TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC.
HEADQUARTERS: P.O. BOX 33695 DENVER, COLORADO 80233-0695 303-452-6111

December 23, 2019

Mrs. Janet Binns
Division of Reclamation, Mining and Safety
1313 Sherman Street, RM 215
Denver, Colorado 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 2019 Water Year (October 2018 – September 2019) 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 report, please contact Tony Tennyson at (970) 824-1232.

Sincerely,

Daniel J. Casiraro
Senior Manager
Environmental Services

DJC:TT:der

Enclosure

cc: Frank Ferris (via email)
G474.11.3(21)c-6

2019 Annual Hydrology Report

Water Year October 1, 2018 to September 30, 2019

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 2018 through September 2019.

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 previously mentioned information can be located in Permit No. C-1981-008.

Surface Water

Surface water monitoring sites are comprise of several sites which comprise the current, upstream and downstream condition and are briefly described below. Please see Map 2.04.7-1A for locations.

- SW-N102 is located on a tributary of Calamity Draw at the discharge point for Pond 007.
- SW-N103 represents the downstream condition on Calamity Draw.
- SW-N108 represents the upstream condition upstream Calamity Draw.
- SW-N104 is located at the inlet of the 26" HDPE pipe on the West Lateral Ditch upstream of the mine permit area.
- SW-N1 is located on Tuttle Draw and represents the upstream condition above mining.
- SW-N3 is located on Tuttle Draw and represents the downstream condition below mining.

Surface monitoring data for the water year for all sites listed above can be found in Appendix 1.

New Horizon currently samples each surface water site for a variety of quality parameters. Of all the parameters that are analyzed for, 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. Water monitoring data through 2019 can

be found in Appendix 1. Summary graphs of the indicator parameters for all monitoring locations are provided in Appendix 2.

Calamity Draw – Data for sites SW-N108 (up gradient site), SW-N103 (down gradient site), and SW-N102 (Outfall at Pond 007 and denoted as NPDES 007) have been complied and are shown on the summary tables below and graphically. Summary tables for indicator parameters are provide below for each site and include data from 2000 to 2019 if available.

SW-N103							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	8.2	0.1	0.4	8.4	8.0	2/18/11	8/28/18
Lab Cond. (umhos/cm)	2,142	962	2,220	3,310	1,090	2/20/19	8/18/16
TDS (mg/l)	1,866	996	2,365	3,120	755	2/20/19	8/18/16
Sulfate (mg/l)	1,091	654	1,634	2,050	416	2/10/15	9/18/19
Calcium (mg/l)	291	123	305	456	151	2/10/15	6/6/19
Iron (tot rec ug/l)	665	465	1,510	1,730	220	8/27/13	2/18/13
Magnesium (mg/l)	125	79	192	232	40	3/16/12	8/18/16
Sodium (mg/l)	78	46	114	140	26	2/18/13	8/18/16

SW-N102 (Pond 007 Outfall)							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	8.2	0.3	1.7	8.9	7.2	7/25/08	8/16/02
Lab Cond. (umhos/cm)	1,667	1,203	3,613	4,000	387	3/7/02	7/2/10
TDS (mg/l)	1,413	1,163	3,549	3,790	241	3/18/02	7/14/10
Sulfate (mg/l)	853	787	2,499	2,580	81	3/11/02	8/29/11
Calcium	218	146	424	480	56	11/30/05	9/3/08
Iron (tot rec ug/l)	249	141	1,090	1,170	80	11/23/11	12/1/03
Magnesium (mg/l)	112	102	302	313	11	3/13/02	7/1/10
Sodium (mg/l)	52	49	170	175	5	3/13/02	7/1/10

SW-N108							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	8.0	0.3	1.3	8.4	7.1	8/21/12	8/16/02
Lab Cond. (umhos/cm)	1,984	985	2,622	3,440	818	3/15/05	8/16/08
TDS (mg/l)	1,697	990	2,885	3,410	525	3/16/05	9/17/08
Sulfate (mg/l)	1,015	666	2,040	2,290	250	3/9/05	8/29/08
Calcium (mg/l)	259	122	318	428	110	2/10/15	9/3/08
Iron (tot rec ug/l)	1,625	2,221	10,930	11,100	170	2/24/04	2/24/06
Magnesium (mg/l)	125	82	245	275	30	3/1/05	5/16/18
Sodium (mg/l)	70	53	213	228	15	5/12/08	5/16/18

A review of the water year data indicates several maximums were captures for laboratory conductivity and TDS at the down gradient location SW-N103. Also, two minimums occurred at SW-N103 for sulfate and calcium. SW-N108 results tracked within past sampling analyses. As shown on the graphs for indicator parameters SW-N103 and SW-N108 typically tend to graph the same, whereas SW-N102 tends to be decreasing in some of the indicator parameters. Overall, sampling results indicate normal seasonal fluctuations also including influences by annual irrigation.

Tuttle Draw – Data for sites SW-N1 (up gradient site), SW-N3 (down gradient site), and SW-N104 (inlet of West Lateral Ditch) have been complied and shown in summary tables below and graphically. Summary tables for indicator parameters are provide below for each site and include data from 2000 to 2019 if available.

SW-N1							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	8.2	0.3	1.4	8.5	7.5	2/18/11	**11/13/18**
Lab Cond. (umhos/cm)	934	617	2,613	2,910	297	9/26/12	6/5/19
TDS (mg/l)	679	527	2,509	2,690	181	9/26/12	8/24/07
Sulfate (mg/l)	328	309	1,630	1,700	70	9/26/12	8/16/07
Calcium (mg/l)	118	79	455	496	41	9/26/12	6/5/19
Iron (tot rec ug/l)	1,329	1,828	8,890	9,050	160	8/16/07	2/24/06
Magnesium (mg/l)	54	51	196	204	8	9/26/12	8/17/07
Sodium (mg/l)	21	18	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	0.3	1.4	8.6	7.2	9/4/08	8/16/02
Lab Cond. (umhos/cm)	1,808	936	3,240	3,640	400	2/10/15	8/13/07
TDS (mg/l)	1,554	976	3,208	3,440	232	2/10/15	8/24/17
Sulfate (mg/l)	899	622	2,130	2,220	90	2/10/15	8/17/07
Calcium (mg/l)	247	136	504	558	54	8/31/02	8/17/07
Iron (tot rec ug/l)	1,219	1,786	10,470	10,600	130	8/16/07	5/17/08
Magnesium (mg/l)	111	75	246	259	13	2/10/15	11/21/07
Sodium (mg/l)	59	48	204	212	8	2/20/12	8/20/07

SW-N104							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	8.2	0.5	2.3	8.6	6.3	5/16/18	8/16/02
Lab Cond. (umhos/cm)	356	60	206	452	246	12/4/02	8/13/07
TDS (mg/l)	221	46	168	291	123	12/13/02	5/28/08
Sulfate (mg/l)	88	31	126	130	4	8/15/02	5/16/08
Calcium (mg/l)	57	11	33	73	40	9/24/04	5/15/19
Iron (tot rec ug/l)	1,657	2,258	8,680	8,780	100	8/16/07	9/21/04
Magnesium (mg/l)	7	1	5	9	4	12/5/02	5/16/18
Sodium (mg/l)	5	1	4	7	3	8/30/02	8/20/07

A review of the water year data indicates a minimum for laboratory conductivity and calcium, and one maximum for pH occurred at SW-N1. One minimum occurred for calcium at SW-N104 (which is at the inlet at the West Lateral Ditch). As shown on the graphs for all indicator parameters, all three same locations tend to track the same. However, SW-N3 is showing slight

increases in laboratory conductivity, TDS, sulfate, and sodium. Monitoring results are show normal seasonal fluctuations, data was consistent with previous ranges, and shows influences from irrigation.

Ground Water

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 the hydrology report. These are lab pH, lab conductivity, TDS, sulfate, calcium, iron, magnesium, sodium and elevation. Water monitoring data from 2000 through 2019 can be found in Appendix 3, and summary graphs of the indicator parameters are provided in Appendix 4. Please see Map 2.04.7-1A for monitoring locations. Groundwater elevations where data is available are provided in Appendix 5.

GW-N16P1, GW-N17P1, and GW-N18P1 Well Series

GW-N16P1 monitors the underburden aquifer directly adjacent to the mining area. GW-N17P1 monitors the Dakota coal aquifer directly adjacent to the mining area, and GW-N18P1 monitors the overburden aquifer directly adjacent to the mining area.

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

GW-N16P1							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	8.3	0.2	1.6	8.6	7.0	2/23/09	6/1/03
Lab Cond. (umhos/cm)	3,113	747	4,047	4,060	3	11/27/18	11/19/05
TDS (mg/l)	2,242	537	1,520	3,010	1,490	8/8/17	12/13/05
Sulfate (mg/l)	1,102	421	1,180	1,710	530	8/8/17	12/1/05
Calcium (mg/l)	41	15	45	65	20	6/24/19	2/17/06
Iron (tot rec ug/l)	84	55	190	200	10	5/21/13	3/23/10
Manganese (mg/l)	0.02	0.02	0.07	0.08	0.003	3/8/05	9/13/04
Sodium (mg/l)	681	129	428	905	477	9/24/19	12/6/03
Magnesium (mg/l)	19	7	29	29	1	8/8/18	2/26/07

GW-N17P1							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	8.2	0.3	2.2	8.9	6.7	5/18/09	6/1/03
Lab Cond. (umhos/cm)	4,580	375	1,750	5,240	3,490	11/28/06	5/18/09
TDS (mg/l)	3,589	504	2,220	4,680	2,460	2/26/18	5/27/09
Sulfate (mg/l)	2,009	374	1,750	2,850	1,100	11/15/17	5/21/09
Calcium (mg/l)	128	113	369	381	12	8/28/18	9/9/02
Iron (tot rec ug/l)	3,079	6,964	29,490	29,500	10	8/8/17	3/23/10
Manganese (mg/l)	0.07	0.08	0.30	0.30	0.003	2/26/18	8/27/03
Sodium (mg/l)	914	137	581	1,240	659	12/13/02	2/26/18
Magnesium (mg/l)	91	79	275	275	1	8/28/18	2/26/07

GW-N18P1							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	7.7	0.3	2.3	8.5	6.2	6/2/06	6/1/03
Lab Cond. (umhos/cm)	2,659	954	4,990	6,190	1,200	2/22/10	5/28/04
TDS (mg/l)	2,297	812	3,166	4,040	874	3/1/10	6/28/04
Sulfate (mg/l)	1,361	812	2,140	2,520	380	3/28/03	9/10/04
Calcium (mg/l)	360	100	416	588	172	5/20/08	9/15/04
Iron (tot rec ug/l)	735	2,796	16,690	16,700	10	2/23/10	8/11/16
Manganese (mg/l)	0.11	0.27	1.44	1.44	0.003	8/29/08	6/2/03
Sodium (mg/l)	130	191	866	878	12	2/23/10	6/6/04
Magnesium (mg/l)	152	64	343	344	1	2/26/09	2/26/07

A review of the water year for this series of wells adjacent to the mining area indicates several minimum levels for laboratory conductivity, calcium, and sodium at GW-N16P1. No other minimum or and a maximum values were record. As shown on the graphs for indicator parameters, calcium, iron, and magnesium are slightly increasing at GW-17P1, and laboratory conductivity, sodium, sulfate and TDS are slight increasing at GW-N-16P1. All the other indicator parameters track similar with sampling results indicating normal seasonal fluctuations including influences for seasonal irrigation of the reclamation areas.

GW-N3 Well

GW-N3 monitors the underburden aquifer adjacent to the New Horizon 1 mine area. The GW-N3 well is located north of Tuttle Draw and north of the New Horizon permit area.

Summary of the indicator parameters for GW-N3 is provided as follows:

GW-N3							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	7.7	0.1	0.7	8.0	7.3	2/25/08	5/14/08
Lab Cond. (umhos/cm)	2,549	236	1,200	3,050	1,850	3/8/07	7/26/18
TDS (mg/l)	2,249	171	760	2,480	1,720	11/16/17	5/20/15
Sulfate (mg/l)	1,310	124	582	1,500	918	11/14/12	5/17/16
Calcium (mg/l)	418	27	132	469	337	8/29/08	5/20/15
Iron (tot rec ug/l)	7,747	2,717	16,920	22,000	5,080	11/16/17	5/20/15
Manganese (mg/l)	1.26	0.17	0.97	1.47	0.496	2/28/11	3/2/07
Sodium (mg/l)	58	10	59	101	42	3/2/07	5/20/15
Magnesium (mg/l)	148	16	76	184	108	3/2/07	5/20/15

A review of the water year for this well indicates no maximums or minimums for any parameter occurred during the water year. As shown on the graphs for indicator parameters, the majority of the indicator parameters are trending down. Sampling results indicate normal seasonal fluctuations.

GW-N36, GW-N37, and GW-N38 Well Series:

GW-N36 monitors the overburden aquifer and represents the up gradient condition above mining activities. GW-N37 monitors the Dakota coal aquifer, and GW-N38 monitors the underburden aquifer. All three wells represent the up gradient condition above mining.

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)	1,423	466	1,470	1,940	470	11/20/07	5/23/18
TDS (mg/l)	1,003	343	1,012	1,380	368	11/11/15	5/31/17
Sulfate (mg/l)	421	108	399	572	173	11/16/16	5/23/18
Calcium (mg/l)	149	50	176	216	40	2/23/11	5/23/18
Iron (tot rec ug/l)	664	602	2,590	2,660	70	12/1/10	7/25/17
Manganese (mg/l)	0.12	0.08	0.37	0.40	0.032	8/29/08	5/20/15
Sodium (mg/l)	68	26	82	101	19	2/23/11	5/23/18
Magnesium (mg/l)	72	28	95	112	17	2/23/11	5/23/18

GW-N37							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	4.9	0.7	2.5	6.4	3.9	5/18/16	5/15/06
Lab Cond. (umhos/cm)	498	74	266	612	346	5/13/06	7/26/18
TDS (mg/l)	312	34	167	393	226	5/25/06	7/25/17
Sulfate (mg/l)	195	31	123	270	147	5/23/06	7/26/18
Calcium (mg/l)	45	9	32	61	30	5/11/06	7/26/18
Iron (tot rec ug/l)	873	1,421	4,559	4,600	41	5/18/11	7/26/18
Manganese (mg/l)	0.03	0.01	0.05	0.06	0.014	5/18/16	8/29/12
Sodium (mg/l)	18	2	8	22	14	5/31/17	5/20/15
Magnesium (mg/l)	19	4	16	27	11	5/11/06	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 (tot rec ug/l)	3,667	2,826	5,370	6,860	1,490	6/24/19	5/18/11
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 up gradient to the mining area indicates several maximums occurred at GW-N38 for laboratory conductivity, TDS, sulfate, total recoverable iron, manganese, sodium, and magnesium. One minimum occurred at GW-46 for laboratory pH. The other two wells in these series tracked within normal fluctuations. All three of these wells are not influenced by the mining or reclamation and express the up gradient condition above the remaining reclamation areas.

GW-N39 and GW-N40

GW-N39 monitors the alluvial aquifer which represents the up gradient condition on Calamity Draw. GW-N40 monitors the alluvial aquifer which represents the down gradient condition on Calamity Draw.

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

GW-N39							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	7.5	0.3	1.5	7.9	6.4	7/26/17	8/16/02
Lab Cond. (umhos/cm)	2,834	224	1,140	3,260	2,120	3/15/05	7/26/18
TDS (mg/l)	2,656	176	950	3,230	2,280	9/4/02	5/18/16
Sulfate (mg/l)	1,578	137	760	2,020	1,260	8/15/02	5/18/16
Calcium (mg/l)	609	33	152	687	535	8/19/11	9/15/04
Iron (tot rec ug/l)	22,478	4,871	25,300	38,700	13,400	12/27/18	6/24/19
Manganese (mg/l)	9.6	1.1	4.7	11.7	7.0	3/8/05	2/9/16
Sodium (mg/l)	40	8	33	64	31	3/9/05	2/9/16
Magnesium (mg/l)	102	18	99	174	75	8/30/02	2/9/16

GW-N40							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	7.8	0.3	1.3	8.2	6.9	11/21/09	8/16/02
Lab Cond. (umhos/cm)	3,079	411	2,870	4,910	2,404	8/28/18	9/23/19
TDS (mg/l)	2,859	462	3,130	4,900	1,770	8/28/18	9/23/19
Sulfate (mg/l)	1,786	284	2,150	3,080	930	8/11/16	9/23/19
Calcium (mg/l)	492	75	365	650	285	3/19/03	9/23/19
Iron (tot rec ug/l)	2,952	4,845	25,800	26,000	200	11/22/10	11/21/11
Manganese (mg/l)	2.19	0.76	4.35	4.61	0.26	2/15/18	9/17/05
Sodium (mg/l)	104	61	418	468	50	8/11/16	11/18/11
Magnesium (mg/l)	189	59	359	470	111	8/28/18	9/23/19

A review of the water year data indicates a minimum and maximum occurred for total recoverable iron at GW-N39. Several minimum values for laboratory electrical conductivity, TDS, sulfate, calcium, and magnesium occurred at GW-N40. As shown on the graphs for indicator parameters, both the up gradient and down gradient monitoring locations trend similar. Sampling results indicate normal seasonal fluctuations also including influences by annual irrigation.

GW-N41, GW-N42, and GW-N43

GW-N41 monitors the overburden aquifer up gradient of the mining area. GW-N42 monitors the Dakota coal aquifer up gradient of the mining area, and GW-N43 monitors the underburden aquifer up gradient of the mining area.

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

GW-N41							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	8.0	0.4	2.1	8.3	6.2	7/26/17	6/1/03
LabCond. (umhos/cm)	735	132	592	1,020	428	5/29/07	5/20/09
TDS (mg/l)	446	78	363	609	246	5/30/07	6/9/09
Sulfate (mg/l)	114	33	134	180	46	5/19/07	5/27/09
Calcium (mg/l)	85	14	57	116	59	5/23/07	5/28/09
Iron (tot rec ug/l)	572	632	2,380	2,430	50	8/23/10	7/26/17
Manganese (mg/l)	0.006	0.015	0.084	0.087	0.003	9/23/19	6/2/03
Sodium (mg/l)	14	8	25	32	6	6/6/04	5/23/18
Magnesium (mg/l)	43	10	45	63	18	5/15/06	5/28/09

GW-N42							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	6.0	0.5	0.9	6.5	5.9	5/26/02	8/16/02
Lab Cond. (umhos/cm)	709	84	152	764	612	5/26/02	6/1/03
TDS (mg/l)	469	72	131	517	386	9/4/02	6/16/03
Sulfate (mg/l)	243	74	140	300	160	8/15/02	6/6/03
Calcium (mg/l)	71	10	18	78	60	8/30/02	6/2/03
Iron (tot rec ug/l)	-	-	-	-	-	-	-
Manganese (mg/l)	0.06	.08	0.15	0.16	0.01	8/30/02	6/2/03
Sodium (mg/l)	33	6	3	36	30	6/4/03	6/9/02
Magnesium (mg/l)	37	5	9	41	32	6/9/02	6/2/03

GW-N43							
Parameter	**Mean**	**Std dev**	**Range**	**Max.**	**Min.**	**Max at**	**Min at**
Lab pH	4.6	0.9	3.2	6.8	3.6	5/14/08	8/16/02
Lab Cond. (umhos/cm)	728	244	1,211	1,670	459	5/14/08	8/19/15
TDS (mg/l)	471	206	954	1,220	266	5/28/08	8/19/15
Sulfate (mg/l)	305	129	597	770	173	5/16/08	8/19/15
Calcium (mg/l)	66	30	149	182	33	5/16/08	9/23/19
Iron (tot rec ug/l)	347	222	750	930	180	5/26/11	5/31/17
Manganese (mg/l)	0.30	0.22	0.90	1.02	0.12	5/14/08	8/19/15
Sodium (mg/l)	27	6	31	50	19	5/14/08	9/23/19
Magnesium (mg/l)	26	16	90	104	14	5/14/08	9/23/19

A review of the water year data indicates that a maximum value for manganese occurred at GW-N41, and several minimums for sulfate, sodium, and magnesium occurred at GW-N43. No other minimum or and a maximum values were record. As shown on the graphs for indicator parameters (where data is available as GW-N42 is typically dry), GW-N41 and GW-N43 track similar with sampling results indicating normal seasonal fluctuations including influences for seasonal irrigation for the up gradient condition above all mining and reclamation activities.

GW-N44, GW-N45, and GW-N46

GW-N44 monitors the overburden aquifer and represents the down gradient condition. GW-N45 monitors the Dakota coal aquifer, and GW-N46 monitors the underburden aquifer and represents the down gradient condition.

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	7.8	0.3	1.9	8.6	6.7	2/18/14	6/1/03
Lab Cond. (umhos/cm)	3,297	1,622	10,810	12,300	1,490	6/6/17	8/9/18
TDS (mg/l)	3,115	1,838	12,380	13,800	1,420	6/6/17	8/3/17
Sulfate (mg/l)	1,982	1,335	8,798	9,510	712	6/6/17	8/9/18
Calcium (mg/l)	378	77	362	514	152	3/13/02	6/6/17
Iron (tot rec ug/l)	5,559	12,825	61,573	61,600	27	5/17/12	6/26/19
Manganese (mg/l)	0.46	0.68	4.51	4.51	0.00	2/27/18	8/23/11
Sodium (mg/l)	168	185	1,321	1,350	29	6/6/17	11/12/13
Magnesium (mg/l)	281	253	1,873	1,970	97	6/6/17	11/12/13

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)	7,321	3,391	12,840	14,700	1,860	5/20/15	6/6/17
TDS (mg/l)	7,530	5,190	17,140	18,600	1,460	11/14/12	6/6/17
Sulfate (mg/l)	4,556	3,936	13,030	13,400	370	8/17/15	12/28/01
Calcium (mg/l)	110	64	279	307	28	11/14/12	2/17/06
Iron (tot rec ug/l)	1,009	1,138	5,800	5,900	100	11/12/13	11/14/12
Manganese (mg/l)	0.38	0.62	1.92	1.92	.003	3/14/17	6/6/17
Sodium (mg/l)	1,063	257	1,479	1,520	41	11/14/12	6/6/17
Magnesium (mg/l)	848	860	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	8.4	0.2	2.1	8.8	6.7	2/25/08	6/1/03
Lab Cond. (umhos/cm)	3,166	203	910	3,580	2,670	2/17/06	12/20/01
TDS (mg/l)	2,173	103	550	2,540	1,990	7/19/05	11/12/13
Sulfate (mg/l)	746	63	264	860	596	1/9/02	2/18/14
Calcium (mg/l)	15	31	257	264	7	6/4/05	2/9/16
Iron (tot rec ug/l)	204	153	760	770	10	11/14/12	3/23/10
Manganese (mg/l)	0.01	0.01	0.08	0.08	0.003	1/3/02	2/10/15
Sodium (mg/l)	750	46	216	833	617	3/9/05	2/9/16
Magnesium (mg/l)	9	3	24	30	6	6/4/05	2/9/16

A review of the water year for this series of wells down gradient to the mining area indicates one minimum value for total recoverable iron occurred at GW-N44 during the water year. No other minimum or and a maximum values were record. As shown on the graphs for the indicator parameters, laboratory electrical conductivity, calcium, magnesium, manganese, sulfate, and TDS are slighty trending upward at GW-N45. All the other parameters for the other wells track similar to each other and indicate normal fluctuations including influences from irrigation.

Appendix 1
Surface Water Monitoring Data

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Site: SW-N1

	11/13/2018	2/20/2019	6/5/2019	9/17/2019
Al, tot rec, ug/L	80.0	200.	3530.	590.
As, TD, mg/L	0.000800	0.000500	0.000700	0.000900
Ca, diss, mg/L	182.	178.	40.9	78.0
Cation-Anion Bal, %	-5.300		0.000	2.000
Cd, diss, mg/L	<0.0		0.0000700	<0.0
Cd, TD, mg/L	<0.0	<0.0	<0.0	<0.0
Cl, diss, mg/L	15.7	17.2	2.60	4.20
Cu, diss, mg/L	<0.0		0.00240	0.000900
Cu, TD, mg/L	0.00300	<0.0	0.00900	<0.0
Fe, diss, mg/L	0.144		0.310	0.0230
Fe, TD, mg/L	0.0280	0.0300	0.0700	0.0400
Fe, tot rec, ug/L	279.	280.	1720.	360.
HCO3, mg/L	472.	358.	95.0	106.
Mg, diss, mg/L	87.5	93.0	8.70	12.0
Mn, TD, mg/L	0.120	0.280	<0.0	<0.0
Mo, diss, mg/L	<0.0		<0.0	<0.0
Na, diss, mg/L	31.3	33.0	4.80	6.90
NH3 as N, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO2 + NO3, diss, mg/L	<0.0	0.0300	0.0800	0.110
NO2, diss, mg/L	<0.0		<0.0	<0.0
NO3, diss, mg/L	<0.0		0.0800	0.110
P, tot, mg/L	<0.0	<0.0	0.0700	0.0200
Pb, diss, mg/L	<0.0		0.00130	0.000400
Pb, TD, mg/L	<0.0	<0.0	0.000300	0.000300
pH (field), pH	8.140	7.840	8.330	8.340
pH (lab), pH		8.300	8.300	8.300
PO4, total soluble, mg/L			0.0300	0.0300
SAR, ratio	0.480	0.510	0.180	0.190
Se, TD, mg/L	0.000200	0.000500	0.000600	0.000400
SO4, diss, mg/L	494.	552.	51.5	130.
Spec. Cond. (field), umhos/cm	1632.000	1706.000	324.000	483.000
Spec. Cond. (lab), umhos/cm	1480.000	1560.000	297.000	490.000
Sum Anions, meq/L	20.000		3.000	5.000
Sum Cations, meq/L	18.000		3.000	5.200
TDS, mg/L	1130.	1180.	224.	334.
Temp (Celcius), degrees C	1.500	1.300	11.300	16.900
TSS, mg/L	<0.0	<0.0	89.0	18.0
Zn, TD, mg/L	0.0120	<0.0	0.00900	0.0180

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Site: SW-N3

	11/13/2018	2/20/2019	6/5/2019	9/17/2019
Al, tot rec, ug/L	110.	200.	2690.	1190.
As, TD, mg/L	0.000500	0.000400	<0.0	0.000700
Ca, diss, mg/L	415.	374.	118.	169.
Cation-Anion Bal, %	3.800		-0.500	0.000
Cd, diss, mg/L	<0.0		0.0000600	<0.0
Cd, TD, mg/L	<0.0	<0.0	<0.0	<0.0
Cl, diss, mg/L	19.9	19.8	5.60	7.80
Cu, diss, mg/L	<0.0		0.00150	<0.0
Cu, TD, mg/L	<0.0	<0.0	0.00800	<0.0
Fe, diss, mg/L	0.0700		0.0940	0.0540
Fe, TD, mg/L	0.0800	0.0500	0.0500	0.0700
Fe, tot rec, ug/L	273.	330.	1370.	710.
HCO3, mg/L	432.	408.	155.	199.
Mg, diss, mg/L	190.	176.	39.3	54.1
Mn, TD, mg/L	0.920	0.900	0.0100	0.100
Mo, diss, mg/L	<0.0		<0.0	<0.0
Na, diss, mg/L	90.6	77.4	16.0	24.1
NH3 as N, diss, mg/L	1.00	0.640	<0.0	0.0600
NO2 + NO3, diss, mg/L	0.310	0.190	0.0600	0.100
NO2, diss, mg/L	0.0100		<0.0	0.0100
NO3, diss, mg/L	0.300		0.0600	0.0900
P, tot, mg/L	<0.0	<0.0	0.0600	0.0300
Pb, diss, mg/L	<0.0		0.000300	0.000300
Pb, TD, mg/L	<0.0	<0.0	<0.0	0.000200
pH (field), pH	8.100	7.830	8.100	7.920
pH (lab), pH	8.200	8.200	8.300	8.300
PO4, total soluble, mg/L	<0.0		0.0300	0.0300
SAR, ratio	0.940	0.840	0.330	0.420
Se, TD, mg/L	<0.0	0.000600	0.000800	0.000400
SO4, diss, mg/L	1480.	1050.	325.	475.
Spec. Cond. (field), umhos/cm	3440.000	3510.000	947.000	1159.000
Spec. Cond. (lab), umhos/cm	3030.000	2880.000	900.000	1180.000
Sum Anions, meq/L	38.000		10.000	14.000
Sum Cations, meq/L	41.000		9.900	14.000
TDS, mg/L	2920.	2640.	700.	908.
Temp (Celcius), degrees C	7.900	2.500	12.700	16.400
TSS, mg/L	<0.0	7.00	68.0	38.0
Zn, TD, mg/L	0.0130	0.00800	<0.0	0.0120

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Site: SW-N103

	11/13/2018	2/20/2019	6/6/2019	9/18/2019
Al, tot rec, ug/L	200.	200.	570.	350.
As, TD, mg/L	0.000400	<0.0	0.00100	0.000900
Ca, diss, mg/L	374.	357.	151.	169.
Cd, TD, mg/L	<0.0	<0.0	<0.0	<0.0
Cl, diss, mg/L	24.0	32.3	9.50	8.10
Cu, TD, mg/L	0.00200	<0.0	0.00900	<0.0
Fe, TD, mg/L	0.0290	0.0400	0.110	0.0300
Fe, tot rec, ug/L	300.	360.	550.	330.
HCO3, mg/L	350.	360.	200.	190.
Mg, diss, mg/L	154.	186.	45.8	45.8
Mn, TD, mg/L	0.720	0.200	0.120	<0.0
Na, diss, mg/L	101.	123.	36.2	31.9
NH3 as N, diss, mg/L	0.120	0.900	<0.0	<0.0
NO2 + NO3, diss, mg/L	0.460	0.850	0.100	0.0900
P, tot, mg/L	0.0900	0.210	0.0700	0.0700
Pb, TD, mg/L	<0.0	<0.0	<0.0	<0.0
pH (field), pH	8.100	8.100	8.000	7.800
pH (lab), pH	8.200	8.200	8.300	8.400
SAR, ratio	1.100	1.300	0.670	0.570
Se, TD, mg/L	0.000600	0.00240	0.000700	0.000400
SO4, diss, mg/L	1460.	1340.	451.	416.
Spec. Cond. (field), umhos/cm	3600.000	3870.000	1.190	1168.000
Spec. Cond. (lab), umhos/cm	3020.000	3310.000	1170.000	1180.000
TDS, mg/L	2880.	3120.	914.	926.
Temp (Celcius), degrees C	3.400	2.300	14.800	14.600
TSS, mg/L	5.00	6.00	22.0	10.0
Zn, TD, mg/L	0.0130	<0.0	<0.0	0.0100

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

	5/15/2019	8/13/2019	9/9/2019	9/18/2019
Al, diss, mg/L		<0.0	<0.0	
Al, tot rec, ug/L	2150.			650.
As, TD, mg/L	<0.0			<0.0
Ca, diss, mg/L	40.3	41.4	68.5	71.4
Cation-Anion Bal, %		-3.700	3.600	
Cd, TD, mg/L	<0.0			<0.0
Cl, diss, mg/L	2.70	1.80	3.50	3.90
Cu, diss, mg/L		0.00110	0.000900	
Cu, TD, mg/L	<0.0			<0.0
Fe, diss, mg/L		<0.0	<0.0	
Fe, TD, mg/L	0.0400			<0.0
Fe, tot rec, ug/L	1460.	360.	250.	410.
HCO3, mg/L	88.1	66.9	87.9	93.5
Mg, diss, mg/L	6.50	4.40	7.20	7.70
Mn, TD, mg/L	<0.0			<0.0
Mo, diss, mg/L		<0.0	<0.0	
Na, diss, mg/L	4.30	3.30	5.20	6.00
NH3 as N, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO2 + NO3, diss, mg/L	<0.0	<0.0	0.100	0.200
NO2, diss, mg/L		<0.0	<0.0	
NO3, diss, mg/L		<0.0	0.100	
P, tot, mg/L	0.0400	0.0100	0.0300	0.0300
Pb, diss, mg/L		<0.0	0.000100	
Pb, TD, mg/L	<0.0			<0.0
pH (field), pH	8.600	8.400	8.300	8.300
pH (lab), pH	8.400	8.200	8.200	8.400
SAR, ratio	0.170			0.180
Se, TD, mg/L	0.000900			<0.0
SO4, diss, mg/L	39.3	65.1	103.	112.
Spec. Cond. (field), umhos/cm	309.000			428.000
Spec. Cond. (lab), umhos/cm	269.000	282.000	412.000	435.000
Sum Anions, meq/L		2.800	4.000	
Sum Cations, meq/L		2.600	4.300	
TDS, mg/L	200.	190.	272.	288.
Temp (Celcius), degrees C	13.500	16.300	15.900	16.300
TSS, mg/L	60.0			23.0
Zn, TD, mg/L	<0.0			0.0400

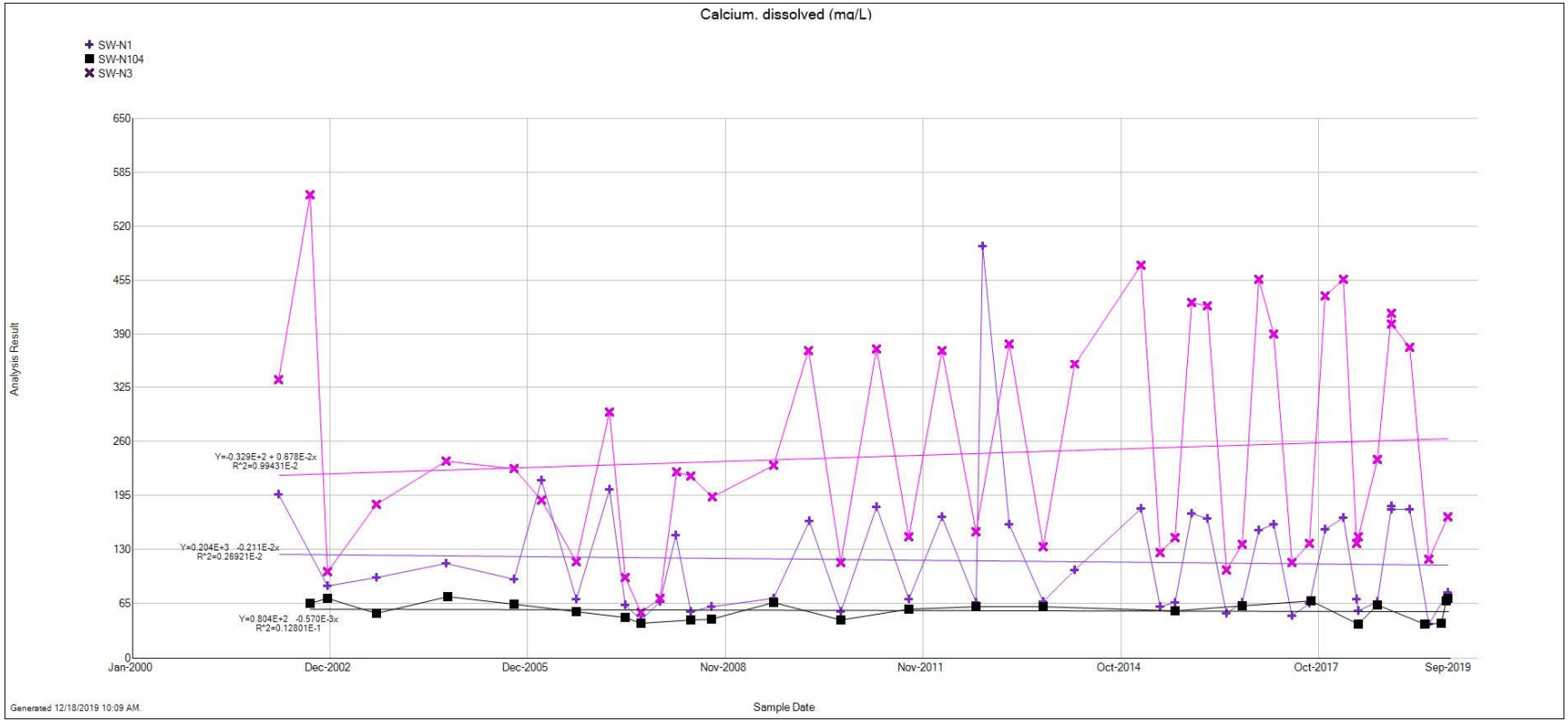
New Horizon Mine

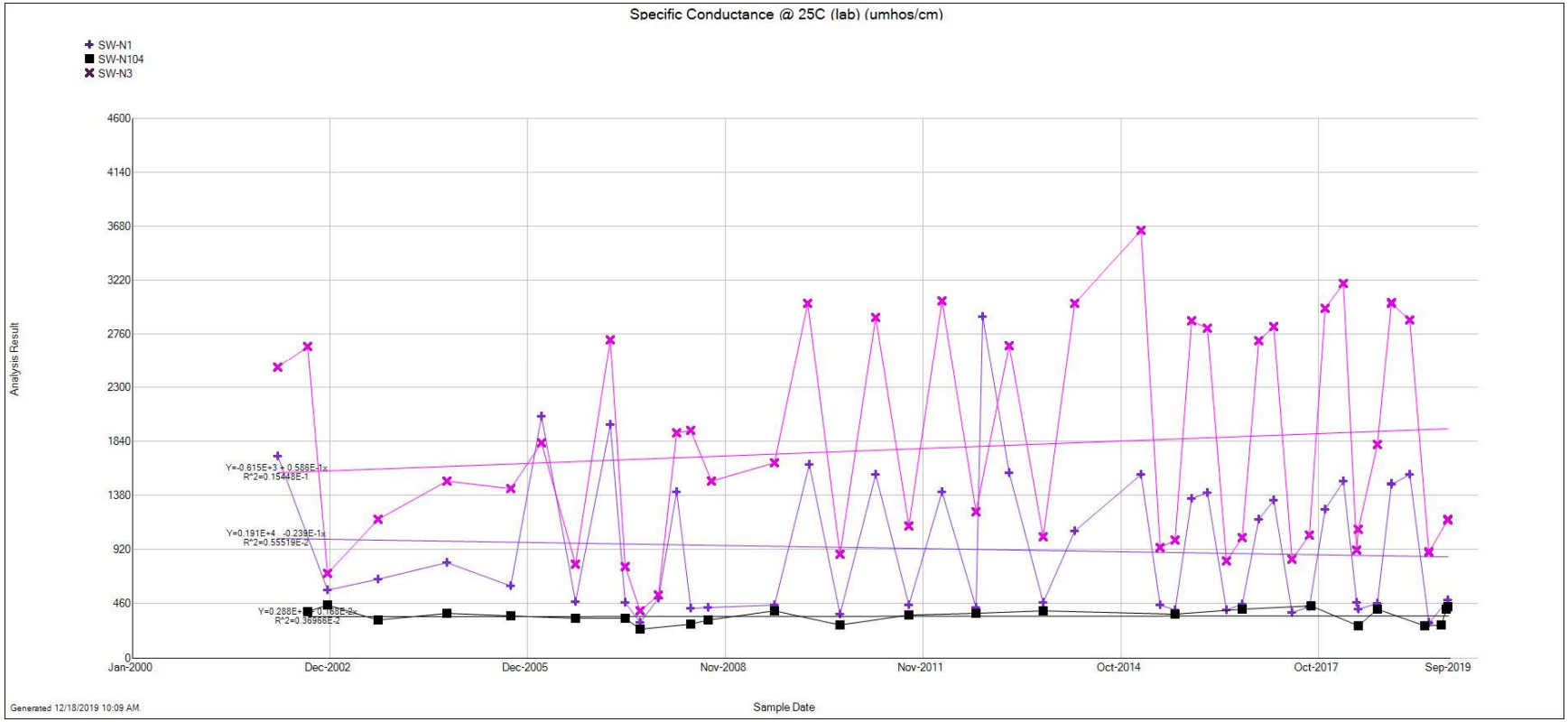
Date Range: 10/01/2018 to 09/30/2019

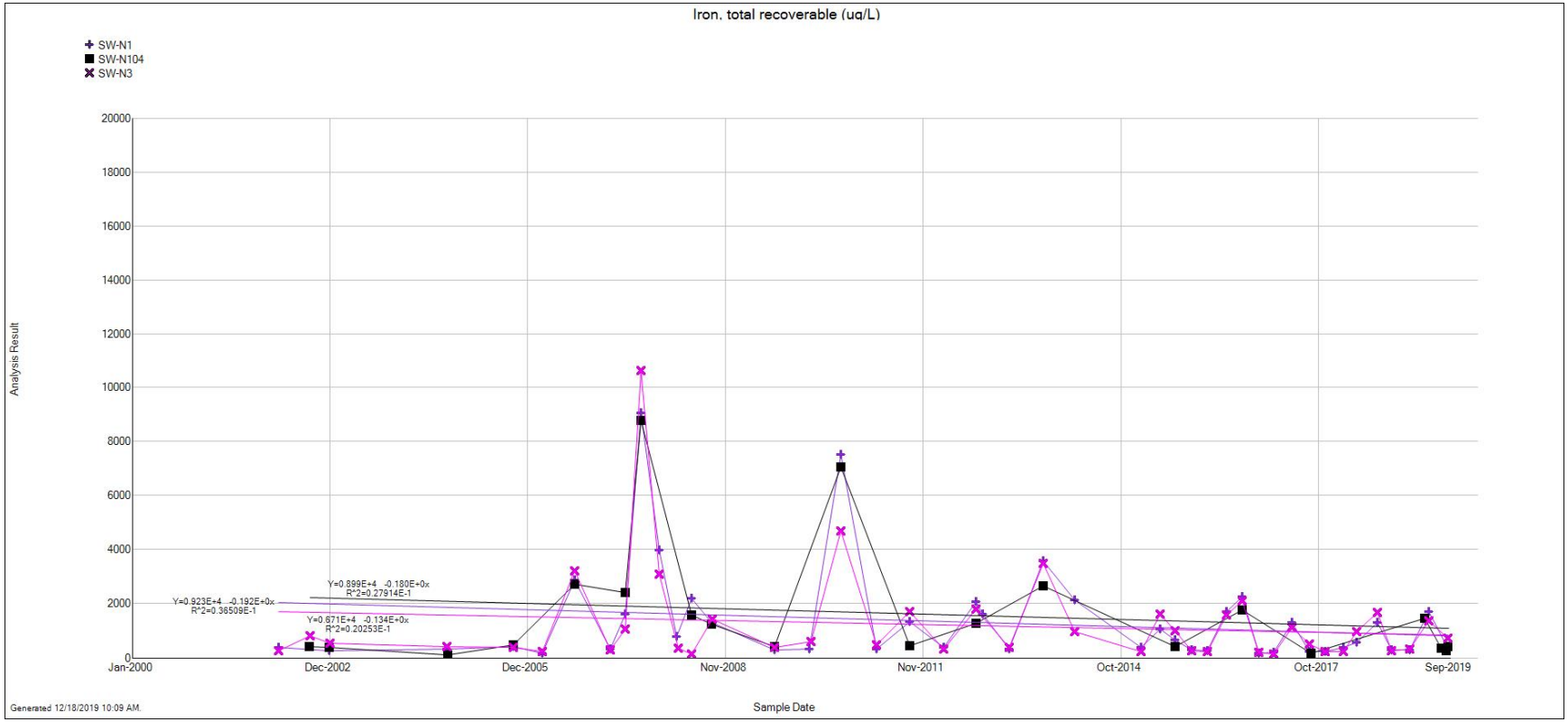
Site: SW-N108

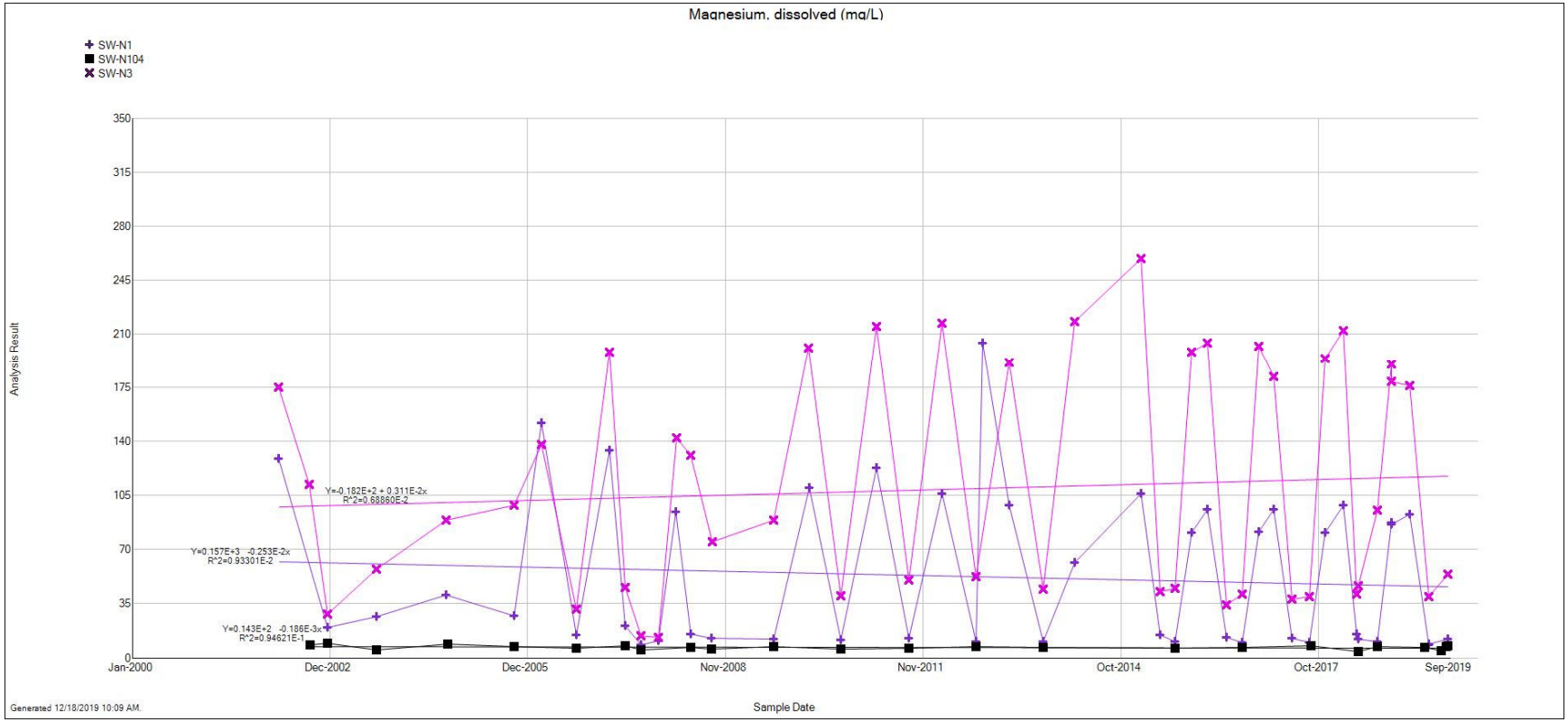
	11/13/2018	2/20/2019	2/22/2019	6/6/2019	9/17/2019
Al, tot rec, ug/L	200.	300.		450.	740.
As, TD, mg/L	<0.0	0.000500		0.00140	
Ca, diss, mg/L	333.	360.		134.	143.
Cation-Anion Bal, %					4.800
Cd, diss, mg/L					<0.0
Cd, TD, mg/L	0.000100	0.000200		<0.0	
Cl, diss, mg/L	19.9	35.1		12.2	6.20
Cu, diss, mg/L					<0.0
Cu, TD, mg/L	0.00200	0.00200		0.00700	
Fe, diss, mg/L					0.0640
Fe, TD, mg/L	0.0660	0.0600		0.140	
Fe, tot rec, ug/L	630.	900.		620.	1440.
HCO3, mg/L	308.	367.		215.	189.
Mg, diss, mg/L	146.	215.		49.9	34.8
Mn, TD, mg/L	1.41	1.39		0.120	
Mo, diss, mg/L					<0.0
Na, diss, mg/L	78.9	148.		50.2	15.7
NH3 as N, diss, mg/L	0.220	0.270		<0.0	<0.0
NO2 + NO3, diss, mg/L	0.630	1.09		<0.0	0.0400
NO2, diss, mg/L					<0.0
NO3, diss, mg/L					0.0400
P, tot, mg/L	<0.0	0.0200		0.0700	
Pb, diss, mg/L					<0.0
Pb, TD, mg/L	<0.0	<0.0		0.000200	
pH (field), pH	7.700	7.700	7.740	7.910	7.840
pH (lab), pH	8.100	8.100		8.400	8.300
PO4, total soluble, mg/L					0.120
SAR, ratio	0.920	1.500		0.950	0.310
Se, TD, mg/L	0.000500	0.00480		0.000900	
SO4, diss, mg/L	1270.	1260.		401.	306.
Spec. Cond. (field), umhos/cm	3110.000		3800.000	1.184	923.000
Spec. Cond. (lab), umhos/cm	2670.000	3300.000		1150.000	939.000
Sum Anions, meq/L					10.000
Sum Cations, meq/L					11.000
TDS, mg/L	2490.	3080.		880.	704.
Temp (Celcius), degrees C	4.800	3.500	3.500	14.200	16.500
TSS, mg/L	5.00	<0.0		10.0	23.0
Zn, TD, mg/L	0.0470	0.0450		<0.0	

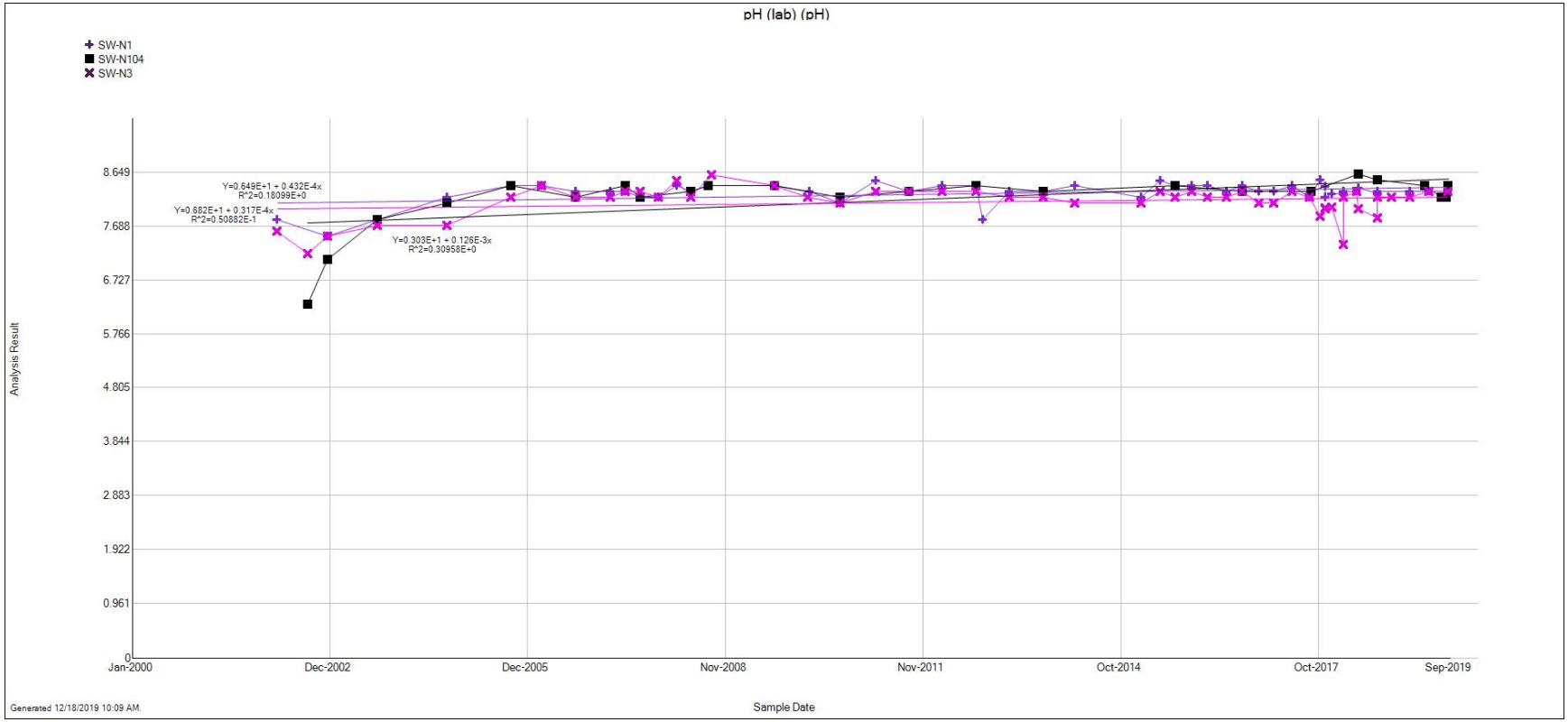
Appendix 2
Surface Water Monitoring Graphs

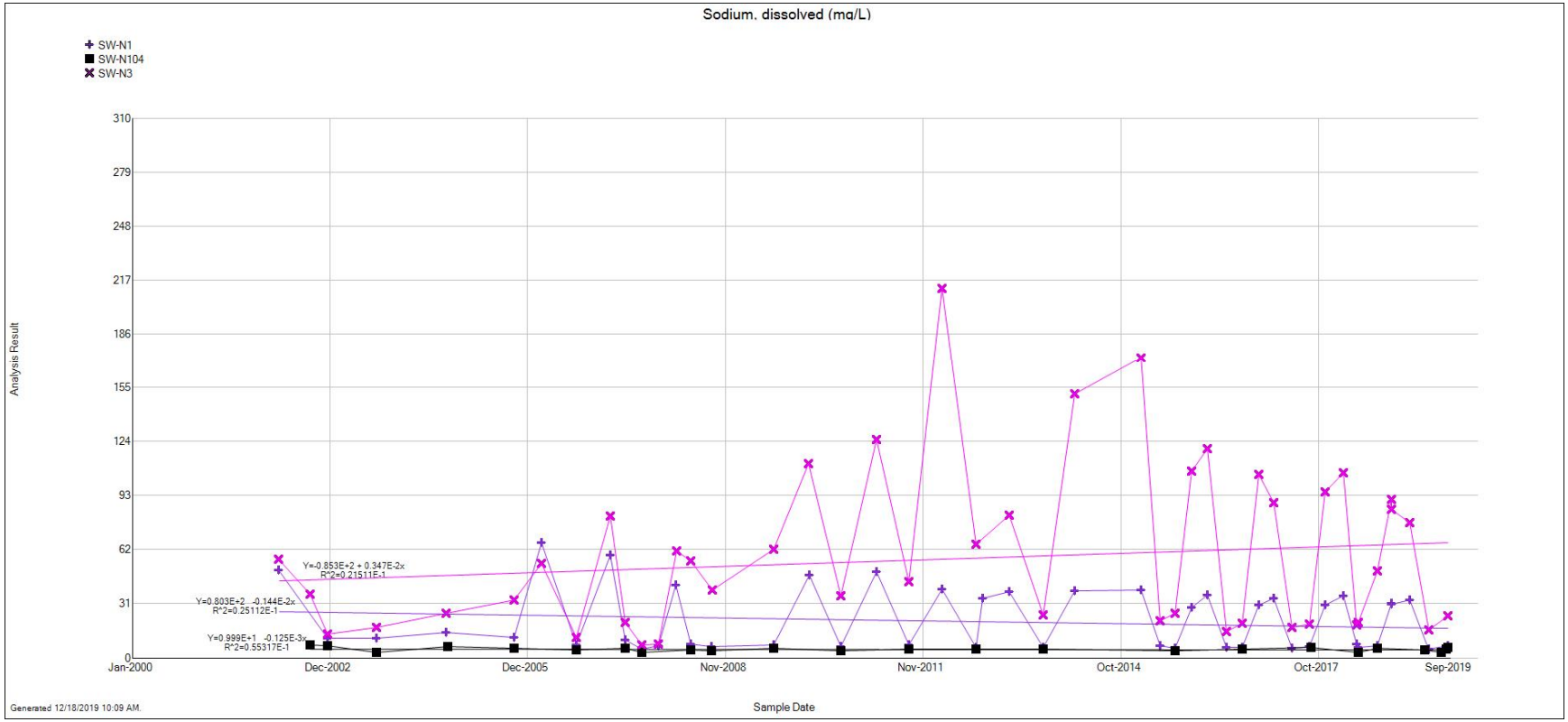

Calcium, dissolved (mg/L)
SW-N1
SW-N104
SW-N3
650
585
520
455
390
325
260
195
130
65
0
Analysis Result
Y=-0.329E+2 + 0.678E-2x
R^2=0.99431E-2
Y=0.204E+3 -0.211E-2x
R^2=0.26921E-2
Y=0.804E+2 -0.570E-3x
R^2=0.12801E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/18/2019 10:09 AM.

