



November 9, 2023

Mr. Clayton Wein  
Environmental Protection Specialist  
Colorado Division of Reclamation, Mining and Safety  
1313 Sherman Street, Room 215  
Denver, CO 80203

**RE: Annual Hydrology Report  
New Horizon Mine  
Permit No. C-1981-008**

Dear Mrs. Binns:

Enclosed please find the Annual Hydrology Report for the 2023 Water Year (October 2022 – September 2023) for Elk Ridge Mining and Reclamation, LLC (Elk Ridge) New Horizon Mine. Tri-State Generation and Transmission Association, Inc. (Tri-State) is the parent to Elk Ridge, and in accordance with Rule 4.05.13(4)(c) is submitting the Annual Hydrology Report on behalf of the New Horizon Mine.

If you have any questions about the enclosed minor revision, please contact Tony Tennyson at (970) 326-3560 or [ttennyson@tristategt.org](mailto:ttennyson@tristategt.org).

Sincerely,

DocuSigned by:

*Chris Gilbreath*

D250C711D0BF450...

Chris Gilbreath  
Senior Manager,  
Remediation and Reclamation

CG:TT:der

Enclosures

cc: Tony Tennyson (via email)  
File: G474-11.3(21)b-5

**2023 Annual Hydrology Report**

**Water Year October 1, 2022 to September 30, 2023**

**Elk Ridge Mining and Reclamation, LLC**

**New Horizon Mine**

**Permit No. C-1981-008**

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#### **Rule 4.05.13(4)(c) Annual Hydrology Report Requirements**

(i) Water quantity monitoring data for the water year is presented Appendix 1 and Appendix 2 of this report.

(ii) Water quality monitoring data for the water year is presented in Appendix 1 and Appendix 2 of this report. Discharge monitoring reports (DMR) are submitted to the Colorado Department of Public Health and Environment. Copies of each DMR are provided monthly to the Division during the report year and are included in this report by reference only.

(iii) A written interpretation of the data has been requested by the Division in accordance with Rule 4.05.13(4)(c)(iii) and is included within this annual hydrology report.

The monitoring timeframe for this annual hydrology report is from October 1, 2022 through September 30, 2023.

A description of the surface and ground water monitoring plan including the monitoring frequency is located in Section 2.04.7. All monitoring locations are shown on Map 2.04-7-1A. This information can be found in Permit No. C-1981-008.

#### **Surface Water**

Surface water monitoring is comprised of two monitoring locations, which are located up gradient and down gradient of mining and reclamation areas on Tuttle Draw. SW-N1 represents the upstream condition above mining and reclamation, and SW-N3 represents the downstream condition.

Surface water monitoring data for the water year for both sites can be found in Appendix 1.

New Horizon samples both surface water monitoring locations for a variety of quality parameters. Of all the parameters that are analyzed, several key indicator parameters have been identified and are addressed annually for the hydrology report. These parameters are lab pH, lab conductivity, TDS, sulfate, calcium, iron, magnesium, and sodium.

#### **SW-N1 and SW-N3 – Tuttle Draw**

Data for the indicator parameters for the up-gradient surface monitoring location SW-N1 and the down gradient surface water monitoring location SW-N3, has been compiled and are shown on the summary tables below. The summary data tables provided data for each surface water monitoring locations from 2001 to 2022 if available.

Surface water monitoring data for the water year for both sites can be found in Appendix 1. Appendix 2 contains a graphical representation of all surface water monitoring data with a linear regression to help define any applicable trends that may be apparent in the monitoring data.

Summary of the indicator parameters for each surface water monitoring location are provided as follows:



| SW-N1                |       |         |       |       |      |         |          |
|----------------------|-------|---------|-------|-------|------|---------|----------|
| Parameter            | Mean  | Std dev | Range | Max.  | Min. | Max at  | Min at   |
| Lab pH               | 8.2   | 0.3     | 1.4   | 8.5   | 7.1  | 2/18/11 | 11/13/18 |
| Lab Cond. (umhos/cm) | 917   | 593     | 2,613 | 2,910 | 297  | 9/26/12 | 6/5/19   |
| TDS (mg/l)           | 696   | 549     | 2,509 | 2,690 | 181  | 9/26/12 | 8/24/07  |
| Sulfate (mg/l)       | 309   | 285     | 1,653 | 1,700 | 48   | 9/26/12 | 6/5/19   |
| Calcium (mg/l)       | 121   | 86      | 455   | 496   | 41   | 9/26/12 | 6/5/19   |
| Iron (ug/l)          | 1,219 | 1,613   | 8,890 | 9,050 | 160  | 8/16/07 | 2/24/06  |
| Magnesium (mg/l)     | 52    | 49      | 196   | 204   | 8    | 9/26/12 | 8/17/07  |
| Sodium (mg/l)        | 21    | 17      | 61    | 66    | 5    | 2/17/06 | 8/20/07  |

| SW-N3                |       |         |        |        |      |         |          |
|----------------------|-------|---------|--------|--------|------|---------|----------|
| Parameter            | Mean  | Std dev | Range  | Max.   | Min. | Max at  | Min at   |
| Lab pH               | 8.1   | 0.2     | 1.4    | 8.6    | 7.2  | 9/4/08  | 8/16/02  |
| Lab Cond. (umhos/cm) | 1,772 | 923     | 3,240  | 3,640  | 400  | 2/10/15 | 8/13/07  |
| TDS (mg/l)           | 1,553 | 976     | 3,208  | 3,440  | 232  | 2/10/15 | 8/24/17  |
| Sulfate (mg/l)       | 877   | 601     | 2,130  | 2,220  | 90   | 2/10/15 | 8/17/07  |
| Calcium (mg/l)       | 244   | 138     | 549    | 558    | 9    | 8/31/02 | 5/24/21  |
| Iron (tot rec ug/l)  | 1,103 | 1,562   | 10,470 | 10,600 | 130  | 8/16/07 | 5/17/08  |
| Magnesium (mg/l)     | 109   | 74      | 246    | 259    | 13   | 2/10/15 | 11/21/07 |
| Sodium (mg/l)        | 56    | 44      | 204    | 212    | 8    | 2/20/12 | 8/20/07  |

A review of the water year data indicates that all sample results trended within previous results, with the mean of all the indicator parameters remaining relatively constant. Influences from irrigation water on Tuttle Draw are readily apparent during the irrigation season at and around New Horizon Mine.

#### Surface Water Data Interpretation

As shown on the graphs in Appendix 2 for the indicator parameters, when comparing the up gradient and down gradient locations, SW-N3 tends to historically trend higher for several of the indicator parameters including calcium, laboratory conductivity, magnesium, sodium, sulfate and TDS. Iron and pH tend to historically trend higher at the up-gradient location SW-N1. Iron is historically trending down at both locations.

Overall, the indicator parameters as shown in Appendix 2 for up gradient and down gradient of mining and reclamation areas are stable. Long term monitoring results indicate normal seasonal fluctuations within Tuttle Draw, with the seasonal influences from local irrigation water being readily apparent when active irrigation is occurring.

## **Groundwater**

New Horizon currently samples each groundwater site for a variety of quality parameters. Of all the parameters that are analyzed for, several key indicator parameters are identified and are addressed annually for this hydrology report. These are lab pH, lab conductivity, TDS, sulfate, calcium, iron, manganese, sodium and magnesium.

Ground water monitoring data for the water year can be found in Appendix 3. Appendix 4 contains a graphical representation of all ground water monitoring data with a linear regression to help define any applicable trends that may be apparent in all the monitoring data. Groundwater elevations where data is available are provided in Appendix 5.

### **Wells GW-N36, GW-N37, and GW-N38**

GW-N36 monitors the overburden aquifer, GW-N37 monitors the Dakota coal aquifer, and GW-N38 monitors the underburden aquifer. This cluster of wells represent the groundwater quality up gradient of the mining area.

Summary of the indicator parameters for each well are provided as follows:

| GW-N36               |       |         |       |       |       |          |         |
|----------------------|-------|---------|-------|-------|-------|----------|---------|
| Parameter            | Mean  | Std dev | Range | Max.  | Min.  | Max at   | Min at  |
| Lab pH               | 7.4   | 0.6     | 3.2   | 8.5   | 5.3   | 2/19/14  | 6/21/22 |
| Lab Cond. (umhos/cm) | 1,386 | 477     | 1,480 | 1,240 | 406   | 11/20/07 | 6/9/20  |
| TDS (mg/l)           | 1,003 | 358     | 1,240 | 1,600 | 360   | 1/10/23  | 6/9/20  |
| Sulfate (mg/l)       | 413   | 110     | 406   | 572   | 166   | 11/16/16 | 6/9/20  |
| Calcium (mg/l)       | 146   | 52      | 176   | 216   | 40    | 2/23/11  | 5/23/18 |
| Iron (mg/l)          | 0.097 | 0.094   | 0.271 | 0.290 | 0.019 | 1/10/23  | 6/21/21 |
| Manganese (mg/l)     | 0.12  | 0.07    | 0.37  | 0.40  | 0.032 | 8/29/08  | 5/20/15 |
| Sodium (mg/l)        | 69    | 28      | 96    | 112   | 16    | 2/23/11  | 6/9/20  |
| Magnesium (mg/l)     | 69    | 28      | 96    | 112   | 16    | 2/23/11  | 6/9/20  |

| GW-N37               |       |         |       |       |       |         |         |
|----------------------|-------|---------|-------|-------|-------|---------|---------|
| Parameter            | Mean  | Std dev | Range | Max.  | Min.  | Max at  | Min at  |
| Lab pH               | 4.9   | 0.6     | 2.5   | 6.4   | 3.9   | 5/18/16 | 5/15/06 |
| Lab Cond. (umhos/cm) | 512   | 106     | 502   | 848   | 346   | 9/7/22  | 7/26/18 |
| TDS (mg/l)           | 335   | 80      | 384   | 610   | 226   | 9/7/22  | 7/25/17 |
| Sulfate (mg/l)       | 199   | 39      | 143   | 290   | 147   | 9/7/22  | 7/26/18 |
| Calcium (mg/l)       | 47    | 13      | 60    | 90    | 30    | 9/7/22  | 7/26/18 |
| Iron (mg/l)          | 0.043 | 0.031   | 0.071 | 0.098 | 0.027 | 9/7/22  | 6/21/22 |
| Manganese (mg/l)     | 0.03  | 0.01    | 0.05  | 0.06  | 0.012 | 5/18/16 | 6/21/22 |
| Sodium (mg/l)        | 18    | 3       | 11    | 25    | 14    | 9/7/22  | 5/20/15 |
| Magnesium (mg/l)     | 19    | 5       | 21    | 32    | 11    | 9/7/22  | 7/26/18 |

| GW-N38               |        |         |        |        |        |         |         |
|----------------------|--------|---------|--------|--------|--------|---------|---------|
| Parameter            | Mean   | Std dev | Range  | Max.   | Min.   | Max at  | Min at  |
| Lab pH               | 8.0    | 0.1     | 0.3    | 8.1    | 7.8    | 8/25/08 | 6/24/19 |
| Lab Cond. (umhos/cm) | 1,261  | 191     | 475    | 1,410  | 935    | 6/24/19 | 5/13/11 |
| TDS (mg/l)           | 933    | 191     | 525    | 1,160  | 525    | 6/24/19 | 5/23/11 |
| Sulfate (mg/l)       | 406    | 79      | 202    | 472    | 270    | 6/24/19 | 5/18/11 |
| Calcium (mg/l)       | 268    | 47      | 118    | 308    | 190    | 8/17/09 | 5/16/11 |
| Iron (mg/l)          | 0      | 0       | 0      | 0      | 0      | NA      | NA      |
| Manganese (mg/l)     | 0.0065 | 0.009   | 0.0201 | 0.0226 | 0.0025 | 6/24/19 | 8/29/08 |
| Sodium (mg/l)        | 14     | 7       | 17     | 24     | 8      | 6/24/19 | 5/16/11 |
| Magnesium (mg/l)     | 18     | 3       | 8      | 23     | 15     | 6/24/19 | 5/16/11 |

A review of the water year for this series of wells indicates two maximums occurred at GW-N36 for TDS and Iron. GW-38 was dry all water year. GW-N37 had a significant number of maximums values during the water including laboratory conductivity, TDS, sulfate, calcium, iron, sodium, and magnesium. GW-N37 also had two minimum values for iron and manganese respectively. These three wells are not influenced by the mining and reclamation activities at New Horizon and express the up-gradient condition above mining.

#### Wells GW-N44, GW-N45, and GW-N46

GW-N44 monitors the overburden aquifer, GW-N45 monitors the Dakota coal aquifer, and GW-N46 monitors the underburden aquifer. This cluster of wells monitors the groundwater quality down gradient of the mining area.

Summary of the indicator parameters for each well are provided as follows:

| GW-N44               |       |         |        |        |        |         |          |
|----------------------|-------|---------|--------|--------|--------|---------|----------|
| Parameter            | Mean  | Std dev | Range  | Max.   | Min.   | Max at  | Min at   |
| Lab pH               | 7.9   | 0.3     | 1.9    | 8.6    | 6.7    | 2/18/14 | 6/1/03   |
| Lab Cond. (umhos/cm) | 3,010 | 1,571   | 11,386 | 12,300 | 914    | 6/6/17  | 12/7/20  |
| TDS (mg/l)           | 2,822 | 1,753   | 12,400 | 13,800 | 1,400  | 6/6/17  | 6/1/22   |
| Sulfate (mg/l)       | 1,761 | 1,280   | 8,800  | 9,510  | 710    | 6/6/17  | 12/1/22  |
| Calcium (mg/l)       | 360   | 79      | 362    | 514    | 152    | 3/13/02 | 6/6/17   |
| Iron (mg/l)          | 0.01  | .005    | .015   | .022   | 0.007  | 5/17/23 | 12/7/20  |
| Manganese (mg/l)     | 0.37  | 0.63    | 4.51   | 4.51   | 0.0006 | 2/27/18 | 6/23/21  |
| Sodium (mg/l)        | 149   | 179     | 1,321  | 1,350  | 29     | 6/6/17  | 11/12/13 |
| Magnesium (mg/l)     | 246   | 238     | 1,892  | 1,970  | 79     | 6/6/17  | 3/16/20  |

| GW-N45               |       |         |        |        |       |          |          |
|----------------------|-------|---------|--------|--------|-------|----------|----------|
| Parameter            | Mean  | Std dev | Range  | Max.   | Min.  | Max at   | Min at   |
| Lab pH               | 8.2   | 0.2     | 1.7    | 8.8    | 7.1   | 2/19/14  | 6/1/03   |
| Lab Cond. (umhos/cm) | 6,939 | 3,313   | 12,840 | 14,700 | 1,860 | 5/20/15  | 6/6/17   |
| TDS (mg/l)           | 7,003 | 4,956   | 17,140 | 18,600 | 1,460 | 11/14/12 | 6/6/17   |
| Sulfate (mg/l)       | 4,166 | 3,743   | 13,030 | 13,400 | 370   | 8/17/15  | 12/28/01 |
| Calcium (mg/l)       | 98    | 65      | 288    | 307    | 19    | 11/14/12 | 12/1/21  |
| Iron (mg/l)          | 0.090 | 0.193   | 0.684  | 0.700  | 0.016 | 12/10/20 | 9/7/22   |
| Manganese (mg/l)     | 0.39  | .059    | 1.92   | 1.92   | 0.003 | 3/14/17  | 6/6/17   |
| Sodium (mg/l)        | 1,026 | 257     | 1,479  | 1,520  | 41    | 11/14/12 | 6/6/17   |
| Magnesium (mg/l)     | 768   | 813     | 2,734  | 2,800  | 66    | 11/14/12 | 3/13/02  |

| GW-N46               |       |         |       |       |       |         |          |
|----------------------|-------|---------|-------|-------|-------|---------|----------|
| Parameter            | Mean  | Std dev | Range | Max.  | Min.  | Max at  | Min at   |
| Lab pH               | 8.5   | 0.2     | 2.3   | 9.0   | 6.7   | 5/17/23 | 6/1/03   |
| Lab Cond. (umhos/cm) | 3,172 | 225     | 1,340 | 3,580 | 2,240 | 2/17/06 | 12/10/20 |
| TDS (mg/l)           | 2,162 | 115     | 660   | 2,540 | 1,880 | 7/19/05 | 1/10/23  |
| Sulfate (mg/l)       | 727   | 104     | 580   | 860   | 280   | 1/9/02  | 5/17/23  |
| Calcium (mg/l)       | 15    | 30      | 259   | 264   | 5     | 6/4/05  | 5/17/23  |
| Iron (mg/l)          | 0.038 | 0.029   | 0.105 | 0.116 | 0.011 | 6/1/22  | 5/17/23  |
| Manganese (mg/l)     | 0.02  | 0.03    | 0.16  | 0.16  | 0.003 | 6/29/21 | 2/10/15  |
| Sodium (mg/l)        | 743   | 45      | 216   | 833   | 617   | 3/9/05  | 2/9/16   |
| Magnesium (mg/l)     | 9     | 3       | 26    | 30    | 4     | 6/4/05  | 7/19/23  |

A review of the water year for this series of wells down gradient to the mining and reclamation areas indicates one maximum value for iron occurred at GW-N44 and one maximum value for lab pH occurred at GW-46. Multiple minimum values occurred at GW-N46 for TDS, sulfate, calcium, iron, and magnesium.

### Groundwater Data Interpretation

The graphs in Appendix 4 provides the indicator parameters in comparison with the up-gradient and down-gradient locations with the overburden aquifer, coal aquifer, and underburden aquifer compared accordingly.

#### Overburden Aquifer

When comparing the up gradient (GW-N36) and down gradient (GW-N44) wells for the overburden aquifer, G-N44 tends to historically trend higher for the indicator parameters with the exceptions of iron, manganese, and sodium. The up-gradient conditions for the indicator parameters trend in a consistent manner with seasonal influences from local irrigation readily apparent in the data. The down gradient conditions are all trending significantly downward with the expectation of pH was is trending slight upward over time.

#### Coal Aquifer

When comparing the up gradient (GW-N37) and down gradient (GW-N45) wells for the Dakota Spring aquifer, GW-N37 historically trends lower for all the indicator parameters. Further, the data indicates that the Dakota Aquifer up gradient of mining and reclamation trends in a stable manner. Data obtained from GW-45 historically trends higher than the up-gradient condition. All of the indicator parameters for GW-45 are trending upward; however, sampling results for the past twelve quarters of sampling (with the exception of pH and iron) are showing a significant downward trend. This indicates that impacts from mining and reclamation on the down gradient coal aquifer are stabilizing out. Seasonal influences from local irrigation are not apparent in the data obtained from either well.

#### Underburden Aquifer

When comparing the up gradient (GW-N38) and down gradient (GW-N46) wells for the underburden aquifer, G-N38 historically tends to be dry thus the data evaluation is limited. Data obtained from GW-46 reveals for that all the indicator parameters are stable with a few outliers of high analytical results. Seasonal influences from local irrigation are not apparent in the data obtained from either well.

### Groundwater Elevations

Groundwater elevations from all the wells are presented in Appendix 5. Data for GW-N36 and GW-N44 indicates a stable static water levels with noticeable seasonal influences from irrigation. GW-N37 (when water is available) and GW-N45 also indicated a stable water level in the Dakota Aquifer. More variability is present in underburden aquifer as shown for GW-N46, especially in the years when mining occurred. Overall, since reclamation has occurred water levels in the underburden aquifer (GW-N46) are stabilizing.

