COLOWYO COAL COMPANY L.P.

Permit No. C-1981-019

Annual Hydrology
Water Year January 1, 2021 to December 31, 2021

Annual Reclamation Report
Report Year 2021

SECTION 1 – SURFACE AND GROUND WATER DATA 1

RULE REQUIREMENT 1
SURFACE WATER 1
Good Spring Creek 2
Taylor Creek 5
Jubb Creek 6
Collom Gulch 8
Little Collom Gulch 10
GROUNDWATER 11
Good Spring Creek 11
Taylor Creek 15
Gossard Loadout 16
Little Collom Gulch 17
Collom Gulch 19
Jubb Creek 21
Trout Creek Sandstone Aquifer 23
SPOIL SPRING DEVELOPMENT 23

SECTION 2 – CDRMS ARR FORM AND SUPPORT DOCUMENTS 25

RULE REQUIREMENT 25
PERMITTEE 25
DISTURBED ACRES 25
BACKFILLAND GRADED ACRES 25
TOPSOIL REPLACEMENT & SEEDING ACRES 25
FIGURE 2-1 –ANNUAL RECLAMATION REPORT FORM 27
FIGURE 2-2 – COLOWYO RECLAMATION TABLE 29
FIGURE 2-3 – COLOWYO SEED TAG DOCUMENTATION 31

SECTION 3 – REGRADED OVERBURDEN SAMPLING 33

RULE REQUIREMENT 33
GENERAL DISCUSSION 33
FIGURE 3-1 – REGRADED OVERBURDEN ANALYTICAL RESULTS 34

SECTION 4 – INTERIM REVEGETATION MONITORING REPORT 35

RULE REQUIREMENT 35
GENERAL DISCUSSION 35

SECTION 5 – TOPSOIL 31

RULE REQUIREMENT 31
GENERAL DISCUSSION 31
FIGURE 5-1 – TOPSOIL MOVEMENTS DURING REPORT PERIOD 32
FIGURE 5-2 - TOPSOIL STOCKPILE FOR REPORT YEAR 33
FIGURE 5-3 –TOPSOIL BALANCE 34

SECTION 6 –DITCH CONSTRUCTION CERTIFICATIONS 35

RULE REQUIREMENT 35
GENERAL DISCUSSION 35

SECTION 7 –WEED MANAGEMENT 36

RULE REQUIREMENT 36

GENERAL DISCUSSION 36

LIST OF EXHIBITS

Exhibit 1A – Surface Water Data Water Year 2021
Exhibit 1B – Surface Water Graphs
Exhibit 1C – Ground Water Data Water Year 2021
Exhibit 1D – Ground Water Graphs
Exhibit 2 – Annual Report Map
Exhibit 4 – Interim Revegetation Report

SECTION 1 – SURFACE AND GROUND WATER DATA

RULE REQUIREMENT

Rule 4.05.13(4)(c) Monitoring Report Requirements

(i) Water quantity data for the monitoring sites is presented in Exhibit 1A and 1C of this report.

(ii) Water quality data obtained from the monitoring sites is presented in Exhibit 1A through 1D of this report. Discharge monitoring reports are submitted to the Colorado Department of Public Health and Environment on a monthly basis. A copy is forwarded to the Division each month.

(iii) A written interpretation of the data was requested by the Division in a letter to Colowyo dated September 30, 2013. Colowyo has been providing a written interpretation of the data annually, beginning with the submittal of the 2013 annual hydrology report; therefore, compliance has been met for this Rule as requested by the Division.

All analytical results from surface and ground water monitoring have been tabulated and are kept on file at the Colowyo mine site. Historical data is presented in past annual hydrology reports. The monitoring timeframe for this annual hydrology report (water year) is from January 1, 2021 through December 31, 2021.

A description of the surface and ground water monitoring plan is located in Colowyo's Permit No. C-1981-008, Volume 15, Section 4.05.13. Please see Map 10A in the permit for monitoring locations. Monitoring of each location occurs on a quarterly basis

SURFACE WATER

Colowyo currently samples each surface water monitoring location for a variety of quality parameters. Of all the parameters that are analyzed for, several key indicator parameters are identified an analyzed in more depth within this report. These are lab pH, lab conductivity, TDS, sulfate, calcium, iron, magnesium, sodium, and flow rate. Summary of the indicator parameters for each surface water monitoring location is provided in a table format. Surface water monitoring sites within each corresponding drainage have been compiled together and analyzed together as up gradient and down gradient conditions where applicable.

Sampling results acquired during the water year from each surface water monitoring location are presented in Exhibit 1A. Exhibit 1B presents a graphical statistical analysis of the up and down gradient surface monitoring locations (where applicable) for each

drainage potentially impacted by Colowyo's mining operations. These drainages include Good Spring Creek, Taylor Creek, Jubb Creek, Little Collom Gulch, and Collom Gulch.

Good Spring Creek

Five surface water-monitoring locations have been established along Good Spring Creek.

New Upper Good Springs Creek (NUGSC) is a downstream site, located south of the mine along State Highway 13. Monitoring has occurred from 1992 to 2021.

Lower Good Spring Creek (LGSC) is a downstream site below NUGSC, located below active mining conditions along State Highway 13. Monitoring has occurred from 1982 to 2021.

Upper West Fork Good Spring Creek (UWFGSC) is an upstream site, located southwest of the mine along State Highway 13. Monitoring has occurred from the fourth quarter of 2007 to 2021.

The final two monitoring locations, EFGSC and LWFGSC are flow measurements only. The flows from these two locations are applied to create the actual flow for NUGSC.

NUGSC:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.18	0.25	1.1	8.6	7.5	04/27/98	10/24/02
Lab Cond.	1506	294	2842	3600	758	03/06/98	05/27/93
TDS	1136	231	1250	1610	360	7/8/2002	05/08/02
Sulfate	498	138	760	930	170	7/8/2002	05/20/97
Calcium	126	19	166	169	3.4	08/02/02	06/01/93
Iron	0.78	1.5	8.53	8.54	0.01	05/17/99	02/11/02
Magnesium	122.7	29.1	226.9	228	1.1	08/02/02	04/27/98
Sodium	48.1	15.7	121.1	138	16.9	11/10/08	04/27/98
Flow rate	2.90	3.24	19.94	20	0.06	04/27/98	07/30/13

NUGSC Water Year Review

There were not any minimum or maximum values from sampling in 2021 at NUGSC. All sampling results for 2020 tracked similar to historical analysis. For the indicator parameters most are staying very stable with no trends apparent. Laboratory pH is

slightly trending upward, and sulfate is showing a minor trend downward over time. Data for the water year for NUGSC is provided in Exhibit 1A.

LGSC:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.08	0.26	2.5	8.6	6.1	08/19/91	05/14/91
Lab Cond.	1727	331	3139	3300	161	08/21/18	06/23/92
TDS	1381	351	3420	4050	630	11/08/00	05/23/95
Sulfate	655	161	815	1050	235	08/21/18	05/20/97
Calcium	141	24	198	208	10	12/28/89	3/13/84
Iron	0.63	0.88	8.81	8.84	0.03	08/13/08	04/08/15
Magnesium	144.7	29.2	225.3	226.0	0.7	12/04/89	05/20/97
Sodium	87.4	47.9	323.3	343	19.7	08/21/18	04/17/00
Flow rate	4.01	5.09	46.94	47.0	0.06	04/27/98	12/06/99

LGSC Water Year Review

No results from 2021 sampling were minimum or maximum values for any parameters listed above during the monitoring period. All sampling results for 2021 tracked consistent with historical analyses. For the indicator parameters most are staying very stable. Laboratory conductivity, TDS, pH, and sodium are trending upward, while sulfate is showing a minor trend downward over time. Flows for Good Spring Creek are trending down also. Data for the water year for LGSC is provided in Exhibit 1A.

UWFGSC:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.5	0.1	0.5	8.6	8.1	06/18/08	11/2/09
Lab Cond.	960	214	1027	1330	303	03/19/14	04/15/08
TDS	699	151	620	930	310	9/15/21	5/15/19
Sulfate	220	76	290	358	68	9/15/21	5/15/19
Calcium	97	16	66	121	55	11/10/11	5/15/19
Iron	1.47	2.07	9.81	9.86	0.05	04/27/16	10/31/12
Magnesium	77	20	90	120	30	9/15/21	5/15/19
Sodium	9	3	15	19	4	2/23/10	5/15/19
Flow rate	1.09	1.82	8.92	8.94	0.02	5/15/19	10/31/12

UWFGSC Water Year Review

For the 2021 water year, maximum values for TDS, sulfate and magnesium occurred. All other sampling results for 2021 tracked similar to historical analysis. For the indicator parameters most are staying very stable with no trends apparent. Data for the water year for UWFGSC is provided in Exhibit 1A.

Good Spring Creek Impact Assessment

As shown on the graphs in Exhibit 1B for the indicator parameters, when comparing the up gradient and down gradient locations, LGSC tends to be historically higher for some the indicator parameters including calcium, laboratory conductivity, magnesium, sodium, sulfate, and TDS. As discussed in Volume 1, Section 2.04.7, TDS concentrations showed an incremental increase (pre-mine) of 40 mg/l to 50 mg/l per mile of flow for Wilson and Good Spring Creeks. Therefore, the increase in the indicator parameters tracks similar to surface water conditions found on Good Spring Creek prior to mining occurring.

Overall, the indicator parameters up gradient versus down gradient of mining are typically stable including calcium, iron, magnesium, and sulfate. Sodium, electrical conductivity, and TDS at LGSC are trending upward over time compared to the up-gradient locations, while pH at all up gradient and down gradient locations is increasing. pH at the down gradient location LGSC is lower overall than NUGSC and UWFGSC.

TDS concentrations were predicted to increase in surface water during the post-mining period [Volume 1 Section 2.04.7 and Volume 12 Section 2.05.6(3)(b)(iii)] with sulfate being the dominate increasing ion. This impact would be due to infiltration through mine spoil material. Water flowing through the backfill spoil areas is expected to exhibit a temporary increase in TDS owing to rapid dissolution of relatively soluble minerals such as gypsum and calcite. The increase in TDS and major ions is predicated to be followed by a gradual decrease over time. Data from the down gradient location LGSC is showing increases in TDS as predicted. Please refer to Exhibit 1B for graphs presenting the long-term trends for LGSC in comparison to the up-gradient monitoring locations NUGSC and UWFGSC. The trends in the data presented including an increase in TDS due to mining are as predicated to occur within the Good Spring Creek watershed.

Base flows in Good Spring Creek were also anticipated to be decreased by approximately 7% for approximately 45 years due to mining [Volume 12 Section 2.05.6(3)(b)(iii)]. Data from the down gradient location LGSC is trending downward, while the up-gradient locations are remaining stable or slightly increasing (Exhibit 1B). However, the Colowyo Mine area has experienced drought conditions for many years and decreased flows in Good Spring Creek cannot fully be contributed to mining activities from Colowyo specifically, as overall precipitation over the long term in the area of Colowyo has been

trending down. This predicted impact in decreased flows from mining activities has been minimized overall.

Taylor Creek

One surface water-monitoring location, Lower Taylor Creek (LTC) has been established along Taylor Creek and is a downstream site, located below active mining conditions near Moffat County Road 17. Monitoring has occurred from 1983 to 2021. Colowyo's mining area extends into the headwaters of Taylor Creek; therefore, no upstream monitoring location has been established for comparison of data to the down gradient LTC location.

LTC:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.2	0.3	1.7	8.7	7	09/13/16	02/22/89
Lab Cond.	1811	653	3550	3750	200	11/30/17	02/28/90
TDS	1481	629	2776	2920	144	11/10/11	02/28/90
Sulfate	698	354	1591	1610	19	11/10/11	02/28/90
Calcium	96	25	133	159	26	11/10/11	02/05/01
Iron	3.6	15.4	132.0	132.0	0.01	02/28/90	09/13/95
Magnesium	126	41	230	238	8	10/12/88	02/28/90
Sodium	201	168	694	700	6	11/12/19	02/28/90
Flow rate	0.35	0.78	6.3	6.3	0	04/29/86	12/13/02

LTC Water Year Review

Sampling results for the 2021 water year track within all previous acquired results and no minimum or maximum values were noted. For the indicator parameters, some are increasing including laboratory conductivity, TDS, sulfate, pH, and sodium. Data for the water year for LTC is provided in Exhibit 1A.

Taylor Creek Impact Assessment

TDS concentrations were predicted to increase in surface water during the post-mining period [Volume 1 Section 2.04.7 and Volume 12 Section 2.05.6(3)(b)(iii)] with sulfate being the dominate increasing ion. This impact would be due to infiltration through mine spoil material. Water flowing through the backfill spoil areas is expected to exhibit a temporary increase in TDS owing to rapid dissolution of relatively soluble minerals such as gypsum and calcite. The increase in TDS and major ions is predicated to be followed by a gradual decrease over time. A significant acreage of reclamation has occurred in the

Taylor Creek watershed, and data from LTC is showing increases in TDS as predicted. Please refer to Exhibit 1B for graphs presenting the long-term trends for LTC. The trends in the data presented, including an increase in TDS, confirm predictions from mining activities occurring within the Taylor Creek watershed.

Base flows in Taylor Creek were also anticipated to be decreased by approximately 2% [Volume 12 Section 2.05.6(3)(b)(iii)] from mining activities in the South Taylor Pit. Data from LTC is trending downward (Exhibit 1B). The notable part of this downward trend is an extended period of minimal to zero flows recorded in at LTC. Prior to mining activities Taylor Creek was an ephemeral drainage at best, and Colowyo uses water from Taylor Creek as part of a water right held by Colowyo on Taylor Creek above LTC. In approximately 2011, flows from Taylor Creek became more consistent than was recorded from 2002, and have been more consistent than the previous years of minimal or no flow. If the years of low to zero flow were removed, the base flows in Taylor Creek would be consistent or increasing. Given this, the predicted impact of decreased flows has not occurred overall as flows in Taylor Creek have increased or have been more consistent since approximately 2011.

Jubb Creek

Two surface water-monitoring locations have been established along Jubb Creek. Confluence of Jubb Creek (CJC) represents the aggregate water quality in the Jubb Creek basin, downstream of mining impacted areas. Monitoring has occurred from the first quarter of 2011 to 2021.

West Fork of Jubb Creek (WFJC) represents conditions in the Jubb Creek watershed adjacent to the mining disturbance. Monitoring has occurred from the first quarter of 2011 to 2021.

CJC:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.4	0.1	0.4	8.6	8.2	08/18/11	03/14/12
Lab Cond.	1991	255	1460	2380	920	11/26/16	03/22/11
TDS	1544	189	1150	1820	670	08/01/12	03/22/11
Sulfate	637	112	680	859	179	11/21/16	03/22/11
Calcium	141	16	77	178	101	08/01/12	3/6/19
Iron	0.83	1.48	8.88	8.93	0.05	9/4/19	08/18/11
Magnesium	156	21	130	199	69	11/21/16	03/22/11
Sodium	137	23	140	167	27	08/01/12	03/22/11
Flow rate	0.09	0.13	0.79	0.8	0.01	9/4/19	08/20/18

CJC Water Year Review

No minimum or maximum value were recorded in 2021 for CJC. For the indicator parameters most are stable over time at CJC except for iron, which is increasing. Data for the water year for CJC is provided in Exhibit 1A.

WFJC:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.44	0.10	0.6	8.6	8	11/19/13	03/14/12
Lab Cond.	1230.7	133.5	858	1740	882	03/22/11	05/04/11
TDS	901.8	115.0	680	1450	770	03/22/11	05/04/11
Sulfate	326.5	65.8	415	651	236	03/22/11	11/08/11
Calcium	119.2	8.2	39	135	96	11/05/14	09/18/17
Iron	0.36	0.60	3.52	3.57	0.05	05/04/11	08/18/11
Magnesium	99.4	11.0	64	143	79	03/22/11	05/04/11
Sodium	18.7	21.2	126	139	13	03/22/11	11/29/17
Flow rate	0.03	0.03	0.13	0.13	0.00	05/15/11	08/20/18

WFJC Water Year Review

No maximum or minimum values were recorded in 2021 as WFJC was dry at for all sampling events during the water year 2021. For the indicator parameters, all have been stable overtime at WFJC. Data for the water year for WFJC is provided in Exhibit 1A.

Jubb Creek Impact Assessment

A complete data set from March of 2011 to December of 2021 is presented on the graphs in Exhibit 1B, which provides WFJC and CJC indicator parameters together on one

graph. While reviewing this data, it needs to be noted that the Jubb Creek Haul Road disturbance commenced in 2017, and mining in the Collom Pit commenced in 2018; therefore, data acquired prior to 2017 represents the background condition prior to mining occurring.

Data results as shown for the indicator parameters establishes the down gradient location CJC tends to be higher overall than WFJC, except for pH. Iron is trending upward at the CJC. All the remaining indicator parameters tend to track along with baseline conditions of Jubb Creek for both CJC and WFJC.

Potential mining impacts to Jubb Creek as described in Colowyo's permit were not anticipated to be statistically significant [Volume 15 Section 2.05.6(3)(b)(i & ii)]. To date, the data acquired and presented in this report indicates all the indicator parameter are tracking similar to pre-mine conditions except for iron at CJC. This suggests that iron may be potentially affecting Jubb Creek. The remaining indicator parameters track similar to pre-mining conditions, which indicates that surface water impacts from the Jubb Creek Haul Road and Collom mining operations are being minimized on Jubb Creek.

Collom Gulch

Two surface water-monitoring locations have been established along Collom Gulch. Upper Collom Gulch (UCG) represents the water quality conditions in Collom Gulch upstream of the Collom mining area. Monitoring has occurred from the first quarter of 2011 through 2021.

Lower Collom Gulch (LCG) represents the conditions in Collom Gulch downstream of mining impacts. Monitoring has occurred from the first quarter of 2011 through 2021.

UCG:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.6	0.1	0.4	8.7	8.3	08/01/12	03/22/11
Lab Cond.	679	159	726	1140	414	03/18/11	5/13/19
TDS	461	122	550	820	270	03/22/11	5/13/19
Sulfate	107	67	272	273	1	03/22/11	11/08/11
Calcium	73	16	70	118	48	03/22/11	5/13/19
Iron	1.6	2.1	8.95	9.0	0.05	04/26/16	08/18/11
Magnesium	45	15	74	97	23	03/22/11	05/19/14
Sodium	12	3	12	18	6	07/31/13	5/13/19
Flow rate	0.25	0.44	1.57	1.57	0	04/26/16	03/13/13

UCG Water Year Review

No maximum or minimum values were recorded in 2021. For the indicator parameters all demonstrate a consistent stability over time. Data acquired in 2021 tracked within previously analysis acquired from this UCG. Data for the water year for UCG is provided in Exhibit 1A.

LCG:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.4	0.1	0.6	8.7	8.1	08/20/18	03/14/12
Lab Cond.	996	175	1139	1830	691	5/13/19	05/04/11
TDS	685	156	1100	1540	440	5/13/19	05/24/17
Sulfate	203	81	558	658	100	5/13/19	05/24/17
Calcium	100	12	63	138	75	5/13/19	05/24/17
Iron	0.93	1.39	7.12	7.17	0.05	04/26/16	08/18/11
Magnesium	67	17	119	159	40	5/13/19	05/24/17
Sodium	29	17	119	133	14	5/13/19	03/22/11
Flow rate	0.26	0.42	1.57	1.57	0.00	05/04/11	10/20/15

LCG Water Year Review

No maximum or minimum values were recorded in 20201. The indicator parameters at LCG have been stable over time. Data acquired in 2021 from LCG tracked within previously analysis acquired from this location. Data for the water year for LCG is provided in Exhibit 1A.

Collom Gulch Impact Assessment

A complete data set from March of 2011 to December of 2021 is presented on the graphs in Exhibit 1B, which provides UCG and LCG indicator parameters together on one graph. While reviewing this data, it should be noted that mining in the Collom Pit commenced in 2018; therefore, data acquired prior to 2018 represents the background condition prior to mining occurring.

Data results as shown from the indicator parameters express that the down gradient location LCG and up gradient UCG trend very similar over time for all the indicator parameters. Iron is trending upward at the up-gradient location UCG, while the down gradient LCG tends to remain constant. All the remaining indicator parameters tend to track along with baseline conditions of Collom Gulch.

Potential mining impacts to Collom Gulch as described Colowyo's permit were not anticipated to be statistically significant [Volume 15 Section 2.05.6(3)(b)(i & ii)]. To date, the data acquired and presented in this report indicates all the indicator parameter are tracking similar to pre-mine conditions with influences from seasonal fluctuations. This signifies that impacts from the Collom mining operations have not occurred as predicated to date.

Little Collom Gulch

One surface water monitoring location, LLCG, has been established along Little Collom Gulch and represents the conditions in Little Collom Gulch downstream of mining disturbances. The Collom mining area extends nearly to the headwaters of Little Collom Gulch; therefore, no upstream monitoring location can be established for comparison of data to the down gradient LLCG monitoring location.

Little Collom Gulch Water Year Review

No flow has been observed at LLCG either during baseline data collection or during the ongoing monitoring that began in first quarter of 2011. Since no data has been collected from this site due to nonexistent flows, an evaluation, tabular and graphically analysis have not been completed for this monitoring location.

Little Collom Gulch Impact Assessment

Potential mining impacts to Little Collom Gulch as described Colowyo's permit were not anticipated to be statistically significant [Volume 15 Section 2.05.6(3)(b)(i & ii)]. Since no surface water flows have been present in Little Collom Gulch, there have not been any surface water impacts to Little Collom Gulch.

GROUNDWATER

Colowyo currently samples each ground water well for a variety of quality parameters. Of all the parameters that are analyzed for, several key indicator parameters are identified an analyzed in more depth within this report. These are lab pH, lab conductivity, TDS, sulfate, calcium, iron, magnesium, sodium, and water elevation. Summary of the indicator parameters, not including LGSW-1 and LWCW-1, for each ground water well is provided in a table format. Ground water wells within each corresponding drainage have been compiled together and analyzed together as up gradient and down gradient conditions where applicable.

LGSW-1 and LWCW-1 are points of compliance wells and data for each well for the water year is included in Exhibit 1C only. Indicator parameters and are not analyzed nor provided for either of these wells. A data review narrative is provided for LGSW-1 and LWCW-1 in the Good Spring and Taylor Creek sections of the hydrology report.

Sampling results acquired during the water year from each ground water well are presented in Exhibit 1C. Exhibit 1D presents a graphical statistical analysis of the up and down gradient well (where applicable) for each drainage potentially impacted by Colowyo's mining operations. These drainages include Good Spring Creek, Taylor Creek, Jubb Creek, Little Collom Gulch, and Collom Gulch.

One well is located near the Gossard Loadout facility, which evaluates water quality adjacent to the Gossard Loadout facility, and another well is located down gradient of the confluence of Taylor and Wilson Creek and represents the further downstream point below all mining activities above Taylor and Wilson Creeks.

The Trout Creek well is a deep well that monitors potential impacts to the Trout Creek Sandstone, which is the only regional aquifer in the vicinity of the Colowyo Mine.

Good Spring Creek

Five ground water wells have been established along Good Spring Creek.

A-6 Well (A-6) is located south of the mine along State Highway 13, and this site represents up gradient, undisturbed or background conditions. Monitoring has occurred from 1984 through 2021.

A-7 Well (A-7) is located south of the mine along State Highway 13 and represents a potential down gradient condition below the South Taylor Pit operations. Monitoring started in the second quarter of 2008 and has continued through 2021.

A-8 Well (A-8) is located south of the mine, west of State Highway 13, and represents the condition up gradient of the South Taylor mining activities. Monitoring started in the second quarter of 2008 and has continued through 2021.

North Good Springs Well (NGSW) is located along State Highway 13 and this site represents the down gradient condition below mining activities. Monitoring has occurred from 1989 to 2021.

Lower Good Spring Well 1 (LGSW-1) is located along State Highway 13 and this site represents a further down gradient condition below mining activities. It is located further downstream on Good Spring Creek than NGSW. LGSW-1 is designated as a point of compliance well. Monitoring of LGSW-1 commenced in the fourth quarter of 2021, and only one sample has been acquired to date and included in this annual hydrology report.

A-6:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	7.8	0.4	1.9	8.6	6.7	11/30/93	11/21/02
Lab Cond.	1110	72	512	1440	928	05/01/85	04/27/98
TDS	696	77	750	930	180	07/17/01	03/13/93
Sulfate	138	48	334	430	96	07/17/01	05/15/00
Calcium	61	16	121	169	48	11/18/97	11/13/00
Iron	0.22	0.36	1.81	1.82	0.01	09/26/98	11/18/97
Magnesium	53	15	128	169	41	11/18/97	03/21/11
Sodium	125	18	133	151	18	9/14/20	04/27/98
Elevation	6897.9	2.8	14.5	3602.5	6888.0	05/01/85	07/31/00

A-6 Water Year Review

No minimum or maximum value for an indicator parameter occurred in 2021. All the indicator parameters for the water year tracked within similar results as previous data acquired. The indicator parameters specify pH is slightly increasing while most of the indicator parameters are stable except for iron which is decreasing at this location. Data for the water year for monitoring location A-6 is provided in Exhibit 1C.

A-7:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.1	0.2	0.8	8.4	7.6	5/15/19	11/10/08
Lab Cond.	1513	162	1100	2260	1160	06/18/08	05/05/10
TDS	1140	209	1160	2100	940	06/18/08	9/9/17
Sulfate	422	123	794	1110	316	06/18/08	11/12/19
Calcium	125	18	112	214	102	05/03/11	11/30/17
Iron	0.05	0.01	0.05	0.1	0.05	08/17/11	06/18/08
Magnesium	119	24	151	244	93	06/18/08	11/30/17
Sodium	49	7	43	77	34	06/18/08	05/20/14
Elevation	6888.7	3.5	20.1	6904.9	6884.8	11/12/19	9/14/20

A-7 Water Year Review

No minimum or maximum value for an indicator parameter occurred in 2021. All the indicator parameters for the water year tracked within similar results as previous data acquired. The indicator parameters specify pH and sodium are slightly increasing while all the other indicator parameters are stable or decreasing at this location. Data for the water year for monitoring location A-7 is provided in Exhibit 1C.

A-8:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.1	0.2	0.8	8.4	7.6	05/21/13	11/10/08
Lab Cond.	1254	350	1443	2330	887	03/12/13	05/5/10
TDS	952	349	1420	2040	620	03/12/13	03/13/12
Sulfate	349	207	804	977	173	03/12/13	08/03/10
Calcium	121	31	129	219	90	03/12/13	06/18/08
Iron	0.06	0.05	0.31	0.36	0.05	11/10/08	06/18/08
Magnesium	103	36	142	214	72	03/12/13	03/13/12
Sodium	17	6	24	35	11	03/12/13	03/13/12
Elevation	7105.2	4.9	16.7	7116.9	7100.2	06/18/08	09/19/17

A-8 Water Year Review

No results from 2021 sampling were minimum or maximum values for any parameters listed above during the water year. All sampling results from 2021 tracked within historical analyses. For the indicator parameters most are showing a slight increase over time or are stable, while iron is indicating it is decreasing. Data for the water year for monitoring location A-8 is provided in Exhibit 1C.

NGSW:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	7.9	0.3	1.7	8.5	6.8	08/19/91	10/03/00
Lab Cond.	2091	299	1550	2700	1150	10/17/91	04/27/98
TDS	1708	265	1410	2190	780	04/27/16	04/27/98
Sulfate	797	157	1192	1340	148	03/17/09	05/05/10
Calcium	173	27	169	262	93	03/13/07	10/08/98
Iron	0.08	0.13	1.18	1.19	0.01	6/4/20	10/01/01
Magnesium	173	28	194	270	76	03/13/07	04/27/98
Sodium	105	31	167	199	32	5/24/21	04/27/98
Elevation	6534.9	1.8	10	6540.7	6530.7	03/13/93	05/19/99

NGSW Water Year Review

One sampling result for sodium was a maximum value in 2021. All other monitoring results acquired during the water year tracked within previous results. For the indicator parameters, TDS, sulfate, sodium, pH, EC, calcium, and magnesium are trending upward. Water year data for monitoring location NGSW is provided in Exhibit 1C.

LGSW-1:

LGSW-1 is designated as a point of compliance well on Good Spring Creek, and the sampling parameters for LGSW-1 can be found in Volume 2C, Exhibit 7, Item 19, Table 16, and are also included in Exhibit 1C.

One sample has been obtained from LGSW-1 on December 14, 2021. As provided in Exhibit 1C, TDS exceeded the Table 6 standard. This was reported to the Division on January 7, 2022 as required by Rule 4.05.13(1)(c)(i).

Good Spring Creek Impact Assessment

For the indicator parameters, please see Exhibit 1D, when comparing the up gradient and down gradient locations, for all the indicator parameters, NGSW is trending higher than the up-gradient wells except for iron which is stable at NGSW.

Ground water impacts are not anticipated to be affected by mining, primarily because there is not a continuous, regional ground water system within the stratigraphic section that was or is mined [Volume 1 Sections 2.04.7, 4.05.11 and Volume 12 Sections 2.04.7(1), 2.05.6(3)(b)(iii)]. As discussed in Volume 1, Section 2.04.7, TDS

concentrations showed an incremental increase (pre-mine) of 40 mg/l to 50 mg/l per mile of flow for Wilson and Good Spring Creeks. This predication could be apparent within the alluvial aquifer along Good Spring Creek and TDS value found farther down gradient along Good Spring Creek. Other contributing factors to the alluvial aquifer along Good Spring Creek are the ranching operation that Good Spring Creek runs through the entire private property, and possibly discharges from Colowyo's sediment ponds. However, Streeter Pond is the only sediment pond that discharges in a consistent manner, and it has been released from monitoring requirements in Colowyo's Industrial Wastewater Permit by the Colorado Department of Public Health and Environment Water Quality Division.

Taylor Creek

One ground water well, MT-95-02, has been established along Taylor Creek and represents the down gradient condition below mining activities. Monitoring started in the first quarter of 2008 and has continued through 2021. An up gradient well location is not established for Taylor Creek as mining occurs in the headwaters of the Taylor Creek watershed.

MT-95-02:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.0	0.2	1.0	8.4	7.4	5/15/19	11/10/08
Lab Cond.	2789	273	1400	3470	2070	12/14/21	05/05/10
TDS	2275	188	790	2720	1930	12/14/21	12/10/20
Sulfate	922	88	412	1170	758	3/9/20	05/14/12
Calcium	206	17	112	233	121	9/14/20	11/10/11
Iron	0.05	0.00	0.01	0.06	0.05	11/10/08	11/02/09
Magnesium	200	13	80	227	147	6/4/20	11/10/11
Sodium	195	56	277	371	94	12/14/21	08/13/08
Elevation	6435.4	0.6	3.4	6437.9	6434.5	05/03/11	3/5/19

MT-95-02 Water Year Review
Maximum values for lab conductivity, TDS, and sodium were recorded during 2021. Water year data for monitoring location MT-95-02 is provided in Exhibit 1C.

LWCW-1:
LWCW-1 is designated as a point of compliance well below the confluence of Taylor and Wilson Creeks. The sampling parameters for LWCW-1 can be found in Volume 2C, Exhibit 7, Item 19, Table 16, and are also included in Exhibit 1C.

One sample has been obtained from LWCW-1 on December 14, 2021. As provided in Exhibit 1C, manganese exceeded the Table 6 standard. This was reported to the Division on January 7, 2022 as required by Rule 4.05.13(1)(c)(i).

Taylor Creek Impact Assessment

A complete data set for MT-95-02 from 2008 to December of 2021 is presented on the graphs in Exhibit 1D. For the indicator parameters, laboratory conductivity, pH, sodium, sulfate, and TDS are showing an increase over time, while calcium, iron, and magnesium are indicating downward trends or remaining constant. TDS values were previously elevated (above 2,000 mg/l) when monitoring commenced at this location in 2008.

Ground water impacts are not anticipated to be affected by mining, primarily because there is not a continuous, regional ground water system within the stratigraphic section that was or is mined [Volume 1 Sections 2.04.7, 4.05.11 and Volume 12 Sections 2.04.7(1), 2.05.6(3)(b)(iii)]. TDS and other indicator parameters that are trending higher at MT-95-02 can be attributed to discharges from the East Taylor Pond which are being addressed with the Colorado Department of Public Health and Environment – Water Quality Division through compliance with Colowyo's Industrial Wastewater Discharge Permit.

Gossard Loadout

One ground water well has been established along the Gossard Loadout facility. The Gossard Well is located within the rail loop facility and represents the condition of groundwater associated with the Gossard Loadout Facility. Monitoring has occurred from 1983 to 2021.

Gossard:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.0	0.3	1.6	8.6	7	10/08/98	10/21/02
Lab Cond.	2002	264	1310	2670	1360	11/22/16	03/29/85
TDS	1494	268	1238	2200	962	09/13/16	03/13/93
Sulfate	583	178	1025	1030	5	11/22/16	05/20/14
Calcium	115	25	190	202	12	11/10/11	11/30/93
Iron	0.74	2.94	28.99	29	0.01	10/08/98	10/21/02
Magnesium	138	27	202	217	15	10/08/98	11/30/93
Sodium	169	26	221	240	19	10/08/98	11/30/93
Elevation	6330.0	2.8	14	6339.1	6325.1	10/03/00	03/28/91

Gossard Water Year Review

No results from 2021 sampling were minimum or maximum values for any parameters listed above during the monitoring period. All sampling results tracked within previous analysis. Water year data for the Gossard well is provided in Exhibit 1C.

Gossard Impact Assessment

A complete data set for the Gossard well from 1983 to December of 2021 is presented on the graphs in Exhibit 1D. For the indicator parameters, laboratory conductivity, calcium, sodium, magnesium, sulfate, and TDS are showing an increase over time, iron is trending down, and pH remains relatively constant. The water level in the Gossard well is also trending upward overtime.

Ground water impacts are not anticipated to be affected by mining, primarily because there is not a continuous, regional ground water system within the stratigraphic section that was or is mined [Volume 1 Sections 2.04.7, 4.05.11 and Volume 12 Sections 2.04.7(1), 2.05.6(3)(b)(iii)]. TDS and other indicator parameters that are trending higher at the Gossard may be attributed to the conditions described for Taylor Creek in the *Taylor Creek Impact Assessment* for Surface Water provided previously in this hydrology report.

However, it is also possible that the alluvial aquifer along Wilson Creek is increasing in water since the mass wasting event that occurred in the spring of 1984 along the entire length Wilson Creek above and below mining including the Gossard Loadout facility. This increase in alluvial aquifer water level in Wilson Creek is shown in the Gossard well water elevation (Exhibit 1D). As discussed in Volume 1, Section 2.04.7, TDS concentrations showed an incremental increase (pre-mine) of 40 mg/l to 50 mg/l per mile of flow for Wilson and Good Spring Creeks. Since Wilson Creek is not impacted by mining activities the trending upward values for TDS and the major ions may be attributed to this natural phenomenon rather than impacts from mining.

Little Collom Gulch

One ground water well, MLC-04-01, has been established along Little Collom Gulch. This site represents the down gradient condition below the Collom Pit. Monitoring started in the first quarter of 2011 and has continued through 2021.

MLC-04-01:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.13	0.20	1.2	8.4	7.20	03/13/13	03/22/11
Lab Cond.	1107	394	1309	1610	301	03/18/14	5/13/19
TDS	783	294	1080	1280	200	5/24/21	5/13/19
Sulfate	249	119	502	505	3	05/15/12	03/22/11
Calcium	111	39	130	161	31	05/19/14	5/13/19
Iron	0.05	0.04	0.25	0.25	0.0006	03/14/12	9/14/2020
Magnesium	65	25	86	95	9	05/19/14	03/22/11
Sodium	41	17	73	78	5	11/27/18	03/22/11
Elevation*	45.1	4.9	27.4	50.2	22.8	11/28/18	03/13/18

*Water elevation is static water level depth from the top of casing.

MLC-04-01 Water Year Review

One maximum value for TDS occurred in 2021. that was a non-detect in the analysis. All the other indicator parameters from sampling results in 2021 track within previous analytical results. Water year data for monitoring location MLC-04-01 is provided in Exhibit 1C.

Little Collom Gulch Impact Assessment

A complete data set from March of 2011 to December of 2021 is presented on the graphs in Exhibit 1D. While reviewing this data, it needs to be noted that the mining in the Collom Pit commenced in 2018; therefore, data acquired prior to 2017 represents the background condition prior to mining occurring.

Data results as shown for the indicator parameters (Exhibit 1D) establishes that MLC-04-01 historically trends down for all the indicator parameters except for pH that is slight trending upward.

Impacts to ground water in Little Collom Gulch valley fill deposits were not anticipated to occur as described in Colowyo's permit [Volume 15 Section 2.05.6(3)(b)(i & ii)]. To date, the data acquired and presented in this report (Exhibit 1C and Exhibit 1D) indicates all the indicator parameter are tracking similar to pre-mine conditions. This demonstrates that ground water impacts to the Little Collom Gulch valley fill deposits have not occurred to date as predicted.

Collom Gulch

Two ground water wells have been established along Collom Gulch. MC-04-01 is located in Collom Gulch, and this site represents the condition adjacent to the Collom Pit. Monitoring started in the first quarter of 2011 and has continued through 2020.

MC-04-02 is located in Collom Gulch, and this site represents the down gradient condition below the Collom Pit.

MC-04-01:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.1	0.2	0.8	8.4	7.6	11/27/18	11/05/14
Lab Cond.	894	147	889	1270	381	6/4/20	9/14/20
TDS	620	143	990	1240	250	6/4/20	9/14/20
Sulfate	177	57	253	308	55	05/19/14	9/14/20
Calcium	89	15	95	133	38	6/4/20	9/14/20
Iron	0.05	0.02	0.13	0.18	0.05	03/14/12	03/22/11
Magnesium	58	12	62	80	18	05/23/13	9/14/20
Sodium	17	5	36	46	10	6/4/20	9/14/20
Elevation*	25.0	4.4	31.3	48.8	17.5	03/13/18	5/13/19

*Water elevation is static water level depth from the top of casing.

MC-04-01 Water Year Review

No minimum or maximum values were recorded in 2021 for MC-04-01. The indicator parameters for MC-04-01 indicate that calcium, electrical conductivity, iron, magnesium sulfate, and TDS are trending down, sodium is stable, and pH is slight increasing over time. Water year data for monitoring location MC-04-01 is provided in Exhibit 1C.

MC-04-02:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.1	0.2	0.8	8.4	7.6	11/27/18	11/05/14
Lab Cond.	1284	144	844	1490	646	08/27/14	08/20/18
TDS	868	106	630	1010	380	11/01/12	08/20/18
Sulfate	253	45	221	321	100	11/01/12	12/10/20
Calcium	122	18	67	148	81	08/27/14	11/27/18
Iron	0.07	0.12	0.77	0.82	0.05	03/14/12	03/22/11
Magnesium	76	12	43	92	49	08/27/14	12/14/21
Sodium	64	29	147	160	13	03/13/13	11/27/18
Elevation*	11.4	1.0	4.5	14.1	9.6	01/12/15	05/24/17

*Water elevation is static water level depth from the top of casing.

MC-04-02 Water Year Review

One minimum value for magnesium occurred in 2021 at MC-04-02. All other sampling results tracking within previous values acquired, including data acquired prior to mining commencing in 2018. The indicator parameters for MC-04-02 indicate that calcium, electrical conductivity, iron, magnesium sulfate, and TDS are trending down, sodium is stable, and pH is slight increasing over time. Water year data for monitoring location MC-04-02 is provided in Exhibit 1C.

Collom Gulch Impact Assessment

A complete data set from March of 2011 to December of 2021 is presented on the graphs in Exhibit 1D. The graphs provided include MC-04-01 and MC-04-02 indicator parameters together on one graph for comparisons of both monitoring locations. While reviewing this data, it needs to be noted that the mining in the Collom Pit commenced in 2018; therefore, data acquired prior to 2017 represents the background condition prior to mining occurring.

Data results as shown for the indicator parameters (Exhibit 1D) establishes that MC-04-02 historically tracks higher for most of the indicator parameters, while both monitoring locations trend similar in regard to iron and pH. Overall, all the indicator parameters from both monitoring locations tend to track consistently over time showing consistent or decreasing values over time except for pH, which is showing a minor increase.

Impacts to ground water in the Collom Gulch valley fill deposits were not anticipated to occur as described in Colowyo's permit [Volume 15 Section 2.05.6(3)(b)(i & ii)]. To date, the data acquired and presented in this report (Exhibit 1C and Exhibit 1D) indicates all the indicator parameter are tracking similar to pre-mine conditions with most values

are overall decreasing. This demonstrates that ground water impacts to the Collom Gulch valley fill deposits have not occurred to date as predicated.

Jubb Creek

Two ground water wells have been established along Jubb Creek. MJ-95-01 is located in the West Fork Jubb Creek, and this site represents the down gradient condition below the Collom Pit. Monitoring started in the first quarter of 2011 and has continued through 2021.

MJ-95-03 is located in the Jubb Creek just downstream of the confluence of the West and East Forks of Jubb Creek, and this site represents the condition down gradient of the Collom Pit.

MJ-95-01:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.0	0.2	1.0	8.3	7.3	11/27/18	11/05/14
Lab Cond.	1285	79	350	1420	1070	08/27/14	05/04/11
TDS	863	76	520	940	720	08/18/11	09/18/17
Sulfate	241	36	245	277	32	08/18/11	12/14/21
Calcium	121	4	18	131	113	05/19/14	05/24/17
Iron	0.07	0.05	0.25	0.30	0.05	03/14/12	03/22/11
Magnesium	93	4	14	101	87	05/19/14	03/14/12
Sodium	29	2	11	34	23	9/14/20	05/24/17
Elevation*	13.9	3.2	17.0	24.3	7.3	11/08/11	04/30/18

*Water elevation is static water level depth from the top of casing.

MJ-95-01 Water Year Review

One minimum value for sulfate was recorded during 2021. Indicator parameters for MJ-95-01 are trending along the same path as pre-mining conditions with all indicator parameters trending in a stable manner except for pH, which is slightly increasing. Water year data for monitoring location MJ-95-01 is provided in Exhibit 1C.

MJ-95-03:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	8.2	0.1	0.7	8.4	7.7	11/27/18	11/05/14
Lab Cond.	2245	147	700	2460	1760	08/20/18	05/04/11
TDS	1805	82	340	1920	1600	08/18/11	05/24/17
Sulfate	798	47	205	891	686	05/04/11	11/08/11
Calcium	146	7	26	161	135	9/14/20	11/19/13
Iron	0.06	0.03	0.17	0.22	0.05	03/14/12	03/22/11
Magnesium	192	10	39	217	178	03/22/11	11/29/17
Sodium	140	12	55	166	111	03/22/11	12/10/20
Elevation*	20.2	0.8	5.8	21.6	15.8	09/13/16	11/08/11

*Water elevation is static water level depth from the top of casing.

MJ-95-03 Water Year Review

No maximum or minimum values were recorded in 2021 at MJ-95-03. Indicator parameters for MJ-95-03 are trending along the same path as pre-mining conditions with all indicator parameters trending in a stable manner except for pH, which is slightly increasing. Water year data for monitoring location MJ-95-03 is provided in Exhibit 1C.

Jubb Creek Impact Assessment

A complete data set from March of 2011 to December of 2021 is presented on the graphs in Exhibit 1D. The graphs provided include MJ-95-01 and MJ-95-03 indicator parameters together on one graph for comparisons of both monitoring locations. While reviewing this data, it needs to be noted that the Jubb Creek Haul Road disturbance commenced in 2017, and mining in the Collom Pit commenced in 2018; therefore, data acquired prior to 2017 represents the background condition prior to mining occurring.

Data results as shown for the indicator parameters (Exhibit 1D), establishes that MJ-95-03 historically tracks higher for all indicator parameters, while both monitoring locations trend similar in regard to iron. Overall, all the indicator parameters from both monitoring locations tend to track consistently over time, which pH showing a minor increase.

Potential mining impacts to Jubb Creek as described in Colowyo's permit were not anticipated to be statistically significant [Volume 15 Section 2.05.6(3)(b)(i & ii)]. To date, the data acquired and presented in this report indicates all the indicator parameter are tracking similar to pre-mine conditions, which indicates that ground water impacts within the Jubb Creek watershed are being minimized.

Trout Creek Sandstone Aquifer

One deep ground water well has been established into the Trout Creek Sandstone and is located on the northeastern edge of the Collom Pit. This well represents the regional aquifer condition of the Trout Creek Sandstone aquifer. Monitoring started in the first quarter of 2017 and has continued through 2021.

Trout Creek Well:

Parameter	Mean	Std dev	Range	Max.	Min.	Max at	Min at
Lab pH	9.3	0.3	0.9	9.5	8.6	08/20/18	3/6/19
Lab Cond.	1106	45	210	1220	1010	03/15/17	3/6/19
TDS	696	31	140	800	660	03/15/17	3/9/20
Sulfate	237	24	96	309	213	03/15/17	9/4/19
Calcium	6	3	12	16	4	03/15/17	12/10/20
Iron	0.07	0.04	0.17	0.22	0.05	03/13/18	11/29/17
Magnesium	22	5	23	38	15	03/15/17	5/24/21
Sodium	215	20	73	253	180	5/24/21	11/29/17
Elevation*	589.1	1.3	3.4	591.0	587.6	09/18/17	12/14/21

*Water elevation is static water level depth from the top of casing.

Trout Creek Well Water Year Review

Two minimum values occurred in 2021 for magnesium and water elevation (depth). One maximum occurred for sodium. All other indicator parameters tracked within previous analytical results. Water year data for the Trout Creek well is provided in Exhibit 1C.

Trout Creek Well Impact Assessment

A complete data set from the first quarter of 2017 to December of 2021 is presented on the graphs in Exhibit 1D. Impacts to Trout Creek Sandstone aquifer were not anticipated to occur as described in Colowyo's permit [Volume 15 Section 2.05.6(3)(b)(i & ii)]. To date, the data acquired and presented in this report indicates all the indicator parameter are tracking similar to pre-mine conditions (in this case only data from 2017), which demonstrates that ground water impacts to the Trout Creek Sandstone aquifer have not occurred to date as predicated.

SPOIL SPRING DEVELOPMENT

Several springs have been identified on the reclaimed surface at the Colowyo Mine. These springs are the result of groundwater movement from groundwater complexes that were present pre-mining, whose waters pass through regraded overburden subsurface from the highwall (non-mined areas) and emerge at a location down gradient in the

reclaimed surface. Colowyo has detected three springs that originate from non-mined areas in the highwall and percolate through the regraded spoil and emerge on the reclaimed surface. One spring is located just south of the East Taylor Pond in reclamation parcel WP014. Two additional springs have been located in the East Pit reclamation parcel EP057, south of the Final East Pit Ditch where the final highwall was regraded to PMT.

Exhibit 1A

Surface Water Data

Water Year January 1, 2021 to December 31, 2021

Colowyo Mine
Site - CJC
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	<0.003	<0.003	Dry	<0.003
Ca, diss, mg/L	123	136		154
Fe, tot, mg/L	0.59	2.71		0.90
FlowStreamInst, cfs	0.010	0.02		0.020
HCO3, mg/L	611	695		639
Hg, tot rec, ug/L	<0.001	<0.001		<0.001
Mg, diss, mg/L	136	147		163
Mn, tot rec, mg/L	0.07	0.19		0.08
Na, diss, mg/L	134	157		158
NH3 as N, diss, mg/L	<0.029	<0.029		<0.029
NO2 + NO3, diss, mg/L	<0.16	<0.16		<0.16
NO2, diss, mg/L	<0.012	<0.036		<0.036
NO3, diss, mg/L	<0.0060	<0.018		<0.018
P, tot, mg/L	<0.0085	0.10		<0.0085
Pb, tot rec, mg/L	<0.20	<0.20		<0.20
pH (field)	7.6	7.7		8.1
pH (lab)	8.3	8.4		8.5
Se, tot rec, ug/L	<0.005	<0.005		<0.005
SO4, diss, mg/L	580	650		722
Spec. Cond. (field), umhos/cm	1940	1870		2450
Spec. Cond. (lab), umhos/cm	1730	1920		2210
TDS, mg/L	1460	1520		1690
Temp (Celcius), degrees C	3.9	13.4		2.7
TSS, mg/L	9	60		6
Zn, tot rec, mg/L	<0.05	<0.05		<0.05

Colowyo Mine
Site - LCG
Water Year 1/1/2020 - 12/31/2020

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	94	96	91	107
Fe, tot, mg/L	0.91	3.91	0.11	0.40
FlowStreamInst, cfs	0.030	0.05	0.030	0.020
HCO3, mg/L	460	427	416	465
Hg, tot rec, ug/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	59	69	69	64
Mn, tot rec, mg/L	0.25	0.28	<0.03	0.13
Na, diss, mg/L	27	30	25	29
NH3 as N, diss, mg/L	<0.029	<0.029	<0.029	0.1
NO2 + NO3, diss, mg/L	0.8	0.3	<0.052	0.3
NO2, diss, mg/L	<0.012	<0.012	<0.024	<0.024
NO3, diss, mg/L	0.8	0.3	<0.012	0.3
P, tot, mg/L	0.05	0.19	<0.05	<0.05
Pb, tot rec, mg/L	<0.20	<0.20	<0.20	<0.20
pH (field)	7.7	7.4	7.5	7.9
pH (lab)	8.4	8.4	8.4	8.5
Se, tot rec, ug/L	<0.005	<0.005	<0.005	<0.005
SO4, diss, mg/L	194	176	184	186
Spec. Cond. (field), umhos/cm	1030	970	930	1140
Spec. Cond. (lab), umhos/cm	954	976	881	1020
TDS, mg/L	690	650	640	710
Temp (Celcius), degrees C	3.6	8.4	10.2	2.4
TSS, mg/L	35	164	<5.0	14
Zn, tot rec, mg/L	<0.05	<0.05	<0.05	<0.05

Colowyo Mine
Site - LGSC
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	150	160	160	180
Fe, tot, mg/L	0.19	0.43	0.35	0.23
FlowStreamInst, cfs	2.65	5.2	0.3	0.14
HCO3, mg/L	620	630	840	790
Hg, tot rec, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	150	180	180	180
Mn, tot rec, mg/L	0.11	0.13	0.13	0.19
Na, diss, mg/L	140	170	290	270
NH3 as N, diss, mg/L	<0.029	<0.029	<0.029	<0.029
NO2 + NO3, diss, mg/L	1.0	0.30	<0.16	0.50
NO2, diss, mg/L	<0.012	<0.036	<0.072	<0.072
NO3, diss, mg/L	1.0	0.30	<0.036	0.50
P, tot, mg/L	<0.0085	<0.0085	0.060	<0.0085
Pb, tot rec, mg/L	<0.20	<0.20	<0.20	<0.20
pH (field)	8.0	8.1	8.1	*
pH (lab)	8.3	8.4	8.4	8.4
Se, tot rec, mg/L	0.006	<0.005	<0.005	<0.005
SO4, diss, mg/L	700	770	900	950
Spec. Cond. (field), umhos/cm	2090	2070	2480	*
Spec. Cond. (lab), umhos/cm	1900	2110	2130	2690
TDS, mg/L	1650	1720	2090	2120
Temp (Celcius), degrees C	5.3	11.6	13.4	*
TSS, mg/L	<5.0	7.0	6.0	<5.0
Zn, tot rec, mg/L	<0.05	<0.05	<0.05	<0.05

*Due to a field error field parameters for the 12/14/2021 sample were not acquired.

Colowyo Mine
Site - LLCG
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	Dry	Dry	Dry	Dry
Ca, diss, mg/L				
Fe, tot, mg/L				
FlowStreamInst, cfs				
HCO3, mg/L				
Hg, tot rec, ug/L				
Mg, diss, mg/L				
Mn, tot rec, mg/L				
Na, diss, mg/L				
NH3 as N, diss, mg/L				
NO2 + NO3, diss, mg/L				
NO2, diss, mg/L				
NO3, diss, mg/L				
P, tot, mg/L				
Pb, tot rec, mg/L				
pH (field)				
pH (lab)				
Se, tot rec, ug/L				
SO4, diss, mg/L				
Spec. Cond. (field), umhos/cm				
Spec. Cond. (lab), umhos/cm				
TDS, mg/L				
Temp (Celcius), degrees C				
TSS, mg/L				
Zn, tot rec, mg/L				

Colowyo Mine
Site - LTC
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	<0.003	<0.003	Dry	Dry
Ca, diss, mg/L	103	101		
Fe, tot, mg/L	0.070	0.06		
FlowStreamInst, cfs	0.01	0.02		
HCO3, mg/L	593	560		
Hg, tot rec, mg/L	<0.001	<0.001		
Mg, diss, mg/L	130	170		
Mn, tot rec, mg/L	<0.03	<0.03		
Na, diss, mg/L	430	563		
NH3 as N, diss, mg/L	<0.029	<0.029		
NO2 + NO3, diss, mg/L	0.20	<0.16		
NO2, diss, mg/L	<0.012	<0.072		
NO3, diss, mg/L	0.20	<0.036		
P, tot, mg/L	<0.0085	<0.0085		
Pb, tot rec, mg/L	<0.20	<0.20		
pH (field)	7.7	7.7		
pH (lab)	8.4	8.6		
Se, tot rec, mg/L	<0.005	<0.005		
SO4, diss, mg/L	875	1300		
Spec. Cond. (field), umhos/cm	2750	3070		
Spec. Cond. (lab), umhos/cm	2420	3150		
TDS, mg/L	2050	2540		
Temp (Celcius), degrees C	2.8	8.8		
TSS, mg/L	<5.0	<5.0		
Zn, tot rec, mg/L	<0.05	<0.05		

Colowyo Mine
Site - NUGSC
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	130	120	130	140
Fe, tot, mg/L	0.13	1.8	1.4	1.9
FlowStreamInst, cfs	0.52	2.38	0.12	0.07
HCO3, mg/L	480	460	520	530
Hg, tot rec, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	130	120	170	130
Mn, tot rec, mg/L	<0.03	0.1	0.09	0.08
Na, diss, mg/L	57	55	77	76
NH3 as N, diss, mg/L	<0.029	<0.029	<0.029	<0.029
NO2 + NO3, diss, mg/L	3.3	3.2	4.1	2.8
NO2, diss, mg/L	<0.012	<0.024	<0.036	<0.036
NO3, diss, mg/L	3.3	3.2	4.1	2.8
P, tot, mg/L	<0.0085	0.14	0.090	0.14
Pb, tot rec, mg/L	<0.20	<0.20	<0.20	<0.20
pH (field)	7.8	7.9	8.2	8.1
pH (lab)	8.3	8.4	8.4	8.5
Se, tot rec, mg/L	0.017	0.012	0.016	0.013
SO4, diss, mg/L	500	440	640	570
Spec. Cond. (field), umhos/cm	1620	1450	1740	1920
Spec. Cond. (lab), umhos/cm	1480	1460	1550	1780
TDS, mg/L	1300	1100	1500	1300
Temp (Celcius), degrees C	4.2	12.1	12	6.3
TSS, mg/L	6.0	120	68	79
Zn, tot rec, mg/L	<0.05	<0.05	<0.05	<0.05

Colowyo Mine
Site - UCG
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	Dry	<0.25	Dry	Dry
Ca, diss, mg/L		67		
Fe, tot, mg/L		0.22		
FlowStreamInst, cfs		0.02		
HCO3, mg/L		318		
Hg, tot rec, ug/L		<0.001		
Mg, diss, mg/L		37		
Mn, tot rec, mg/L		<0.03		
Na, diss, mg/L		11		
NH3 as N, diss, mg/L		<0.1		
NO2 + NO3, diss, mg/L		0.2		
NO2, diss, mg/L		0.2		
NO3, diss, mg/L		<0.1		
P, tot, mg/L		<0.05		
Pb, tot rec, mg/L		<0.2		
pH (field)		7.4		
pH (lab)		8.6		
Se, tot rec, ug/L		<0.005		
SO4, diss, mg/L		50		
Spec. Cond. (field), umhos/cm		590		
Spec. Cond. (lab), umhos/cm		587		
TDS, mg/L		360		
Temp (Celcius), degrees C		5.8		
TSS, mg/L		<5		
Zn, tot rec, mg/L		<0.05		

Colowyo Mine
Site - UWFGSC
Water Year 1/1/2021 - 12/31/2021

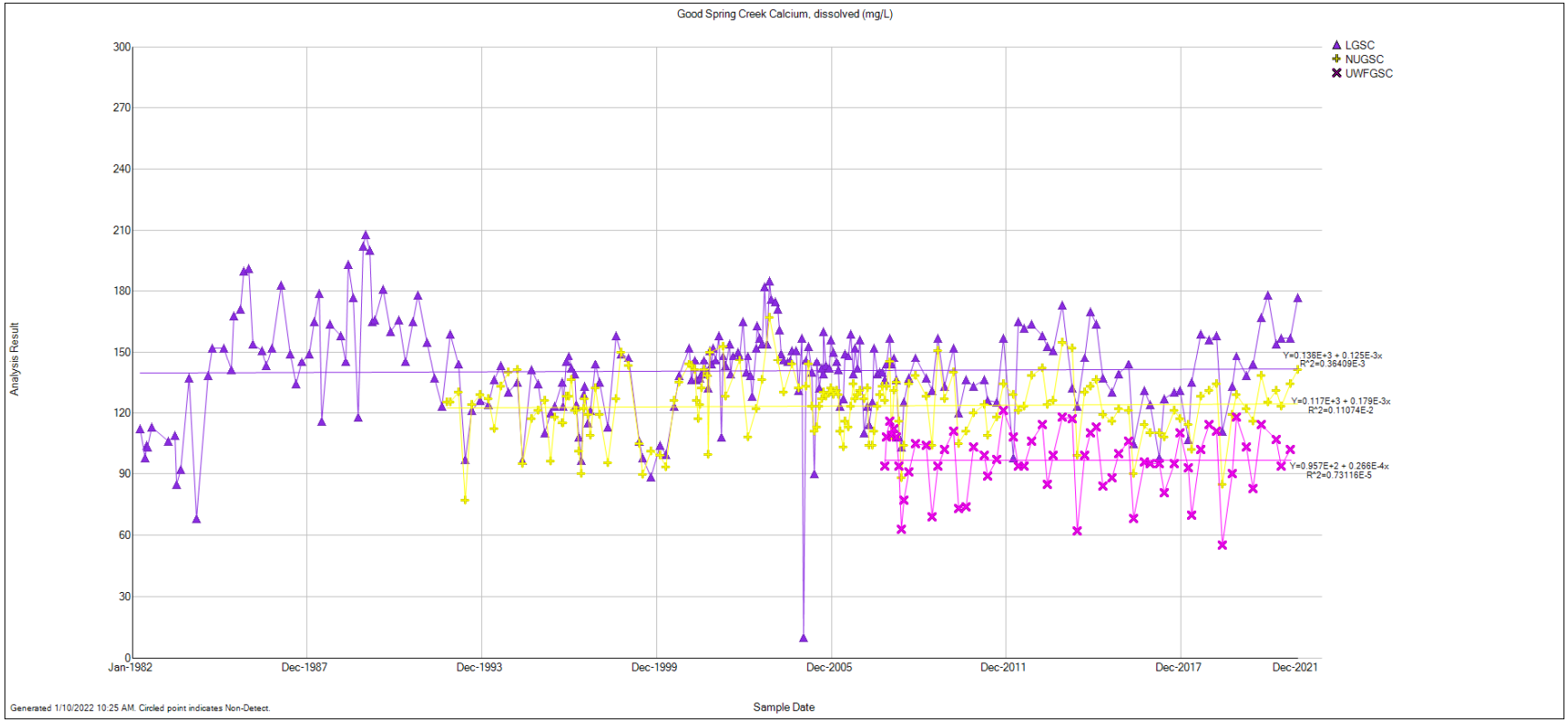
	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	<0.003	<0.003	<0.003	Dry
Ca, diss, mg/L	110	94	100	
Fe, tot, mg/L	0.31	3.56	0.08	
FlowStreamInst, cfs	0.09	0.12	0.04	
HCO3, mg/L	410	340	380	
Hg, tot rec, ug/L	<0.001	<0.001	<0.001	
Mg, diss, mg/L	84	75	120	
Mn, tot rec, mg/L	0.04	0.19	<0.03	
Na, diss, mg/L	9	8	11	
NH3 as N, diss, mg/L	<0.029	<0.029	<0.029	
NO2 + NO3, diss, mg/L	3.4	2.3	3.1	
NO2, diss, mg/L	<0.012	0.10	<0.024	
NO3, diss, mg/L	3.4	2.1	3.1	
P, tot, mg/L	<0.0085	0.27	<0.0085	
Pb, tot rec, mg/L	<0.20	<0.20	<0.20	
pH (field)	7.9	8.1	8.1	
pH (lab)	8.4	8.6	8.6	
Se, tot rec, mg/L	0.009	0.008	0.0011	
SO4, diss, mg/L	256	190	358	
Spec. Cond. (field), umhos/cm	1120	890	1110	
Spec. Cond. (lab), umhos/cm	1020	903	1100	
TDS, mg/L	790	640	930	
Temp (Celcius), degrees C	1.4	11.6	12.1	
TSS, mg/L	15	233	<5.0	
Zn, tot rec, ug/L	<0.05	<0.05	<0.05	

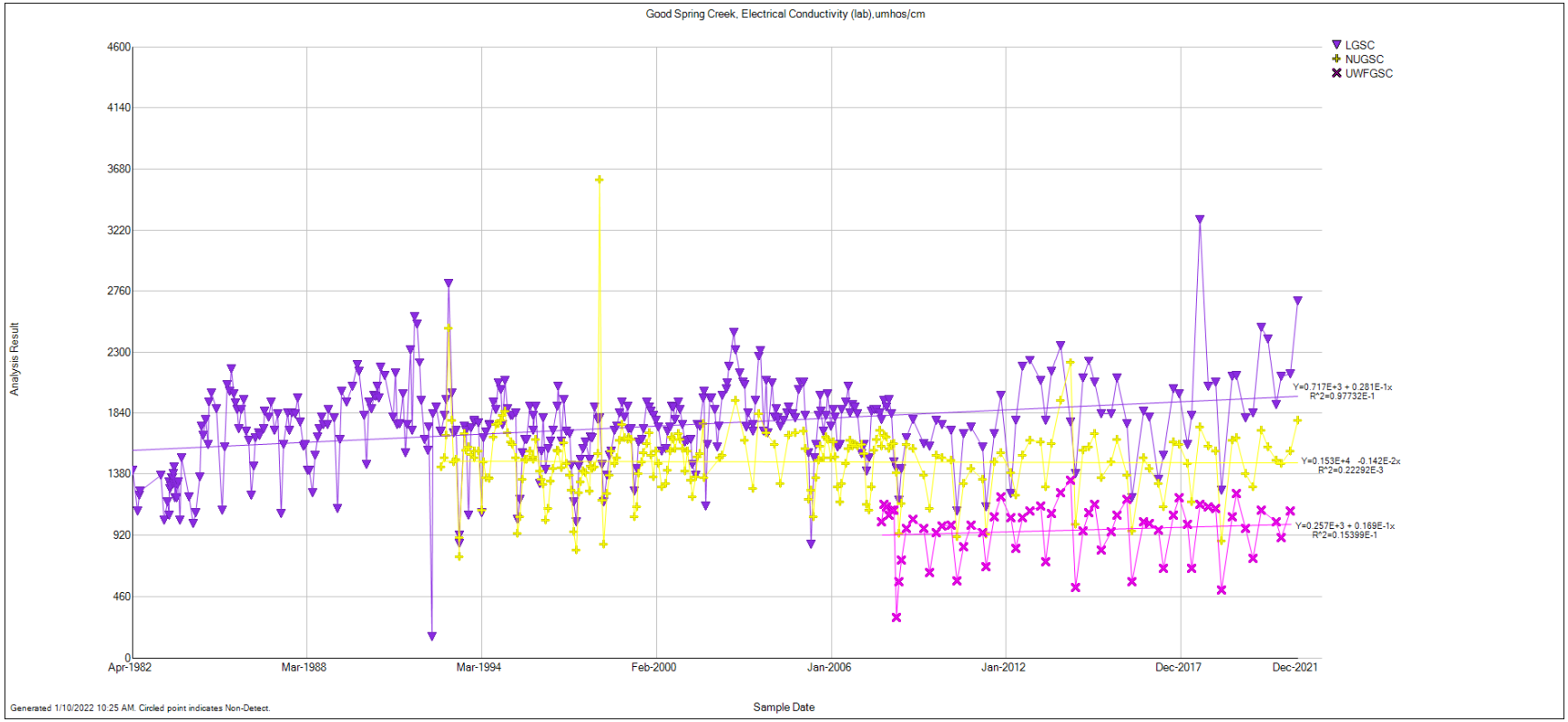
Colowyo Mine
Site - WFJC
Water Year 1/1/2021 - 12/31/2021

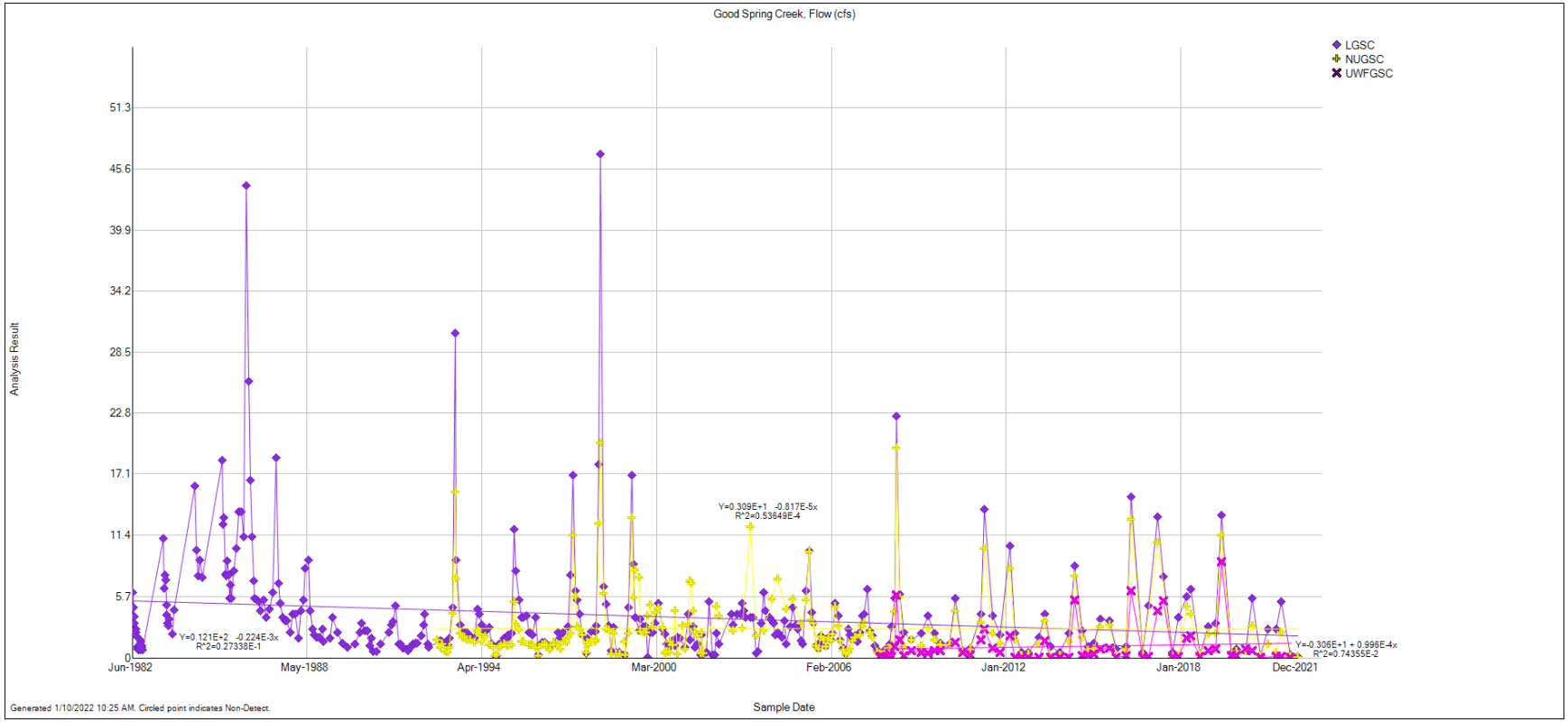
	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, tot rec, mg/L	Dry	Dry	Dry	Dry
Ca, diss, mg/L				
Fe, tot, mg/L				
FlowStreamInst, cfs				
HCO3, mg/L				
Hg, tot rec, ug/L				
Mg, diss, mg/L				
Mn, tot rec, mg/L				
Na, diss, mg/L				
NH3 as N, diss, mg/L				
NO2 + NO3, diss, mg/L				
NO2, diss, mg/L				
NO3, diss, mg/L				
P, tot, mg/L				
Pb, tot rec, mg/L				
pH (field)				
pH (lab)				
Se, tot rec, ug/L				
SO4, diss, mg/L				
Spec. Cond. (field), umhos/cm				
Spec. Cond. (lab), umhos/cm				
TDS, mg/L				
Temp (Celcius), degrees C				
TSS, mg/L				
Zn, tot rec, mg/L				

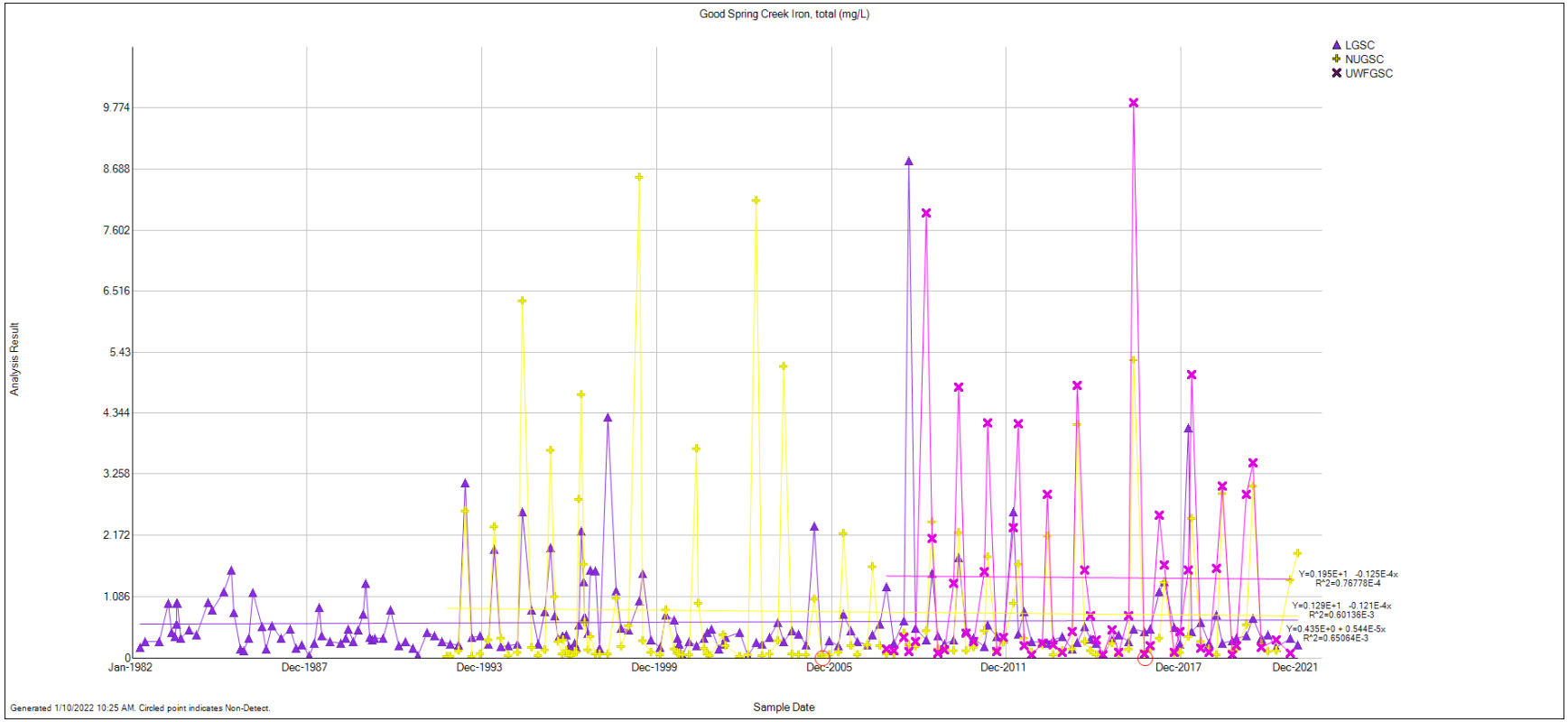
Exhibit 1B

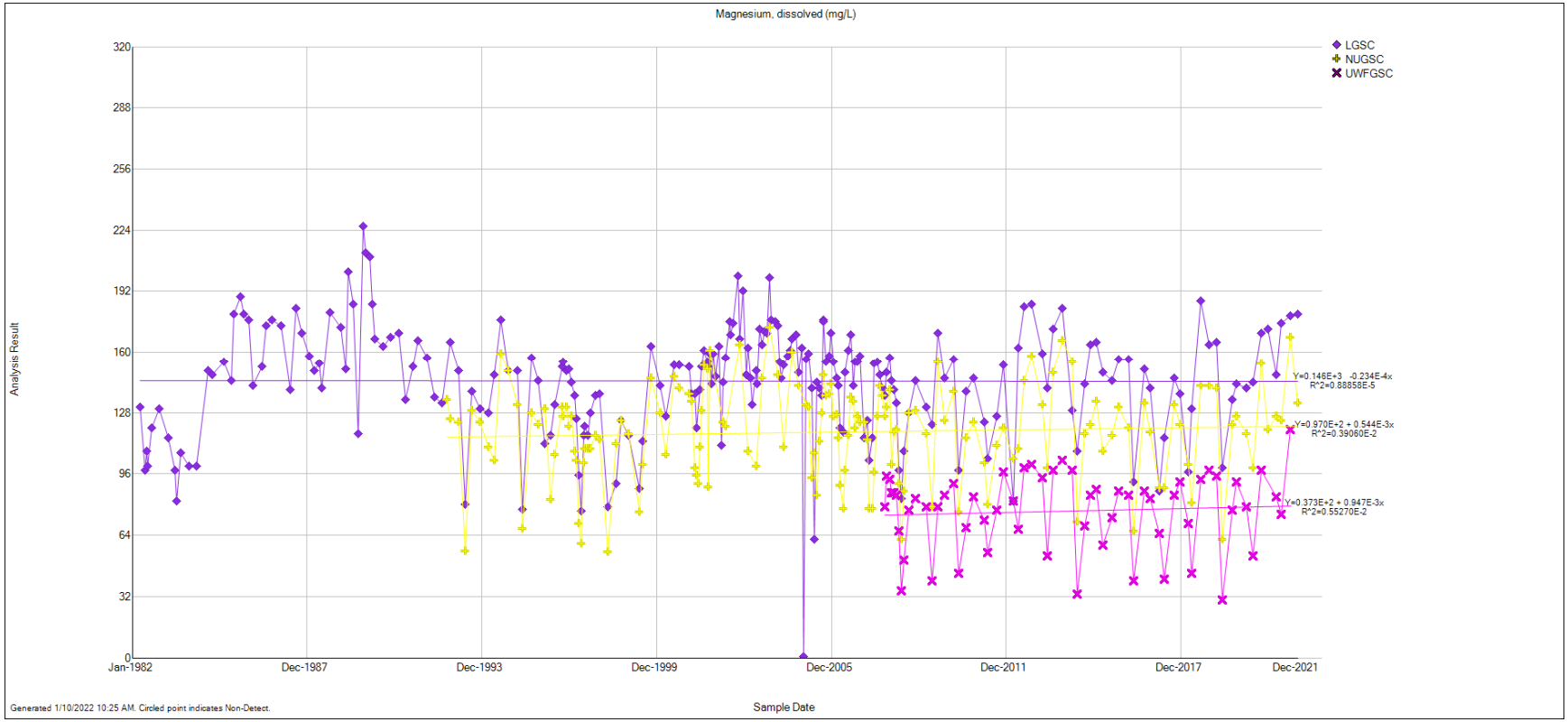
Surface Water Graphs

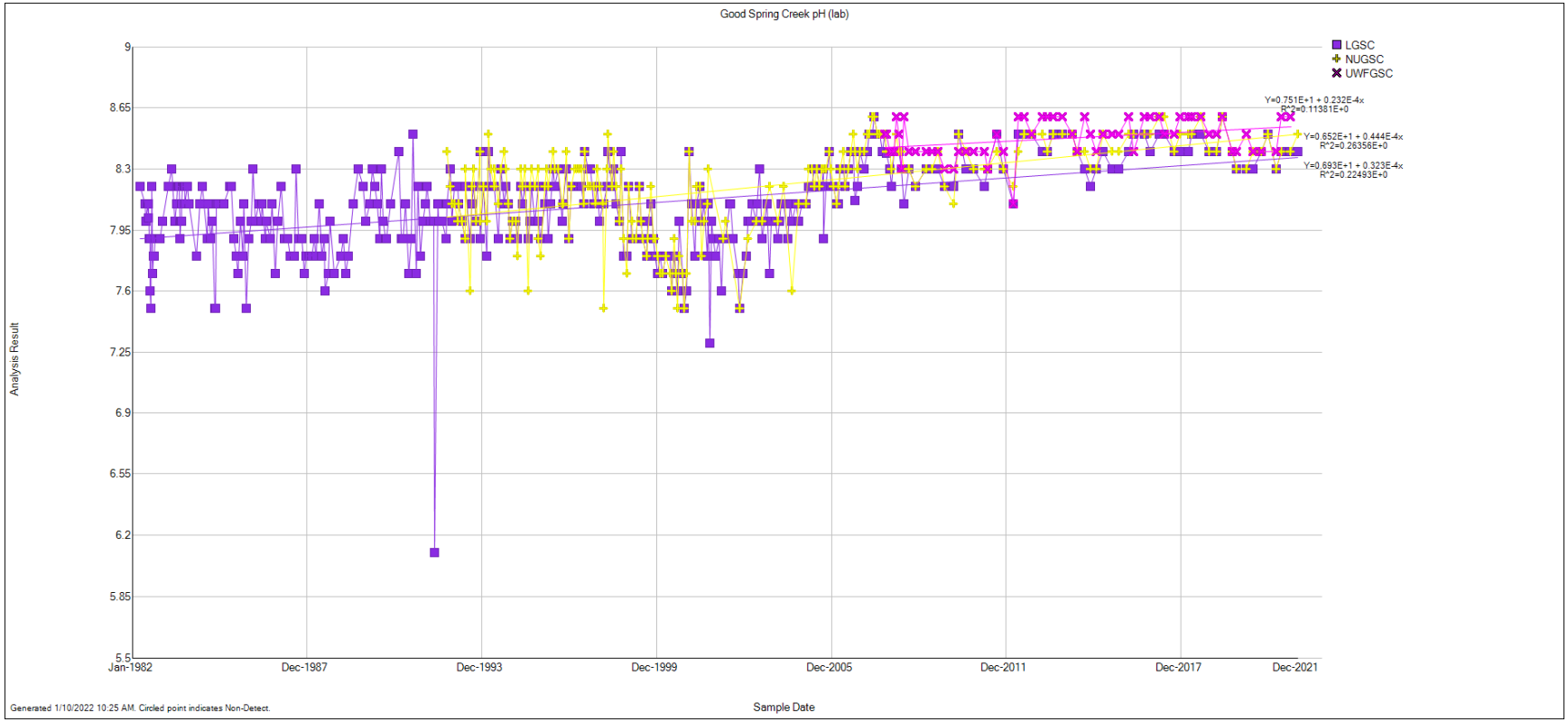

Good Spring Creek Calcium, dissolved (mg/L)
LGSC
NUGSC
UWFGSC
Y=0.136E+3 + 0.125E-3x
R^2=0.36409E-3
Y=0.117E+3 + 0.179E-3x
R^2=0.11074E-2
Y=0.957E+2 + 0.266E-4x
R^2=0.73116E-5
Analysis Result
300
270
240
210
180
150
120
90
60
30
0
Jan-1982
Dec-1987
Dec-1993
Dec-1999
Dec-2005
Dec-2011
Dec-2017
Dec-2021
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.
Sample Date

