2020 ANNUAL HYDROLOGY REPORT

SENECA II-W MINE

PERMIT C-82-057

February 2021

Submitted To: Colorado Division of Reclamation, Mining and Safety
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SENECA Coal Company

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1.0 INTRODUCTION

This Annual Hydrology Report presents the hydrologic monitoring data collected during the 2020 water year (October 2019 – September 2020) at the Seneca Coal Company's (SCC) Seneca II-W Mine (SIIW). The AHR fulfills the reporting requirements under the Colorado Division of Reclamation, Mining, and Safety (CDRMS) Permit No. C-82-057.

1.1 BACKGROUND

SIIW is a surface coal mine located in Routt County, approximately 9 miles south of Hayden, Colorado (Figure 1). Mining began at SIIW in August 1990. Production ceased in 2005 and the last of the coal at SIIW was removed in January 2006. The mine has been reclaimed and vegetated for many years and SCC is actively pursuing bond release.

2.0 METEOROLOGICAL

Meteorological data for the 2020 water year is presented in Appendix A. The 2020 data was obtained from NOAA weather station USC00053867 located in Hayden, Colorado (www.ncdc.noaaa.gov/cdo-wb/). A total of 18.19 inches of precipitation was measured in 2020, which is 0.8 inches less than the 1981-2020 average of 18.27 inches. January through March were wetter than normal, but the remaining months were drier than average. Snowpack runoff, as estimated by totaling November through March precipitation, was 10.57 inches, which was 3.02 inches above the 1981-2020 average of 7.55 inches.

3.0 GROUNDWATER

The SIIW groundwater monitoring program includes 14 monitoring wells. The following table includes the wells monitored, the water bearing unit they are screened in, the frequency of monitoring, and the required parameters list. The monitoring well locations are shown on Figure 1. Groundwater monitoring was completed by experienced personnel using accepted monitoring practices. All samples were analyzed by ACZ Laboratories.

Site	Unit	Monitoring Frequency		Parameter List
		Water Level	Water Quality	
DCAL-02	Dry Creek Alluvium	A	A	GW Long
WHAL7-2	Hubberson Gulch Alluvium	A	A	GW Long
WOV14	Wadge Overburden	A	A	GW Long
WOV17	Wadge Overburden	A	A	GW Short
WOV25	Wadge Overburden	A	A	GW Long
WW14	Wadge Coal	A	A	GW Long
WW17	Wadge Coal	A	A	GW Short
WW25	Wadge Coal	A	A	GW Long
WSOV25	Sage Creek Overburden	A	A	GW Long
WSC25	Sage Creek Coal	A	A	GW Long
WWCOV25	Wolf Creek Overburden	A	A	GW Long
WWC17	Wolf Creek Overburden	A	NR	NR
WWC25	Wolf Creek Coal	A	A	GW Long
WWCU25	Wolf Creek Underburden	A	A	GW Long

Note
A: Annual
NR: Not Required
GW Long: Field conductivity, field pH, field temperature, fluoride, dissolved iron, dissolved manganese, nitrate, nitrite, dissolved selenium, sulfate, total dissolved solids
GW Short: Field conductivity, field pH, field temperature, dissolved iron, dissolved manganese, total dissolved solids

3.1 WATER LEVELS

The static water levels measured during the 2020 water year are included with the groundwater quality data in Appendix B. Water level hydrographs for each of the wells are also provided in Appendix C. The static water level was measured at all wells except for WSC25, where the well casing was damaged and a measurement could not be made. The water levels measured at all wells this year were within their respective historic range. Water levels in most of the water bearing units at SIIW exhibit seasonal fluctuations. The water table in the shallow alluvial wells fluctuates in response to seasonal precipitation events, with the water table typically at its highest during the spring snowmelt seasons and then declining through late summer/early fall in response to the dry conditions. The water levels in the bedrock overburden and coal seams also fluctuate in response to recharge from seasonal precipitation but are partially influenced by interactions with groundwater in the reclaimed mine spoil.

3.2 GROUNDWATER QUALITY

Monitoring well DCAL-02 serves as the Groundwater Point of Compliance (GWPOC) for SIIW (see Technical Revision 63). This well is screened within the Dry Creek Alluvium and is located downgradient of the mines permit boundary. Only a small portion of the SIIW mining area was located within the Sage Creek Watershed and a GWPOC for the Sage Creek Alluvium was deemed unnecessary because the spoil ground water in this area flows to the west along the dipping bedrock, away from the Sage Creek tributaries. GWPOC bedrock wells were also deemed unnecessary because of the limited potential for the mine to negatively impact the quality of bedrock groundwater. The low hydraulic conductivity of the bedrock units inhibits groundwater from migrating away from the mine and low permeable confining layers further isolates groundwater at the mine from the nearest aquifer, the Trout Creek Sandstone. Bedrock groundwater has not historically been used in this area because its undisturbed, ambient, quality is marginal to unsuitable for both livestock and irrigation purposes and the yields are low.

Analytical results from the groundwater monitoring conducted in 2020 are provided in Appendix B. Table B.1 provides a comparison of the DCAL-02 samples to the Dry Creek Alluvial GWPOC water quality standards established in TR-63. Table B.2 includes the analytical results for the remaining monitoring wells however a comparison to water quality standards is not made as these wells are not GWPOC's. The groundwater quality at Dry Creek Alluvial Well DCAL-02 met all applicable water quality standards. Results of a Mann-Kendall statistical trend analysis also indicate that total dissolved solids (TDS) concentration at DCAL-02 remain stable at the 95% confidence interval.