**Appendix 1**  
**Surface Water Monitoring Data**

## New Horizon Mine

### Analysis Results by Date (column) and Parameter (row)

Date Range: 10/01/2022 to 09/30/2023

Site: SW-N1

|                       | 10/5/2022 | 3/27/2023 | 5/4/2023 | 7/31/2023 |
|-----------------------|-----------|-----------|----------|-----------|
| pH (field), pH        | 8.4       | 8.1       | 8.2      | 8.2       |
| pH (lab), pH          | 7.7       | 8.1       | 8.3      | 7.9       |
| Spec. Cond. (lab)     | 461       | 1630      | 458      | 347       |
| Spec Cond. (field)    | 463       | 1611      | 463      | 370       |
| TDS, mg/L             | 320       | 1200      | 340      | 250       |
| TSS, mg/L             | 230       | <5.0      | 90       | 51        |
| Ca, diss, mg/L        | 67        | 160       | 53       | 55        |
| Mg, diss, mg/L        | 14        | 110       | 20       | 8.7       |
| NH3 as N, diss, mg/L  | <0.050    | <0.050    | <0.050   | <0.10     |
| NO2 + NO3, diss, mg/L | 0.038     | <0.020    | 0.065    | 0.038     |
| Na, diss, mg/L        | 8.2       | 63        | 9.2      | 5.1       |
| SO4, diss, mg/L       | 130       | 630       | 110      | 85        |
| As, tot rec, ug/L     | 2.6       | 0.8       | 1.7      | 1.5       |
| Fe, tot rec, ug/L     | 3200      | 570       | 2100     | 780       |
| Hg, tot, mg/L         | <0.00020  | <0.00020  | <0.00020 | <0.00020  |
| Mn, diss, mg/L        | <0.010    | 0.42      | <0.010   | <0.010    |
| Se, diss, mg/L        | 0.00043   | 0.0004    | 0.00063  | 0.00036   |
| Zn, tot rec, ug/L     | 49        | <20.      | 34       | 22        |
| PO4, tot, mg/L        | 0.03      | 0.0496    | 0.0496   | 0.0527    |
| Pb, tot rec, mg/L     | 8.2       | 0.16      | 5.7      | 4.9       |
| HCO3, mg/L            | 120       | 410       | 130      | 99        |
| SAR, ratio            | 0.24      | 0.96      | 0.28     | 0.17      |
| Cl, diss, mg/L        | 4.1       | 24        | 4.5      | 1.8       |
| Al, tot rec, ug/L     | 8000      | 300       | 4800     | 1900      |
| Cd, tot rec, mg/L     | 0.3       | <0.050    | 0.14     | 0.15      |
| Cu, diss, mg/L        | 0.0012    | <0.00080  | 0.0015   | 0.0008    |

## New Horizon Mine

### Analysis Results by Date (column) and Parameter (row)

Date Range: 10/01/2022 to 09/30/2023

Site: SW-N3

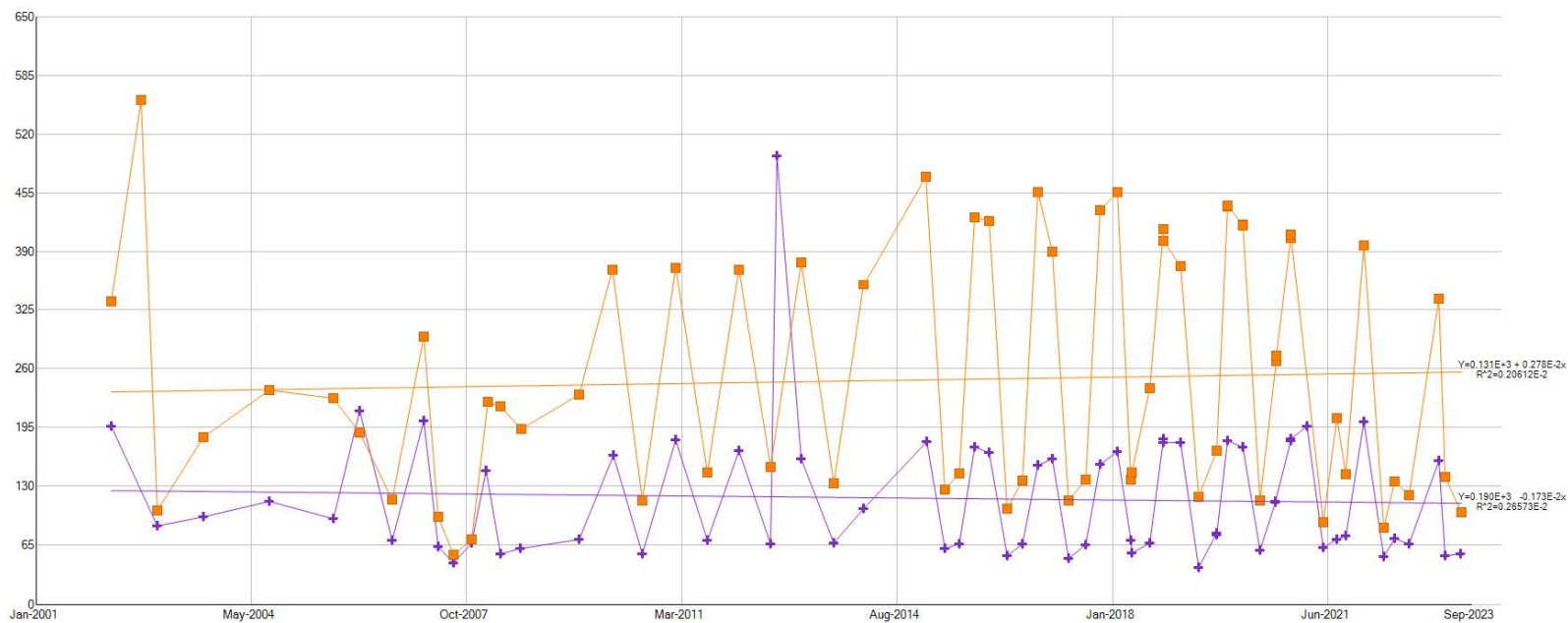
|                       | 10/5/2022 | 3/27/2023 | 5/4/2023 | 8/3/2023 |
|-----------------------|-----------|-----------|----------|----------|
| pH (field), pH        | 7.9       | 8.0       | 7.7      | 7.9      |
| pH (lab), pH          | 7.8       | 7.9       | 8.2      | 7.5      |
| Spec. Cond. (lab)     | 917       | 2580      | 1170     | 771      |
| Spec Cond. (field)    | 936       | 2564      | 1191     | 762      |
| TDS, mg/L             | 700       | 2300      | 920      | 580      |
| TSS, mg/L             | 140       | <5.0      | 52       | 80       |
| Ca, diss, mg/L        | 120       | 340       | 140      | 100      |
| Mg, diss, mg/L        | 42        | 170       | 62       | 32       |
| NH3 as N, diss, mg/L  | 0.13      | 0.39      | 0.11     | 0.18     |
| NO2 + NO3, diss, mg/L | 0.07      | 0.16      | 0.06     | 0.079    |
| Na, diss, mg/L        | 21        | 89        | 31       | 18       |
| SO4, diss, mg/L       | 360       | 1300      | 480      | 250      |
| As, tot rec, ug/L     | 1.8       | 0.55      | 1.3      | 1.4      |
| Fe, tot rec, ug/L     | 2200      | 410       | 1600     | 1300     |
| Hg, tot, mg/L         | <0.00020  | <0.00020  | <0.00020 | <0.00020 |
| Mn, diss, mg/L        | 0.035     | 0.76      | 0.092    | 0.02     |
| Se, diss, mg/L        | 0.00041   | 0.00024   | 0.00047  | 0.00029  |
| Zn, tot rec, ug/L     | 24        | <40       | 26       | 38       |
| PO4, tot, mg/L        | 0.0682    | 0.0341    | 0.0347   | 0.03     |
| Pb, tot rec, mg/L     | 5.6       | <0.20     | 3.3      | 6.1      |
| HCO3, mg/L            | 160       | 400       | 220      | 160      |
| SAR, ratio            | 0.42      | 1         | 0.55     | 0.39     |
| Cl, diss, mg/L        | 6.3       | 18        | 8.8      | 3.9      |
| Al, tot rec, ug/L     | 5200      | <100      | 3000     | 2600     |
| Cd, tot rec, mg/L     | 0.19      | <0.10     | 0.12     | 0.17     |
| Cu, diss, mg/L        | <0.00080  | <0.00080  | 0.001    | 0.0011   |



**Appendix 2**  
**Surface Water Monitoring Graphs**

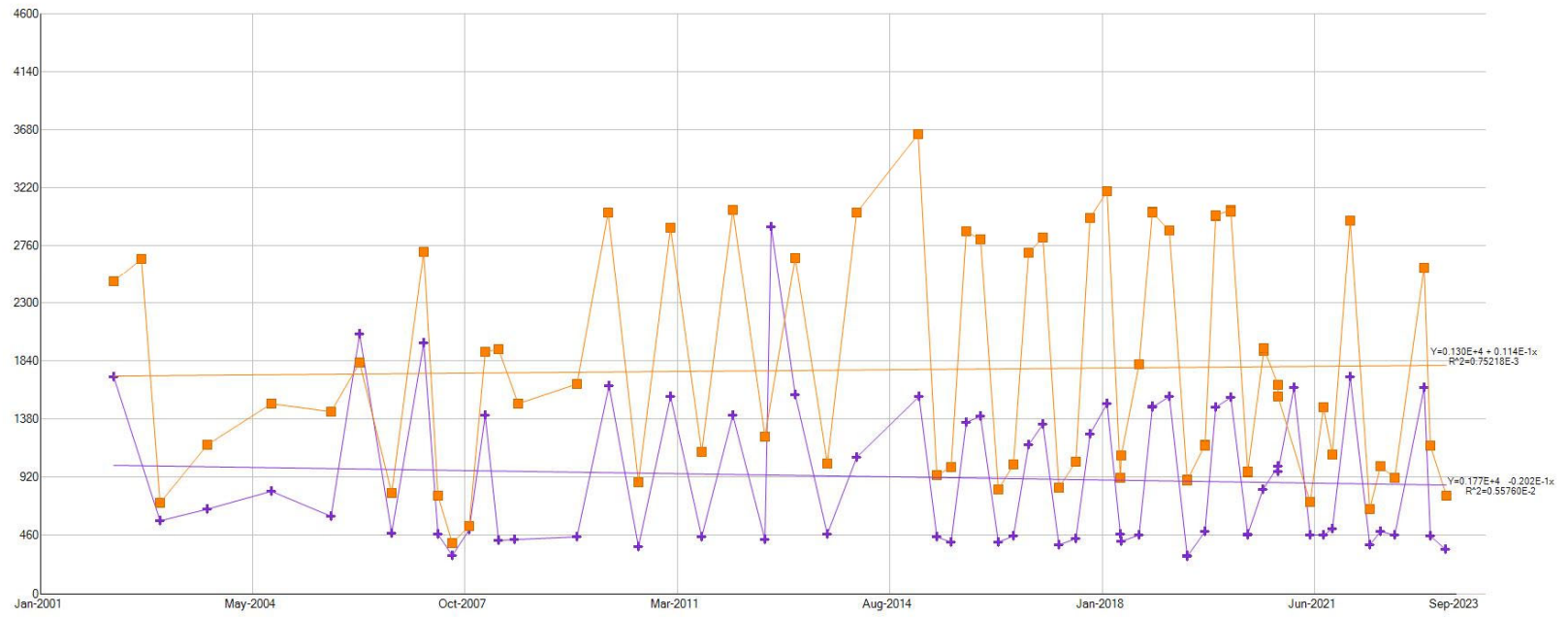
Calcium, dissolved (mg/L)

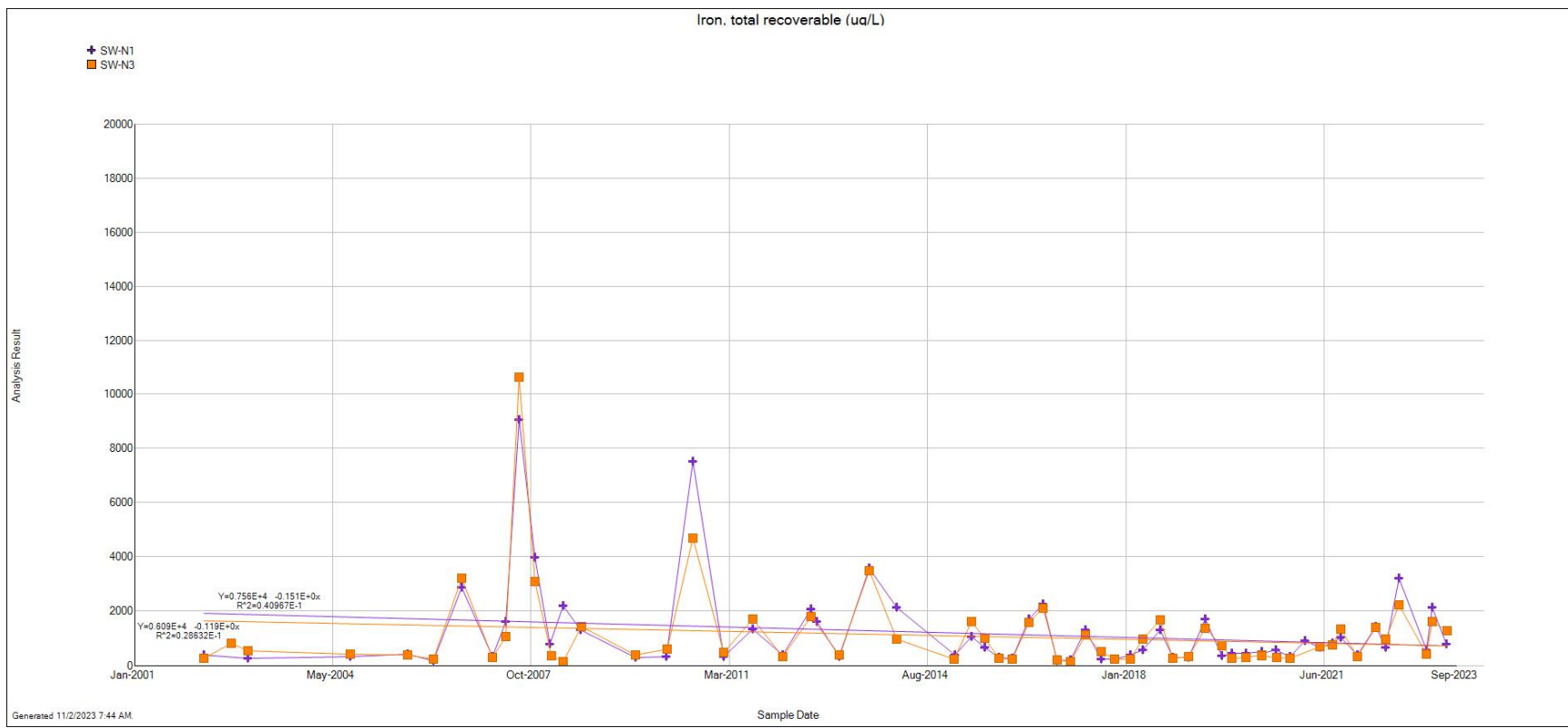
✦ SW-N1  
■ SW-N3



Specific Conductance @ 25C (lab) (umhos/cm)

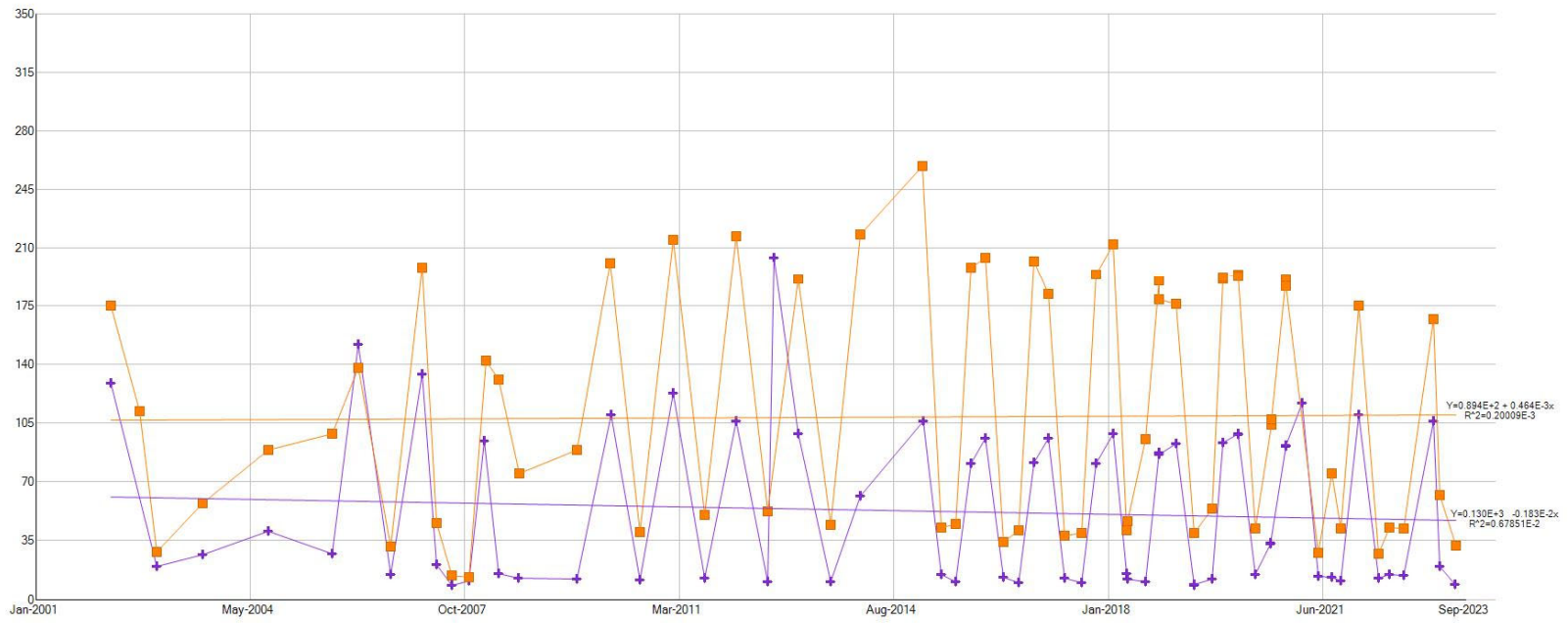
✦ SW-N1  
■ SW-N3





Magnesium, dissolved (mg/L)