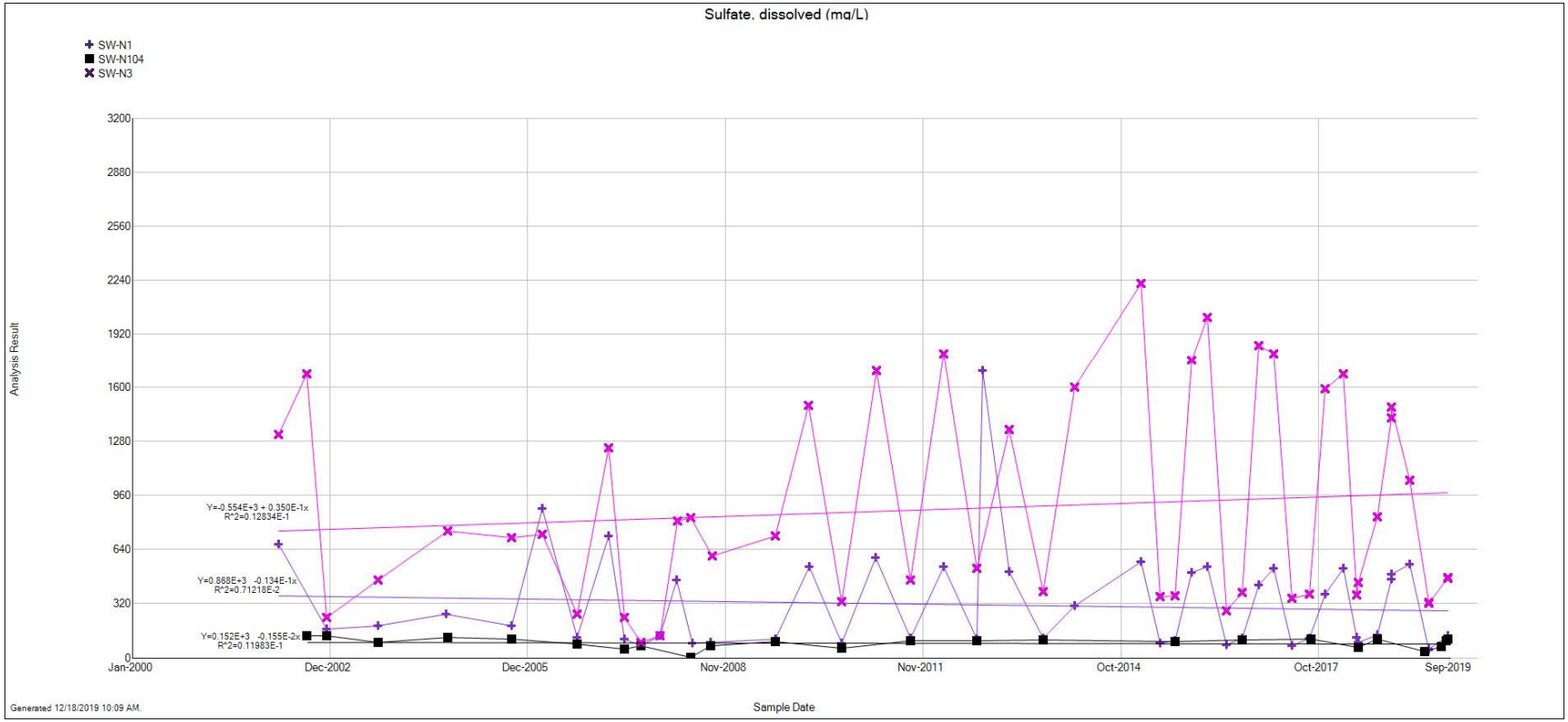

Specific Conductance @ 25C (lab) (umhos/cm)
SW-N1
SW-N104
SW-N3
Analysis Result
4600
4140
3680
3220
2760
2300
1840
1380
920
460
0
Y=-0.615E+3 + 0.586E-1x
R^2=0.15448E-1
Y=0.191E+4 -0.239E-1x
R^2=0.55519E-2
Y=0.288E+3 -0.163E-2x
R^2=0.36966E-2
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:09 AM.
Sample Date

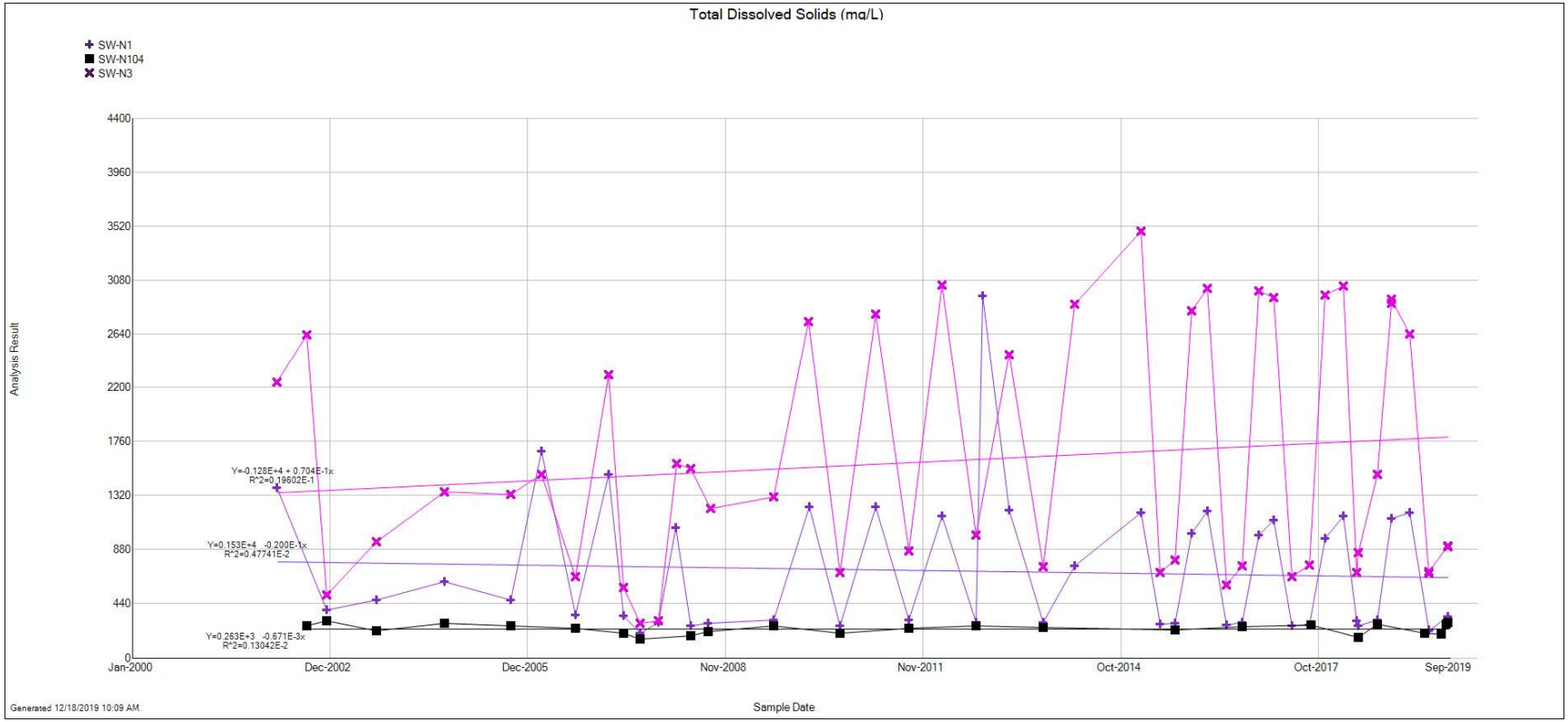

Iron, total recoverable (ug/L)
SW-N1
SW-N104
SW-N3
Analysis Result
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Y=0.899E+4 -0.180E+0x
R^2=0.27914E-1
Y=0.923E+4 -0.192E+0x
R^2=0.36509E-1
Y=0.671E+4 -0.134E+0x
R^2=0.20253E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:09 AM.
Sample Date

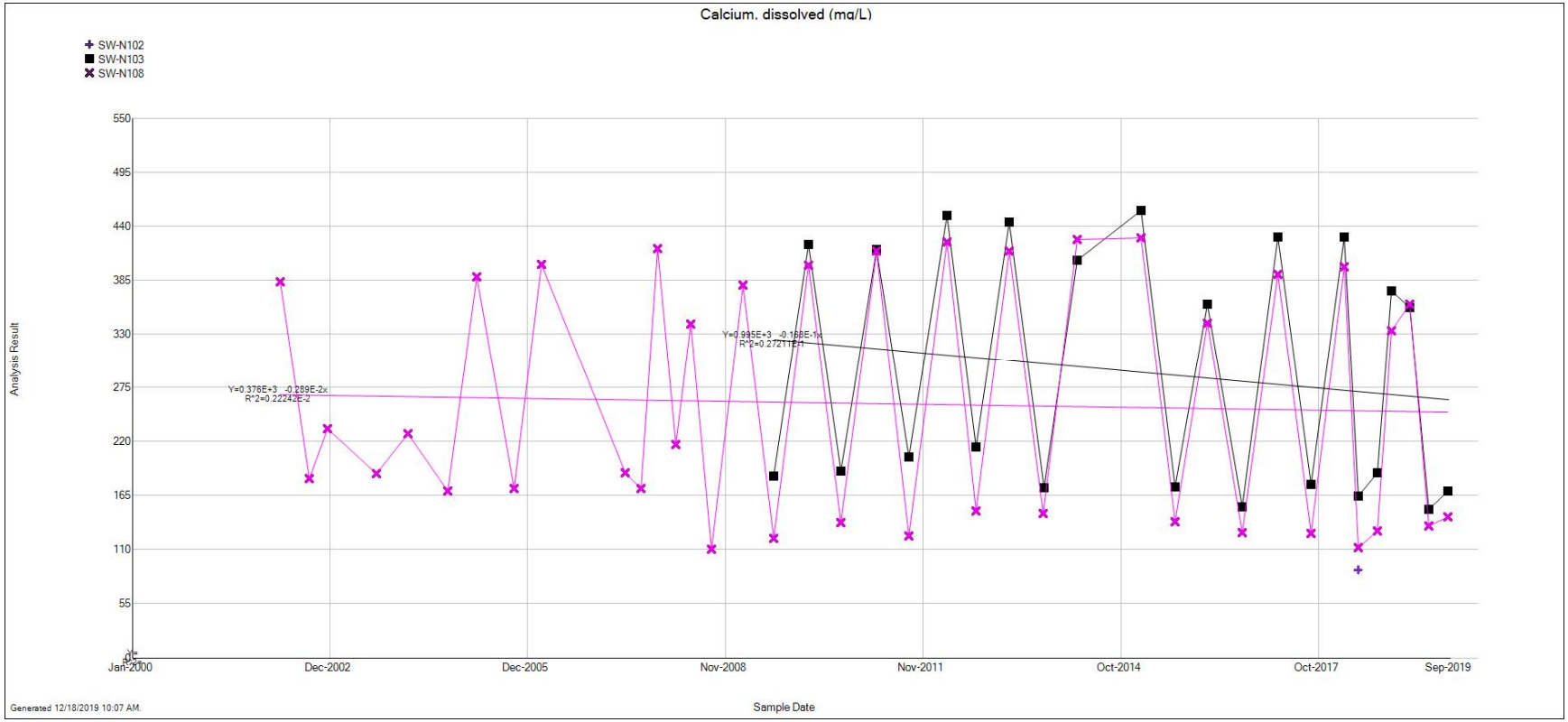

Magnesium, dissolved (mg/L)
SW-N1
SW-N104
SW-N3
Analysis Result
350
315
280
245
210
175
140
105
70
35
0
Y=-0.182E+2 + 0.311E-2x
R^2=0.68860E-2
Y=0.157E+3 -0.253E-2x
R^2=0.93301E-2
Y=0.143E+2 -0.186E-3x
R^2=0.94621E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:09 AM.
Sample Date

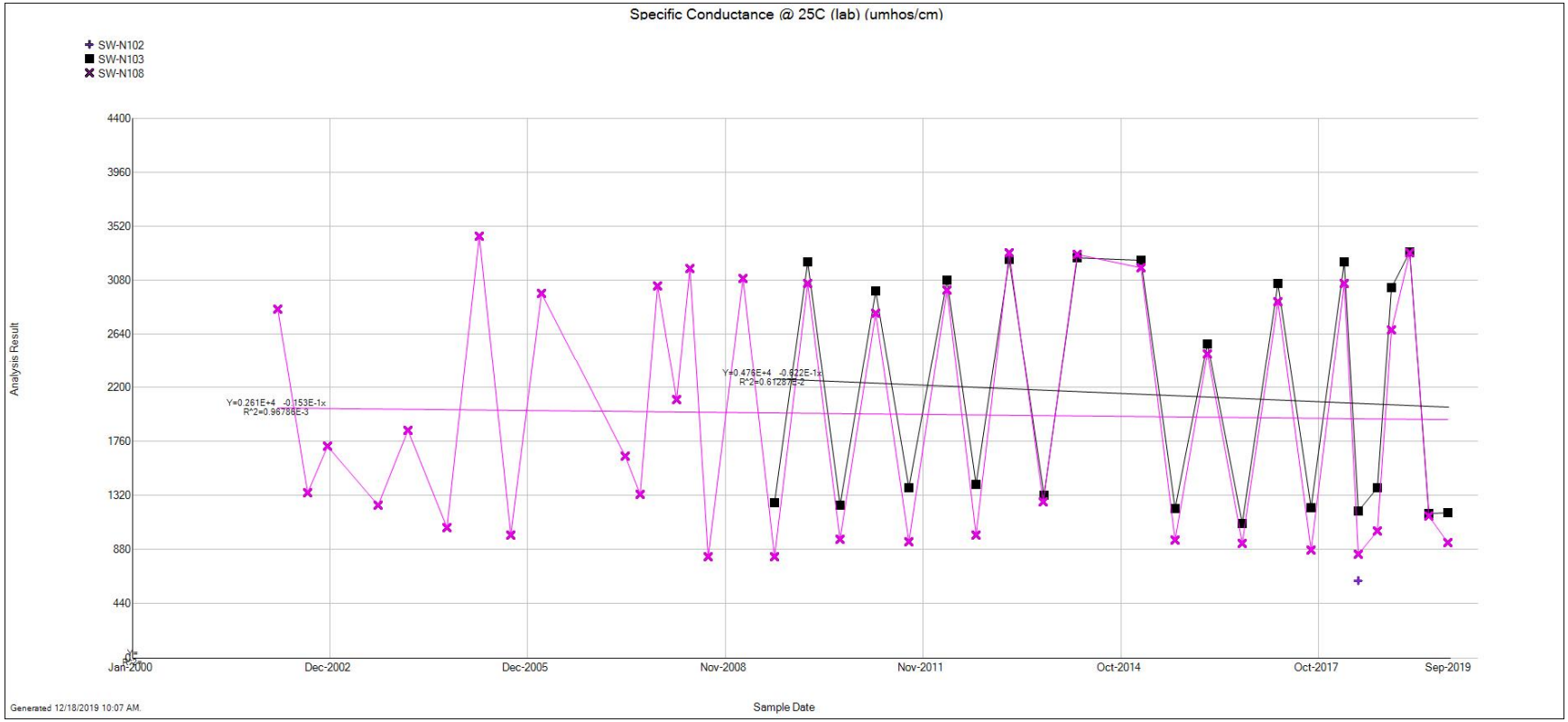

pH (lab) (pH)
SW-N1
SW-N104
SW-N3
Y=0.649E+1 + 0.432E-4x
R^2=0.18099E+0
Y=0.682E+1 + 0.317E-4x
R^2=0.50882E-1
Y=0.303E+1 + 0.126E-3x
R^2=0.30958E+0
8.649
7.688
6.727
5.766
4.805
3.844
2.883
1.922
0.961
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/18/2019 10:09 AM.

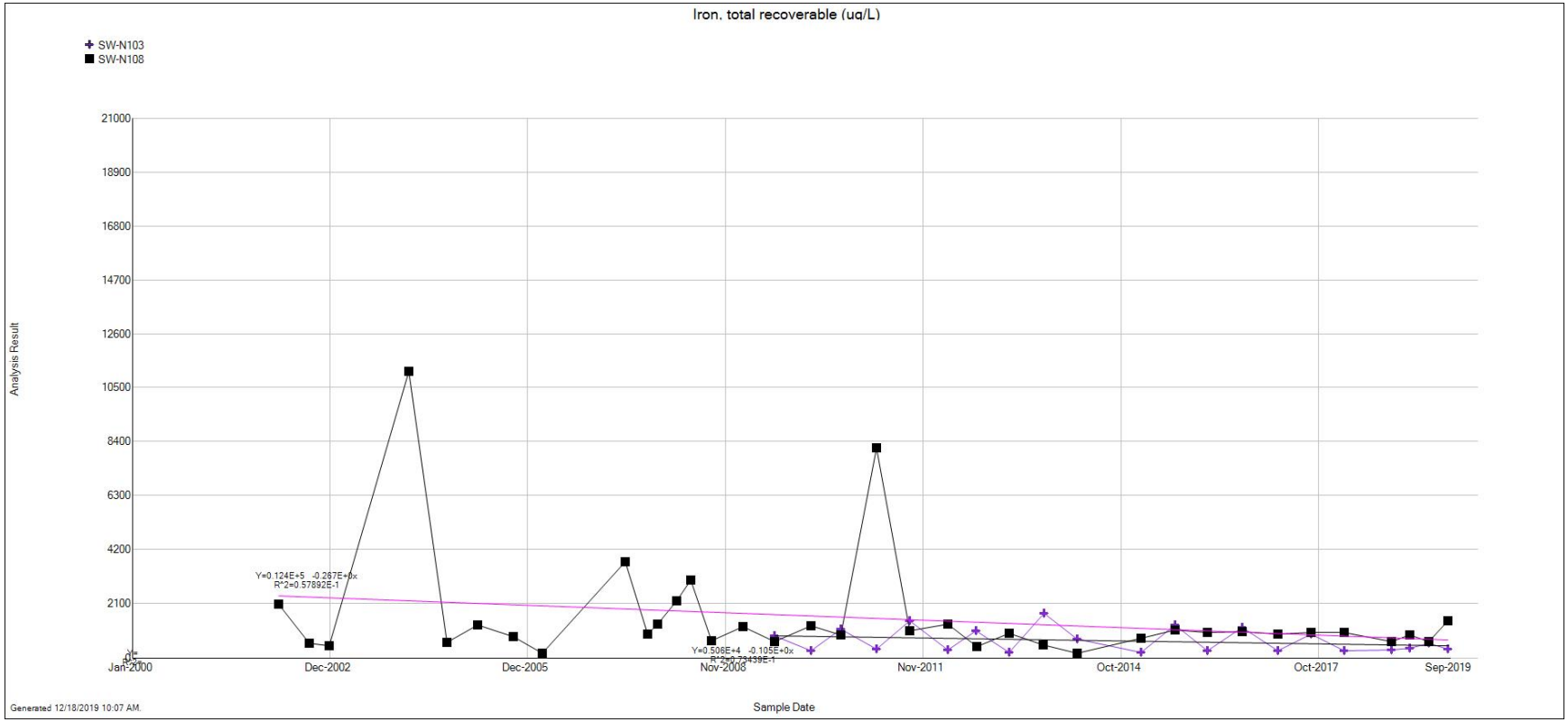

Sodium, dissolved (mg/L)
SW-N1
SW-N104
SW-N3
Analysis Result
310
279
248
217
186
155
124
93
62
31
0
Y=-0.853E+2 + 0.347E-2x
R^2=0.21511E-1
Y=0.803E+2 -0.144E-2x
R^2=0.25112E-1
Y=0.999E+1 -0.125E-3x
R^2=0.55317E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:09 AM.
Sample Date

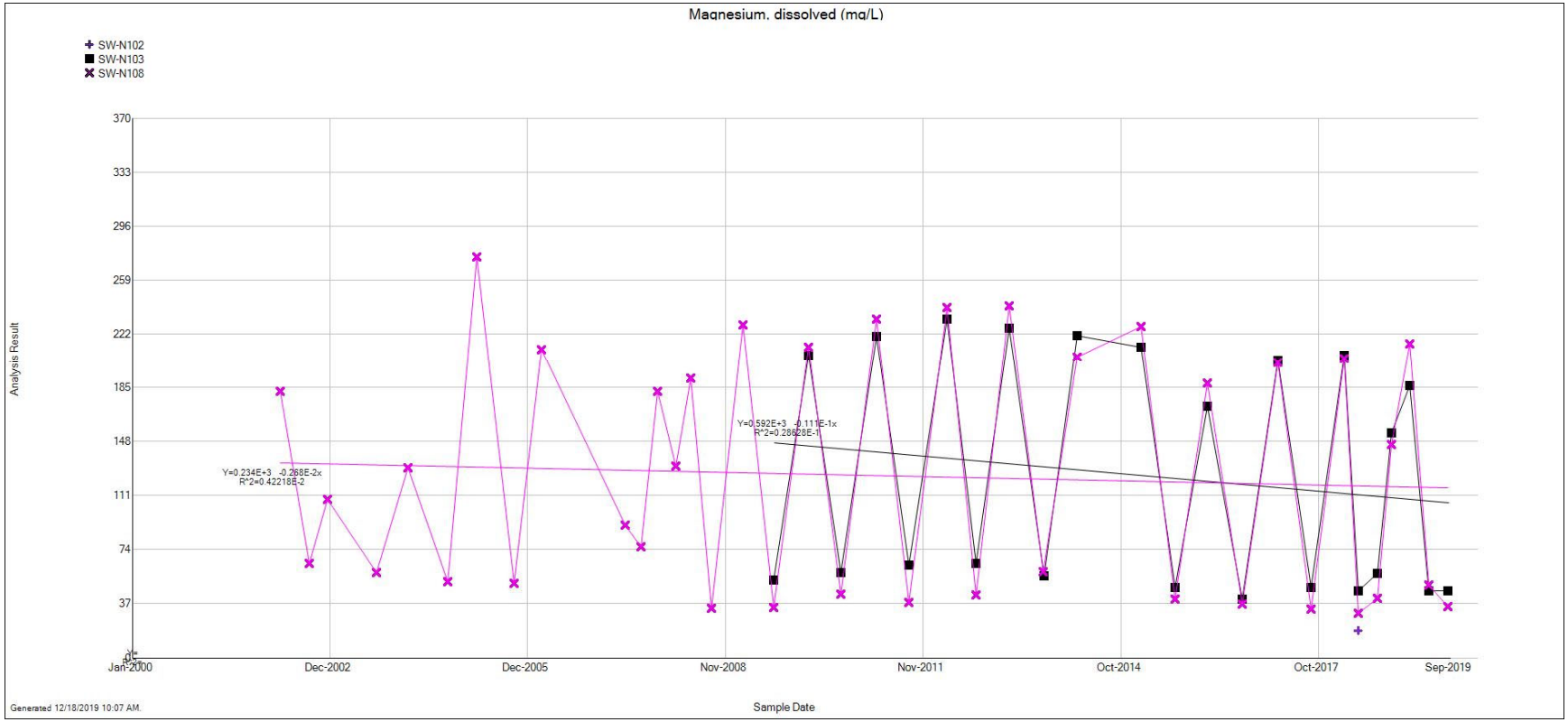

Sulfate, dissolved (mg/L)
SW-N1
SW-N104
SW-N3
Analysis Result
3200
2880
2560
2240
1920
1600
1280
960
640
320
0
Y=-0.554E+3 + 0.350E-1x
R^2=0.12834E-1
Y=0.868E+3 -0.134E-1x
R^2=0.71218E-2
Y=0.152E+3 -0.155E-2x
R^2=0.11983E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:09 AM.
Sample Date

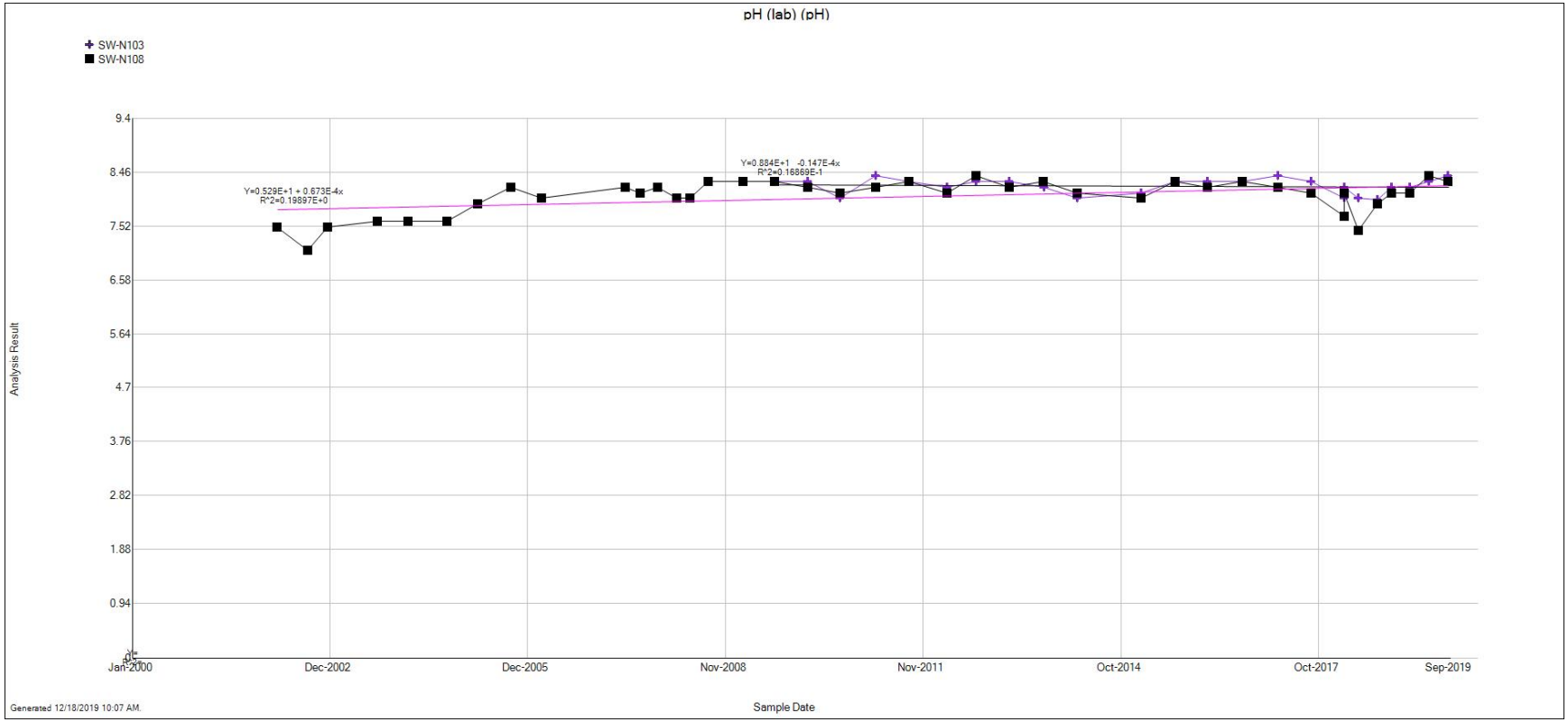

Total Dissolved Solids (mg/L)
SW-N1
SW-N104
SW-N3
Analysis Result
4400
3960
3520
3080
2640
2200
1760
1320
880
440
0
Y=-0.128E+4 + 0.704E-1x
R^2=0.19602E-1
Y=0.153E+4 -0.200E-1x
R^2=0.47741E-2
Y=0.263E+3 -0.671E-3x
R^2=0.13042E-2
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:09 AM.
Sample Date

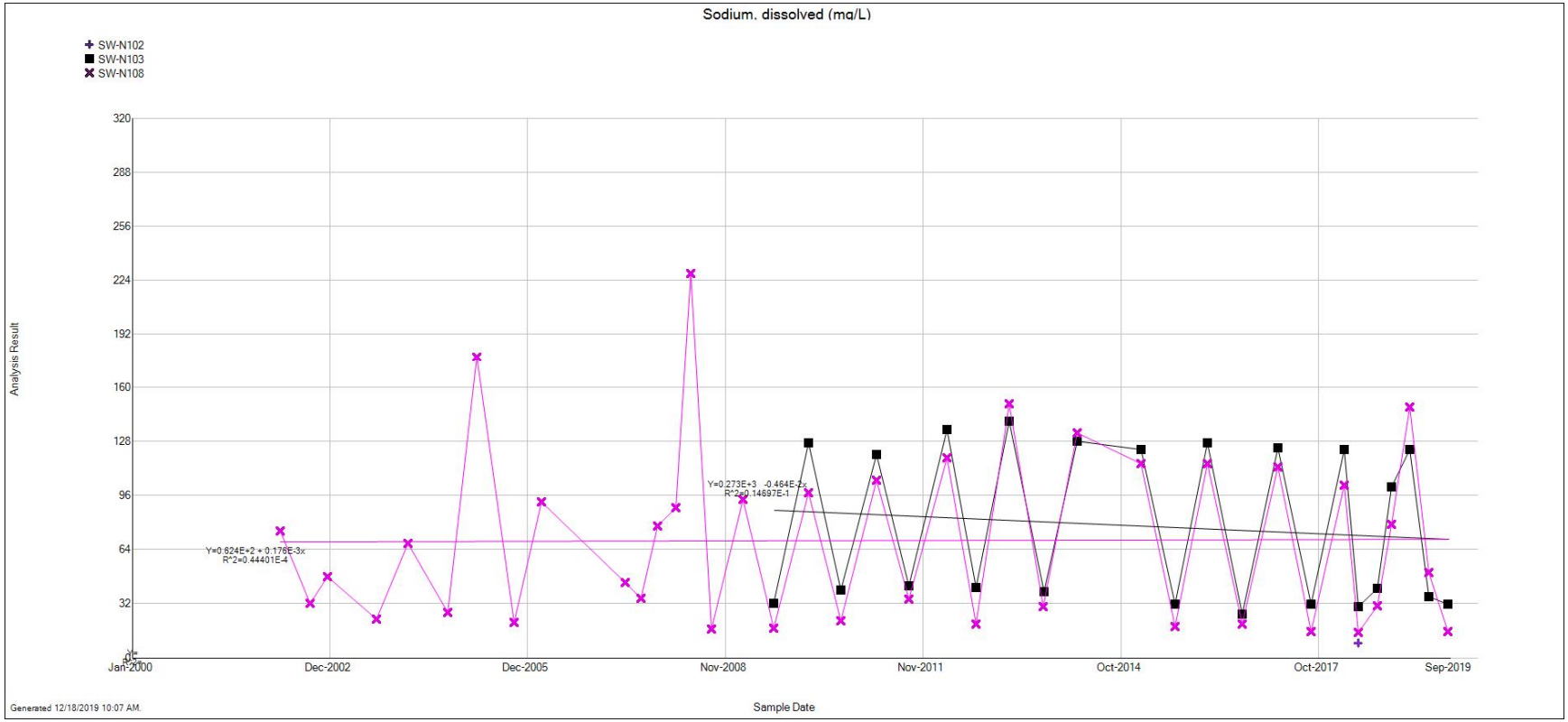

Calcium, dissolved (mg/L)
SW-N102
SW-N103
SW-N108
Analysis Result
550
495
440
385
330
275
220
165
110
55
0
Y=0.376E+3 -0.289E-2x
R^2=0.22242E-2
Y=0.995E+3 -0.168E-1x
R^2=0.27211E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:07 AM.
Sample Date

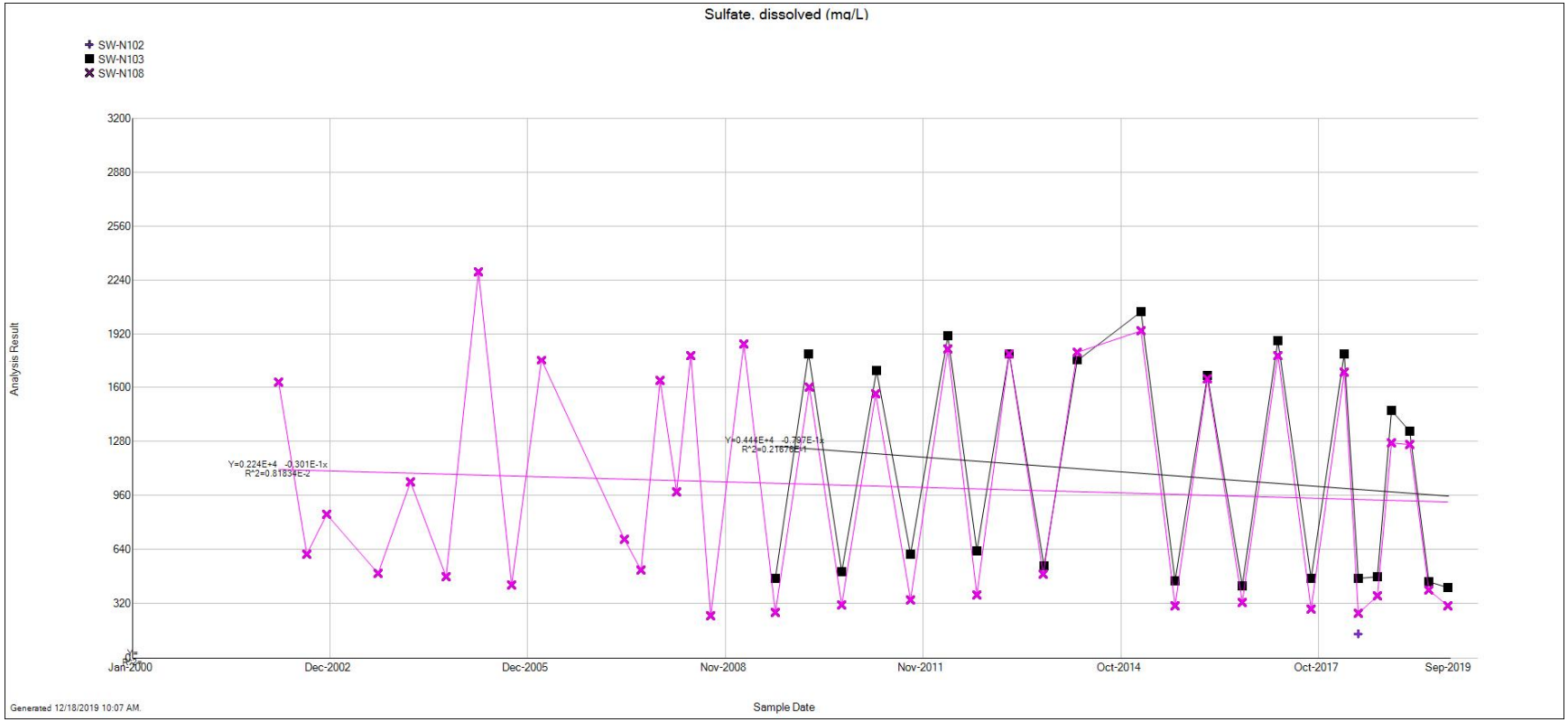

Specific Conductance @ 25C (lab) (umhos/cm)
SW-N102
SW-N103
SW-N108
Analysis Result
4400
3960
3520
3080
2640
2200
1760
1320
880
440
0
Y=0.261E+4 -0.153E-1x
R^2=0.96786E-3
Y=0.476E+4 -0.922E-1x
R^2=0.61287E-2
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:07 AM.
Sample Date

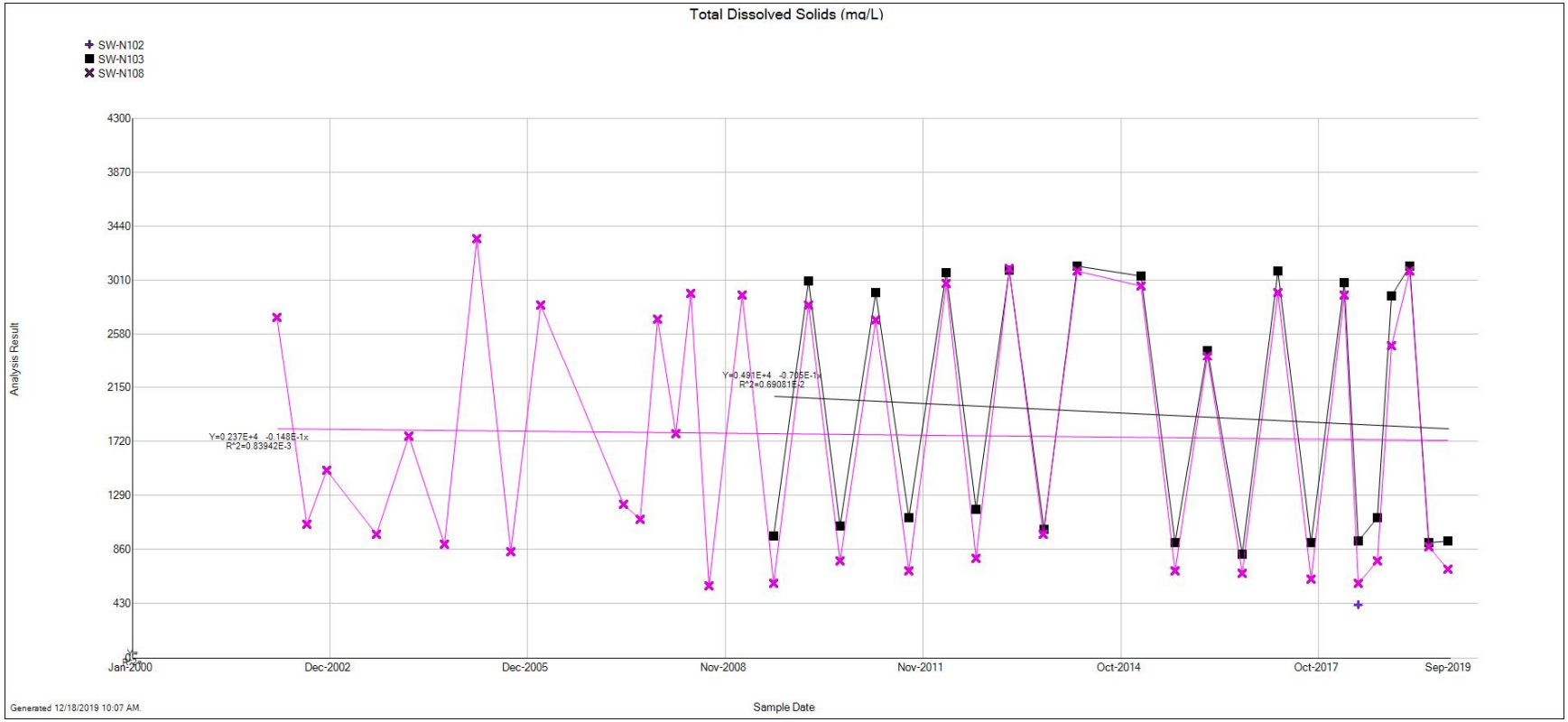

Iron, total recoverable (ug/L)
SW-N103
SW-N108
21000
18900
16800
14700
12600
10500
8400
6300
4200
2100
0
Analysis Result
Y=0.124E+5 -0.267E+0x
R^2=0.57892E-1
Y=0.506E+4 -0.105E+0x
R^2=0.73439E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:07 AM.
Sample Date


Magnesium, dissolved (mg/L)
SW-N102
SW-N103
SW-N108
Analysis Result
370
333
296
259
222
185
148
111
74
37
0
Y=0.234E+3 -0.288E-2x
R^2=0.42218E-2
Y=0.592E+3 -0.111E-1x
R^2=0.28628E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:07 AM.
Sample Date


pH (lab) (pH)
SW-N103
SW-N108
Y=0.884E+1 -0.147E-4x
R^2=0.16869E-1
Y=0.529E+1 + 0.673E-4x
R^2=0.19897E+0
9.4
8.46
7.52
6.58
5.64
4.7
3.76
2.82
1.88
0.94
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/18/2019 10:07 AM.


