



November 8, 2021

Mrs. Janet Binns
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 2021 Water Year (October 2020 – September 2021) 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.

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

2021 Annual Hydrology Report

Water Year October 1, 2020 to September 30, 2021

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 quarterly 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, 2020 through September 30, 2021.

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 currently 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 2021 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	8.3	0.2	1.4	8.5	7.1	2/18/11	11/13/18
Lab Cond. (umhos/cm)	942	598	2,613	2,910	297	9/26/12	6/5/19
TDS (mg/l)	716	559	2,509	2,690	181	9/26/12	8/24/07
Sulfate (mg/l)	319	292	1,653	1,700	48	9/26/12	6/5/19
Calcium (mg/l)	120	76	455	496	41	9/26/12	6/5/19
Iron (ug/l)	1,212	1,700	8,890	9,050	160	8/16/07	2/24/06
Magnesium (mg/l)	55	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	8.2	0.2	1.4	8.6	7.2	9/4/08	8/16/02
Lab Cond. (umhos/cm)	1,829	925	3,240	3,640	400	2/10/15	8/13/07
TDS (mg/l)	1,612	984	3,208	3,440	232	2/10/15	8/24/17
Sulfate (mg/l)	915	607	2,130	2,220	90	2/10/15	8/17/07
Calcium (mg/l)	254	139	549	558	9	8/31/02	5/24/21
Iron (tot rec ug/l)	1,089	1,666	10,470	10,600	130	8/16/07	5/17/08
Magnesium (mg/l)	114	74	246	259	13	2/10/15	11/21/07
Sodium (mg/l)	59	45	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. One sample result at SW-N3 had a minimum value recorded. Seasonal 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 some 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	7.6	0.5	2.7	8.5	5.8	2/19/14	5/15/06
Lab Cond. (umhos/cm)	1,407	465	1,480	1,940	460	11/20/07	6/9/20
TDS (mg/l)	1,006	346	1,040	1,400	360	12/7/20	6/9/20
Sulfate (mg/l)	418	109	406	572	166	11/16/16	6/9/20
Calcium (mg/l)	148	51	176	216	40	2/23/11	5/23/18
Iron (mg/l)	0.072	0.067	0.151	0.170	0.019	3/10/20	6/21/21
Manganese (mg/l)	0.12	0.08	0.37	0.40	0.032	8/29/08	5/20/15
Sodium (mg/l)	67	27	83	101	18	2/23/11	6/9/20
Magnesium (mg/l)	71	28	96	112	16	2/23/11	6/9/20

*Previous analysis was reported in ug/l total recoverable. During the water year this was changed to mg/l dissolved.

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)	491	71	266	612	346	5/13/06	7/26/18
TDS (mg/l)	314	35	167	393	226	5/25/06	7/25/17
Sulfate (mg/l)	191	31	123	270	147	5/23/06	7/26/18
Calcium (mg/l)	44	9	32	61	30	5/11/06	7/26/18
Iron (mg/l)*	0.030	0.000	0.000	0.030	0.030	6/21/21	6/21/21
Manganese (mg/l)	0.03	0.01	0.05	0.06	0.014	5/18/16	8/29/12
Sodium (mg/l)	17	2	8	22	14	5/31/17	5/20/15
Magnesium (mg/l)	18	4	16	27	11	5/11/06	7/26/18

*Previous analysis was reported in ug/l total recoverable. During the water year this was changed to mg/l dissolved.

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

*Previous analysis was reported in ug/l total recoverable. During the water year this was changed to mg/l dissolved.

A review of the water year for this series of wells indicates one maximum occurred at GW-N36 for TDS. GW-38 was dry all water year. 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)	3,134	1,606	11,386	12,300	914	6/6/17	12/7/20
TDS (mg/l)	2,953	1,797	12,380	13,800	1,420	6/6/17	8/3/17
Sulfate (mg/l)	1,860	1,309	8,798	9,510	712	6/6/17	8/9/18
Calcium (mg/l)	368	80	362	514	152	3/13/02	6/6/17
Iron (mg/l)*	0.008	0.002	0.004	0.011	0.007	3/23/21	12/7/20
Manganese (mg/l)	0.41	0.65	4.51	4.51	0.0006	2/27/18	6/23/21
Sodium (mg/l)	161	184	1,321	1,350	29	6/6/17	11/12/13
Magnesium (mg/l)	262	245	1,892	1,970	79	6/6/17	3/16/20

*Previous analysis was reported in ug/l total recoverable. During the water year this was changed to mg/l dissolved.

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)	7,224	3,360	12,840	14,700	1,860	5/20/15	6/6/17
TDS (mg/l)	7,406	5,049	17,140	18,600	1,460	11/14/12	6/6/17
Sulfate (mg/l)	4,463	3,819	13,030	13,400	370	8/17/15	12/28/01
Calcium (mg/l)	106	64	285	307	22	11/14/12	9/28/21
Iron (mg/l)*	0.196	0.336	0.676	0.700	0.024	12/10/20	6/23/21
Manganese (mg/l)	0.41	0.61	1.92	1.92	0.003	3/14/17	6/6/17
Sodium (mg/l)	1,053	256	1,479	1,520	41	11/14/12	6/6/17
Magnesium (mg/l)	828	833	2,734	2,800	66	11/14/12	3/13/02

*Previous analysis was reported in ug/l total recoverable. During the water year this was changed to mg/l dissolved.

GW-N46							
Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.5	0.2	2.1	8.8	6.7	2/25/08	6/1/03
Lab Cond. (umhos/cm)	3,158	224	1,340	3,580	2,240	2/17/06	12/10/20
TDS (mg/l)	2,176	101	550	2,540	1,990	7/19/05	11/12/13
Sulfate (mg/l)	744	63	264	860	596	1/9/02	2/18/14
Calcium (mg/l)	15	30	257	264	7	6/4/05	2/9/16
Iron (mg/l)*	0.020	0.007	0.014	0.028	0.014	9/28/21	3/23/21
Manganese (mg/l)	0.02	0.02	0.16	0.16	0.003	6/29/21	2/10/15
Sodium (mg/l)	748	45	216	833	617	3/9/05	2/9/16
Magnesium (mg/l)	9	3	24	30	6	6/4/05	2/9/16

*Previous analysis was reported in ug/l total recoverable. During the water year this was changed to mg/l dissolved.

A review of the water year for this series of wells down gradient to the mining and reclamation areas indicates one maximum value for manganese occurred at GW-N46, and several minimum sampling results occurred at GW-N44 for conductivity, manganese and magnesium, a minimum value for calcium at GW-N45, and a minimum value for laboratory conductivity occurred at GW-N46.

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 some the indicator parameters including calcium, conductivity, magnesium, manganese, sodium, sulfate and TDS. Iron and pH tend to historically trend higher at the up gradient location GW-N36. 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, G-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 much higher than the up gradient condition. All of the indicator parameters for GW-45 are trending upward; however, sampling results for the past six 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: 10/01/2020 to 09/30/2021

Site: SW-N1

	11/17/2020	2/24/2021	5/24/2021	8/11/2021
pH (field), pH	8.2	8.3	8.4	8.5
pH (lab), pH	8.3	8.3	8.4	8.4
Spec. Cond. (lab)	1010	1630	460	461
Spec Cond. (field)	1408	1527	442	945
TDS, mg/L	1170	1180	298	322
TSS, mg/L	5	14	29	59
Ca, diss, mg/L	180	196	62.2	71.8
Mg, diss, mg/L	91.4	117	13.6	13.4
NH3 as N, diss, mg/L	<0.05	<0.05	<0.05	<0.05
NO2 + NO3, diss, mg/L	<0.02	<0.02	<0.02	<0.02
Na, diss, mg/L	38.8	34	6.76	7.03
SO4, diss, mg/L	441	443	105	130
As, tot rec, ug/L	0.0006*	0.0005*	1.3	1.7
Fe, tot rec, ug/L	310	900	670	830
Hg, tot, mg/L	<0.002	<0.002	<0.002	<0.002
Mn, diss, mg/L	0.191	0.118	0.014	<0.01
Se, diss, mg/L	0.00014	0.00037	0.00041	0.00033
Zn, tot rec, ug/L	<0.02*	<0.02*	47	25
PO4, tot, mg/L	0.16	0.0341	0.32	0.041
Pb, tot rec, mg/L	<0.0001	0.00014	0.008	0.005
HCO3, mg/L	372	385	No results from lab**	No results from lab**
SAR, ratio	0.52	0.6	0.2	0.2
Cl, diss, mg/L	18.4	20.6	3.99	3.29
Al, tot rec, ug/L	148	78	731	119
Cd, tot rec, mg/L	<0.005	<0.005	0.238	0.185
Cu, diss, mg/L	0.0008	0.0008	0.0017	0.00094

*The laboratory calculated this as mg/l dissolved.

**Due to an error with the laboratory they did not analyzed for this constituent.

New Horizon Mine

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

Date Range: 10/01/2020 to 09/30/2021

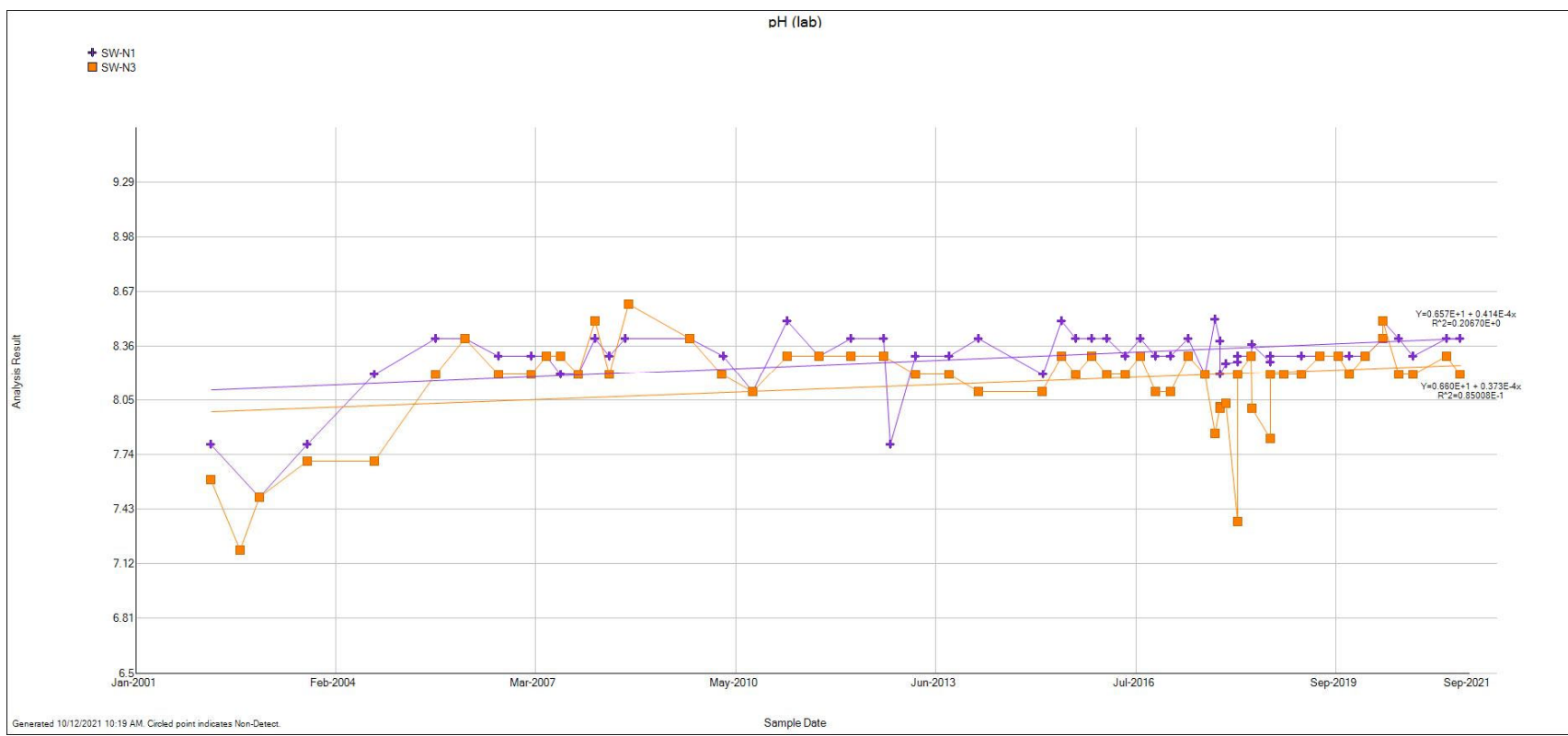
Site: SW-N3

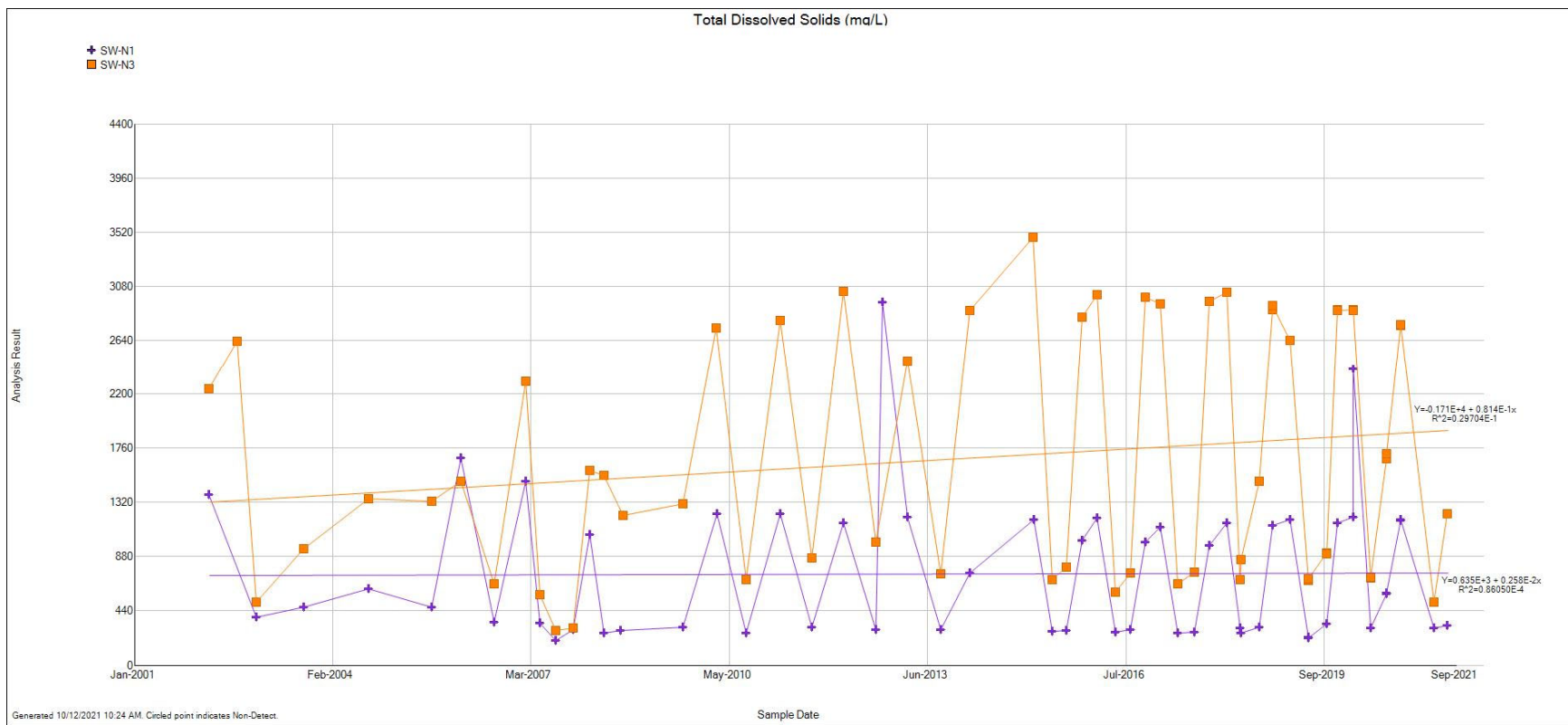
	11/17/2020	2/24/2021	5/24/2021	8/11/2021
pH (field), pH	8.1	7.9	8.3	7.9
pH (lab), pH	8.2	8.3	8.3	8.2
Spec. Cond. (lab)	1650	2800	723	1470
Spec Cond. (field)	2848	2780	680	1445
TDS, mg/L	2800	2790	510	1200
TSS, mg/L	7.0	<5	28	36
Ca, diss, mg/L	410	428	9.1	210
Mg, diss, mg/L	190	202	28	75
NH3 as N, diss, mg/L	1.03	0.45	0.13	0.35
NO2 + NO3, diss, mg/L	0.17	0.383	0.065	0.07
Na, diss, mg/L	88	87	14	40
SO4, diss, mg/L	1500	1480	220	720
As, tot rec, ug/L	0.0004*	0.0004*	1.1	1.4
Fe, tot rec, ug/L	250	280	680	740
Hg, tot, mg/L	<0.00010	<0.00010	<0.00010	<0.00010
Mn, diss, mg/L	0.69	0.755	0.084	0.061
Se, diss, mg/L	<0.00005	0.00033	0.00043	0.00027
Zn, tot rec, ug/L	<0.02*	<0.02*	25	13
PO4, tot, mg/L	0.1	<0.01	0.04	0.022
Pb, tot rec, mg/L	<0.001	0.0002	0.004	0.002
HCO3, mg/L	424	387	No results from lab**	No results from lab**
SAR, ratio	0.92	0.87	0.33	0.61
Cl, diss, mg/L	17.	18.6	6.5	12.
Al, tot rec, ug/L	<100	<100	840	750
Cd, tot rec, mg/L	0.001	0.00005	0.005	0.008
Cu, diss, mg/L	<0.0004	<0.0004	0.0011	<0.0004