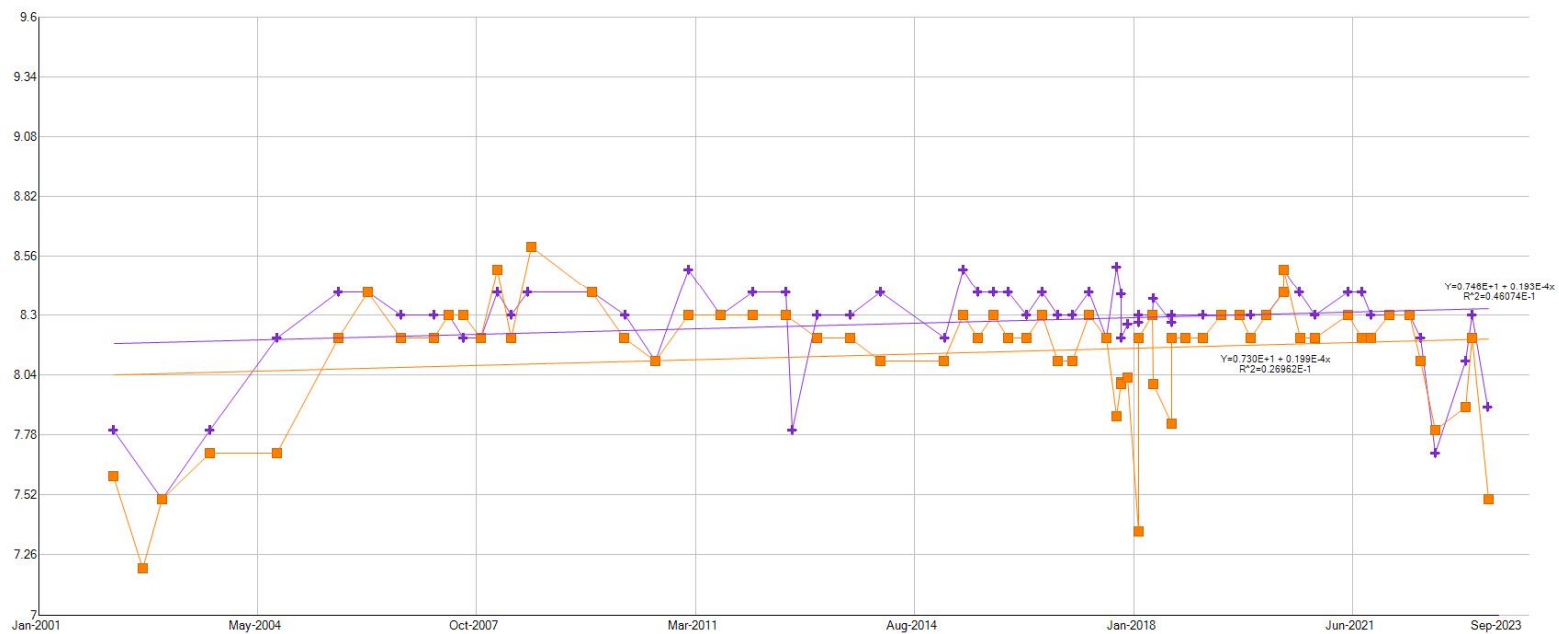
✦ SW-N1  
■ SW-N3



pH (lab)

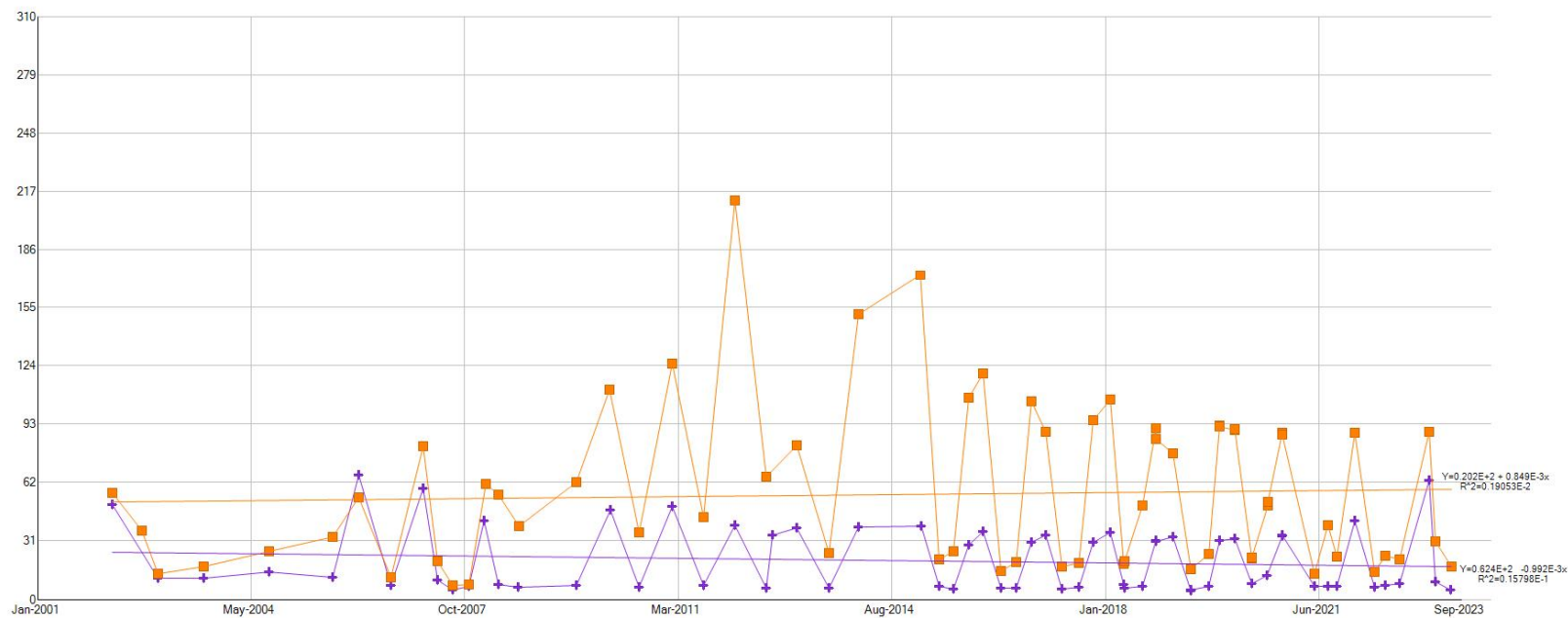
✦ SW-N1  
■ SW-N3

Analysis Result



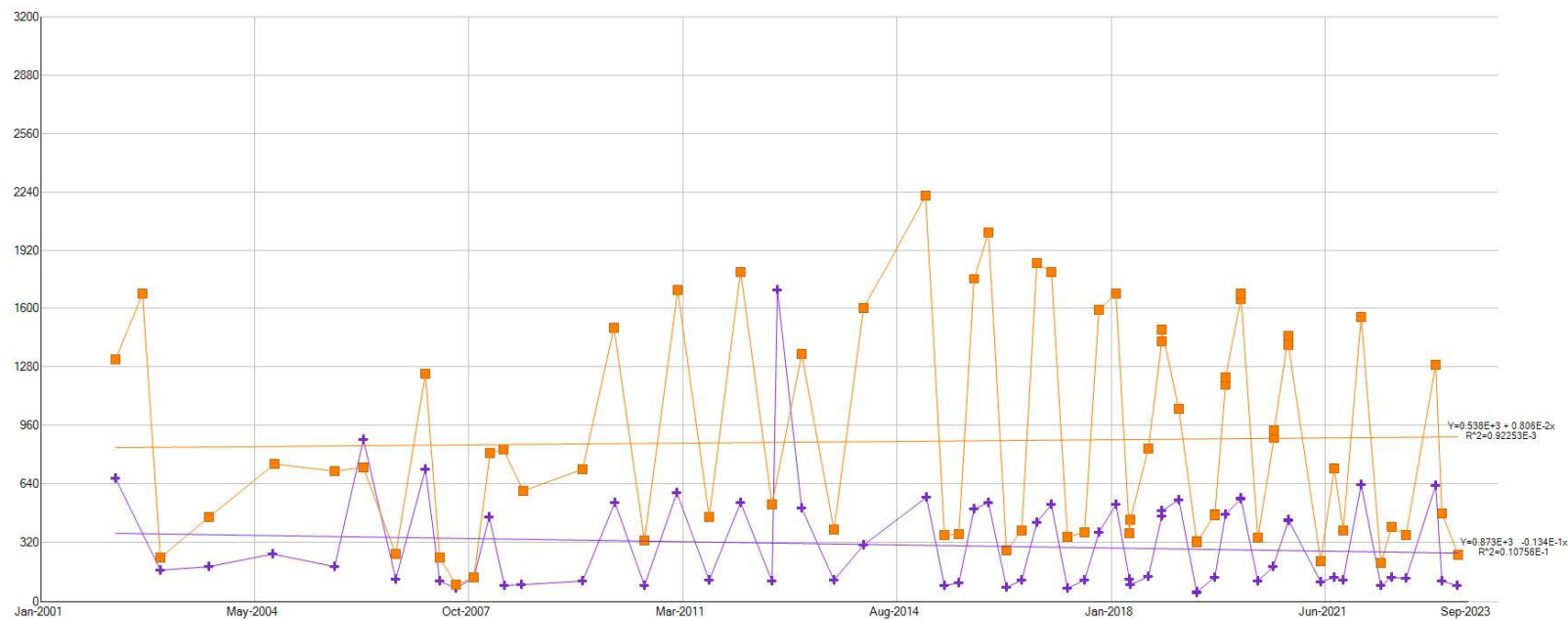
# Sodium, dissolved (mg/L)

+ SW-N1  
 ■ SW-N3

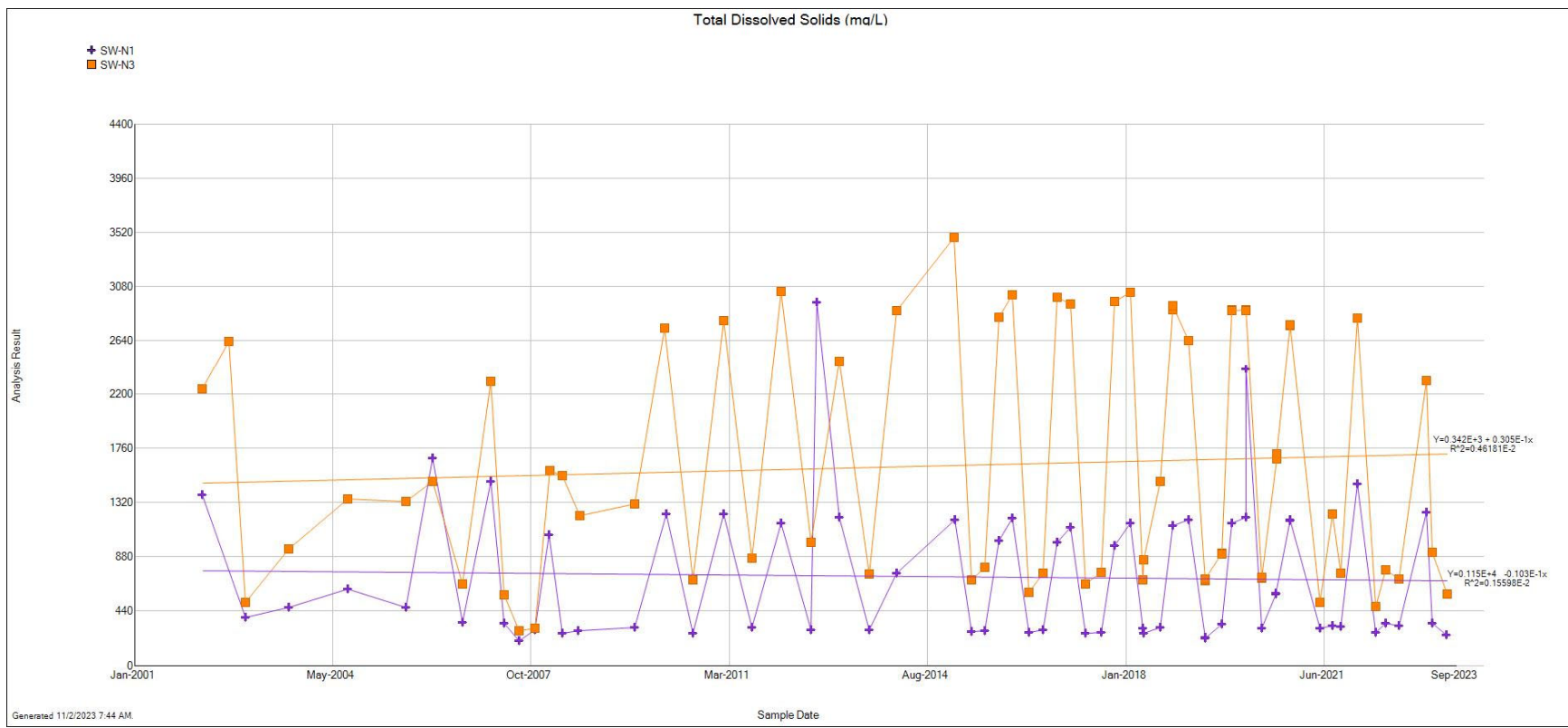


# Sulfate, dissolved (mg/L)

+ SW-N1  
 ■ SW-N3







**Appendix 3**  
**Groundwater Monitoring Data**

## New Horizon Mine

### Analysis Results by Date (column) and Parameter (row)

Date Range: 10/01/2022 to 09/30/2023

Well: GW-N36

|                               | 11/15/2022 | 1/10/2023 | 4/12/2023 | 7/18/2023 |
|-------------------------------|------------|-----------|-----------|-----------|
| Al, diss, mg/L                | 0.047      | 0.044     | 0.006     | 0.87      |
| Alkalinity, lab, mg/L         | 490        | 520       | 610       | 14        |
| As, diss, mg/L                | 0.00021    | 0.00027   | <0.00020  | 0.00022   |
| Ca, diss, mg/L                | 180        | 180       | 180       | 83        |
| Cation-Anion Bal, %           | -5.0       | -2.4      | -7.0      | 3.2       |
| Cl, diss, mg/L                | 25         | 25        | 25        | 33        |
| CO3, mg/L                     | <2.0       | <2.0      | <2.0      | <2.0      |
| Fe, diss, mg/L                | 0.25       | 0.29      | 0.027     | 0.062     |
| HCO3, mg/L                    | 490        | 520       | 610       | 14        |
| Hg, diss, mg/L                | <0.00020   | <0.00020  | <0.00020  | <0.00020  |
| K, diss, mg/L                 | 25         | 28        | 28        | 2.6       |
| Mg, diss, mg/L                | 76         | 82        | 84        | 32        |
| Mn, diss, mg/L                | 0.17       | 0.13      | 0.12      | 0.04      |
| Mo, diss, mg/L                | <0.020     | <0.020    | <0.020    | <0.020    |
| Na, diss, mg/L                | 74         | 82        | 85        | 24        |
| NH3 as N, diss, mg/L          | 0.74       | 0.54      | 0.67      | <0.10     |
| NO2, diss, mg/L               | <0.010     | <0.010    | <0.010    | <0.010    |
| NO3, diss, mg/L               | 0.17       | 0.36      | 0.28      | 1.3       |
| Orthophosphate, diss, mg/l    | 0.037      | <0.030    | 0.13      | 0.034     |
| Pb, diss, mg/L                | 0.00034    | 0.00061   | <0.00010  | 0.00031   |
| pH (field), pH                | 6.9        | 7.0       | 6.9       | 5.3       |
| pH (lab), pH                  | 7.8        | 7.2       | 7.7       | 5.7       |
| Se, diss, mg/L                | <0.00010   | <0.00010  | <0.00020  | 0.016     |
| SO4, diss, mg/L               | 480        | 470       | 470       | 300       |
| Spec. Cond. (field), umhos/cm | 1683       | 1664      | 1709      | 749       |
| Spec. Cond. (lab), umhos/cm   | 1680       | 1580      | 1730      | 738       |
| TDS, mg/L                     | 1200       | 1600      | 1300      | 610       |
| Temp (Celcius), degrees C     | 12.9       | 14.1      | 14.4      | 15.9      |
| Zinc, diss, mg/l              | 0.027      | 0.024     | 0.021     | 0.067     |

**New Horizon Mine****Analysis Results by Date (column) and Parameter (row)****Date Range: 10/01/2022 to 09/30/2023****Well: GW-N37**

|                             | 11/15/2022 | 1/10/2023 | 4/12/2023 | 7/18/2023 |
|-----------------------------|------------|-----------|-----------|-----------|
| Al, diss, mg/L              | Dry        | Dry       | Dry       | 1.7       |
| Alkalinity, lab, mg/L       |            |           |           | <2.0      |
| As, diss, mg/L              |            |           |           | <0.0002   |
| Ca, diss, mg/L              |            |           |           | 71        |
| Cation-Anion Bal, %         |            |           |           | 2.2       |
| Cl, diss, mg/L              |            |           |           | 31        |
| CO3, mg/L                   |            |           |           | 2         |
| Fe, diss, mg/L              |            |           |           | 0.032     |
| HCO3, mg/L                  |            |           |           | <2.0      |
| Hg, diss, mg/L              |            |           |           | <0.0002   |
| K, diss, mg/L               |            |           |           | 1.6       |
| Mg, diss, mg/L              |            |           |           | 28        |
| Mn, diss, mg/L              |            |           |           | 0.027     |
| Mo, diss, mg/L              |            |           |           | <0.02     |
| Na, diss, mg/L              |            |           |           | 22        |
| NH3 as N, diss, mg/L        |            |           |           | <0.1      |
| NO2, diss, mg/L             |            |           |           | <0.01     |
| NO3, diss, mg/L             |            |           |           | 1.3       |
| Orthophosphate, diss, mg/l  |            |           |           | 0.071     |
| Pb, diss, mg/L              |            |           |           | 0.0018    |
| pH (field), pH              |            |           |           | 4         |
| pH (lab), pH                |            |           |           | 4.1       |
| Se, diss, mg/L              |            |           |           | 0.0028    |
| SO4, diss, mg/L             |            |           |           | 280       |
| Spec. Cond. (field),        |            |           |           | 712       |
| Spec. Cond. (lab), umhos/cm |            |           |           | 684       |
| TDS, mg/L                   |            |           |           | 530       |
| Temp (Celcius), degrees C   |            |           |           | 14.1      |
| Zinc, diss, mg/l            |            |           |           | 0.065     |

## New Horizon Mine

### Analysis Results by Date (column) and Parameter (row)

Date Range: 10/01/2022 to 09/30/2023

Well: GW-N38

|                               | 11/15/2022 | 1/10/2023 | 4/12/2023 | 7/18/2023 |
|-------------------------------|------------|-----------|-----------|-----------|
| Al, diss, mg/L                | Dry        | Dry       | Dry       | Dry       |
| Alkalinity, lab, mg/L         |            |           |           |           |
| As, TD, mg/L                  |            |           |           |           |
| Ca, diss, mg/L                |            |           |           |           |
| Cation-Anion Bal, %           |            |           |           |           |
| Cl, diss, mg/L                |            |           |           |           |
| CO3, mg/L                     |            |           |           |           |
| Fe, diss, mg/L                |            |           |           |           |
| Fe, tot rec, ug/L             |            |           |           |           |
| HCO3, mg/L                    |            |           |           |           |
| Hg, diss, mg/L                |            |           |           |           |
| K, diss, mg/L                 |            |           |           |           |
| Mg, diss, mg/L                |            |           |           |           |
| Mn, TD, mg/L                  |            |           |           |           |
| Mo, diss, mg/L                |            |           |           |           |
| Na, diss, mg/L                |            |           |           |           |
| NH3 as N, diss, mg/L          |            |           |           |           |
| NO2 + NO3, diss, mg/L         |            |           |           |           |
| NO2, diss, mg/L               |            |           |           |           |
| NO3, diss, mg/L               |            |           |           |           |
| pH (field), pH                |            |           |           |           |
| pH (lab), pH                  |            |           |           |           |
| Se, TD, mg/L                  |            |           |           |           |
| SO4, diss, mg/L               |            |           |           |           |
| Spec. Cond. (field), umhos/cm |            |           |           |           |
| Spec. Cond. (lab), umhos/cm   |            |           |           |           |
| TDS, mg/L                     |            |           |           |           |
| Temp (Celcius), degrees C     |            |           |           |           |
| Temp (Celcius), degrees C     |            |           |           |           |
| Zn, TD, mg/L                  |            |           |           |           |

