.0	NA	11	0	0	0		20.0	04/24/21	0.49	n	-25.5	↓	0.02	34.4	NA	38	0	0	0		48.4	05/13/15	0.01	> Up n	8.9	↔	0.06	13.9	NA	41	0	0	0		17.1	04/19/22	0.46	n
Copper, dissolved	µg/l	1000	1.25	NC		NC	1.2	0.1	11	11	0	0		4.0	06/05/13	0.00	< Up n	NC		NC	1.3	0.1	38	34	0	0		5.0	05/12/19	0.00	< Up n	NC		NC	1.8	0.2	41	35	0	0		5.0	02/11/19	0.00	< Up n
Specific Conductance, field	umhos/cm	--	1.10	1.4	↔	0.38	622.3	NA	11	0	0	0		651.0	04/24/21	0.50	n	-38.5	↓	0.00	1336.2	NA	38	0	0	0		1886.0	05/13/15	0.00	> Up n	0.6	↔	0.43	587.6	NA	41	0	0	0		953.0	07/18/22	0.48	n
Titanium, dissolved	µg/l	--	1.06	NC		NC	1.1	NA	10	9	0	0		2.4	06/03/22	0.03	> Up n	NC		NC	1.5	NA	36	36	0	0		5.0	08/25/20	0.25	n	NC		NC	1.6	NA	39	39	0	0		5.0	10/17/22	0.25	n
Total Dissolved Solids	mg/l	500	1.04	-1.6	↔	0.38	423.5	84.7	11	0	0	0		452.0	05/20/20	0.50	n	-44.9	↓	0.00	983.5	196.7	38	0	0	38	10/14/22	1520.0	09/15/16	0.01	> Up n	-0.6	↔	0.41	370.4	74.1	41	0	0	0		418.0	07/18/22	0.48	n
Chromium, dissolved	µg/l	100	1.03	NC		NC	0.9	0.9	11	11	0	0		2.0	06/05/13	NC		NC		NC	0.9	0.9	38	38	0	0		2.0	12/05/13	NC		NC		NC	1.0	1.0	41	41	0	0		2.0	12/02/13	NC	
Calcium, dissolved	mg/l	--	1.02	-3.5	↔	0.38	91.8	NA	11	0	0	0		109.0	04/24/21	0.50	n	-28.7	↓	0.01	203.2	NA	38	0	0	0		299.0	09/15/16	0.01	> Up n	-2.0	↔	0.36	81.3	NA	41	0	0	0		103.0	10/17/22	0.49	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	-2.9	↔	0.08	7.1	38.1	11	0	0	0		7.4	09/09/14	0.00	> Up n	2.1	↔	0.06	6.6	89.8	38	0	0	9	04/16/22	6.9	07/16/22	0.00	< Up n	-0.9	↔	0.30	6.7	81.1	41	0	0	5	01/24/22	7.0	12/07/15	0.20	n
Sulfate, as SO4	mg/l	250	0.98	-12.2	↓	0.02	135.0	54.0	11	0	0	0		152.0	06/08/16	0.50	n	-50.4	↓	0.00	440.4	176.2	38	0	0	37	10/14/22	702.0	09/15/16	0.04	> Up n	-18.8	↓	0.00	134.5	53.8	41	0	0	0		155.0	09/18/13	0.47	n
Lead, dissolved	µg/l	5	0.97	NC		NC	0.2	4.3	11	11	0	0		1.0	06/05/13	NC		NC		NC	0.2	4.7	38	38	0	0		1.0	12/05/13	NC		NC		NC	0.3	6.4	41	41	0	0		1.0	10/17/22	NC	
Mercury, dissolved	µg/l	2	0.96	NC		NC	0.2	11.2	11	10	0	0		0.7	06/03/22	0.01	< Up n	NC		NC	0.3	14.6	38	38	0	0		0.7	10/14/22	0.00	> Up n	NC		NC	0.3	13.4	41	41	0	0		0.7	10/17/22	0.00	< Up n
Boron, dissolved	µg/l	6000	0.82	-13.8	↓	0.01	1151.4	19.2	11	0	0	0		1330.0	06/10/14	0.50	n	43.5	↑	0.01	72.3	1.2	38	14	0	0		100.0	10/14/22	0.00	< Up n	-7.6	↔	0.09	456.6	7.6	41	0	0	0		581.0	09/08/14	0.50	n
Sodium, dissolved	mg/l	--	0.64	-22.6	↓	0.00	9.8	NA	11	0	0	0		10.9	05/11/15	0.13	n	-89.6	↓	0.00	44.1	NA	38	0	0	0		92.4	09/17/15	0.01	> Up n	3.6	↔	0.09	13.7	NA	41	0	0	0		15.9	01/25/21	0.41	n
Barium, dissolved	µg/l	2000	0.32	-15.0	↓	0.06	75.8	3.8	11	0	0	0		137.0	05/08/19	0.50	n	-41.7	↓	0.00	24.0	1.2	38	0	0	0		43.0	03/06/14	0.00	< Up n	-8.3	↔	0.05	29.1	1.5	41	0	0	0		35.8	10/17/22	0.49	n
Selenium, dissolved	µg/l	50	0.25	NC		NC	0.3	0.6	11	11	0	0		0.8	06/05/13	0.00	< Up n	NC		NC	0.5	1.0	38	32	0	0		5.0	08/11/19	0.05	< Up p	NC		NC	0.9	1.8	41	41	0	0		5.0	04/19/22	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	NC		NC	0.4	3.5	38	32	0	0		5.4	06/02/14	0.00	< Up n	NC		NC	0.0	0.5	41	39	0	0		1.2	03/03/14	0.00	< Up n

Brunner Island - Basin 5 - Statistics Summary

4th Quarter 2022

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Down MW-8-3A Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	mg/l	0.3	66.19	-2.9	↔	0.45	5.8	1940.0	41	0	0	40	10/17/22	11.0	06/06/17	0.00	> Up n
Arsenic, dissolved	µg/l	10	58.32	23.3	↑	0.20	10.5	105.1	41	1	0	25	10/17/22	19.6	10/14/21	0.00	> Up n
Manganese, dissolved	µg/l	300	23.04	27.3	↑	0.03	6442.0	2147.3	41	0	0	41	10/17/22	9120.0	10/14/21	0.00	> Up n
Molybdenum, dissolved	µg/l	40	17.06	3.6	↔	0.35	64.8	162.1	41	0	0	37	10/17/22	94.6	11/04/19	0.00	> Up n
Aluminum, dissolved	µg/l	200	8.55	NC		NC	59.9	29.9	41	41	0	0		100.0	10/17/22	NC	
Nickel, dissolved	µg/l	100	6.16	NC		NC	3.1	3.1	41	28	0	0		11.7	11/04/19	0.37	n
Potassium, dissolved	mg/l	--	5.16	23.0	↑	0.00	2.8	NA	41	0	0	0		3.4	07/18/22	0.46	n
Cadmium, dissolved	µg/l	5	4.89	NC		NC	0.1	2.8	41	41	0	0		1.0	08/24/20	NC	
Zinc, dissolved	µg/l	2000	4.19	NC		NC	5.4	0.3	41	33	0	0		20.0	12/12/13	0.07	n
Strontium, dissolved	µg/l	4000	2.85	46.2	↑	0.00	760.8	19.0	41	0	0	0		1010.0	04/18/22	0.00	> Up n
Fluoride, total as F	mg/l	2	2.78	-9.8	↔	0.10	0.4	21.3	41	0	0	0		0.7	02/03/20	0.00	> Up n
Beryllium, dissolved	µg/l	4	2.18	NC		NC	0.1	3.6	41	41	0	0		0.5	08/22/18	NC	
Chloride, total as Cl	mg/l	250	2.10	583.7	↑	0.00	31.6	12.7	41	1	0	0		140.0	01/24/22	0.03	> Up n
Chemical Oxygen Demand	mg/l	--	1.90	NC		NC	2.5	NA	41	40	0	0		22.1	07/18/22	0.49	n
Lithium, dissolved	µg/l	83	1.89	-6.6	↔	0.24	16.1	19.4	41	0	0	0		22.0	10/14/21	0.49	n
Silver, dissolved	µg/l	100	1.33	NC		NC	1.0	1.0	41	41	0	0		10.0	12/12/13	NC	
Ammonia, as N	mg/l	--	1.32	5.6	↔	0.32	0.2	NA	41	6	0	0		0.4	08/24/20	0.00	> Up n
Vanadium, dissolved	µg/l	2.9	1.27	NC		NC	1.4	49.8	41	41	0	0		2.3	10/17/22	0.00	< Up n
Total Organic Carbon	mg/l	--	1.27	5.1	↔	0.36	1.7	NA	41	0	0	0		4.2	07/18/22	0.00	> Up n
Magnesium, dissolved	mg/l	--	1.25	37.5	↑	0.00	30.2	NA	41	0	0	0		39.3	01/24/22	0.37	n
Copper, dissolved	µg/l	1000	1.25	NC		NC	1.4	0.1	41	36	0	0		4.0	12/12/13	0.00	< Up n
Specific Conductance, field	umhos/cm	--	1.10	56.9	↑	0.00	923.1	NA	41	0	0	0		1315.0	07/18/22	0.42	n
Titanium, dissolved	µg/l	--	1.06	NC		NC	2.2	NA	39	39	0	0		5.0	10/17/22	0.25	n
Total Dissolved Solids	mg/l	500	1.04	48.6	↑	0.00	673.9	134.8	41	0	0	41	10/17/22	886.0	07/18/22	0.50	n
Chromium, dissolved	µg/l	100	1.03	NC		NC	0.9	0.9	41	41	0	0		2.0	12/12/13	NC	
Calcium, dissolved	mg/l	--	1.02	46.7	↑	0.00	146.4	NA	41	0	0	0		198.0	04/26/21	0.48	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	-2.6	↔	0.03	6.4	106.8	41	0	0	25	10/17/22	6.8	04/18/22	0.00	< Up n
Sulfate, as SO4	mg/l	250	0.98	22.2	↑	0.01	249.0	99.6	41	0	0	19	07/18/22	331.0	05/06/19	0.49	n
Lead, dissolved	µg/l	5	0.97	NC		NC	0.3	5.5	41	41	0	0		1.0	12/12/13	NC	
Mercury, dissolved	µg/l	2	0.96	NC		NC	0.3	13.6	41	41	0	0		0.7	10/17/22	0.00	> Up n
Boron, dissolved	µg/l	6000	0.82	1.0	↔	0.42	409.4	6.8	41	0	0	0		472.0	11/06/20	0.50	n
Sodium, dissolved	mg/l	--	0.64	162.5	↑	0.00	10.5	NA	41	0	0	0		31.1	04/18/22	0.00	< Up n
Barium, dissolved	µg/l	2000	0.32	16.3	↑	0.15	46.0	2.3	41	0	0	0		69.0	11/06/20	0.48	n
Selenium, dissolved	µg/l	50	0.25	NC		NC	0.5	1.0	41	41	0	0		5.0	08/12/19	0.00	< Up n
Nitrate, as N	mg/l	10	0.10	NC		NC	0.1	0.9	41	38	0	0		2.4	07/18/22	0.00	< Up n

PARAMETER	Down MW-8-3B Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	-28.5	↓	0.13	0.4	122.7	41	4	0	23	01/24/22	0.9	09/19/16	0.00	> Up n
Arsenic, dissolved	-29.1	↓	0.04	5.9	59.4	41	0	0	0		9.8	12/03/12	0.00	> Up n
Manganese, dissolved	6.3	↔	0.39	1312.9	437.6	41	0	0	40	10/17/22	2000.0	07/18/22	0.00	> Up n
Molybdenum, dissolved	-11.7	↓	0.02	144.5	361.3	41	0	0	41	10/17/22	170.0	11/04/19	0.00	> Up n
Aluminum, dissolved	NC		NC	56.1	28.1	41	41	0	0		100.0	10/17/22	NC	
Nickel, dissolved	NC		NC	1.0	1.0	41	36	0	0		9.8	11/04/19	0.00	< Up n
Potassium, dissolved	4.5	↔	0.10	1.6	NA	41	0	0	0		2.0	07/18/22	0.46	n
Cadmium, dissolved	NC		NC	0.4	7.8	41	41	0	0		1.0	10/17/22	NC	
Zinc, dissolved	NC		NC	5.7	0.3	41	34	0	0		20.0	12/12/13	0.05	< Up n
Strontium, dissolved	14.9	↑	0.00	362.8	9.1	41	0	0	0		443.0	07/18/22	0.00	> Up n
Fluoride, total as F	-13.3	↓	0.03	0.5	24.5	41	2	0	0		0.9	05/13/15	0.00	> Up n
Beryllium, dissolved	NC		NC	0.1	3.4	41	41	0	0		0.2	12/12/13	NC	
Chloride, total as Cl	1301.7	↑	0.00	16.1	6.4	41	0	0	0		92.4	11/06/20	0.00	> Up n
Chemical Oxygen Demand	NC		NC	5.7	NA	41	41	0	0		20.0	01/25/21	0.16	n
Lithium, dissolved	-9.1	↔	0.02	25.7	30.9	41	0	0	0		35.8	01/24/22	0.48	n
Silver, dissolved	NC		NC	1.6	1.6	41	40	0	0		34.3	09/21/15	0.08	n
Ammonia, as N	NC		NC	0.0	NA	41	26	0	0		0.3	02/03/20	0.00	< Up n
Vanadium, dissolved	NC		NC	1.5	53.1	41	35	0	0		2.3	10/17/22	0.00	> Up n
Total Organic Carbon	21.7	↑	0.03	0.9	NA	41	3	0	0		2.8	07/18/22	0.22	n
Magnesium, dissolved	21.2	↑	0.00	23.4	NA	41	0	0	0		30.5	01/24/22	0.48	n
Copper, dissolved	NC		NC	0.7	0.1	41	36	0	0		6.1	03/07/17	0.00	< Up n
Specific Conductance, field	23.6	↑	0.00	758.8	NA	41	0	0	0		1005.0	10/17/22	0.50	n
Titanium, dissolved	NC		NC	2.0	NA	39	39	0	0		5.0	10/17/22	0.25	n
Total Dissolved Solids	21.0	↑	0.00	506.7	101.3	41	0	0	21	10/17/22	613.0	10/17/22	0.49	n
Chromium, dissolved	NC		NC	0.9	0.9	41	41	0	0		2.0	12/12/13	NC	
Calcium, dissolved	24.7	↑	0.00	124.6	NA	41	0	0	0		169.0	10/17/22	0.46	n
Antimony, dissolved	NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	-1.7	↔	0.10	6.9	63.4	41	0	0	0		7.2	11/08/18	0.00	> Up n
Sulfate, as SO4	13.9	↑	0.02	150.2	60.1	41	0	0	1	05/13/15	281.0	05/13/15	0.48	n
Lead, dissolved	NC		NC	0.3	5.6	41	41	0	0		1.0	11/04/19	NC	
Mercury, dissolved	NC		NC	0.3	13.3	41	41	0	0		0.7	10/17/22	0.00	< Up n
Boron, dissolved	-1.8	↔	0.28	345.5	5.8	41	0	0	0		406.0	11/06/20	0.48	n
Sodium, dissolved	20.7	↑	0.00	6.6	NA	41	0	0	0		9.3	07/18/22	0.00	< Up n
Barium, dissolved	29.0	↑	0.00	54.8	2.7	41	0	0	0		76.7	11/06/20	0.50	n
Selenium, dissolved	NC		NC	0.5	0.9	41	41	0	0		5.0	08/12/19	0.00	< Up n
Nitrate, as N	NC		NC	0.1	1.3	41	35	0	0		2.2	07/18/22	0.00	< Up n

PARAMETER	Down MW-8-4 Trend (%)		p	x̄	x̄ (%)	n	ND	J	>		Max		p (comparison	
Iron, dissolved	NC		NC	0.0	1.2	41	40	0	0		0.1	04/18/22	0.00	< Up n
Arsenic, dissolved	NC		NC	0.8	8.0	41	30	0	0		3.8	09/16/14	0.27	n
Manganese, dissolved	-66.0	↓	0.00	14403.2	4801.1	41	0	0	41	10/14/22	42600.0	12/06/12	0.00	> Up n
Molybdenum, dissolved	NC		NC	0.6	1.6	41	36	0	0		5.1	07/23/21	0.00	< Up n
Aluminum, dissolved	-86.0	↓	0.00	1332.3	666.2	41	1	0	21	07/19/22	11900.0	12/06/12	0.00	> Up n
Nickel, dissolved	-60.9	↓	0.00	116.9	116.9	41	0	0	18	07/19/22	330.0	12/06/12	0.00	> Up n
Potassium, dissolved	-36.3	↓	0.00	2.0	NA	41	0	0	0		4.4	12/06/12	0.40	n
Cadmium, dissolved	-61.9	↓	0.00	2.4	48.5	41	4	0	4	09/22/16	8.2	12/06/12	0.00	> Up n
Zinc, dissolved	-81.6	↓	0.00	172.3	8.6	41	0	0	0		678.0	12/06/12	0.00	> Up n
Strontium, dissolved	-49.5	↓	0.00	402.3	10.1	41	0	0	0		751.0	12/06/12	0.00	> Up n
Fluoride, total as F	-17.3	↓	0.29	0.4	20.0	41	6	0	0		1.3	12/06/12	0.00	> Up n
Beryllium, dissolved	NC		NC	1.5	37.2	41	22	0	5	09/22/16	8.4	12/06/12	0.00	> Up n
Chloride, total as Cl	-43.5	↓	0.00	34.3	13.7	41	0	0	0		82.5	09/24/15	0.00	> Up n
Chemical Oxygen Demand	NC		NC	2.9	NA	41	39	0	0		21.2	07/23/21	0.25	n
Lithium, dissolved	-53.2	↓	0.00	18.9	22.8	41	1	0	0		46.3	12/06/12	0.41	n
Silver, dissolved	NC		NC	1.2	1.2	41	41	0	0		10.0	12/12/13	NC	
Ammonia, as N	NC		NC	0.0	NA	41	31	0	0		0.3	05/20/20	0.00	< Up n
Vanadium, dissolved	NC		NC	1.6	56.5	41	41	0	1	06/16/13	10.0	06/16/13	0.00	> Up n
Total Organic Carbon	9.8	↔	0.27	0.8	NA	41	5	0	0		2.6	07/19/22	0.37	n
Magnesium, dissolved	-43.8	↓	0.00	49.9	NA	41	0	0	0		67.4	03/20/13	0.00	> Up n
Copper, dissolved	NC		NC	5.9	0.6	41	21	0	0		20.0	09/19/13	0.00	> Up n
Specific Conductance, field	-36.9	↓	0.00	1148.2	NA	41	0	0	0		1660.0	12/06/12	0.20	n
Titanium, dissolved	NC		NC	1.3	NA	39	35	0	0		5.6	01/22/22	0.00	> Up n
Total Dissolved Solids	-41.1	↓	0.00	930.0	186.0	41	0	0	41	10/14/22	1380.0	12/06/12	0.05	n
Chromium, dissolved	NC		NC	0.9	0.9	41	41	0	0		2.0	12/12/13	NC	
Calcium, dissolved	-38.0	↓	0.00	142.2	NA	41	0	0	0		207.0	12/06/12	0.48	n
Antimony, dissolved	NC		NC	NC	NC	0	0	0	0		NC		NC	
pH, field	7.7	↔	0.01	5.3	216.2	41	0	0	41	10/14/22	6.4	04/18/22	0.00	< Up n
Sulfate, as SO4	-47.7	↓	0.00	539.0	215.6	41	0	0	41	10/14/22	902.0	12/06/12	0.00	> Up n
Lead, dissolved	NC		NC	0.3	6.1	41	41	0	0		1.0	12/12/13	NC	
Mercury, dissolved	NC		NC	0.3	13.2	41	41	0	0		0.7	10/14/22	0.00	< Up n
Boron, dissolved	-28.0	↓	0.00	307.2	5.1	41	0	0	0		504.0	12/06/12	0.49	n
Sodium, dissolved	-38.3	↓	0.00	22.6	NA	41	0	0	0		45.6	09/24/15	0.49	n
Barium, dissolved	1.9	↔	0.38	14.1	0.7	41	0	0	0		18.7	01/22/22	0.00	< Up n
Selenium, dissolved	NC		NC	1.2	2.3	41	24	0	0		5.0	07/19/22	0.05	< Up p
Nitrate, as N	NC		NC	0.7	6.5	41	26	0	1	09/16/14	12.2	09/16/14	0.00	< Up n

Brunner Island - Basin 5 - Statistics Summary

4th Quarter 2022

PARAMETER	UNITS	STD.	UPGRADIENT VS DOWNGRADIENT	Down MW-8-5A																Down MW-8-5B													
				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	66.19	NC		NC	0.0	5.8	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
Arsenic, dissolved	µg/l	10	58.32	-16.4	↓	0.00	123.7	1236.7	41	0	0	41	10/14/22	145.0	11/28/12	0.00	> Up n	-12.2	↓	0.01	259.1	2590.7	41	0	0	41	10/14/22	372.0	07/23/21	0.00	> Up n
Manganese, dissolved	µg/l	300	23.04	22.2	↑	0.00	401.8	133.9	41	0	0	41	10/14/22	496.0	01/22/22	0.00	> Up n	-16.0	↓	0.01	421.6	140.5	41	0	0	41	10/14/22	532.0	09/12/13	0.00	> Up n
Molybdenum, dissolved	µg/l	40	17.06	-8.0	↔	0.01	388.4	971.0	41	0	0	41	10/14/22	453.0	08/25/20	0.00	> Up n	-5.1	↔	0.19	345.8	864.6	41	0	0	41	10/14/22	412.0	08/25/20	0.00	> Up n
Aluminum, dissolved	µg/l	200	8.55	NC		NC	61.6	30.8	41	41	0	0		100.0	10/14/22	NC		NC		NC	65.4	32.7	41	41	0	0		100.0	10/14/22	NC	
Nickel, dissolved	µg/l	100	6.16	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
Potassium, dissolved	mg/l	--	5.16	14.3	↑	0.00	4.1	NA	41	0	0	0		4.7	04/15/22	0.00	> Up n	17.7	↑	0.00	3.9	NA	41	0	0	0		4.7	10/14/22	0.00	> Up n
Cadmium, dissolved	µg/l	5	4.89	NC		NC	0.5	9.2	41	30	0	0		1.0	10/14/22	0.00	> Up n	NC		NC	0.5	9.1	41	34	0	0		1.0	10/14/22	0.21	n
Zinc, dissolved	µg/l	2000	4.19	NC		NC	5.3	0.3	41	36	0	0		20.0	09/12/13	0.01	< Up n	NC		NC	5.3	0.3	41	38	0	0		20.0	09/12/13	0.00	< Up n
Strontium, dissolved	µg/l	4000	2.85	22.6	↑	0.00	713.8	17.8	41	0	0	0		811.0	04/15/22	0.00	> Up n	16.8	↑	0.00	839.9	21.0	41	0	0	0		991.0	11/05/20	0.00	> Up n
Fluoride, total as F	mg/l	2	2.78	-8.0	↔	0.07	0.9	46.3	41	0	0	0		1.1	11/28/12	0.00	> Up n	-15.5	↓	0.01	0.7	36.2	41	0	0	0		0.9	11/28/12	0.00	> Up n
Beryllium, dissolved	µg/l	4	2.18	NC		NC	0.1	3.6	41	41	0	0		0.5	09/15/14	NC		NC		NC	0.1	3.4	41	41	0	0		0.2	12/02/13	NC	
Chloride, total as Cl	mg/l	250	2.10	139.1	↑	0.00	20.9	8.3	41	0	0	0		33.0	02/13/19	0.00	> Up n	90.8	↑	0.00	15.5	6.2	41	0	0	0		24.0	08/15/18	0.01	> Up n
Chemical Oxygen Demand	mg/l	--	1.90	NC		NC	4.3	NA	41	41	0	0		20.0	10/15/21	0.16	n	NC		NC	4.5	NA	41	41	0	0		20.0	07/23/21	0.16	n
Lithium, dissolved	µg/l	83	1.89	7.3	↔	0.11	192.4	231.8	41	0	0	41	10/14/22	260.0	01/22/22	0.00	> Up n	2.4	↔	0.35	152.7	183.9	41	0	0	41	10/14/22	217.0	10/15/21	0.00	> Up n
Silver, dissolved	µg/l	100	1.33	NC		NC	1.0	1.0	41	41	0	0		10.0	12/02/13	NC		NC		NC	0.8	0.8	41	41	0	0		10.0	12/02/13	NC	
Ammonia, as N	mg/l	--	1.32	-5.5	↔	0.28	0.4	NA	41	0	0	0		0.6	11/06/19	0.00	> Up n	-23.4	↓	0.01	0.3	NA	41	2	0	0		1.2	08/25/20	0.00	> Up n
Vanadium, dissolved	µg/l	2.9	1.27	NC		NC	3.5	119.3	41	32	0	16	02/13/19	10.0	03/13/13	0.05	> Up n	NC		NC	1.7	57.7	41	38	0	1	03/13/13	10.0	03/13/13	0.00	> Up n
Total Organic Carbon	mg/l	--	1.27	27.9	↑	0.01	0.8	NA	41	8	0	0		4.7	07/16/22	0.06	n	24.9	↑	0.03	0.7	NA	41	8	0	0		4.0	07/16/22	0.03	> Up n
Magnesium, dissolved	mg/l	--	1.25	9.3	↔	0.00	37.5	NA	41	0	0	0		42.8	01/22/22	0.00	> Up n	8.9	↔	0.01	31.2	NA	41	0	0	0		36.1	11/05/20	0.47	n
Copper, dissolved	µg/l	1000	1.25	NC		NC	1.5	0.2	41	31	0	0		10.4	03/07/17	0.07	n	NC		NC	2.0	0.2	41	36	0	0		5.0	05/07/19	0.00	> Up n
Specific Conductance, field	umhos/cm	--	1.10	19.8	↑	0.00	1032.9	NA	41	0	0	0		1143.0	01/22/22	0.49	n	16.3	↑	0.00	942.8	NA	41	0	0	0		1075.0	07/23/21	0.50	n
Titanium, dissolved	µg/l	--	1.06	NC		NC	1.8	NA	39	39	0	0		5.0	04/15/22	0.25	n	NC		NC	1.8	NA	39	39	0	0		5.0	01/22/22	0.25	n
Total Dissolved Solids	mg/l	500	1.04	14.6	↑	0.00	745.5	149.1	41	0	0	41	10/14/22	828.0	09/12/17	0.49	n	10.2	↑	0.00	670.2	134.0	41	0	0	41	10/14/22	754.0	07/23/21	0.49	n
Chromium, dissolved	µg/l	100	1.03	NC		NC	1.0	1.0	41	39	0	0		2.0	12/02/13	0.00	> Up n	NC		NC	1.0	1.0	41	41	0	0		2.0	12/02/13	NC	
Calcium, dissolved	mg/l	--	1.02	17.4	↑	0.00	166.4	NA	41	0	0	0		204.0	10/14/22	0.47	n	15.3	↑	0.00	154.3	NA	41	0	0	0		193.0	07/23/21	0.46	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	
pH, field	s.u.	6.5-8.5	0.99	-5.1	↔	0.00	7.0	51.6	41	0	0	1	02/13/19	7.4	12/07/15	0.00	> Up n	-4.6	↔	0.00	7.1	37.0	41	0	0	0		7.6	12/02/13	0.00	> Up n
Sulfate, as SO4	mg/l	250	0.98	14.6	↑	0.00	299.7	119.9	41	0	0	41	10/14/22	340.0	05/11/15	0.49	n	9.9	↔	0.02	267.8	107.1	41	0	0	30	10/14/22	325.0	07/23/21	0.48	n
Lead, dissolved	µg/l	5	0.97	NC		NC	0.3	5.3	41	41	0	0		1.0	12/02/13	NC		NC		NC	0.3	6.4	41	41	0	0		1.0	12/02/13	NC	
Mercury, dissolved	µg/l	2	0.96	NC		NC	0.3	13.9	41	41	0	0		0.7	10/14/22	0.00	> Up n	NC		NC	0.3	14.3	41	28	0	0		0.7	10/14/22	0.00	> Up n
Boron, dissolved	µg/l	6000	0.82	-5.9	↔	0.05	868.2	14.5	41	0	0	0		965.0	04/15/22	0.49	n	-9.8	↔	0.01	829.9	13.8	41	0	0	0		963.0	10/14/22	0.49	n
Sodium, dissolved	mg/l	--	0.64	91.6	↑	0.00	9.4	NA	41	0	0	0		13.6	07/16/22	0.00	< Up n	50.6	↑	0.00	8.4	NA	41	0	0	0		11.5	10/14/22	0.00	< Up n
Barium, dissolved	µg/l	2000	0.32	2.6	↔	0.23	43.9	2.2	41	0	0	0		50.0	05/11/15	0.48	n	-1.8	↔	0.31	67.6	3.4	41	0	0	0		80.6	12/04/14	0.50	n
Selenium, dissolved	µg/l	50	0.25	NC		NC	0.4	0.7	41	41	0	0		0.8	12/02/13	0.00	< Up n	NC		NC	0.4	0.7	41	41	0	0		0.8	12/02/13	0.00	< Up n
Nitrate, as N	mg/l	10	0.10	NC		NC	0.0	0.3	41	40	0	0		0.9	06/14/16	0.00	< Up n	NC		NC	0.1	0.8	41	41	0	0		0.5	07/16/22	0.00	< Up n

Notes:

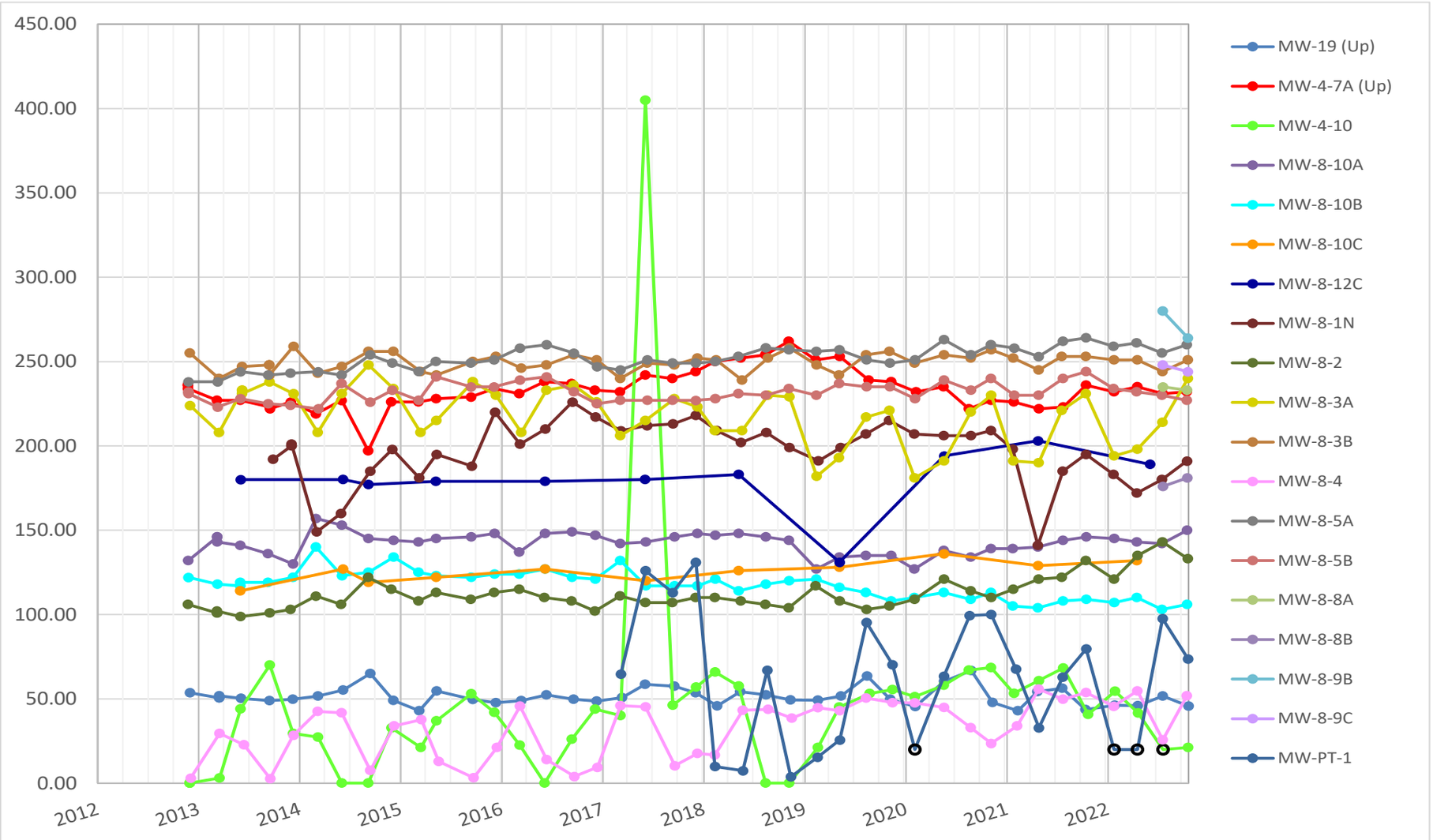
1. Upgradient vs downgradient represents the ratio of average concentration in all downgradient wells to average concentration of all upgradient wells (i.e. how many times greater is the concentration in downgradient v
2. Rows are sorted according to "Upgradient vs. Downgradient" ratio. Parameters with 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 2022

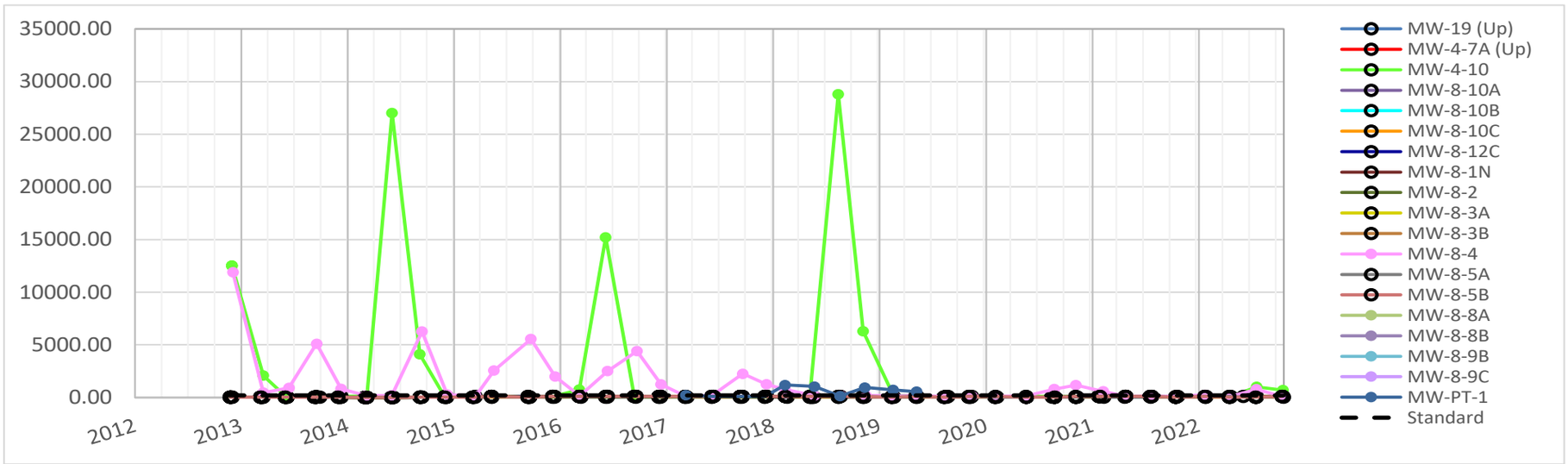
Alkalinity, total as CaCO3 [mg/l]

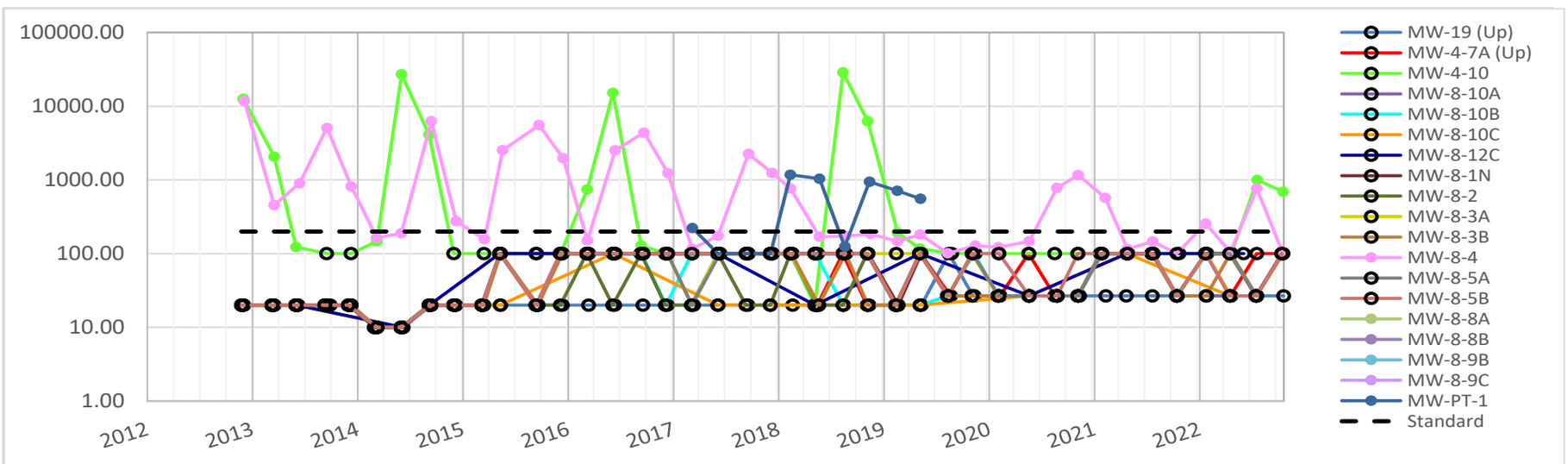


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

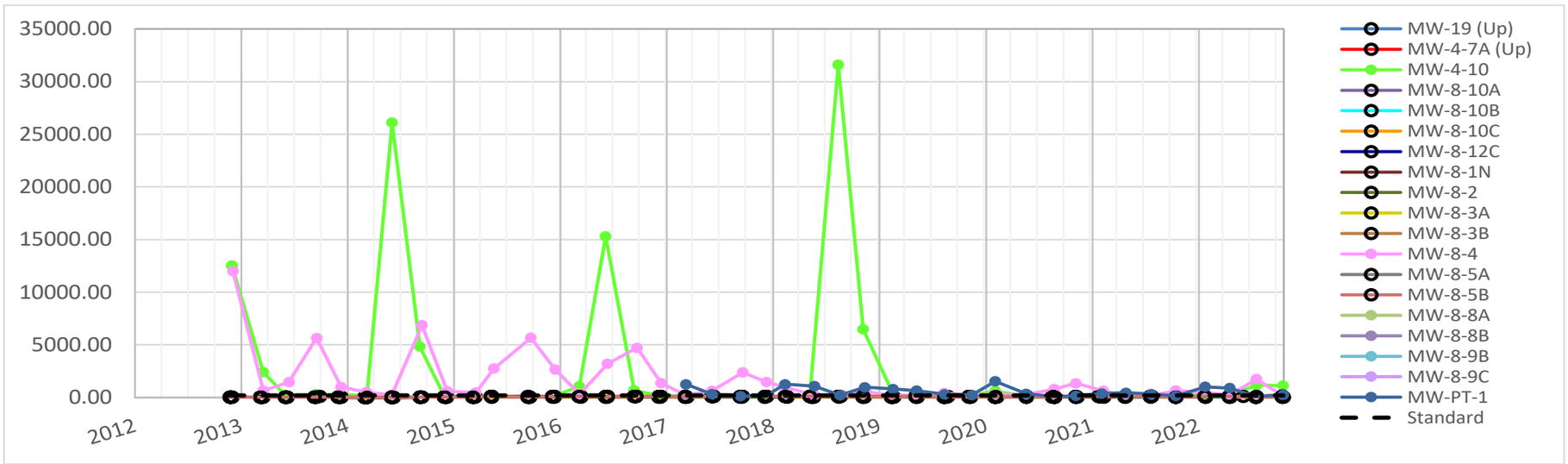
Aluminum, dissolved [µg/l]