Sodium, dissolved (mg/L)
SW-N102
SW-N103
SW-N108
Analysis Result
320
288
256
224
192
160
128
96
64
32
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.824E+2 + 0.176E-3x
R^2=0.44401E-4
Y=0.273E+3 -0.464E-2x
R^2=0.14697E-1
Generated 12/18/2019 10:07 AM.
Sample Date


Sulfate, dissolved (mg/L)
SW-N102
SW-N103
SW-N108
Analysis Result
3200
2880
2560
2240
1920
1600
1280
960
640
320
0
Y=0.224E+4 -0.301E-1x
R^2=0.81834E-2
Y=0.444E+4 -0.797E-1x
R^2=0.21678E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:07 AM.
Sample Date


Total Dissolved Solids (mg/L)
SW-N102
SW-N103
SW-N108
Analysis Result
4300
3870
3440
3010
2580
2150
1720
1290
860
430
0
Y=0.491E+4 -0.705E-1x
R^2=0.69081E-2
Y=0.237E+4 -0.148E-1x
R^2=0.83942E-3
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/18/2019 10:07 AM.
Sample Date

Appendix 3
Groundwater Monitoring Data

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N16P1

	11/27/2018	3/19/2019	6/24/2019	9/24/2019	9/25/2019
Al, diss, mg/L	<0.0	<0.0	<0.0	<0.0	
As, TD, mg/L	<0.0	<0.0	<0.0	<0.0	
Ca, diss, mg/L	62.6	62.5	64.9	64.8	
Cation-Anion Bal, %	2.300	1.100	3.400	0.000	
Cl, diss, mg/L	24.9	24.1	23.6	22.1	
Fe, diss, mg/L	<0.0	0.0200	0.0300	<0.0	
Fe, tot rec, ug/L	36.0	70.0	50.0	30.0	
HCO3, mg/L	501.	483.	509.	500.	
Mg, diss, mg/L	28.1	28.4	27.9	29.1	
Mn, TD, mg/L		0.0379	0.0430	0.0350	
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0	
Na, diss, mg/L	865.	854.	896.	905.	
NH3 as N, diss, mg/L	1.46	1.53	1.44	1.39	
NO2 + NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0	
NO2, diss, mg/L	<0.0	<0.0	0.0200	<0.0	
NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0	
P, tot, mg/L	<0.0	<0.0	<0.0	<0.0	
Pb, TD, mg/L	<0.0	<0.0	<0.0	<0.0	
pH (field), pH	7.710	7.550	7.620	7.600	7.630
pH (lab), pH	8.300	8.400	8.200	8.300	
PO4, tot, mg/L	<0.0	<0.0	<0.0	<0.0	
Se, TD, mg/L	0.000200	<0.0	<0.0	<0.0	
SO4, diss, mg/L	1470.	1520.	1550.	1660.	
Spec. Cond. (field), umhos/cm	4370.000	4360.000	4080.000		4070.000
Spec. Cond. (lab), umhos/cm	4060.000	3870.000	4000.000	4030.000	
Sum Anions, meq/L	42.000	43.000	43.000	46.000	
Sum Cations, meq/L	44.000	44.000	46.000	46.000	
TDS, mg/L	2990.	2960.	2940.	2970.	
Temp (Celcius), degrees C	13.500	13.800	14.600	13.900	13.900
Zn, TD, mg/L	<0.0	<0.0	0.00900	<0.0	

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N17P1

	11/27/2018	3/19/2019	6/24/2019	9/24/2019
Al, diss, mg/L	<0.0	<0.0	<0.0	<0.0
As, TD, mg/L	<0.0	<0.0	<0.0	<0.0
Ca, diss, mg/L	257.	286.	25.8	271.
Cation-Anion Bal, %	6.800	6.300	2.300	0.000
Cl, diss, mg/L	26.2	26.1	19.8	23.9
Fe, diss, mg/L	0.0300	<0.0	0.0200	0.100
Fe, tot rec, ug/L	882.	27500.	70.0	280.
HCO3, mg/L	641.	632.	620.	622.
Mg, diss, mg/L	182.	207.	16.2	191.
Mn, TD, mg/L		0.180	0.00760	0.157
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	792.	785.	934.	828.
NH3 as N, diss, mg/L	2.26	2.80	0.910	2.22
NO2 + NO3, diss, mg/L	<0.0	<0.0	0.620	<0.0
NO2, diss, mg/L	<0.0	<0.0	0.0900	<0.0
NO3, diss, mg/L	<0.0	<0.0	0.530	<0.0
P, tot, mg/L	0.0300	0.490	<0.0	<0.0
Pb, TD, mg/L	<0.0	<0.0	<0.0	<0.0
pH (field), pH	7.350	7.170	6.890	7.300
pH (lab), pH	8.100	8.200	8.400	8.100
PO4, tot, mg/L	0.0900	1.50	<0.0	<0.0
Se, TD, mg/L	0.000500	<0.0	<0.0	<0.0
SO4, diss, mg/L	1980.	2190.	1330.	2540.
Spec. Cond. (field), umhos/cm	5320.000	5380.000	3210.000	4920.000
Spec. Cond. (lab), umhos/cm	4820.000	4730.000	3920.000	4900.000
Sum Anions, meq/L	55.000	59.000	42.000	66.000
Sum Cations, meq/L	63.000	67.000	44.000	66.000
TDS, mg/L	4190.	4260.	2820.	4150.
Temp (Celcius), degrees C	13.200	13.800	14.000	14.900
Zn, TD, mg/L	<0.0	<0.0	0.0100	0.0300

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N18P1

	11/27/2018	3/19/2019	6/24/2019	9/24/2019
Al, diss, mg/L	<0.0		<0.0	<0.0
As, TD, mg/L	0.000900	<0.0	<0.0	<0.0
Ca, diss, mg/L	181.	409.	536.	455.
Cation-Anion Bal, %	5.100	0.000	3.400	2.600
Cl, diss, mg/L	16.4	18.3	16.2	14.0
Fe, diss, mg/L	0.0550	0.0100	0.0100	0.0100
Fe, tot rec, ug/L	301.	40.0	30.0	30.0
HCO3, mg/L	494.	431.	440.	487.
Mg, diss, mg/L	95.7	193.	198.	168.
Mn, TD, mg/L		0.0665	0.0196	0.00340
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	789.	93.1	63.5	82.8
NH3 as N, diss, mg/L	1.43	0.170	<0.0	<0.0
NO2 + NO3, diss, mg/L	<0.0	0.790	0.640	0.470
NO2, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO3, diss, mg/L	<0.0	0.790	0.640	0.470
P, tot, mg/L	<0.0	<0.0	<0.0	<0.0
Pb, TD, mg/L	<0.0	<0.0	<0.0	<0.0
pH (field), pH	7.100	6.790	6.810	6.700
pH (lab), pH	7.900	8.000	7.900	7.800
PO4, tot, mg/L	<0.0	<0.0	<0.0	<0.0
Se, TD, mg/L	0.000600	0.00430	0.00180	0.00100
SO4, diss, mg/L	1730.	1530.	1620.	1310.
Spec. Cond. (field), umhos/cm	4240.000	3040.000	3120.000	2800.000
Spec. Cond. (lab), umhos/cm	3620.000	2920.000	3140.000	2740.000
Sum Anions, meq/L	47.000	41.000	43.000	38.000
Sum Cations, meq/L	52.000	41.000	46.000	40.000
TDS, mg/L	3140.	2890.	3100.	2550.
Temp (Celcius), degrees C	12.600	13.400	13.200	13.500
Zn, TD, mg/L	0.0230	0.0230	0.0110	0.0360

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N3

	11/12/2018	3/19/2019	6/19/2019	9/24/2019
Al, diss, mg/L	<0.0	0.0700	<0.0	<0.0
As, TD, mg/L	0.00210	0.00180	0.00170	0.00190
Ca, diss, mg/L	368.	431.	383.	417.
Cation-Anion Bal, %	0.000	2.800	1.600	-6.700
Cl, diss, mg/L	20.2	21.2	16.3	20.4
Fe, diss, mg/L	1.54	1.53	1.26	2.04
Fe, tot rec, ug/L	8320.	9950.	7770.	7950.
HCO3, mg/L	405.	417.	357.	394.
Mg, diss, mg/L	125.	151.	123.	141.
Mn, TD, mg/L	1.27	1.24	1.23	1.23
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	46.6	56.6	46.0	56.1
NH3 as N, diss, mg/L	0.440	0.470	0.360	0.420
NO2 + NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO2, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0
P, tot, mg/L	0.0500	0.0900	0.0500	0.0500
Pb, TD, mg/L	<0.0	<0.0	0.000400	<0.0
pH (field), pH	6.600	6.500	6.630	6.510
pH (lab), pH	7.600	7.700	7.800	7.700
PO4, tot, mg/L	0.160	0.280	0.160	0.160
Se, TD, mg/L	0.000200	<0.0	0.000400	<0.0
SO4, diss, mg/L	1050.	1240.	1120.	1480.
Spec. Cond. (field), umhos/cm	3780.000	2900.000	2620.000	2660.000
Spec. Cond. (lab), umhos/cm	2510.000	2550.000	2360.000	2600.000
Sum Anions, meq/L	31.000	35.000	31.000	40.000
Sum Cations, meq/L	31.000	37.000	32.000	35.000
TDS, mg/L	2360.	2470.	2190.	2480.
Temp (Celcius), degrees C	16.600	17.400	18.600	17.400
Zn, TD, mg/L	0.0110	0.00900	0.0110	0.0130

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N36

	11/12/2018	3/19/2019	6/20/2019	9/23/2019
Al, diss, mg/L	<0.0	0.0800	0.290	0.400
As, TD, mg/L	<0.0	<0.0	<0.0	<0.0
Ca, diss, mg/L	178.	163.	83.5	58.8
Cation-Anion Bal, %	0.000	0.000	1.800	-2.400
Cl, diss, mg/L	30.0	27.7		10.7
Fe, diss, mg/L	0.0600	0.195	0.0170	0.0540
Fe, tot rec, ug/L	621.	585.	50.0	72.0
HCO3, mg/L	583.	511.	78.0	63.4
Mg, diss, mg/L	91.5	82.9	32.1	23.0
Mn, TD, mg/L	0.0714	0.0704	0.155	0.0919
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	88.5	81.4	33.1	25.8
NH3 as N, diss, mg/L	1.05	0.890		0.0600
NO2 + NO3, diss, mg/L	<0.0	0.0900		0.520
NO2, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO3, diss, mg/L	<0.0	0.0900	0.430	0.520
P, tot, mg/L	<0.0	<0.0	<0.0	<0.0
Pb, TD, mg/L	<0.0	<0.0	0.000300	0.000400
pH (field), pH	6.930		5.790	5.800
pH (lab), pH	7.900	8.100		7.000
PO4, tot, mg/L	<0.0	<0.0	<0.0	<0.0
Se, TD, mg/L	<0.0	<0.0	0.00120	0.00120
SO4, diss, mg/L	419.	376.		231.
Spec. Cond. (field), umhos/cm	1812.000	1666.000	814.000	632.000
Spec. Cond. (lab), umhos/cm	1850.000	1580.000	801.000	629.000
Sum Anions, meq/L	21.000	19.000	8.200	6.500
Sum Cations, meq/L	21.000	19.000	8.500	6.200
TDS, mg/L	1380.	1190.	590.	458.
Temp (Celcius), degrees C	13.900		14.600	16.800
Zn, TD, mg/L	0.0270	0.0300	0.100	0.0720

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N37

	6/20/2019	9/24/2019
Al, diss, mg/L	1.13	0.760
As, TD, mg/L	<0.0	<0.0
Ca, diss, mg/L	46.2	31.7
Cation-Anion Bal, %	4.300	1.400
Cl, diss, mg/L		9.20
Fe, diss, mg/L	0.0300	0.153
Fe, tot rec, ug/L	39.0	158.
HCO3, mg/L	<0.0	<0.0
Mg, diss, mg/L	17.7	12.3
Mn, TD, mg/L	0.0226	0.0201
Mo, diss, mg/L	<0.0	<0.0
Na, diss, mg/L	19.0	16.3
NH3 as N, diss, mg/L		<0.0
NO2 + NO3, diss, mg/L		0.520
NO2, diss, mg/L	<0.0	<0.0
NO3, diss, mg/L	0.650	0.520
P, tot, mg/L	<0.0	0.0100
Pb, TD, mg/L	0.00100	0.000900
pH (field), pH		4.200
pH (lab), pH		4.900
PO4, tot, mg/L	<0.0	0.0300
Se, TD, mg/L	0.00160	0.00120
SO4, diss, mg/L		148.
Spec. Cond. (field), umhos/cm		394.000
Spec. Cond. (lab), umhos/cm	509.000	392.000
Sum Anions, meq/L	4.400	3.400
Sum Cations, meq/L	4.800	3.500
TDS, mg/L	374.	324.
Temp (Celcius), degrees C		15.700
Zn, TD, mg/L	0.0550	0.0420

Date Range: 10/01/2018 to 09/30/2019
Well: GW-N38

	6/20/2019	6/24/2019
Al, diss, mg/L		0.100
As, TD, mg/L		0.000700
Ca, diss, mg/L		291.
Cation-Anion Bal, %		5.900
Cl, diss, mg/L		48.3
Fe, diss, mg/L		0.219
Fe, tot rec, ug/L		6860.
HCO3, mg/L		248.
Mg, diss, mg/L		23.0
Mn, TD, mg/L		0.0226
Mo, diss, mg/L		<0.0
Na, diss, mg/L		24.2
NH3 as N, diss, mg/L		0.350
NO2 + NO3, diss, mg/L		1.92
NO2, diss, mg/L		0.420
NO3, diss, mg/L		1.50
P, tot, mg/L		0.260
Pb, TD, mg/L		0.000500
pH (field), pH	6.670	
pH (lab), pH		7.800
PO4, tot, mg/L		0.810
Se, TD, mg/L		0.00160
SO4, diss, mg/L		472.
Spec. Cond. (field), umhos/cm	1350.000	
Spec. Cond. (lab), umhos/cm		1410.000
Sum Anions, meq/L		16.000
Sum Cations, meq/L		18.000
TDS, mg/L		1160.
Temp (Celcius), degrees C	16.300	
Zn, TD, mg/L		0.0160

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N39

	12/27/2018	3/20/2019	6/24/2019	9/23/2019
Al, diss, mg/L	0.150	0.0800	<0.0	<0.0
As, TD, mg/L	0.00150	0.00140	0.000700	0.00120
Ca, diss, mg/L	649.	631.	630.	638.
Cation-Anion Bal, %	3.600	3.700	4.700	6.000
Cl, diss, mg/L	18.6	12.6	15.0	10.1
Fe, diss, mg/L	5.83	4.87	1.85	3.97
Fe, tot rec, ug/L	38700.	22200.	13400.	24900.
HCO3, mg/L	425.	404.	426.	424.
Mg, diss, mg/L	96.7	86.9	116.	103.
Mn, TD, mg/L		8.13	8.00	9.83
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	41.4	41.8	61.8	53.7
NH3 as N, diss, mg/L	0.630	0.860	0.530	0.430
NO2 + NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO2, diss, mg/L	<0.0	<0.0	<0.0	0.0100
NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0
P, tot, mg/L	0.220	0.0400	0.0400	0.0800
Pb, TD, mg/L	0.000200	<0.0	<0.0	<0.0
pH (field), pH		6.430	6.870	6.710
pH (lab), pH	7.800	7.700	7.600	7.700
PO4, tot, mg/L	0.680	0.120	0.120	0.250
Se, TD, mg/L	0.000300	<0.0	<0.0	0.000300
SO4, diss, mg/L	1460.	1430.	1530.	1460.
Spec. Cond. (field), umhos/cm		3340.000	3.190	2980.000
Spec. Cond. (lab), umhos/cm	3040.000	2730.000	2840.000	3010.000
Sum Anions, meq/L	40.000	39.000	41.000	39.000
Sum Cations, meq/L	43.000	42.000	45.000	44.000
TDS, mg/L	2900.	2800.	2740.	2970.
Temp (Celcius), degrees C		6.300	11.800	14.200
Zn, TD, mg/L	0.156	0.0100	0.0250	0.0130

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N40

	11/12/2018	3/20/2019	6/24/2019	9/23/2019
Al, diss, mg/L	0.0800	0.160	<0.0	<0.0
As, TD, mg/L	<0.0	0.000500	<0.0	0.000500
Ca, diss, mg/L	256.	479.	413.	285.
Cation-Anion Bal, %	-1.600	4.000	1.300	1.900
Cl, diss, mg/L	17.4	29.5	23.3	10.1
Fe, diss, mg/L	0.0240	0.0400	0.0400	0.0240
Fe, tot rec, ug/L	3790.	1770.	2010.	1490.
HCO3, mg/L	441.	453.	360.	310.
Mg, diss, mg/L	150.	255.	170.	111.
Mn, TD, mg/L	1.73	2.44	1.54	1.80
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	94.9	144.	95.8	79.7
NH3 as N, diss, mg/L	0.0900	0.120	0.200	0.210
NO2 + NO3, diss, mg/L	<0.0	0.0500	<0.0	0.0200
NO2, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO3, diss, mg/L	<0.0	0.0500	<0.0	0.0200
P, tot, mg/L	0.120	0.0900	0.0900	0.0800
Pb, TD, mg/L	<0.0	<0.0	<0.0	<0.0
pH (field), pH	7.170	6.940	7.270	7.120
pH (lab), pH	7.900	8.000	7.900	7.900
PO4, tot, mg/L	0.370	0.280	0.280	0.250
Se, TD, mg/L	<0.0	<0.0	<0.0	<0.0
SO4, diss, mg/L	1020.	1810.	1410.	930.
Spec. Cond. (field), umhos/cm	2860.000	4010.000	2.740	2048.000
Spec. Cond. (lab), umhos/cm	2510.000	3230.000	2740.000	2040.000
Sum Anions, meq/L	31.000	48.000	38.000	26.000
Sum Cations, meq/L	30.000	52.000	39.000	27.000
TDS, mg/L	2270.	3310.	2590.	1770.
Temp (Celcius), degrees C	10.500	5.300	10.800	15.300
Zn, TD, mg/L	<0.0	0.00800	<0.0	0.0100

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N41

	3/19/2019	6/20/2019	9/23/2019
Al, diss, mg/L		0.390	<0.0
As, TD, mg/L		<0.0	<0.0
Ca, diss, mg/L		53.8	87.1
Cation-Anion Bal, %		1.900	-1.900
Cl, diss, mg/L			3.40
Fe, diss, mg/L		0.0120	0.0320
Fe, tot rec, ug/L		494.	1740.
HCO3, mg/L		172.	286.
Mg, diss, mg/L		21.9	37.3
Mn, TD, mg/L		0.127	0.0868
Mo, diss, mg/L		<0.0	<0.0
Na, diss, mg/L		16.7	7.60
NH3 as N, diss, mg/L			<0.0
NO2 + NO3, diss, mg/L			0.100
NO2, diss, mg/L		<0.0	<0.0
NO3, diss, mg/L		0.370	0.100
P, tot, mg/L		<0.0	0.0600
Pb, TD, mg/L		0.000200	<0.0
pH (field), pH	7.250	3.870	7.020
pH (lab), pH		8.000	8.100
PO4, tot, mg/L		<0.0	0.190
Se, TD, mg/L		0.00170	0.000400
SO4, diss, mg/L		71.9	106.
Spec. Cond. (field), umhos/cm	1080.000	600.000	737.000
Spec. Cond. (lab), umhos/cm		605.000	722.000
Sum Anions, meq/L		5.100	8.100
Sum Cations, meq/L		5.300	7.800
TDS, mg/L		430.	498.
Temp (Celcius), degrees C	11.000	17.100	17.500
Zn, TD, mg/L		0.0680	0.0120

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N39

	12/27/2018	3/20/2019	6/24/2019	9/23/2019
Al, diss, mg/L	0.150	0.0800	<0.0	<0.0
As, TD, mg/L	0.00150	0.00140	0.000700	0.00120
Ca, diss, mg/L	649.	631.	630.	638.
Cation-Anion Bal, %	3.600	3.700	4.700	6.000
Cl, diss, mg/L	18.6	12.6	15.0	10.1
Fe, diss, mg/L	5.83	4.87	1.85	3.97
Fe, tot rec, ug/L	38700.	22200.	13400.	24900.
HCO3, mg/L	425.	404.	426.	424.
Mg, diss, mg/L	96.7	86.9	116.	103.
Mn, TD, mg/L		8.13	8.00	9.83
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	41.4	41.8	61.8	53.7
NH3 as N, diss, mg/L	0.630	0.860	0.530	0.430
NO2 + NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO2, diss, mg/L	<0.0	<0.0	<0.0	0.0100
NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0
P, tot, mg/L	0.220	0.0400	0.0400	0.0800
Pb, TD, mg/L	0.000200	<0.0	<0.0	<0.0
pH (field), pH		6.430	6.870	6.710
pH (lab), pH	7.800	7.700	7.600	7.700
PO4, tot, mg/L	0.680	0.120	0.120	0.250
Se, TD, mg/L	0.000300	<0.0	<0.0	0.000300
SO4, diss, mg/L	1460.	1430.	1530.	1460.
Spec. Cond. (field), umhos/cm		3340.000	3.190	2980.000
Spec. Cond. (lab), umhos/cm	3040.000	2730.000	2840.000	3010.000
Sum Anions, meq/L	40.000	39.000	41.000	39.000
Sum Cations, meq/L	43.000	42.000	45.000	44.000
TDS, mg/L	2900.	2800.	2740.	2970.
Temp (Celcius), degrees C		6.300	11.800	14.200
Zn, TD, mg/L	0.156	0.0100	0.0250	0.0130

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N43

	11/12/2018	3/19/2019	6/20/2019	9/23/2019
Al, diss, mg/L	0.130		3.91	2.45
As, TD, mg/L	0.000700		<0.0	<0.0
Ca, diss, mg/L	130.		52.0	32.6
Cation-Anion Bal, %	9.100		3.600	-2.500
Cl, diss, mg/L	9.50		7.60	6.80
Fe, diss, mg/L	0.0530		0.128	0.163
Fe, tot rec, ug/L	3850.		197.	204.
HCO3, mg/L	94.9		<0.0	<0.0
Mg, diss, mg/L	47.9		19.7	14.0
Mn, TD, mg/L	0.348		0.217	0.137
Mo, diss, mg/L	<0.0		<0.0	<0.0
Na, diss, mg/L	28.8		23.7	19.0
NH3 as N, diss, mg/L	0.160		0.0600	0.0500
NO2 + NO3, diss, mg/L	2.48		3.58	2.48
NO2, diss, mg/L	<0.0		<0.0	<0.0
NO3, diss, mg/L	2.48		3.58	2.48
P, tot, mg/L	0.100		<0.0	<0.0
Pb, TD, mg/L	0.00100		0.00110	0.000900
pH (field), pH	5.830	6.070		3.900
pH (lab), pH	7.000		4.000	4.100
PO4, tot, mg/L	0.310		<0.0	<0.0
Se, TD, mg/L	0.00230		0.00240	0.00200
SO4, diss, mg/L	366.		235.	177.
Spec. Cond. (field), umhos/cm	1175.000	1285.000		476.000
Spec. Cond. (lab), umhos/cm	1510.000		611.000	465.000
Sum Anions, meq/L	10.000		5.400	4.100
Sum Cations, meq/L	12.000		5.800	3.900
TDS, mg/L	1280.		426.	322.
Temp (Celcius), degrees C	10.300	13.000		14.300
Zn, TD, mg/L	0.0480		0.118	0.0900

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N44

	11/26/2018	3/20/2019	6/26/2019	8/26/2019
Al, diss, mg/L	<0.0	<0.0	<0.0	<0.0
As, TD, mg/L	<0.0	<0.0	<0.0	<0.0
Ca, diss, mg/L	305.	352.	300.	279.
Cation-Anion Bal, %	0.000	5.300	0.000	0.000
Cl, diss, mg/L	15.9	13.9	12.0	
Fe, diss, mg/L	0.0390	<0.0	0.00900	0.00700
Fe, tot rec, ug/L	49.0	97.0	27.0	140.
HCO3, mg/L	384.	382.	407.	388.
Mg, diss, mg/L	112.	127.	103.	104.
Mn, TD, mg/L		0.00400	<0.0	0.00240
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	40.5	39.0	40.7	43.6
NH3 as N, diss, mg/L	<0.0	<0.0	<0.0	
NO2 + NO3, diss, mg/L	0.140	0.180	0.280	
NO2, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO3, diss, mg/L	0.140	0.180	0.280	0.210
P, tot, mg/L	<0.0	<0.0	<0.0	<0.0
Pb, TD, mg/L	<0.0	<0.0	<0.0	<0.0
pH (field), pH	7.270	7.110	7.200	7.200
pH (lab), pH	8.100	8.100	8.000	
PO4, tot, mg/L	<0.0	<0.0	<0.0	<0.0
Se, TD, mg/L	0.00410	0.00350	0.00330	0.00300
SO4, diss, mg/L	868.	921.	777.	
Spec. Cond. (field), umhos/cm	1991.000	2400.000	1.891	1896.000
Spec. Cond. (lab), umhos/cm	2000.000	2070.000	1910.000	1860.000
Sum Anions, meq/L	26.000	27.000	25.000	24.000
Sum Cations, meq/L	26.000	30.000	25.000	24.000
TDS, mg/L	1730.	1920.	1600.	1530.
Temp (Celcius), degrees C	11.800	9.900	11.600	10.800
Zn, TD, mg/L	<0.0	<0.0	<0.0	0.0110

New Horizon Mine

Date Range: 10/01/2018 to 09/30/2019

Well: GW-N45

	11/26/2018	3/20/2019	6/26/2019	8/26/2019
Al, diss, mg/L	<0.0	<0.0	<0.0	<0.0
As, TD, mg/L	<0.0	<0.0	<0.0	<0.0
Ca, diss, mg/L	147.	138.	180.	144.
Cation-Anion Bal, %	3.800	9.600	-3.800	-2.200
Cl, diss, mg/L	67.8	66.3	73.5	
Fe, diss, mg/L	0.110	0.0500	0.0600	0.0600
Fe, tot rec, ug/L	1370.	110.	100.	80.0
HCO3, mg/L	1150.	1150.	1150.	1130.
Mg, diss, mg/L	1670.	1700.	1890.	1630.
Mn, TD, mg/L		1.00	1.63	1.28
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	1360.	1320.	1480.	1380.
NH3 as N, diss, mg/L	2.36	2.69	2.77	2.32
NO2 + NO3, diss, mg/L	<0.0	0.150	<0.0	
NO2, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO3, diss, mg/L	<0.0	0.150	<0.0	<0.0
P, tot, mg/L	0.0900	0.0800	0.0700	0.0700
Pb, TD, mg/L	0.00100	0.000400	0.00100	<0.0
pH (field), pH		7.640	7.570	7.630
pH (lab), pH	8.100	8.200	8.000	8.100
PO4, tot, mg/L	0.280	0.250	0.220	0.220
Se, TD, mg/L	0.00100	0.000300	<0.0	<0.0
SO4, diss, mg/L	7840.	6850.	10600.	8860.
Spec. Cond. (field), umhos/cm		11620.000	13210.000	11950.000
Spec. Cond. (lab), umhos/cm	11200.000	9730.000	12900.000	11800.000
Sum Anions, meq/L	190.000	169.000	248.000	211.000
Sum Cations, meq/L	205.000	205.000	230.000	202.000
TDS, mg/L	13500.	12500.	15500.	12600.
Temp (Celcius), degrees C		10.600	12.800	12.200
Zn, TD, mg/L	<0.0	0.0120	<0.0	<0.0

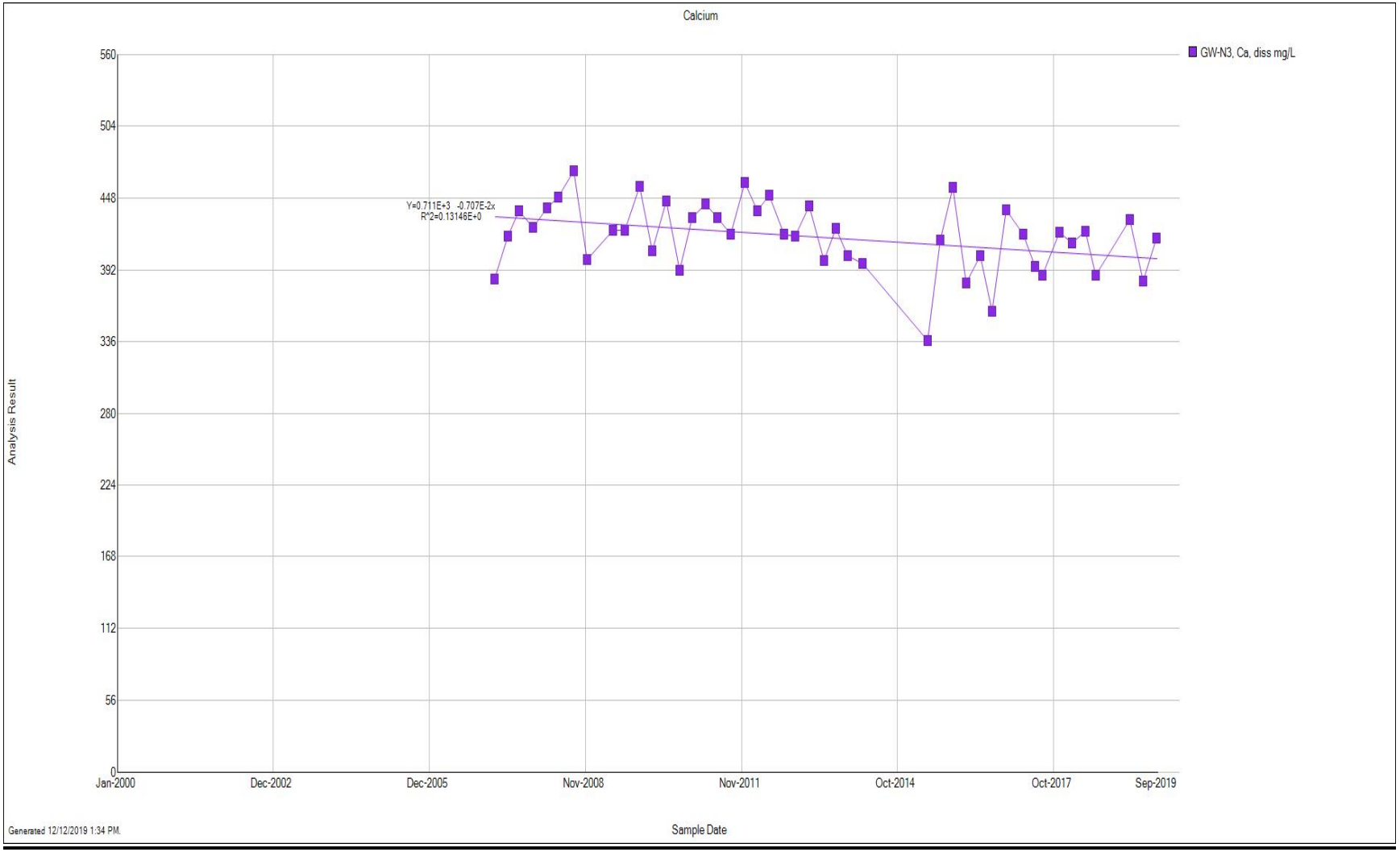
New Horizon Mine

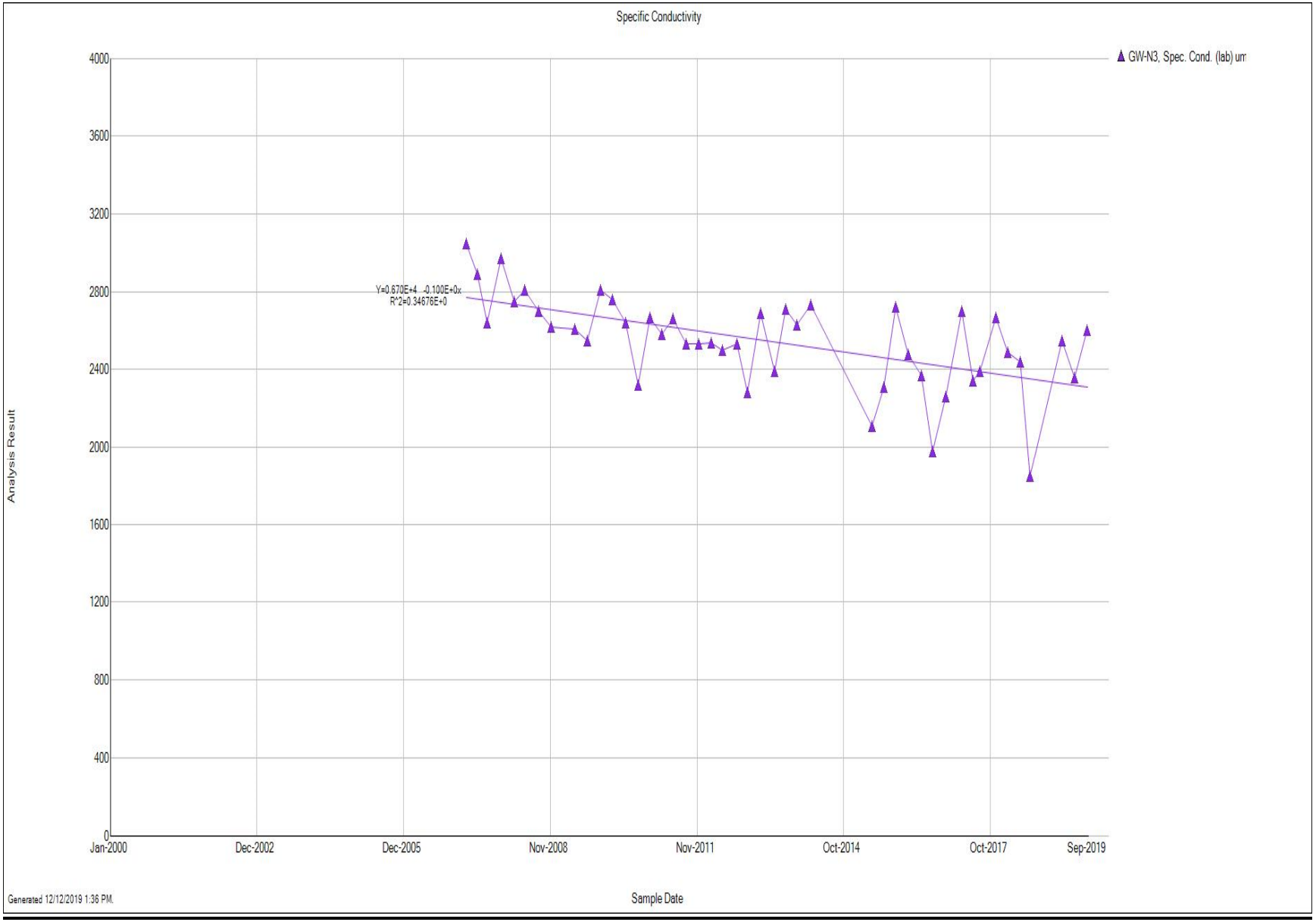
Date Range: 10/01/2018 to 09/30/2019

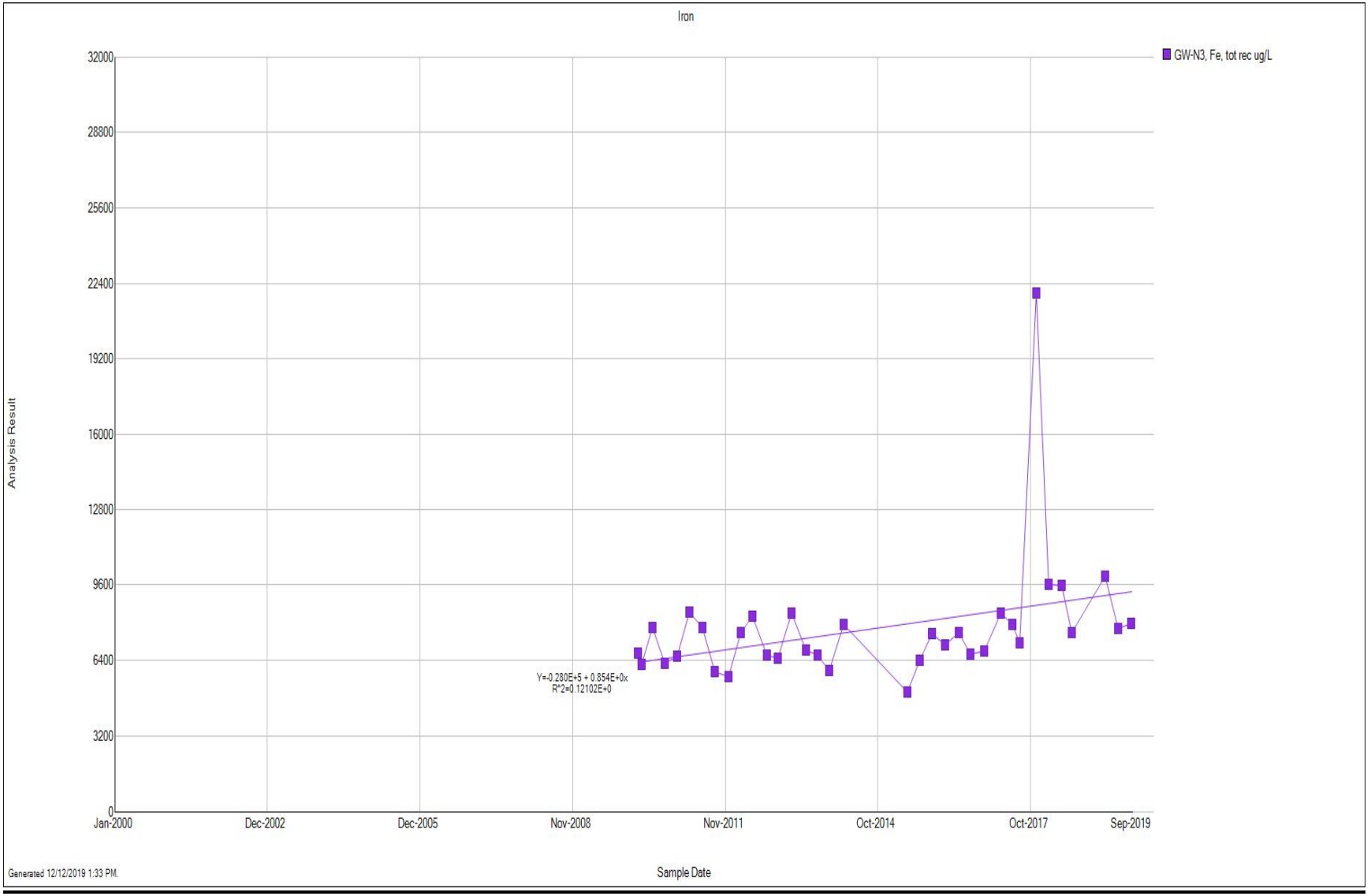
Well: GW-N46

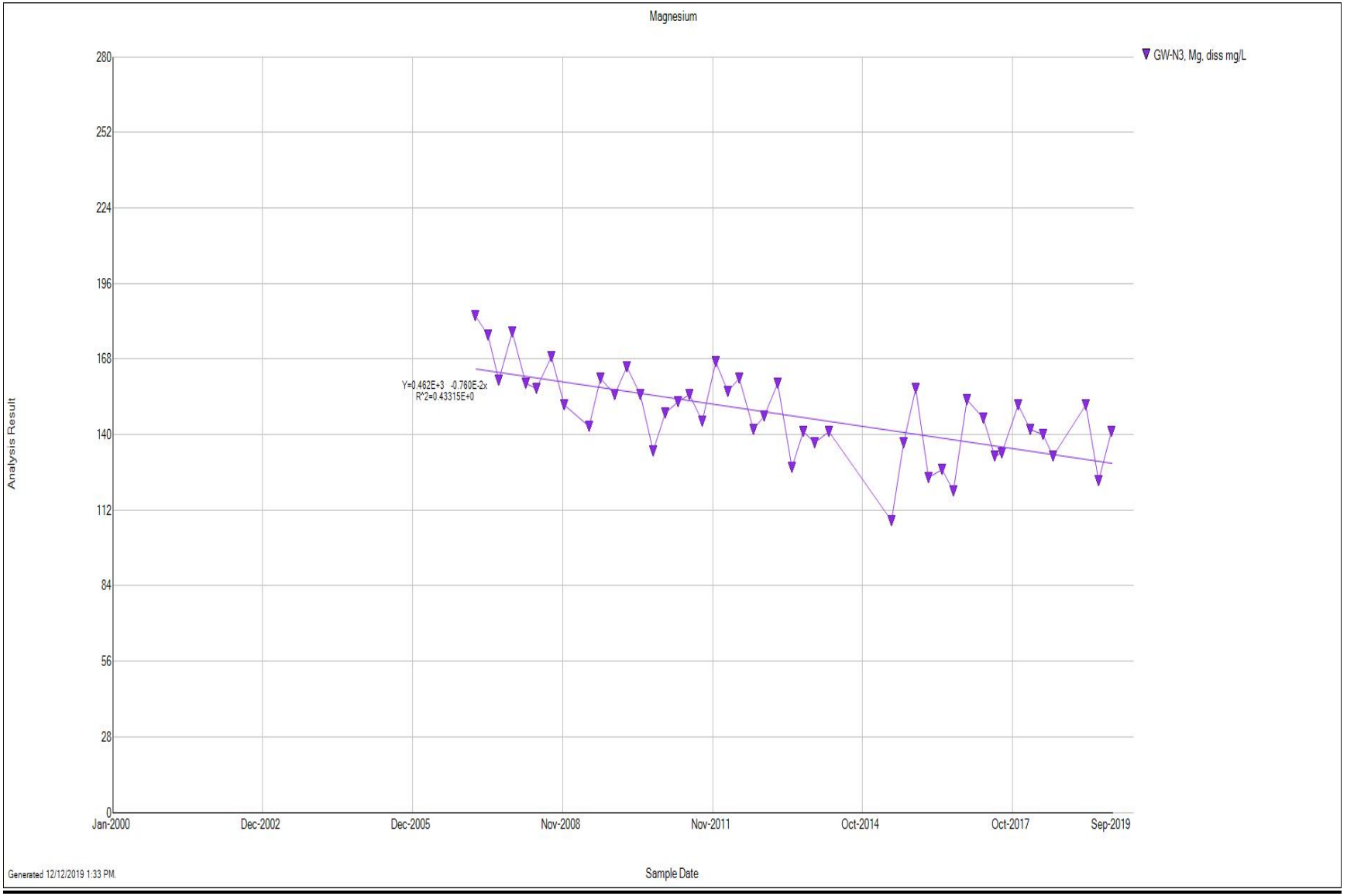
	11/26/2018	3/20/2019	6/26/2019	8/26/2019
Al, diss, mg/L	<0.0	<0.0	<0.0	<0.0
As, TD, mg/L	<0.0	0.000500	0.00120	0.00100
Ca, diss, mg/L	8.80	9.70	9.00	8.70
Cation-Anion Bal, %	-2.900	2.900	-1.400	0.000
Cl, diss, mg/L	46.7	45.2	44.7	47.0
Fe, diss, mg/L	0.0370	0.0300	0.0300	0.0300
Fe, tot rec, ug/L	452.	200.	60.0	60.0
HCO3, mg/L	944.	890.	920.	897.
Mg, diss, mg/L	6.60	7.40	6.10	6.30
Mn, TD, mg/L		0.00700	0.00590	0.00700
Mo, diss, mg/L	<0.0	<0.0	<0.0	<0.0
Na, diss, mg/L	740.	758.	752.	773.
NH3 as N, diss, mg/L	0.630	0.570	0.420	0.280
NO2 + NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO2, diss, mg/L	<0.0	<0.0	<0.0	<0.0
NO3, diss, mg/L	<0.0	<0.0	<0.0	<0.0
P, tot, mg/L	0.0700	0.0400	0.0200	0.0300
Pb, TD, mg/L	<0.0	0.000200	<0.0	<0.0
pH (field), pH	8.090	7.890	7.990	8.000
pH (lab), pH	8.500	8.600	8.400	8.600
PO4, tot, mg/L	0.220	0.120	0.0600	0.0900
Se, TD, mg/L	0.000500	<0.0	<0.0	<0.0
SO4, diss, mg/L	693.	600.	696.	693.
Spec. Cond. (field), umhos/cm	3410.000	3390.000	3.130	3120.000
Spec. Cond. (lab), umhos/cm	3070.000	3020.000	3110.000	3180.000
Sum Anions, meq/L	36.000	33.000	35.000	35.000
Sum Cations, meq/L	34.000	35.000	34.000	35.000
TDS, mg/L	2130.	2140.	2120.	2070.
Temp (Celcius), degrees C	11.800	12.000	13.400	13.200
Zn, TD, mg/L	<0.0	<0.0	<0.0	<0.0

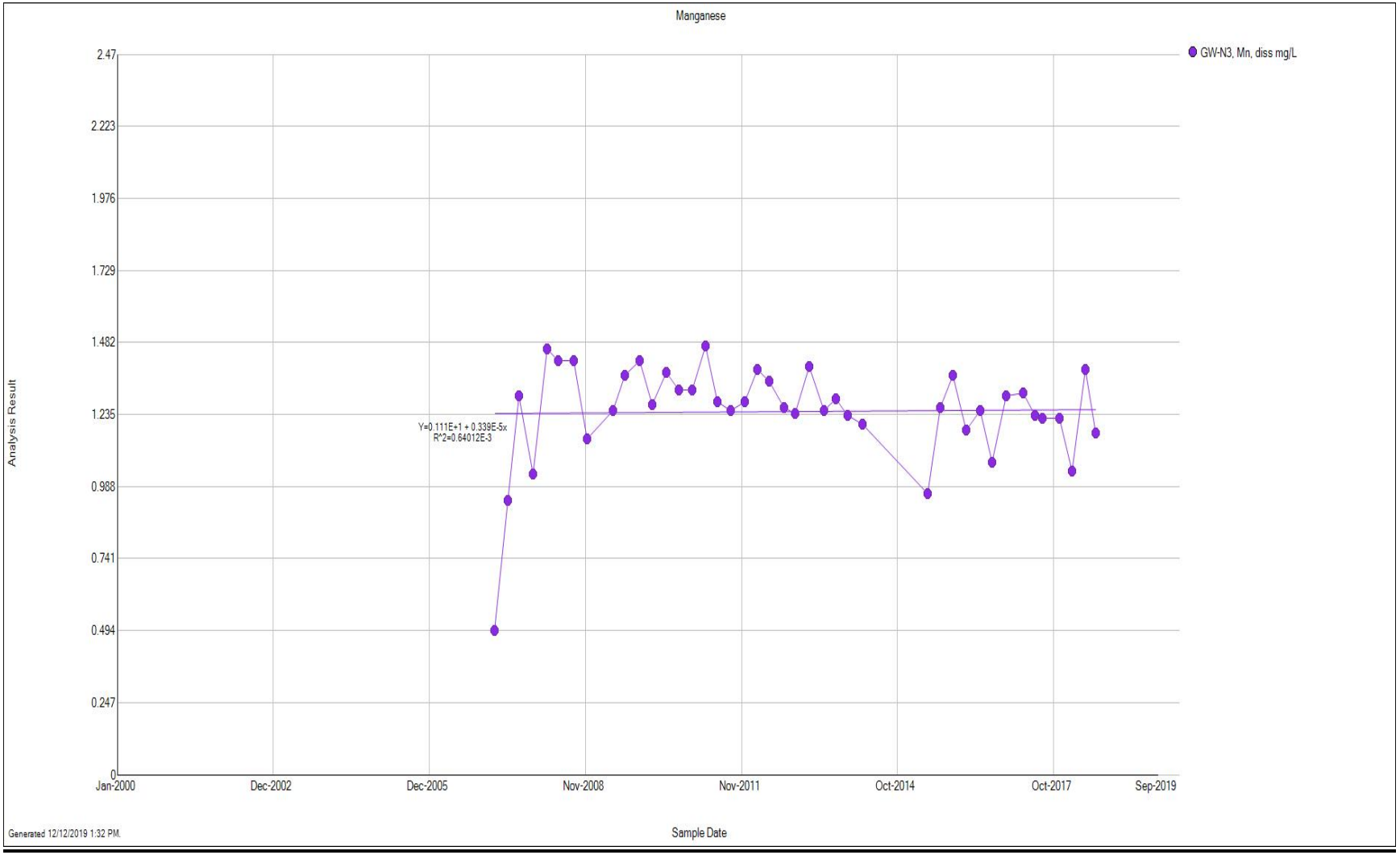
Appendix 4
Groundwater Monitoring Graphs

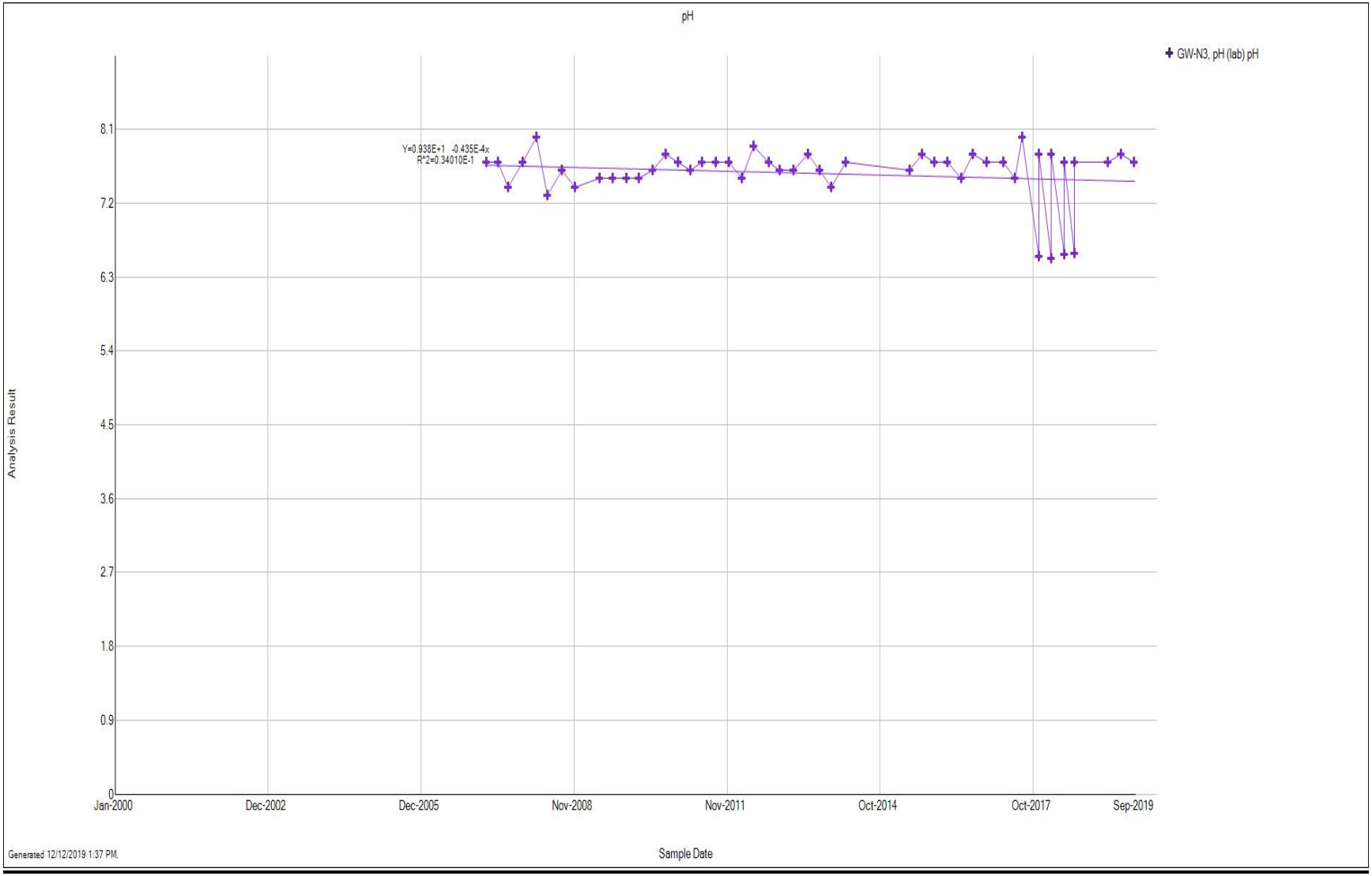

Calcium
GW-N3, Ca, diss mg/L
Y=0.711E+3 -0.707E-2x
R^2=0.13146E+0
560
504
448
392
336
280
224
168
112
56
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 1:34 PM.

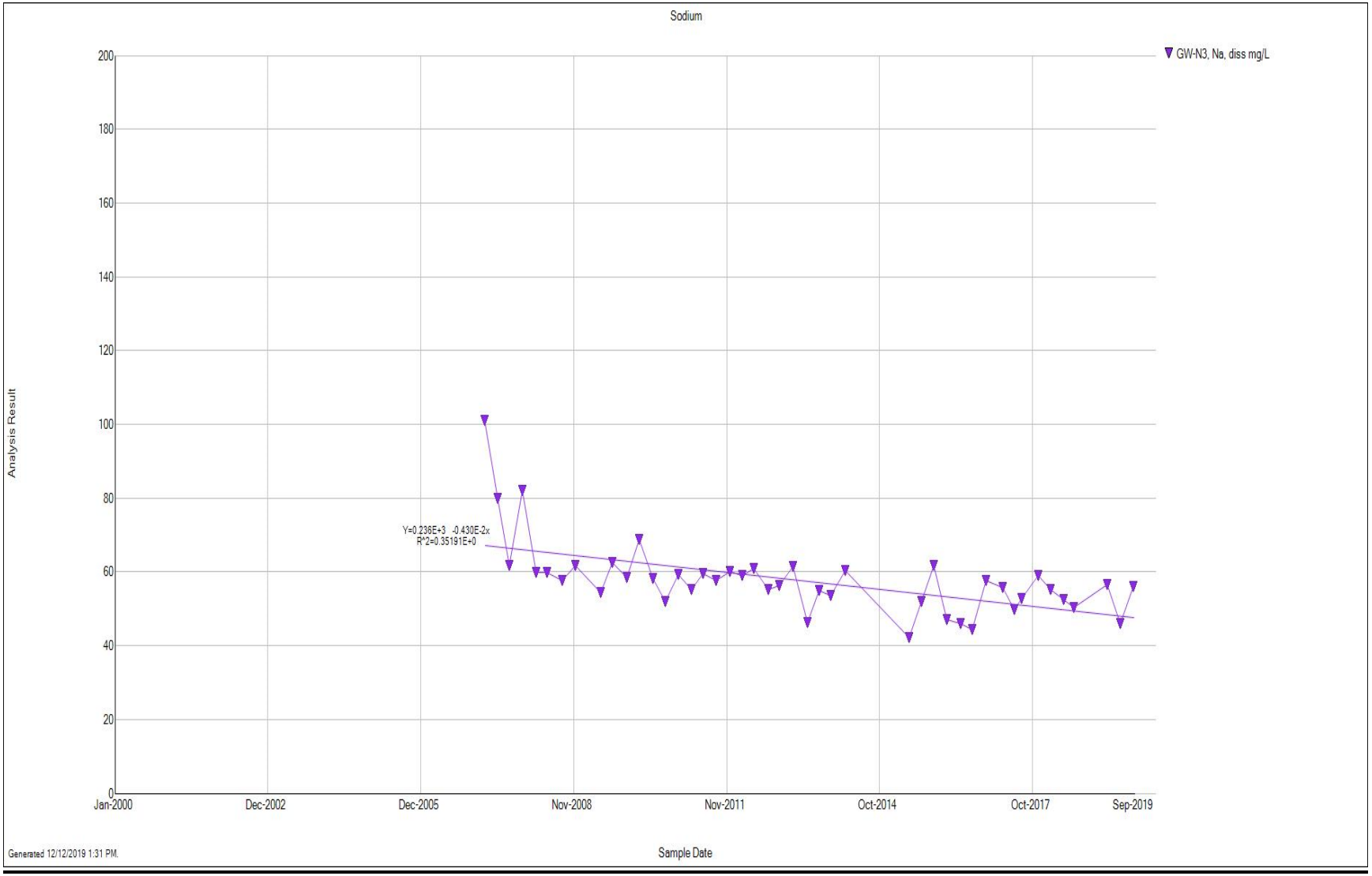

Specific Conductivity
GW-N3, Spec. Cond. (lab) um
Y=0.670E+4 -0.100E+0x
R^2=0.34676E+0
4000
3600
3200
2800
2400
2000
1600
1200
800
400
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 1:36 PM.