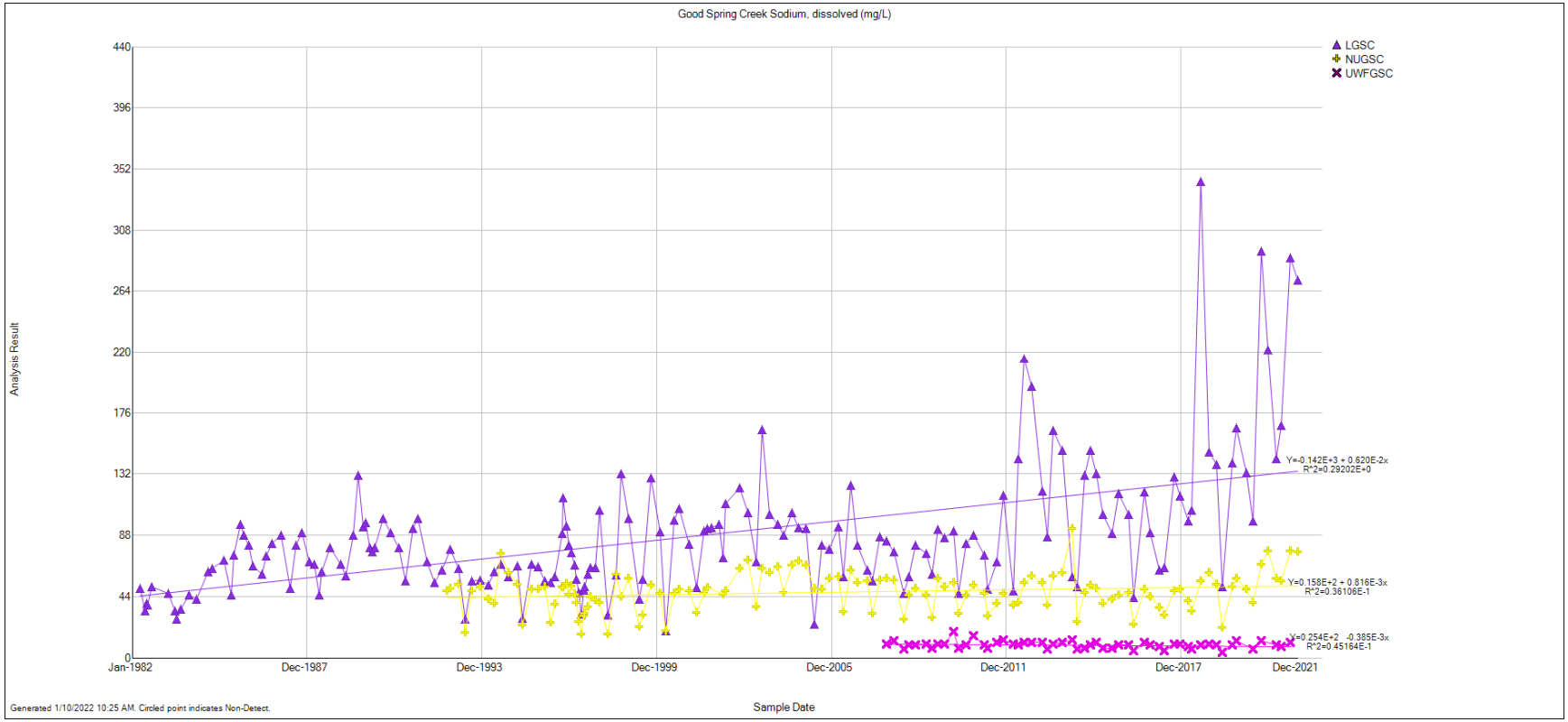

Good Spring Creek, Electrical Conductivity (lab),umhos/cm
LGSC
NUGSC
UWFGSC
Y=0.717E+3 + 0.281E-1x
R^2=0.97732E-1
Y=0.153E+4 - .0.142E-2x
R^2=0.22292E-3
Y=0.257E+3 + 0.169E-1x
R^2=0.15399E-1
Analysis Result
4600
4140
3680
3220
2760
2300
1840
1380
920
460
0
Apr-1982
Mar-1988
Mar-1994
Feb-2000
Jan-2006
Jan-2012
Dec-2017
Dec-2021
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.
Sample Date

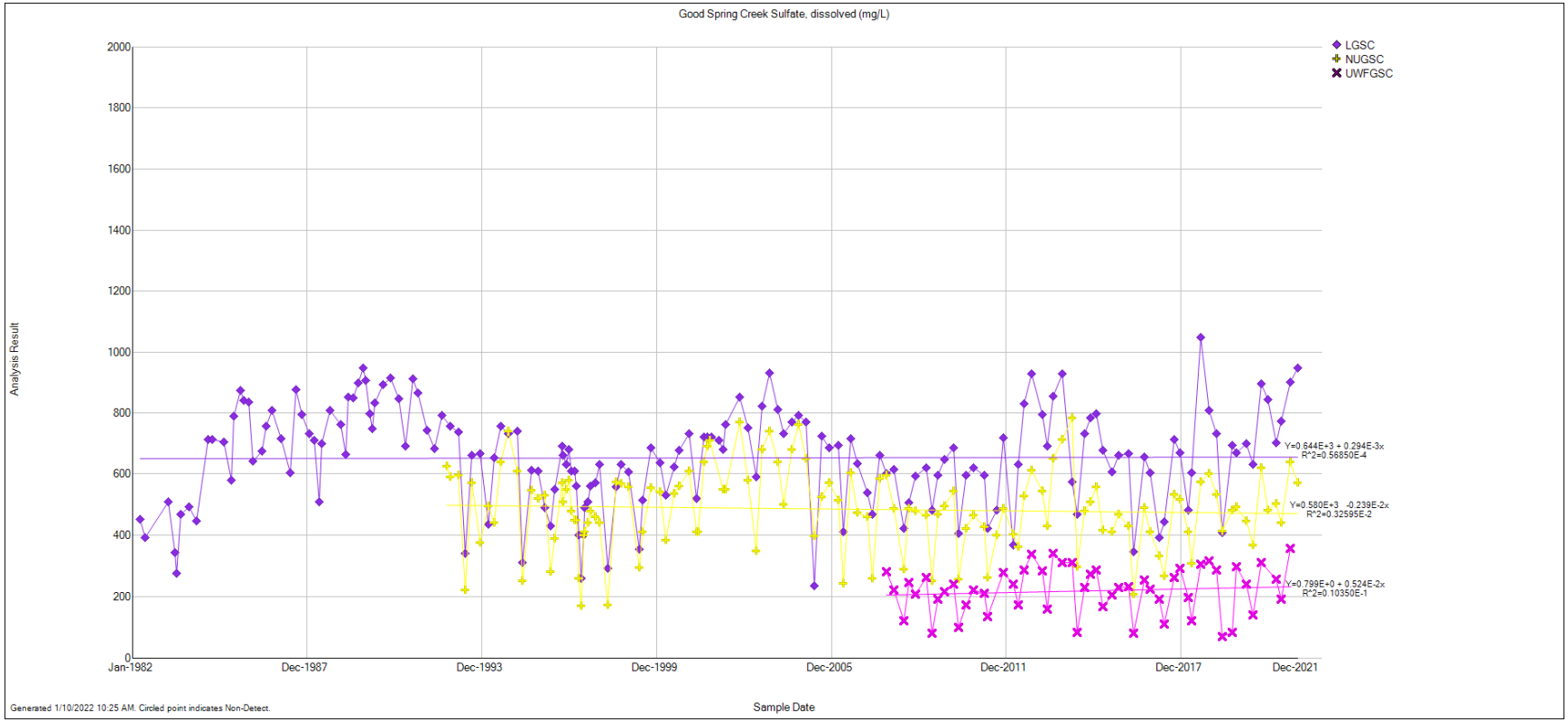

Good Spring Creek, Flow (cfs)
LGSC
NUGSC
UWFGSC
Analysis Result
51.3
45.6
39.9
34.2
28.5
22.8
17.1
11.4
5.7
0
Jun-1982
May-1988
Apr-1994
Mar-2000
Feb-2006
Jan-2012
Jan-2018
Dec-2021
Y=0.121E+2 -0.224E-3x
R^2=0.27338E-1
Y=0.309E+1 -0.817E-5x
R^2=0.53649E-4
Y=-0.306E+1 + 0.996E-4x
R^2=0.74355E-2
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.
Sample Date

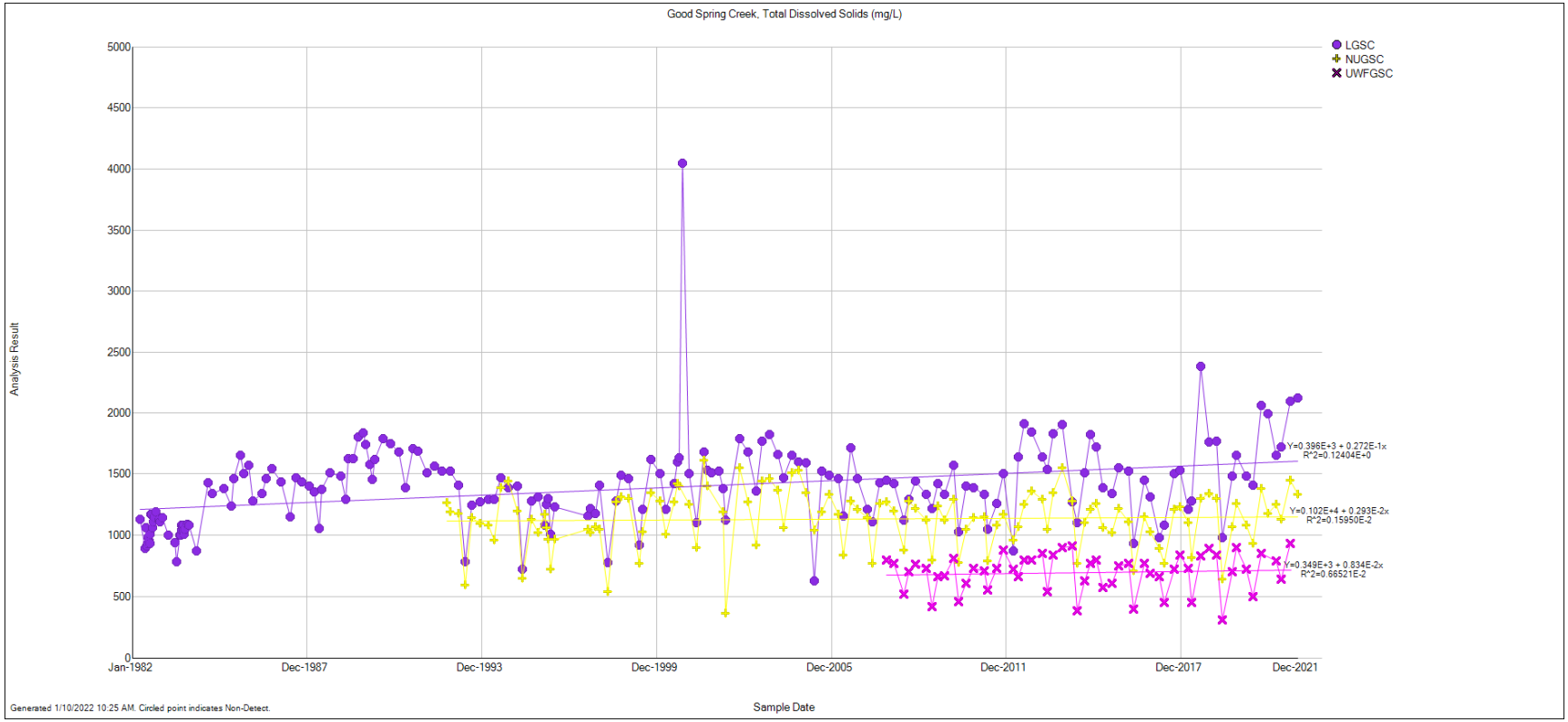

Good Spring Creek Iron, total (mg/L)
LGSC
NUGSC
UWFGSC
Analysis Result
9.774
8.688
7.602
6.516
5.43
4.344
3.258
2.172
1.086
0
Jan-1982
Dec-1987
Dec-1993
Dec-1999
Dec-2005
Dec-2011
Dec-2017
Dec-2021
Y=0.195E+1 -0.125E-4x
R^2=0.76778E-4
Y=0.129E+1 -0.121E-4x
R^2=0.60136E-3
Y=0.435E+0 + 0.544E-5x
R^2=0.65064E-3
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.
Sample Date

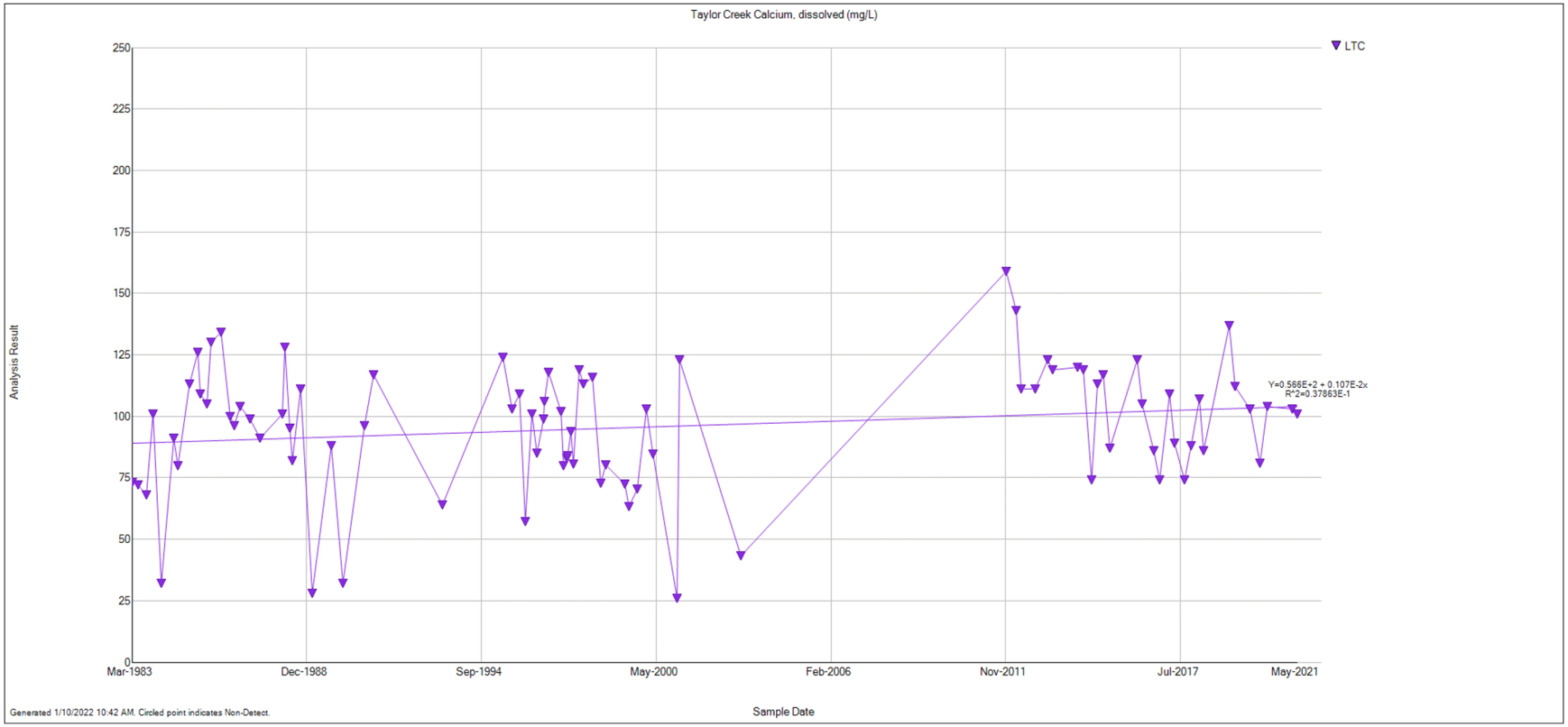

Magnesium, dissolved (mg/L)
LGSC
NUGSC
UWFGSC
Analysis Result
320
288
256
224
192
160
128
96
64
32
0
Jan-1982
Dec-1987
Dec-1993
Dec-1999
Dec-2005
Dec-2011
Dec-2017
Dec-2021
Y=0.146E+3 -0.234E-4x
R^2=0.88858E-5
Y=0.970E+2 + 0.544E-3x
R^2=0.39060E-2
Y=0.373E+2 + 0.947E-3x
R^2=0.55270E-2
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.
Sample Date

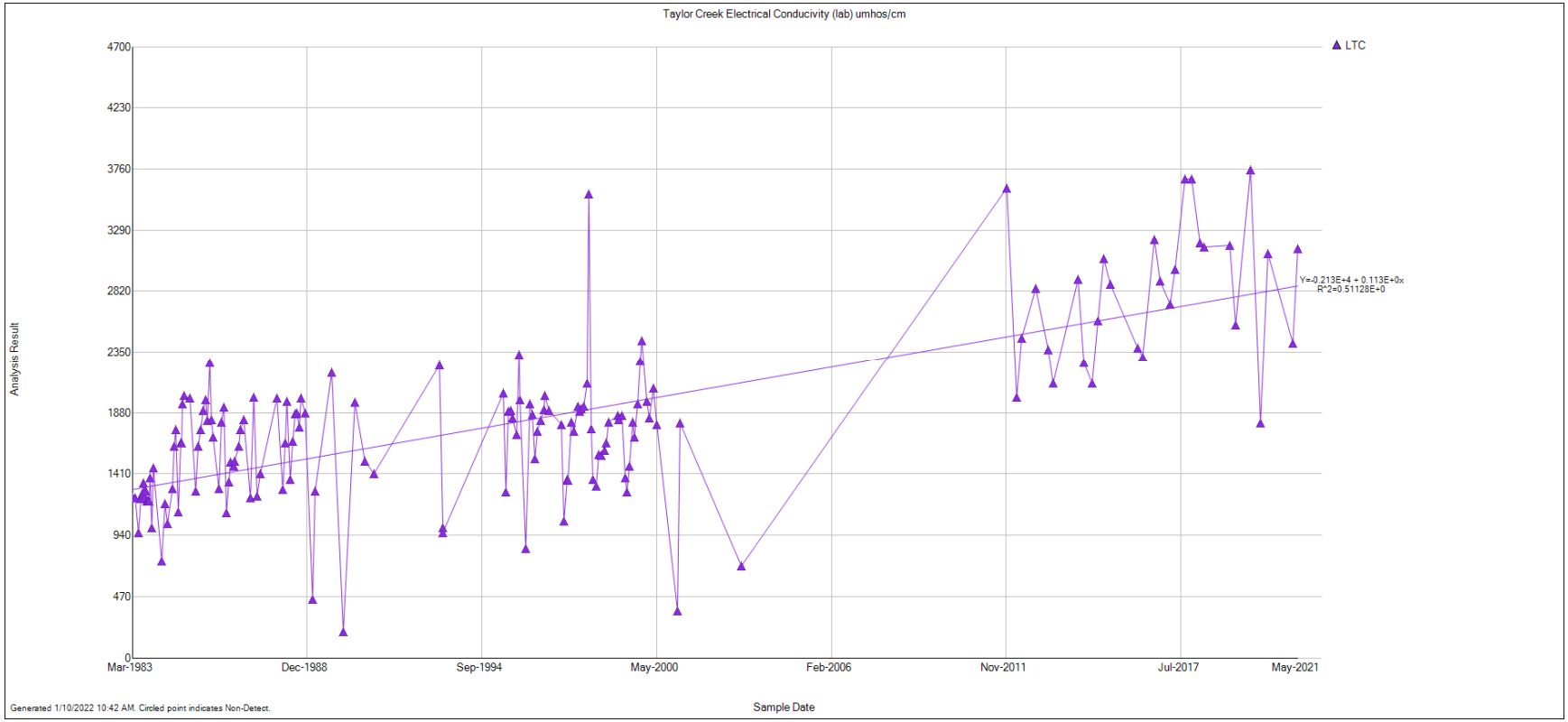

Good Spring Creek pH (lab)
LGSC
NUGSC
UWFGSC
Y=0.751E+1 + 0.232E-4x
R^2=0.11381E+0
Y=0.652E+1 + 0.444E-4x
R^2=0.26356E+0
Y=0.693E+1 + 0.323E-4x
R^2=0.22493E+0
Analysis Result
9
8.65
8.3
7.95
7.6
7.25
6.9
6.55
6.2
5.85
5.5
Jan-1982
Dec-1987
Dec-1993
Dec-1999
Dec-2005
Dec-2011
Dec-2017
Dec-2021
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.
Sample Date

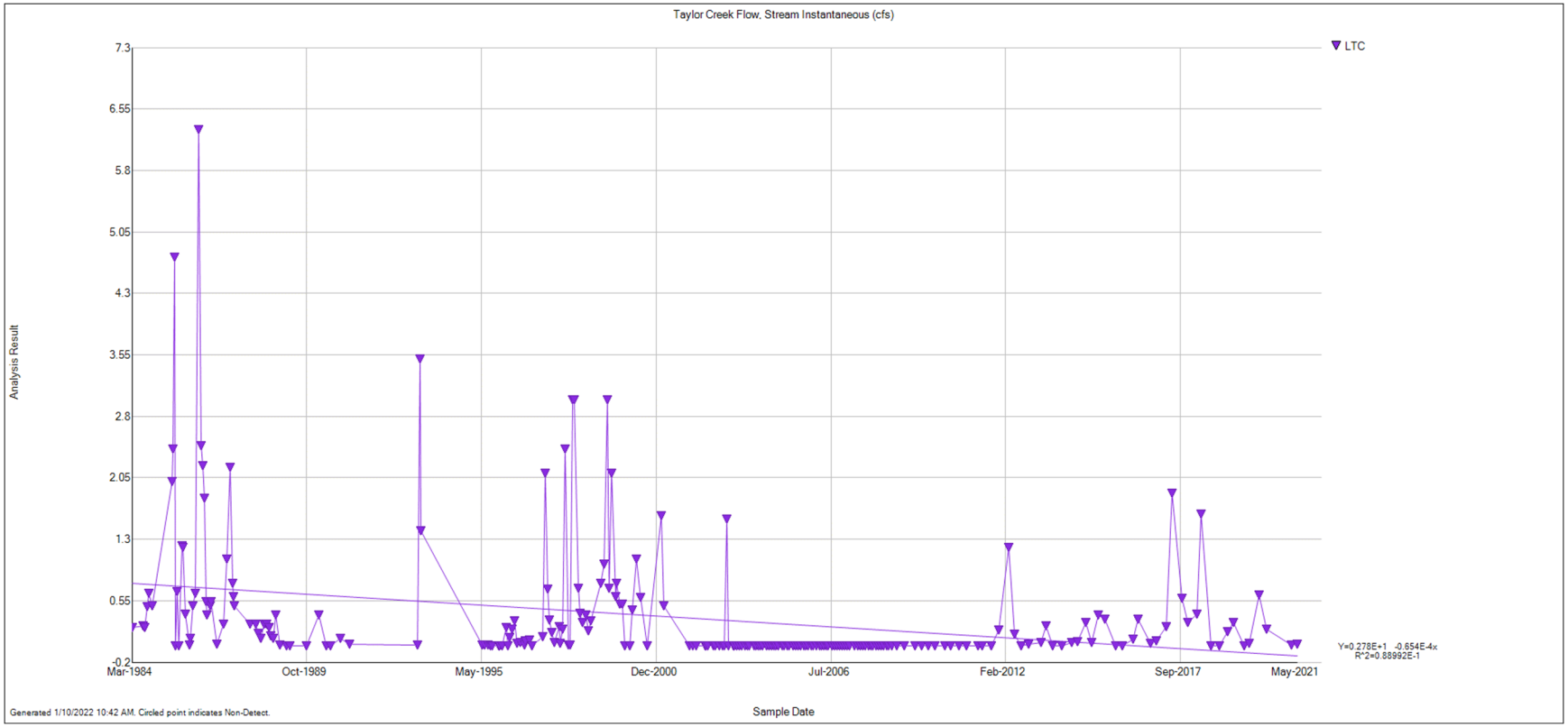

Good Spring Creek Sodium, dissolved (mg/L)
LGSC
NUGSC
UWFGSC
Y=-0.142E+3 + 0.820E-2x
R^2=0.29202E+0
Y=0.158E+2 + 0.816E-3x
R^2=0.36106E-1
Y=0.254E+2 -0.385E-3x
R^2=0.45164E-1
Analysis Result
440
396
352
308
264
220
176
132
88
44
0
Jan-1982
Dec-1987
Dec-1993
Dec-1999
Dec-2005
Dec-2011
Dec-2017
Dec-2021
Sample Date
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.

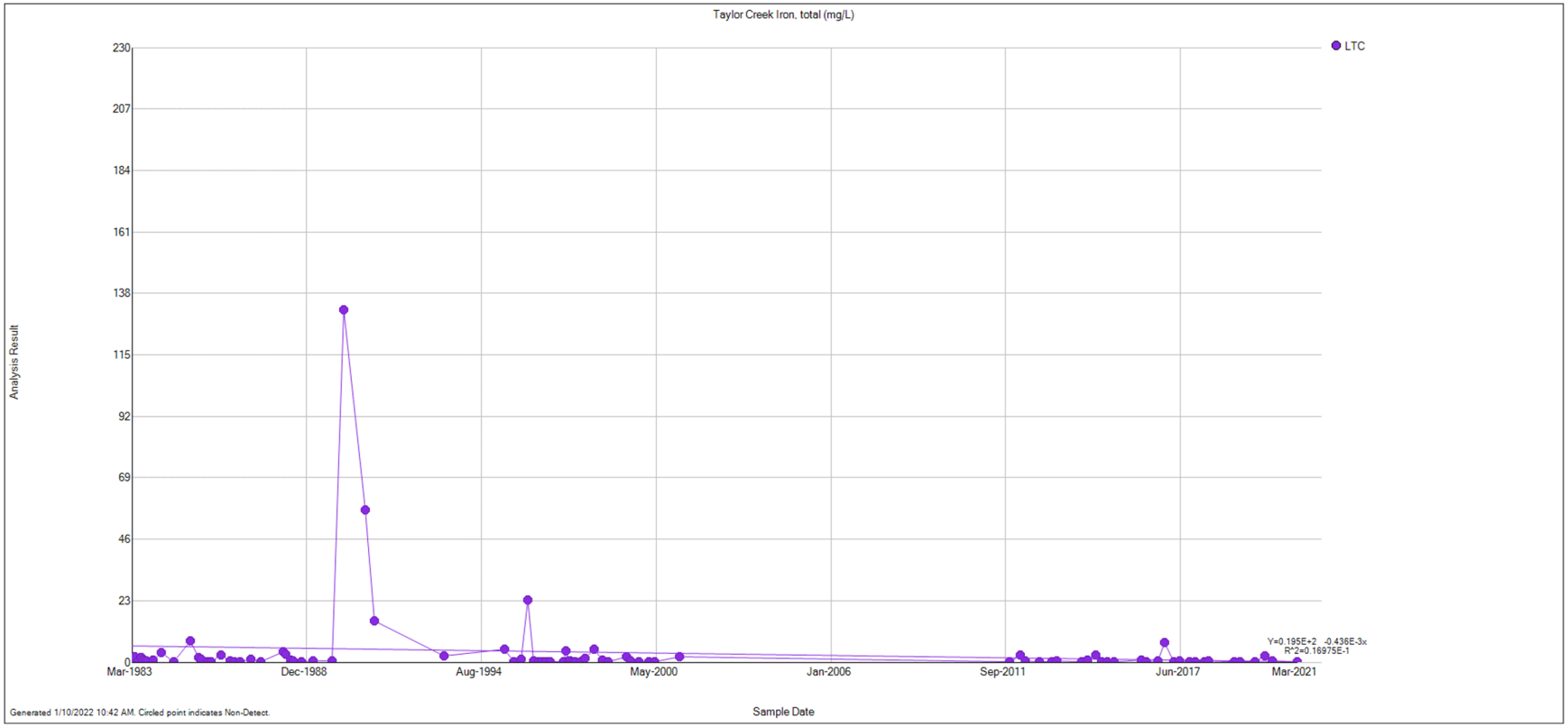

Good Spring Creek Sulfate, dissolved (mg/L)
LGSC
NUGSC
UWFGSC
Y=0.644E+3 + 0.294E-3x
R^2=0.56850E-4
Y=0.580E+3 -0.239E-2x
R^2=0.32595E-2
Y=0.799E+0 + 0.524E-2x
R^2=0.10350E-1
Analysis Result
Sample Date
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.

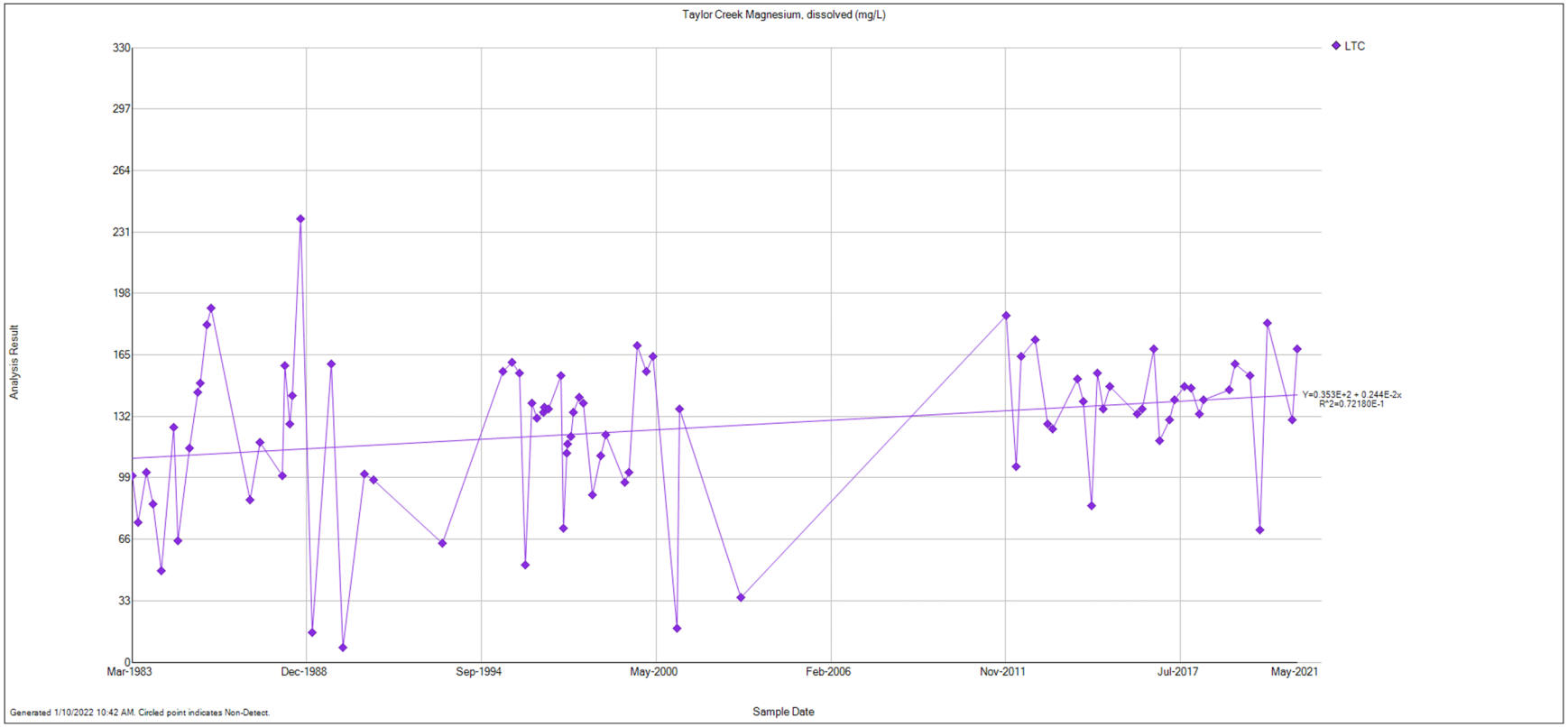

Good Spring Creek, Total Dissolved Solids (mg/L)
LGSC
NUGSC
UWFGSC
Y=0.396E+3 + 0.272E-1x
R^2=0.12404E+0
Y=0.102E+4 + 0.293E-2x
R^2=0.15950E-2
Y=0.349E+3 + 0.834E-2x
R^2=0.66521E-2
Analysis Result
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Jan-1982
Dec-1987
Dec-1993
Dec-1999
Dec-2005
Dec-2011
Dec-2017
Dec-2021
Generated 1/10/2022 10:25 AM. Circled point indicates Non-Detect.
Sample Date

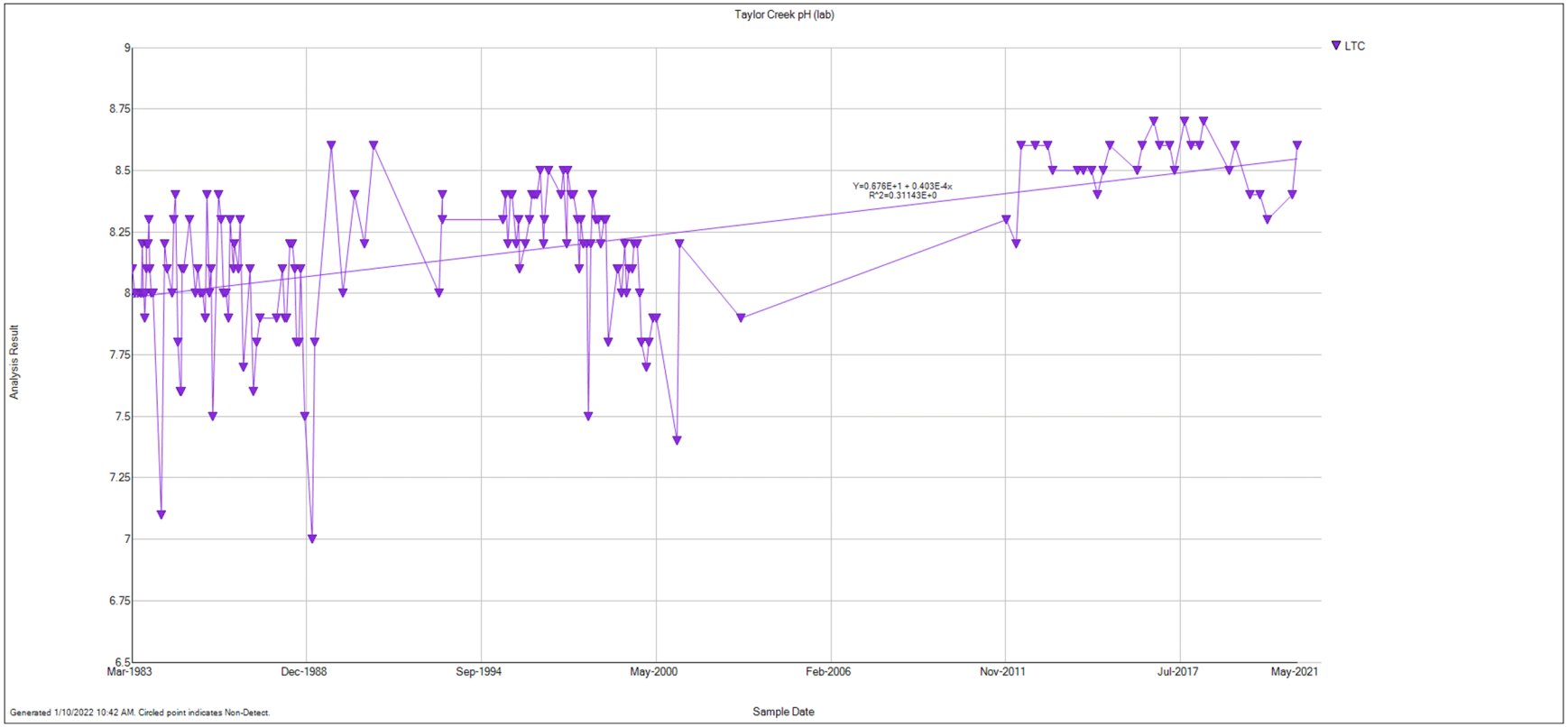

Taylor Creek Calcium, dissolved (mg/L)
LTC
Y=0.566E+2 + 0.107E-2x
R^2=0.37863E-1
Analysis Result
250
225
200
175
150
125
100
75
50
25
0
Mar-1983
Dec-1988
Sep-1994
May-2000
Feb-2006
Nov-2011
Jul-2017
May-2021
Sample Date
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.

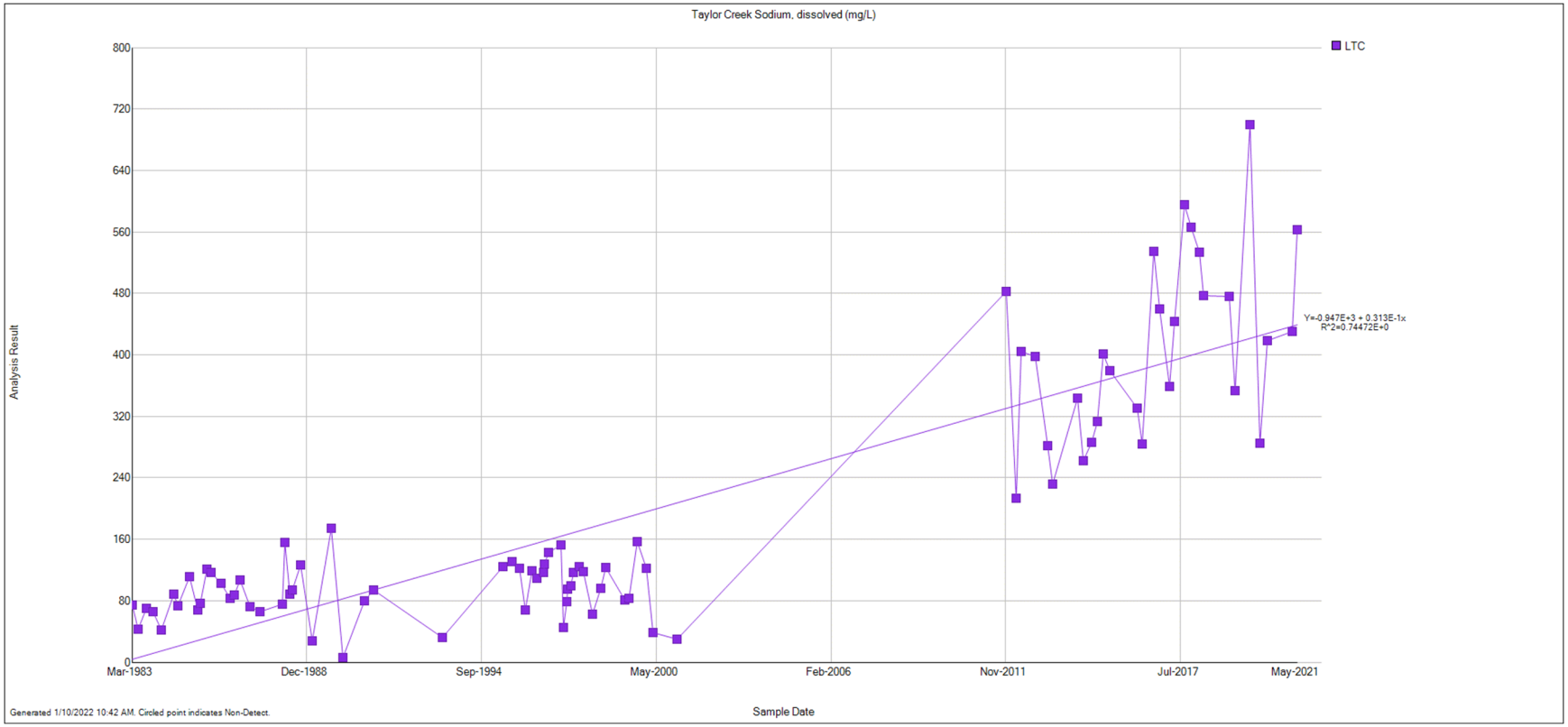

Taylor Creek Electrical Conducivity (lab) umhos/cm
LTC
Y=-0.213E+4 + 0.113E+0x
R^2=0.51128E+0
Analysis Result
4700
4230
3760
3290
2820
2350
1880
1410
940
470
0
Mar-1983
Dec-1988
Sep-1994
May-2000
Feb-2006
Nov-2011
Jul-2017
May-2021
Sample Date
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.

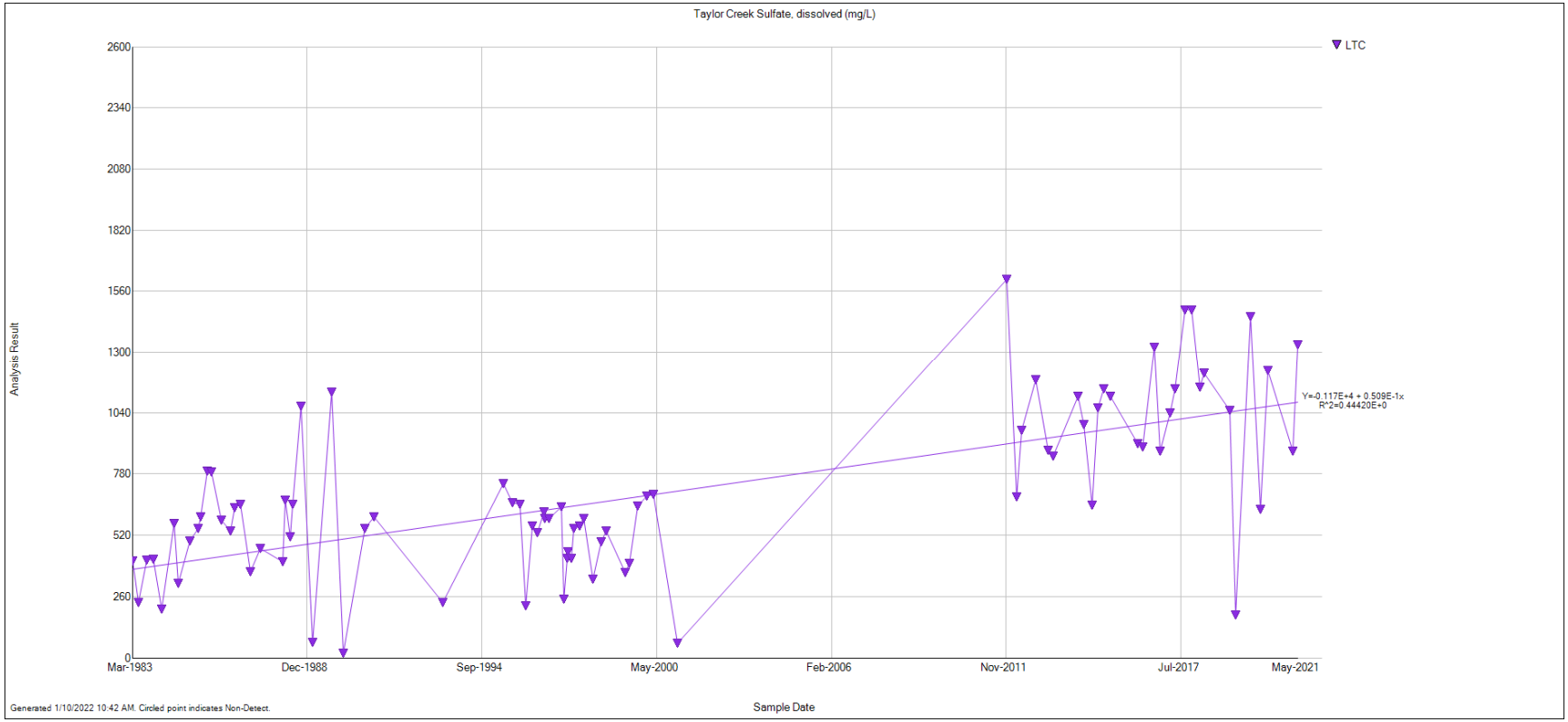

Taylor Creek Flow, Stream Instantaneous (cfs)
LTC
Analysis Result
7.3
6.55
5.8
5.05
4.3
3.55
2.8
2.05
1.3
0.55
-0.2
Mar-1984
Oct-1989
May-1995
Dec-2000
Jul-2006
Feb-2012
Sep-2017
May-2021
Y=0.278E+1 -0.654E-4x
R^2=0.88992E-1
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.
Sample Date

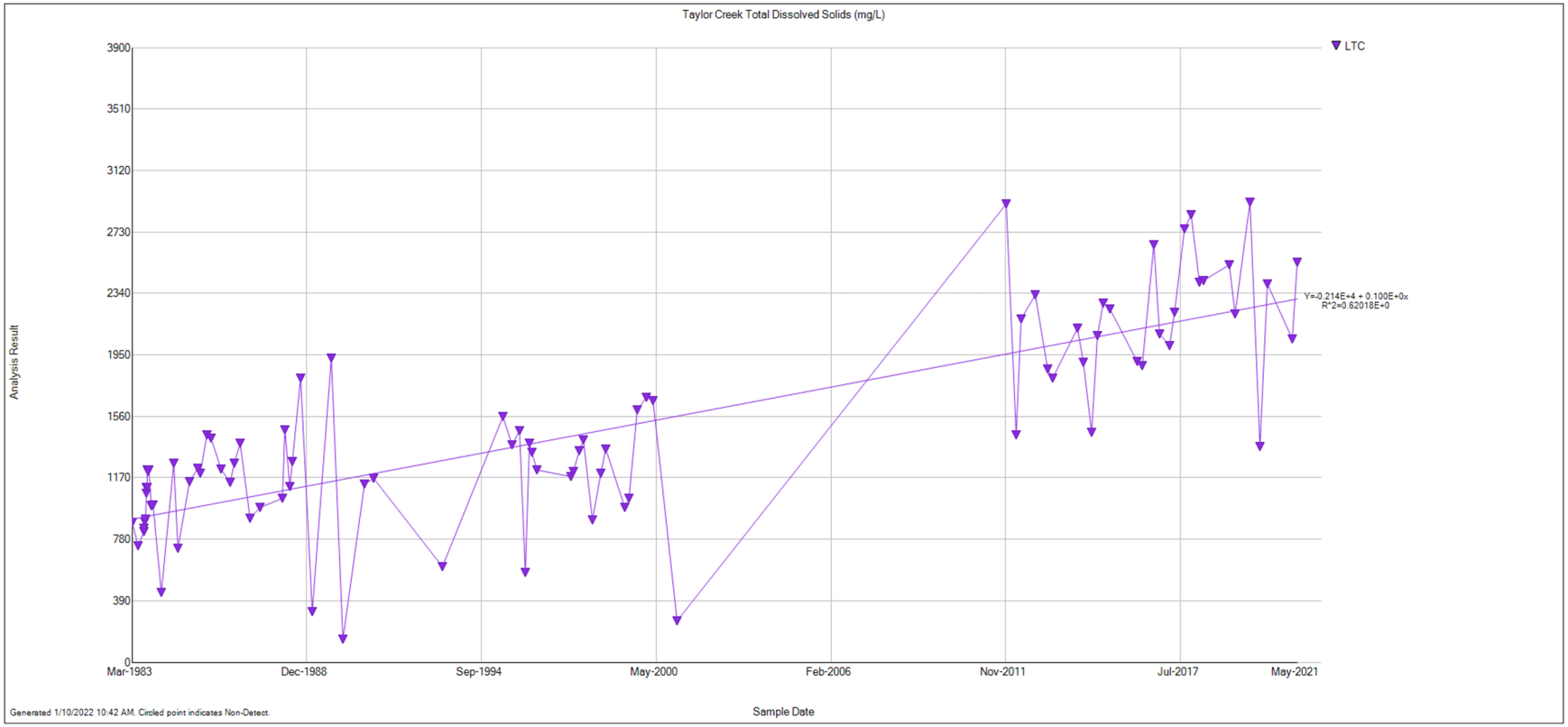

Taylor Creek Iron, total (mg/L)
LTC
Analysis Result
230
207
184
161
138
115
92
69
46
23
0
Mar-1983
Dec-1988
Aug-1994
May-2000
Jan-2006
Sep-2011
Jun-2017
Mar-2021
Y=0.195E+2 -0.436E-3x
R^2=0.16975E-1
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.
Sample Date

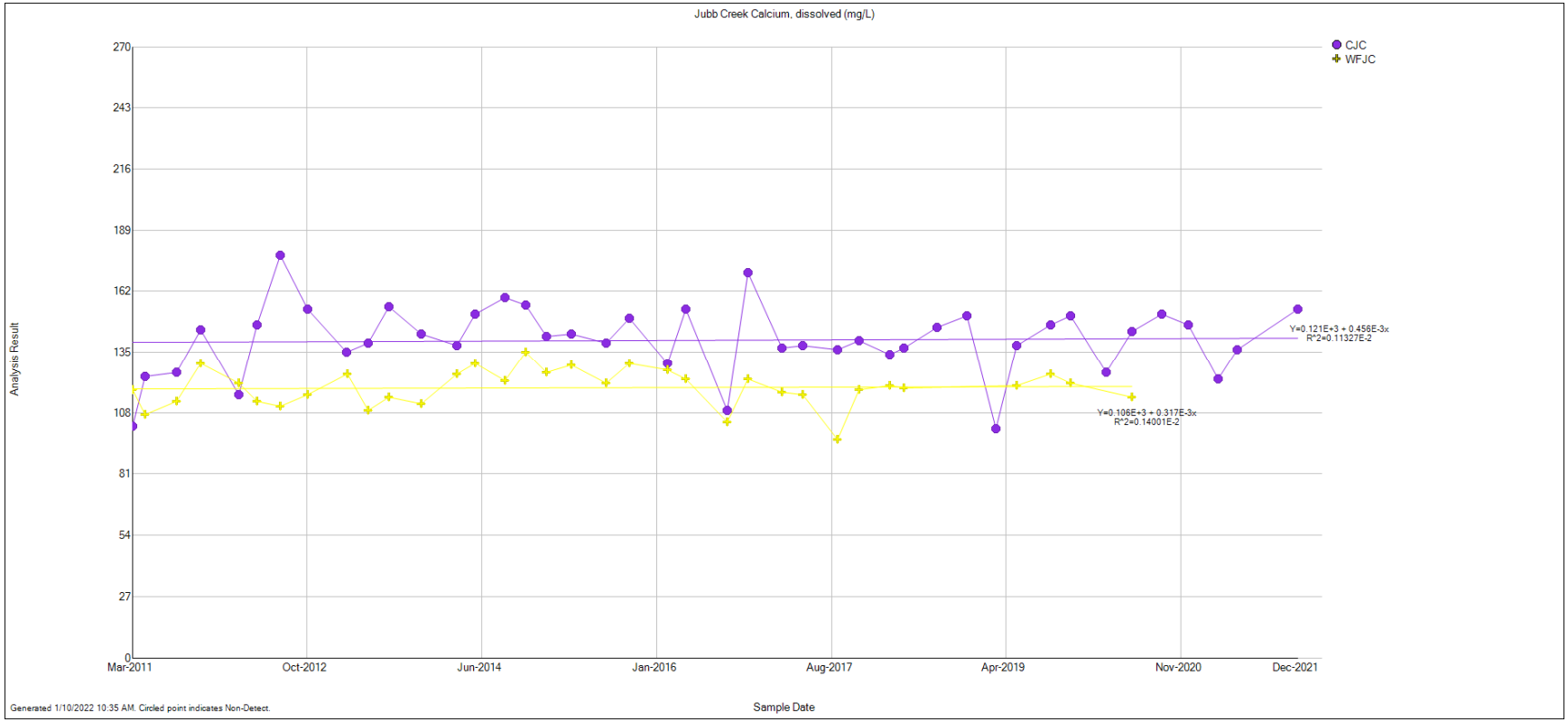

Taylor Creek Magnesium, dissolved (mg/L)
LTC
Y=0.353E+2 + 0.244E-2x
R^2=0.72180E-1
Analysis Result
330
297
264
231
198
165
132
99
66
33
0
Mar-1983
Dec-1988
Sep-1994
May-2000
Feb-2006
Nov-2011
Jul-2017
May-2021
Sample Date
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.

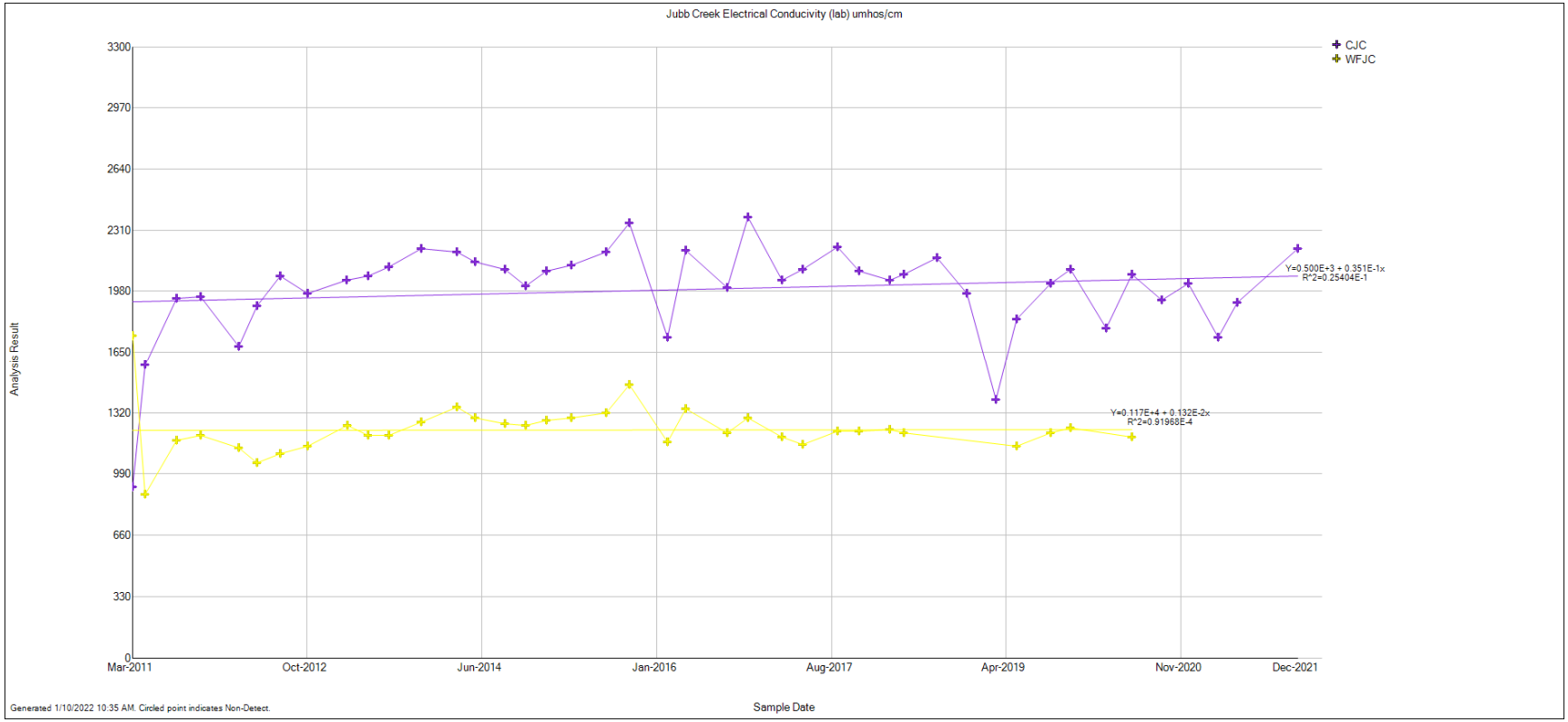

Taylor Creek pH (lab)
LTC
Y=0.676E+1 + 0.403E-4x
R^2=0.31143E+0
Analysis Result
9
8.75
8.5
8.25
8
7.75
7.5
7.25
7
6.75
6.5
Mar-1983
Dec-1988
Sep-1994
May-2000
Feb-2006
Nov-2011
Jul-2017
May-2021
Sample Date
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.

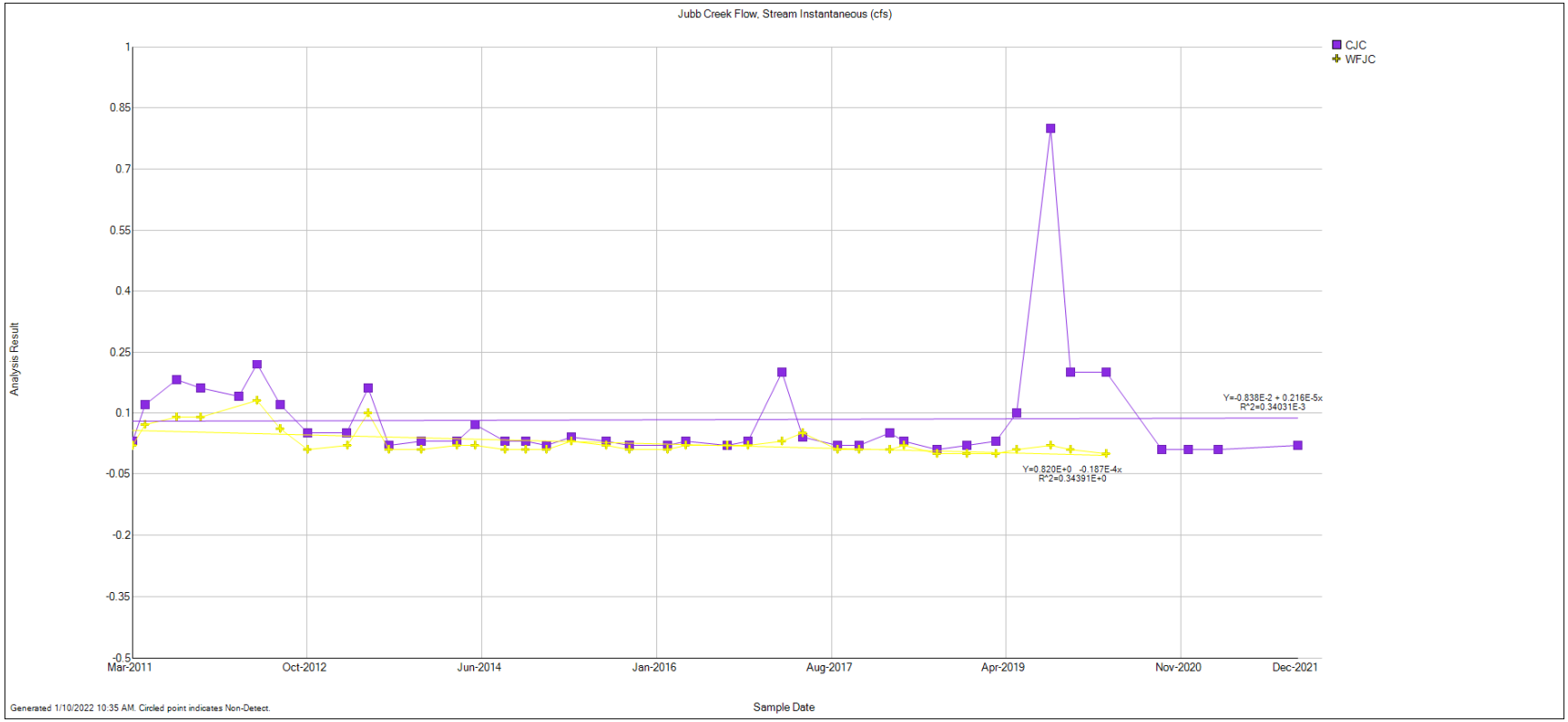

Taylor Creek Sodium, dissolved (mg/L)
LTC
Y=-0.947E+3 + 0.313E-1x
R^2=0.74472E+0
Analysis Result
800
720
640
560
480
400
320
240
160
80
0
Mar-1983
Dec-1988
Sep-1994
May-2000
Feb-2006
Nov-2011
Jul-2017
May-2021
Sample Date
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.

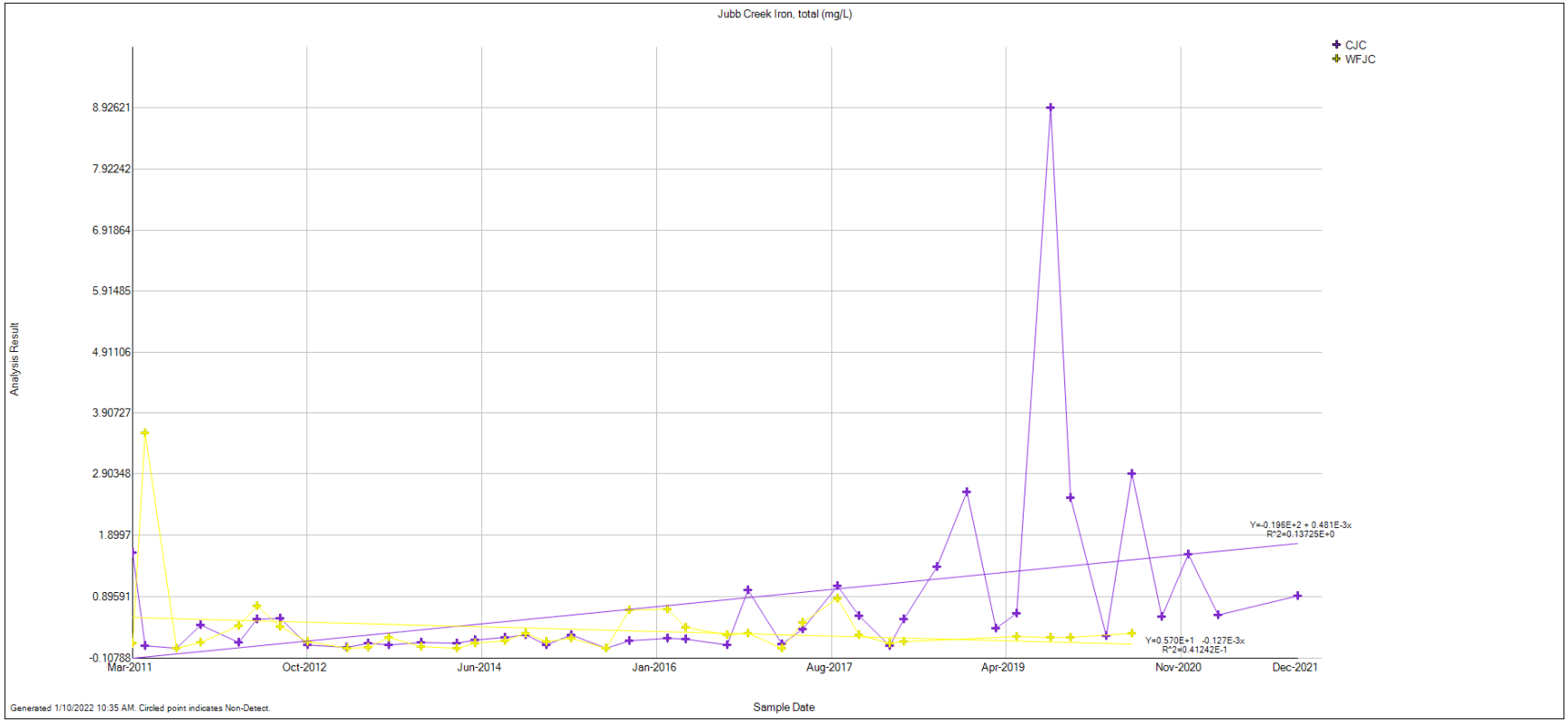

Taylor Creek Sulfate, dissolved (mg/L)
LTC
Y=-0.117E+4 + 0.509E-1x
R^2=0.44420E+0
Analysis Result
2600
2340
2080
1820
1560
1300
1040
780
520
260
0
Mar-1983
Dec-1988
Sep-1994
May-2000
Feb-2006
Nov-2011
Jul-2017
May-2021
Sample Date
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.

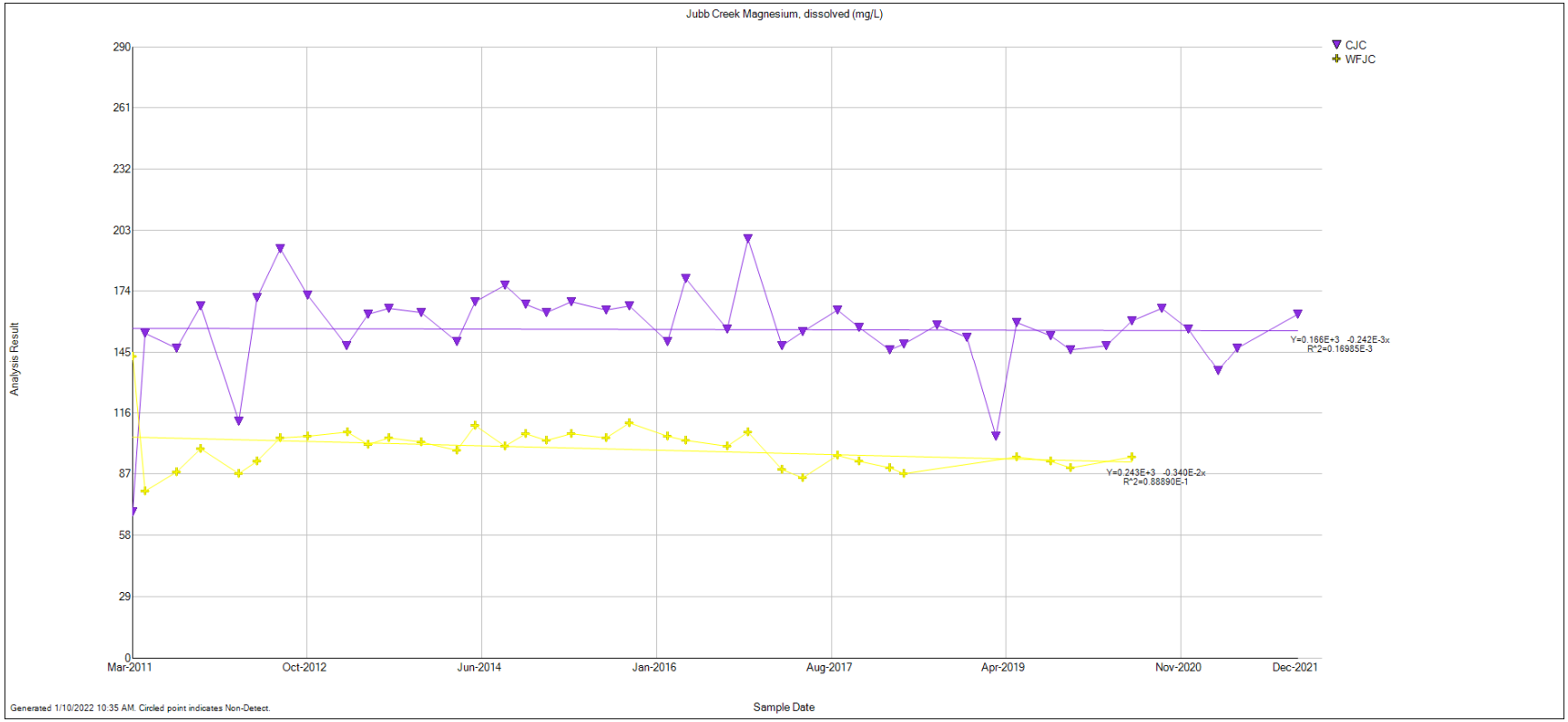

Taylor Creek Total Dissolved Solids (mg/L)
LTC
Y=-0.214E+4 + 0.100E+0x
R^2=0.62018E+0
Analysis Result
3900
3510
3120
2730
2340
1950
1560
1170
780
390
0
Mar-1983
Dec-1988
Sep-1994
May-2000
Feb-2006
Nov-2011
Jul-2017
May-2021
Sample Date
Generated 1/10/2022 10:42 AM. Circled point indicates Non-Detect.

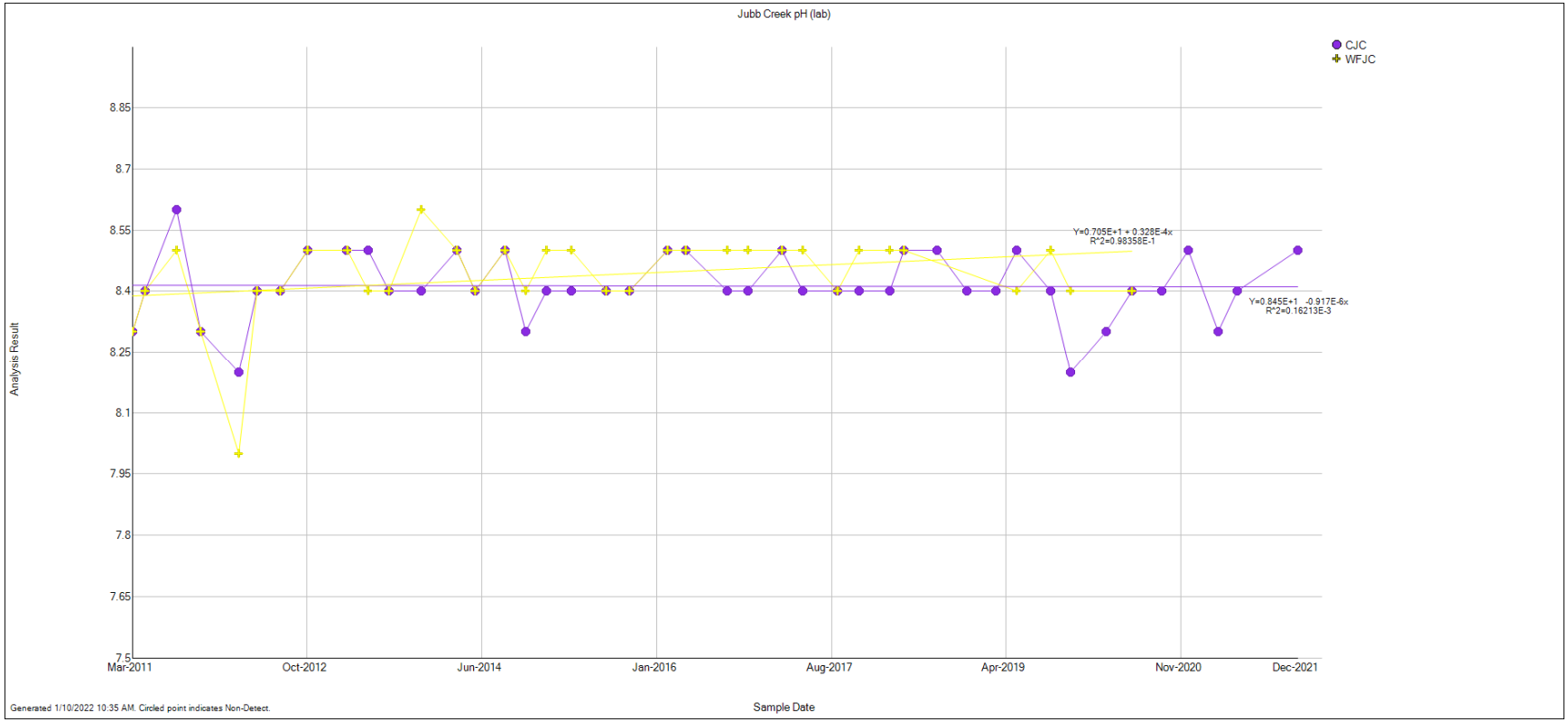

Jubb Creek Calcium, dissolved (mg/L)
CJC
WFJC
Y=0.121E+3 + 0.456E-3x
R^2=0.11327E-2
Y=0.106E+3 + 0.317E-3x
R^2=0.14001E-2
Analysis Result
270
243
216
189
162
135
108
81
54
27
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

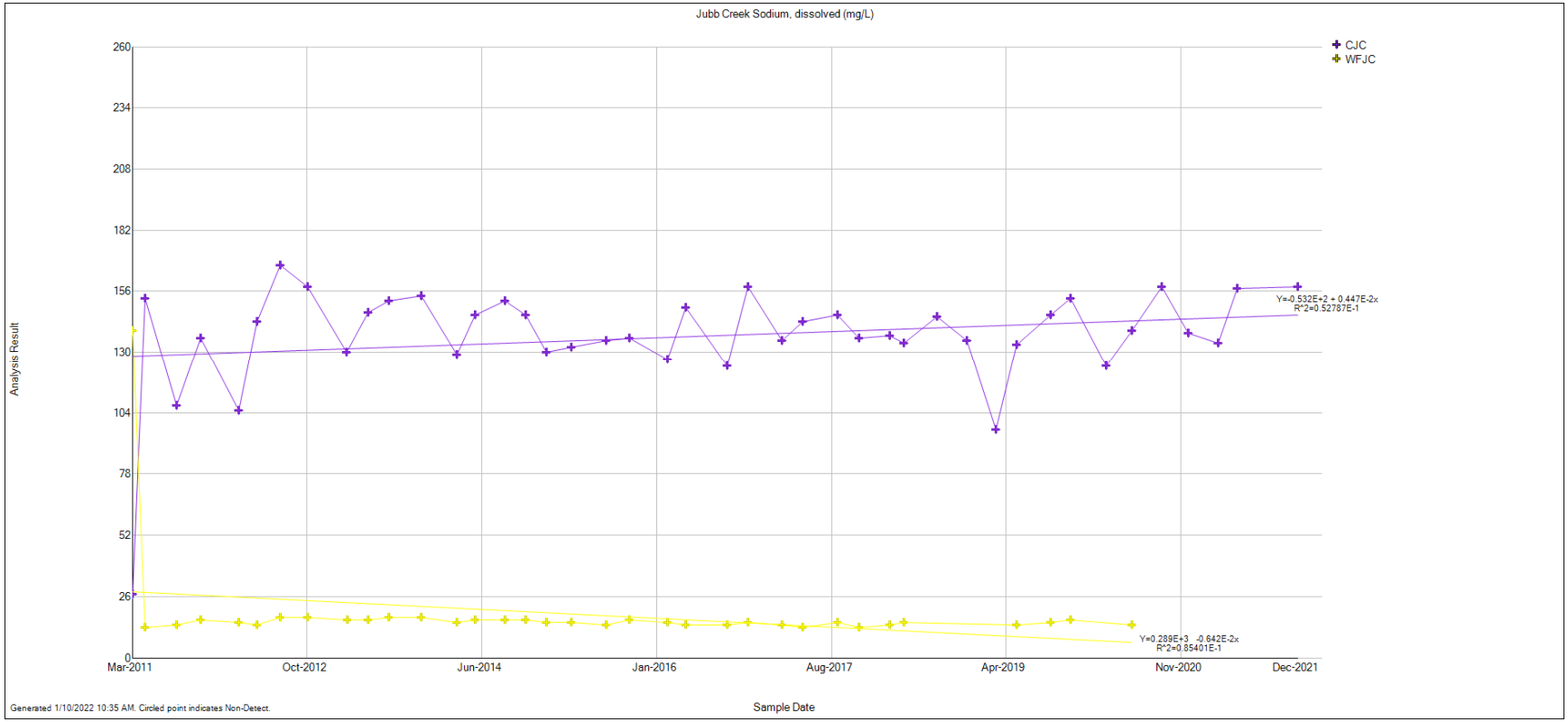

Jubb Creek Electrical Conducivity (lab) umhos/cm
CJC
WFJC
Y=0.500E+3 + 0.351E-1x
R^2=0.25404E-1
Y=0.117E+4 + 0.132E-2x
R^2=0.91968E-4
Analysis Result
3300
2970
2640
2310
1980
1650
1320
990
660
330
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

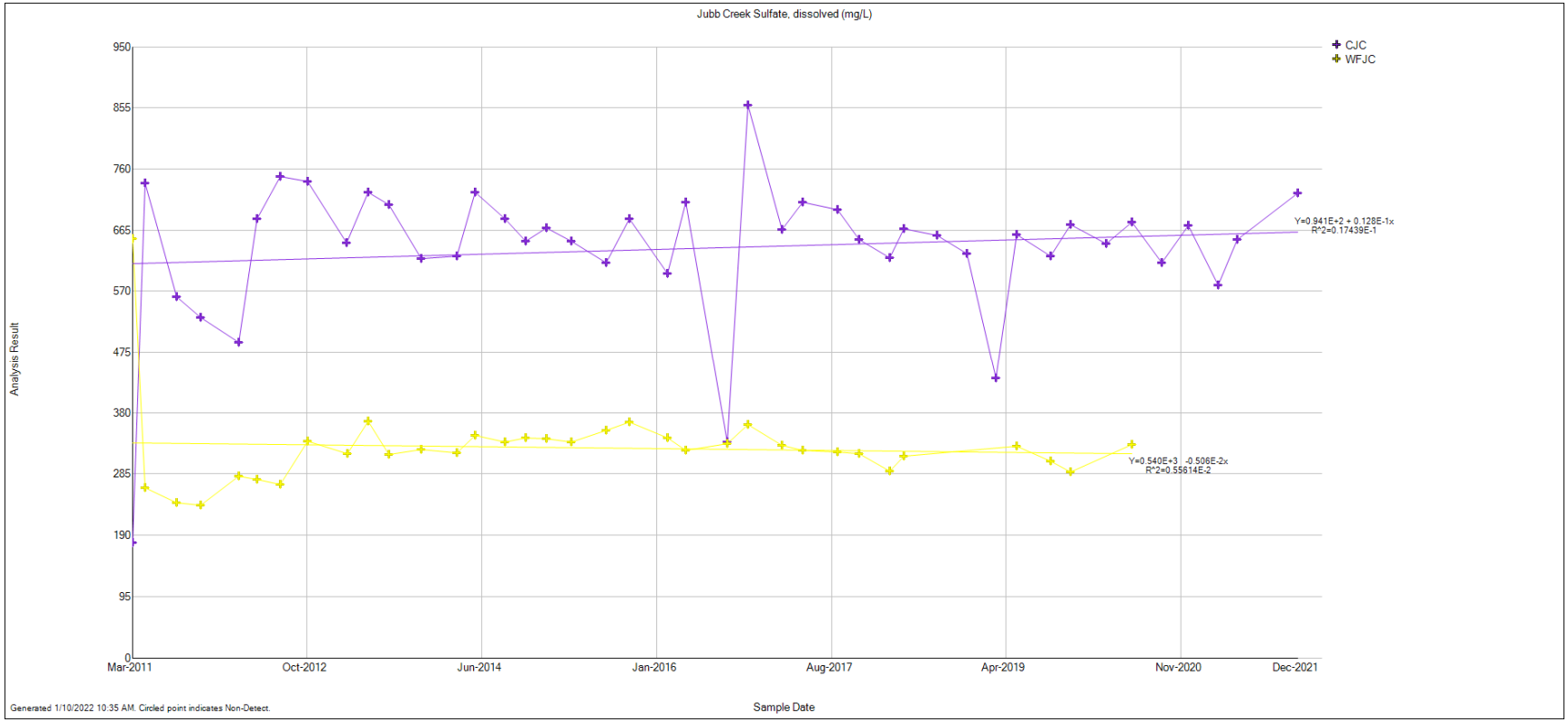

Jubb Creek Flow, Stream Instantaneous (cfs)
CJC
WFJC
Analysis Result
1
0.85
0.7
0.55
0.4
0.25
0.1
-0.05
-0.2
-0.35
-0.5
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=-0.838E-2 + 0.216E-5x
R^2=0.34031E-3
Y=0.820E+0 -0.187E-4x
R^2=0.34391E+0
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