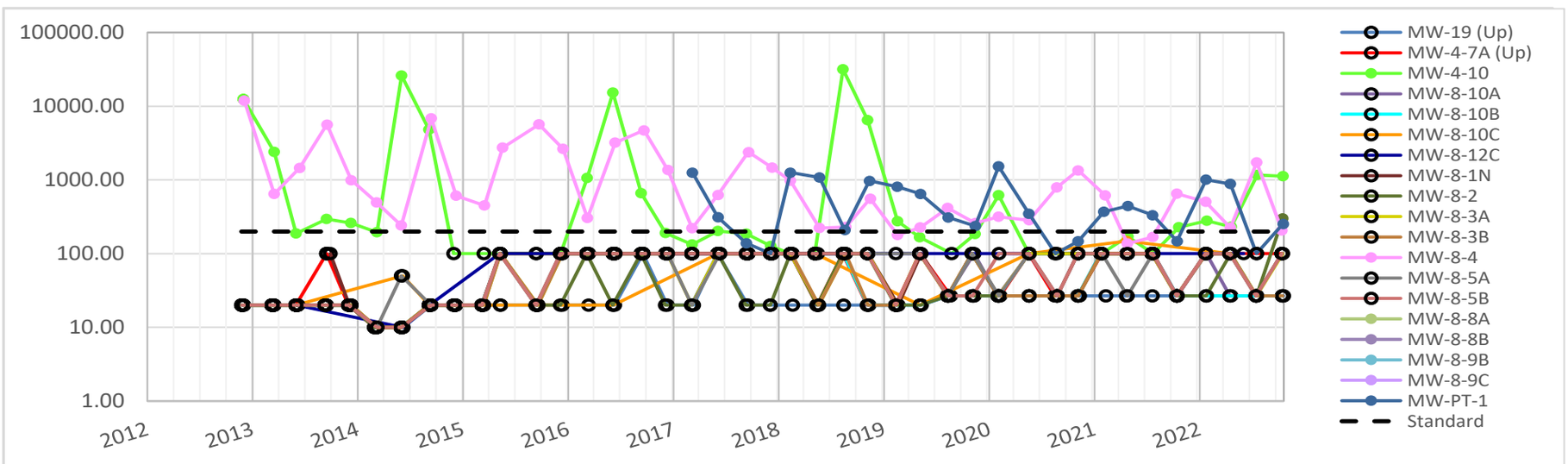




Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Aluminum, total [µg/l]

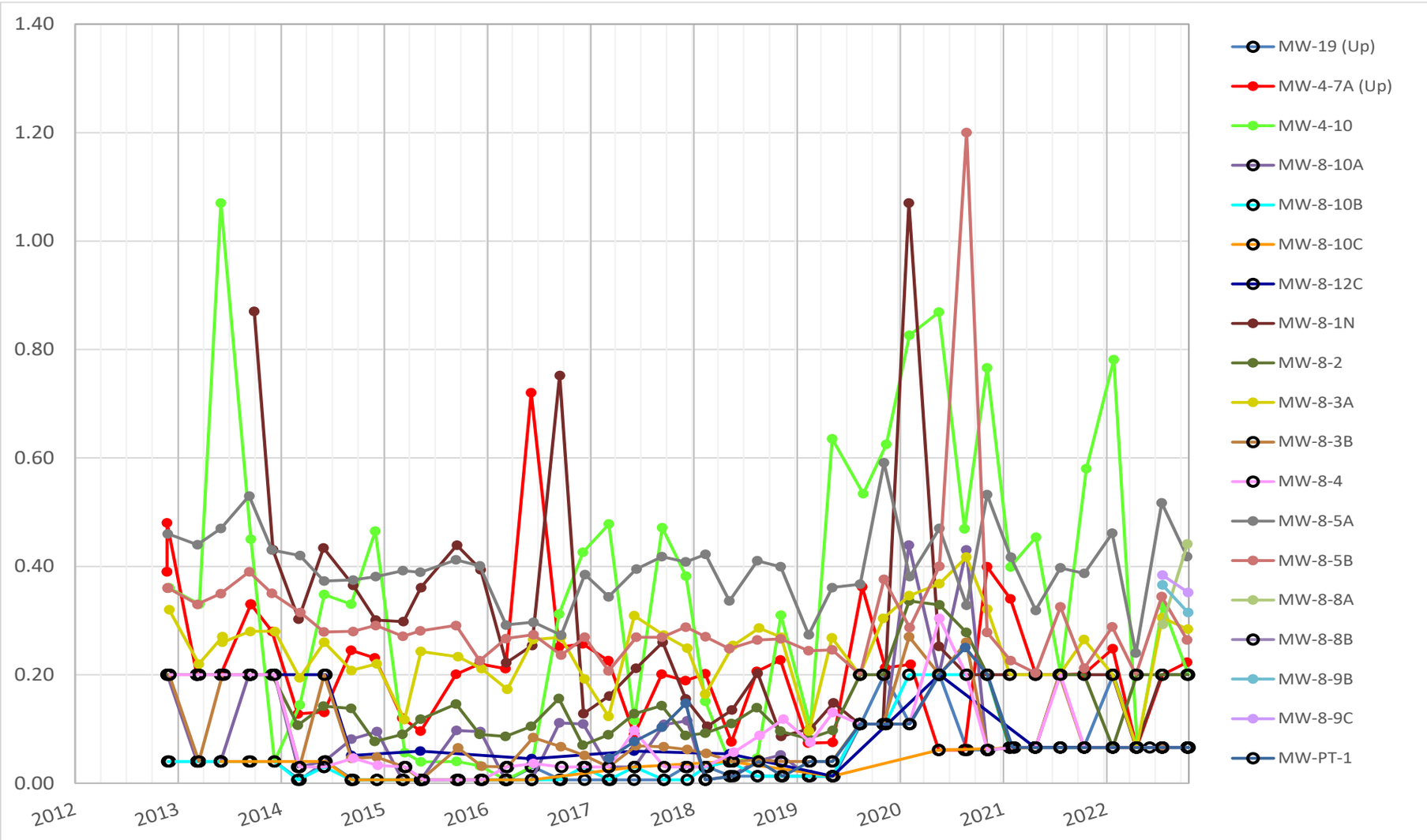




Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

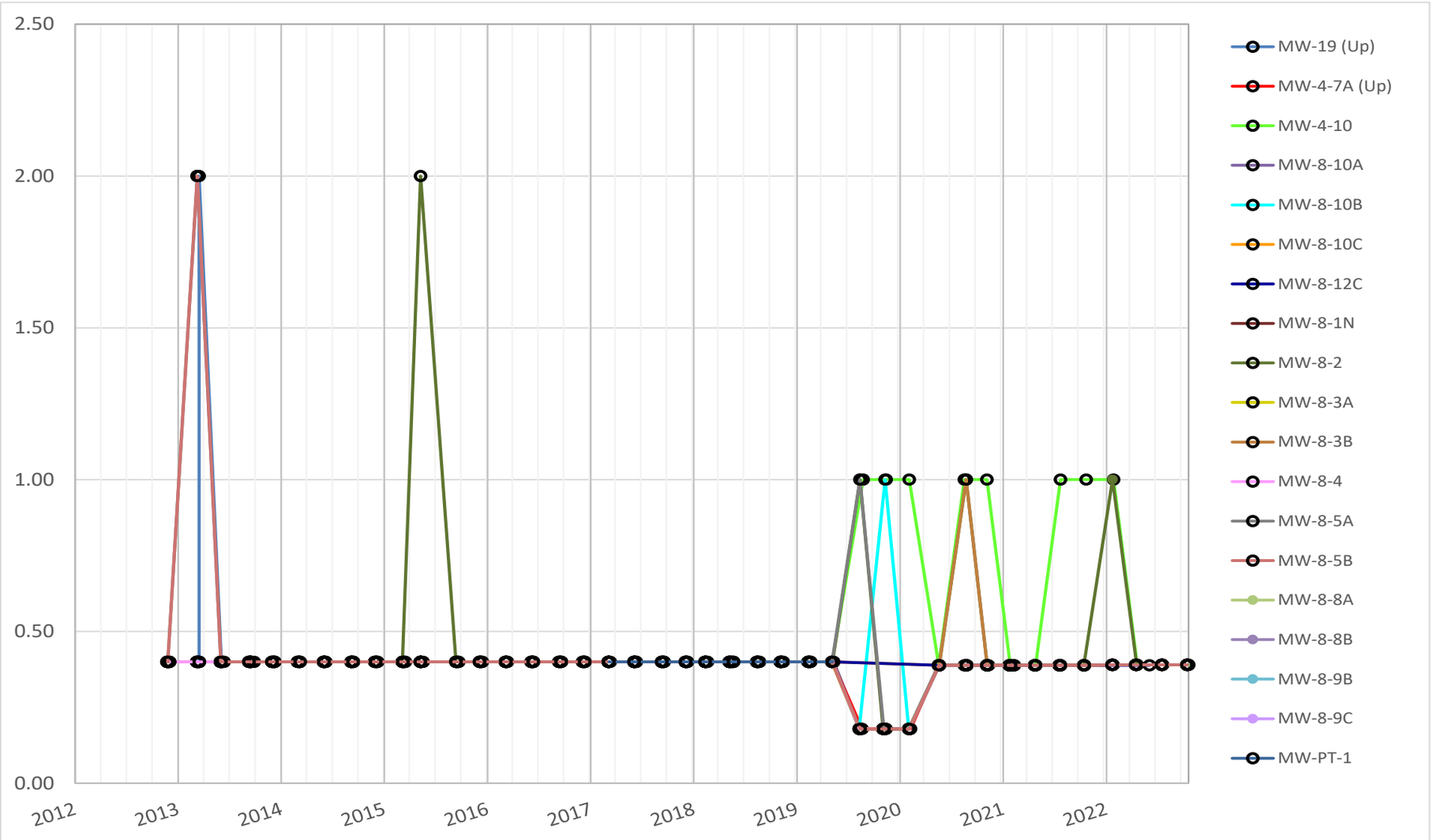
Ammonia, as N [mg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Antimony, dissolved [µg/l]

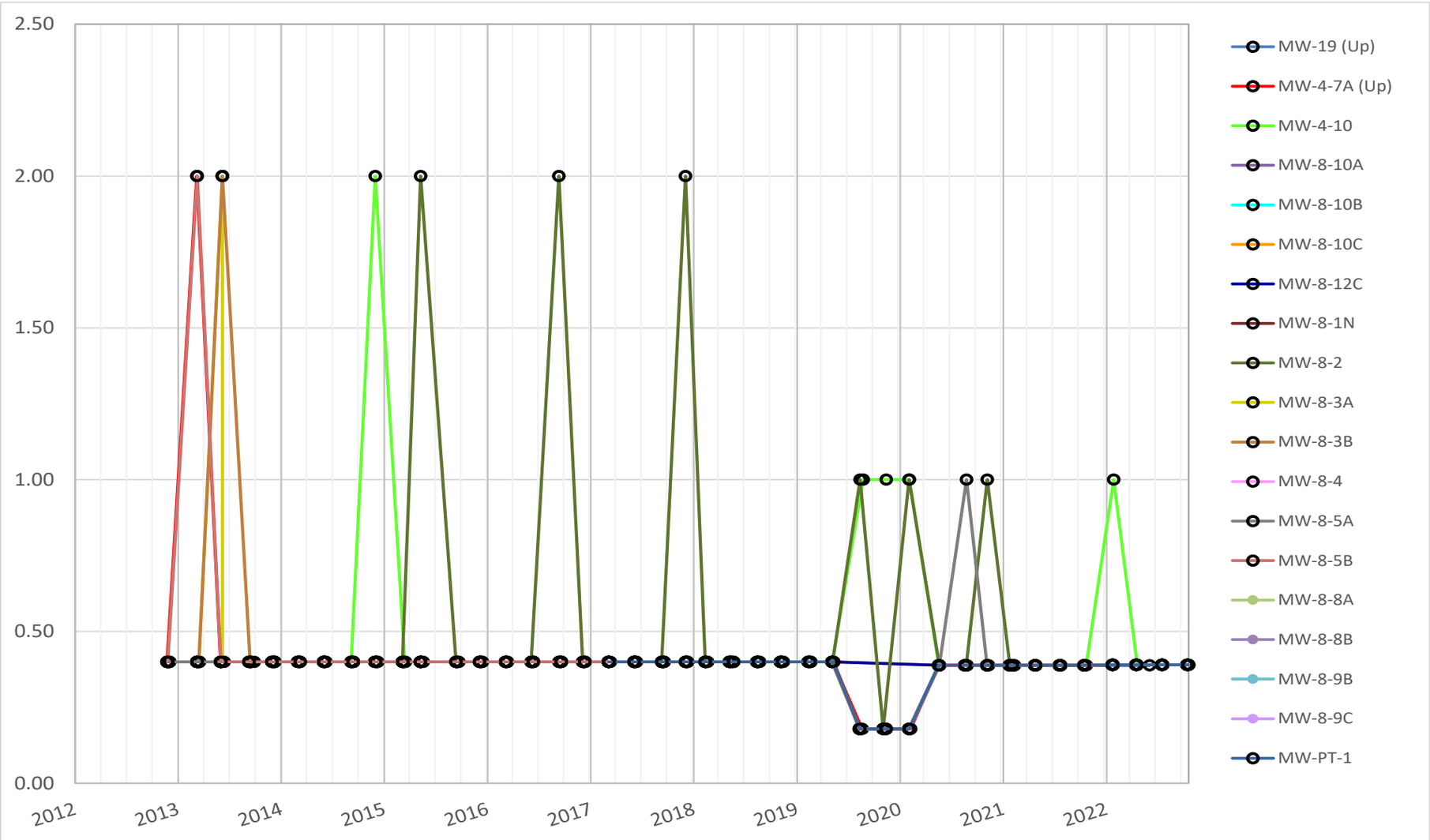


NOTE: Data does not exceed standard of 6 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

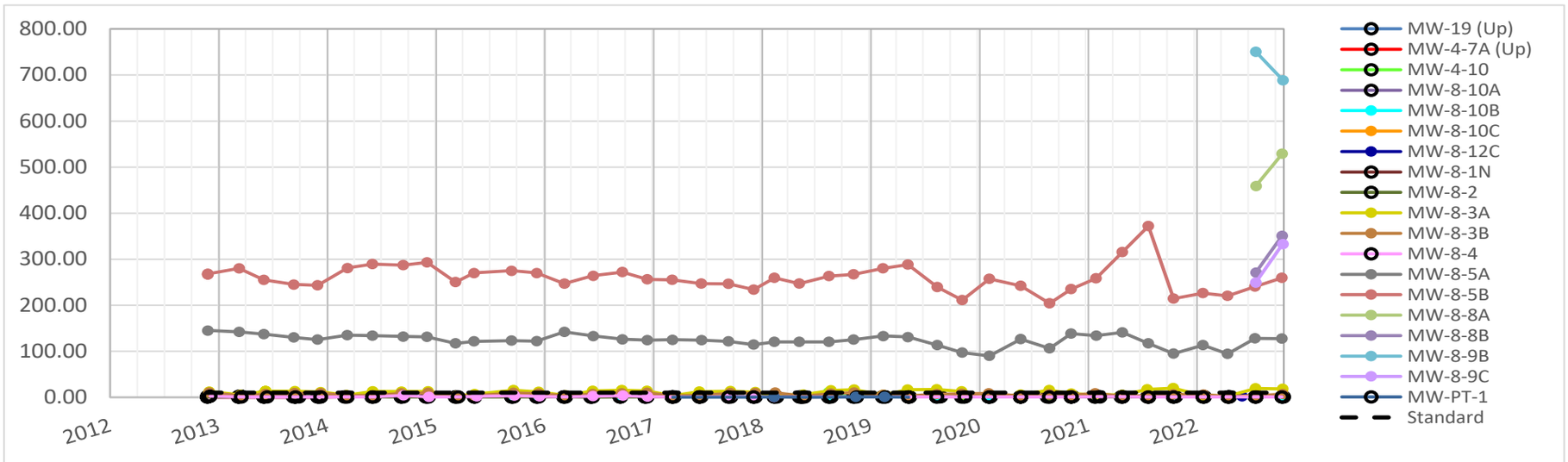
Antimony, total [µg/l]

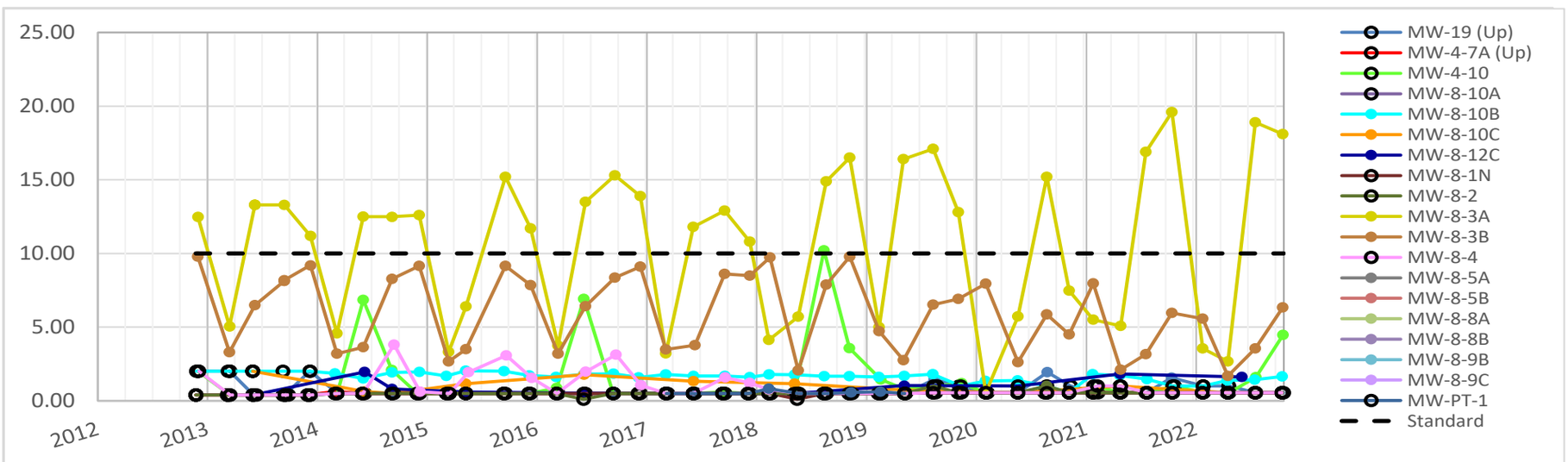


NOTE: Data does not exceed standard of 6 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

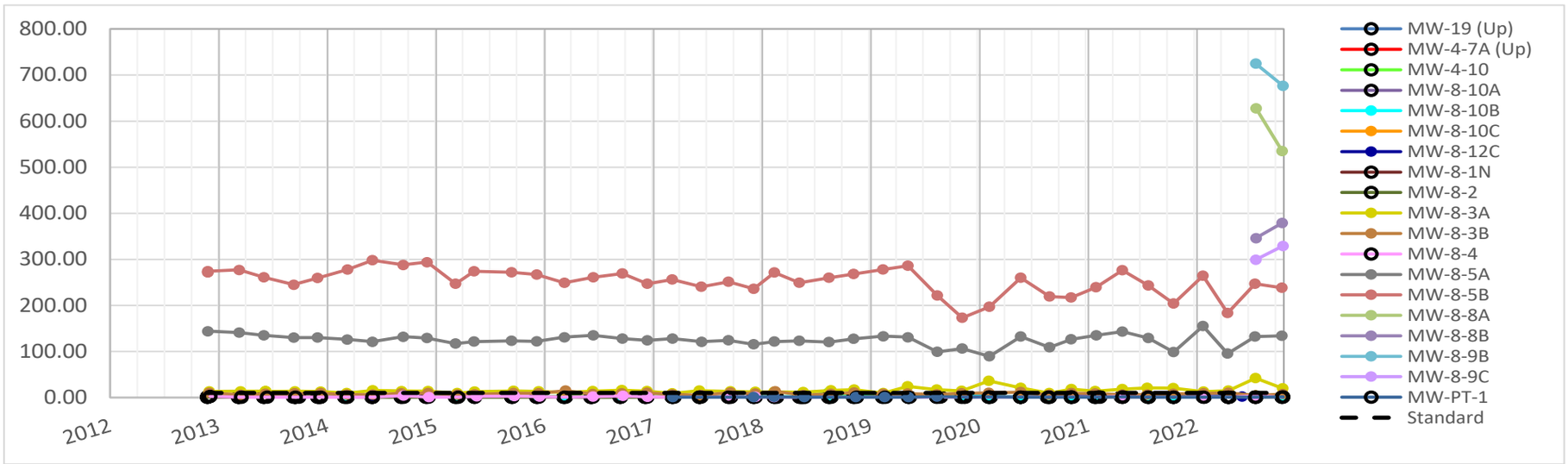
Arsenic, dissolved [µg/l]

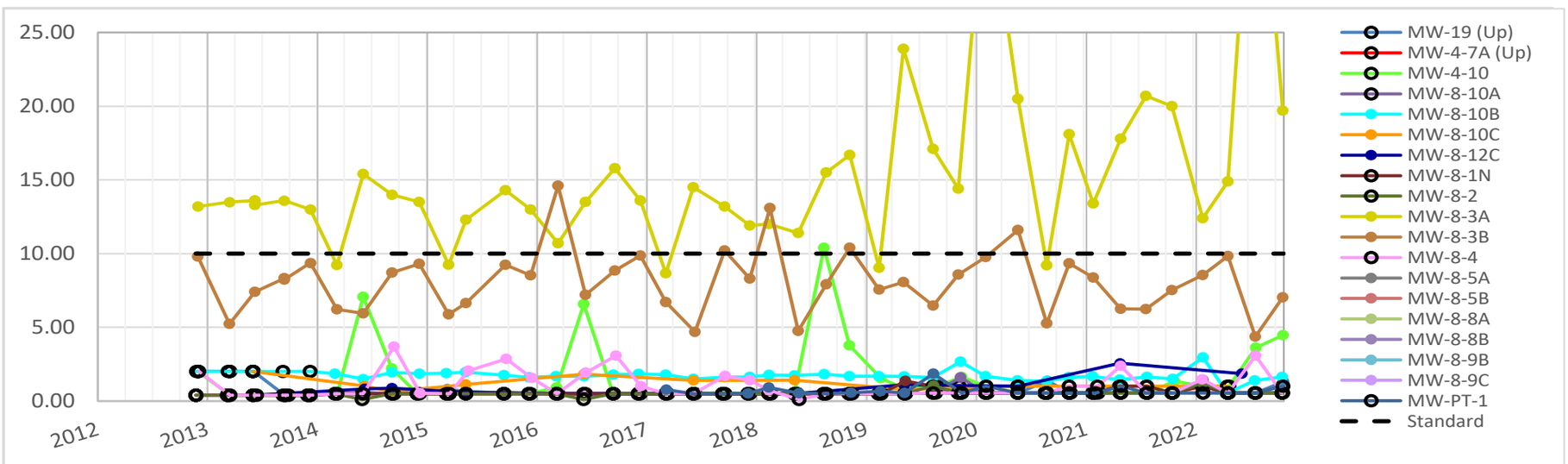




Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

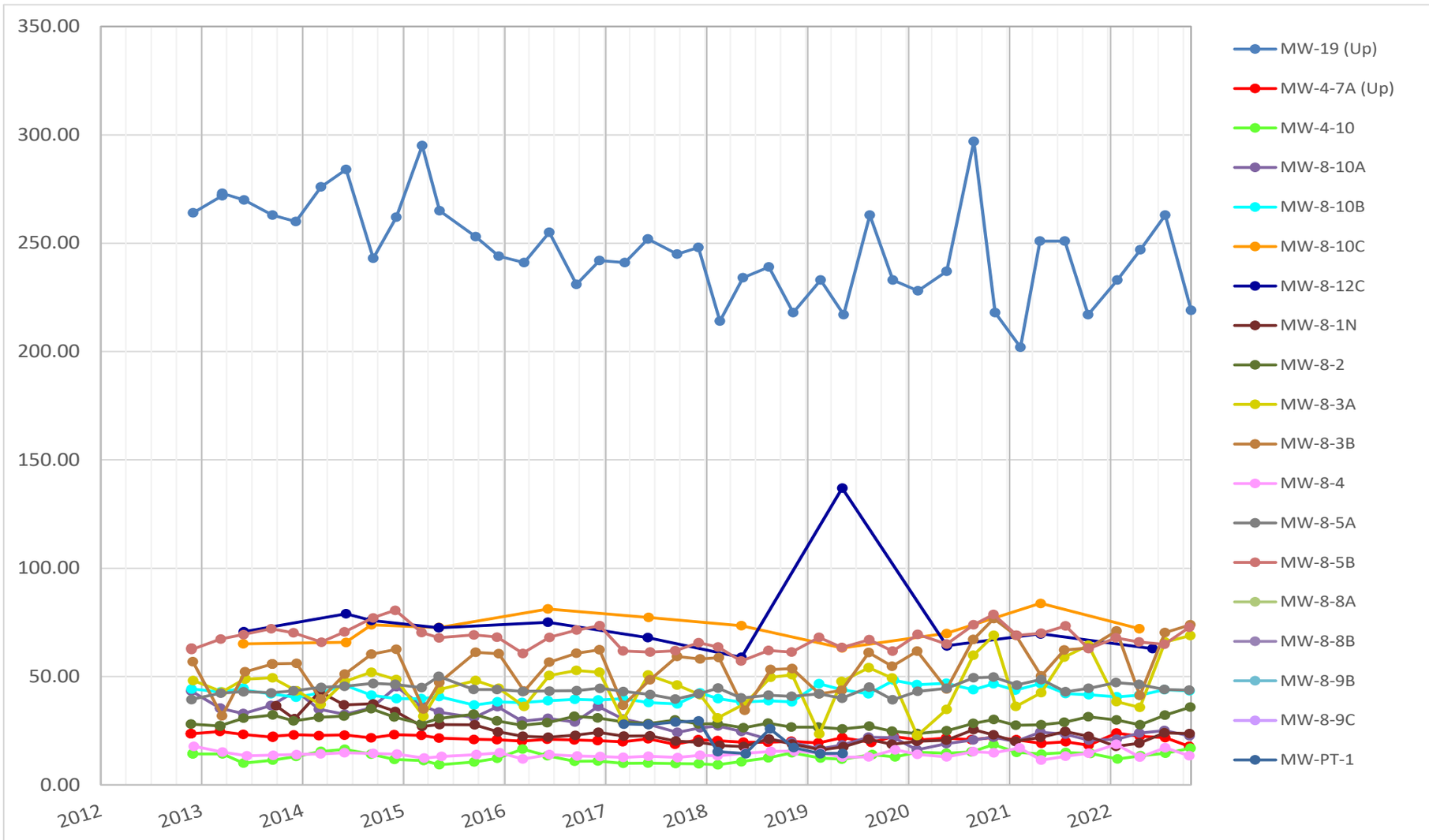
Arsenic, total [µg/l]





Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

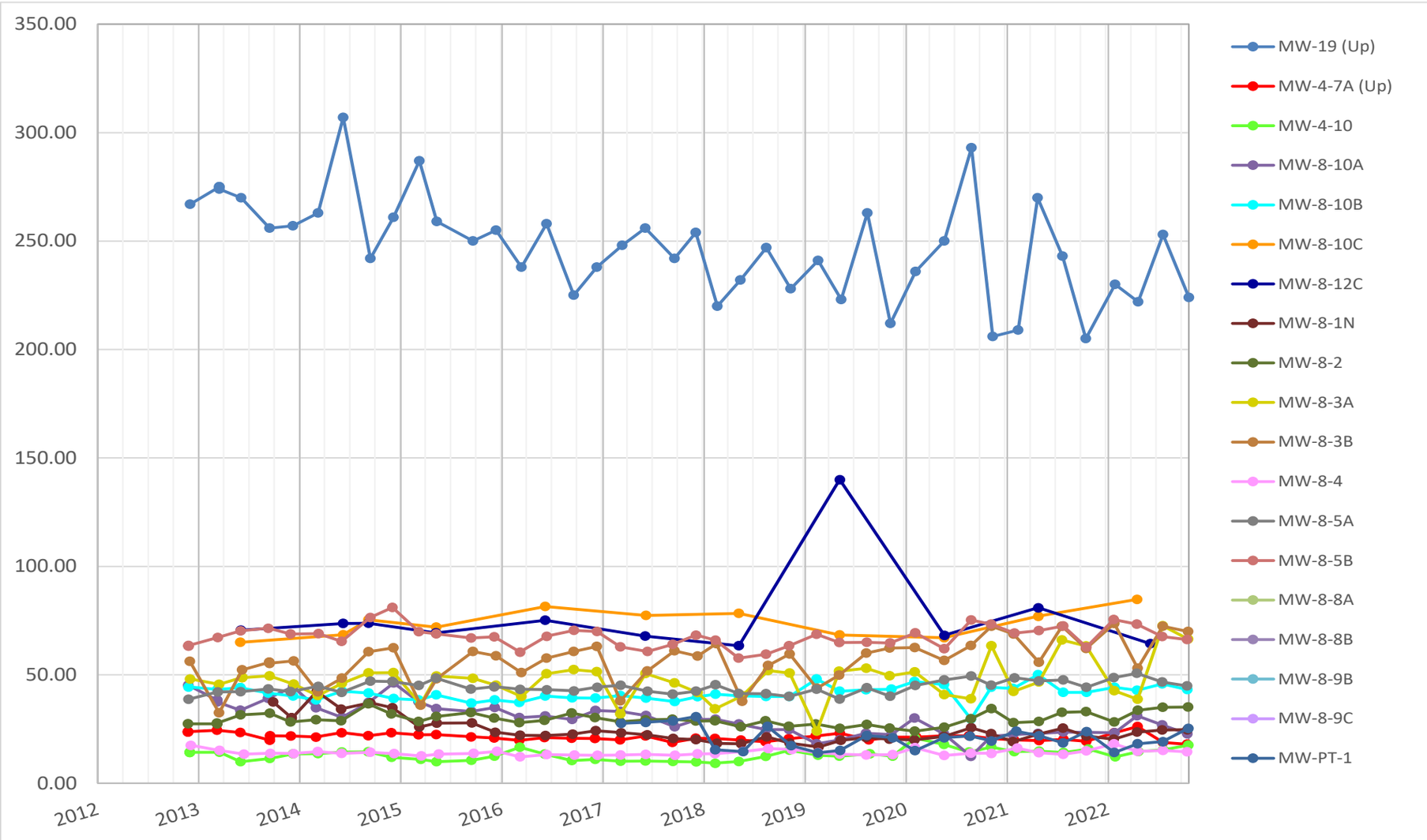
Barium, dissolved [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

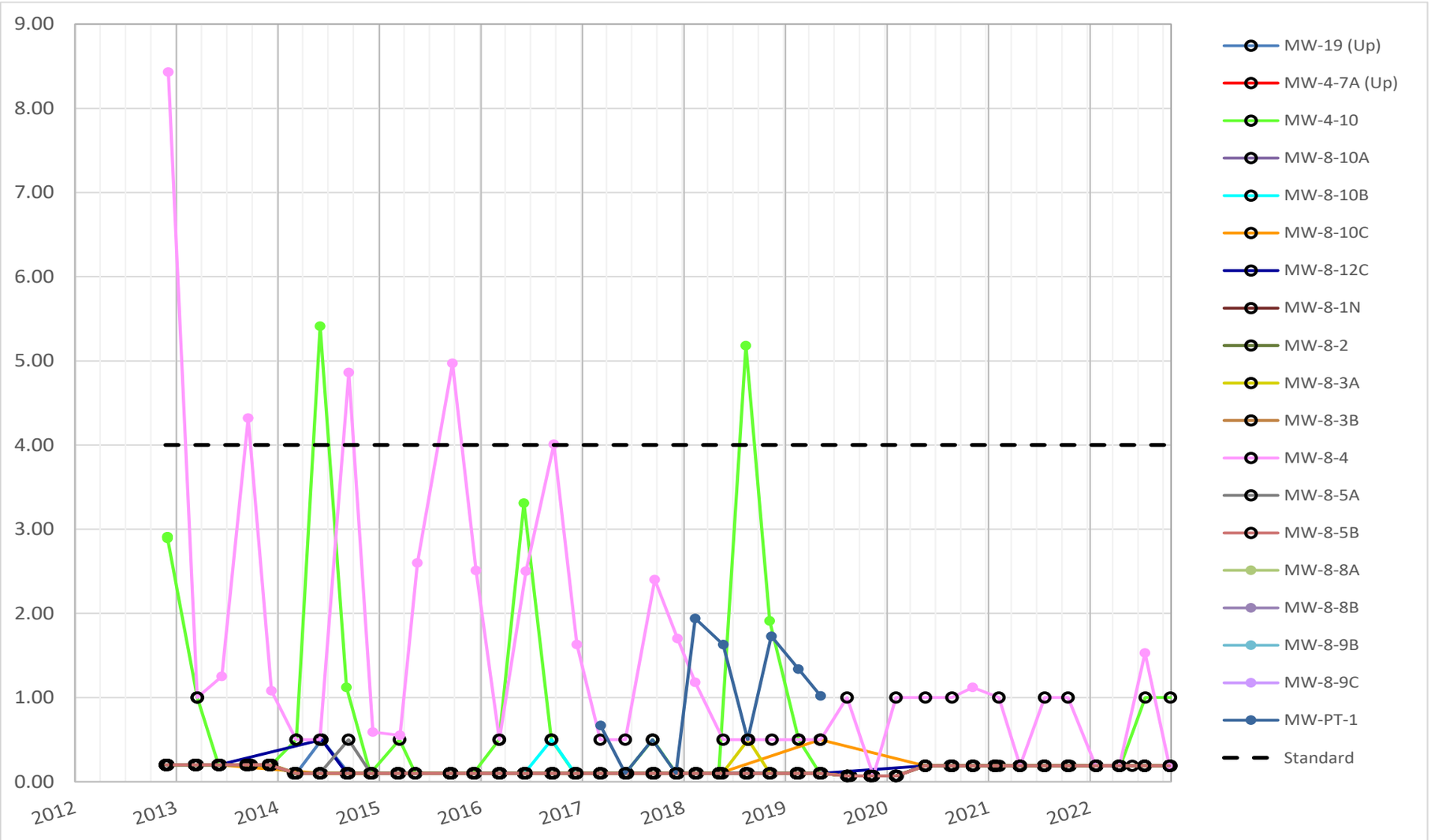
Barium, total [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

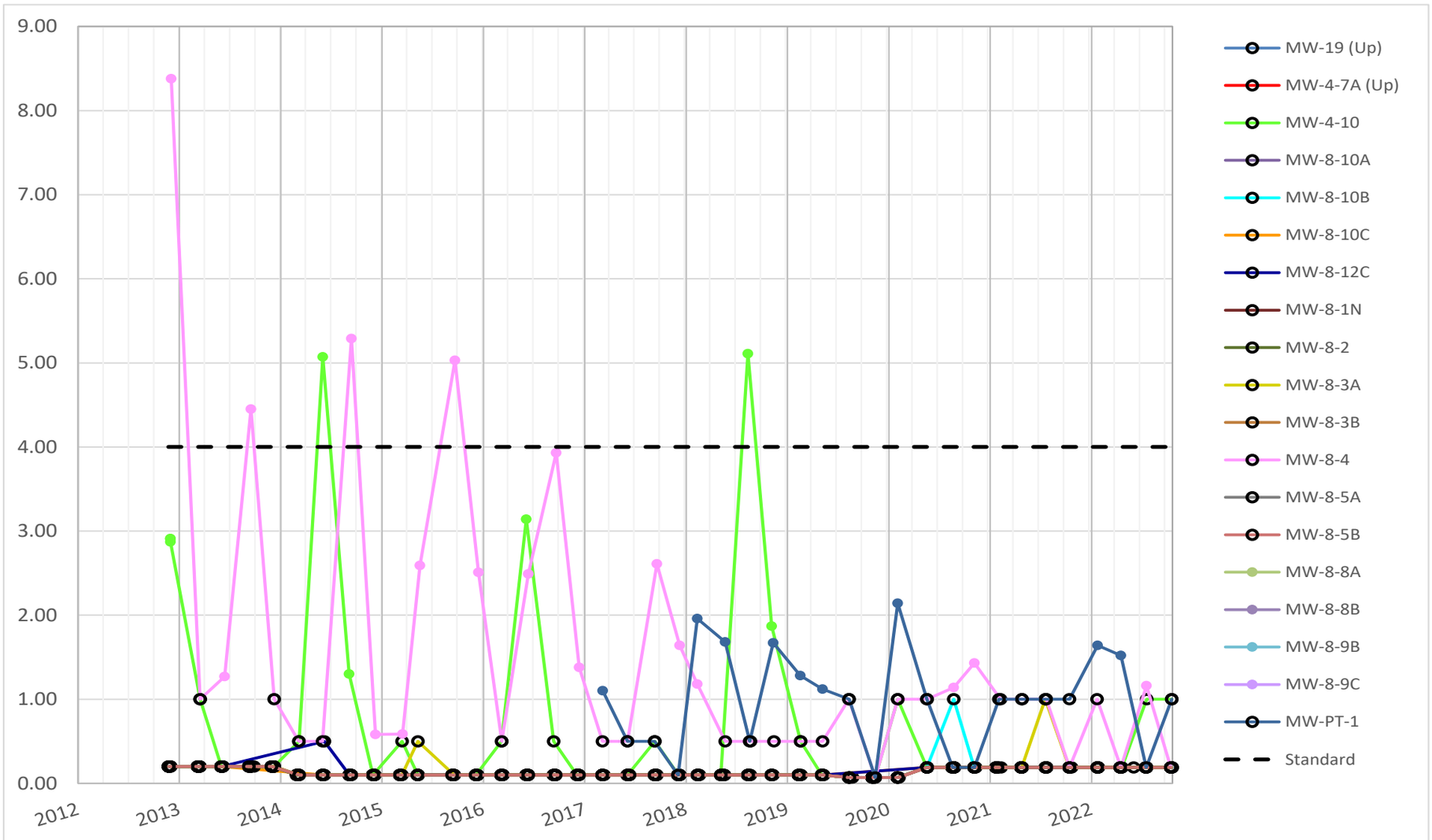
Beryllium, dissolved [µg/l]