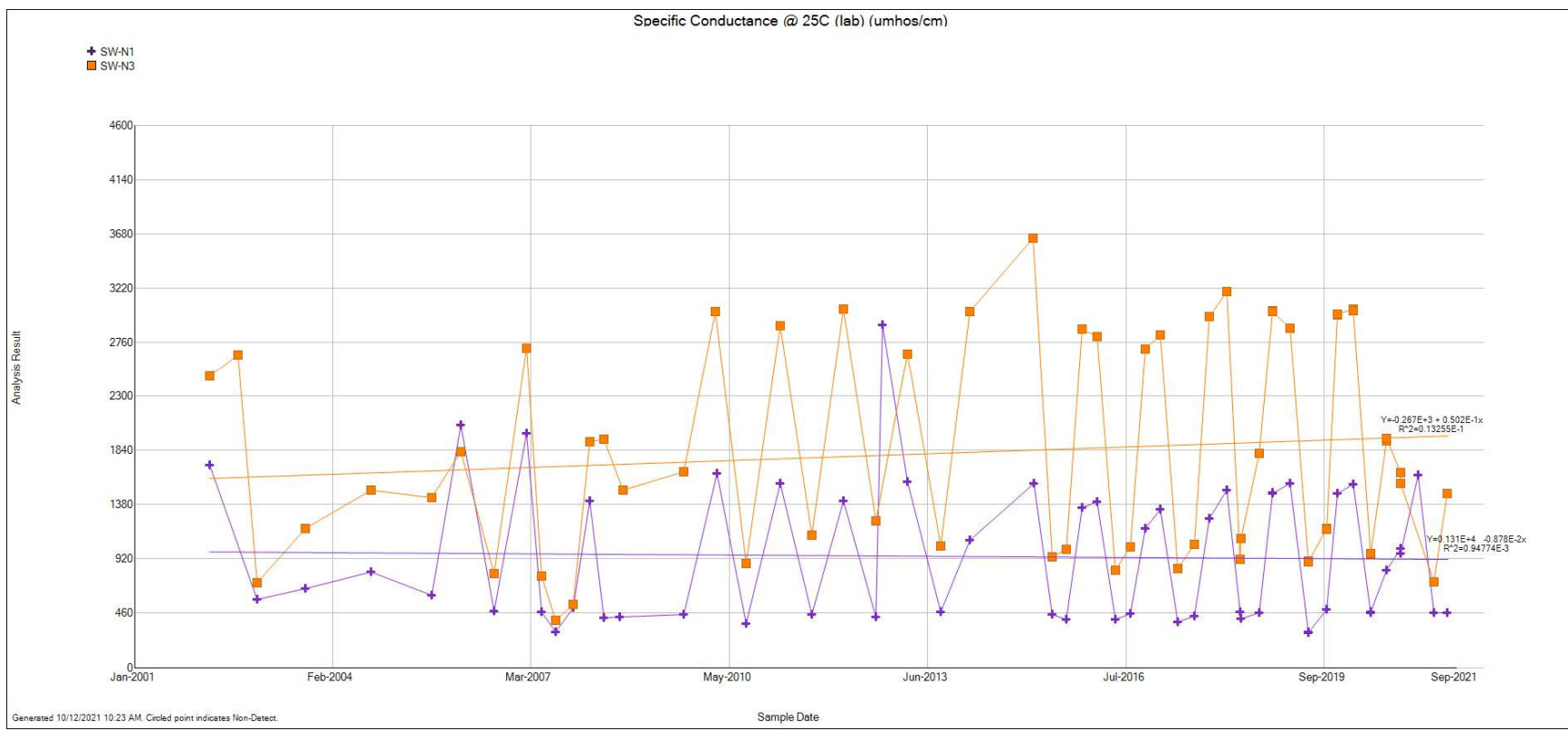
*The laboratory calculated this as mg/l dissolved.

**Due to an error with the laboratory they did not analyzed for this constituent.

Appendix 2
Surface Water Monitoring Graphs

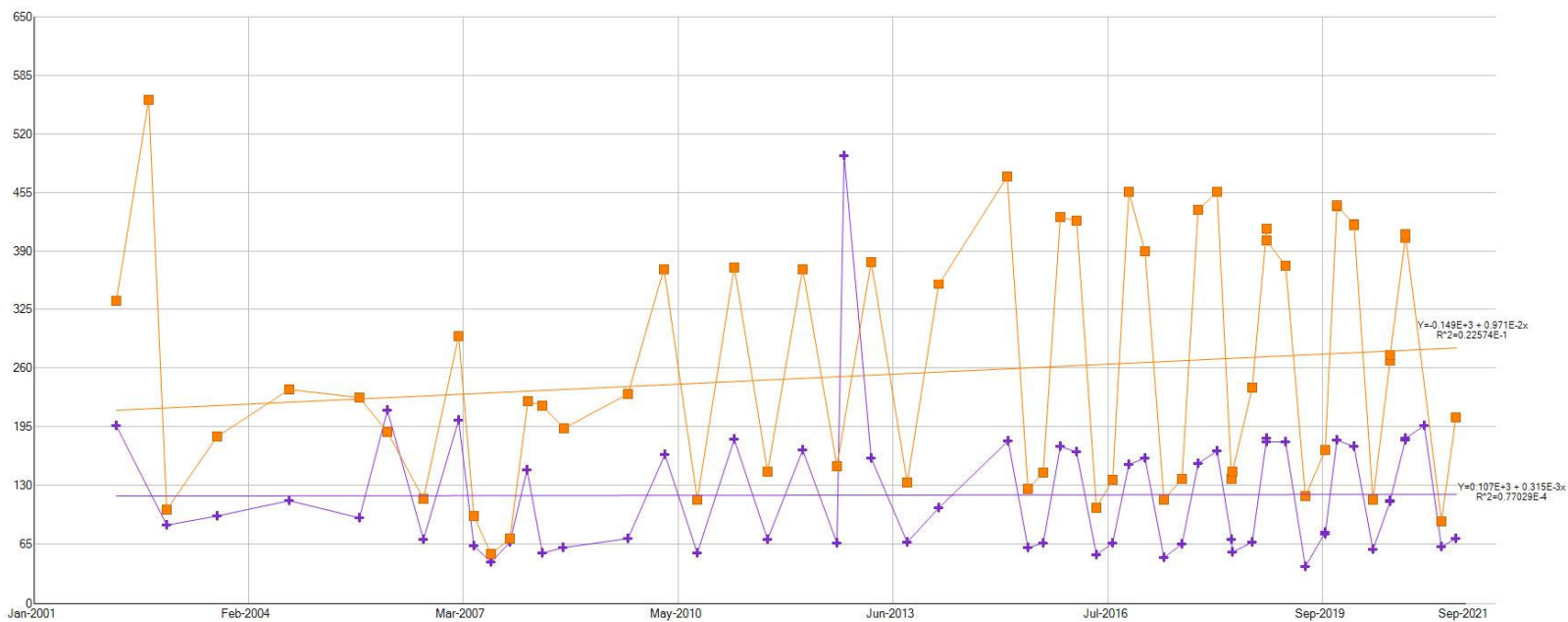






Calcium, dissolved (mg/L)

+ SW-N1
 ■ SW-N3

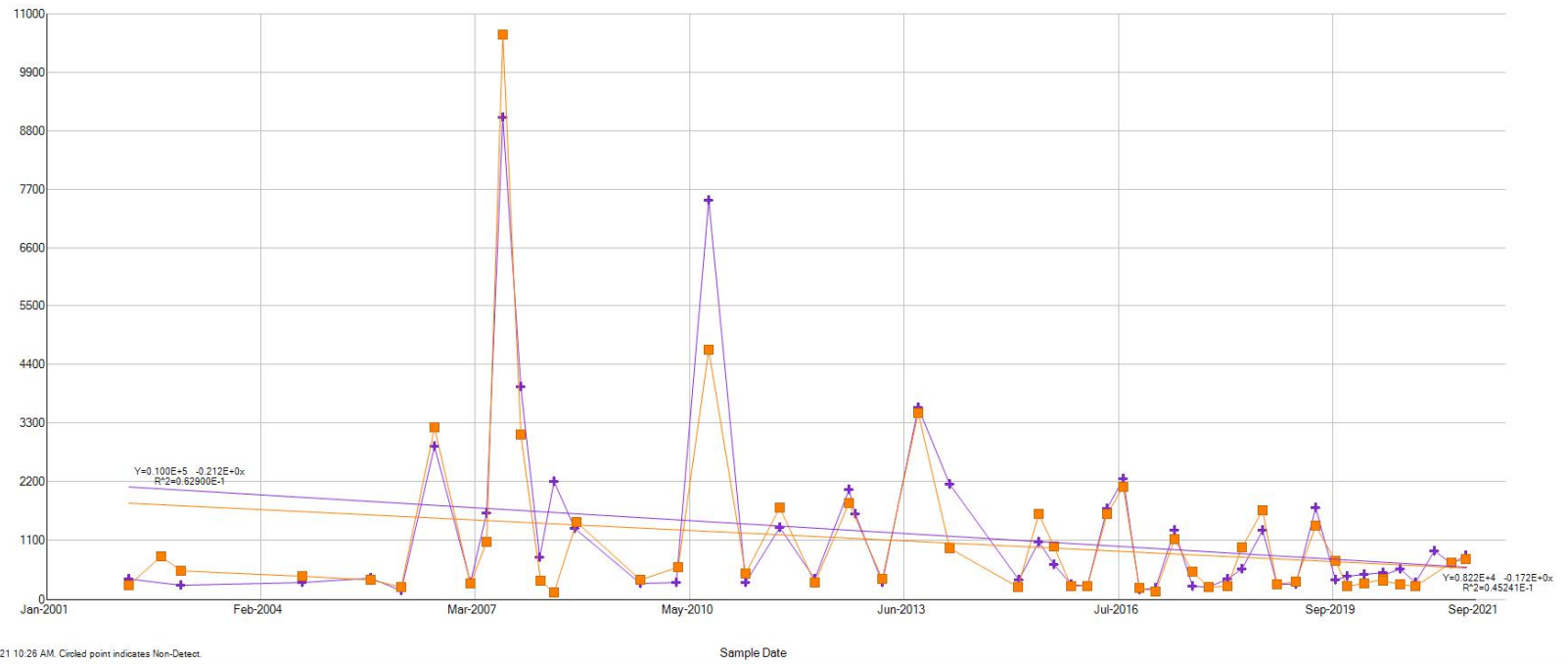


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Sample Date

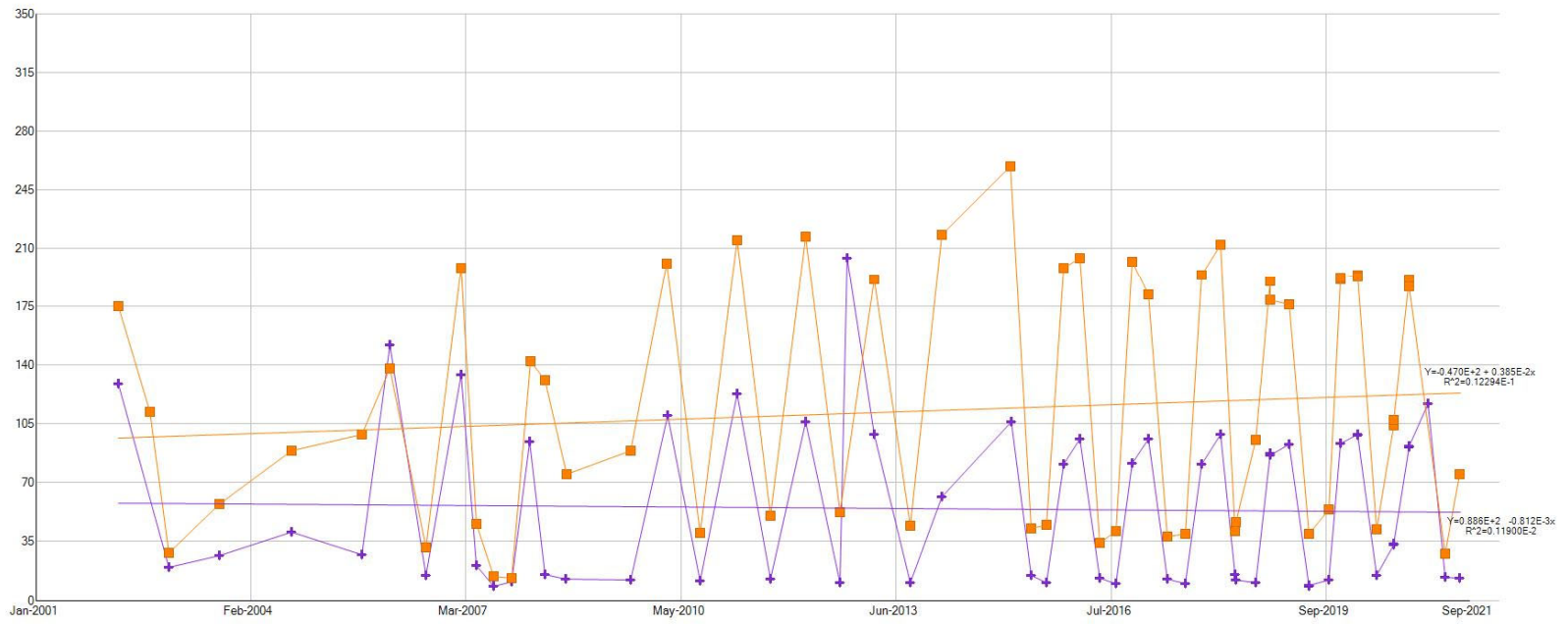
Iron, total recoverable (uq/L)

✦ SW-N1
■ SW-N3



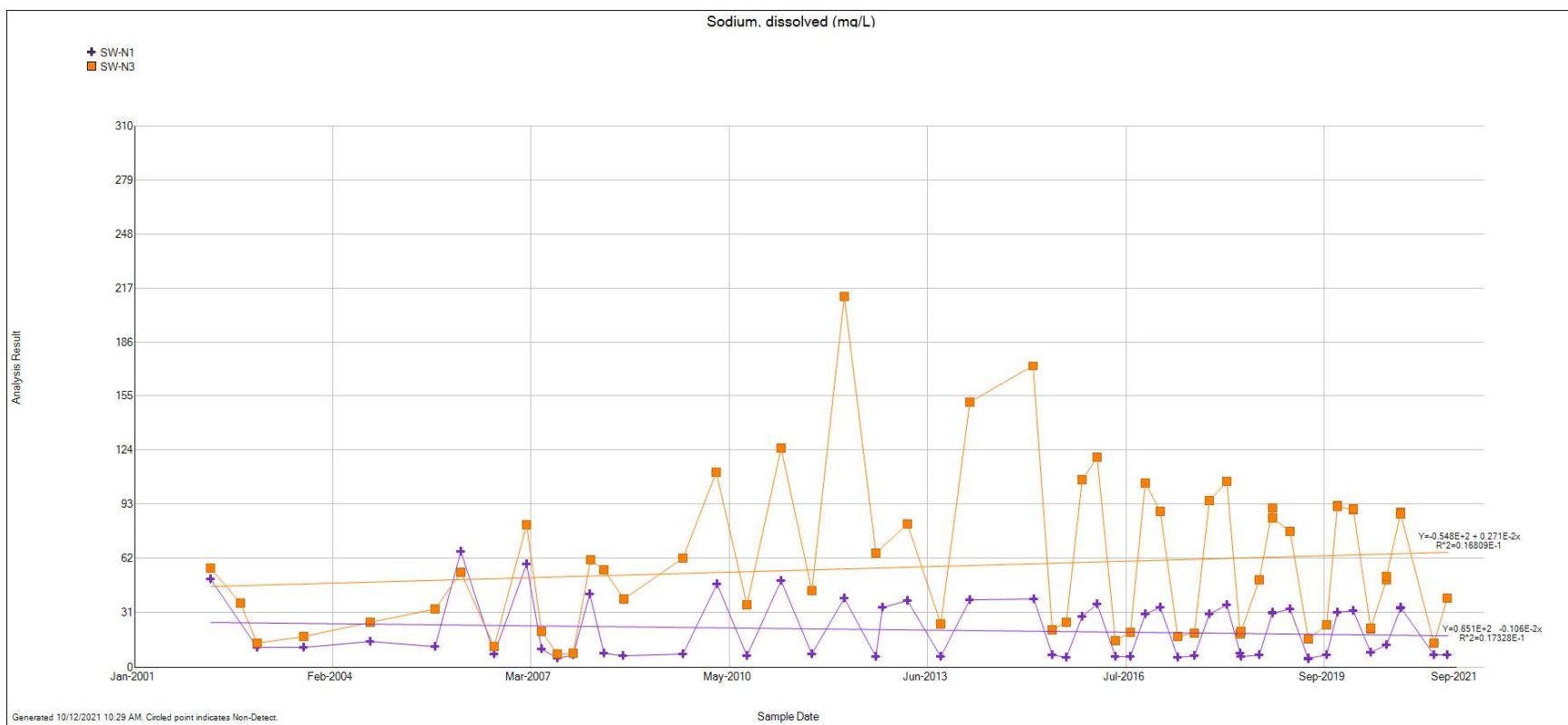
Magnesium, dissolved (mg/L)