Predictions for the expected TDS increases to be observed at various monitoring wells were made in the Probable Hydrologic Consequences (PHC, Tab 17) section of the SIIW Permit Application Package (PAP). The following table outlines these predictions along with this year's observed value.

Well	Predicted TDS (mg/L)	This Years TDS (mg/L)
WHAL7-2	1299	1070
WOV14	4385	3830
WOV17	4295	4700*
WOV25	-	1720
WW14	2630	4530*
WW17	3002	648
WW25	-	404

Note
*Indicates value above prediction

In 2020, the TDS at two of the seven wells exceeded the predicted TDS value. Its important to acknowledge that the TDS predictions were intended to demonstrate the magnitude of potential average increases in the postmining groundwater adjacent to the mine pits and were not intended to be compared to a singular well. This is illustrated through the application of the predicted Wadge Overburden TDS value (4295 mg/L) to WOV17. The 4295 mg/L value was calculated by multiplying the predicted 5.5% increase in TDS for this area to the pre-mine TDS average (4072 mg/L) measured at several Wadge Overburden Wells. However, the pre-mine average TDS at WOV17 was 8043 mg/L, which was already

significantly greater than the predicted value. In this instance a more appropriate comparison would be to compare the 2020 WOV17 TDS to its baseline average times the estimated 5.5% increase (8043 + 5.5% = 8485 mg/L). This indicates that the 2020 value of 4700 mg/L is a significant improvement and well within the projected value at this location. Regardless, both wells with TDS above the predicted post mine value are screened within the bedrock and the low hydraulic conductivity of these units will continue to limit the extent of the TDS changes to only bedrock groundwater in close proximity to the mine.

4.0 SURFACE WATER

SIIW lies within the Dry Creek and Sage Creek Watersheds. The majority of the permit area drains to the west towards Hubberson Gulch (a tributary to Dry Creek) and Dry Creek, which flows north to the Yampa River. The remainder of the permit area drains northeast towards Sage Creek, which flows north-northeast to the Yampa River. The following table includes the list of SIIW surface water monitoring points, the watershed they are located in, the frequency of monitoring, and the required parameters list. See Figure 1 for the location of the surface water monitoring points. Surface water monitoring was completed by experienced personnel using accepted monitoring practices. All samples were analyzed by ACZ Laboratories.

Site	Type	Watershed	Monitoring Frequency		Parameter List
			Flow	Water Quality	
WSH9	Surface Water	Dry Creek	June/Sept	June/Sept	SW Short
NPDES17	NPDES	Dry Creek	M	M	NPDES
NPDES16	NPDES	Dry Creek	M	M	NPDES
WSH7*	Surface Water	Dry Creek	NR	NR	NR
NPDES6	NPDES	Dry Creek	M	M	NPDES
WSHF1	Surface Water	Dry Creek	SA	SA	SW Long
NPDES5	NPDES	Dry Creek	M	M	NPDES
WSD5	Surface Water	Dry Creek	SA	SA	SW Long
NPDES15	NPDES	Sage Creek	M	M	NPDES
NPDES9	NPDES	Sage Creek	M	M	NPDES
WSSF3	Surface Water	Sage Creek	SA	SA	SW Long

Note

*Monitoring at WSH7 was suspended per TR-69. However, since samples were collected in 2020 the location is retained on the monitoring list and the results have been reported.

SA: Semiannual during spring snowmelt and summer baseflow

NR: Not Required

M: Monthly

SW Long: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, total mercury, ammonia, nitrate, nitrite, dissolved selenium, sulfate, sulfide, total dissolved solids, total suspended solids

SW Short: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, total suspended solids, total dissolved solids

NPDES: See NPDES permit CO-0000221

The Colorado Water Quality Control Commission (CWQCC) has established segment specific aquatic life water quality standards (CDPHE, Reg. 33) for upper Dry Creek (Yampa River Segment 13d) and Sage Creek (Yampa River Segment 13e). Therefore, the following surface water quality discussion has been organized by drainage basin. The 2020 Water Year surface water quality data is provided in Appendix D. Samples from this year's stream points are compared to both the Colorado Department of Public Health & Environment (CDPHE) surface water agricultural use standards (CDPHE, Reg. 31) and the appropriate segment specific aquatic life water quality standards. Samples from NPDES outfalls are compared to NPDES discharge limits as well as the segment specific aquatic life standards. Additional discussion of the water quality in each stream segment follows.

4.1 Dry Creek

Analytical results for the 2020 surface water monitoring conducted at the four Dry Creek stream points is provided in Table D.1 of Appendix D and the results of the Dry Creek outfalls are included in Tables D.2 through D.5. There were no exceedances of any NPDES permit limit or Yampa Segment 13d water quality standard at the four Dry Creek NPDES Outfalls in 2020. The stream points were compliant with all Agricultural Use standards and all Yampa Segment 13d standards except for total recoverable iron, sulfide, and mercury.

Total recoverable iron exceeded the Yampa Segment 13d surface water quality standard twice at steam point WSH7 and three times at WSHF1. Table D.6 provides a statistical summary of the pre-mine total recoverable iron measured at Dry Creek stream points WSH7, WSHF1, and WSD5. None of the total recoverable iron exceedances in 2020 were outside of the range measured prior to mining.