Talen Energy
Brunner Island - Basin 5

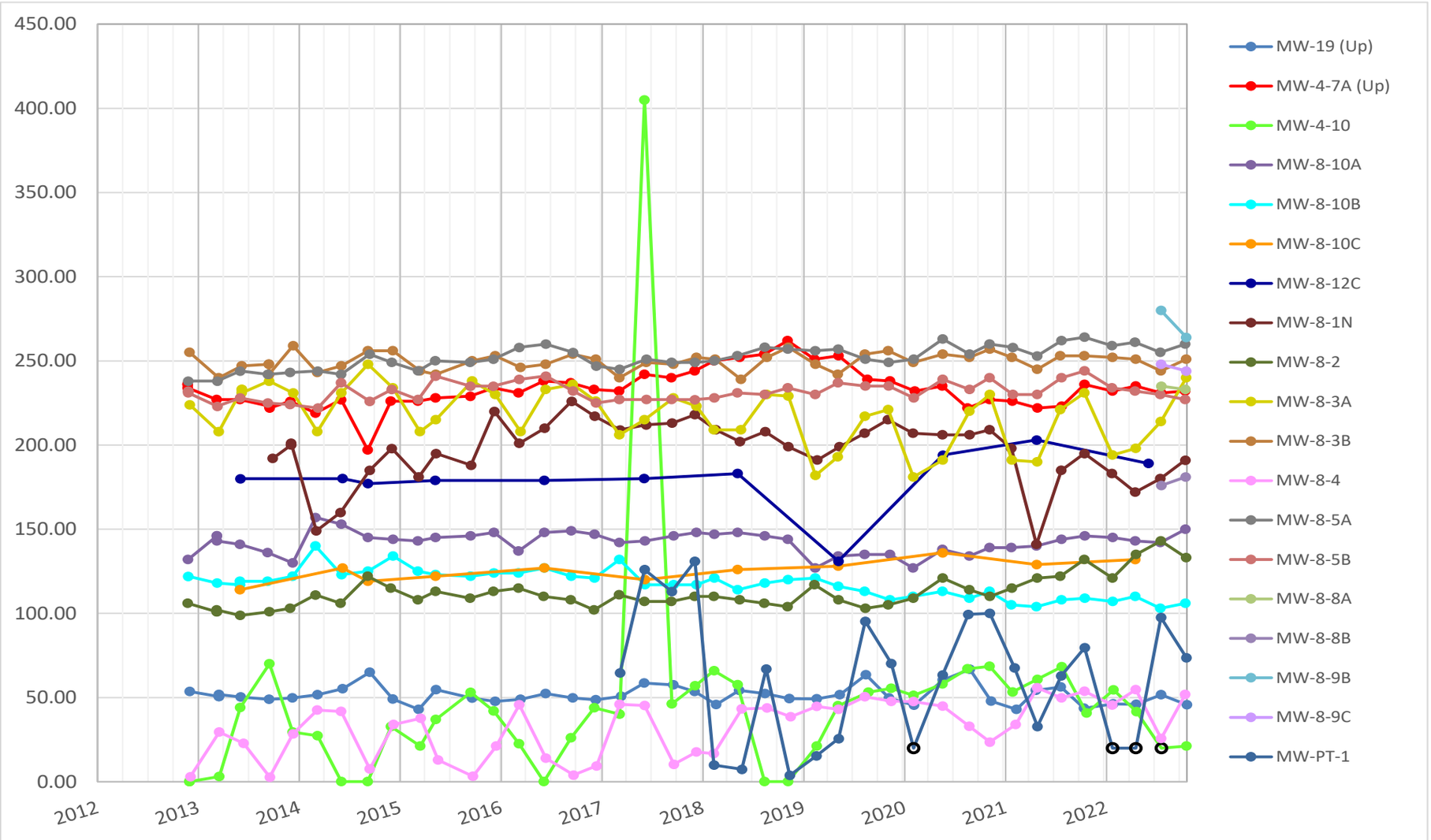
4th Quarter 2022

Beryllium, total [µg/l]



Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

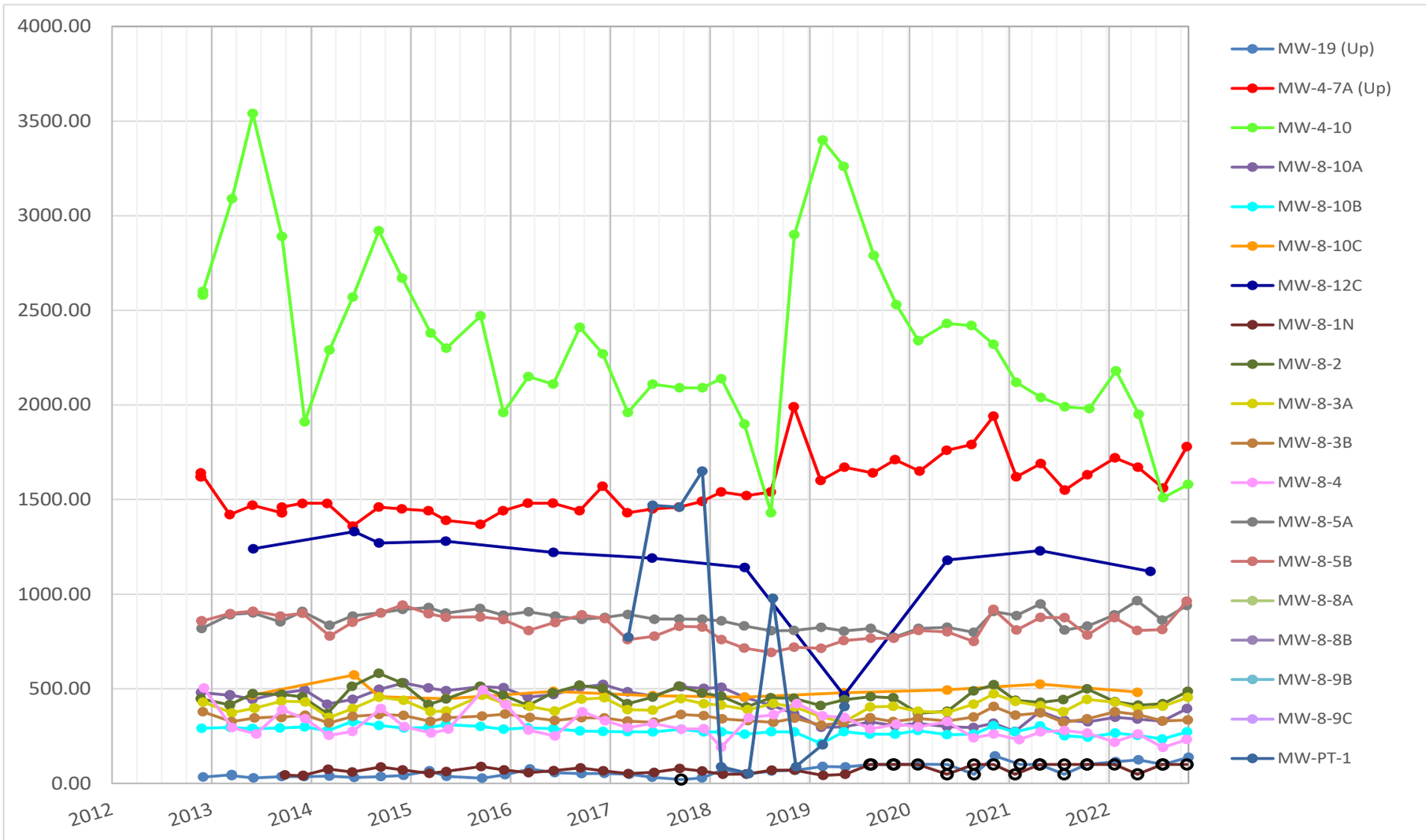
Bicarbonate [mg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

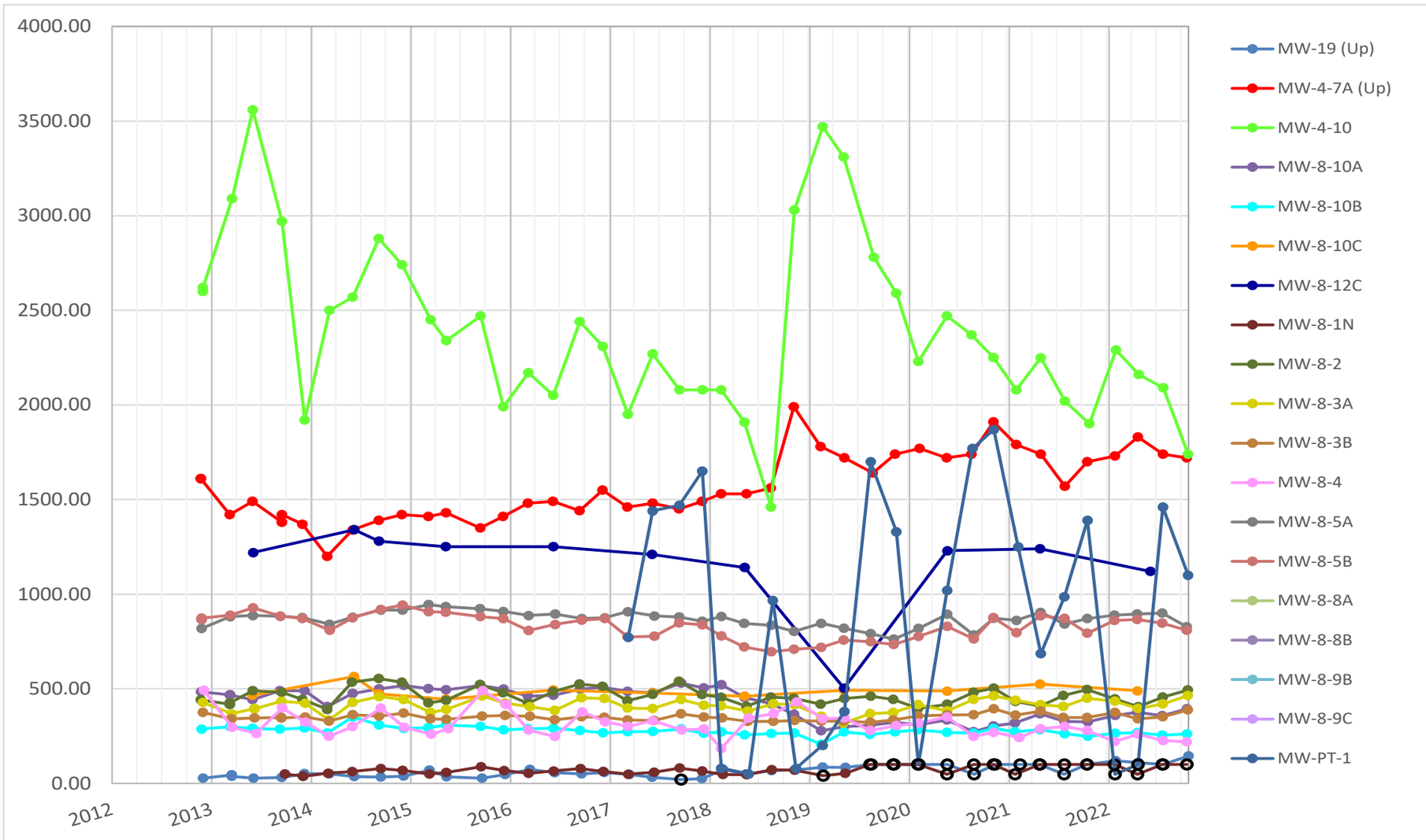
Boron, dissolved [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

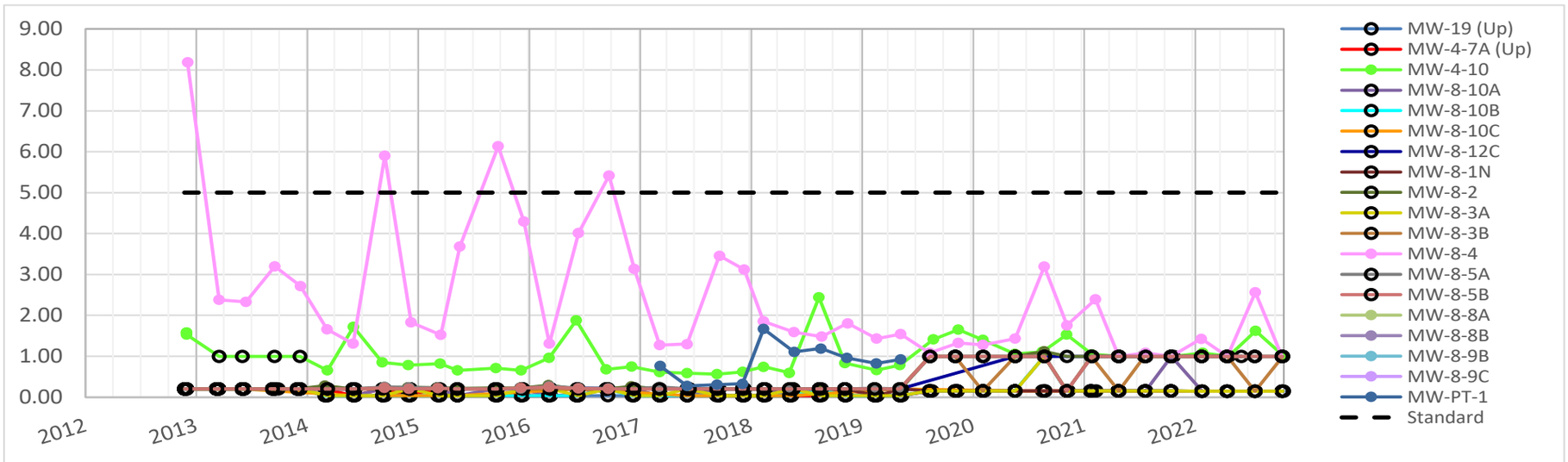
Boron, total [µg/l]

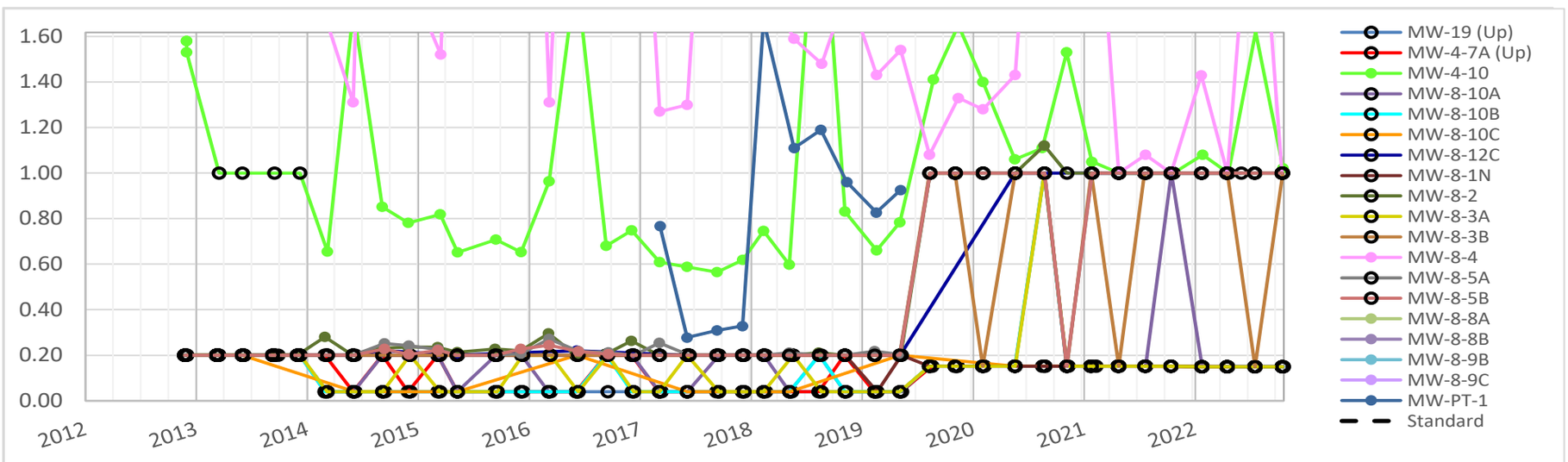


NOTE: Data does not exceed standard of 6000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

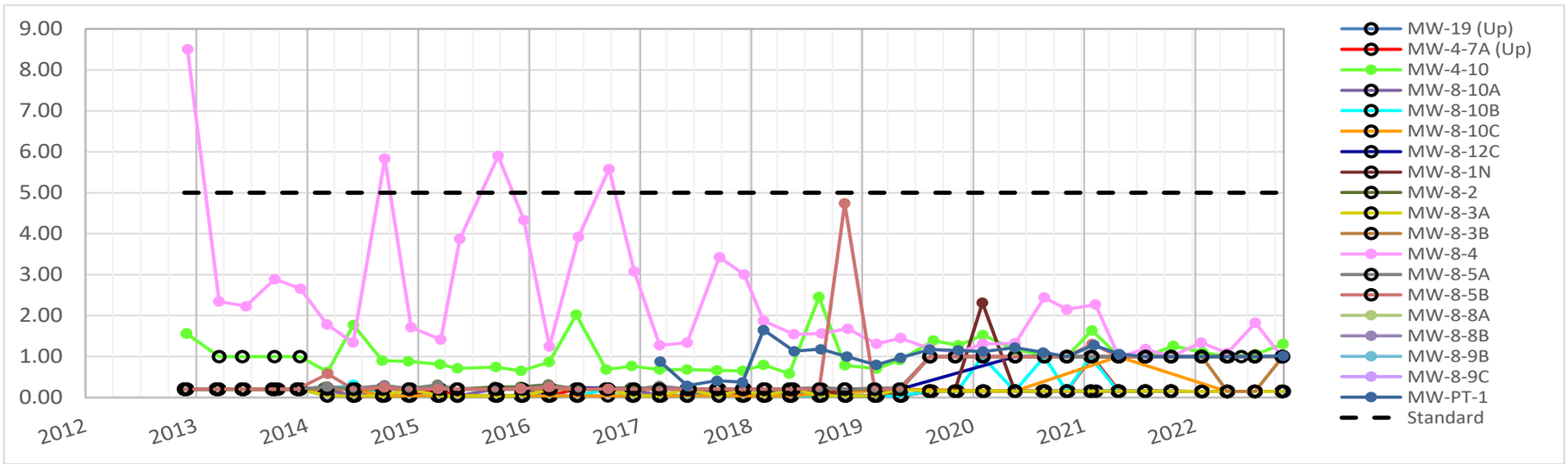
Cadmium, dissolved [µg/l]

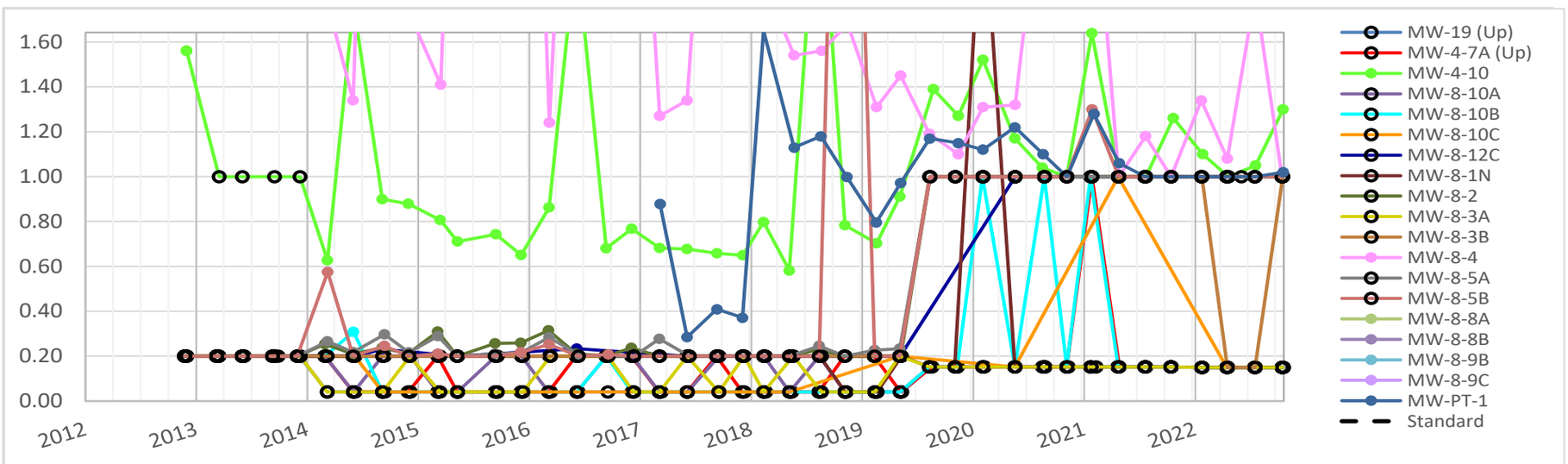




Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

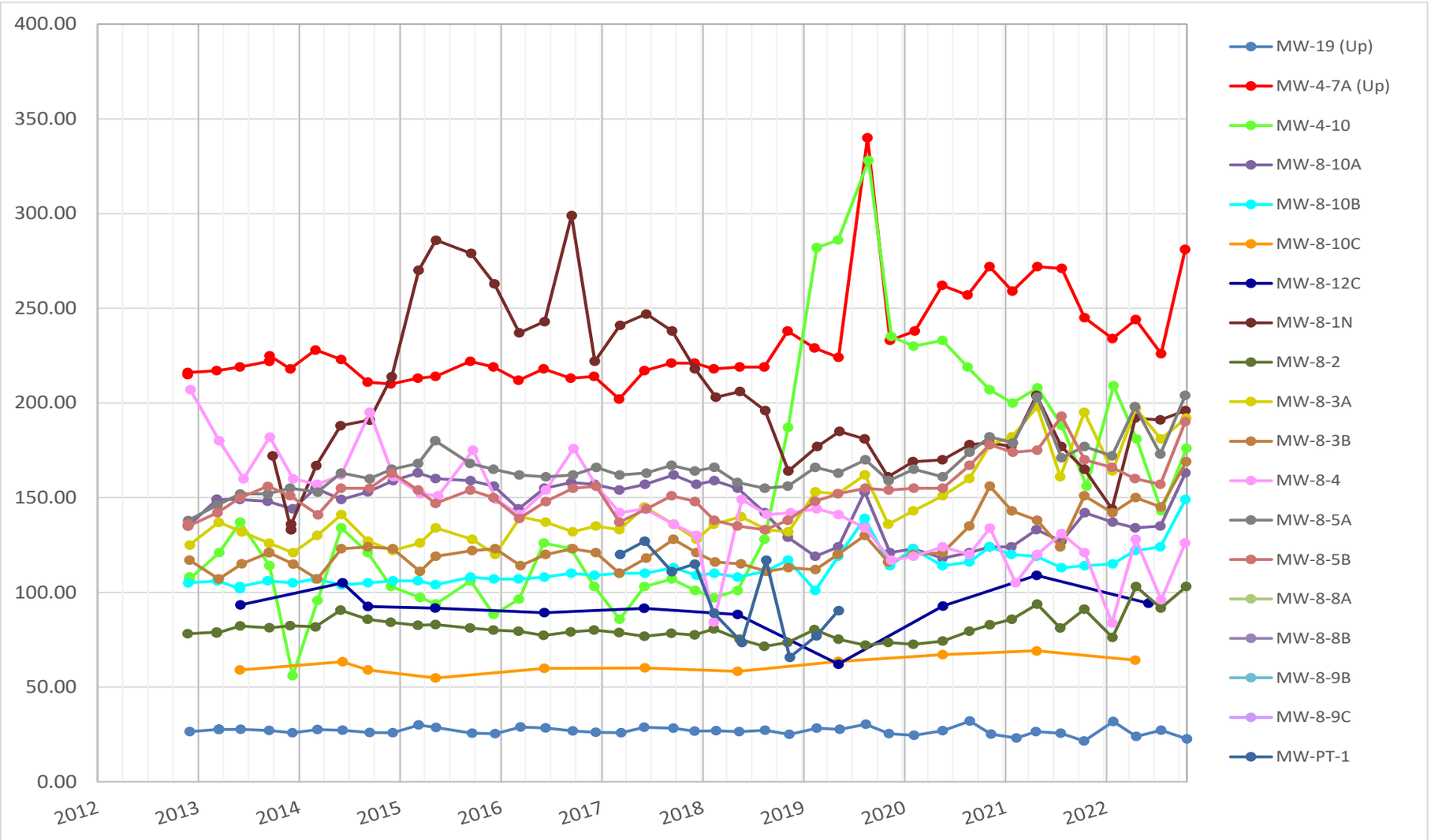
Cadmium, total [µg/l]





Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Calcium, dissolved [mg/l]

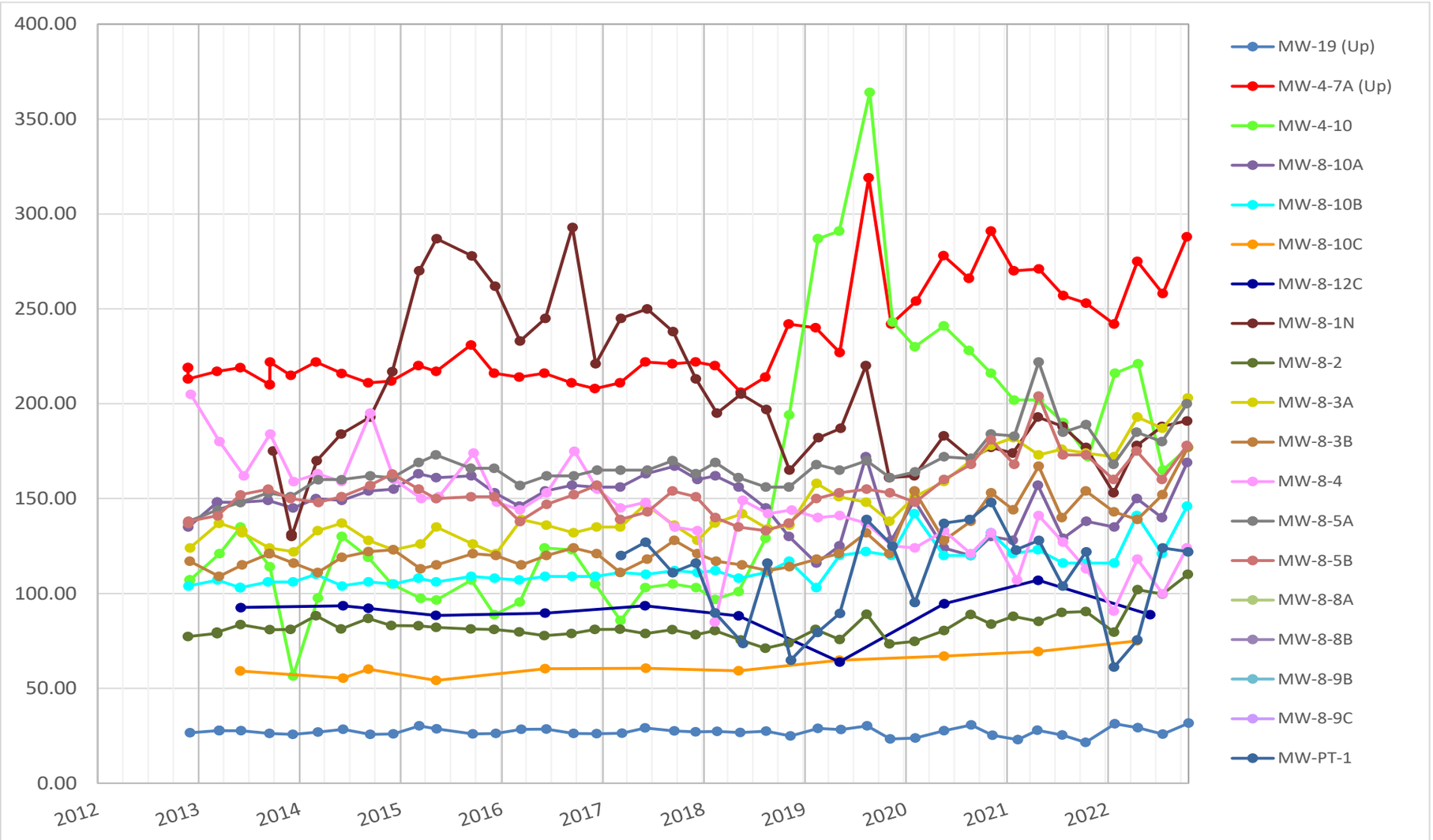


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

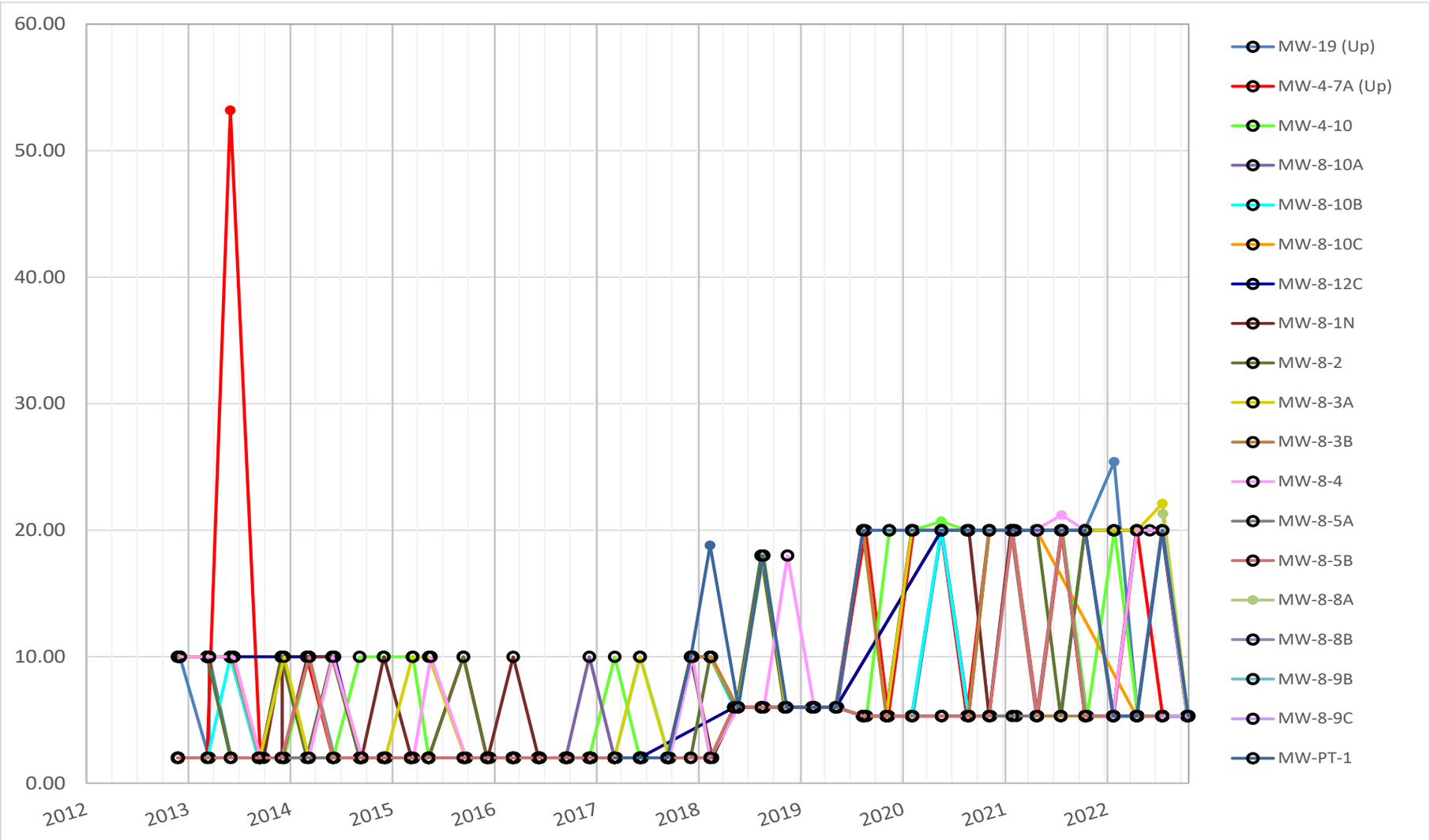
Calcium, total [mg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

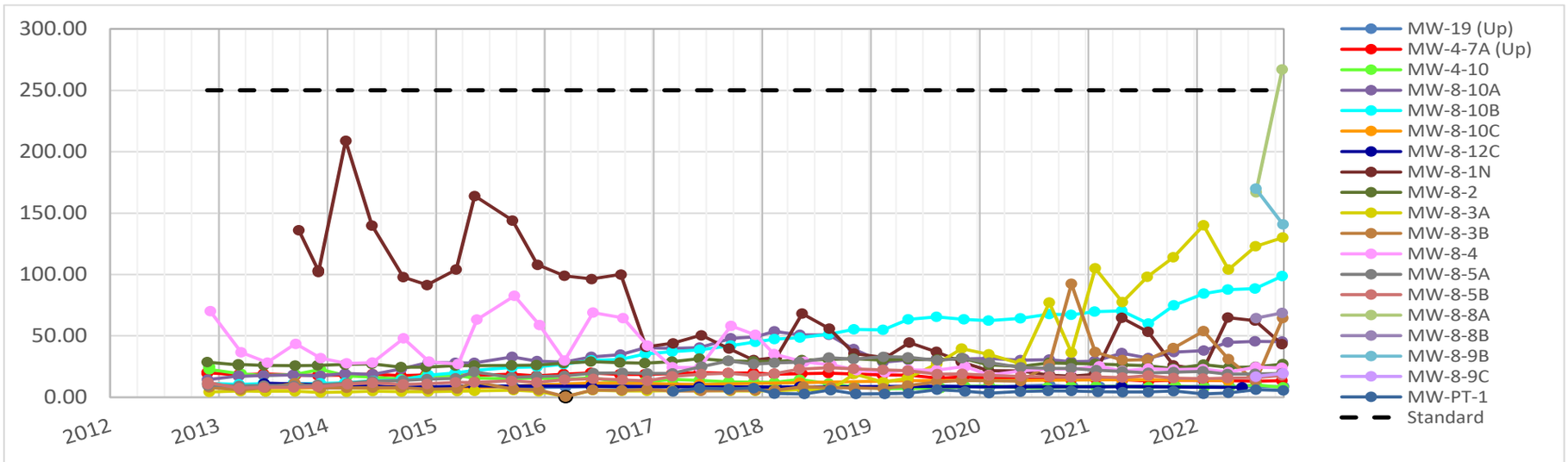
Chemical Oxygen Demand [mg/l]

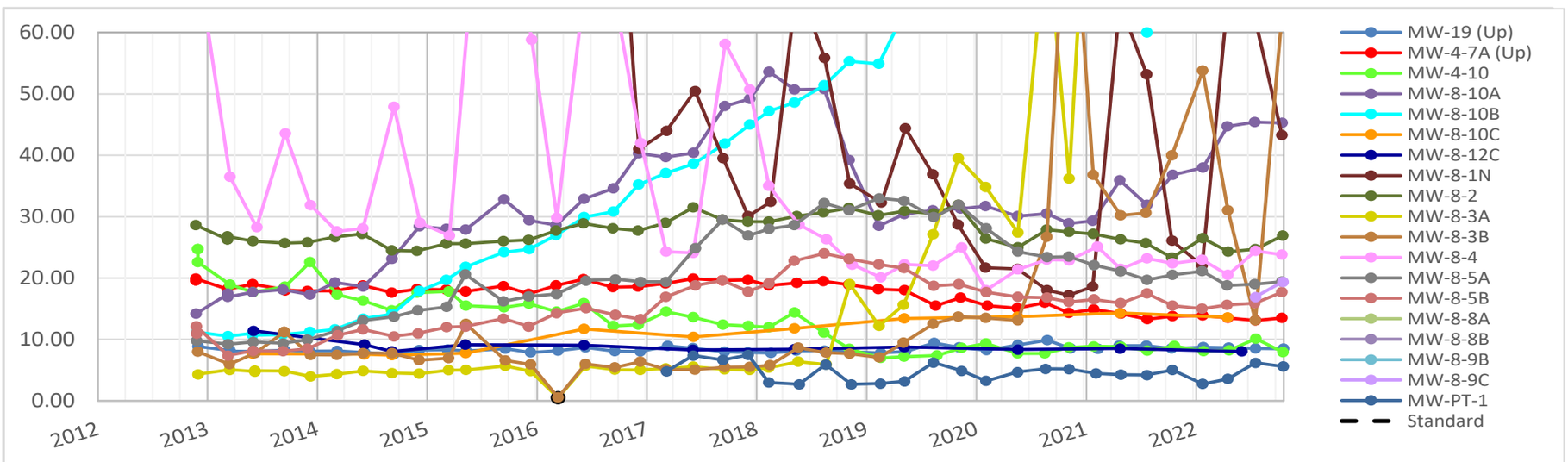


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

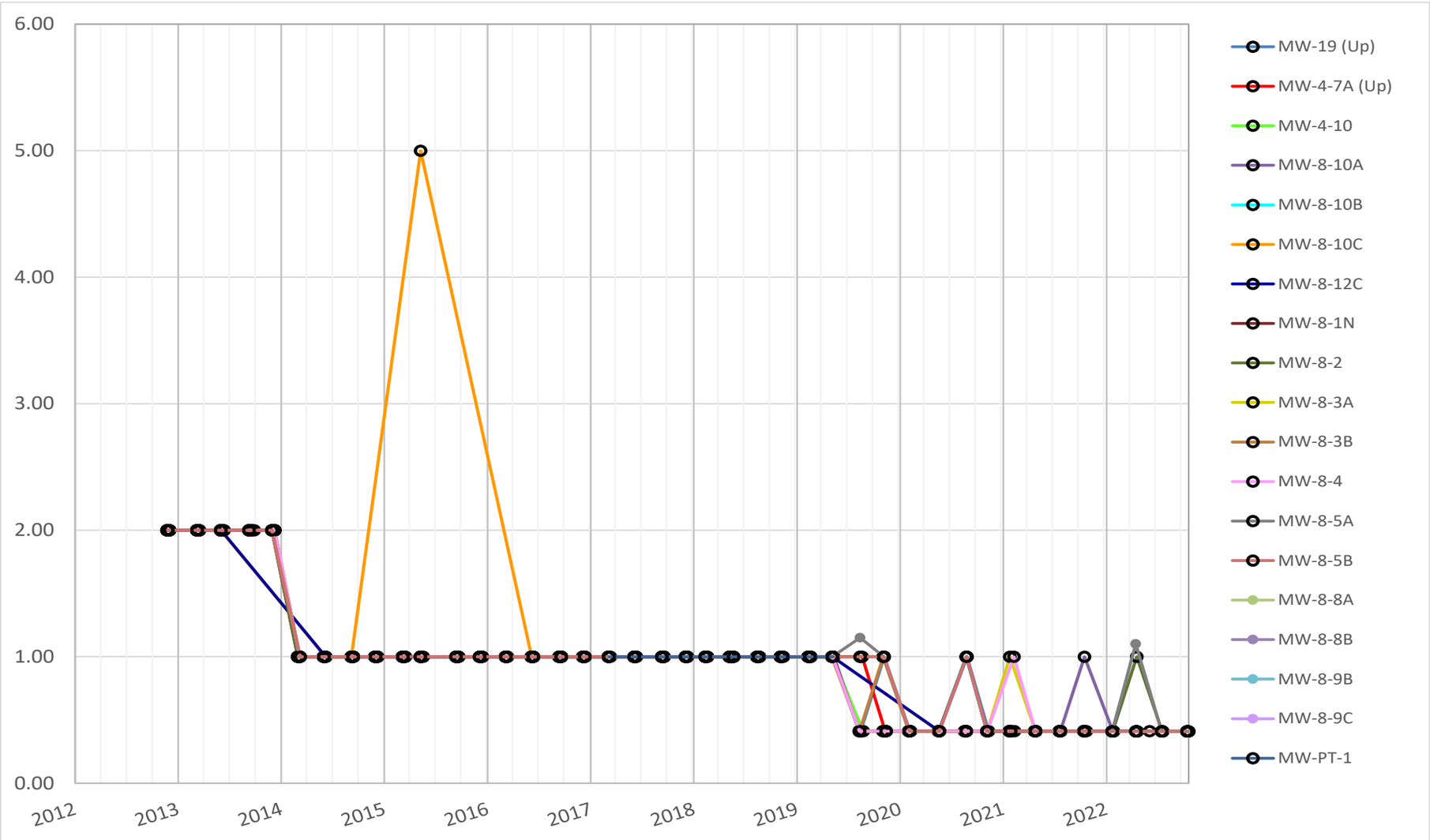
Chloride, total as Cl [mg/l]





Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

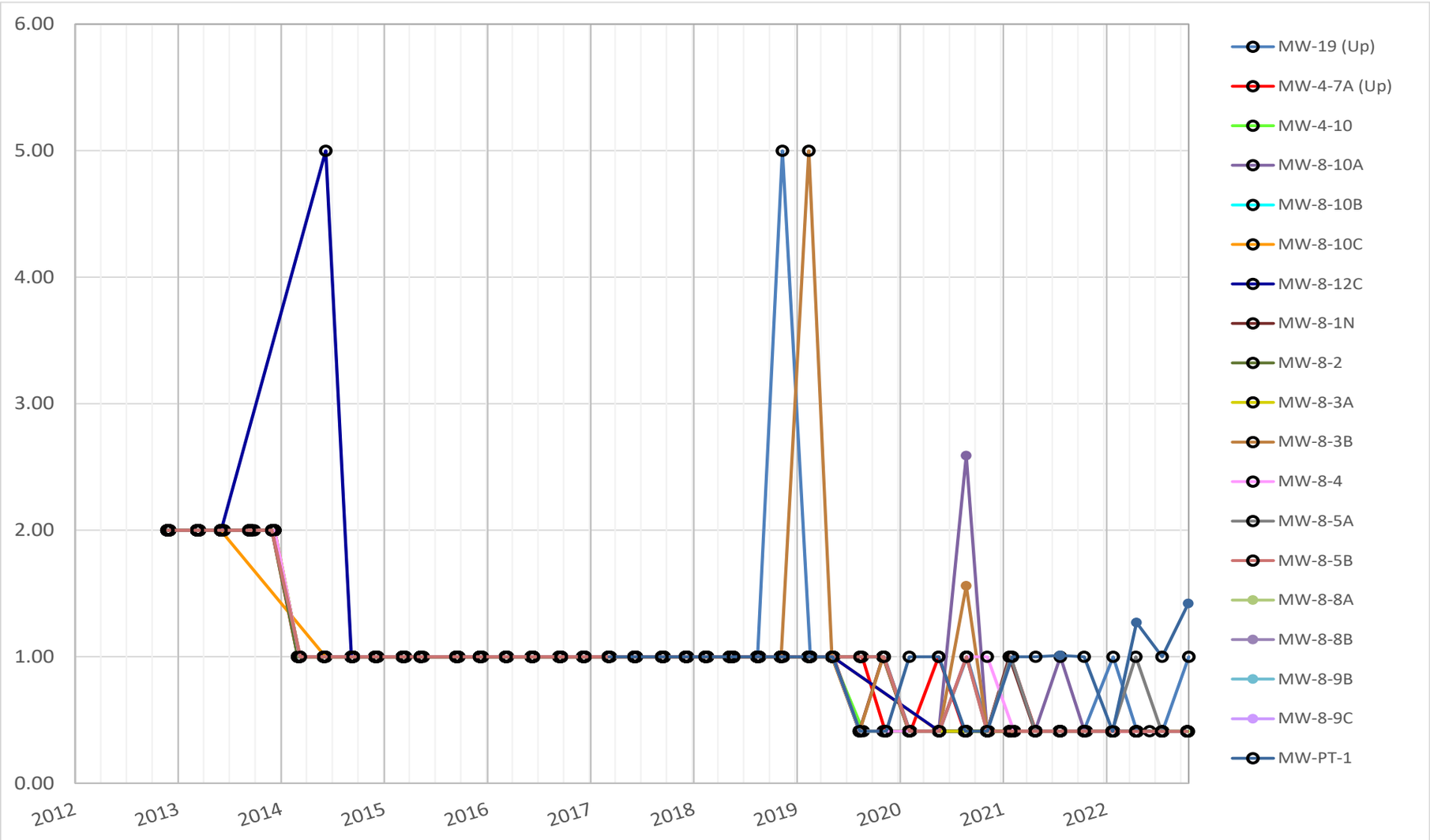
Chromium, dissolved [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

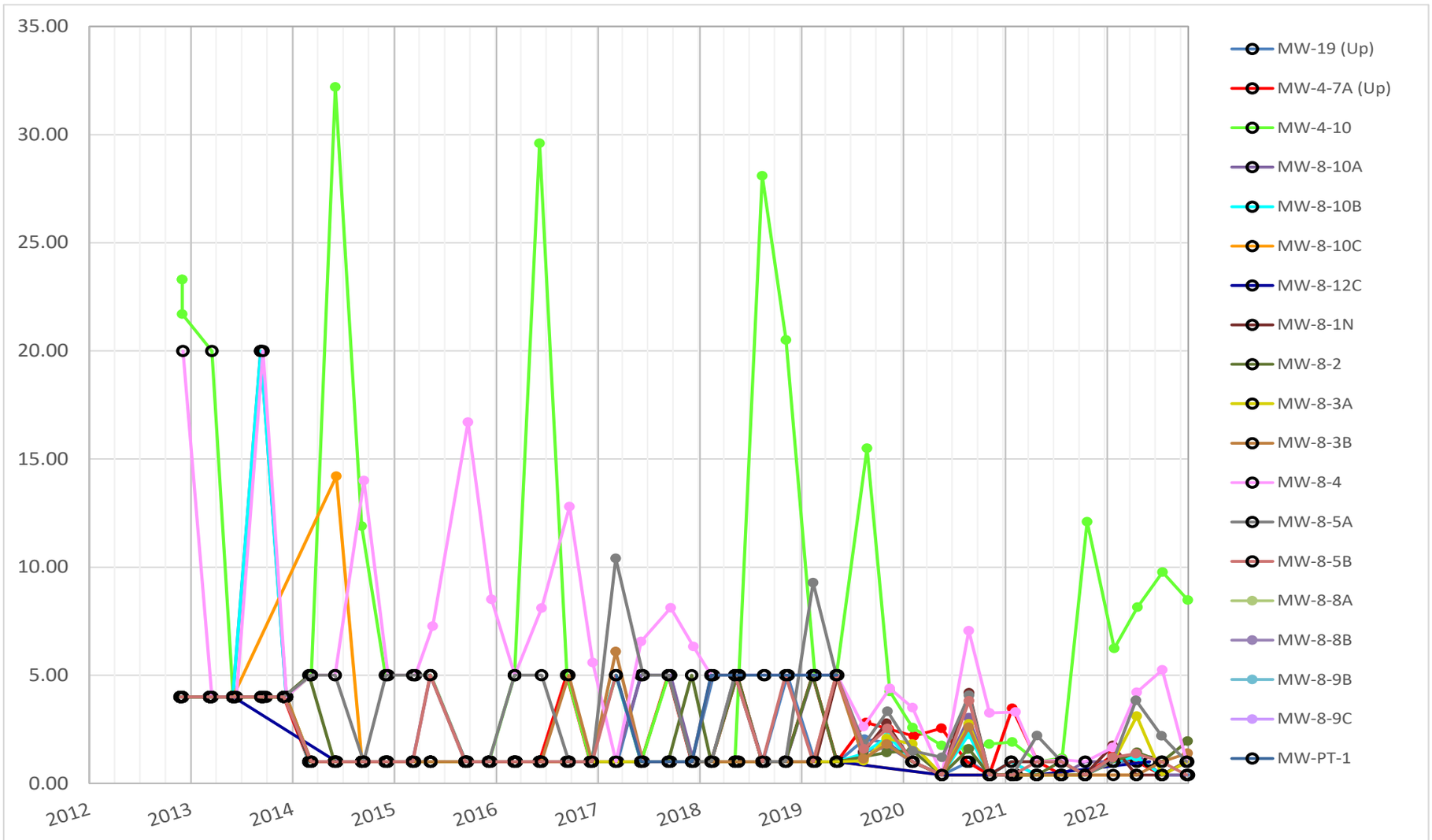
Chromium, total [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

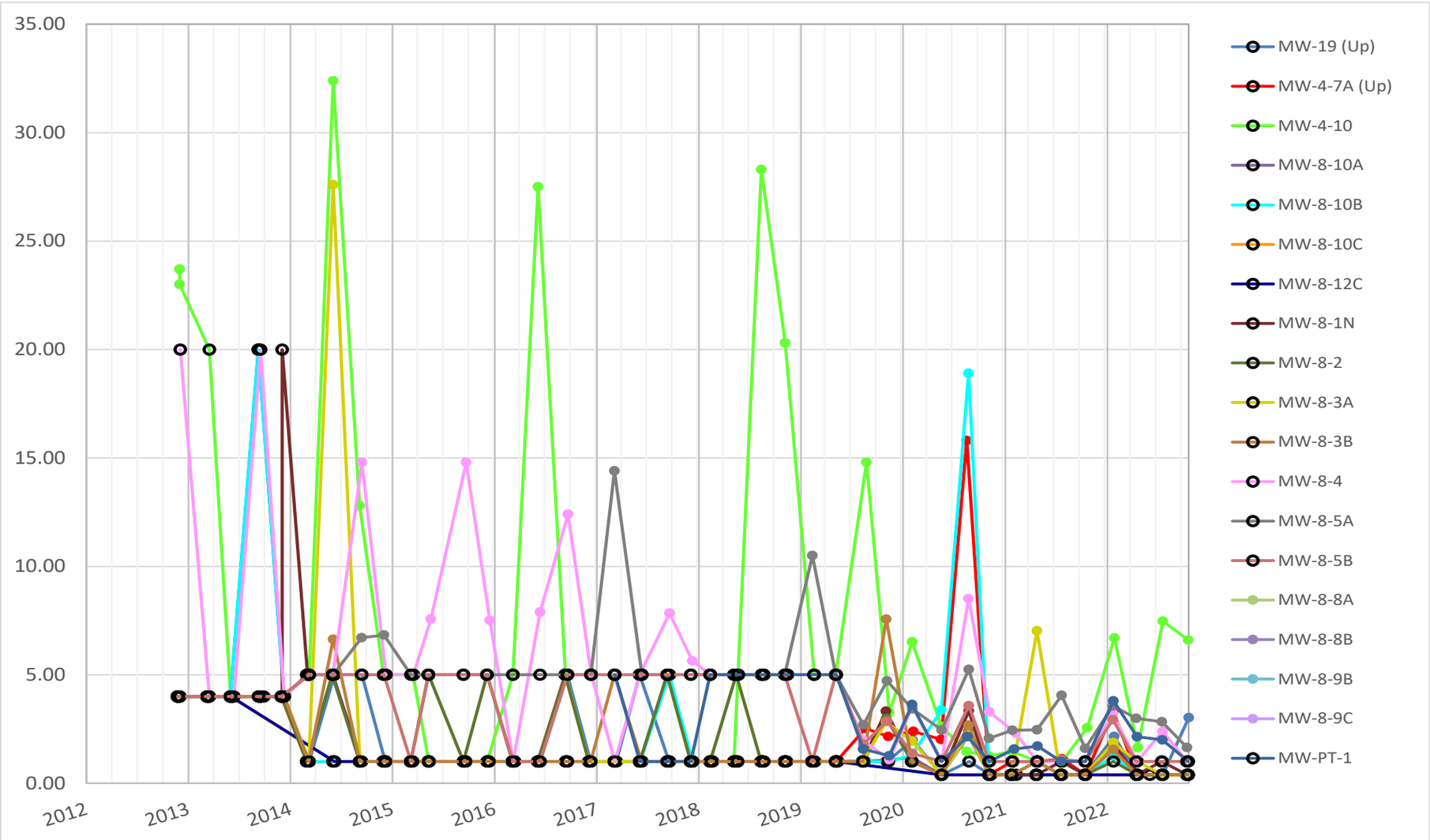
Copper, dissolved [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Copper, total [µg/l]

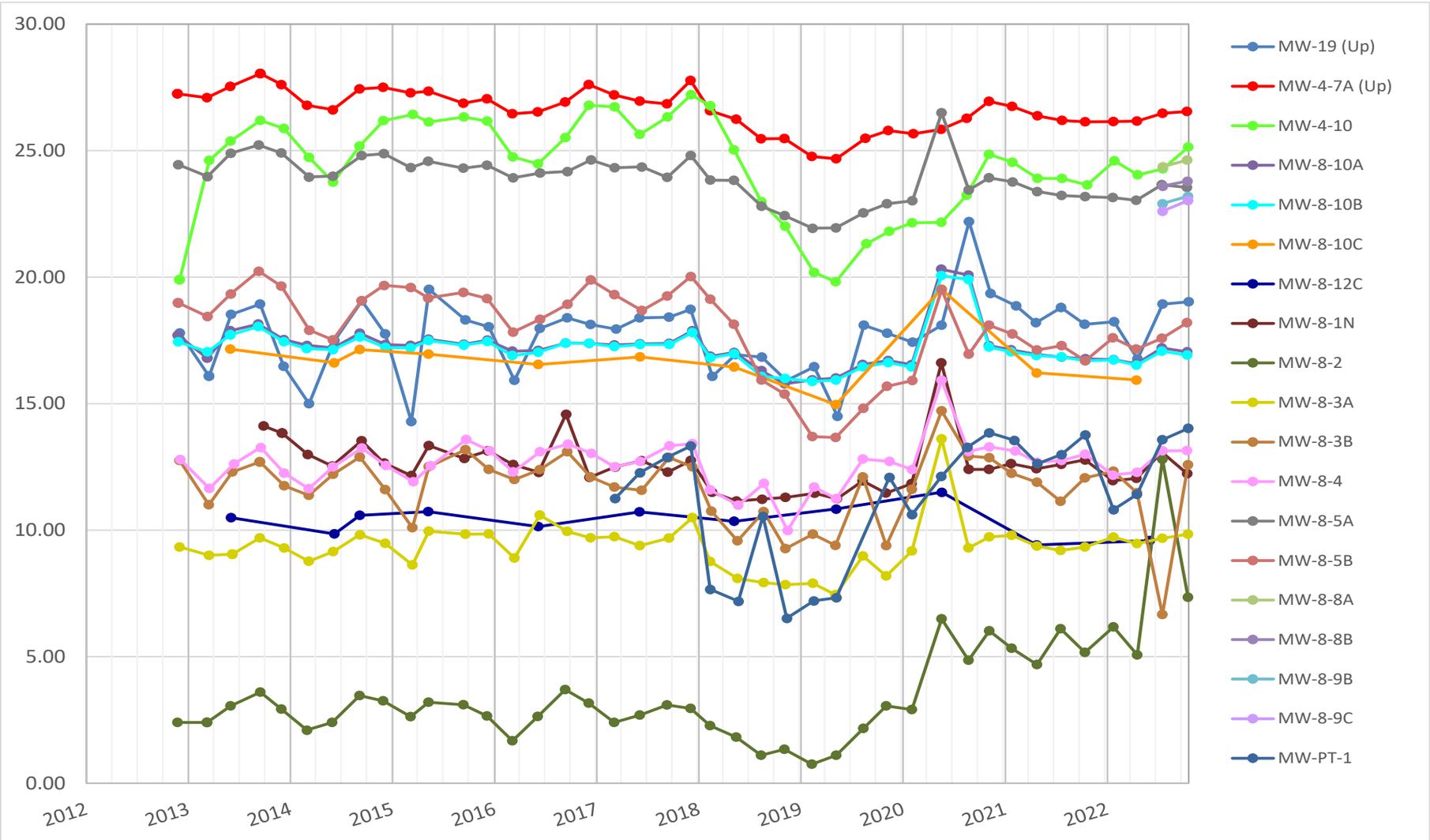


NOTE: Data does not exceed standard of 1000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

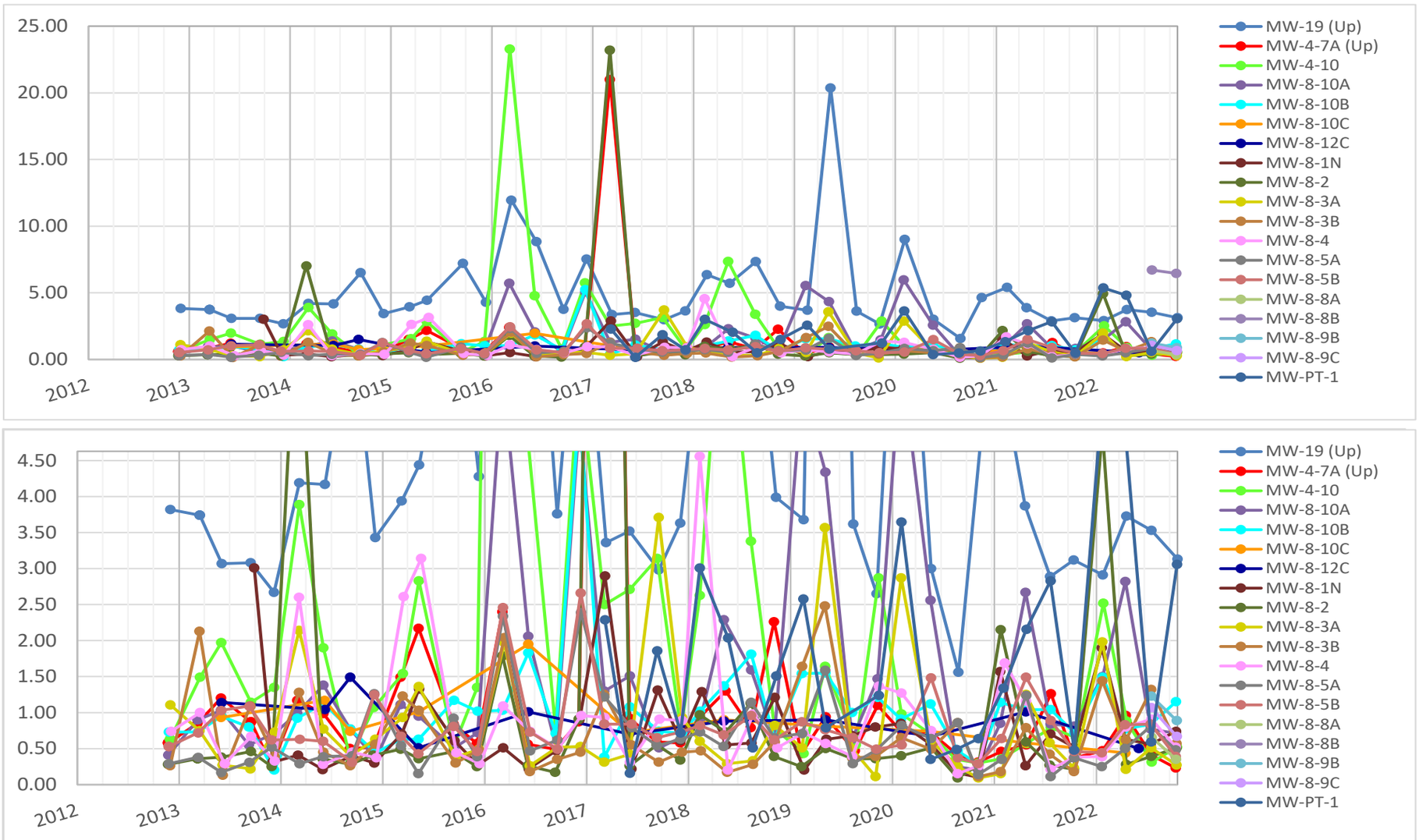
Depth to Water [ft]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

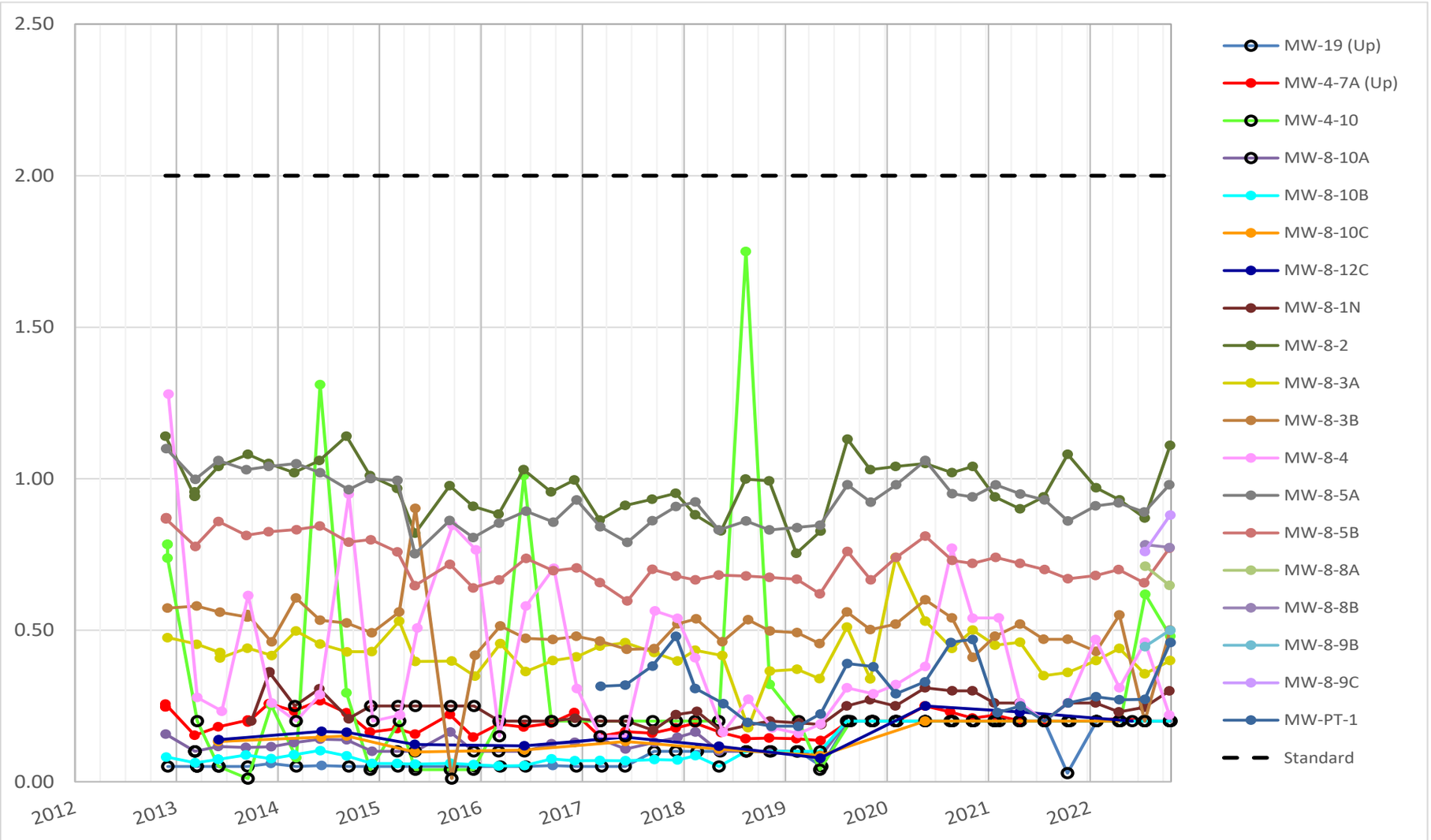
Dissolved Oxygen, field [mg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

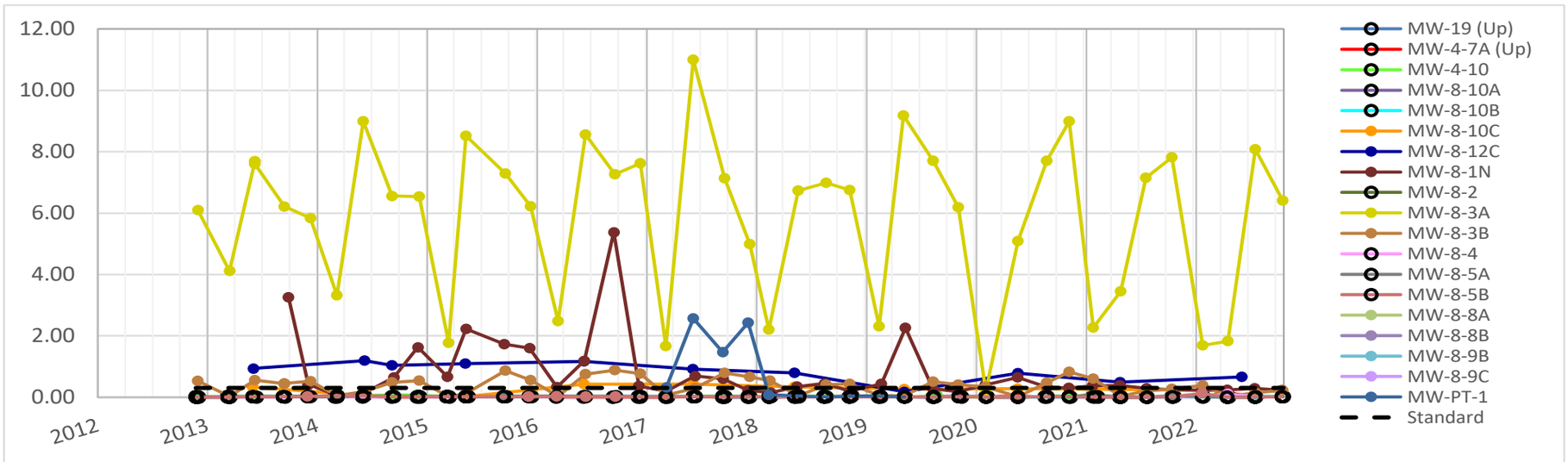
Fluoride, total as F [mg/l]

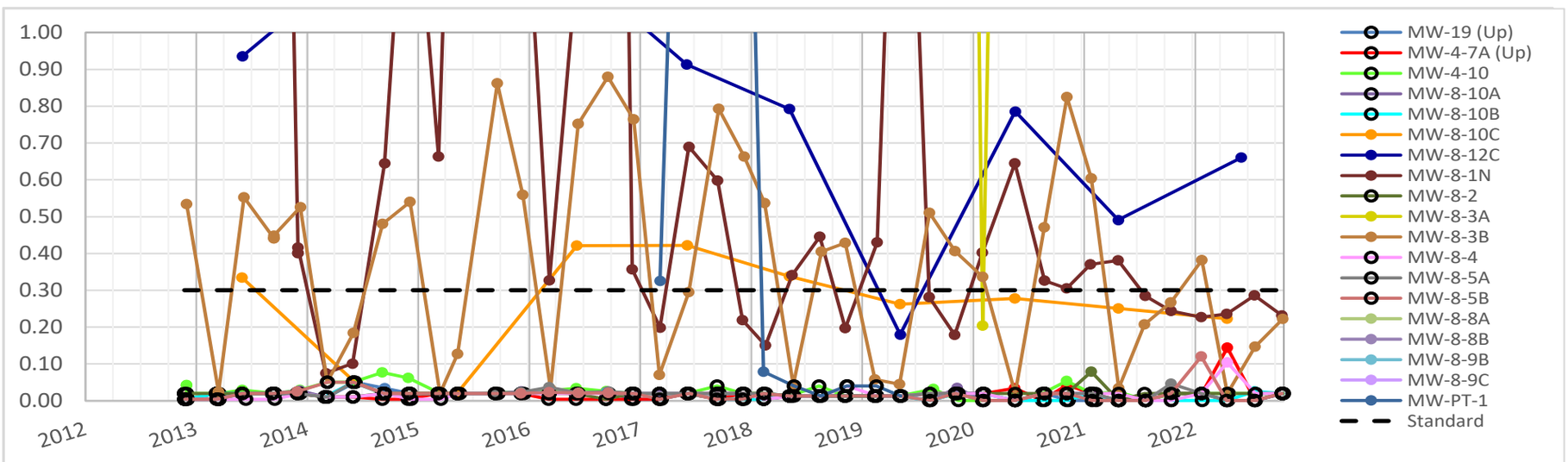


NOTE: Data does not exceed standard of 2 mg/l during this time frame

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

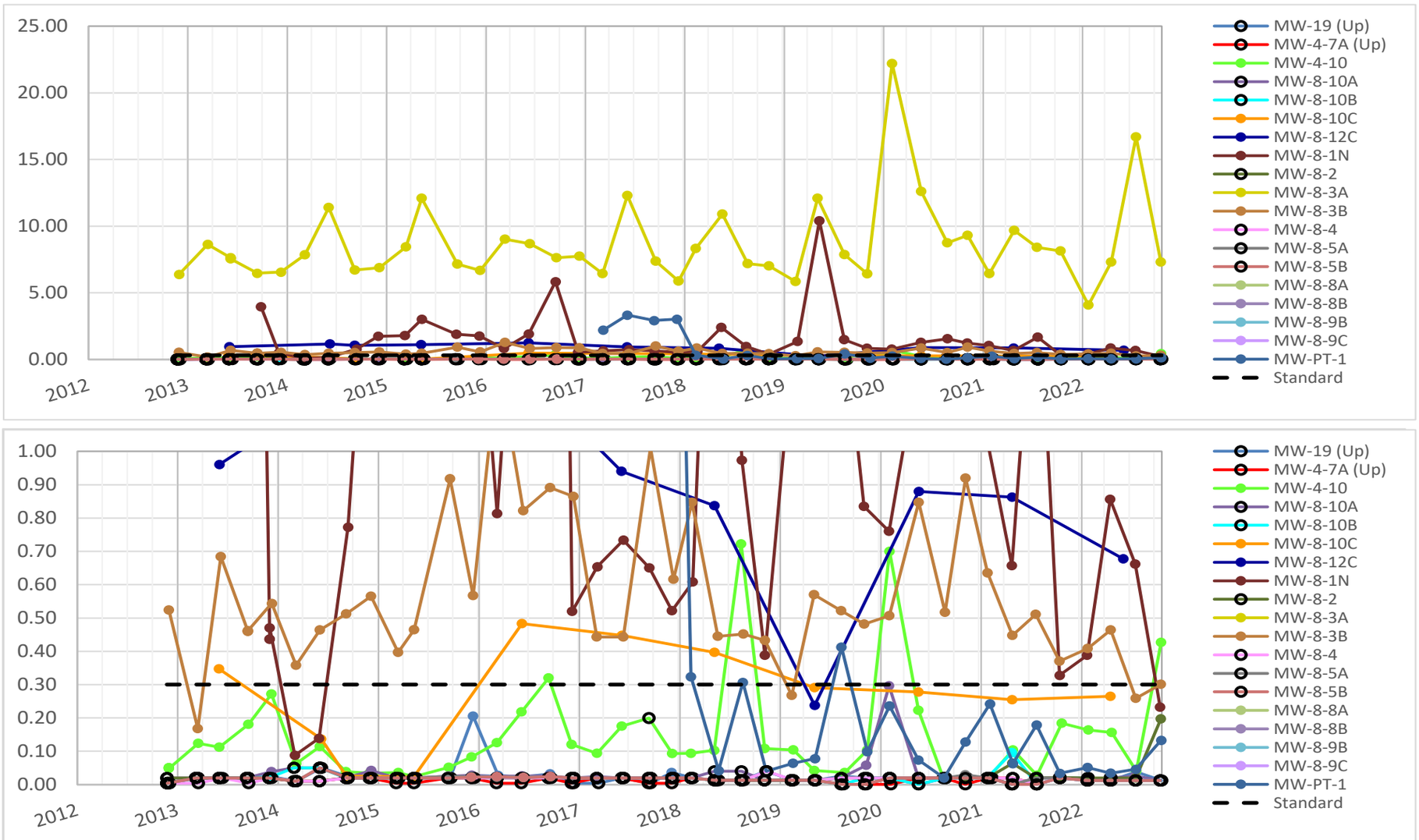
Iron, dissolved [mg/l]





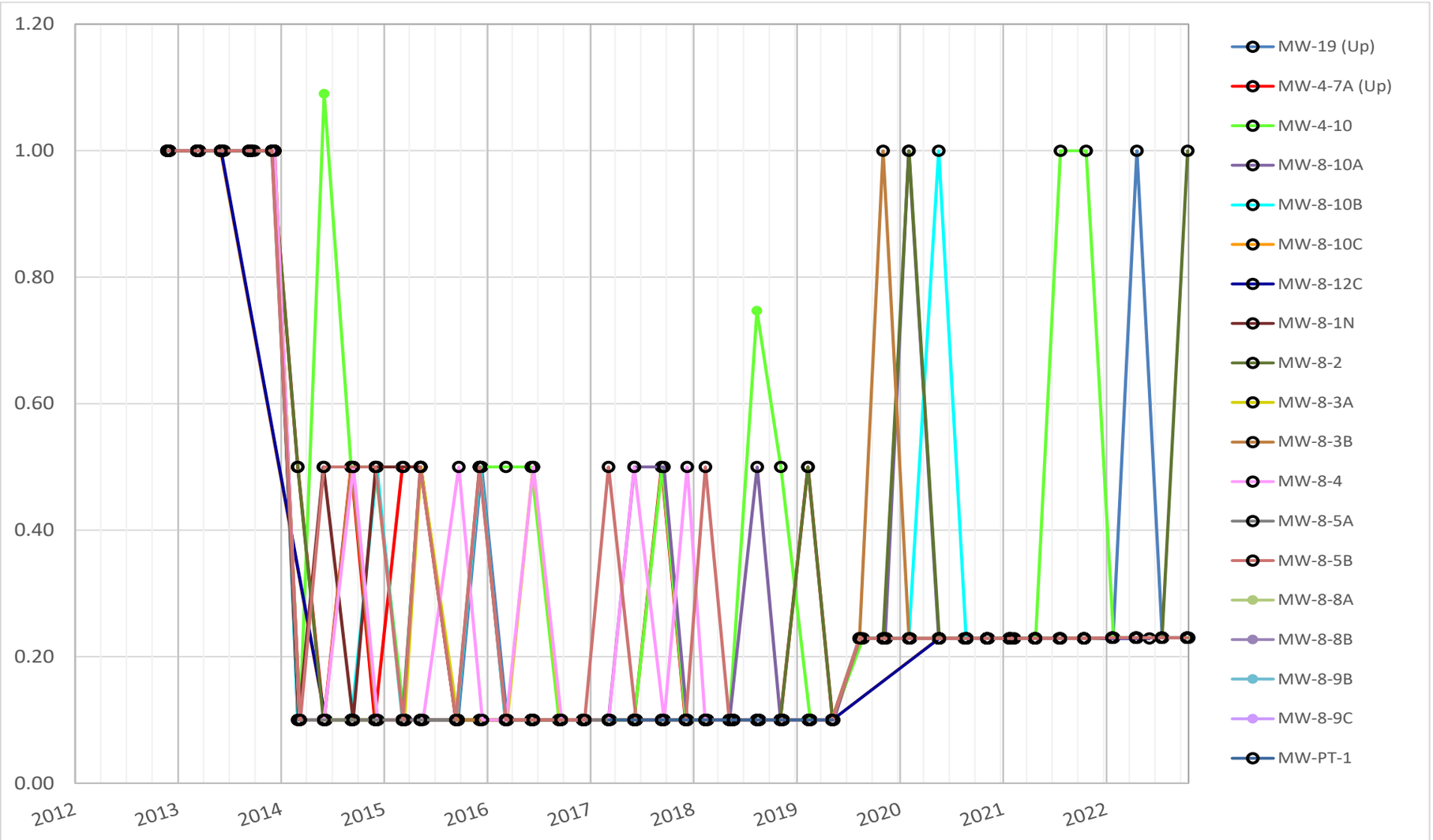
Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Iron, total [mg/l]



Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Lead, dissolved [µg/l]