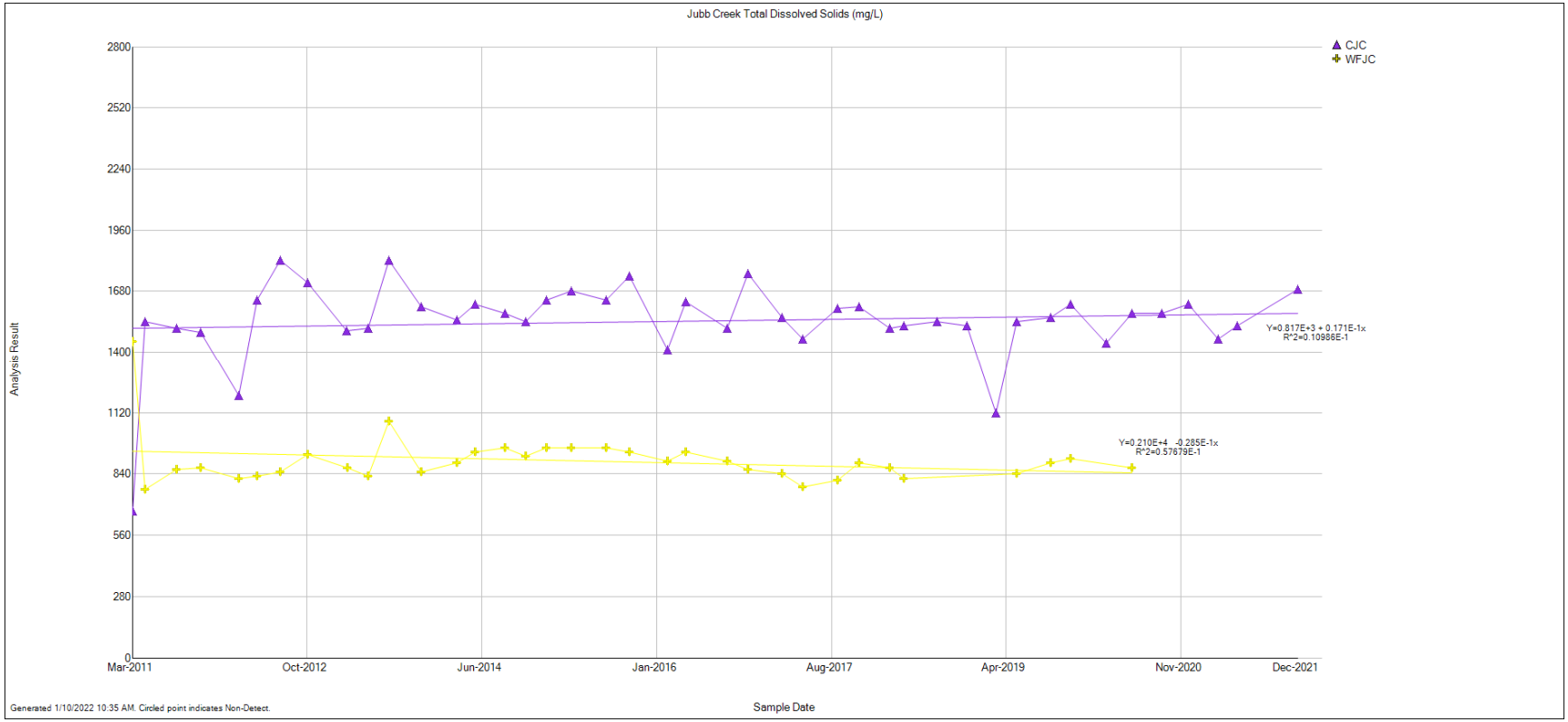

Jubb Creek Iron, total (mg/L)
CJC
WFJC
Analysis Result
8.92621
7.92242
6.91864
5.91485
4.91106
3.90727
2.90348
1.8997
0.89591
-0.10788
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=-0.196E+2 + 0.481E-3x
R^2=0.13725E+0
Y=0.570E+1 -0.127E-3x
R^2=0.41242E-1
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

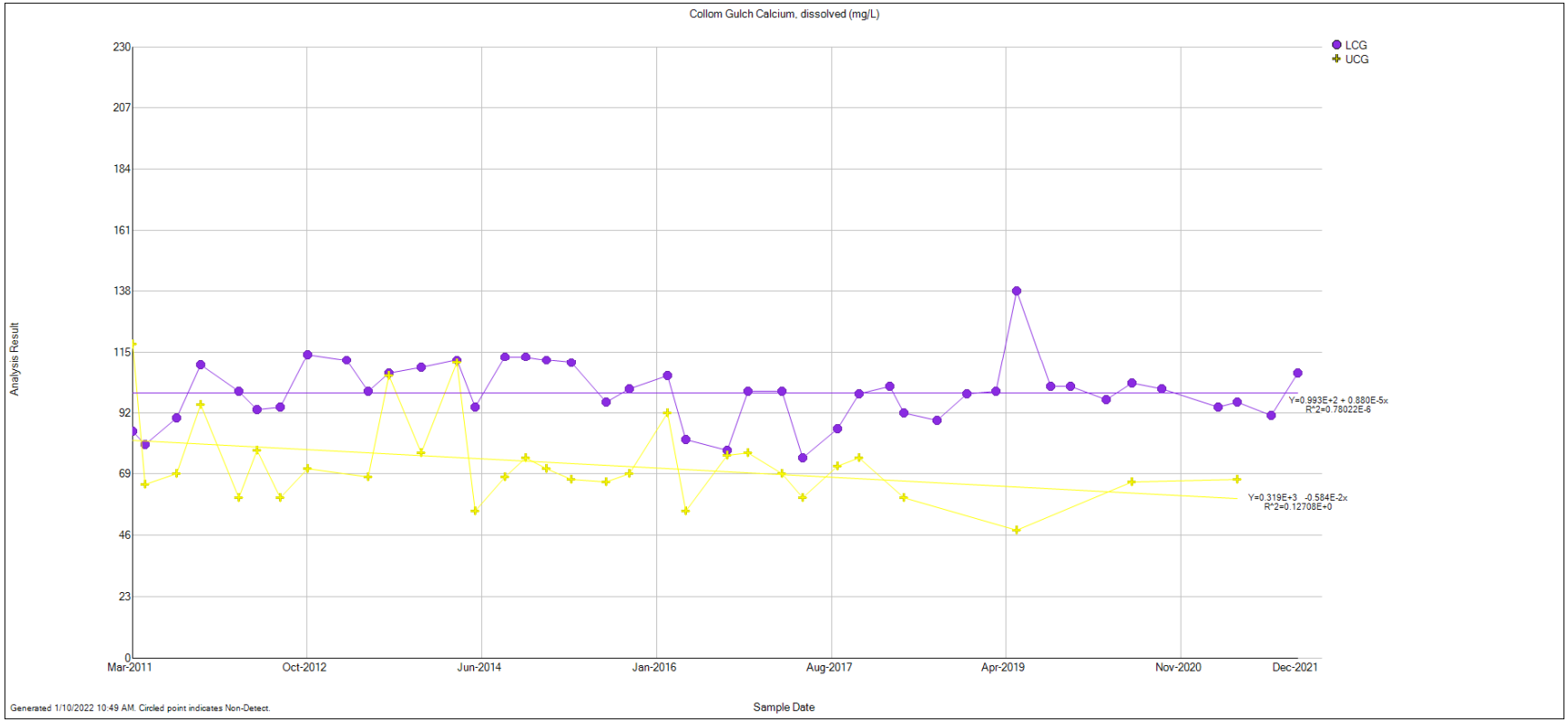

Jubb Creek Magnesium, dissolved (mg/L)
CJC
WFJC
290
261
232
203
174
145
116
87
58
29
0
Analysis Result
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.166E+3 -0.242E-3x
R^2=0.16985E-3
Y=0.243E+3 -0.340E-2x
R^2=0.88890E-1
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

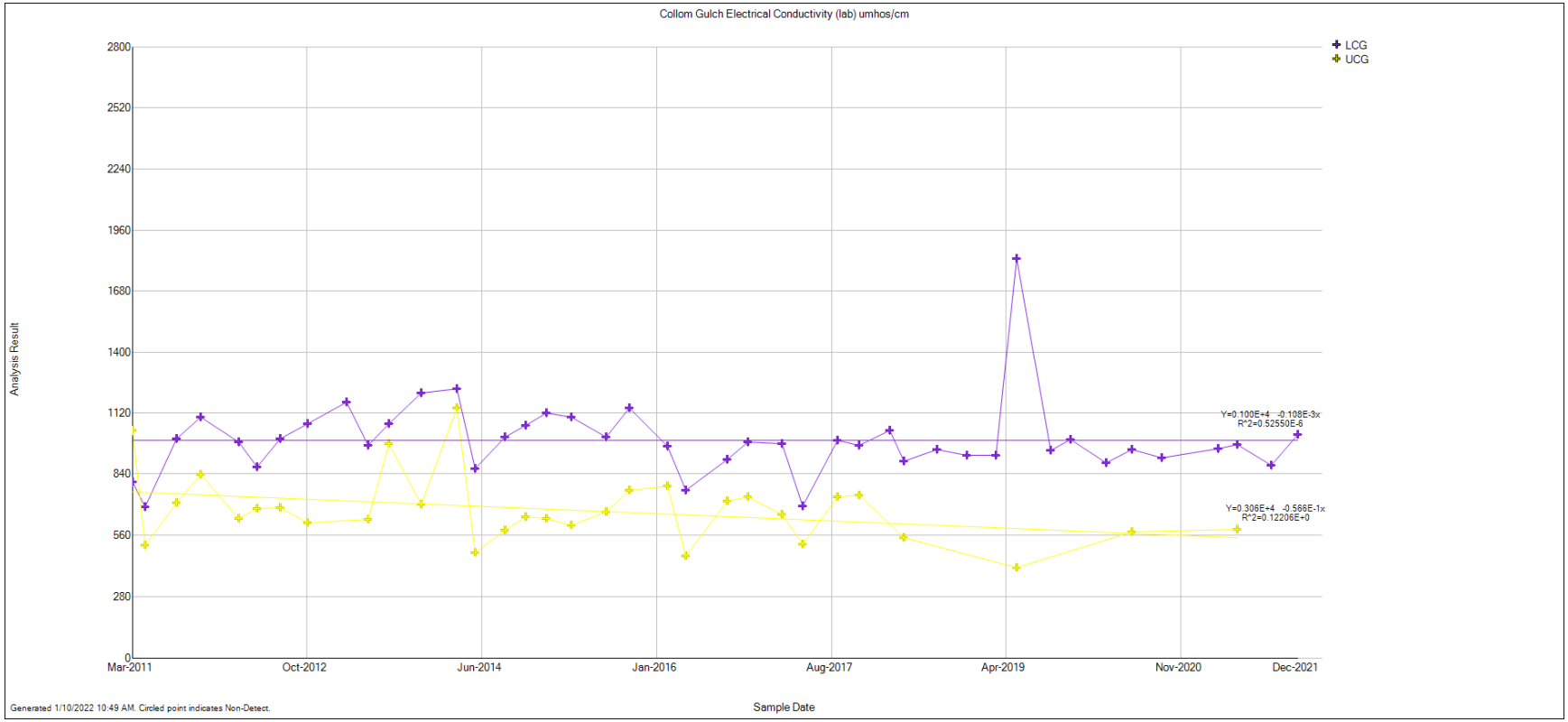

Jubb Creek pH (lab)
CJC
WFJC
Y=0.705E+1 + 0.328E-4x
R^2=0.98358E-1
Y=0.845E+1 -0.917E-6x
R^2=0.16213E-3
Analysis Result
8.85
8.7
8.55
8.4
8.25
8.1
7.95
7.8
7.65
7.5
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

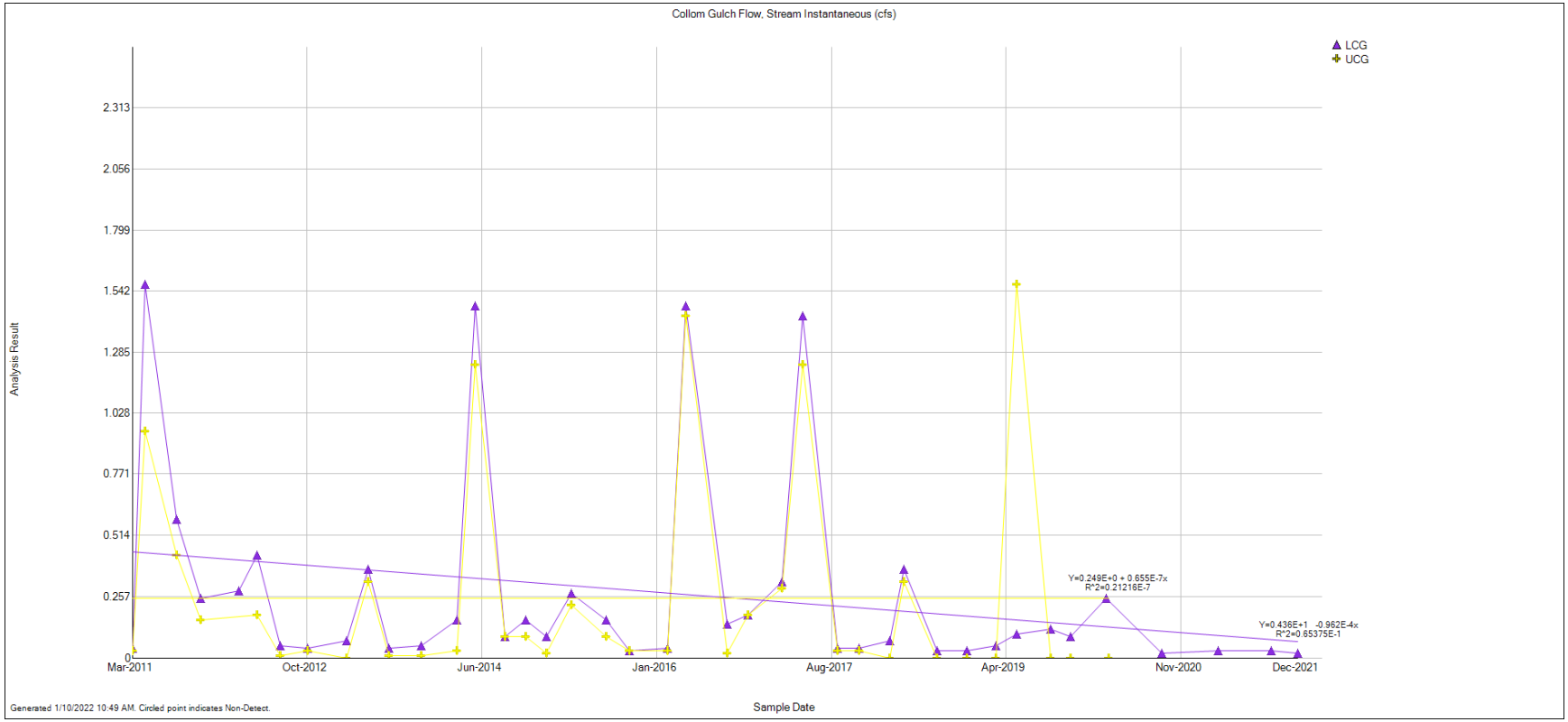

Jubb Creek Sodium, dissolved (mg/L)
CJC
WFJC
Y=-0.532E+2 + 0.447E-2x
R^2=0.52787E-1
Y=0.289E+3 + -0.642E-2x
R^2=0.85401E-1
Analysis Result
260
234
208
182
156
130
104
78
52
26
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

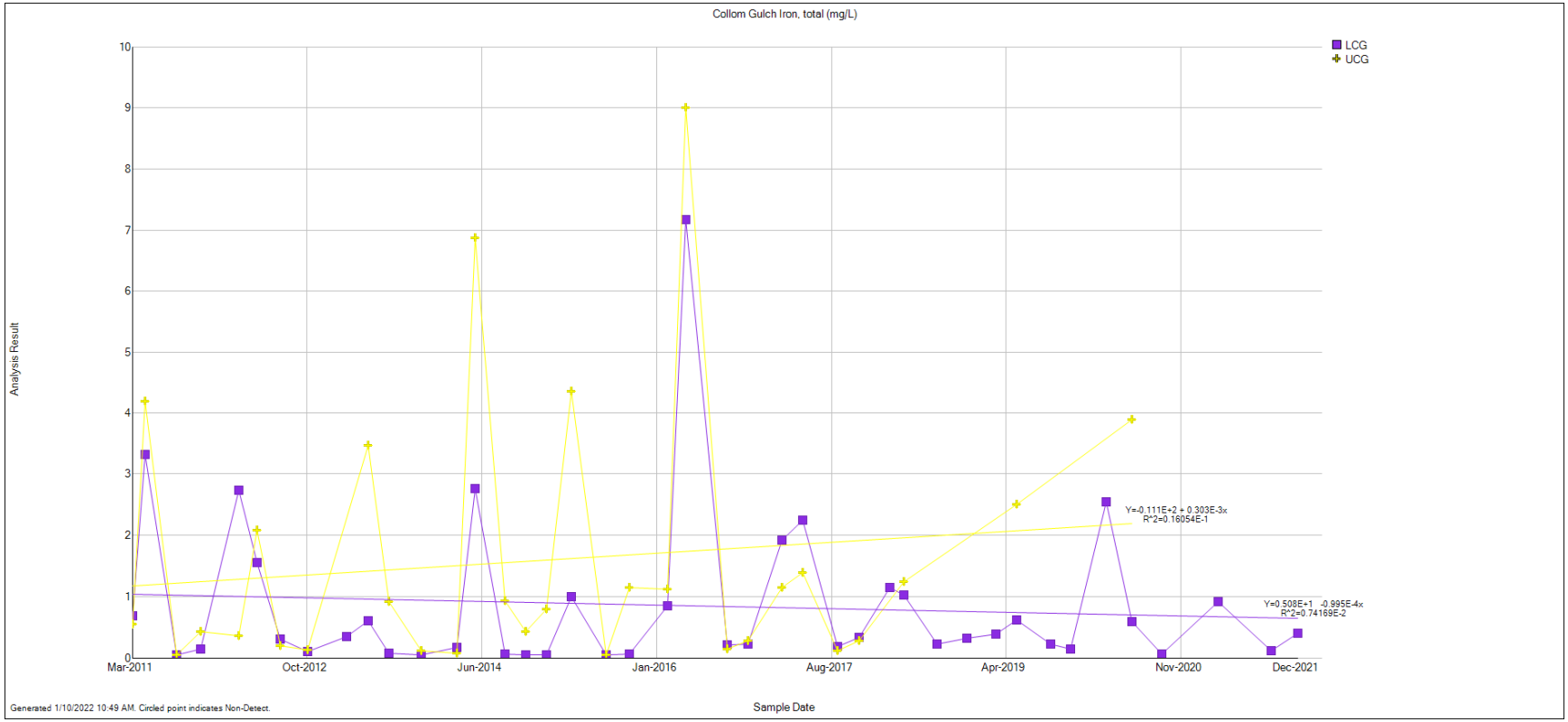

Jubb Creek Sulfate, dissolved (mg/L)
CJC
WFJC
Y=0.941E+2 + 0.128E-1x
R^2=0.17439E-1
Y=0.540E+3 -0.506E-2x
R^2=0.55614E-2
Analysis Result
950
855
760
665
570
475
380
285
190
95
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

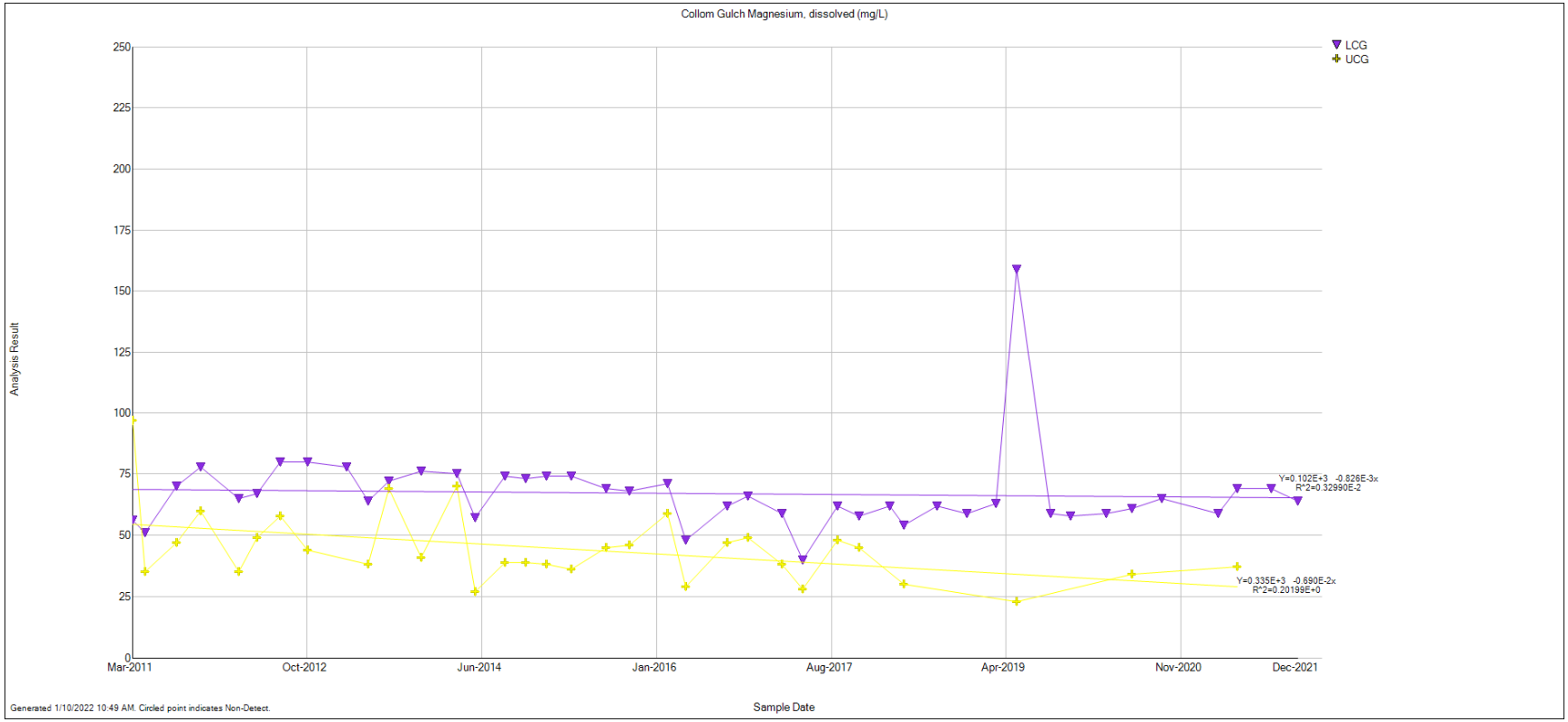

Jubb Creek Total Dissolved Solids (mg/L)
CJC
WFJC
Y=0.817E+3 + 0.171E-1x
R^2=0.10986E-1
Y=0.210E+4 -0.285E-1x
R^2=0.57679E-1
Analysis Result
2800
2520
2240
1960
1680
1400
1120
840
560
280
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:35 AM. Circled point indicates Non-Detect.
Sample Date

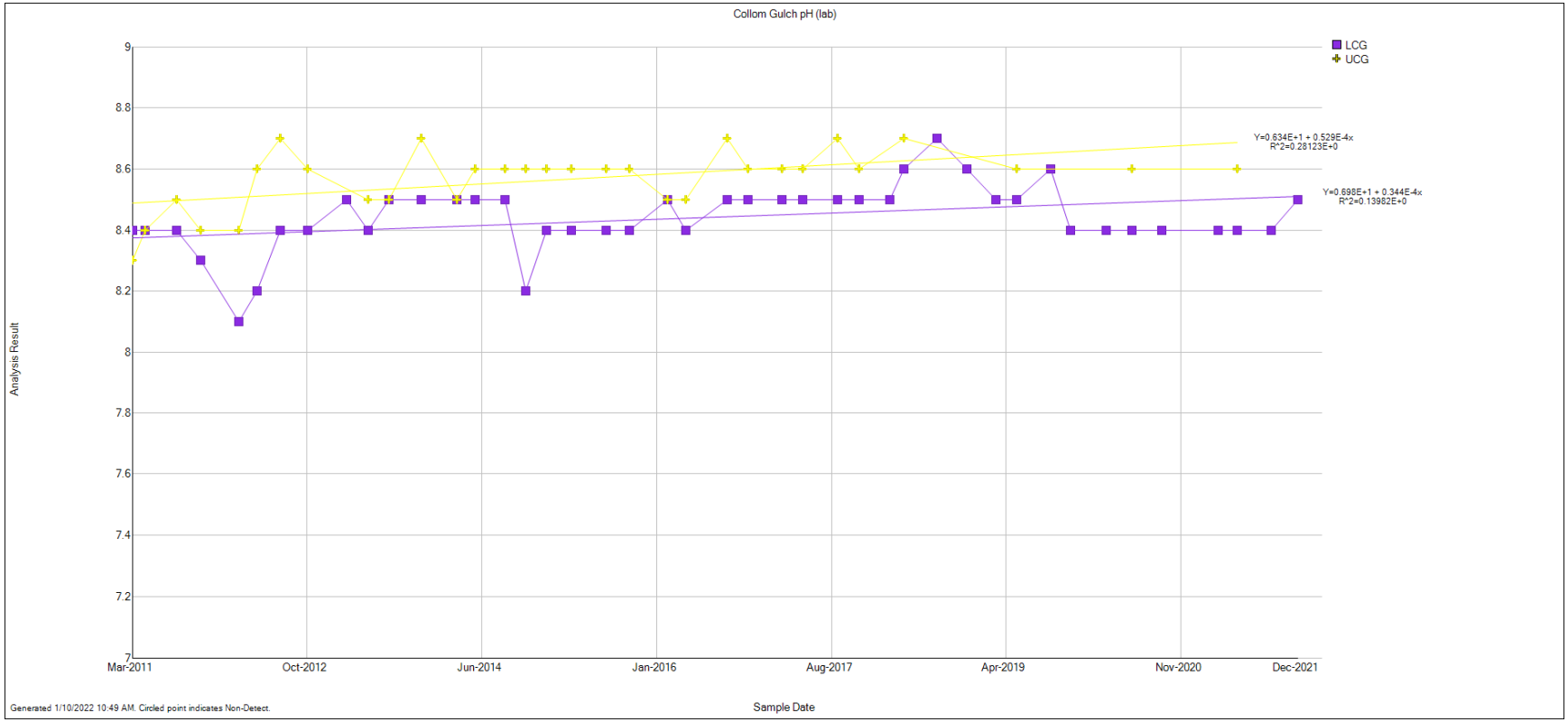

Collom Gulch Calcium, dissolved (mg/L)
LCG
UCG
Analysis Result
230
207
184
161
138
115
92
69
46
23
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.993E+2 + 0.880E-5x
R^2=0.78022E-6
Y=0.319E+3 -0.584E-2x
R^2=0.12708E+0
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.
Sample Date

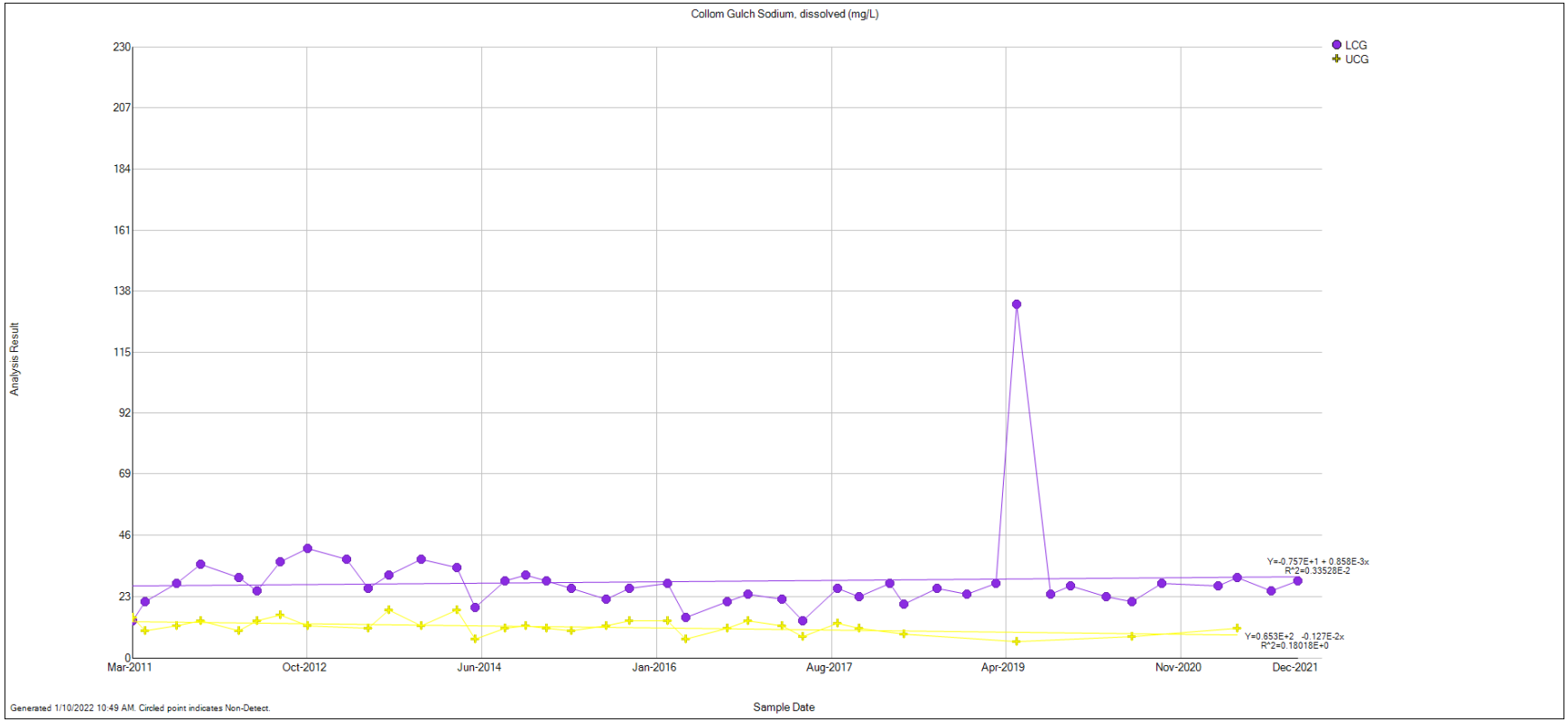

Collom Gulch Electrical Conductivity (lab) umhos/cm
LCG
UCG
Y=0.100E+4 -0.108E-3x
R^2=0.52550E-6
Y=0.306E+4 -0.566E-1x
R^2=0.12206E+0
2800
2520
2240
1960
1680
1400
1120
840
560
280
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Analysis Result
Sample Date
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.

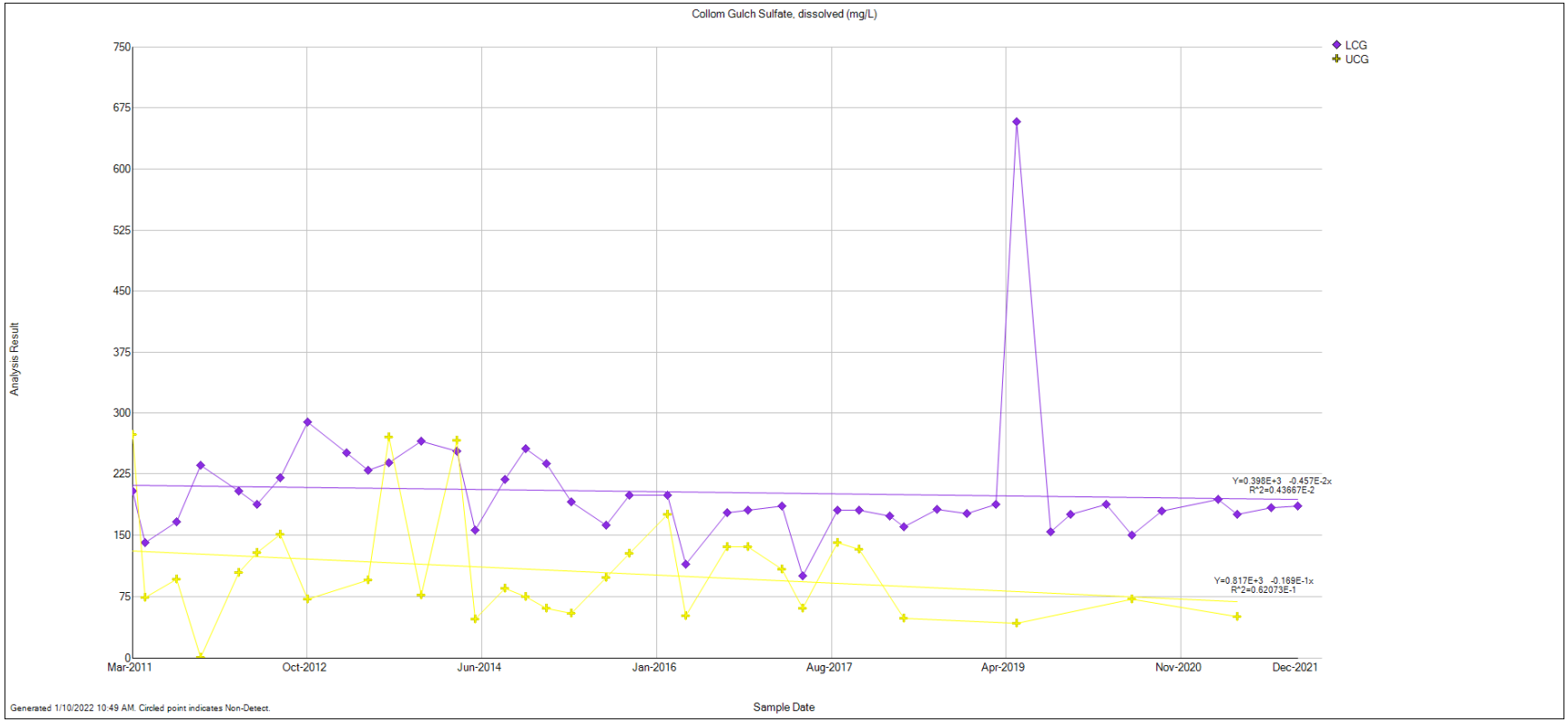

Collom Gulch Flow, Stream Instantaneous (cfs)
LCG
UCG
Analysis Result
2.313
2.056
1.799
1.542
1.285
1.028
0.771
0.514
0.257
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.249E+0 + 0.655E-7x
R^2=0.21216E-7
Y=0.436E+1 -0.962E-4x
R^2=0.65375E-1
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.
Sample Date


Collom Gulch Iron, total (mg/L)
LCG
UCG
Analysis Result
10
9
8
7
6
5
4
3
2
1
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=-0.111E+2 + 0.303E-3x
R^2=0.16054E-1
Y=0.508E+1 -0.995E-4x
R^2=0.74169E-2
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.
Sample Date


Collom Gulch Magnesium, dissolved (mg/L)
LCG
UCG
Analysis Result
250
225
200
175
150
125
100
75
50
25
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.102E+3 -0.826E-3x
R^2=0.32990E-2
Y=0.335E+3 -0.690E-2x
R^2=0.20199E+0
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.
Sample Date


Collom Gulch pH (lab)
LCG
UCG
Y=0.634E+1 + 0.529E-4x
R^2=0.28123E+0
Y=0.698E+1 + 0.344E-4x
R^2=0.13982E+0
Analysis Result
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.
Sample Date


Collom Gulch Sodium, dissolved (mg/L)
LCG
UCG
Analysis Result
230
207
184
161
138
115
92
69
46
23
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=-0.757E+1 + 0.858E-3x
R^2=0.33528E-2
Y=0.653E+2 -0.127E-2x
R^2=0.18018E+0
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.
Sample Date


Collom Gulch Sulfate, dissolved (mg/L)
LCG
UCG
Analysis Result
750
675
600
525
450
375
300
225
150
75
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.398E+3 -0.457E-2x
R^2=0.43667E-2
Y=0.817E+3 -0.169E-1x
R^2=0.62073E-1
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.
Sample Date

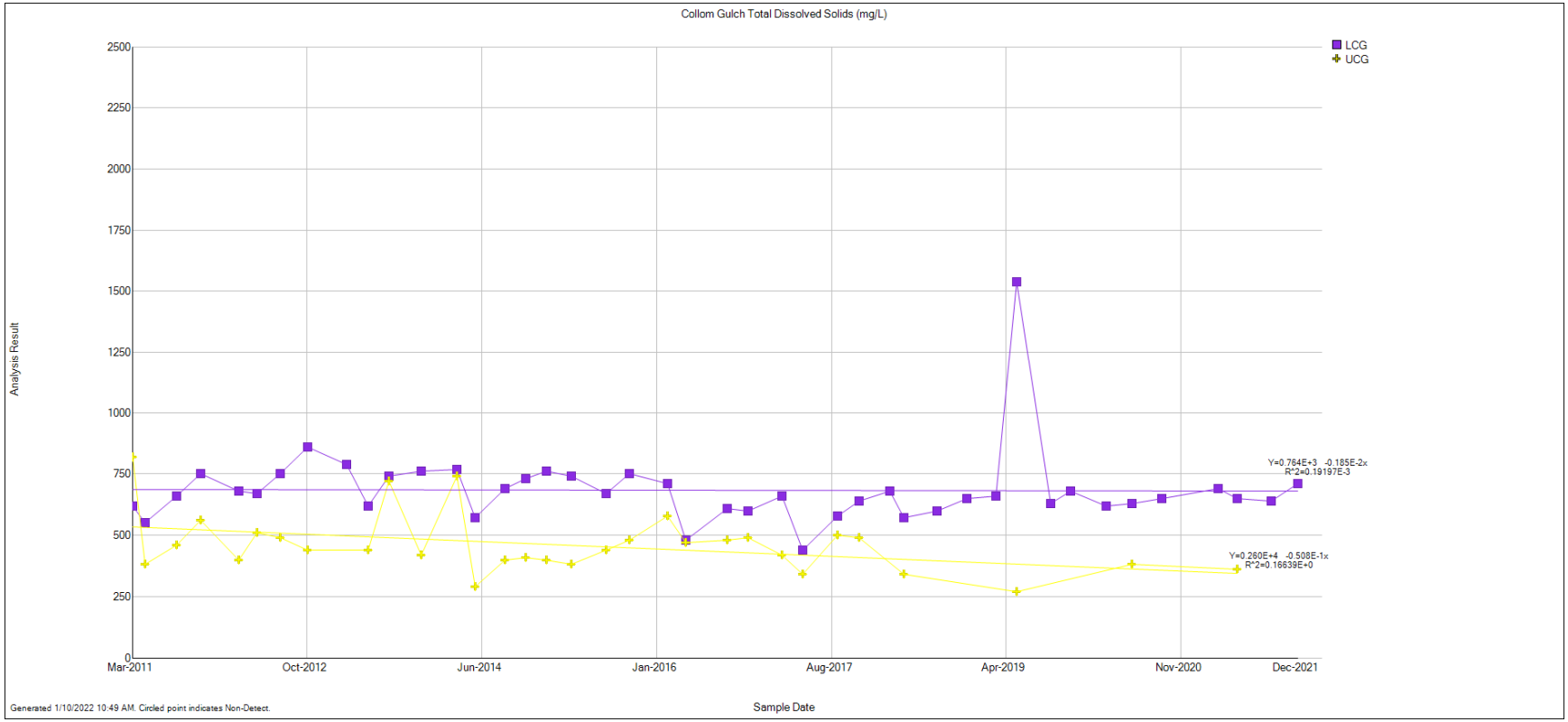

Collom Gulch Total Dissolved Solids (mg/L)
LCG
UCG
Analysis Result
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.764E+3 -0.185E-2x
R^2=0.19197E-3
Y=0.260E+4 -0.508E-1x
R^2=0.16639E+0
Generated 1/10/2022 10:49 AM. Circled point indicates Non-Detect.
Sample Date

Exhibit 1C

Ground Water Data

Water Year January 1, 2021 to December 31, 2021

Colowyo Mine
Well A-6
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	54	55	56	58
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	6900.5	6899.6	6894.1	6897.6
HCO3, mg/L	646	635	645	667
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	46	50	51	48
Mn, diss, mg/L	0.04	0.04	0.04	0.05
Na, diss, mg/L	140	149	136	148
NH3 as N, diss, mg/L	1.7	1.5	1.5	1.6
NO3, diss, mg/L	<0.1	<0.1	<0.1	<0.1
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.5	7.5	7.5	7.3
pH (lab)	8.0	8.0	8.3	8.3
Se, diss, mg/L	<0.005	<0.005	<0.005	<0.005
SO4, diss, mg/L	123	136	131	139
Spec. Cond. (field), umhos/cm	1150	1110	1120	1240
Spec. Cond. (lab), umhos/cm	1070	1130	1040	1130
TDS, mg/L	700	730	690	710
Temp (Celcius), degrees C	9.1	9.2	10.1	10.2
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well A-7
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	137	128	128	145
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	6889.1	6889.0	6884.8	6885.1
HCO3, mg/L	510.	509	554	588
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	123	125	123	122
Mn, diss, mg/L	<0.02	<0.02	<0.02	<0.02
Na, diss, mg/L	54	58	57	61
NH3 as N, diss, mg/L	<0.5	<0.5	<0.5	<0.5
NO3, diss, mg/L	3.9	2.6	1.5	3.1
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.3	7.1	7.1	7.4
pH (lab)	8.0	8.0	8.1	8.2
Se, diss, mg/L	0.012	0.011	0.0070	0.013
SO4, diss, mg/L	475	443	489	526
Spec. Cond. (field), umhos/cm	1620	1520	1510	1820
Spec. Cond. (lab), umhos/cm	1520	1540	1450	1690
TDS, mg/L	1270	1190	1240	1290
Temp (Celcius), degrees C	7.9	7.9	9.1	8.4
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well A-8
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	Dry	Dry	Dry
Ca, diss, mg/L	90			
Fe, diss, mg/L	<0.05			
Elevation SWL, ft MSL	7103.5			
HCO3, mg/L	454			
Hg, diss, mg/L	<0.001			
Mg, diss, mg/L	73			
Mn, diss, mg/L	<0.03			
Na, diss, mg/L	14			
NH3 as N, diss, mg/L	<0.5			
NO3, diss, mg/L	2.4			
Ortho PO4 as P, mg/l	<0.1			
Pb, diss, mg/L	<0.05			
pH (field)	7.4			
pH (lab)	8.0			
Se, diss, mg/L	0.006			
SO4, diss, mg/L	187			
Spec. Cond. (field), umhos/cm	1050			
Spec. Cond. (lab), umhos/cm	986			
TDS, mg/L	700			
Temp (Celcius), degrees C	9.1			
Zn, diss, mg/L	<0.05			

Colowyo Mine
Well NGSW
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	182	194	190	201
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	6535.9	6534.5	6531.2	6532.4
HCO3, mg/L	785	746	779	895
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	172	204	195	184
Mn, diss, mg/L	0.09	0.38	1.02	1.01
Na, diss, mg/L	191	199	166	172
NH3 as N, diss, mg/L	<0.5	<0.5	<0.5	<0.5
NO3, diss, mg/L	0.30	<0.1	<0.1	<0.1
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.5	7.7	7.8	7.2
pH (lab)	8.0	8.0	8.1	8.2
Se, diss, mg/L	<0.005	<0.005	<0.005	<0.005
SO4, diss, mg/L	995	926	920	905
Spec. Cond. (field), umhos/cm	2520	2430	2410	2690
Spec. Cond. (lab), umhos/cm	2270	2480	2050	2540
TDS, mg/L	2120	2100	2110	2100
Temp (Celcius), degrees C	8.9	9.7	10.4	10.6
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well MT-95-02
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	210	207	202	221
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	6435.6	6435.4	6434.9	6435.4
HCO3, mg/L	807	861	835	861
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	197	207	210	208
Mn, diss, mg/L	<0.02	<0.02	<0.02	<0.02
Na, diss, mg/L	325	361	301	371
NH3 as N, diss, mg/L	<0.5	<0.5	<0.5	<0.5
NO3, diss, mg/L	0.60	0.50	0.50	0.50
Ortho PO4 as P, mg/l	<0.018	<0.11	<0.11	<0.11
Pb, diss, mg/L	<0.1	<0.1	<0.1	<0.1
pH (field)	7.5	7.7	7.8	7.3
pH (lab)	7.9	8.0	8.0	8.2
Se, diss, mg/L	<0.05	<0.05	<0.05	<0.05
SO4, diss, mg/L	947	105	1010	1070
Spec. Cond. (field), umhos/cm	3160	3120	3190	3710
Spec. Cond. (lab), umhos/cm	2860	3230	2600	3470
TDS, mg/L	2690	271	2670	2720
Temp (Celcius), degrees C	10.8	2710	13.2	11.8
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well Gossard
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	145	128	94	94
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	6331.8	6331.9	6331.9	6330.7
HCO3, mg/L	600	611	622	611
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	159	160	116	108
Mn, diss, mg/L	<0.03	<0.03	<0.03	<0.03
Na, diss, mg/L	209	208	166	182
NH3 as N, diss, mg/L	<0.5	<0.5	<0.5	<0.5
NO3, diss, mg/L	0.50	<0.1	0.70	0.70
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.5	7.8	7.8	7.7
pH (lab)	8.0	8.2	8.3	8.3
Se, diss, mg/L	0.0050	0.0050	<0.005	<0.005
SO4, diss, mg/L	794	732	441	450
Spec. Cond. (field), umhos/cm	2320	2190	1940	1990
Spec. Cond. (lab), umhos/cm	2110	2190	1570	1820
TDS, mg/L	1880	1690	1250	1260
Temp (Celcius), degrees C	10.8	11.2	12.8	11.2
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well MLC-04-01
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	99	139	107	90
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	47.9	48.1	48.7	48.8
HCO3, mg/L	386	534	428	368
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	53	87	67	48
Mn, diss, mg/L	<0.03	<0.03	<0.03	<0.03
Na, diss, mg/L	36	56	40	34
NH3 as N, diss, mg/L	<0.5	<0.5	<0.5	<0.5
NO3, diss, mg/L	0.5	0.6	0.6	1.2
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.5	7.6	7.6	7.5
pH (lab)	8.1	8.0	8.2	8.3
Se, diss, mg/L	<0.005	0.007	0.005	<0.005
SO4, diss, mg/L	196	287	230	181
Spec. Cond. (field), umhos/cm	620	1350	1240	1030
Spec. Cond. (lab), umhos/cm	976	1400	1010	920
TDS, mg/L	700	1280	770	610
Temp (Celcius), degrees C	10.1	10.9	11.3	10.3
Zn, diss, mg/L	<0.01	<0.01	<0.01	0.01

Colowyo Mine
Well MC-04-01
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	84	87	83	86
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	24.5	22.5	25.5	28.4
HCO3, mg/L	389	379	414	411
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	52	60	59	51
Mn, diss, mg/L	<0.03	<0.03	<0.03	<0.03
Na, diss, mg/L	16	20	24	18
NH3 as N, diss, mg/L	<0.5	<0.5	<0.5	<0.5
NO3, diss, mg/L	1.7	1.5	1.1	2.0
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.6	7.7	7.8	7.5
pH (lab)	8.0	8.0	8.1	8.3
Se, diss, mg/L	<0.005	<0.005	<0.005	<0.005
SO4, diss, mg/L	131	192	153	148
Spec. Cond. (field), umhos/cm	840	950	910	950
Spec. Cond. (lab), umhos/cm	784	875	814	841
TDS, mg/L	550	660	590	570
Temp (Celcius), degrees C	9.7	9.1	9.2	7.1
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well MC-04-02
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	88	128	128	83
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	12.6	12.8	12.8	12.9
HCO3, mg/L	592	599	620	620
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	50	84	84	49
Mn, diss, mg/L	<0.03	0.49	0.36	0.23
Na, diss, mg/L	130	53	38	160
NH3 as N, diss, mg/L	<0.5	<0.5	<0.5	<0.5
NO3, diss, mg/L	<0.1	<0.1	<0.1	<0.1
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.5	7.5	7.7	7.6
pH (lab)	8.1	8.1	8.1	8.3
Se, diss, mg/L	<0.005	<0.005	<0.005	<0.005
SO4, diss, mg/L	203	254	237	219
Spec. Cond. (field), umhos/cm	1280	1260	1260	1380
Spec. Cond. (lab), umhos/cm	1170	1280	1130	1260
TDS, mg/L	840	880	880	830
Temp (Celcius), degrees C	9.1	10.2	10.5	9.6
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well MJ-95-01
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	117	117	120	122
Fe, diss, mg/L	<0.05	<0.05	<0.05	0.08
Elevation SWL, ft MSL	12.8	10.34	13.8	16.5
HCO3, mg/L	644	590	654	671
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	87	97	98	90
Mn, diss, mg/L	0.04	0.04	0.04	0.05
Na, diss, mg/L	30	30	30	32
NH3 as N, diss, mg/L	1.8	1.7	1.8	1.8
NO3, diss, mg/L	0.1	<0.1	<0.1	<0.1
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.4	7.6	7.5	7.5
pH (lab)	8.0	7.9	8.0	8.2
Se, diss, mg/L	<0.005	<0.005	<0.005	<0.005
SO4, diss, mg/L	224	262	232	32
Spec. Cond. (field), umhos/cm	1310	1290	1280	1310
Spec. Cond. (lab), umhos/cm	1220	1240	1160	1330
TDS, mg/L	860	1240	860	860
Temp (Celcius), degrees C	9.3	9.0	10.4	10.5
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well MJ-95-03
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	149	144	147	154
Fe, diss, mg/L	<0.05	<0.05	<0.05	<0.05
Elevation SWL, ft MSL	20.2	20.3	20.5	21.5
HCO3, mg/L	696	687	729	814
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	179	189	204	188
Mn, diss, mg/L	<0.03	<0.03	<0.03	0.03
Na, diss, mg/L	148	159	142	154
NH3 as N, diss, mg/L	<0.5	<0.5	<0.5	<0.5
NO3, diss, mg/L	0.3	0.6	0.2	<0.1
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	7.5	7.8	7.9	7.4
pH (lab)	8.1	8.1	8.2	8.2
Se, diss, mg/L	<0.005	<0.005	<0.005	<0.005
SO4, diss, mg/L	774	821	799	803
Spec. Cond. (field), umhos/cm	2320	2260	2110	2550
Spec. Cond. (lab), umhos/cm	2110	2270	1910	2350
TDS, mg/L	1940	1840	1900	1840
Temp (Celcius), degrees C	10.8	10.9	12.1	11.2
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
Well Trout Creek
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	3/23/2021	5/24/2021	9/15/2021	12/14/2021
As, diss, mg/L	<0.003	<0.003	<0.003	<0.003
Ca, diss, mg/L	4.0	4.0	4.0	4.0
Fe, diss, mg/L	<0.05	0.09	0.06	0.06
Elevation SWL, ft MSL	587.7	587.7	587.6	587.6
HCO3, mg/L	278	255	272	308
Hg, diss, mg/L	<0.001	<0.001	<0.001	<0.001
Mg, diss, mg/L	17	15	17	16
Mn, diss, mg/L	<0.03	<0.03	<0.03	<0.03
Na, diss, mg/L	226	253	226	248
NH3 as N, diss, mg/L	1.9	1.9	1.8	1.9
NO3, diss, mg/L	<0.1	<0.1	<0.1	<0.1
Ortho PO4 as P, mg/l	<0.1	<0.1	<0.1	<0.1
Pb, diss, mg/L	<0.05	<0.05	<0.05	<0.05
pH (field)	9.2	9	9.2	9.5
pH (lab)	9.2	9.5	9.4	9.3
Se, diss, mg/L	<0.005	<0.005	<0.005	<0.005
SO4, diss, mg/L	226	260	213	224
Spec. Cond. (field), umhos/cm	1090	1080	1090	1240
Spec. Cond. (lab), umhos/cm	1080	1110	1060	1120
TDS, mg/L	690	690	680	690
Temp (Celcius), degrees C	11.5	12.4	15.2	10.1
Zn, diss, mg/L	<0.01	<0.01	<0.01	<0.01

Colowyo Mine
LGSW-1
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	N/A*	N/A*	N/A*	12/14/2021
As, diss, mg/L				0.008
Fe, diss, mg/L				<0.05
Hg, diss, mg/L				<0.001
Mn, diss, mg/L				0.47
NO2 + NO3, diss, mg/L				<0.1
NO2, diss, mg/L				<0.1
NO3, diss, mg/L				<0.1
pH (field), SU				7.5
Se, diss, mg/L				<0.005
SO4, diss, mg/L				817
TDS, mg/L				1960**
Zn, diss, mg/L				<0.01

*Well sampling commenced in the 4th quarter of 2021.

**Exceeded Table 16 Value (Volume 2C, Exhibit 7, Item 19)

Colowyo Mine
LWCW-1
Water Year 1/1/2021 - 12/31/2021

	Sample Date			
	N/A*	N/A*	N/A*	12/14/2021
As, diss, mg/L				<0.003
Fe, diss, mg/L				<0.05
Hg, diss, mg/L				<0.001
Mn, diss, mg/L				1.71**
NO2 + NO3, diss, mg/L				0.2
NO2, diss, mg/L				<0.1
NO3, diss, mg/L				0.2
pH (field), SU				7.5
Se, diss, mg/L				<0.005
SO4, diss, mg/L				639
TDS, mg/L				1540
Zn, diss, mg/L				<0.01

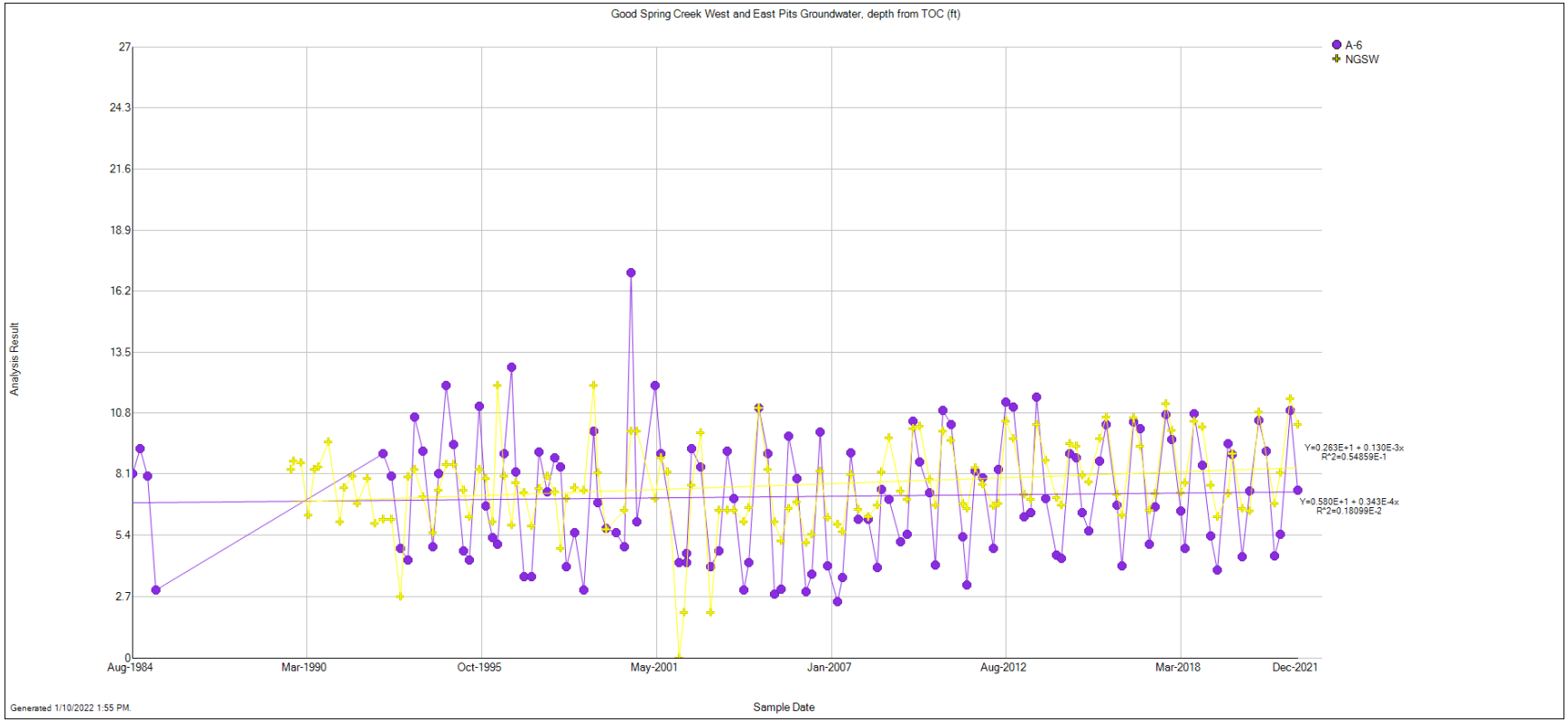
*Well sampling commenced in the 4th quarter of 2021.

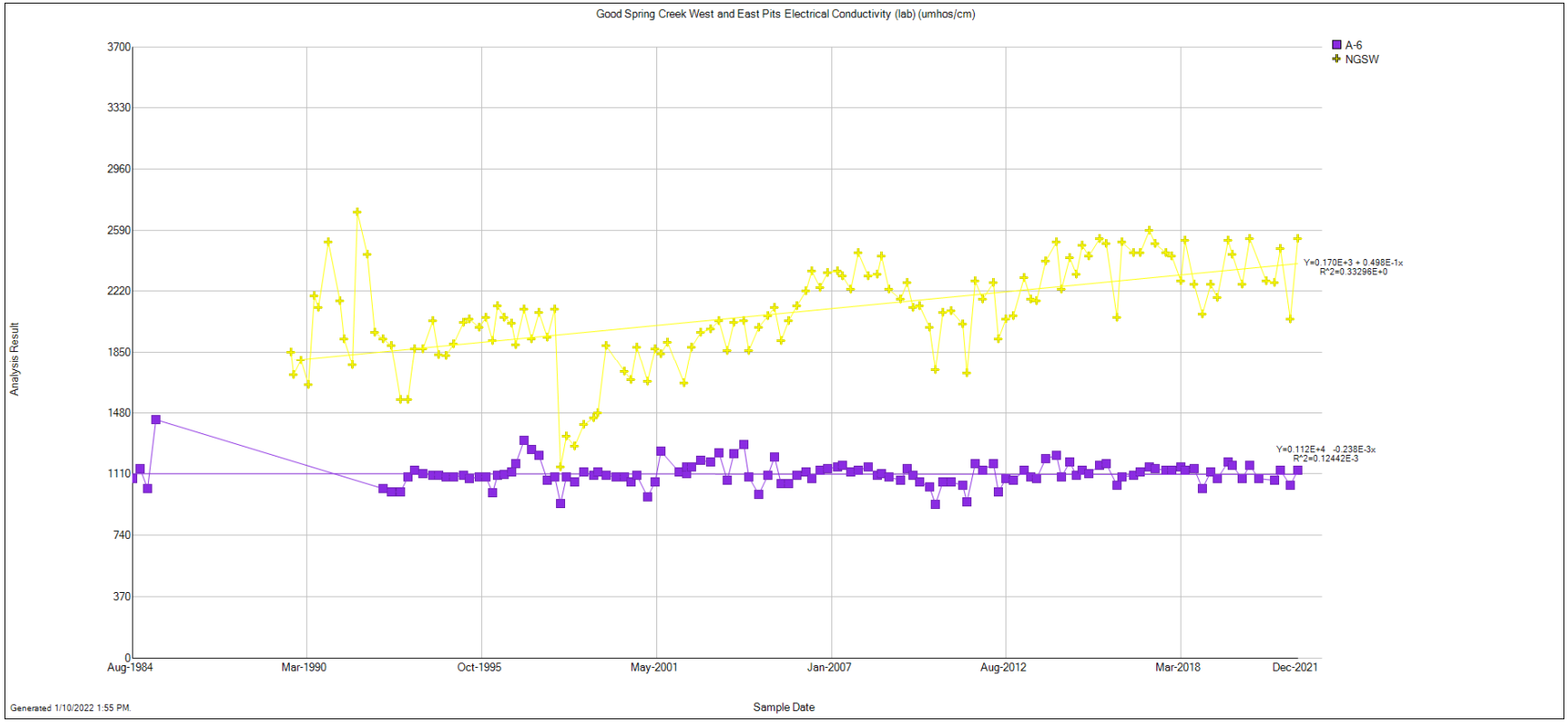
**Exceeded Table 16 Value (Volume 2C, Exhibit 7, Item 19)

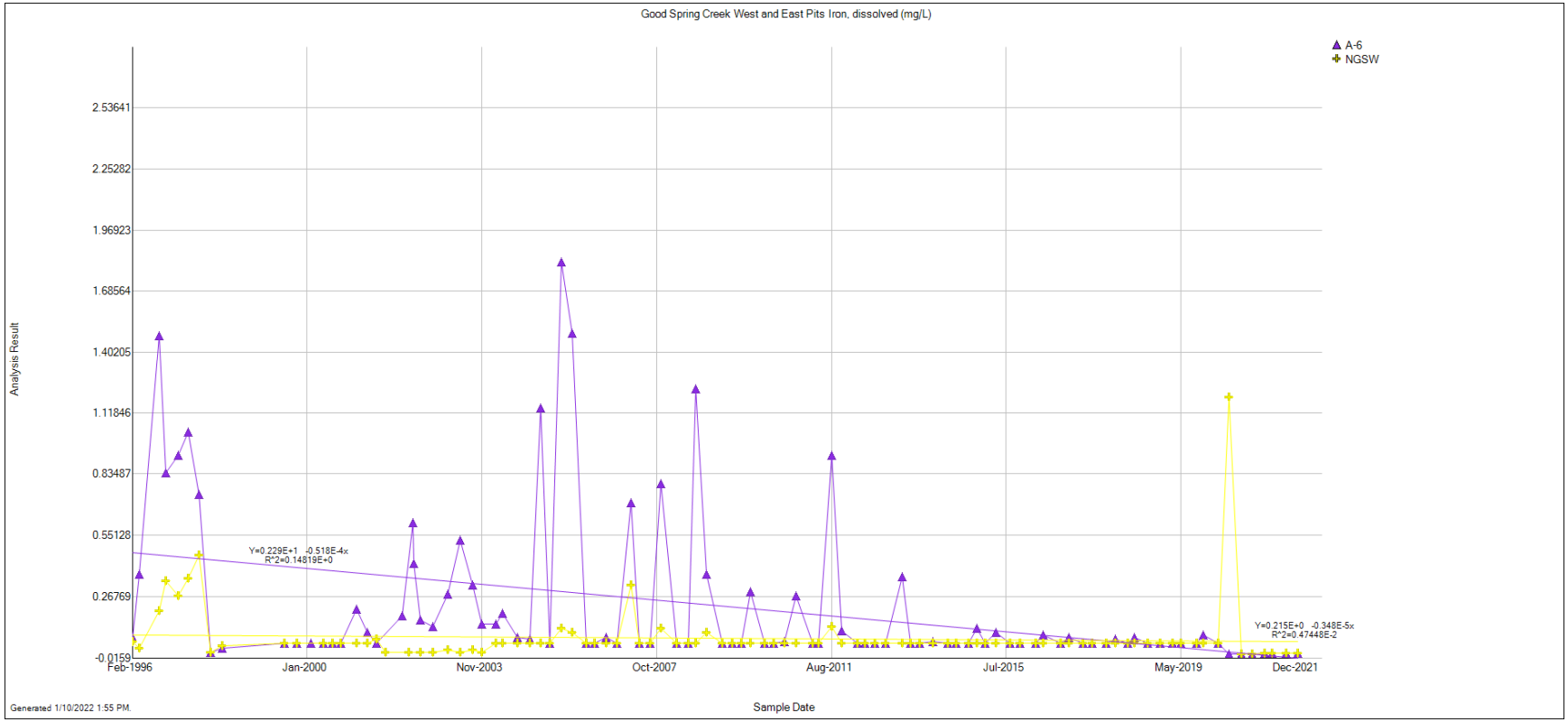
Exhibit 1D

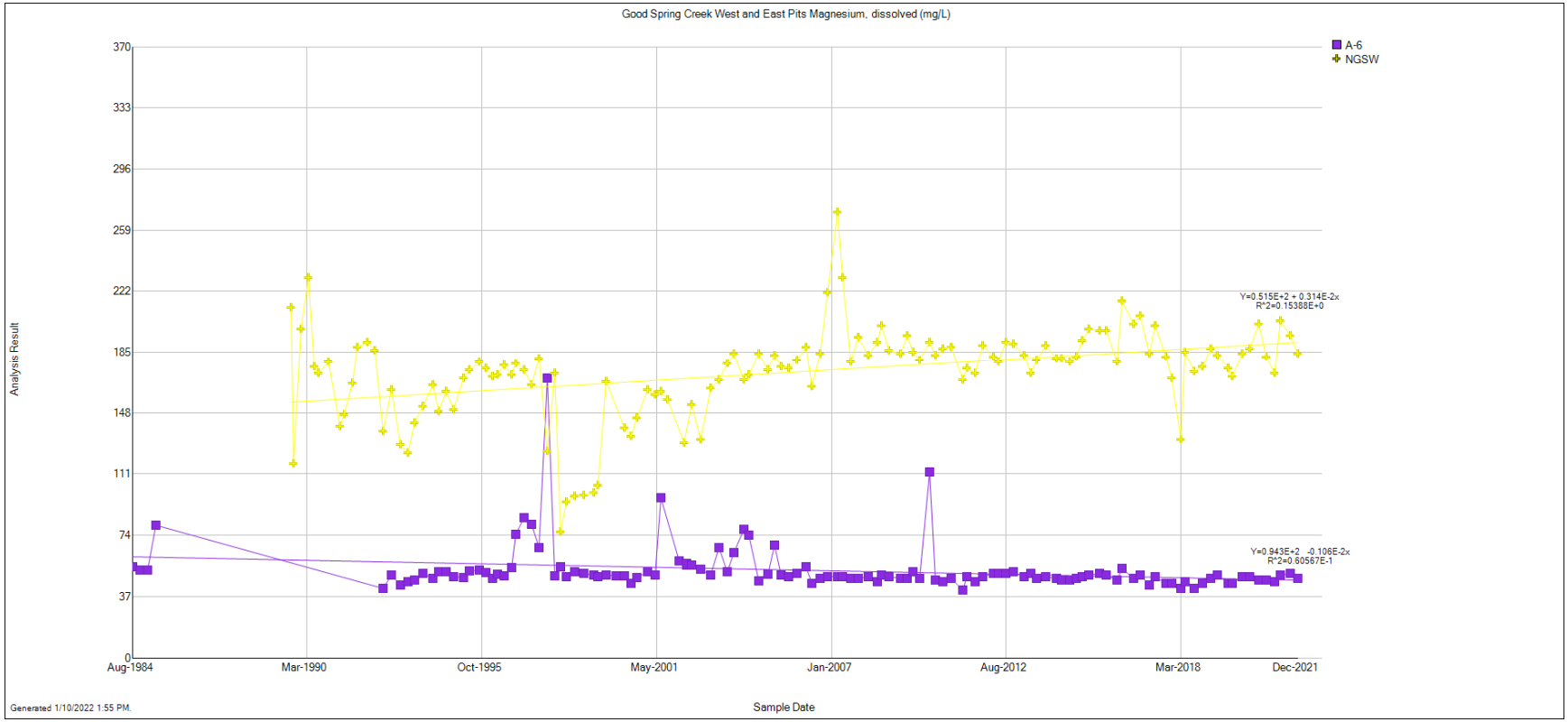
Ground Water Graphs

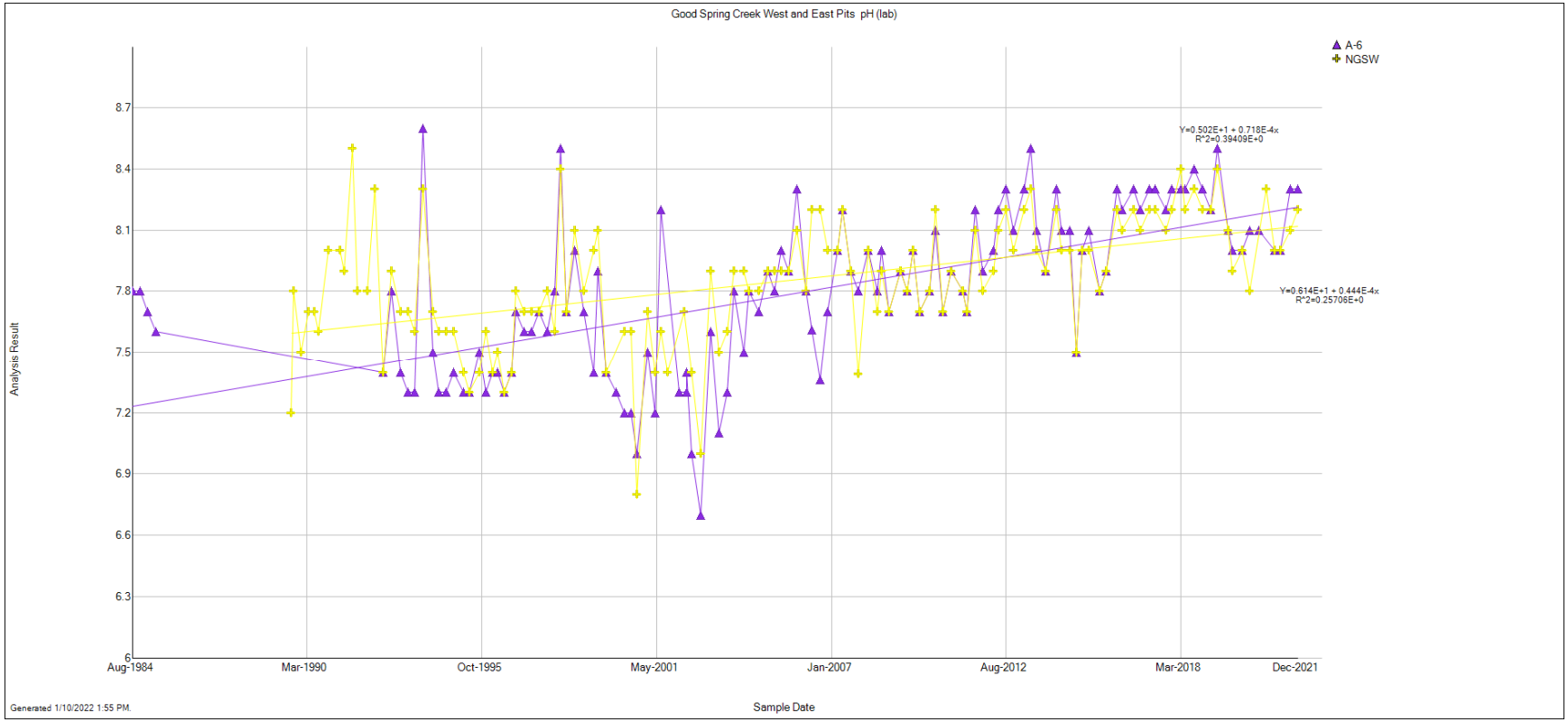

Good Spring Creek West and East Pits Calcium, dissolved (mg/L)
A-6
NGSW
Y=0.646E+2 + 0.282E-2x
R^2=0.12917E+0
Y=0.102E+3 -0.104E-2x
R^2=0.51874E-1
Analysis Result
Sample Date
Generated 1/10/2022 1:55 PM.
360
324
288
252
216
180
144
108
72
36
0
Aug-1984
Mar-1990
Oct-1995
May-2001
Jan-2007
Aug-2012
Mar-2018
Dec-2021

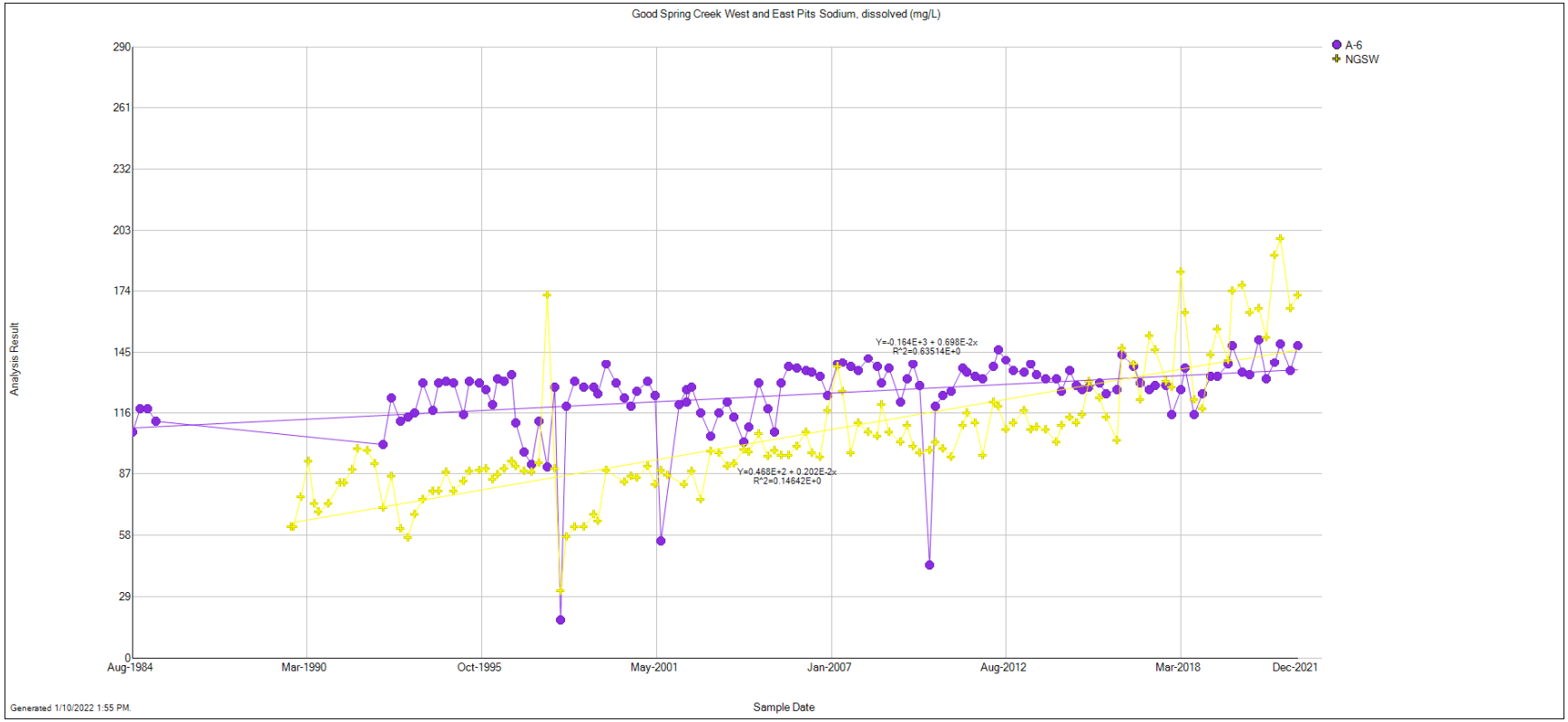

Good Spring Creek West and East Pits Groundwater, depth from TOC (ft)
A-6
NGSW
Analysis Result
27
24.3
21.6
18.9
16.2
13.5
10.8
8.1
5.4
2.7
0
Aug-1984
Mar-1990
Oct-1995
May-2001
Jan-2007
Aug-2012
Mar-2018
Dec-2021
Sample Date
Y=0.263E+1 + 0.130E-3x
R^2=0.54859E-1
Y=0.580E+1 + 0.343E-4x
R^2=0.18099E-2
Generated 1/10/2022 1:55 PM.

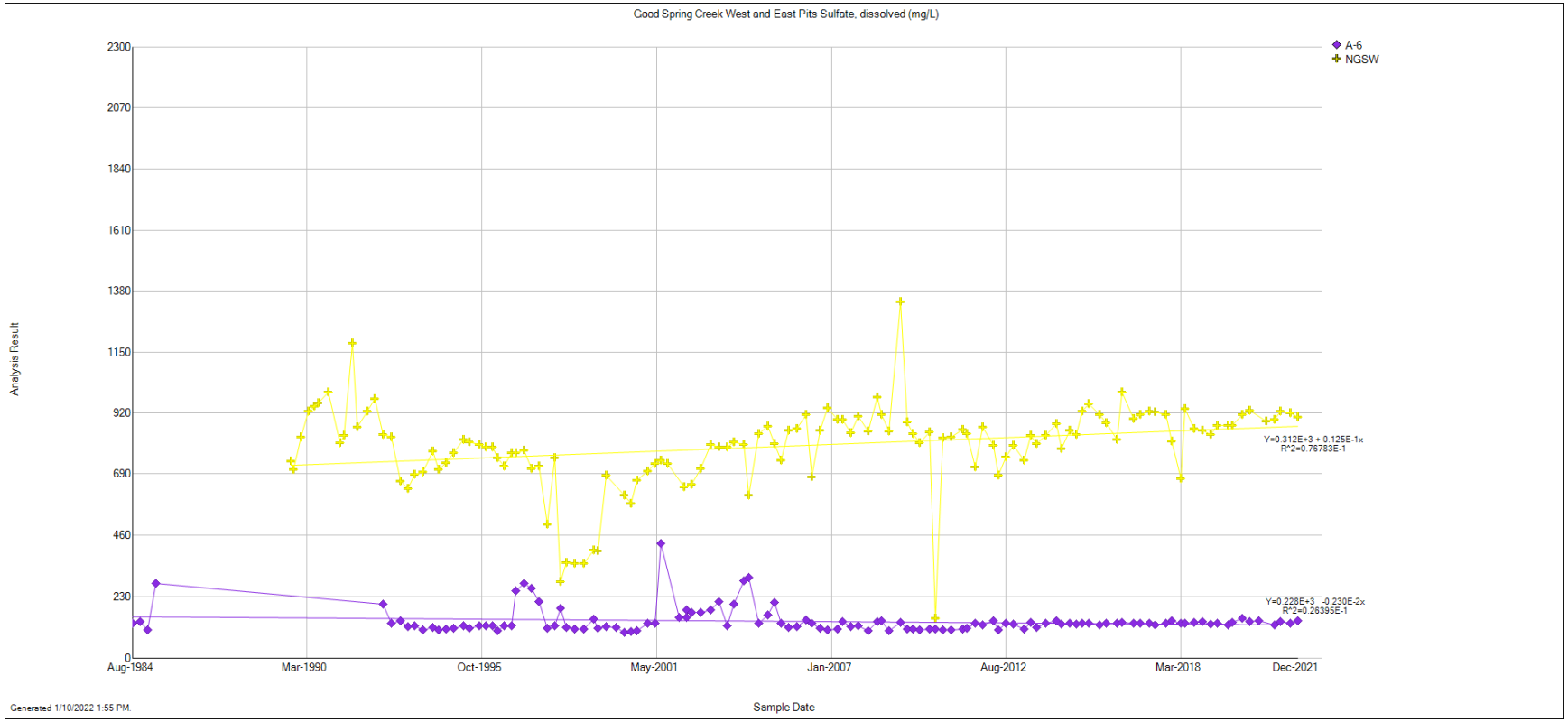

Good Spring Creek West and East Pits Electrical Conductivity (lab) (umhos/cm)
A-6
NGSW
Y=0.170E+3 + 0.498E-1x
R^2=0.33296E+0
Y=0.112E+4 -0.238E-3x
R^2=0.12442E-3
Analysis Result
3700
3330
2960
2590
2220
1850
1480
1110
740
370
0
Aug-1984
Mar-1990
Oct-1995
May-2001
Jan-2007
Aug-2012
Mar-2018
Dec-2021
Sample Date
Generated 1/10/2022 1:55 PM.

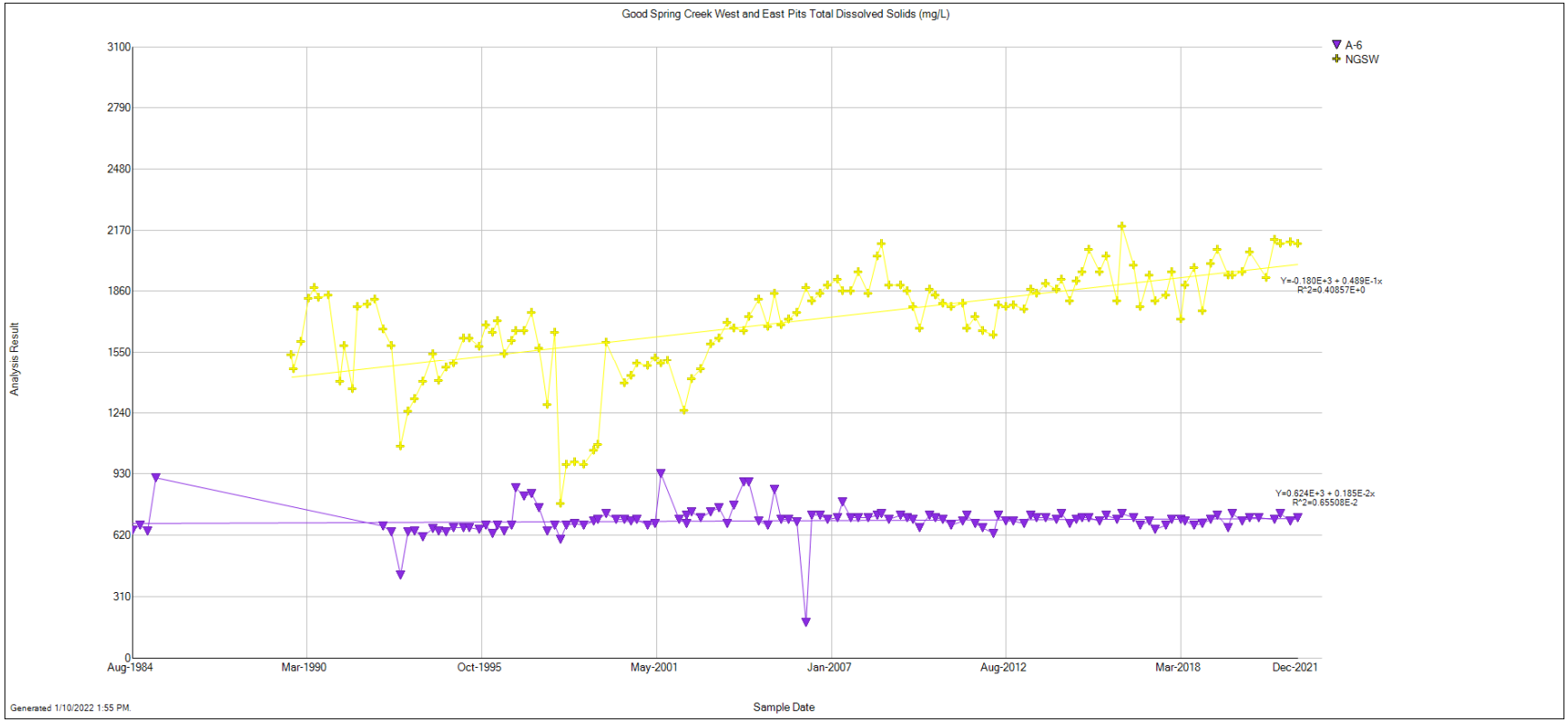

Good Spring Creek West and East Pits Iron, dissolved (mg/L)
A-6
NGSW
Analysis Result
2.53641
2.25282
1.96923
1.68564
1.40205
1.11846
0.83487
0.55128
0.26769
-0.0159
Y=0.229E+1 -0.518E-4x
R^2=0.14819E+0
Y=0.215E+0 -0.348E-5x
R^2=0.47448E-2
Feb-1996
Jan-2000
Nov-2003
Oct-2007
Aug-2011
Jul-2015
May-2019
Dec-2021
Sample Date
Generated 1/10/2022 1:55 PM.