**New Horizon Mine****Analysis Results by Date (column) and Parameter (row)****Date Range: 10/01/2021 to 09/30/2022****Well: GW-N44**

|                               | 11/16/2022 | 1/10/2023 | 5/16/2023 | 7/19/2023 |
|-------------------------------|------------|-----------|-----------|-----------|
| Al, diss, mg/L                | <0.0050    | 0.0056    | 0.0054    | <0.0050   |
| Alkalinity, lab, mg/L         | 370        | 370       | 400       | 370       |
| As, diss, mg/L                | <0.00040   | <0.00020  | 0.00020   | 0.00034   |
| Ca, diss, mg/L                | 300        | 310       | 280       | 300       |
| Cation-Anion Bal, %           | -2         | -1.9      | -5.9      | 0         |
| Cl, diss, mg/L                | 6.6        | 6.5       | 6.6       | 8.5       |
| CO3, mg/L                     | <2.0       | <2.0      | <2.0      | <2.0      |
| Fe, diss, mg/L                | <0.014     | 0.011     | 0.022     | 0.012     |
| HCO3, mg/L                    | 370        | 370       | 400       | 370       |
| Hg, diss, mg/L                | <0.00020   | <0.00020  | <0.00020  | <0.00020  |
| K, diss, mg/L                 | 1.9        | 2.1       | 2         | 1.9       |
| Mg, diss, mg/L                | 93         | 100       | 100       | 130       |
| Mn, diss, mg/L                | <0.010     | <0.010    | <0.010    | <0.010    |
| Mo, diss, mg/L                | <0.020     | <0.020    | <0.020    | <0.020    |
| Na, diss, mg/L                | 29         | 31        | 38        | 59        |
| NH3 as N, diss, mg/L          | <0.050     | <0.050    | <0.050    | <0.10     |
| NO2, diss, mg/L               | <0.010     | <0.010    | <0.010    | <0.010    |
| NO3, diss, mg/L               | 0.065      | 0.061     | 0.085     | 0.14      |
| Orthophosphate, diss, mg/l    | <0.030     | <0.030    | 0.034     | 0.059     |
| Pb, diss, mg/L                | 0.00016    | <0.00010  | 0.00054   | <0.00010  |
| pH (field), pH                | 7.2        | 7.2       | 7.3       | 7.4       |
| pH (lab), pH                  | 8.0        | 7.4       | 8.2       | 7.7       |
| Se, diss, mg/L                | 0.0023     | 0.0026    | 0.0019    | 0.0032    |
| SO4, diss, mg/L               | 820        | 920       | 910       | 990       |
| Spec. Cond. (field), umhos/cm | 1894       | 1996      | 1861      | 2056      |
| Spec. Cond. (lab), umhos/cm   | 1900       | 1930      | 1870      | 2040      |
| TDS, mg/L                     | 1620       | 1740      | 1610      | 1900      |
| Temp (Celcius), degrees C     | 9.7        | 10.1      | 10.9      | 13        |
| Zinc, diss, mg/l              | <0.020     | <0.020    | 0.030     | <0.020    |

## New Horizon Mine

### Analysis Results by Date (column) and Parameter (row)

Date Range: 10/01/2022 to 09/30/2023

Well: GW-N45

|                               | 11/16/2022 | 1/10/2023 | 5/17/2023 | 7/19/2023 |
|-------------------------------|------------|-----------|-----------|-----------|
| Al, diss, mg/L                | 0.0082     | 0.011     | 0.074     | 0.014     |
| Alkalinity, lab, mg/L         | 1170       | 1270      | 1190      | 1250      |
| As, diss, mg/L                | 0.00052    | 0.0012    | 0.0013    | 0.0025    |
| Ca, diss, mg/L                | 20         | 20        | 34        | 23        |
| Cation-Anion Bal, %           | -2.1       | -6.1      | -3.8      | -2        |
| Cl, diss, mg/L                | 51         | 61        | 58        | 54        |
| CO3, mg/L                     | 110        | 22        | 96        | 39        |
| Fe, diss, mg/L                | 0.017      | 0.028     | 0.072     | 0.039     |
| HCO3, mg/L                    | 1200       | 1300      | 1200      | 1200      |
| Hg, diss, mg/L                | <0.00020   | <0.00020  | <0.00020  | <0.00020  |
| K, diss, mg/L                 | 6.8        | 7.4       | 8.6       | 7.5       |
| Mg, diss, mg/L                | 160        | 160       | 270       | 180       |
| Mn, diss, mg/L                | 0.12       | 0.14      | 0.21      | 0.14      |
| Mo, diss, mg/L                | <0.040     | <0.040    | <0.040    | <0.020    |
| Na, diss, mg/L                | 740        | 730       | 870       | 760       |
| NH3 as N, diss, mg/L          | 1.1        | 0.92      | 1.2       | 0.1       |
| NO2, diss, mg/L               | <0.010     | <0.010    | <0.10     | <0.010    |
| NO3, diss, mg/L               | <0.20      | <0.40     | <0.20     | <0.20     |
| Orthophosphate, diss, mg/l    | 0.25       | 0.84      | 0.32      | 0.34      |
| Pb, diss, mg/L                | 0.00015    | 0.00023   | 0.00045   | 0.0002    |
| pH (field), pH                | 8.5        | 8.1       | 8.1       | 8.1       |
| pH (lab), pH                  | 8.6        | 8.3       | 8.5       | 8.3       |
| Se, diss, mg/L                | 0.023      | <0.00020  | <0.00020  | <0.00010  |
| SO4, diss, mg/L               | 1000       | 1200      | 1900      | 1200      |
| Spec. Cond. (field), umhos/cm | 3821       | 4026      | 4627      | 3917      |
| Spec. Cond. (lab), umhos/cm   | 3870       | 3790      | 4880      | 3990      |
| TDS, mg/L                     | 2830       | 2800      | 3820      | 3020      |
| Temp (Celcius), degrees C     | 10.3       | 10.4      | 13.2      | 14.7      |
| Zinc, diss, mg/l              | <0.04      | <0.04     | <0.04     | <0.04     |

# New Horizon Mine

## Analysis Results by Date (column) and Parameter (row)

Date Range: 10/01/2022 to 09/30/2023

Well: GW-N46

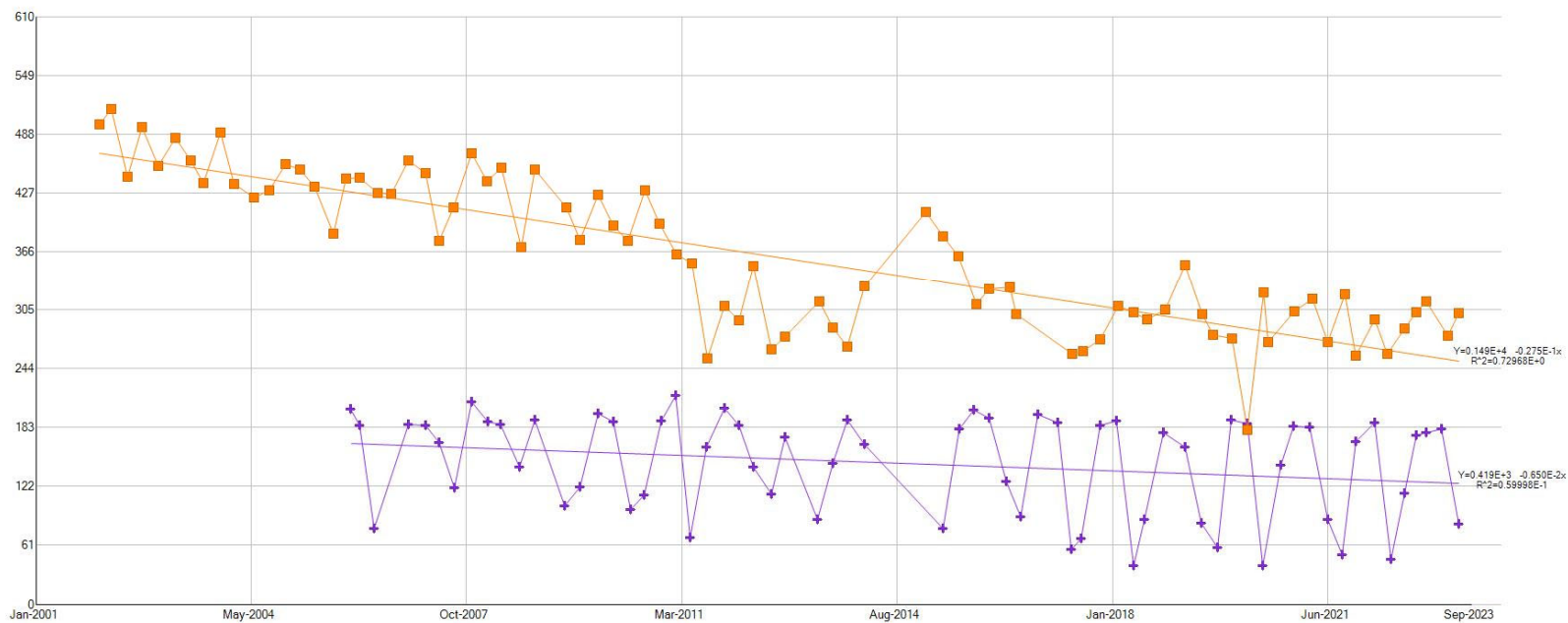
|                               | 11/16/2022 | 1/10/2023 | 5/17/2023 | 7/19/2023 |
|-------------------------------|------------|-----------|-----------|-----------|
| Al, diss, mg/L                | 0.026      | 0.03      | 0.013     | 0.02      |
| Alkalinity, lab, mg/L         | 1090       | 1190      | 1150      | 1250      |
| As, diss, mg/L                | <0.00040   | <0.00020  | <0.00020  | <0.00020  |
| Ca, diss, mg/L                | 5.6        | 5.5       | 5.2       | 5.4       |
| Cation-Anion Bal, %           | -4.6       | -7.7      | -7.5      | -13.5     |
| Cl, diss, mg/L                | 86         | 97        | 100       | 93        |
| CO3, mg/L                     | 180        | 110       | 180       | 230       |
| Fe, diss, mg/L                | 0.034      | 0.026     | 0.011     | 0.047     |
| HCO3, mg/L                    | 1100       | 1200      | 1200      | 1000      |
| Hg, diss, mg/L                | <0.00020   | <0.00020  | <0.00020  | <0.00020  |
| K, diss, mg/L                 | 6.2        | 6.7       | 6.1       | 6.2       |
| Mg, diss, mg/L                | 4          | 4.1       | 4         | 3.96      |
| Mn, diss, mg/L                | <0.010     | <0.010    | <0.010    | <0.010    |
| Mo, diss, mg/L                | <0.020     | <0.020    | <0.020    | <0.020    |
| Na, diss, mg/L                | 680        | 660       | 700       | 700       |
| NH3 as N, diss, mg/L          | 0.82       | 0.66      | 0.72      | 0.84      |
| NO2, diss, mg/L               | <0.010     | <0.010    | <0.10     | <0.010    |
| NO3, diss, mg/L               | <0.20      | <0.40     | <0.20     | <0.20     |
| Orthophosphate, diss, mg/l    | 0.92       | 1.3       | 0.47      | 0.43      |
| Pb, diss, mg/L                | 0.00027    | 0.00025   | <0.00010  | 0.00027   |
| pH (field), pH                | 8.6        | 8.6       | 8.5       | 8.6       |
| pH (lab), pH                  | 8.9        | 8.7       | 9.0       | 8.8       |
| Se, diss, mg/L                | 0.011      | 0.025     | <0.00010  | <0.00010  |
| SO4, diss, mg/L               | 290        | 280       | 330       | 700       |
| Spec. Cond. (field), umhos/cm | 2876       | 2883      | 2767      | 2853      |
| Spec. Cond. (lab), umhos/cm   | 2870       | 2750      | 2910      | 2780      |
| TDS, mg/L                     | 1960       | 1880      | 1890      | 1930      |
| Temp (Celcius), degrees C     | 9.98       | 10.6      | 12.3      | 12.5      |
| Zinc, diss, mg/l              | <0.020     | <0.020    | <0.020    | <0.020    |



**Appendix 4**  
**Groundwater Monitoring Graphs**

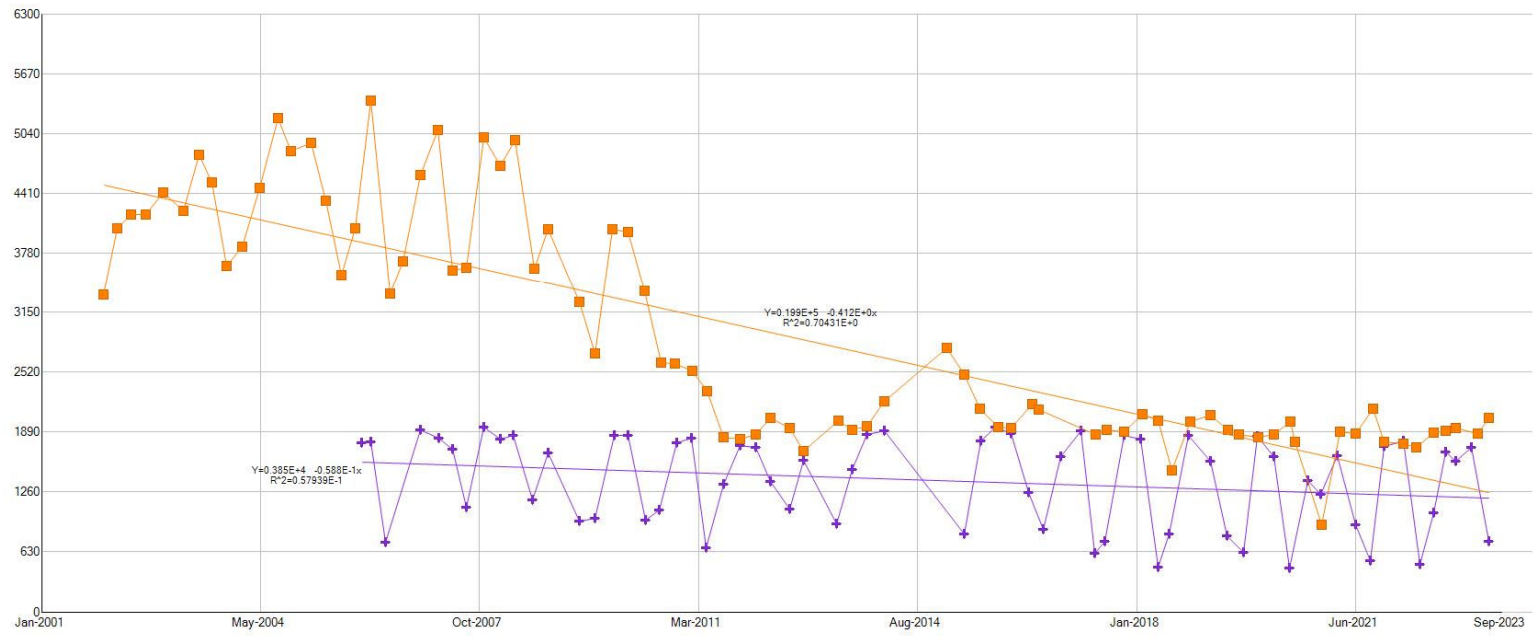
# Calcium, dissolved (mg/L)

+ GW-N36  
 ■ GW-N44



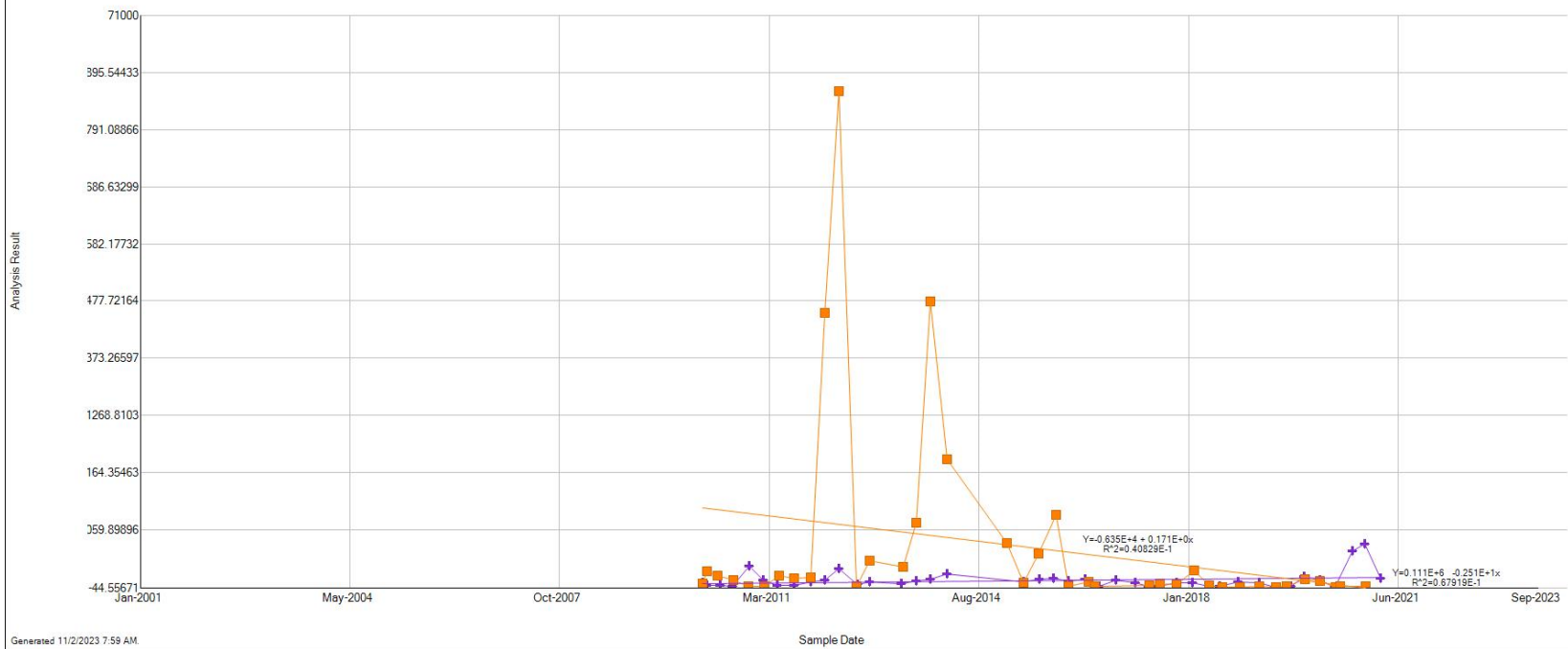
Specific Conductance @ 25C (lab) (umhos/cm)

✚ GW-N36  
■ GW-N44



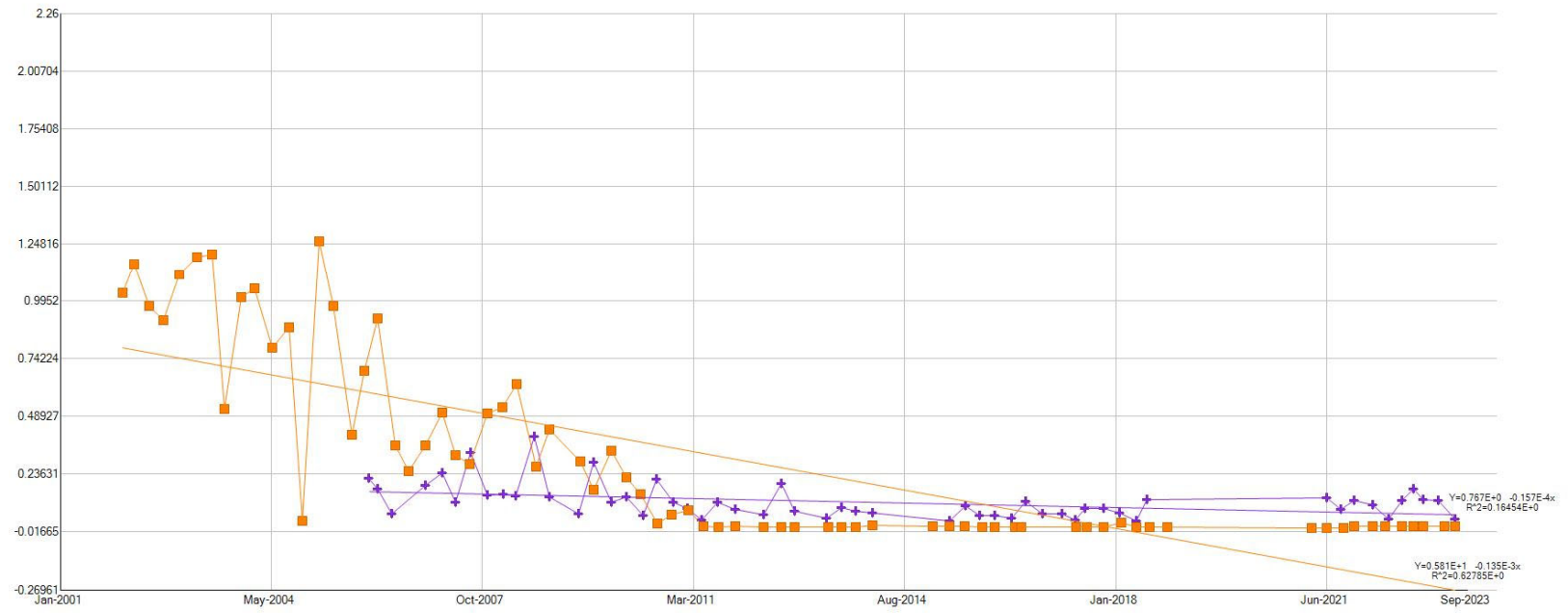
Iron, total recoverable (uq/L)