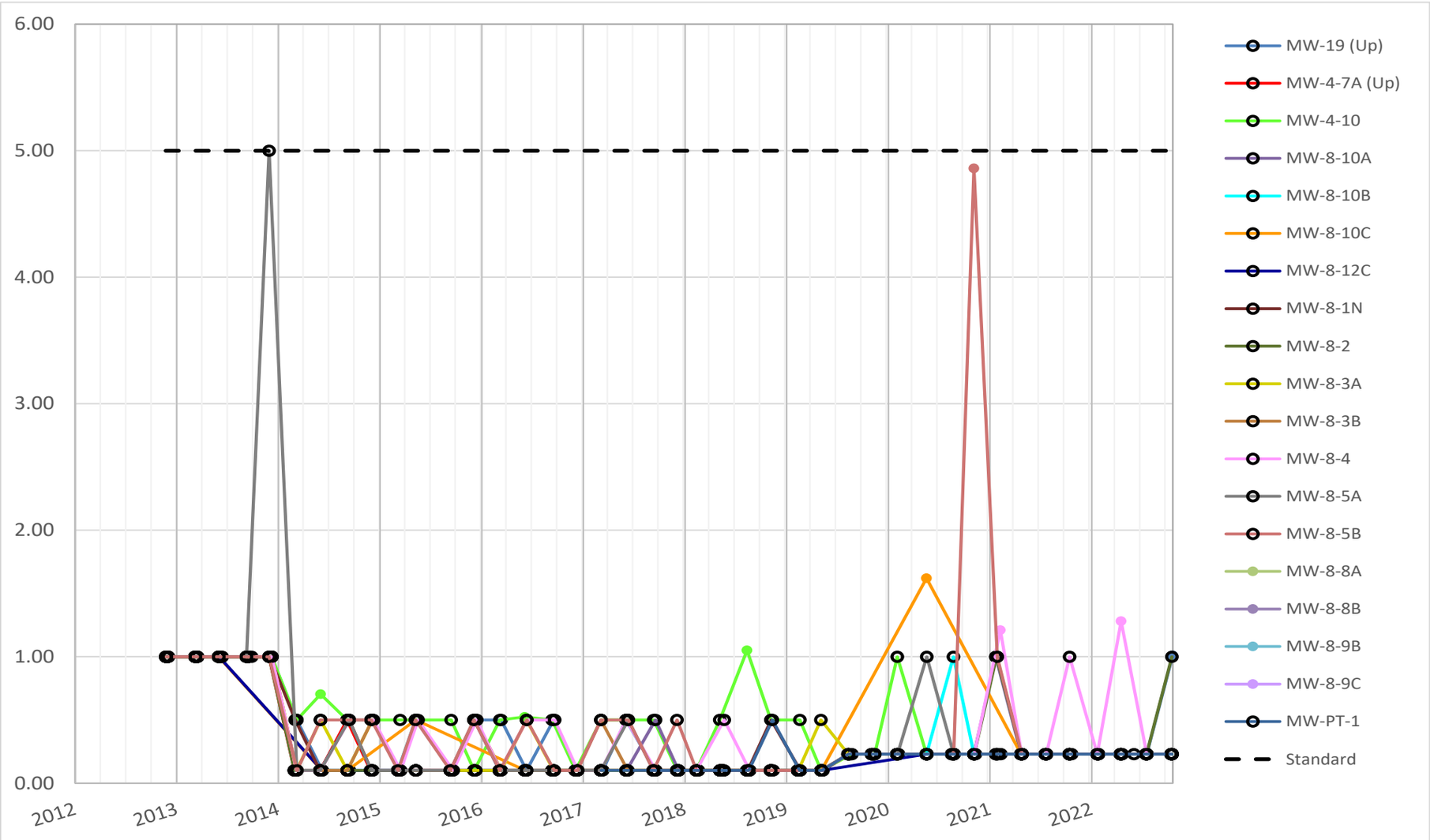


NOTE: Data does not exceed standard of 5 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

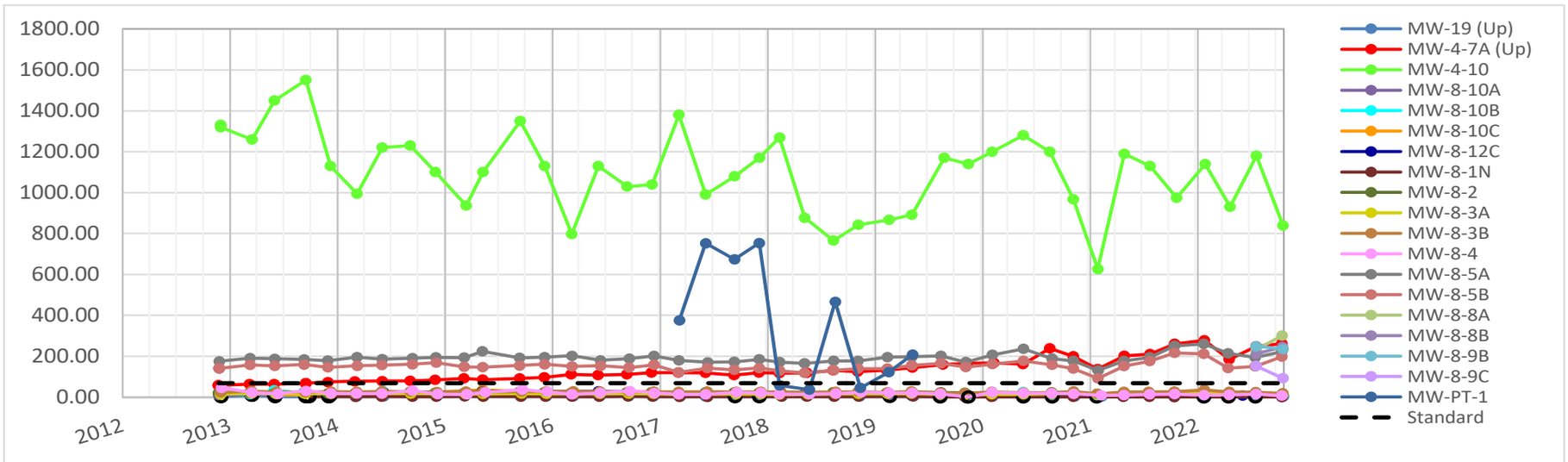
Lead, total [µg/l]

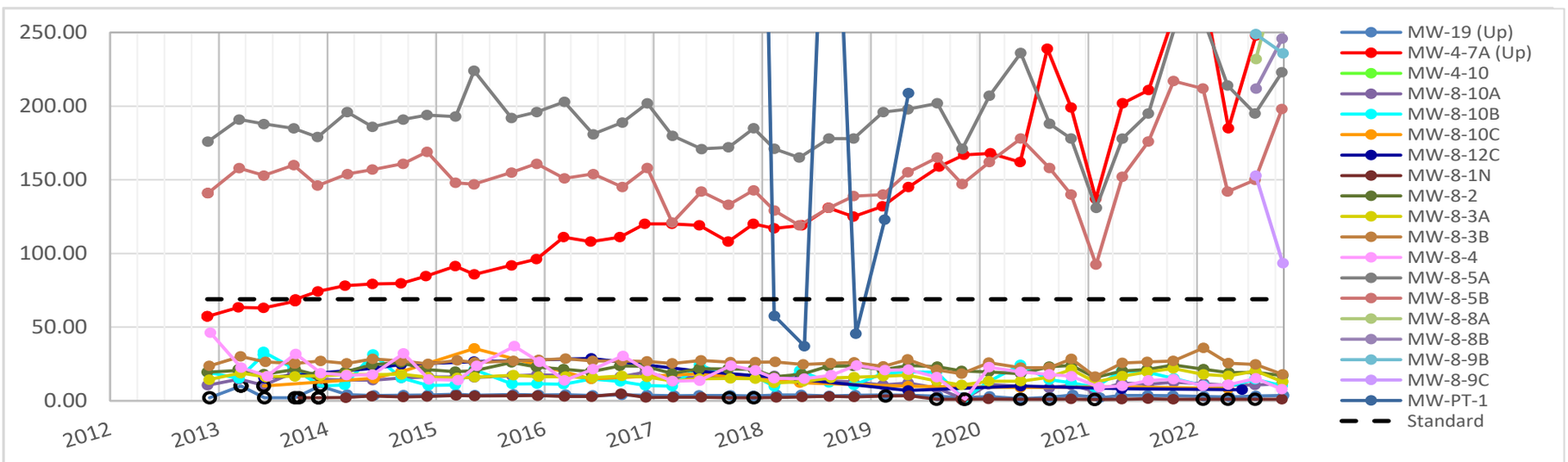


Talen Energy

Brunner Island - Basin 5 4th Quarter 2022

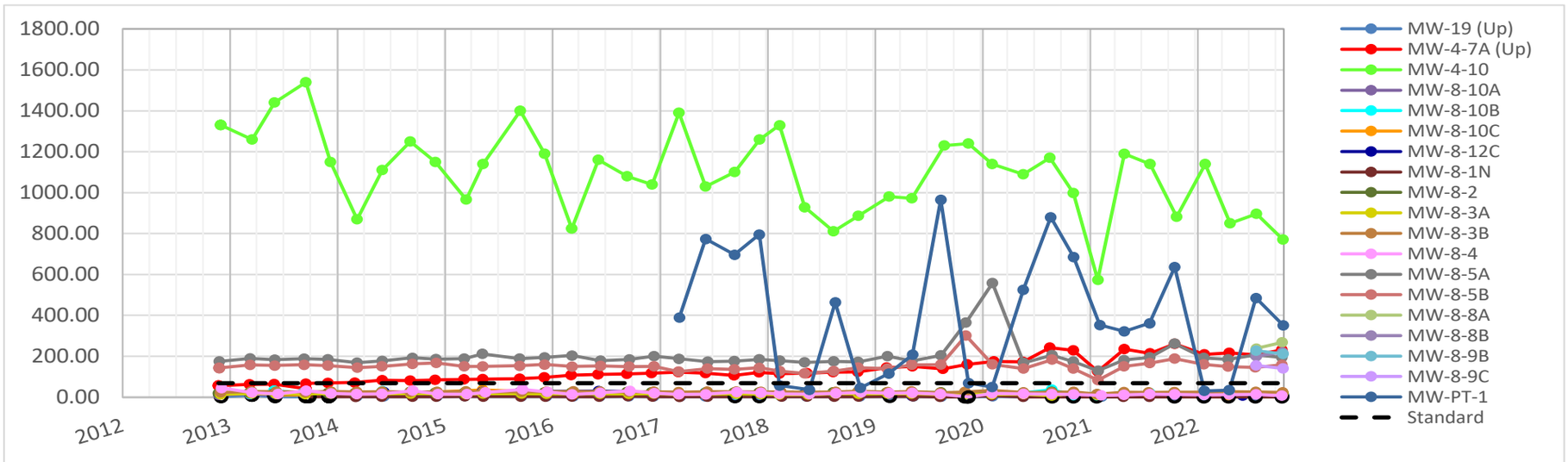
Lithium, dissolved [µg/l]

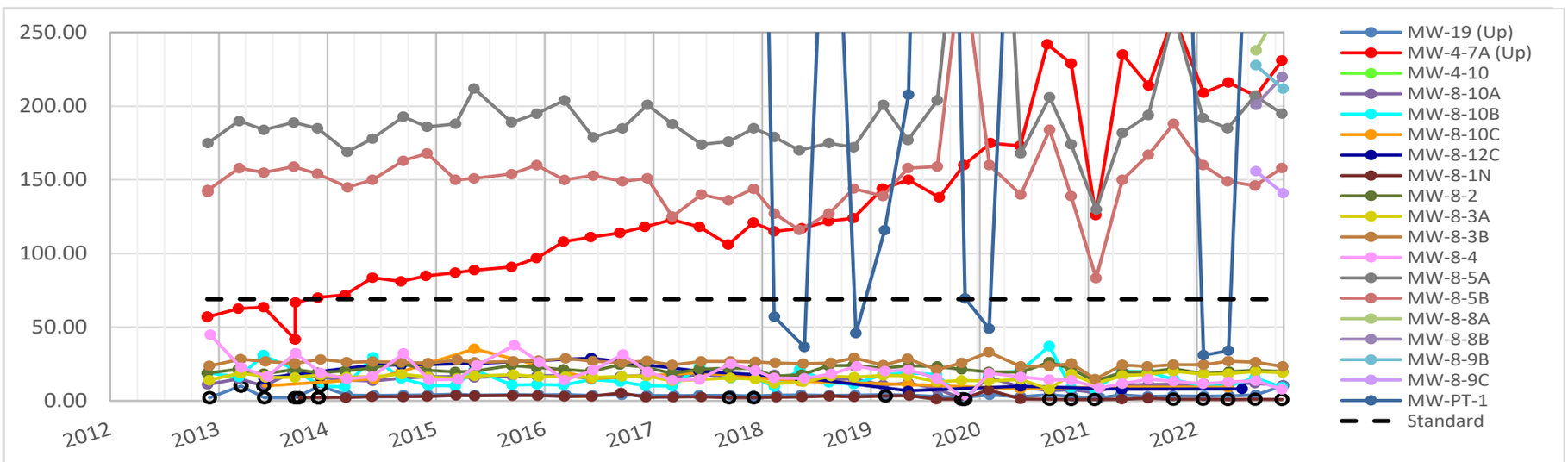




Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

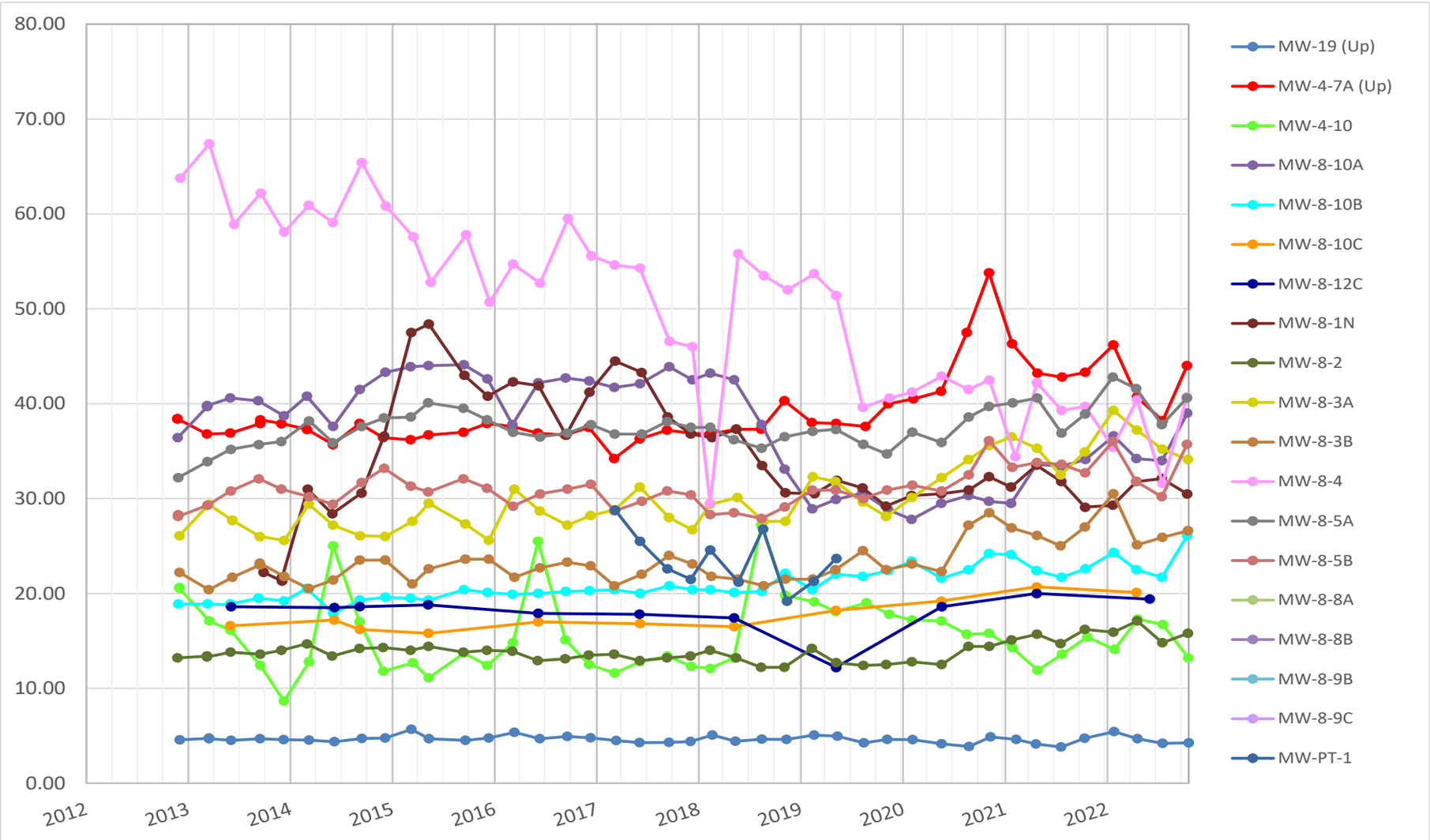
Lithium, total [µg/l]





Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

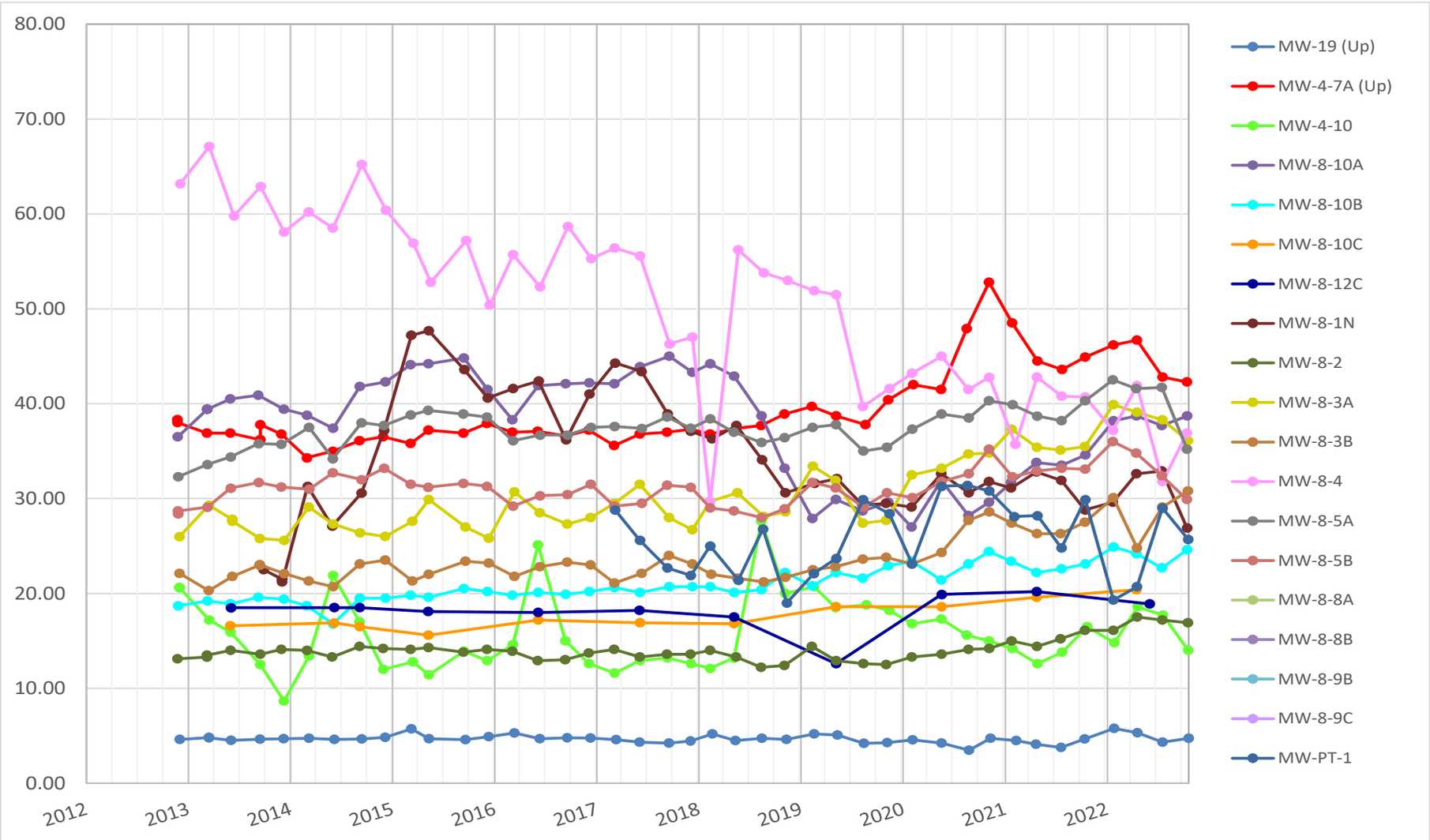
Magnesium, dissolved [mg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

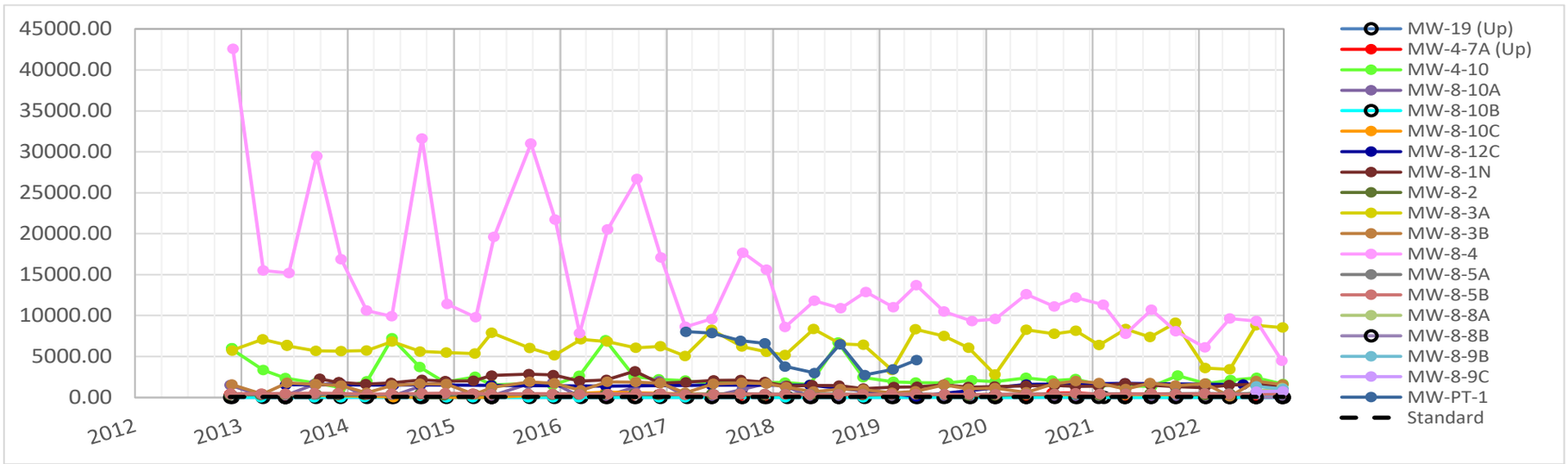
Magnesium, total [mg/l]

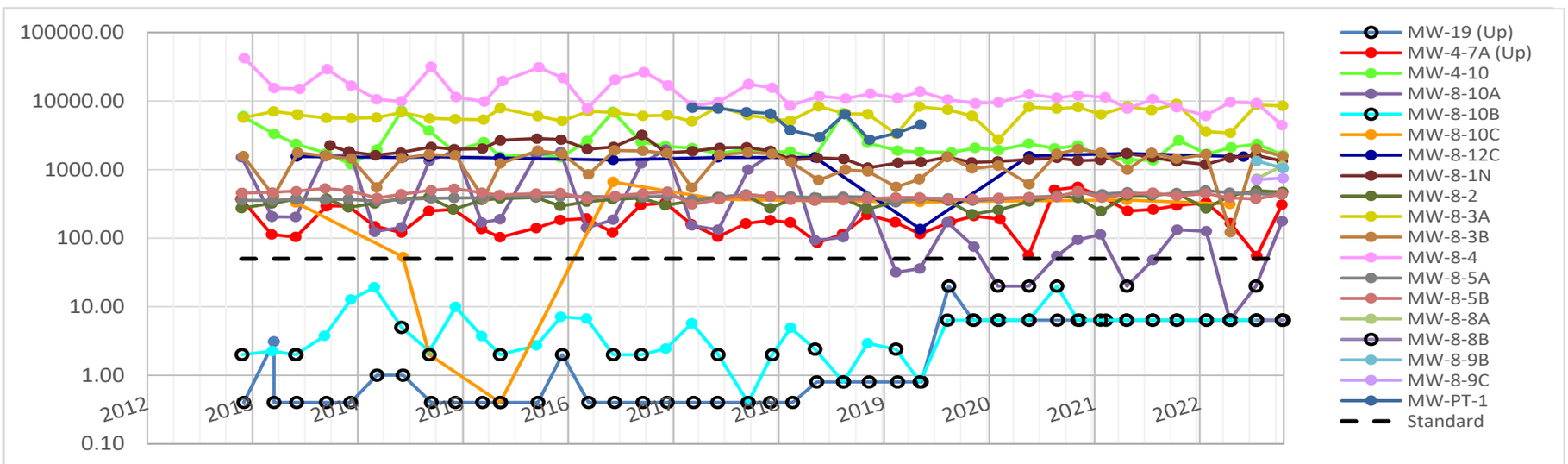


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

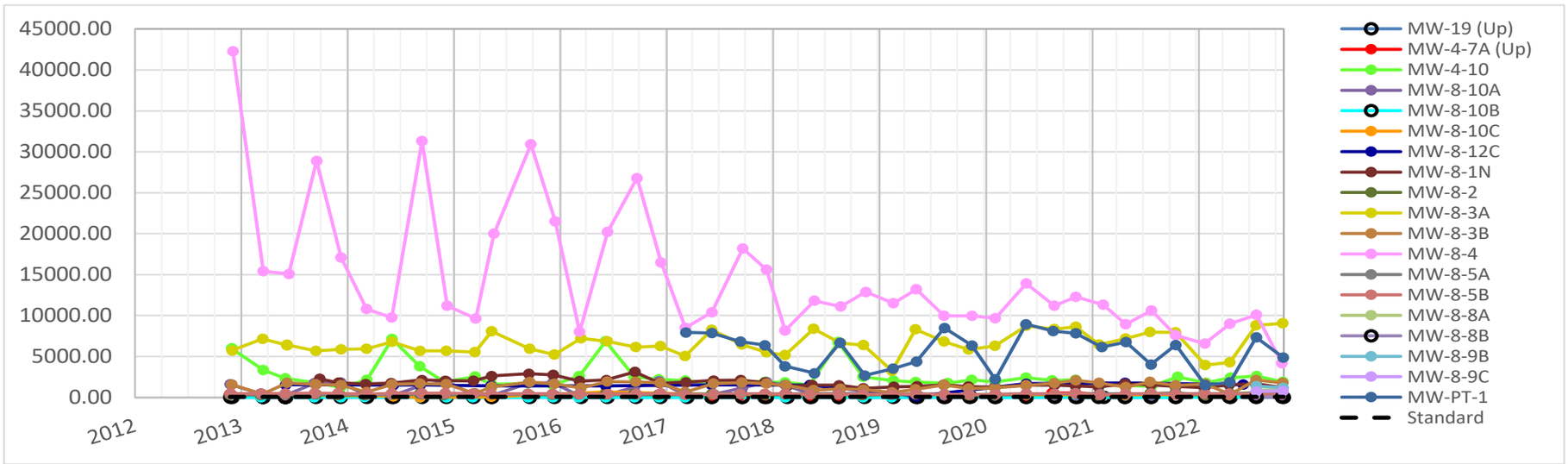
Manganese, dissolved [µg/l]

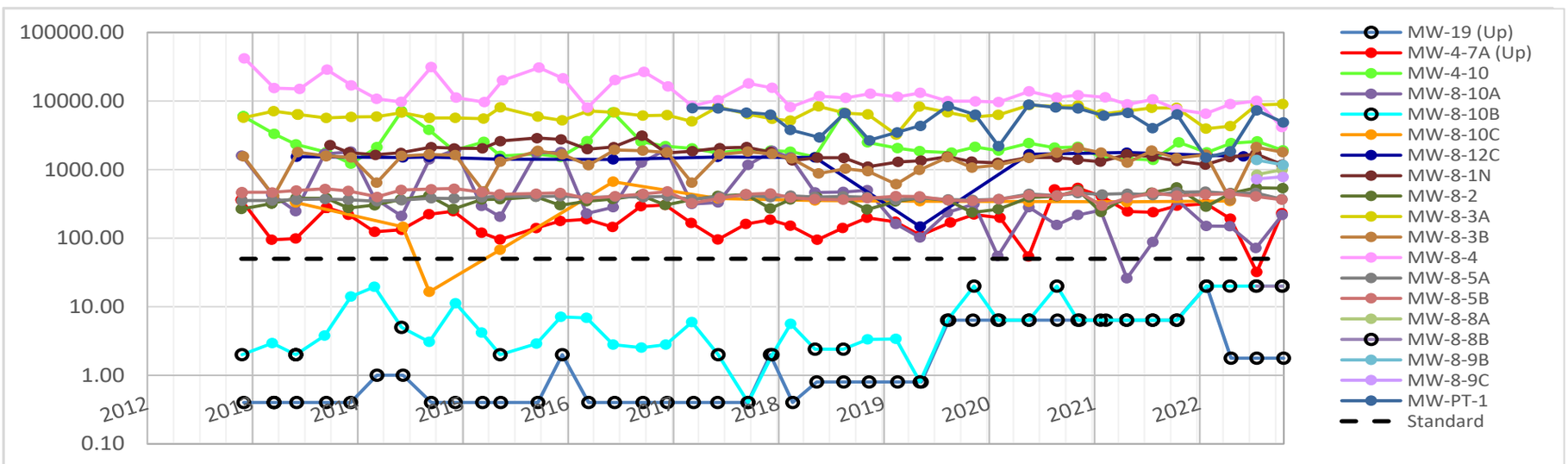




Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

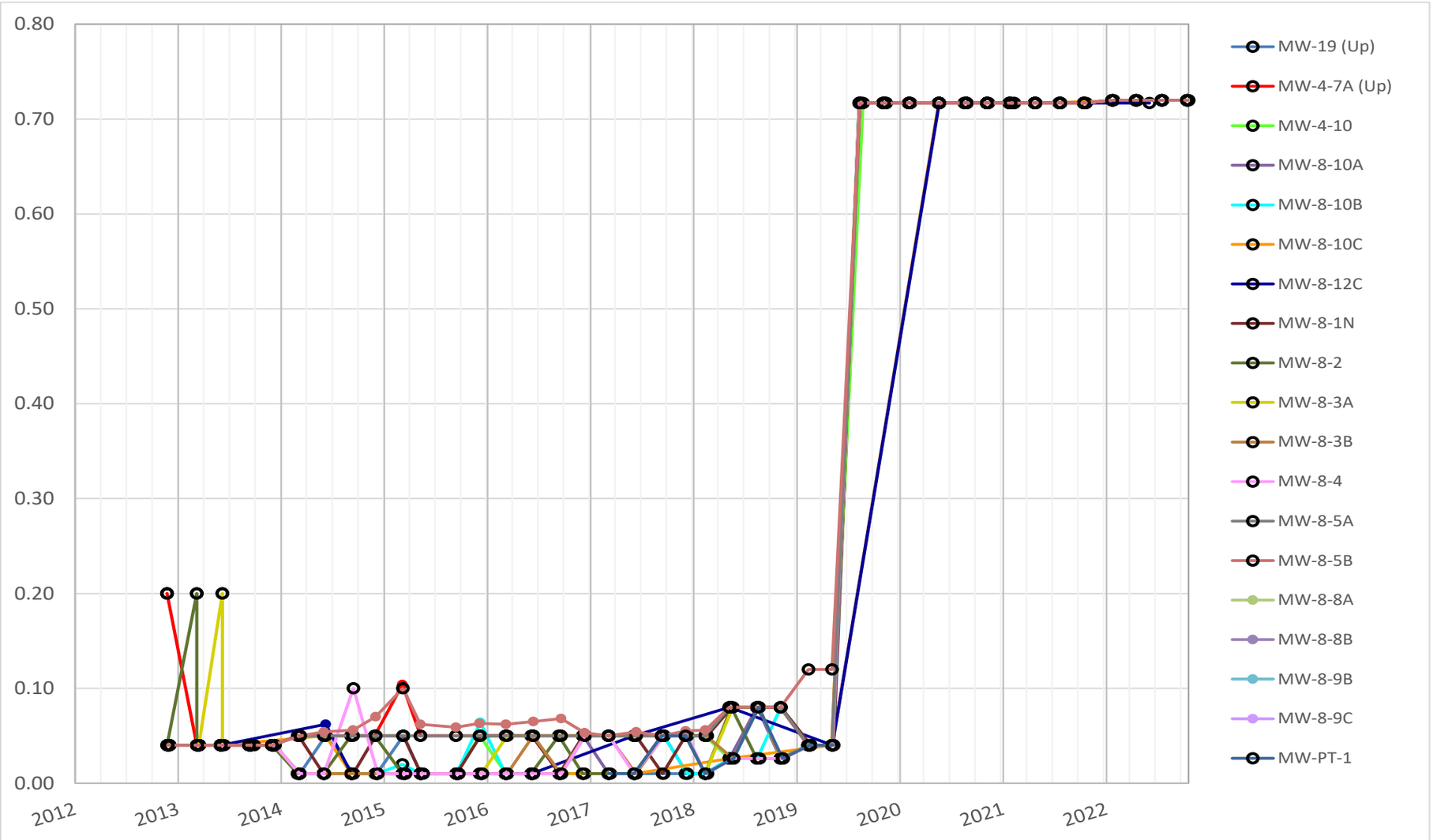
Manganese, total [µg/l]





Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

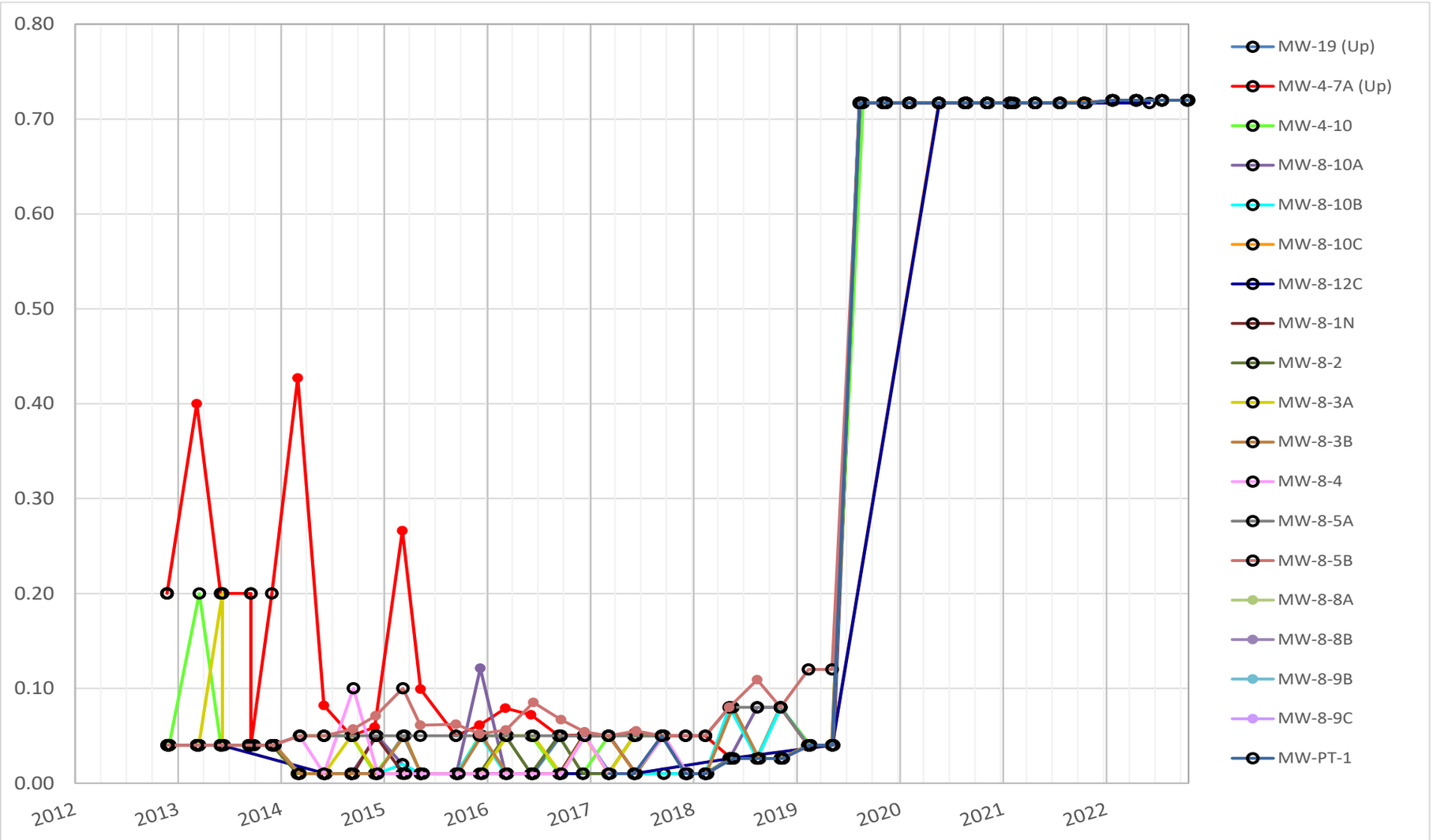
Mercury, dissolved [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Mercury, total [µg/l]



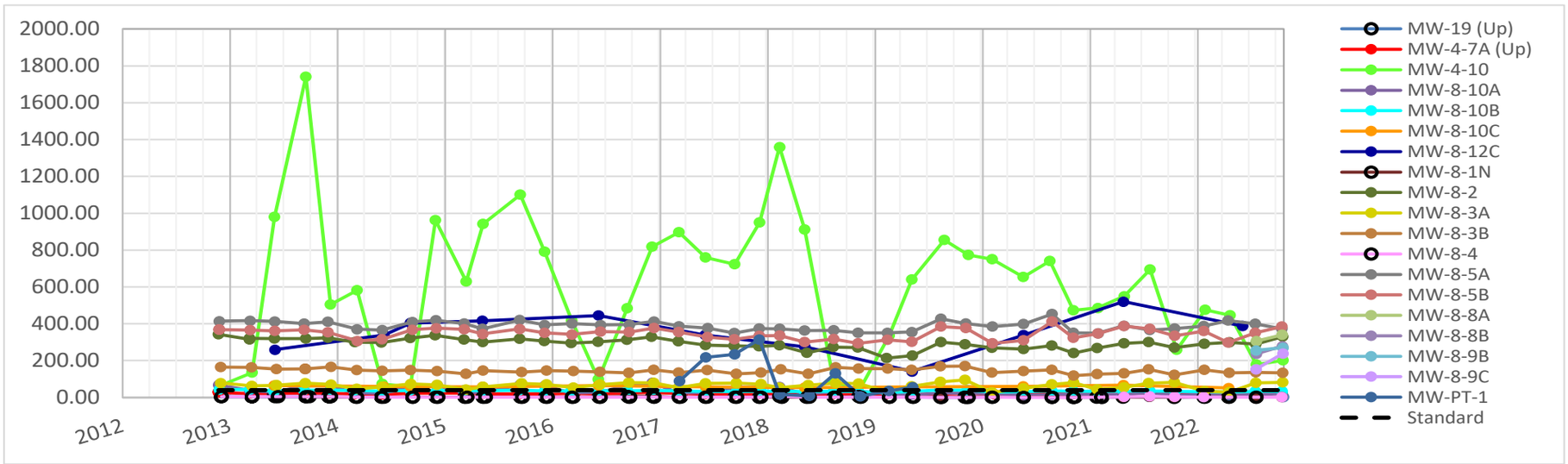
NOTE: Data does not exceed standard of 2 µg/l during this time frame