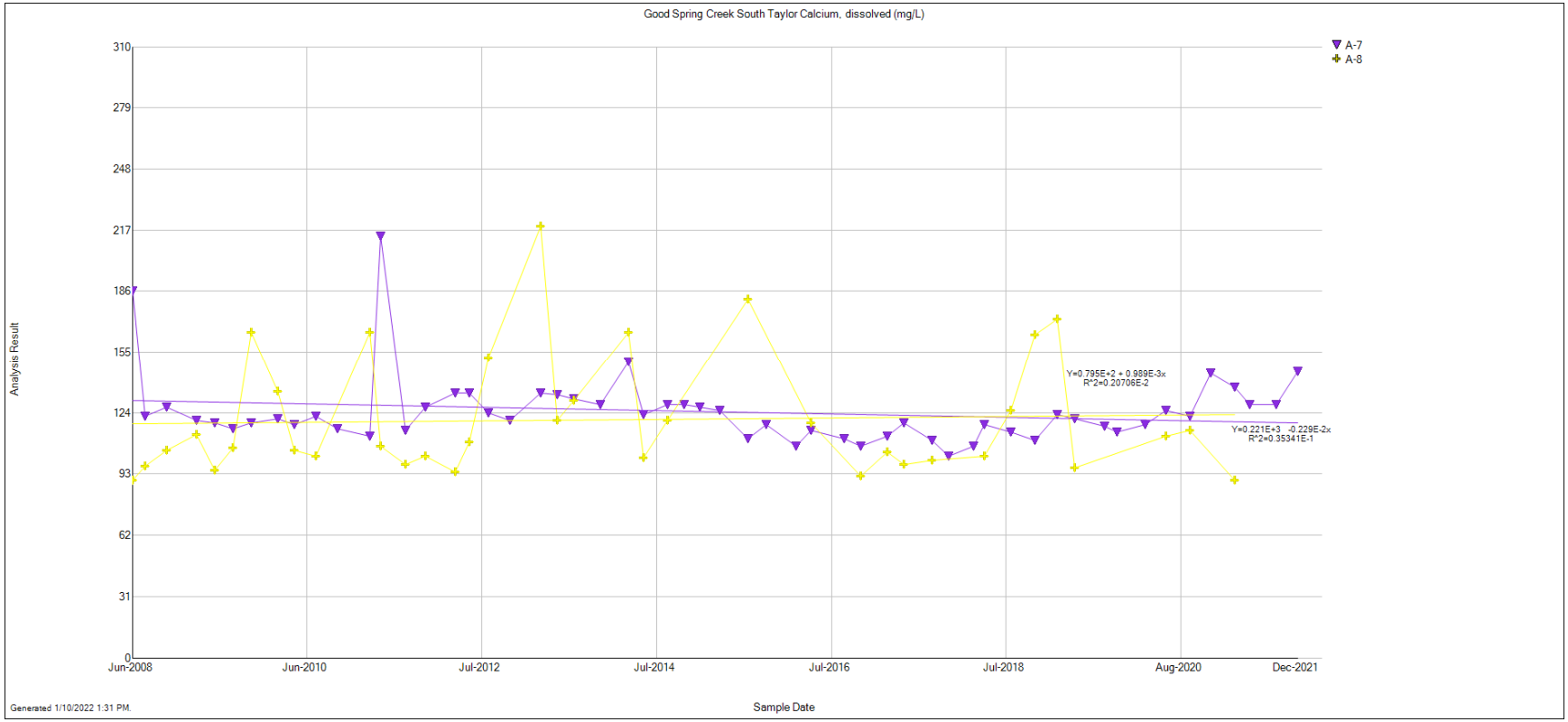

Good Spring Creek West and East Pits Magnesium, dissolved (mg/L)
A-6
NGSW
Y=0.515E+2 + 0.314E-2x
R^2=0.15388E+0
Y=0.943E+2 -0.106E-2x
R^2=0.80567E-1
Analysis Result
370
333
296
259
222
185
148
111
74
37
0
Aug-1984
Mar-1990
Oct-1995
May-2001
Jan-2007
Aug-2012
Mar-2018
Dec-2021
Sample Date
Generated 1/10/2022 1:55 PM.

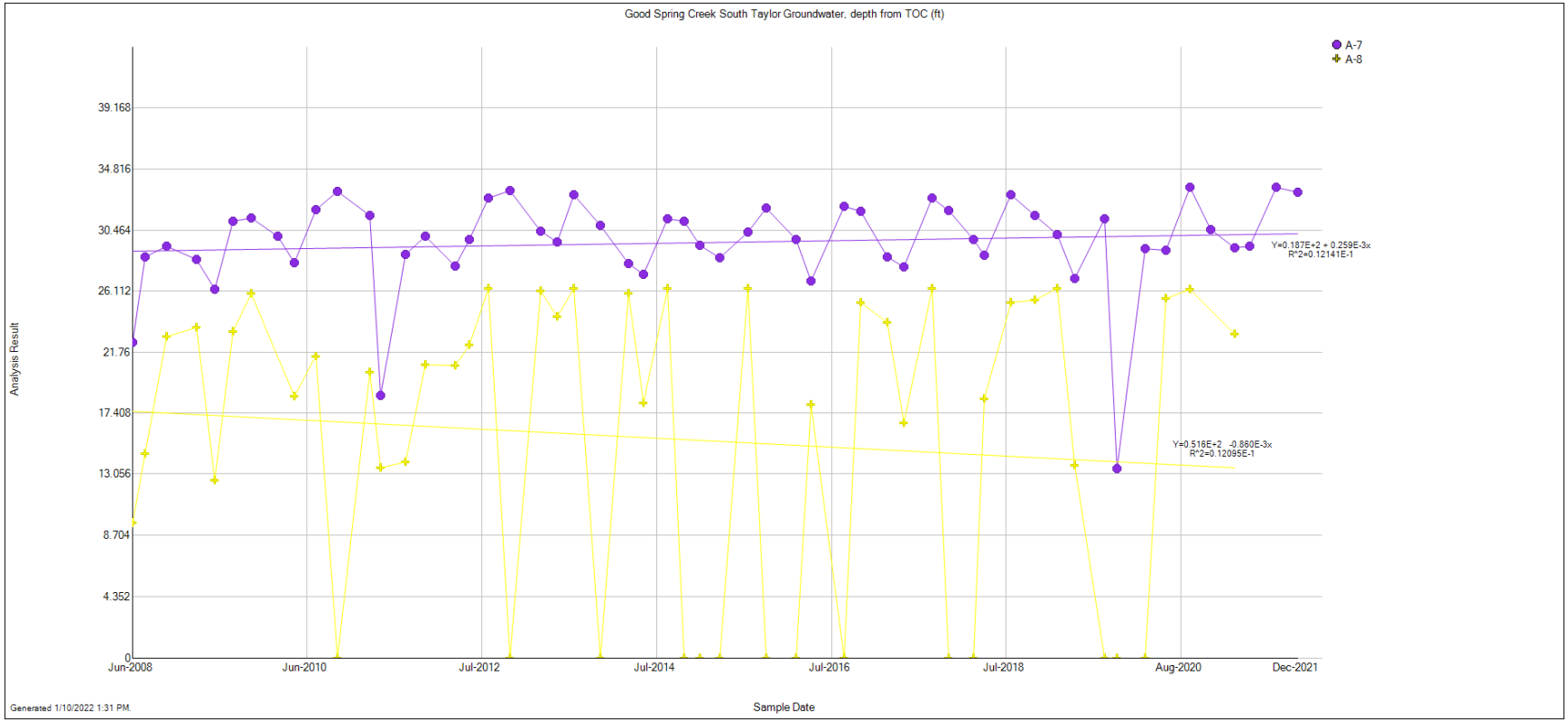

Good Spring Creek West and East Pits pH (lab)
A-6
NGSW
Y=0.502E+1 + 0.718E-4x
R^2=0.39409E+0
Y=0.614E+1 + 0.444E-4x
R^2=0.25706E+0
Analysis Result
8.7
8.4
8.1
7.8
7.5
7.2
6.9
6.6
6.3
6
Aug-1984
Mar-1990
Oct-1995
May-2001
Jan-2007
Aug-2012
Mar-2018
Dec-2021
Generated 1/10/2022 1:55 PM.
Sample Date

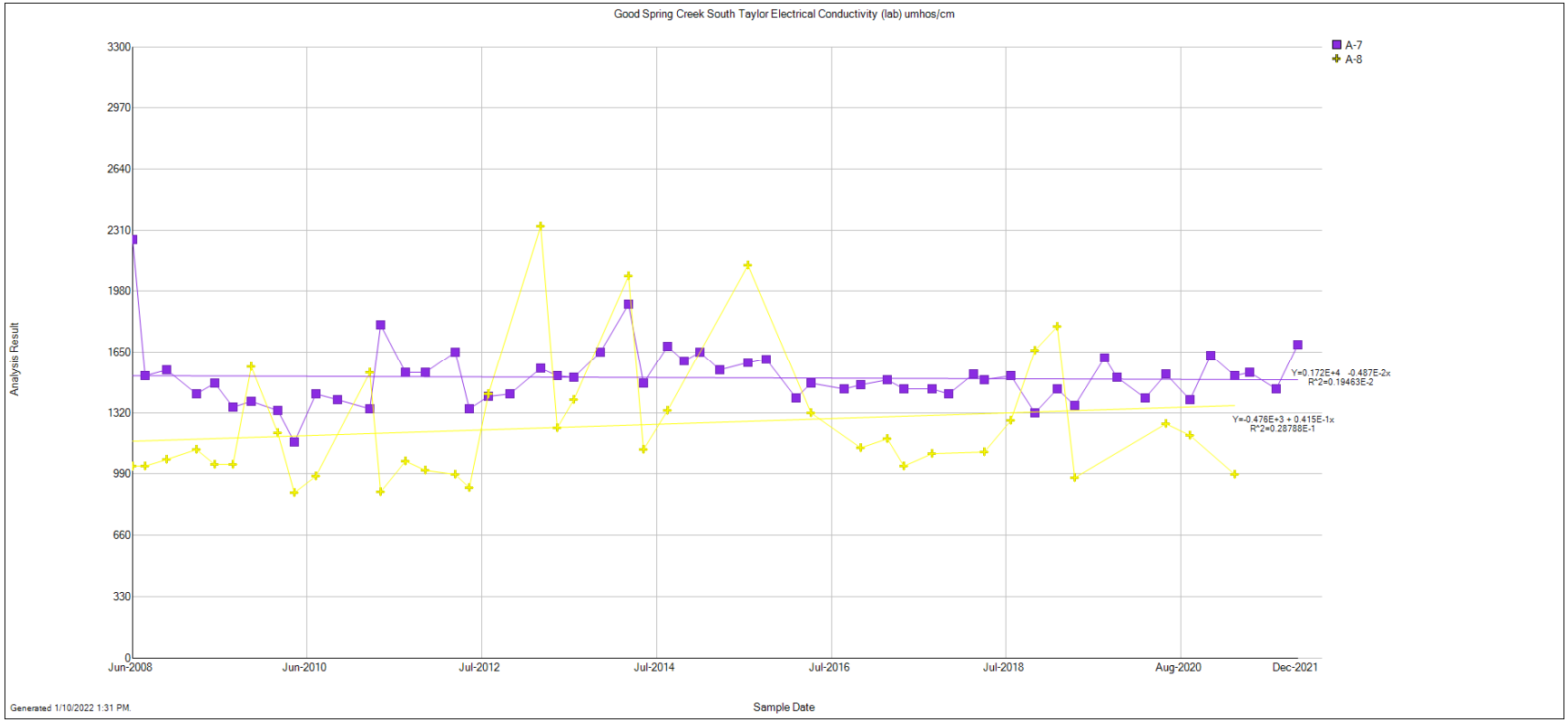

Good Spring Creek West and East Pits Sodium, dissolved (mg/L)
A-6
NGSW
Y=-0.164E+3 + 0.698E-2x
R^2=0.63514E+0
Y=0.468E+2 + 0.202E-2x
R^2=0.14642E+0
290
261
232
203
174
145
116
87
58
29
0
Aug-1984
Mar-1990
Oct-1995
May-2001
Jan-2007
Aug-2012
Mar-2018
Dec-2021
Analysis Result
Sample Date
Generated 1/10/2022 1:55 PM.

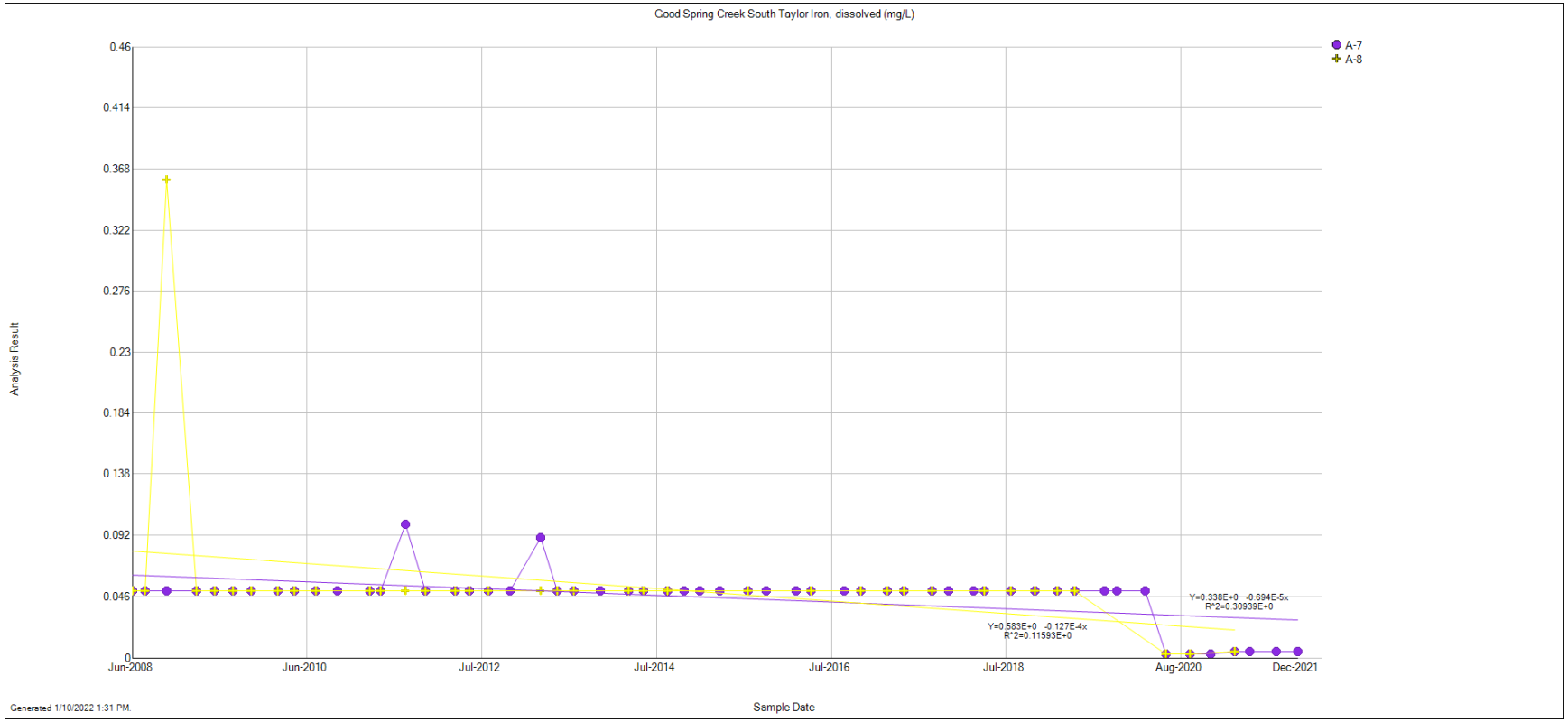

Good Spring Creek West and East Pits Sulfate, dissolved (mg/L)
A-6
NGSW
Analysis Result
2300
2070
1840
1610
1380
1150
920
690
460
230
0
Aug-1984
Mar-1990
Oct-1995
May-2001
Jan-2007
Aug-2012
Mar-2018
Dec-2021
Y=0.312E+3 + 0.125E-1x
R^2=0.76783E-1
Y=0.228E+3 -0.230E-2x
R^2=0.26395E-1
Generated 1/10/2022 1:55 PM.
Sample Date

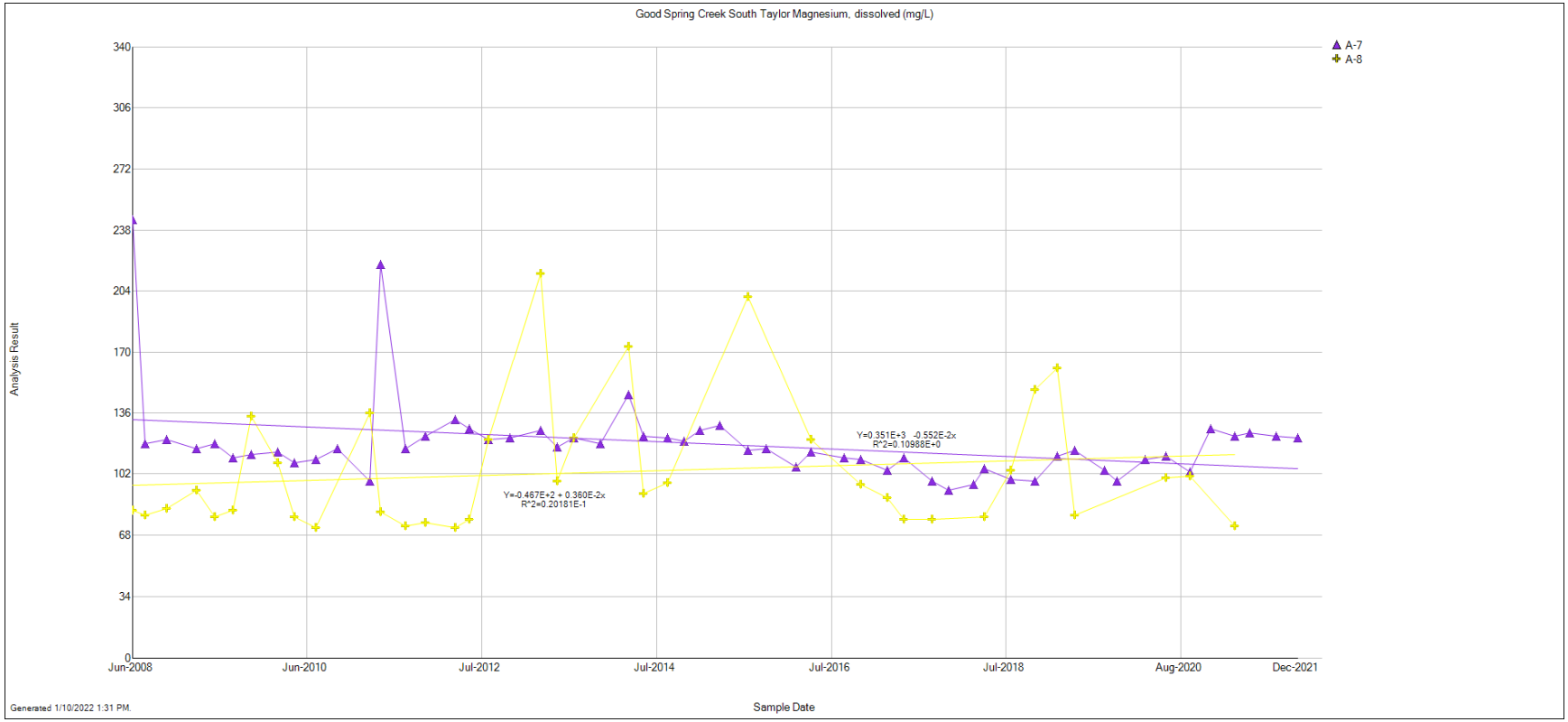

Good Spring Creek West and East Pits Total Dissolved Solids (mg/L)
A-6
NGSW
Y=-0.180E+3 + 0.489E-1x
R^2=0.40857E+0
Y=0.624E+3 + 0.185E-2x
R^2=0.65508E-2
Analysis Result
3100
2790
2480
2170
1860
1550
1240
930
620
310
0
Aug-1984
Mar-1990
Oct-1995
May-2001
Jan-2007
Aug-2012
Mar-2018
Dec-2021
Sample Date
Generated 1/10/2022 1:55 PM.

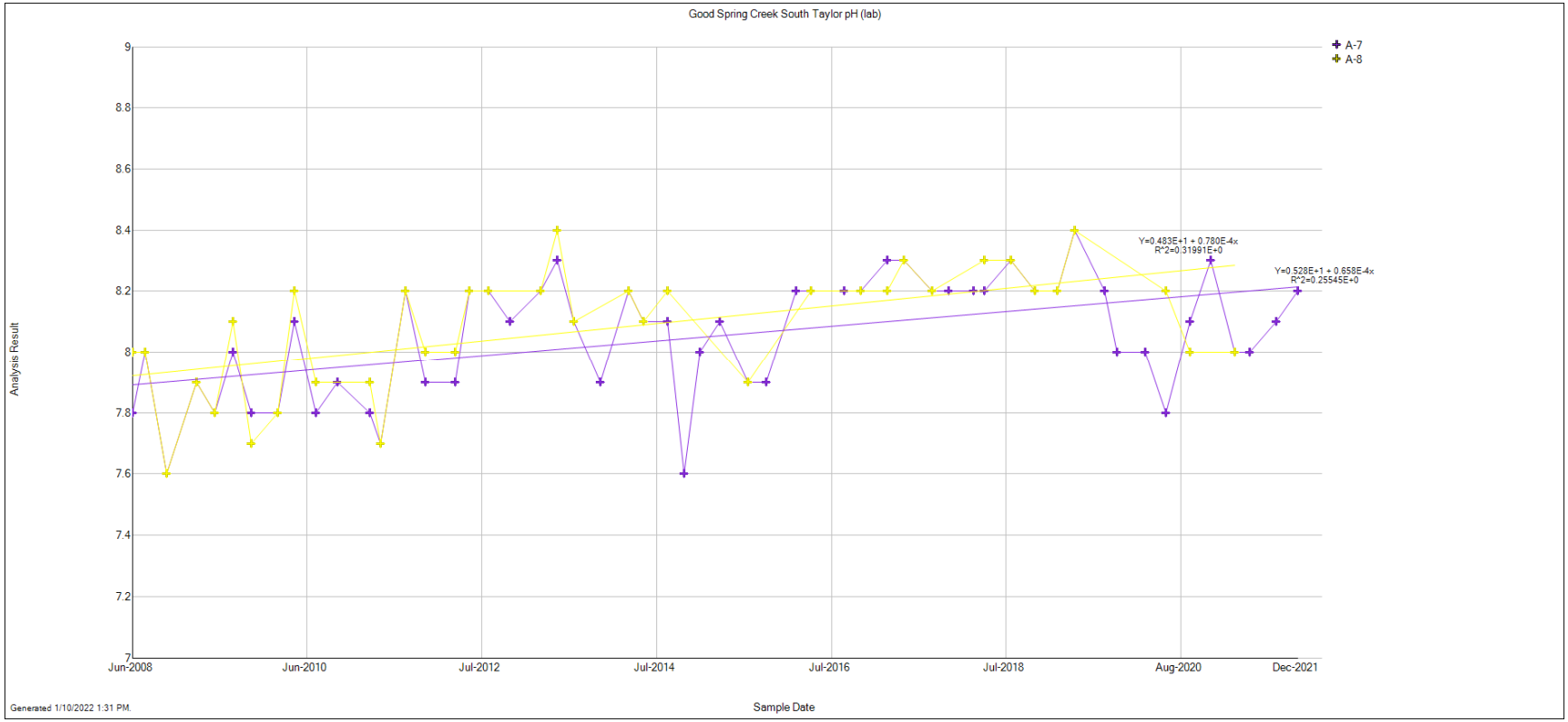

Good Spring Creek South Taylor Calcium, dissolved (mg/L)
A-7
A-8
Analysis Result
310
279
248
217
186
155
124
93
62
31
0
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Y=0.795E+2 + 0.989E-3x
R^2=0.20706E-2
Y=0.221E+3 -0.229E-2x
R^2=0.35341E-1
Generated 1/10/2022 1:31 PM.
Sample Date

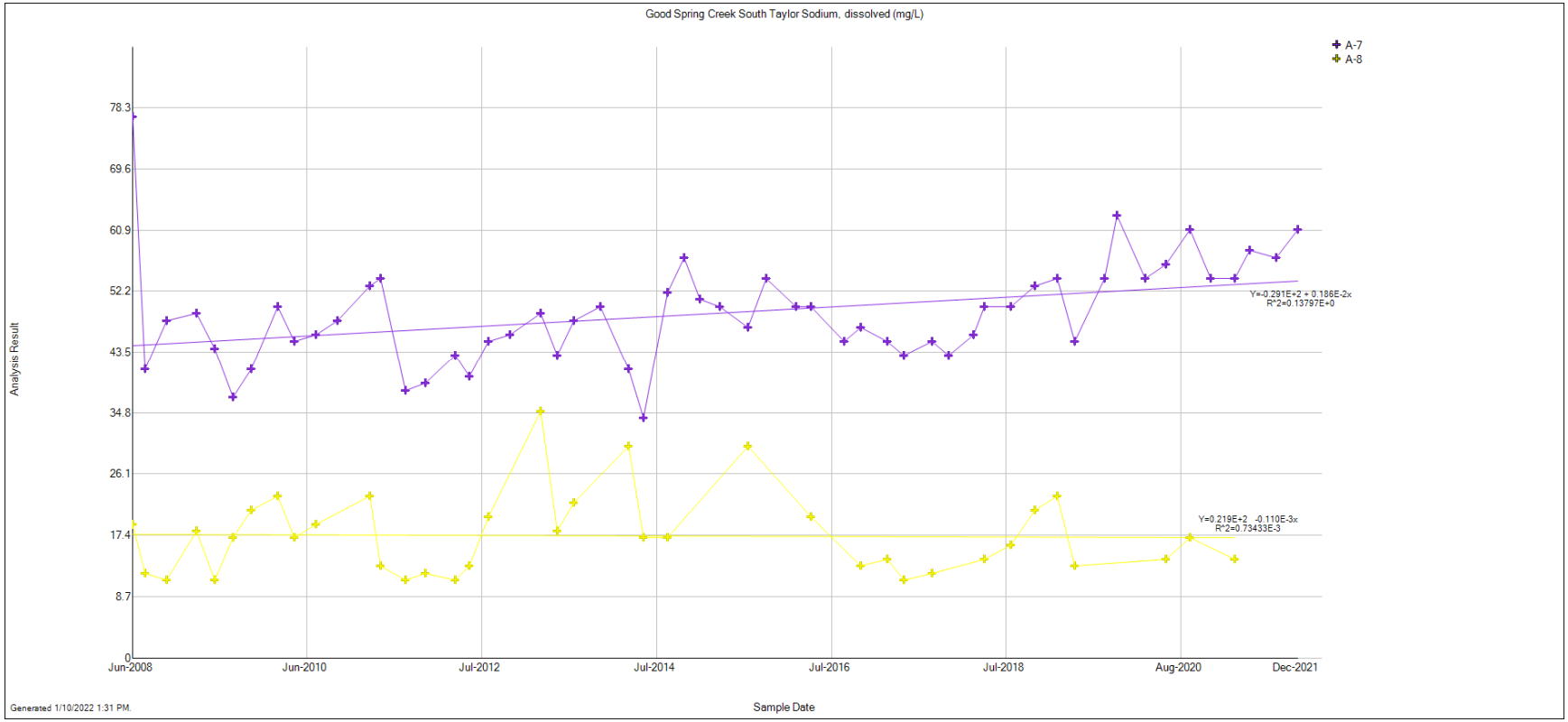

Good Spring Creek South Taylor Groundwater, depth from TOC (ft)
A-7
A-8
Y=0.187E+2 + 0.259E-3x
R^2=0.12141E-1
Y=0.516E+2 -0.860E-3x
R^2=0.12095E-1
39.168
34.816
30.464
26.112
21.76
17.408
13.056
8.704
4.352
0
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Analysis Result
Sample Date
Generated 1/10/2022 1:31 PM.

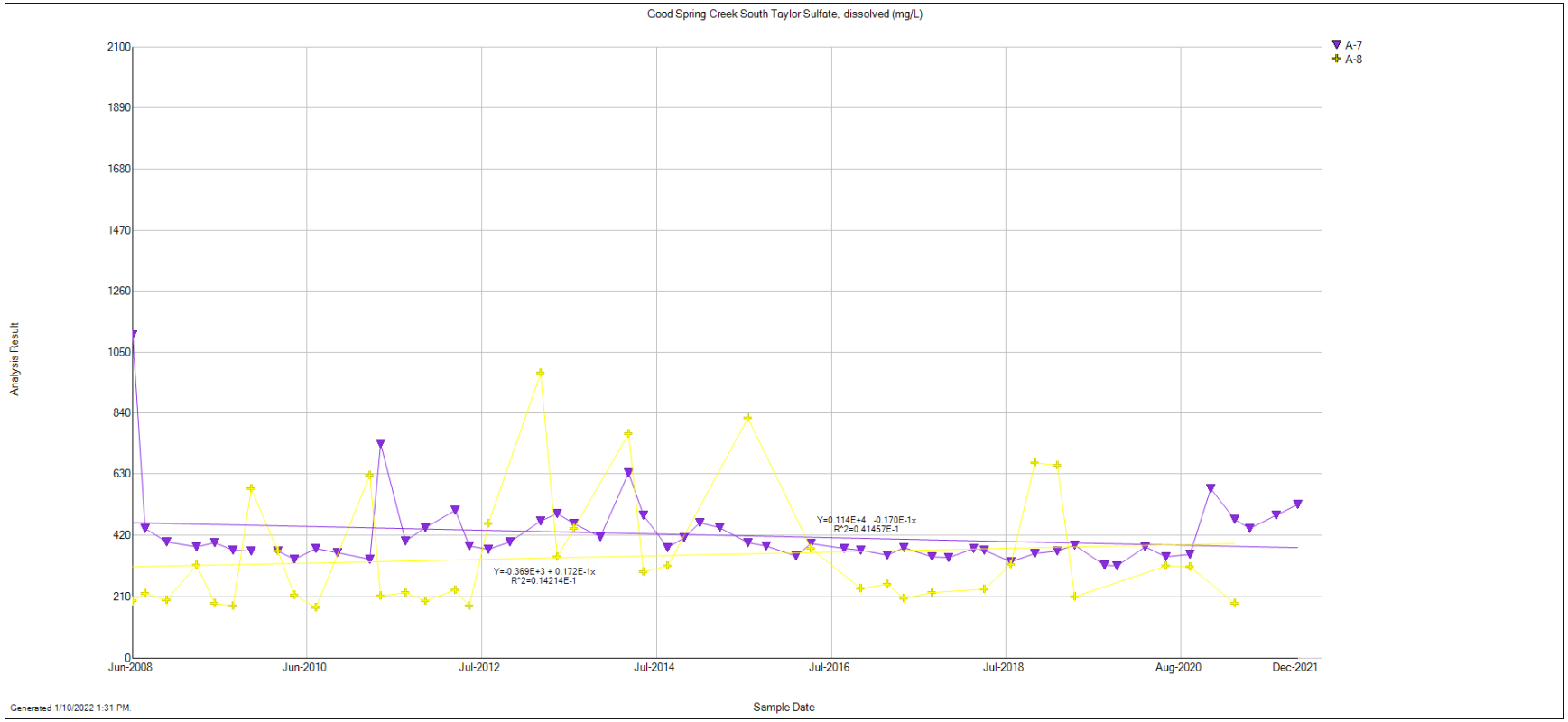

Good Spring Creek South Taylor Electrical Conductivity (lab) umhos/cm
A-7
A-8
3300
2970
2640
2310
1980
1650
1320
990
660
330
0
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Y=0.172E+4 -0.487E-2x
R^2=0.19463E-2
Y=-0.478E+3 + 0.415E-1x
R^2=0.28788E-1
Analysis Result
Generated 1/10/2022 1:31 PM.
Sample Date

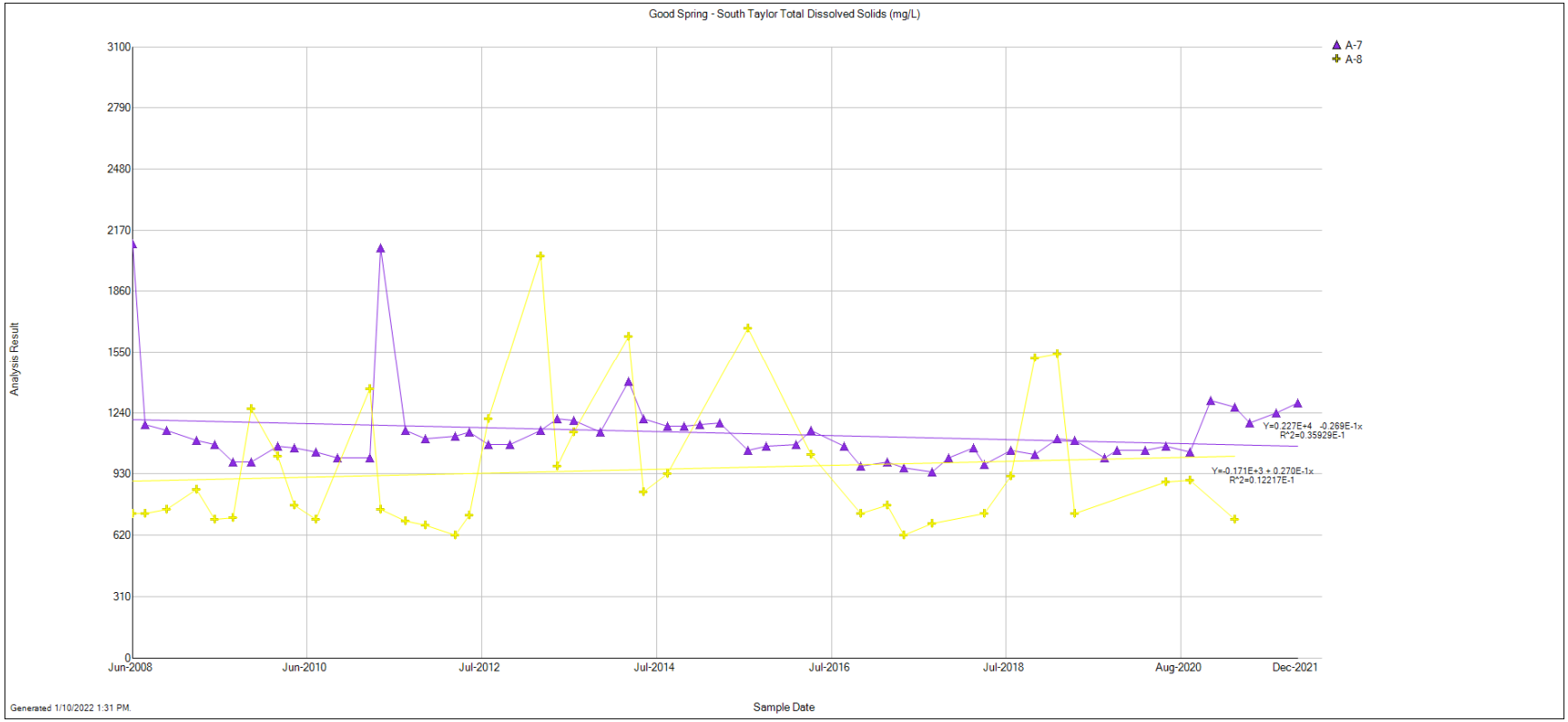

Good Spring Creek South Taylor Iron, dissolved (mg/L)
A-7
A-8
0.46
0.414
0.368
0.322
0.276
0.23
0.184
0.138
0.092
0.046
0
Analysis Result
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Y=0.338E+0 -0.694E-5x
R^2=0.30939E+0
Y=0.583E+0 -0.127E-4x
R^2=0.11593E+0
Generated 1/10/2022 1:31 PM.
Sample Date

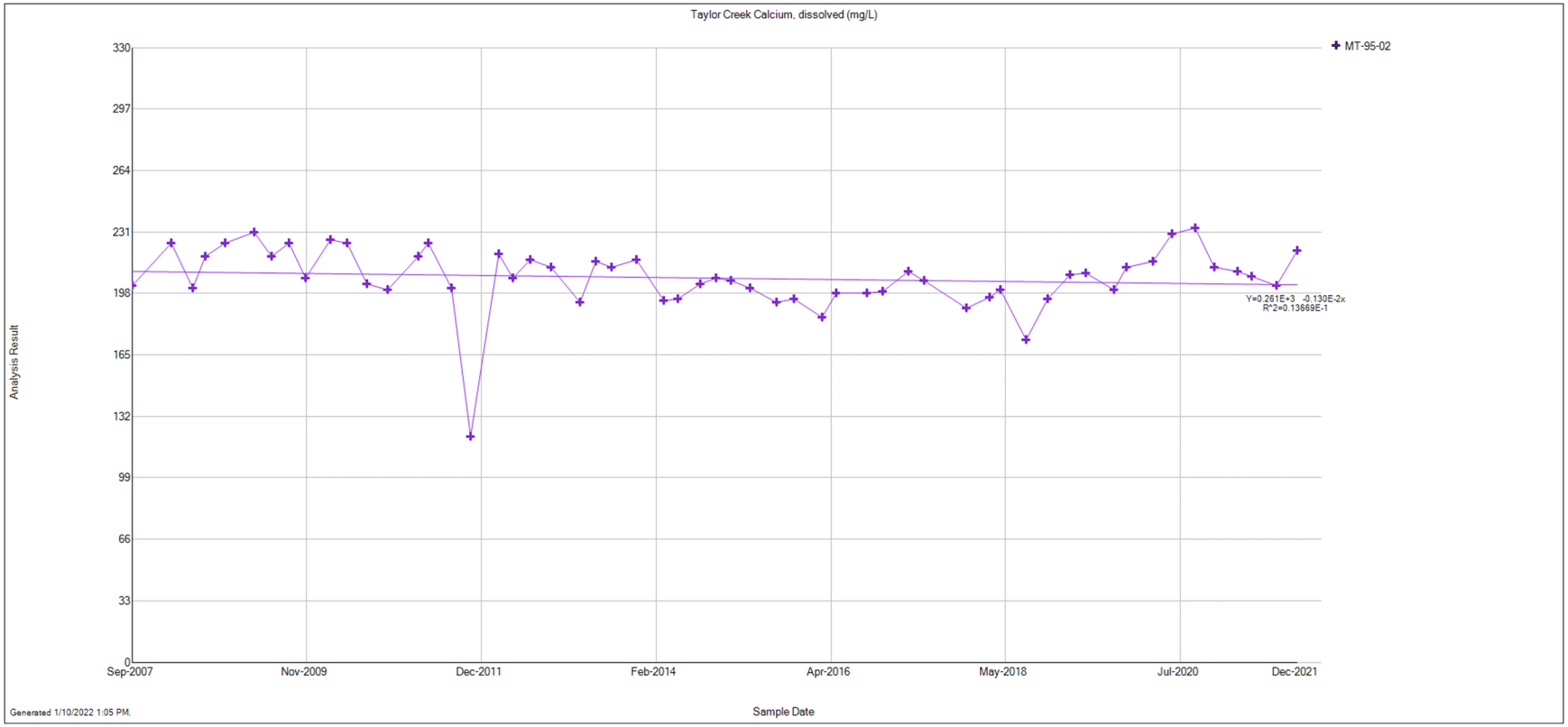

Good Spring Creek South Taylor Magnesium, dissolved (mg/L)
A-7
A-8
Analysis Result
340
306
272
238
204
170
136
102
68
34
0
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Y=0.351E+3 -0.552E-2x
R^2=0.10988E+0
Y=-0.467E+2 + 0.360E-2x
R^2=0.20181E-1
Generated 1/10/2022 1:31 PM.
Sample Date

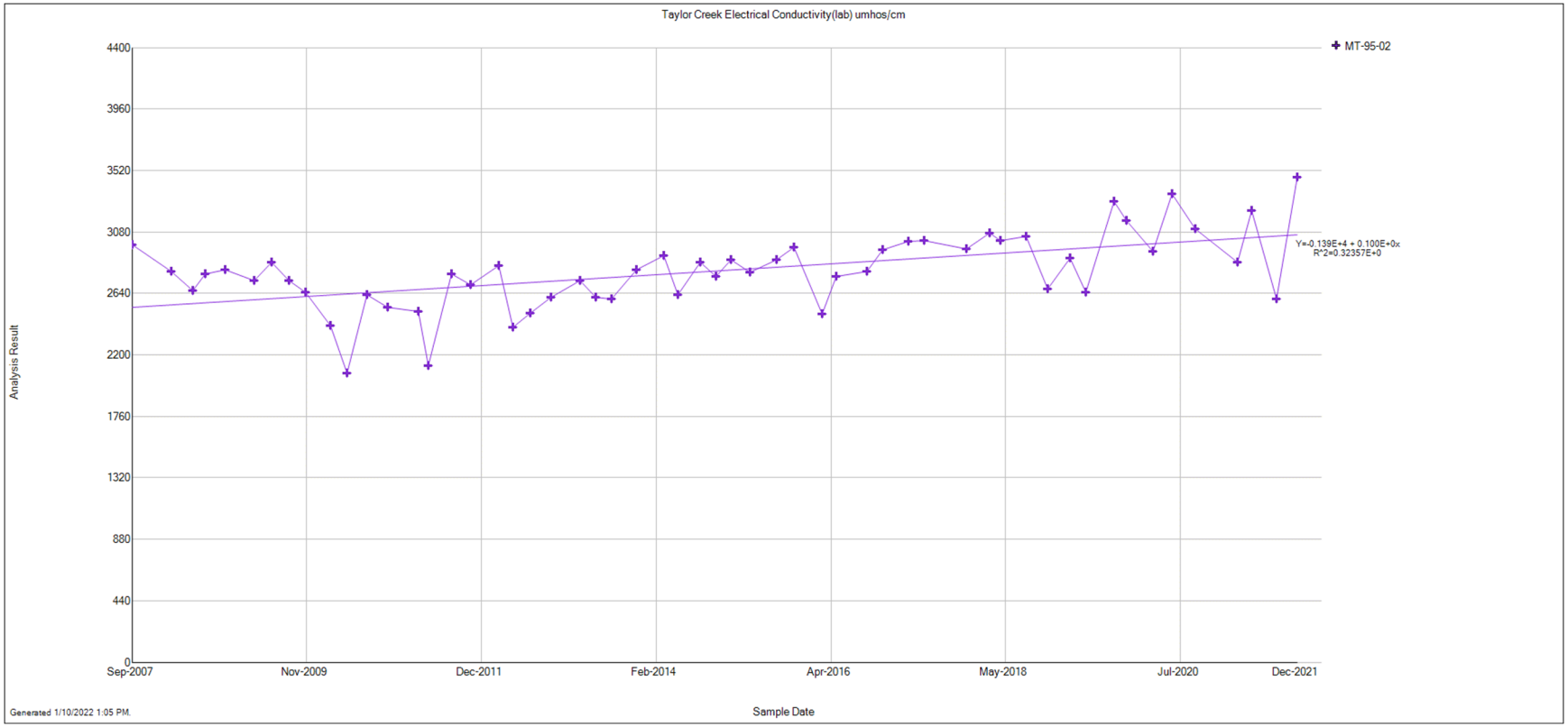

Good Spring Creek South Taylor pH (lab)
A-7
A-8
Y=0.483E+1 + 0.780E-4x
R^2=0.31991E+0
Y=0.528E+1 + 0.658E-4x
R^2=0.25545E+0
Analysis Result
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Generated 1/10/2022 1:31 PM.
Sample Date

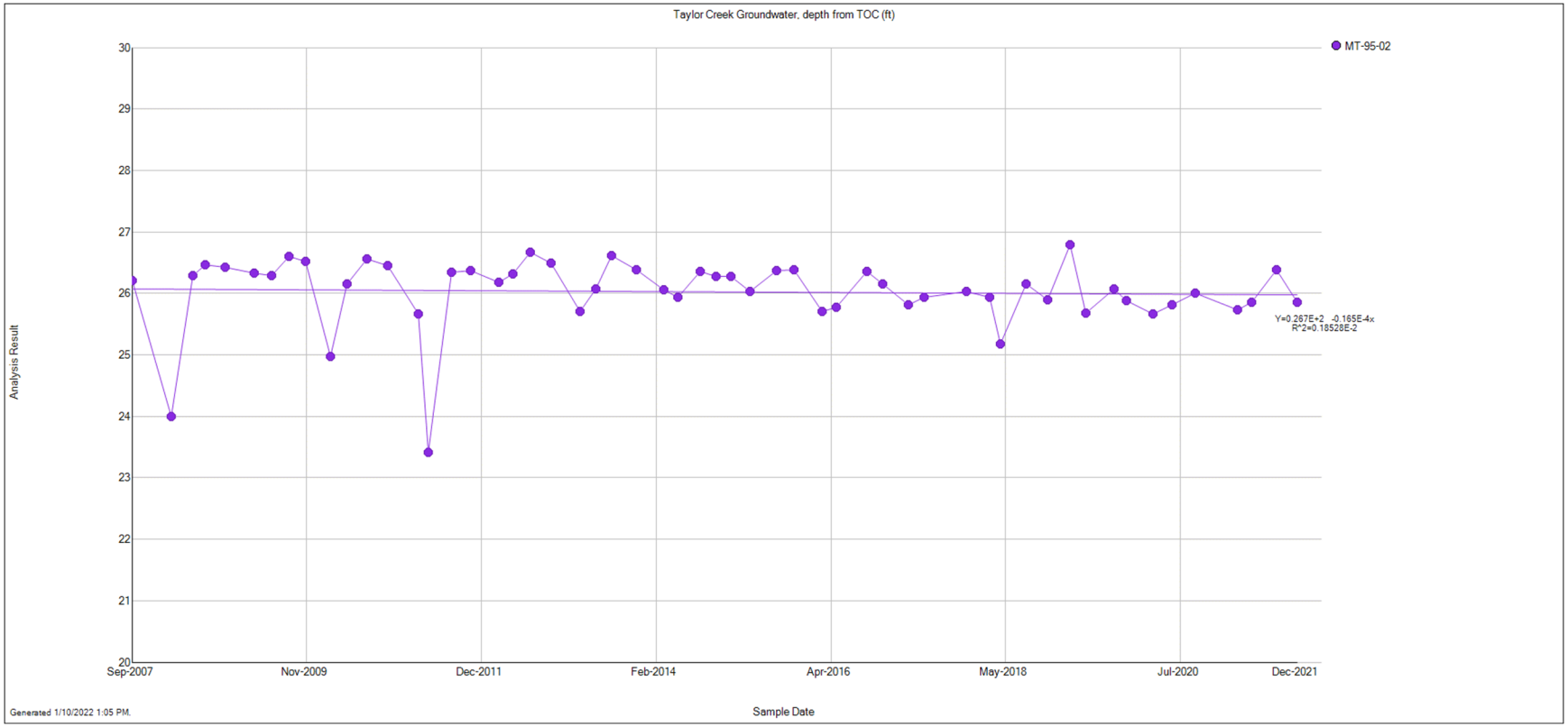

Good Spring Creek South Taylor Sodium, dissolved (mg/L)
A-7
A-8
Y=-0.291E+2 + 0.186E-2x
R^2=0.13797E+0
Y=0.219E+2 -0.110E-3x
R^2=0.73433E-3
78.3
69.6
60.9
52.2
43.5
34.8
26.1
17.4
8.7
0
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Analysis Result
Sample Date
Generated 1/10/2022 1:31 PM.

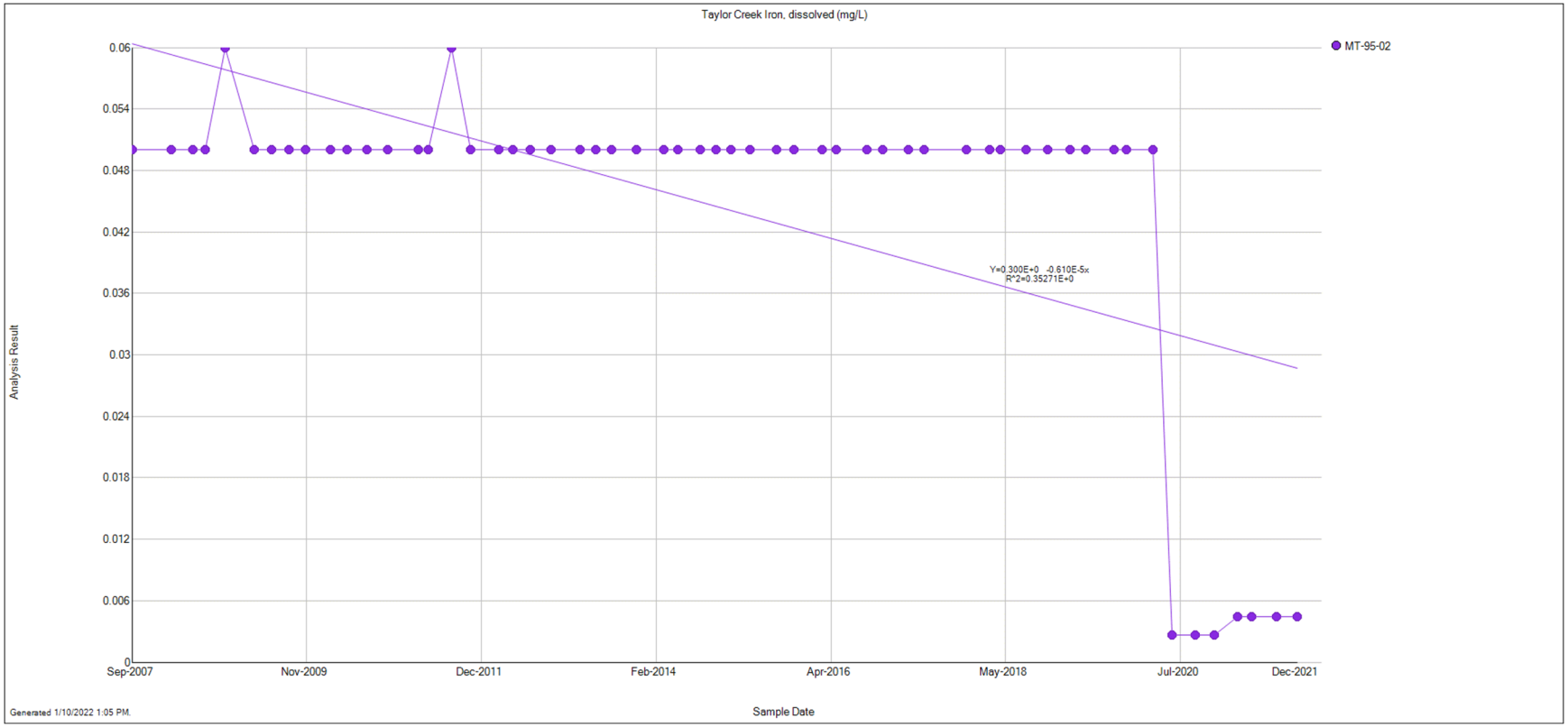

Good Spring Creek South Taylor Sulfate, dissolved (mg/L)
A-7
A-8
Analysis Result
2100
1890
1680
1470
1260
1050
840
630
420
210
0
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Y=0.114E+4 -0.170E-1x
R^2=0.41457E-1
Y=-0.369E+3 + 0.172E-1x
R^2=0.14214E-1
Generated 1/10/2022 1:31 PM.
Sample Date

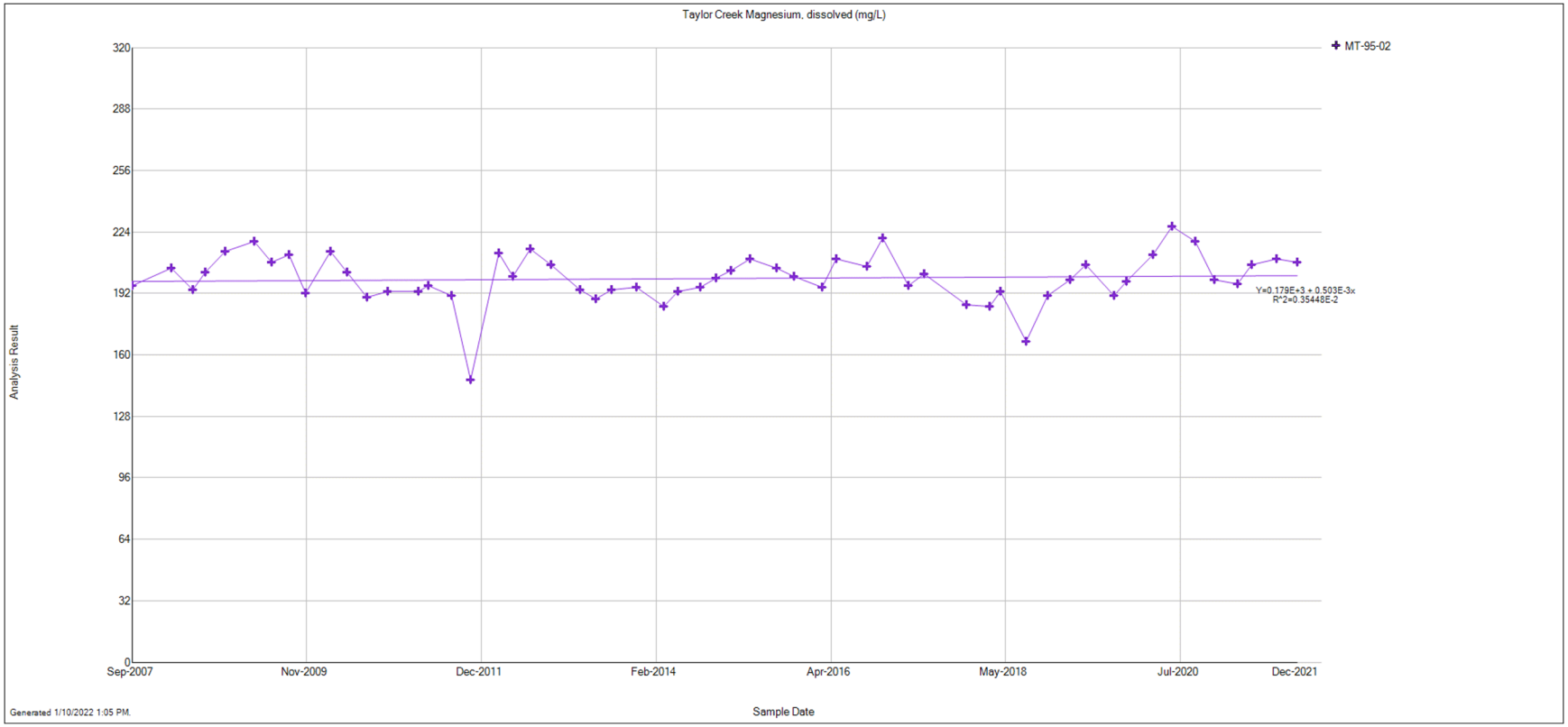

Good Spring - South Taylor Total Dissolved Solids (mg/L)
A-7
A-8
Y=0.227E+4 -0.269E-1x
R^2=0.35929E-1
Y=-0.171E+3 + 0.270E-1x
R^2=0.12217E-1
Analysis Result
3100
2790
2480
2170
1860
1550
1240
930
620
310
0
Jun-2008
Jun-2010
Jul-2012
Jul-2014
Jul-2016
Jul-2018
Aug-2020
Dec-2021
Generated 1/10/2022 1:31 PM.
Sample Date

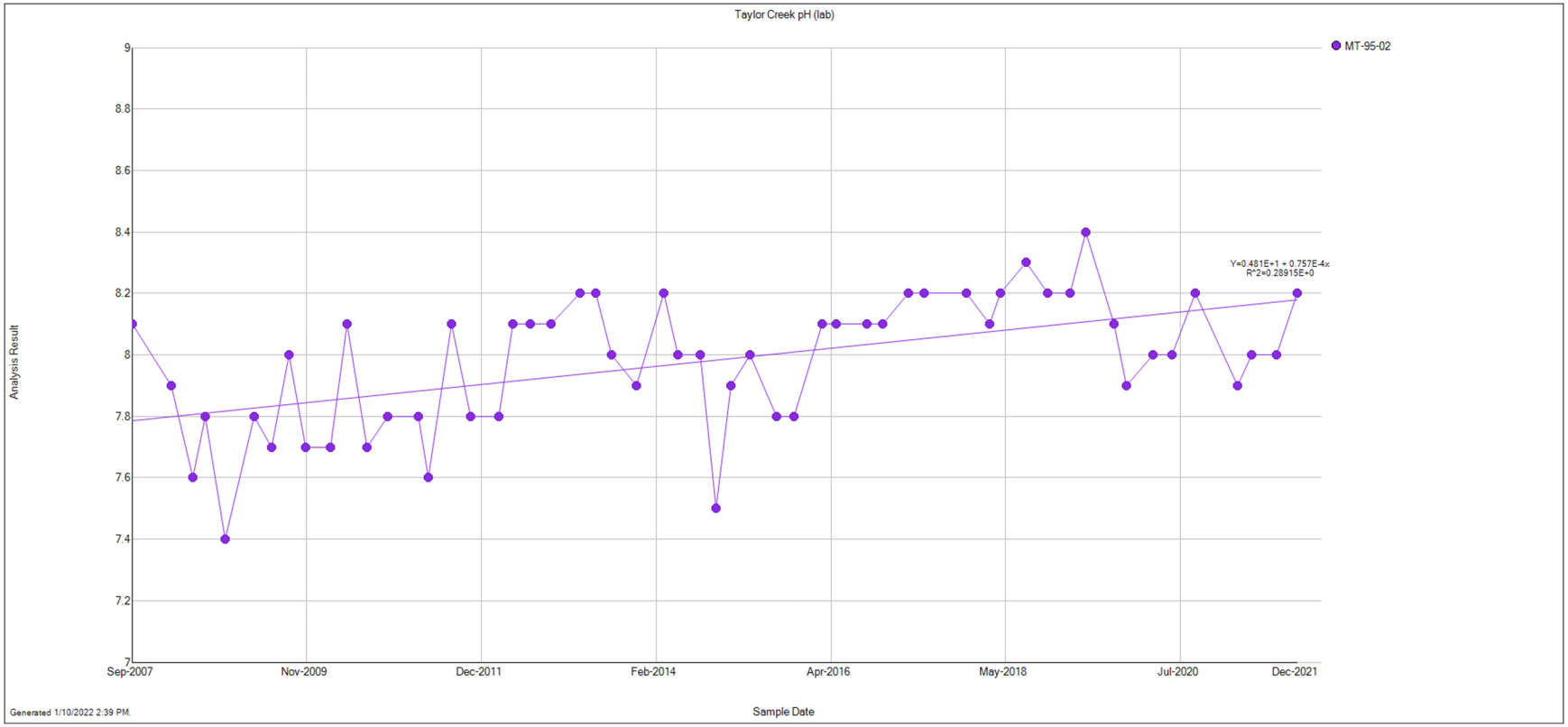

Taylor Creek Calcium, dissolved (mg/L)
MT-95-02
330
297
264
231
198
165
132
99
66
33
0
Analysis Result
Sep-2007
Nov-2009
Dec-2011
Feb-2014
Apr-2016
May-2018
Jul-2020
Dec-2021
Sample Date
Y=0.261E+3 -0.130E-2x
R^2=0.13669E-1
Generated 1/10/2022 1:05 PM.

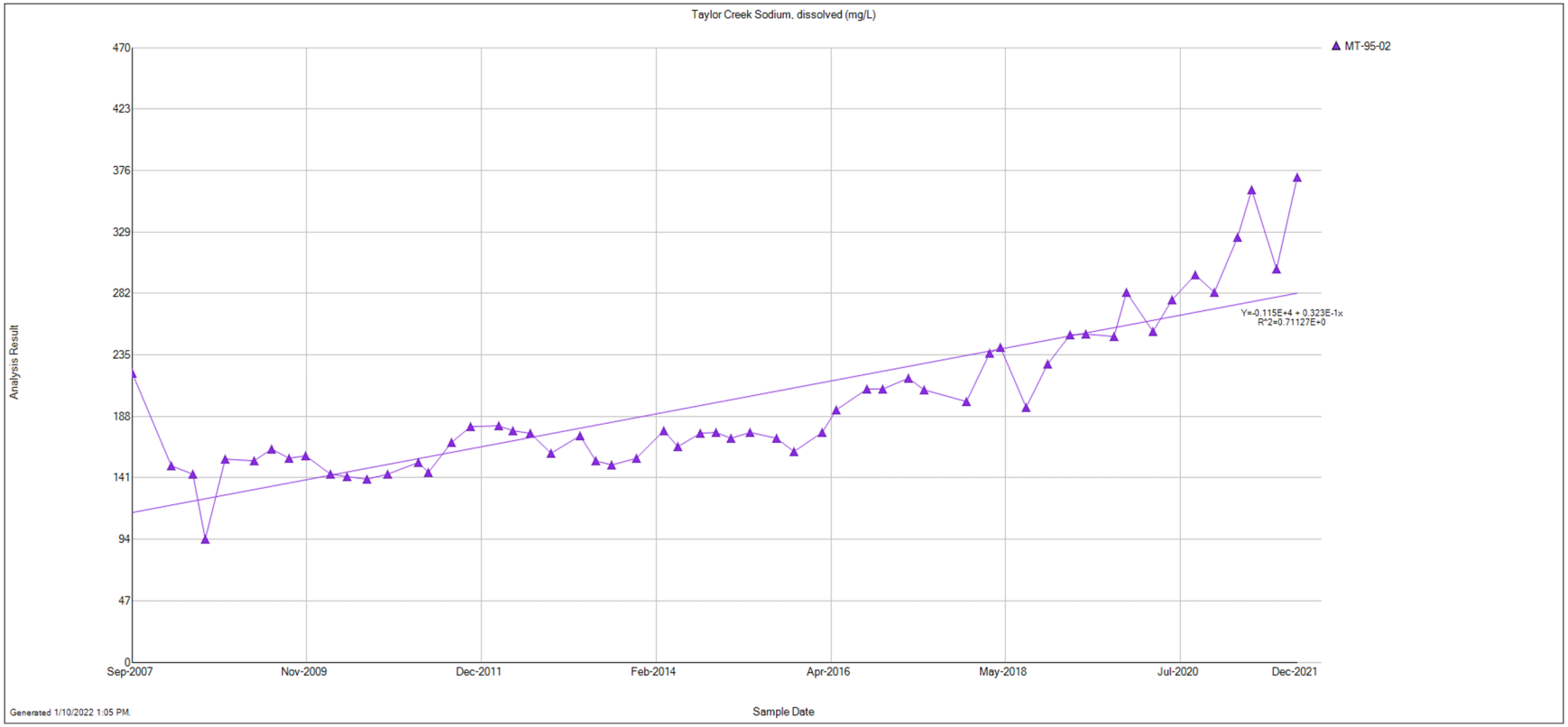

Taylor Creek Electrical Conductivity(lab) umhos/cm
MT-95-02
Y=-0.139E+4 + 0.100E+0x
R^2=0.32357E+0
Analysis Result
4400
3960
3520
3080
2640
2200
1760
1320
880
440
0
Sep-2007
Nov-2009
Dec-2011
Feb-2014
Apr-2016
May-2018
Jul-2020
Dec-2021
Generated 1/10/2022 1:05 PM.
Sample Date

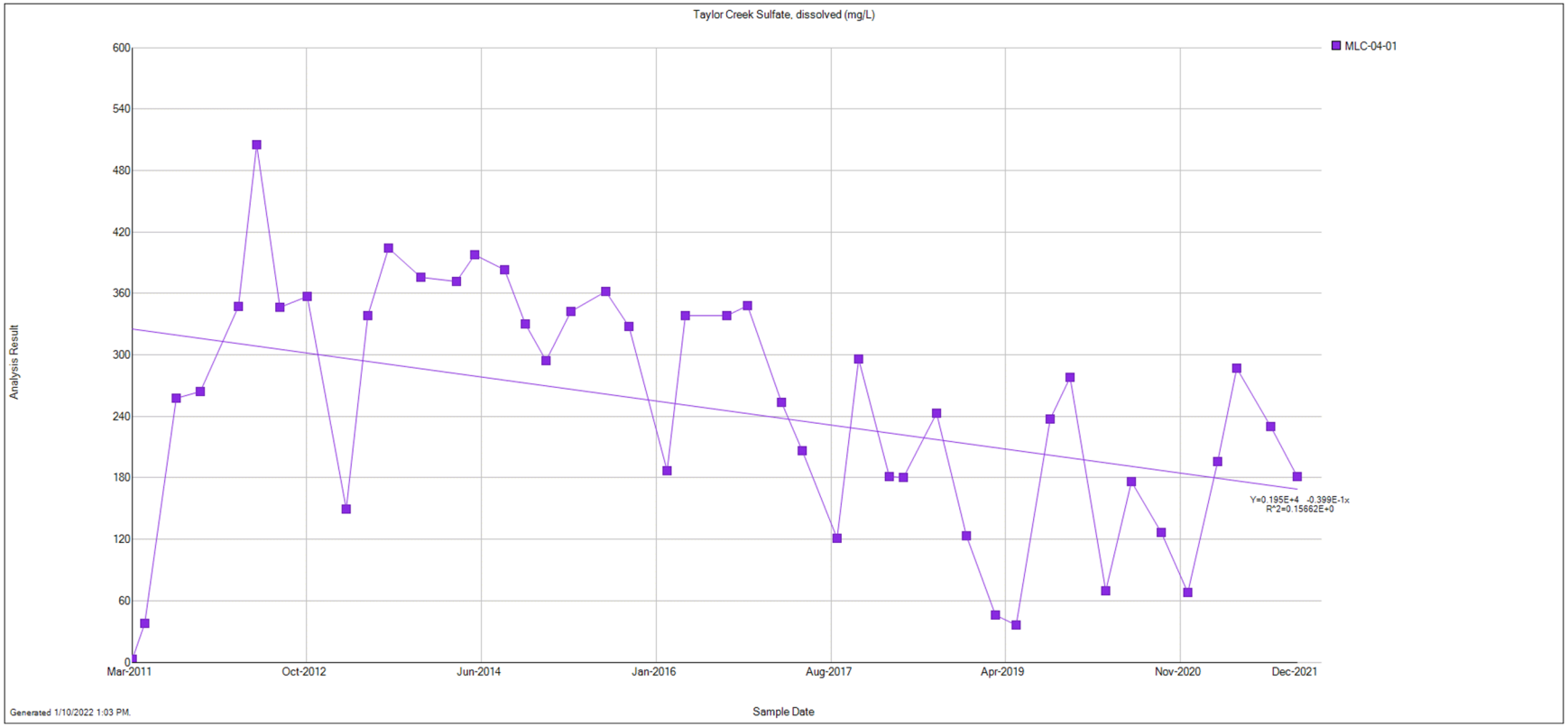

Taylor Creek Groundwater, depth from TOC (ft)
MT-95-02
Y=0.267E+2 -0.165E-4x
R^2=0.18528E-2
Analysis Result
30
29
28
27
26
25
24
23
22
21
20
Sep-2007
Nov-2009
Dec-2011
Feb-2014
Apr-2016
May-2018
Jul-2020
Dec-2021
Generated 1/10/2022 1:05 PM.
Sample Date

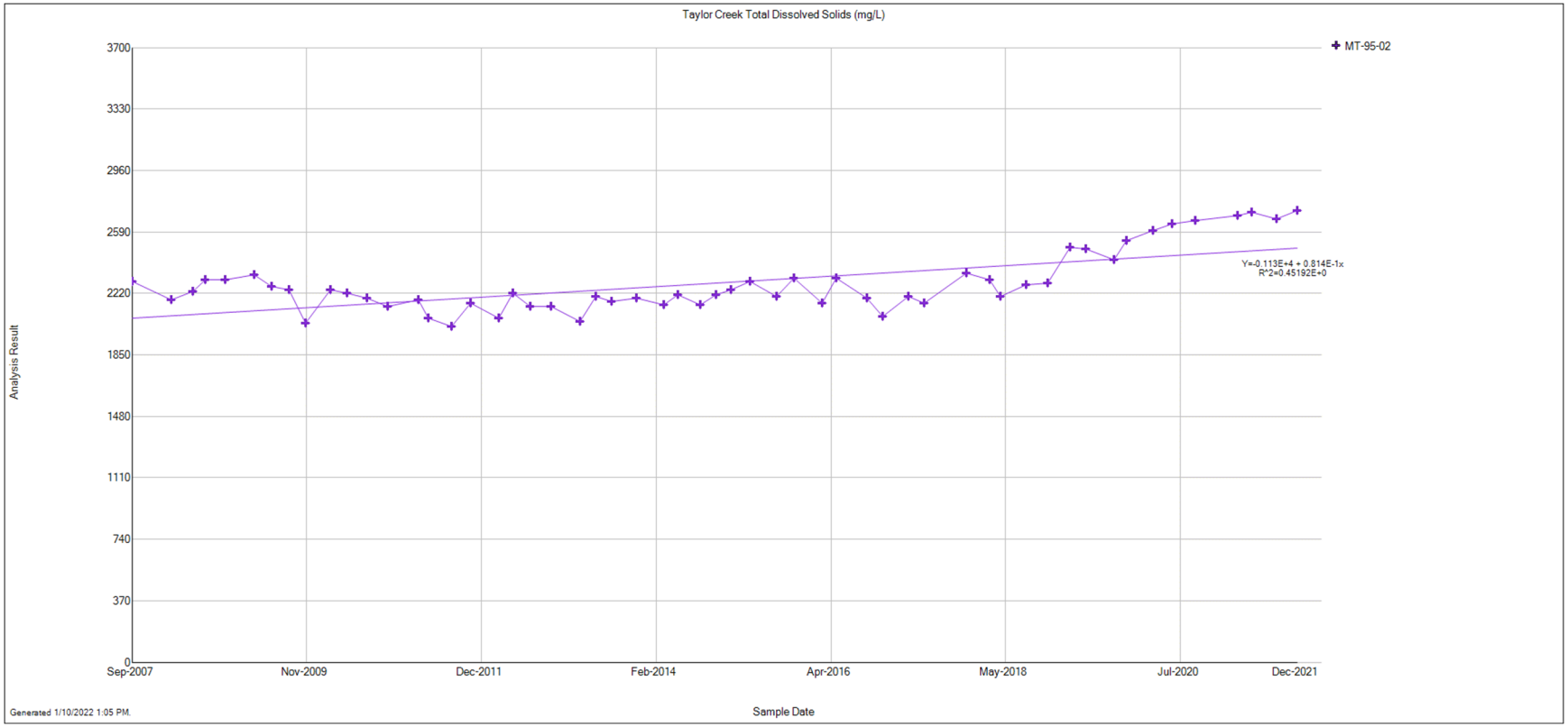

Taylor Creek Iron, dissolved (mg/L)
MT-95-02
Y=0.300E+0 -0.610E-5x
R^2=0.35271E+0
Analysis Result
0.06
0.054
0.048
0.042
0.036
0.03
0.024
0.018
0.012
0.006
0
Sep-2007
Nov-2009
Dec-2011
Feb-2014
Apr-2016
May-2018
Jul-2020
Dec-2021
Generated 1/10/2022 1:05 PM.
Sample Date

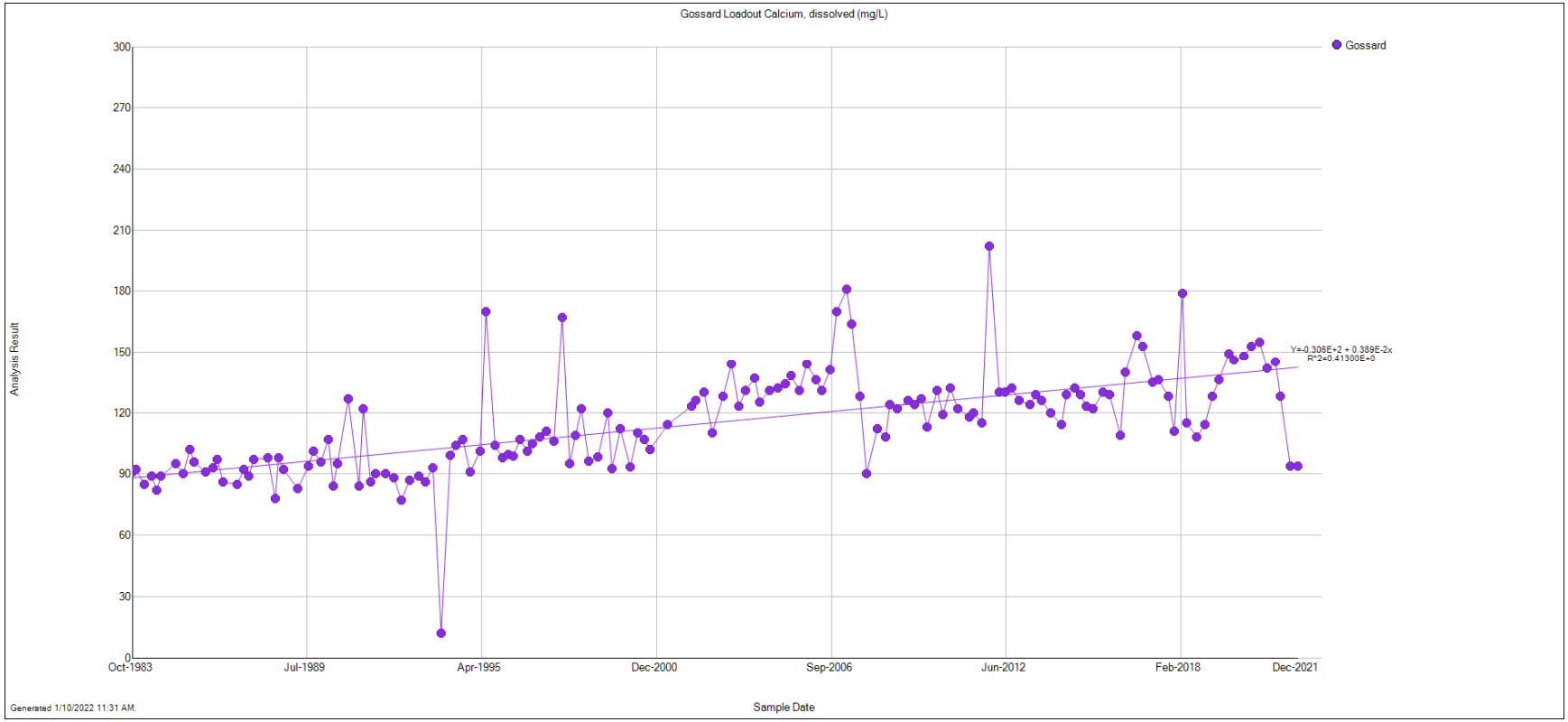

Taylor Creek Magnesium, dissolved (mg/L)
MT-95-02
Y=0.179E+3 + 0.503E-3x
R^2=0.35448E-2
Analysis Result
320
288
256
224
192
160
128
96
64
32
0
Sep-2007
Nov-2009
Dec-2011
Feb-2014
Apr-2016
May-2018
Jul-2020
Dec-2021
Sample Date
Generated 1/10/2022 1:05 PM.

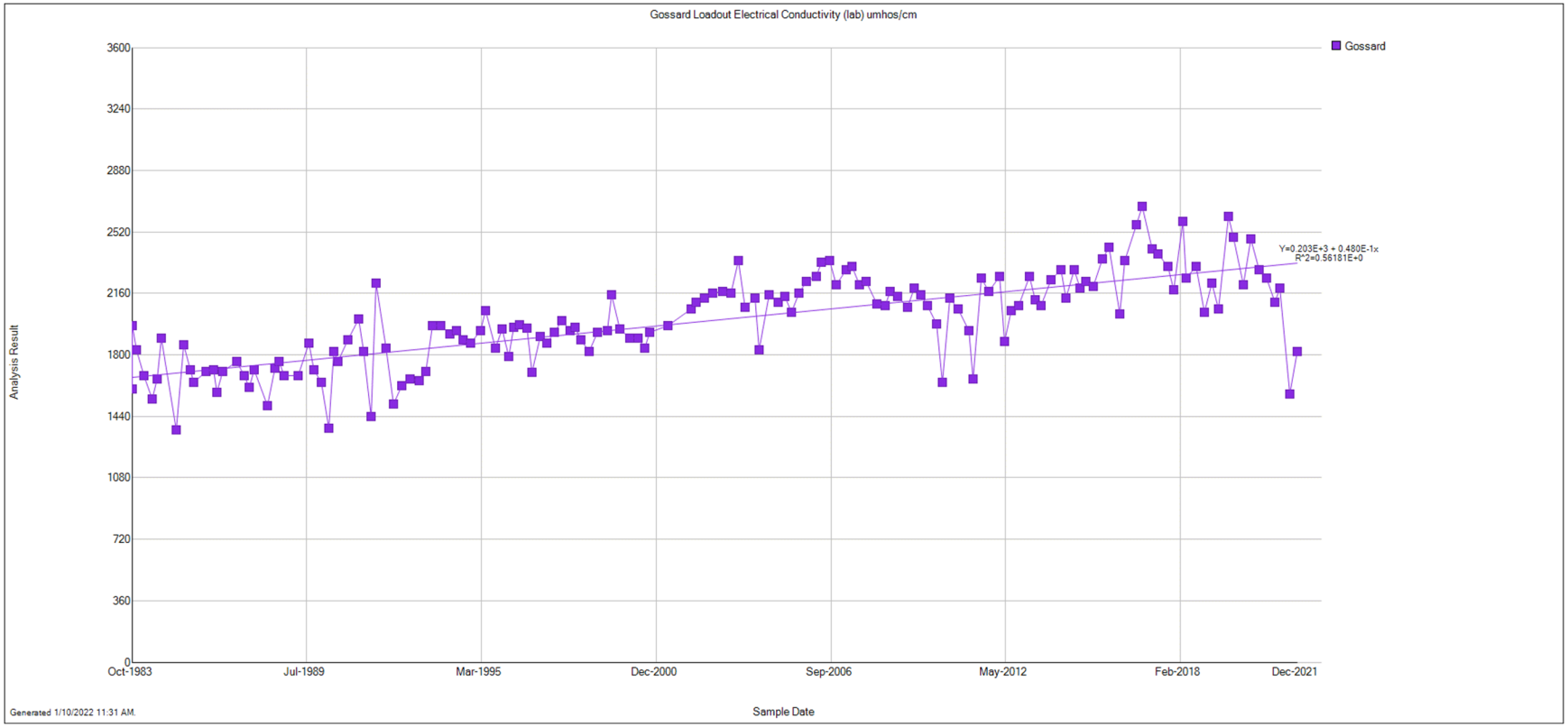

Taylor Creek pH (lab)
MT-95-02
Y=0.481E+1 + 0.757E-4x
R^2=0.28915E+0
Analysis Result
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
Sep-2007
Nov-2009
Dec-2011
Feb-2014
Apr-2016
May-2018
Jul-2020
Dec-2021
Sample Date
Generated 1/10/2022 2:39 PM.