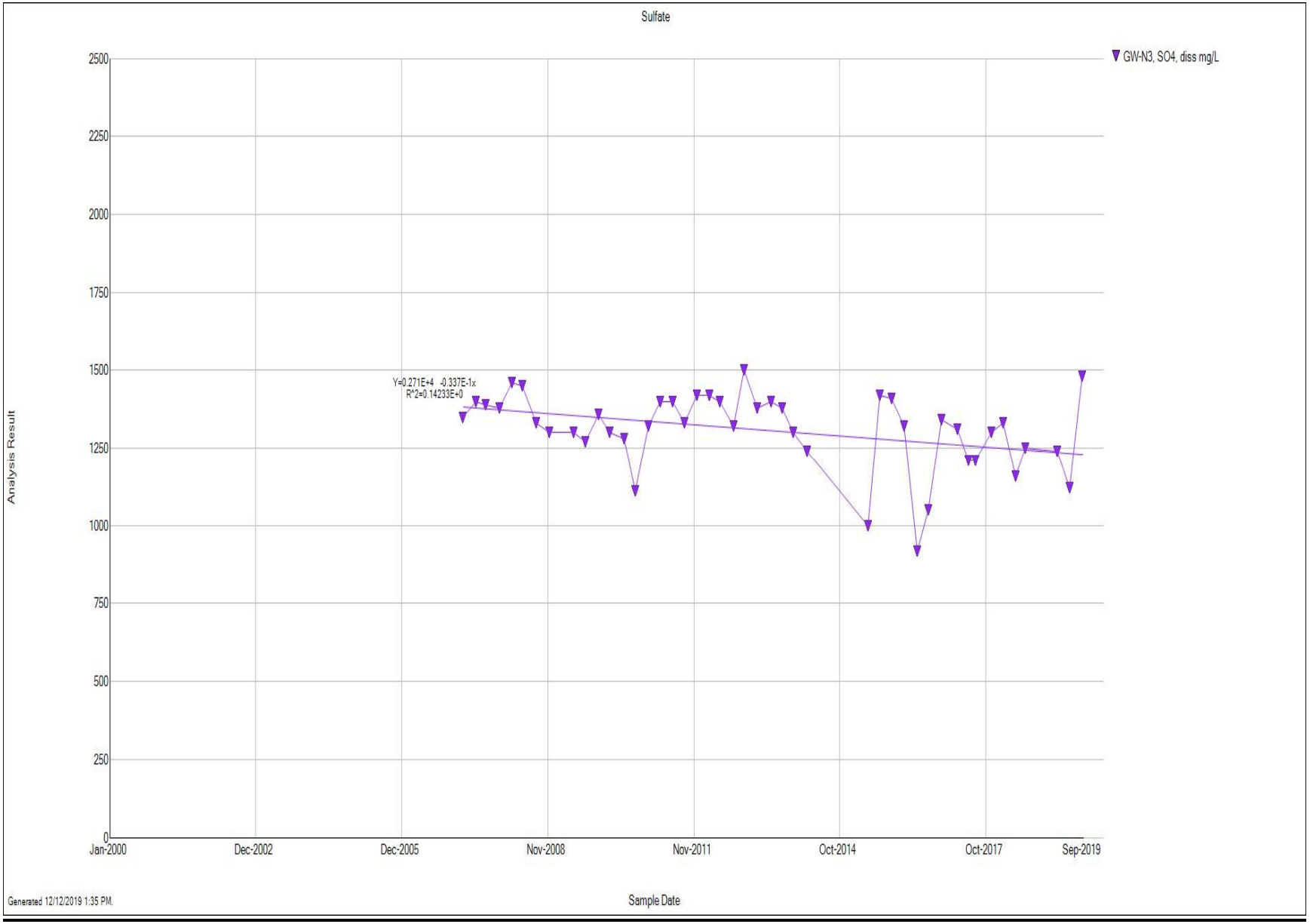

Iron
GW-N3, Fe, tot rec ug/L
Analysis Result
32000
28800
25600
22400
19200
16000
12800
9600
6400
3200
0
Y=-0.280E+5 + 0.854E+0x
R^2=0.12102E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 1:33 PM.

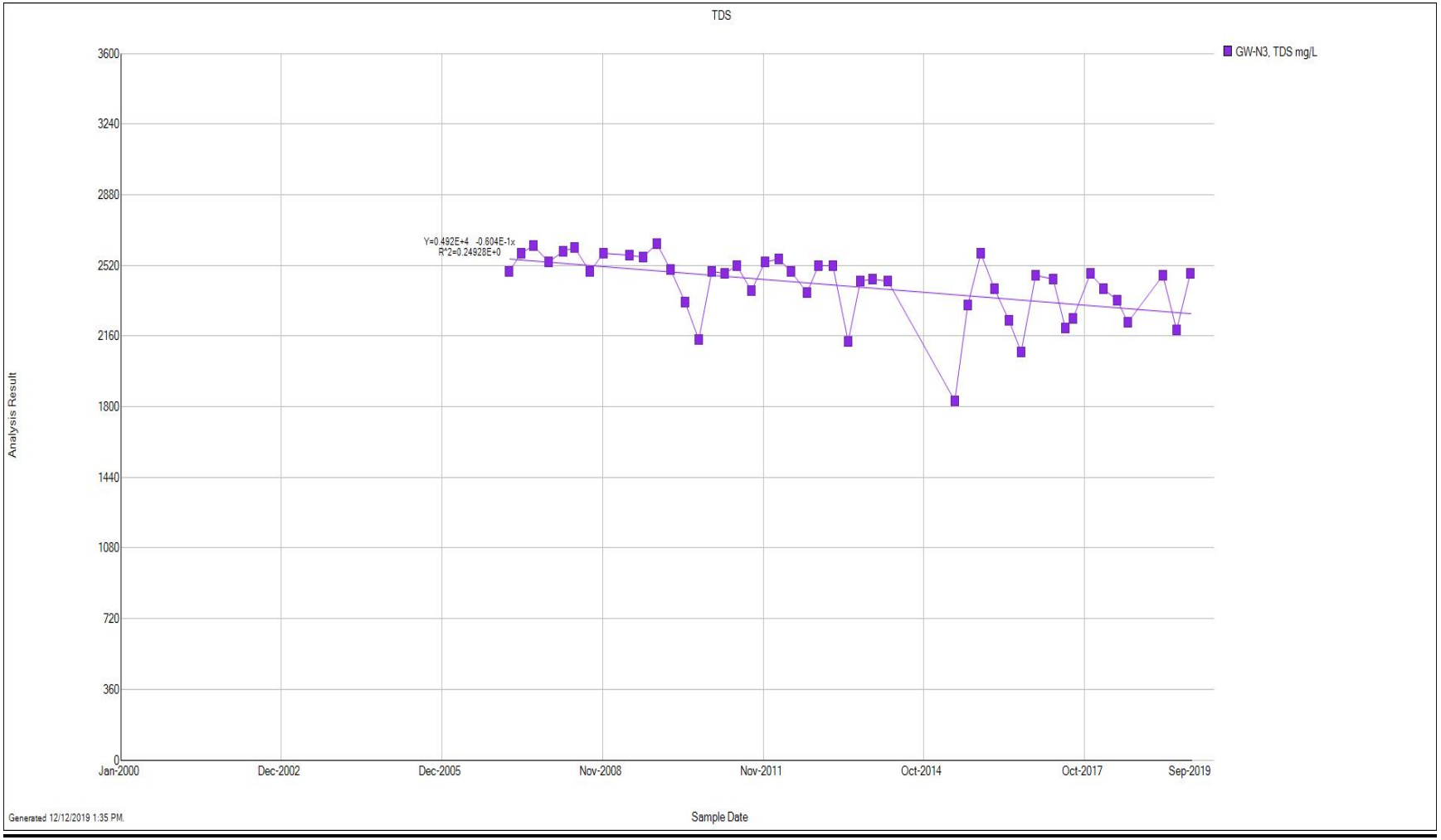

Magnesium
GW-N3, Mg, diss mg/L
Y=0.462E+3 -0.760E-2x
R^2=0.43315E+0
Analysis Result
280
252
224
196
168
140
112
84
56
28
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 1:33 PM.
Sample Date

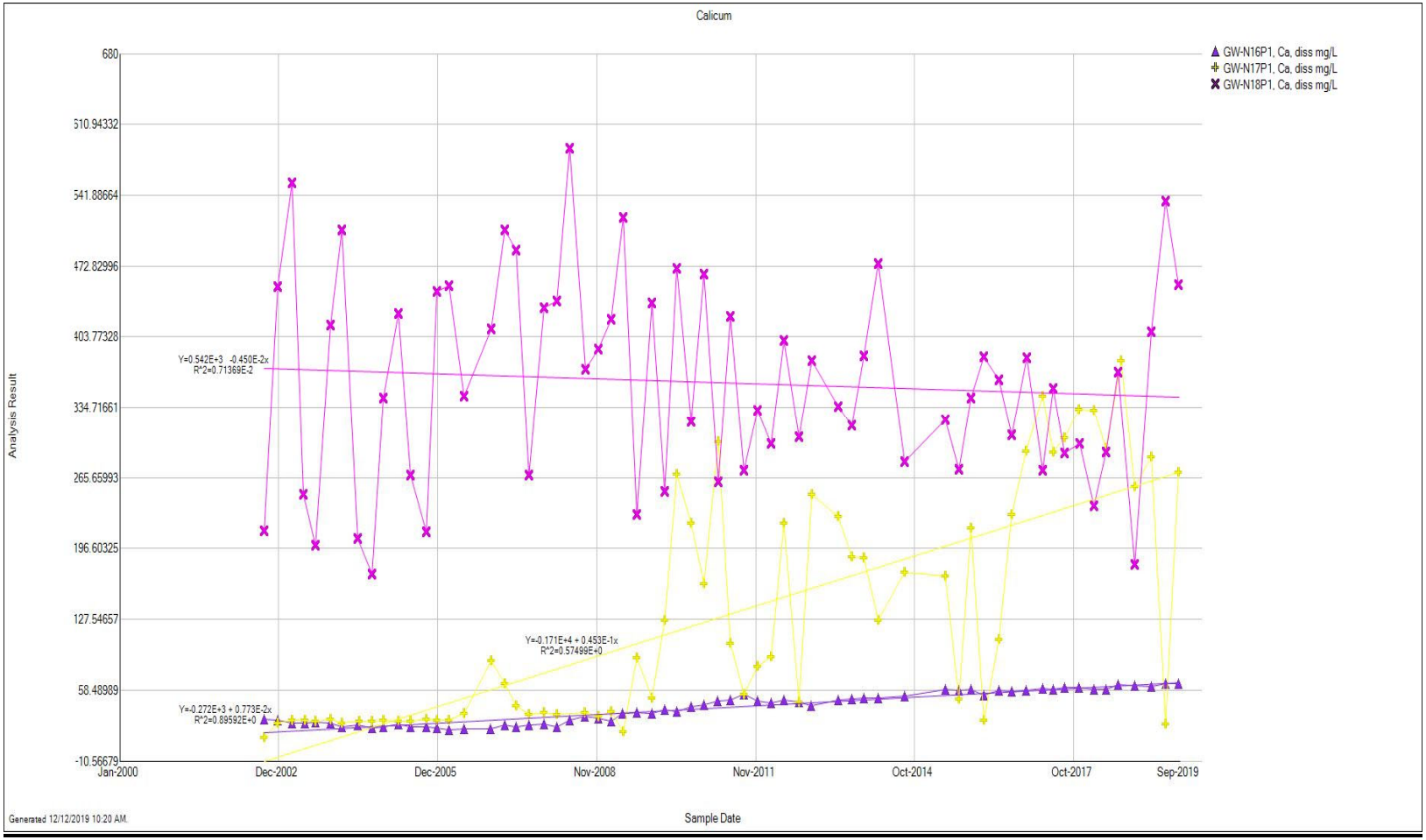

Manganese
GW-N3, Mn, diss mg/L
2.47
2.223
1.976
1.729
1.482
1.235
0.988
0.741
0.494
0.247
0
Analysis Result
Y=0.111E+1 + 0.339E-5x
R^2=0.64012E-3
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 1:32 PM.

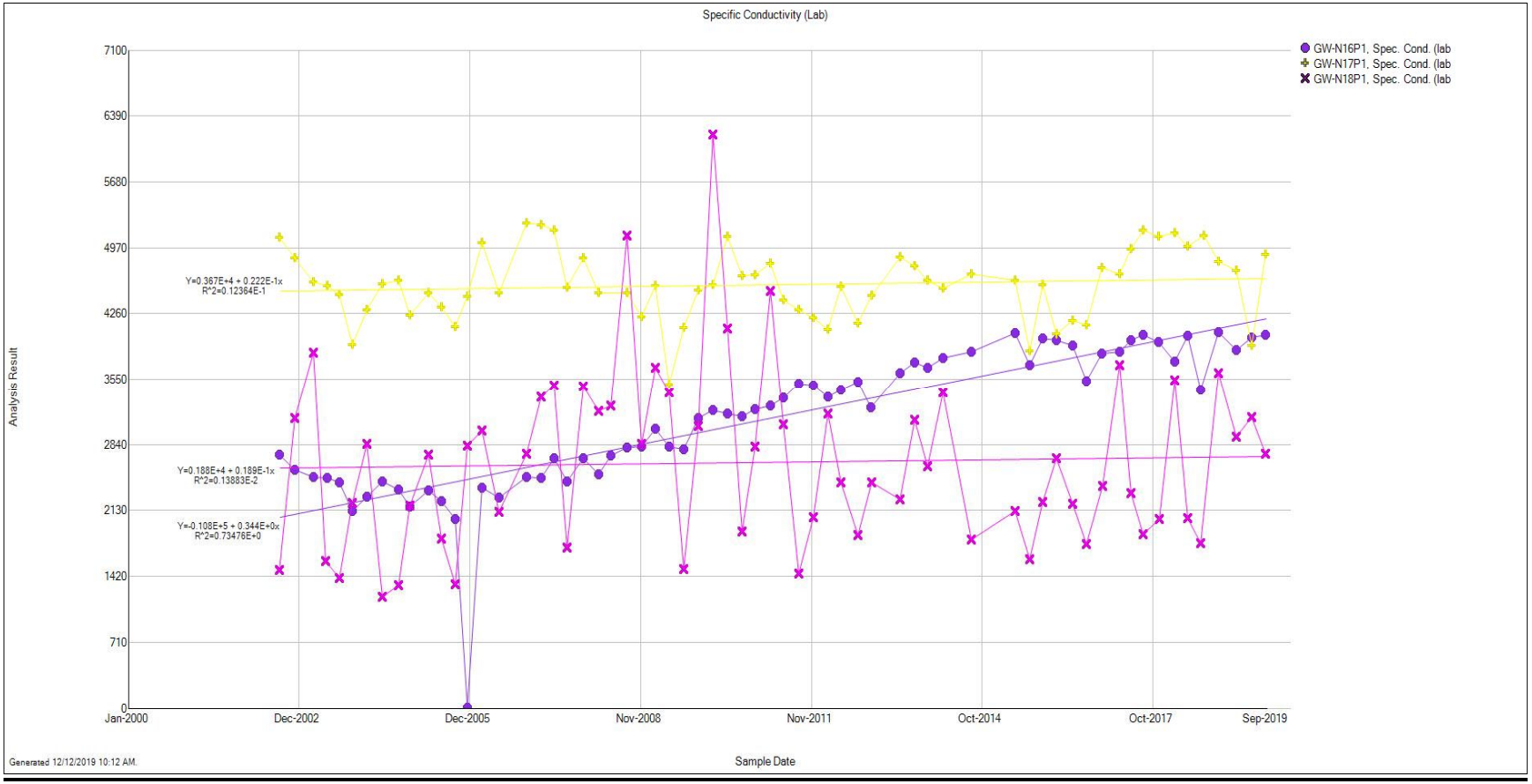

pH
GW-N3, pH (lab) pH
Y=0.938E+1 -0.435E-4x
R^2=0.34010E-1
8.1
7.2
6.3
5.4
4.5
3.6
2.7
1.8
0.9
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 1:37 PM.

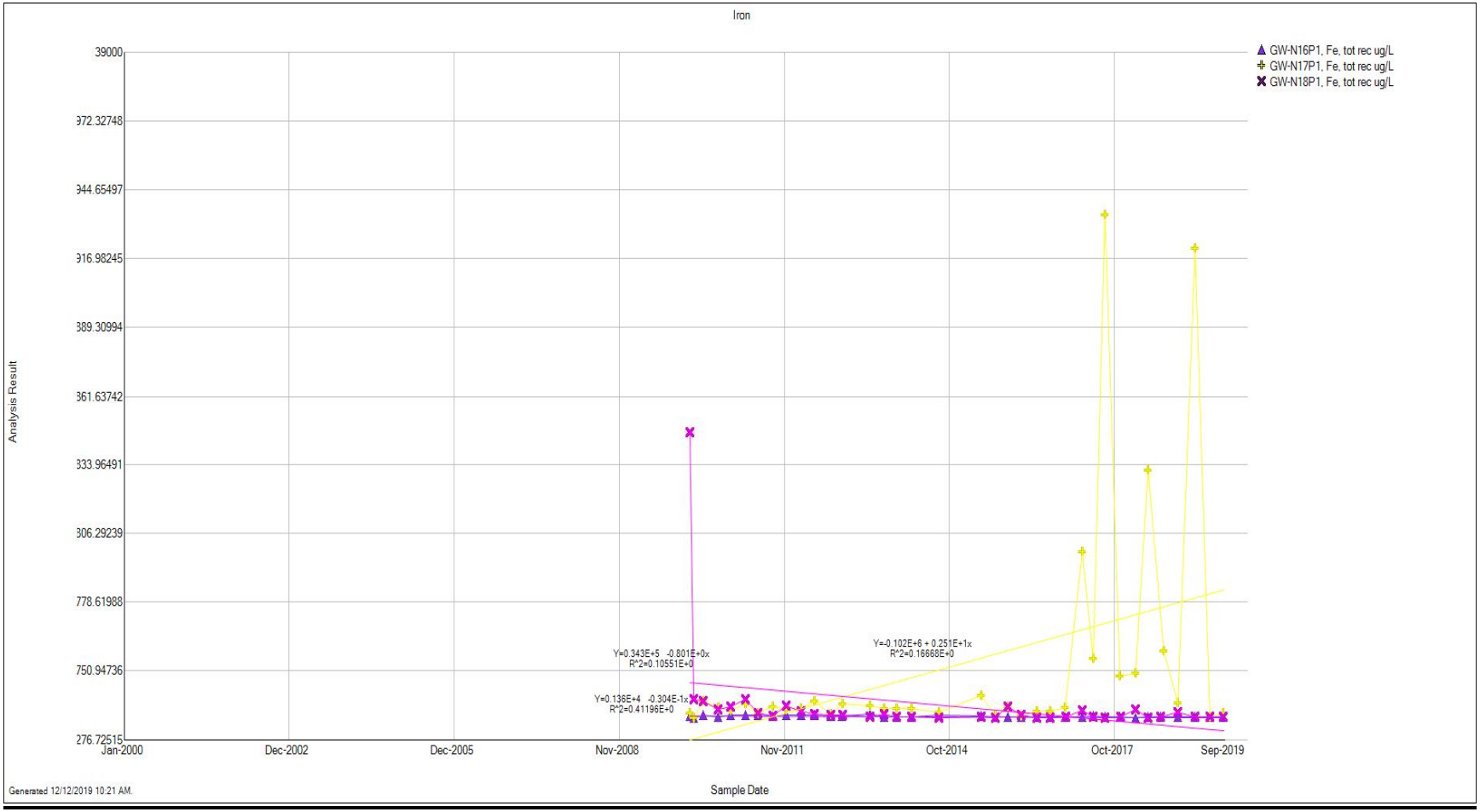

Sodium
GW-N3, Na, diss mg/L
Analysis Result
200
180
160
140
120
100
80
60
40
20
0
Y=0.236E+3 -0.430E-2x
R^2=0.35191E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 1:31 PM.
Sample Date

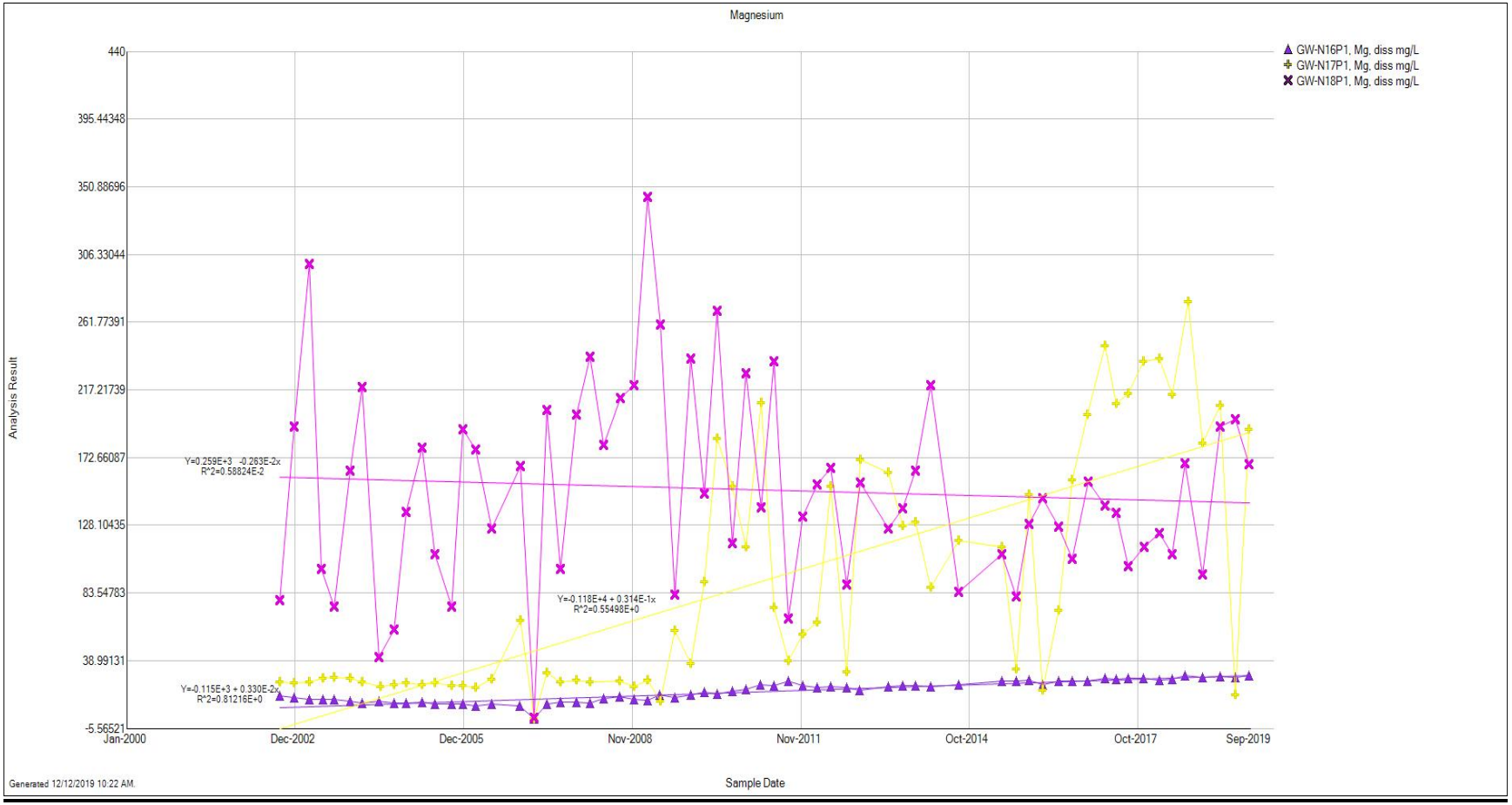

Sulfate
GW-N3, SO4, diss mg/L
Y=0.271E+4 -0.337E-1x
R^2=0.14233E+0
Analysis Result
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 1:35 PM.

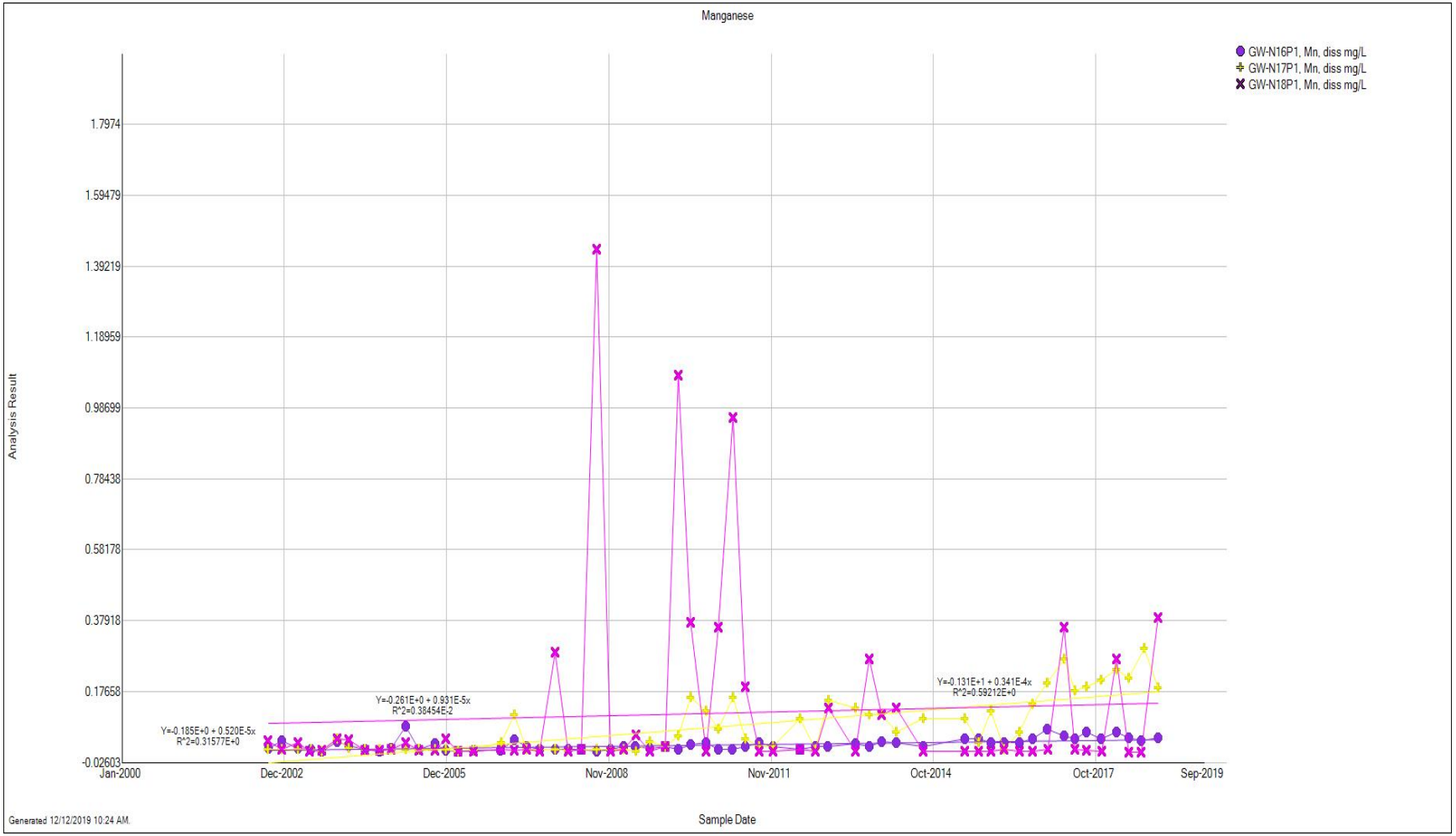

TDS
GW-N3, TDS mg/L
Y=0.492E+4 -0.604E-1x
R^2=0.24928E+0
3600
3240
2880
2520
2160
1800
1440
1080
720
360
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 1:35 PM.

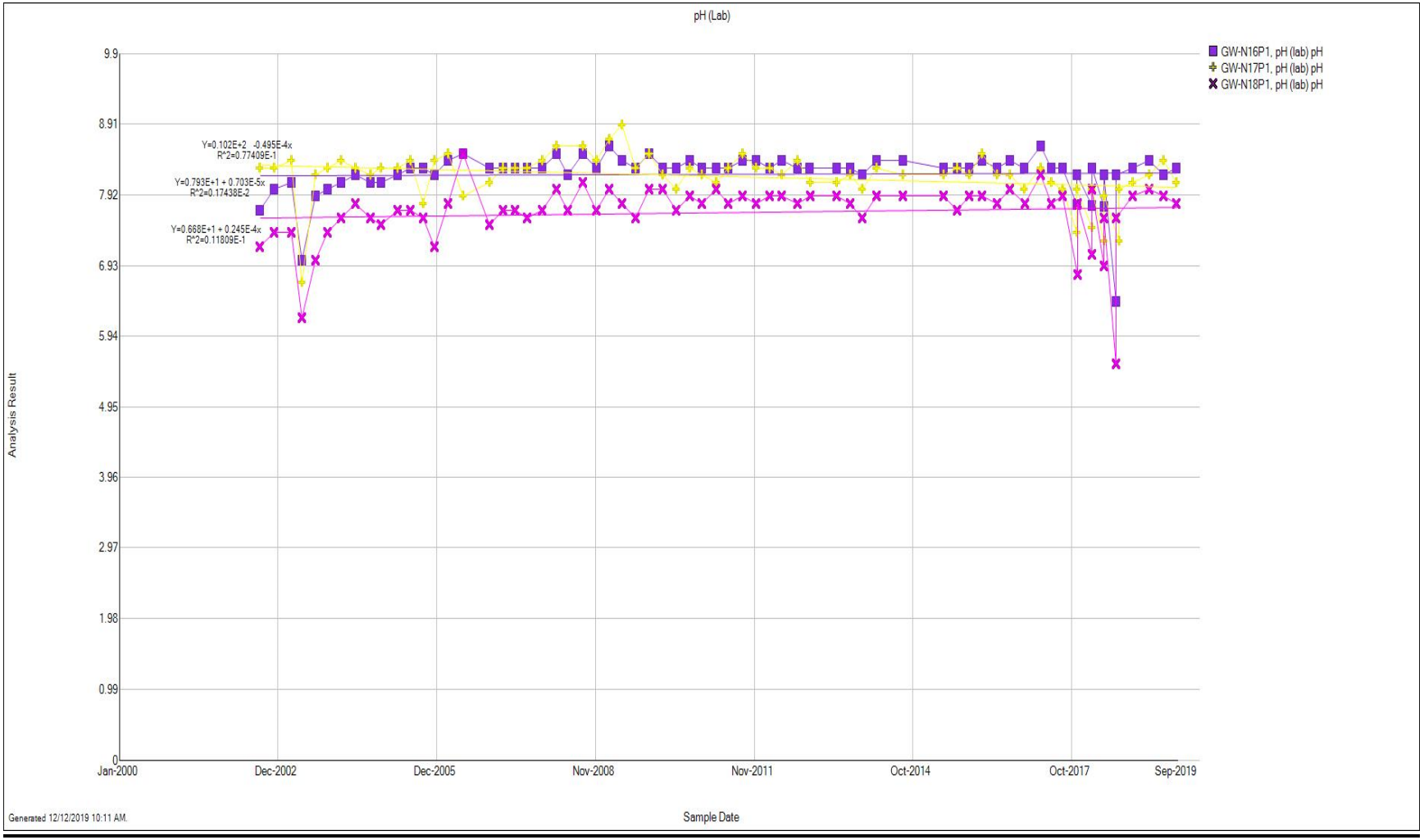

Calicum
GW-N16P1, Ca, diss mg/L
GW-N17P1, Ca, diss mg/L
GW-N18P1, Ca, diss mg/L
680
510.94332
541.88664
472.82996
403.77328
334.71661
265.65993
196.60325
127.54657
58.48989
-10.56679
Analysis Result
Y=0.542E+3 -0.450E-2x
R^2=0.71369E-2
Y=-0.171E+4 + 0.453E-1x
R^2=0.57499E+0
Y=-0.272E+3 + 0.773E-2x
R^2=0.89592E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 10:20 AM.

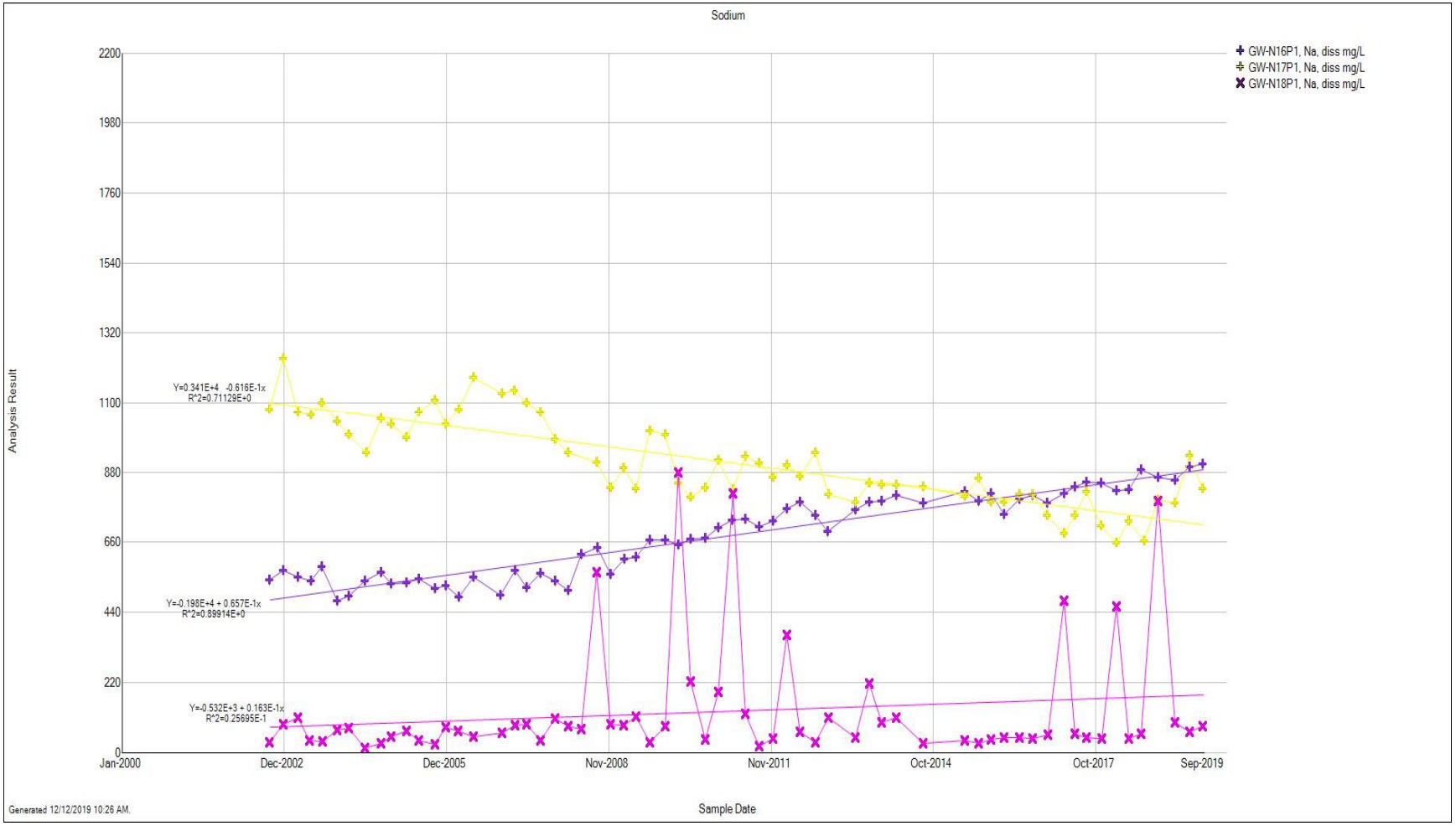

Specific Conductivity (Lab)
GW-N16P1, Spec. Cond. (lab
GW-N17P1, Spec. Cond. (lab
GW-N18P1, Spec. Cond. (lab
Y=0.367E+4 + 0.222E-1x
R^2=0.12364E-1
Y=0.188E+4 + 0.189E-1x
R^2=0.13883E-2
Y=-0.108E+5 + 0.344E+0x
R^2=0.73476E+0
7100
6390
5680
4970
4260
3550
2840
2130
1420
710
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Analysis Result
Sample Date
Generated 12/12/2019 10:12 AM.

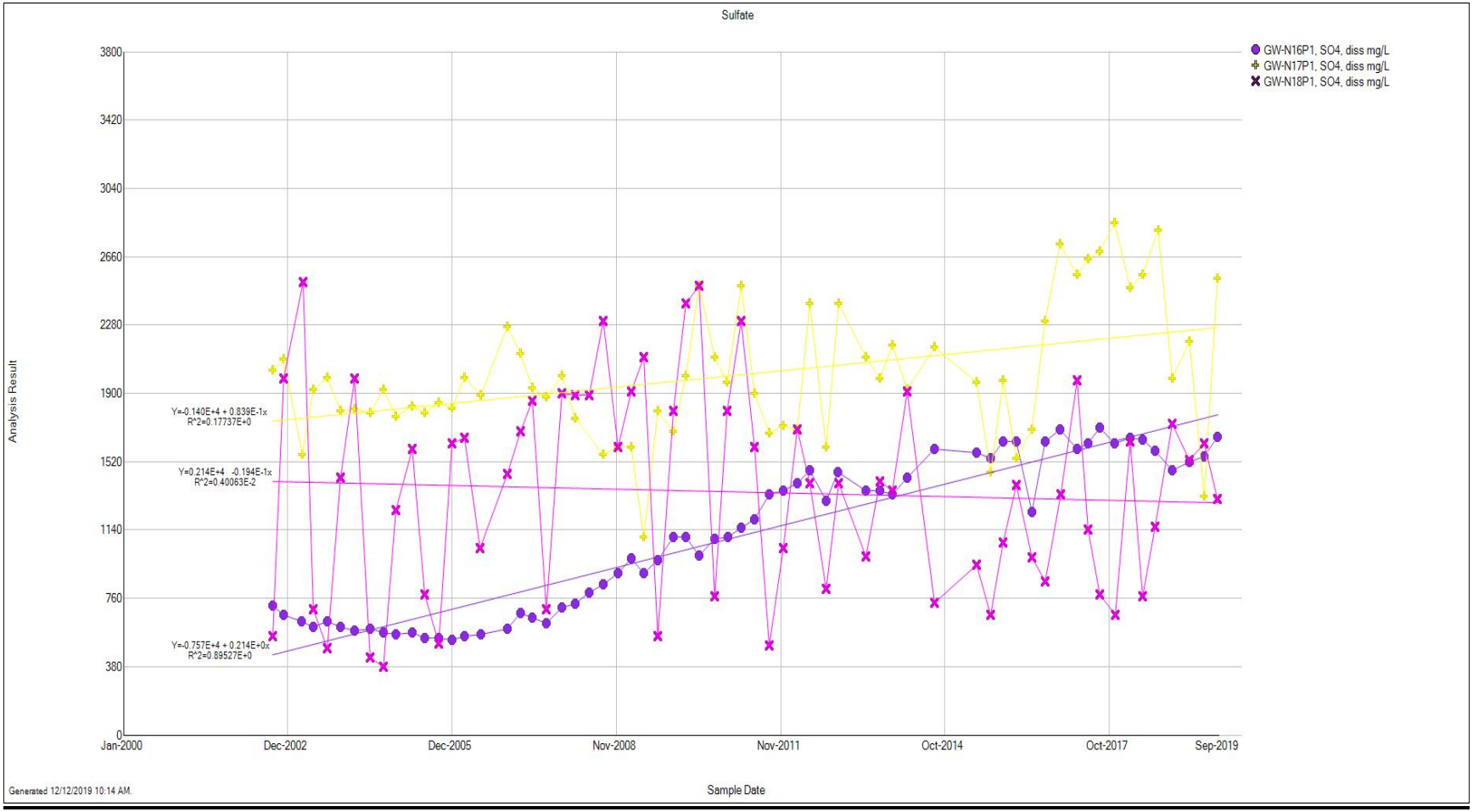

Iron
GW-N16P1, Fe, tot rec ug/L
GW-N17P1, Fe, tot rec ug/L
GW-N18P1, Fe, tot rec ug/L
39000
372.32748
344.65497
316.98245
289.30994
261.63742
233.96491
206.29239
178.61988
150.94736
276.72515
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.343E+5 -0.801E+0x
R^2=0.10551E+0
Y=0.136E+4 -0.304E-1x
R^2=0.41196E+0
Y=-0.102E+6 + 0.251E+1x
R^2=0.16668E+0
Generated 12/12/2019 10:21 AM.
Sample Date

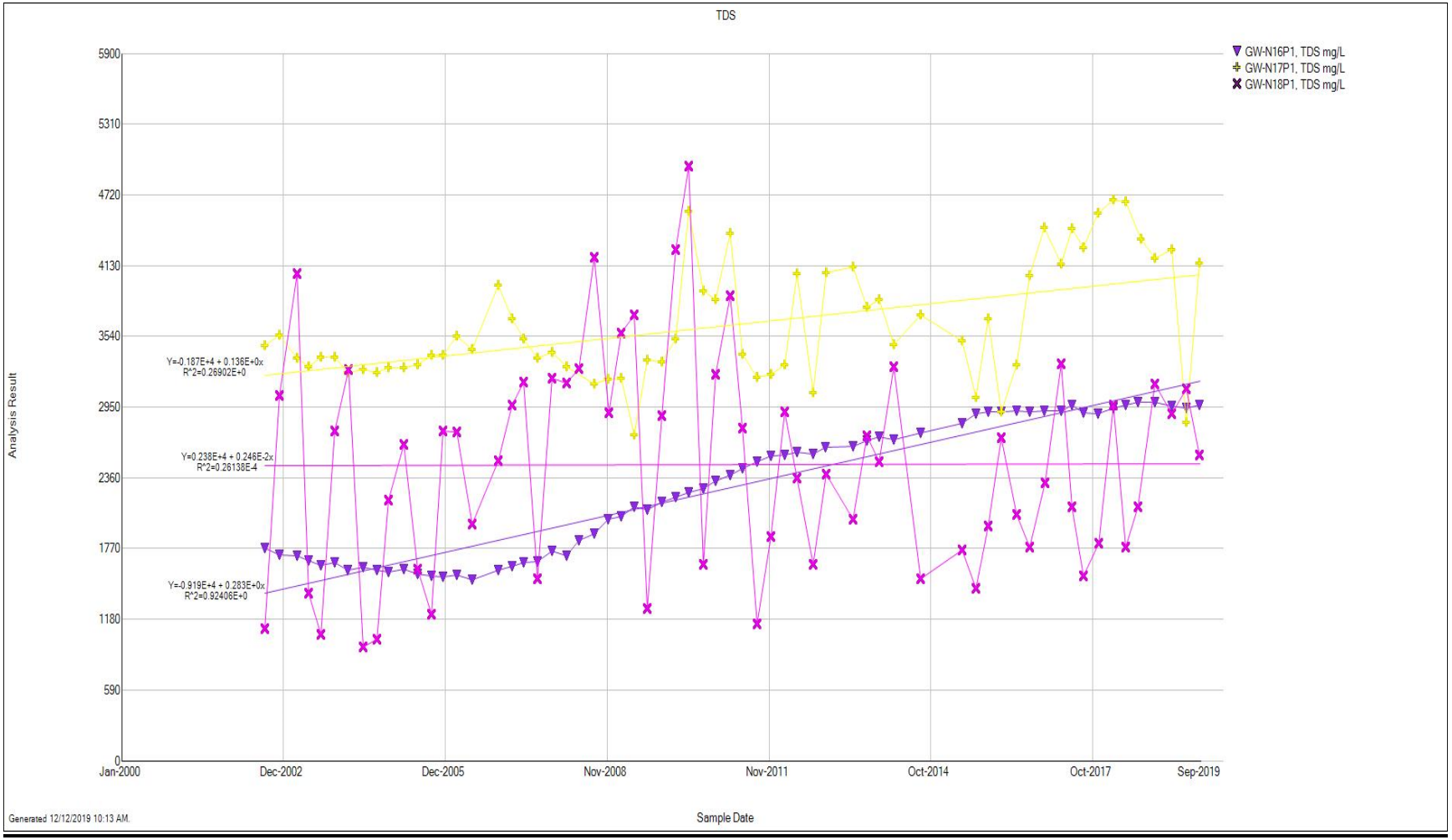

Magnesium
GW-N16P1, Mg, diss mg/L
GW-N17P1, Mg, diss mg/L
GW-N18P1, Mg, diss mg/L
Analysis Result
440
395.44348
350.88696
306.33044
261.77391
217.21739
172.66087
128.10435
83.54783
38.99131
-5.56521
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.259E+3 -0.263E-2x
R^2=0.58824E-2
Y=-0.118E+4 + 0.314E-1x
R^2=0.55498E+0
Y=-0.115E+3 + 0.330E-2x
R^2=0.81216E+0
Generated 12/12/2019 10:22 AM.
Sample Date

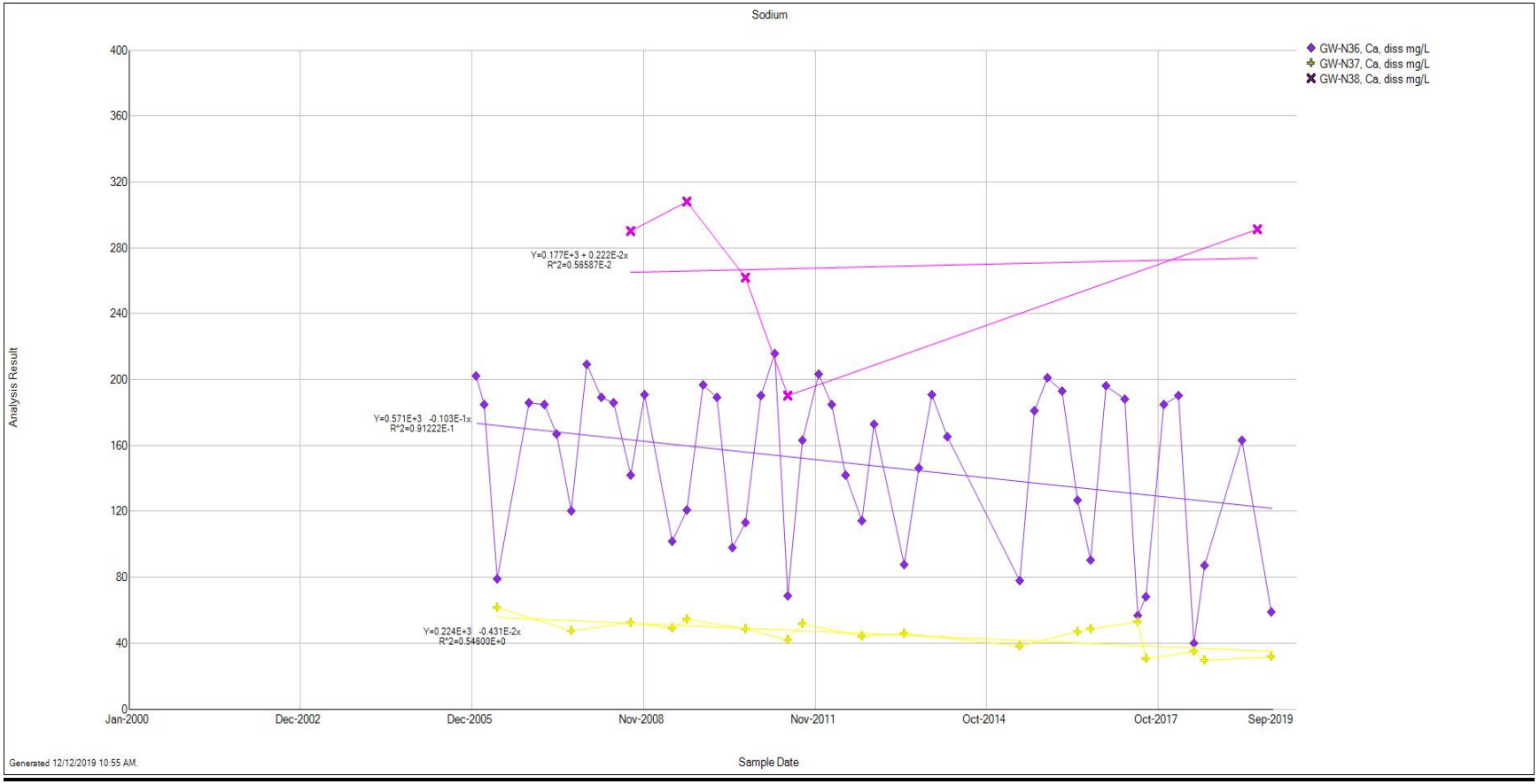

Manganese
GW-N16P1, Mn, diss mg/L
GW-N17P1, Mn, diss mg/L
GW-N18P1, Mn, diss mg/L
Analysis Result
1.7974
1.59479
1.39219
1.18959
0.98699
0.78438
0.58178
0.37918
0.17658
-0.02603
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=-0.185E+0 + 0.520E-5x
R^2=0.31577E+0
Y=-0.261E+0 + 0.931E-5x
R^2=0.38454E-2
Y=-0.131E+1 + 0.341E-4x
R^2=0.59212E+0
Generated 12/12/2019 10:24 AM.
Sample Date

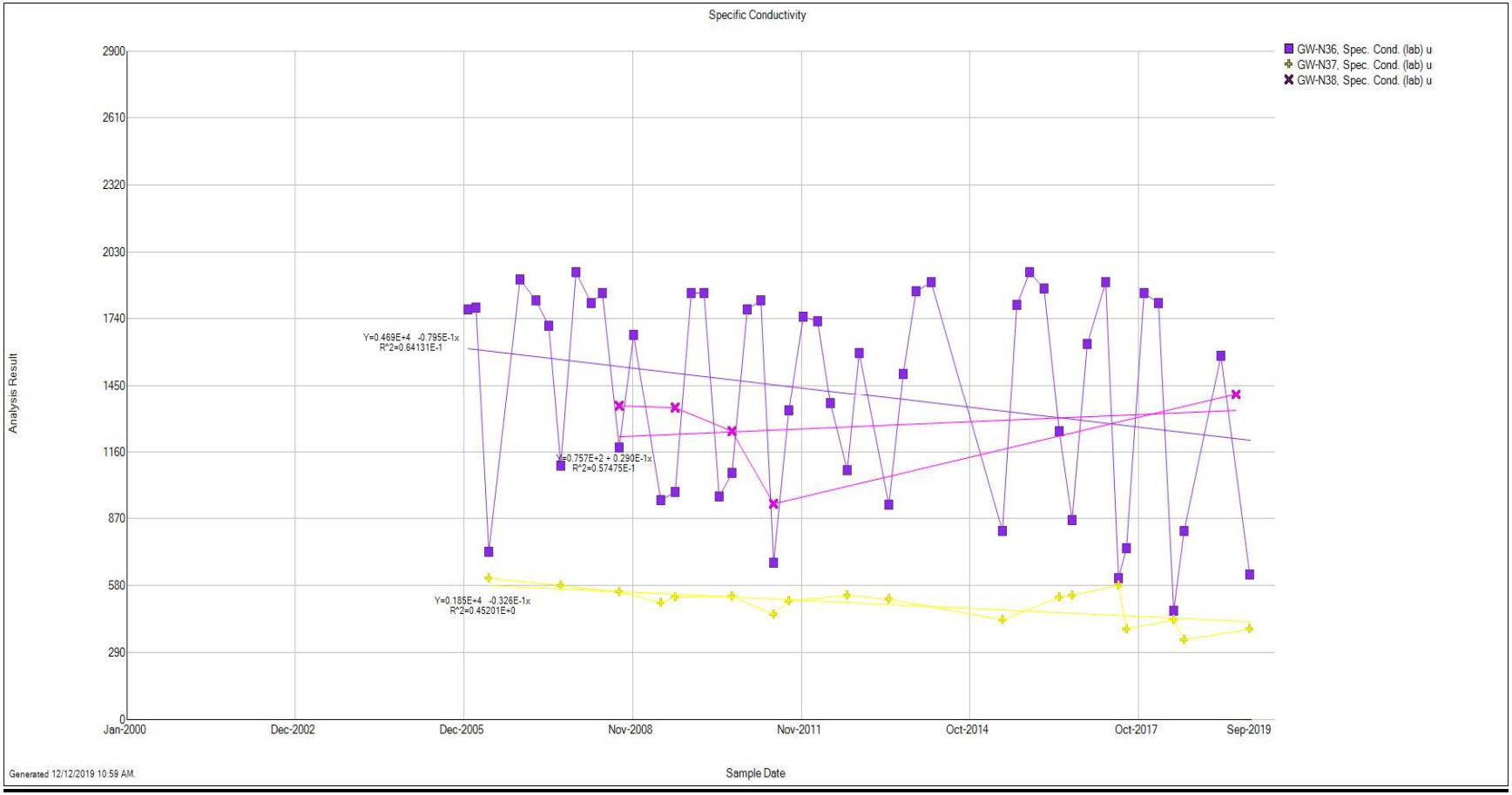

pH (Lab)
GW-N16P1, pH (lab) pH
GW-N17P1, pH (lab) pH
GW-N18P1, pH (lab) pH
Y=0.102E+2 -0.495E-4x
R^2=0.77409E-1
Y=0.793E+1 + 0.703E-5x
R^2=0.17438E-2
Y=0.668E+1 + 0.245E-4x
R^2=0.11809E-1
9.9
8.91
7.92
6.93
5.94
4.95
3.96
2.97
1.98
0.99
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 10:11 AM.