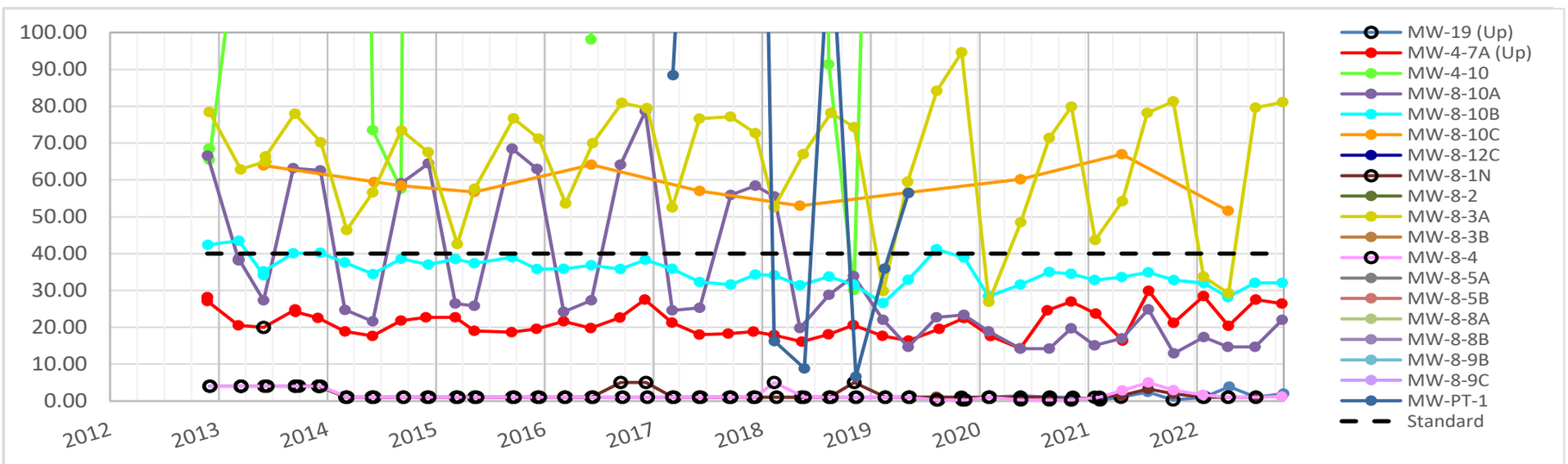
Talen Energy

Brunner Island - Basin 5

4th Quarter 2022

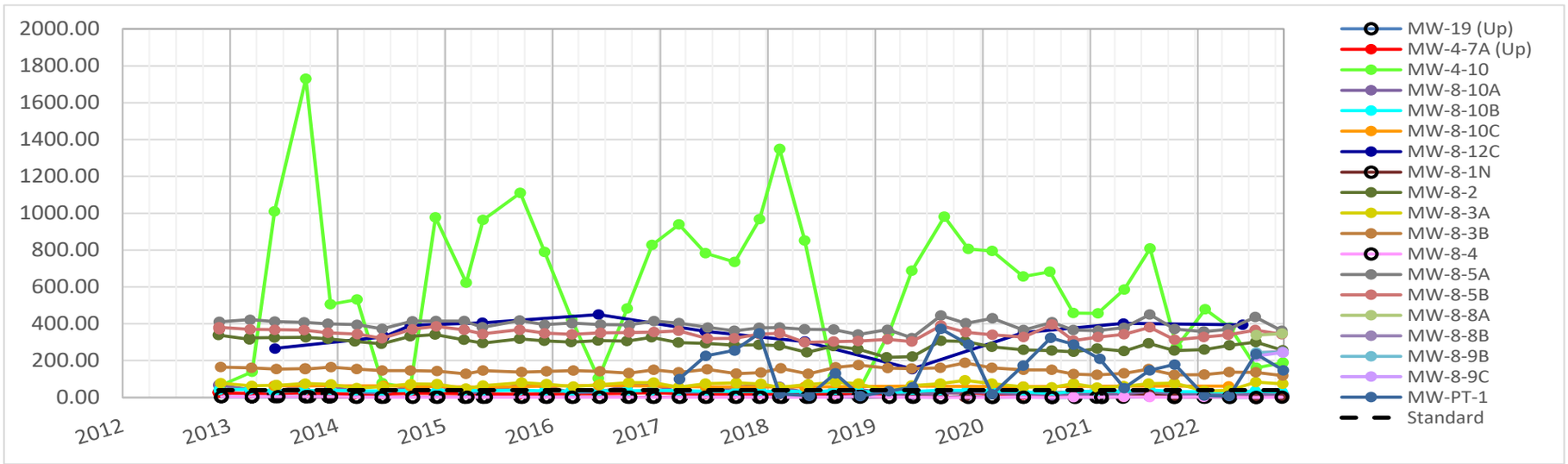
Molybdenum, dissolved [µg/l]

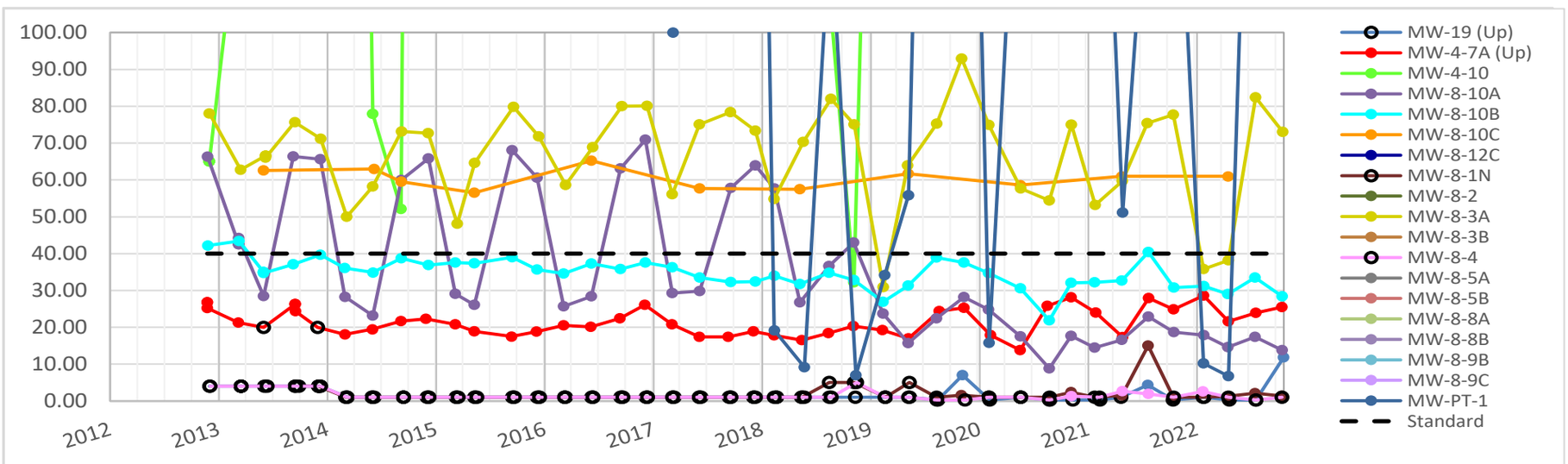




Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Molybdenum, total [µg/l]

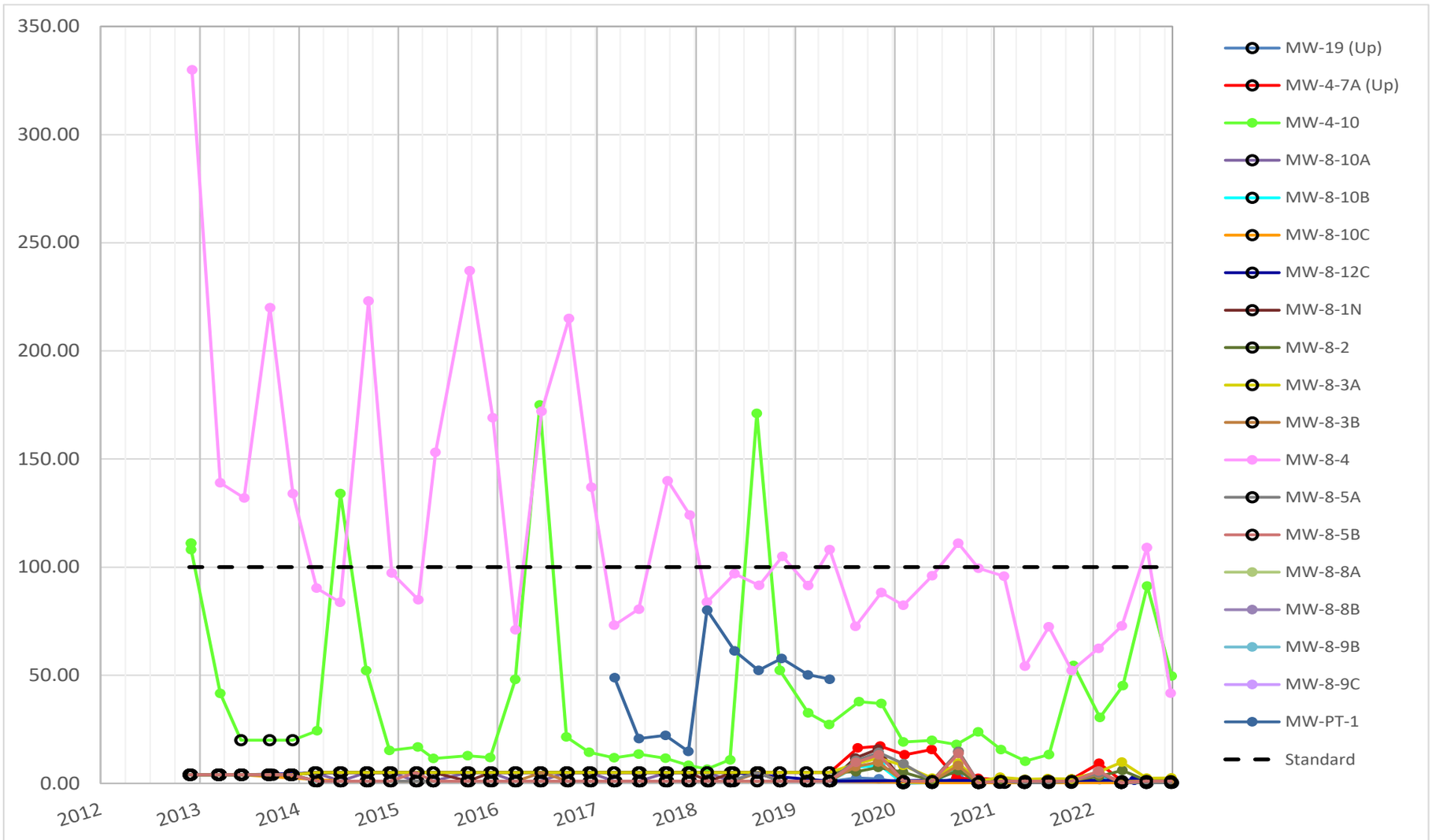




Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

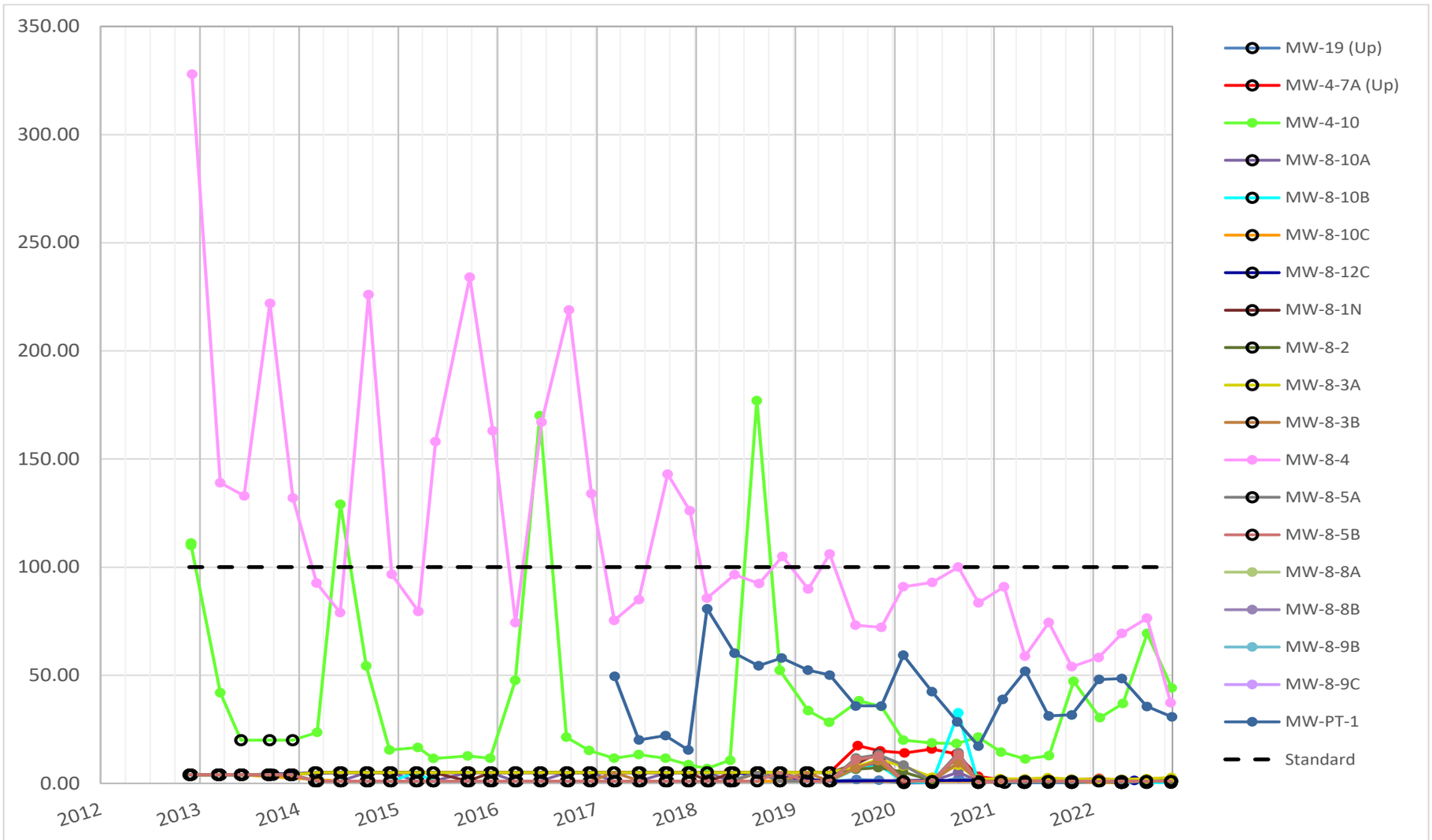
Nickel, dissolved [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

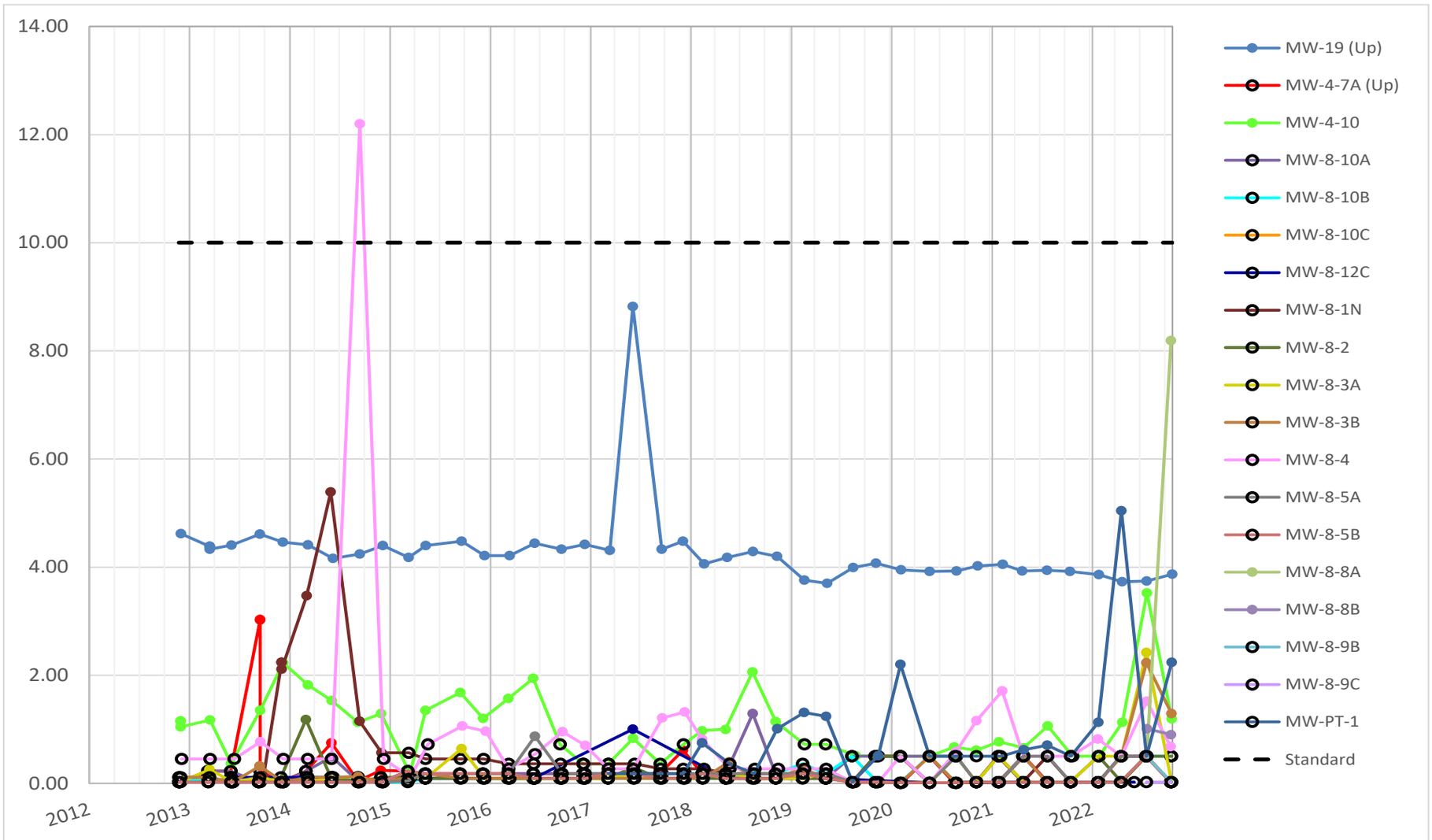
Nickel, total [µg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

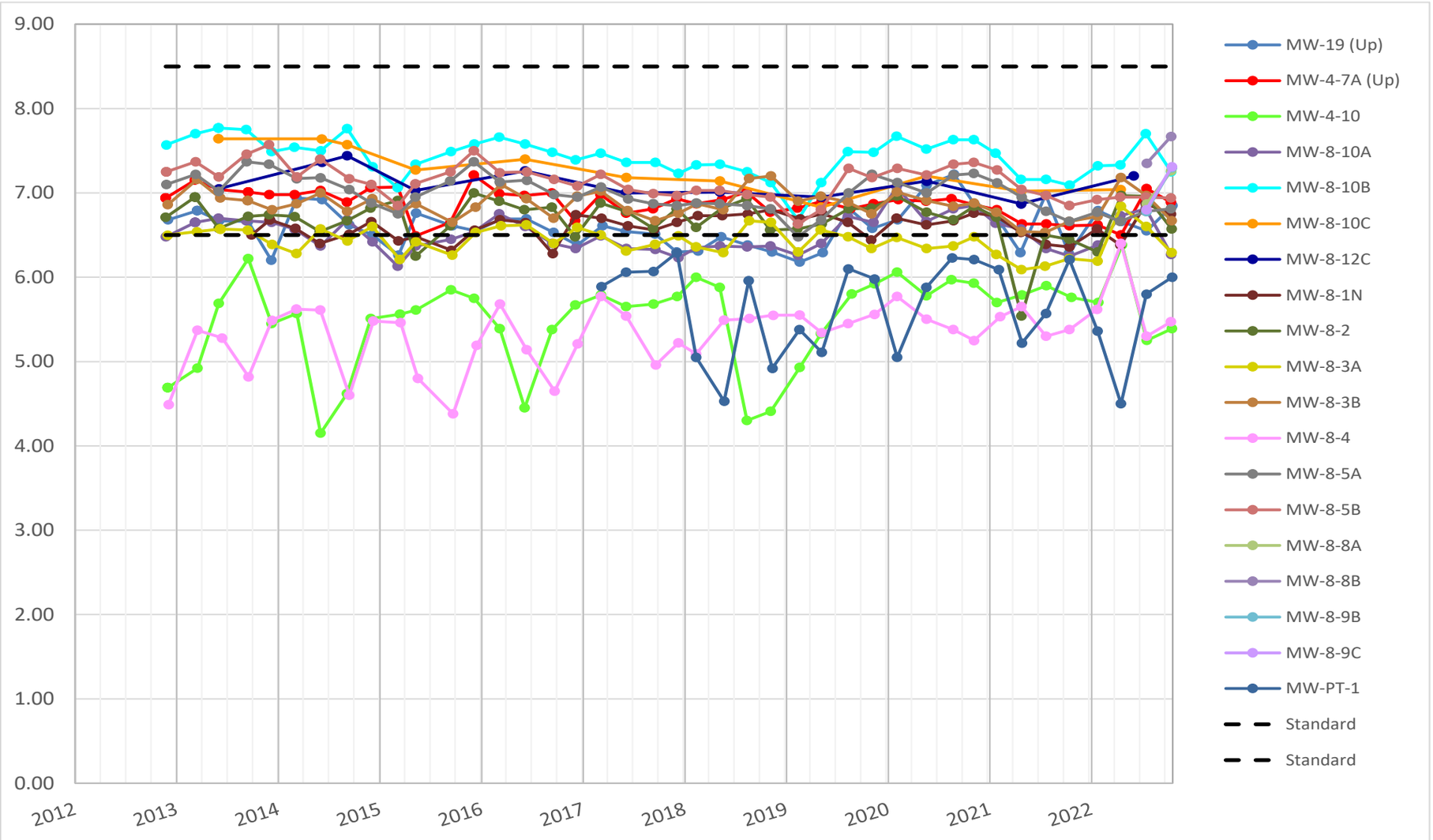
Nitrate, as N [mg/l]



Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

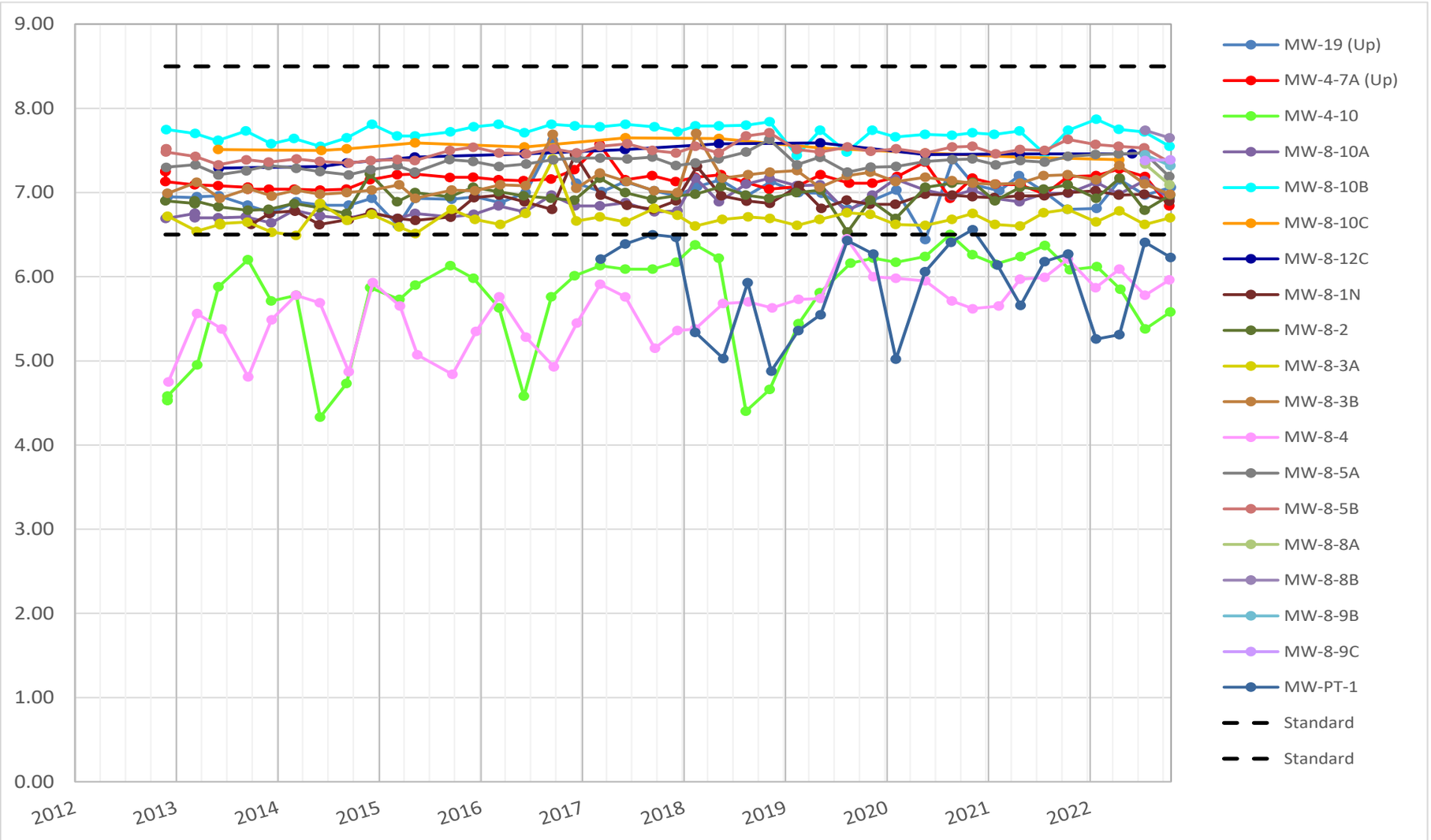
pH, field [s.u.]



Talen Energy
Brunner Island - Basin 5

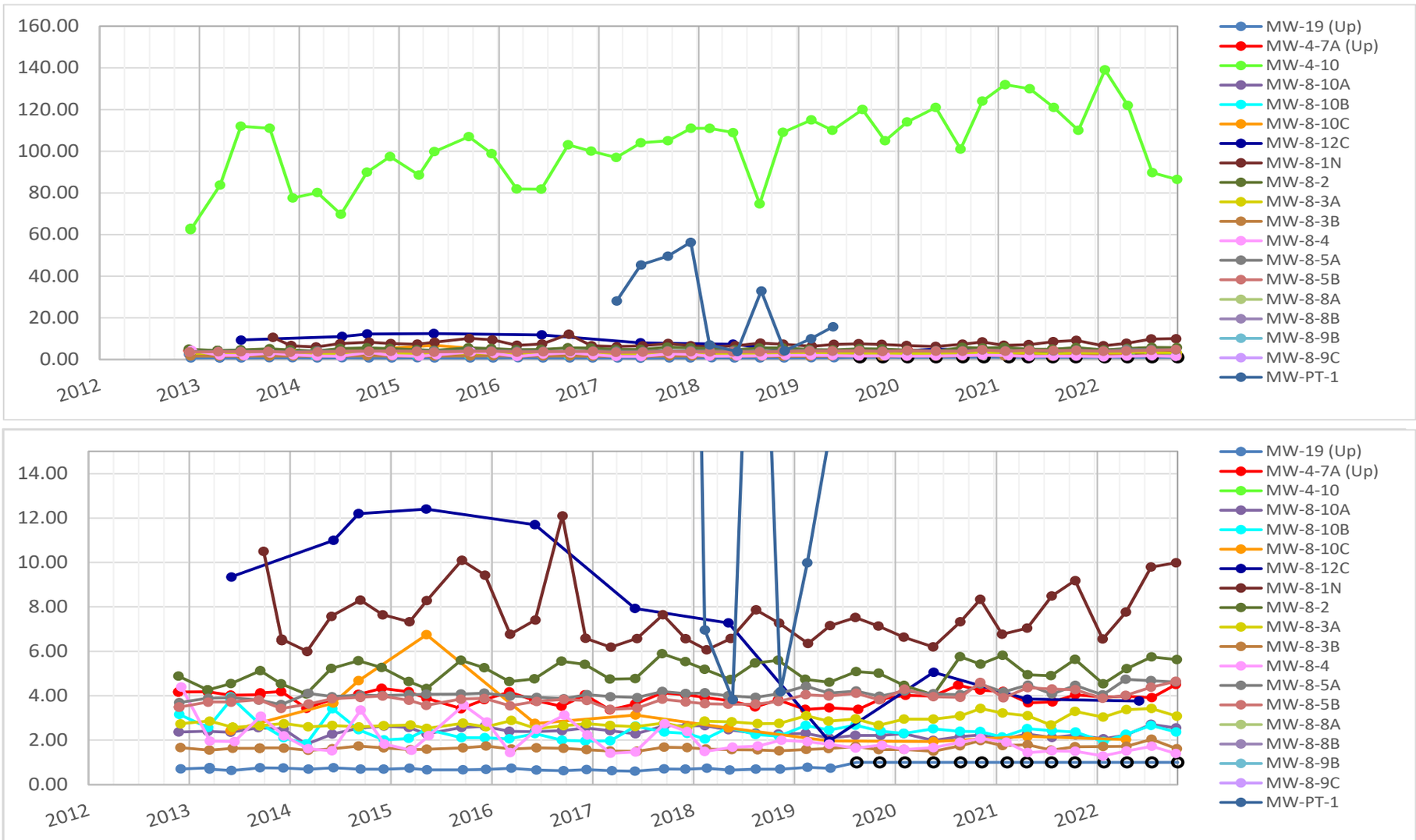
4th Quarter 2022

pH, lab [s.u.]



Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

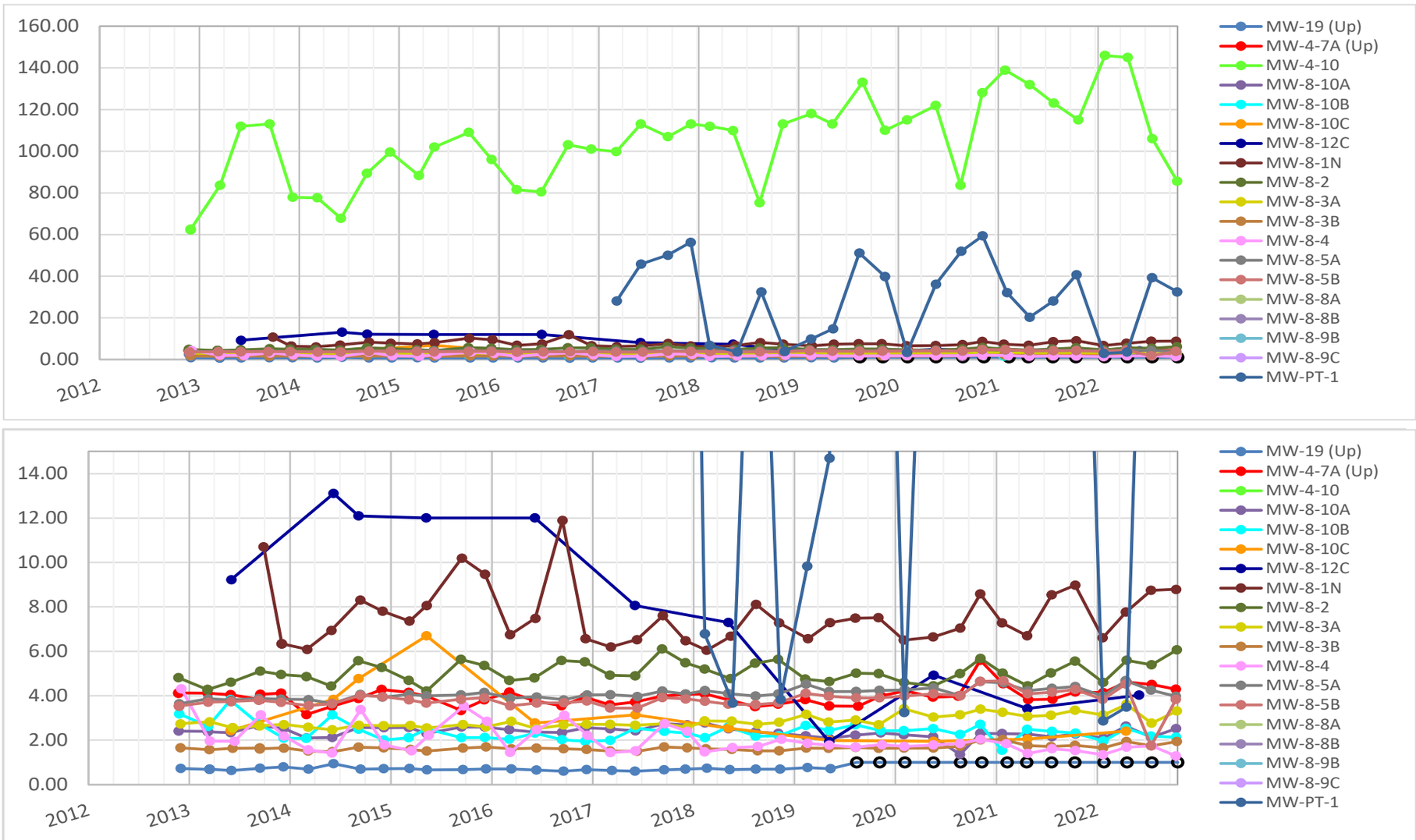
Potassium, dissolved [mg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Potassium, total [mg/l]

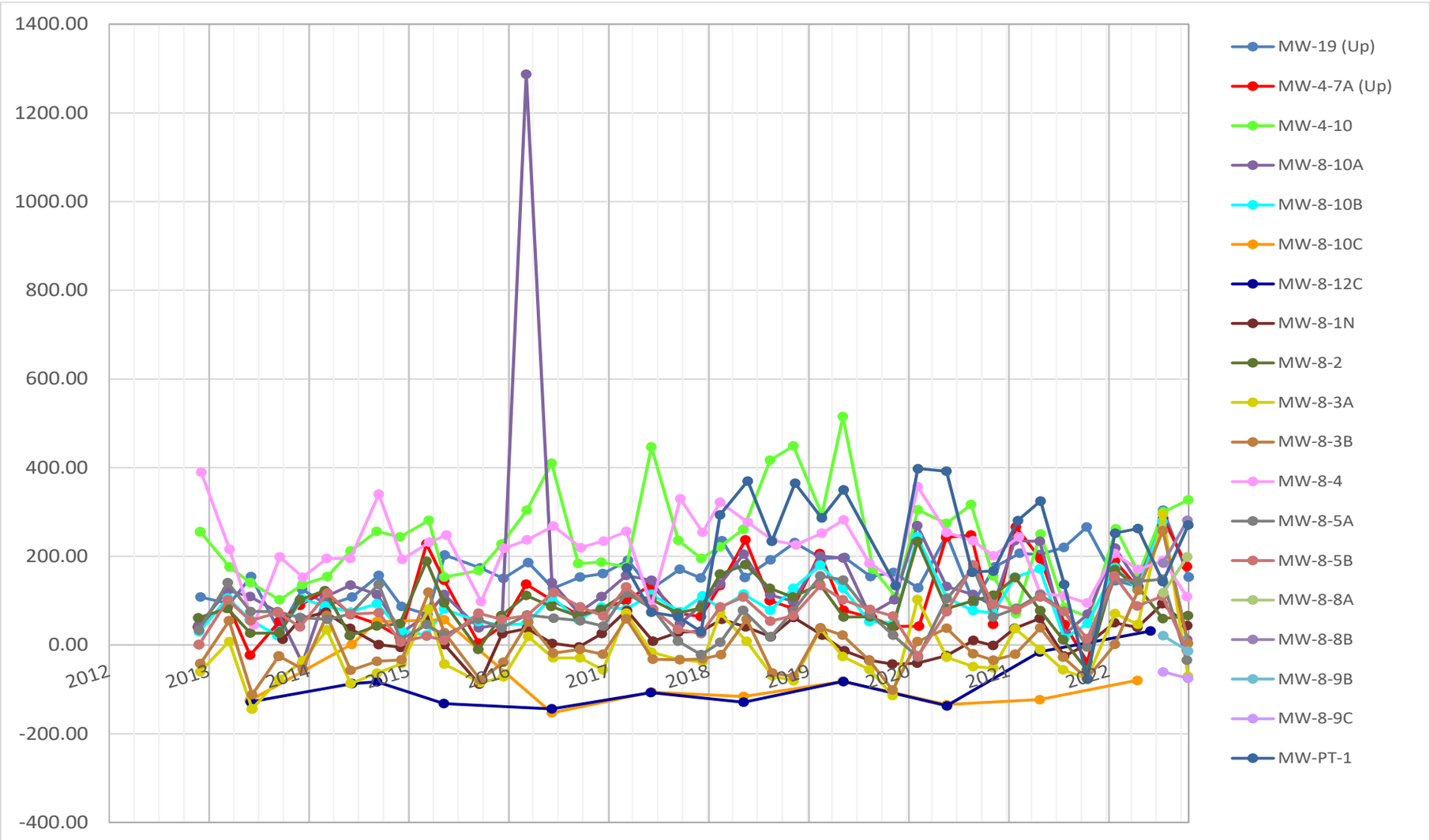


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

Redox, field [mv]