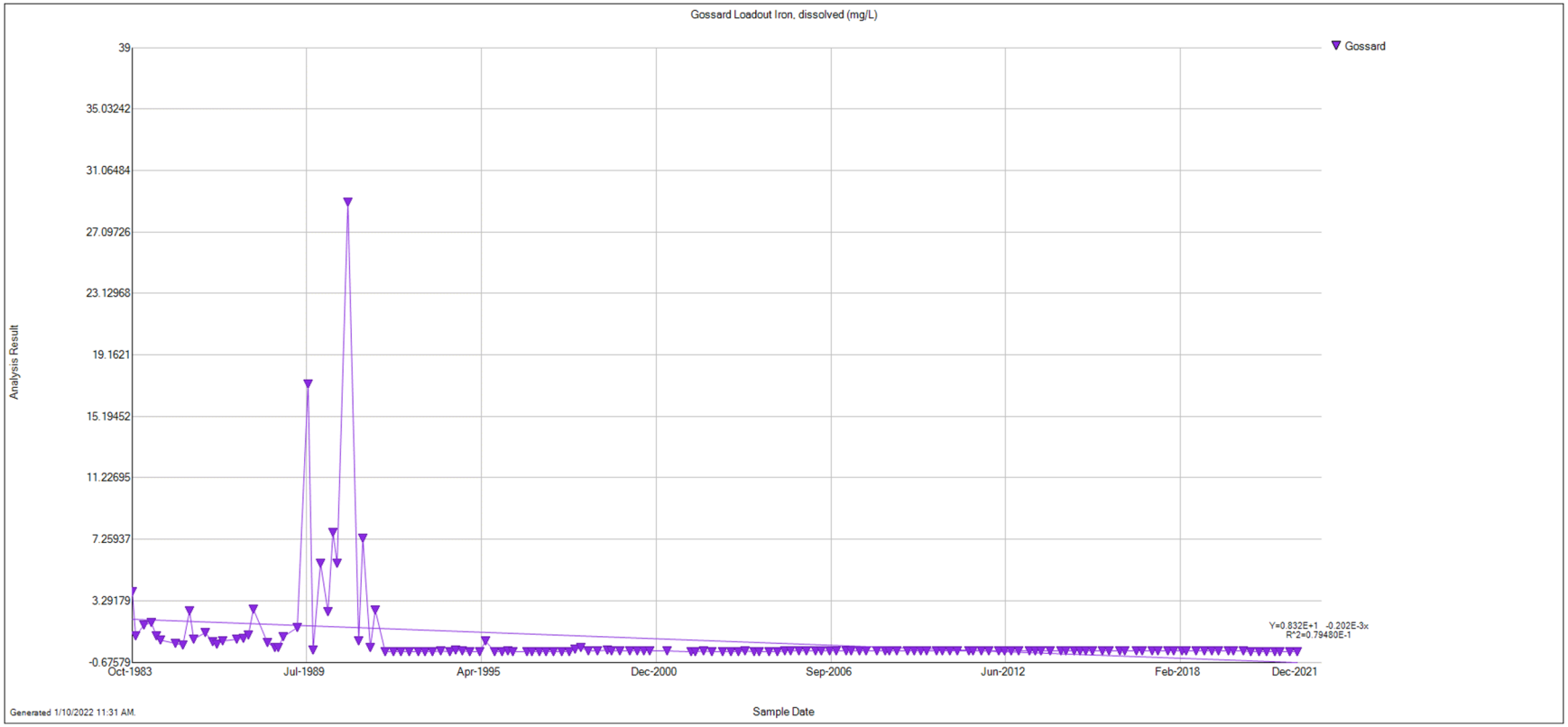

Taylor Creek Sodium, dissolved (mg/L)
MT-95-02
Y=-0.115E+4 + 0.323E-1x
R^2=0.71127E+0
Analysis Result
470
423
376
329
282
235
188
141
94
47
0
Sep-2007
Nov-2009
Dec-2011
Feb-2014
Apr-2016
May-2018
Jul-2020
Dec-2021
Sample Date
Generated 1/10/2022 1:05 PM.

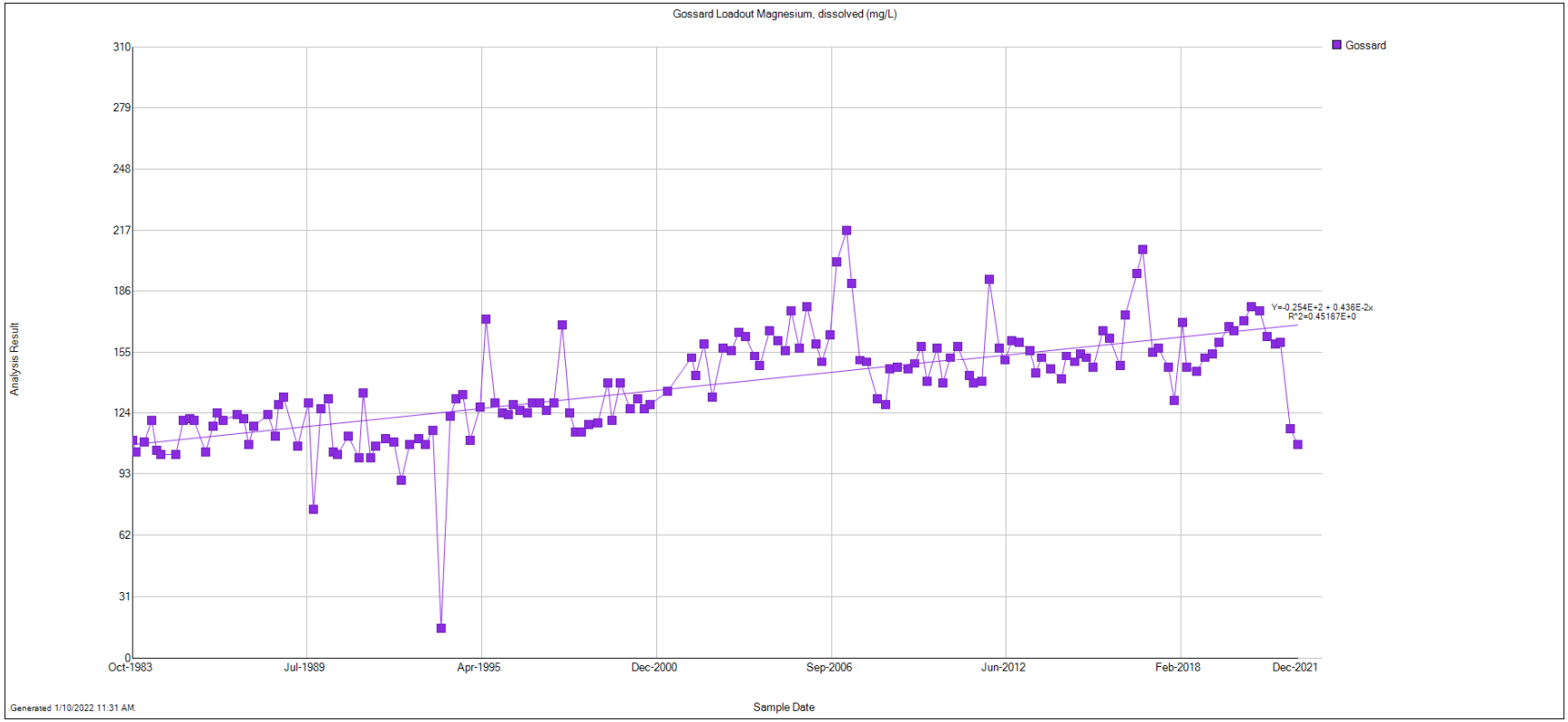

Taylor Creek Sulfate, dissolved (mg/L)
MLC-04-01
Analysis Result
600
540
480
420
360
300
240
180
120
60
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.195E+4 -0.399E-1x
R^2=0.15662E+0
Generated 1/10/2022 1:03 PM.
Sample Date

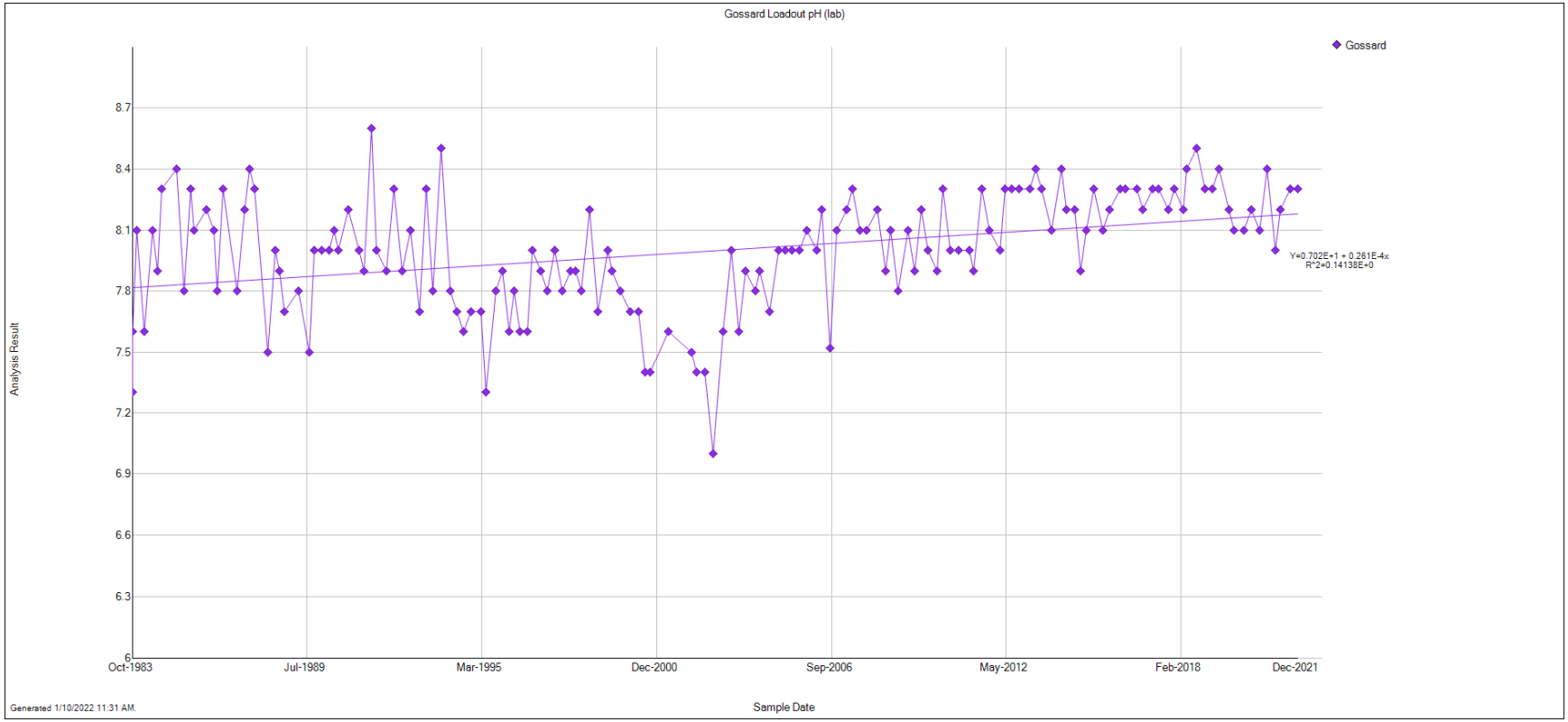

Taylor Creek Total Dissolved Solids (mg/L)
MT-95-02
Y=-0.113E+4 + 0.814E-1x
R^2=0.45192E+0
Analysis Result
3700
3330
2960
2590
2220
1850
1480
1110
740
370
0
Sep-2007
Nov-2009
Dec-2011
Feb-2014
Apr-2016
May-2018
Jul-2020
Dec-2021
Generated 1/10/2022 1:05 PM.
Sample Date

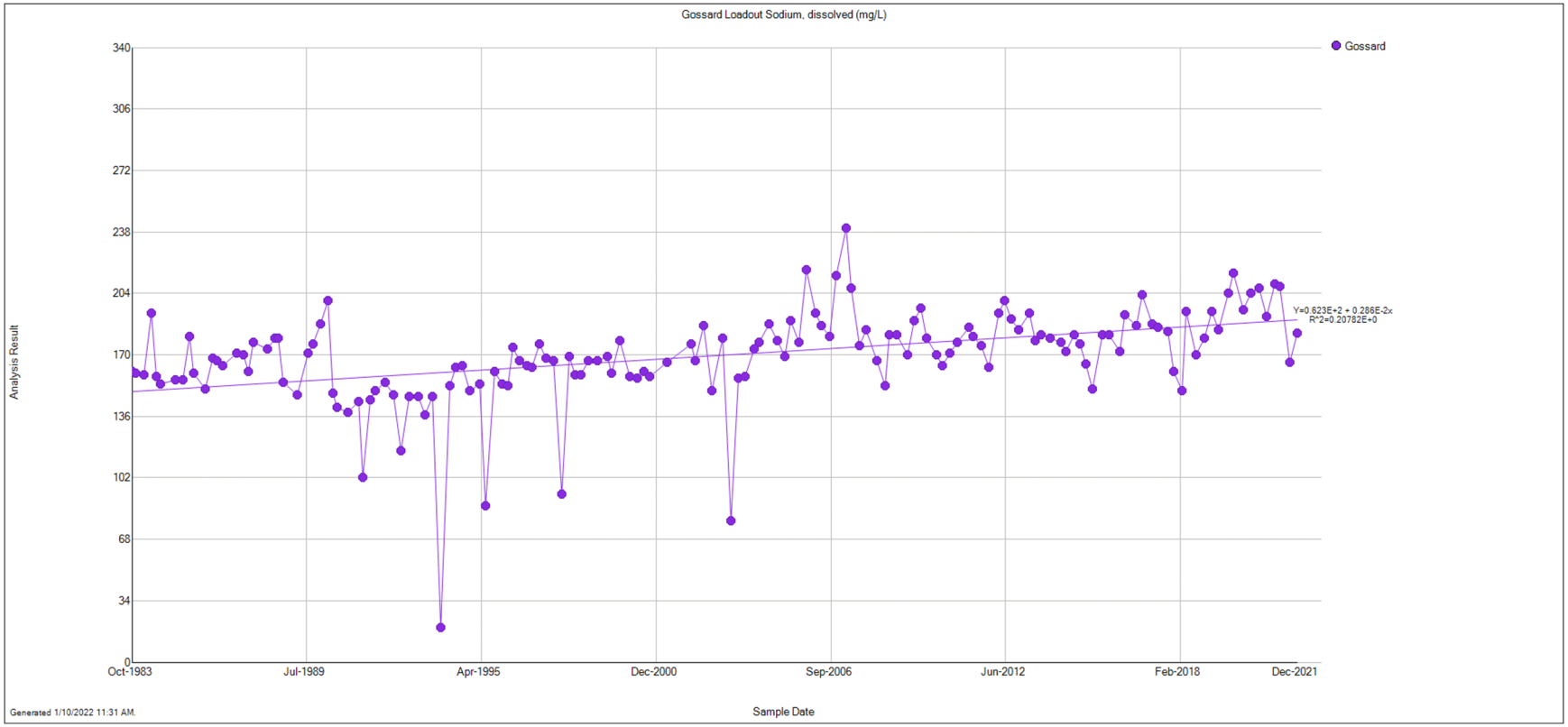

Gossard Loadout Calcium, dissolved (mg/L)
Gossard
Y=-0.306E+2 + 0.389E-2x
R^2=0.41300E+0
Analysis Result
300
270
240
210
180
150
120
90
60
30
0
Oct-1983
Jul-1989
Apr-1995
Dec-2000
Sep-2006
Jun-2012
Feb-2018
Dec-2021
Generated 1/10/2022 11:31 AM.
Sample Date

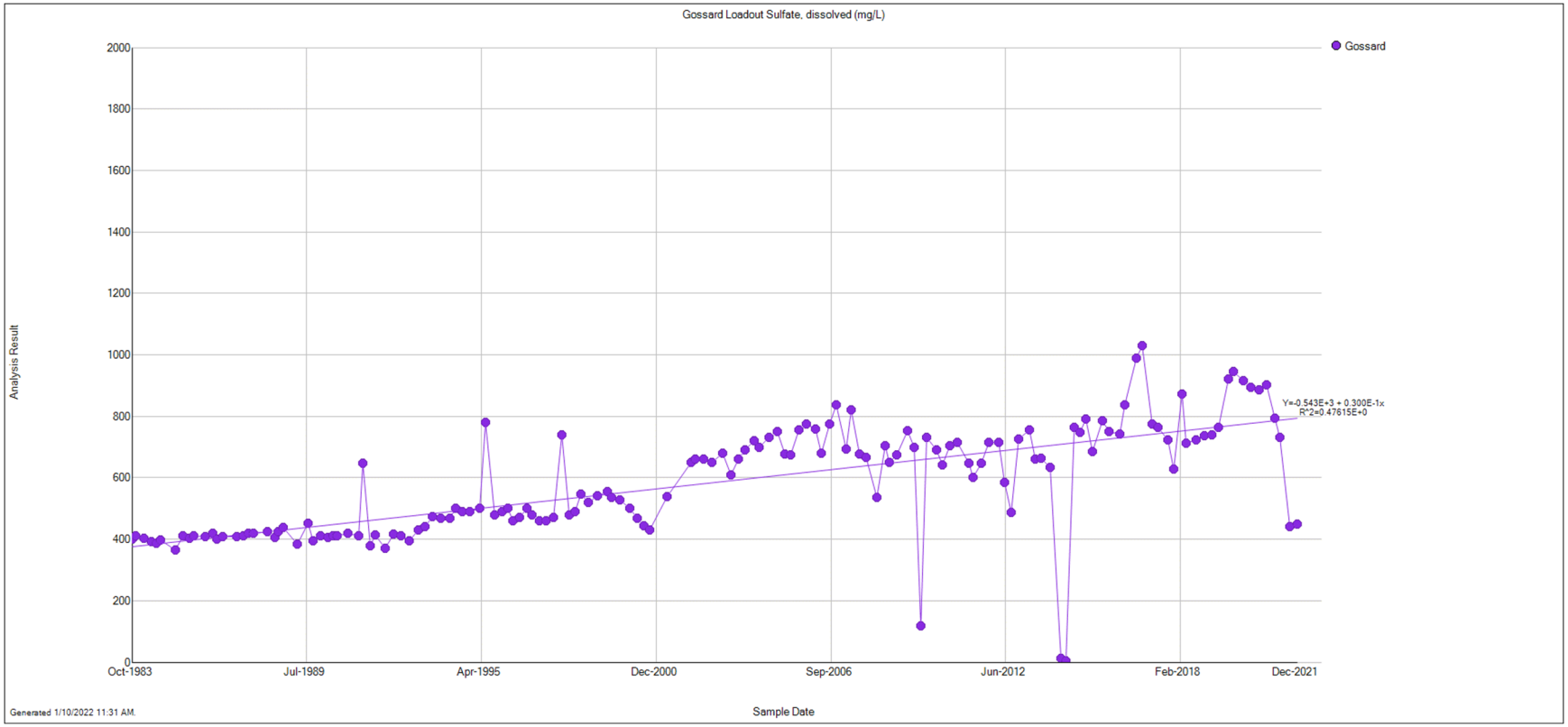

Gossard Loadout Electrical Conductivity (lab) umhos/cm
Gossard
Y=0.203E+3 + 0.480E-1x
R^2=0.56181E+0
Analysis Result
3600
3240
2880
2520
2160
1800
1440
1080
720
360
0
Oct-1983
Jul-1989
Mar-1995
Dec-2000
Sep-2006
May-2012
Feb-2018
Dec-2021
Generated 1/10/2022 11:31 AM.
Sample Date

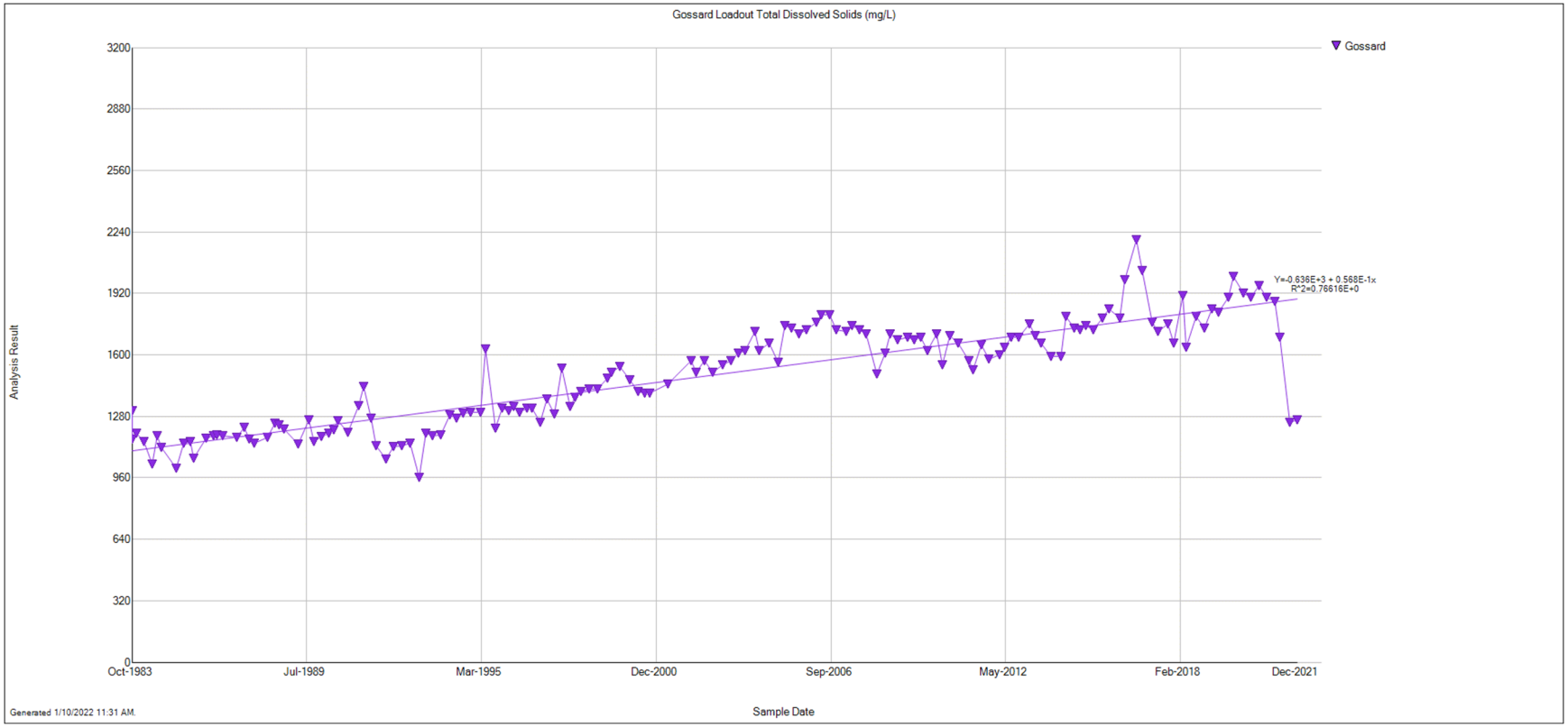

Gossard Loadout Iron, dissolved (mg/L)
Gossard
39
35.03242
31.06484
27.09726
23.12968
19.1621
15.19452
11.22695
7.25937
3.29179
-0.67579
Analysis Result
Oct-1983
Jul-1989
Apr-1995
Dec-2000
Sep-2006
Jun-2012
Feb-2018
Dec-2021
Sample Date
Y=8.832E+1 -0.202E-3x
R^2=0.79480E-1
Generated 1/10/2022 11:31 AM.

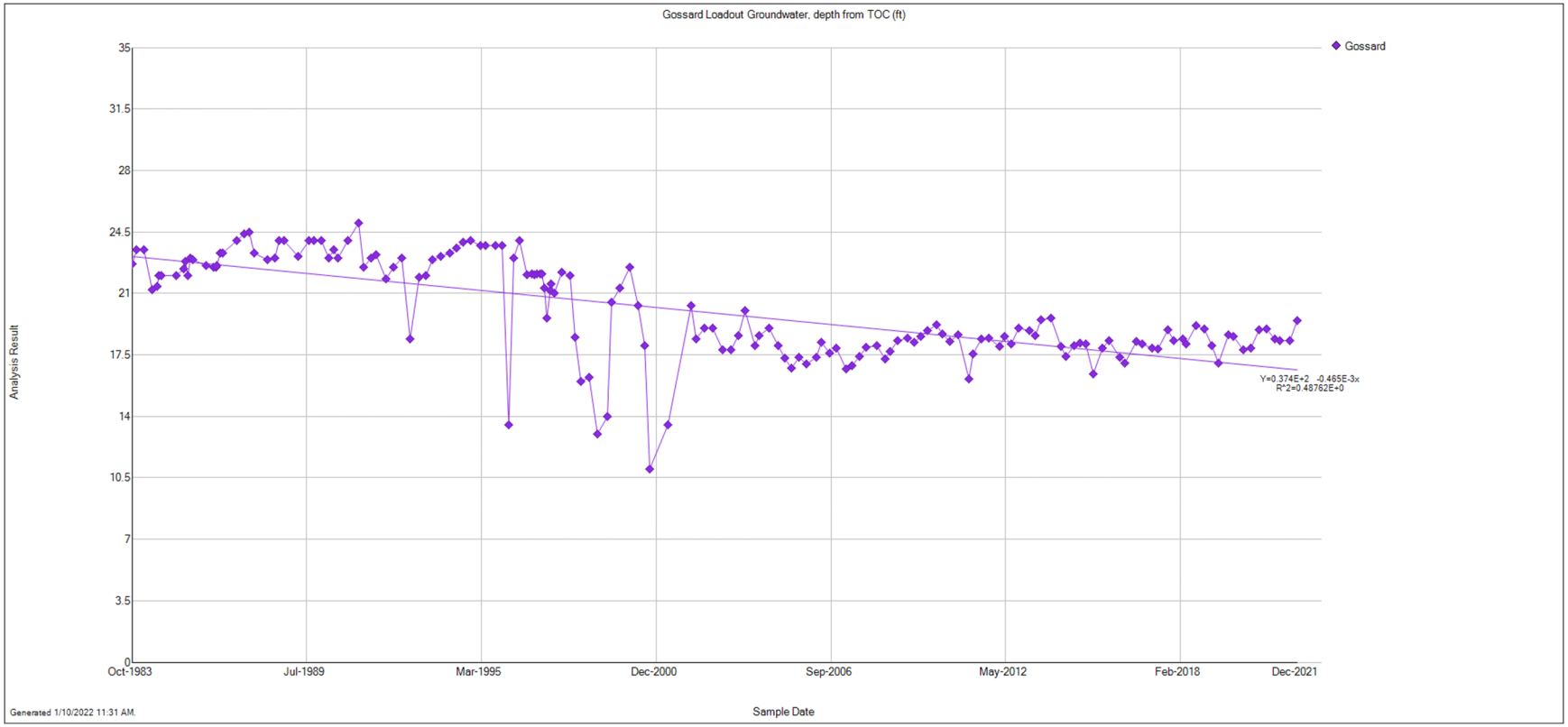

Gossard Loadout Magnesium, dissolved (mg/L)
Gossard
Y=-0.254E+2 + 0.436E-2x
R^2=0.45167E+0
Analysis Result
310
279
248
217
186
155
124
93
62
31
0
Oct-1983
Jul-1989
Apr-1995
Dec-2000
Sep-2006
Jun-2012
Feb-2018
Dec-2021
Generated 1/10/2022 11:31 AM.
Sample Date

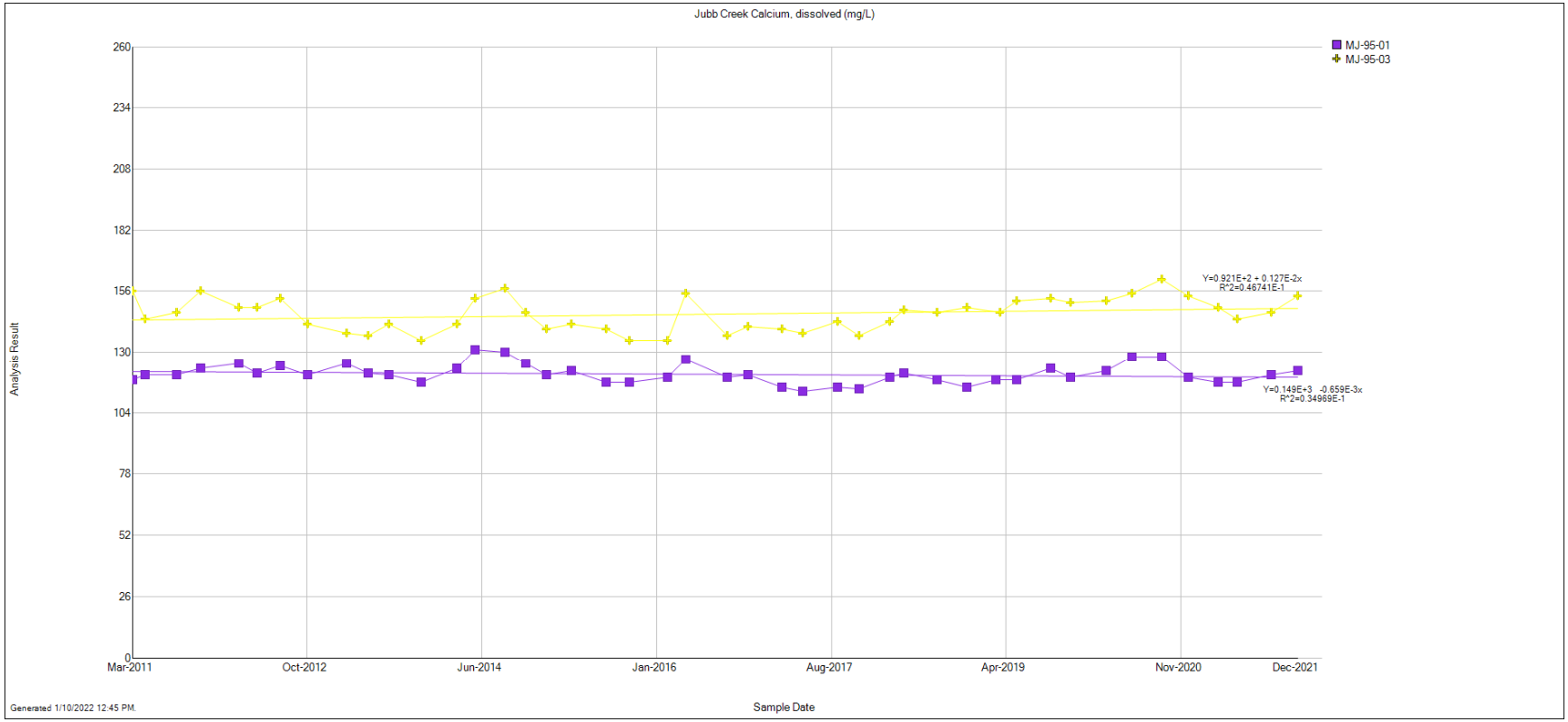

Gossard Loadout pH (lab)
Gossard
Y=0.702E+1 + 0.261E-4x
R^2=0.14138E+0
Analysis Result
8.7
8.4
8.1
7.8
7.5
7.2
6.9
6.6
6.3
6
Oct-1983
Jul-1989
Mar-1995
Dec-2000
Sep-2006
May-2012
Feb-2018
Dec-2021
Generated 1/10/2022 11:31 AM.
Sample Date

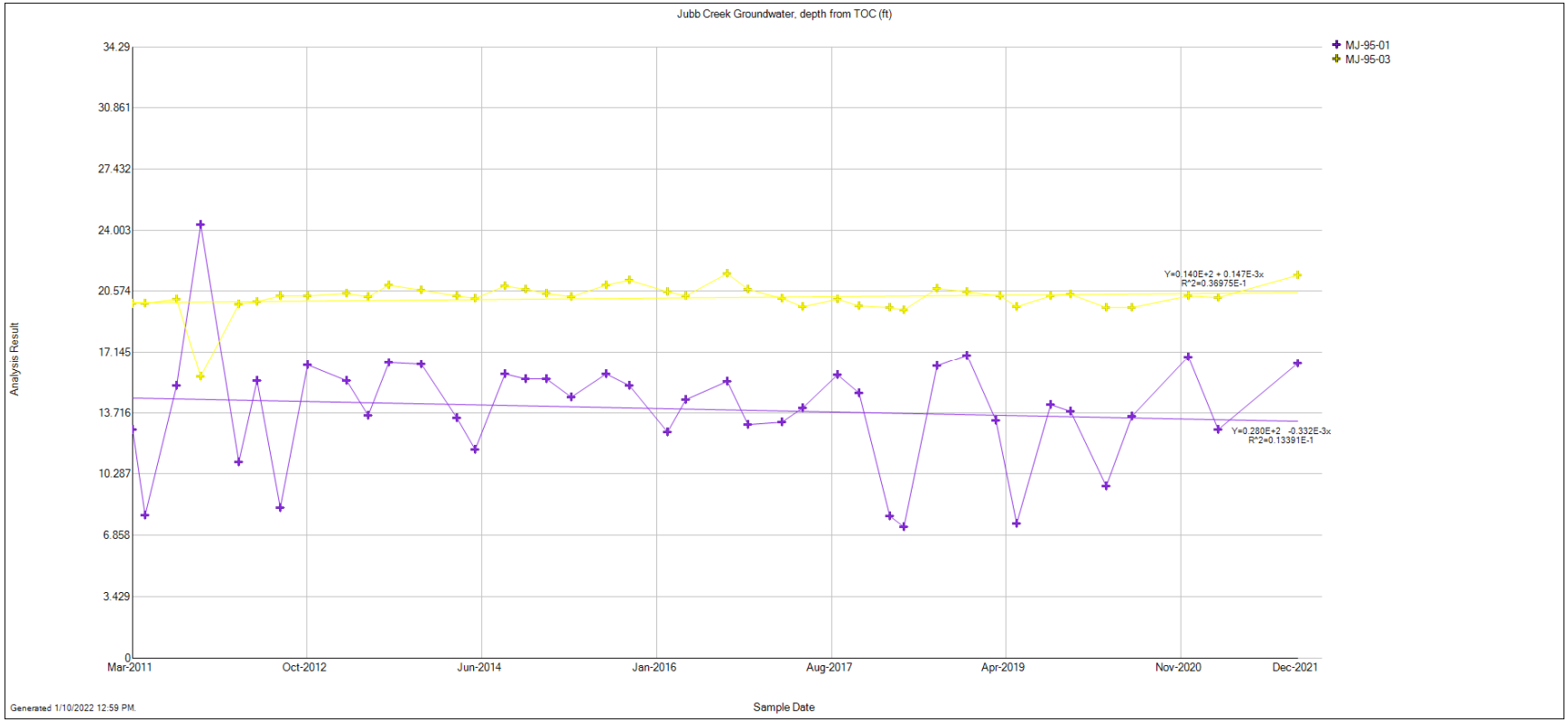

Gossard Loadout Sodium, dissolved (mg/L)
Gossard
Y=0.623E+2 + 0.286E-2x
R^2=0.20782E+0
Analysis Result
340
306
272
238
204
170
136
102
68
34
0
Oct-1983
Jul-1989
Apr-1995
Dec-2000
Sep-2006
Jun-2012
Feb-2018
Dec-2021
Sample Date
Generated 1/10/2022 11:31 AM.

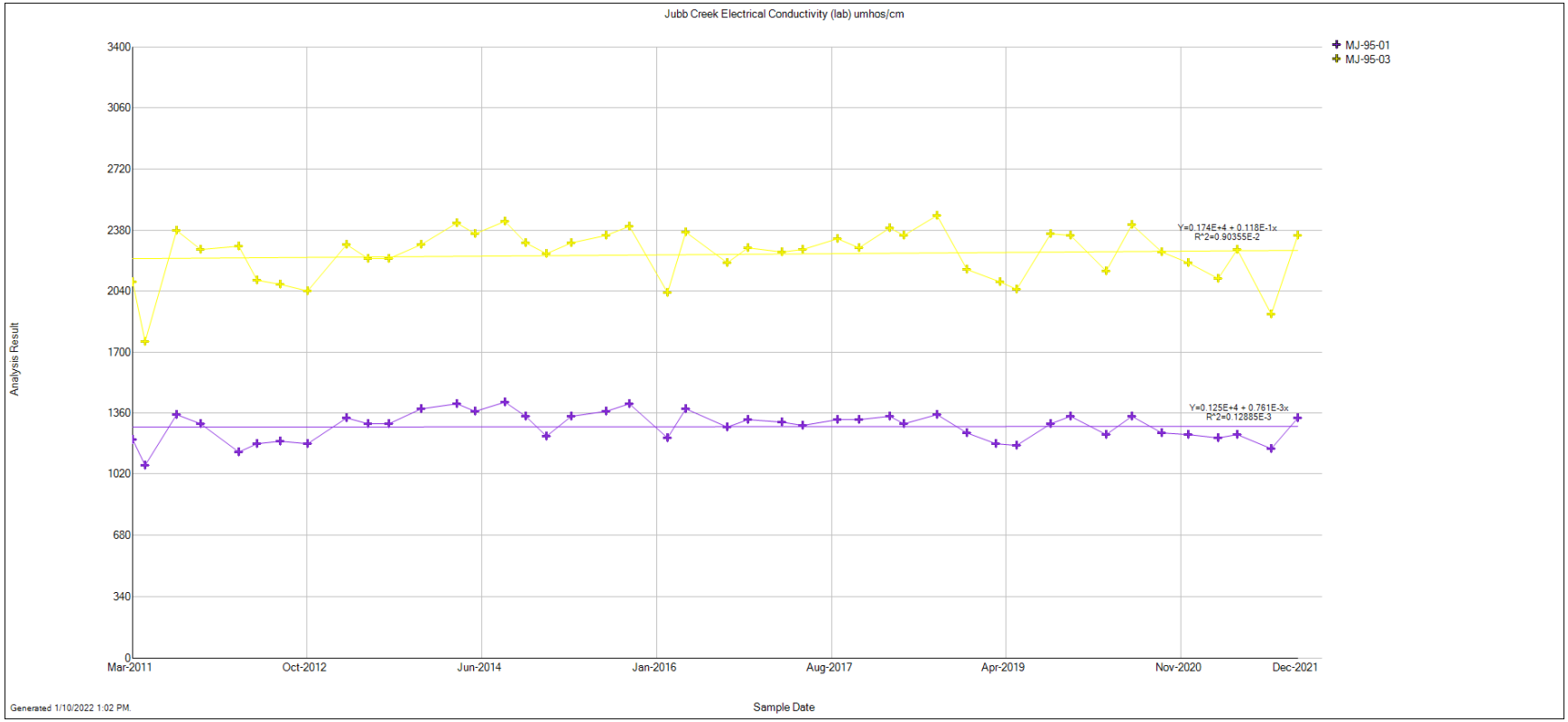

Gossard Loadout Sulfate, dissolved (mg/L)
Gossard
Analysis Result
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Oct-1983
Jul-1989
Apr-1995
Dec-2000
Sep-2006
Jun-2012
Feb-2018
Dec-2021
Y=-0.543E+3 + 0.300E-1x
R^2=0.47615E+0
Generated 1/10/2022 11:31 AM.
Sample Date

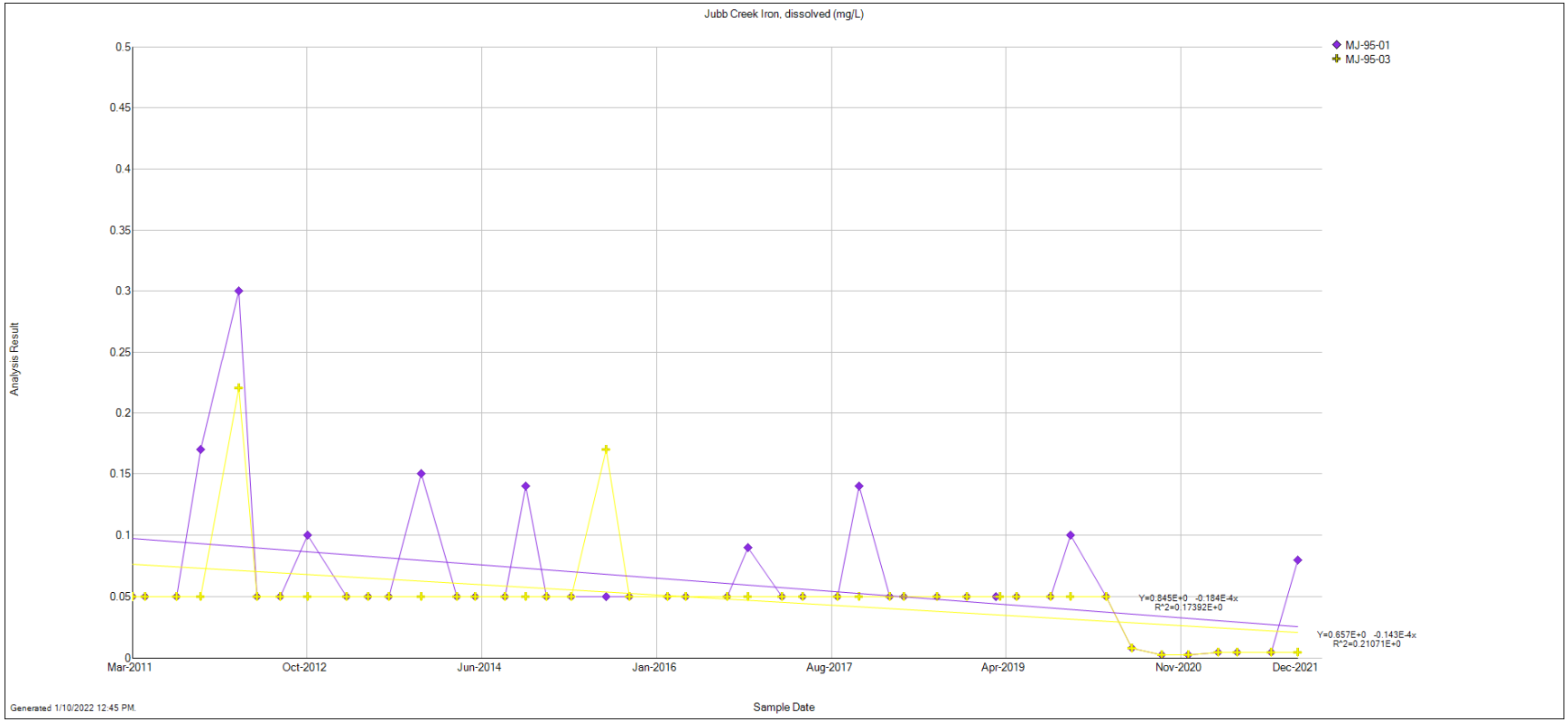

Gossard Loadout Total Dissolved Solids (mg/L)
Gossard
Y=-0.636E+3 + 0.568E-1x
R^2=0.76616E+0
Analysis Result
3200
2880
2560
2240
1920
1600
1280
960
640
320
0
Oct-1983
Jul-1989
Mar-1995
Dec-2000
Sep-2006
May-2012
Feb-2018
Dec-2021
Generated 1/10/2022 11:31 AM.
Sample Date

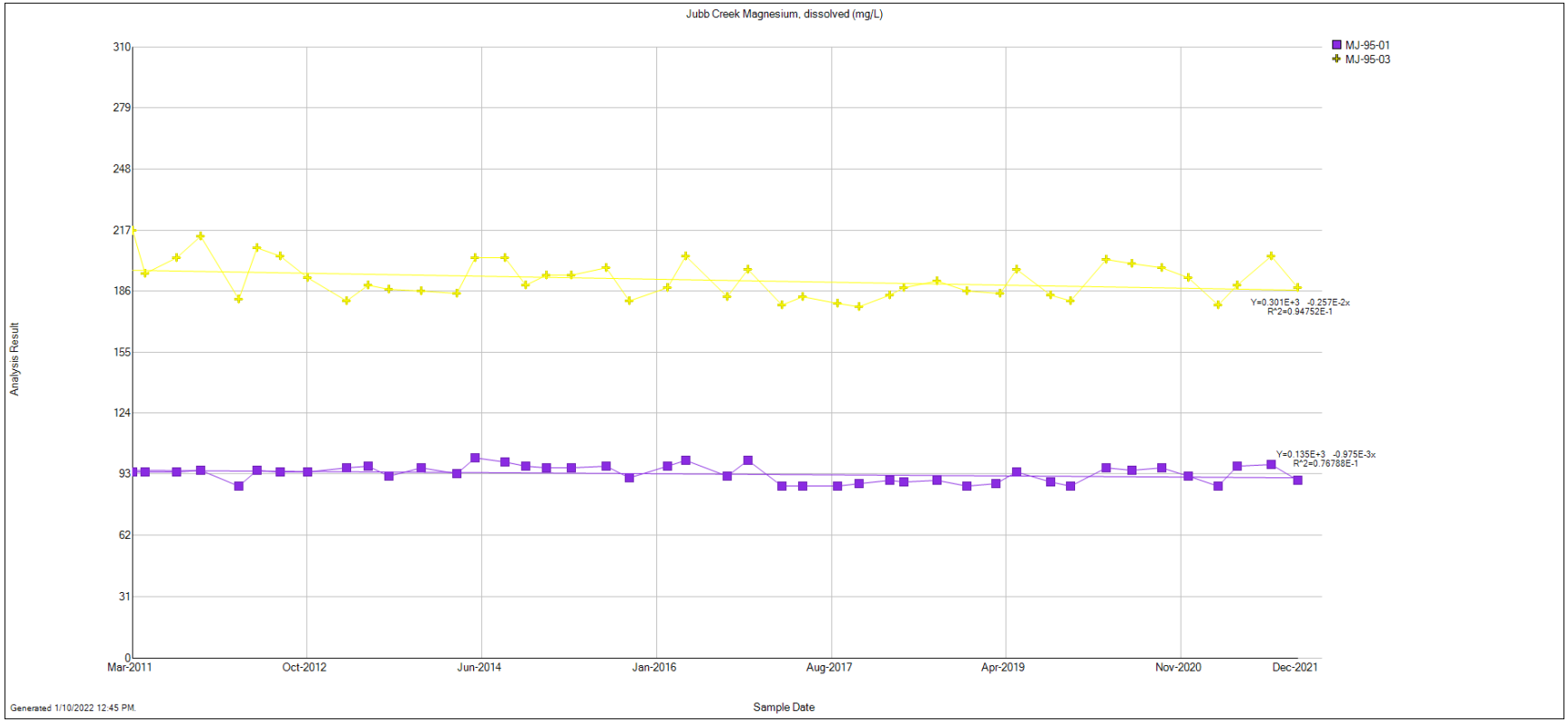

Gossard Loadout Groundwater, depth from TOC (ft)
Gossard
Analysis Result
35
31.5
28
24.5
21
17.5
14
10.5
7
3.5
0
Oct-1983
Jul-1989
Mar-1995
Dec-2000
Sep-2006
May-2012
Feb-2018
Dec-2021
Y=0.374E+2 -0.465E-3x
R^2=0.48762E+0
Generated 1/10/2022 11:31 AM.
Sample Date

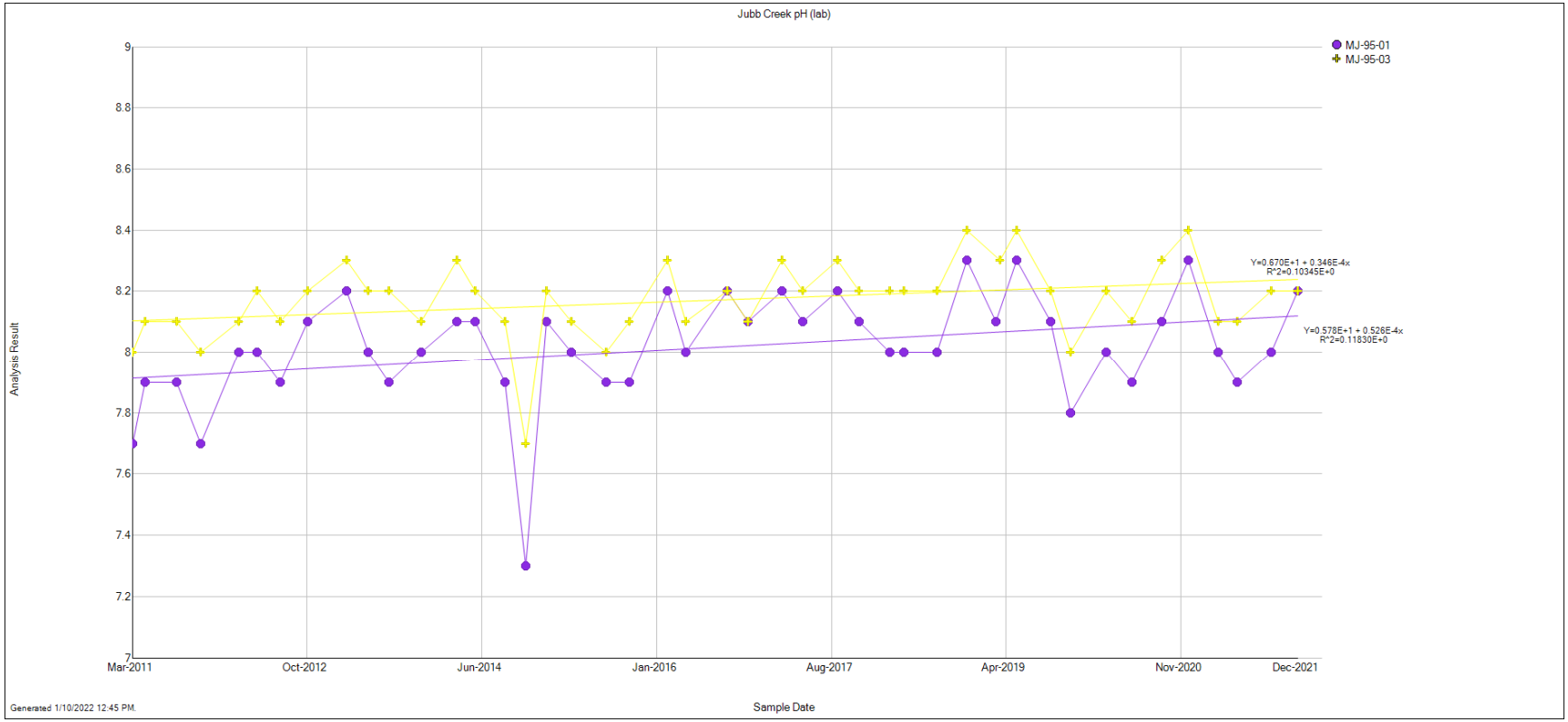

Jubb Creek Calcium, dissolved (mg/L)
MJ-95-01
MJ-95-03
Y=0.921E+2 + 0.127E-2x
R^2=0.46741E-1
Y=0.149E+3 -0.659E-3x
R^2=0.34969E-1
Analysis Result
260
234
208
182
156
130
104
78
52
26
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 12:45 PM.
Sample Date

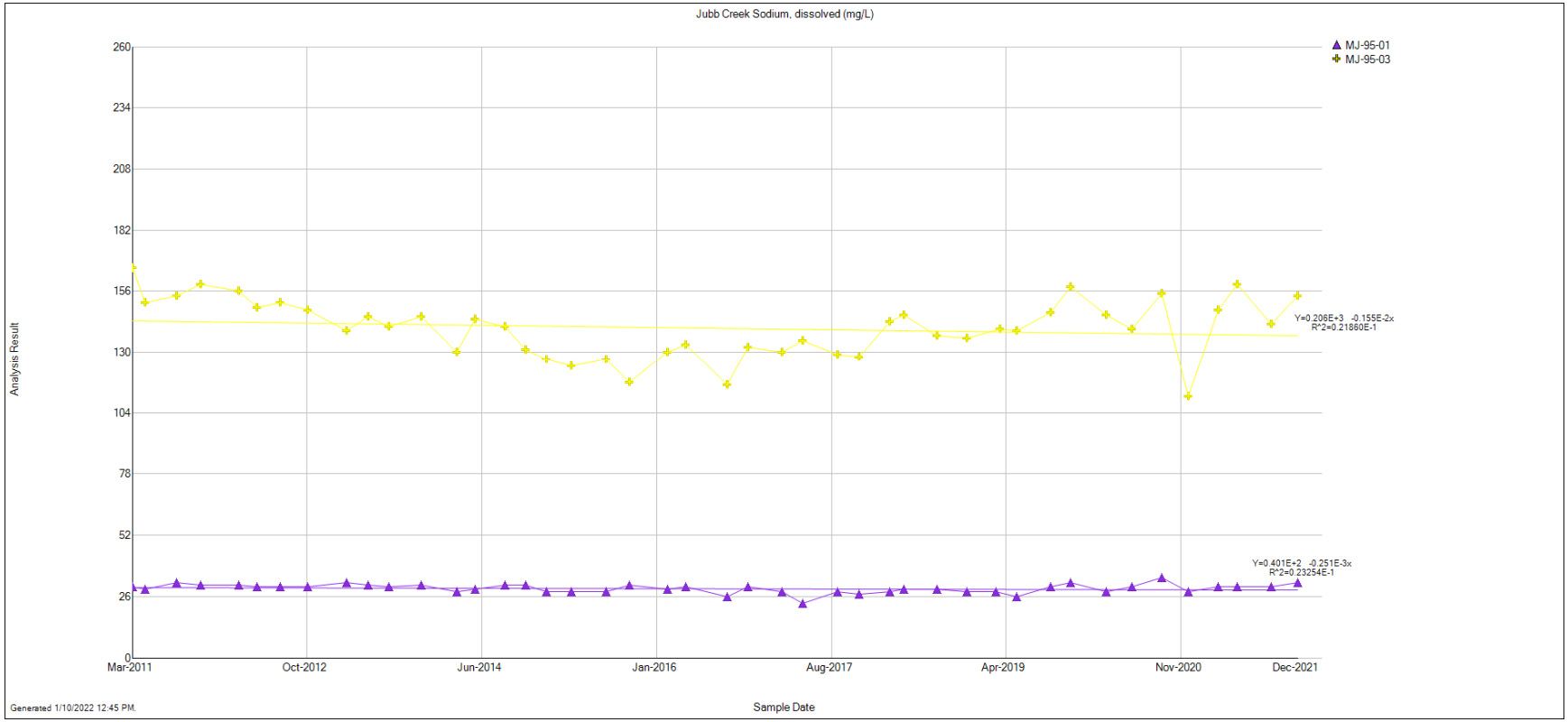

Jubb Creek Groundwater, depth from TOC (ft)
MJ-95-01
MJ-95-03
Y=0.140E+2 + 0.147E-3x
R^2=0.36975E-1
Y=0.280E+2 -0.332E-3x
R^2=0.13391E-1
34.29
30.861
27.432
24.003
20.574
17.145
13.716
10.287
6.858
3.429
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Analysis Result
Sample Date
Generated 1/10/2022 12:59 PM.

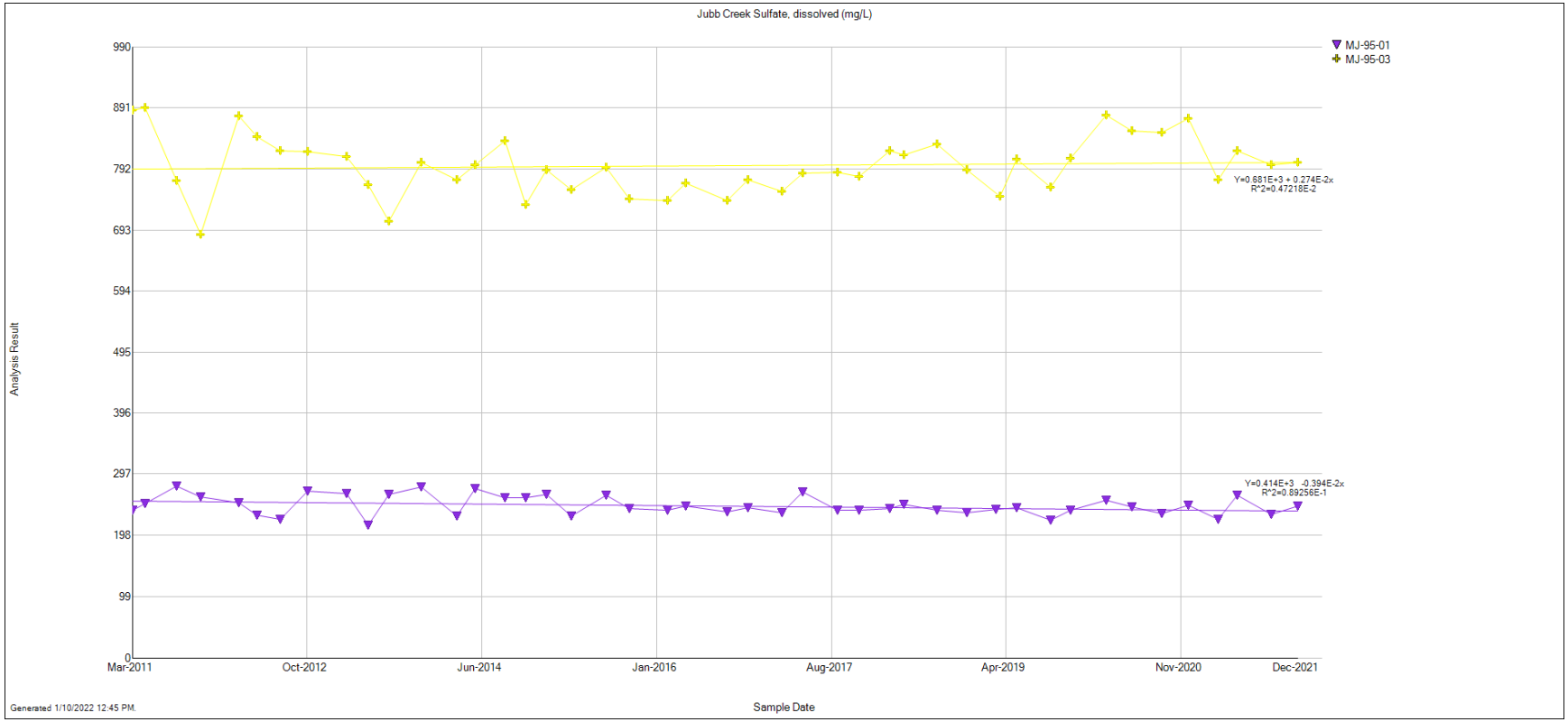

Jubb Creek Electrical Conductivity (lab) umhos/cm
MJ-95-01
MJ-95-03
Y=0.174E+4 + 0.118E-1x
R^2=0.90355E-2
Y=0.125E+4 + 0.761E-3x
R^2=0.12885E-3
Analysis Result
3400
3060
2720
2380
2040
1700
1360
1020
680
340
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 1:02 PM.
Sample Date

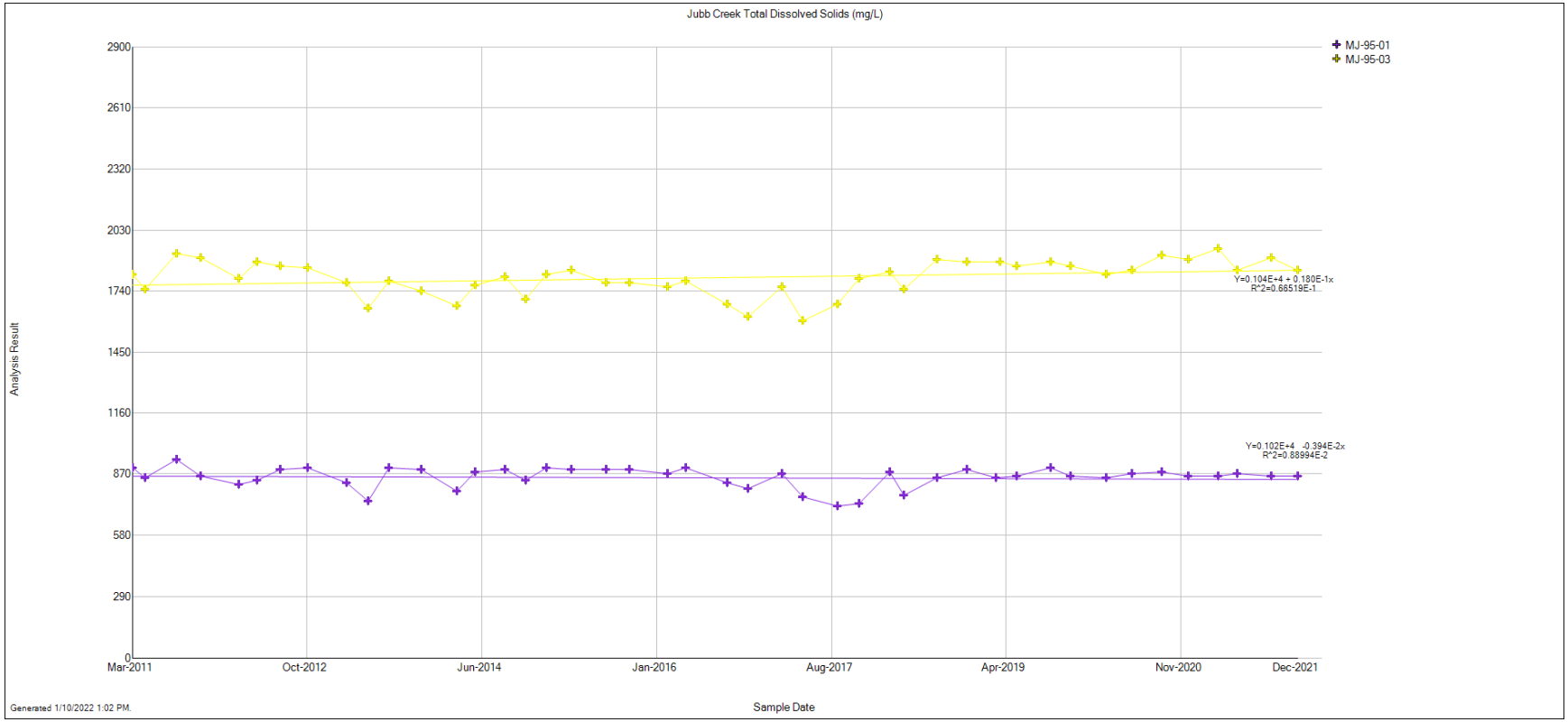

Jubb Creek Iron, dissolved (mg/L)
MJ-95-01
MJ-95-03
Analysis Result
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.845E+0 -0.184E-4x
R^2=0.17392E+0
Y=0.657E+0 -0.143E-4x
R^2=0.21071E+0
Generated 1/10/2022 12:45 PM.
Sample Date

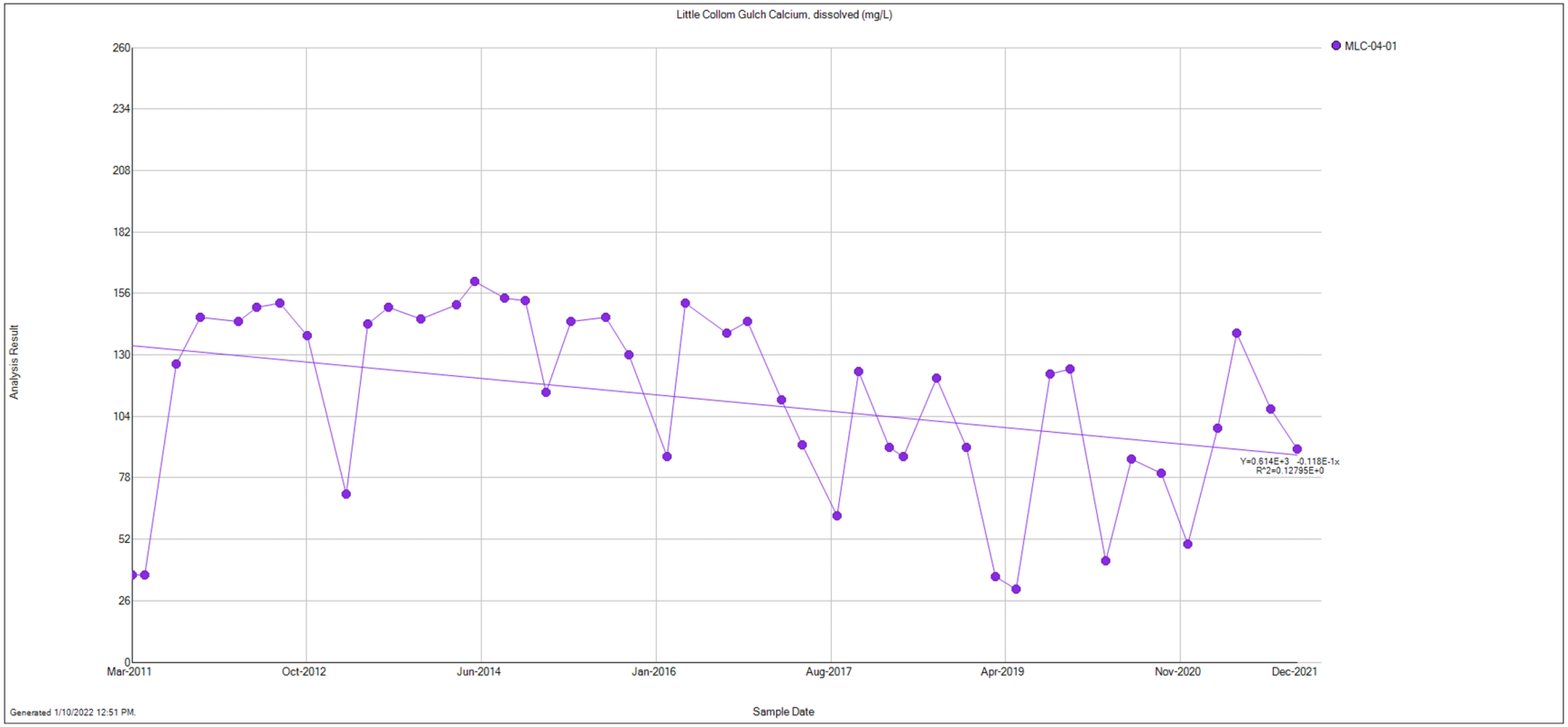

Jubb Creek Magnesium, dissolved (mg/L)
MJ-95-01
MJ-95-03
Y=0.301E+3 -0.257E-2x
R^2=0.94752E-1
Y=0.135E+3 -0.975E-3x
R^2=0.76788E-1
Analysis Result
310
279
248
217
186
155
124
93
62
31
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 12:45 PM.
Sample Date

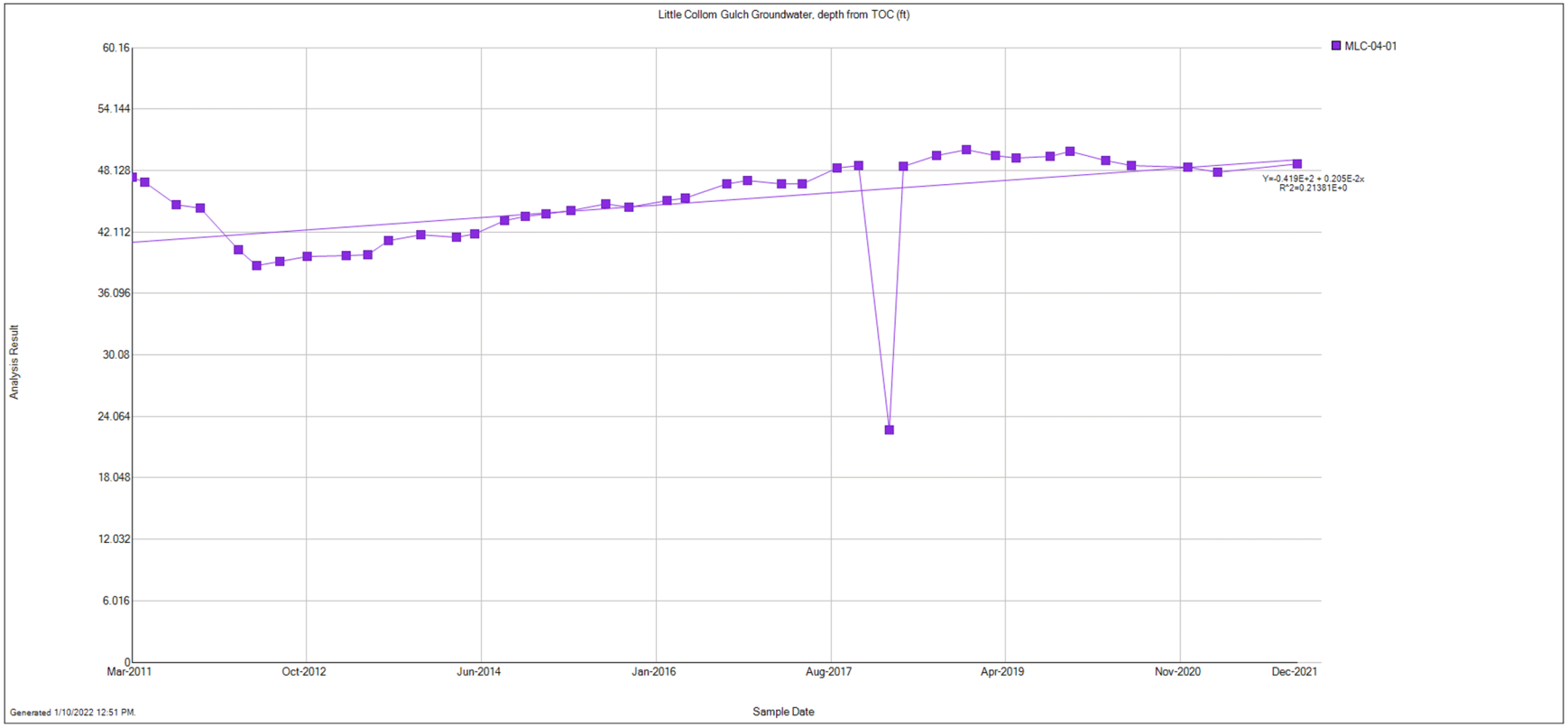

Jubb Creek pH (lab)
MJ-95-01
MJ-95-03
Y=0.670E+1 + 0.346E-4x
R^2=0.10345E+0
Y=0.578E+1 + 0.526E-4x
R^2=0.11830E+0
Analysis Result
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 12:45 PM.
Sample Date

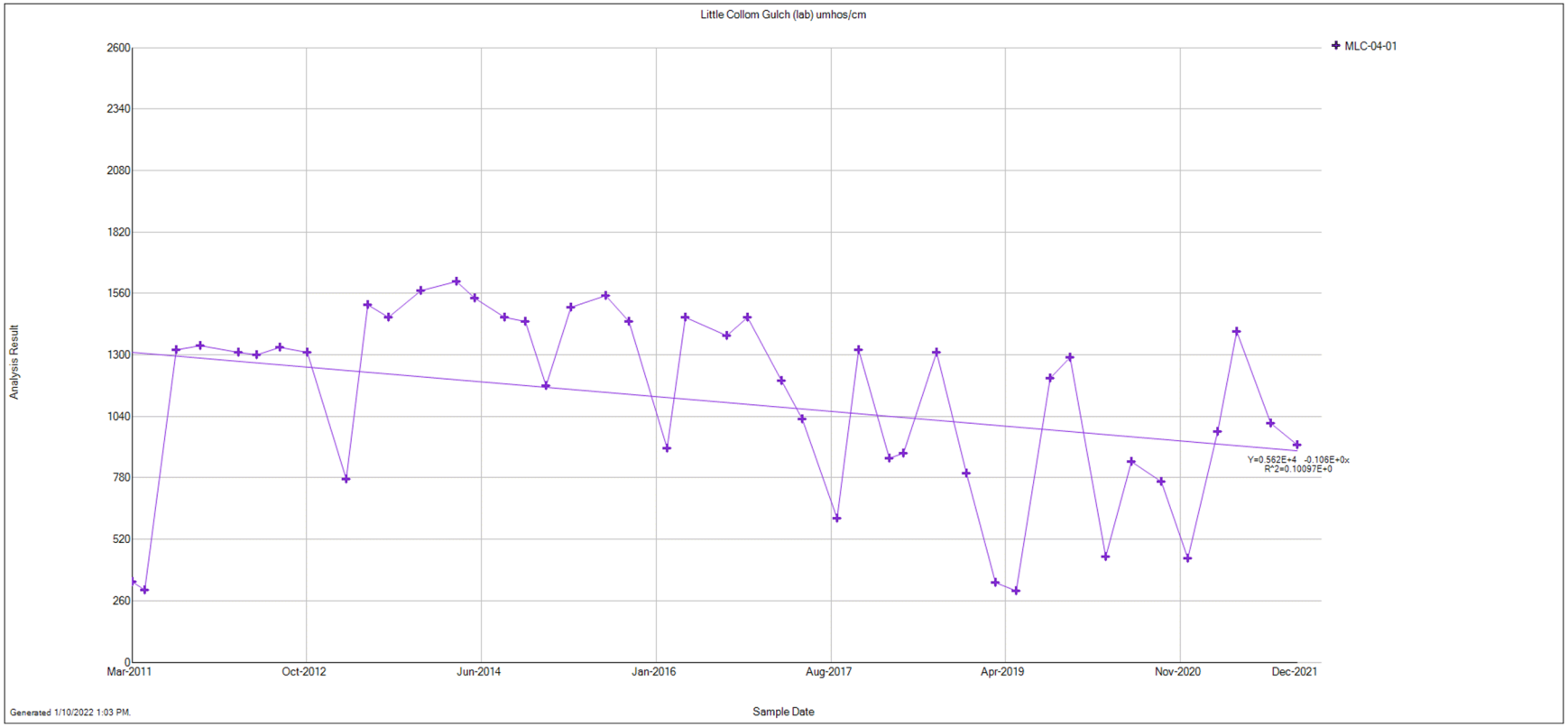

Jubb Creek Sodium, dissolved (mg/L)
MJ-95-01
MJ-95-03
Y=0.206E+3 -0.155E-2x
R^2=0.21880E-1
Y=0.401E+2 -0.251E-3x
R^2=0.23254E-1
Analysis Result
260
234
208
182
156
130
104
78
52
26
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 12:45 PM.
Sample Date

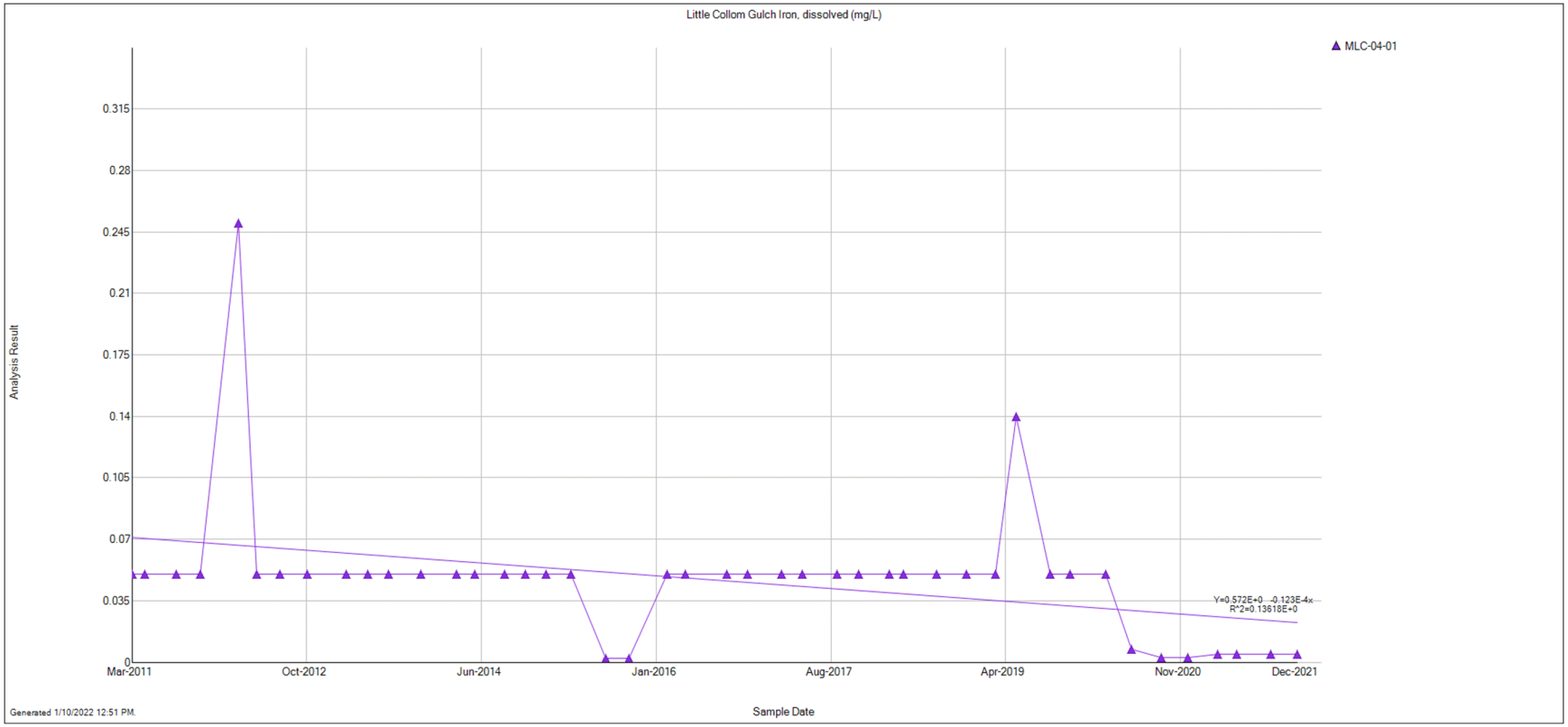

Jubb Creek Sulfate, dissolved (mg/L)
MJ-95-01
MJ-95-03
Y=0.681E+3 + 0.274E-2x
R^2=0.47218E-2
Y=0.414E+3 -0.394E-2x
R^2=0.89256E-1
Analysis Result
990
891
792
693
594
495
396
297
198
99
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 12:45 PM.
Sample Date

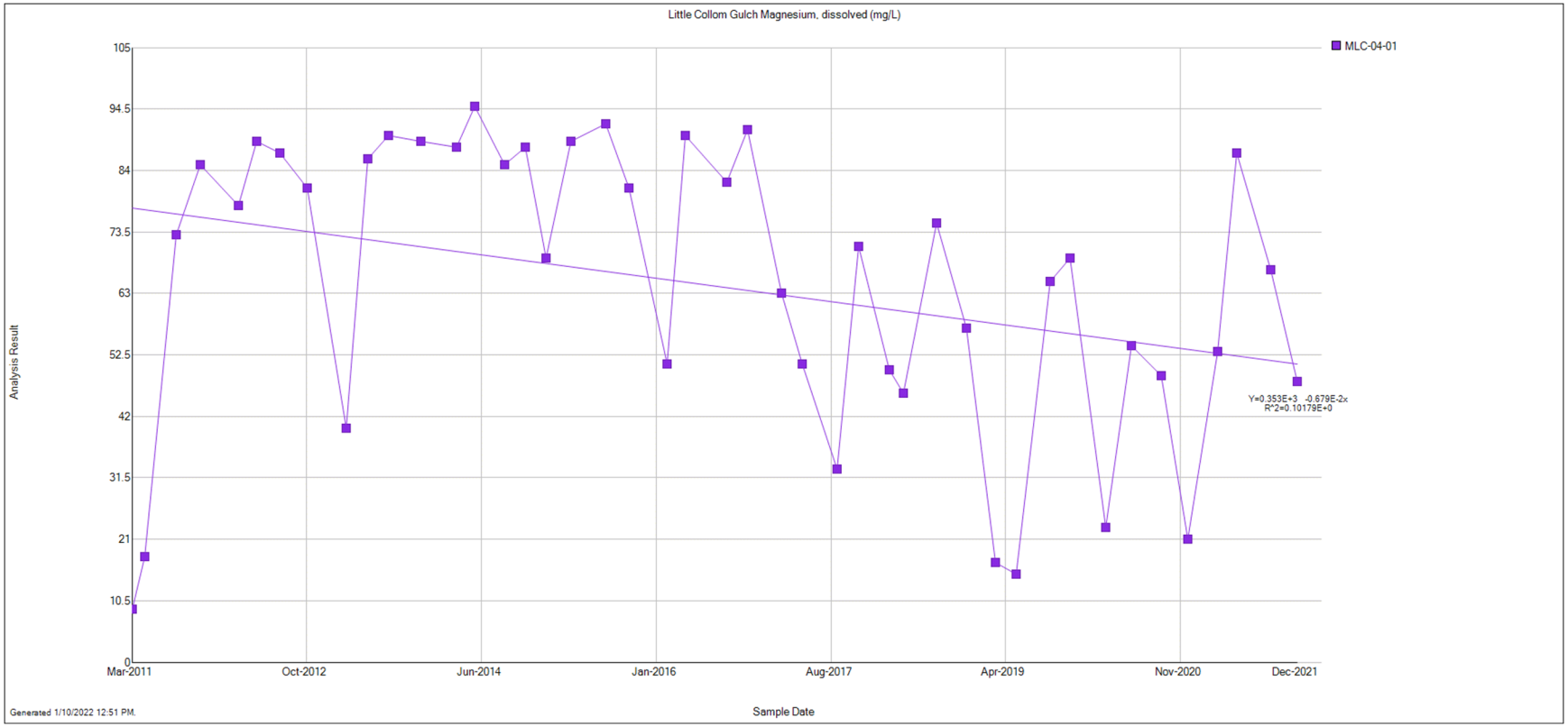

Jubb Creek Total Dissolved Solids (mg/L)
MJ-95-01
MJ-95-03
Y=0.104E+4 + 0.180E-1x
R^2=0.66519E-1
Y=0.102E+4 -0.394E-2x
R^2=0.88994E-2
Analysis Result
2900
2610
2320
2030
1740
1450
1160
870
580
290
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 1:02 PM.
Sample Date