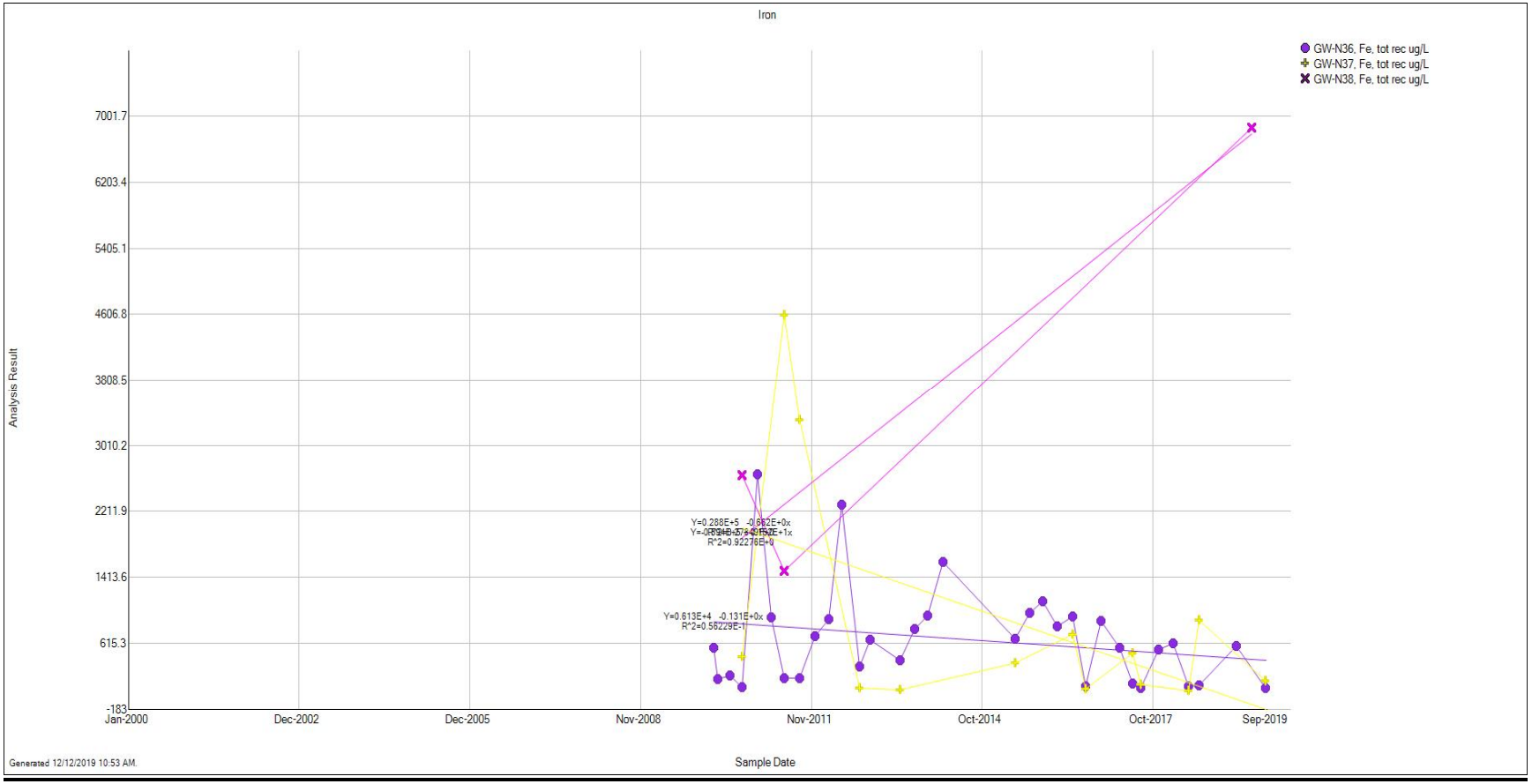

Sodium
GW-N16P1, Na, diss mg/L
GW-N17P1, Na, diss mg/L
GW-N18P1, Na, diss mg/L
Y=0.341E+4 -0.616E-1x
R^2=0.71129E+0
Y=-0.198E+4 + 0.657E-1x
R^2=0.89914E+0
Y=-0.532E+3 + 0.163E-1x
R^2=0.25695E-1
Analysis Result
2200
1980
1760
1540
1320
1100
880
660
440
220
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 10:26 AM.

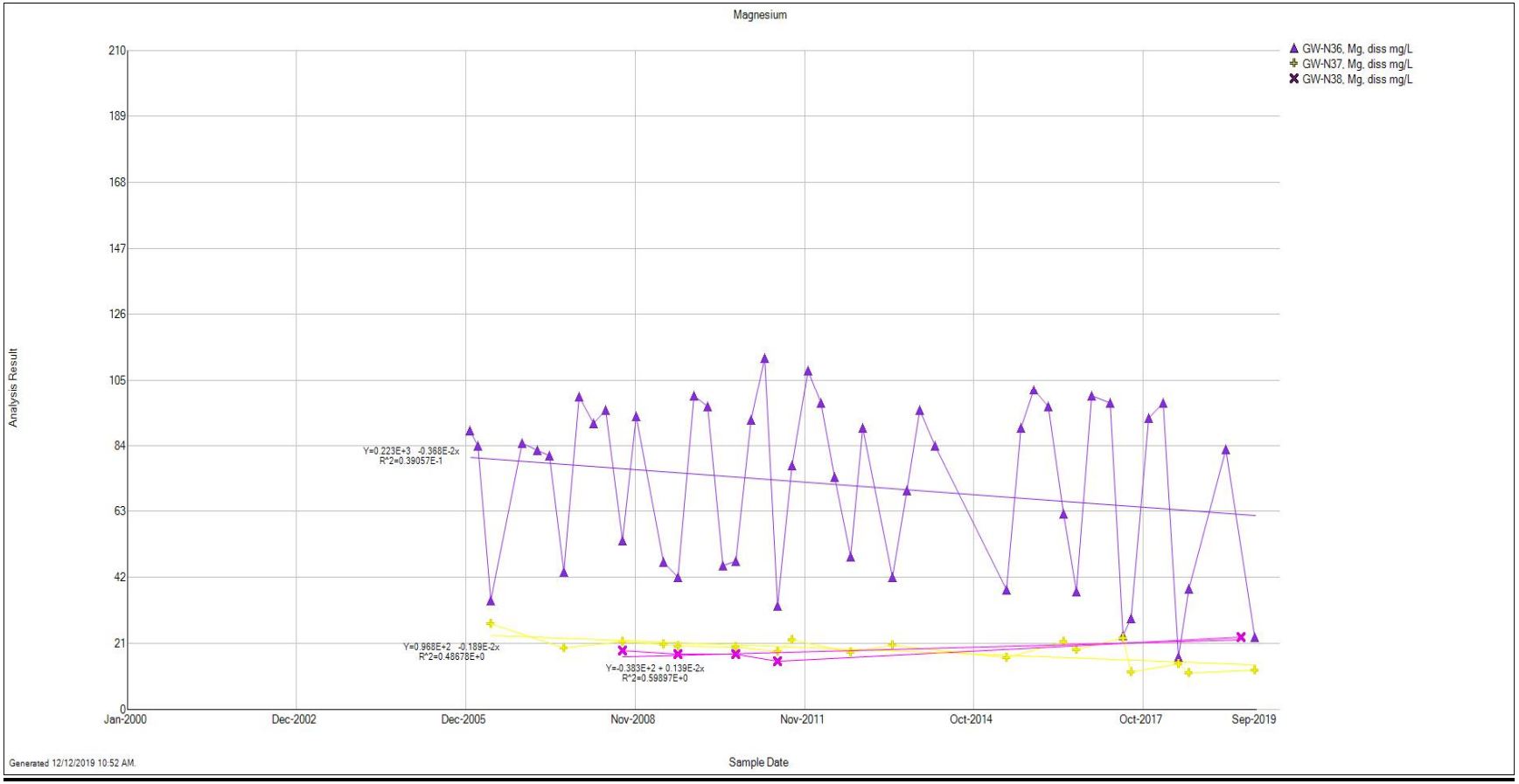

Sulfate
GW-N16P1, SO4, diss mg/L
GW-N17P1, SO4, diss mg/L
GW-N18P1, SO4, diss mg/L
Y=-0.140E+4 + 0.839E-1x
R^2=0.17737E+0
Y=0.214E+4 -0.194E-1x
R^2=0.40063E-2
Y=-0.757E+4 + 0.214E+0x
R^2=0.89527E+0
Analysis Result
3800
3420
3040
2660
2280
1900
1520
1140
760
380
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 10:14 AM.
Sample Date

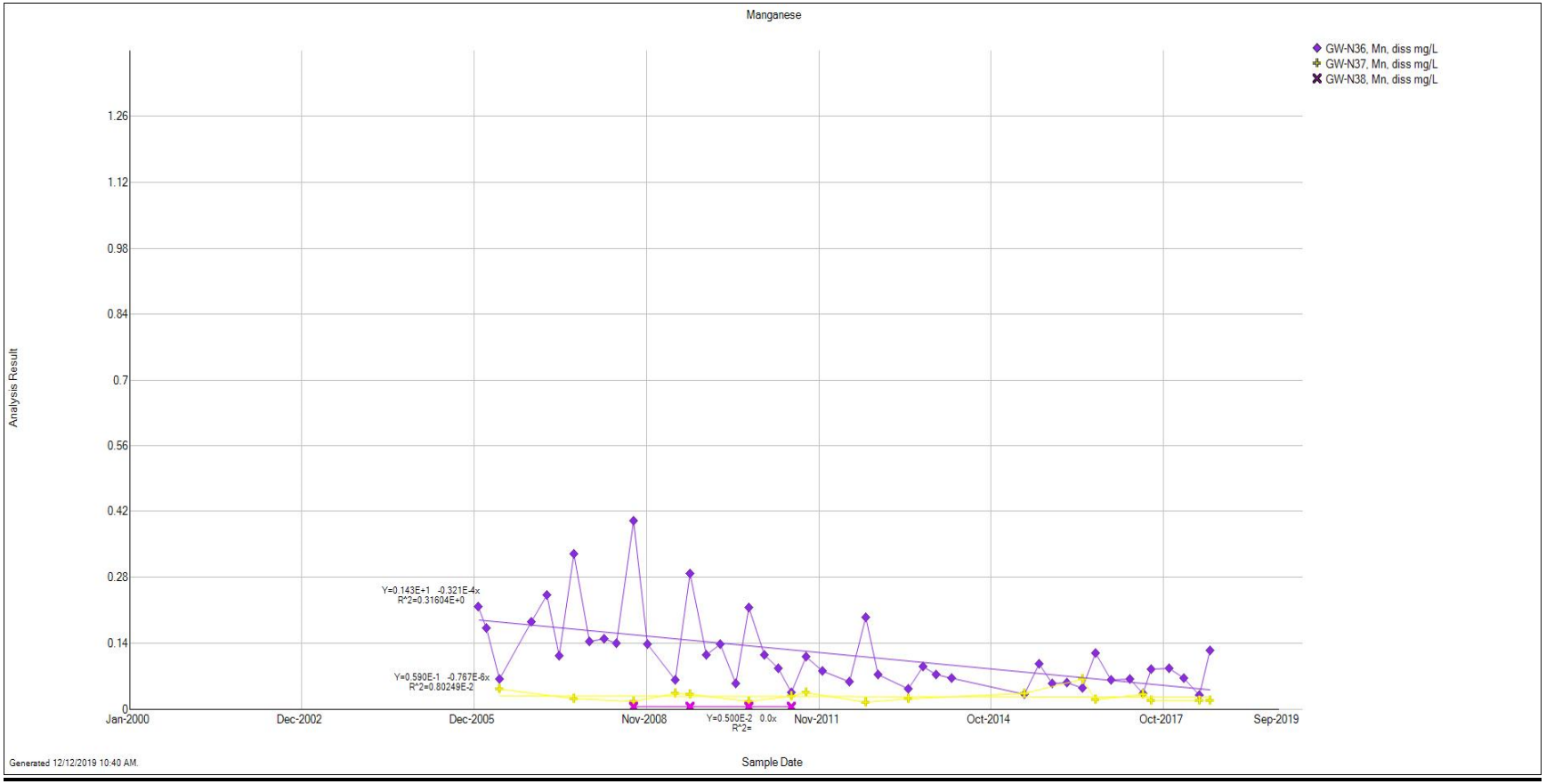

TDS
GW-N16P1, TDS mg/L
GW-N17P1, TDS mg/L
GW-N18P1, TDS mg/L
Y=-0.187E+4 + 0.136E+0x
R^2=0.26902E+0
Y=0.238E+4 + 0.246E-2x
R^2=0.26138E-4
Y=-0.919E+4 + 0.283E+0x
R^2=0.92406E+0
Analysis Result
5900
5310
4720
4130
3540
2950
2360
1770
1180
590
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 10:13 AM.

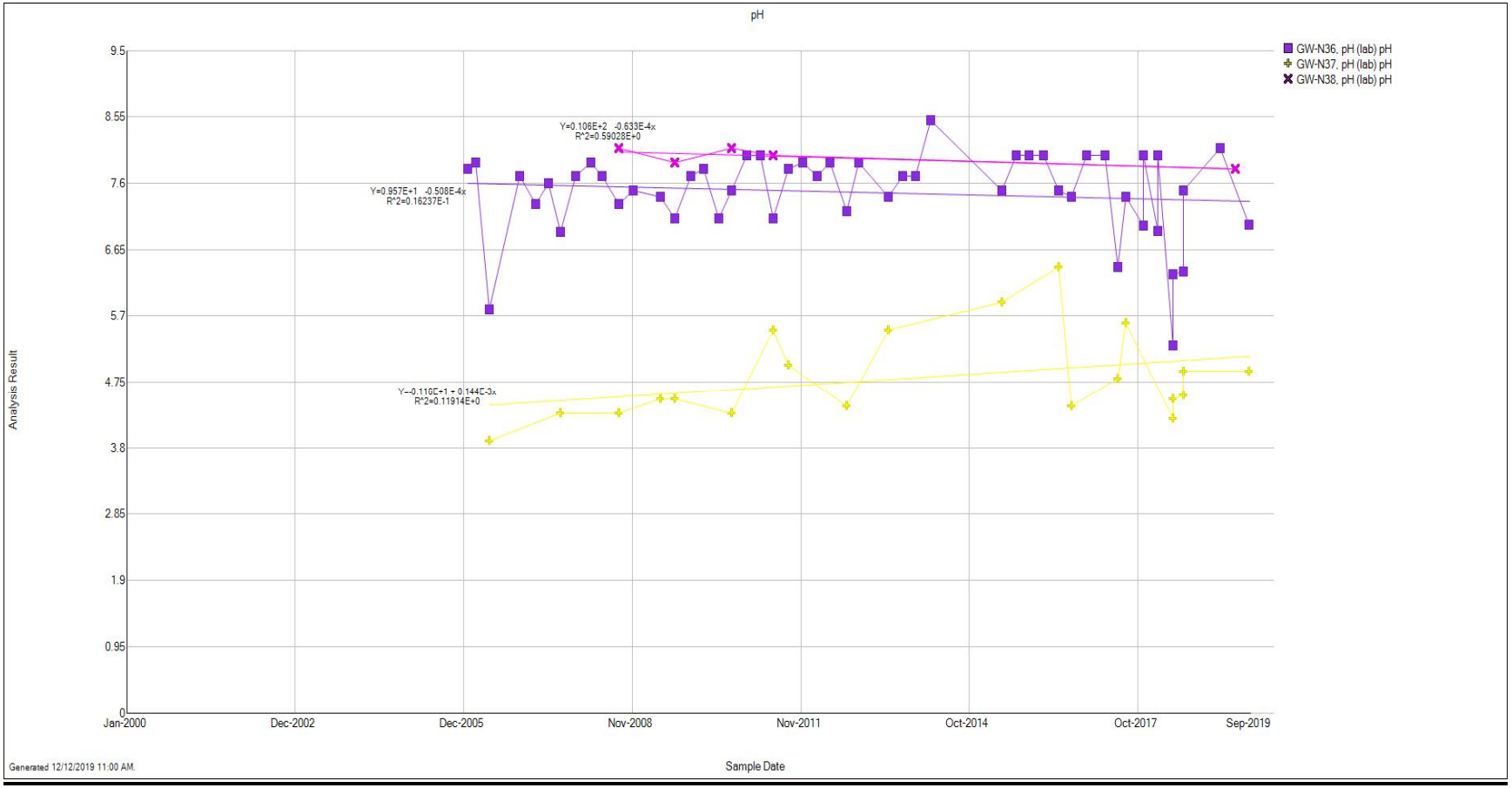

Sodium
GW-N36, Ca, diss mg/L
GW-N37, Ca, diss mg/L
GW-N38, Ca, diss mg/L
Y=0.177E+3 + 0.222E-2x
R^2=0.56587E-2
Y=0.571E+3 -0.103E-1x
R^2=0.91222E-1
Y=0.224E+3 -0.431E-2x
R^2=0.54600E+0
Analysis Result
Sample Date
Generated 12/12/2019 10:55 AM.
0
40
80
120
160
200
240
280
320
360
400
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019

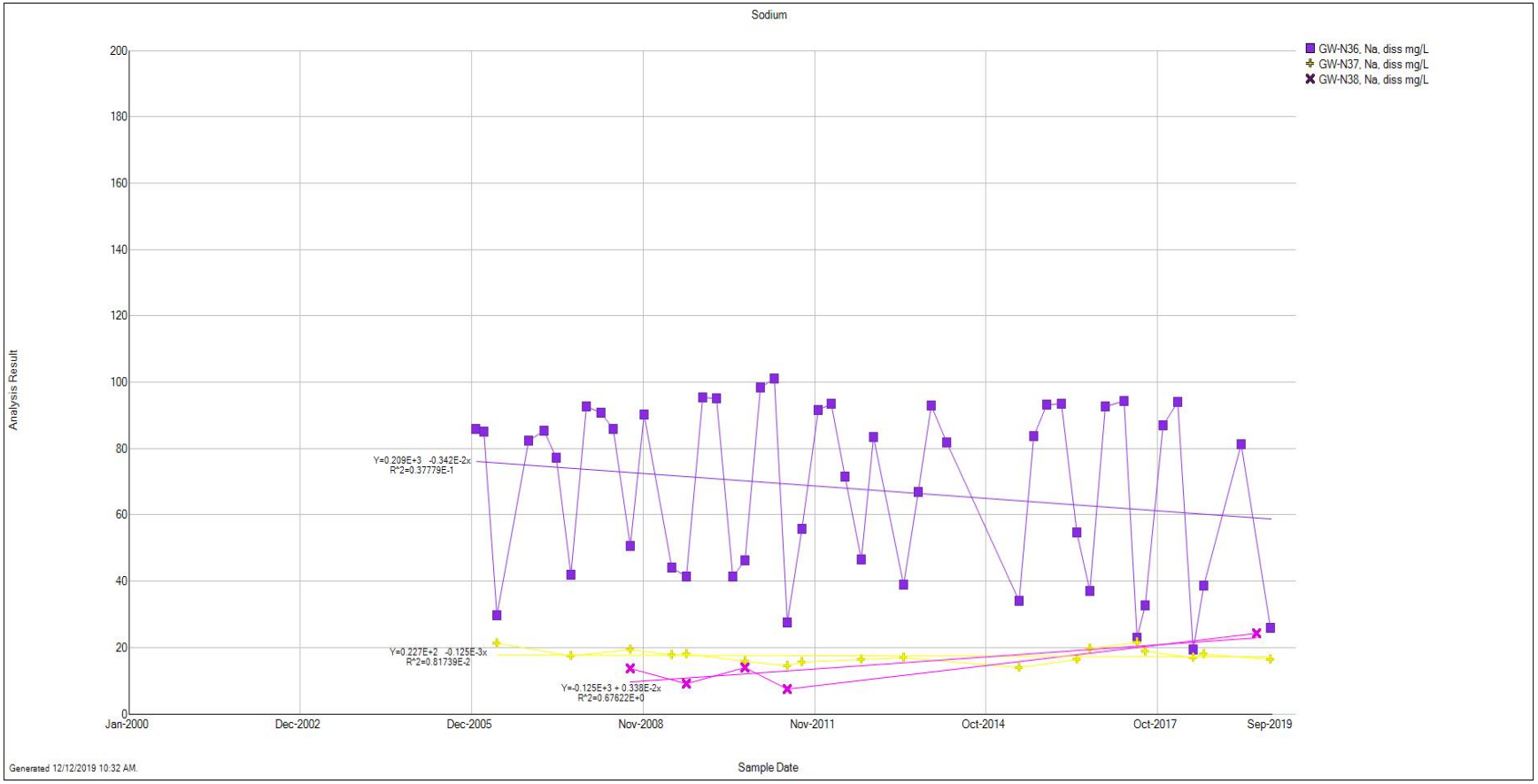

Specific Conductivity
GW-N36, Spec. Cond. (lab) u
GW-N37, Spec. Cond. (lab) u
GW-N38, Spec. Cond. (lab) u
Y=0.469E+4 -0.795E-1x
R^2=0.64131E-1
Y=0.757E+2 + 0.290E-1x
R^2=0.57475E-1
Y=0.185E+4 -0.326E-1x
R^2=0.45201E+0
Analysis Result
2900
2610
2320
2030
1740
1450
1160
870
580
290
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 10:59 AM.
Sample Date

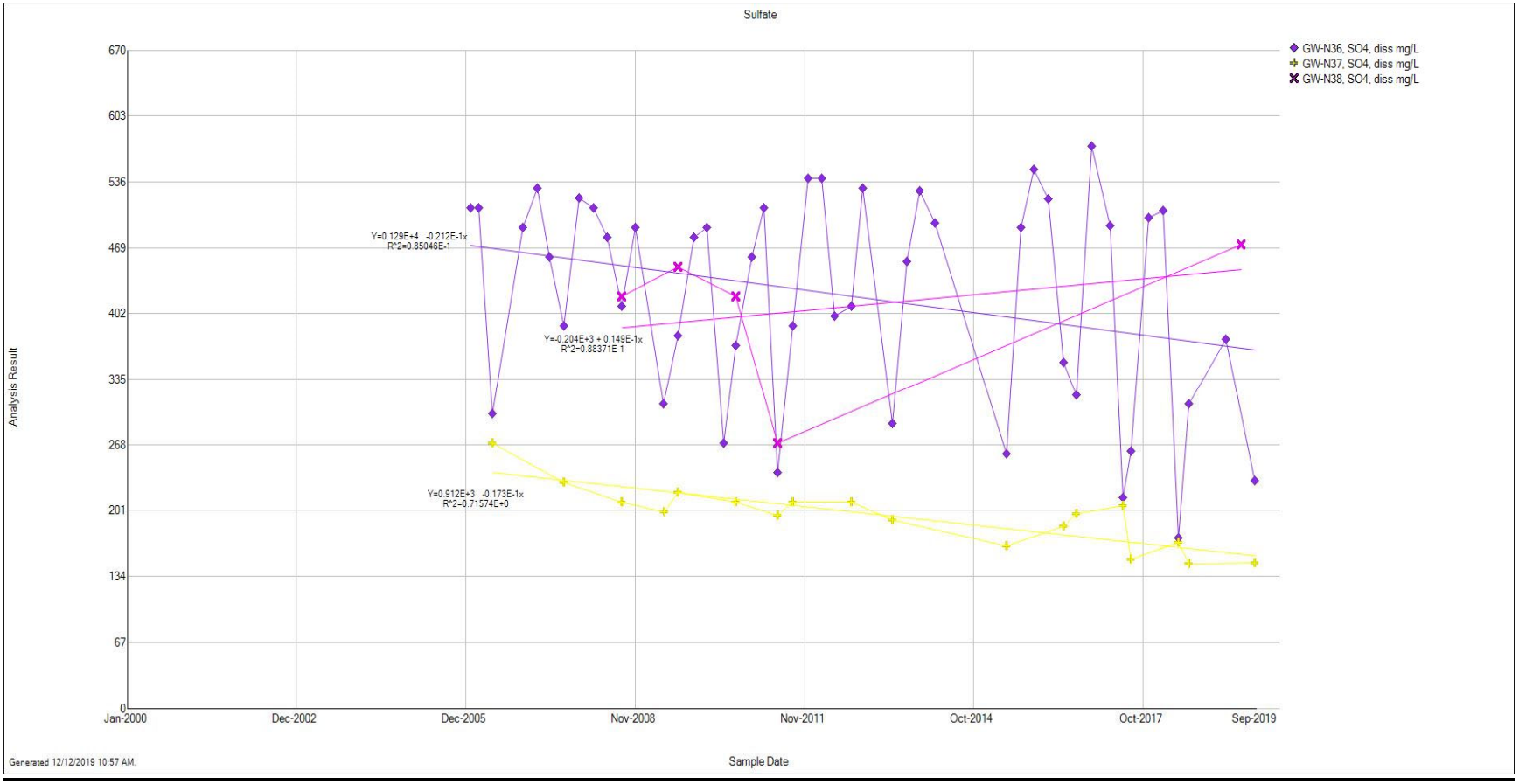

Iron
GW-N36, Fe, tot rec ug/L
GW-N37, Fe, tot rec ug/L
GW-N38, Fe, tot rec ug/L
Analysis Result
7001.7
6203.4
5405.1
4606.8
3808.5
3010.2
2211.9
1413.6
615.3
-183
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.288E+5 -0.962E+0x
R^2=0.92276E+9
Y=0.613E+4 -0.131E+0x
R^2=0.58229E-1
Generated 12/12/2019 10:53 AM.
Sample Date

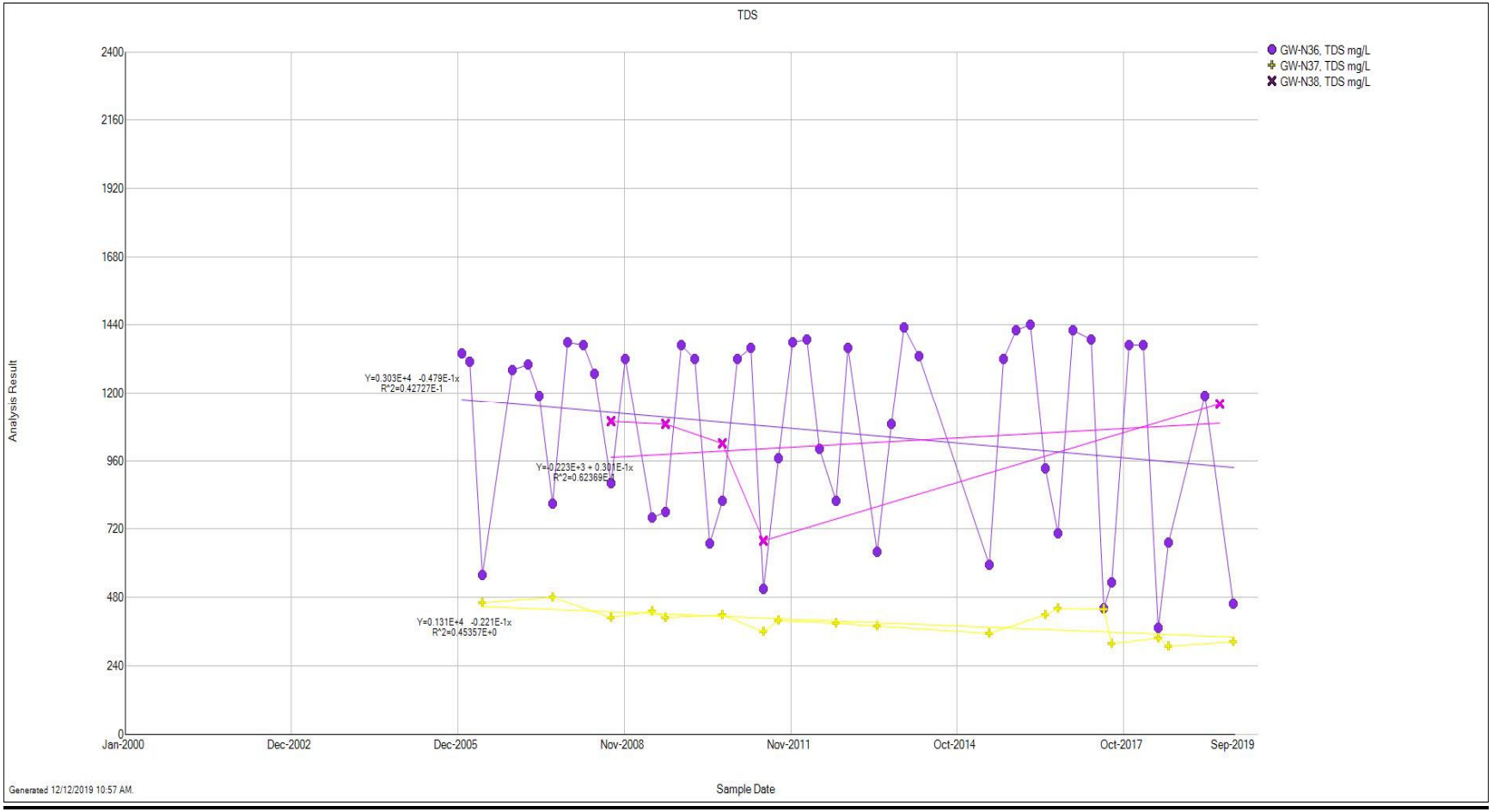

Magnesium
GW-N36, Mg, diss mg/L
GW-N37, Mg, diss mg/L
GW-N38, Mg, diss mg/L
Analysis Result
210
189
168
147
126
105
84
63
42
21
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.223E+3 -0.388E-2x
R^2=0.39057E-1
Y=0.968E+2 -0.189E-2x
R^2=0.48678E+0
Y=-0.383E+2 + 0.139E-2x
R^2=0.59897E+0
Generated 12/12/2019 10:52 AM.
Sample Date

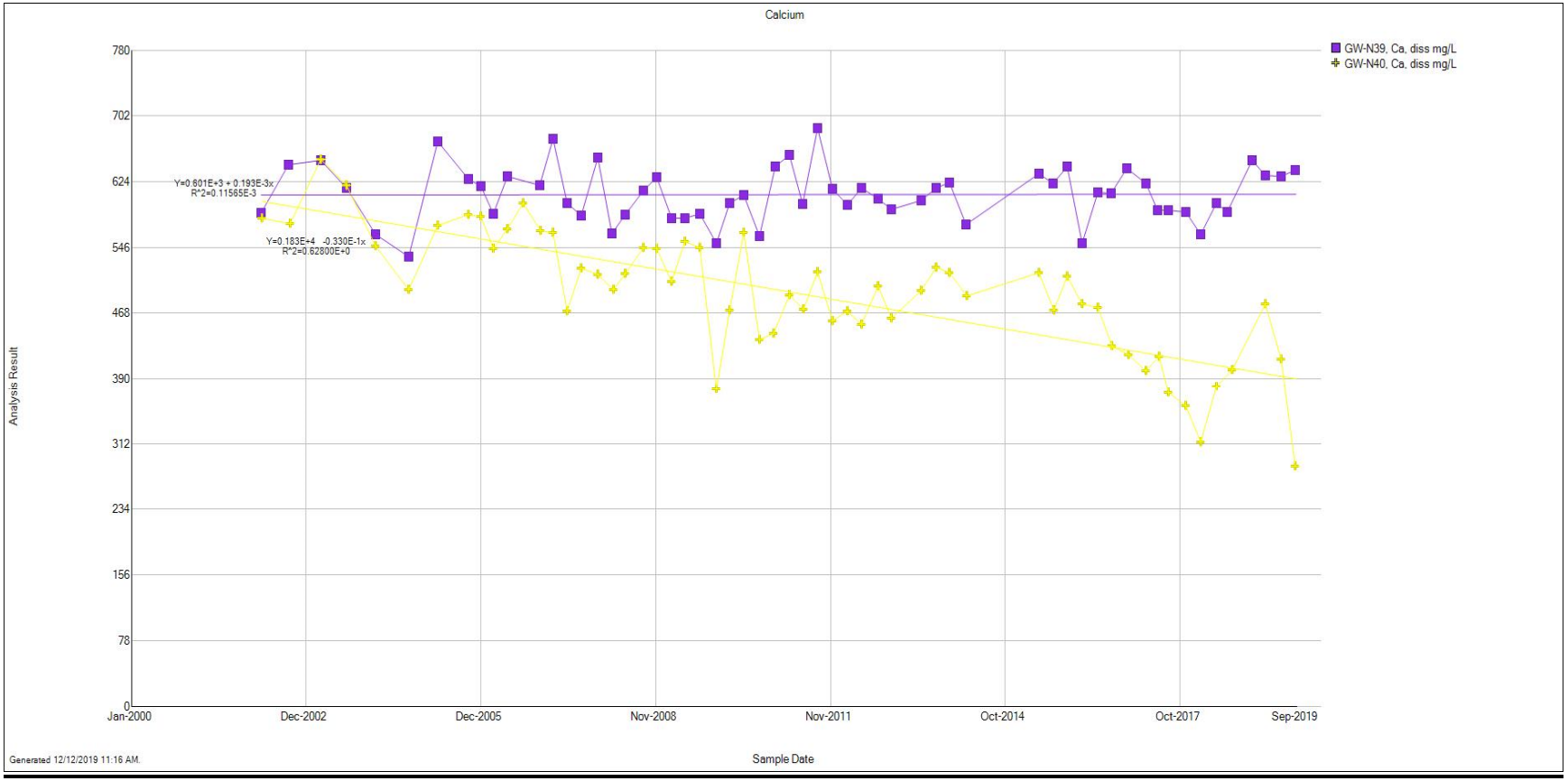

Manganese
GW-N36, Mn, diss mg/L
GW-N37, Mn, diss mg/L
GW-N38, Mn, diss mg/L
Analysis Result
1.26
1.12
0.98
0.84
0.7
0.56
0.42
0.28
0.14
0
Y=0.143E+1 -0.321E-4x
R^2=0.31604E+0
Y=0.590E-1 -0.767E-6x
R^2=0.80249E-2
Y=0.500E-2 0.0x
R^2=
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 10:40 AM.
Sample Date

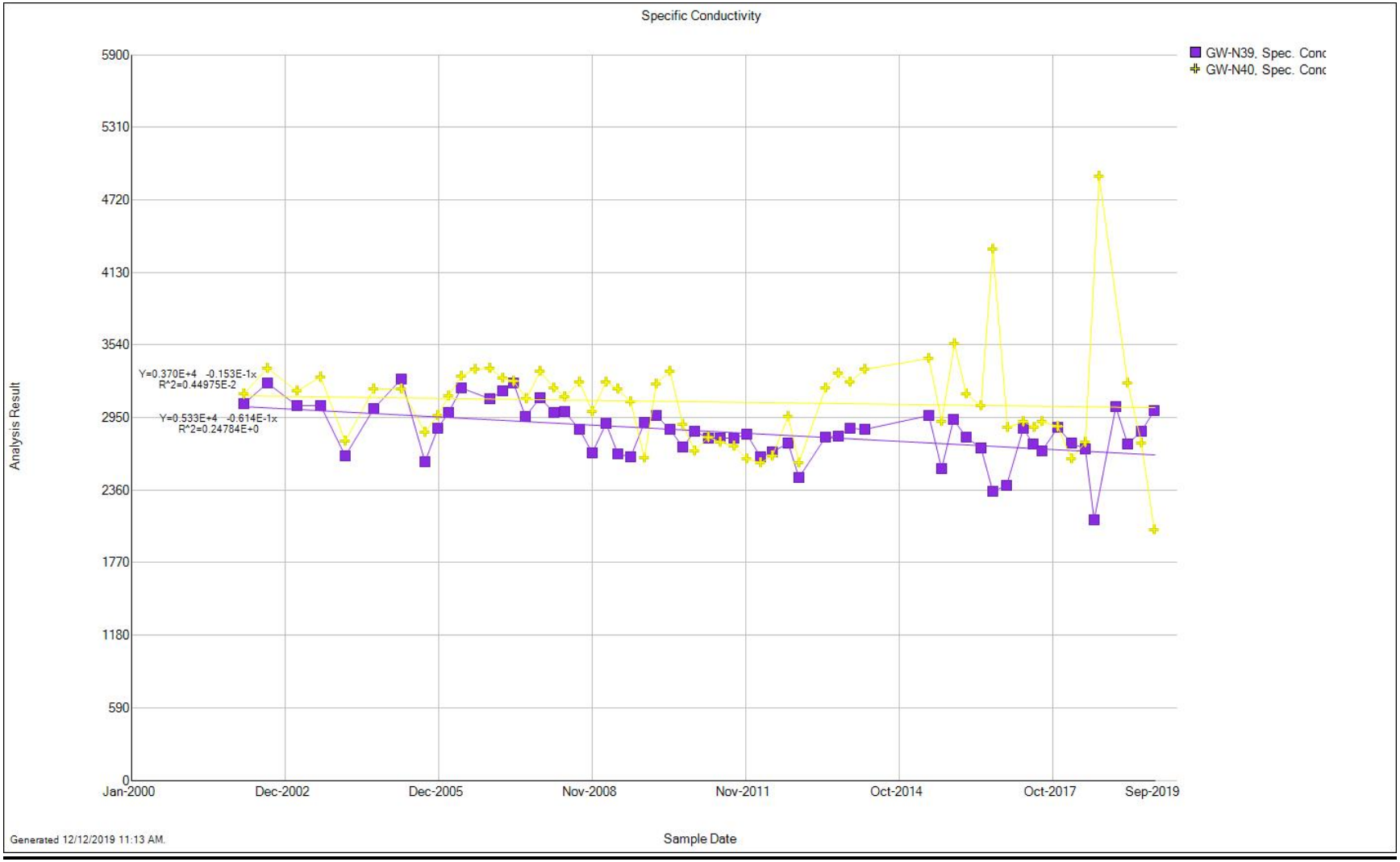

pH
GW-N36, pH (lab) pH
GW-N37, pH (lab) pH
GW-N38, pH (lab) pH
Y=0.106E+2 -0.633E-4x
R^2=0.59028E+0
Y=0.957E+1 -0.508E-4x
R^2=0.16237E-1
Y=-0.116E+1 + 0.144E-3x
R^2=0.11914E+0
9.5
8.55
7.6
6.65
5.7
4.75
3.8
2.85
1.9
0.95
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Analysis Result
Sample Date
Generated 12/12/2019 11:00 AM.

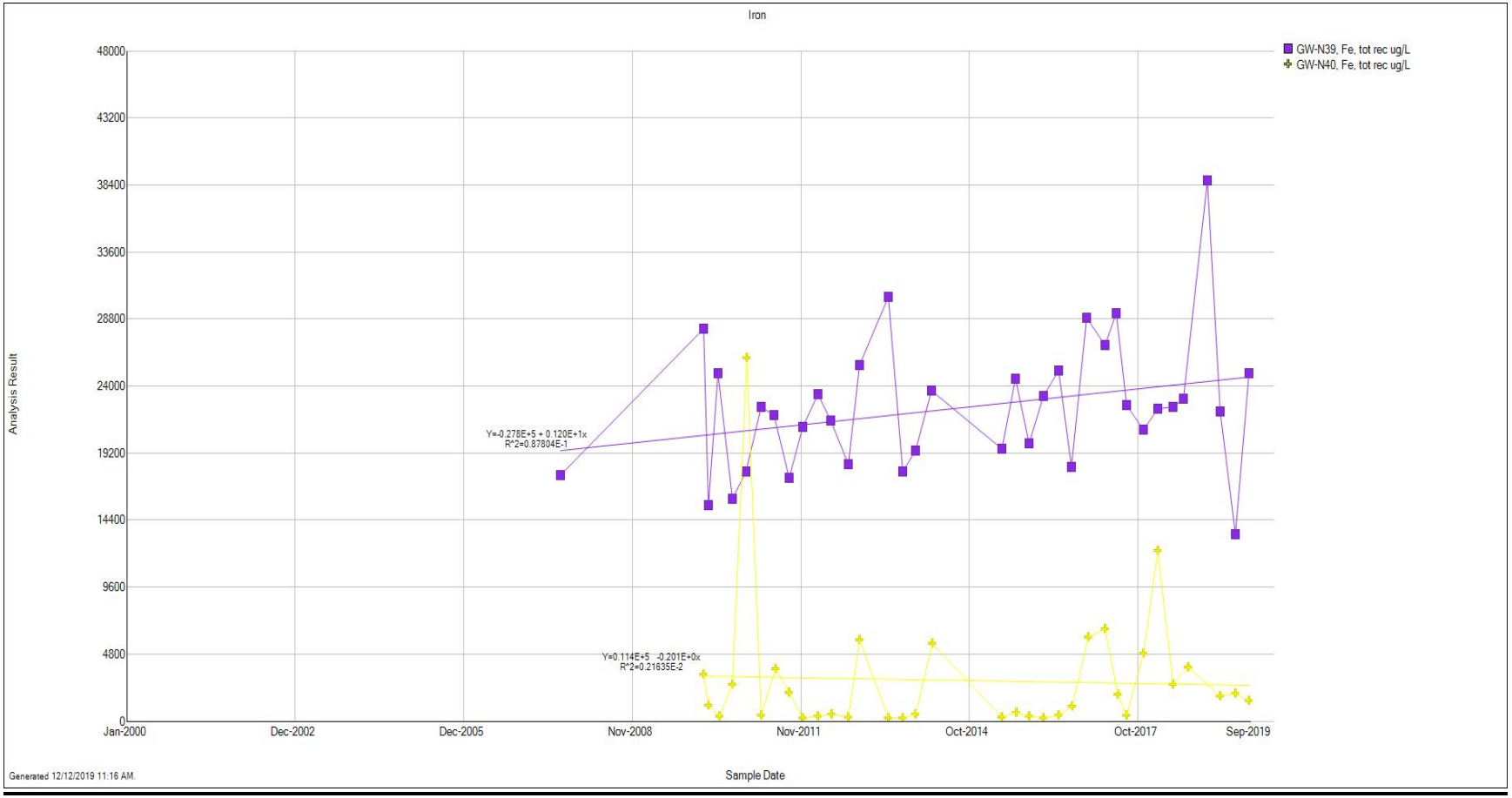

Sodium
GW-N36, Na, diss mg/L
GW-N37, Na, diss mg/L
GW-N38, Na, diss mg/L
Analysis Result
Sample Date
Generated 12/12/2019 10:32 AM.
Y=0.209E+3 -0.342E-2x
R^2=0.37779E-1
Y=0.227E+2 -0.125E-3x
R^2=0.81739E-2
Y=-0.125E+3 + 0.338E-2x
R^2=0.67622E+0
0
20
40
60
80
100
120
140
160
180
200
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019

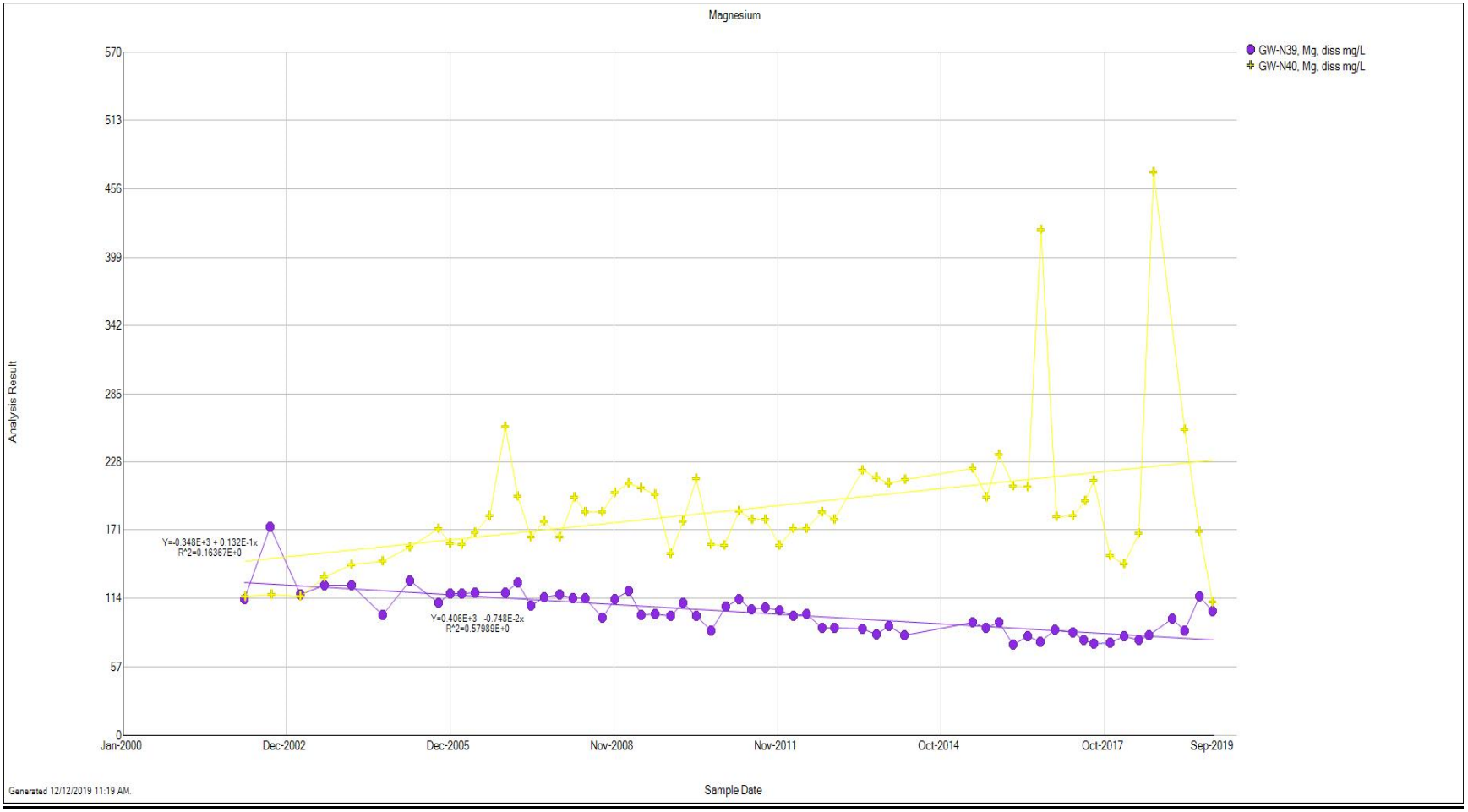

Sulfate
GW-N36, SO4, diss mg/L
GW-N37, SO4, diss mg/L
GW-N38, SO4, diss mg/L
Y=0.129E+4 -0.212E-1x
R^2=0.85046E-1
Y=-0.204E+3 + 0.149E-1x
R^2=0.88371E-1
Y=0.912E+3 -0.173E-1x
R^2=0.71574E+0
Analysis Result
670
603
536
469
402
335
268
201
134
67
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 10:57 AM.
Sample Date