+ SW-N1
 ■ SW-N3



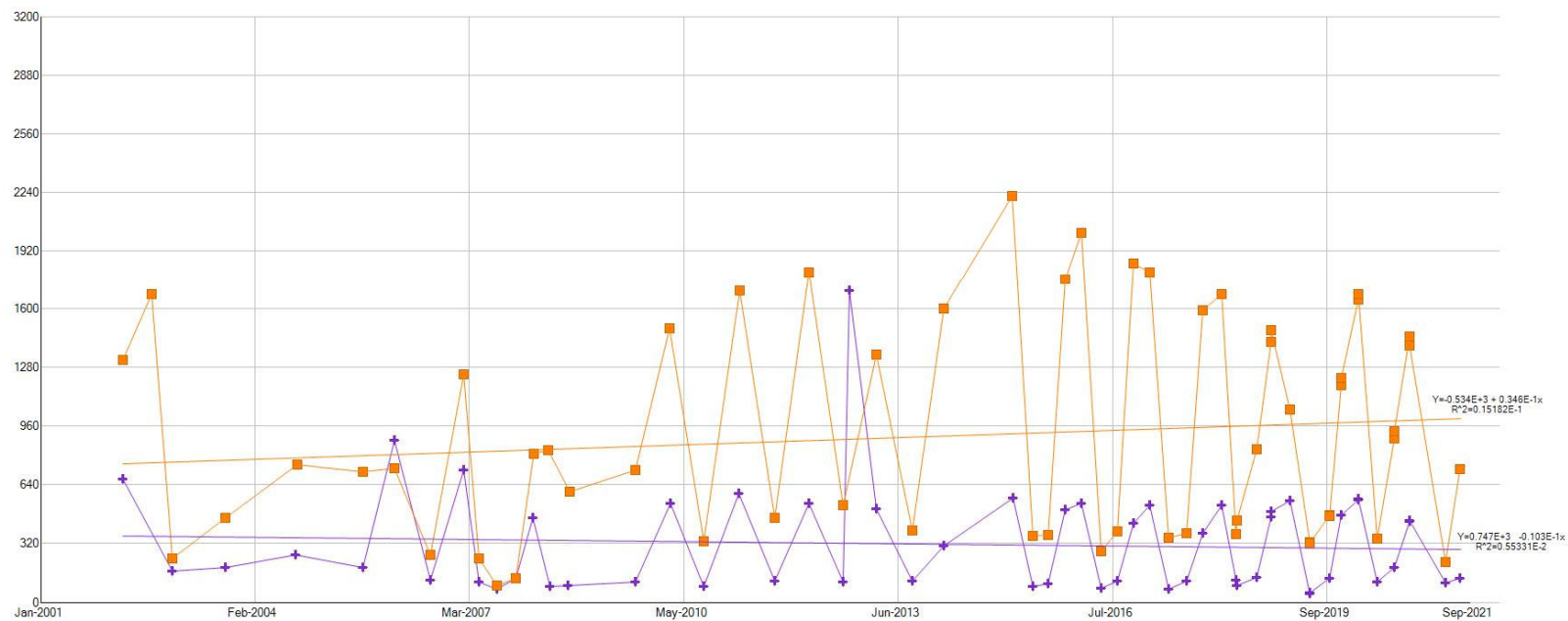
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Sample Date



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: 10/01/2020 to 09/30/2021

Well: GW-N36

	12/7/2020	3/10/2021	6/21/2021	9/15/2021
Al, diss, mg/L	<0.025	<0.025	0.13	0.41
Alkalinity, lab, mg/L	580	520	160	33
As, diss, mg/L	<0.0004*	<0.0004*	<0.00010	<0.00010
Ca, diss, mg/L	180	180	88	51
Cation-Anion Bal, %	-4.5	0.0	-7.8	1.9
Cl, diss, mg/L	28	26	21	9.8
CO3, mg/L	<0.1	<0.1	<0.1	<0.1
Fe, diss, mg/L	0.051	0.17	0.019	0.046
HCO3, mg/L	580	520	160	33
Hg, diss, mg/L	<0.00010	<0.00010	<0.00010	<0.00010
K, diss, mg/L	30	27	12	4.4
Mg, diss, mg/L	92	81	38	19
Mn, diss, mg/L	0.08	0.14	0.13	0.082
Mo, diss, mg/L	<0.010	<0.010	<0.010	<0.010
Na, diss, mg/L	87	80	37	21
NH3 as N, diss, mg/L	1.03	0.86	0.25	0.053
NO2, diss, mg/L	<0.0050	<0.0050	<0.0050	<0.0050
NO3, diss, mg/L	<0.010	0.07	0.46	0.44
Orthophosphate, diss, mg/l	0.018	<0.03	<0.03	0.034
Pb, diss, mg/L	0.0002	0.00021	0.00046	0.0003
pH (field), pH	7.1	7	6.7	6.3
pH (lab), pH	7.9	7.8	7.5	6.8
Se, diss, mg/L	0.0004	0.0002	0.00065	0.0013
SO4, diss, mg/L	500	430	330	200
Spec. Cond. (field), umhos/cm	1847	1674	913	498
Spec. Cond. (lab), umhos/cm	1230	1640	917	534
TDS, mg/L	1400	1200	620	410
Temp (Celcius), degrees C	14.3	12.2	21.5	15.9
Zinc, diss, mg/l	0.0485	0.0269	0.0854	0.0867

*Laboratory analysis were changed from total dissolved to dissolved during the water year.

This data represents total dissolved.

New Horizon Mine**Analysis Results by Date (column) and Parameter (row)****Date Range: 10/01/2020 to 09/30/2021****Well: GW-N37**

	12/7/2020	3/10/2021	6/21/2021	9/15/2021
Al, diss, mg/L	Dry	Dry	0.82	0.68
Alkalinity, lab, mg/L			<1.0	<1.0
As, diss, mg/L			<0.00010	<0.00010
Ca, diss, mg/L			40	36
Cation-Anion Bal, %			-2.4	1.4
Cl, diss, mg/L			15	8.7
CO3, mg/L			<1.0	<1.0
Fe, diss, mg/L			0.03	0.03
HCO3, mg/L			<1.0	<1.0
Hg, diss, mg/L			<0.0002	<0.0002
K, diss, mg/L			1.9	1.3
Mg, diss, mg/L			16	14
Mn, diss, mg/L			0.03	0.019
Mo, diss, mg/L			<0.010	<0.01
Na, diss, mg/L			15	15.7
NH3 as N, diss, mg/L			<0.025	<0.05
NO2, diss, mg/L			<0.0050	<0.01
NO3, diss, mg/L			0.49	0.614
Orthophosphate, diss, mg/l			<0.03	0.0527
Pb, diss, mg/L			0.00046	0.00092
pH (field), pH			4.7	4.6
pH (lab), pH			4.8	4.4
Se, diss, mg/L			0.0011	0.00167
SO4, diss, mg/L			180	156
Spec. Cond. (field), umhos/cm			496	439
Spec. Cond. (lab), umhos/cm			463	444
TDS, mg/L			270	348
Temp (Celcius), degrees C			15.6	17.5
Zinc, diss, mg/l			0.0854	0.0315

New Horizon Mine

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

Date Range: 10/01/2020 to 09/30/2021

Well: GW-N38

	12/7/2020	3/10/2021	6/21/2021	9/15/2021
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: 10/01/2020 to 09/30/2021

Well: GW-N44

	12/7/2020	3/23/2021	6/23/2021	9/28/2021
Al, diss, mg/L	<0.050	<0.0050	<0.0050	<0.0050
Alkalinity, lab, mg/L	400	370	370	380
As, diss, mg/L	<0.0004*	<0.00020	<0.00020	<0.00020
Ca, diss, mg/L	300	320	270	320
Cation-Anion Bal, %	-2.000	-1.900	-2.100	0.000
Cl, diss, mg/L	9.9	9.0	9.6	9.5
CO3, mg/L	<2.0	<2.0	<2.0	<2.0
Fe, diss, mg/L	<0.0070	0.011	<0.0070	<0.0070
HCO3, mg/L	400	370	370	380
Hg, diss, mg/L	<0.00020	<0.00020	<0.00020	<0.00020
K, diss, mg/L	2.0	1.9	1.9	2.0
Mg, diss, mg/L	100	100	94	110
Mn, diss, mg/L	0.00874	0.0019	0.00066	0.0023
Mo, diss, mg/L	<0.020	<0.020	<0.020	<0.020
Na, diss, mg/L	32	30	34	45
NH3 as N, diss, mg/L	<0.050	<0.050	<0.050	<0.050
NO2, diss, mg/L	<0.010	<0.010	<0.010	<0.010
NO3, diss, mg/L	0.12	0.13	0.19	0.14
Orthophosphate, diss, mg/l	<0.03	<0.030	<0.030	<0.030
Pb, diss, mg/L	<0.0002*	<0.00010	<0.00010	<0.00010
pH (field), pH	7.7	7.4	7.1	7.4
pH (lab), pH	8.1	8.1	8.0	8.2
Se, diss, mg/L	0.0044	0.0048	0.0038	0.0029
SO4, diss, mg/L	850	940	750	900
Spec. Cond. (field), umhos/cm	2038	2022	1847	2191
Spec. Cond. (lab), umhos/cm	914	1890	1870	2130
TDS, mg/L	1700	1700	1600	1700
Temp (Celcius), degrees C	8.2	8.6	10.6	10.9
Zinc, diss, mg/l	<0.012*	<0.0060	<0.0060	<0.0060

*Laboratory analysis were changed from total dissolved to dissolved during the water year.

This data represents total dissolved.

New Horizon Mine
Analysis Results by Date (column) and Parameter (row)

Date Range: 10/01/2020 to 09/30/2021

Well: GW-N45

	12/10/2020	3/23/2021	6/23/2021	9/28/2021
Al, diss, mg/L	<0.25	<0.025	<0.010	<0.010
Alkalinity, lab, mg/L	1200	1200	1200	1300
As, diss, mg/L	0.00107*	<0.0010	0.0018	0.0016
Ca, diss, mg/L	34	41	31	22
Cation-Anion Bal, %	-2.300	-3.900	-3.200	-6.800
Cl, diss, mg/L	65	51	57	69
CO3, mg/L	94	100	49	140
Fe, diss, mg/L	<0.70	<0.035	0.024	0.026
HCO3, mg/L	1100	1100	1200	1100
Hg, diss, mg/L	<0.00020	<0.00020	<0.00020	<0.00020
K, diss, mg/L	8.3	9.1	8.4	7.0
Mg, diss, mg/L	330	390	290	190
Mn, diss, mg/L	0.26	0.26	0.20	0.16
Mo, diss, mg/L	<0.10	<0.040	<0.040	<0.040
Na, diss, mg/L	820	880	790	710
NH3 as N, diss, mg/L	1.4	1.3	1.3	1.1
NO2, diss, mg/L	<0.010	<0.010	<0.010	<0.010
NO3, diss, mg/L	<0.020	<0.020	<0.020	<0.020
Orthophosphate, diss, mg/l	0.15	0.13	0.13	0.16
Pb, diss, mg/L	<0.00050	<0.00050	<0.00020	<0.00020
pH (field), pH	8.2	8.1	7.9	8.1
pH (lab), pH	8.5	8.5	8.4	8.7
Se, diss, mg/L	<0.0005*	0.27	<0.00020	0.070
SO4, diss, mg/L	2000	2600	1800	1400
Spec. Cond. (field), umhos/cm	5148	5511	3094	3205
Spec. Cond. (lab), umhos/cm	2310	5100	5000	4520
TDS, mg/L	4100	4600	3900	3100
Temp (Celcius), degrees C	10.8	10.9	12.4	11.6
Zinc, diss, mg/l	<0.030	<0.030	<0.012	<0.012

*Laboratory analysis were changed from total dissolved to dissolved during the water year.

This data represents total dissolved.

New Horizon Mine

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

Date Range: 10/01/2020 to 09/30/2021

Well: GW-N46

	12/10/2020	3/23/2021	6/29/2021	9/28/2021
Al, diss, mg/L	<0.10	<0.010	<0.010	0.024
Alkalinity, lab, mg/L	960	950	950	960
As, diss, mg/L	0.005*	0.0029	0.0029	0.0034
Ca, diss, mg/L	13	12	13	10
Cation-Anion Bal, %	-2.900	-1.500	-1.400	-4.600
Cl, diss, mg/L	46	41	45	45
CO3, mg/L	64	79	42	86
Fe, diss, mg/L	0.023	<0.014	<0.014	0.028
HCO3, mg/L	900	870	910	870
Hg, diss, mg/L	<0.00020	<0.00020	<0.00020	<0.00020
K, diss, mg/L	9.2	8.9	9.5	8.4
Mg, diss, mg/L	8.3	8.6	9.0	6.9
Mn, diss, mg/L	0.051*	0.039	0.16	0.0037
Mo, diss, mg/L	<0.040	<0.040	<0.040	<0.040
Na, diss, mg/L	720	710	750	670
NH3 as N, diss, mg/L	0.10	0.88	1.1	0.82
NO2, diss, mg/L	0.082	0.13	0.076	0.083
NO3, diss, mg/L	0.25	0.10	0.24	0.42
Orthophosphate, diss, mg/l	0.39	0.30	0.54	0.27
Pb, diss, mg/L	0.00036*	0.00025	<0.00020	0.00024
pH (field), pH	8.1	8.3	7.9	8.1
pH (lab), pH	8.6	8.6	8.4	8.7
Se, diss, mg/L	0.0025*	0.0016	0.0012	0.0017
SO4, diss, mg/L	700	670	770	650
Spec. Cond. (field), umhos/cm	3274	3123	3094	3205
Spec. Cond. (lab), umhos/cm	2240	3010	3220	3460
TDS, mg/L	2200	2100	2200	2200
Temp (Celcius), degrees C	10.4	11.5	13.2	12
Zinc, diss, mg/l	0.0891*	<0.012	<0.012	<0.012

*Laboratory analysis were changed from total dissolved to dissolved during the water year.

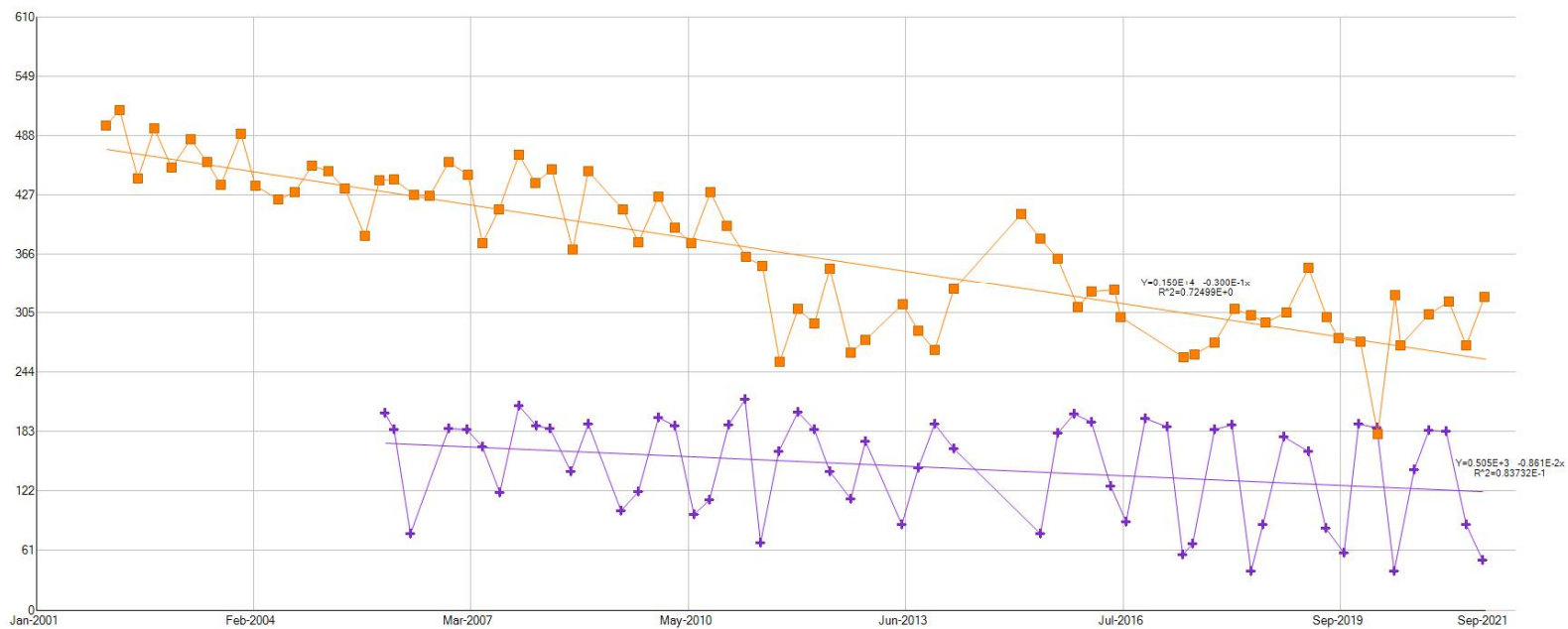
This data represents total dissolved.