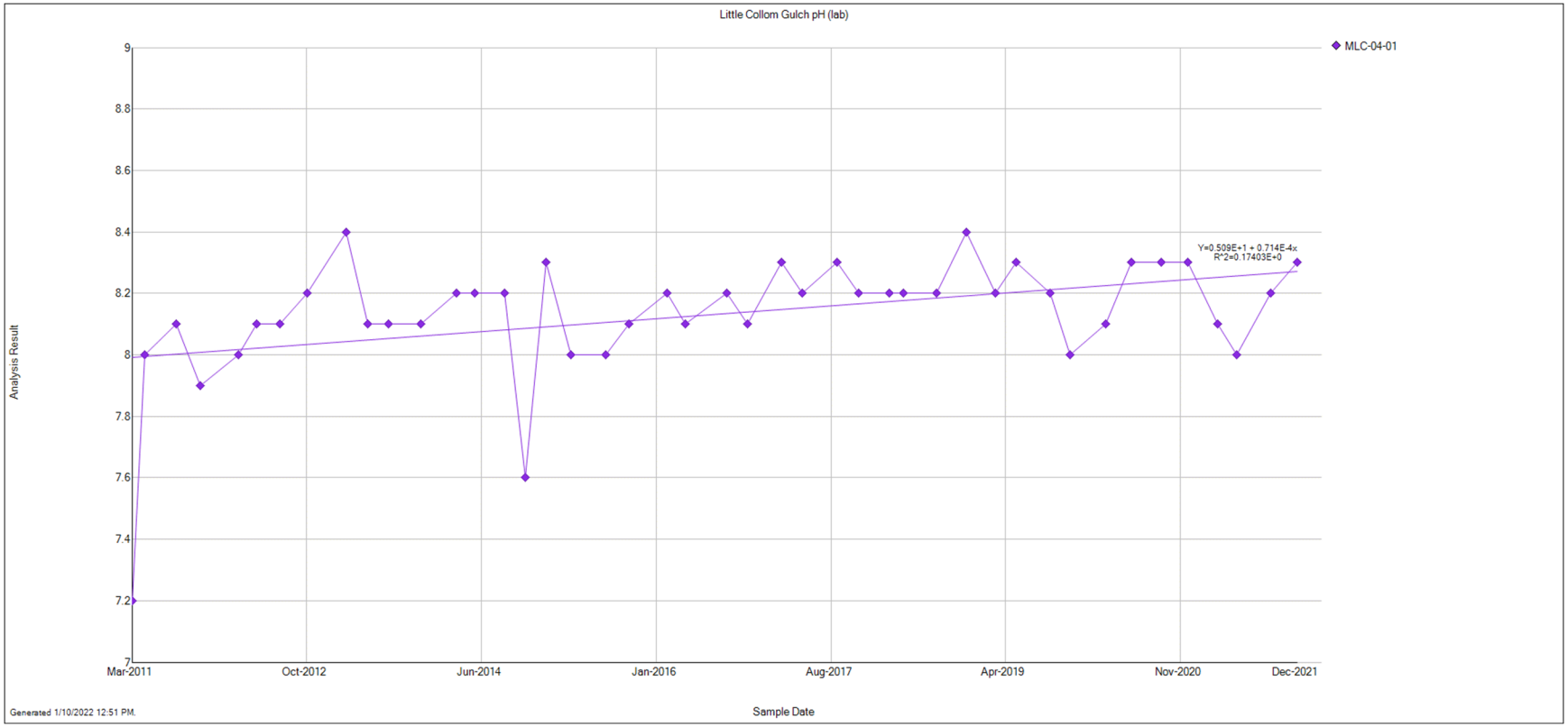

Little Collom Gulch Calcium, dissolved (mg/L)
MLC-04-01
Analysis Result
260
234
208
182
156
130
104
78
52
26
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.614E+3 -0.118E-1x
R^2=0.12795E+0
Generated 1/10/2022 12:51 PM.
Sample Date

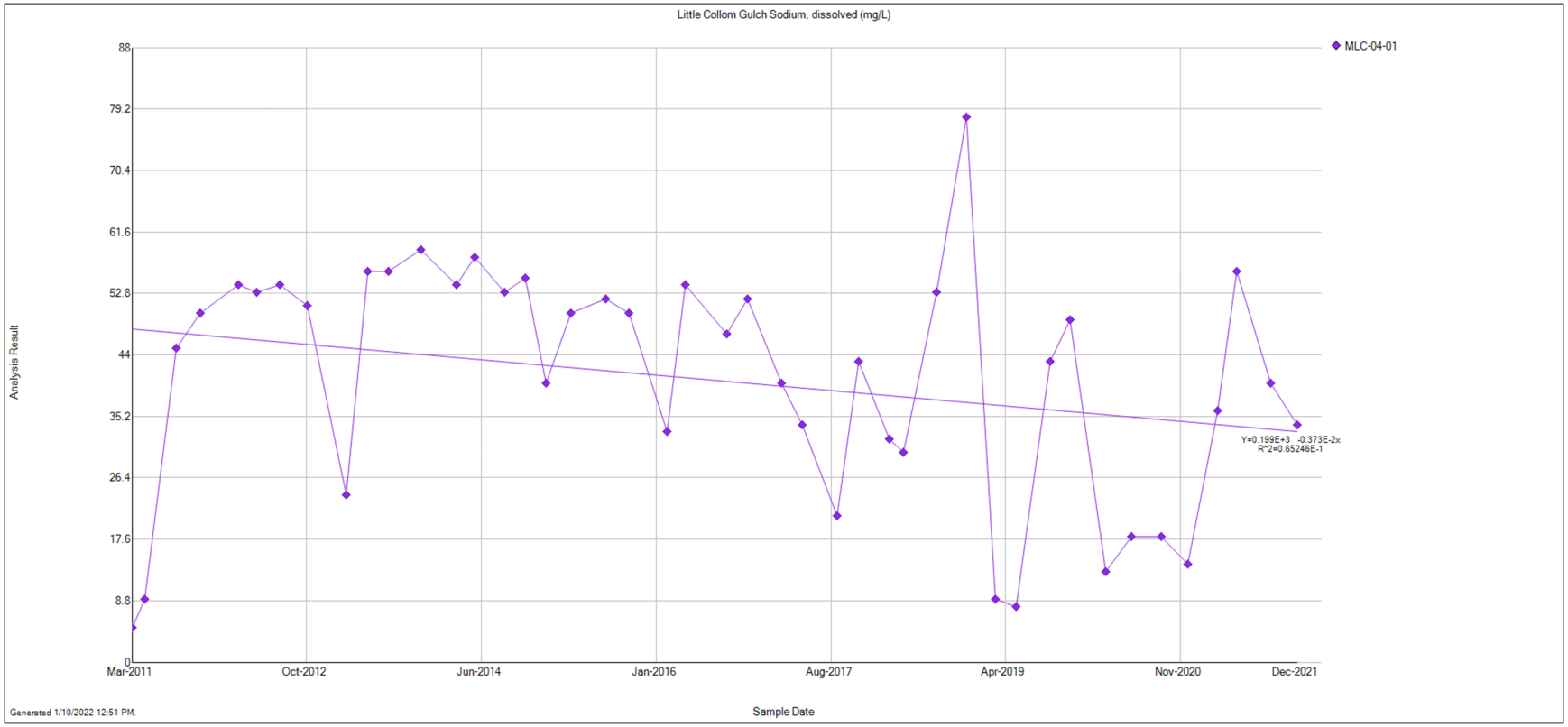

Little Collom Gulch Groundwater, depth from TOC (ft)
MLC-04-01
Y=-0.419E+2 + 0.205E-2x
R^2=0.21381E+0
Analysis Result
60.16
54.144
48.128
42.112
36.096
30.08
24.064
18.048
12.032
6.016
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 12:51 PM.
Sample Date

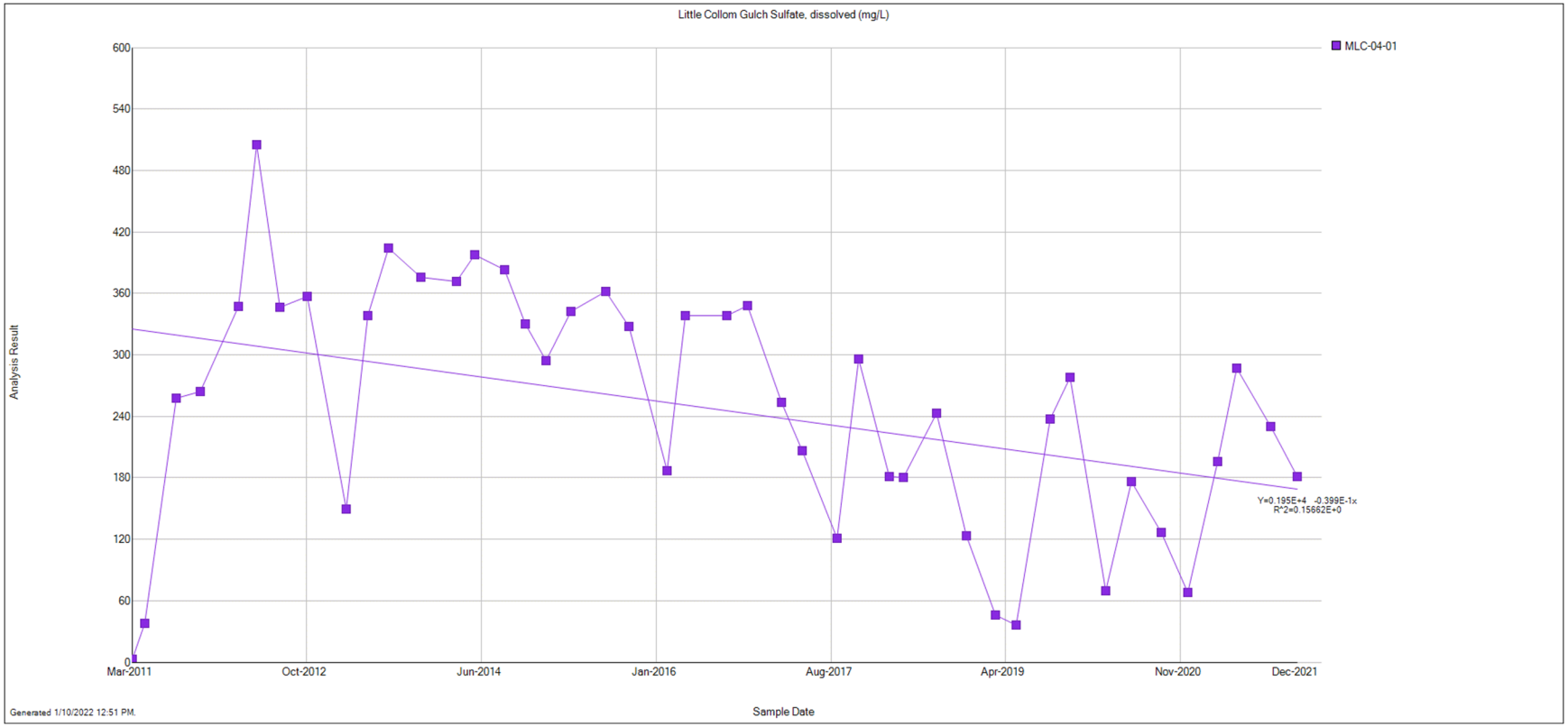

Little Collom Gulch (lab) umhos/cm
MLC-04-01
Analysis Result
2600
2340
2080
1820
1560
1300
1040
780
520
260
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.562E+4 -0.106E+0x
R^2=0.10097E+0
Generated 1/10/2022 1:03 PM.
Sample Date

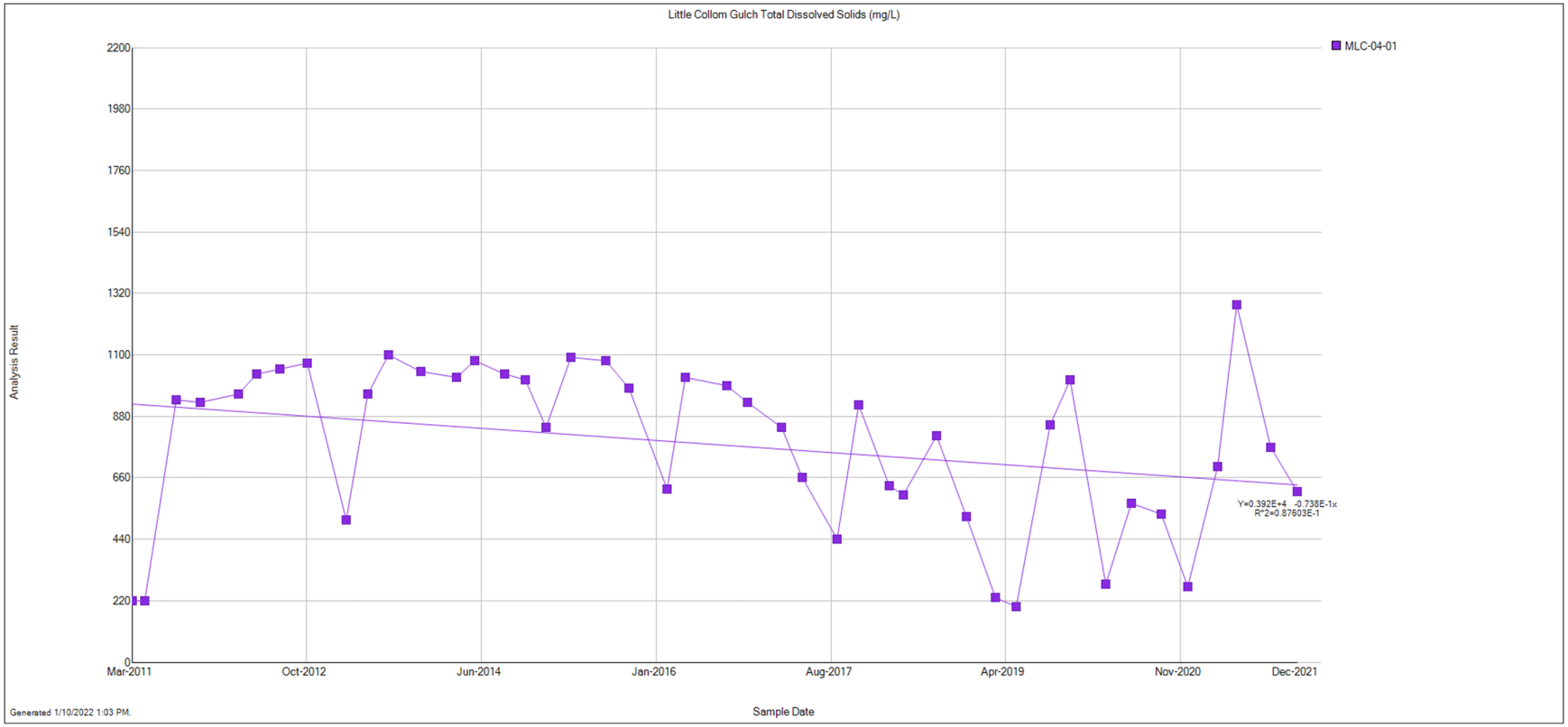

Little Collom Gulch Iron, dissolved (mg/L)
MLC-04-01
Analysis Result
0.315
0.28
0.245
0.21
0.175
0.14
0.105
0.07
0.035
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.572E+0 -0.123E-4x
R^2=0.13618E+0
Generated 1/10/2022 12:51 PM.
Sample Date

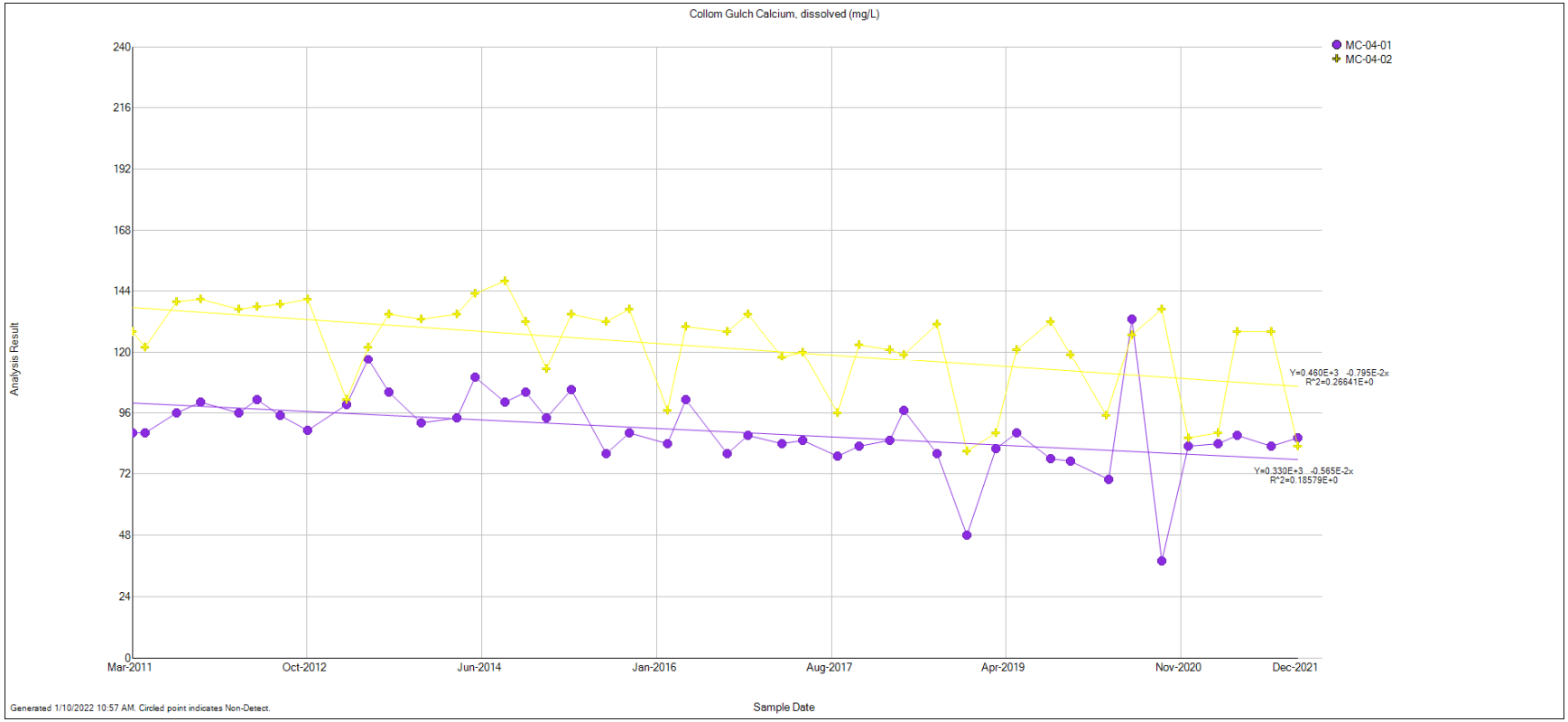

Little Collom Gulch Magnesium, dissolved (mg/L)
MLC-04-01
105
94.5
84
73.5
63
52.5
42
31.5
21
10.5
0
Analysis Result
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Sample Date
Y=0.353E+3 -0.679E-2x
R^2=0.10179E+0
Generated 1/10/2022 12:51 PM.

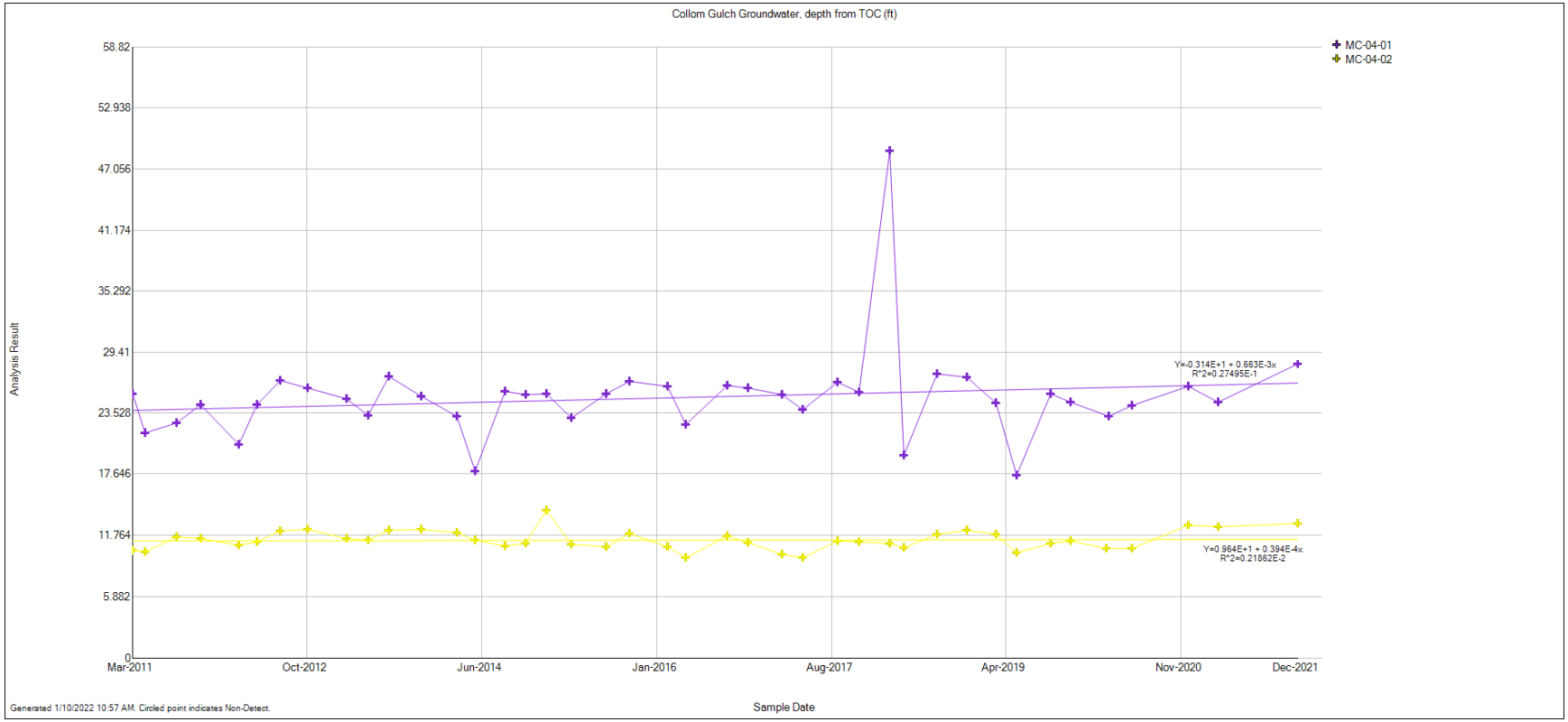

Little Collom Gulch pH (lab)
MLC-04-01
Y=0.509E+1 + 0.714E-4x
R^2=0.17403E+0
Analysis Result
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Sample Date
Generated 1/10/2022 12:51 PM.

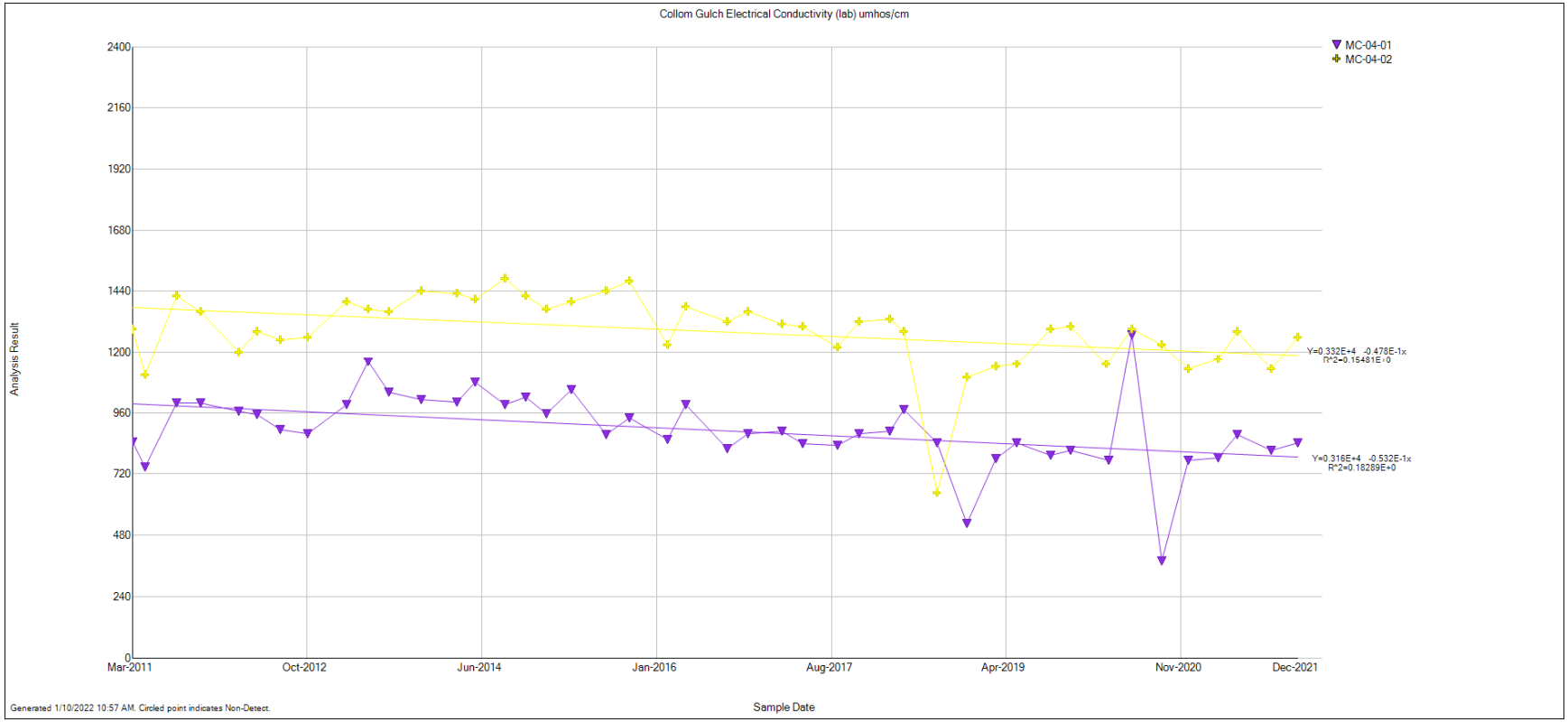

Little Collom Gulch Sodium, dissolved (mg/L)
MLC-04-01
Analysis Result
88
79.2
70.4
61.6
52.8
44
35.2
26.4
17.6
8.8
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.199E+3 -0.373E-2x
R^2=0.65246E-1
Generated 1/10/2022 12:51 PM.
Sample Date

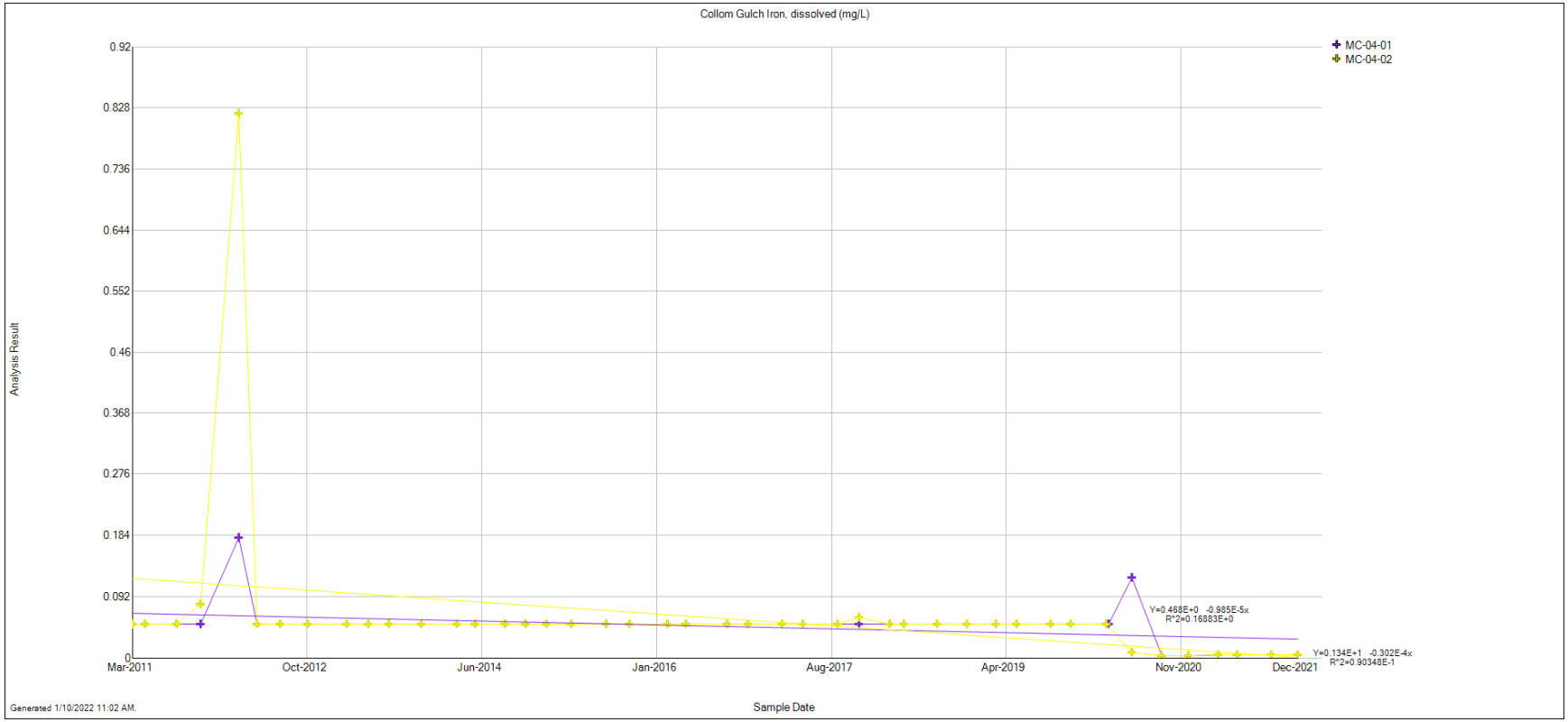

Little Collom Gulch Sulfate, dissolved (mg/L)
MLC-04-01
Analysis Result
600
540
480
420
360
300
240
180
120
60
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.195E+4 -0.399E-1x
R^2=0.15662E+0
Generated 1/10/2022 12:51 PM.
Sample Date

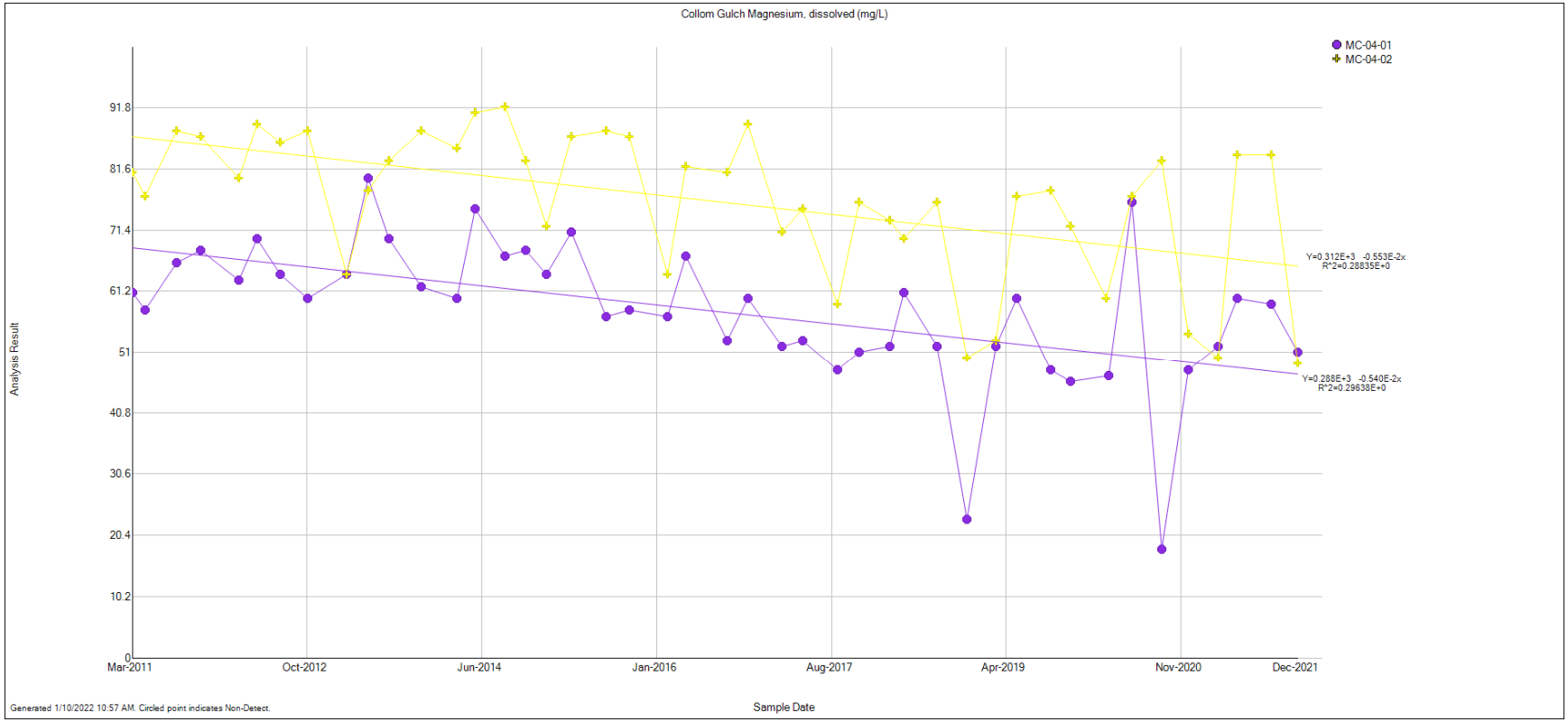

Little Collom Gulch Total Dissolved Solids (mg/L)
MLC-04-01
Analysis Result
2200
1980
1760
1540
1320
1100
880
660
440
220
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.392E+4 - 0.738E-1x
R^2=0.87603E-1
Generated 1/10/2022 1:03 PM.
Sample Date

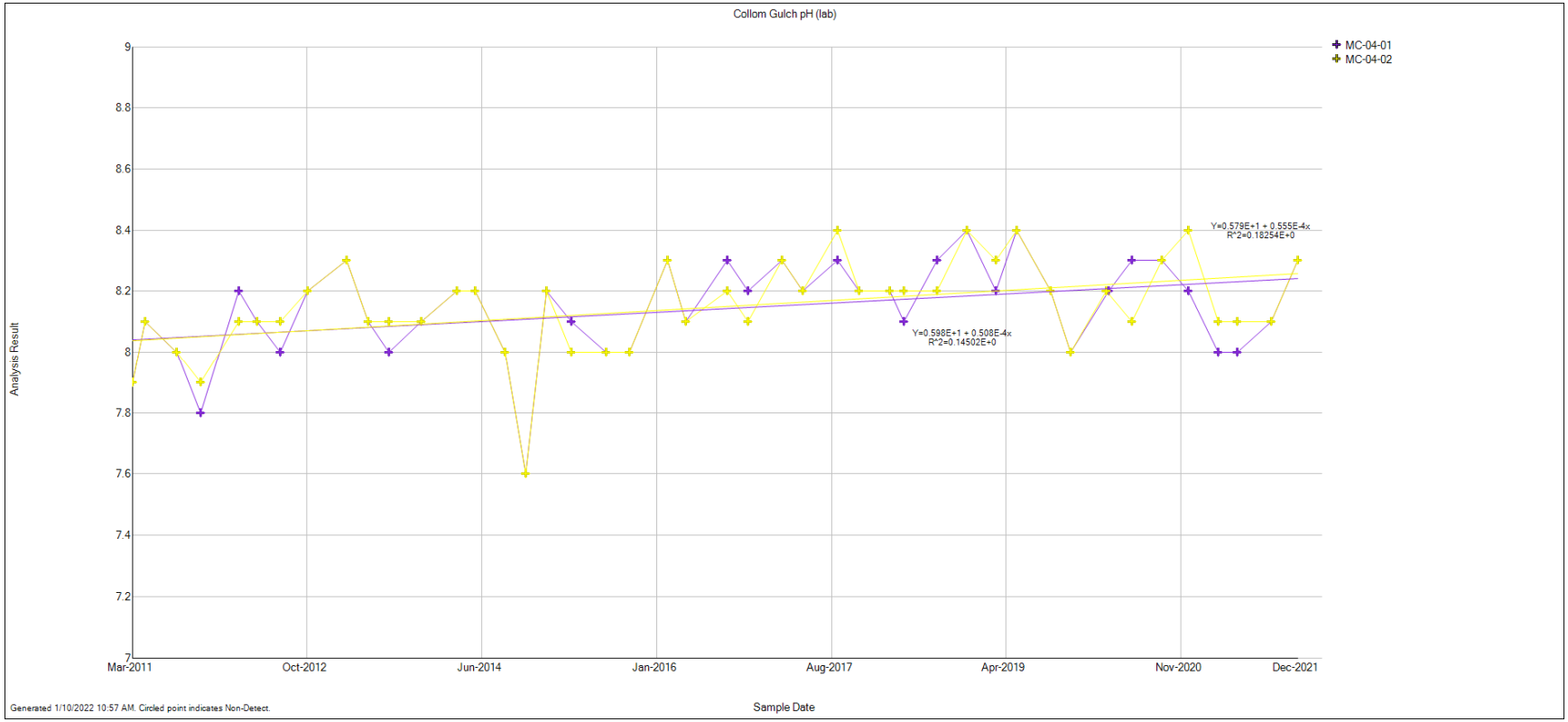

Collom Gulch Calcium, dissolved (mg/L)
MC-04-01
MC-04-02
Analysis Result
240
216
192
168
144
120
96
72
48
24
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.460E+3...-0.795E-2x
R^2=0.26641E+0
Y=0.330E+3...-0.565E-2x
R^2=0.18579E+0
Generated 1/10/2022 10:57 AM. Circled point indicates Non-Detect.
Sample Date

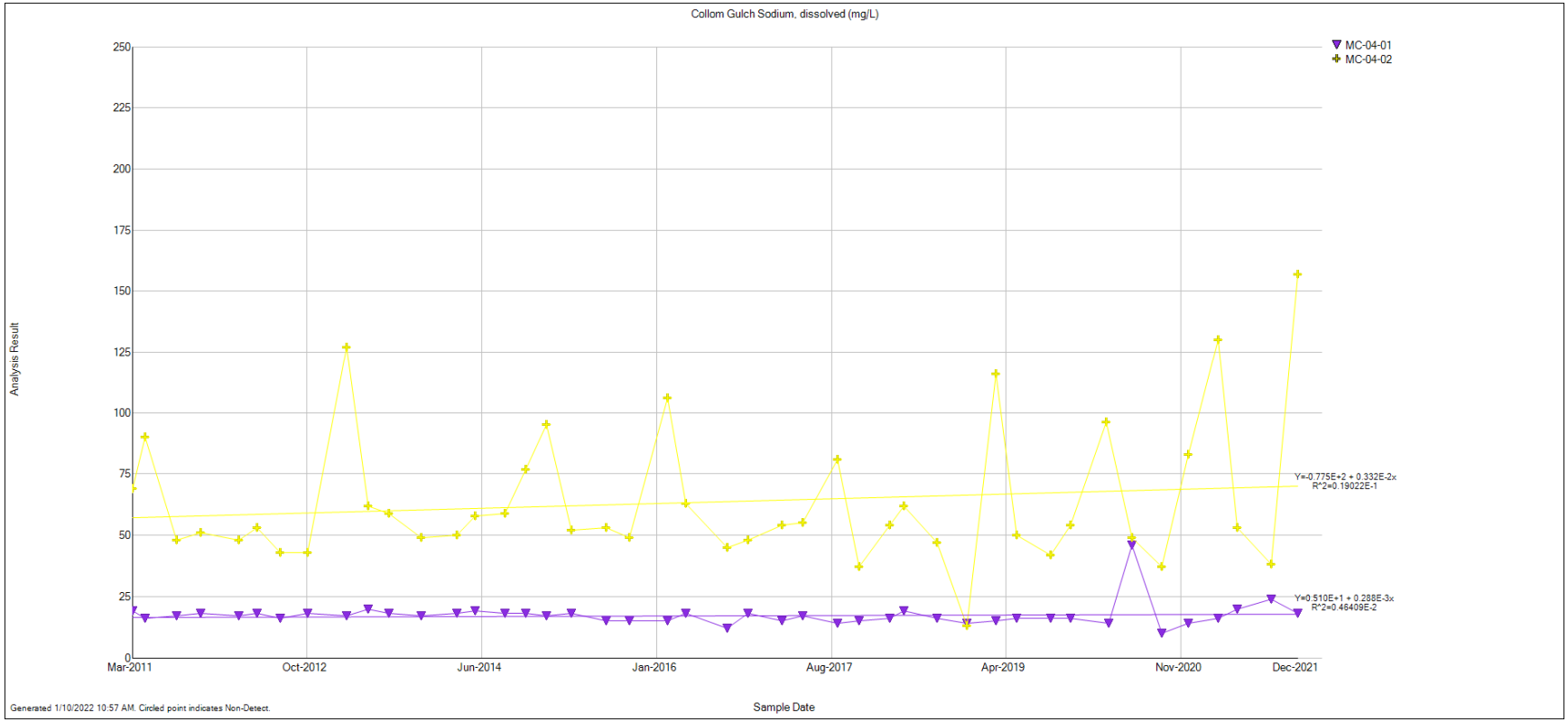

Collom Gulch Groundwater, depth from TOC (ft)
MC-04-01
MC-04-02
Y=-0.314E+1 + 0.663E-3x
R^2=0.27495E-1
Y=0.964E+1 + 0.394E-4x
R^2=0.21882E-2
Analysis Result
58.82
52.938
47.056
41.174
35.292
29.41
23.528
17.646
11.764
5.882
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:57 AM. Circled point indicates Non-Detect.
Sample Date

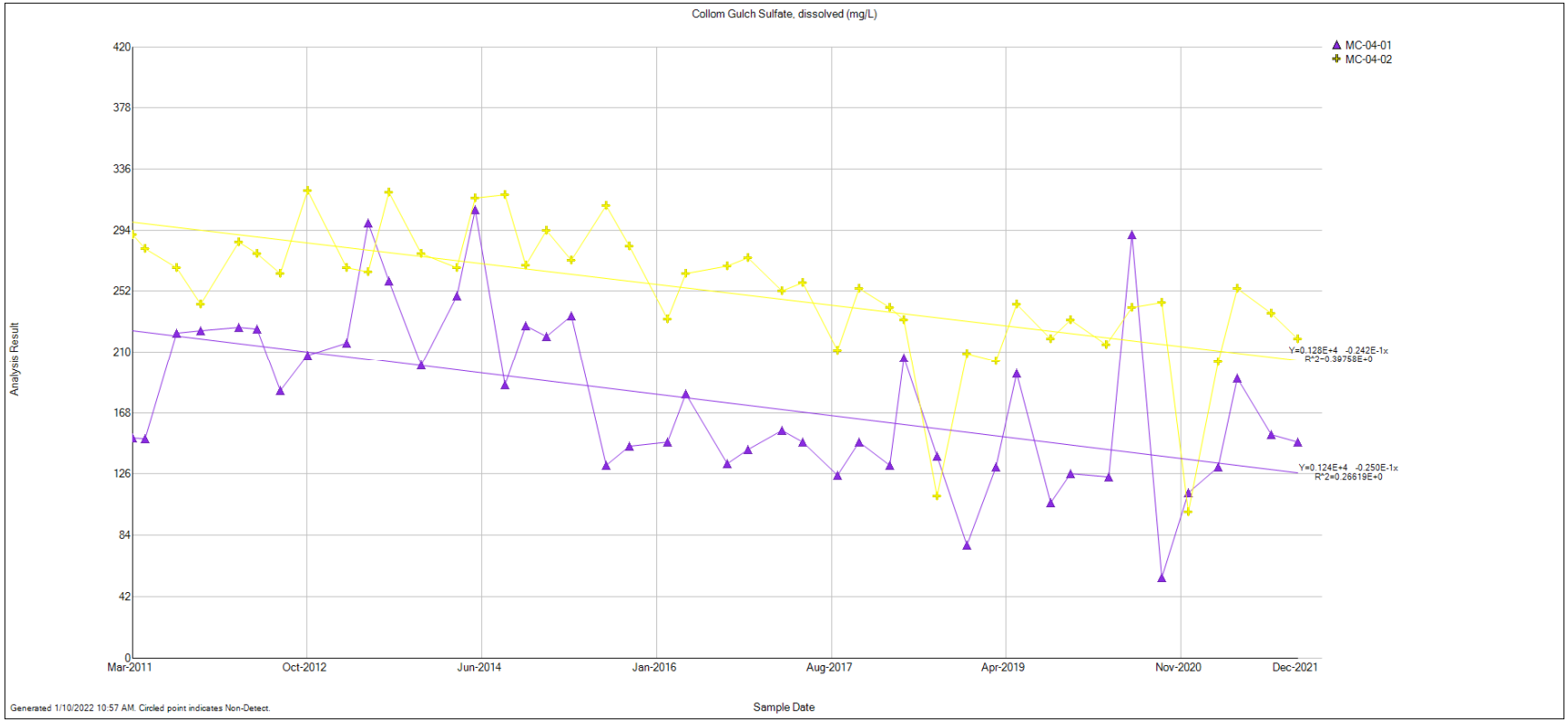

Collom Gulch Electrical Conductivity (lab) umhos/cm
MC-04-01
MC-04-02
Y=0.332E+4 -0.478E-1x
R^2=0.15481E+0
Y=0.316E+4 -0.532E-1x
R^2=0.18289E+0
Analysis Result
2400
2160
1920
1680
1440
1200
960
720
480
240
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:57 AM. Circled point indicates Non-Detect.
Sample Date

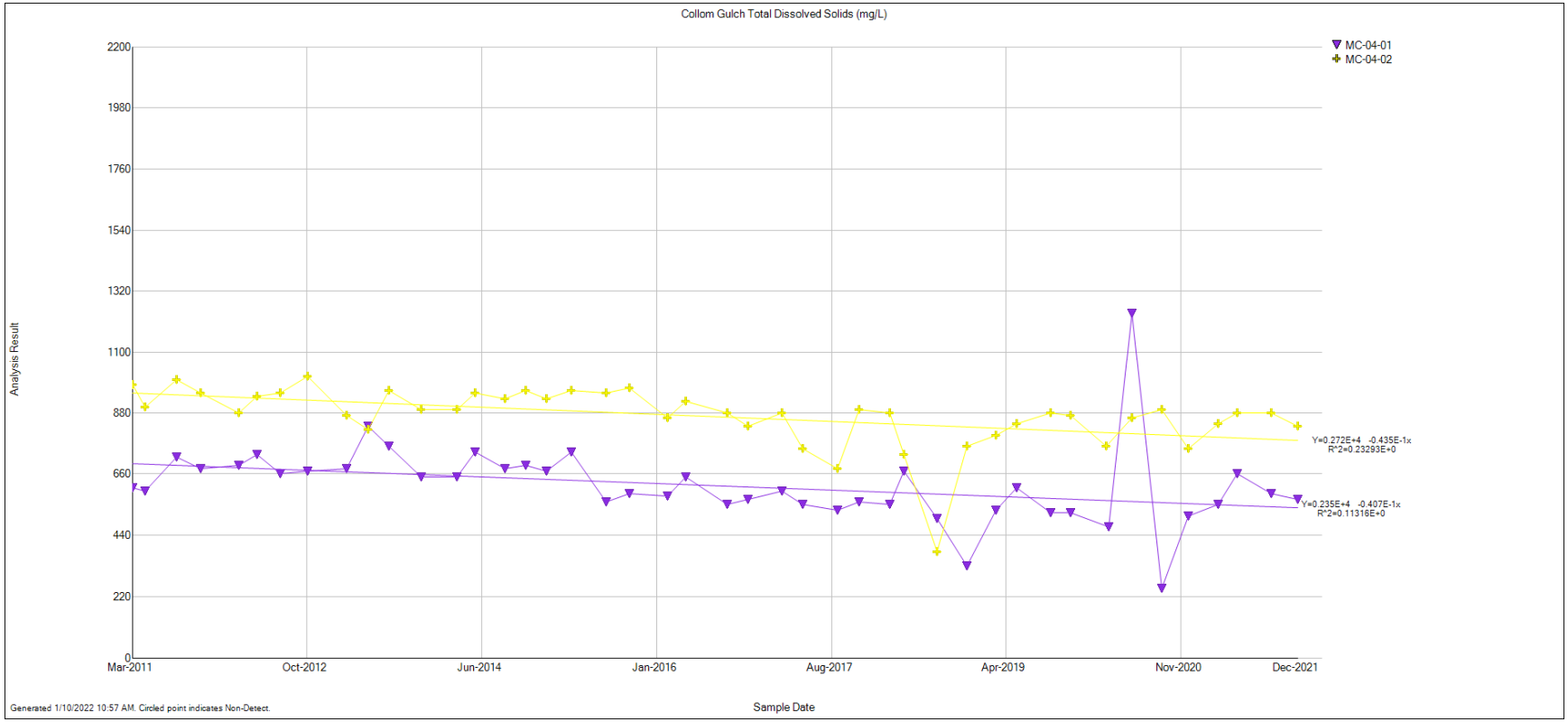

Collom Gulch Iron, dissolved (mg/L)
MC-04-01
MC-04-02
Analysis Result
0.92
0.828
0.736
0.644
0.552
0.46
0.368
0.276
0.184
0.092
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=0.468E+0 -0.985E-5x
R^2=0.16883E+0
Y=0.134E+1 -0.302E-4x
R^2=0.90348E-1
Generated 1/10/2022 11:02 AM.
Sample Date

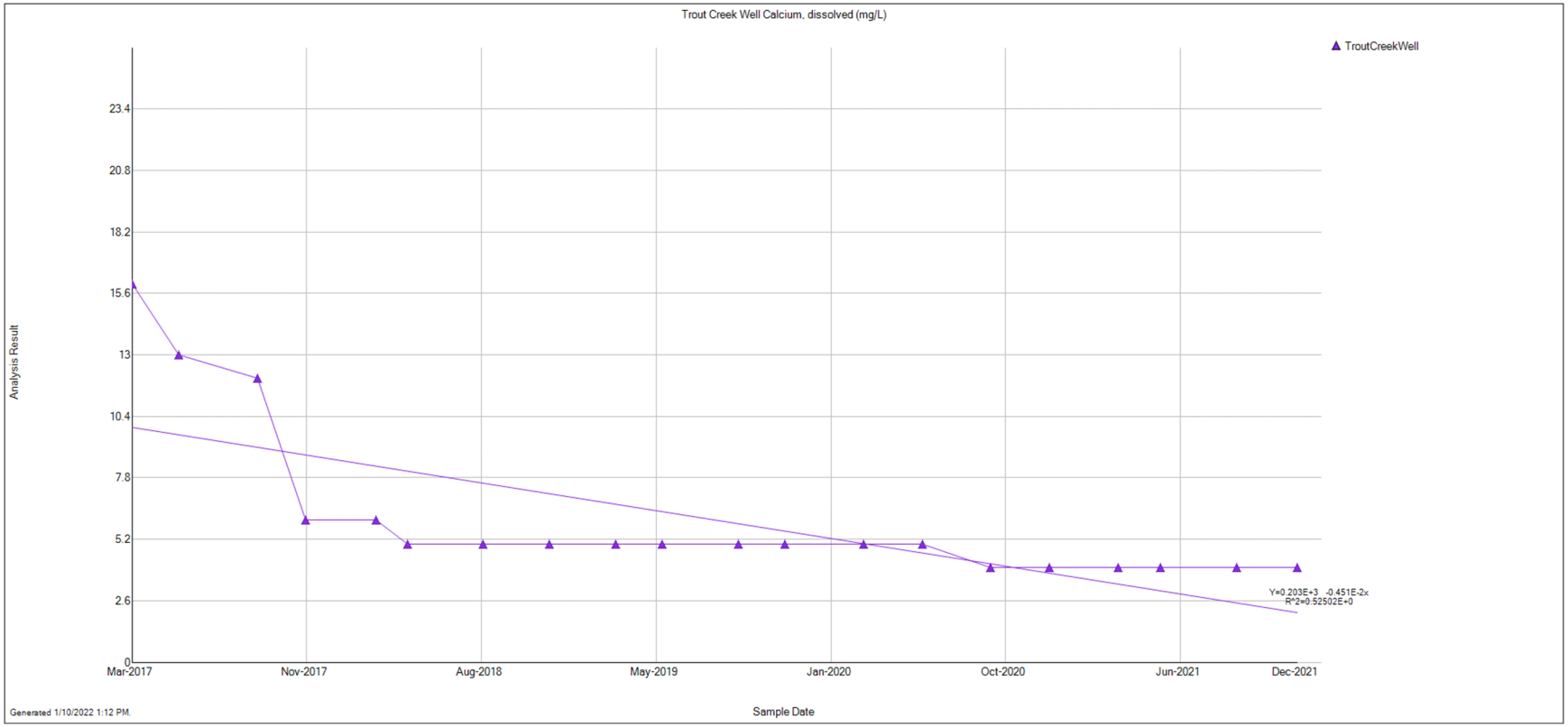

Collom Gulch Magnesium, dissolved (mg/L)
MC-04-01
MC-04-02
Y=0.312E+3 -0.553E-2x
R^2=0.28835E+0
Y=0.288E+3 -0.540E-2x
R^2=0.29638E+0
Analysis Result
91.8
81.6
71.4
61.2
51
40.8
30.6
20.4
10.2
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:57 AM. Circled point indicates Non-Detect.
Sample Date

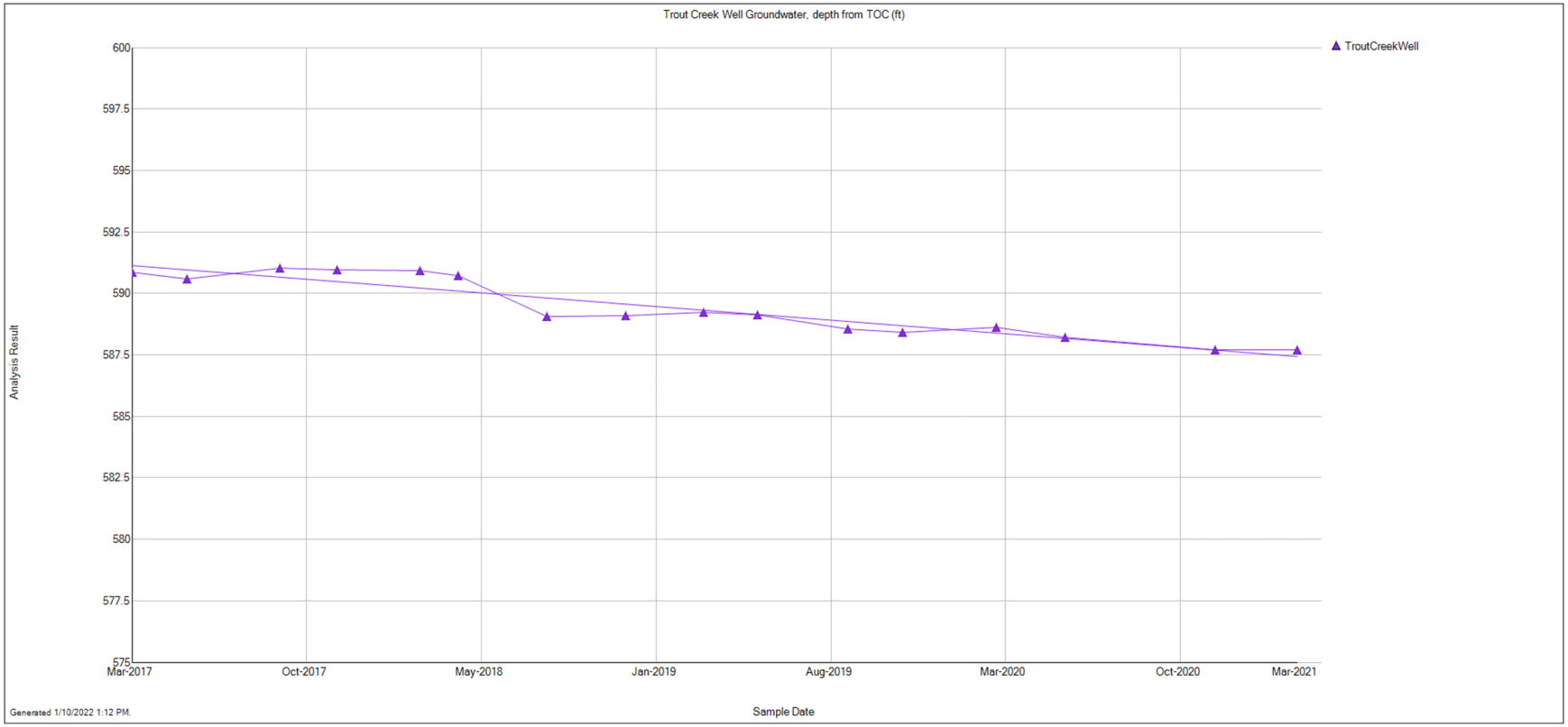

Collom Gulch pH (lab)
MC-04-01
MC-04-02
Y=0.579E+1 + 0.555E-4x
R^2=0.18254E+0
Y=0.598E+1 + 0.508E-4x
R^2=0.14502E+0
Analysis Result
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:57 AM. Circled point indicates Non-Detect.
Sample Date

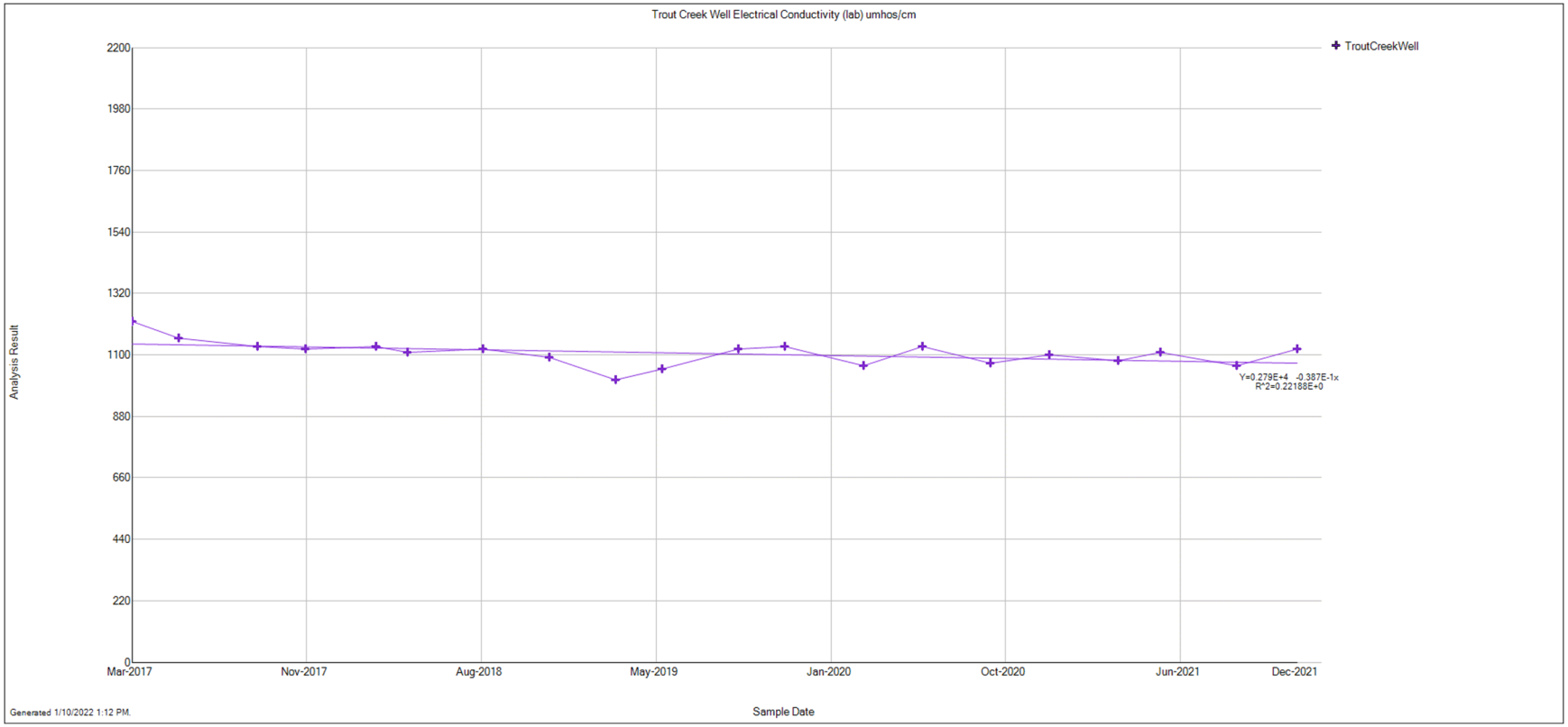

Collom Gulch Sodium, dissolved (mg/L)
MC-04-01
MC-04-02
Analysis Result
250
225
200
175
150
125
100
75
50
25
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Y=-0.775E+2 + 0.332E-2x
R^2=0.19022E-1
Y=0.510E+1 + 0.288E-3x
R^2=0.46409E-2
Generated 1/10/2022 10:57 AM. Circled point indicates Non-Detect.
Sample Date

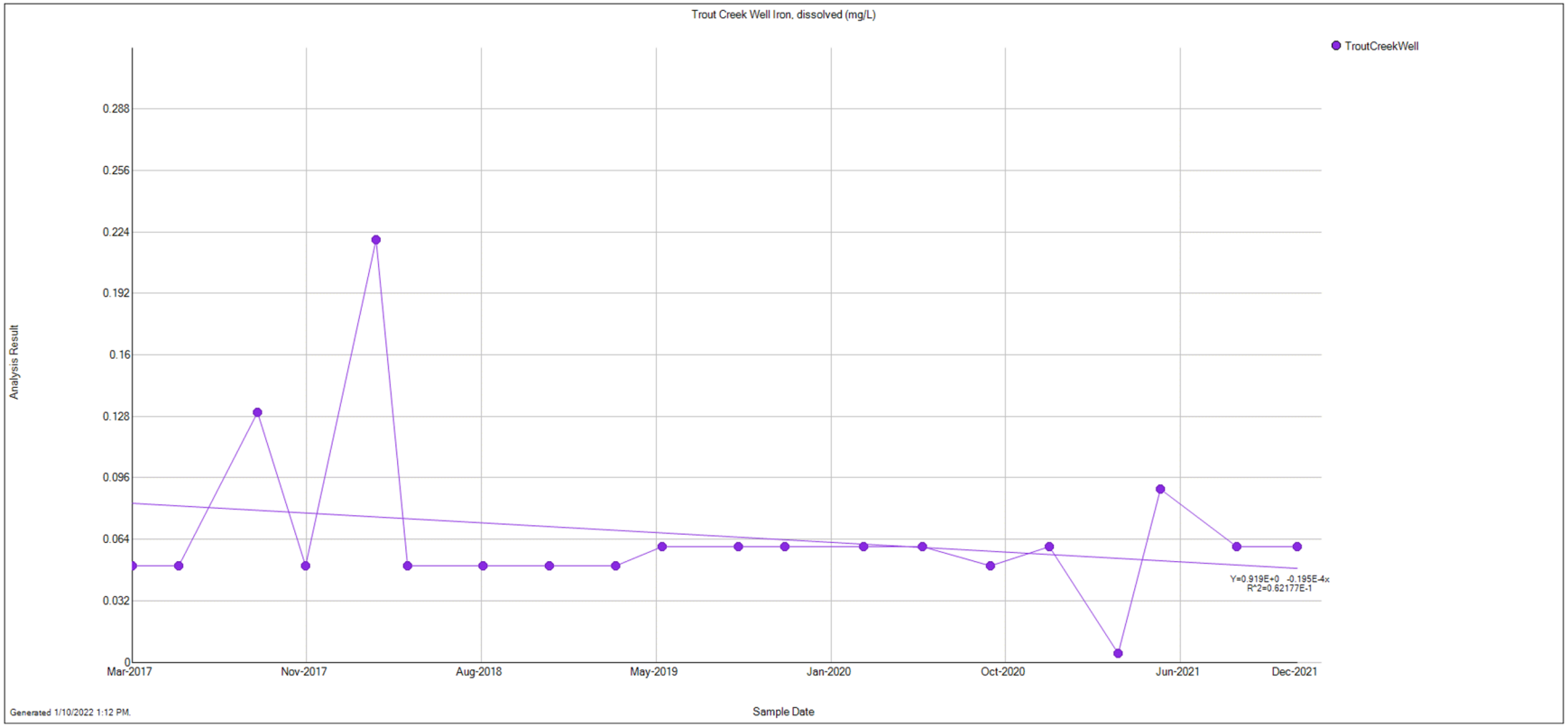

Collom Gulch Sulfate, dissolved (mg/L)
MC-04-01
MC-04-02
Y=0.128E+4 -0.242E-1x
R^2=0.39758E+0
Y=0.124E+4 -0.250E-1x
R^2=0.26619E+0
Analysis Result
420
378
336
294
252
210
168
126
84
42
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:57 AM. Circled point indicates Non-Detect.
Sample Date

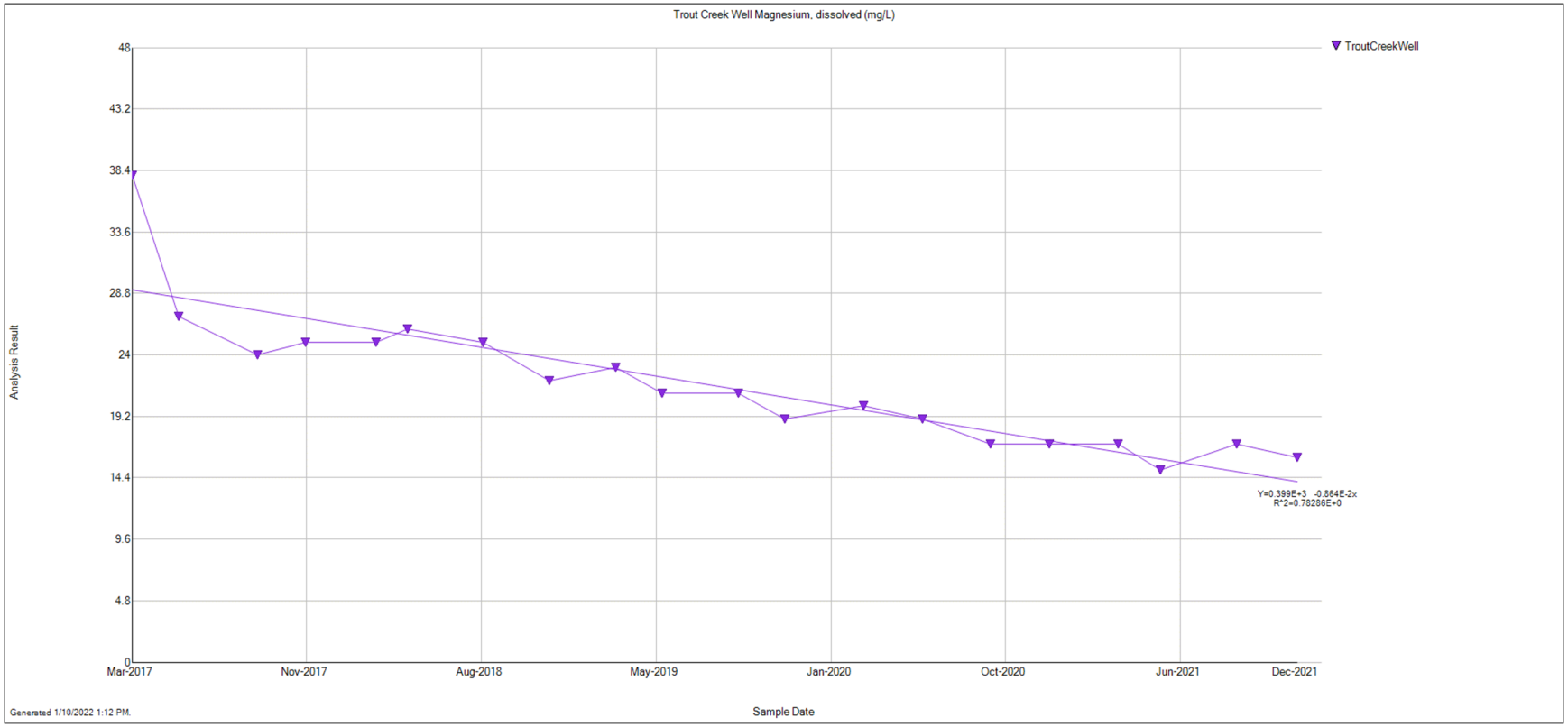

Collom Gulch Total Dissolved Solids (mg/L)
MC-04-01
MC-04-02
Y=0.272E+4 -0.435E-1x
R^2=0.23293E+0
Y=0.235E+4 -0.407E-1x
R^2=0.11316E+0
Analysis Result
2200
1980
1760
1540
1320
1100
880
660
440
220
0
Mar-2011
Oct-2012
Jun-2014
Jan-2016
Aug-2017
Apr-2019
Nov-2020
Dec-2021
Generated 1/10/2022 10:57 AM. Circled point indicates Non-Detect.
Sample Date

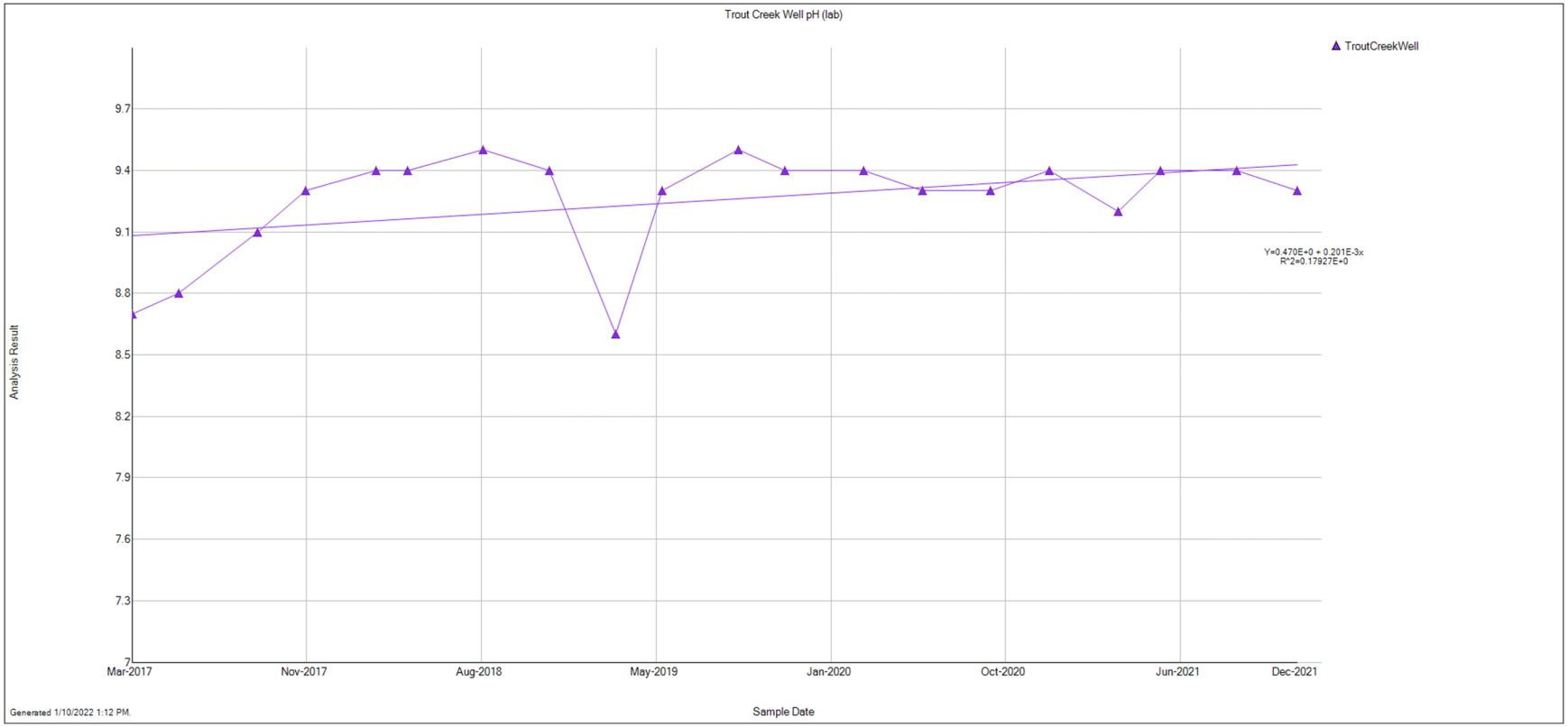

Trout Creek Well Calcium, dissolved (mg/L)
TroutCreekWell
Analysis Result
23.4
20.8
18.2
15.6
13
10.4
7.8
5.2
2.6
0
Mar-2017
Nov-2017
Aug-2018
May-2019
Jan-2020
Oct-2020
Jun-2021
Dec-2021
Y=0.203E+3 -0.451E-2x
R^2=0.52502E+0
Generated 1/10/2022 1:12 PM.
Sample Date

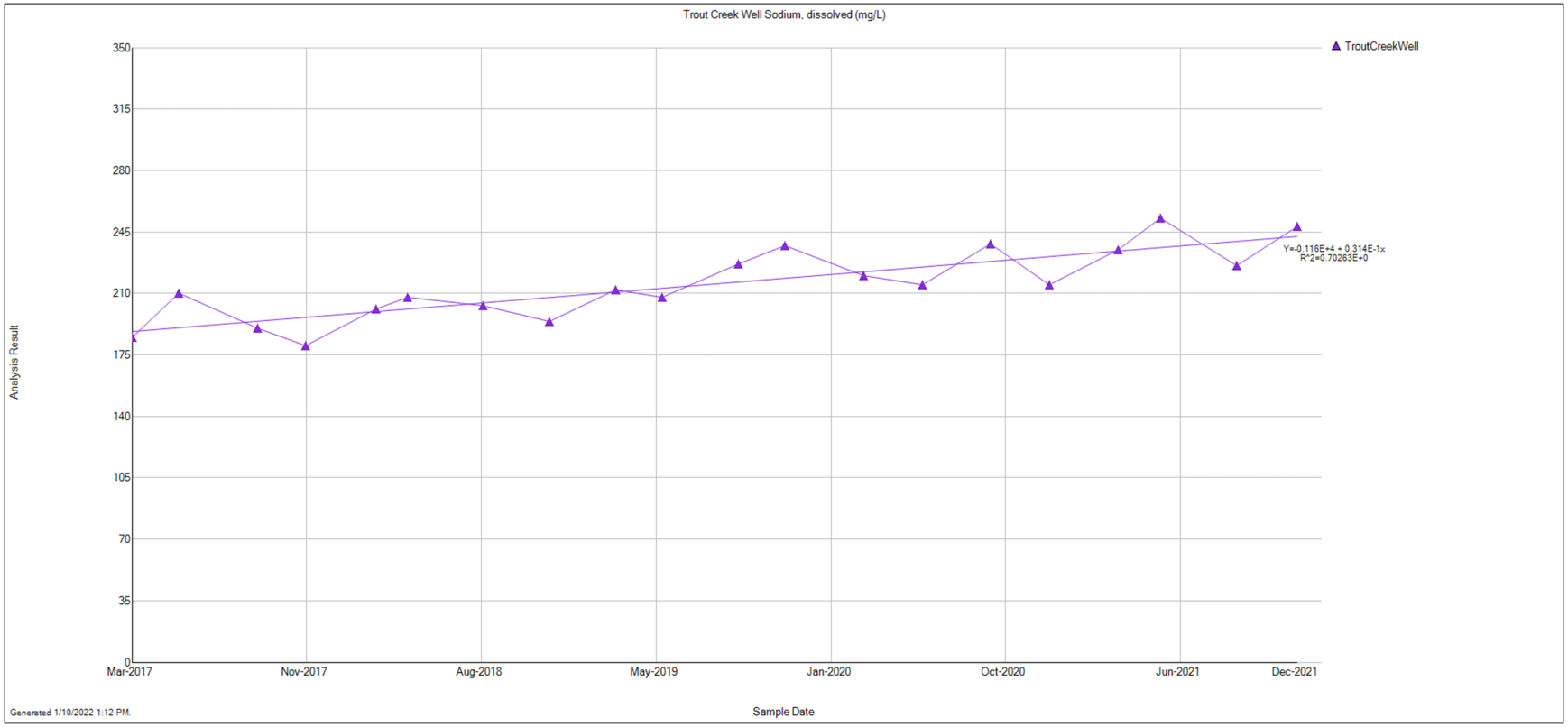

Trout Creek Well Groundwater, depth from TOC (ft)
TroutCreekWell
600
597.5
595
592.5
590
587.5
585
582.5
580
577.5
575
Analysis Result
Mar-2017
Oct-2017
May-2018
Jan-2019
Aug-2019
Mar-2020
Oct-2020
Mar-2021
Sample Date
Generated 1/10/2022 1:12 PM.