Synoptic watershed monitoring was conducted at the Dry Creek outfalls and stream points on April 22nd, July 21st, and September 1st. Exceedances of the iron standard occurred at stream points WSH7 and WSHF1 during the July 21st and September 1st events. However, no exceedances of iron occurred at Outfalls 006, 016, and 017 during these events and the iron concentrations at the outfalls were an order of

magnitude less than the concentration measured at the downstream points indicating the elevated iron in Dry Creek is unrelated to runoff from the mine.

Total recoverable iron is strongly correlated with suspended solids at stream points WSH7 (r^2: 0.92) and WSHF1 (r^2: 0.97) (Appendix D Figure D.1). SIIW has been vegetated and stable for over a decade and TSS in the mine discharges is typically an order of magnitude less than the concentrations observed at the stream points. This further supports the conclusion that the iron measured at WSH7 and WSHF1 is unrelated to runoff from the reclaimed mine and is the result of natural erosion that is occurring in unaffected areas of the watershed.

The method detection limit for the sulfide analysis (MDL: 0.02 mg/L) conducted by SCC's lab exceeds the CDPHE Yampa Segment 13d water quality standard for un-ionized sulfide (H_2S) of 0.002 mg/L. All but one of the four sulfide samples analyzed were non-detect. This analytical method detects both dissolved sulfides and acid-soluble metallic sulfides that are present in suspended matter and provides a single cumulative concentration. The single detection occurred in the WSHF1 the 6/2 sample which also had very high TSS (180 mg/L). Its expected that the detection was resultant of the acid-soluble metallic sulfides present on suspended matter and not dissolved sulfide as any dissolved sulfide present in oxygenated surface waters is expected to be oxidized to sulfate quickly. Furthermore, dissolved sulfide includes both the ionized (HS^-) and un-ionized forms of hydrogen sulfide (H_2S). The distribution of sulfide between the un-ionized hydrogen sulfide and ionized form is dependent on the temperature and pH. At low pH most of the dissolved sulfide exists as the toxic un-ionized hydrogen sulfide. In alkaline waters, like those present at SIIW, most of the dissolved sulfide is present as non-toxic ionized sulfide. The pH at WSHF1 during the 6/2 event was 8.22 standard units.

The method detection limit for mercury (0.2 ug/L) used by SCC's lab for stream points WSHF1 and WSD5 is above the 0.01 ug/L aquatic life standard for mercury. None of the samples collected during 2020 exceeded the labs method detection limit. The CDPHE performed a reasonable potential analysis for the Seneca NPDES outfalls and mercury monitoring was dropped from all outfalls except Outfall 005, which did not have enough sample data for CDPHE to complete the analysis. Based on historic data its not expected that there were true exceedances of the mercury standard.

4.2 SAGE CREEK

Analytical results for the 2020 surface water monitoring conducted at Sage Creek stream point WSSF3 is provided in Table D.7 of Appendix D and the analytical results for the two outfalls that report to Sage Creek outfalls are included in Table D.8. There were no exceedances of any NPDES permit limits or Yampa Segment 13e water quality standards at the two Sage Creek NPDES Outfalls in 2020. Total recoverable iron exceeded the Yampa Segment 13e surface water quality standard twice at WSSF3 in 2020. The iron in these samples (1.04 – 1.47 mg/L) was just above the water quality standard. The pH in both samples was alkaline but the total suspended solids (range: 31 - 44 mg/L; mean: 37.5 mg/L) was elevated relative to historic levels (range: 2010-2019: <5 – 21 mg/L; mean: 9.5 mg/L). The SIIW drainage area that reports to Sage Creek has been vegetated and stable for over a decade and the slightly elevated iron may be the result of natural erosion in the unaffected portions of the watershed or the sampler could have accidentally disturbed the base of the stream channel while collecting the sample. As discussed in Section 4.1, the lab used by SCC has a method detection limit for mercury and sulfide that are above the Segment 13e water quality standard. None of the samples collected from WSSF3 in 2020 exceed the labs mercury or sulfide method detection limit.

In the Probable Hydrological Consequences (PHC, Tab 17) section of the SIIW PAP, predictions were made for the expected TDS increases to be observed at several stream points. The following table outlines these predictions along with this year's average concentration.

Stream Point	Predicted TDS (mg/L)	Mean TDS (mg/L)*
WSHF1	2527	2340
WSD5	2451	1820
WSSF3	626**	945

* Duplicates removed from average calculation

** Predicted TDS value does not account for later contributions from Yoast Mine (C-1994-082). Predicted TDS concentration at WSSF3 in Yoast Mine PHC is 2118 mg/L.

The annual average TDS measured at Dry Creek monitoring points WSHF1 and WSD5 were below the concentrations predicted in the SIIW PHC. Although the TDS at Sage

Creek monitoring point WSSF3 exceeds the SIIW PHC prediction its important to recognize that this location also receives drainage from the Yoast Mine (C-1994-082). The Yoast Mine was permitted approximately 12 years after SIIW and the contributions from Yoast were not considered at the time of the SIIW PHC predictions. Therefore, a more meaningful comparison of the current TDS at WSSF3 would be to the 2118 mg/L value predicted for WSSF3 in the Yoast Mine PHC. The 945 mg/L average TDS measured in 2020 remains nearly 1200 mg/L less than the predicted post mine concentration and indicates that neither operation has had a significant impact on the potential use of these surface waters for agriculture or livestock purposes.