Appendix 4
Groundwater Monitoring Graphs

Calcium, dissolved (mg/L)

+ GW-N36
 ■ GW-N44

Analysis Result



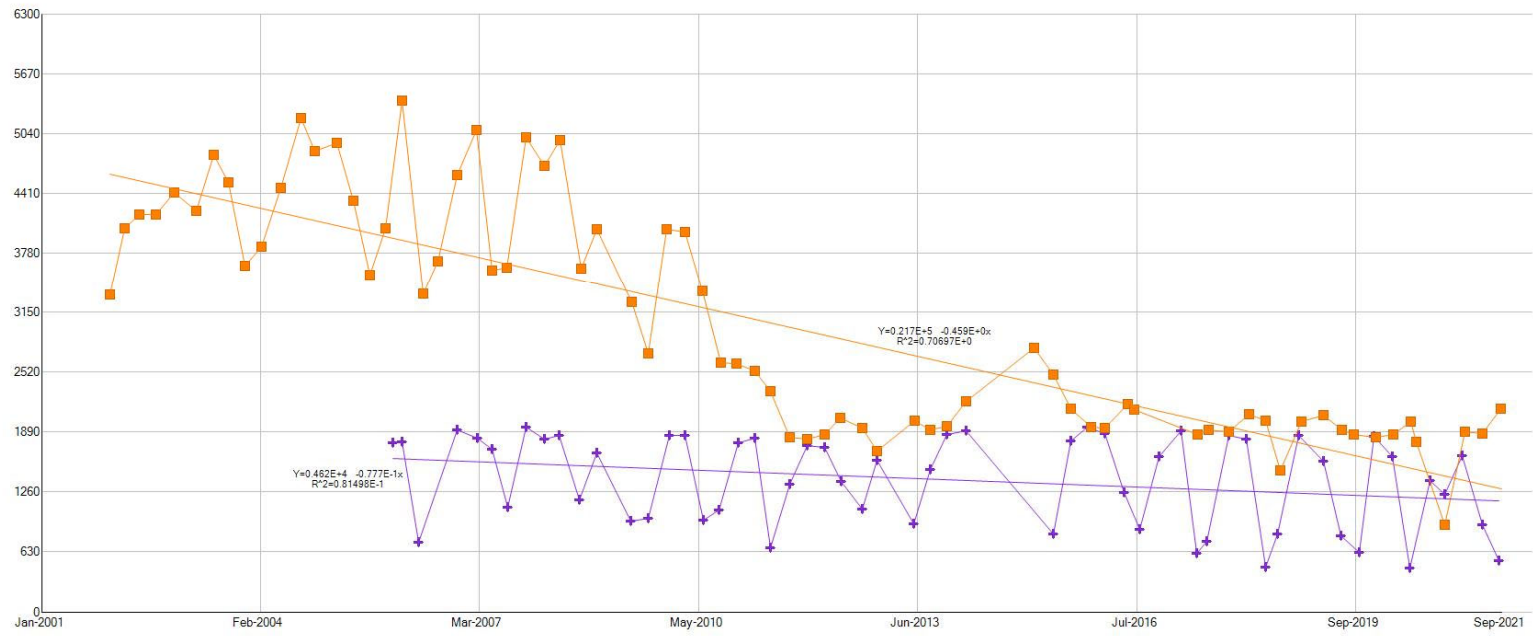
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Sample Date

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

✦ GW-N36
■ GW-N44

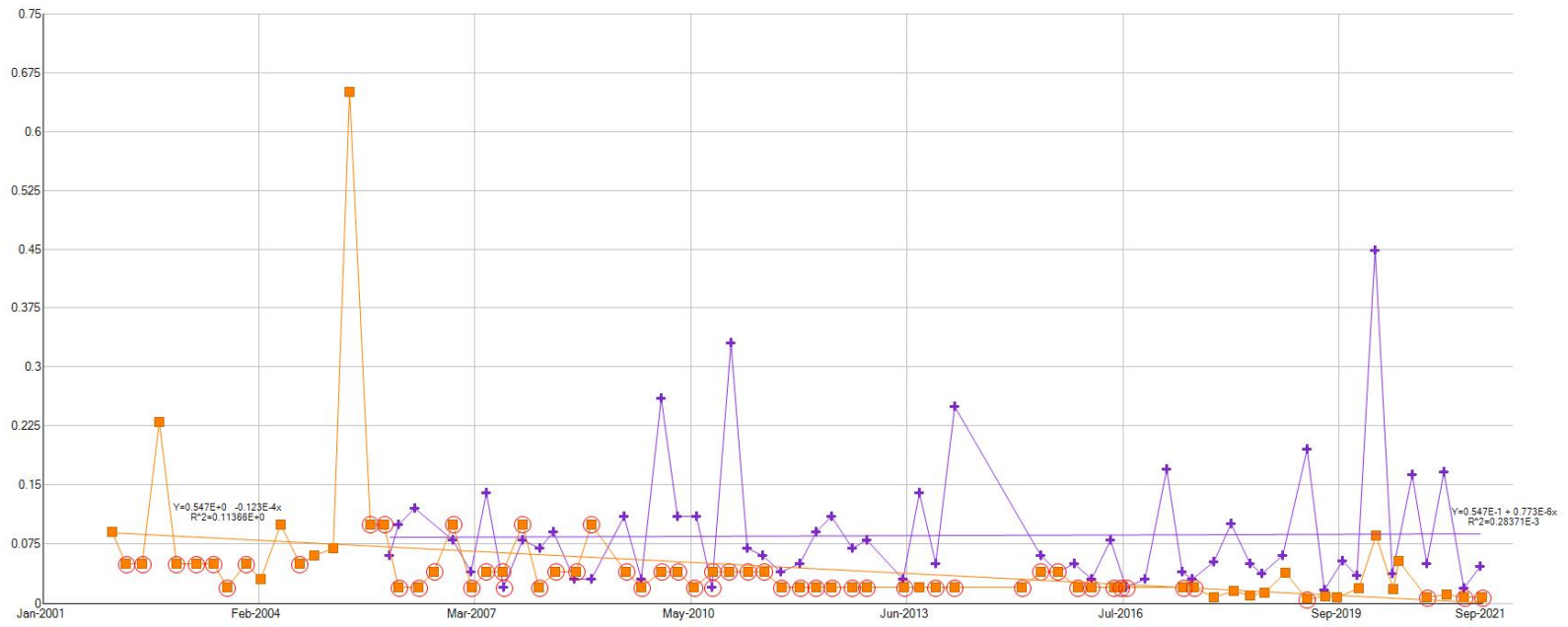
Analysis Result



Sample Date

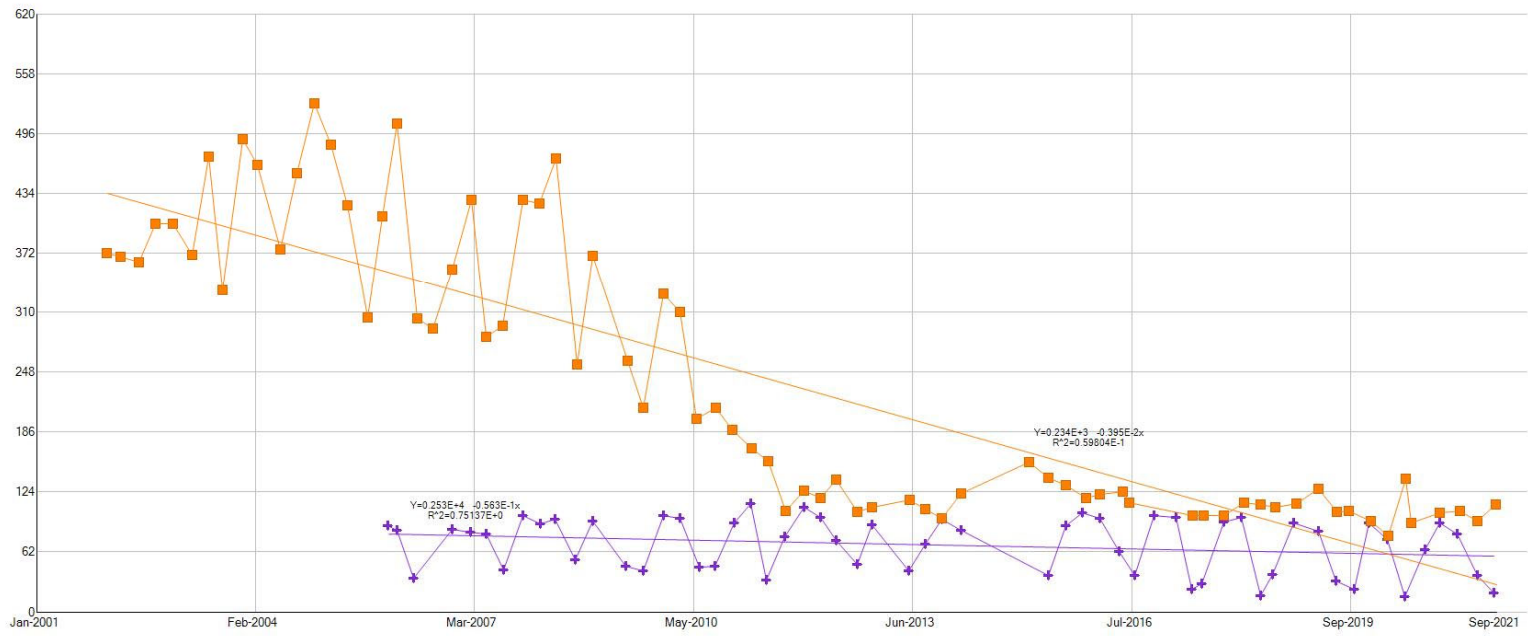
Iron, dissolved (mg/L)

✦ GW-N36
■ GW-N44



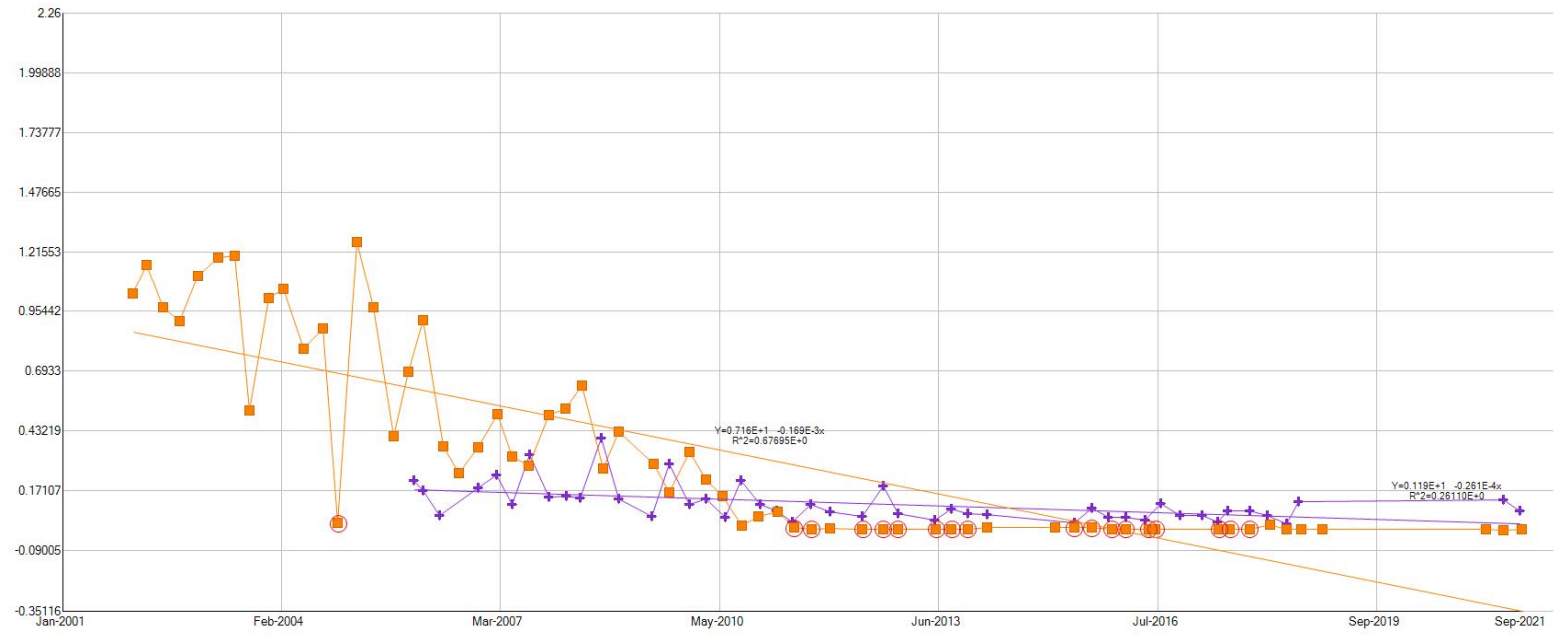
Magnesium, dissolved (mg/L)

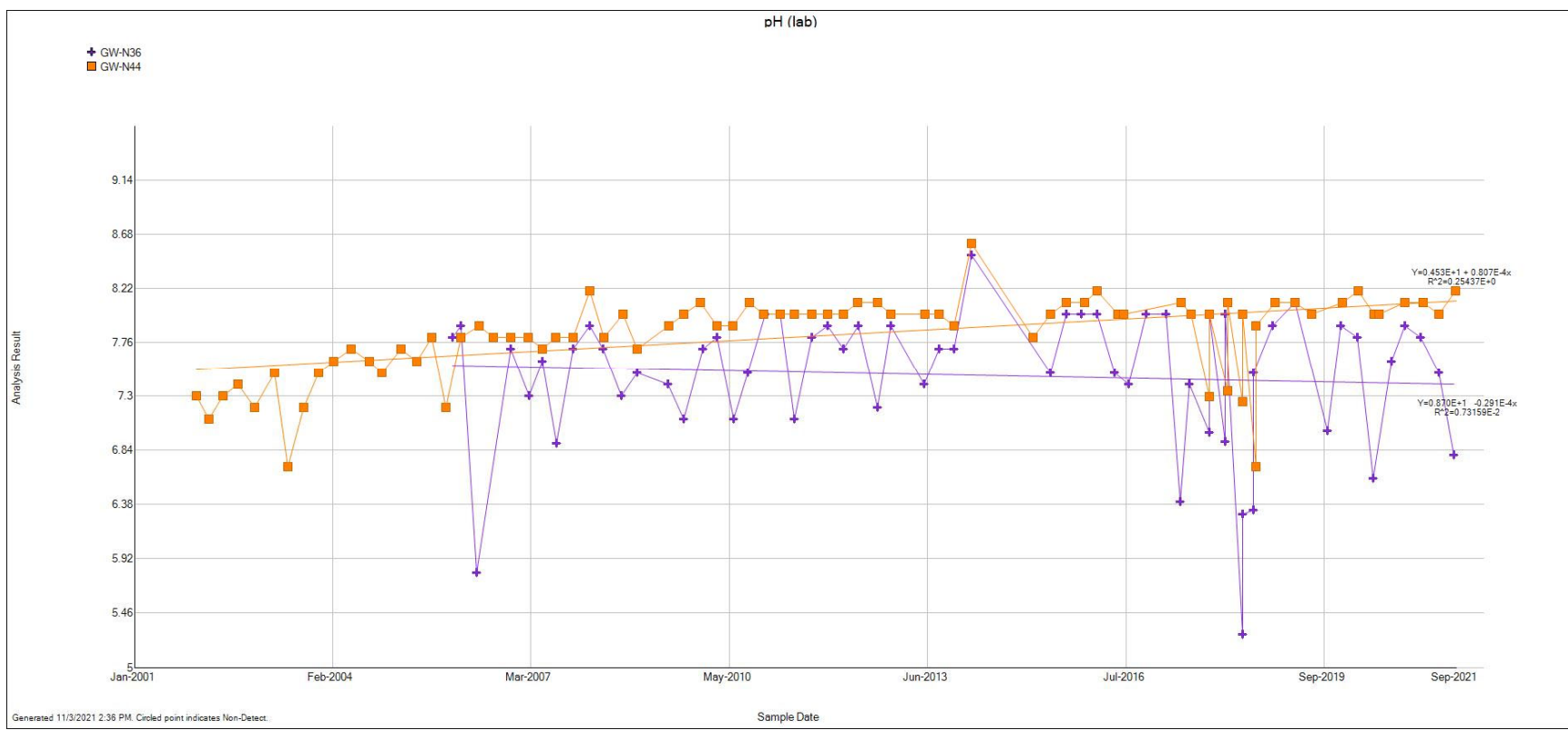
✦ GW-N36
■ GW-N44

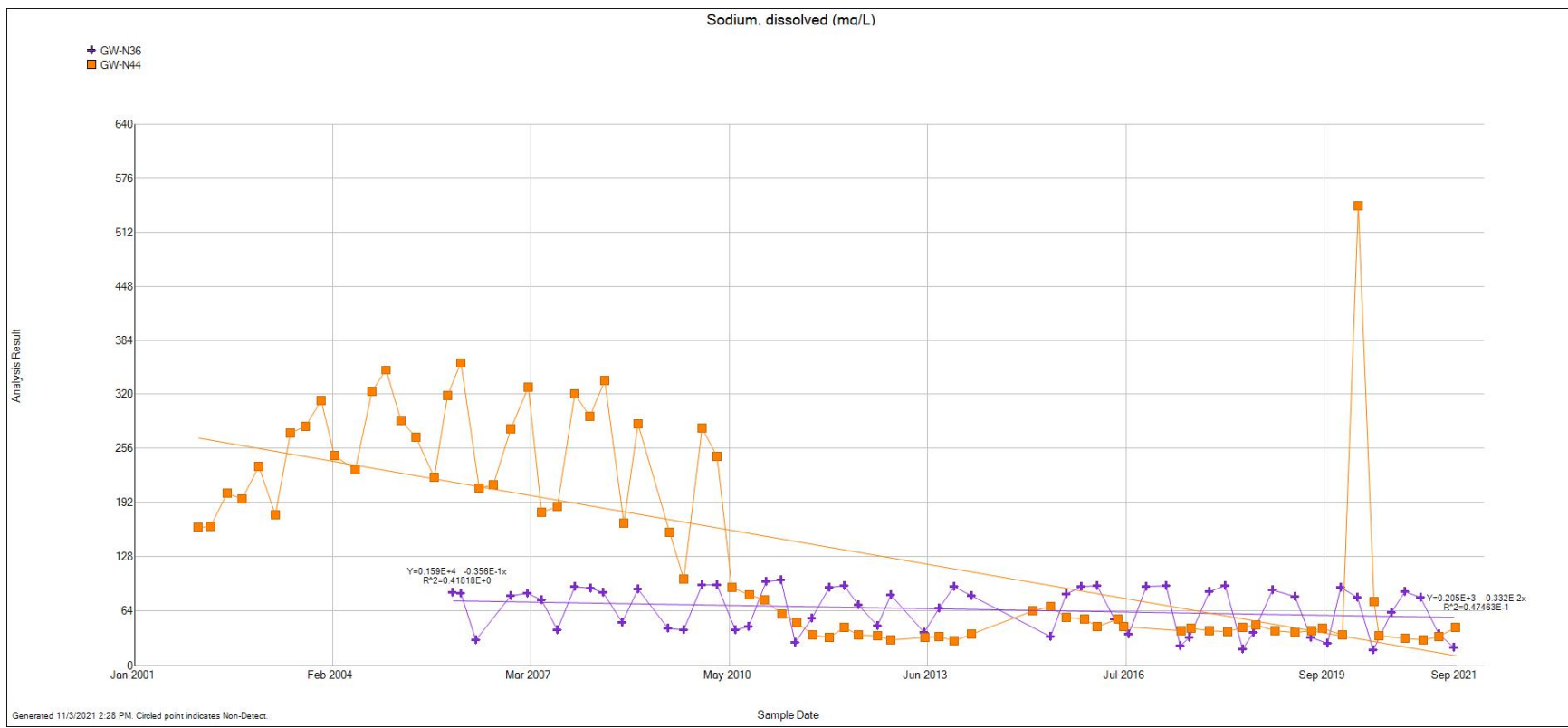


Manganese, dissolved (mg/L)