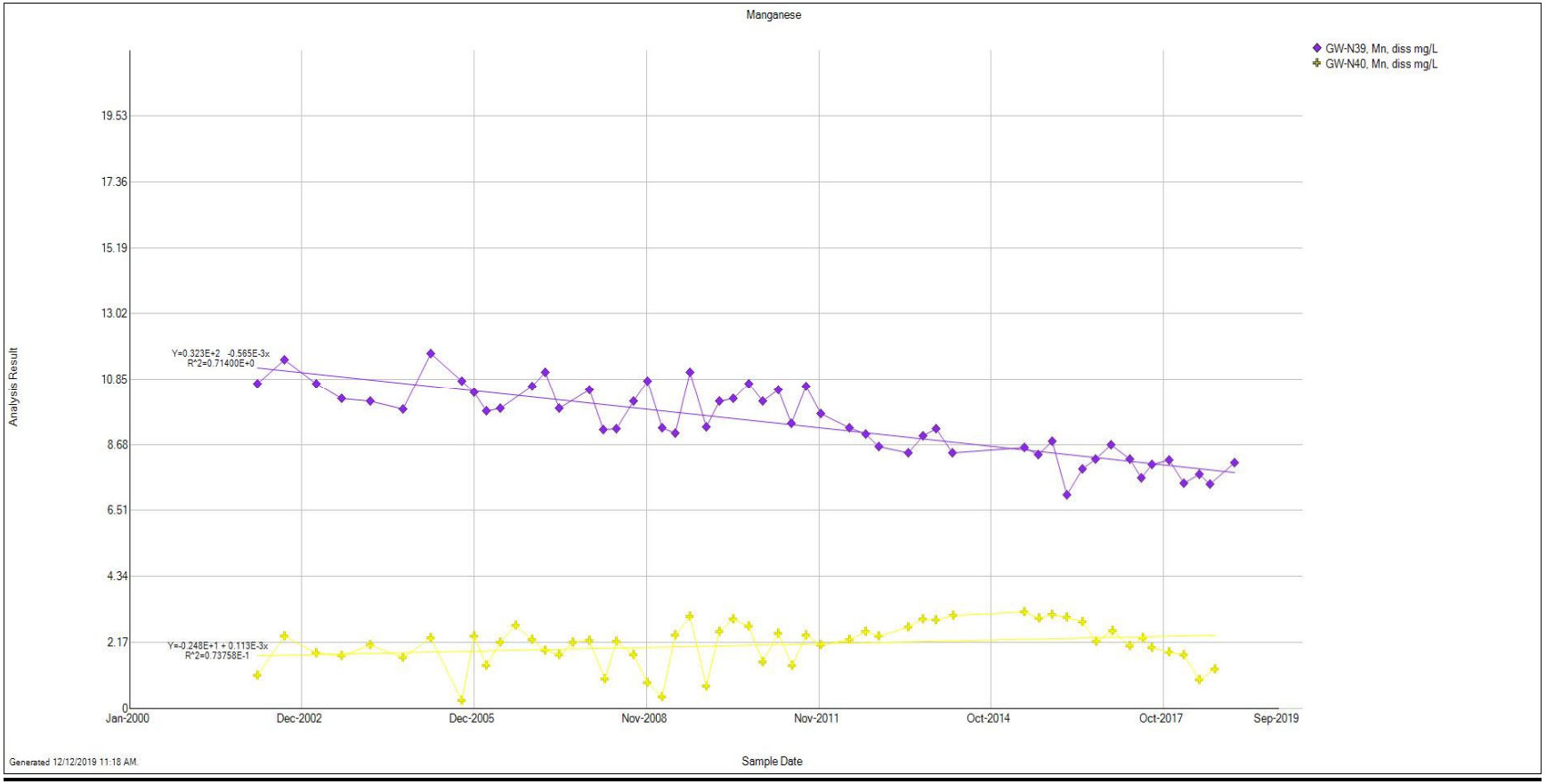

TDS
GW-N36, TDS mg/L
GW-N37, TDS mg/L
GW-N38, TDS mg/L
Y=0.303E+4 -0.479E-1x
R^2=0.42727E-1
Y=0.223E+3 + 0.301E-1x
R^2=0.62369E-1
Y=0.131E+4 -0.221E-1x
R^2=0.45357E+0
Analysis Result
Sample Date
Generated 12/12/2019 10:57 AM.
2400
2160
1920
1680
1440
1200
960
720
480
240
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019

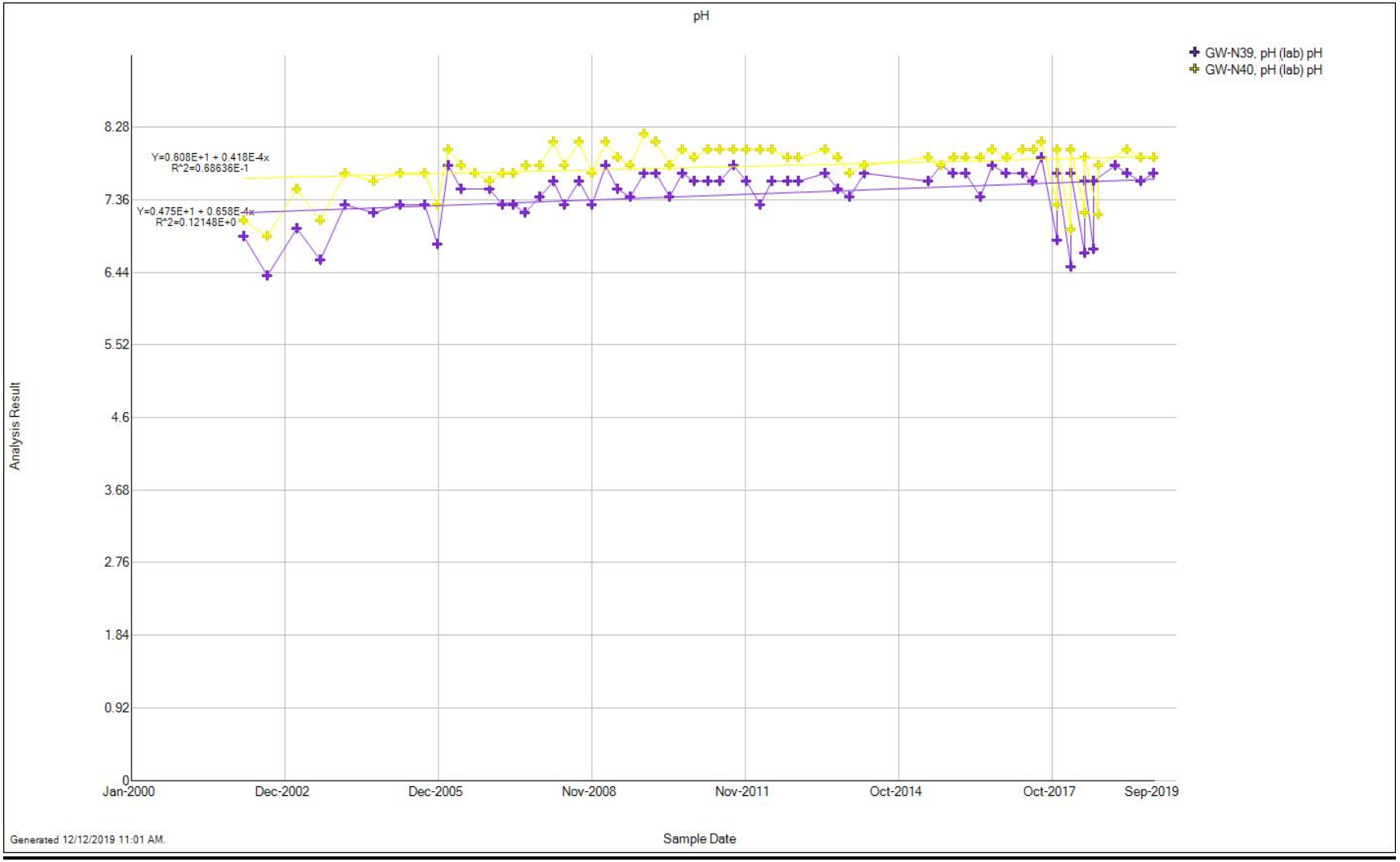

Calcium
GW-N39, Ca, diss mg/L
GW-N40, Ca, diss mg/L
Y=0.601E+3 + 0.193E-3x
R^2=0.11565E-3
Y=0.183E+4 -0.330E-1x
R^2=0.62800E+0
Analysis Result
780
702
624
546
468
390
312
234
156
78
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:16 AM.
Sample Date

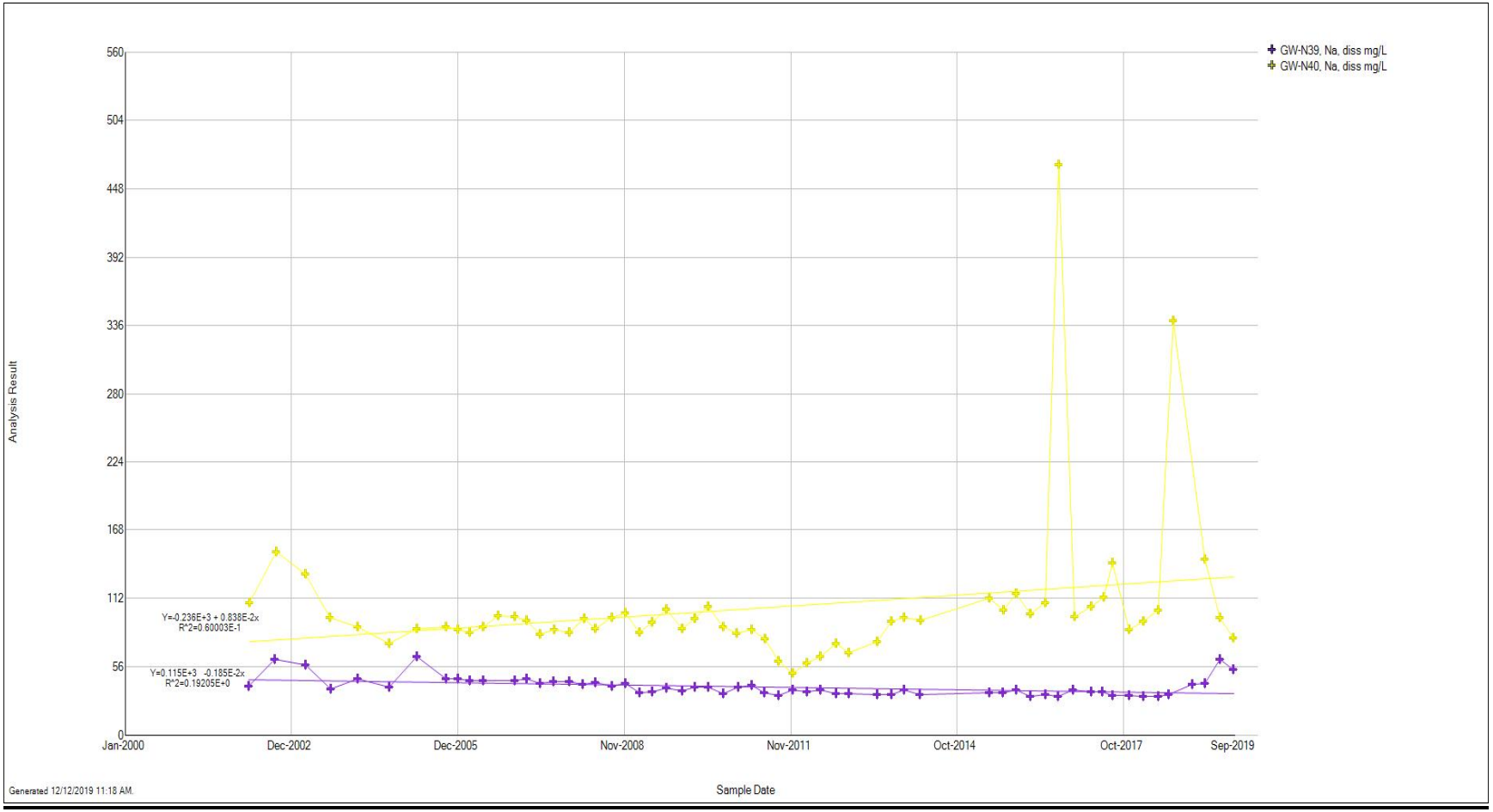

Specific Conductivity
GW-N39, Spec. Conc
GW-N40, Spec. Conc
Y=0.370E+4 -0.153E-1x
R^2=0.44975E-2
Y=0.533E+4 -0.614E-1x
R^2=0.24784E+0
5900
5310
4720
4130
3540
2950
2360
1770
1180
590
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 11:13 AM.

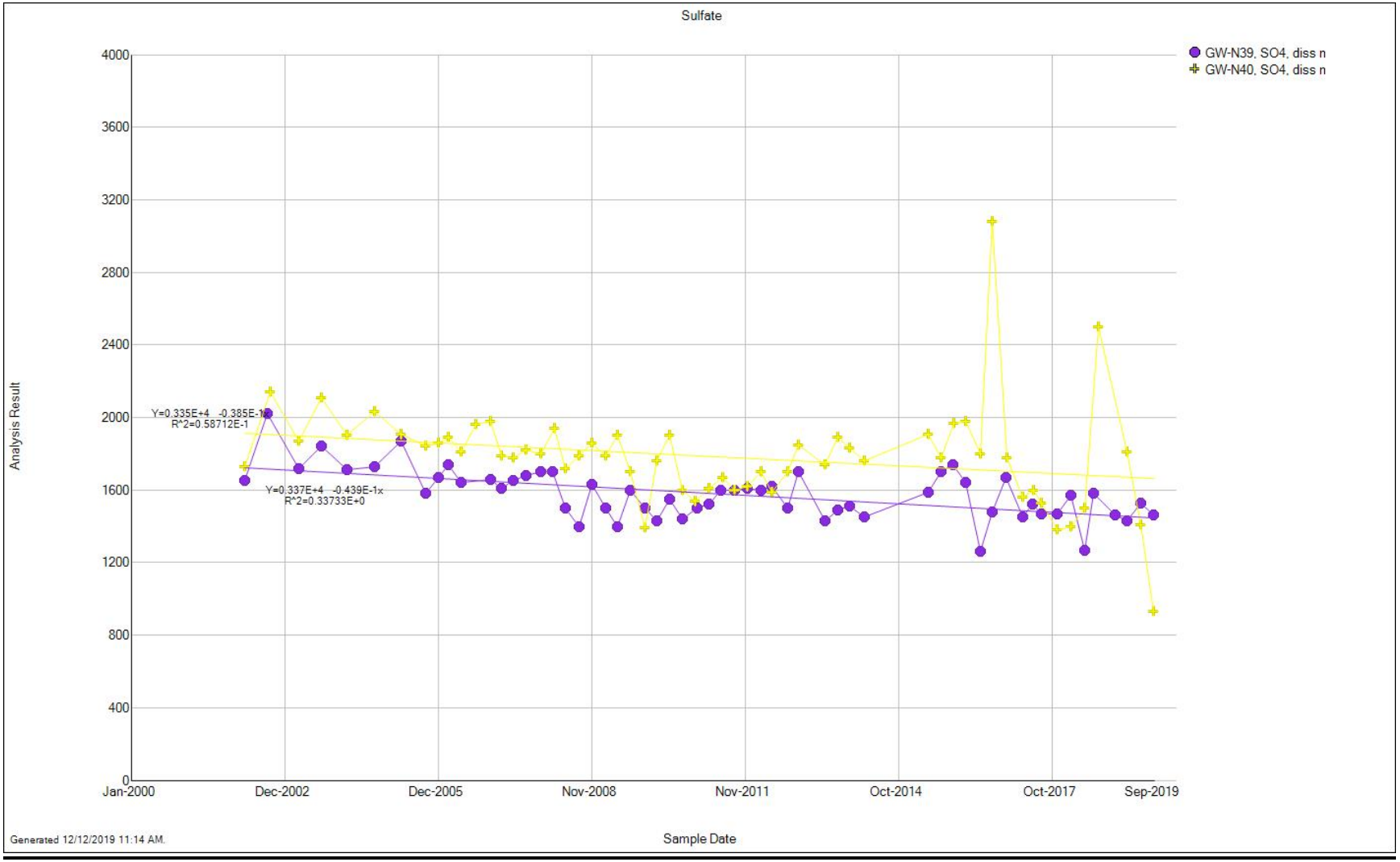

Iron
GW-N39, Fe, tot rec ug/L
GW-N40, Fe, tot rec ug/L
Analysis Result
48000
43200
38400
33600
28800
24000
19200
14400
9600
4800
0
Y=-0.278E+5 + 0.120E+1x
R^2=0.87804E-1
Y=0.114E+5 -0.201E+0x
R^2=0.21635E-2
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:16 AM.
Sample Date

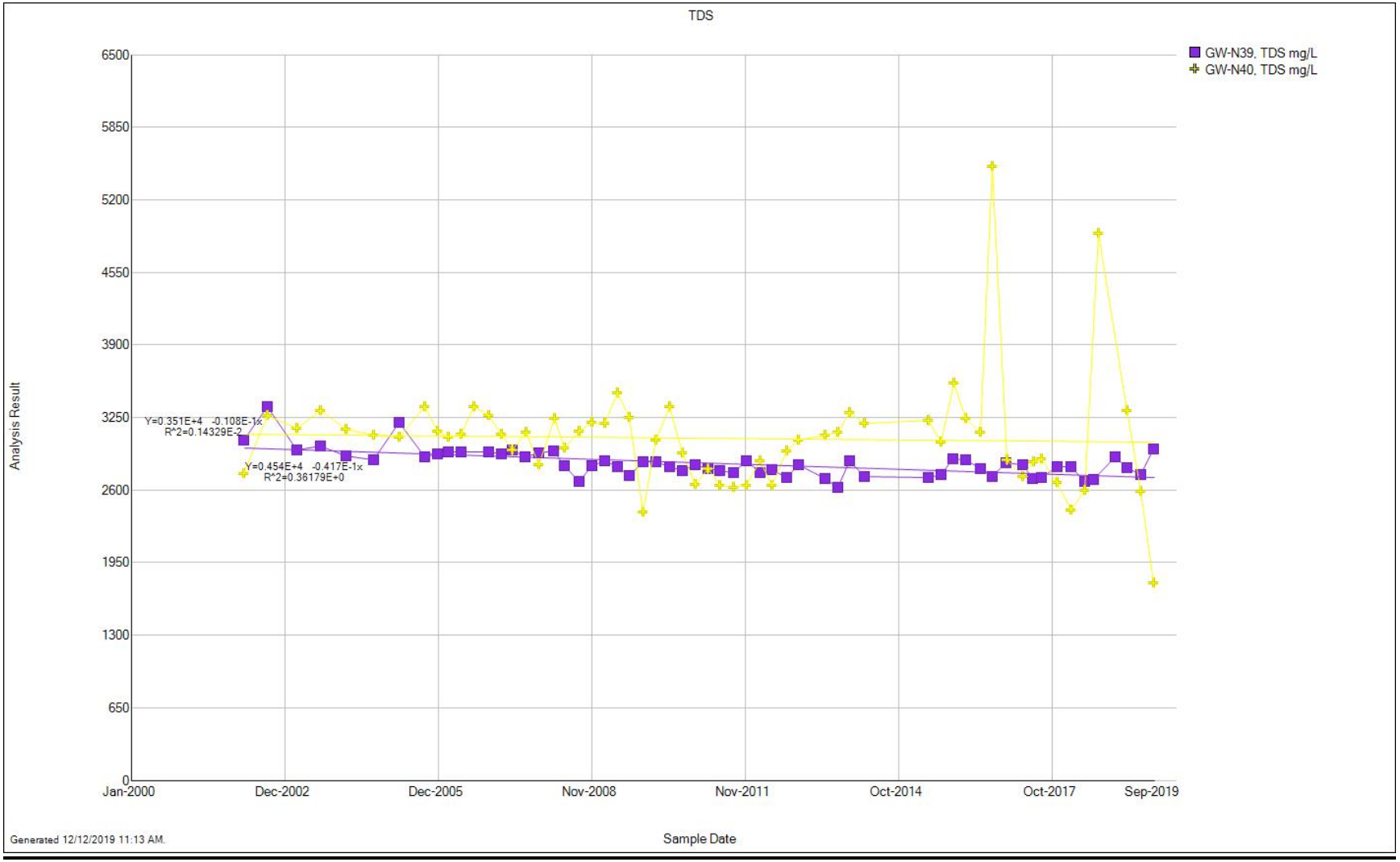

Magnesium
GW-N39, Mg, diss mg/L
GW-N40, Mg, diss mg/L
Analysis Result
570
513
456
399
342
285
228
171
114
57
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=-0.348E+3 + 0.132E-1x
R^2=0.16367E+0
Y=0.406E+3 -0.748E-2x
R^2=0.57989E+0
Generated 12/12/2019 11:19 AM.
Sample Date

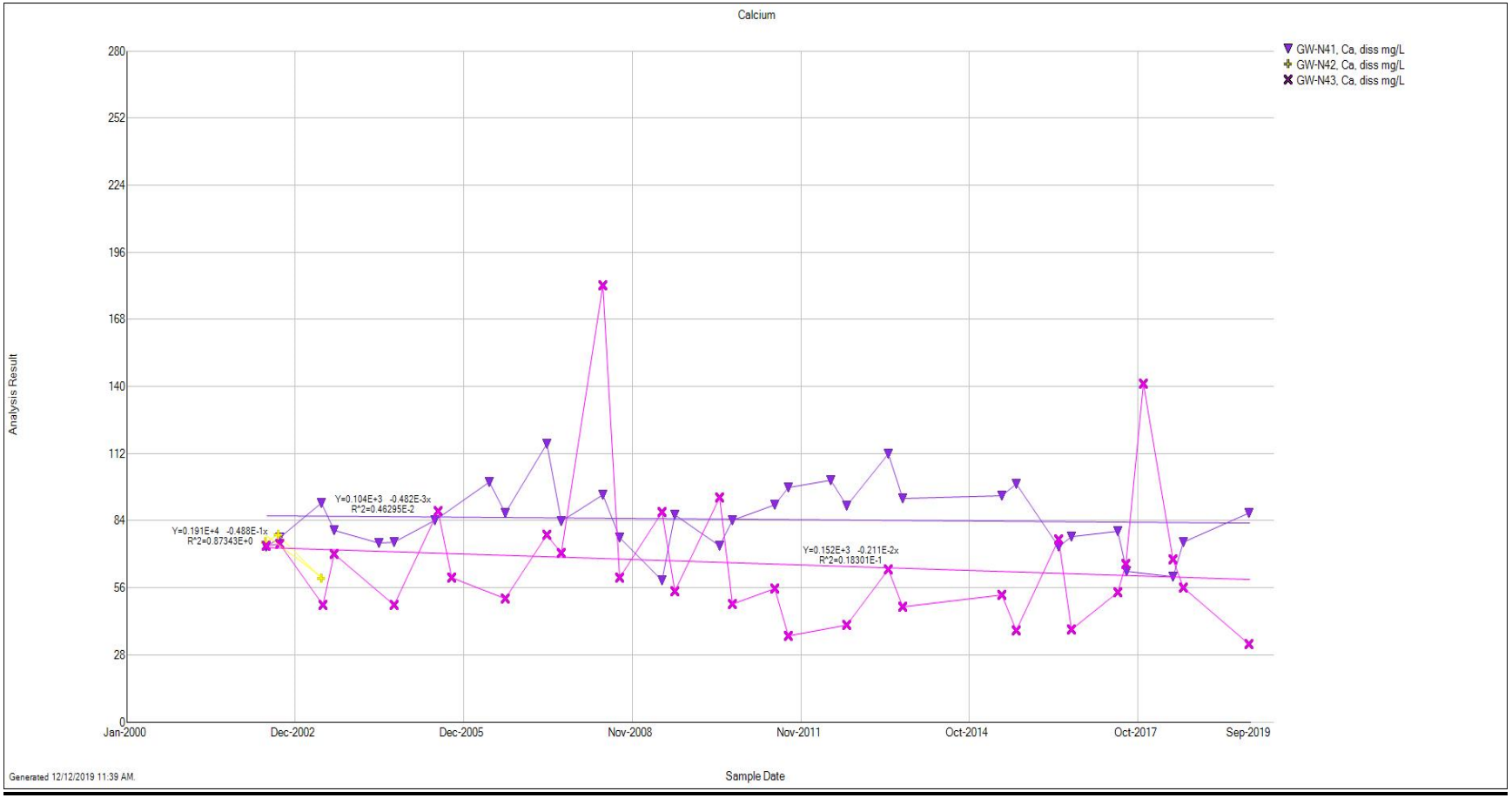

Manganese
GW-N39, Mn, diss mg/L
GW-N40, Mn, diss mg/L
Analysis Result
19.53
17.36
15.19
13.02
10.85
8.68
6.51
4.34
2.17
0
Y=0.323E+2 -0.565E-3x
R^2=0.71400E+0
Y=-0.248E+1 + 0.113E-3x
R^2=0.73758E-1
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:18 AM.
Sample Date

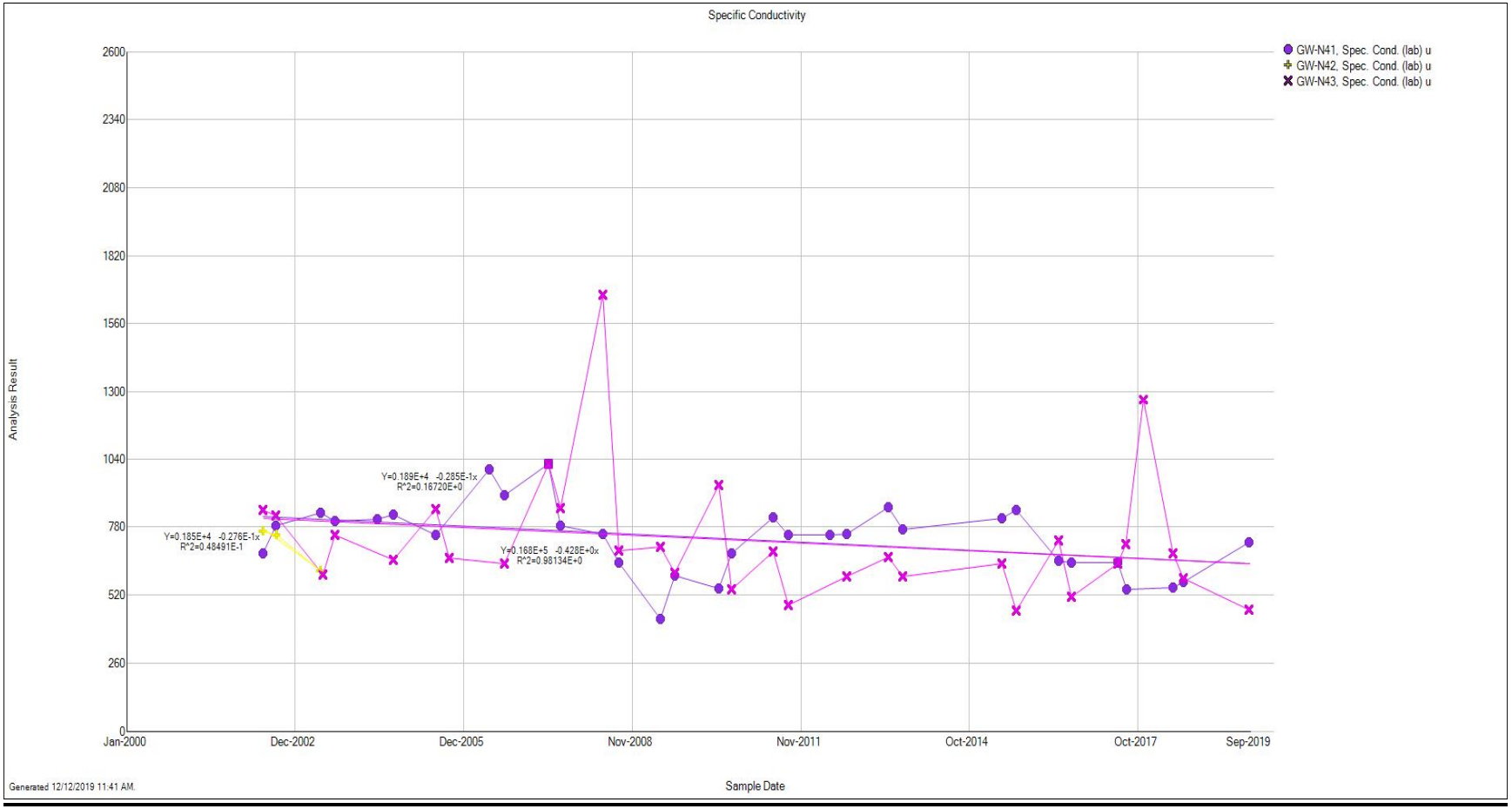

pH
GW-N39, pH (lab) pH
GW-N40, pH (lab) pH
Y=0.608E+1 + 0.418E-4x
R^2=0.68636E-1
Y=0.475E+1 + 0.658E-4x
R^2=0.12148E+0
8.28
7.36
6.44
5.52
4.6
3.68
2.76
1.84
0.92
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 11:01 AM.

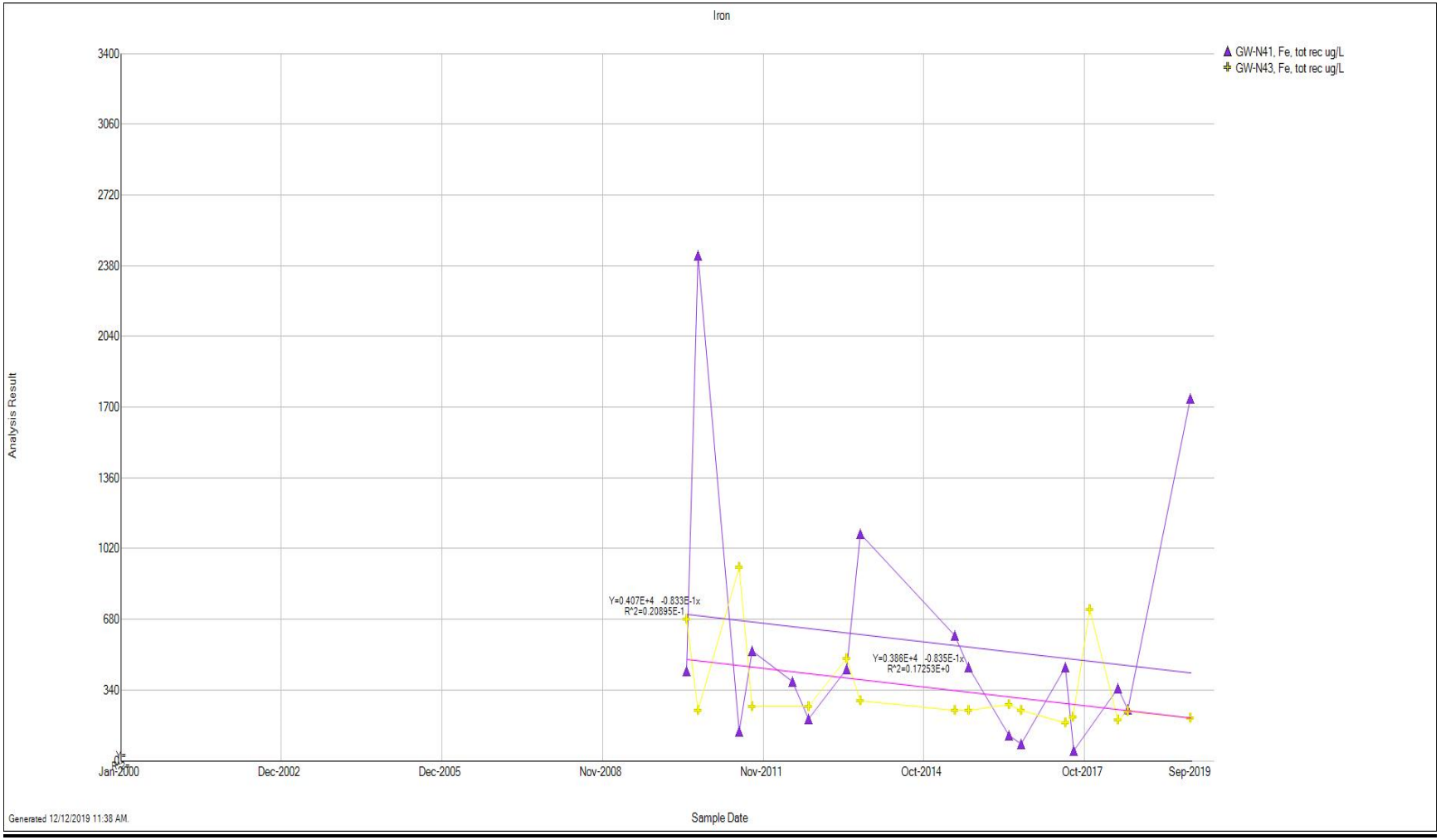

GW-N39, Na, diss mg/L
GW-N40, Na, diss mg/L
Analysis Result
560
504
448
392
336
280
224
168
112
56
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=-0.236E+3 + 0.838E-2x
R^2=0.60003E-1
Y=0.115E+3 -0.185E-2x
R^2=0.19205E+0
Generated 12/12/2019 11:18 AM.
Sample Date

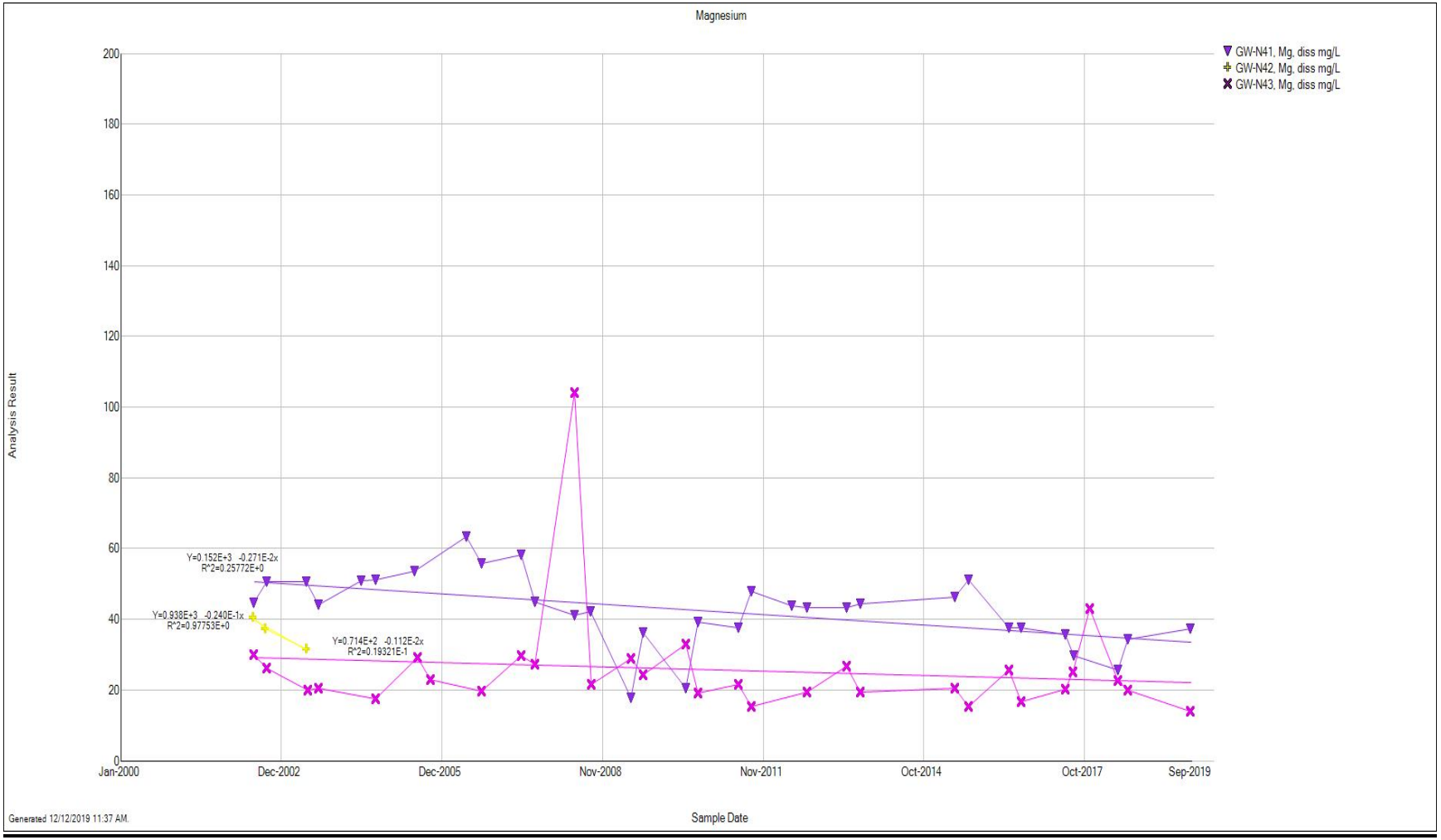

Sulfate
GW-N39, SO4, diss n
GW-N40, SO4, diss n
Analysis Result
4000
3600
3200
2800
2400
2000
1600
1200
800
400
0
Y=0.335E+4 -0.385E-1x
R^2=0.58712E-1
Y=0.337E+4 -0.439E-1x
R^2=0.33733E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:14 AM.
Sample Date

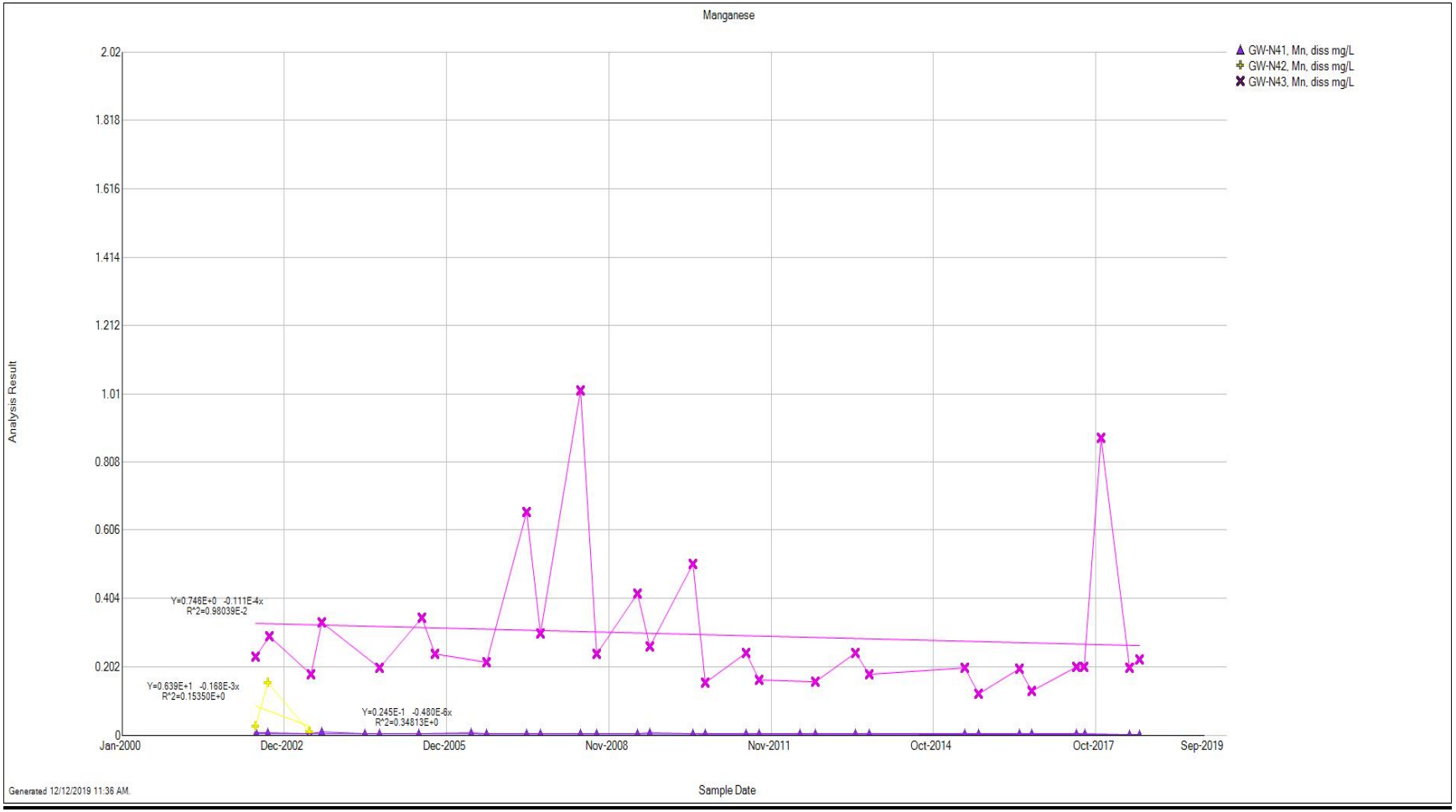

TDS
GW-N39, TDS mg/L
GW-N40, TDS mg/L
Y=0.351E+4 -0.108E-1x
R^2=0.14329E-2
Y=0.454E+4 -0.417E-1x
R^2=0.36179E+0
6500
5850
5200
4550
3900
3250
2600
1950
1300
650
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Analysis Result
Sample Date
Generated 12/12/2019 11:13 AM.

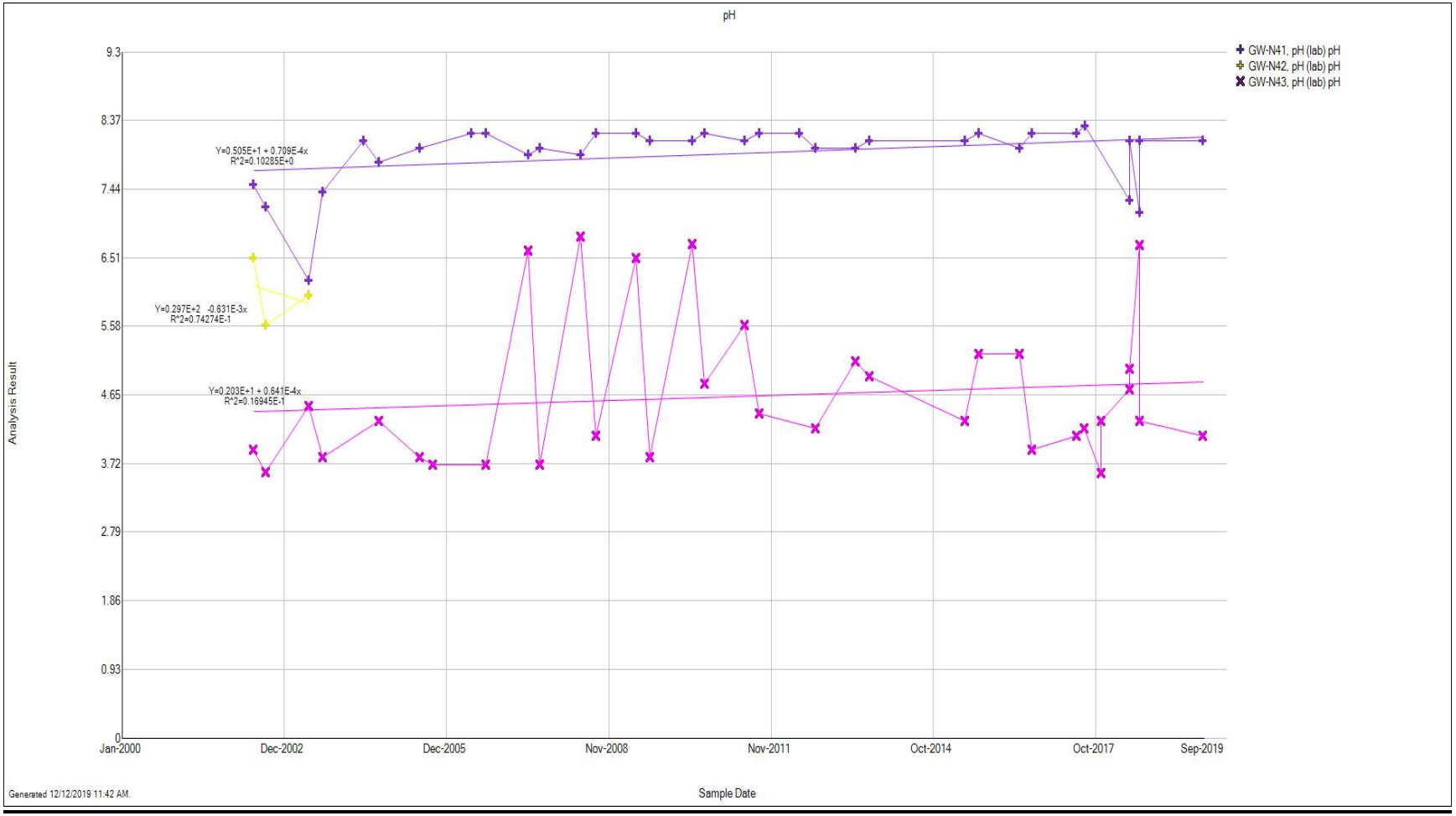

Calcium
GW-N41, Ca, diss mg/L
GW-N42, Ca, diss mg/L
GW-N43, Ca, diss mg/L
Analysis Result
280
252
224
196
168
140
112
84
56
28
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.104E+3 -0.482E-3x
R^2=0.46295E-2
Y=0.191E+4 -0.488E-1x
R^2=0.87343E+0
Y=0.152E+3 -0.211E-2x
R^2=0.18301E-1
Generated 12/12/2019 11:39 AM.
Sample Date

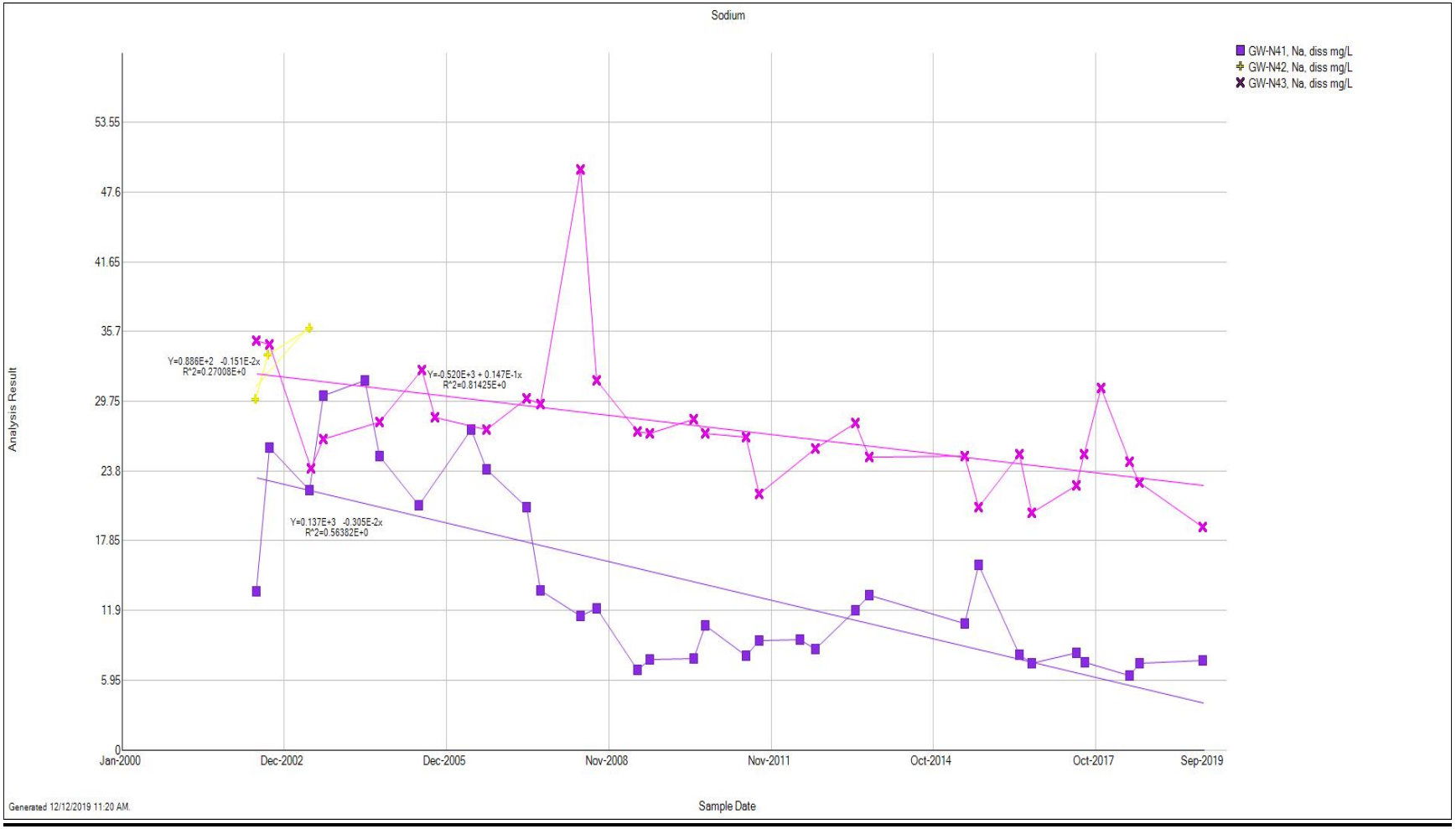

Specific Conductivity
GW-N41, Spec. Cond. (lab) u
GW-N42, Spec. Cond. (lab) u
GW-N43, Spec. Cond. (lab) u
Analysis Result
2600
2340
2080
1820
1560
1300
1040
780
520
260
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.189E+4 -0.285E-1x
R^2=0.16720E+0
Y=0.185E+4 -0.276E-1x
R^2=0.48491E-1
Y=0.168E+5 -0.428E+0x
R^2=0.98134E+0
Generated 12/12/2019 11:41 AM.
Sample Date

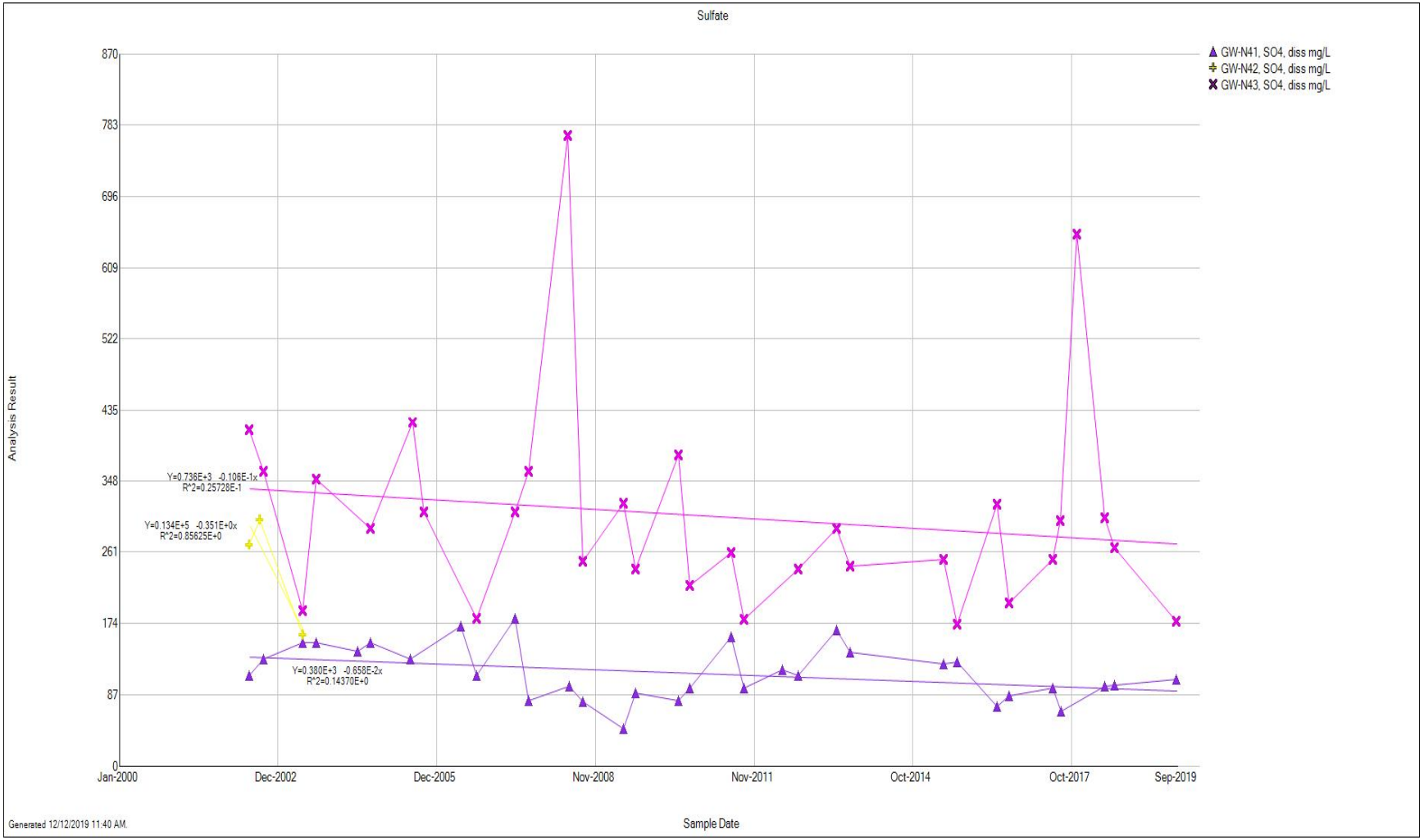

Iron
GW-N41, Fe, tot rec ug/L
GW-N43, Fe, tot rec ug/L
Analysis Result
3400
3060
2720
2380
2040
1700
1360
1020
680
340
Y=0.407E+4 -0.833E-1x
R^2=0.20895E-1
Y=0.386E+4 -0.835E-1x
R^2=0.17253E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:38 AM.
Sample Date