5.0 SPRINGS

The SIIW monitoring program includes nine spring sites. The following table includes the list of springs monitored, the frequency of monitoring, and the required parameters list. See Figure 1 for the location of the spring points. Spring monitoring was completed by experienced personnel using accepted monitoring practices. All samples were analyzed by ACZ Laboratories.

Site	Type	Unit	Monitoring Frequency		Parameter List
			Discharge	Water Quality	
S-46 (WSPG46)	Spring	Native	A	A	SW Long
S-47 (WSPG47)	Spring	Native	A	A	SW Short
S-50 (WSPG50)	Spring	Native	A	A	SW Long
S-7 (WSPG7)	Spring	Native	A	A	SW Long
Spoil Spring 1 (WSSPG1)	Spring	Spoils	A	A	SW Short
Spoil Spring 2 (WSSPG2)	Spring	Spoils	A	A	SW Long
Spoil Spring 3 (WSSPG3)	Spring	Spoils	A	A	SW Long
Spoil Spring 4 (WSSPG4)	Spring	Spoils	A	A	SW Long
Spoil Spring 5 (WSSPG5)	Spring	Spoils	A	A	SW Long

Note
A: Annual
SW Long: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, total mercury, ammonia, nitrate, nitrite, dissolved selenium, sulfate, sulfide, total dissolved solids, total suspended solids
SW Short: Field conductivity, field pH, field temperature, total recoverable iron, dissolved manganese, total suspended solids, total dissolved solids

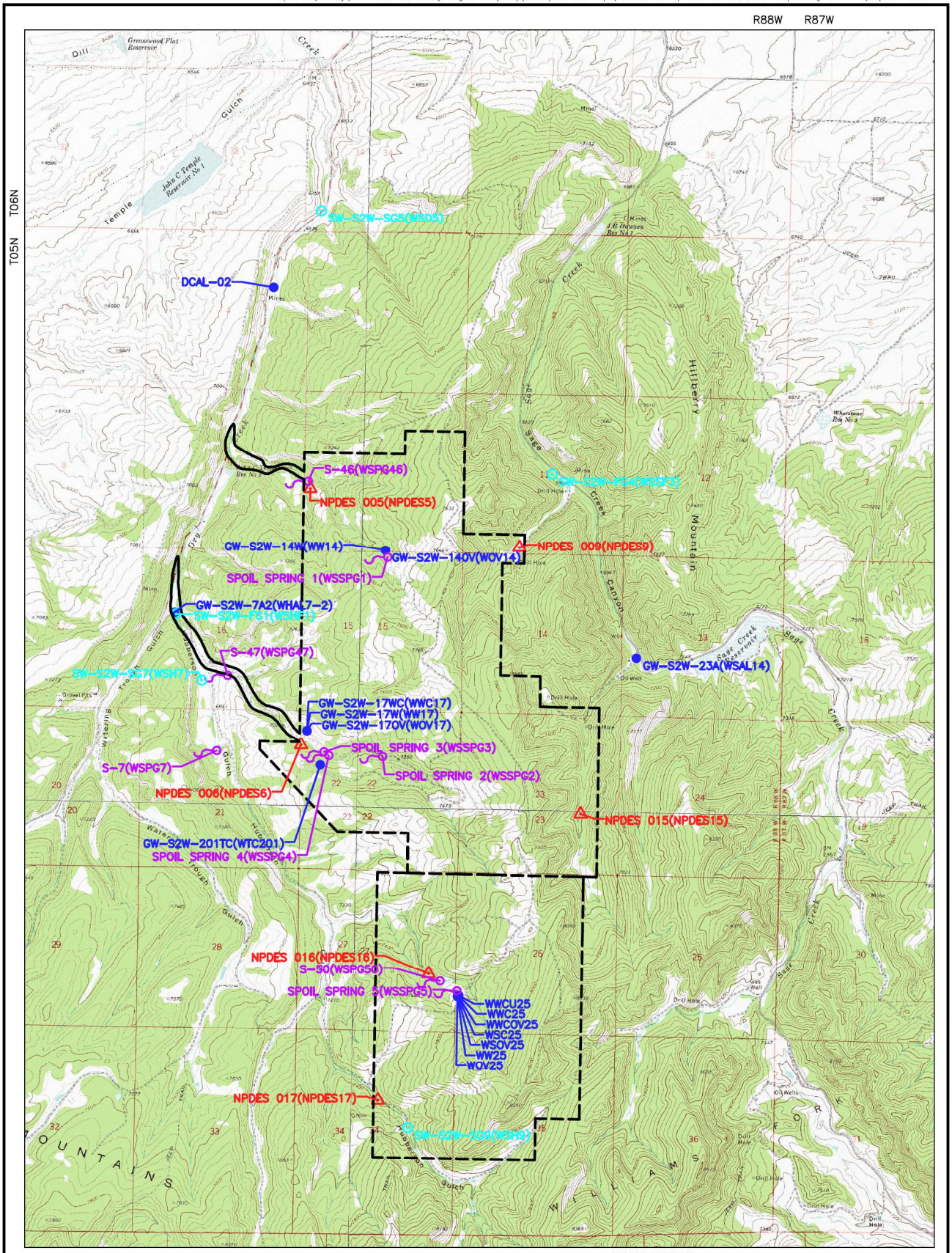
Four native springs and five spoil springs were monitored in 2020. The primary land use in this area, including the reclaimed mine parcels, is livestock grazing and wildlife habitat. Therefore, the water quality data collected from both the native and spoil springs are compared to the CWQCC Agricultural Use standards established in CDPHE Regulation 31.