+ GW-N36
 ■ GW-N44

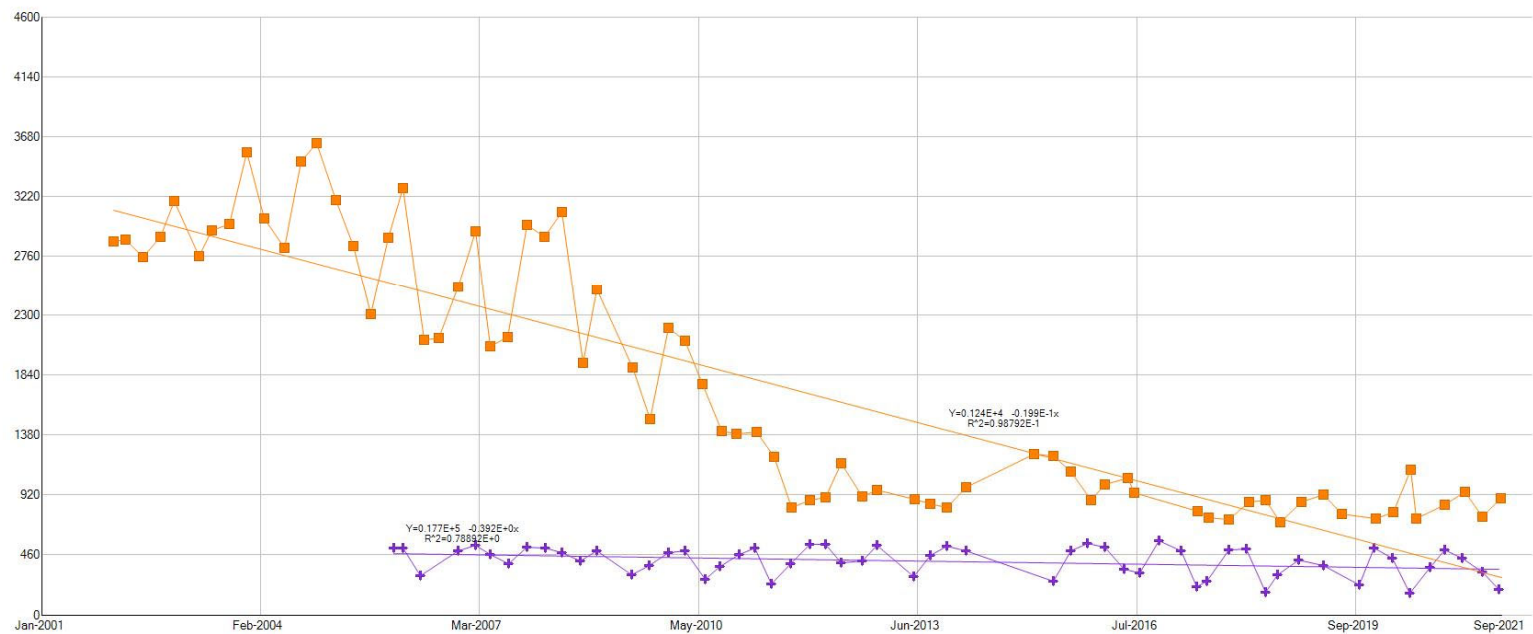






Sulfate, dissolved (mg/L)

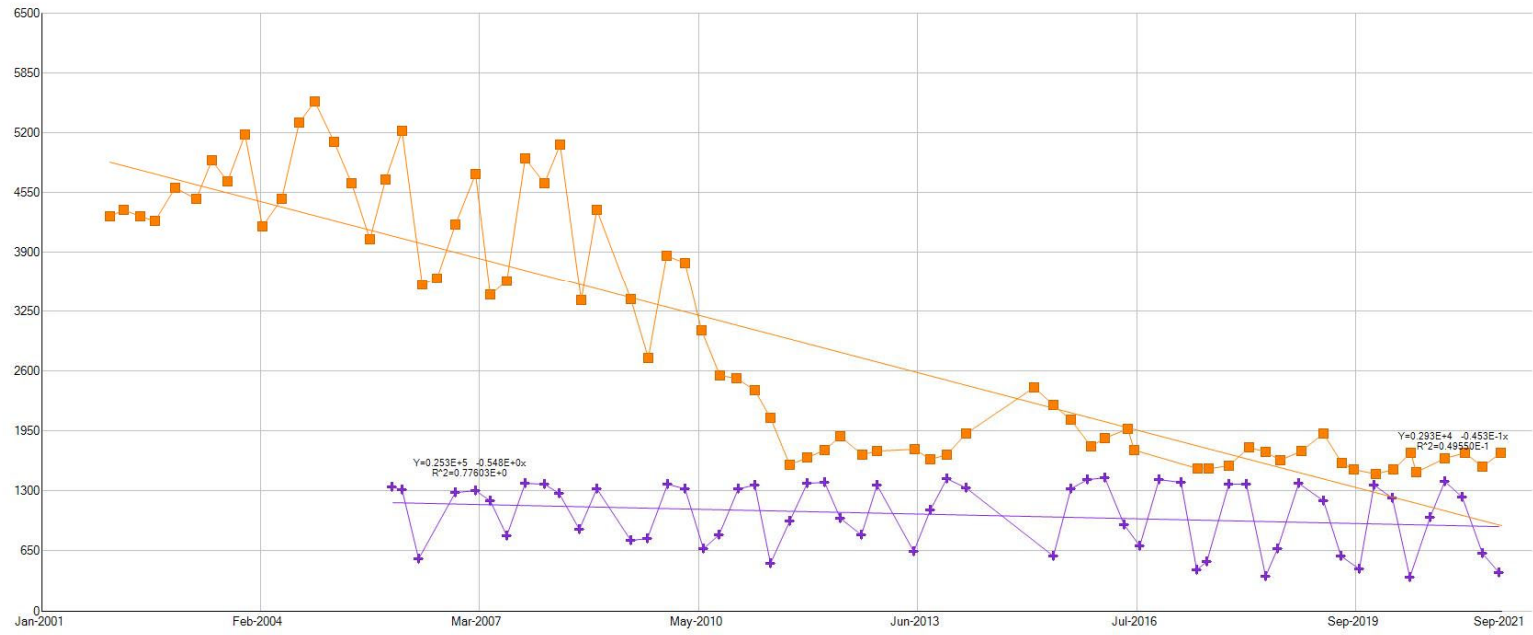
+ GW-N36
 ■ GW-N44



Total Dissolved Solids (mg/L)

+ GW-N36
 ■ GW-N44

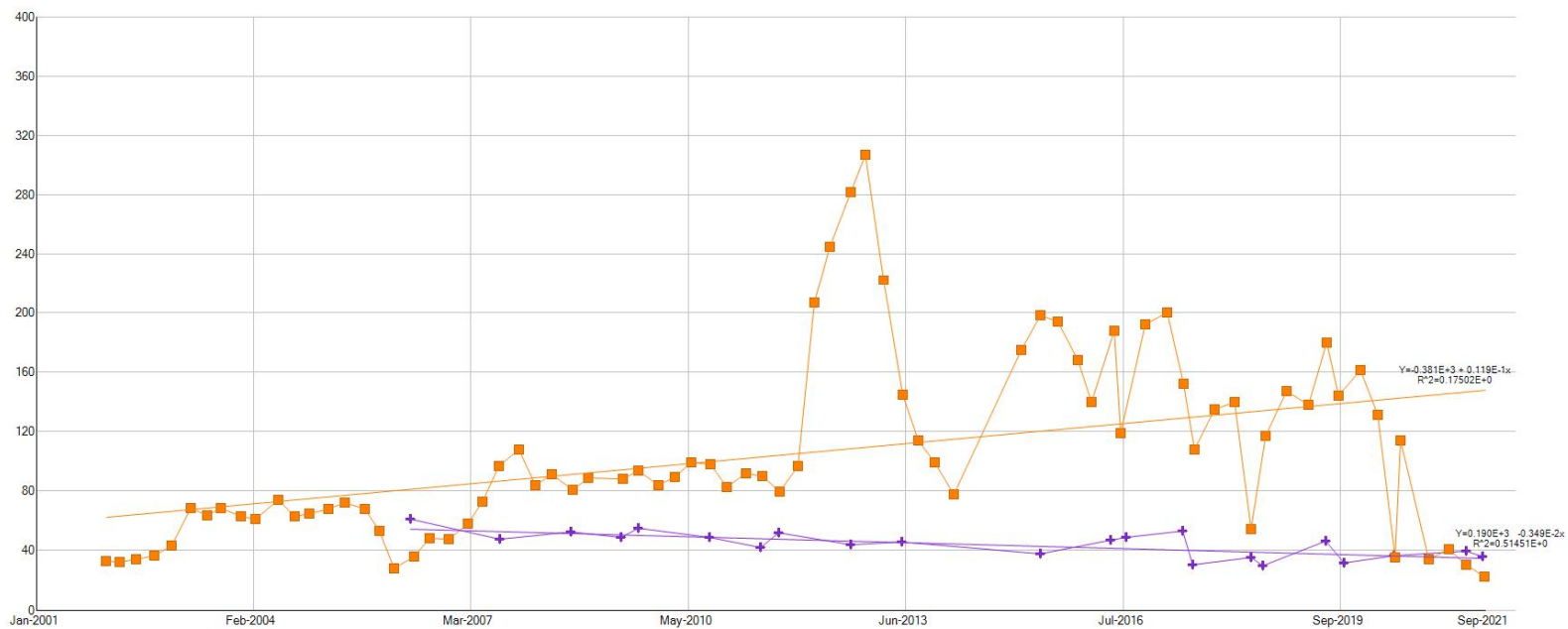
Analysis Result



Sample Date

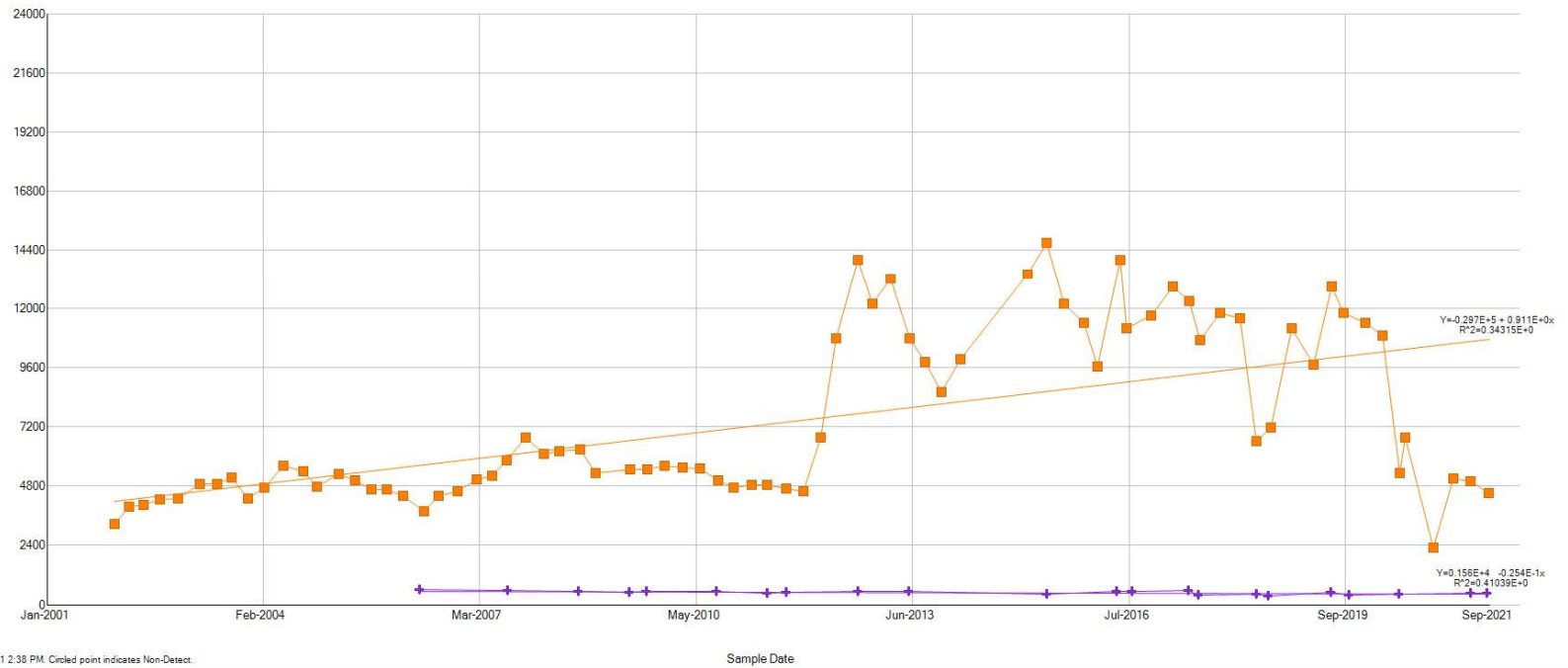
Calcium, dissolved (mg/L)