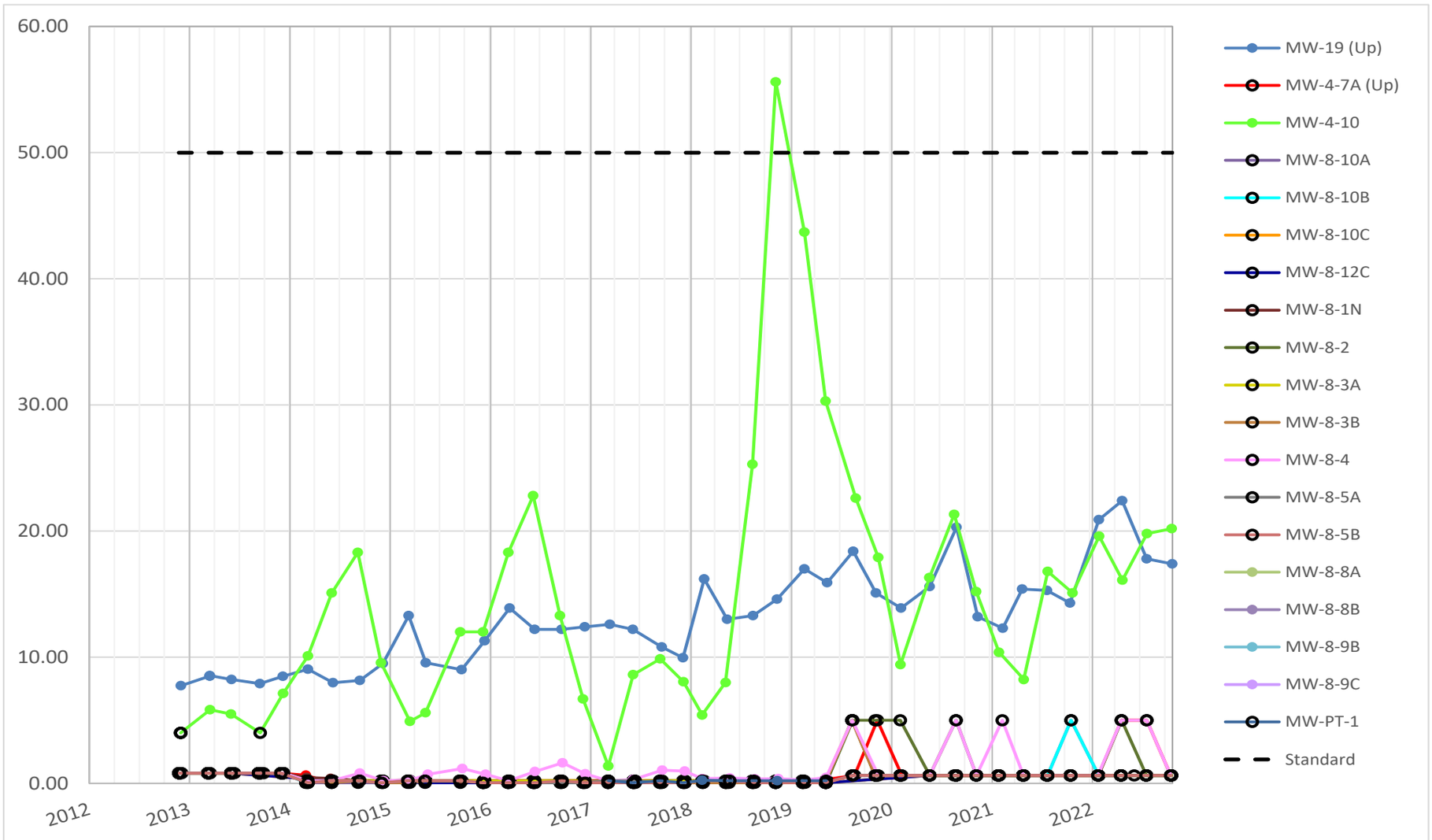


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

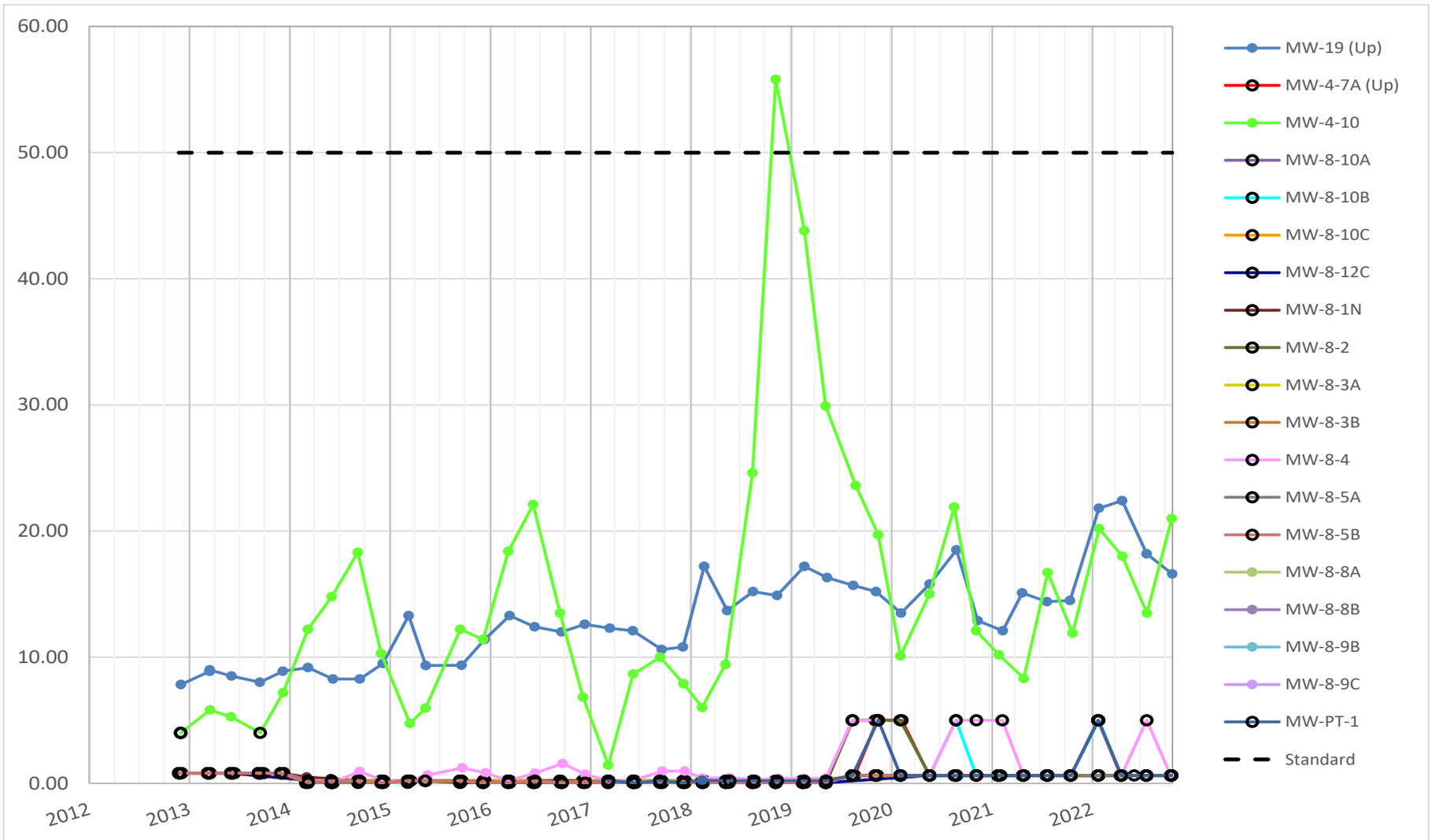
Selenium, dissolved [µg/l]



Talen Energy
Brunner Island - Basin 5

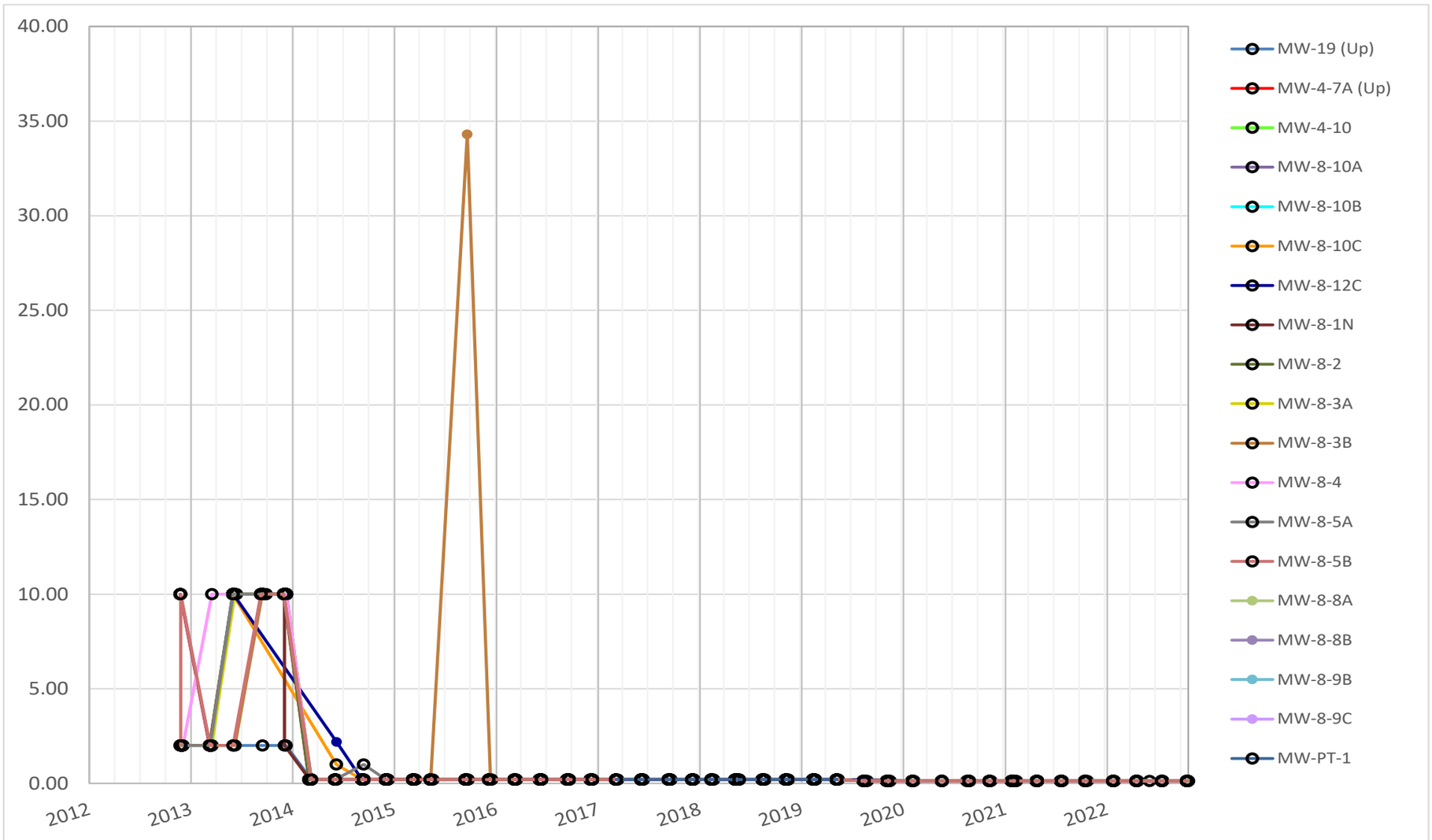
4th Quarter 2022

Selenium, total [µg/l]



Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

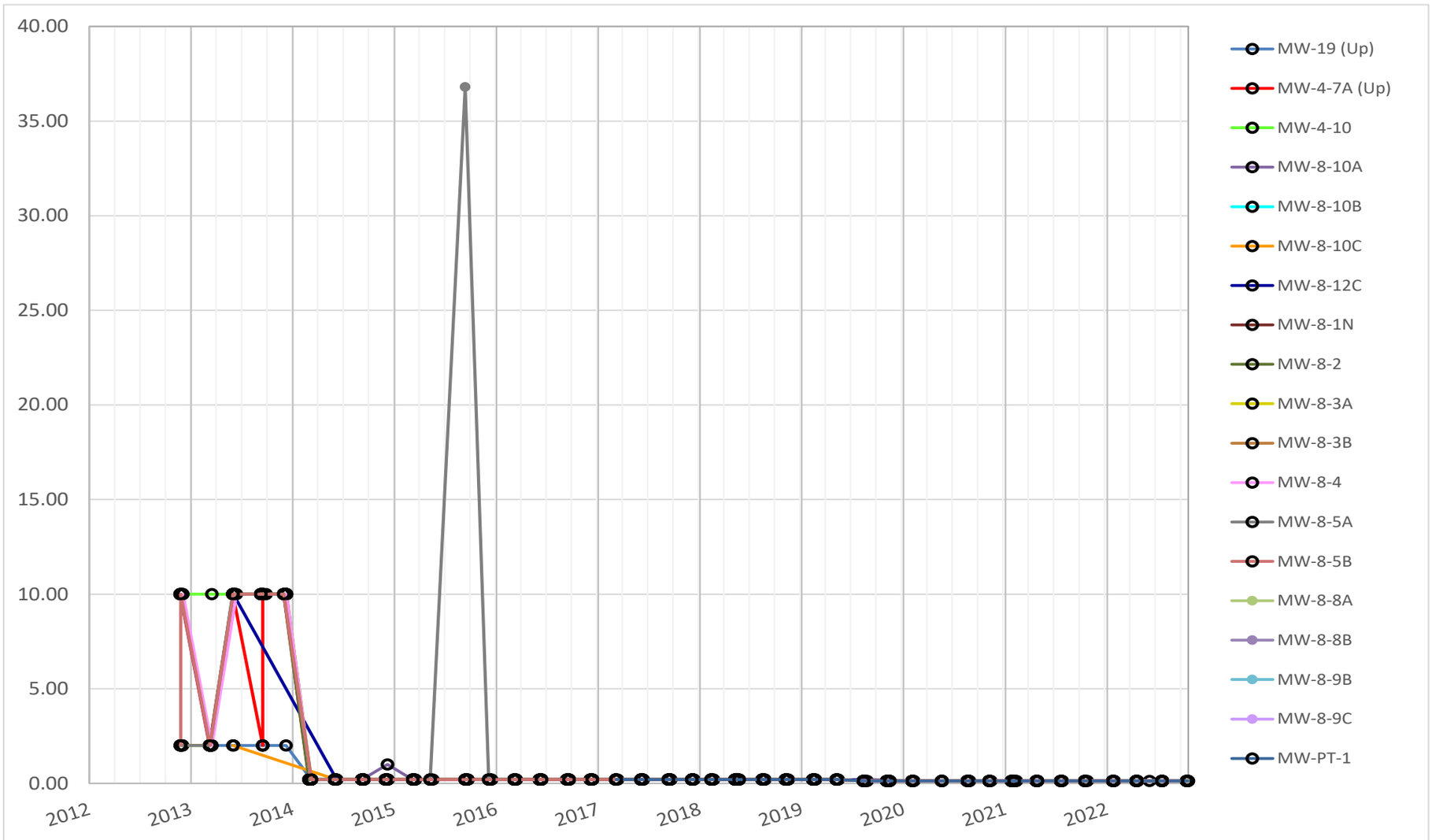
Silver, dissolved [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

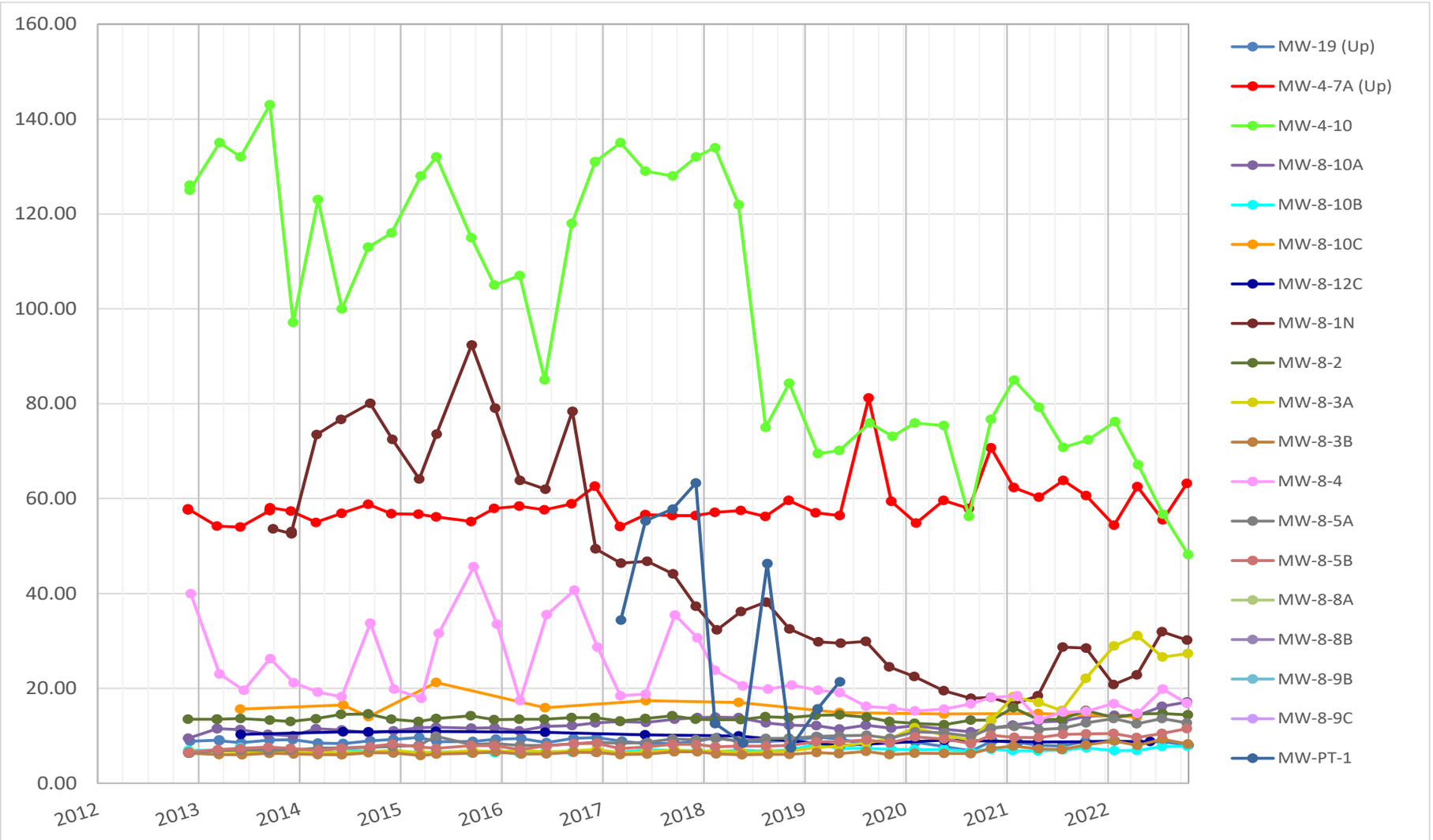
Silver, total [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Sodium, dissolved [mg/l]

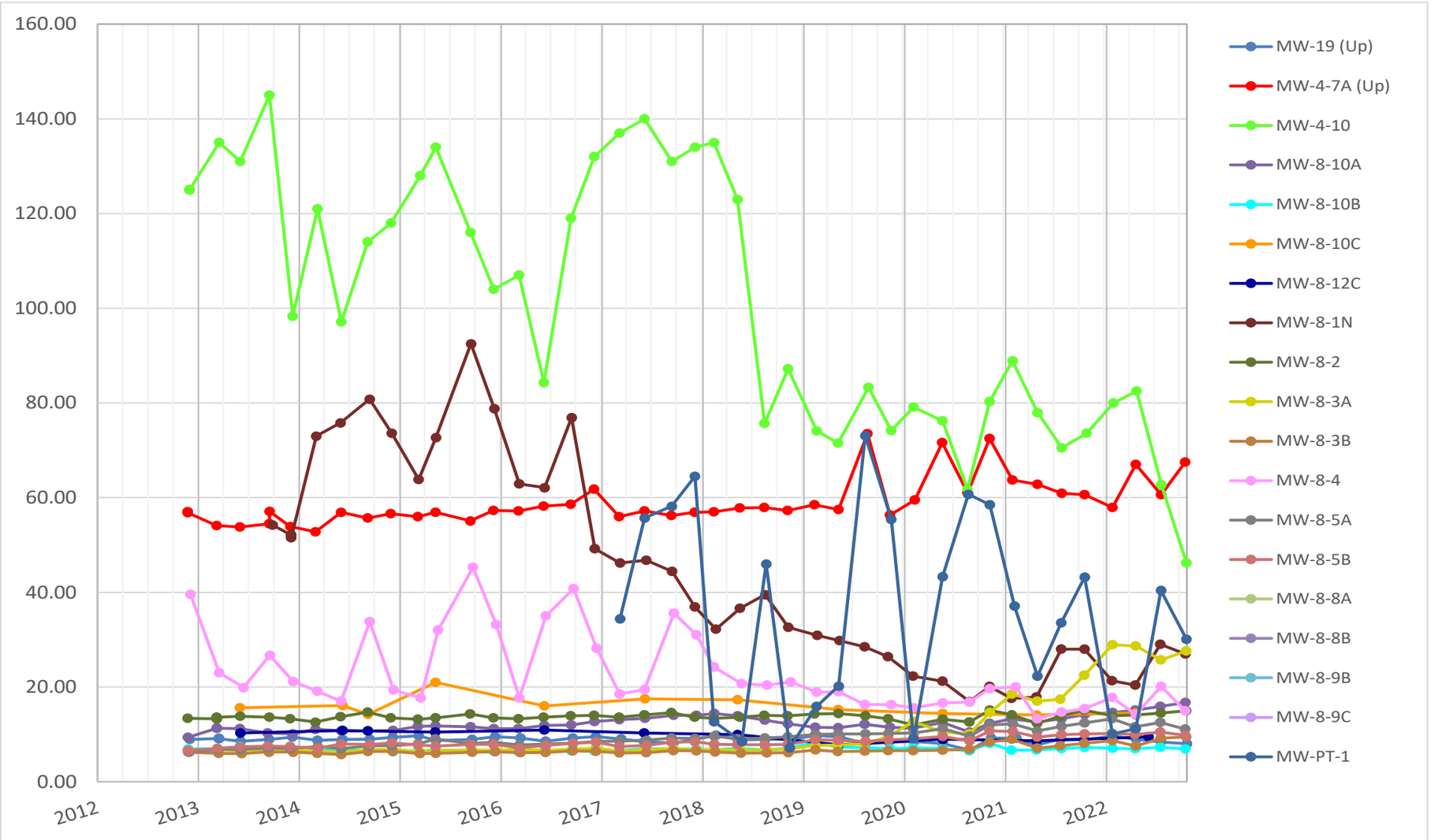


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

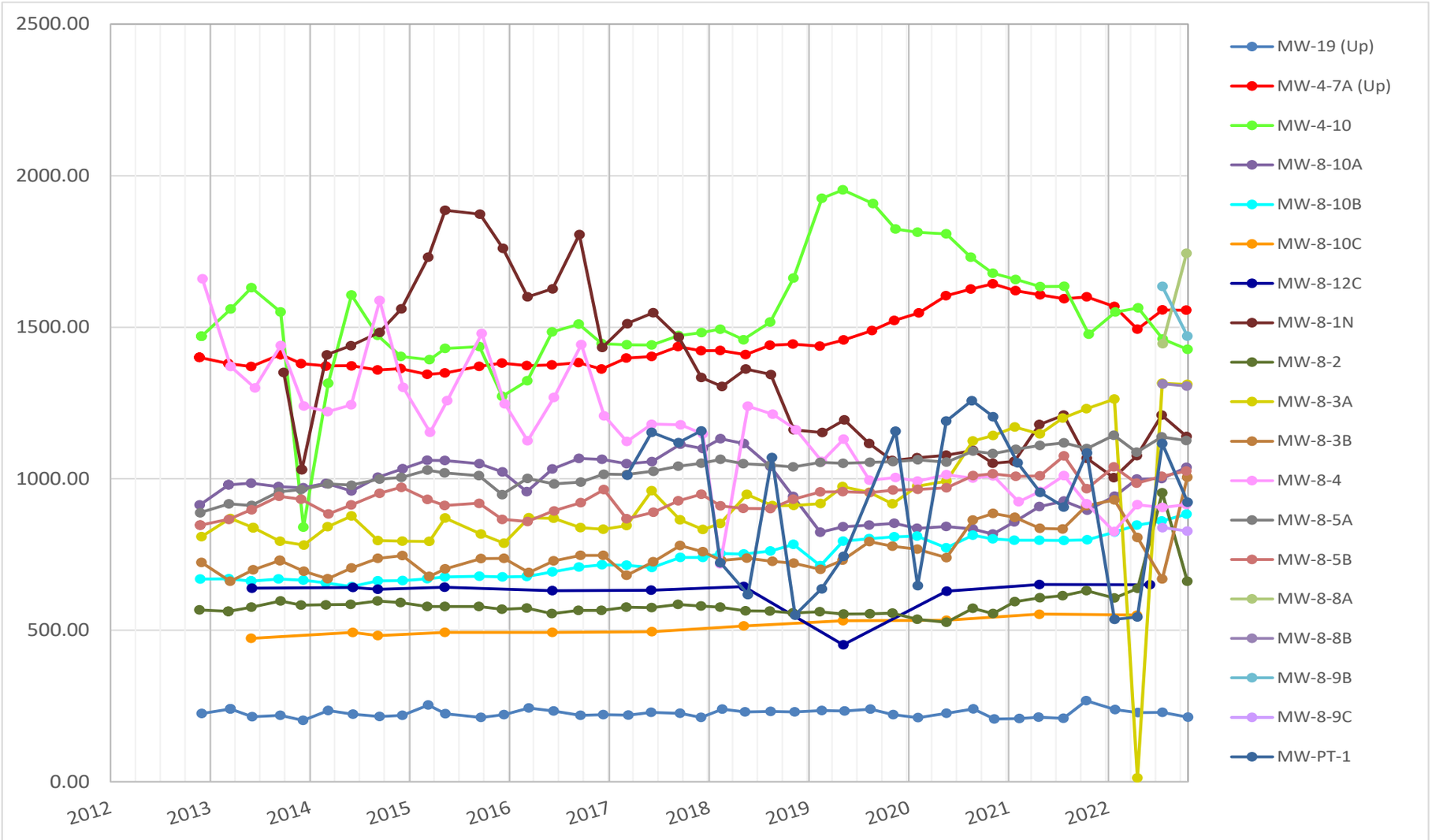
Sodium, total [mg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

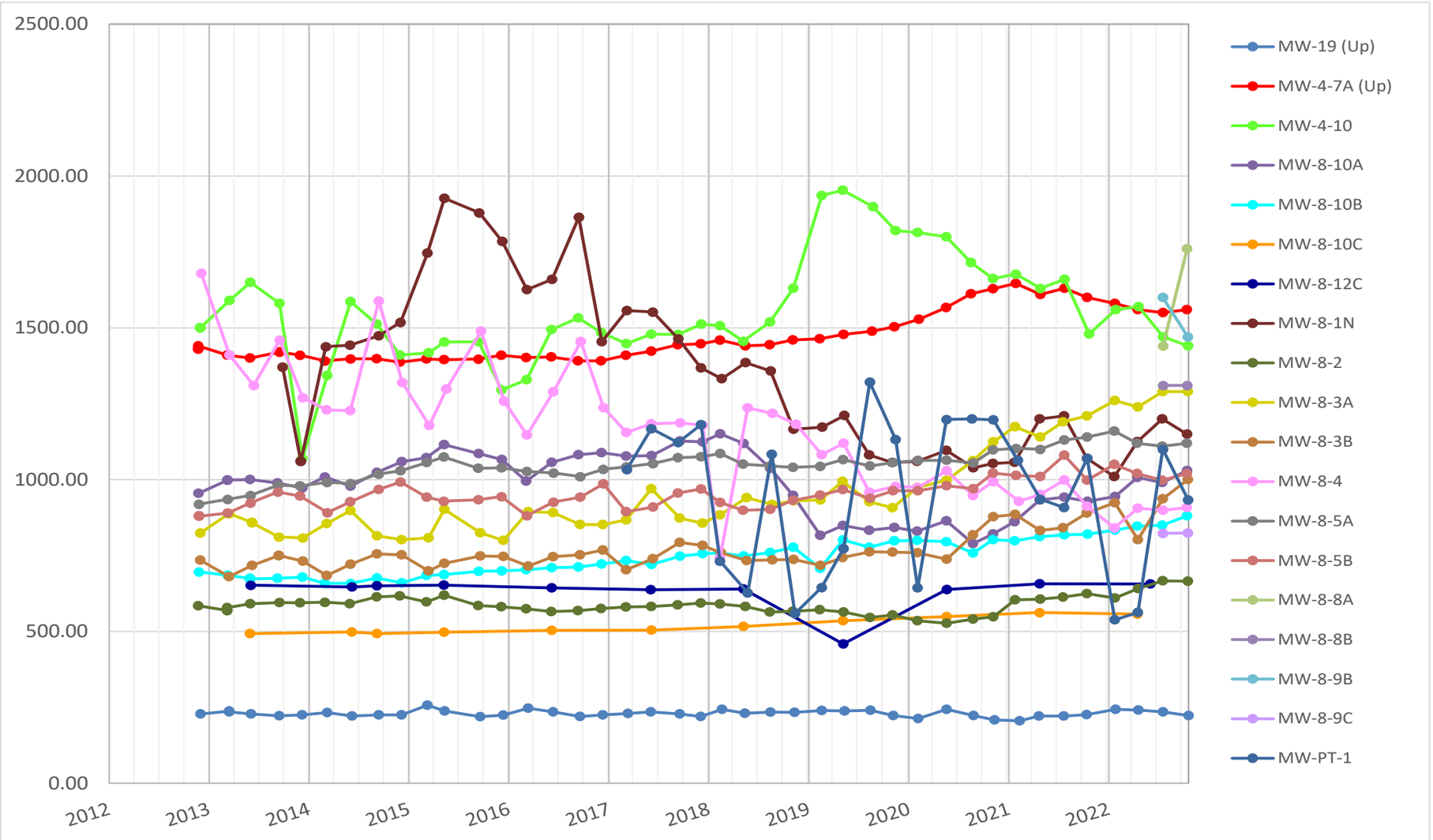
Specific Conductance, field [umhos/cm]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

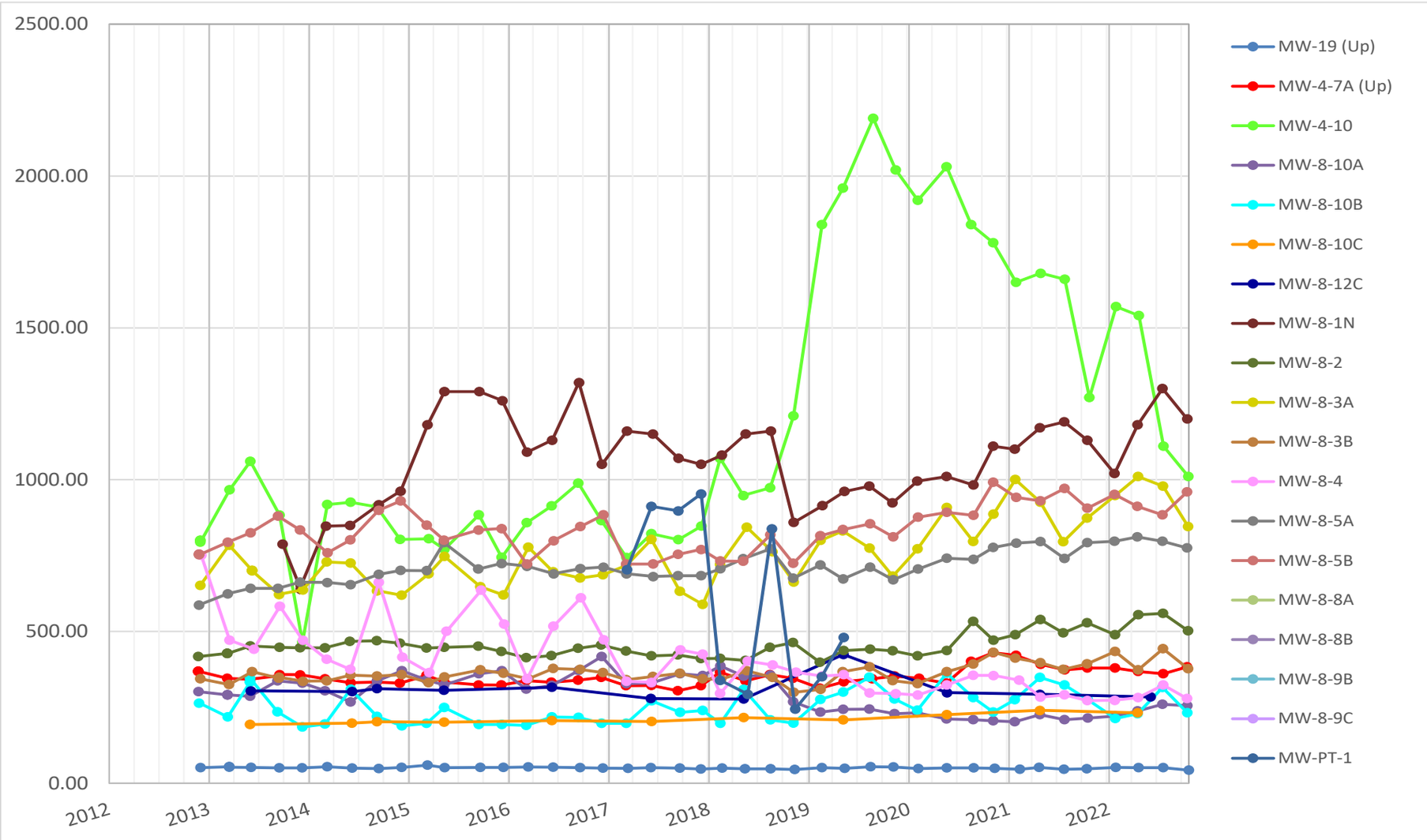
Specific Conductance, lab [umhos/cm]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

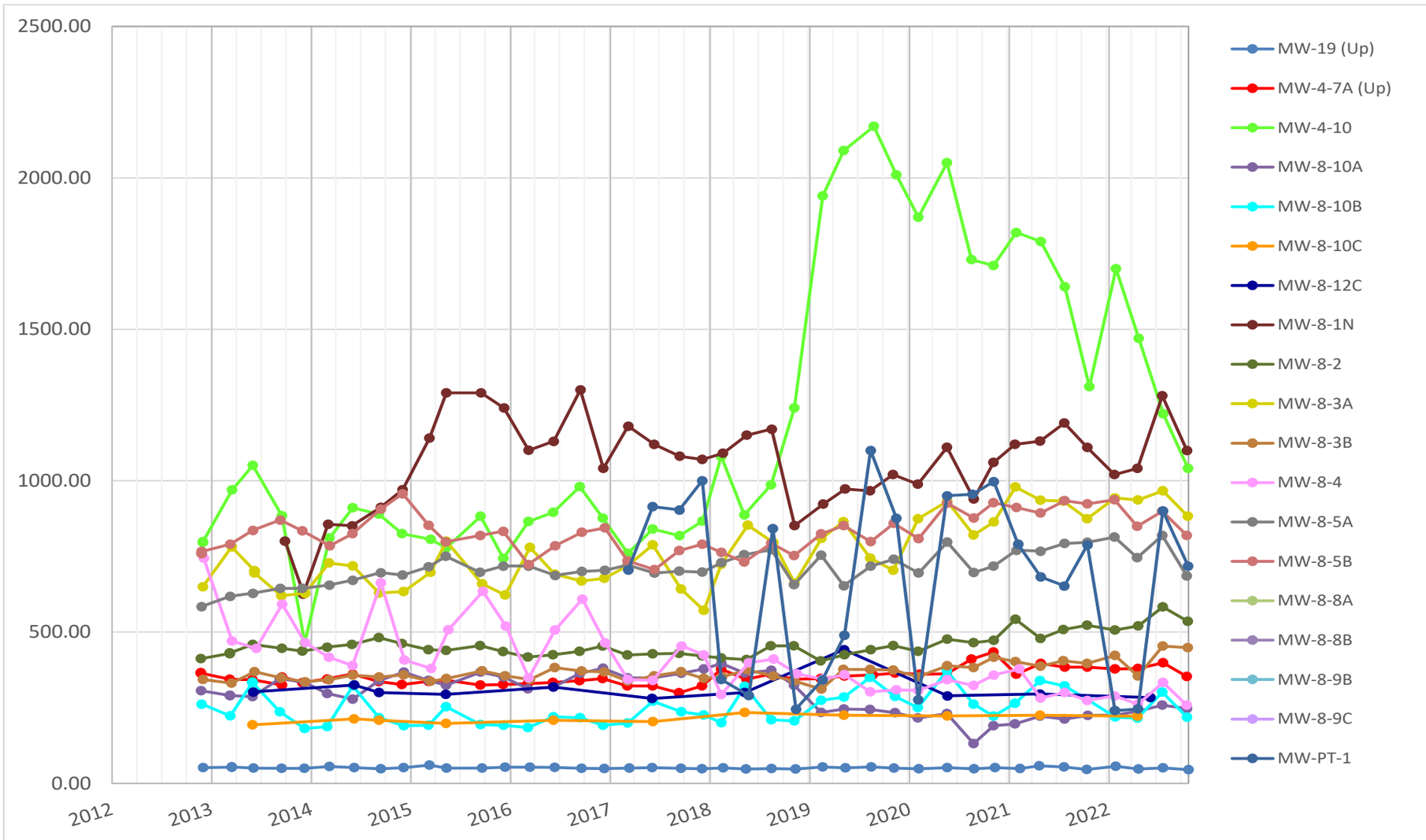
Strontium, dissolved [µg/l]



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

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Strontium, total [µg/l]

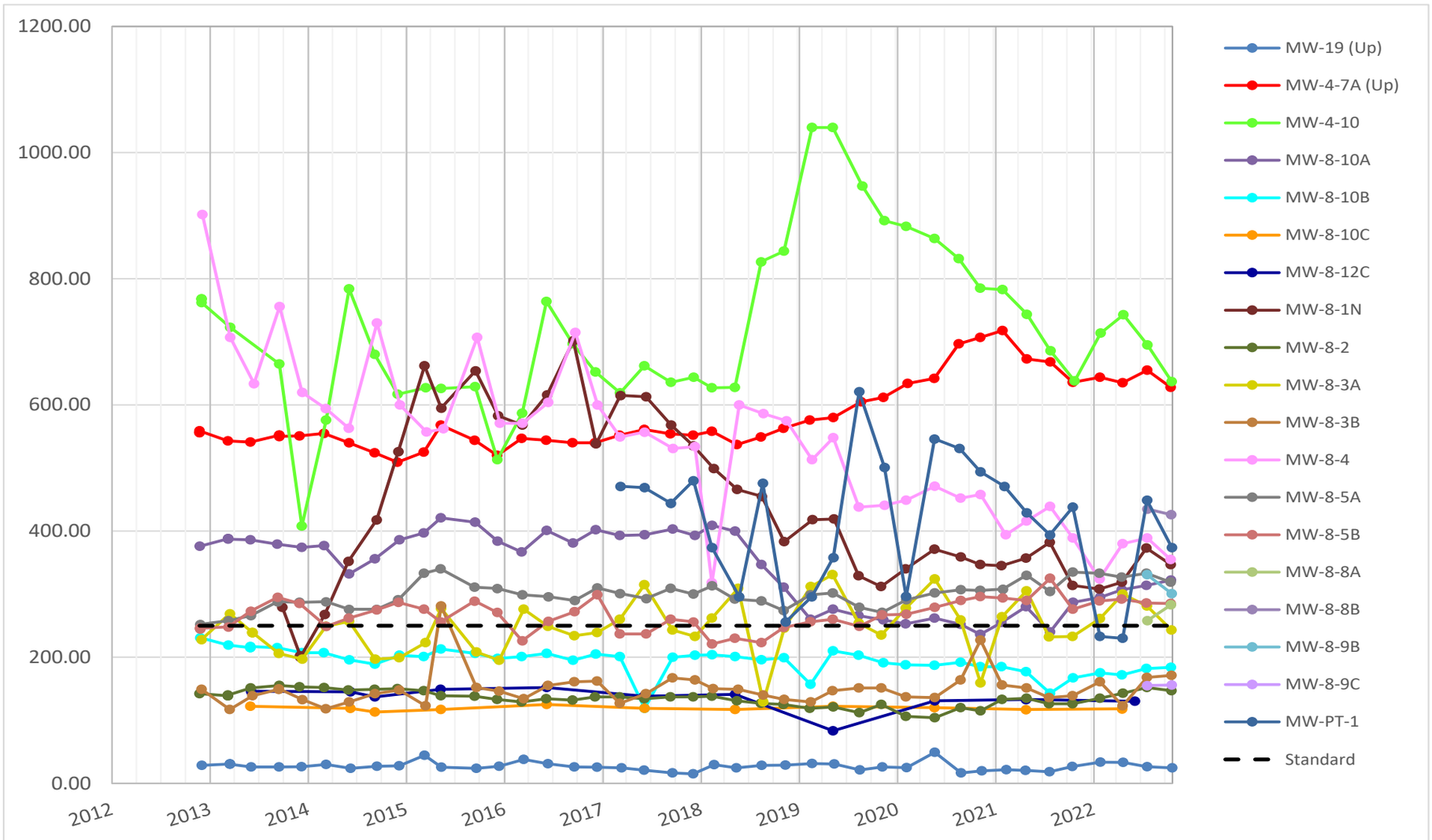


NOTE: Data does not exceed standard of 4000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