Table E.1 in Appendix E includes the analytical results for the spring samples collected in 2020. As is described in the approved SIIW Hydrologic Monitoring Plan (see Tab 15, Appendix 15.3A) springs with flow less than 5 gallons per minute (gpm) should only be analyzed for field parameters. This is because it is often difficult to

collect a representative sample from diffuse flow without disturbing, and inadvertently collecting, sediments and organic matter that can produce false positive metal results. Water from non-flowing, pooled spring water, should also not be collected as stagnant water is often heavily influenced by bacteria and low oxygen conditions that alter the water chemistry. In 2020 none of the native springs had a measured flow above 5 gpm however water quality samples were inadvertently collected from all four locations. Although these results should be considered unrepresentative, all the spring samples were compared to the Agricultural Use water quality standards for discussion purposes. None of the Agricultural Use surface water quality standards were exceeded at the springs. The 0.2 mg/L Manganese Agricultural Use Standard is only applicable when irrigation water is applied to acidic soils (<6.0 pH). For alkaline soils, as are found in the SIIW area, a more appropriate standard would be 10 mg/L (EPA, 1976). Therefore, none of the manganese results above 0.2 mg/L were considered exceedances of the standard.

6.0 SUMMARY

No significant hydrologic impacts, attributable to activities at the SIIW, were noted during 2020. Groundwater levels in all monitoring wells were within the historic range observed at these locations. No exceedances of the groundwater quality standards were observed at the GWPOC. Exceedances of the total recoverable iron chronic aquatic life standards occurred at three of the downstream stream monitoring points. However, there were no exceedances of NPDES permit limits or water quality standards at the outfalls indicating the iron was unrelated to runoff from the SIIW.



GROUNDWATER
SURFACE WATER
NPDES
SPRING
PERMIT BOUNDARY

IMAGE SOURCE:
DIGITAL RASTER GRAPHIC COUNTY MOSAIC BY NRCS OF ROUTT COUNTY, COLORADO FROM GEOSPATIAL DATA GATEWAY (HTTPS://GDG.SC.EGOV.USDA.GOV) DOWNLOADED 10/16

0 3000'
SCALE

DESIGNED BY: JAH	FIGURE 1 MONITORING SITE LOCATIONS
DRAWN BY: SDG	
CHECKED BY: TNS	SENECA II WEST MINE PEABODY SAGE CREEK MINING, LLC PEABODY ENERGY
DATE: 2019	WWC ENGINEERING