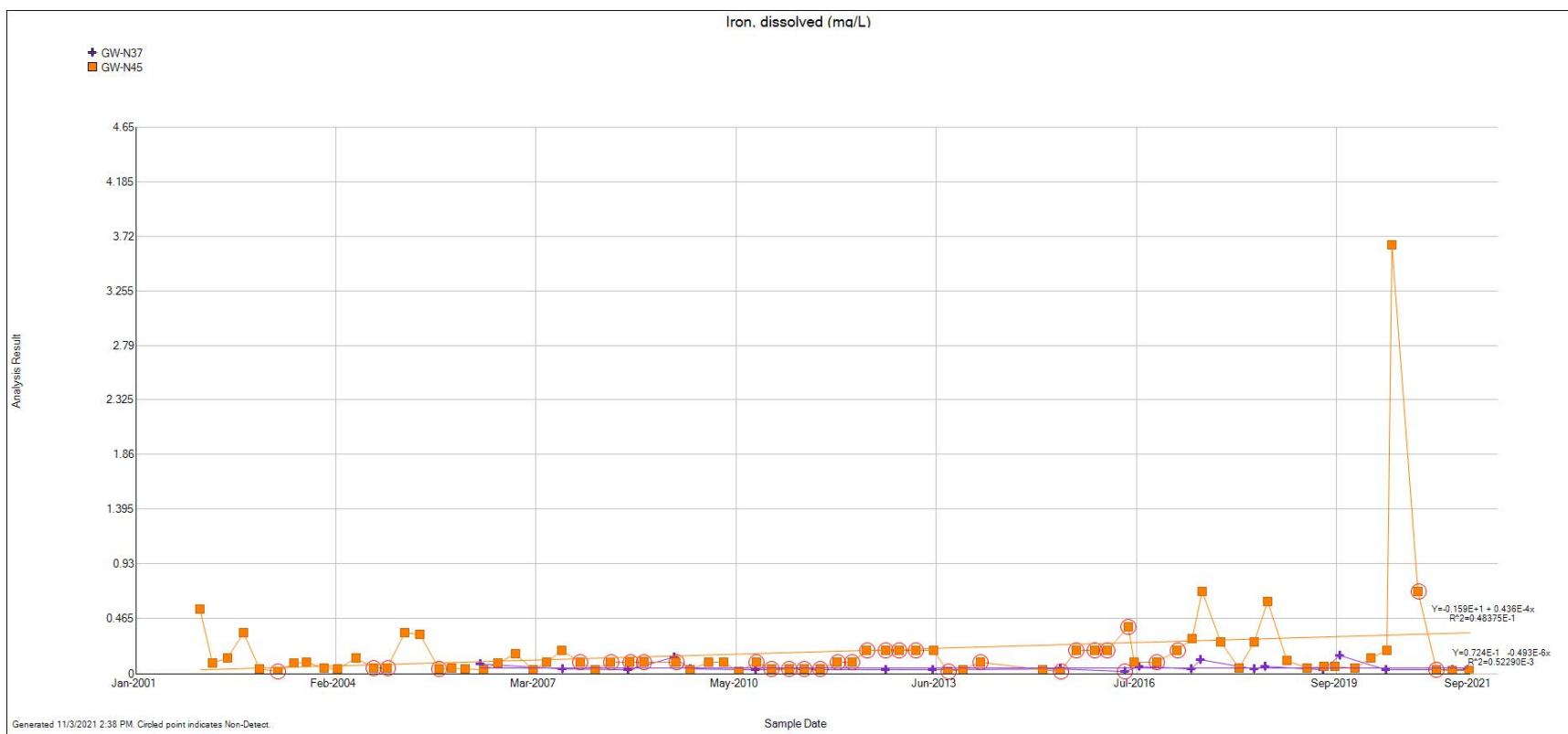
+ GW-N37
 ■ GW-N45



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

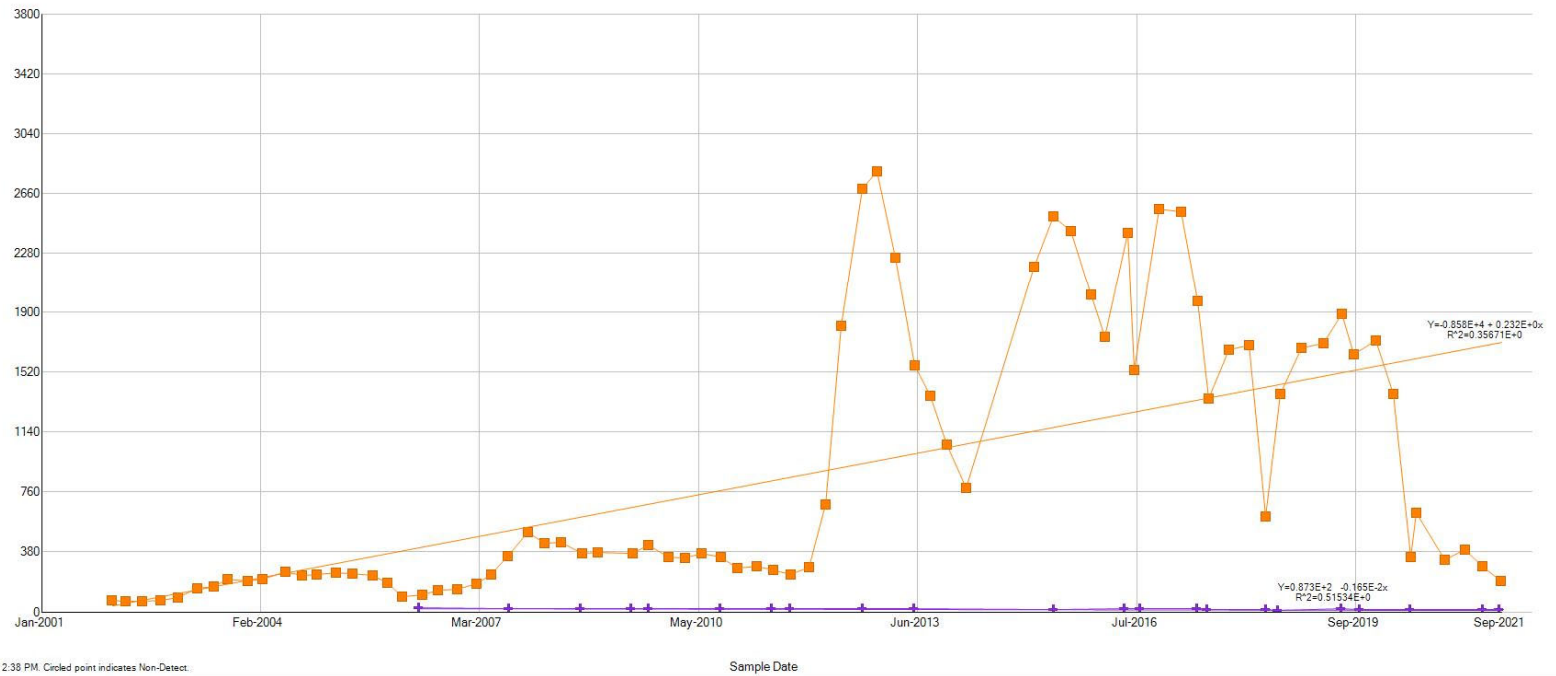
✚ GW-N37
■ GW-N45





Magnesium, dissolved (mg/L)

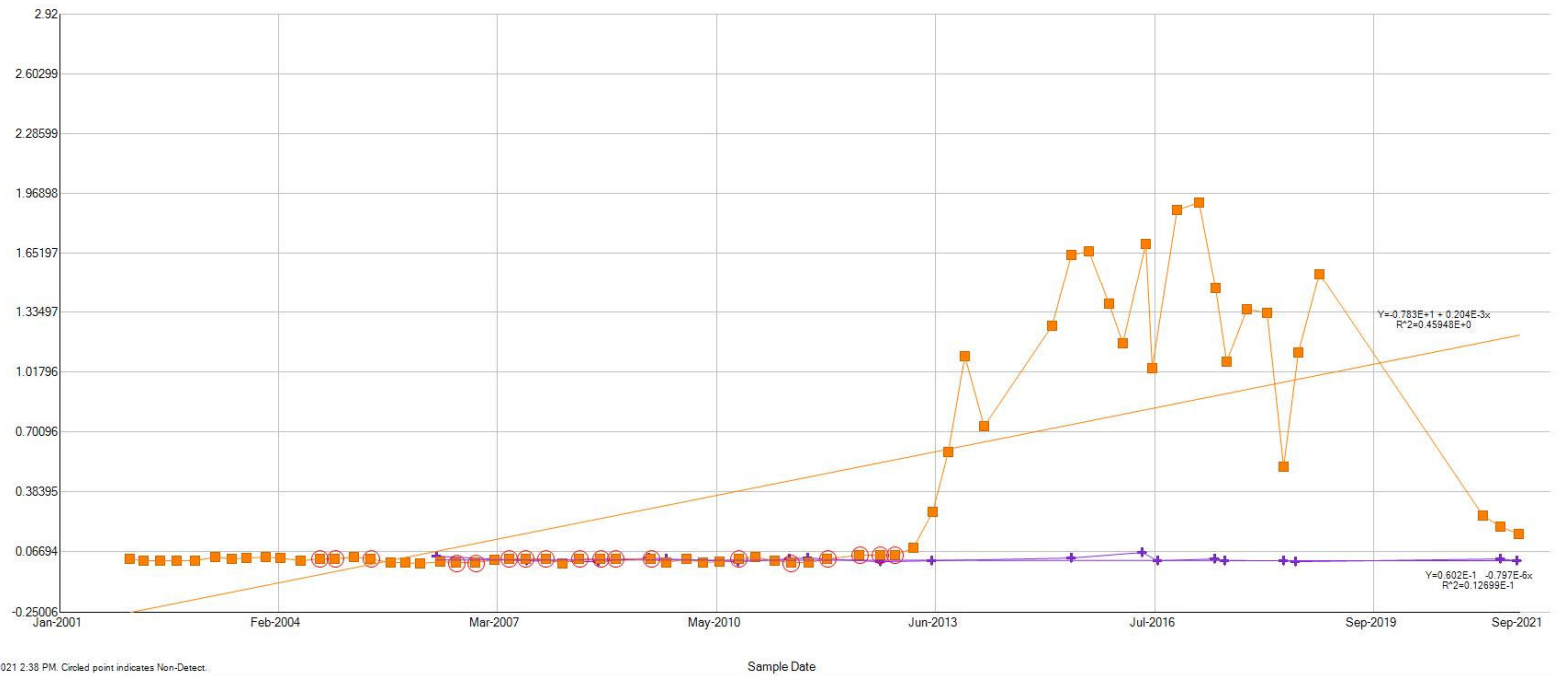
✚ GW-N37
■ GW-N45

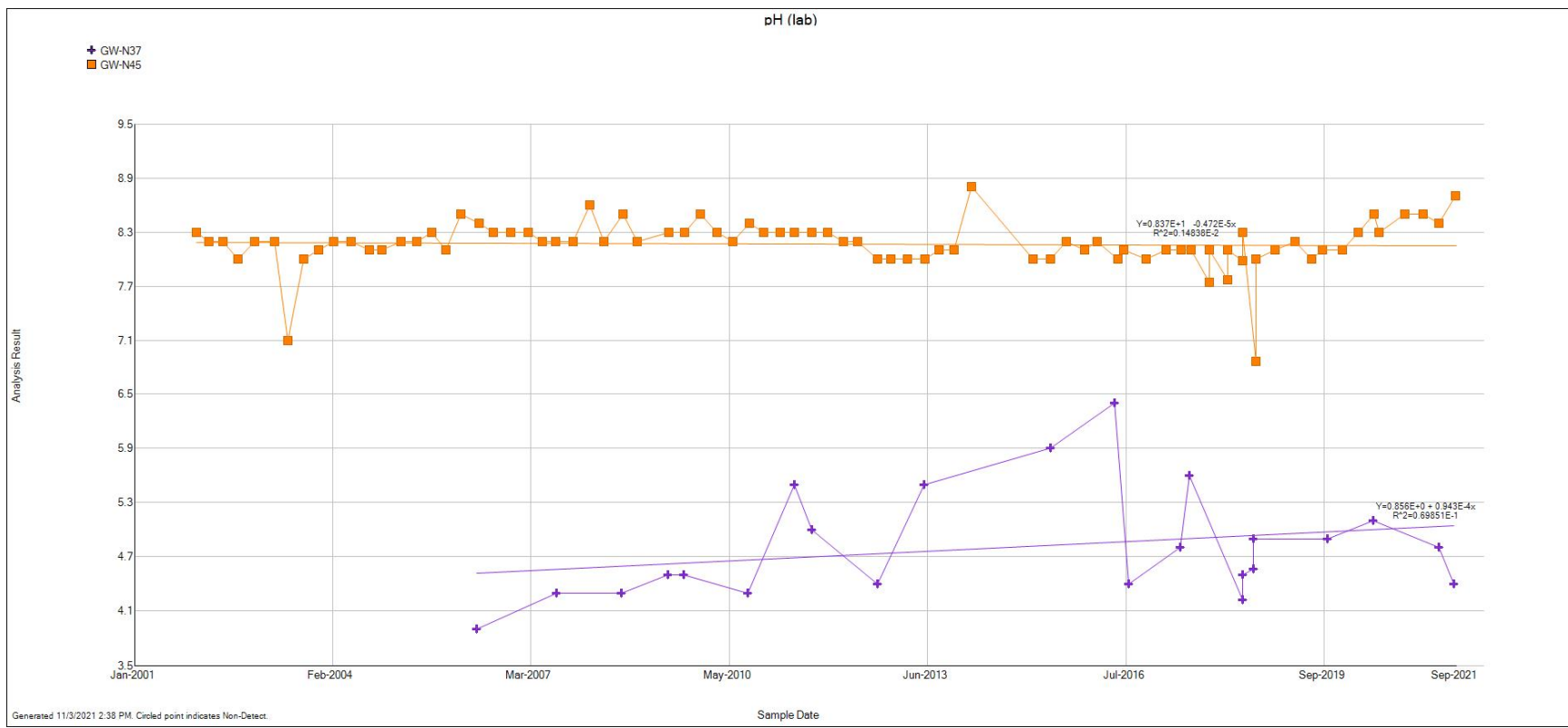


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Manganese, dissolved (mg/L)

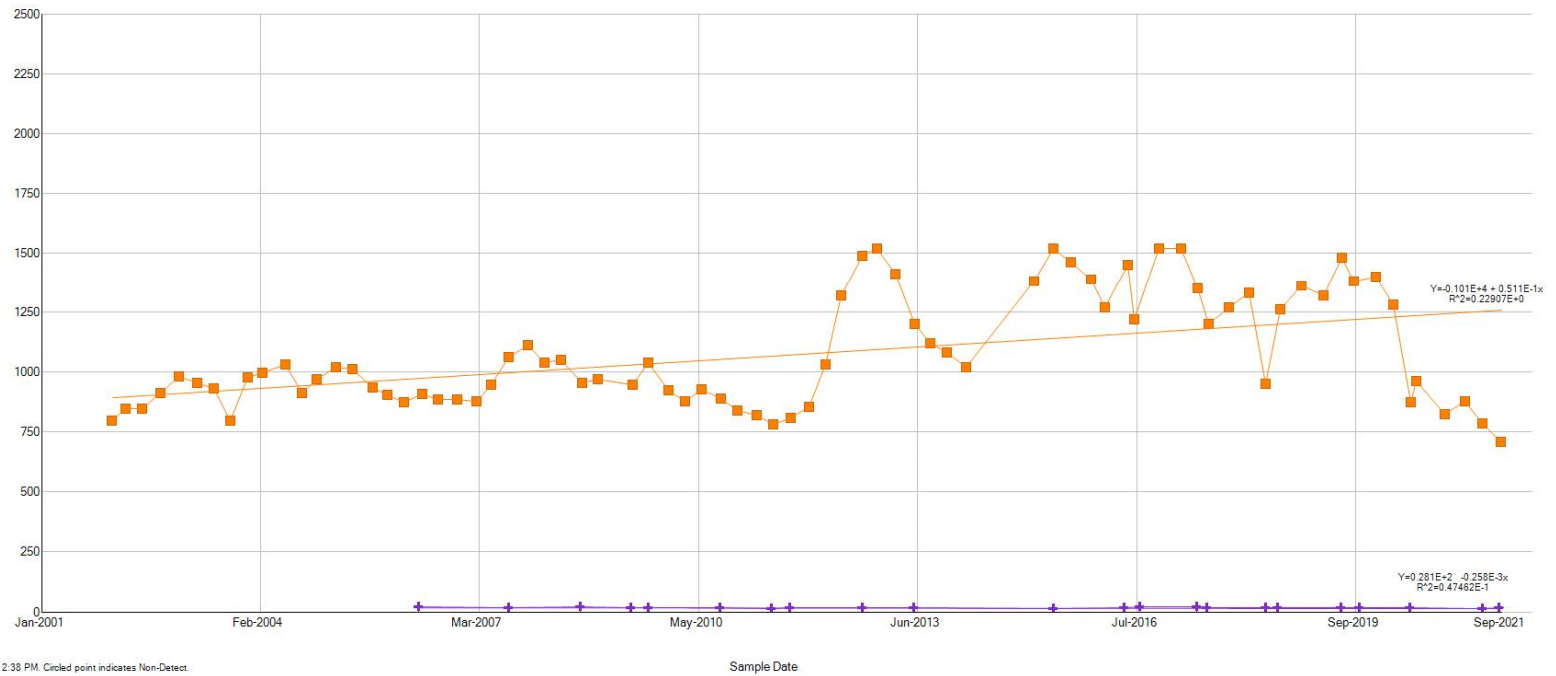
+ GW-N37
 ■ GW-N45





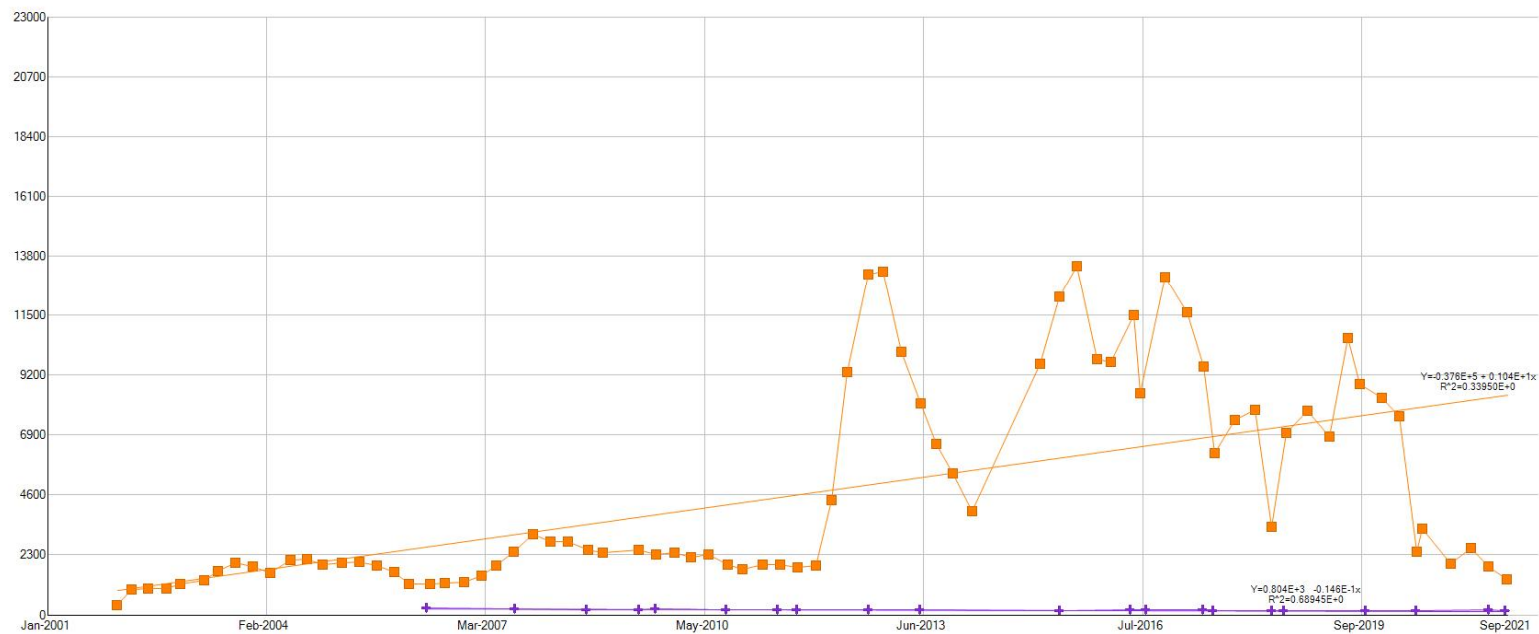
Sodium, dissolved (mg/L)