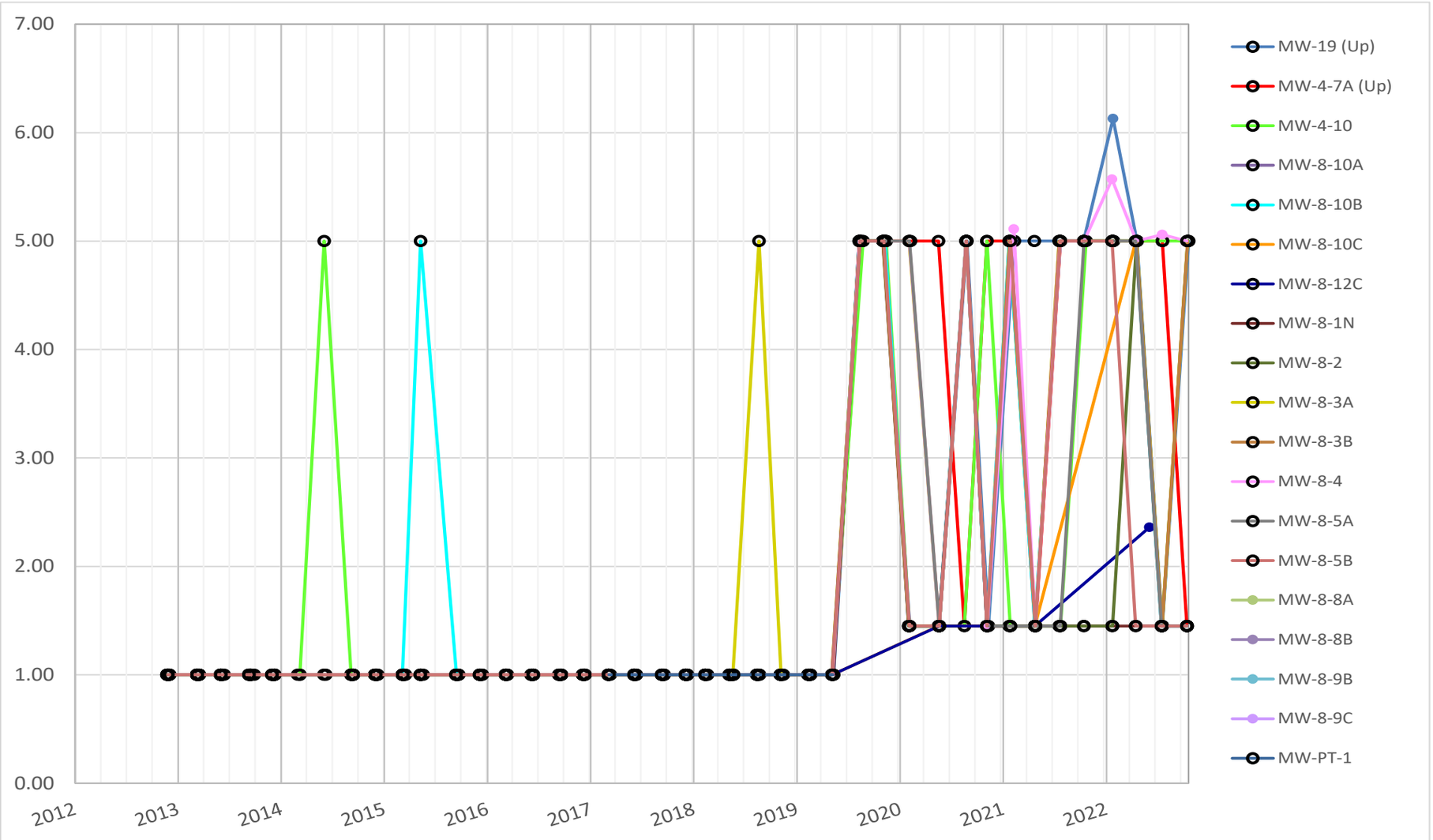
4th Quarter 2022

Sulfate, as SO4 [mg/l]



Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

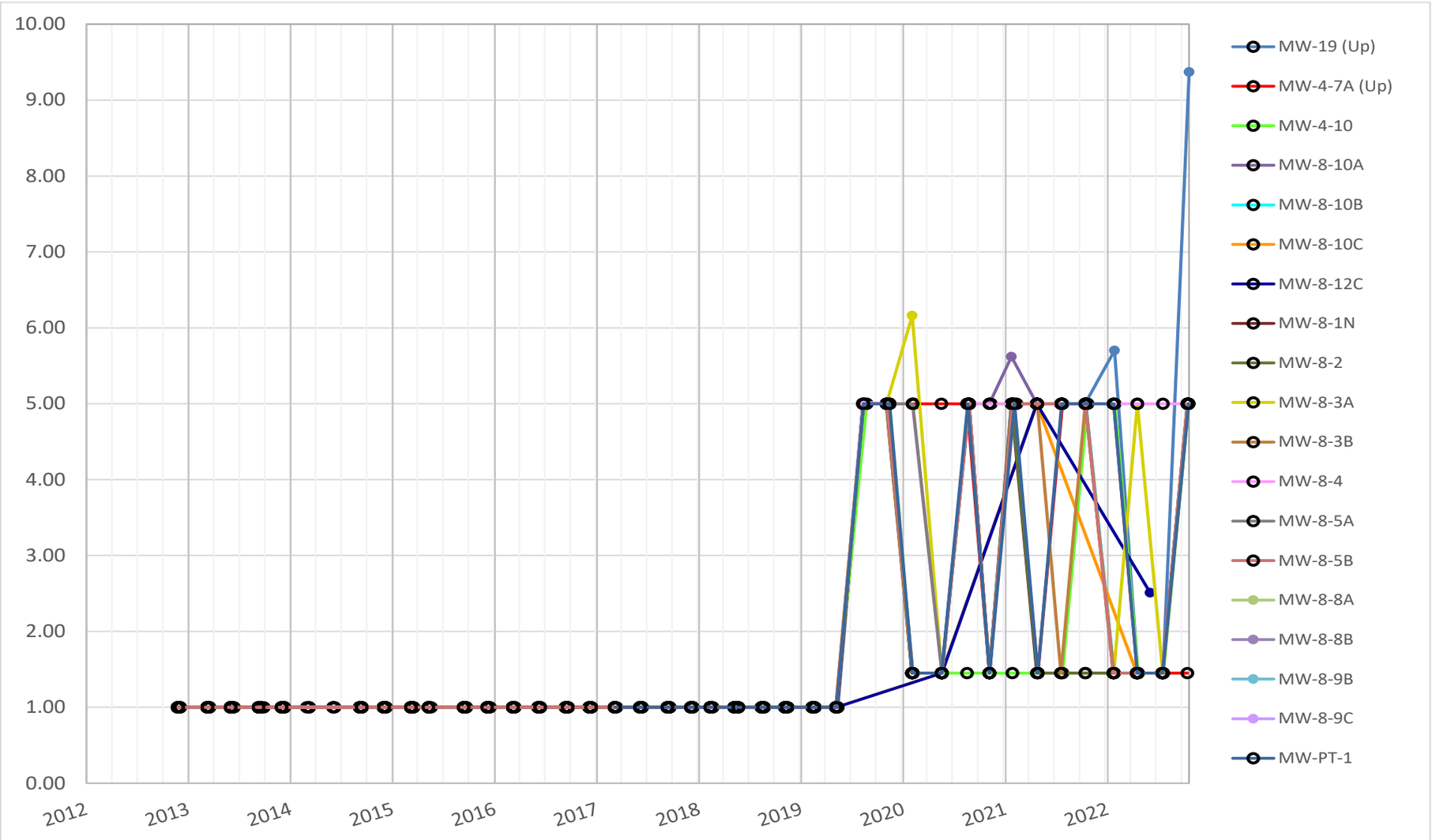
Titanium, dissolved [µg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

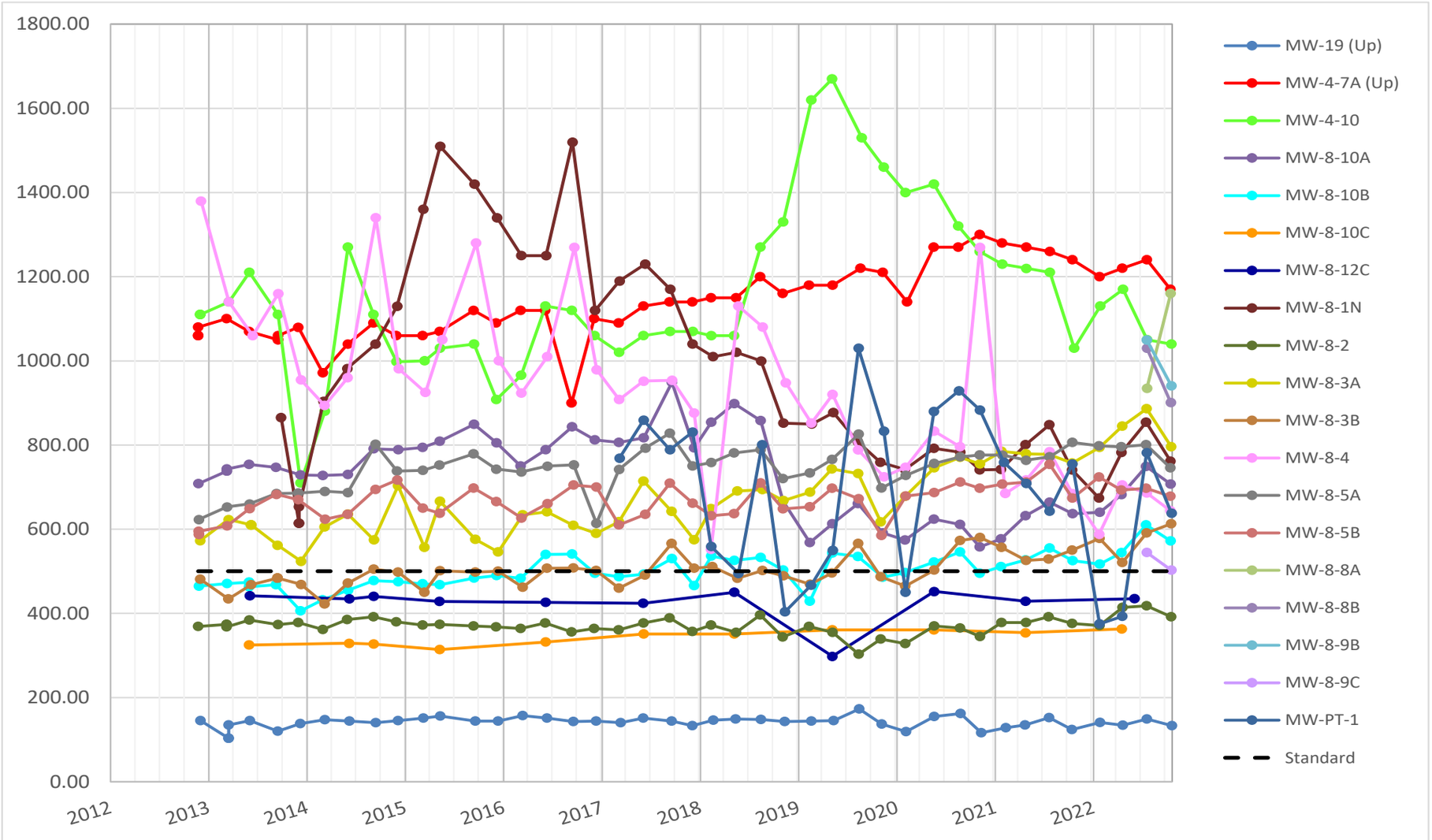
Titanium, total [µg/l]



NOTE: There are no applicable standards for this parameter

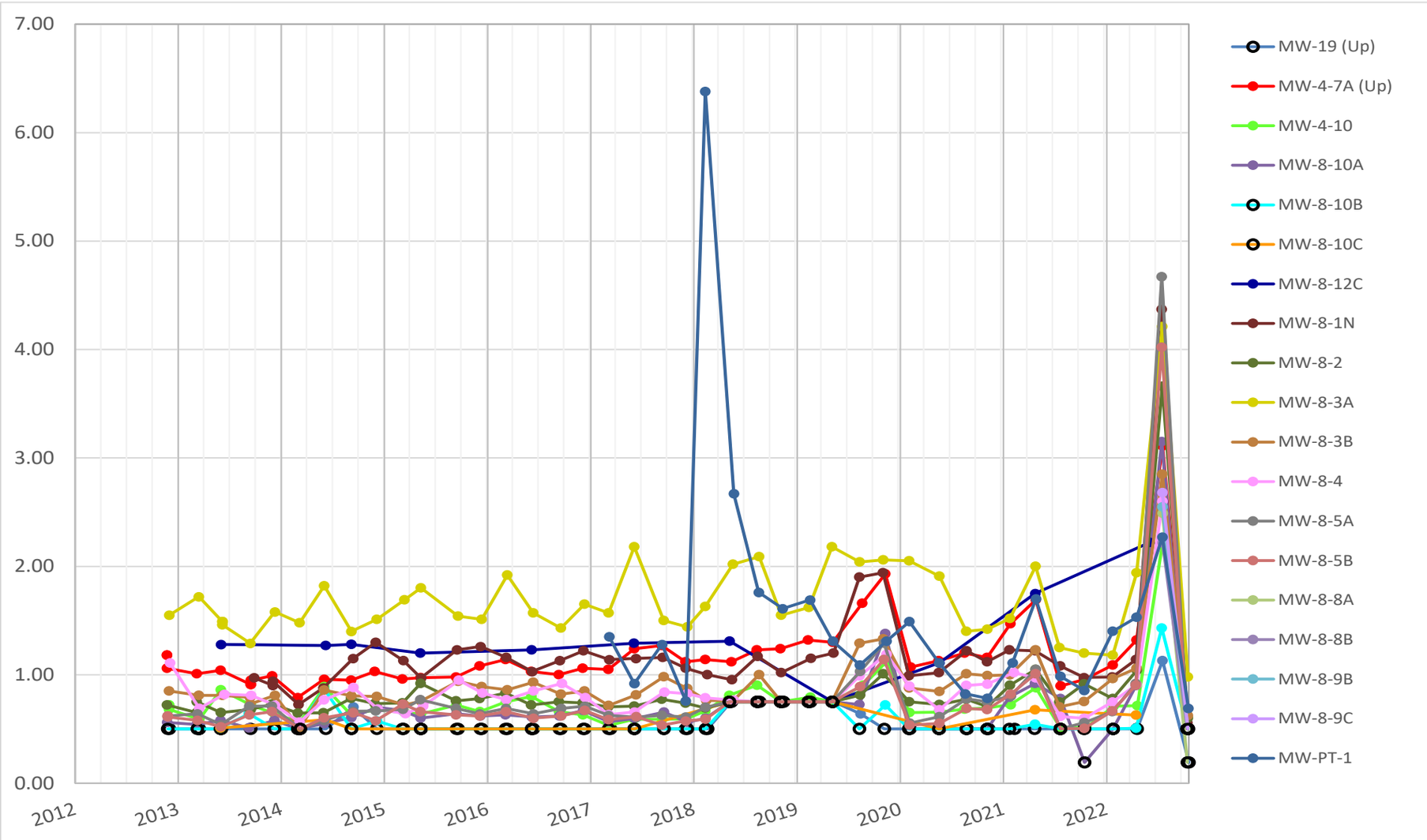
Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Total Dissolved Solids [mg/l]



Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

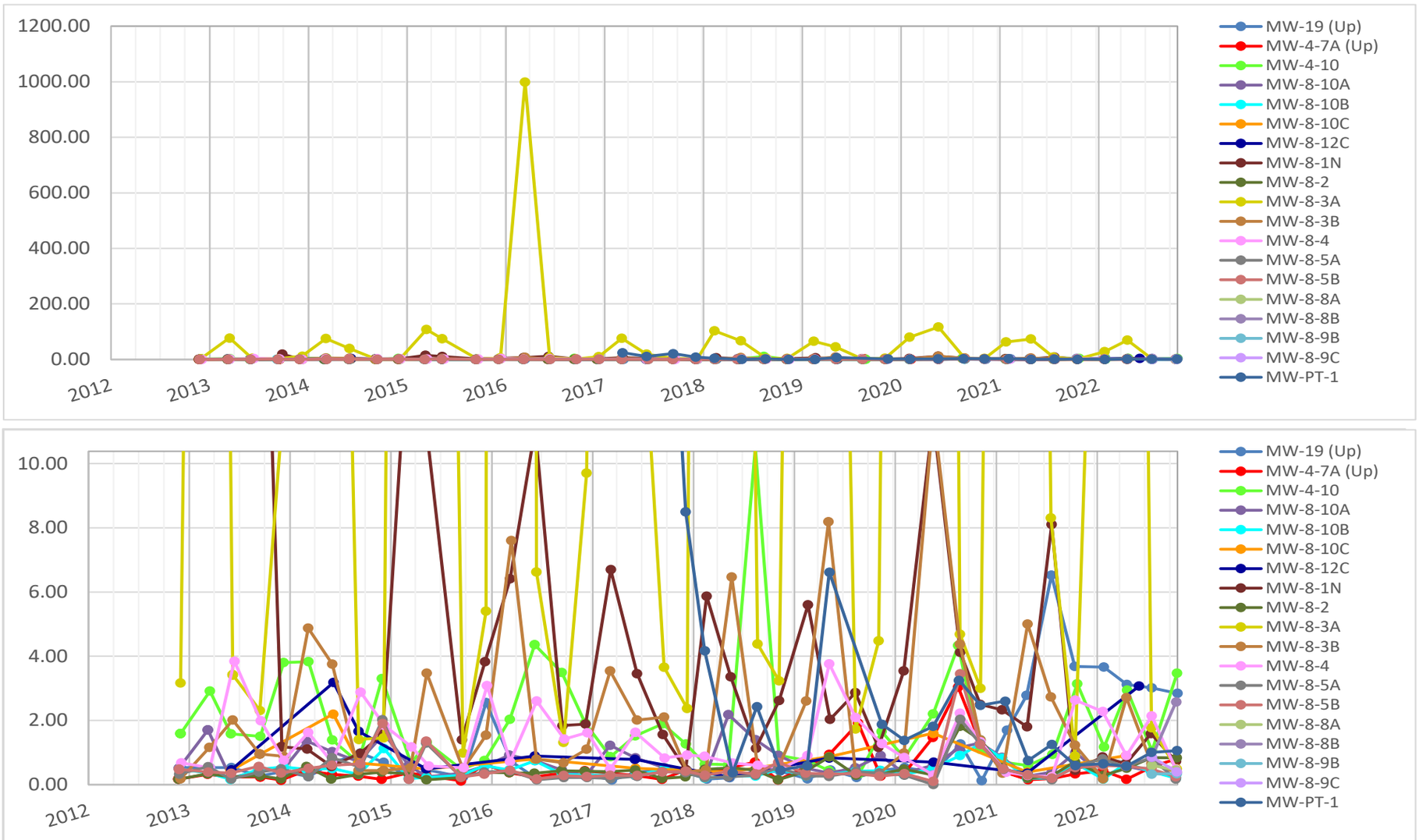
Total Organic Carbon [mg/l]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Turbidity, field [ntu]

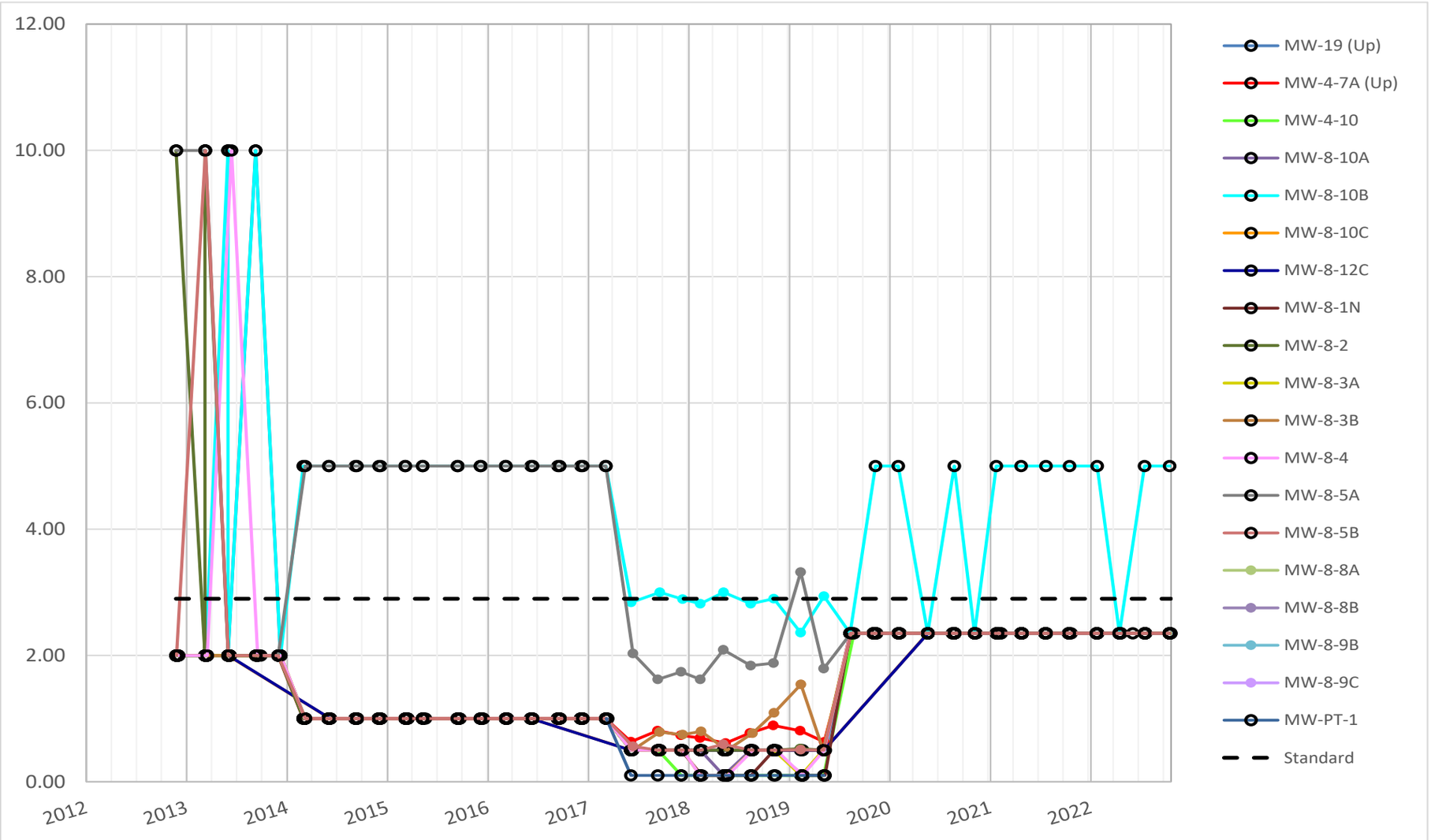


NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5

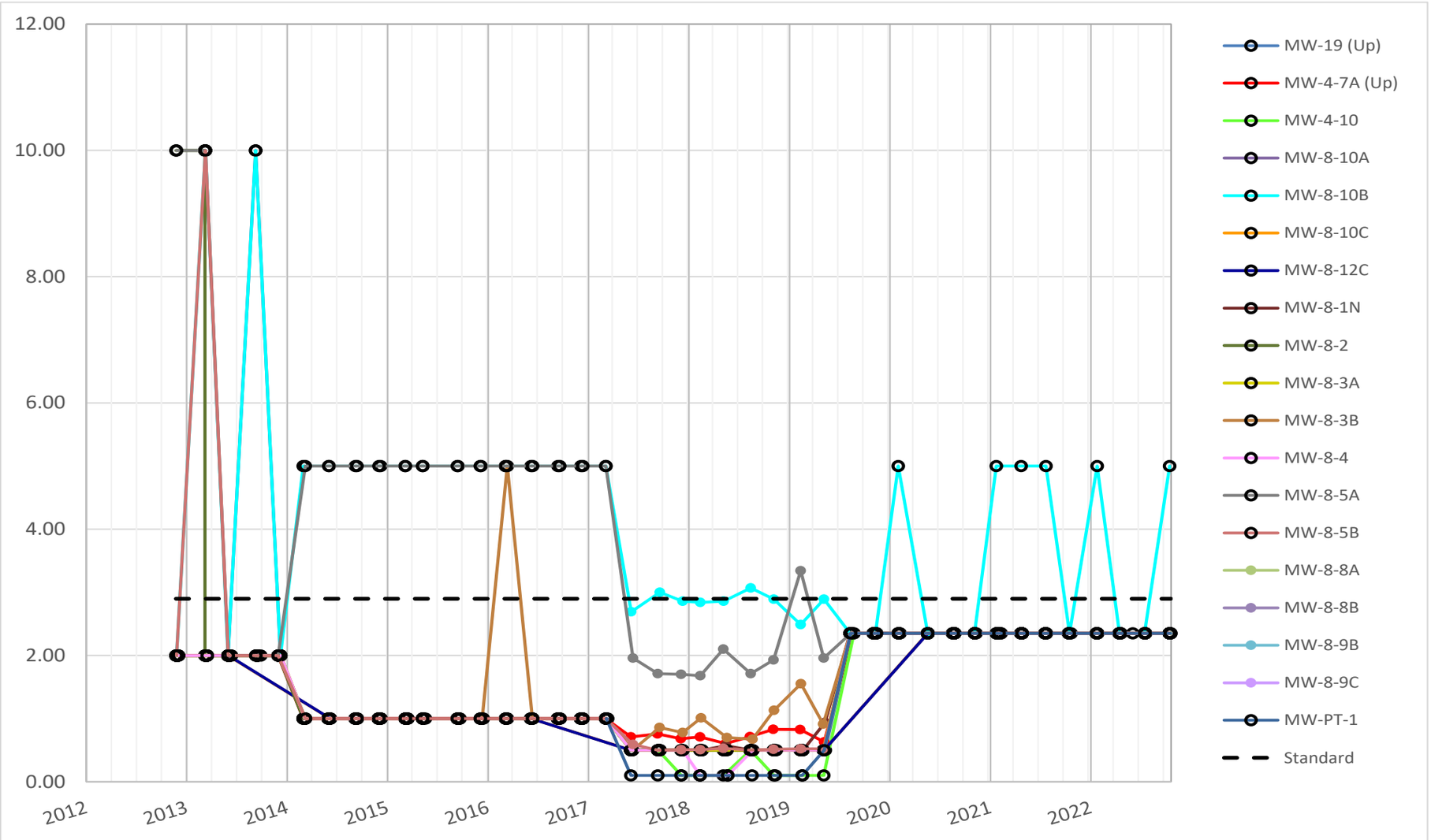
4th Quarter 2022

Vanadium, dissolved [µg/l]



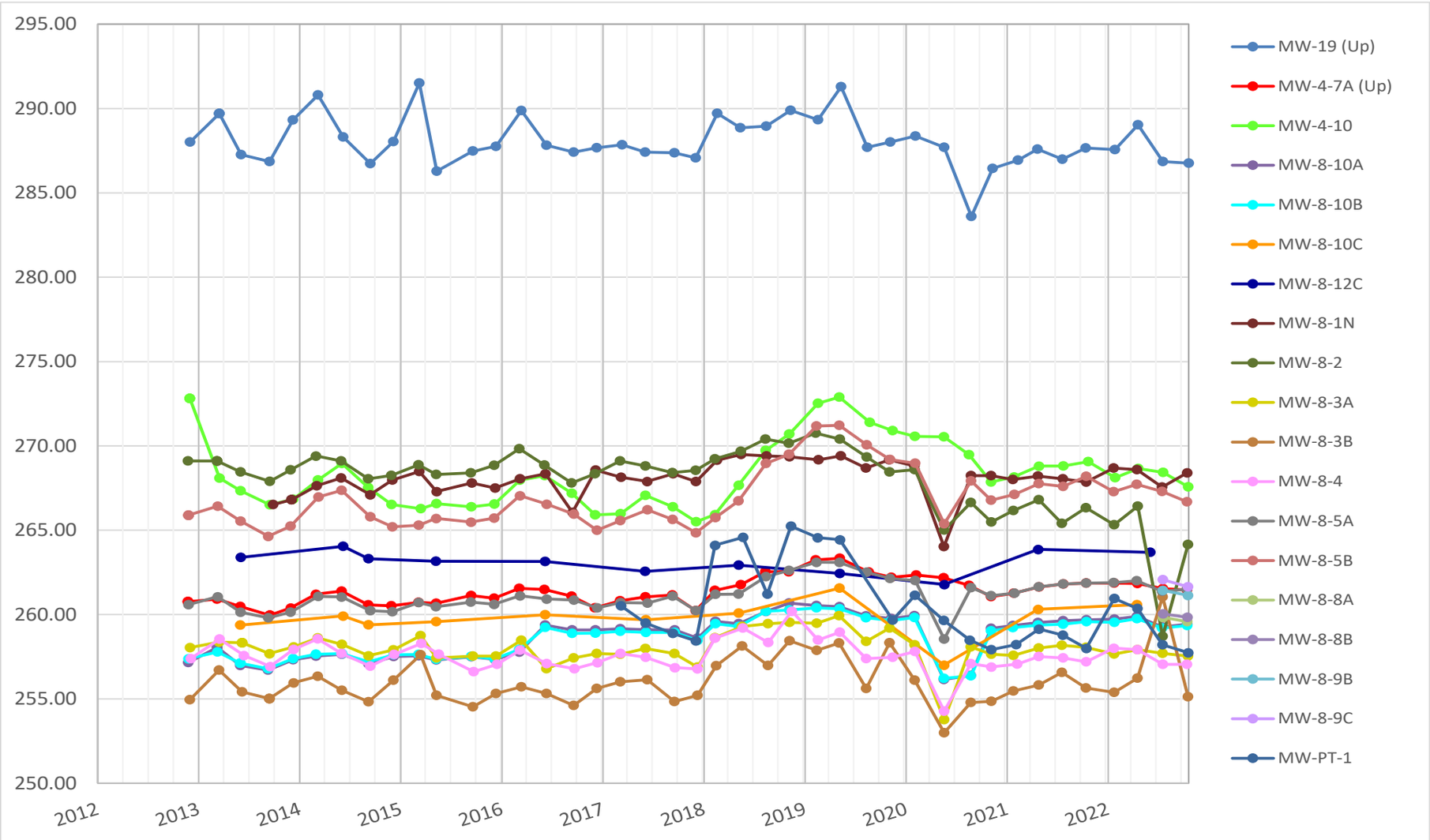
Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Vanadium, total [µg/l]



Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

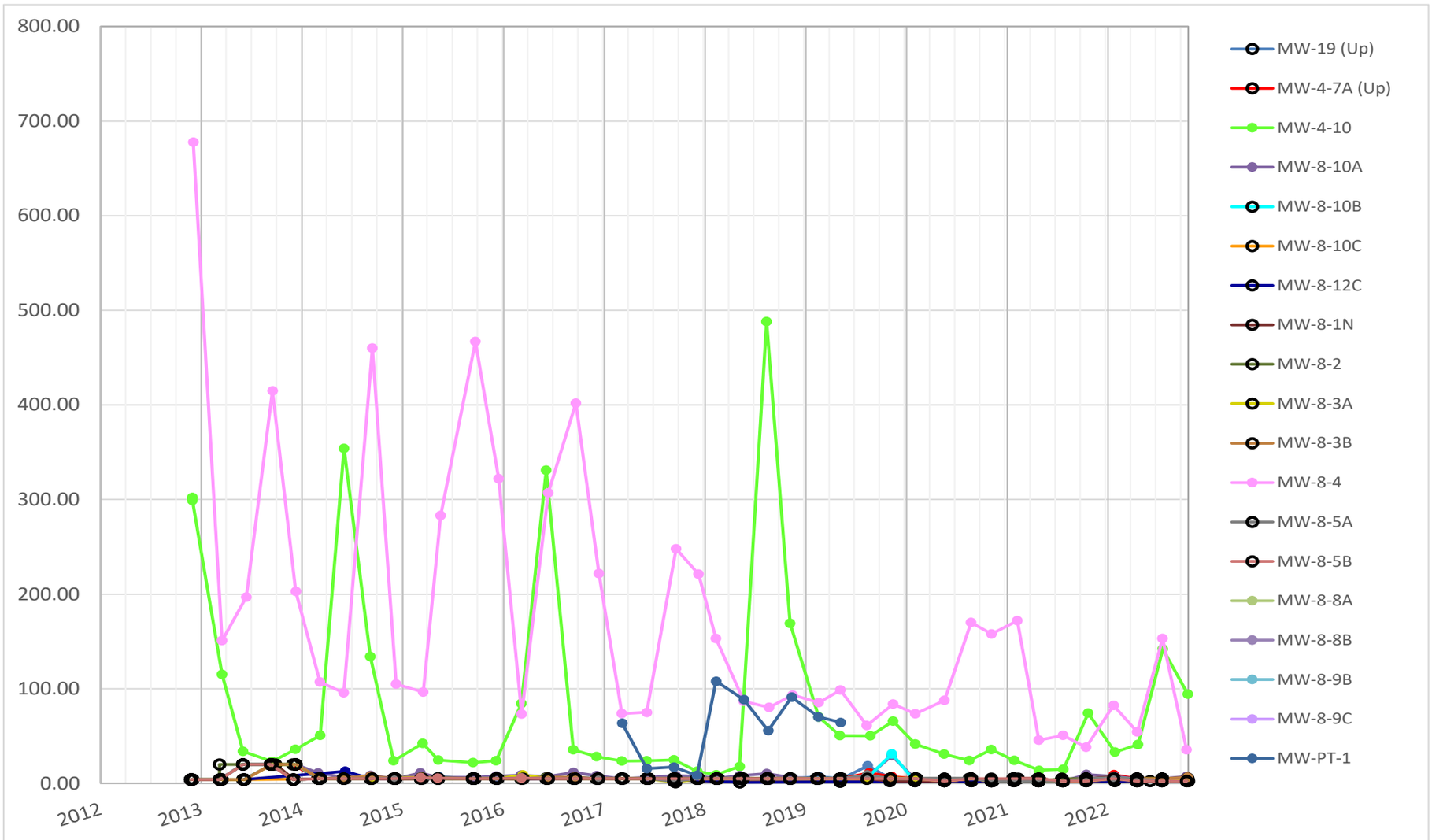
Water Surface Elevation [ft]



NOTE: There are no applicable standards for this parameter

Talen Energy
Brunner Island - Basin 5 4th Quarter 2022

Zinc, dissolved [µg/l]

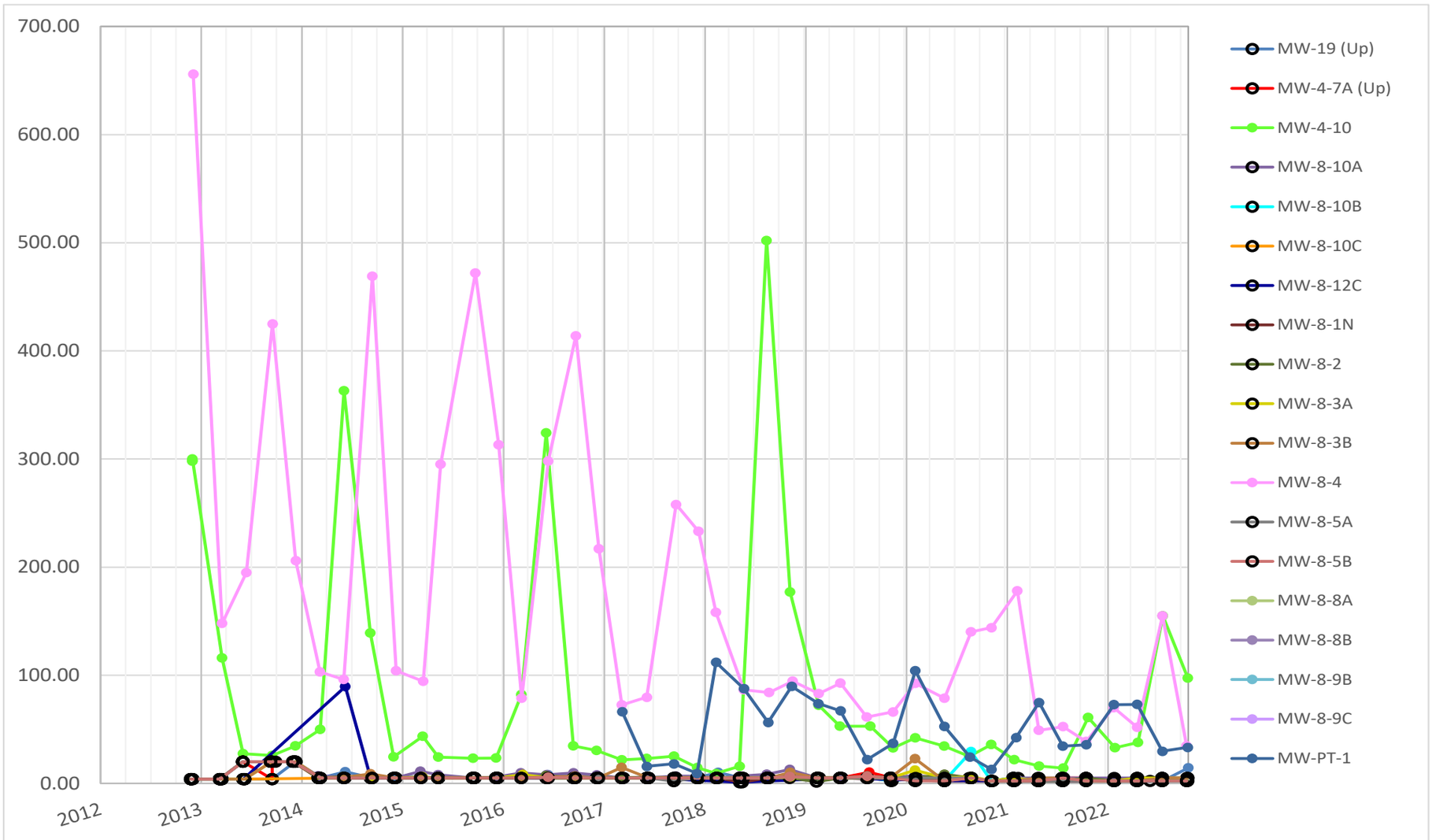


NOTE: Data does not exceed standard of 2000 µg/l during this time frame

Talen Energy
Brunner Island - Basin 5

4th Quarter 2022

Zinc, total [µg/l]



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