✦ GW-N36  
■ GW-N44



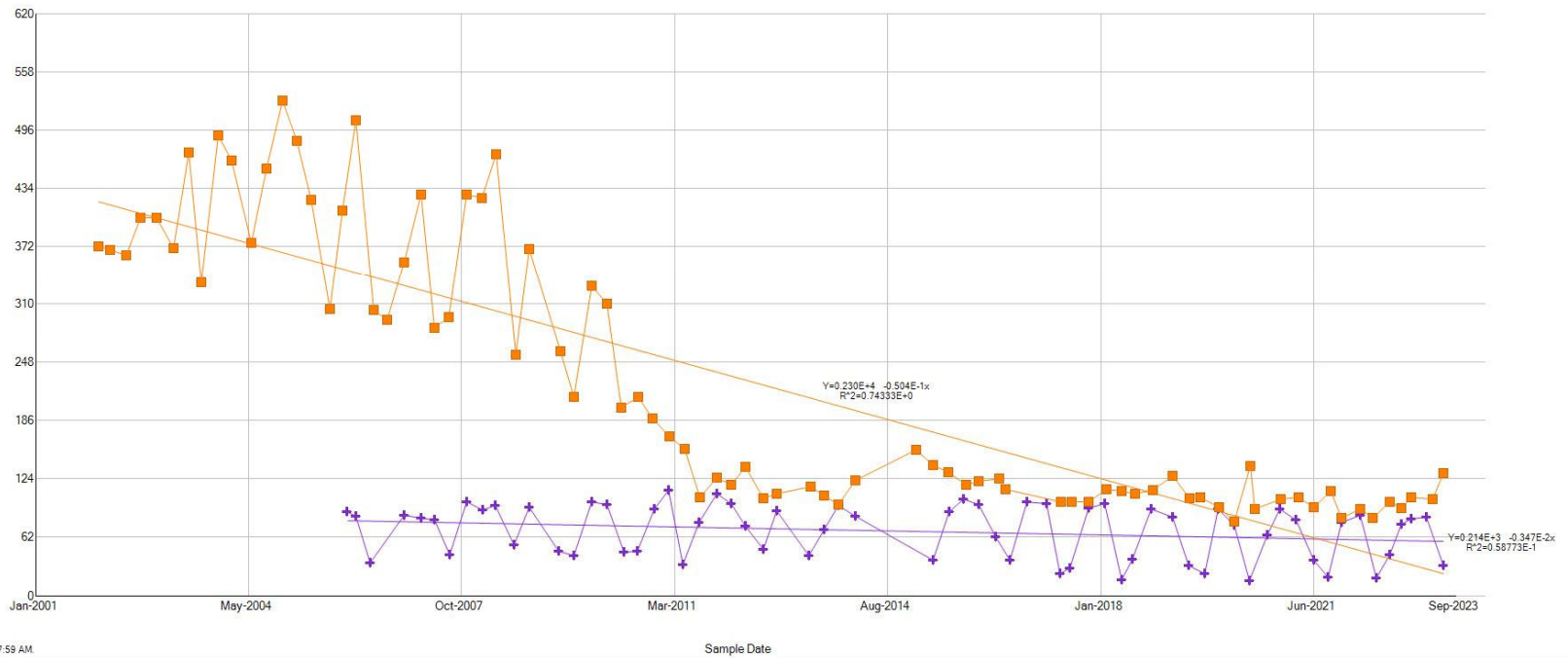
Manganese, dissolved (mg/L)

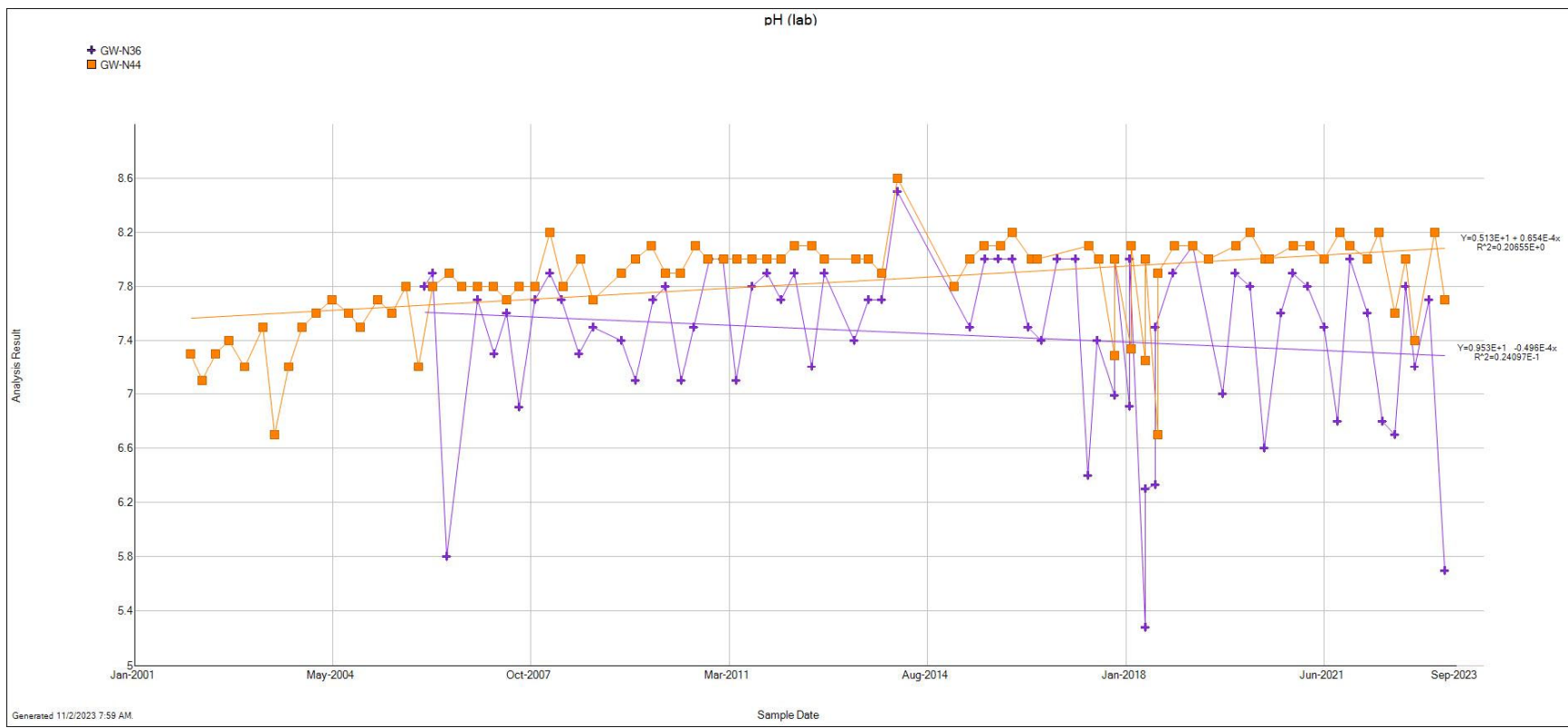
✦ GW-N36  
■ GW-N44



Magnesium, dissolved (mg/L)

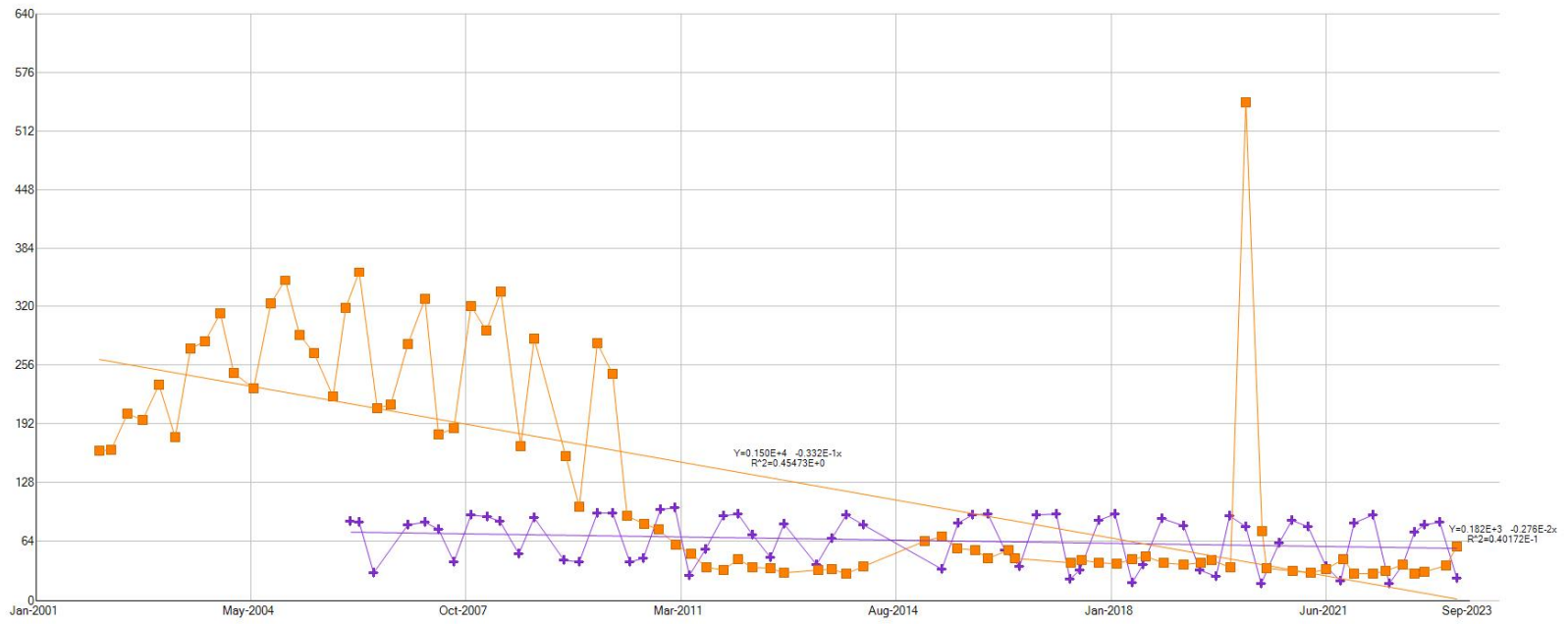
✦ GW-N36  
■ GW-N44





Sodium, dissolved (mg/L)

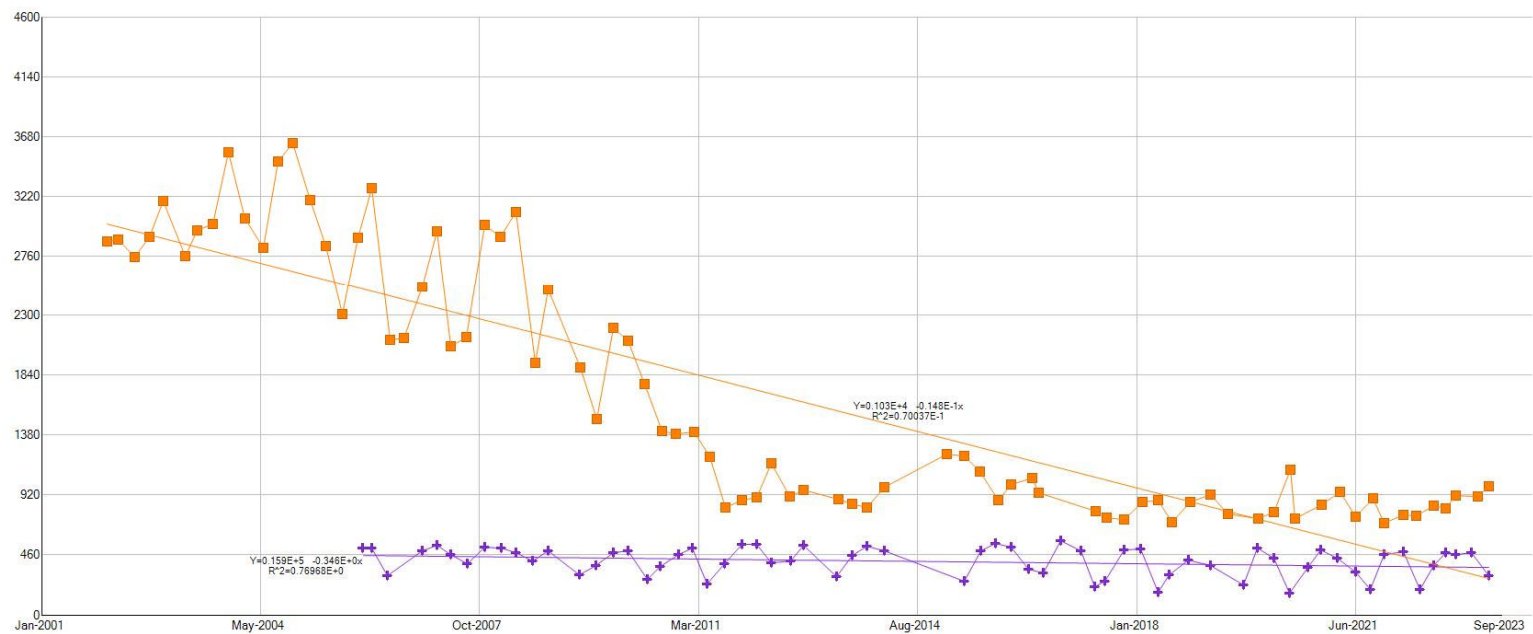
✦ GW-N36  
■ GW-N44





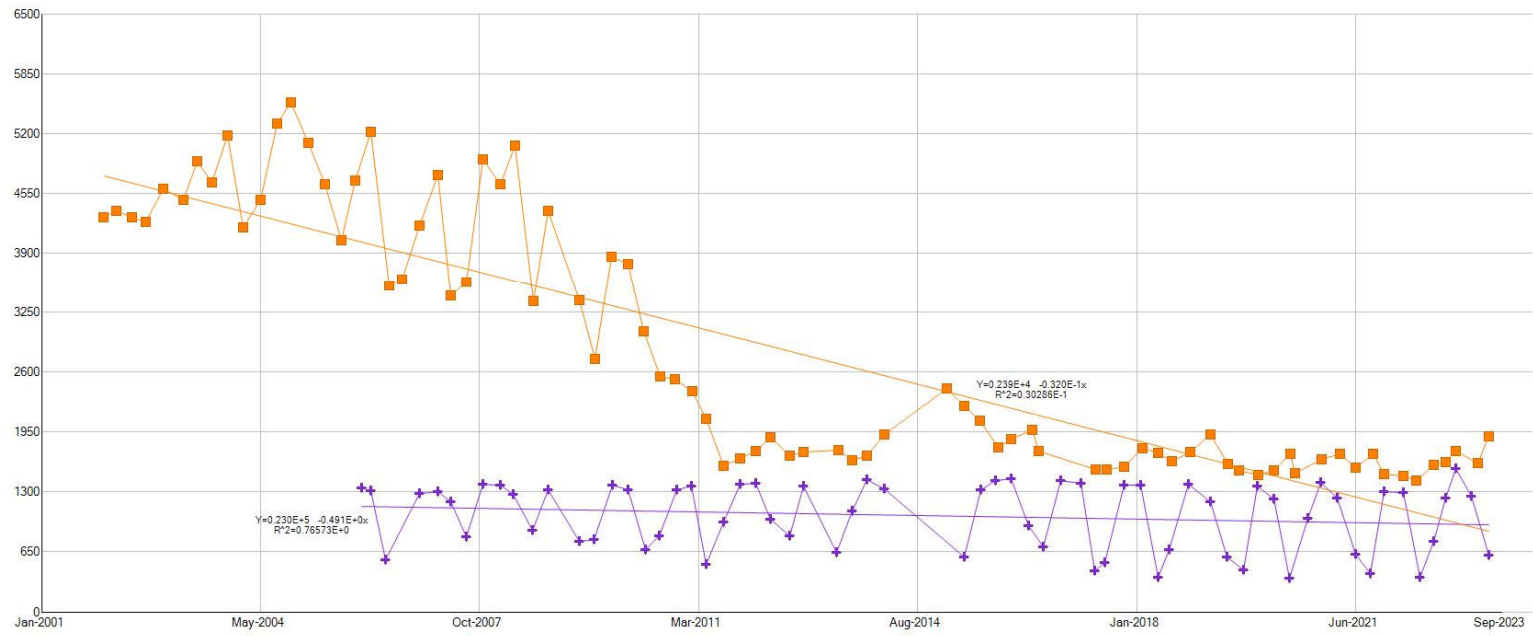
# Sulfate, dissolved (mg/L)

+ GW-N36  
 ■ GW-N44



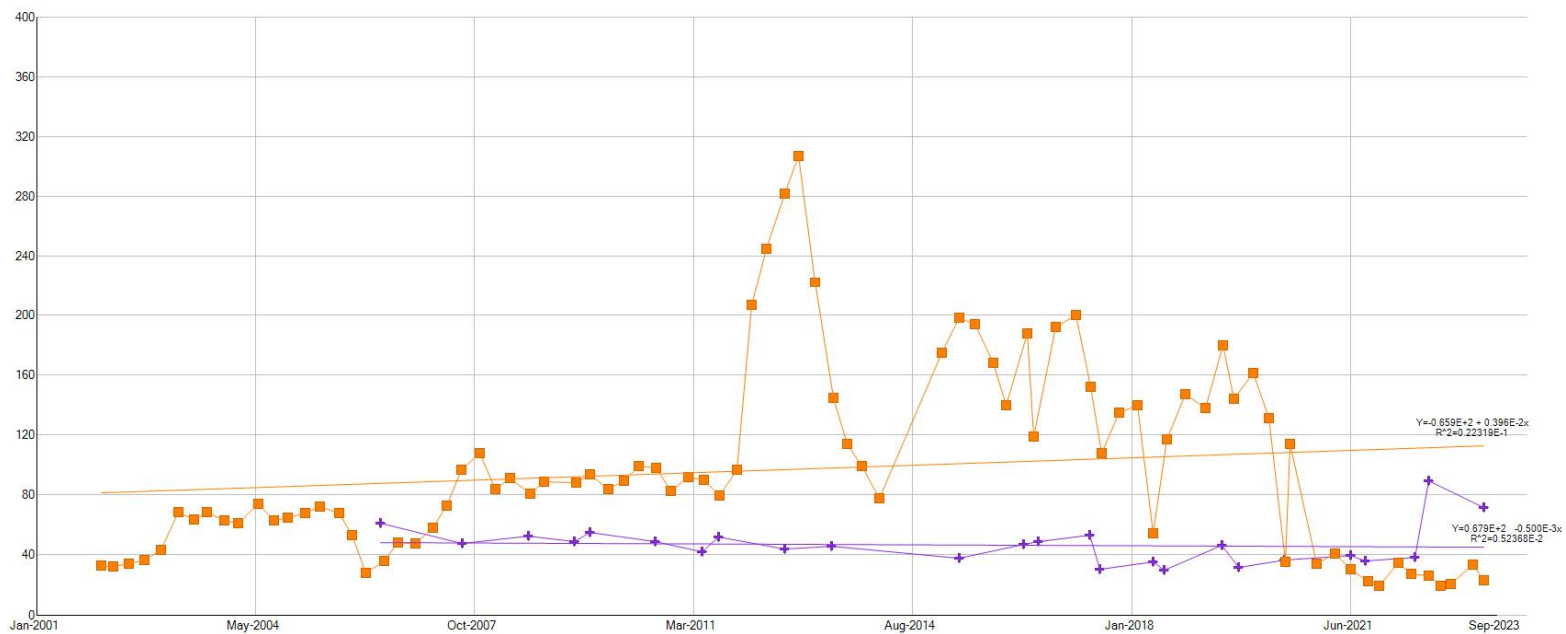
Total Dissolved Solids (mg/L)