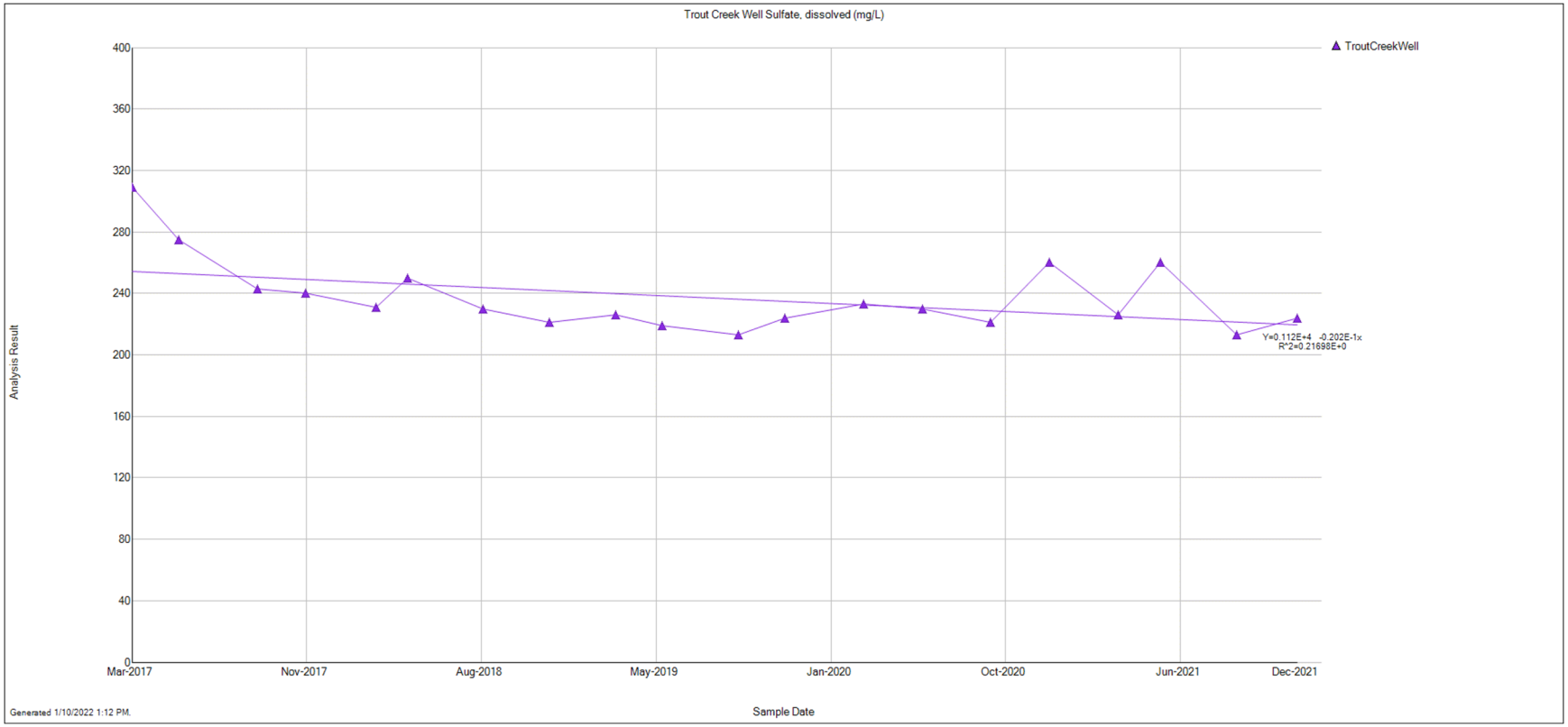

Trout Creek Well Electrical Conductivity (lab) umhos/cm
TroutCreekWell
Analysis Result
2200
1980
1760
1540
1320
1100
880
660
440
220
0
Mar-2017
Nov-2017
Aug-2018
May-2019
Jan-2020
Oct-2020
Jun-2021
Dec-2021
Y=0.279E+4 -0.387E-1x
R^2=0.22188E+0
Generated 1/10/2022 1:12 PM.
Sample Date


Trout Creek Well Iron, dissolved (mg/L)
TroutCreekWell
Analysis Result
0.288
0.256
0.224
0.192
0.16
0.128
0.096
0.064
0.032
0
Mar-2017
Nov-2017
Aug-2018
May-2019
Jan-2020
Oct-2020
Jun-2021
Dec-2021
Y=0.919E+0 -0.195E-4x
R^2=0.62177E-1
Generated 1/10/2022 1:12 PM.
Sample Date


Trout Creek Well Magnesium, dissolved (mg/L)
TroutCreekWell
Analysis Result
48
43.2
38.4
33.6
28.8
24
19.2
14.4
9.6
4.8
0
Mar-2017
Nov-2017
Aug-2018
May-2019
Jan-2020
Oct-2020
Jun-2021
Dec-2021
Y=0.399E+3 -0.864E-2x
R^2=0.78286E+0
Generated 1/10/2022 1:12 PM.
Sample Date


Trout Creek Well pH (lab)
TroutCreekWell
Analysis Result
9.7
9.4
9.1
8.8
8.5
8.2
7.9
7.6
7.3
7
Mar-2017
Nov-2017
Aug-2018
May-2019
Jan-2020
Oct-2020
Jun-2021
Dec-2021
Y=0.470E+0 + 0.201E-3x
R^2=0.17927E+0
Generated 1/10/2022 1:12 PM.
Sample Date


Trout Creek Well Sodium, dissolved (mg/L)
TroutCreekWell
Y=-0.116E+4 + 0.314E-1x
R^2=0.70263E+0
Analysis Result
350
315
280
245
210
175
140
105
70
35
0
Mar-2017
Nov-2017
Aug-2018
May-2019
Jan-2020
Oct-2020
Jun-2021
Dec-2021
Generated 1/10/2022 1:12 PM.
Sample Date


Trout Creek Well Sulfate, dissolved (mg/L)
TroutCreekWell
Analysis Result
400
360
320
280
240
200
160
120
80
40
0
Mar-2017
Nov-2017
Aug-2018
May-2019
Jan-2020
Oct-2020
Jun-2021
Dec-2021
Y=0.112E+4 -0.202E-1x
R^2=0.21698E+0
Generated 1/10/2022 1:12 PM.
Sample Date

SECTION 2 – CDRMS ARR FORM AND SUPPORT DOCUMENTS

RULE REQUIREMENT

Rule 2.04.13(1) (a-f)

2.04.13(1) by April 1, or other such date as agreed on, each permittee shall file an annual reclamation report covering the previous calendar year for all areas under bond. The report shall include, but not be limited to, text, discussion and maps which address:

- the name and address of the permittee and permit number
- location and number of acres disturbed during that year
- location and number of acres backfilled and graded during that year
- location and number of acres topsoiled during that year
- the species, location and number of acres of vegetation planted during that year, including any augmented seeding or cultural practices
- location, number of acres and date of planting for all previously re-vegetated areas

PERMITTEE

Colowyo Coal Company L.P.
5731 State Highway 13
Meeker, CO 81647

DISTURBED ACRES

During 2021, 96.9 acres of additional disturbance occurred onsite. Please see Exhibit 2 for the locations of areas disturbed during 2021.

At the end of 2021, the total disturbance was 5,358.4 acres. Of this, 1,228.1 acres are in long-term facilities, and the active mining area comprised of 1,741.4 acres.

BACKFILLAND GRADED ACRES

During 2021, 13.3 acres were backfilled and graded. To date, 2,287.8 acres have been backfilled and graded. Please see Exhibit 2 for the locations of all areas that have been backfilled and graded to date.

TOPSOIL REPLACEMENT & SEEDING ACRES

During 2021, 13.3 acres were topsoiled, and 13.3 acres were permanently seeded. Please see Exhibit 2 for all locations that have been topsoiled and seeded to date at Colowyo, Figure 2-2 for more detailed description of each reclamation area at Colowyo, and Figure 2-3 for the seed mixture planted in 2021.

The species seeded on Colowyo's reclamation areas follow the approved seed mixtures located in Volume 1.

Figure 2-1 Annual Reclamation Report Form provides a detailed description of the acreages presented above.

Figure 2-1 –Annual Reclamation Report Form

Colorado Division of Reclamation, Mining and Safety

Annual Reclamation Report for Calendar Year – 2021

Colowyo Mine	C-1981-019	Colowyo Coal Company L.P.
Mine Name	Permit Number	Permittee

5731 State Highway 13 Meeker, CO 81641

Address

This report, required by Rule 2.04.13, is due by February 15 of each year, or other date, as agreed upon by the Division. It should include text, discussion, and maps, at a minimum, in addition to any other reclamation monitoring data as required by the approved permit. The location of the acreage reported under each land status category and year of seeding (if applicable) should be clearly identified on a map included with the report.

Land Category	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Acreage in Active Mining Areas[1]	1,662.9	91.8	13.3	=	1,741.4

Land Category	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Acres Disturbed[2]	5,261.5	96.9	0	=	5,358.4
Acres Backfilled and Graded	2,274.5	13.3	0	=	2,287.8
Acres Topsoiled	2,099.3	13.3	0	=	2,112.6

Acreage in Long-term Facilities[3]	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Non-Permanent Facilities	1,175.3	52.8	0	=	1,228.1
Permanent Facilities (permitted)	3.7	0	0	=	3.7
Totals	1,179.0			=	1,231.8

Acres Seeded (permanent)	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
9 Years and Less	979.0	0	213.1	=	765.9
10 Years and Greater	263.1	213.1	0.0	=	476.2
Totals	1,242.1			=	1,242.1

Bond Release	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Phase I Released	1,973.9	18.0	0	=	1,991.9
Phase II Released	1,682.7	0	0	=	1,682.7
Phase III Released	722.5	0	0	=	722.5

[1]Includes pits, topsoil stripped areas in advance of pits, and spoil not backfilled and graded
[2]Surface Mine Acres Disturbed = B&G + Long-Term Facilities + Active Mining Areas; Underground Mine Acres Disturbed = B&G + Long-Term Facilities; Separately-permitted Loadouts = B&G + Long-Term Facilities
[3]Includes haul, access and light-use roads, temporary dams and impoundments; permanent dams and impoundments; diversion and collector ditches, water and air monitoring sites; topsoil stockpiles; overburden stockpiles; repair, storage and construction areas; office area, repair shops, and parking; coal stockpiles, loading, and processing areas; railroads; coal conveyors; refuse piles and coal mine waste impoundments; head-of-hollow fills; valley fills; ventilation shafts and entryways; and non-coal waste disposal area (garbage dumps and coal combustion by-products disposal areas).

Figure 2-2 – Colowyo Reclamation Table

Colowyo Reclamation Table

Area	Reclamation Period		Revegetated	Status						Notes:
	Year	Acreage	Years	Bond Release Phase 1	Bond Release Phase 2	Bond Release Phase 3	Reclaimed (Seeded)	Topsoiled	Backfilled & Graded	
East Pit										
EP010	1988	1.7	33	Apr-98	Aug-01	Aug-12	1.7	1.7	1.7	Phase III Released - Unit was originally 46 acres 1.7 remain inside permit boundary.
EP011	1989	7.8	32	Apr-98	Aug-01	Aug-12	7.8	7.8	7.8	Phase III Released - Unit was originally 50 acres 7.8 remain inside permit boundary.
EP012	1990	5.9	31	Apr-98	Aug-01	Aug-12	5.9	5.9	5.9	Phase III Released - Unit was originally 8.2 acres 5.9 remain inside permit boundary.
EP014	1991	11.5	30	Apr-98	Aug-01	Aug-12	11.5	11.5	11.5	Phase III Released - Unit was originally 24.3 acres 11.5 remain inside permit boundary.
EP015	1991	7.9	30	Apr-98	Aug-01	Aug-12	7.9	7.9	7.9	Phase III Released - Unit was originally 43.7 acres 7.9 remain inside permit boundary.
EP020	1993	3.8	28	Apr-98	Aug-01	Aug-12	3.8	3.8	3.8	Phase III Released - Unit was originally 27.0 acres 3.8 remain inside permit boundary.
EP025	1994	23.6	27	Apr-98	Aug-01	Aug-12	23.6	23.6	23.6	Phase III Released - Unit was originally 54.0 acres 23.6 remain inside permit boundary.
EP026	1995	15.6	26	Apr-98	Aug-01	Aug-12	15.6	15.6	15.6	Phase III Released - Unit was originally 20.0 acres 15.6 remain inside permit boundary.
EP030	1997	3.9	24	Jun-11	Jun-11	Aug-12	3.9	3.9	3.9	Phase III Released - Unit was originally 17.0 acres 3.9 remain inside permit boundary.
EP032	1998	13.9	23	Jun-11	Jun-11	Aug-12	13.9	13.9	13.9	Phase III Released - Unit was originally 17.0 acres 3.9 remain inside permit boundary.
EP034	1999	6.9	22	Jun-11	Jun-11	Aug-12	6.9	6.9	6.9	Phase III Released
EP038	2001	3.2	20	Jun-11	Jun-11	Feb-17	3.2	3.2	3.2	Phase III Released - Unit was originally 4.08 acres 3.2 remain inside permit boundary.
EP039	2003	4.1	18	Jun-11	Jun-11	Feb-17	4.1	4.1	4.1	Phase III Released
EP040	2003	10.3	18	Jun-11	Jun-11	Feb-17	10.3	10.3	10.3	Phase III Released
EP041	2003	29.3	18	Jun-11	Jun-11	Nov-18	29.3	29.3	29.3	Phase III Released - Unit was originally 35.7 acres 29.3 remain inside permit boundary.
EP042	2002	9.6	19	Jun-11	Jun-11	Feb-17	9.6	9.6	9.6	Phase III Released - Unit was originally 21.03 acres 9.6 remain inside permit boundary.
EP043	2002	10.2	19	Jun-11	Jun-11	Feb-17	10.2	10.2	10.2	Phase III Released - Unit was originally 13.89 acres 10.2 remain inside permit boundary.
EP044	2003	6.0	18	Jun-11	Jun-11	Feb-17	6.0	6.0	6.0	Phase III Released - Unit was originally 24.64 acres 6.0 remain inside permit boundary.
EP045	2003	6.1	18	Apr-12	Nov-18	Nov-18	6.1	6.1	6.1	Phase III Released - Unit was originally 7.2 acres 6.1 remain inside permit boundary.
EP046	2005	96.7	16	Apr-12	Nov-18	Nov-18	96.7	96.7	96.7	Phase III Released
EP047	2005	0.0	16	Apr-12	Nov-18	Nov-18	0.0	1.9	1.9	Phase III Released
EP047	2006	1.9	15	Apr-12	Nov-18	Nov-18	1.9	0.0	0.0	Phase III Released
EP049	2006	0.8	15	Apr-12	Nov-18	Nov-18	0.8	0.8	0.8	Phase III Released - Unit was originally 4.0 acres 0.8 remain inside permit boundary.
EP050	2006	0.0	15	Apr-12	Nov-18	Nov-18	0.0	18.0	18.0	Phase III Released - Unit was originally 85.6 acres 77.5 remain inside permit boundary.
EP050	2007	77.5	14	Apr-12	Nov-18	Nov-18	77.5	59.5	59.5	Phase III Released - Unit was originally 85.6 acres 77.5 remain inside permit boundary.
EP051	2009	32.0	12	Apr-12	Nov-18		32.0	32.0	32.0	8.0 ac Redisturbed in 2010 Reseeded in 2010
EP052	2010	37.0	11	Apr-12	Nov-18		37.0	37.0	37.0	37.0 Acres Seeded in 2011
EP053	2010	17.4	11	Apr-12	Nov-18		17.4	17.4	17.4	17.4 Acres Seeded 2011
EP054	2010	17.4	11	Apr-12	Nov-18		17.4	17.4	17.4	
EP055	2010	8.8	11	Apr-12	Nov-18		8.8	8.8	8.8	Old R3 stockpile
EP056	2011	34.8	10	Apr-12			34.8	34.8	34.8	34.8 acres seeded as grassland
EP057	2012	70.7	9	Aug-13	Nov-18		62.7	62.7	70.7	1.6 ac regrade only, 62.7 topsoiled seeded
EP058	2014	33.4	7	Jan-16	Oct-19		33.4	33.4	33.4	33.8 acres seeded as grassland
EP059	2016	48.9	5	Jan-18	Oct-20		30.9	30.9	48.9	30.9 acres seeded as grassland. Reseeded 30.9 acres in the fall of 2020.
EP060	2017	5.5	4	Aug-18	Oct-20		5.5	5.5	0.0	Redisturbance Topsoil Pile and Road No Backfill Sagebrush Steppe. 0.9 acres.
EP061	2018	14.5	3	Sep-19			14.5	14.5	0.0	All Regrade occurred with EP057 and EP059. Sagebrush Steppe 14.5 acres.
EP062	2019	7.0	2	Jun-21			7.0	7.0	7.0	Topsoil pile footprint reclaimed. 7.0 acres Sagebrush Steppe. Reseeded 7.0 acres in fall of 2020.
Grand Totals		**327.4**					**301.4**	**301.4**	**307.4**	Remove Phase III acreage from Grand Totals.
West Pit										
WP001	1995	6.2	26	Apr-98	Aug-01	Aug-12	6.2	6.2	6.2	Phase III Released
WP002	1995	32.7	26	Apr-98	Aug-01	Aug-12	32.7	32.7	32.7	Phase III Released
WP003	1995	7.0	26	Jun-11	Jun-11	Nov-18	7.0	7.0	7.0	Phase III Released
WP004	1996	8.9	25	Jun-11	Jun-11	Nov-18	8.9	8.9	8.9	Phase III Released
WP005	1997	6.1	24	Jun-11	Jun-11	Aug-12	6.1	6.1	6.1	Phase III Released
WP006	1998	2.0	23	Jun-11	Jun-11	Aug-12	2.0	2.0	2.0	Phase III Released
WP007	1999	7.9	22	Jun-11	Jun-11	Aug-12	7.9	7.9	7.9	Phase III Released
WP008	2000	10.1	21	Jun-11	Jun-11	Feb-17	10.1	10.1	10.1	Phase III Released
WP009	2001	0.5	20	Jun-11	Jun-11	Feb-17	0.5	0.5	0.5	Phase III Released
WP010	2001	5.2	20	Jun-11			5.2	5.2	5.2	August 2021 - Sprayed Entire Unit with Esplanade Herbicide
WP011	2001	1.7	20	Jun-11	Jun-11	Feb-17	1.7	1.7	1.7	Phase III Released
WP012	2002	0.0	19	Apr-12	Nov-18	Nov-18	0.0	4.0	4.0	Phase III Released
WP013	2006	4.0	15	Apr-12	Nov-18	Nov-18	3.9	0.0	0.0	Phase III Released
WP014	2009	47.3	12	Apr-12	Nov-18		51.3	51.3	51.3	6 Acres Redisturbed in 2010 Reseeded in 2010. Moved 4.4 acres to WP019.
WP015	2010	94.0	11	Apr-12	Nov-18		94.0	94.0	127.2	69.7 acres re-seeded in 2013/1.6 acres moved to WP023/23.3 acres moved to WP025 in 2017. Moved 9.9 acres to WP015.
WP016	2011	146.1	10	Apr-12	Nov-18		132.2	132.2	146.1	34.1 Acres Seeded in 2012/17.7 acres regraded 2011/3.7 acres moved to WP023
WP017	2013	12.6	8	Apr-12	Nov-18		12.6	12.6	12.6	12.6 ac Grassland - Regraded in 2011/Seeded in 2013
WP018	2013	31.2	8	Aug-13	Nov-18		31.2	31.2	31.2	24.1 ac Grassland/7.1 Sagebrush Steppe
WP019	2013	35.9	8	Jan-16	Nov-18		22.1	22.1	22.1	1.5 ac Sagebrush Steppe/20.6 acres Grassland - Added 4.0 acres from WP014 and 9.9 acres from WP015. WP014 acreage was seeded in 2009 and WP015 acreage was seeded in 2010.
WP020	2013	95.8	8	Jan-16	Nov-18		95.8	95.8	95.8	9.2 acres Grassland/86.6 Sagebrush Steppe
WP021	2015	75.4	6	Sep-16	Oct-20		64.4	74.9	75.4	2.1 acres regrade only - 74.9 acres Grassland/15.2 acres moved to unit WP023. 10.5 acres (seeded only) moved to WP032. 10.5 acres not Phase II released due to Musk Thistle.
WP022	2016	0.5	5	Aug-18	Oct-20		0.5	0.0	0.0	This was surface disturbance only or an access road. No topsoil stripping or regrade occurred. Planted with Sagebrush Steppe.
WP023	2016	105.4	5	Jan-18	Oct-20		105.4	105.4	107.1	103.9 acres seeded as grassland.
WP024	2017	98.2	4	Aug-18	Oct-20		17.3	17.3	98.2	17.3 acres seeded as Sagebrush Steppe
WP025	2017	23.3	4	Apr-12	Oct-20		23.3	23.3	0.0	Originally part of WP015 Topsoiled 23.3 acres seeded as Sagebrush Steppe.
WP026	2018	54.2	3	Aug-18			54.2	54.2	1.8	52.4 acres regraded in 2017.
WP027	2018	17.8	3	Aug-18			17.8	17.8	0.0	17.8 acres regrade occurred in 2017.
WP028	2018	17.9	3	Sep-19			17.9	17.9	15.3	2.6 acres regraded in 2017.
WP029	2018	38.2	3	Sep-19			38.2	38.2	32.6	5.6 acres regraded in 2017.
WP030	2019	12.1	2	Jun-21			12.1	12.1	12.1	12.1 Acres Sagebrush Steppe - Reclaimed Topsoil pile footprint. Reseeded 12.1 acres in the fall of 2020.
WP031	2019	45.8	2	Jul-20			45.8	45.8	66.6	13.3 acres Sagebrush Steppe - 32.5 acres Grassland - Reseeded 10 Acres in the fall of 2020.
WP032	2015	10.5	6	Sep-16			10.5	0.0	0.0	This was originally part of WP021 - removed during Phase II due to noxious weeds. Topsoil and backfilled acres are still part of WP021.
WP033	2021	3.3	0				3.3	3.3	3.3	3.3 Acres seeded as grazingland.
WP034	2021	10.0	0				10.0	10.0	10.0	10.0 Acres seeded as grazingland.
Grand Totals		**980.7**					**865.1**	**864.6**	**917.9**	Remove Phase III acreage from Grand Totals.

Figure 2-2 – Colowyo Reclamation Table Continued

Colowyo Reclamation Table

Area	Reclamation Period		Status							Notes:
	Year	Acreage	Revegetated Years	Bond Release Phase 1	Bond Release Phase 2	Bond Release Phase 3	Reclaimed (Seeded)	Topsoiled	Backfilled & Graded	
Section 16 Pit										Acres seeded as grazingland.
16002	1993	6.2	28	Jun-11	Jan-18	Jan-18	6.2	6.2	6.2	Phase III Released
16003	1993	25.9	28	Apr-98	Aug-01	Jan-18	25.9	25.9	25.9	Phase III Released
16005	1994	3.9	27	Jun-11	Jan-18	Jan-18	3.9	3.9	3.9	Phase III Released
16006	1994	50.5	27	Apr-98	Aug-01	Jan-18	50.5	50.5	50.5	Phase III Released
16008	1995	41.2	26	Apr-98	Aug-01	Jan-18	41.2	41.2	41.2	Phase III Released
16009	1996	1.3	25	Jun-11	Jan-18	Jan-18	1.3	1.3	1.3	Phase III Released
16010	1996	10.0	25	Jun-11	Jun-11	Jan-18	10.0	10.0	10.0	Phase III Released
16011	1997	6.2	24	Jun-11	Jan-18	Jan-18	6.2	6.2	6.2	Phase III Released
16012	1997	2.0	24	Jun-11	Jan-18	Jan-18	2.0	2.0	2.0	Phase III Released
16013	1997	3.2	24	Jun-11	Jan-18	Jan-18	3.2	3.2	3.2	Phase III Released
16014	1998	7.4	23	Jun-11	Jun-11	Jan-18	7.4	7.4	7.4	Phase III Released
16015	1998	2.0	23	Jun-11	Jan-18	Jan-18	2.0	2.0	2.0	Phase III Released
16016	1999	22.7	22	Jun-11	Jan-18	Jan-18	22.7	22.7	22.7	Phase III Released
Grand Totals		**182.5**					**182.5**	**182.5**	**182.5**	182.5 Acres seeded as grazingland.
South Taylor Pit										Acres seeded as grazingland.
ST001	2011	46.1	10	Jan-16			46.1	46.1	46.1	Only 44.8 acres Phase I released in 2016-19.1 ac Sagebrush Steep/3.3 acres study area/23.7 ac Grassland
ST002	2012	6.3	9	Aug-13	Oct-19		6.3	6.3	6.3	6.3 Grassland acres seeded in 2012
ST003	2013	1.2	8	Jan-16	Oct-19		1.2	1.2	1.2	1.2 acres Grassland
ST004	2014	12.2	7	Jan-16			12.2	12.2	12.2	Only 4.5 acres Phase I released in 2016 - 12.2 acres Grassland
ST005	2016	1.4	5	Aug-18			1.4	0.0	0.0	Wildland Fire Area no backfill and grading occurred or topsoil stripping
Grand Totals		**67.2**					**67.2**	**65.8**	**65.8**	67.2 Acres seeded as grazingland.
Gossard Loadout/Facilities Areas										Acres seeded as grazingland.
GF01	2016	3.4	5	Aug-18	Oct-20		3.4	3.4	3.4	Lower Admin Building - 3.4 acres Sagebrush Steppe
GF03	2017	17.7	4				17.7	17.7	17.7	This was the raw water pipeline. Seeded sagebrush steppe.
GF04	2017	10.4	4				10.4	10.4	10.4	10.4 Acres seeded as grazingland.
Grand Total		**31.5**					**31.5**	**31.5**	**31.5**	31.5 Acres seeded as grazingland.
Collom										Acres seeded as grazingland.
C01	2016	0.3	5	Aug-18			0.3	0.0	0.0	This was brushing only. Seeded sagebrush steppe. Previous total was 0.4 acres. 0.1 acres redisturbed in 2017.
C02	2016	0.2	5	Aug-18			0.2	0.0	0.0	This was brushing only. Seeded sagebrush steppe.
C03	2016	0.1	5				0.1	0.0	0.0	This was brushing only. Seeded sagebrush steppe. Previous total was 0.3 acres. 0.2 acres redisturbed in 2017.
C05	2016	0.1	5	Aug-18			0.1	0.0	0.0	This was brushing only. Seeded sagebrush steppe.
Grand Total		**0.7**					**0.7**	**0.0**	**0.0**	0.7 Acres seeded as grazingland.

Figure 2-3 – Colowyo Seed Tag Documentation

Granite Seed - Denver
From: 490 East 76th Ave., Unit A
Denver, CO 80229

1 of 1

Mix Name: **Table 2.05-7 Grassland-Broadcast only**

3-55519

Mix #: **221792**

Table 2.05-7 Grassland-Broadcast only

% Pure	Common Name	Variety	G + D or H	Origin
27.80	SAGEBRUSH, MOUNTAIN BIG	VNS	77 -TZ	UT
22.53	FESCUE, ROCKY MOUNTAIN	VNS	95 -TZ	CAN
11.03	PENSTEMON, ROCKY MOUNTAIN	Bandera	67 + 30 = 97	OR
5.80	YARROW, WESTERN	Eagle	86 -TZ	WA

0.00 Other Crop
32.82 Inert Matter
0.01 Weed Seed

Date Tested: 02-Dec-20
Hard Seed: 3.33
Noxious Weed: NONE FOUND

Net Weight: 21.01 Lbs. PLS 36.34 Lbs. Bulk

Coverage: 36.344 Bulk #

NOTICE TO BUYER LIMITATIONS OF WARRANTIES AND REMEDIES

Crop yield and quality are dependent upon many factors beyond the control of the labeled seller and NO WARRANTY is made for crop yield and quality. The labeled seller warrants that all seed sold has been labeled as required under applicable state and federal seed law and that the seed conforms to the label description, within recognized tolerances. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE LABEL.

No claim shall be asserted against the labeled seller unless Buyer reports to the labeled seller within a reasonable period after discovery (not to exceed thirty days), any condition that might lead to a complaint. BUYER'S EXCUSIVE REMEDY FOR ANY CLAIM OR LOSS RESULTING FROM BREACH OF WARRANTY, BREACH OF CONTRACT OR NEGLIGENCE (INCLUDING BUT NOT LIMITED TO INCIDENTAL OR CONSEQUENTIAL DAMAGES) SHALL BE LIMITED TO REPAYMENT OF THE PURCHASE PRICE.

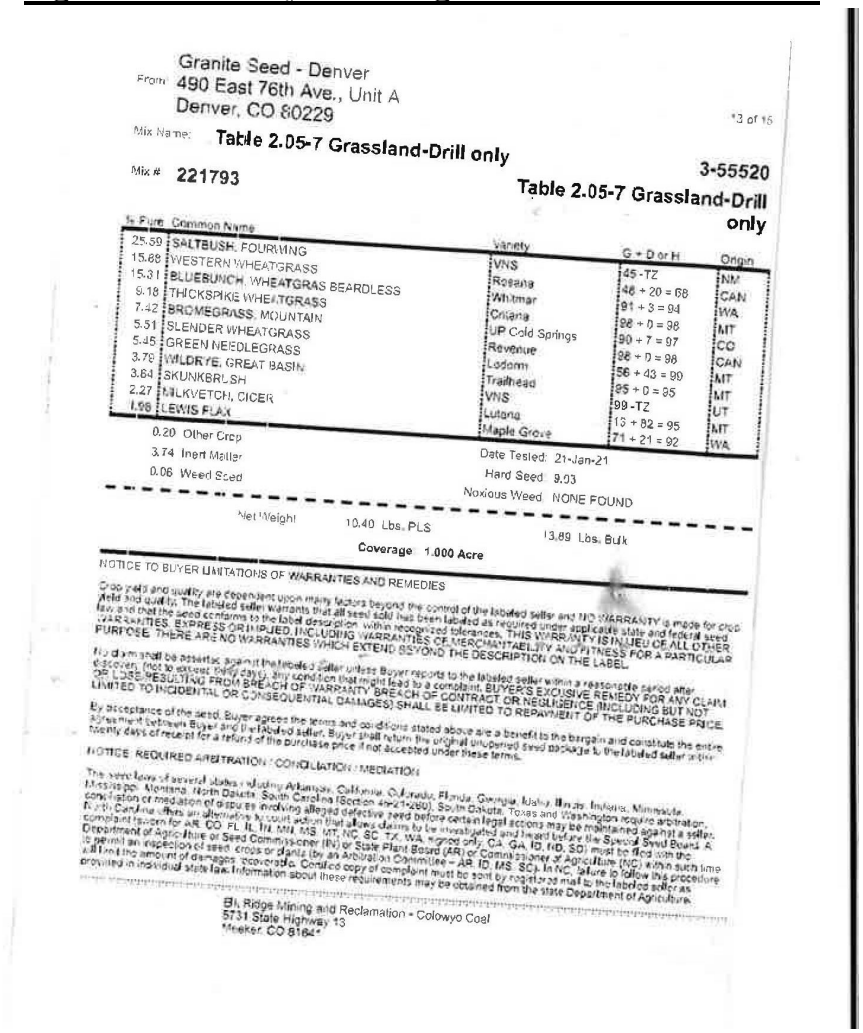
By acceptance of the seed, Buyer agrees the terms and conditions stated above are a benefit to the bargain and constitute the entire agreement between Buyer and the labeled seller. Buyer shall return the original unopened seed package to the labeled seller within twenty days of receipt for a refund of the purchase price if not accepted under these terms.

NOTICE: REQUIRED ARBITRATION / CONCILIATION / MEDIATION

The seed laws of several states including Arkansas, California, Colorado, Florida, Georgia, Idaho, Illinois, Indiana, Minnesota, Mississippi, Montana, North Dakota, South Carolina (Section 46-21-260), South Dakota, Texas and Washington require arbitration, conciliation or mediation of disputes involving alleged defective seed before certain legal actions may be maintained against a seller. North Carolina offers an alternative to court action that allows claims to be investigated and heard before the Special Seed Board. A complaint (sworn for AR, CO, FL, IL, IN, MN, MS, MT, NC, SC, TX, WA; signed only, CA, GA, ID, ND, SD) must be filed with the Department of Agriculture or Seed Commissioner (IN) or State Plant Board (AR) or Commissioner of Agriculture (NC) within such time to permit an inspection of seed, crops or plants (by an Arbitration Committee – AR, ID, MS, SC). In NC, failure to follow this procedure will limit the amount of damages recoverable. Certified copy of complaint must be sent by registered mail to the labeled seller as provided in individual state law. Information about these requirements may be obtained from the state Department of Agriculture.

Elk Ridge Mining and Reclamation - Colowyo Coal
5731 State Highway 13
Meeker, CO 81641

Figure 2-3 – Colowyo Seed Tag Documentation Continued



Granite Seed - Denver
From: 490 East 76th Ave., Unit A
Denver, CO 80229

*3 of 15

Mix Name: **Table 2.05-7 Grassland-Drill only**

Mix # **221793**

3-55520

Table 2.05-7 Grassland-Drill only

% Pure	Common Name	Variety	G + D or H	Origin
25.59	SALTBUSH, FOURWING	VNS	45 -TZ	NM
15.68	WESTERN WHEATGRASS	Rosana	46 + 20 = 68	CAN
15.31	BLUEBUNCH WHEATGRASS BEARDLESS	Whitmar	91 + 3 = 94	WA
9.18	THICKSPIKE WHEATGRASS	Critana	98 + 0 = 98	MT
7.42	BROMEGRASS, MOUNTAIN	UP Cold Springs	90 + 7 = 97	CO
5.51	SLENDER WHEATGRASS	Revenue	98 + 0 = 98	CAN
5.45	GREEN NEEDLEGRASS	Lodorm	56 + 43 = 99	MT
3.78	WILDRYE, GREAT BASIN	Trailhead	85 + 0 = 85	MT
3.64	SKUNKBRUSH	VNS	99 -TZ	UT
2.27	MILKVETCH, CICER	Lutana	13 + 82 = 95	MT
1.98	LEWIS FLAX	Maple Grove	71 + 21 = 92	WA

0.20 Other Crop
3.74 Inert Matter
0.06 Weed Seed

Date Tested: 21-Jan-21
Hard Seed 9.03
Noxious Weed NONE FOUND

Net Weight 10.40 Lbs. PLS 13.89 Lbs. Bulk

Coverage 1.000 Acre

NOTICE TO BUYER LIMITATIONS OF WARRANTIES AND REMEDIES

Crop yield and quality are dependent upon many factors beyond the control of the labeled seller and NO WARRANTY is made for crop yield and quality. The labeled seller warrants that all seed sold has been labeled as required under applicable state and federal seed law, and that the seed conforms to the label description within recognized tolerances. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE LABEL.

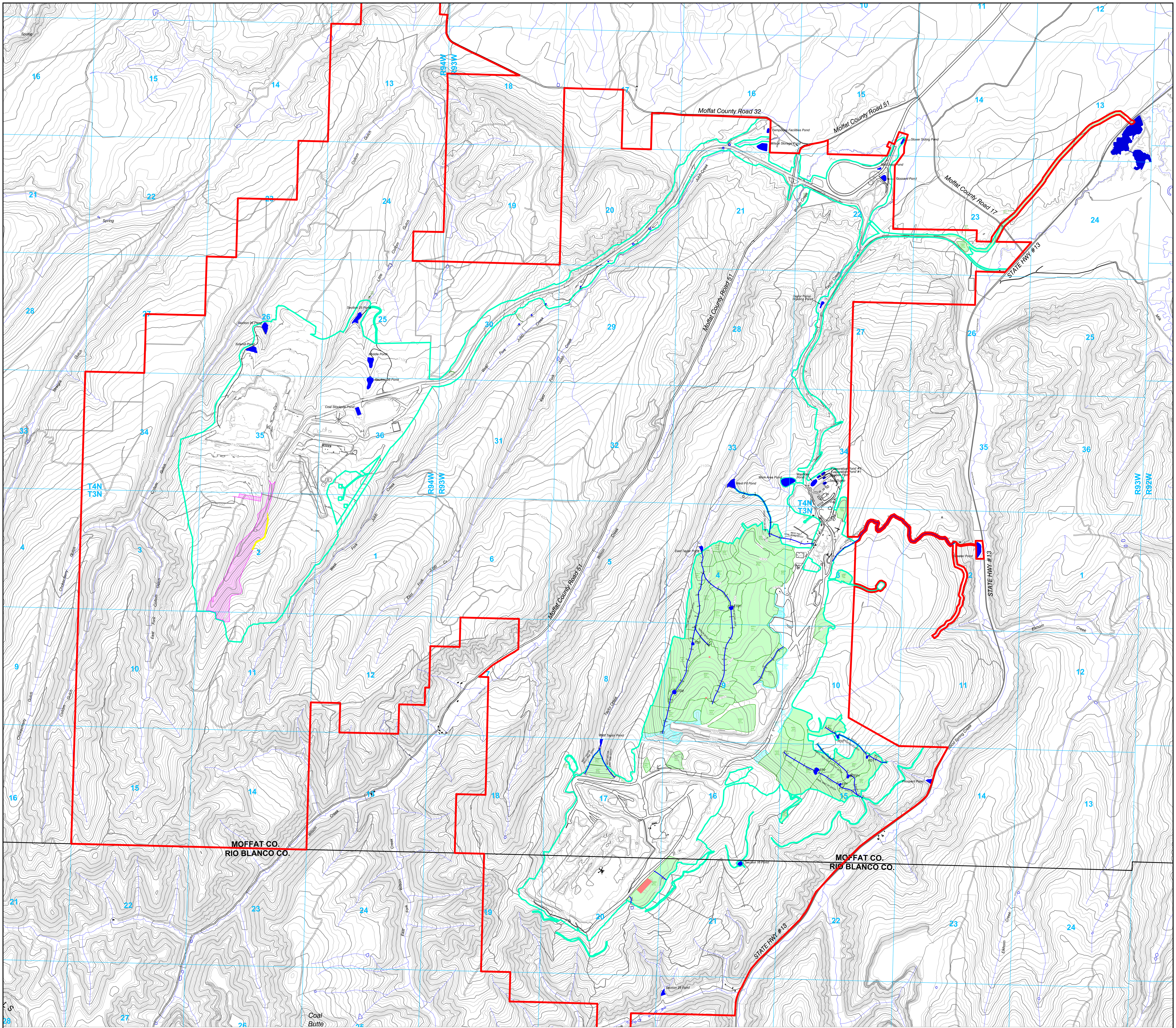
No claim shall be asserted against the labeled seller unless Buyer reports to the labeled seller within a reasonable period after discovery, (not to exceed thirty days), any condition that might lead to a complaint. BUYER'S EXCLUSIVE REMEDY FOR ANY CLAIM OR LOSS RESULTING FROM BREACH OF WARRANTY, BREACH OF CONTRACT OR NEGLIGENCE (INCLUDING BUT NOT LIMITED TO INCIDENTAL OR CONSEQUENTIAL DAMAGES) SHALL BE LIMITED TO REPAYMENT OF THE PURCHASE PRICE.

By acceptance of the seed, Buyer agrees the terms and conditions stated above are a benefit to the bargain and constitute the entire agreement between Buyer and the labeled seller. Buyer shall return the original unopened seed package to the labeled seller within twenty days of receipt for a refund of the purchase price if not accepted under these terms.

NOTICE REQUIRED ARBITRATION / CONCILIATION / MEDIATION

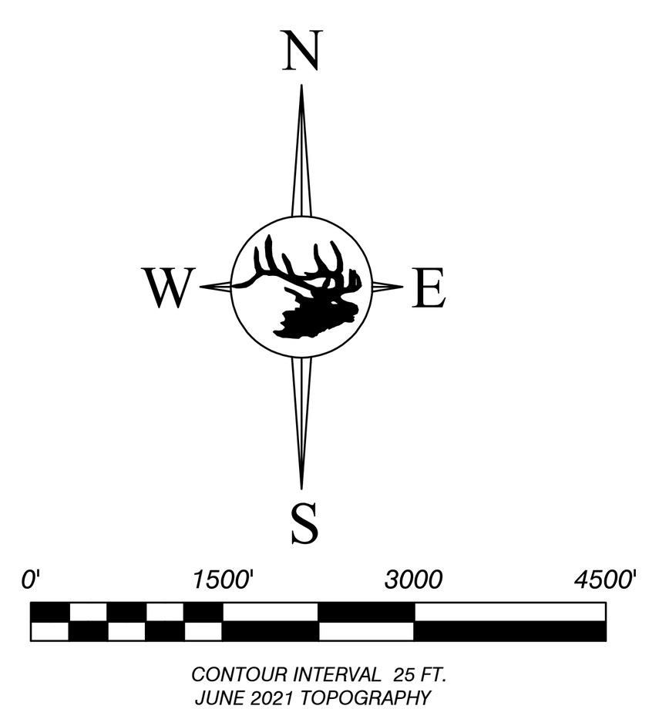
The seed laws of several states (including Arkansas, California, Colorado, Florida, Georgia, Idaho, Illinois, Minnesota, Mississippi, Montana, North Dakota, South Carolina (Section 46-21-280), South Dakota, Texas and Washington) require arbitration, conciliation or mediation of disputes involving alleged defective seed before certain legal actions may be maintained against a seller. North Carolina offers an alternative to court action that allows claims to be investigated and heard before the Special Seed Board. A complaint is given for AR, CO, FL, IL, IN, MN, MS, MT, NC, SC, TX, WA, signed only, CA, GA, ID, ND, SD) must be filed with the Department of Agriculture or Seed Commissioner (IN) or State Plant Board (AR) or Commissioner of Agriculture (NC) within such time as permit an inspection of seed, crops or plants (by an Arbitration Committee – AR, ID, MS, SC). In NC, failure to follow this procedure will limit the amount of damages recoverable. Certified copy of complaint must be sent by registered mail to the labeled seller as provided in individual state law. Information about these requirements may be obtained from the state Department of Agriculture.

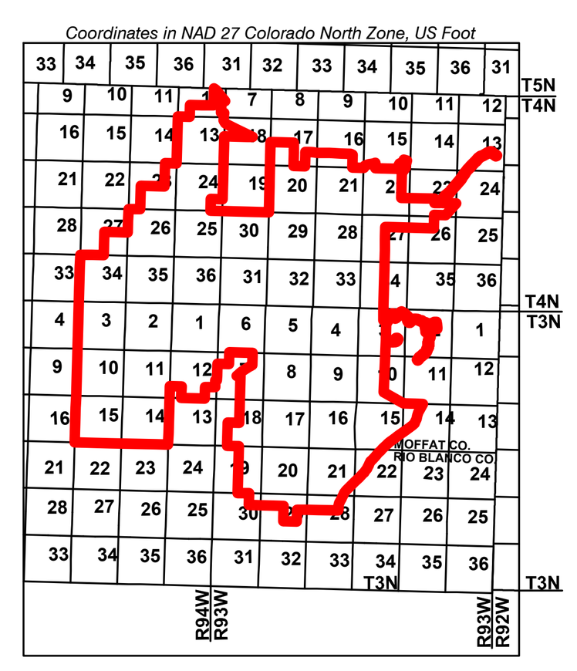
Bk Ridge Mining and Reclamation - Colowyo Coal
5731 State Highway 13
Meeker, CO 8164*



LEGEND

- Permit Boundary
- Disturbance Boundary
- Post-MIne Channels Constructed to Date
- Tall Shrub Study Areas
- Roads
- Topsoil Exemption Area
- Reclamation Areas
- Regraded Areas
- 2021 Disturbance Areas
- Stock Pond or Sediment Pond





ANNUAL REPORT MAP
Colowyo Mine

Colowyo Coal Company
5731 State Highway 13
Meeker, Colorado 81641

SCALE: 1" = 1500'
DATE: 1/13/2020
DRWG. BY: Tony
APPROVED BY:

DWG NO.
EXHIBIT 2

No.	REVISION	DATE	BY	CHK
6	Revised Reclaim Areas, Ditch Construction, Updated Topo	2/9/18	Tony	AA
7	Revised Reclaim Areas, Ditch Construction, Updated Topo, Consolidated to one map	1/11/19	Tony	AA
8	Updated Topography and 2020 Disturbance	1/12/21	Tony	AA
9	Updated Topography, Reclamation Areas, Topsoil Exemption, and 2021 Disturbance	12/28/21	Tony	AA

SECTION 3 – REGRADED OVERBURDEN SAMPLING

RULE REQUIREMENT

Rule 2.04.13(2) the Permittee may provide additional monitoring information as required by the approved permit.

Specific overburden sample suspect levels can be referenced in Volume 1 Section 2.05.3.

GENERAL DISCUSSION

Colowyo sampled two locations of regraded overburden during 2021. Results from both samples did not exceeded parameter thresholds. Please see Figure 3-1 for analytical results for all samples taken in 2021.

Figure 3-1 – Regraded Overburden Analytical Results

GRID #	DATE	EC (mmhos/ cm)	pH	SAR
BB22	20-Oct-21	2.15	7.4	3.71
BB23	20-Oct-21	2.28	7.4	3.35

SECTION 4 – INTERIM REVEGETATION MONITORING REPORT

RULE REQUIREMENT

Rule 2.04.13(2) the Permittee may provide additional monitoring information as required by the approved permit.

GENERAL DISCUSSION

The Interim Revegetation Monitoring Report can be found in Exhibit 4.

Exhibit 4

Interim Vegetation Report

Colowyo Mine

Permit No. C-1981-019

2021 Revegetation Monitoring Report

February, 2022

CEDAR CREEK ASSOCIATES, INC.

Table of Contents

1.0 INTRODUCTION 1
1.1 Climate Data 4
2.0 REVEGETATION SUCCESS STANDARDS 6
3.0 RESULTS 8
3.1 East Pit 9
3.1.1 EP058 – Year 7 Unit 9
3.1.2 EP062 – Year 2 Unit 11
3.2 West Pit 13
3.2.1 WP030 – Year 2 Unit 13
3.2.2 WP031 – Year 2 Unit 15
3.3 South Taylor 17
3.3.1 ST004 – Year 7 Unit 17
3.4 Reference Areas 19
3.4.1 Mountain Shrub Reference Area 19
3.4.2 Sagebrush Reference Area 20
4.0 CONCLUSIONS and RECOMMENDATIONS 21

Appendix A – Charts, Tables, and Raw Data

In-Text Maps, Tables, and Charts

Map 1 - Colowyo Mine – Overview - 2021 3

Table P – Precipitation at Colowyo Mine 2006 - 2021 5
Chart P1 – Seasonal Precipitation - 2006 - 2021 5
Chart P2 – Seasonal Precipitation - 2020/2021 vs. 16 Year Average 5

EP058 Map 9
Compendium 1 – EP058 10

EP062 Map 11
Compendium 2 – EP062 12

WP030 Map 13
Compendium 3 – WP030 14

WP031 Map 15
Compendium 4 – WP031 16

ST004 Map 17
Compendium 5 – ST004 18

Mountain Shrub Reference Area Map 19
Sagebrush Reference Area Map 20

Colowyo Mine

Permit Number: C-1981-019

2021 Revegetation Monitoring Report

Revegetation Units:	Reference Areas:
EP058 WP030 ST004	Mountain Shrub
EP062 WP031	Sagebrush

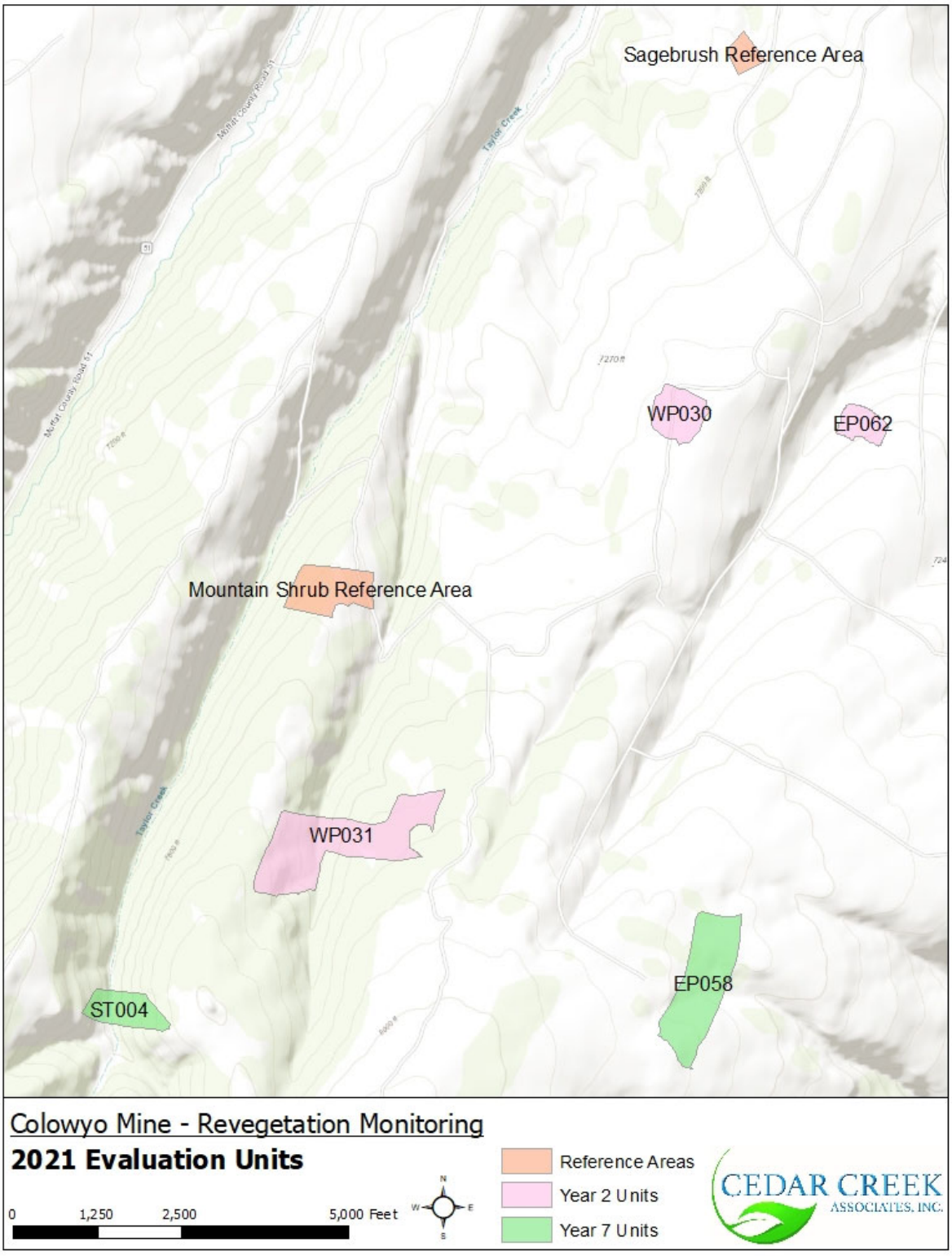
1.0 INTRODUCTION

Cedar Creek Associates, Inc. (Cedar Creek) was contracted in 2021 by Colowyo Coal Company (Colowyo) to implement a revegetation monitoring program within selected revegetated units at the Colowyo Mine. Monitoring was performed in the interest of ascertaining progress toward revegetation success in general accordance with Rule 3.03, Release of Performance Bonds. The revegetated areas evaluated in 2021 consisted of two units within the East Pit, two units within the West Pit, and one South Taylor Pit unit. Units evaluated in 2021 range in size from less than seven to 46 acres. At the time of sampling, revegetation within evaluated units had experienced either 2 or 7 growing seasons following completion of seeding. In addition, two reference areas (Mountain Shrub – 1980 and Sagebrush – 1981) were sampled to provide cover and production comparison values to facilitate an evaluation of progress toward success for the reclaimed units. The location of each unit and associated reference areas evaluated in 2021 are indicated on Map 1, and the sample points within each area are provided on "in-text" maps for each unit in Section 3.0.

Field sampling for the directly measurable variables of ground cover, woody plant density, current annual production (seventh growing season units only) and seedling density (first growing season units only) was systematically conducted within the designated units from August 2nd through August 3rd, 2021. Field efforts in 2021 were conducted under the direct supervision of Cedar Creek's Senior Reclamation Ecologist and Soil Specialist, Mr. Jesse H. Dillon.

The remainder of this document is divided into logical sections. Section 2.0 describes the revegetation performance standards. Section 3.0 provides results separated first by mine area (East Pit, West Pit, and South Taylor Pit) and then by revegetation unit. Each unit and resulting data/mapping are presented separately, along with a brief discussion of pertinent observations and/or recommendations. Section 4.0

presents conclusions and recommendations. Descriptions of vegetation sampling methodologies utilized in 2021 are presented in the Colowyo permit (Volume 1, section 4.15.11). Raw data tables and summaries are presented in Appendix A. In this manner, only the most salient information is provided in the main body of this document. Acreages presented in this document were determined by Colowyo's technical services department.


Sagebrush Reference Area
Moffat County Road 51
Taylor Creek
7270 ft
WP030
EP062
Mountain Shrub Reference Area
WP031
Taylor Creek
EP058
ST004
Colowyo Mine - Revegetation Monitoring
2021 Evaluation Units
0
1,250
2,500
5,000 Feet
N
W
E
S
Reference Areas
Year 2 Units
Year 7 Units
CEDAR CREEK
ASSOCIATES, INC.

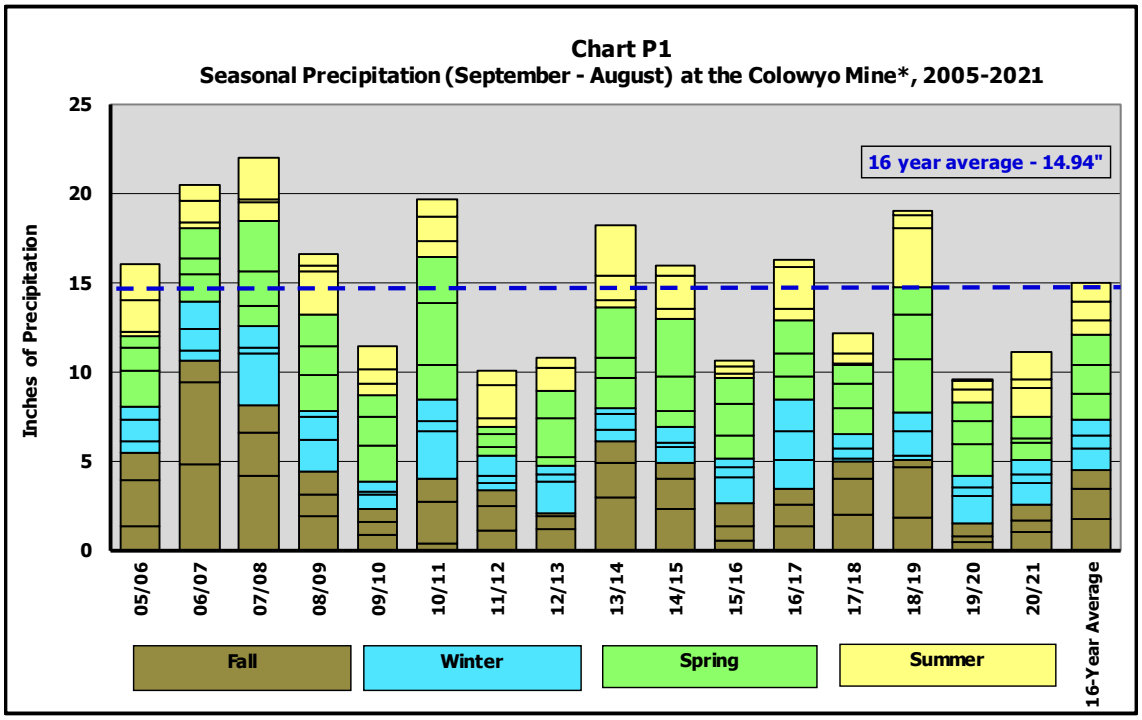
1.1 Climate Data

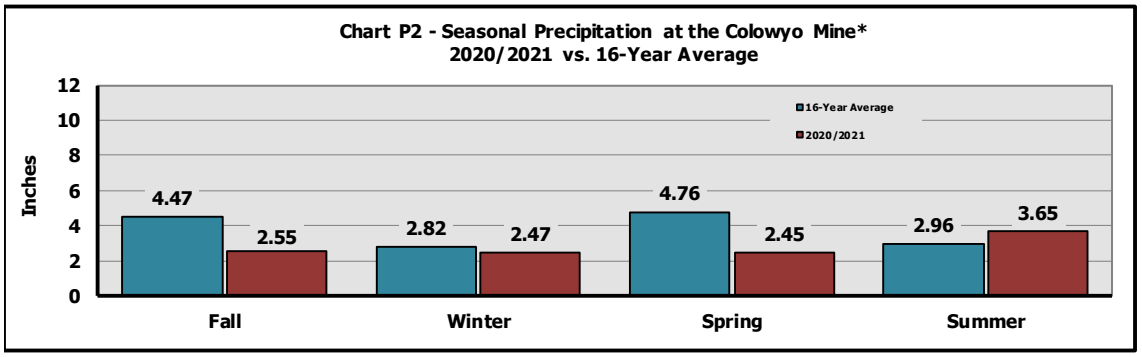
Precipitation data presented on Table P and Charts P1 and P2 is the average of two weather stations at the Colowyo Mine (SCN16 and SCN34 from 2009 to present). Table P presents precipitation accumulated annually at the Colowyo Mine over the past 16 years. Charts P1 and P2 display historical precipitation data organized by growing season. Precipitation in the project area for the 2020/2021 growing season (September 2020 through August 2021) was determined to be 74% of average when compared to the 16-year average (11.12in. vs. 15.00 in.).

Perusal of Chart P2 indicates that 2020 fall precipitation was well-below average with 2.55 inches, 57% of the 16-year average. Winter of 2020 saw approximately average levels with 2.47 inches, 88% of average. Spring of 2021 received well-below average precipitation with 2.45 inches (52% of average) while summer of 2020 received above average levels with 3.65 inches (123% of average). Since growing season precipitation were well-below average in 2020 and 2021, collected data are reflective of below average vegetative vigor and production.

Table P - Annual Precipitation at the Colowyo Mine*, 2006-2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2006	1.19	0.71	2.01	1.33	0.64	0.25	1.77	2.02	4.83	4.62	1.15	0.63	**21.15**
2007	1.21	1.50	1.54	0.92	1.67	0.30	1.27	0.84	4.18	2.38	1.60	2.84	**20.22**
2008	0.35	1.24	1.14	1.94	2.79	1.08	0.17	2.32	1.94	1.16	1.28	1.81	**17.19**
2009	1.32	0.31	1.99	1.67	1.79	2.42	0.33	0.59	0.85	0.71	0.78	0.81	**13.54**
2010	0.16	0.51	2.05	1.64	1.20	0.64	0.78	1.35	0.34	2.34	1.30	2.73	**15.01**
2011	0.55	1.18	1.96	3.45	2.59	0.93	1.38	0.96	1.09	1.38	0.90	0.38	**16.74**
2012	0.40	1.17	0.46	0.73	0.42	0.48	1.85	0.79	1.15	0.73	0.22	1.77	**10.13**
2013	0.43	0.45	0.45	2.25	1.54	0.00	1.26	0.60	2.93	1.96	1.24	0.60	**13.69**
2014	0.91	0.36	1.66	1.14	2.81	0.46	1.30	2.86	2.31	1.68	0.91	0.86	**17.26**
2015	0.27	0.93	0.88	1.91	3.24	0.59	1.87	0.57	0.52	0.79	1.29	1.51	**14.34**
2016	0.56	0.50	1.23	1.81	1.48	0.22	0.44	0.33	1.32	1.24	0.85	1.63	**11.58**
2017	1.63	1.80	1.31	1.31	1.79	0.69	2.34	0.38	1.95	2.03	1.02	0.14	**16.36**
2018	0.60	0.75	1.46	1.45	1.04	0.07	0.53	1.16	1.81	2.84	0.42	0.28	**12.36**
2019	1.37	1.02	2.98	2.47	1.55	3.30	0.78	0.22	0.44	0.30	0.78	1.49	**16.68**
2020	0.49	0.70	1.77	1.25	1.03	0.73	0.48	0.08	1.04	0.59	0.92	1.19	**10.24**
2021	0.48	0.80	1.04	0.25	1.17	1.65	0.50	1.50	1.28	1.80	0.25	1.90	**12.60**
2006-2021 Avg.	**0.74**	**0.87**	**1.49**	**1.59**	**1.67**	**0.86**	**1.06**	**1.03**	**1.75**	**1.66**	**0.93**	**1.28**	**14.94**





* An average of data collected by Colowyo Weather Stations SCN16 and WSTPT prior to 2009, and then from stations SCN16 and SCN34 due to the relocation of WSTPT.

2.0 REVEGETATION SUCCESS STANDARDS

Colowyo has made the commitment to establish reclaimed plant communities that meet the designated post mining land use of rangeland, with the subcomponents of grazingland and wildlife habitat [Volume 1, Section 2.05.5]. Areas designated as grazingland for the post mining land use will aim to establish vegetation communities comprised of species primarily selected for palatability and production, with incidental wildlife habitat, implemented on those lands with slopes greater than 10%. Areas designated for wildlife habitat as the post mining land use will aim to establish a sagebrush steppe vegetation community and will be limited to those lands with slopes less than 10%.

Three reference areas selected to represent the three major vegetative communities are utilized to evaluate revegetation success at Colowyo; the Mountain Shrub reference area, Sagebrush reference area, and Collom Aspen reference area. The comparison between the reclamation area and the reference area occurs as follows:

East and West Pit (Including Gossard Facilities) Reclamation Areas - Reclaimed areas shall be compared to weighted parameters from the Mountain Shrub reference area (55% weight) and the Sagebrush reference area (45% weight) in accordance with Rule 4.15.7(4)(b).

South Taylor Pit Reclamation Areas - Areas reclaimed to grazing land shall be compared to weighted parameters from the Mountain Shrub reference area (52% weight), the Sagebrush reference area (25% weight), and the Collom Aspen reference area (23% weight) in accordance with Rule 4.15.7(4)(b).

The Collom Aspen reference area was not sampled in 2021, so for the purposes of this monitoring effort, the South Taylor Pit reclamation area (ST004) will be compared to the standard used for East and West Pit reclamation areas; which is generally a higher standard.

Reference areas are utilized to test revegetation success for the metrics of herbaceous cover and herbaceous production, while woody plant density and diversity metrics are compared against technical standards. In addition, South Taylor reclamation areas require the establishment of aspens and tall shrubs, but establishment is not addressed in the monitoring efforts. The success criteria for each revegetation metric are described below:

Herbaceous Cover - For revegetation targeting (and achieving) the rangeland land use subcomponents of grazingland and wildlife habitat, herbaceous cover of the revegetated area will be considered adequate for final bond release if it is not less than 90% of the herbaceous cover as

determined from the reference areas with a 90% statistical confidence utilizing a standard students statistical t-test comparison of the means, as described in Rule 4.15.8 (3) (a).

Herbaceous Production - For revegetation targeting the rangeland land use subcomponents of grazingland and wildlife habitat, herbaceous production of the revegetated area will be considered adequate for final bond release if it is not less than 90% of the herbaceous production, as determined from the reference areas with a 90% statistical confidence utilizing a standard students statistical t-test comparison of the means, as described in Rule 4.15.8 (4).

Woody Plant Density - Where shrubs establish to form wildlife habitat, they will be segregated into low and high-density areas, each with a separate woody plant density success criterion. On high-density areas (areas of shrub concentration), the standard shall be 375 live woody plants per acre. At least one-half of these totals shall be sagebrush species. In low-density areas, the standard shall be 200 plants per acre. Furthermore, Colowyo will establish wildlife habitat areas, comprised of both low and high-density areas, on approximately 20% of the acres in each bond release evaluation, with at least 50% of those acres representing high-density areas. The grazingland acres will not be subject to woody plant density standards.

Diversity - The revegetation objective for diversity will be to establish at least four native* perennial species, each more than 3% composition, minimum of two of which are grasses and a minimum of one which is a forb, with the following caveat; If no single forb species exceeds 3% composition, the forb requirement can be met if:

a) at least two native* perennial forbs combined comprise at least 2% composition, or;
b) at least four native* perennial forbs combined comprise at least 1% composition.

The dominant species will contribute to the appropriate structure and stability of the post-mining vegetative community.

* The limitation to native status will not apply to introduced (and CDRMS approved taxa) specifically planted for an approved use such as Orchard grass or Cicer milkvetch.

3.0 RESULTS

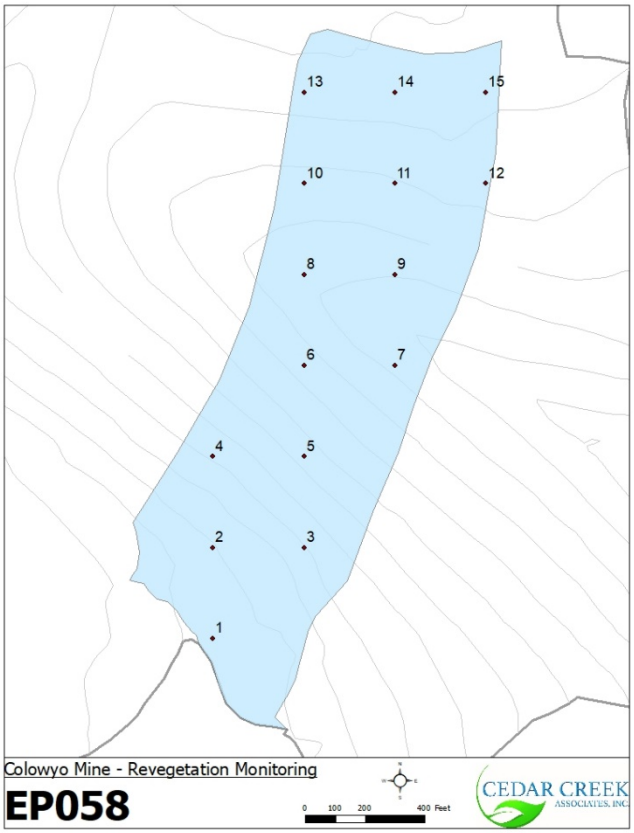
In 2021, two evaluated units have existed for seven years and were assessed with ground cover, diversity, woody plant density, and production sampling protocols. Three evaluated units have existed for two growing seasons; these units were assessed with ground cover, diversity, and woody plant density sampling protocols. Summaries of the results from the seven- and two-year-old units are presented in in-text compendia, with additional summaries and raw data presented in Appendix A. Reference Area results are summarized in Appendix A along with additional raw data.

Considering the 2021 evaluation effort as a whole, observed revegetation at Colowyo is generally in fair condition and on a path to demonstrate success. As seems to be normal for Colowyo revegetation, a few younger units exhibit elevated levels of early seral taxa (annual weedy species). However, based on past history it is unlikely these units will need remediation (herbicide treatment), except in rare occasions, given that precipitation patterns in the area tend to favor seeded perennials over time. The unfavorable precipitation in the fall of 2019 which continued through 2020 and 2021 has likely delayed the progress of the younger units, which should be closely monitored moving forward. As revegetated communities continue to mature, the older units evaluated in 2021 should readily meet both land-use goals and bond release success criteria.

The following sections (Sections 3.1 to 3.6) provide a brief narrative of the results from each individual unit evaluated by Cedar Creek. Also included for each unit is a map indicating the 2021 sample points and a one-page summary (compendium) of all pertinent data collected from the unit in 2021 and previous years, if applicable.

3.1 East Pit

3.1.1 EP058 – Year 7 Unit



EP058 is comprised of approximately 33.40 acres of moderate to steep sloping revegetation. This unit was seeded in 2015 and therefore, was undergoing its seventh growing season in 2021 (Compendium 1). A representative photo for 2021 is presented below.

Ground cover was determined from 15 transects. Desirable perennial plants in 2021 averaged 16.1% which is a decrease from Year 4 sampling (24.5%). Annual forbs initially exhibited elevated cover in Year 2, but have decreased substantially in 2021 with 3.9% average cover. Noxious weeds has remained below 0.5% average cover in years 2, 4, and 7, but reached the highest point in 2021. Cheatgrass exhibited a high of 23.1% average cover in Year 4 and has since dropped significantly to 4.0% in 2021. Annual forbs and grasses tend to decrease on Colowyo's reclamation as perennial plant communities develop. There were 17 species observed on this unit in 2021. Woody plant density was determined from 15 belt transects and indicated 21.6 stems per acre in 2021 conisting of big sagebrush and roundleaf snowberry. Perennial herbaceous production was 664.8 pounds per acre, significantly above the success criteria of 197.8 pounds per acre. Perennial grasses comprise the majority of production while noxious weeds and cheatgrass comprised 6% of the total production with 44.9 pounds per acre (Appendix A - Chart 4 and Table 16).

Unit EP058 exhibited exceptional perennial cover in Year 4, and it is likely that the drop seen in 2021 is due to the recent drought conditions. Even with the decreased cover in 2021, Unit EP058 meets the success criteria. It is likely that perennial cover in this unit will re-bound with the return of average precipitation. It is recommended that this unit be evaluated in 2023 for Year-9 bond release sampling.

Compendium 1 2021

EP058

Location:	**East Pit**	Targeted Post-Mining	**Grazingland**
Acres:	**33.4**	Community:	**Sagebrush Steppe**
First Growing Season:	**2015**		

Ground Cover Results

Number of Ground Cover Transects = 15

	Average Ground Cover (%)			Relative Ground Cover (%)			Species Observed (#)		
	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7
Perennial Grasses	15.6	24.4	15.9	39.3	50.8	64.6	14	10	7
Perennial Forbs	0.1	-	0.2	0.3	-	0.8	3	-	1
Sub-shrubs	-	-	-	-	-	-	-	-	-
Shrubs & Trees	-	0.1	-	-	0.1	-	-	1	-
Annual Grass	7.0	-	0.2	17.6	-	0.8	1	1	1
Annual / Biennial Forbs	16.8	0.5	3.9	42.3	1.0	15.9	7	4	6
Noxious Weeds - Cheatgrass	-	23.1	4.0	-	48.0	16.2	-	1	1
Noxious Weeds - Other	0.2	0.1	0.4	0.5	0.1	1.6	1	1	1
Litter	12.0	20.3	31.5						
Rock	5.5	1.1	2.1						
Bareground	42.8	30.5	41.7						
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**26**	**18**	**17**
Total Plant Cover	**39.7**	**48.1**	**24.7**						
Total Perennial Cover	**15.7**	**24.5**	**16.1**	**39.6**	**50.9**	**65.4**			
Allowable Perennial Herbaceous Cover	**15.7**	**24.4**	**16.1**	**39.6**	**50.8**	**65.4**			

Woody Plant Density Results

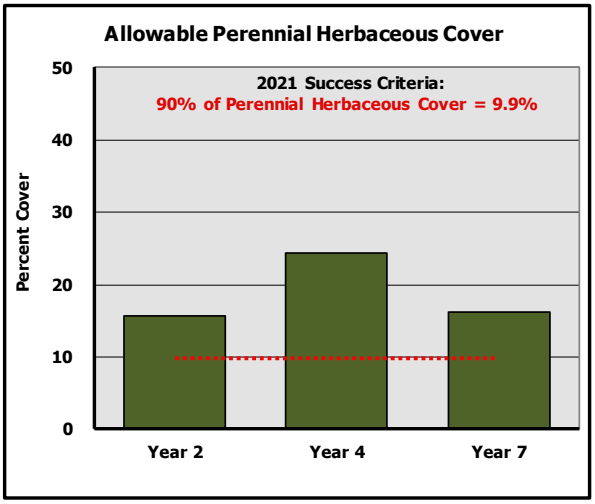
Number of Woody Plant Density Belts = 15

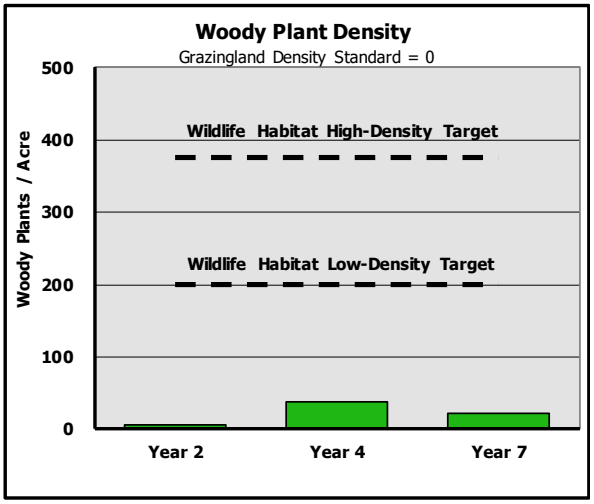
		Stems per Acre		
		Year 2	Year 4	Year 7
Artemisia tridentata	Big Sagebrush	2.7	37.8	16.2
Rosa woodsii	Woods Rose	2.7	-	-
Symphoricarpos rotundifolius	Roundleaf Snowberry	-	-	5.4
Total		**5.4**	**37.8**	**21.6**
Sagebrush Contribution (%)		50%	100%	75%
Percent of Transects Exceeding High-Density Standard (375 Stems per acre)		0%	0%	0%
Percent of Transects Exceeding Low-Density Standard (Between 200 and 375 Stems per acre)		0%	7%	0%

Production Results

		lbs per Acre
		Year 7
Perennial Grasses		657.7
Perennial Forbs		7.1
Sub-shrubs		-
Annual Grasses		-
Annual / Biennial Forbs		8.2
Noxious Weeds	Cheatgrass	44.9
	Other	-
Total Production		**717.9**
Total Perennial Production		664.8
Allowable Perennial Herb. Production		**664.8**

* Evolving post-mining vegetation communites (Grazingland or Sagebrush Steppe) will be delineated after Year 7 evaluation, in preparation for bond release evaluation.



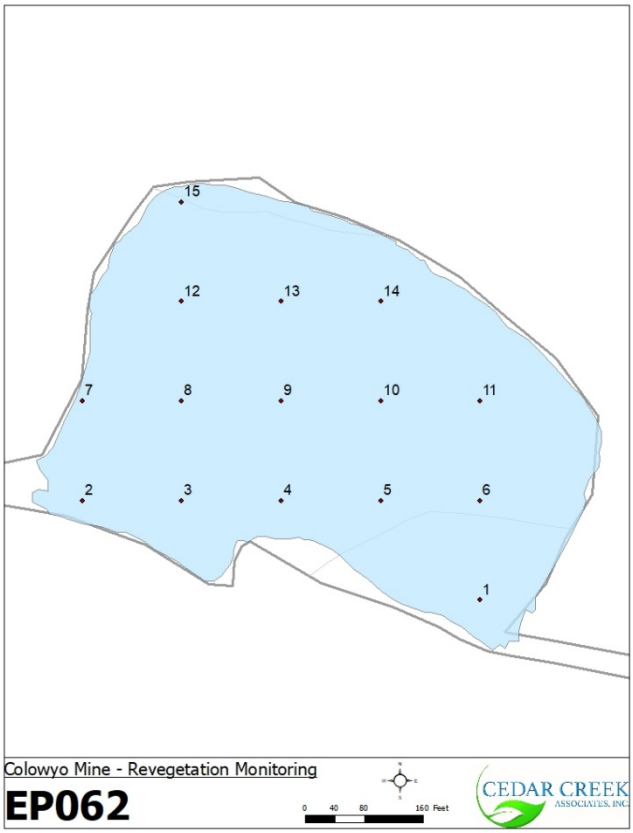


3.1.2 EP062 – Year 2 Unit

EP062 is comprised of approximately 7.0 acres of gently sloping north-facing revegetation. This unit was seeded in 2019 and therefore, was undergoing its second growing season in 2021 (Compendium 2). A representative photo for 2021 is presented below.

Ground cover was determined from 15 transects. Desirable perennial plants in Unit EP062 average 0.5% in 2021. Annual forbs exhibit elevated cover in 2021 with 18.5% average cover. Cheatgrass did not contribute to cover in 2021. Annual forbs and grasses tend to decrease on Colowyo's reclamation as perennial plant communities develop. There were 8 species observed on this unit in 2021. Woody plant density was determined from 15 belt transects and indicated 2.7 stems per acre in 2021 consisting entirely of antelope bitterbrush.

Unit EP062 exhibits poor perennial cover for two-year-old revegetation. It is recommended that this unit be evaluated in 2023 for ground cover and woody plant density in accordance with Colowyo's monitoring schedule.



Compendium 2 2021

EP062

Location: **East Pit** | Targeted Post-Mining Community: **Grazingland**
Acres: **7**
First Growing Season: **2020**

Ground Cover Results

Number of Ground Cover Transects = 15

	Average Ground Cover (%)			Relative Ground Cover (%)			Species Observed (#)		
	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7
Perennial Grasses	0.5			2.8			1		
Perennial Forbs	-			-			-		
Sub-shrubs	-			-			-		
Shrubs & Trees	-			-			-		
Annual Grass	-			-			-		
Annual / Biennial Forbs	18.5			97.2			7		
Noxious Weeds - Cheatgrass	-			-			-		
Noxious Weeds - Other	-			-			-		
Litter	8.1								
Rock	2.5								
Bareground	70.3								
Total	**100.0**			**100.0**			**8**		

Total Plant Cover	**19.0**					
Total Perennial Cover	**0.5**			**2.8**		
Allowable Perennial Herbaceous Cover	**0.5**			**2.8**		

Woody Plant Density Results

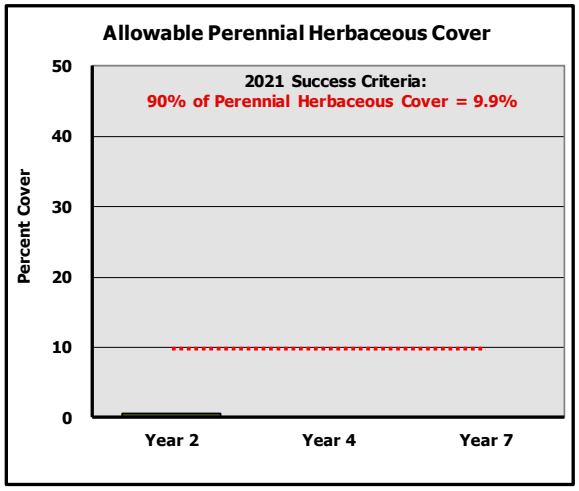
Number of Woody Plant Density Belts = 15

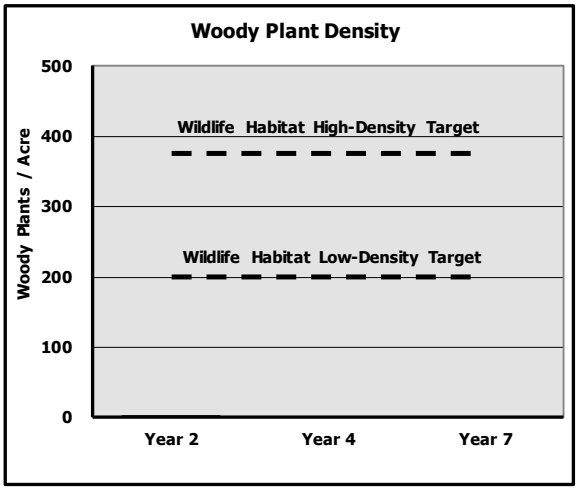
		Stems per Acre		
		Year 2	Year 4	Year 7
Purshia tridentata	Antelope Bitterbrush	2.7		
Total		**2.7**		
Sagebrush Contribution (%)		100%		
Percent of Transects Exceeding High-Density Standard (375 Stems per acre)		0%		
Percent of Transects Exceeding Low-Density Standard (Between 200 and 375 Stems per acre)		0%		

Production Results

		lbs per Acre
		Year 7
Perennial Grasses		
Perennial Forbs		
Sub-shrubs		
Annual Grasses		
Annual / Biennial Forbs		
Noxious Weeds	Cheatgrass	
	Other	
Total Production		
Total Perennial Production		
Allowable Perennial Herb. Production		

* Evolving post-mining vegetation communites (Grazingland or Sagebrush Steppe) will be delineated after Year 7 evaluation, in preparation for bond release evaluation.





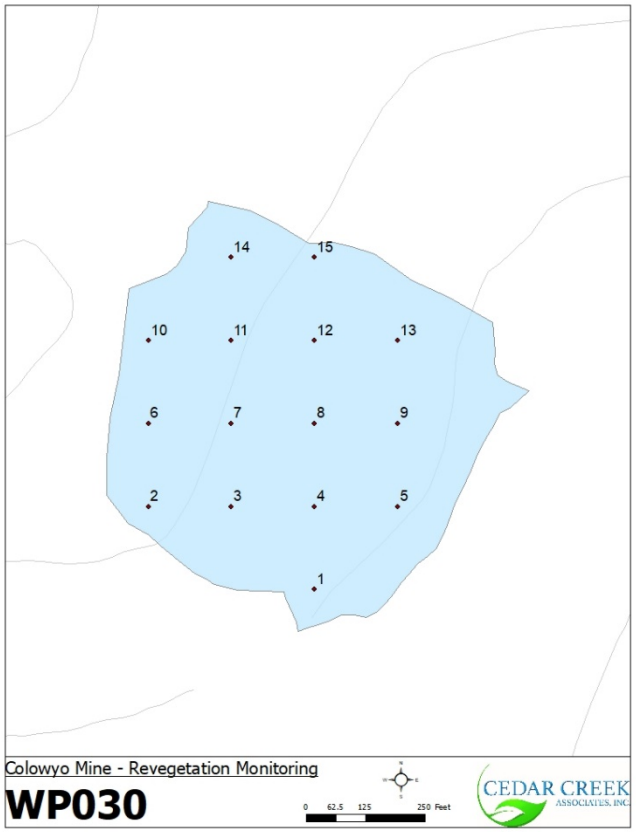
3.2 West Pit

3.2.1 WP030 – Year 2 Unit

WP030 is comprised of approximately 12.1 acres of generally flat revegetation. This unit was seeded in 2019, and therefore, was undergoing its second growing season in 2021 (Compendium 3). A representative photo for 2021 is presented below.