APPENDIX A

METEOROLOGICAL DATA

PERIOD OF RECORD PRECIPITATION SUMMARY													
Water Year	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**TOTAL**
2020	1.90	1.37	2.60	2.53	2.40	1.67	1.75	1.63	0.77	0.71	0.43	0.43	18.19
2019	2.14	1.81	1.62	2.45	1.46	2.89	1.66	1.88	3.57	0.38	0.44	1.53	21.83
2018	2.45	1.31	1.36	1.65	1.92	1.90	2.95	0.85	0.15	0.15	1.33	0.17	16.19
2017	1.29	0.91	2.06	2.70	1.47	0.84	2.06	1.85	0.13	1.68	0.46	1.74	17.19
2016	1.39	1.90	2.55	2.65	1.16	1.40	3.02	1.94	0.40	0.81	0.19	1.02	18.43
2015	1.60	2.10	1.84	0.55	1.02	1.30	1.60	4.36	0.61	2.36	1.53	0.90	19.77
2014	2.69	1.75	1.42	2.02	0.78	1.96	1.19	2.58	0.72	1.50	3.77	0.87	21.25
2013	0.86	0.46	3.21	1.02	0.73	1.29	3.58	1.67	0.06	0.46	1.48	2.76	17.58
2012	1.41	1.65	0.36	0.87	1.97	0.50	1.13	0.22	0.15	2.43	0.55	1.56	12.80
2011	2.18	1.91	2.98	1.59	2.09	2.52	4.50	3.56	0.85	1.82	0.65	1.14	25.79
2010	1.22	0.77	1.24	0.75	0.90	0.73	1.98	2.80	1.34	1.19	1.56	0.62	15.10
2009	0.53	1.16	1.38	2.80	0.60	1.32	1.40	1.89	2.08	0.51	1.04	0.48	15.19
2008	1.41	0.13	3.36	2.51	1.70	1.64	0.94	1.68	0.37	0.57	0.75	0.91	15.97
2007	2.64	0.76	0.86	1.04	1.34	1.46	0.62	0.87	0.33	0.52	1.12	2.72	14.28
2006	2.27	2.04	2.01	1.78	0.58	1.06	0.95	0.93	0.24	1.48	2.71	2.75	18.80
2005	1.34	1.68	0.50	1.49	0.84	0.99	1.97	1.41	3.36	0.57	1.57	1.30	17.02
2004	0.44	2.90	1.58	0.74	1.64	0.40	1.57	1.26	0.86	1.00	1.44	2.76	16.59
2003	1.88	1.09	1.28	0.74	1.95	0.99	2.57	1.15	1.33	0.47	0.62	1.83	15.90
2002	1.14	1.17	0.54	0.88	0.92	1.06	1.39	0.40	0.37	0.78	1.26	1.94	11.85
2001	0.67	1.60	1.16	0.96	1.41	1.07	1.28	1.15	0.85	1.11	2.06	1.66	14.98
2000	0.43	0.61	1.66	1.66	1.68	1.46	1.84	1.94	0.54	0.75	2.38	2.00	16.95
1999	1.85	0.81	1.13	2.13	0.99	0.57	3.21	2.00	1.39	2.10	1.85	0.78	18.81
1998	2.37	1.08	0.95	1.34	1.93	1.77	1.77	0.62	2.51	1.50	0.48	1.50	17.82
1997	1.79	2.39	1.69	2.88	0.97	0.48	3.19	2.75	1.60	1.05	3.57	5.48	27.84
1996	1.32	2.20	1.26	3.60	2.19	0.99	1.34	2.10	1.00	1.33	0.35	1.37	19.05
1995	0.95	2.09	0.68	1.47	0.97	0.82	3.36	4.48	1.54	1.23	0.73	2.69	21.01
1994	3.02	1.61	1.16	0.69	1.13	0.56	1.85	1.07	0.43	0.24	0.98	0.72	13.46
1993	1.46	1.48	1.33	2.28	1.66	1.53	2.55	1.14	1.29	0.65	1.37	1.39	18.13
1992	1.18	2.79	0.85	0.88	1.16	1.20	1.66	3.08	1.15	4.38	0.95	0.98	20.26
1991	3.20	1.71	1.18	1.75	0.86	2.42	1.09	0.96	1.74	1.59	2.00	1.32	19.82
1990	0.77	1.38	2.08	0.65	1.64	1.54	1.36	1.12	1.38	1.14	0.51	1.22	14.79
1989	0.13	2.79	1.13	1.02	2.50	1.38	0.45	1.39	0.53	1.82	1.33	1.52	15.99
1988	1.27	1.22	2.32	2.80	0.70	1.31	0.83	1.85	1.93	0.60	1.03	2.31	18.17
1987	2.65	1.00	0.56	1.28	1.35	1.50	1.60	1.92	0.64	1.78	1.35	0.46	16.09
1986	3.51	4.19	1.34	0.79	3.01	1.59	2.70	0.99	1.00	1.65	1.96	2.12	24.85
1985	2.61	1.68	1.80	2.40	1.01	2.40	3.77	1.40	0.68	1.28	0.64	1.17	20.84
1984	2.16	2.82	5.03	0.59	0.43	2.31	2.68	1.33	2.36	1.84	2.61	1.31	25.47
1983	1.64	1.52	1.03	1.10	1.66	2.17	2.28	1.57	2.76	1.88	1.08	0.79	19.48
1982	3.76	0.78	2.51	1.71	0.62	2.64	1.92	0.97	0.46	1.60	1.19	2.64	20.80
1981	1.09	0.33	0.43	0.53	0.45	2.50	0.69	3.97	1.65	2.24	1.12	1.33	16.33
AVG	1.72	1.57	1.60	1.58	1.34	1.45	1.96	1.77	1.13	1.28	1.31	1.55	18.27

Note

Data from October 1980 to February 1982, and 2011 Water Year and later, from U.S. Department of Commerce - NOAA - Hayden Station. All other data from Seneca II Mine Meteorological Station with Belfort Weighing Bucket Rain Gage. Site relocated to USGS site on August 31, 1991. Precipitation recorded in inches.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2019	10	01	72	27	67	0.00		0.0		0.0								
2019	10	02	67	28	52	0.00		0.0		0.0								
2019	10	03	75	25	69	0.00		0.0		0.0								
2019	10	04	73	33	65	0.00		0.0		0.0								
2019	10	05	66	22	54	0.00		0.0		0.0								
2019	10	06	58	28	50	0.00		0.0		0.0								
2019	10	07	69	23	61	0.00		0.0		0.0								
2019	10	08	71	23	66	0.00		0.0		0.0								
2019	10	09	72	34	46	0.00		0.0		0.0								
2019	10	10	46	20	25	0.09		1.5		0.0								
2019	10	11	44	6	39	0.00		0.0		0.0								
2019	10	12	59	16	52	0.00		0.0		0.0								
2019	10	13	65	18	57	0.00		0.0		0.0								
2019	10	14	65	23	56	0.00		0.0		0.0								
2019	10	15	64	21	58	0.00		0.0		0.0								
2019	10	16	71	28	64	0.00		0.0		0.0								
2019	10	17	72	29	64	0.00		0.0		0.0								
2019	10	18	64	29	43	0.21		2.0		0.0								
2019	10	19	54	22	47	0.00		0.0		0.0								
2019	10	20	48	25	32	0.27		2.0		2.0								
2019	10	21	37	25	35	0.40		4.0		4.0								
2019	10	22	38	23	34	0.00		0.0		2.0								
2019	10	23	44	28	35	0.08		T		2.0								
2019	10	24	37	16	32	0.10		1.0		1.0								
2019	10	25	49	19	43	0.00		0.0		0.0								
2019	10	26	64	24	54	0.00		0.0		0.0								
2019	10	27	54	18	18	0.30		6.0		6.0								
2019	10	28	19	5	17	0.13		2.0		6.0								
2019	10	29	21	8	8	0.27		2.5		6.0								
2019	10	30	12	-6	6	0.05		0.5		6.0								
2019	10	31	30	-4	24	0.00		0.0		6.0								
Summary			54	21		1.90		21.5										

Empty, or blank, cells indicate that a data observation was not reported.