✚ GW-N36  
■ GW-N44



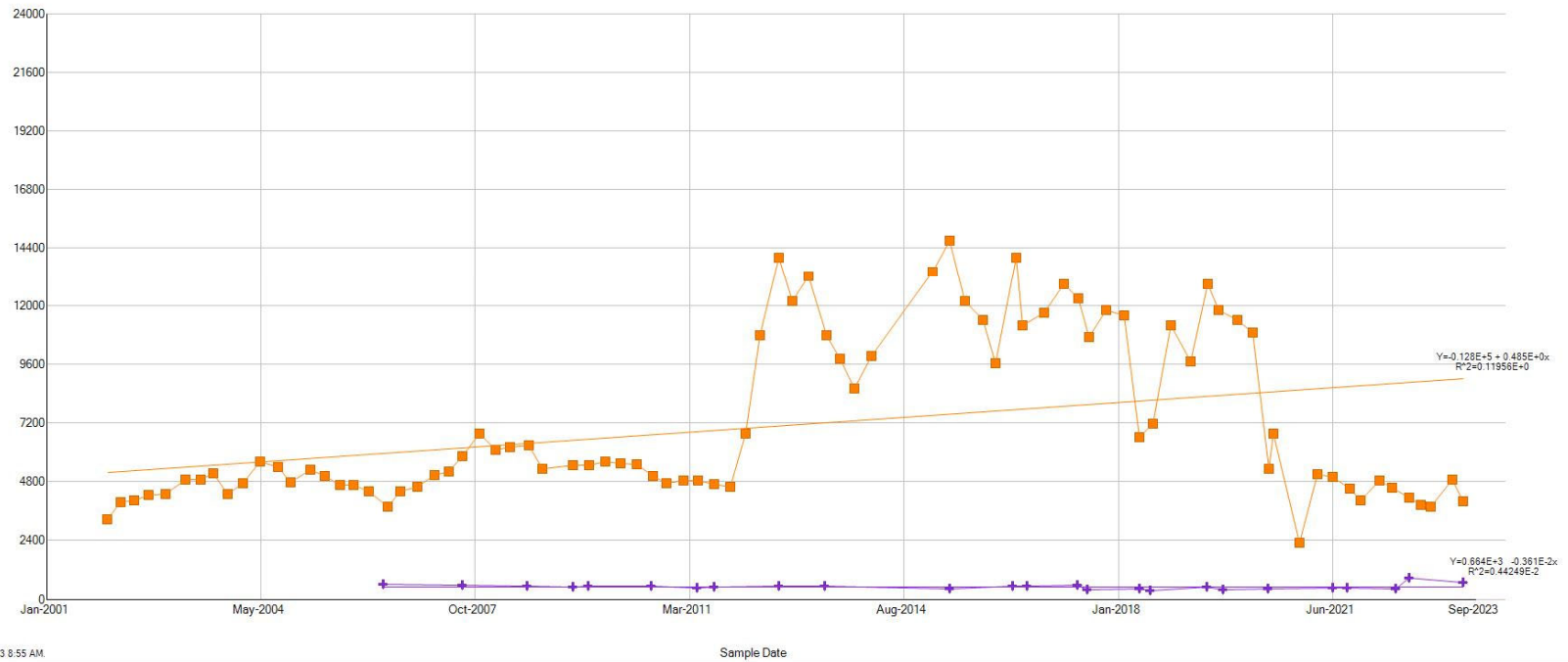
# Calcium, dissolved (mg/L)

+ GW-N37  
 ■ GW-N45



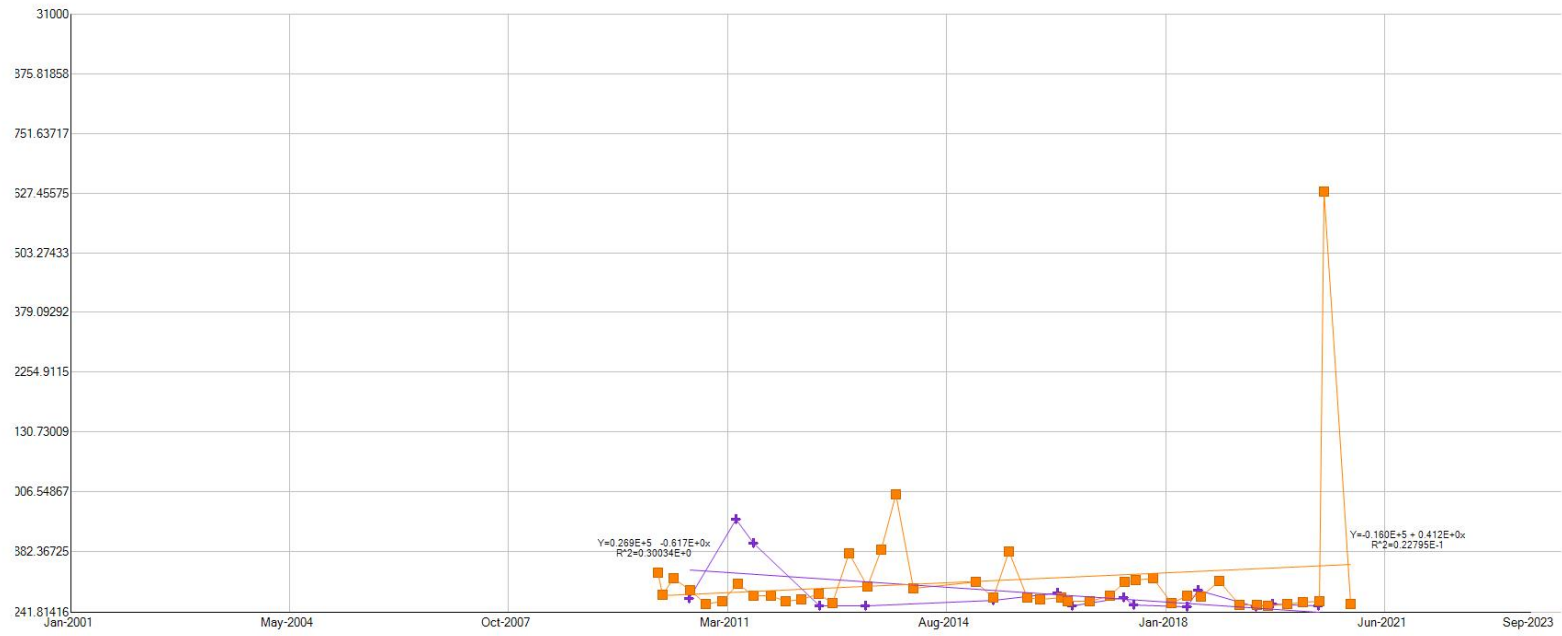
Specific Conductance @ 25C (lab) (umhos/cm)

✚ GW-N37  
■ GW-N45



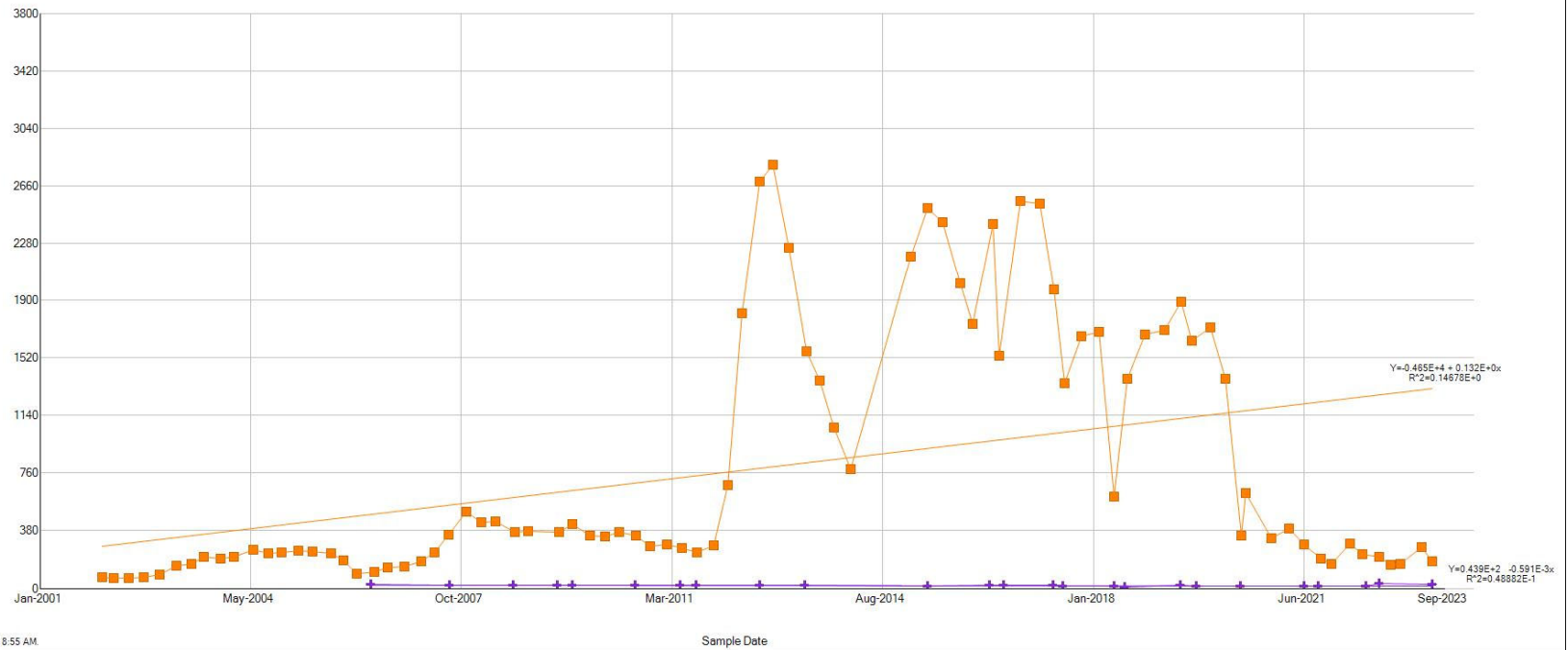
Iron, total recoverable (uq/L)

✦ GW-N37  
■ GW-N45



Magnesium, dissolved (mg/L)

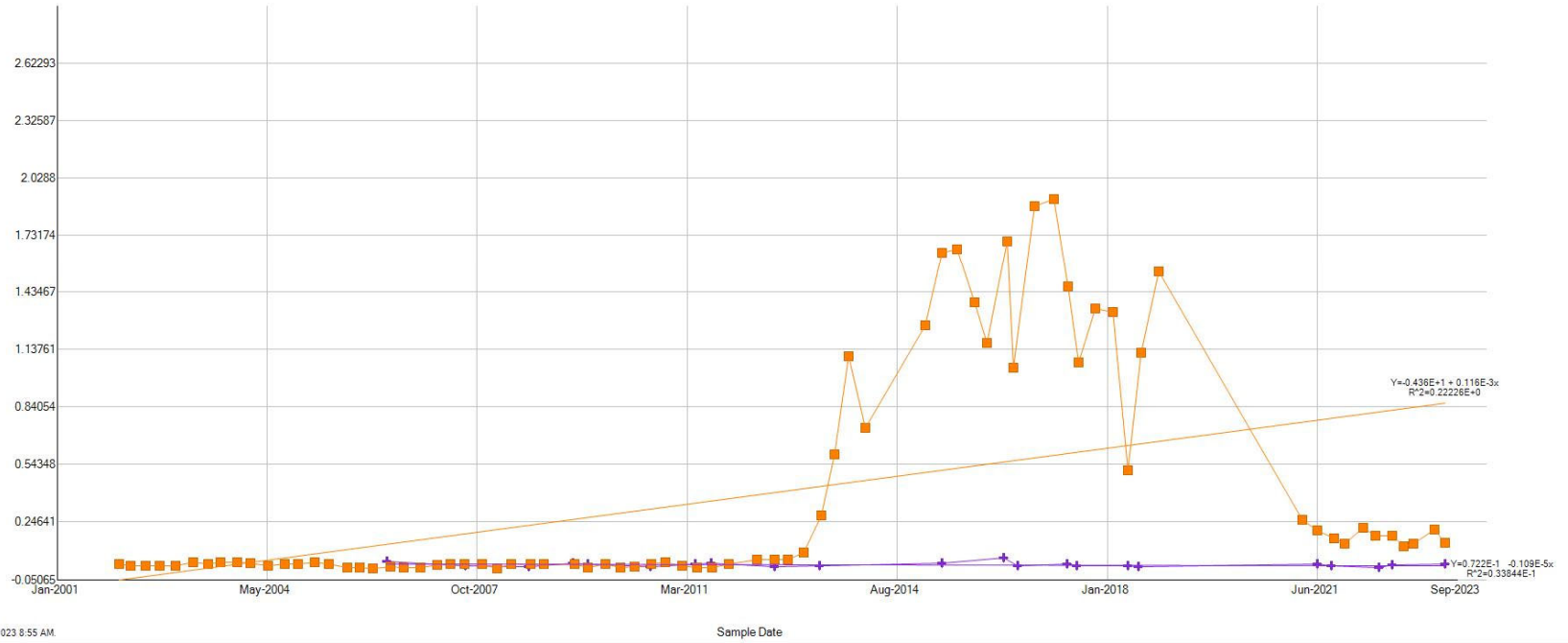
✚ GW-N37  
■ GW-N45



Manganese, dissolved (mg/L)