Ground cover was determined from 15 transects. Desirable perennial plants averaged 2.4% cover in 2021. Annual forbs exhibit elevated cover in 2021 with 19.5% average cover. Cheatgrass exhibits 0.9% average cover. A total of 11 species were observed in 2021. Woody plant density was determined from 15 belt transects and indicated 13.5 stems per acre in 2021, consisting entirely of big sagebrush.

Unit WP030 exhibits poor perennial cover for two-year-old revegetation, likely due to recent drought conditions. It is recommended that this unit be evaluated in 2023 for ground cover and woody plant density in accordance with Colowyo's monitoring schedule.



Compendium 3 2021

WP030

Location: **West Pit**
Acres: **12.1**
First Growing Season: **2020**
Targeted Post-Mining Community: **Grazingland**

Ground Cover Results

Number of Ground Cover Transects = 15

	Average Ground Cover (%)			Relative Ground Cover (%)			Species Observed (#)		
	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7
Perennial Grasses	2.4			10.5			6		
Perennial Forbs	-			-			-		
Sub-shrubs	-			-			-		
Shrubs & Trees	-			-			-		
Annual Grass	-			-			-		
Annual / Biennial Forbs	19.5			85.7			5		
Noxious Weeds - Cheatgrass	0.9			3.8			-		
Noxious Weeds - Other	-			-			-		
Litter	16.2								
Rock	3.7								
Bareground	57.3								
Total	**100.0**			**100.0**			**11**		
Total Plant Cover	**22.8**								
Total Perennial Cover	**2.4**			**10.5**					
Allowable Perennial Herbaceous Cover	**2.4**			**10.5**					

Woody Plant Density Results

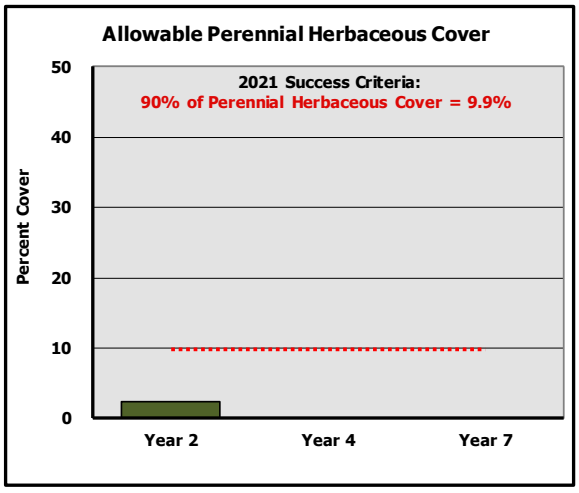
Number of Woody Plant Density belts = 15

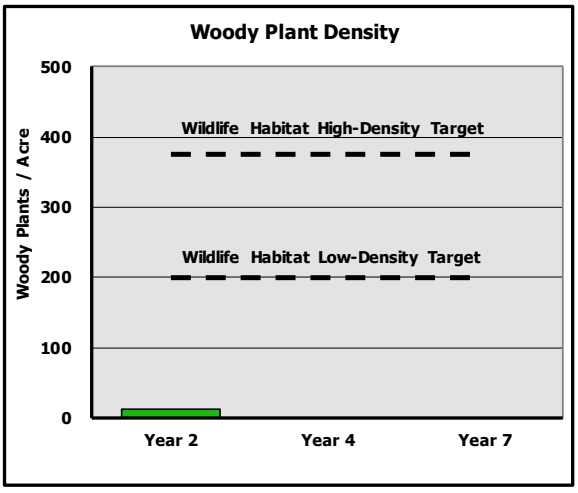
	Stems per Acre		
	Year 2	Year 4	Year 7
Artemisia tridentata Big Sagebrush	13.5		
Total	**13.5**		
Sagebrush Contribution (%)	100%		
Percent of Transects Exceeding High-Density Standard (375 Stems per acre)	0%		
Percent of Transects Exceeding Low-Density Standard (Between 200 and 375 Stems per acre)	0%		

Production Results

	lbs per Acre
	Year 7
Perennial Grasses	
Perennial Forbs	
Sub-shrubs	
Annual Grasses	
Annual / Biennial Forbs	
Noxious Weeds	
Total Production	
Total Perennial Production	
Allowable Perennial Herb. Production	

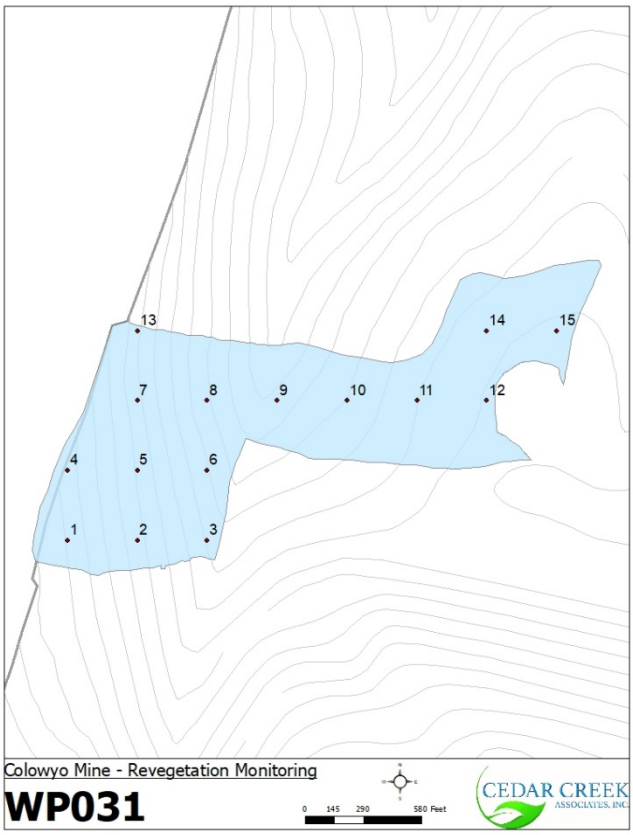
* Evolving post-mining vegetation communites (Grazingland or Sagebrush Steppe) will be delineated after Year 7 evaluation, in preparation for bond release evaluation.





3.2.2 WP031 – Year 2 Unit

WP031 is comprised of approximately 45.8 acres of moderately sloping revegetation. This unit was seeded in 2019, and therefore, was undergoing its second growing season in 2021 (Compendium 4). A representative photo for 2021 is presented below.



Ground cover was determined from 15 transects. Desirable perennial plants averaged 0.2% cover in 2021. Annual forbs exhibit elevated cover in 2021 with 27.5% average cover. Cheatgrass exhibits minor cover with 0.1% average cover. Annual grasses tend to decrease on Colowyo's reclamation as perennial plant communities develop. A total of 8 species were observed in 2021. Woody plant density was determined from 15 belt transects and indicated 2.7 stems per acre in 2021, consisting entirely of four-wing saltbush.

Unit WP031 exhibits poor perennial cover for two-year-old revegetation, likely due to recent drought conditions. It is recommended that this unit be evaluated in 2023 for ground cover and woody plant density in accordance with Colowyo's monitoring schedule.

Compendium 4 2021

WP031

Location: **West Pit**
Acres: **45.8**
First Growing Season: **2020**
Targeted Post-Mining Community: **Grazingland**

Ground Cover Results

Number of Ground Cover Transects = 15

	Average Ground Cover (%)			Relative Ground Cover (%)			Species Observed (#)		
	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7
Perennial Grasses	0.2			0.7			1		
Perennial Forbs	-			-			-		
Sub-shrubs	-			-			-		
Shrubs & Trees	0.1			0.2			1		
Annual Grass	-			-			-		
Annual / Biennial Forbs	27.5			98.6			6		
Noxious Weeds - Cheatgrass	0.1			0.5			-		
Noxious Weeds - Other	-			-			-		
Litter	8.9								
Rock	3.5								
Bareground	59.7								
Total	**100.0**			**100.0**			**8**		
Total Plant Cover	**27.9**								
Total Perennial Cover	**0.3**			**1.0**					
Allowable Perennial Herbaceous Cover	**0.2**			**0.7**					

Woody Plant Density Results

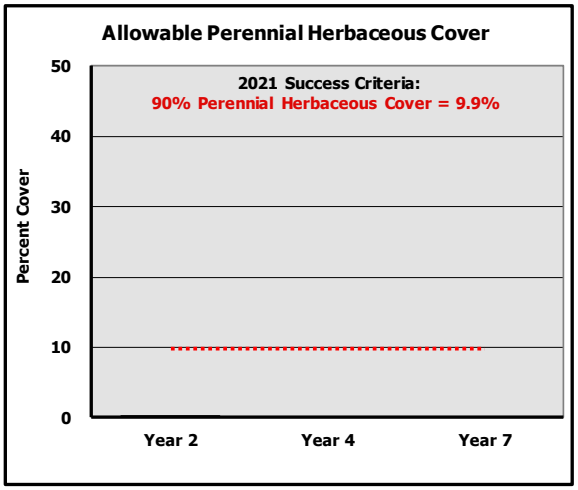
Number of Woody Plant Density belts = 15

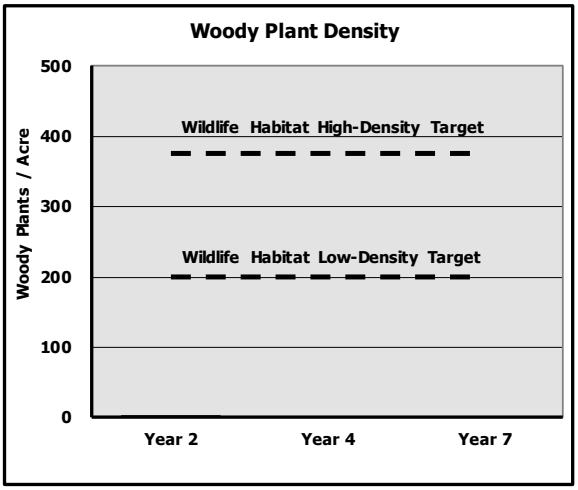
		Stems per Acre		
		Year 2	Year 4	Year 7
Atriplex canescens	Four-wing Saltbush	2.7		
Total		**2.7**		
Sagebrush Contribution (%)		0%		
Percent of Transects Exceeding High-Density Standard (375 Stems per acre)		0%		
Percent of Transects Exceeding Low-Density Standard (Between 200 and 375 Stems per acre)		0%		

Production Results

	lbs per Acre
	Year 7
Perennial Grasses	
Perennial Forbs	
Sub-shrubs	
Annual Grasses	
Annual / Biennial Forbs	
Noxious Weeds	
Total Production	
Total Perennial Production	
Allowable Perennial Herb. Production	

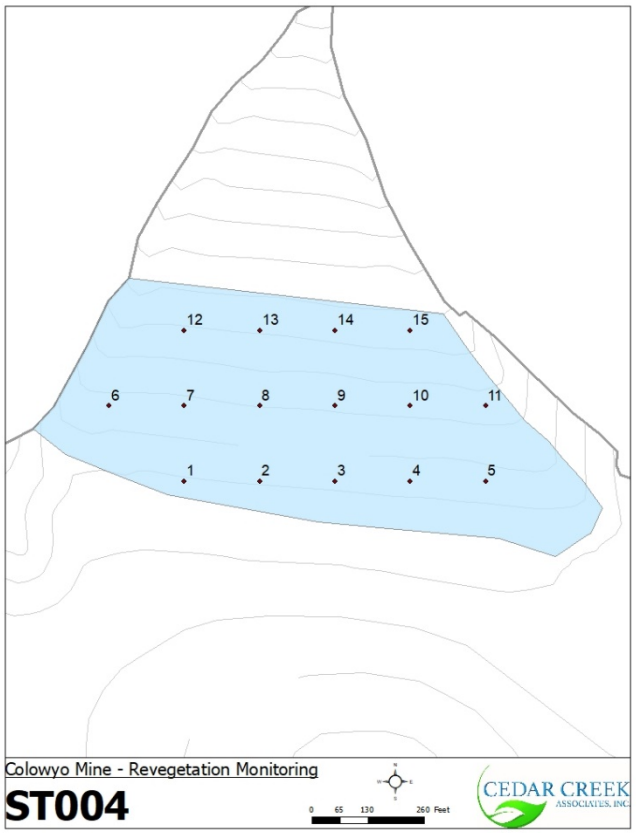
* Evolving post-mining vegetation communites (Grazingland or Sagebrush Steppe) will be delineated after Year 7 evaluation, in preparation for bond release evaluation.





3.3 South Taylor

3.3.1 ST004 – Year 7 Unit



ST004 is comprised of approximately 12.2 acres of steeply sloping north-facing revegetation. This unit was seeded in 2014 and therefore, was undergoing its seventh growing season in 2021 (Compendium 5). A representative photo for 2021 is presented below.

Ground cover was determined from 15 transects. Desirable perennial plants have decreased slightly in Year 7 to 22.2%, likely due to recent drought conditions. Annual forbs increased slightly since Year 4 but remain under 1.0% average cover. Noxious weeds have decrease in year 7 with 1.1% average cover. Annual forbs and grasses tend to decrease on Colowyo's reclamation as perennial plant communities develop. Cheatgrass has decreased to 0.6% average cover in Year 7. A total of 22 species were observed in Year 7. Woody plant density was determined from 15 belt transects. Woody plant density on ST004 indicated 407.4 stems per acre in Year 7, primarily from big sagebrush. Perennial herbaceous production was 547.6 pounds per acre, significantly above the success criteria of 197.8 pounds per acre. Perennial grasses comprise the majority of production while noxious weeds and cheatgrass comprised less than 0.1% of the total production with 1.8 pounds per acre (Appendix A - Chart 4 and Table 16).

Unit ST004 exhibited exceptional perennial cover during Year 4, and it is likely that the drop seen in 2021 is due to the recent drought conditions. Even with the decreased cover in 2021, Unit EP058 meets the success criteria. It is likely that perennial cover in this unit will re-bound with the return of average precipitation. It is recommended that this unit be evaluated in 2023 for Year-9 bond release sampling.

Compendium 5 2021

ST004

Location: **South Taylor Pit** Targeted Post-Mining Community: **Grazingland**

Acres: **12.2**

First Growing Season: **2015**

Ground Cover Results

Number of Ground Cover Transects = 15

	Average Ground Cover (%)			Relative Ground Cover (%)			Species Observed (#)		
	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7	Year 2	Year 4	Year 7
Perennial Grasses	11.1	25.3	19.9	49.0	84.6	80.3	12	8	10
Perennial Forbs	0.5	1.5	2.0	2.4	5.1	8.1	4	3	3
Sub-shrubs	-	-	-	-	-	-	-	-	-
Shrubs & Trees	-	-	0.3	-	-	1.3	-	-	1
Annual Grass	0.1	-	-	0.3	-	-	1	1	-
Annual / Biennial Forbs	10.4	0.2	0.8	46.0	0.7	3.2	8	2	6
Noxious Weeds - Cheatgrass	-	1.4	0.6	-	4.7	2.4	-	1	-
Noxious Weeds - Other	0.5	1.5	1.1	2.4	4.9	4.6	3	2	2
Litter	4.3	11.8	19.0						
Rock	5.7	16.9	12.5						
Bareground	67.4	41.3	43.7						
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**28**	**17**	**22**
Total Plant Cover	**22.6**	**29.9**	**24.7**						
Total Perennial Cover	**11.6**	**26.9**	**22.2**	**51.3**	**89.8**	**89.8**			
Allowable Perennial Herbaceous Cover	**11.6**	**26.9**	**21.9**	**51.3**	**89.8**	**88.4**			

Woody Plant Density Results

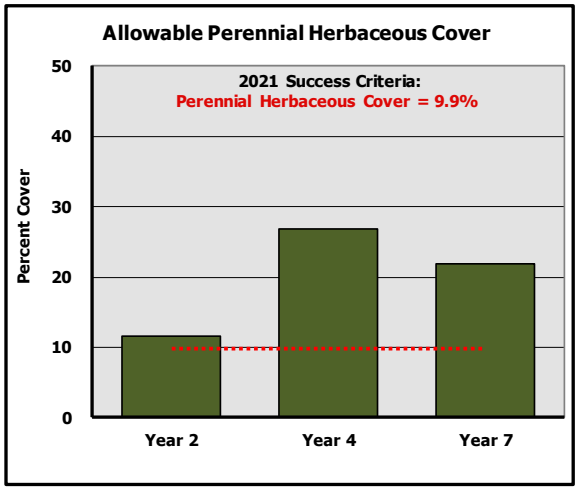
Number of Woody Plant Density Belts = 15

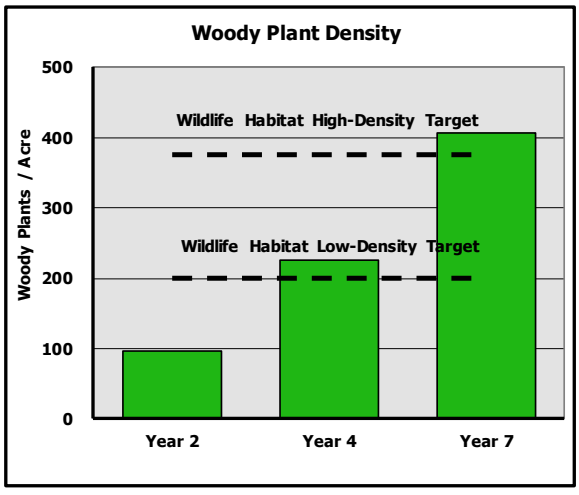
		Stems per Acre		
		Year 2	Year 4	Year 7
Artemisia tridentata	Big Sagebrush	97.1	221.2	369.6
Purshia tridentata	Antelope Bitterbrush	-	5.4	8.1
Symphoricarpos rotundifolius	Roundleaf Snowberry	-	-	29.7
Total		**97.1**	**226.6**	**407.4**
Sagebrush Contribution (%)		100%	98%	91%
Percent of Transects Exceeding High-Density Standard (375 Stems per acre)		7%	20%	40%
Percent of Transects Exceeding Low-Density Standard (Between 200 and 375 Stems per acre)		27%	33%	13%

Production Results

		lbs per Acre
		Year 7
Perennial Grasses		488.8
Perennial Forbs		58.8
Sub-shrubs		-
Annual Grasses		-
Annual / Biennial Forbs		6.8
Noxious Weeds	Cheatgrass	0.7
	Other	1.1
Total Production		**556.2**
Total Perennial Production		547.6
Allowable Perennial Herb. Production		**547.6**

* Evolving post-mining vegetation communites (Grazingland or Sagebrush Steppe) will be delineated after Year 7 evaluation, in preparation for bond release evaluation.

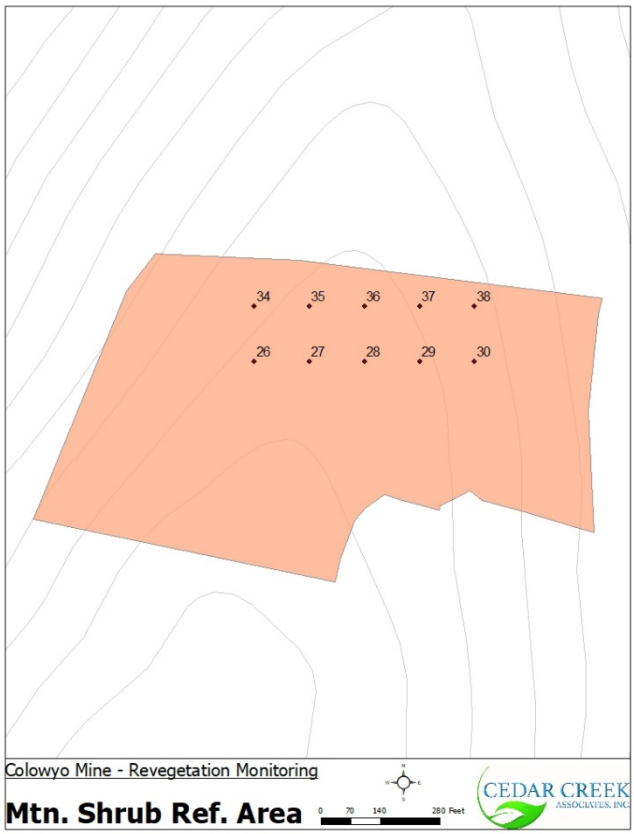




* Aspen Referance Area not Sampled in 2021. East Pit Success Criteria are used as a comparison

3.4 Reference Areas

3.4.1 Mountain Shrub Reference Area

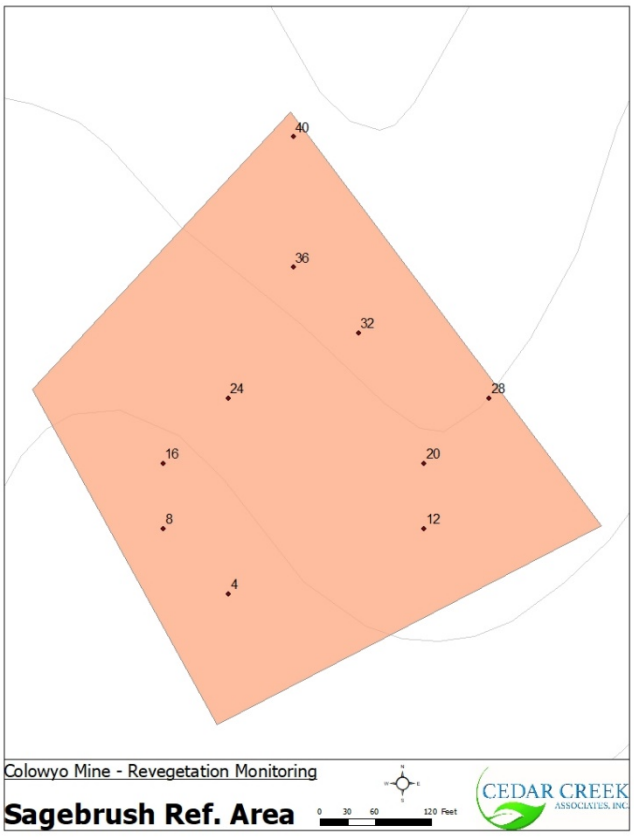


The Mountain Shrub Reference Area is comprised of approximately 18 acres of gently to moderately sloping vegetation with a predominately northwestern aspect (mesic) and eastern aspect (xeric). Rationale for the larger reference area with two dominant aspects is to provide a better representation of the distribution of Mountain Shrub communities located on and around Colowyo Coal Mine properties. The xeric exposure tends to exhibit more elevated herbaceous parameters, given a modest reduction in the overstory. This reference area is located on the undisturbed ridge immediately west of the West Pit Area (Map 1). A representative photo for 2021 is presented below.

Ground cover in the Mountain Shrub Reference Area (Appendix A - Chart 1 and 2; and Table 1 and 2) consisted of 43.6% live vegetation, 0.2% rock, 47.0% litter, and bare soil exposure of 9.2%. Perennial cover across the unit averaged 43.4% with annual and biennial cover averaging 0.2%. There were no contributions to cover by noxious species (including cheatgrass) in 2021. Current annual production across the area averaged 321.0 pounds per acre in 2021 with perennial grasses the dominant category, followed by perennial forbs and sub-shrubs. Total perennial production was 313.2 pounds per acre (Appendix A - Chart 4 and Table 16).

3.4.2 Sagebrush Reference Area

The Sagebrush Reference Area is comprised of approximately 4.7 acres of gentle to moderately sloping topography that has a predominately northern aspect. This reference area is located on a gently sloping ridge north of the Administration / Facilities Area (Map 1). A representative photo from 2021 is presented below.



Ground cover in the Sagebrush Reference Area consisted of 30.8% live vegetation, 2.2% rock, 43.8% litter, and bare soil exposure of 23.2% (Appendix A - Chart 1 and 2; and Table 1 and 2). Perennial cover across the unit averaged 30.1%, with annual and biennial cover of 0.6%, noxious cheatgrass cover of 0.1%, and no other noxious weed cover. Current annual herbaceous production across the area averaged 205.6 pounds per acre in 2021 with sub-shrubs the dominant category, followed by perennial grasses and perennial forbs. Total perennial production was 201.3 pounds per acre (Appendix A - Chart 4 and Table 16).

4.0 CONCLUSIONS and RECOMMENDATIONS

Overall, the revegetation at Colowyo evaluated by Cedar Creek in 2021 can generally be considered in fair to good condition and is typical of reclamation efforts at most western coal mines. As revegetation units age, they typically "thicken" with desirable (seeded) perennial species and exhibit increased diversity, cover, and production. Recent unfavorable precipitation conditions have occurred at Colowyo. Aside from the above-average precipitation in 2019, consecutive low-rainfall years occurred in 2012 and 2013 as well as 2018, 2020, and 2021, which can result in stressed and/or poor revegetation conditions. Units planted during or just prior to the drought will take time to recover. Given the updated comparisons for vegetation parameters presented in the permit (Volume 1, Section 4.15.8; and Volume 15, Section 4.15.8), most areas at Colowyo appear to be progressing along expected pathways whereby success criteria should be achieved at or near the conclusion of the 10-year bond responsibility period.

The East Pit and South Taylor seven-year-old units (EP058 and ST004) have developed enough desirable perennial cover and are passing the bond release standards. In previous years, these unit have performed well above the desirable cover standards, but recent drought conditions have resulted in decreased ground cover. These units should rebound once favorable precipitation returns. The East Pit and West Pit two-year old units (EP062, WP030, and WP031) exhibiting low desirable perennial cover is not unexpected considering these areas have received very little precipitation since seeding in 2019. It is possible that these units may rebound with the return of precipitation and should be reevaluated in 2023 for year 4 monitoring.

Appendix A

Charts, Tables, and Raw Data

Chart 1
Average Ground Cover by Lifeform - 2021

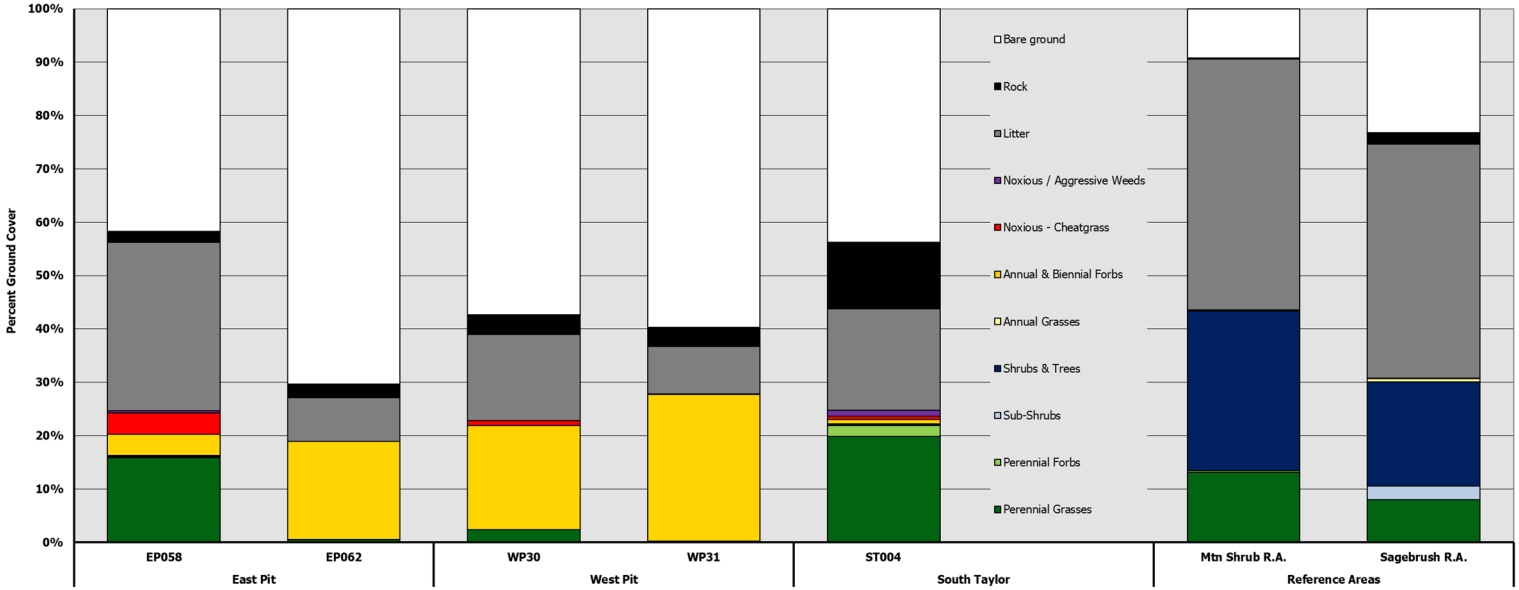


Chart 2
Relative Ground Cover by Lifeform - 2021

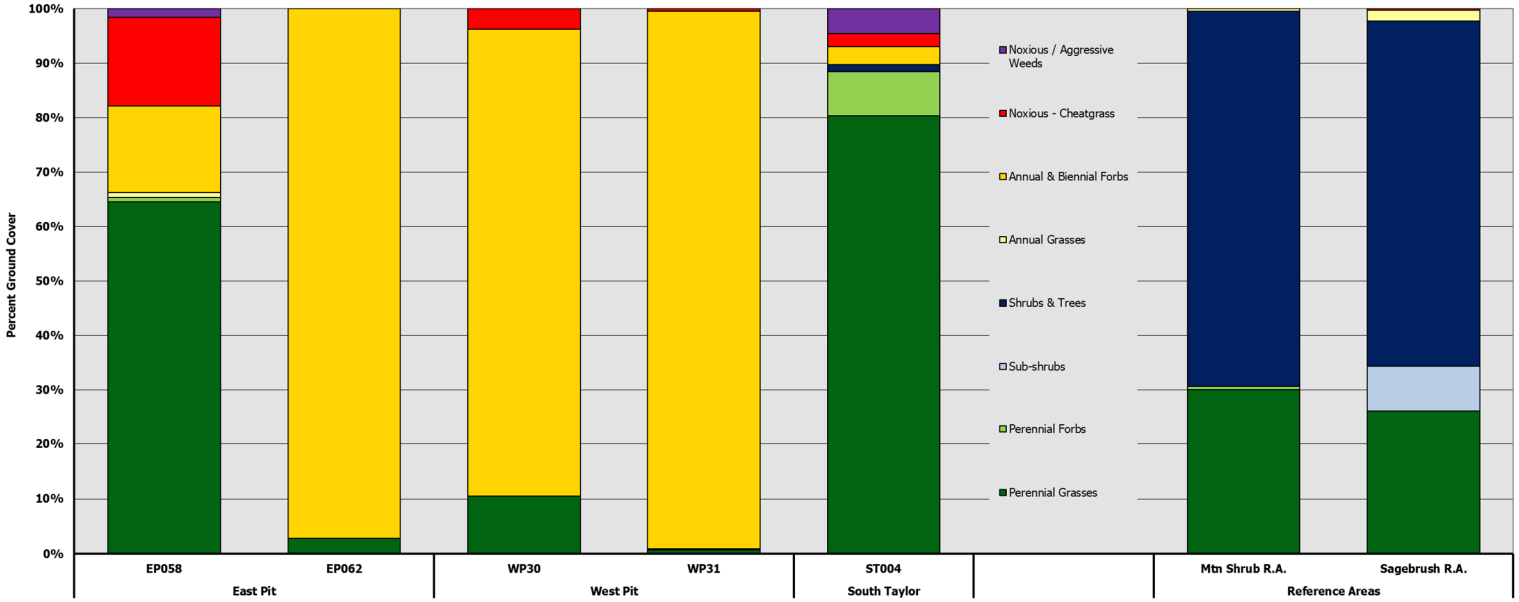


Table 1 Colowyo - Vegetation Cover - 2021

Average Ground Cover Summary

East Pit, West Pit, South Taylor*

Percent Ground Cover Based on Point-Intercept Sampling

Area ——>	EP058	EP062	WP30	WP31	ST004	Mtn Shrub R.A.	Sagebrush R.A.	Weighted Reference Values
Weight ——>	100%	100%	100%	100%	100%	55%	45%	
Total Plant Cover	**24.67**	**19.00**	**22.80**	**27.87**	**24.73**	**43.60**	**30.80**	**37.84**
Rock	2.13	2.53	3.67	3.53	12.53	0.20	2.20	1.10
Litter	31.53	8.13	16.20	8.87	19.00	47.00	43.80	45.56
Bare ground	41.67	70.33	57.33	59.73	43.73	9.20	23.20	15.50
Total Perennial Cover	**16.13**	**0.53**	**2.40**	**0.27**	**22.20**	**43.40**	**30.10**	**37.42**
Total Annual Cover (Non-noxious)	4.13	18.47	19.53	27.47	0.80	0.20	0.60	0.38
Summary by Lifeform:								
Perennial Grasses	**15.93**	**0.53**	**2.40**	**0.20**	**19.87**	**13.10**	**8.00**	**10.81**
Annual Grasses	0.20	-	-	-	-	0.20	0.60	0.38
Noxious - Cheatgrass	4.00	-	0.87	0.13	0.60	-	0.10	
Perennial Forbs	**0.20**	**-**	**-**	**-**	**2.00**	**0.30**	**-**	**0.17**
Annual & Biennial Forbs	3.93	18.47	19.53	27.47	0.80	-	-	**-**
Noxious / Aggressive Weeds	0.40	-	-	-	1.13	-	-	**-**
Sub-Shrubs	**-**	**-**	**-**	**-**	**-**	**-**	**2.60**	**1.17**
Shrubs & Trees	**-**	**-**	**-**	**0.07**	**0.33**	**30.00**	**19.50**	**25.28**
Sample Adequacy Calculations								
Mean=	24.67	19.00	22.80	27.87	24.73	43.60	30.80	
Variance=	66.24	50.29	99.89	107.27	111.92	175.16	74.62	
n=	15	15	15	15	15	15	15	
n_{min}=	19.69	25.20	34.76	24.99	33.10	16.67	14.23	

N=Native, I=Introduced, X=Noxious A=Annual, B=Biennial, P=Perennial

* Aspen Referance Area not Sampled in 2021. East Pit Success Criteria are used as a comparison for South Taylor Pit Units.

Table 2 Colowyo - Vegetation Cover - 2021

Relative Ground Cover Summary (Post-2008)
East Pit, West Pit, South Taylor Pit*

Area ——>	EP058	EP062	WP30	WP31	ST004	Mtn Shrub R.A.	Sagebrush R.A.
Weight ——>	100%	100%	100%	100%	100%	55%	45%
Summary by Lifeform:							
Perennial Grasses	**64.59**	**2.81**	**10.53**	0.72	**80.32**	**30.05**	**25.97**
Annual Grasses	0.81	-	-	-	-	0.46	1.95
Noxious - Cheatgrass	**16.22**	-	**3.80**	0.48	**2.43**	-	0.32
Perennial Forbs	0.81	-	-	-	**8.09**	0.69	-
Annual & Biennial Forbs	**15.95**	**97.19**	**85.67**	**98.56**	**3.23**	-	-
Noxious / Aggressive Weeds	1.62	-	-	-	**4.58**	-	-
Sub-Shrubs	-	-	-	-	-	-	**8.44**
Shrubs & Trees	-	-	-	0.24	1.35	**68.81**	**63.31**
Diversity (Number of Perennial Grasses with between 3% - 50% Relative Cover)							
(Forb Relative Cover with between 1% - 50%):							
Number of Perennial Grasses =	**4**	**0**	**2**	**0**	**5**	**2**	**3**
Forb Relative Cover =	**16.76**	**97.19**	**85.67**	**98.56**	**11.32**	**0.69**	**0.00**

N=Native, I=Introduced, X=Noxious A=Annual, B=Biennial, P=Perennial

* Aspen Referance Area not Sampled in 2021. East Pit Success Criteria are used as a comparison for South Taylor Pit Units.

Table 3 Colowyo - Woody Plant Density - 2021

East Pit, West Pit, and South Taylor Pit Reclamation Units

Woody Plants per Acre

			East Pit		West Pit		South Taylor
		Unit -->	**EP058**	**EP062**	**WP030**	**WP031**	**ST004**
		Growing Seasons -->	7	2	2	2	7
N	P	*Artemisia tridentata* Big Sagebrush	16.2	-	13.5	-	369.6
N	P	*Atriplex canescens* Four-wing Saltbush	-	-	-	2.7	-
N	P	*Purshia tridentata* Antelope Bitterbrush	-	2.7	-	-	8.1
N	P	*Symphoricarpos rotundifolius* Roundleaf Snowberry	5.4	-	-	-	29.7
		Total Per Acre	**21.6**	**2.7**	**13.5**	**2.7**	**407.4**

Chart 3

Woody Plant Density by Species and Area - East Pit, West Pit, and South Taylor Pit - 2021

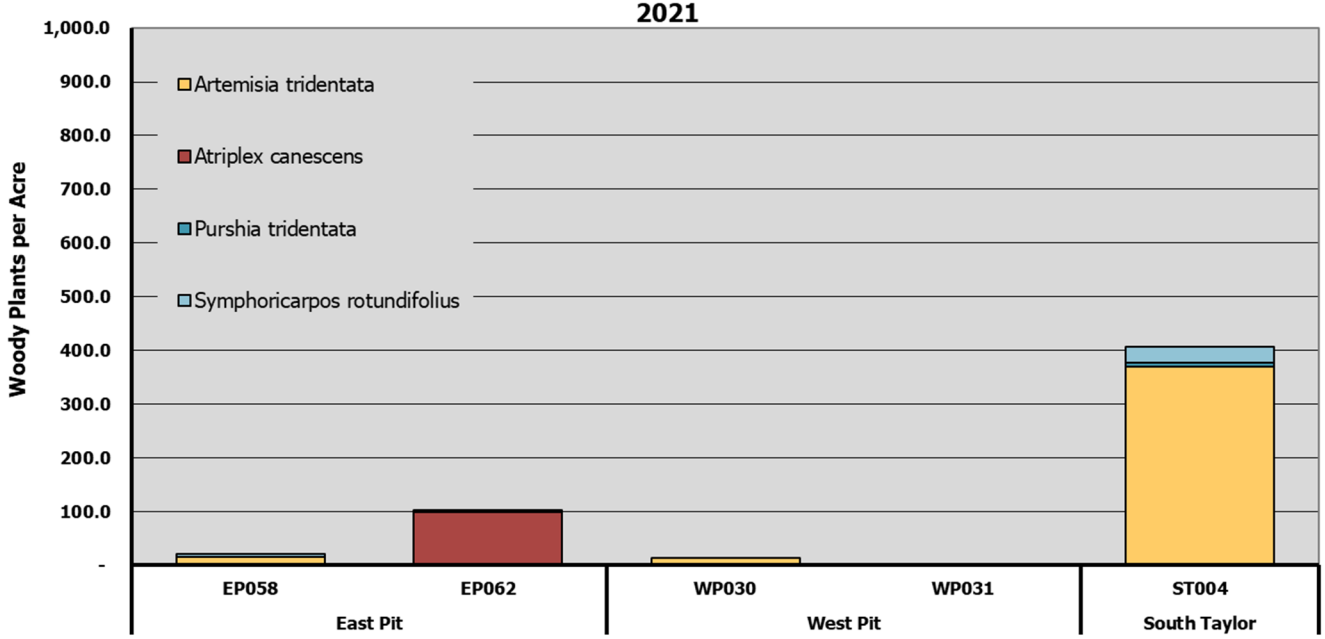


Table 4 Colowyo - Vegetation Cover - 2021

EP058 - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																					
N	P	*Agropyron dasystachyum*	Thickspike Wheatgrass							1	8	8	3	3			6	3	**2.13**	**8.65**	**47**
N	P	*Agropyron smithii*	Western Wheatgrass							1	11	12	6	2	2	4	2	5	**3.00**	**12.16**	**60**
N	P	*Agropyron spicatum*	Bluebunch Wheatgrass	3	16	7	6	21	4	9	9	9	7		1	6	4	4	**7.07**	**28.65**	**93**
I	A	*Bromus japonicus*	Japanese Brome										1		1			1	**0.20**	**0.81**	**20**
X		*Bromus tectorum*	Cheatgrass			1							5	23	12	16	3		**4.00**	**16.22**	**40**
N	P	*Elymus cinereus*	Basin Wildrye	2		3	6	6	7	6		2	1	5		1	1	2	**2.80**	**11.35**	**80**
N	P	*Nassela viridula*	Green Needlegrass		1			2		2					1	1		4	**0.73**	**2.97**	**40**
I	P	*Poa pratensis*	Kentucky Bluegrass															2	**0.13**	**0.54**	**7**
N	P	*Sitanion hystrix*	Bottlebrush Squirreltail									1							**0.07**	**0.27**	**7**
Forbs																					
N	P	*Achillea millefolium*	Common Yarrow							1		2							**0.20**	**0.81**	**13**
I	A	*Chenopodium album*	Lambsquarter											1					**0.07**	**0.27**	**7**
X		*Cirsium arvense*	Canada Thistle						6										**0.40**	**1.62**	**7**
N	A	*Epilobium brachycarpum*	Tall Annual Willowherb									2							**0.13**	**0.54**	**7**
I	B	*Lactuca serriola*	Prickly Lettuce		1		1		3					2					**0.47**	**1.89**	**27**
I	A	*Pocilla biloba*	Twolobed Speedwell		1	6	2			6	1	5						1	**1.47**	**5.95**	**47**
I	A	*Salsola tragus*	Russian Thistle	12	7														**1.27**	**5.14**	**13**
I	A	*Sisymbrium altissimum*	Tumble Mustard											3		4	1		**0.53**	**2.16**	**20**
Sub-Shrubs																					
			none																**0.00**	**0.00**	**0**
Shrubs & Trees																					
			none																**0.00**	**0.00**	**0**
																				Mean	
			Total Plant Cover	**17**	**26**	**17**	**15**	**29**	**20**	**26**	**29**	**41**	**23**	**39**	**17**	**32**	**17**	**22**		**24.67**	
			Rock	2	2	5	0	3	7	3			2	3	4		1			**2.13**	
			Litter	13	39	22	21	44	20	35	29	46	42	45	26	28	40	23		**31.53**	
			Bare ground	68	33	56	64	24	53	36	42	13	33	13	53	40	42	55		**41.67**	
			Total Perennial Cover	**5**	**17**	**10**	**12**	**29**	**11**	**20**	**28**	**34**	**17**	**10**	**4**	**12**	**13**	**20**		**16.13**	

Diversity	**No. of Perennial Grasses (3% - 50% Rel. Cover) = 4** **Forb Relative Cover = 16.76**
Sample Adequacy Calculations	**Plant Cover Mean = 24.67** **t= 1.35** **n = 15** **Variance = 66.24** **n_{min} = 19.69**

N=Native, I=Introduced, X=Noxious, A=Annual, B=Biennial, P=Perennial

Table 5 Colowyo - Vegetation Cover - 2021

EP062 - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																					
I	P	*Agropyron cristatum*	Crested Wheatgrass							3	4				1				**0.53**	**2.81**	**20**
Forbs																					
I	A	*Chenopodium album*	Lambsquarter	1	2	5	2	1	1	2	3	5	4	2	5	4	3	15	**3.67**	**19.30**	**100**
N	A	*Descurainia pinnata*	Pinnate Tansymustard														1		**0.07**	**0.35**	**7**
I	A	*Pocilla biloba*	Twolobed Speedwell							2				1				1	**0.27**	**1.40**	**20**
I	A	*Polygonum aviculare*	Prostrate Knotweed			1													**0.07**	**0.35**	**7**
I	A	*Salsola tragus*	Russian Thistle	29	5	11	1		9	10	2	1	5	3	8	3		8	**6.33**	**33.33**	**87**
I	A	*Sisymbrium altissimum*	Tumble Mustard														1	3	**0.27**	**1.40**	**13**
I	A	*Thlaspi arvense*	Field Pennycress		7	7	8	7	6	7	17	8	6	7	6	7	23	1	**7.80**	**41.05**	**93**
Sub-Shrubs																					
			none																**0.00**	**0.00**	**0**
Shrubs & Trees																					
			none																**0.00**	**0.00**	**0**
																				Mean	
			Total Plant Cover	**30**	**14**	**24**	**11**	**8**	**16**	**24**	**26**	**14**	**15**	**13**	**20**	**14**	**28**	**28**		**19.00**	
			Rock	1	4	3	0	4	5	1	3	4	3	1	1	4	2	2		**2.53**	
			Litter	4	8	5	5	21	7	15	17	19	4	4	2	5	4	2		**8.13**	
			Bare ground	65	74	68	84	67	72	60	54	63	78	82	77	77	66	68		**70.33**	
			Total Perennial Cover	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**0**		**0.53**	

Diversity	**No. of Perennial Grasses (3% - 50% Rel. Cover) = 0** **Forb Relative Cover = 97.19**
Sample Adequacy Calculations	**Plant Cover Mean = 19.00** **t= 1.35** **n = 15** **Variance = 50.29** **n_{min} = 25.20**

N=Native, I=Introduced, X=Noxious, A=Annual, B=Biennial, P=Perennial

Table 6 Colowyo - Vegetation Cover - 2021

WP030 - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

		Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																				
I	P	*Agropyron cristatum* Crested Wheatgrass	1														2	**0.20**	**0.88**	**13**
N	P	*Agropyron dasystachyum* Thickspike Wheatgrass	2									4					5	**0.73**	**3.22**	**20**
X		*Bromus tectorum* Cheatgrass			1	1	1			1		8					1	**0.87**	**3.80**	**40**
N	P	*Elymus cinereus* Basin Wildrye															17	**1.13**	**4.97**	**7**
N	P	*Nassela viridula* Green Needlegrass		2														**0.13**	**0.58**	**7**
I	P	*Poa bulbosa* Bulbous Bluegrass	1															**0.07**	**0.29**	**7**
I	P	*Poa pratensis* Kentucky Bluegrass															2	**0.13**	**0.58**	**7**
Forbs																				
I	A	*Chenopodium album* Lambsquarter		2		1	4		1		3		1			5		**1.13**	**4.97**	**47**
I	B	*Lactuca serriola* Prickly Lettuce		1													3	**0.27**	**1.17**	**13**
I	A	*Pocilla biloba* Twolobed Speedwell				1	1											**0.13**	**0.58**	**13**
I	A	*Salsola tragus* Russian Thistle	11	17	11	8		3	15	4	12		17	6	20	16		**9.33**	**40.94**	**80**
I	A	*Thlaspi arvense* Field Pennycress	13	11	5	19	21	2	3	13	27		1	3	2	10		**8.67**	**38.01**	**87**
Sub-Shrubs																				
		none																**0.00**	**0.00**	**0**
Shrubs & Trees																				
		none																**0.00**	**0.00**	**0**
																			Mean	
		Total Plant Cover	**28**	**33**	**17**	**30**	**27**	**5**	**19**	**18**	**42**	**12**	**19**	**9**	**22**	**31**	**30**		**22.80**	
		Rock	3	1	4	4	9	4	3	3	9	1	5	8	1	0	0		**3.67**	
		Litter	22	14	4	9	10	9	28	12	12	28	8	14	10	13	50		**16.20**	
		Bare ground	47	52	75	57	54	82	50	67	37	59	68	69	67	56	20		**57.33**	
		Total Perennial Cover	**4**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**26**		**2.40**	

Diversity	**No. of Perennial Grasses (3% - 50% Rel. Cover) = 2** **Forb Relative Cover = 85.67**
Sample Adequacy Calculations	**Plant Cover Mean = 22.80** **t= 1.35** **n = 15** **Variance = 99.89** **n_{min} = 34.76**

N=Native, I=Introduced, X=Noxious, A=Annual, B=Biennial, P=Perennial

Table 7 Colowyo - Vegetation Cover - 2021

WP031 - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																					
N	P	*Agropyron dasystachyum*	Thickspike Wheatgrass									3							**0.20**	**0.72**	**7**
X		*Bromus tectorum*	Cheatgrass	1		1													**0.13**	**0.48**	**13**
Forbs																					
I	A	*Chenopodium album*	Lambsquarter		3	5	1	13		1	4						1	1	**1.93**	**6.94**	**53**
I	A	*Pocilla biloba*	Twolobed Speedwell	1		3	2	1		2		3						1	**0.87**	**3.11**	**47**
I	A	*Polygonum aviculare*	Prostrate Knotweed	1															**0.07**	**0.24**	**7**
I	A	*Salsola tragus*	Russian Thistle		2	2			2	2	1	2		2	2	5	3	6	**1.93**	**6.94**	**73**
I	A	*Sisymbrium altissimum*	Tumble Mustard		1					2						1			**0.27**	**0.96**	**20**
I	A	*Thlaspi arvense*	Field Pennycress	18	39	21	25	9	36	32	28	18	40	18	7	24	16	5	**22.40**	**80.38**	**100**
Sub-Shrubs																					
			none																**0.00**	**0.00**	**0**
Shrubs & Trees																					
N	P	*Atriplex canescens*	Four-wing Saltbush								1								**0.07**	**0.24**	**7**
																			Mean		
			Total Plant Cover	**21**	**45**	**32**	**28**	**23**	**38**	**39**	**34**	**26**	**40**	**20**	**9**	**30**	**20**	**13**	**27.87**		
			Rock	7	7	1	6	5	3	1	2	3	2	1	5	3	5	2	**3.53**		
			Litter	12	9	13	9	8	4	13	2	2	1	11	6	14	19	10	**8.87**		
			Bare ground	60	39	54	57	64	55	47	62	69	57	68	80	53	56	75	**59.73**		
			Total Perennial Cover	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0.27**		

Diversity	**No. of Perennial Grasses (3% - 50% Rel. Cover) = 0** **Forb Relative Cover = 98.56**
Sample Adequacy Calculations	**Plant Cover Mean = 27.87** **t= 1.35** **n = 15** **Variance = 107.27** **n_{min} = 24.99**

N=Native, I=Introduced, X=Noxious, A=Annual, B=Biennial, P=Perennial

Table 8 Colowyo - Vegetation Cover - 2021

ST004 - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																					
I	P	*Agropyron cristatum*	Crested Wheatgrass					8		5		6	6		8	3	2	2	**0.13**	**0.54**	**7**
N	P	*Agropyron dasystachyum*	Thickspike Wheatgrass	9	3		5	8		5		6	6		8	3	2	1	**3.73**	**15.09**	**73**
N	P	*Agropyron smithii*	Western Wheatgrass								23	6	6	3	13	4	7	1	**4.20**	**16.98**	**53**
N	P	*Agropyron spicatum*	Bluebunch Wheatgrass	2	23	23	7				8	7	5	2	5	9	7	3	**6.73**	**27.22**	**80**
X		*Bromus tectorum*	Cheatgrass	1					8						2	7			**0.60**	**2.43**	**13**
N	P	*Elymus cinereus*	Basin Wildrye	1	5	5	5	1		3	10		1		2	7		6	**3.07**	**12.40**	**73**
I	P	*Festuca ovina/saximontana*	Hard Fescue												1				**0.07**	**0.27**	**7**
N	P	*Nassela viridula*	Green Needlegrass														1		**0.07**	**0.27**	**7**
I	P	*Poa pratensis*	Kentucky Bluegrass	2				1			7	3		5				2	**1.33**	**5.39**	**40**
N	P	*Poa secunda*	Sandberg Bluegrass												1				**0.07**	**0.27**	**7**
N	P	*Sitanion hystrix*	Bottlebrush Squirreltail					5					1	1					**0.47**	**1.89**	**20**
Forbs																					
N	P	*Achillea millefolium*	Common Yarrow											1					**0.07**	**0.27**	**7**
I	P	*Astragalus cicer*	Cicer Milkvetch			1									3	5	4	3	**1.07**	**4.31**	**33**
X		*Carduus nutans*	Musk Thistle	1			1	3	2				1	3	1		2	1	**1.00**	**4.04**	**60**
X		*Cirsium arvense*	Canada Thistle								1				1				**0.13**	**0.54**	**13**
N	A	*Epilobium brachycarpum*	Tall Annual Willowherb										1						**0.07**	**0.27**	**7**
N	A	*Gayophytum ramosissimum*	Groundsmoke					1											**0.07**	**0.27**	**7**
I	B	*Lactuca serriola*	Prickly Lettuce							1									**0.07**	**0.27**	**7**
N	P	*Linum lewisii*	Lewis Flax		3	3	1				1					2	1	2	**0.87**	**3.50**	**47**
I	A	*Pocilla biloba*	Twolobed Speedwell		2			1	2										**0.33**	**1.35**	**20**
I	A	*Thlaspi arvense*	Field Pennycress						2										**0.13**	**0.54**	**7**
I	B	*Tragopogon dubius*	False Salsify										1				1		**0.13**	**0.54**	**13**
Sub-Shrubs																					
			none																**0.00**	**0.00**	**0**
Shrubs & Trees																					
N	P	*Artemisia tridentata*	Big Sagebrush													1		4	**0.33**	**1.35**	**13**
																				Mean	
			Total Plant Cover	**16**	**36**	**32**	**19**	**20**	**14**	**9**	**50**	**22**	**22**	**15**	**35**	**31**	**25**	**25**		**24.73**	
			Rock	9	8	3	16	8	0	21	6	24	23	18	12	16	15	9		**12.53**	
			Litter	11	24	14	7	15	12	7	32	29	23	40	25	23	8	15		**19.00**	
			Bare ground	64	32	51	58	57	74	63	12	25	32	27	28	30	52	51		**43.73**	
			Total Perennial Cover	**14**	**34**	**32**	**18**	**15**	**0**	**8**	**49**	**22**	**19**	**12**	**33**	**31**	**22**	**24**		**22.20**	

Diversity	**No. of Perennial Grasses (3% - 50% Rel. Cover) = 5** **Forb Relative Cover = 11.32**
Sample Adequacy Calculations	**Plant Cover Mean = 24.73** **t= 1.35** **n = 15** **Variance = 111.92** **n_{min} = 33.10**

N=Native, I=Introduced, X=Noxious, A=Annual, B=Biennial, P=Perennial

Table 9 Colowyo - Vegetation Cover - 2021

Mountain Shrub Reference Area - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	2	3	4	5	6	7	8	9	10	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																
N	P	*Agropyron dasystachyum*	Thickspike Wheatgrass								4	3	4	**1.10**	**2.52**	**30**
N	P	*Agropyron smithii*	Western Wheatgrass				1	1						**0.20**	**0.46**	**20**
I	P	*Bromus inermis*	Smooth Brome	17					5	13	1	20		**5.60**	**12.84**	**50**
I	A	*Bromus japonicus*	Japanese Brome		2									**0.20**	**0.46**	**10**
N	P	*Carex geyeri*	Geyer's Sedge	2	2	3	7	7					8	**2.90**	**6.65**	**60**
N	P	*Hesperostipa comata*	Needla and Thread	5										**0.50**	**1.15**	**10**
N	P	*Nassela viridula*	Green Needlegrass		5	1	7							**1.30**	**2.98**	**30**
I	P	*Poa pratensis*	Kentucky Bluegrass	3					1		2	5		**1.10**	**2.52**	**40**
N	P	*Poa secunda*	Sandberg Bluegrass										4	**0.40**	**0.92**	**10**
Forbs																
N	P	*Erigeron engelmannii*	Engelmann;s Fleabane					1						**0.10**	**0.23**	**10**
N	P	*Lupinus caudatus*	Tailcup Lupine					1						**0.10**	**0.23**	**10**
N	P	*Phlox longifolia*	Longleaf Phlox							1				**0.10**	**0.23**	**10**
Sub-Shrubs																
			none											**0.00**	**0.00**	**0**
Shrubs & Trees																
N	P	*Artemisia tridentata*	Big Sagebrush	9	12		5		8		5	19	11	**6.90**	**15.83**	**70**
N	P	*Mahonia repens*	Creeping Barberry				1	2						**0.30**	**0.69**	**20**
N	P	*Quercus gambellii*	Gambel Oak		12	33		15	39	46	40	12	2	**19.90**	**45.64**	**80**
N	P	*Symphoricarpos rotundifolius*	Roundleaf Snowberry	5	3	11	4	3			1	2		**2.90**	**6.65**	**70**
															Mean	
			Total Plant Cover	**41**	**36**	**48**	**25**	**30**	**53**	**60**	**53**	**61**	**29**		**43.60**	
			Rock	0	0	0	0	0	0	0	0	0	2		**0.20**	
			Litter	54	55	44	65	60	34	35	35	36	52		**47.00**	
			Bare ground	5	9	8	10	10	13	5	12	3	17		**9.20**	
			Total Perennial Cover	**41**	**34**	**48**	**25**	**30**	**53**	**60**	**53**	**61**	**29**		**43.40**	

Diversity	**No. of Perennial Grasses (3% - 50% Rel. Cover) = 2** **Forb Relative Cover = 0.69**
Sample Adequacy Calculations	**Plant Cover Mean = 43.60** **t= 1.35** **n = 15** **Variance = 175.16** **n_{min} = 16.67**

N=Native, I=Introduced, X=Noxious, A=Annual, B=Biennial, P=Perennial

Table 10 Colowyo - Vegetation Cover - 2021

Sagebrush Reference Area - Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	2	3	4	5	6	7	8	9	10	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																
N	P	*Agropyron dasystachyum*	Thickspike Wheatgrass								4	1		**0.50**	**1.62**	**20**
I	P	*Agropyron intermedium*	Intermediate Wheatgrass	2	1		4							**0.70**	**2.27**	**30**
N	P	*Agropyron smithii*	Western Wheatgrass	1				1						**0.20**	**0.65**	**20**
N	P	*Agropyron spicatum*	Bluebunch Wheatgrass					4				3	2	**0.90**	**2.92**	**30**
I	P	*Bromus inermis*	Smooth Brome	4	4	5								**1.30**	**4.22**	**30**
I	A	*Bromus japonicus*	Japanese Brome		1		1	4						**0.60**	**1.95**	**30**
X		*Bromus tectorum*	Cheatgrass						1					**0.10**	**0.32**	**10**
N	P	*Koeleria macrantha*	Prairie Junegrass		1	4	4		4	4	3	1		**2.10**	**6.82**	**70**
N	P	*Nassela viridula*	Green Needlegrass				2							**0.20**	**0.65**	**10**
N	P	*Poa secunda*	Sandberg Bluegrass			3		3	8	7				**2.10**	**6.82**	**40**
Forbs																
			none											**0.00**	**0.00**	**0**
Sub-Shrubs																
N	P	*Gutierrezia sarothrae*	Snakeweed		2		1	3	3	7	9	1		**2.60**	**8.44**	**70**
Shrubs & Trees																
N	P	*Amelanchier alnifolia*	Serviceberry			2						5	1	**0.80**	**2.60**	**30**
N	P	*Artemisia tridentata*	Big Sagebrush	12	16	25	25	16	10	6	7	17	39	**17.30**	**56.17**	**100**
N	P	*Symphoricarpos rotundifolius*	Roundleaf Snowberry				3	2				6	3	**1.40**	**4.55**	**40**
															Mean	
			Total Plant Cover	**19**	**25**	**39**	**40**	**33**	**26**	**24**	**23**	**34**	**45**		**30.80**	
			Rock		3		2	2	4	2	3	4	2		**2.20**	
			Litter	69	43	42	48	54	44	29	23	42	44		**43.80**	
			Bare ground	12	29	19	10	11	26	45	51	20	9		**23.20**	
			Total Perennial Cover	**19**	**24**	**39**	**39**	**29**	**25**	**24**	**23**	**34**	**45**		**30.10**	

Diversity	**No. of Perennial Grasses (3% - 50% Rel. Cover) = 3** **Forb Relative Cover = 0.00**
Sample Adequacy Calculations	**Plant Cover Mean = 30.80** **t= 1.35** **n = 15** **Variance = 74.62** **n_{min} = 14.23**

N=Native, I=Introduced, X=Noxious, A=Annual, B=Biennial, P=Perennial

Table 11 Colowyo - Woody Plant Density - 2021

EP058 - Raw Data

Sampling by 2m x 50m Belt Transects

		Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Count	Per Acre
Shrubs & Trees																			
N	P	*Artemisia tridentata* Big Sagebrush			2			2	2									6	16.2
N	P	*Symphoricarpos rotundifolius* Roundleaf Snowberry					1	1										2	5.4
		Total	0	0	2	0	1	3	2	0	0	0	0	0	0	0	0	8	21.6

Sample Adequacy Calculations			
Mean = 0.53	t= 1.35	n = 15	
Variance = 0.98	n_{min} = 623.90		

Table 12 Colowyo - Woody Plant Density - 2021

EP062 - Raw Data

Sampling by 2m x 50m Belt Transects

		Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Count	Per Acre
Shrubs & Trees																			
N	P	*Purshia tridentata* Antelope Bitterbrush	1															1	2.7
		Total	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2.7

Sample Adequacy Calculations			
Mean = 0.07	t= 1.35	n = 15	
Variance = 0.07	n_{min} = 2713.66		

Table 13 Colowyo - Woody Plant Density - 2021

WP030 - Raw Data

Sampling by 2m x 50m Belt Transects

		Transect No.——>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Count	Per Acre
Shrubs & Trees																			
N	P	*Artemisia tridentata* Big Sagebrush						2				3						5	13.5
		Total	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	5	13.5

Sample Adequacy Calculations			
Mean = 0.33	t= 1.35	n = 15	
Variance = 0.81	n_{min} = 1,318.06		

Table 14 Colowyo - Woody Plant Density - 2021

WP031 - Raw Data

Sampling by 2m x 50m Belt Transects

		Transect No.—>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Count	Per Acre
Shrubs & Trees																			
N	P	*Atriplex canescens* Four-wing Saltbush								1								**1**	**2.7**
		Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2.7**

Sample Adequacy Calculations			
Mean = 0.07	**t= 1.35**	**n = 15**	
Variance = 0.07	**n_{min} = 2,713.66**		

Table 15 Colowyo - Woody Plant Density - 2021

ST004 - Raw Data

Sampling by 2m x 50m Belt Transects

		Transect No.—>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Count	Per Acre
Shrubs & Trees																			
N	P	*Artemisia tridentata* Big Sagebrush		8	23	18		3	2		1	1	2	8	27	18	26	**137**	**369.6**
N	P	*Purshia tridentata* Antelope Bitterbrush				2					1							**3**	**8.1**
N	P	*Symphoricarpos rotundifolius* Roundleaf Snowberry						4						2		5		**11**	**29.7**
		Total	**0**	**8**	**23**	**20**	**0**	**7**	**2**	**0**	**2**	**1**	**2**	**10**	**27**	**23**	**26**	**151**	**407.4**

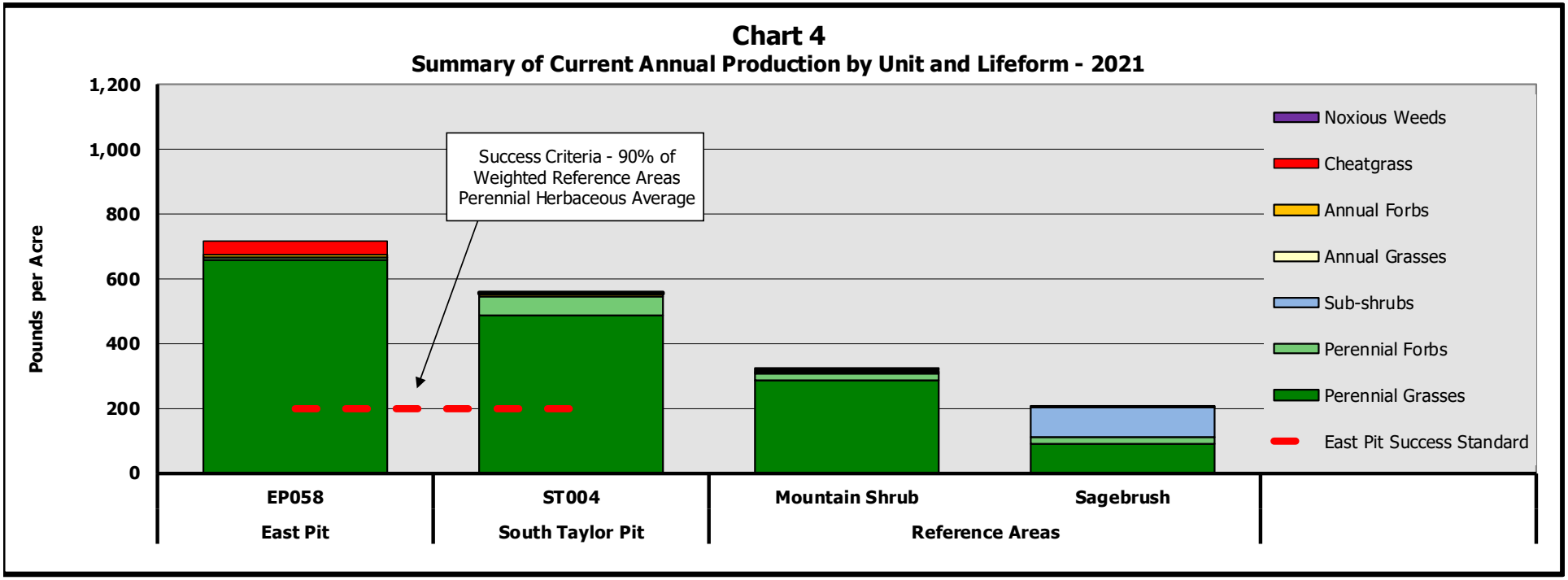
Sample Adequacy Calculations			
Mean = 10.07	**t= 1.35**	**n = 15**	
Variance = 112.07	**n_{min} = 200.06**		

Table 16 Colowyo - Vegetation Production - 2021

Summary of Areas Sampled

Pounds (lbs) per Acre

	Area	Weight	*Perennial Grasses*	*Perennial Forbs*	*Sub-shrubs*	*Annual Grasses*	*Annual Forbs*	*Noxious Weeds*		TOTAL	
								Cheatgrass	*Other*	lbs / ac	Perennial lbs / ac
Reclamation Units	EP058	100%	657.7	7.1	-	-	8.2	44.9	-	**717.9**	**664.8**
	ST004	100%	488.8	58.8	-	-	6.8	0.7	1.1	**556.2**	**547.6**
Reference Areas	Mountain Shrub	55%	288.2	20.7	4.3	-	1.4	5.3	1.1	**321.0**	**313.2**
	Sagebrush	45%	89.4	21.4	90.5	-	3.2	1.1	-	**205.6**	**201.3**
Weighted Averages	**East Pit Comparison**	**55%/45%**	**198.8**	**21.0**	**43.1**	**-**	**2.2**	**3.4**	**0.6**	**269.1**	**262.8**



* Aspen Referance Area not Sampled in 2021. East Pit Success Criteria are used as a comparison

Table 17 Colowyo - Vegetation Production - 2021

EP058 - Raw Data

Oven Dry Weight (grams per 1/2 square meter)

Sample No.	*Perennial Grasses*	*Perennial Forbs*	*Sub-shrubs*	*Annual Grasses*	*Annual / Biennial Forbs*	*Noxious Weeds*		TOTAL	
						Cheatgrass	*Other*	g/0.5m^2	lbs / ac
1	32.5				0.5			**33.0**	**587.9**
2	2.2	2.0				11.9		**16.1**	**286.8**
3	47.3				0.5	0.7		**48.5**	**864.0**
4	60.4				0.6			**61.0**	**1,086.7**
5	42.2				0.7			**42.9**	**764.2**
Average	**36.9**	**0.4**	**0.0**	**0.0**	**0.5**	**2.5**	**0.0**	**40.3**	**717.9**

Sampling Adequacy:			
	n= 5	**t = 1.533**	**var. = 285.355**
		Mean = 40.30	**n_{min} = 41.303**

Table 18 Colowyo - Vegetation Production - 2021

ST004 - Raw Data

Oven Dry Weight (grams per 1/2 square meter)

Sample No.	*Perennial Grasses*	*Perennial Forbs*	*Sub-shrubs*	*Annual Grasses*	*Annual / Biennial Forbs*	*Noxious Weeds*		TOTAL	
						Cheatgrass	*Other*	g/0.5m^2	lbs / ac
1	18.9	8.1			1.0			**28.0**	**498.8**
2	19.9				0.1		0.3	**20.3**	**361.6**
3	24.7	7.5						**32.2**	**573.6**
4	36.9	0.9			0.4			**38.2**	**680.5**
5	36.8				0.4	0.2		**37.4**	**666.2**
Average	**27.4**	**3.3**	**0.0**	**0.0**	**0.4**	**0.0**	**0.1**	**31.2**	**556.2**

Sampling Adequacy:			
	n= 5	**t = 1.533**	**var. = 54.372**
		Mean = 31.22	**n_{min} = 13.113**

Table 19 Colowyo - Vegetation Production - 2021

Mountain Shrub Reference Area - Raw Data

Oven Dry Weight (grams per 1/2 square meter)

Sample No.	*Perennial Grasses*	*Perennial Forbs*	*Sub-shrubs*	*Annual Grasses*	*Annual / Biennial Forbs*	*Noxious Weeds*		TOTAL	
						Cheatgrass	*Other*	g/0.5m^2	lbs / ac
1	30.4							**30.4**	**541.5**
2	14.3		1.2					**15.5**	**276.1**
3	8.0	4.1			0.4		0.3	**12.8**	**228.0**
4	10.6	1.2						**11.8**	**210.2**
5	17.6	0.5				1.5		**19.6**	**349.2**
Average	**16.2**	**1.2**	**0.2**	**0.0**	**0.1**	**0.3**	**0.1**	**18.0**	**321.0**

Sampling Adequacy:		**t = 1.533**	**var. = 57.012**
	n= 5	**Mean = 18.02**	**n_{min} = 41.272**

Table 20 Colowyo - Vegetation Production - 2021

Sagebrush Reference Area - Raw Data

Oven Dry Weight (grams per 1/2 square meter)

Sample No.	*Perennial Grasses*	*Perennial Forbs*	*Sub-shrubs*	*Annual Grasses*	*Annual / Biennial Forbs*	*Noxious Weeds*		TOTAL	
						Cheatgrass	*Other*	g/0.5m^2	lbs / ac
1	8.5	1.1	4.7		0.3			**14.6**	**260.1**
2	1.4	3.3						**4.7**	**83.7**
3	10.3		4.4			0.3		**15.0**	**267.2**
4	2.1		16.3					**18.4**	**327.8**
5	2.8	1.6			0.6			**5.0**	**89.1**
Average	**5.0**	**1.2**	**5.1**	**0.0**	**0.2**	**0.1**	**0.0**	**11.5**	**205.6**

Sampling Adequacy:		**t = 1.533**	**var. = 39.488**
	n= 5	**Mean = 11.54**	**n_{min} = 69.704**

SECTION 5 – TOPSOIL

RULE REQUIREMENT

Rule 2.04.13(2) the Permittee may provide additional monitoring information as required by the approved permit.

GENERAL DISCUSSION

In 2021, Colowyo removed topsoil and placed it in stockpile for advancement of the Collom Pit. Figure 5-1 provides the topsoil pile location for all topsoil that was removed.

In 2021, topsoil replacement occurred on reclamation areas WP033 and WP034. Please see Exhibit 2 for locations of both reclamation units where topsoil was replaced. Topsoil replacement depths were verified after laydown occurred and the locations sample and depths encountered are presented on Exhibit 5.

One topsoil exemption area (2.5 acres total) was granted in the Collom Pit in 2021. The D2 coal seam wall and bench were developed to provide a coal face for highwall mining. This wall was developed along the estimated oxidation line as well as 50' depth-of-cover contour using the available geologic model. Following excavation of the highwall mining wall, it was discovered that the D2 seam was oxidized/burned and that the D2 seam did not exist at the current face of the excavated wall. Following the initial excavation of the wall, the topsoil stripping boundary was extended outward to allow for wall advancement to the east. This resulted in an area approximately 50' wide area that topsoil was not removed and is located above a wall that is approximately 50' high. The surface grades above the wall ranged from 2.5:1 -3.0:1. Due to the steep grades as well as the heavily fractured, oxidized/burned wall, it is determined that topsoil removal within this narrow corridor presented a working hazard.

As such, Colowyo was granted a topsoil removal exemption (email from Mr. Jason Musick on November 6,2021) for the area which contains approximately 2,032 cubic yards of topsoil. Please see Exhibit 2 for the location of the topsoil removal exemption area.

Figure 5-2 provides each topsoil stockpile and the corresponding volume of material contained within each pile. Figure 5-3 provides the overall topsoil balance at the end of the year 2020 for the entire Colowyo mine site.

Figure 5-1 – Topsoil Movements During Report Period

Topsoil Removal

Task	Activity	Topsoil Placement Area
1	Removed Topsoil for advancement of the Collom Pit	Pile 26A

Topsoil Replacement

Task	Activity	Topsoil Pile Mined
1	Topsoil Replacement on WP033 and WP034	Topsoil Pile 16E

Areas Exempt from Topsoil Stripping Due to Conditions

Task	Activity	Acres Exempt
1	Topsoil Removal Exemption Little Collom Gulch - Collom Pit See Exhibit 2 for Location of Exemption	2.5

Figure 5-2 - Topsoil Stockpile for Report Year

Stockpile Number	Change in 2021 (cubic yards)	End of Year, 2021 (cubic yards)
9A		416
9B		26,612
15A		1,130,663
15E		3,201
15F		8,119
15G		24,656
15I		9,362
16A		77,392
16C		141,291
16D		923,289
16E	(19,244)	768,122
17A		1,686
17B		3,673
17C		1,396
17D		1,310
17E		735
18		458,707
17F		1,460
20A		24,968
21A		25,615
21B		42,433
21C		19,262
21D		53,537
22A		50,264
25A		533,961
26A	223,652	882,581
26B		0
27A		12,316
Windrow 1		3,410
Windrow 2		298
Windrow 3		3,892
Windrow 4		2,189
Windrow 6		120
Windrow 8		1,490
Windrow 9		9,781
Windrow 12		9,960
Windrow 13		5,348
Windrow 14		2,135
Windrow 15		3,392
28A		1,059
29A		29,042
30A		31,806
30B		21,631
36A		66,417
Collom Drill Pad Windrows		16,131
Total	204,408	5,500,099

*Revised Volume Based on Survey Conducted in November of 2021

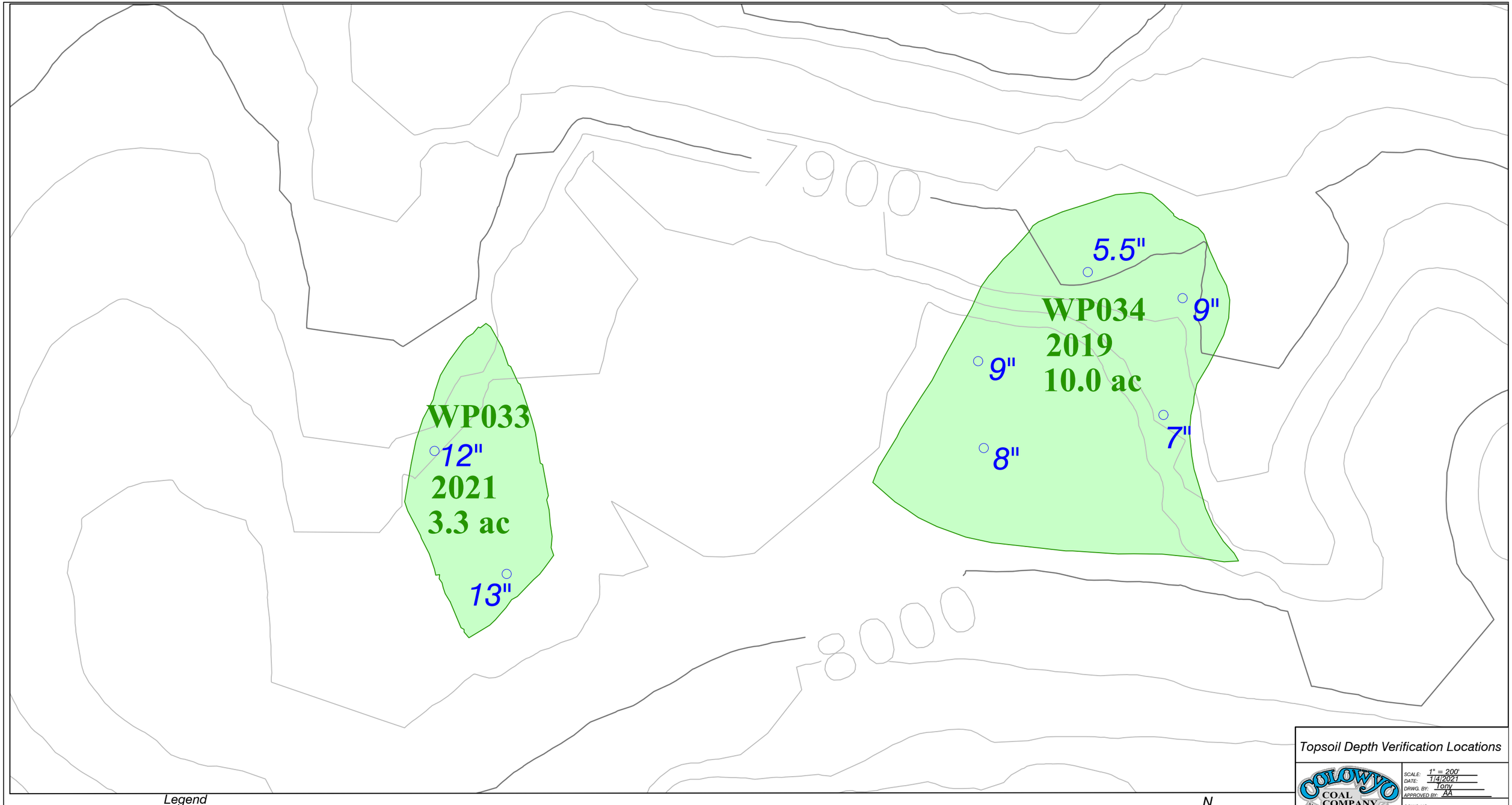
Figure 5-3 –Topsoil Balance

Topsoil Balance As of December 2021

1	Disturbed Lands (See Figure 2-1)	4,635.9	acres*
2	Lands with Redistributed Topsoil (See Figure 2-1)	1,390.1	acres*
3	Lands Yet to be Retopsoiled (Line 1 Minus 2)	3,245.8	acres
4	Lands Yet to be Retopsoiled	141,387,000.0	sq. feet
5	Volume of Topsoil in Stockpiles (From Figure 5-2)	5,500,099.1	cu. yards*
6	Line 5 times 27	148,503,000.0	cu. ft
7	Average Replacement Depth Available (Line 6 divided by Line 4)	1.1	feet
8	Average Replacement Depth Available	12.6	inches

* All Phase III released acres have been removed.

Note: Values presented above represent an estimate of areas and volumes as of the date shown above. Stockpile inventories change frequently as mining plans vary.



Legend

RECLAIMED AREAS

X" TOPSOIL VERIFICATION LOCATION

0' 200' 400'

Contour Interval 25 FT.
June 2021 Topography

N W E S

NOTE: PLEASE SEE EXHIBIT 2A FOR LOCATION OF RECLAMATION AREAS SHOWN ABOVE.

Topsoil Depth Verification Locations

Colowyo Coal Company
0721 State Highway 13
Meeker, Colorado 81641

SCALE: 1" = 200'
DATE: 1/4/2021
DRWG. BY: Tony
APPROVED BY: AA

DRWG NO. Exhibit 5

No.	REVISION	DATE	BY	CHK

SECTION 6 –DITCH CONSTRUCTION CERTIFICATIONS

RULE REQUIREMENT

Rule 2.04.13(2) the Permittee may provide additional monitoring information as required by the approved permit.

Please see Volume 1 Section 2.04.13 for the requirement that these ditch construction certifications be included in the annual reclamation report.

GENERAL DISCUSSION

During 2021, no post mine channels were constructed.

SECTION 7 –WEED MANAGEMENT

RULE REQUIREMENT

Rule 2.04.13(2) the Permittee may provide additional monitoring information as required by the approved permit.

Please see Volume 1 Section 2.04.13 for the requirement that weed management be included in the annual reclamation report.

GENERAL DISCUSSION

Colowyo utilizes a combination of pickup mounted and UTV mounted boom/hand wand applicators to facilitate chemical control of noxious weeds within the entire permit boundary. Specifically, targeted weed species include but are not limited to thistles, Houndstongue Mullein, knapweeds, whitetop, leafy spurge, etc. The below noted reclamation parcels were specifically treated and noted as they have not been Phase III released to date. However, Colowyo makes every attempt to spray all lands within the permit boundary where noxious weeks are present. It is not practical to map each location, and many are too small of patch or individual plant and are random in nature to map out effectively.

East Pit – Units EP051 through EP054, and Units EP056 through EP061
West Pit – Units WP010 and Units WP014 through WP029, and WP032
South Taylor Pit – Units ST001-ST004
Gossard Loadout/Facilities Area – Units GF01-GF04

Please see Exhibit 2 for the reclamation units noted above.