✚ GW-N37
■ GW-N45



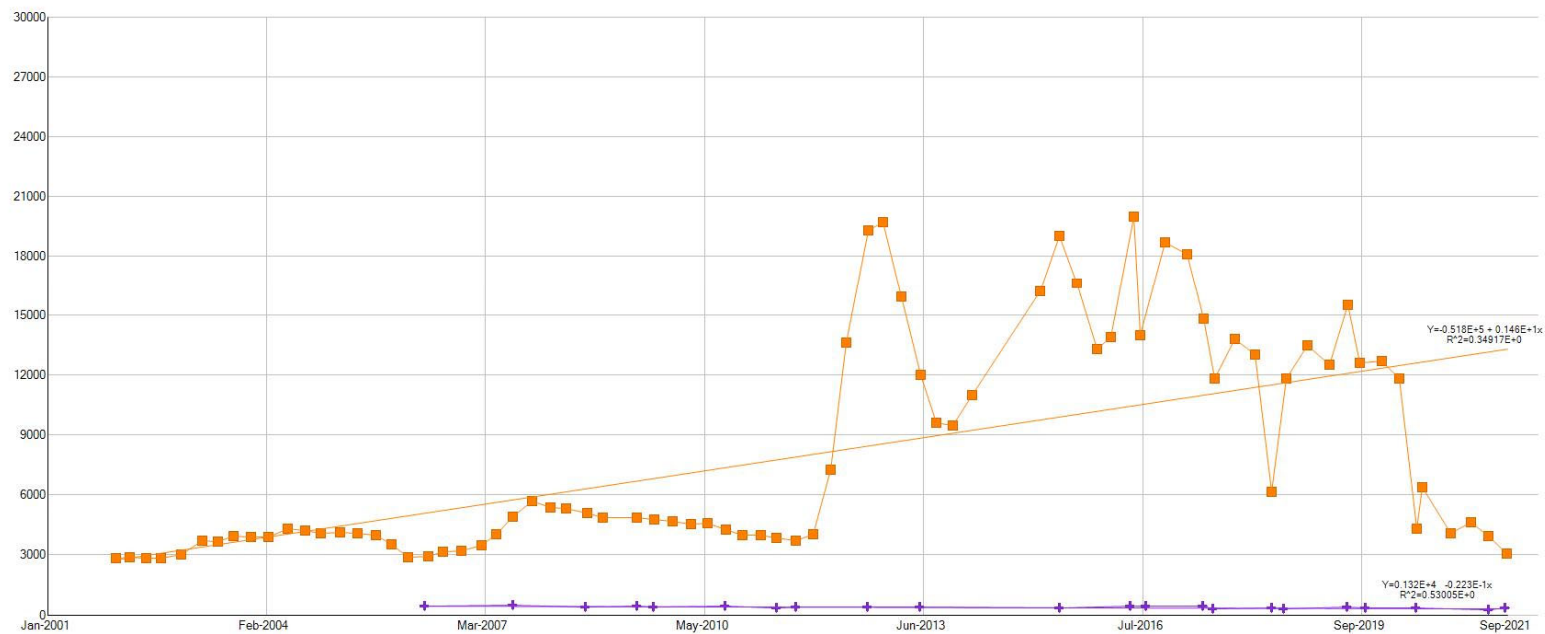
Sulfate, dissolved (mg/L)

+ GW-N37
 ■ GW-N45



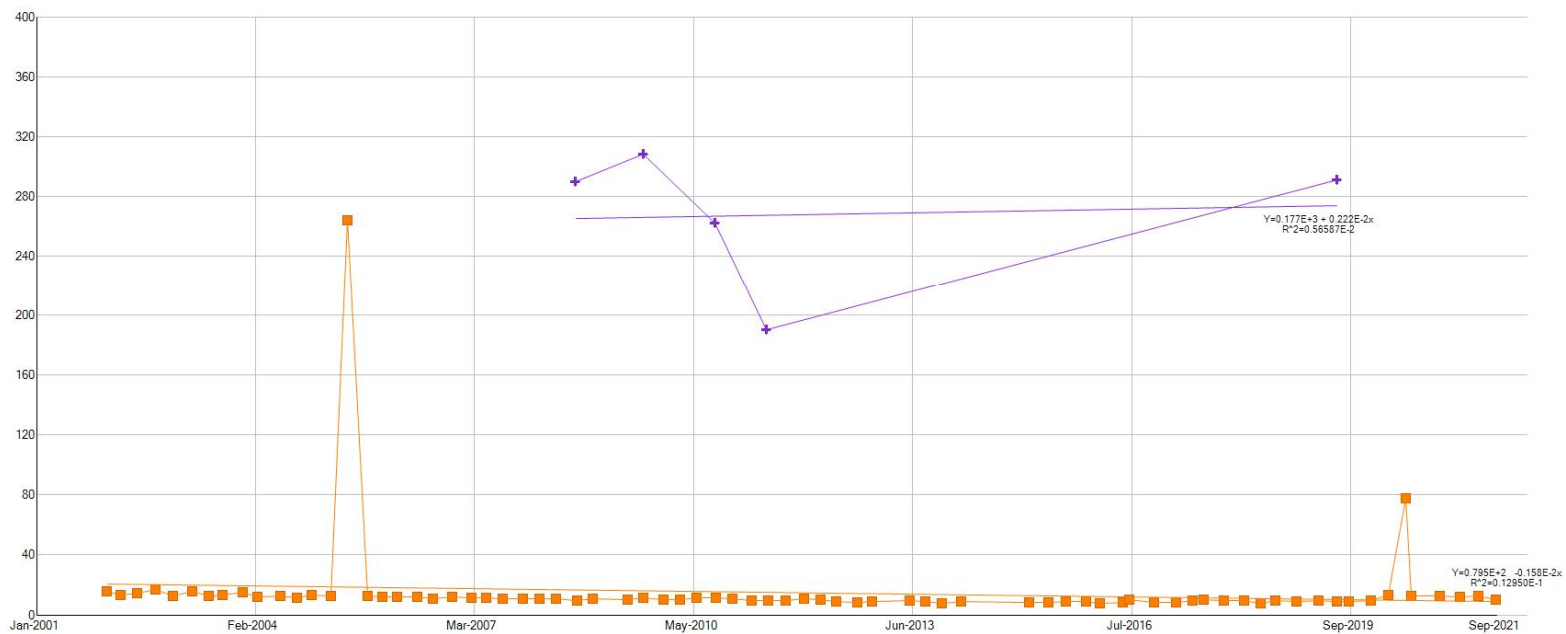
Total Dissolved Solids (mg/L)

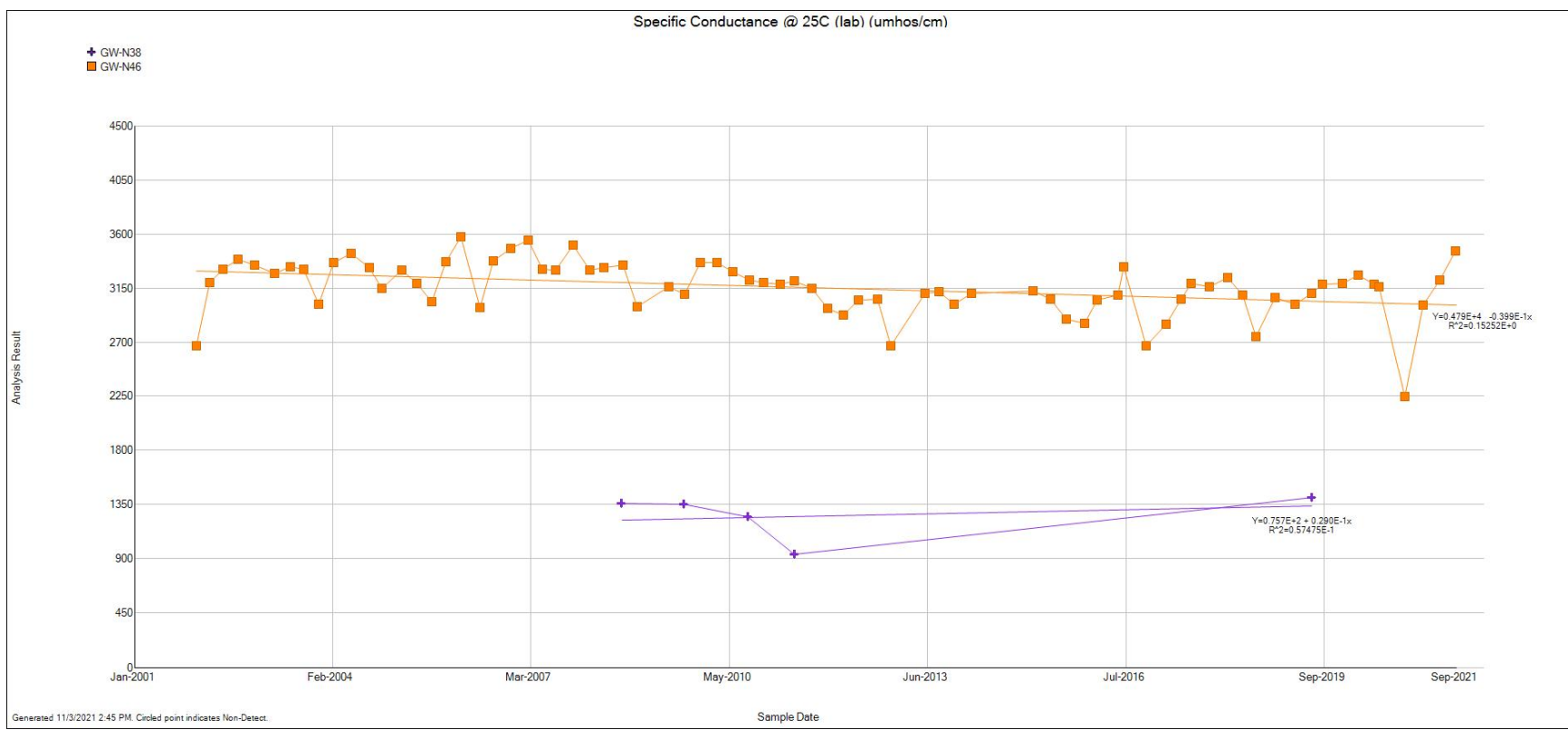
+ GW-N37
 ■ GW-N45

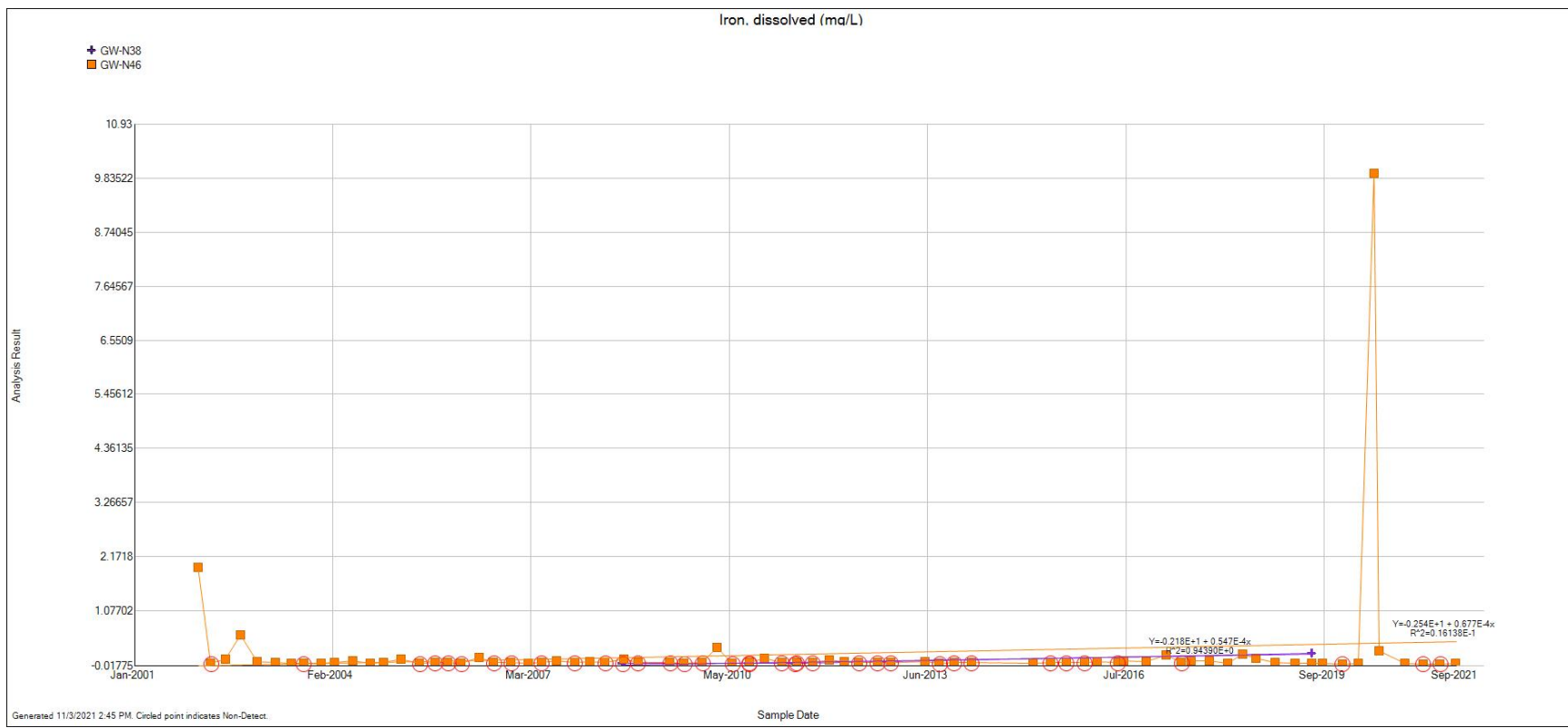


Calcium, dissolved (mg/L)

+ GW-N38
 ■ GW-N46



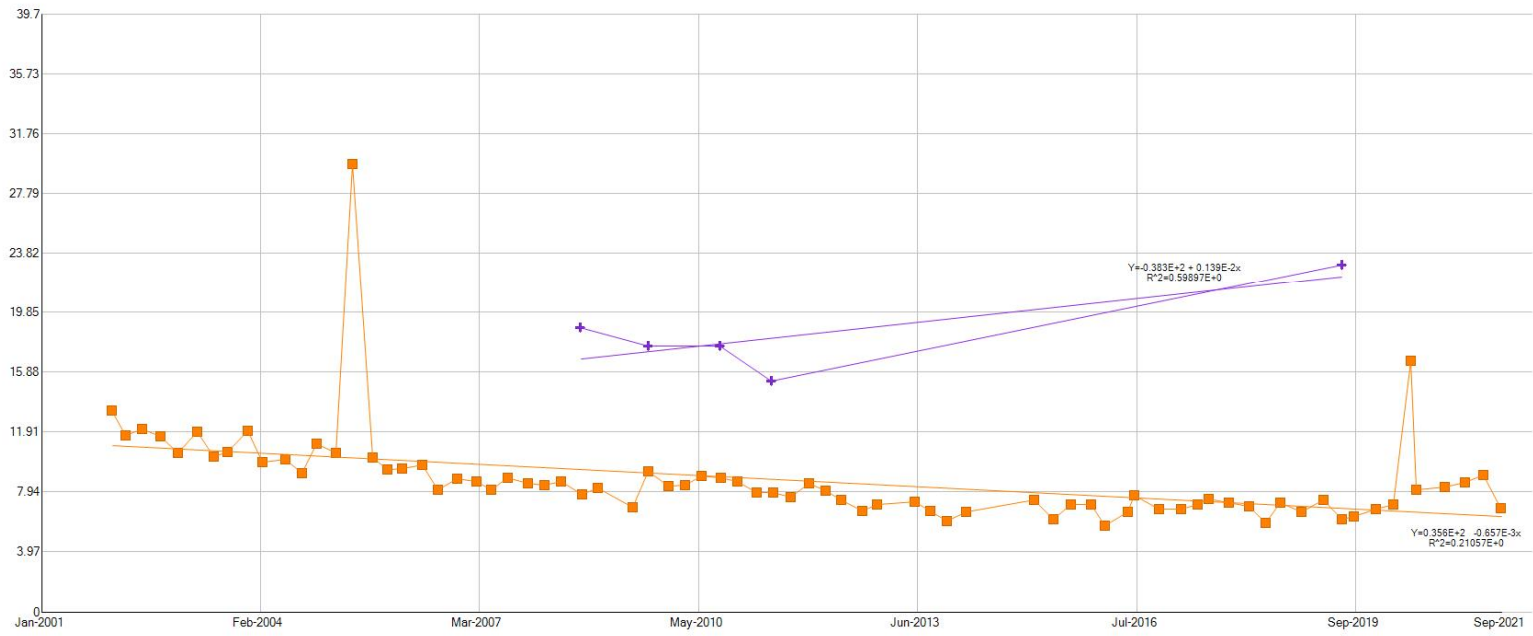




Magnesium, dissolved (mg/L)