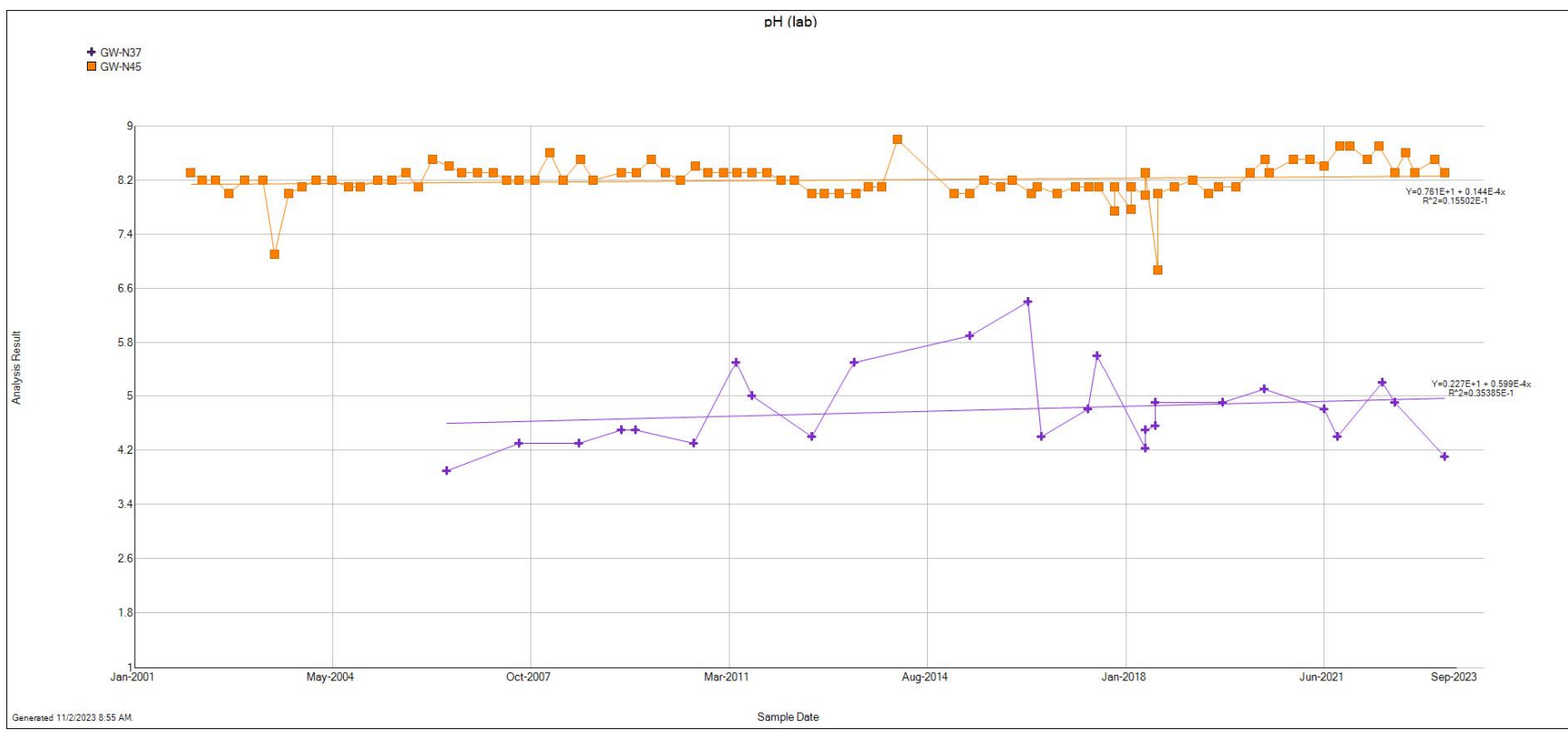
✚ GW-N37  
■ GW-N45

Analysis Result



Generated 11/2/2023 8:55 AM

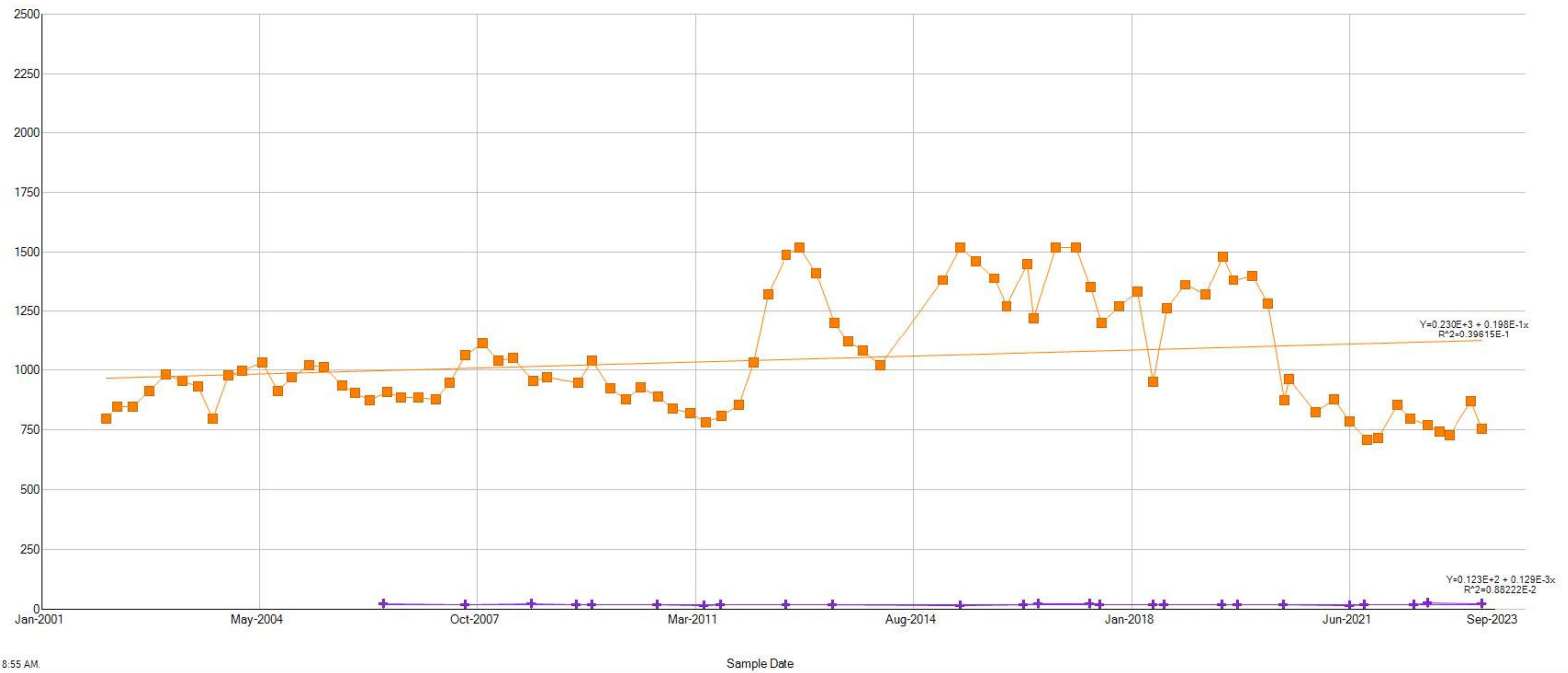
Sample Date





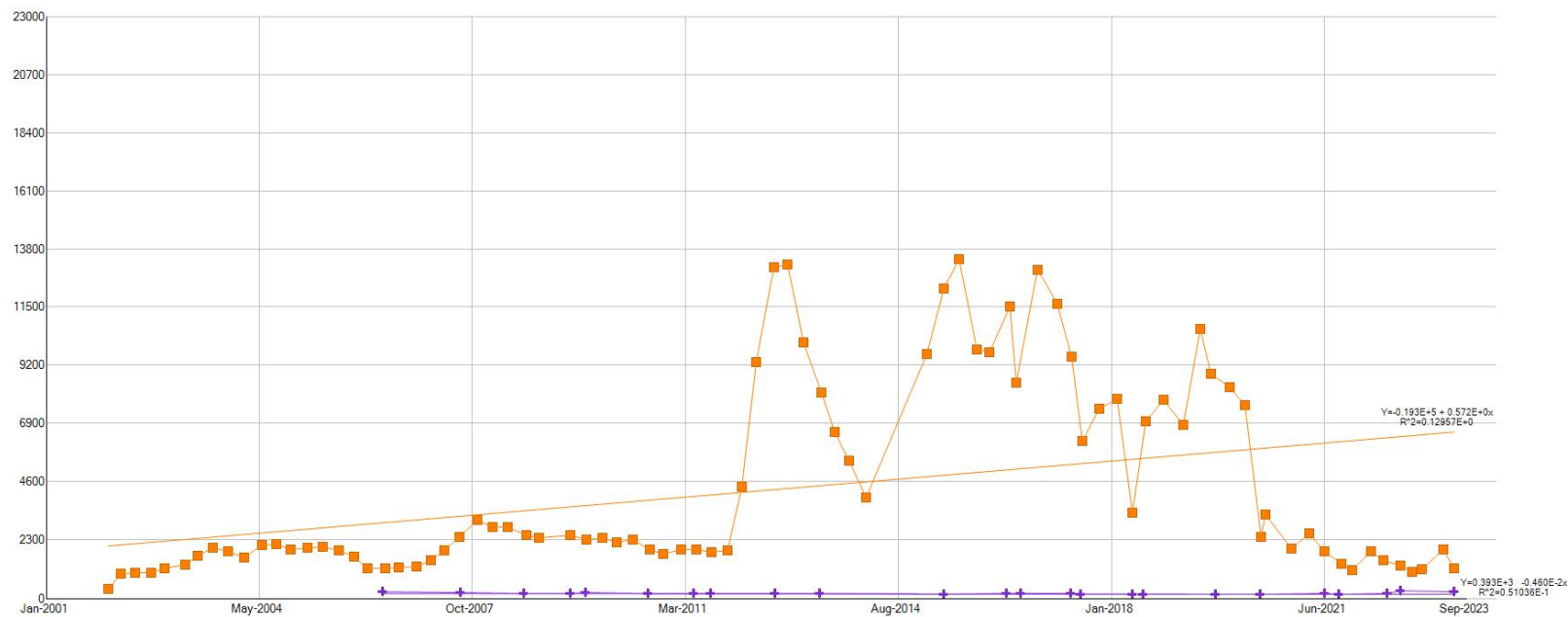
Sodium, dissolved (mg/L)

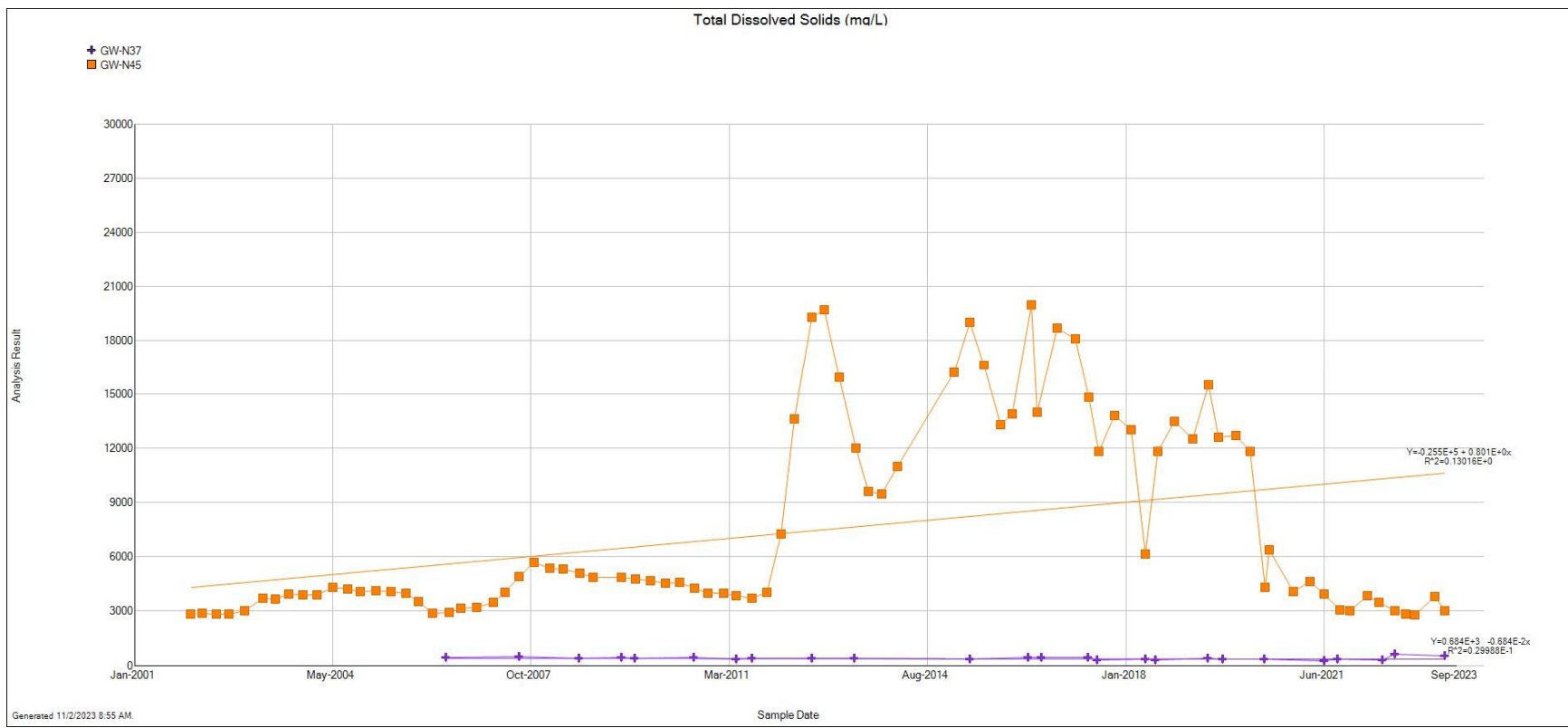
✚ GW-N37  
■ GW-N45



# Sulfate, dissolved (mg/L)

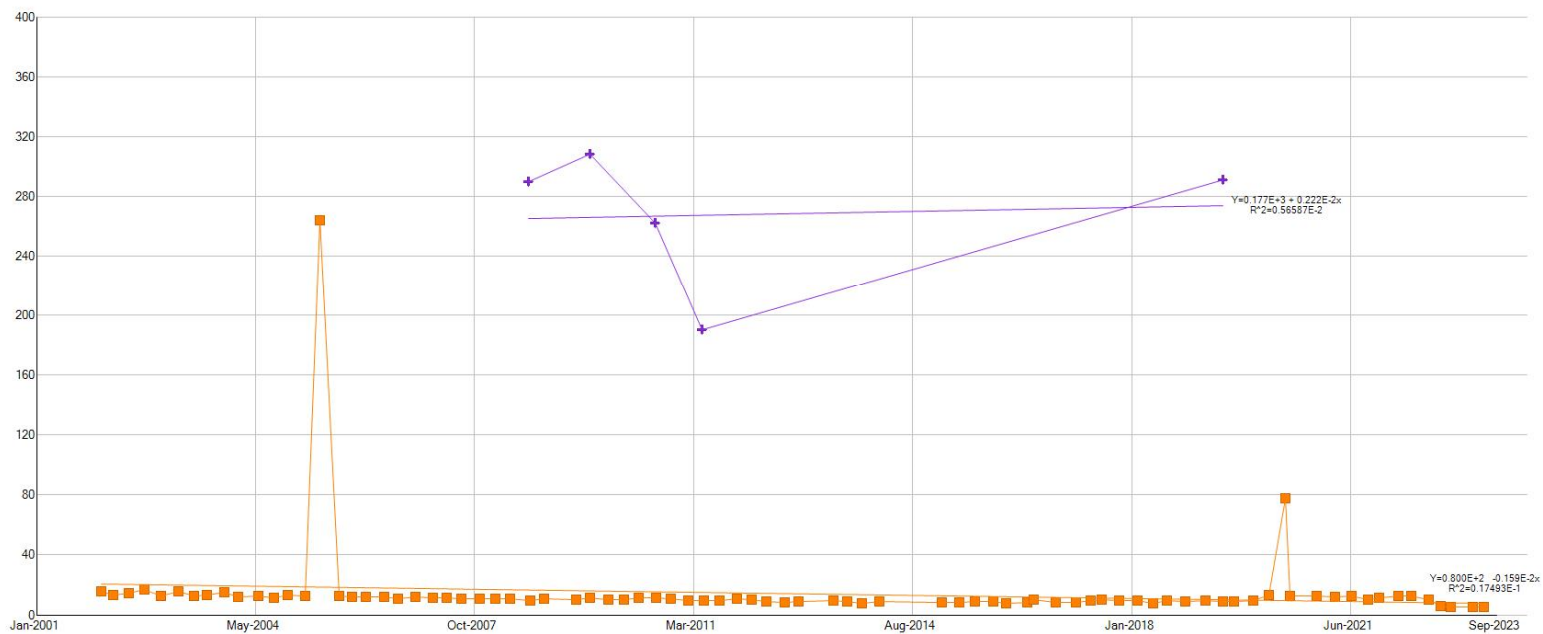
+ GW-N37  
 ■ GW-N45





Calcium, dissolved (mg/L)

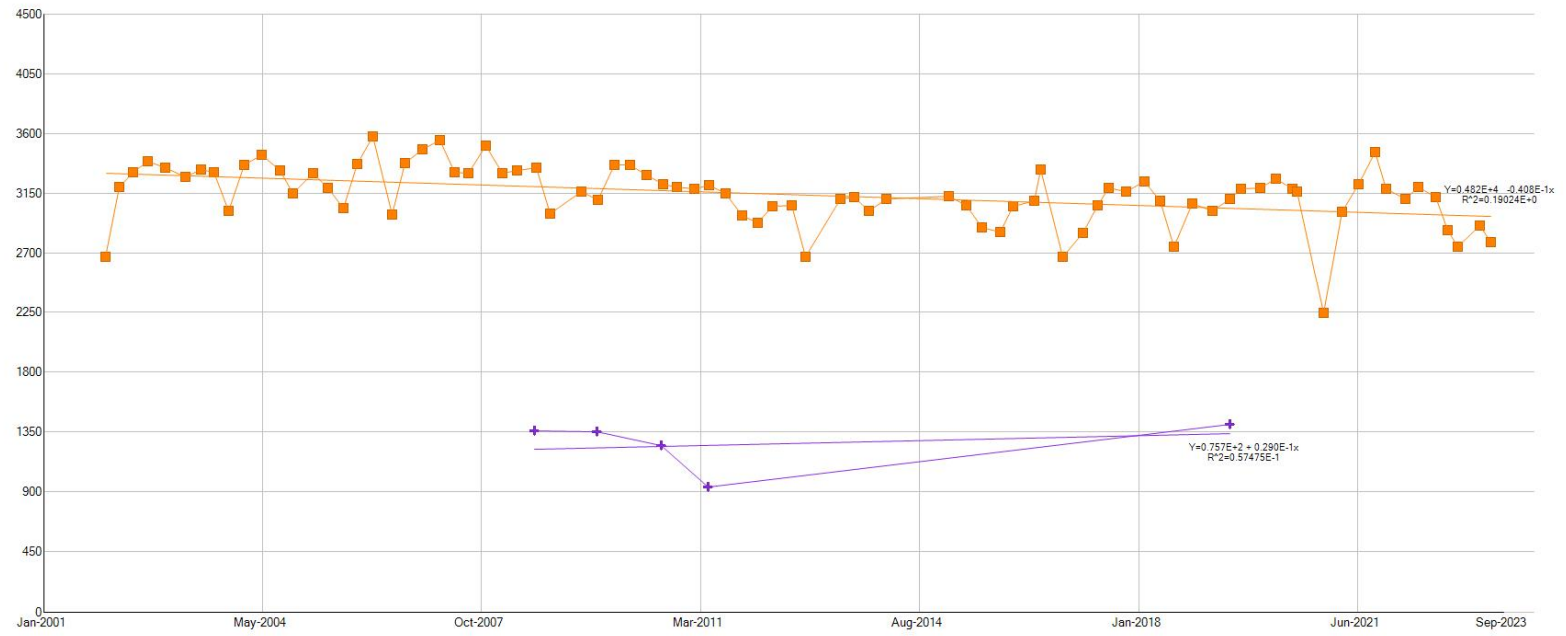
✦ GW-N38  
■ GW-N46



Specific Conductance @ 25C (lab) (umhos/cm)

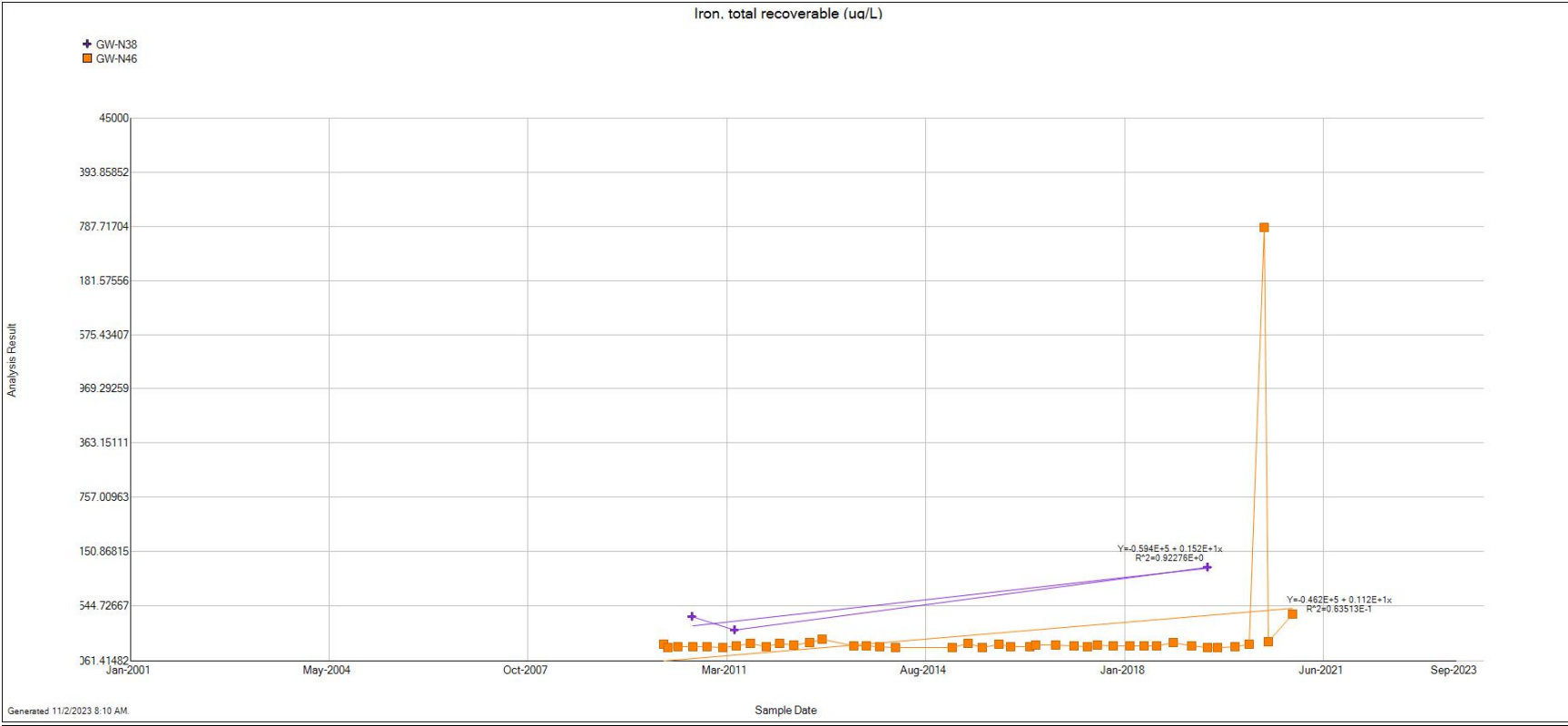
✚ GW-N38  
■ GW-N46

Analysis Result



Generated 11/2/2023 8:10 AM

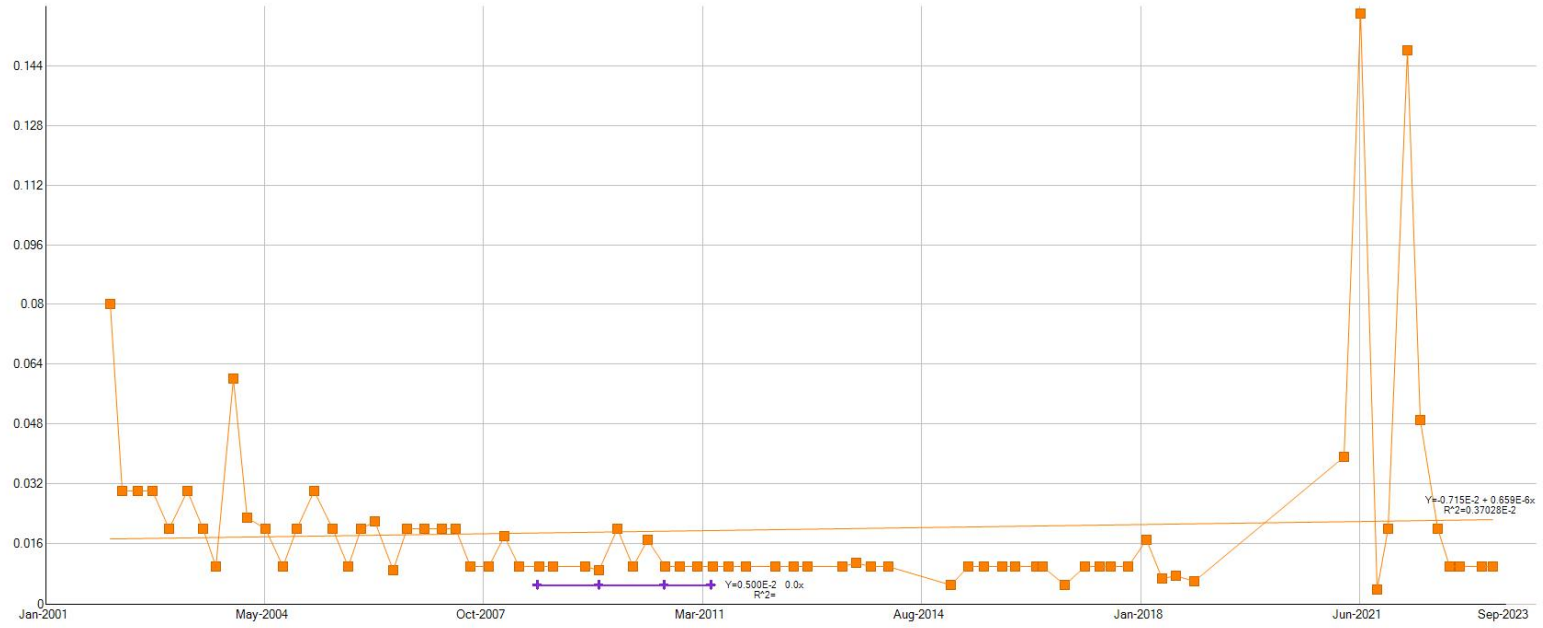
Sample Date



Manganese, dissolved (mg/L)