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"s" This data value failed one of NCDC's quality control tests. "At Obs." = Temperature at time of observation

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2019	11	01	35	12	25	0.00		0.0		6.0								
2019	11	02	41	10	32	0.00		0.0		4.0								
2019	11	03	45	18	37	0.00		0.0		3.0								
2019	11	04	49	30	40	0.00		0.0		2.0								
2019	11	05	51	20	37	0.00		0.0		1.0								
2019	11	06	54	21	40	0.00		0.0		0.0								
2019	11	07	51	17	36	0.00		0.0		0.0								
2019	11	08	65	36	57	0.00		0.0		0.0								
2019	11	09	61	24	42	0.00		0.0		0.0								
2019	11	10	58	22	37	0.00		0.0		0.0								
2019	11	11	41	20	25	0.00		0.0		0.0								
2019	11	12	50	13	36	0.00		0.0		0.0								
2019	11	13	52	23	40	0.00		0.0		0.0								
2019	11	14	53	19	37	0.00		0.0		0.0								
2019	11	15	59	22	47	0.00		0.0		0.0								
2019	11	16	49	25	39	0.00		0.0		0.0								
2019	11	17	51	18	36	0.00		0.0		0.0								
2019	11	18	52	28	40	0.00		0.0		0.0								
2019	11	19	62	23	50	0.00		0.0		0.0								
2019	11	20	50	34	39	0.14		0.0		0.0								
2019	11	21	39	27	29	0.16		1.5		1.0								
2019	11	22	29	23	28	0.18		3.0		3.0								
2019	11	23	39	18	29	0.00		0.0		2.0								
2019	11	24	43	15	33	0.00		0.0		2.0								
2019	11	25	38	23	31	0.05		0.5		2.0								
2019	11	26	38	17	17	0.45		5.0		7.0								
2019	11	27	35	2	25	0.00		0.0		7.0								
2019	11	28	45	22	35	0.00		0.0		5.0								
2019	11	29	51	23	30	0.05		0.5		2.0								
2019	11	30	30	19	19	0.34		4.5		6.0								
		Summary	47	21		1.37		15.0										

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

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Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2019	12	01	30	5	20	0.00		0.0		5.0								
2019	12	02	39	10	29	0.00		0.0		4.0								
2019	12	03	43	25	27	0.00		0.0		3.0								
2019	12	04	41	21	29	0.00		0.0		2.0								
2019	12	05	34	26	32	0.65		7.0		9.0								
2019	12	06	38	28	30	0.00		0.0		8.0								
2019	12	07	37	12	32	0.00		0.0		7.0								
2019	12	08	37	28	29	0.25		1.0		8.0								
2019	12	09	32	27	27	T		0.5		8.0								
2019	12	10	34	19	27	0.00		0.0		8.0								
2019	12	11	29	10	25	T		T		8.0								
2019	12	12	33	16	30	0.15		2.0		10.0								
2019	12	13	36	28	28	0.32		3.0		12.0								
2019	12	14	31	24	26	0.55		8.5		19.0								
2019	12	15	26	0	5	0.02		0.5		19.0								
2019	12	16	15	-6	4	0.00		0.0		19.0								
2019	12	17	18	-8	11	0.00		0.0		19.0								
2019	12	18	22	2	16	0.00		0.0		19.0								
2019	12	19	21	2	13	0.00		0.0		16.0								
2019	12	20	28	4	20	0.00		0.0		15.0								
2019	12	21	32	11	26	0.00		0.0		14.0								
2019	12	22	33	15	24	0.00		0.0		14.0								
2019	12	23	28	14	26	0.00		0.0		14.0								
2019	12	24	38	16	26	0.00		0.0		13.0								
2019	12	25	37	24	29	0.24		2.5		15.0								
2019	12	26	29	16	16	T		0.5		15.0								
2019	12	27	16	3	8	0.00		0.0		15.0								
2019	12	28	19	7	12	0.38		4.5		19.0								
2019	12	29	14	0	0	0.04		0.8		19.0								
2019	12	30	20	0	12	0.00		0.0		19.0								
2019	12	31	18	-1	14	0.00		0.0		19.0								
Summary			29	12		2.60		30.8										