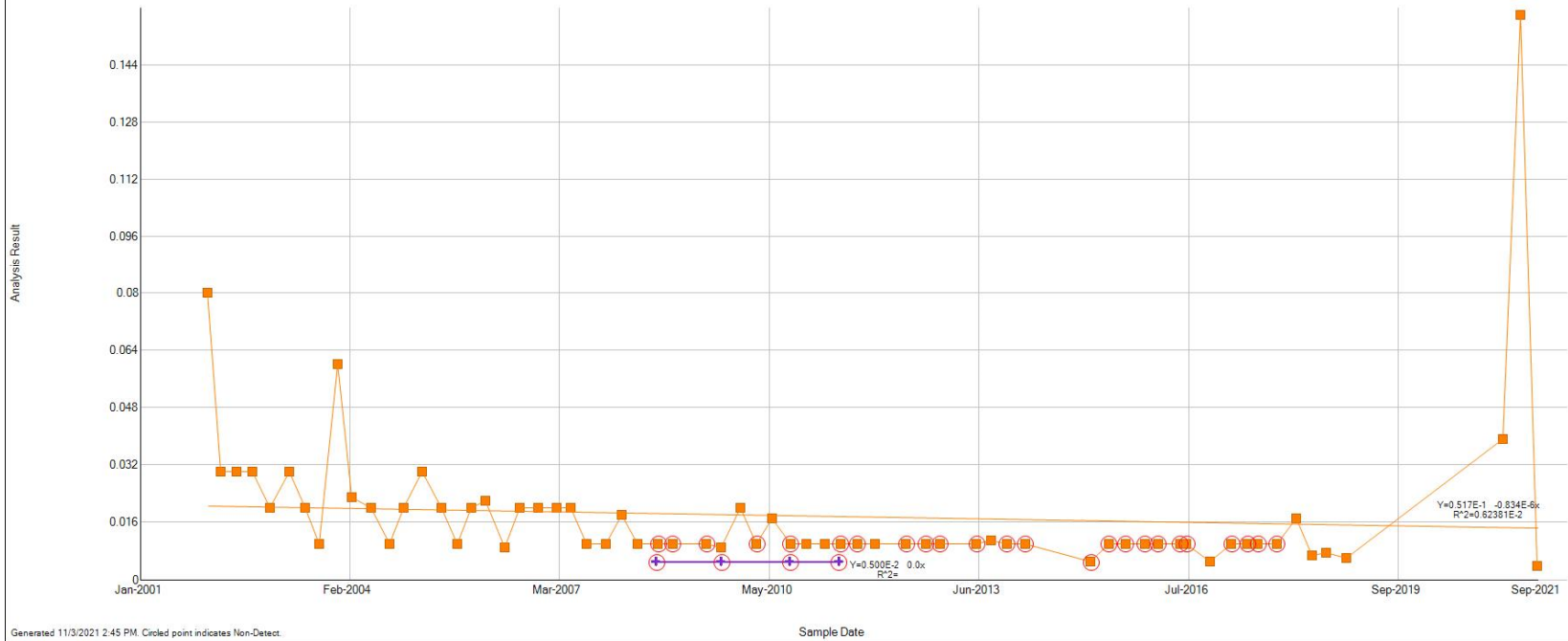
✚ GW-N38
■ GW-N46

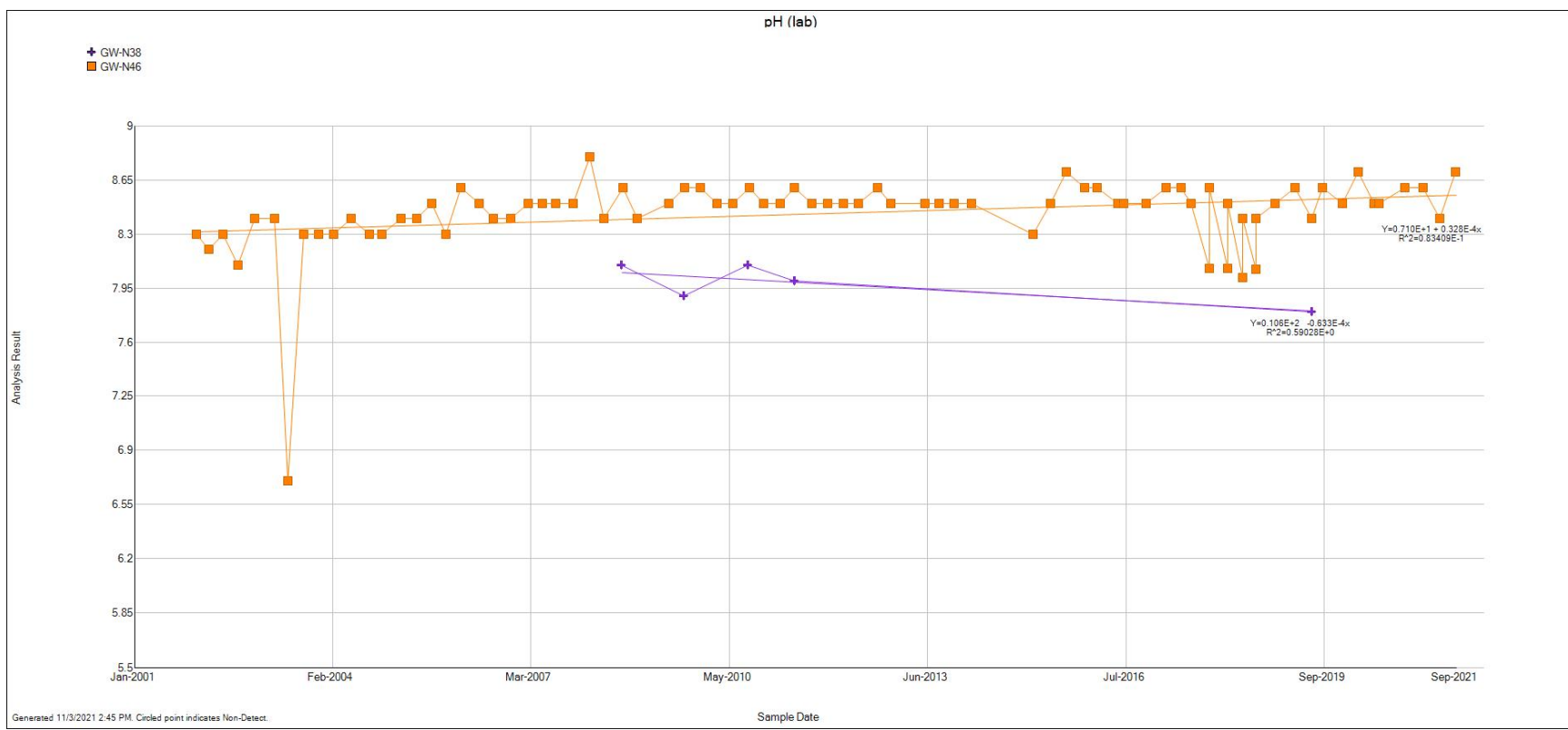
Analysis Result

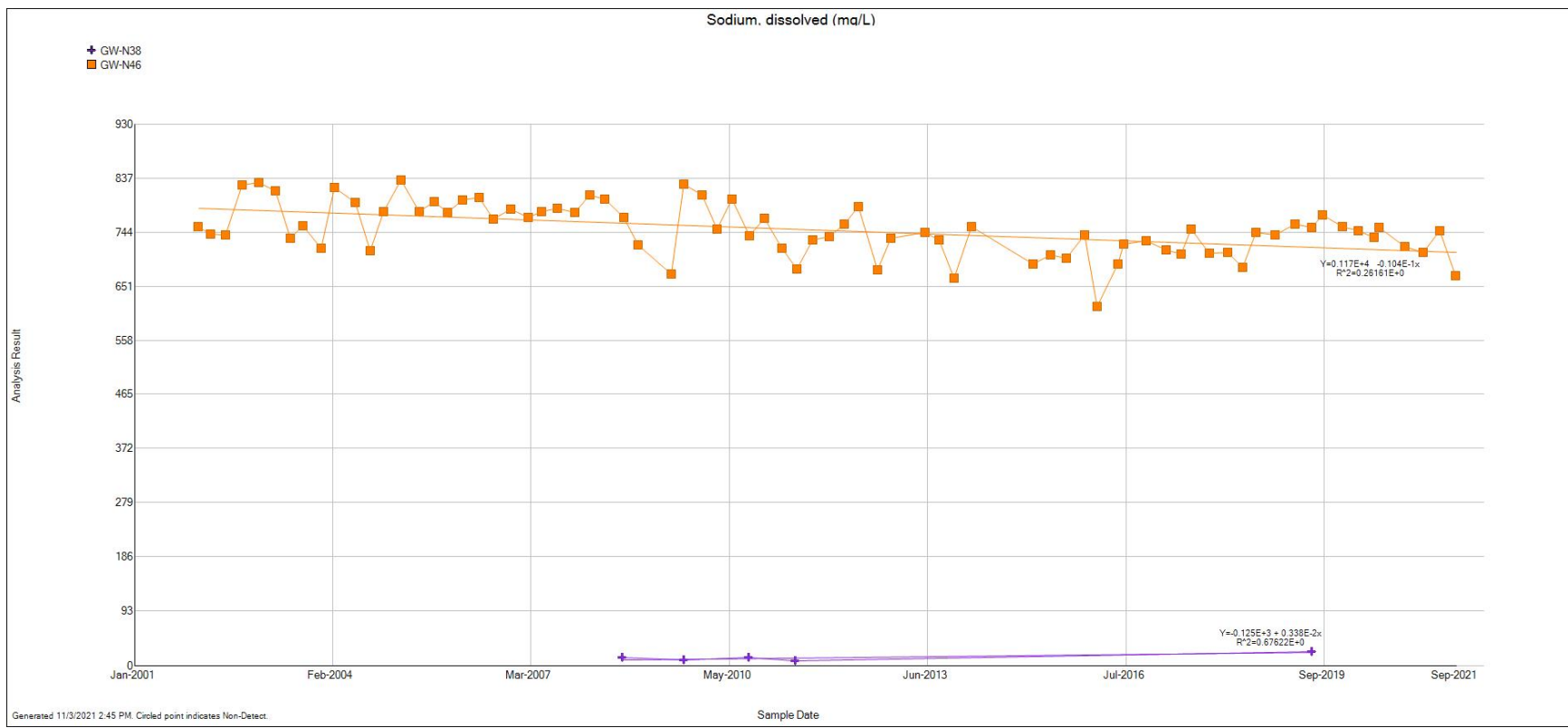


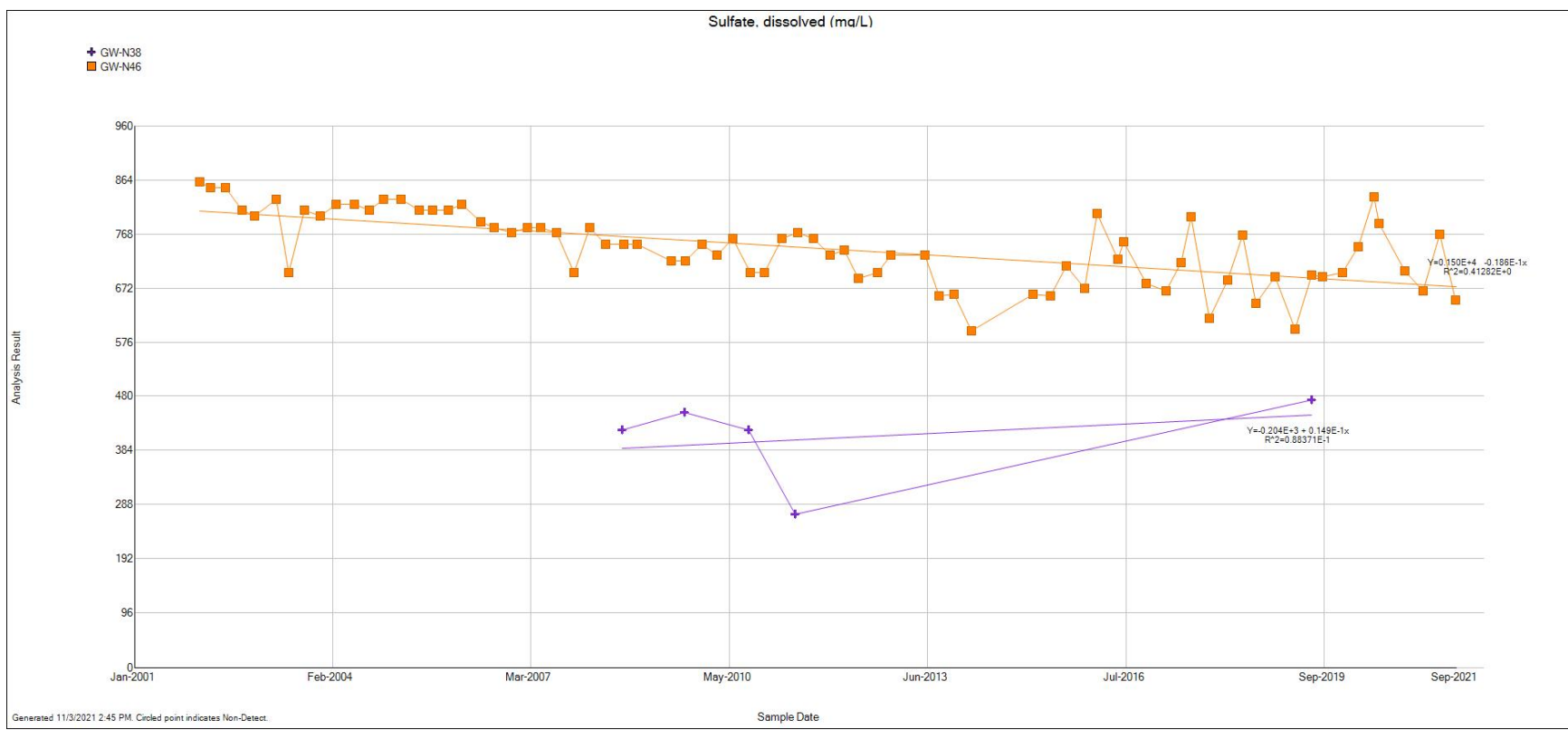
Manganese, dissolved (mg/L)

✚ GW-N38
■ GW-N46



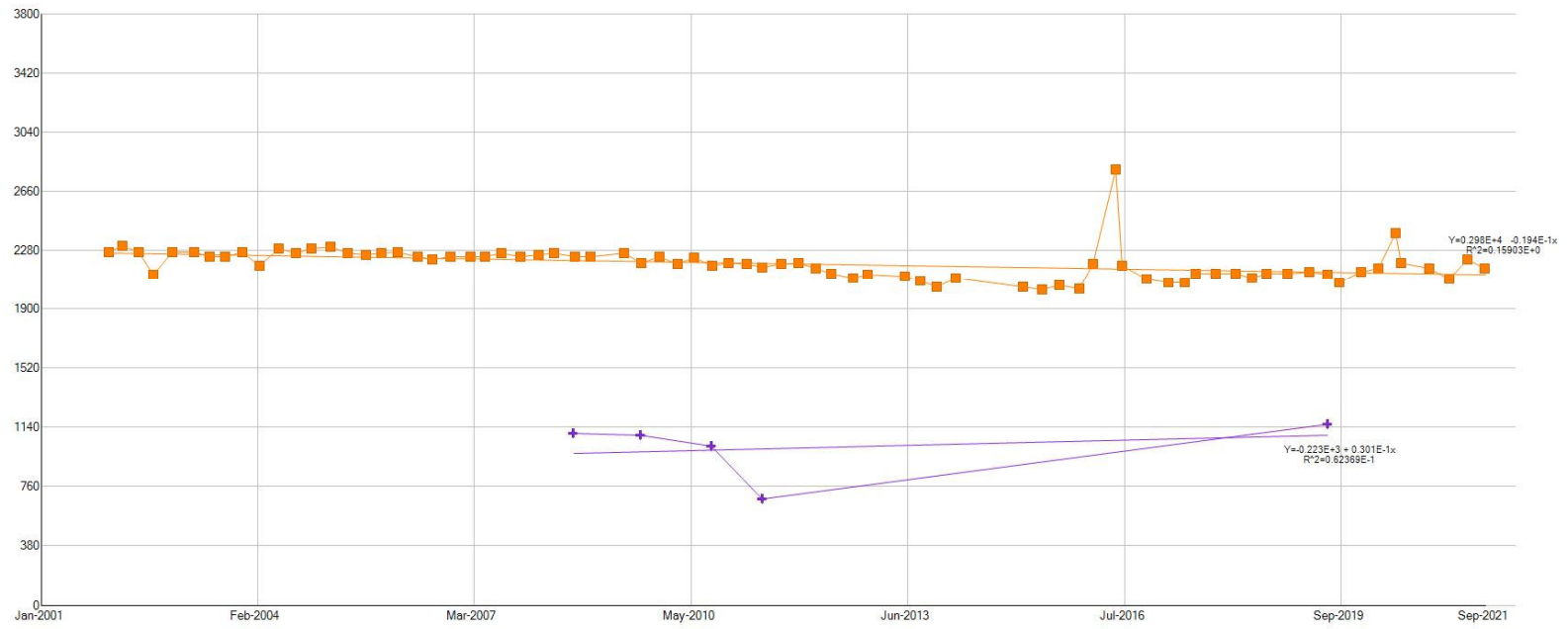






Total Dissolved Solids (mg/L)

+ GW-N38
 ■ GW-N46



Appendix 5
Groundwater Elevations