✚ GW-N38  
■ GW-N46

Analysis Result

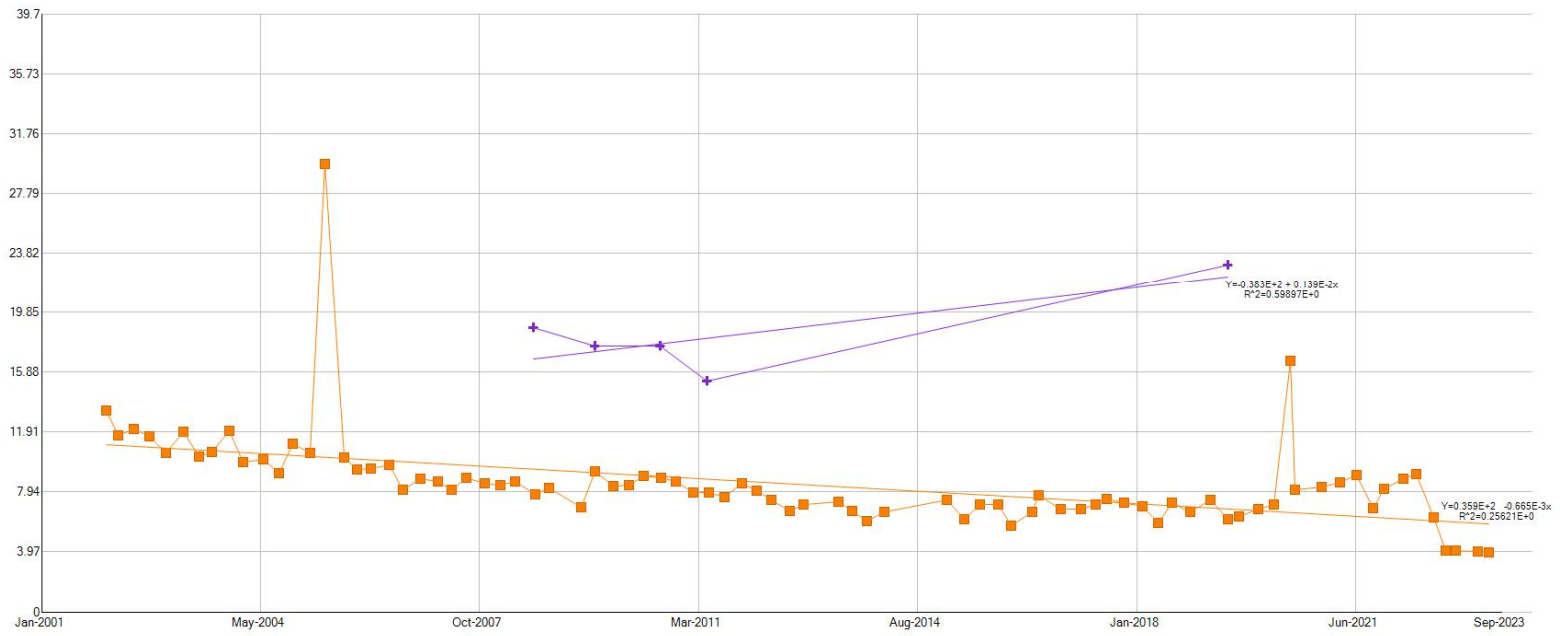


Generated 11/2/2023 8:10 AM

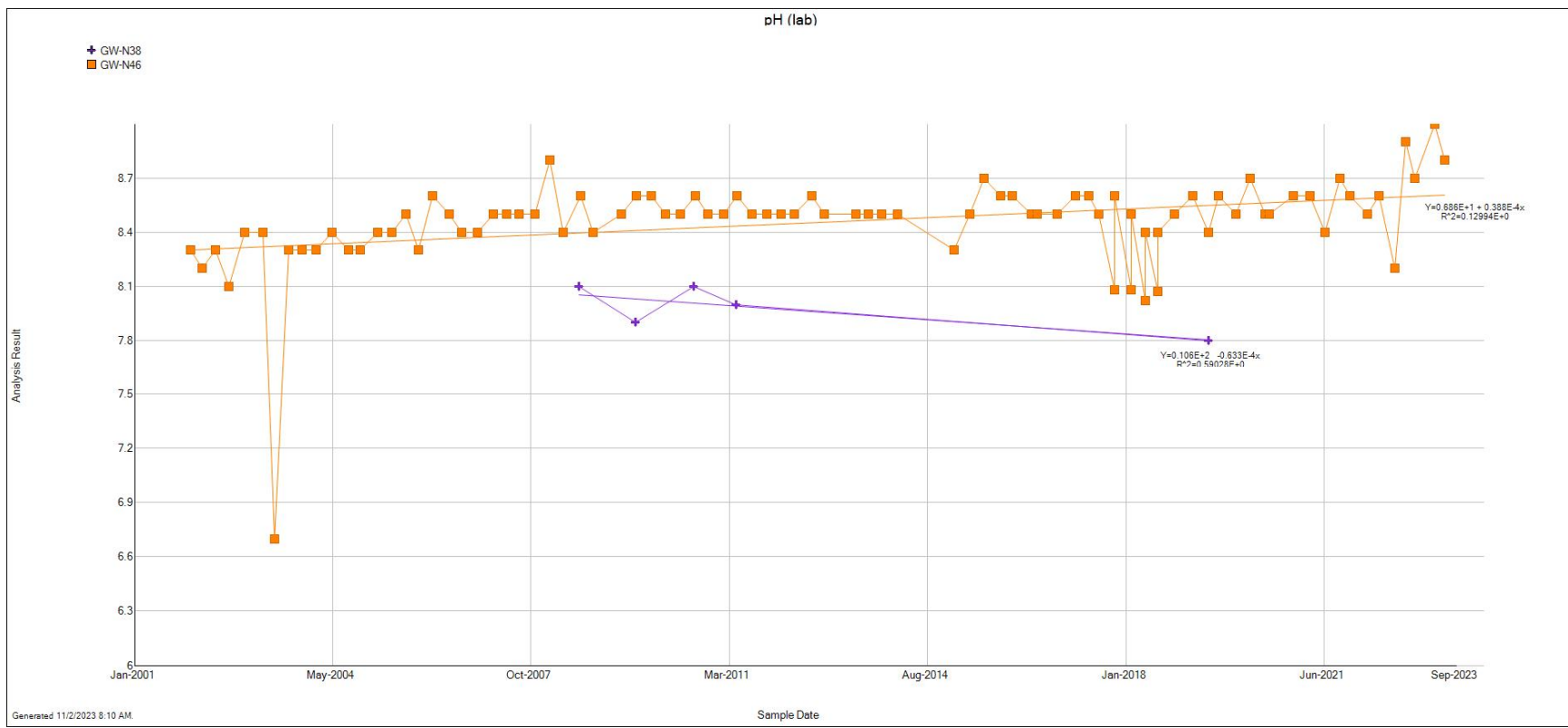
Sample Date

Magnesium, dissolved (mg/L)

✦ GW-N38  
■ GW-N46

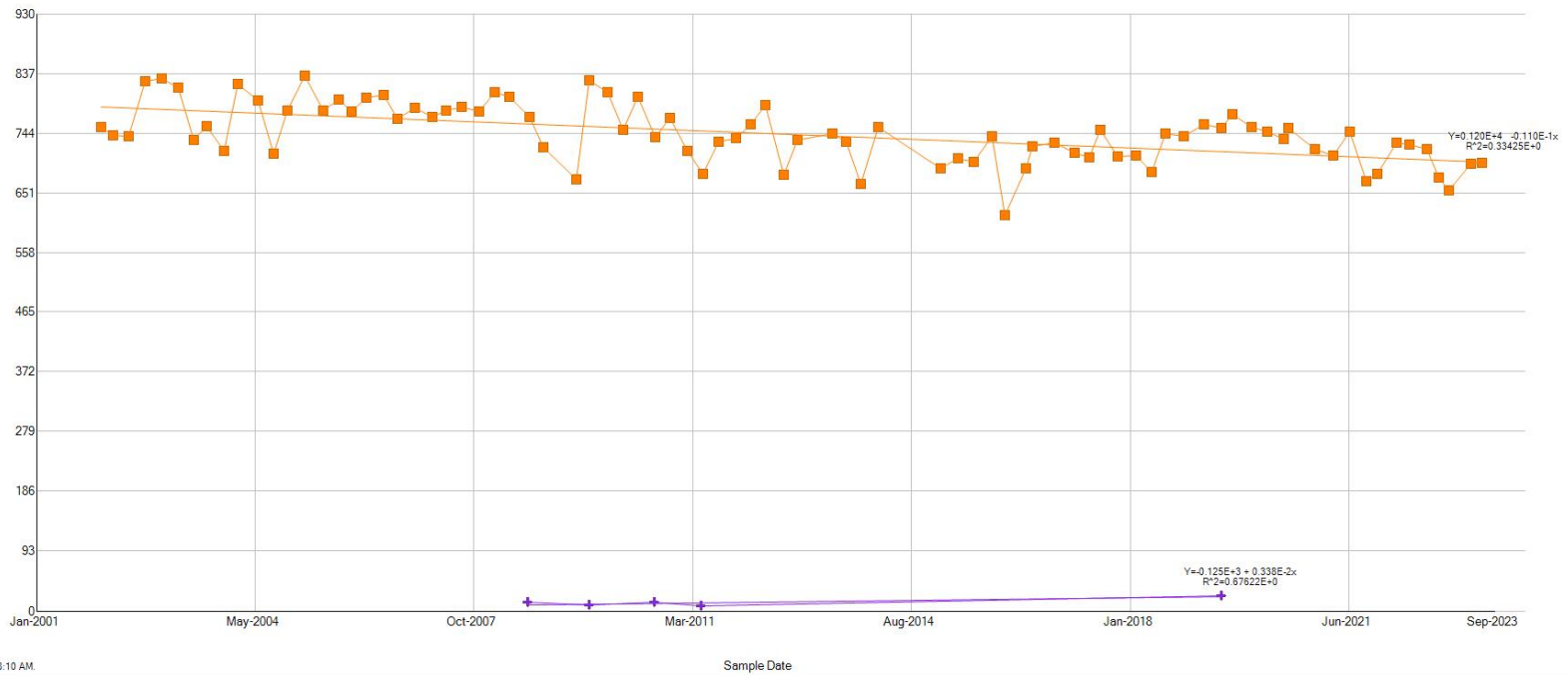






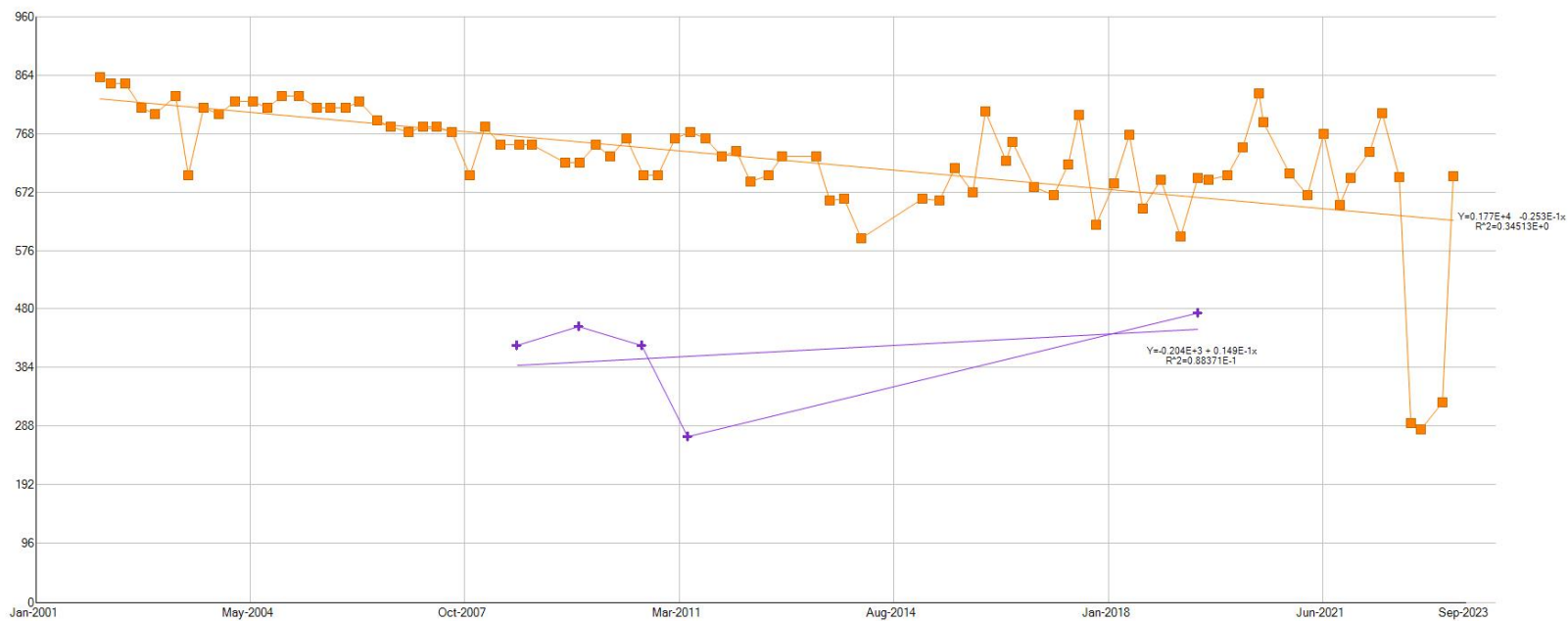
Sodium, dissolved (mg/L)

✚ GW-N38  
■ GW-N46



# Sulfate, dissolved (mg/L)

+ GW-N38  
 ■ GW-N46



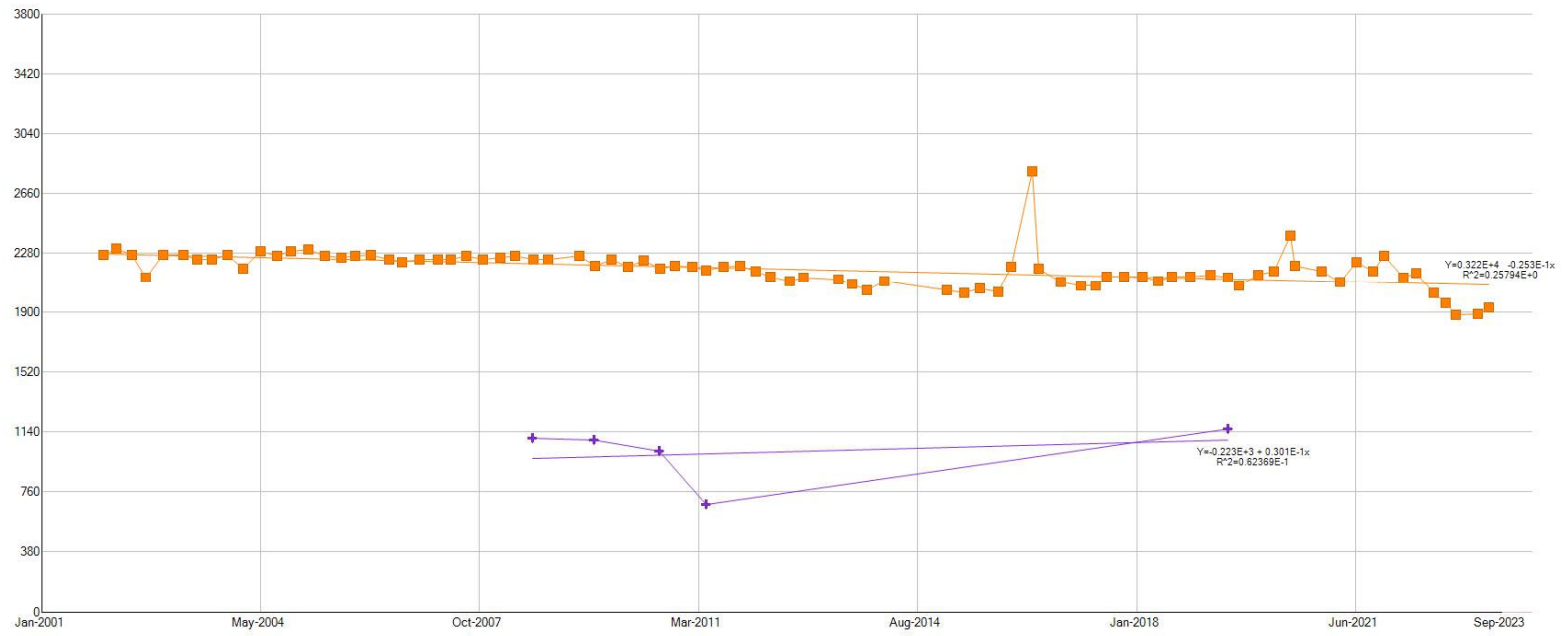
Analysis Result

Generated 11/2/2023 8:10 AM

Sample Date

Total Dissolved Solids (mg/L)

✚ GW-N38  
■ GW-N46



**Appendix 5**  
**Groundwater Elevations**