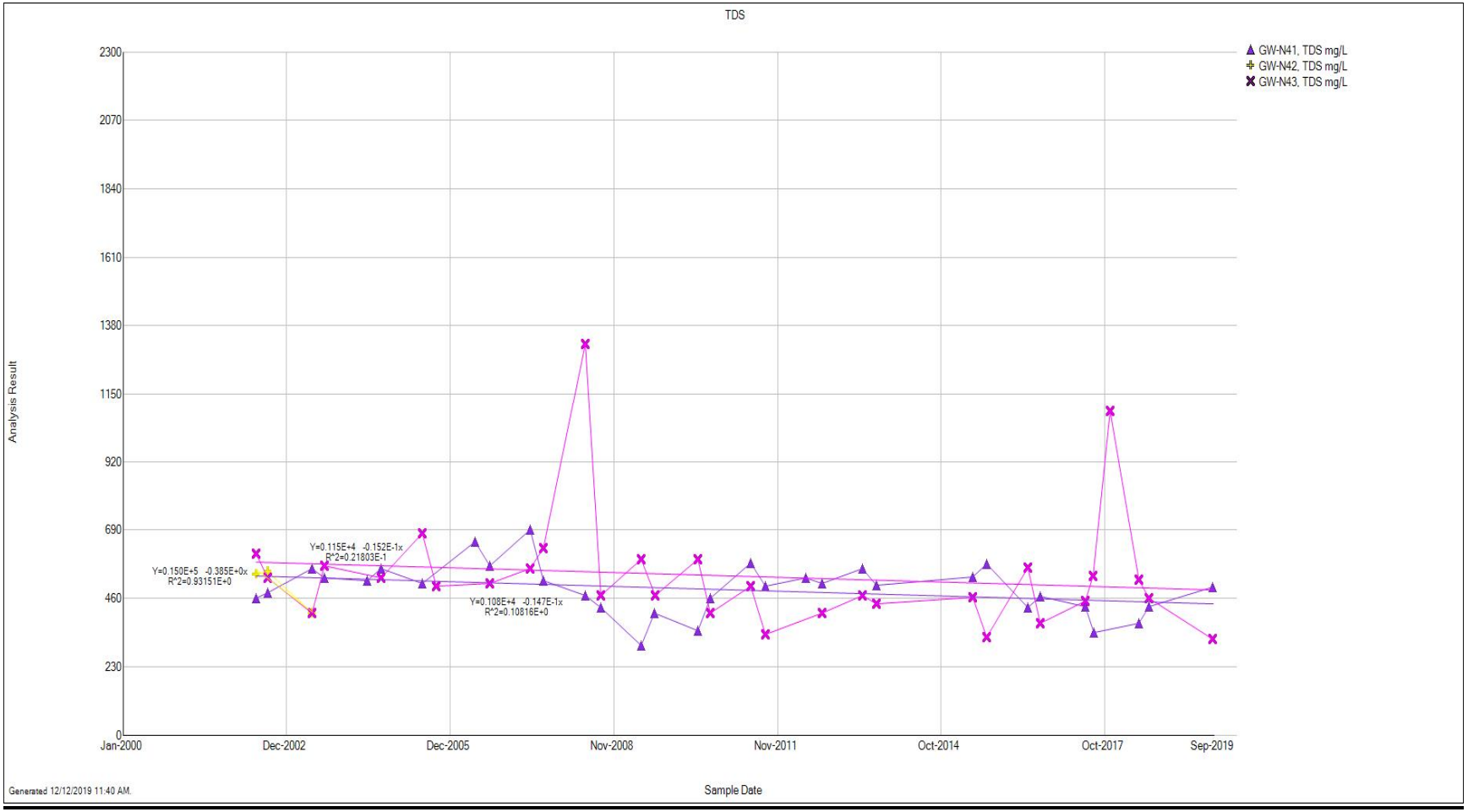

Magnesium
GW-N41, Mg, diss mg/L
GW-N42, Mg, diss mg/L
GW-N43, Mg, diss mg/L
Analysis Result
Sample Date
Generated 12/12/2019 11:37 AM.
Y=0.152E+3 -0.271E-2x
R^2=0.25772E+0
Y=0.938E+3 -0.240E-1x
R^2=0.97753E+0
Y=0.714E+2 -0.112E-2x
R^2=0.19321E-1
200
180
160
140
120
100
80
60
40
20
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019

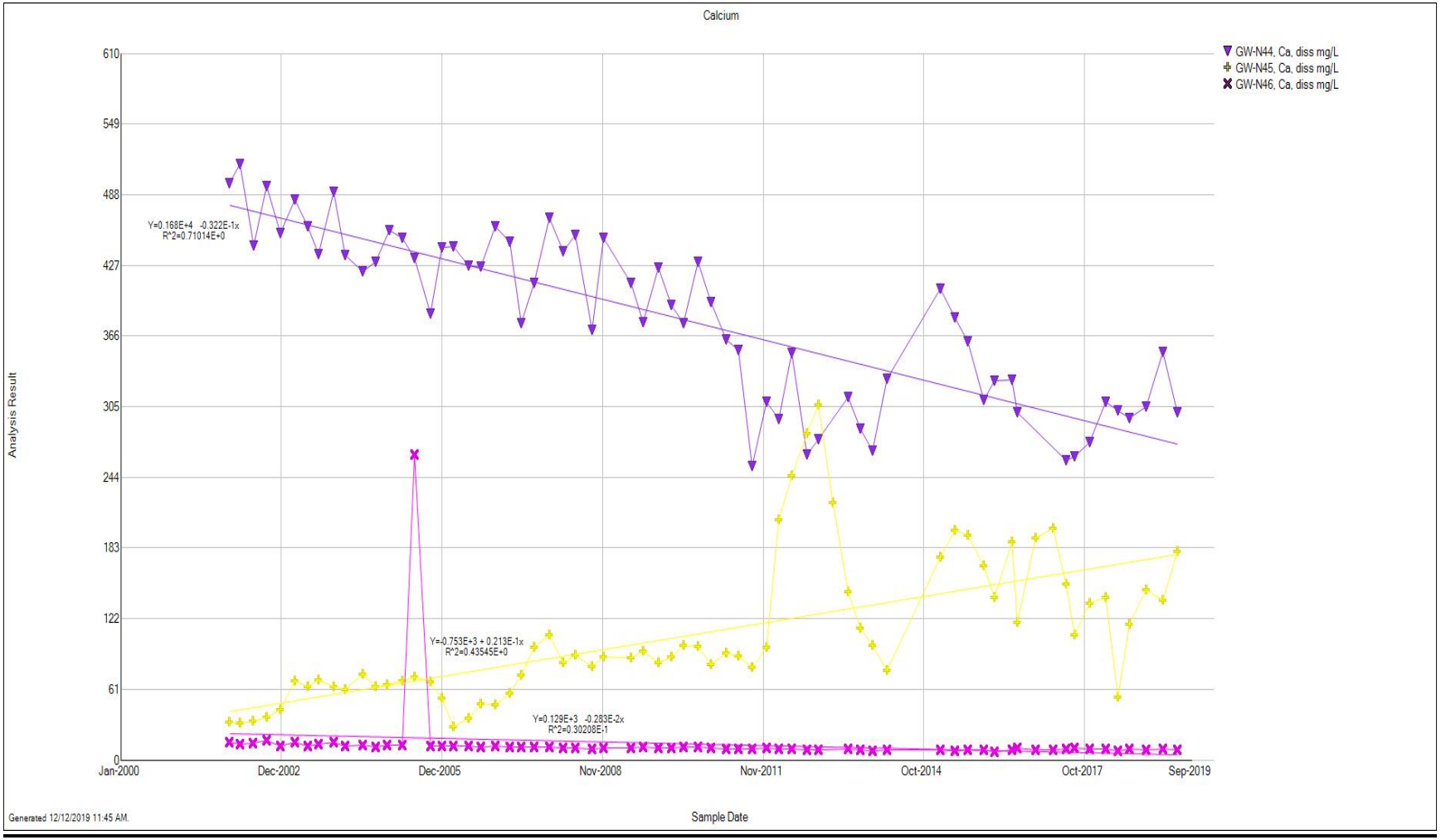

Manganese
GW-N41, Mn, diss mg/L
GW-N42, Mn, diss mg/L
GW-N43, Mn, diss mg/L
Analysis Result
2.02
1.818
1.616
1.414
1.212
1.01
0.808
0.606
0.404
0.202
0
Y=0.746E+0 -0.111E-4x
R^2=0.98039E-2
Y=0.639E+1 -0.168E-3x
R^2=0.15350E+0
Y=0.245E-1 -0.480E-6x
R^2=0.34813E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:36 AM.
Sample Date

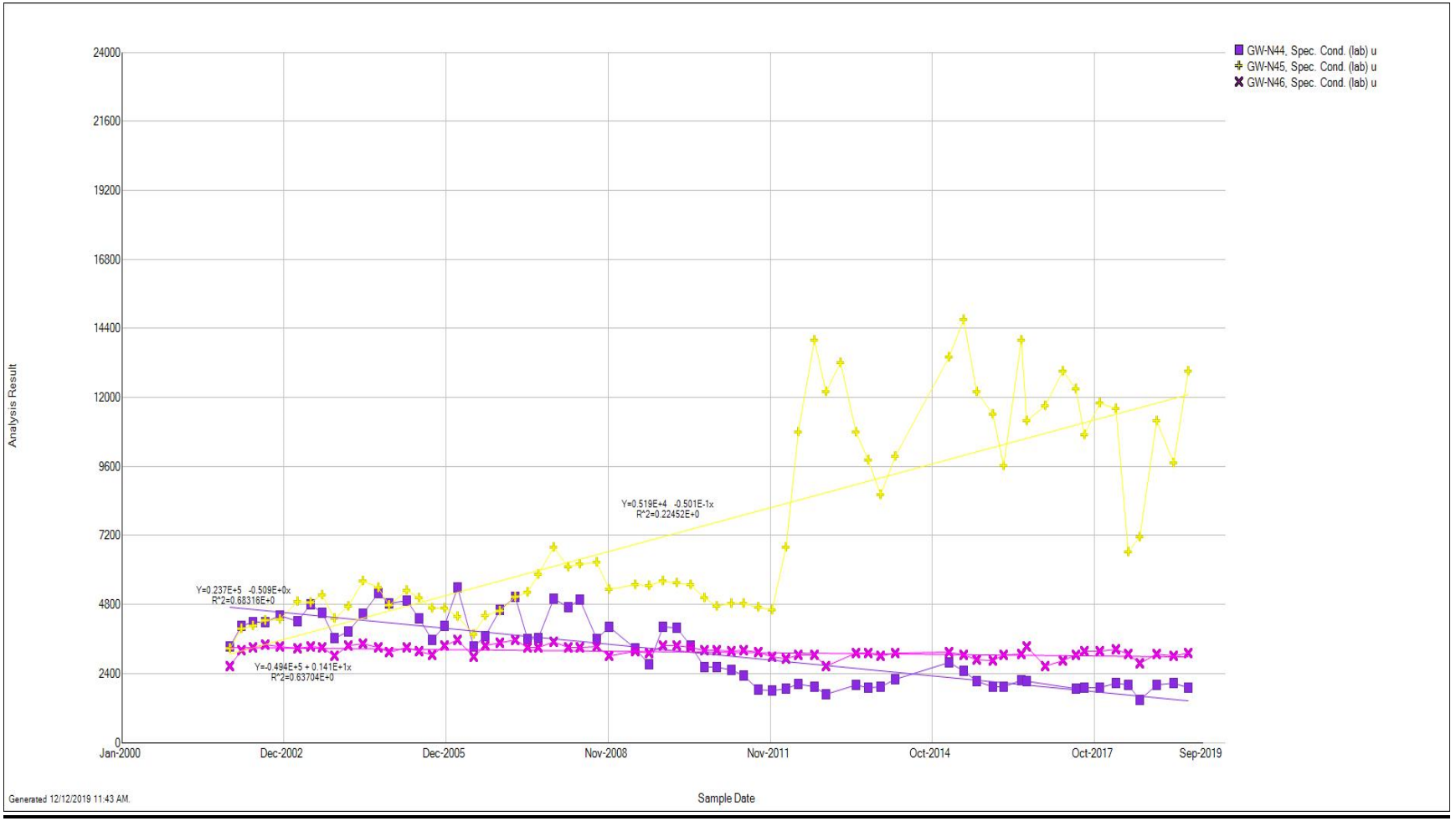

pH
GW-N41, pH (lab) pH
GW-N42, pH (lab) pH
GW-N43, pH (lab) pH
Y=0.505E+1 + 0.709E-4x
R^2=0.10285E+0
Y=0.297E+2 -0.631E-3x
R^2=0.74274E-1
Y=0.203E+1 + 0.641E-4x
R^2=0.16945E-1
9.3
8.37
7.44
6.51
5.58
4.65
3.72
2.79
1.86
0.93
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Analysis Result
Sample Date
Generated 12/12/2019 11:42 AM.

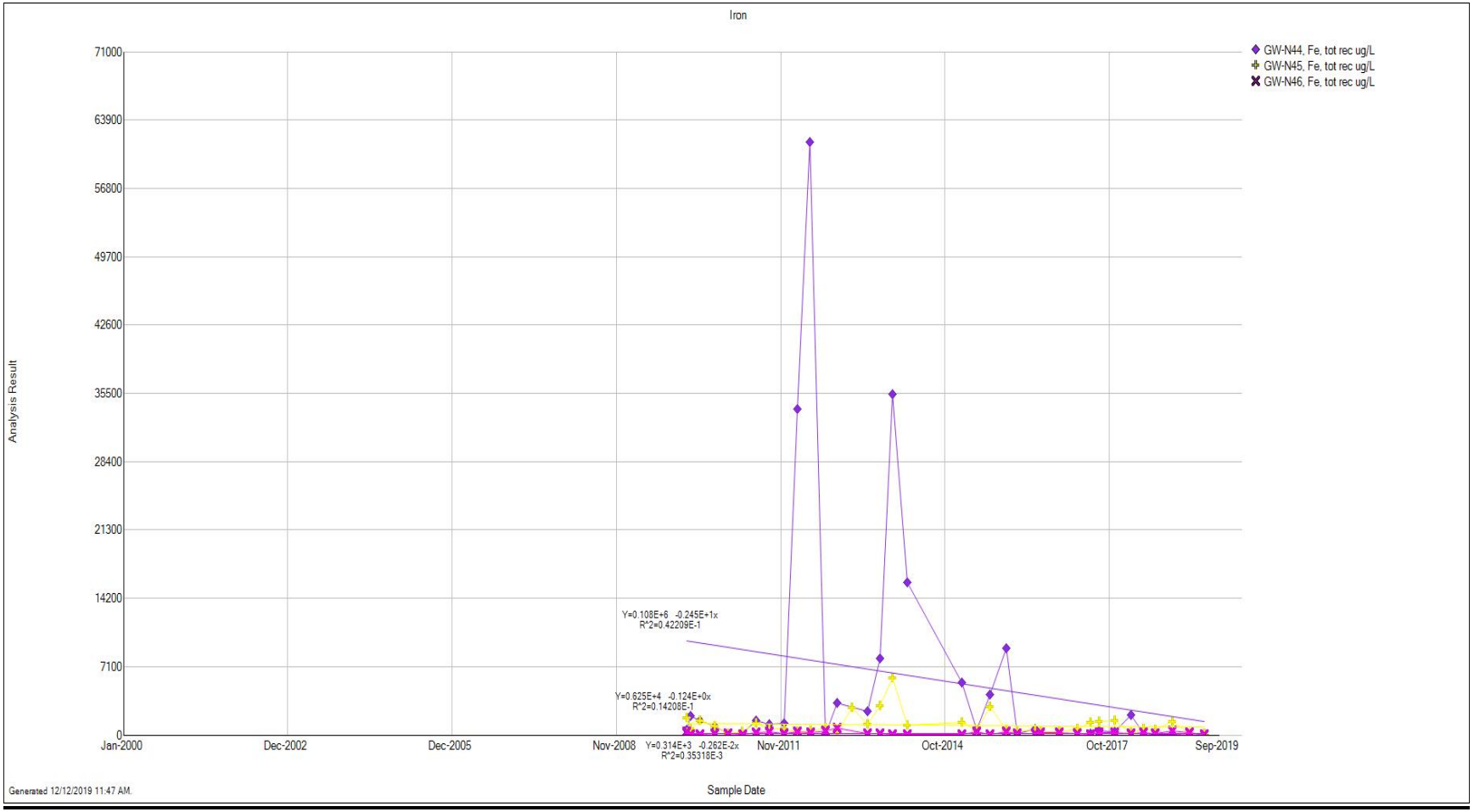

Sodium
GW-N41, Na, diss mg/L
GW-N42, Na, diss mg/L
GW-N43, Na, diss mg/L
Analysis Result
53.55
47.6
41.65
35.7
29.75
23.8
17.85
11.9
5.95
0
Y=0.886E+2 -0.151E-2x
R^2=0.27008E+0
Y=-0.520E+3 + 0.147E-1x
R^2=0.81425E+0
Y=0.137E+3 -0.305E-2x
R^2=0.56382E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:20 AM.
Sample Date

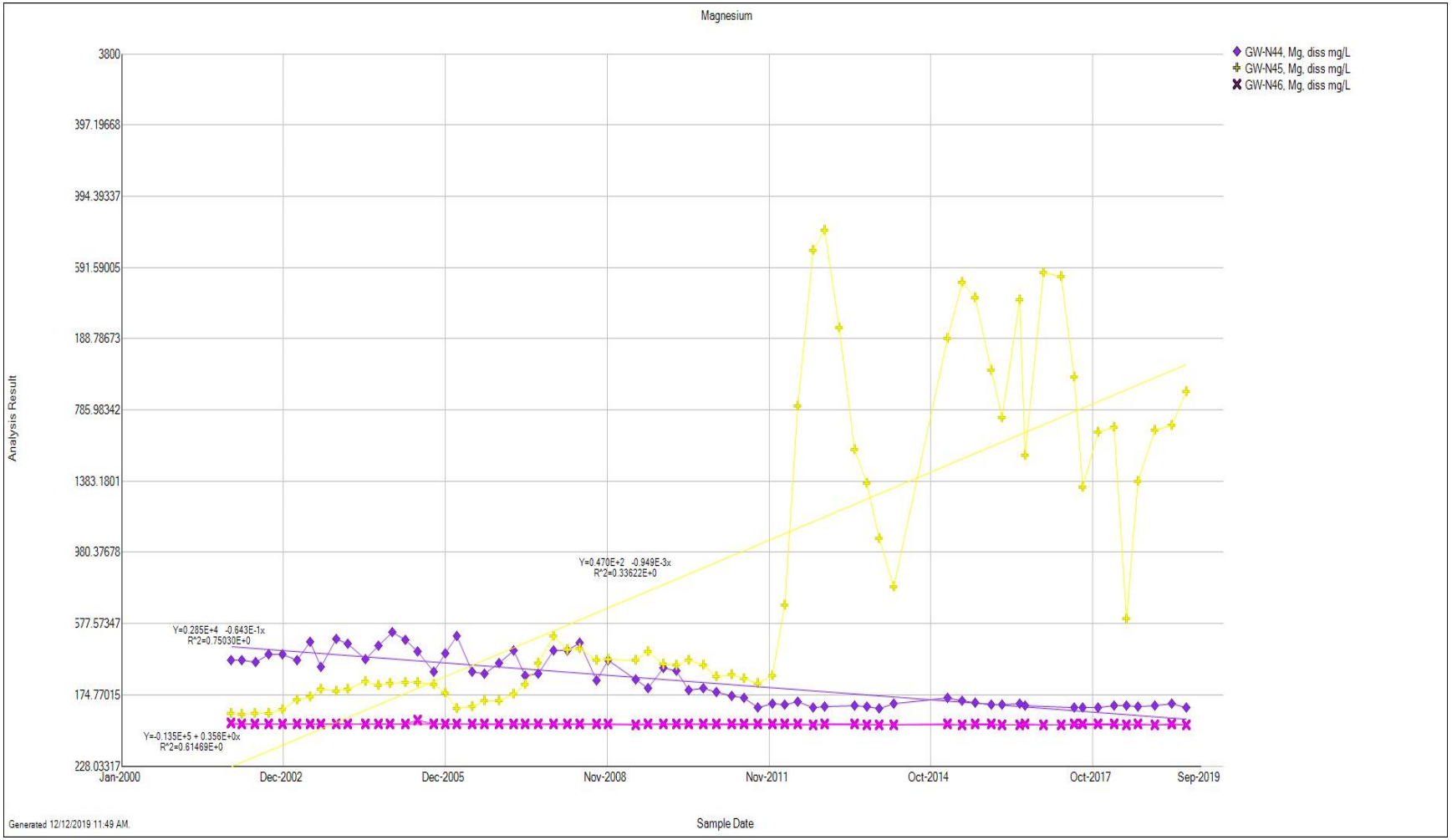

Sulfate
GW-N41, SO4, diss mg/L
GW-N42, SO4, diss mg/L
GW-N43, SO4, diss mg/L
Analysis Result
870
783
696
609
522
435
348
261
174
87
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.738E+3 -0.106E-1x
R^2=0.25728E-1
Y=0.134E+5 -0.351E+0x
R^2=0.85625E+0
Y=0.380E+3 -0.658E-2x
R^2=0.14370E+0
Generated 12/12/2019 11:40 AM.
Sample Date

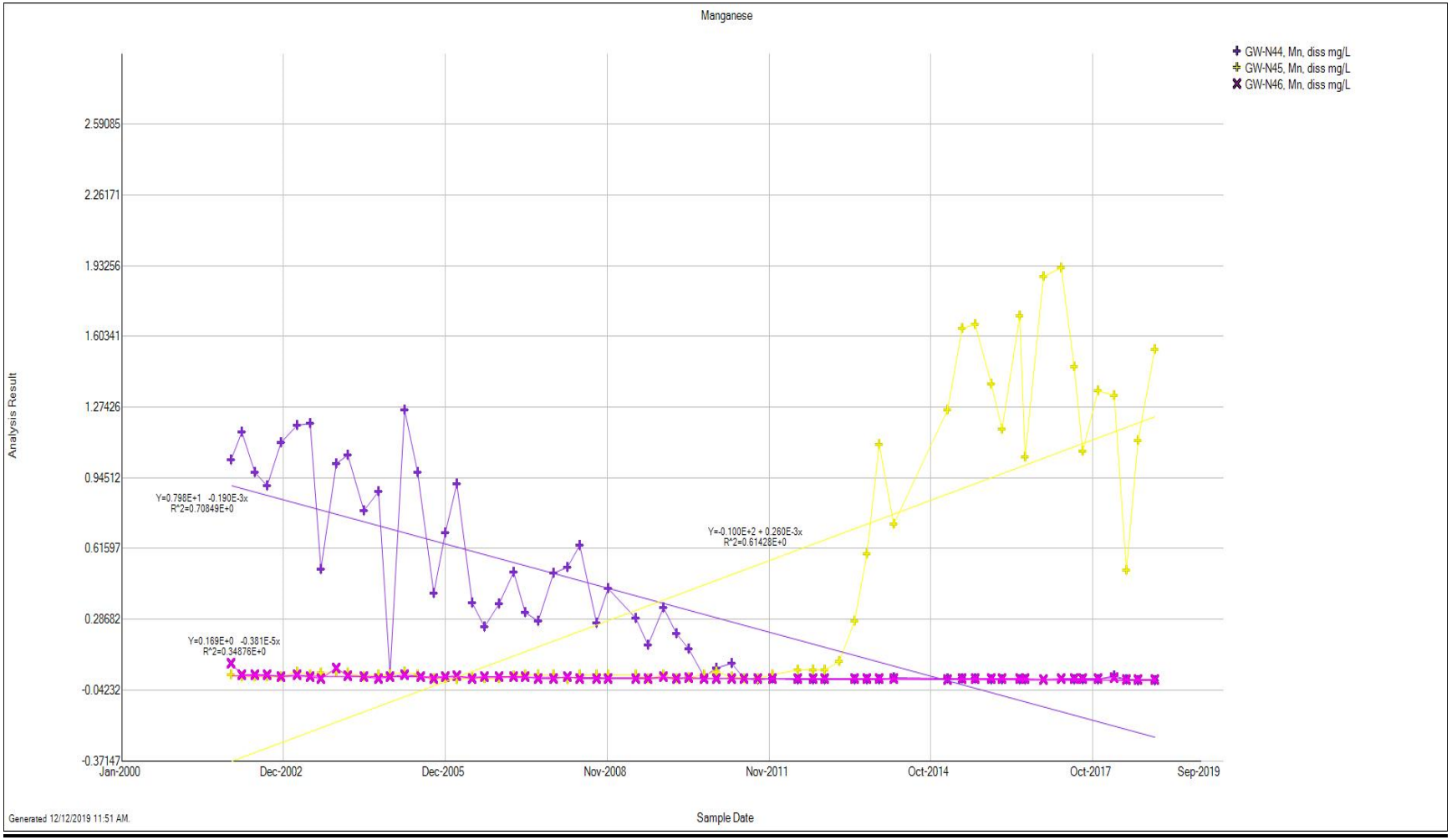

TDS
GW-N41, TDS mg/L
GW-N42, TDS mg/L
GW-N43, TDS mg/L
Analysis Result
2300
2070
1840
1610
1380
1150
920
690
460
230
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.115E+4 -0.152E-1x
R^2=0.21803E-1
Y=0.150E+5 -0.385E+0x
R^2=0.93151E+0
Y=0.108E+4 -0.147E-1x
R^2=0.10816E+0
Generated 12/12/2019 11:40 AM.
Sample Date

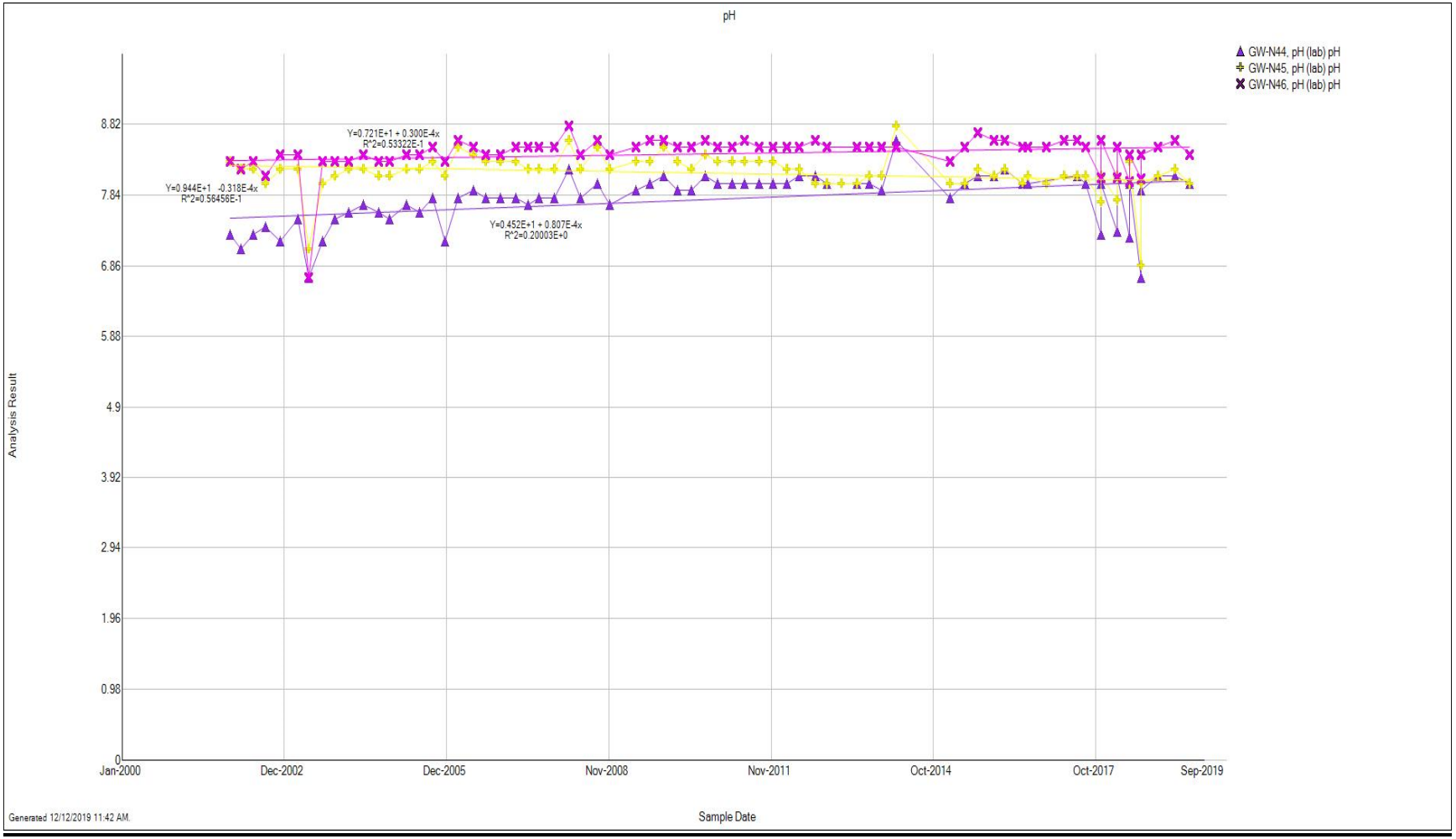

Calcium
GW-N44, Ca, diss mg/L
GW-N45, Ca, diss mg/L
GW-N46, Ca, diss mg/L
Y=0.168E+4 -0.322E-1x
R^2=0.71014E+0
Y=0.753E+3 + 0.213E-1x
R^2=0.43545E+0
Y=0.129E+3 -0.283E-2x
R^2=0.30208E-1
610
549
488
427
366
305
244
183
122
61
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Analysis Result
Sample Date
Generated 12/12/2019 11:45 AM.

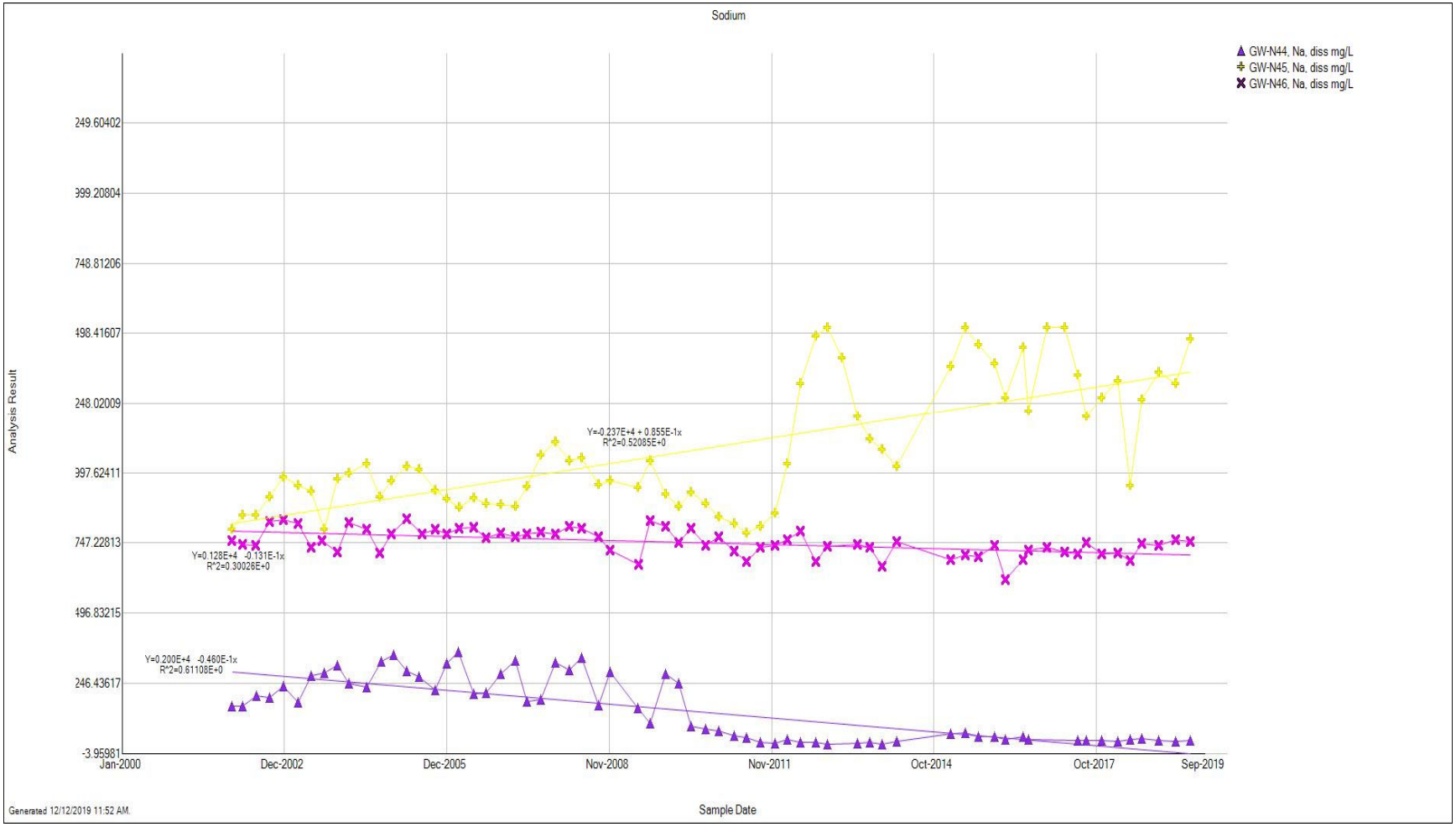

GW-N44, Spec. Cond. (lab) u
GW-N45, Spec. Cond. (lab) u
GW-N46, Spec. Cond. (lab) u
Analysis Result
24000
21600
19200
16800
14400
12000
9600
7200
4800
2400
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.519E+4 -0.501E-1x
R^2=0.22452E+0
Y=0.237E+5 -0.509E+0x
R^2=0.68316E+0
Y=-0.494E+5 + 0.141E+1x
R^2=0.63704E+0
Generated 12/12/2019 11:43 AM.
Sample Date

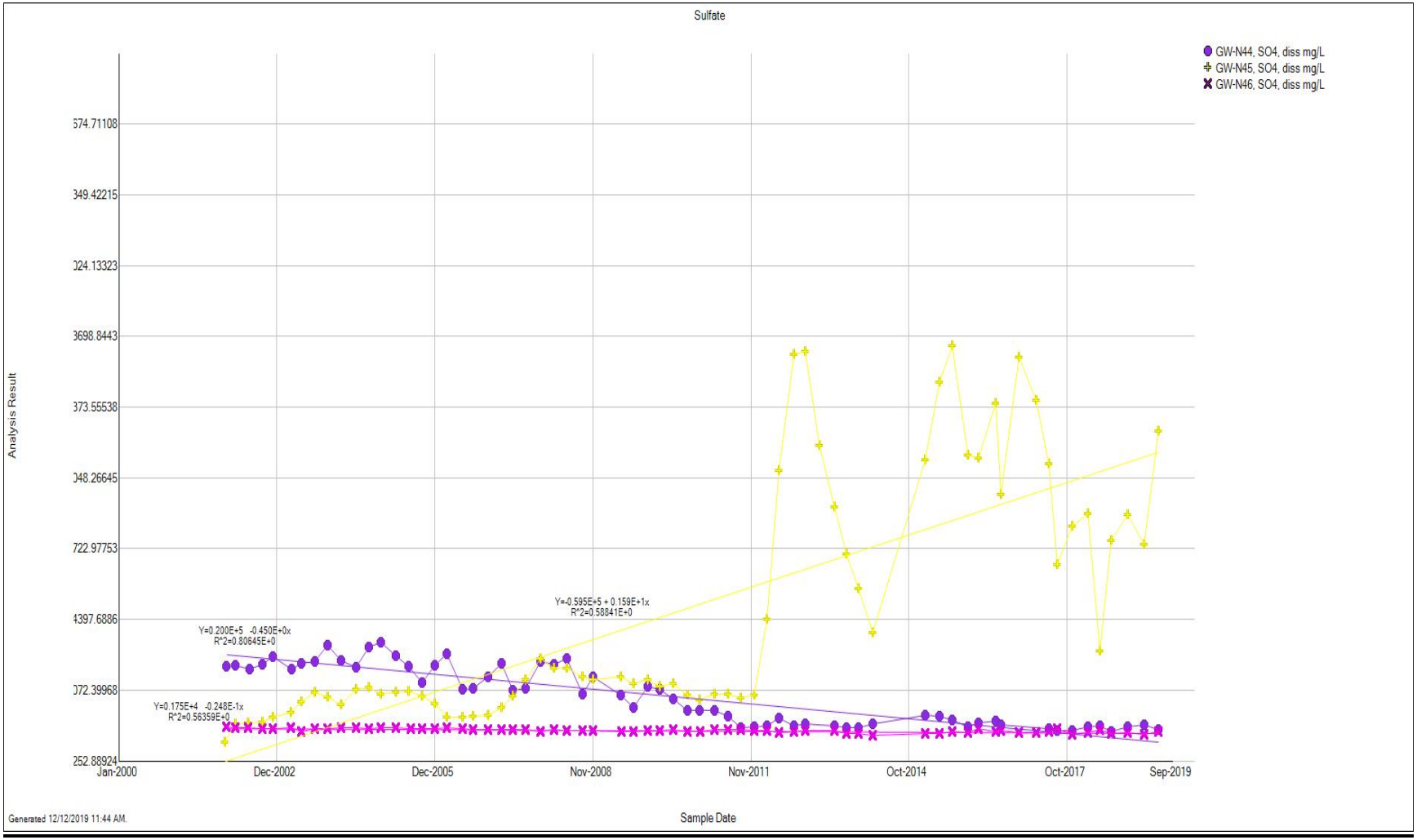

Iron
GW-N44, Fe, tot rec ug/L
GW-N45, Fe, tot rec ug/L
GW-N46, Fe, tot rec ug/L
Analysis Result
71000
63900
56800
49700
42600
35500
28400
21300
14200
7100
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.108E+6 -0.245E+1x
R^2=0.42209E-1
Y=0.625E+4 -0.124E+0x
R^2=0.14208E-1
Y=0.314E+3 -0.262E-2x
R^2=0.35318E-3
Generated 12/12/2019 11:47 AM.
Sample Date

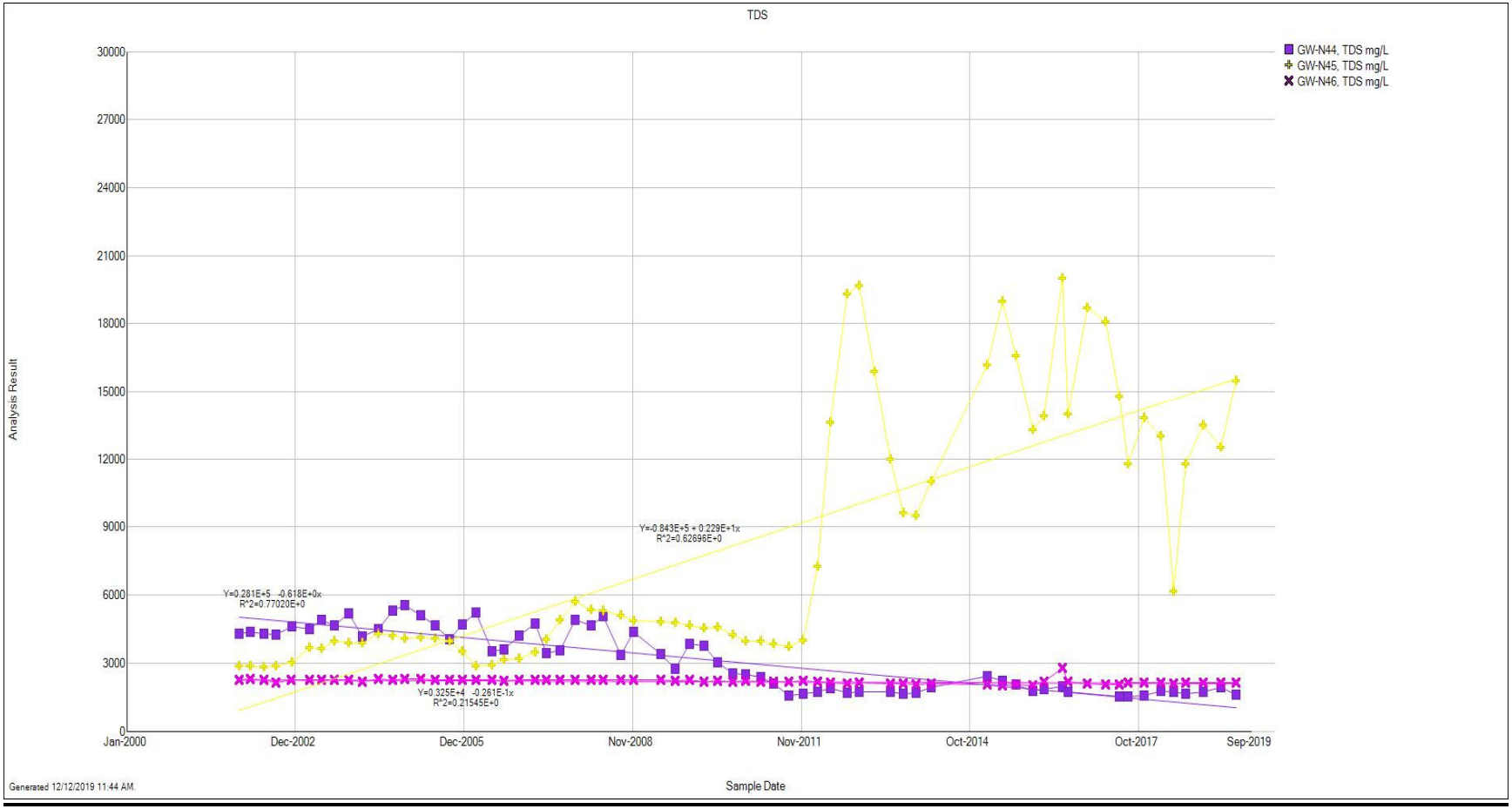

Magnesium
GW-N44, Mg, diss mg/L
GW-N45, Mg, diss mg/L
GW-N46, Mg, diss mg/L
Analysis Result
3800
397.19668
394.39337
391.59005
188.78673
785.98342
1383.1801
980.37678
577.57347
174.77015
228.03317
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.470E+2 -0.949E-3x
R^2=0.33622E+0
Y=0.285E+4 -0.643E-1x
R^2=0.75030E+0
Y=-0.135E+5 + 0.356E+0x
R^2=0.61469E+0
Generated 12/12/2019 11:49 AM.
Sample Date


Manganese
GW-N44, Mn, diss mg/L
GW-N45, Mn, diss mg/L
GW-N46, Mn, diss mg/L
Analysis Result
2.59085
2.26171
1.93256
1.60341
1.27426
0.94512
0.61597
0.28682
-0.04232
-0.37147
Y=0.798E+1 -0.190E-3x
R^2=0.70849E+0
Y=-0.100E+2 + 0.260E-3x
R^2=0.61428E+0
Y=0.169E+0 -0.381E-5x
R^2=0.34876E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:51 AM.
Sample Date

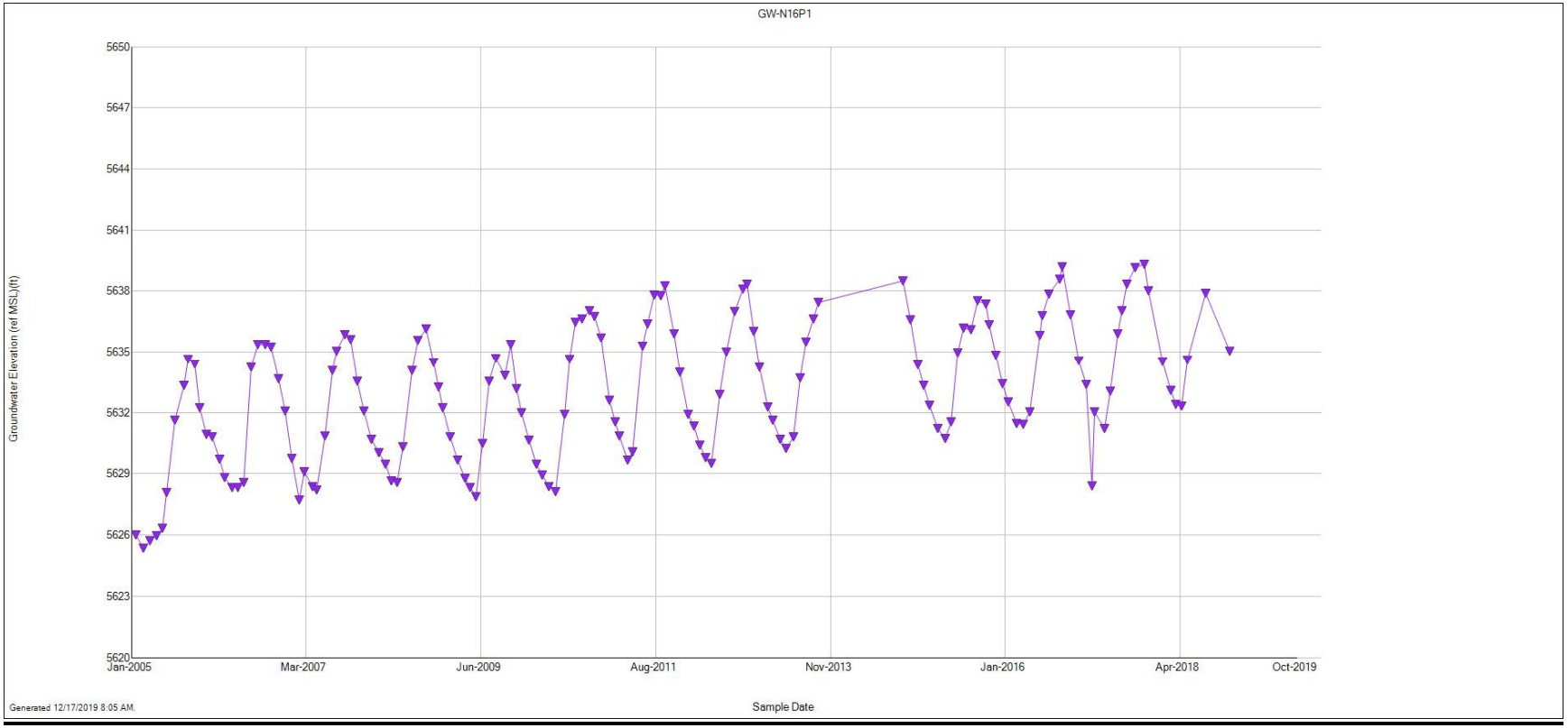

pH
GW-N44, pH (lab) pH
GW-N45, pH (lab) pH
GW-N46, pH (lab) pH
Y=0.721E+1 + 0.300E-4x
R^2=0.53322E-1
Y=0.944E+1 -0.318E-4x
R^2=0.56456E-1
Y=0.452E+1 + 0.807E-4x
R^2=0.20003E+0
8.82
7.84
6.86
5.88
4.9
3.92
2.94
1.96
0.98
0
Analysis Result
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 11:42 AM.

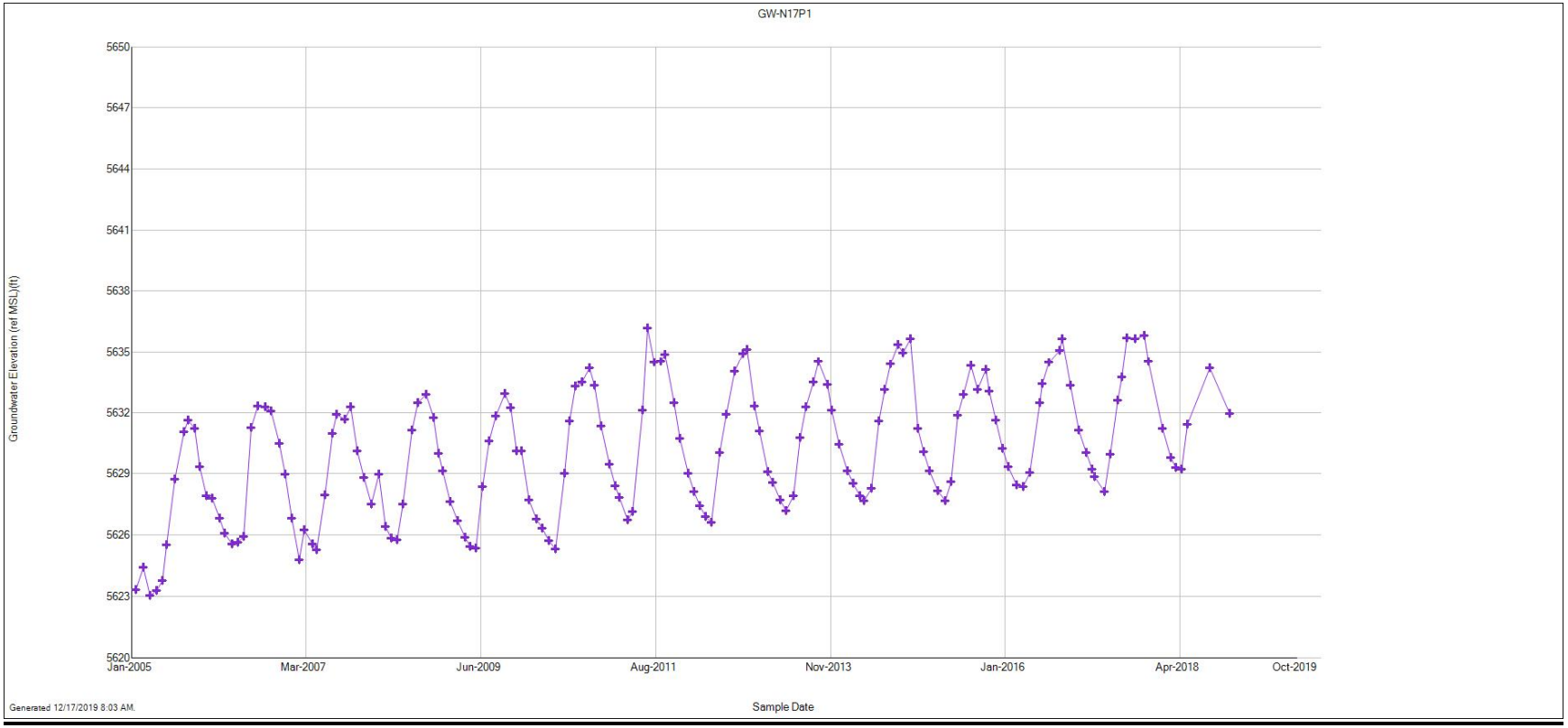

Sodium
GW-N44, Na, diss mg/L
GW-N45, Na, diss mg/L
GW-N46, Na, diss mg/L
Analysis Result
249.60402
399.20804
748.81206
498.41607
248.02009
397.62411
747.22813
496.83215
246.43617
-3.95981
Y=-0.237E+4 + 0.855E-1x
R^2=0.52085E+0
Y=0.128E+4 -0.131E-1x
R^2=0.30026E+0
Y=0.200E+4 -0.460E-1x
R^2=0.61108E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Generated 12/12/2019 11:52 AM.
Sample Date

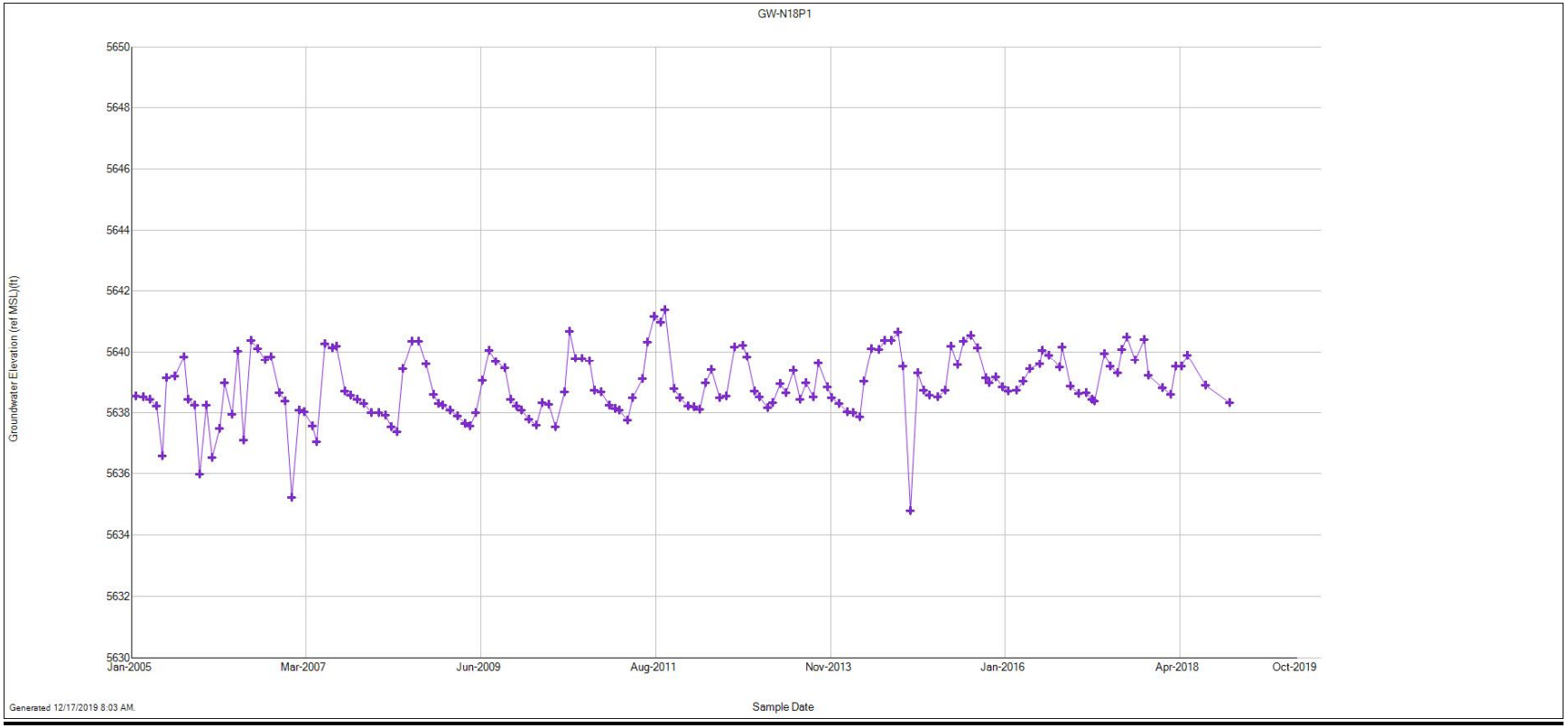

Sulfate
GW-N44, SO4, diss mg/L
GW-N45, SO4, diss mg/L
GW-N46, SO4, diss mg/L
574.71108
349.42215
024.13323
3698.8443
373.55538
048.26645
722.97753
4397.6886
072.39968
252.88924
Analysis Result
Y=0.200E+5 -0.450E+0x
R^2=0.80645E+0
Y=0.175E+4 -0.248E-1x
R^2=0.56359E+0
Y=-0.595E+5 + 0.159E+1x
R^2=0.58841E+0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Sample Date
Generated 12/12/2019 11:44 AM.

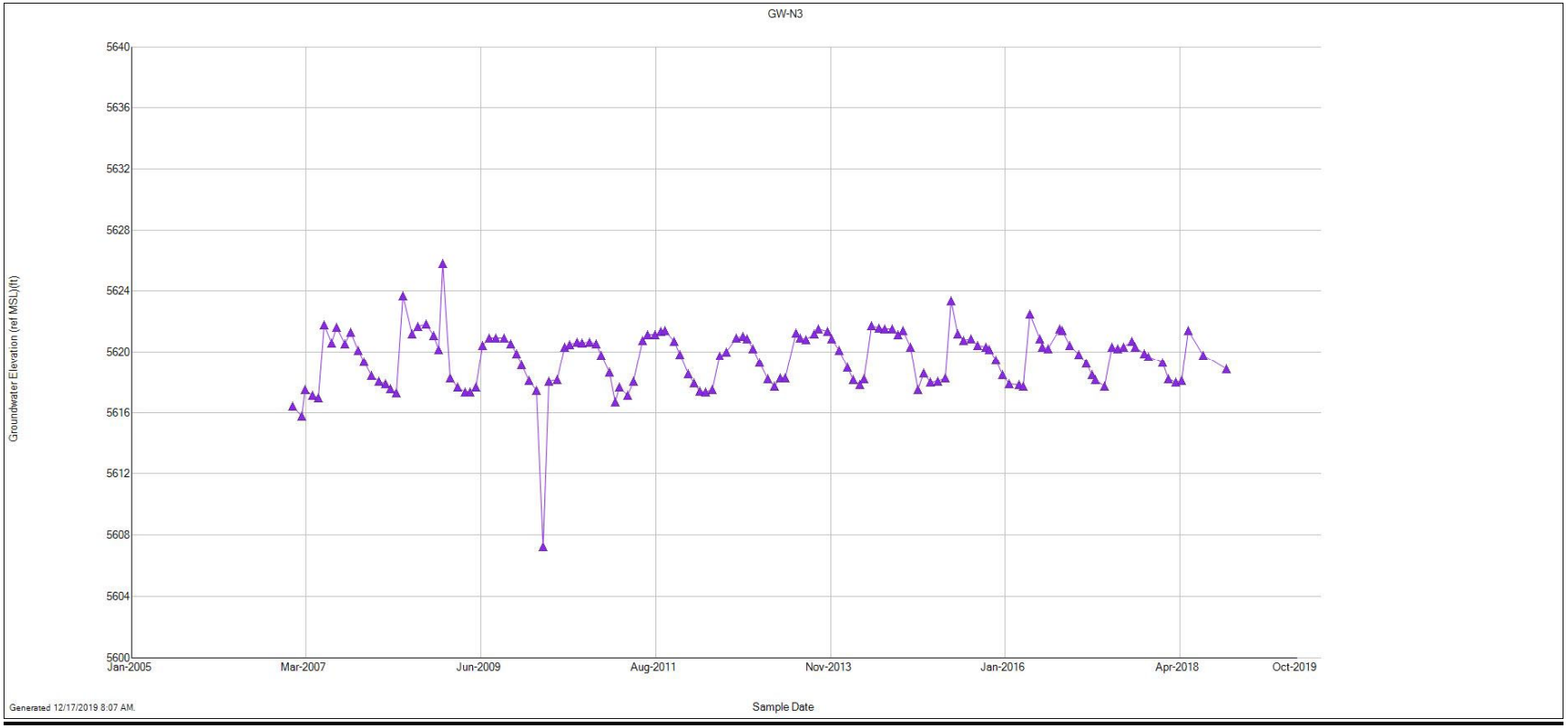

TDS
GW-N44, TDS mg/L
GW-N45, TDS mg/L
GW-N46, TDS mg/L
Analysis Result
30000
27000
24000
21000
18000
15000
12000
9000
6000
3000
0
Jan-2000
Dec-2002
Dec-2005
Nov-2008
Nov-2011
Oct-2014
Oct-2017
Sep-2019
Y=0.843E+5 + 0.229E+1x
R^2=0.62696E+0
Y=0.281E+5 -0.618E+0x
R^2=0.77020E+0
Y=0.325E+4 -0.261E-1x
R^2=0.21545E+0
Generated 12/12/2019 11:44 AM.
Sample Date

Appendix 5
Groundwater Elevations


GW-N16P1
Groundwater Elevation (ref MSL)(ft)
5650
5647
5644
5641
5638
5635
5632
5629
5626
5623
5620
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Generated 12/17/2019 8:05 AM.
Sample Date


GW-N17P1
Groundwater Elevation (ref MSL)(ft)
5650
5647
5644
5641
5638
5635
5632
5629
5626
5623
5620
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Generated 12/17/2019 8:03 AM.
Sample Date


GW-N18P1
Groundwater Elevation (ref MSL)(ft)
5650
5648
5646
5644
5642
5640
5638
5636
5634
5632
5630
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Generated 12/17/2019 8:03 AM.
Sample Date


GW-N3
Groundwater Elevation (ref MSL)(ft)
5640
5636
5632
5628
5624
5620
5616
5612
5608
5604
5600
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
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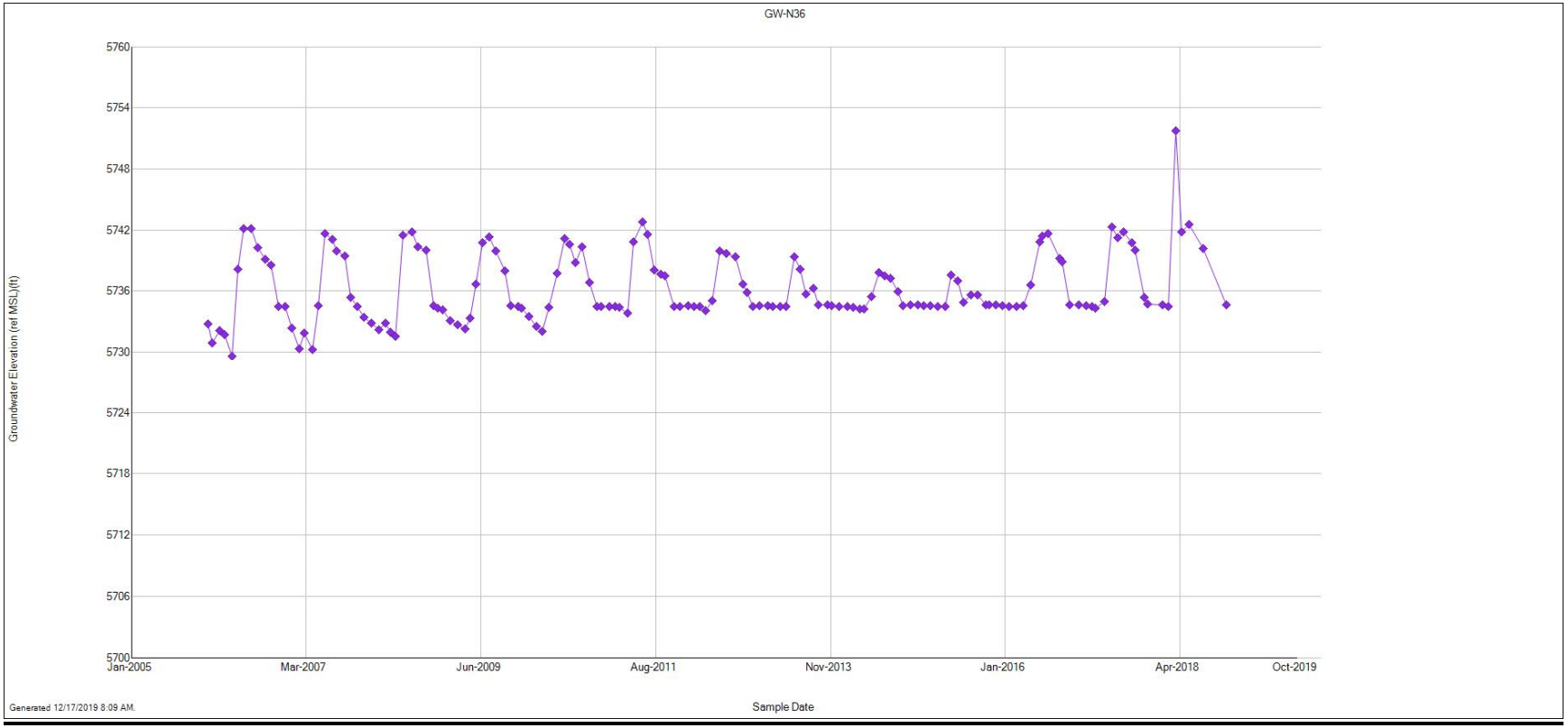
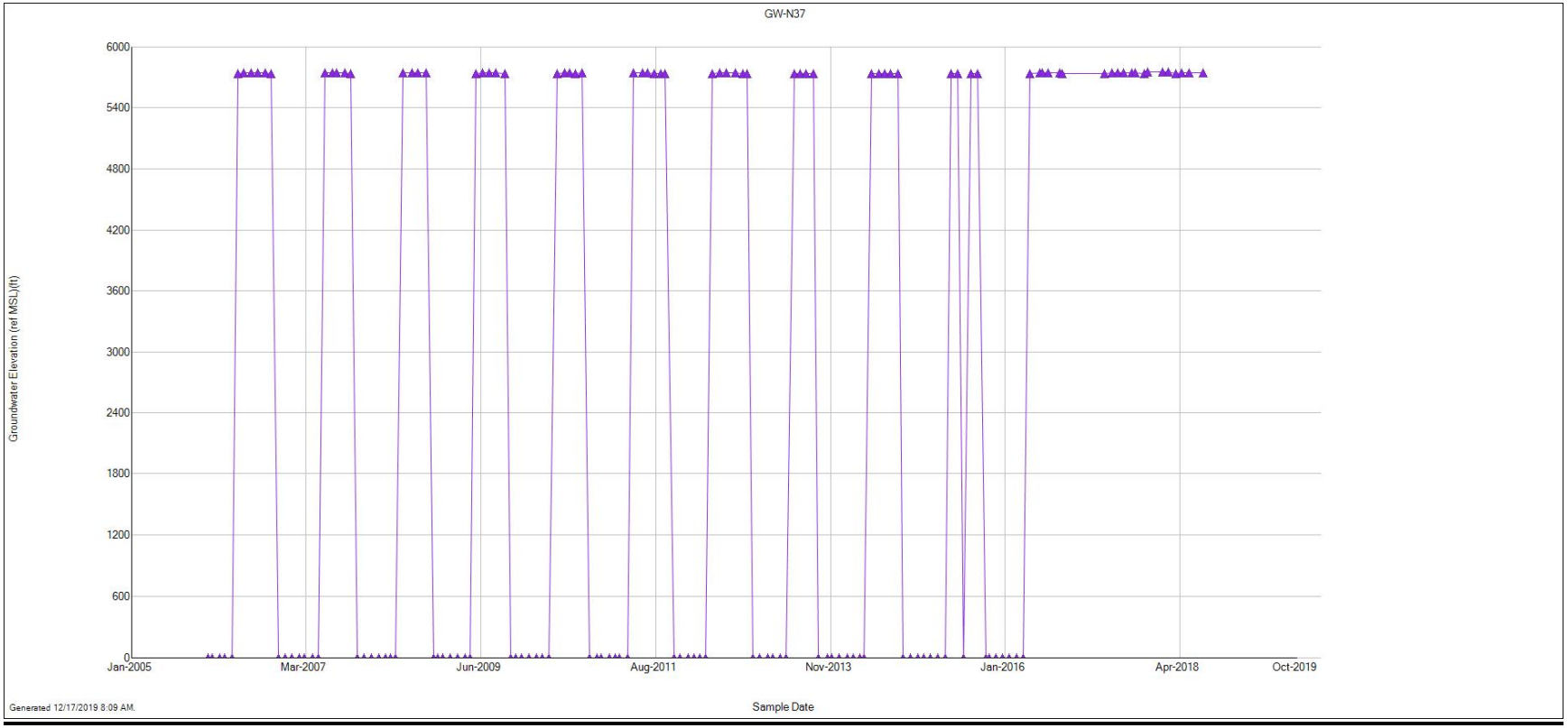
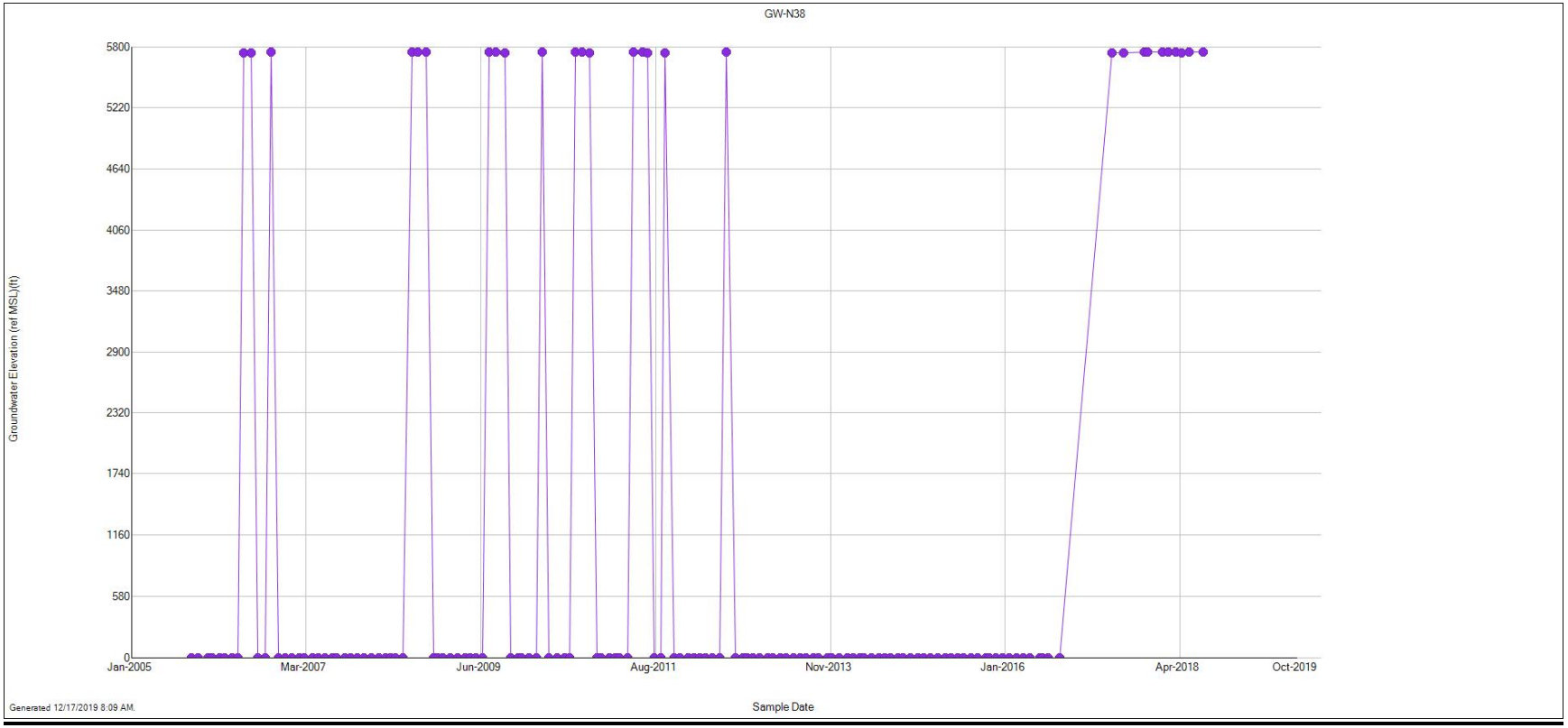
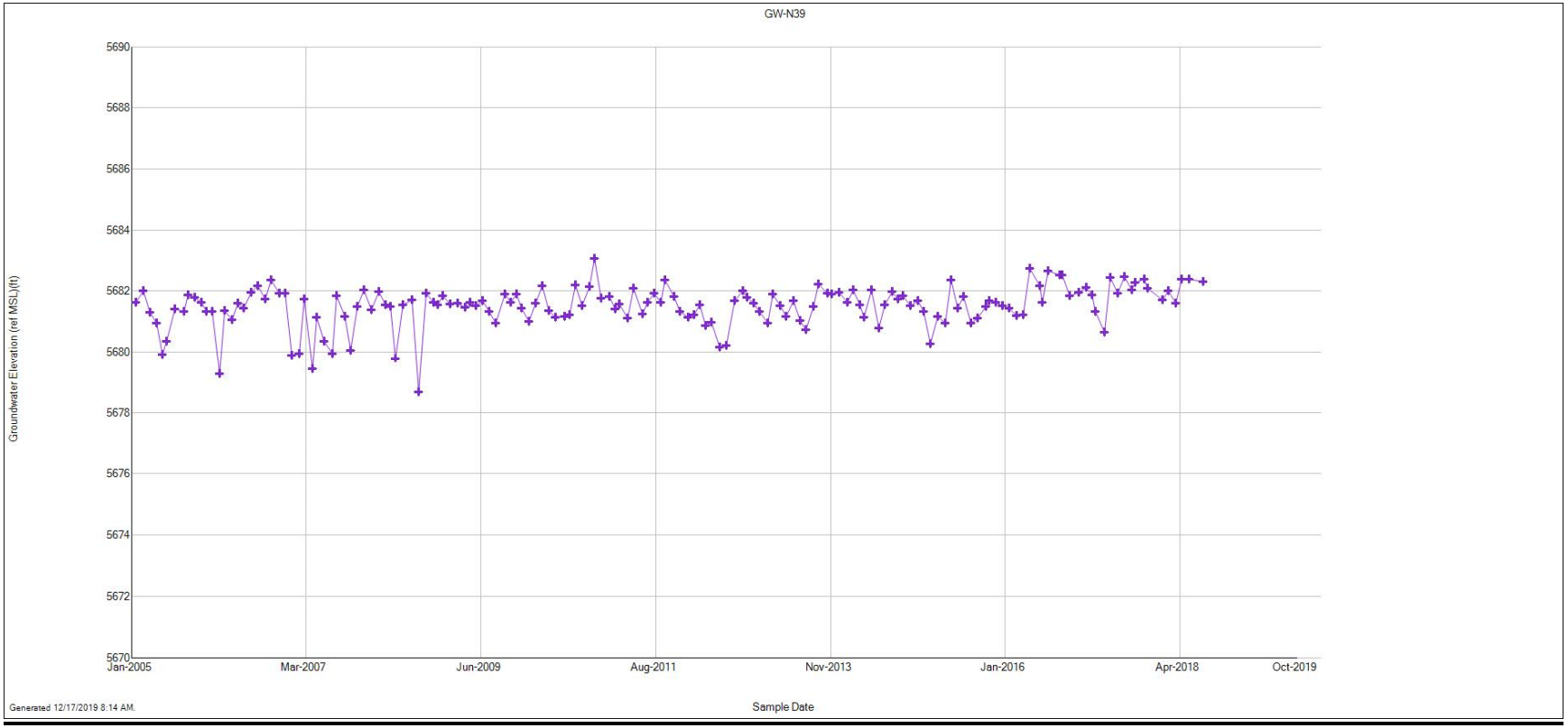
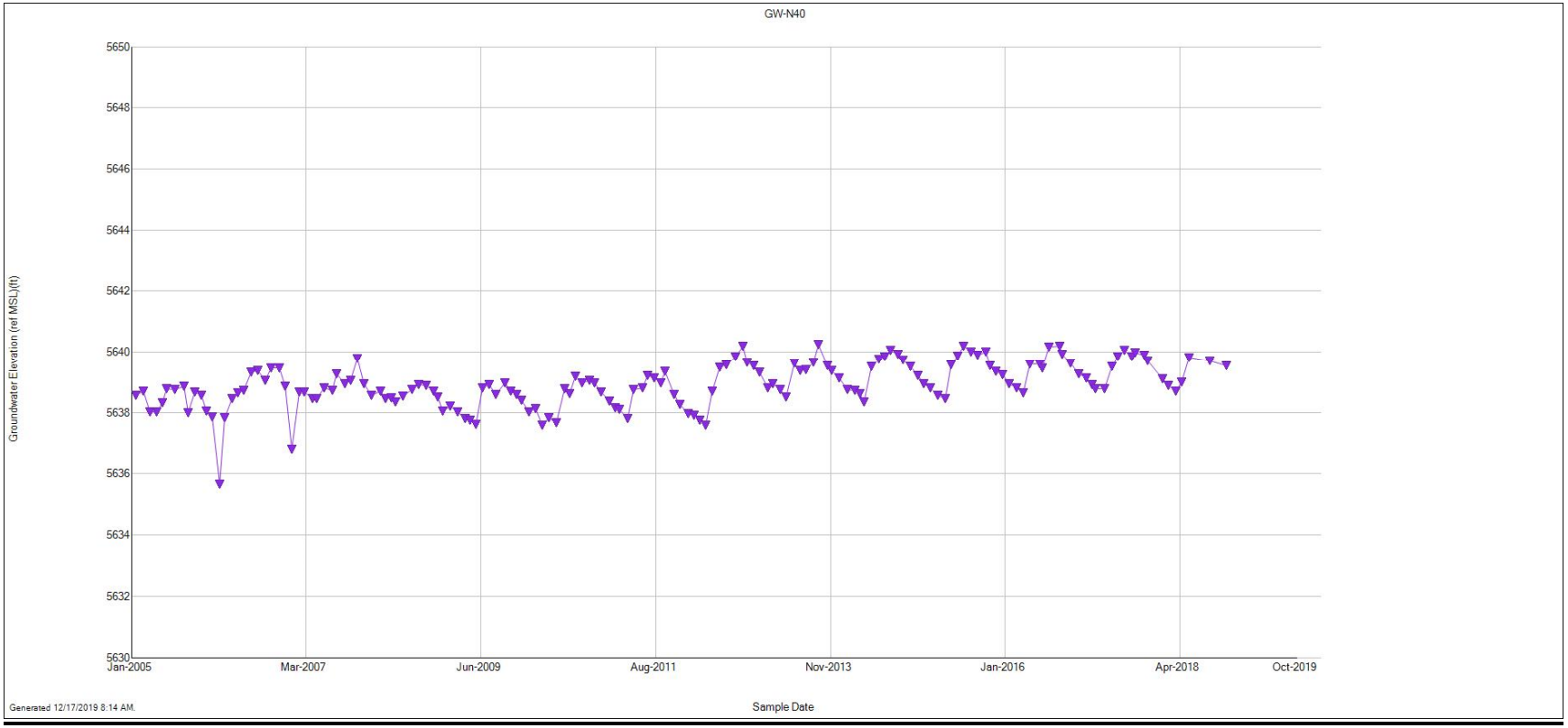
Sample Date

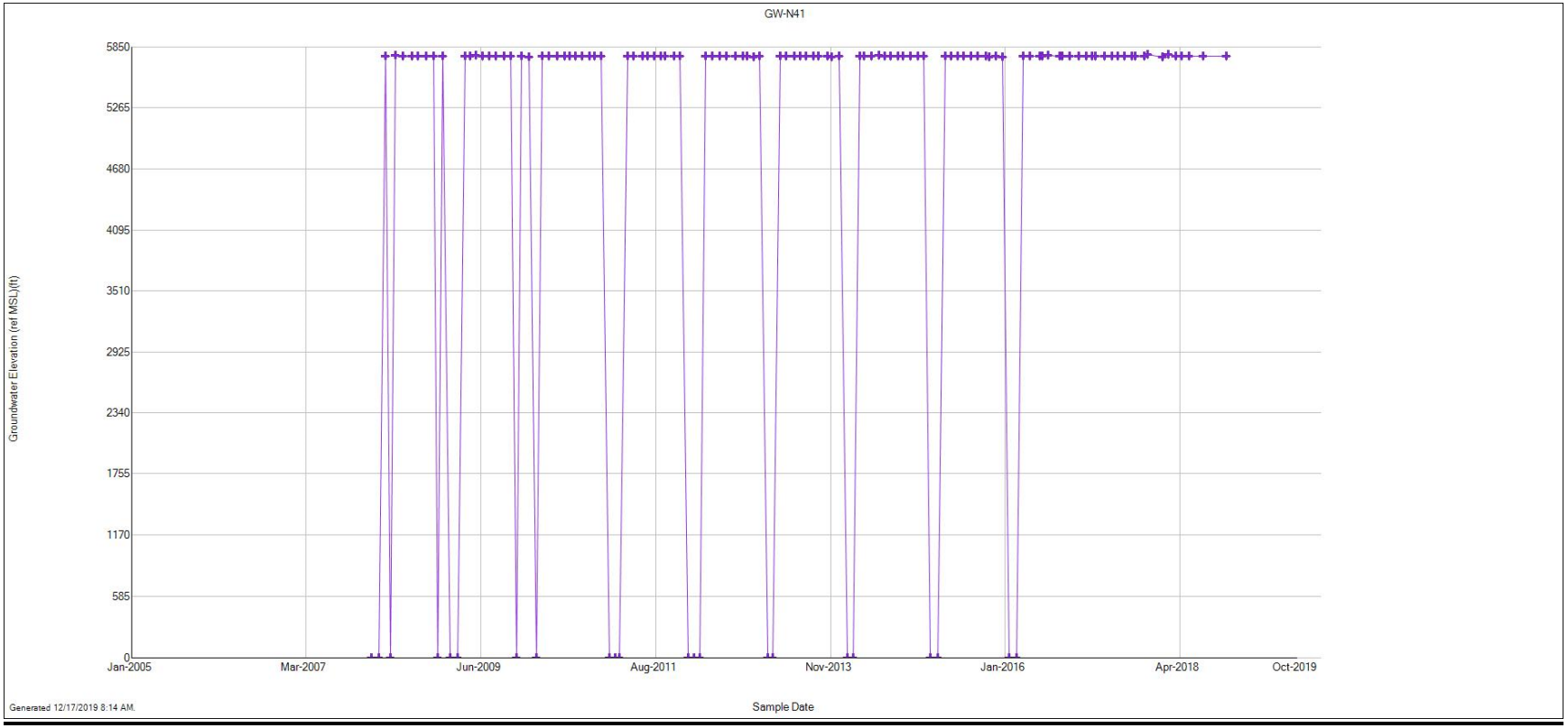

GW-N36
Groundwater Elevation (ref MSL)(ft)
5760
5754
5748
5742
5736
5730
5724
5718
5712
5706
5700
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Generated 12/17/2019 8:09 AM.
Sample Date

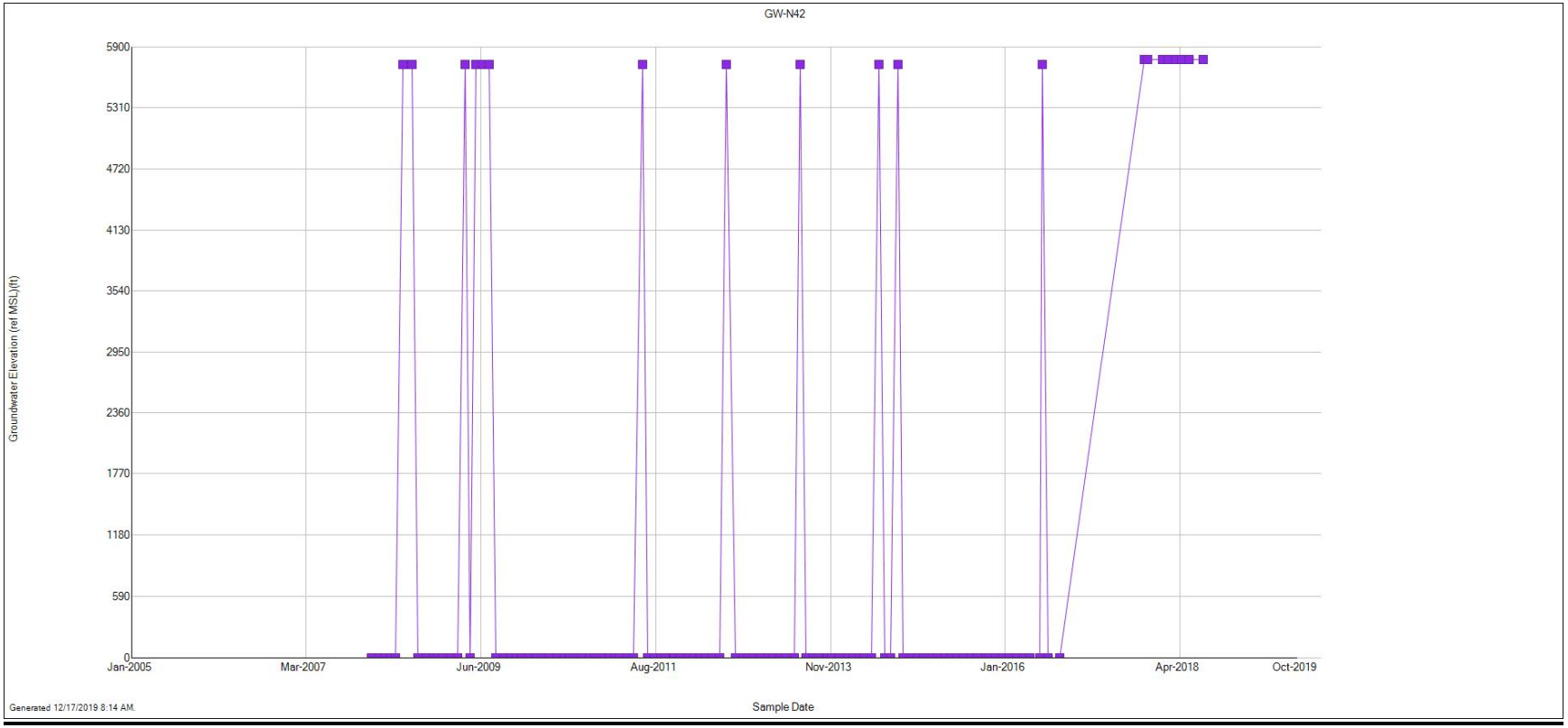

GW-N37
Groundwater Elevation (ref MSL)(ft)
6000
5400
4800
4200
3600
3000
2400
1800
1200
600
0
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Generated 12/17/2019 8:09 AM.
Sample Date

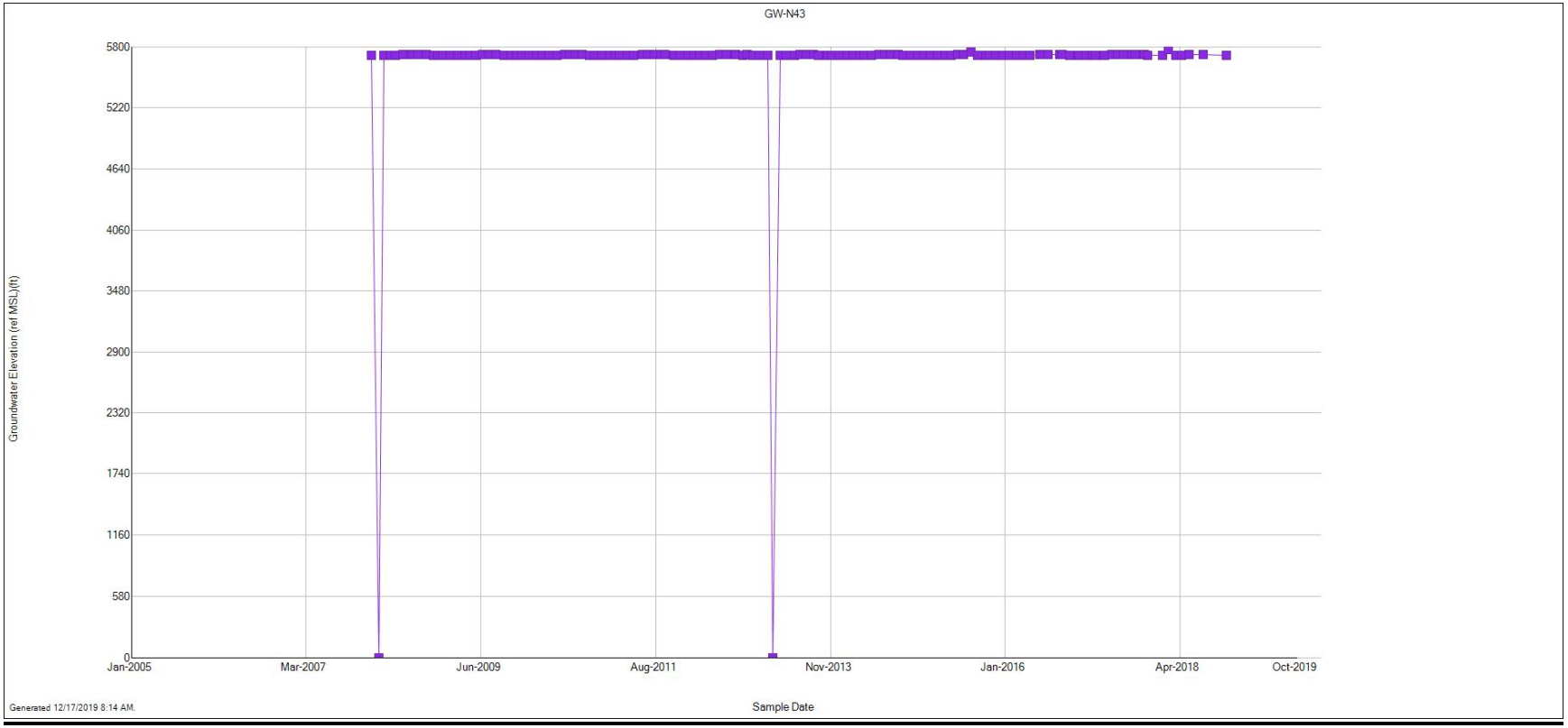

GW-N38
Groundwater Elevation (ref MSL)(ft)
5800
5220
4640
4060
3480
2900
2320
1740
1160
580
0
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Sample Date
Generated 12/17/2019 8:09 AM.

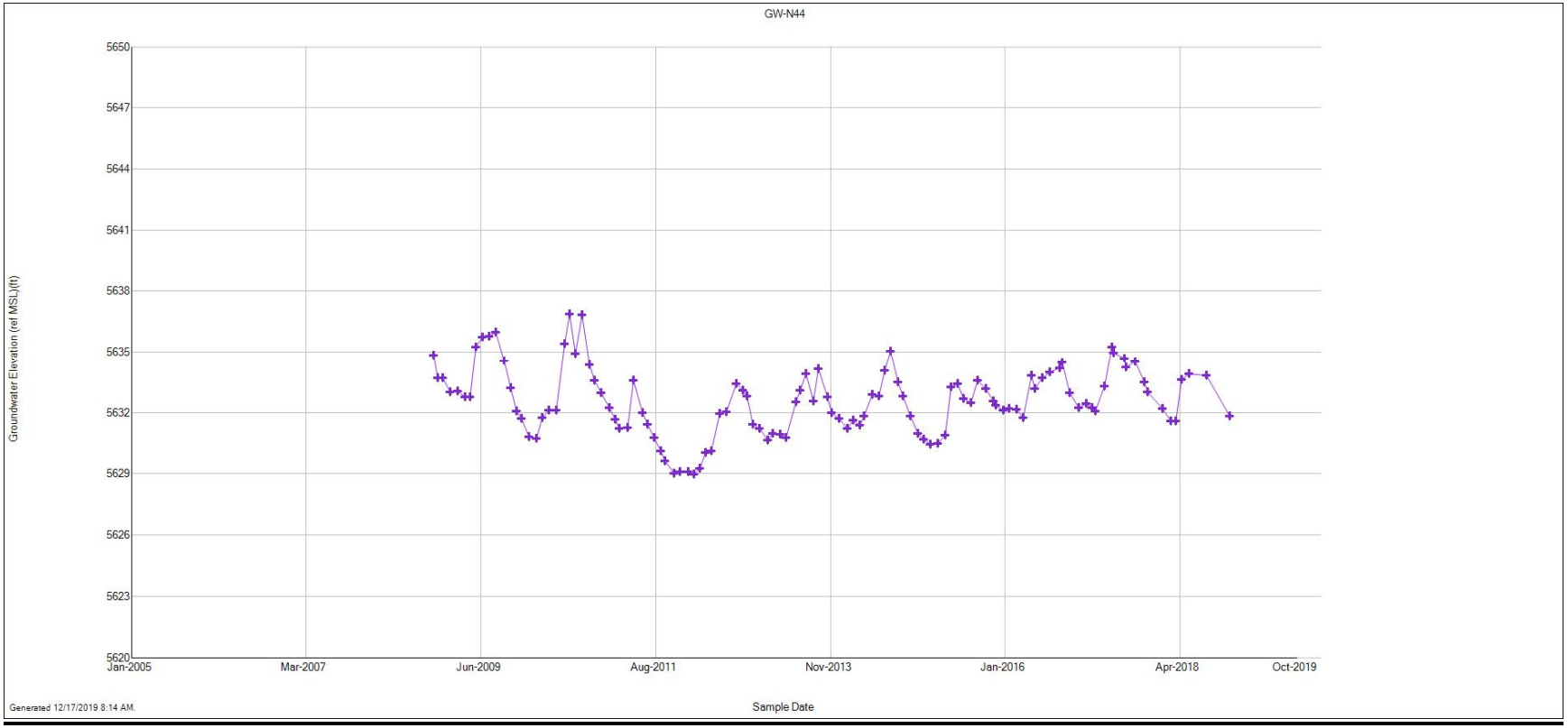

GW-N39
Groundwater Elevation (ref MSL)(ft)
5690
5688
5686
5684
5682
5680
5678
5676
5674
5672
5670
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Generated 12/17/2019 8:14 AM.
Sample Date


GW-N40
Groundwater Elevation (ref MSL)(ft)
5650
5648
5646
5644
5642
5640
5638
5636
5634
5632
5630
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Generated 12/17/2019 8:14 AM.
Sample Date


GW-N41
Groundwater Elevation (ref MSL)(ft)
5850
5265
4680
4095
3510
2925
2340
1755
1170
585
0
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Sample Date
Generated 12/17/2019 8:14 AM.


GW-N42
Groundwater Elevation (ref MSL)(ft)
5900
5310
4720
4130
3540
2950
2360
1770
1180
590
0
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Sample Date
Generated 12/17/2019 8:14 AM.


GW-N43
Groundwater Elevation (ref MSL)(ft)
5800
5220
4640
4060
3480
2900
2320
1740
1160
580
0
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Sample Date
Generated 12/17/2019 8:14 AM.


GW-N44
Groundwater Elevation (ref MSL)(ft)
5650
5647
5644
5641
5638
5635
5632
5629
5626
5623
5620
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Sample Date
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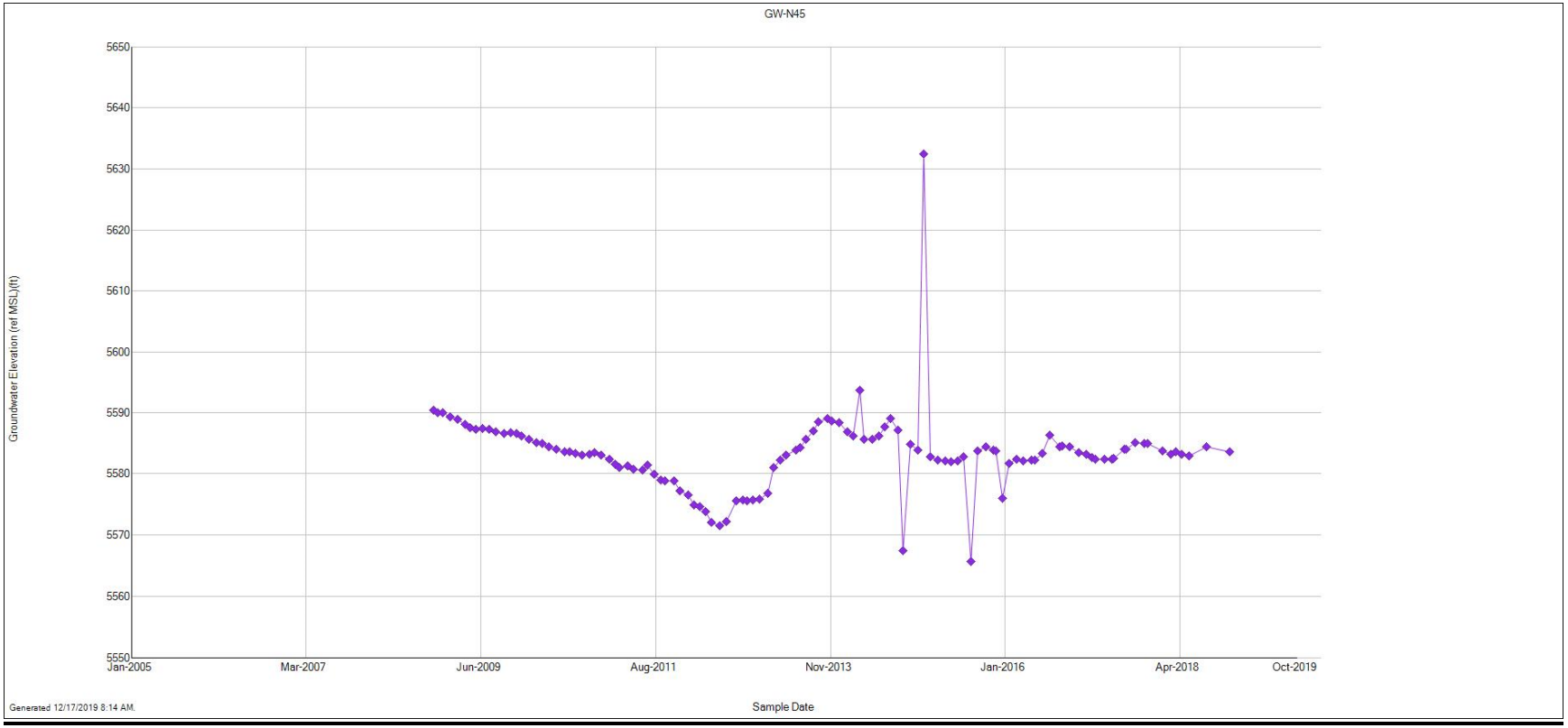
GW-N45
Groundwater Elevation (ref MSL)(ft)
5650
5640
5630
5620
5610
5600
5590
5580
5570
5560
5550
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
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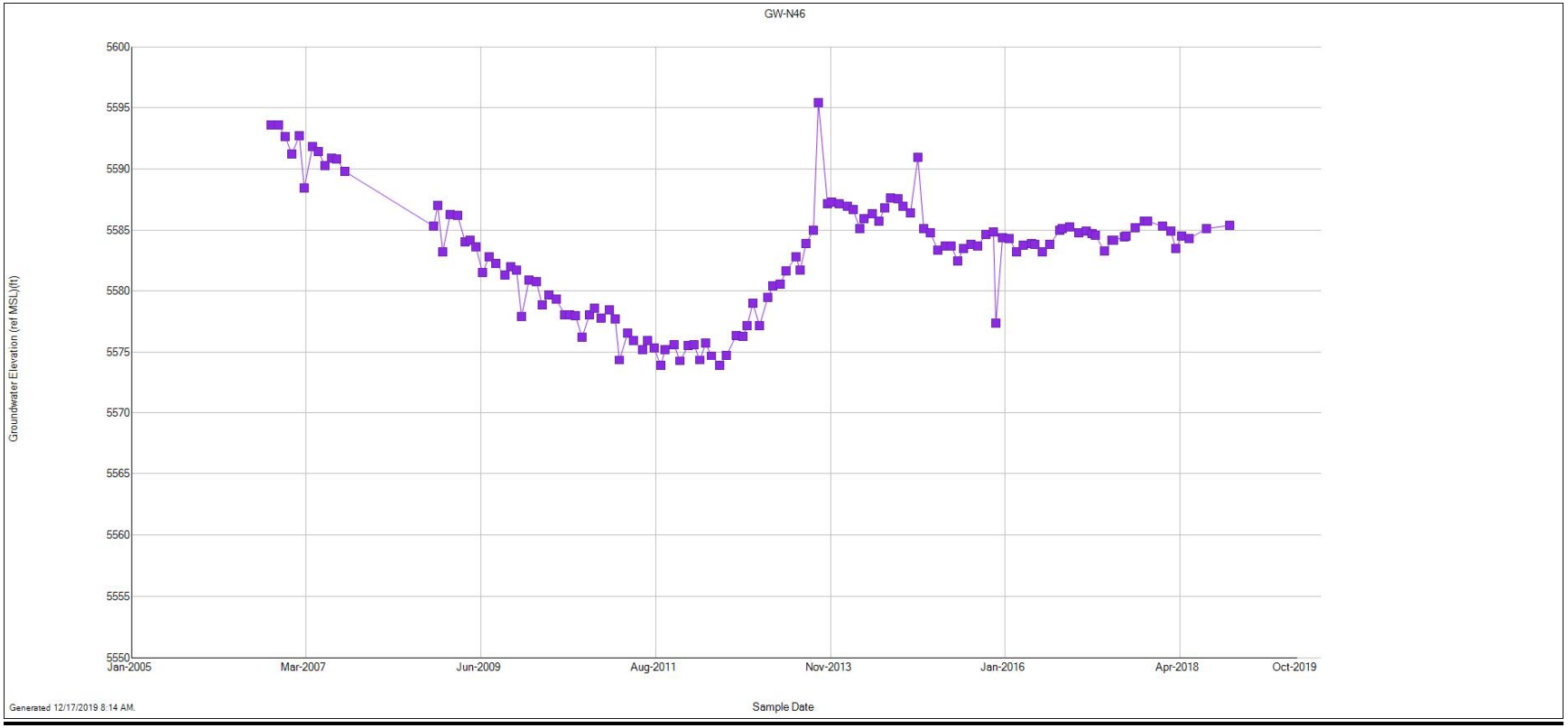
Sample Date


GW-N46
Groundwater Elevation (ref MSL)(ft)
5600
5595
5590
5585
5580
5575
5570
5565
5560
5555
5550
Jan-2005
Mar-2007
Jun-2009
Aug-2011
Nov-2013
Jan-2016
Apr-2018
Oct-2019
Generated 12/17/2019 8:14 AM.
Sample Date