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

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Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	01	01	26	14	22	0.35		4.5		22.0								
2020	01	02	29	18	19	0.16		2.5		23.0								
2020	01	03	27	16	24	0.00		0.0		23.0								
2020	01	04	31	9	18	0.00		0.0		20.0								
2020	01	05	28	5	20	0.00		0.0		19.0								
2020	01	06	31	10	12	0.05		0.5		19.0								
2020	01	07	33	12	16	0.00		0.0		18.0								
2020	01	08	28	8	27	0.00		0.0		18.0								
2020	01	09	28	19	23	0.31		3.0		21.0								
2020	01	10	23	3	3	0.12		2.0		22.0								
2020	01	11	15	-7	13	0.06		1.0		22.0								
2020	01	12	23	13	19	0.10		2.0		23.0								
2020	01	13	28	12	24	0.06		1.0		21.0								
2020	01	14	38	7	28	0.00		0.0		20.0								
2020	01	15	28	9	11	0.20		5.0		24.0								
2020	01	16	30	9	17	0.00		0.0		22.0								
2020	01	17	36	10	21	0.17		1.5		23.0								
2020	01	18	22	-1	15	0.00		0.0		22.0								
2020	01	19	26	3	13	0.00		0.0		21.0								
2020	01	20	28	3	18	0.00		0.0		21.0								
2020	01	21	36	16	29	0.06		T		21.0								
2020	01	22	34	26	28	0.20		3.0		22.0								
2020	01	23	28	20	26	0.21		3.0		23.0								
2020	01	24	30	13	25	0.00		0.0		22.0								
2020	01	25	35	23	24	0.07		1.0		21.0								
2020	01	26	38	17	30	0.00		0.0		20.0								
2020	01	27	31	22	26	0.25		2.0		22.0								
2020	01	28	34	13	18	0.00		0.0		22.0								
2020	01	29	29	17	26	0.00		0.0		21.0								
2020	01	30	27	17	17	0.16		3.0		23.0								
2020	01	31	25	5	20	0.00		0.0		23.0								
Summary			29	12		2.53		35.0										

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

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Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	02	01	32	14	25	0.00		0.0		22.0								
2020	02	02	33	6	23	0.00		0.0		22.0								
2020	02	03	38	14	14	0.07		0.5		22.0								
2020	02	04	14	1	1	0.00		0.0		22.0								
2020	02	05	12	-10	9	T		T		22.0								
2020	02	06	21	8	21	0.67		10.5		31.0								
2020	02	07	36	8	35	0.67		4.0		33.0								
2020	02	08	44	29	29	0.00		0.0		29.0								
2020	02	09	29	14	14	0.17		2.0		31.0								
2020	02	10	29	-4	10	0.00		0.0		31.0								
2020	02	11	10	-13	3	0.00		0.0		31.0								
2020	02	12	26	1	11	0.00		0.0		29.0								
2020	02	13	34	6	19	0.07		1.5		29.0								
2020	02	14	31	1	26	0.00		0.0		28.0								
2020	02	15	31	10	25	0.00		0.0		28.0								
2020	02	16	32	21	29	0.20		4.0		32.0								
2020	02	17	30	19	19	0.23		3.0		32.0								
2020	02	18	19	-8	8	0.00		0.0		32.0								
2020	02	19	18	-1	5	0.00		0.0		32.0								
2020	02	20		-20		0.00		0.0		32.0								
2020	02	21	31	-17	16	0.00		0.0		29.0								
2020	02	22	33	2	26	0.00		0.0		29.0								
2020	02	23	34	22	25	0.23		2.5		30.0								
2020	02	24	26	9	20	0.09		1.5		29.0								
2020	02	25	20	4	11	T		T		29.0								
2020	02	26	24	-6	20	0.00		0.0		28.0								
2020	02	27	32	9	25	0.00		0.0		28.0								
2020	02	28	34	5	24	0.00		0.0		28.0								
2020	02	29	39	6	30	0.00		0.0		28.0								
Summary			28	4		2.40		29.5										

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National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	03	01	41	15	32	T		T		27.0								
2020	03	02	32	19	23	0.02		0.3		26.0								
2020	03	03	33	4	27	0.00		0.0		26.0								
2020	03	04	34	11	28	0.00		0.0		26.0								
2020	03	05	40	12	32	0.00		0.0		26.0								
2020	03	06	42	21	34	0.00		0.0		25.0								
2020	03	07	51	22	42	0.00		0.0		24.0								
2020	03	08	45	32	33	0.15		0.0		21.0								
2020	03	09	40	30	35	0.15		0.5		21.0								
2020	03	10	43	29	36	T		0.0		19.0								
2020	03	11	43	24	40	0.01		0.0		18.0								
2020	03	12	48	29	39	0.11		0.0		16.0								
2020	03	13	43	25	38	0.07		0.5		15.0								
2020	03	14	45	33	44	0.03		0.0		14.0								
2020	03	15	52	27	47	0.00		0.0		13.0								
2020	03	16	52	23	42	0.00		0.0		12.0								
2020	03	17	54	29	51	0.00		0.0		11.0								
2020	03	18	51	26	39	0.00		0.0		9.0								
2020	03	19	39	29	32	0.17		T		8.0								
2020	03	20	40	25	32	0.29		3.0		7.0								
2020	03	21	45	21	39	0.00		0.0		6.0								
2020	03	22	43	28	38	0.45		4.0		10.0								
2020	03	23	43	23	32	0.19		1.5		9.0								
2020	03	24	48	29	46	T		T		6.0								
2020	03	25	46	32	41	0.00		0.0		5.0								
2020	03	26	52	24	42	0.00		0.0		3.0								
2020	03	27	42	26	33	0.03		T		3.0								
2020	03	28	39	21	35	T		T		2.0								
2020	03	29	45	24	39	0.00		0.0		T								
2020	03	30	49	26	47	0.00		0.0		0.0								
2020	03	31	57	31	52	0.00		0.0		0.0								
Summary			44	24		1.67		9.8										

Empty, or blank, cells indicate that a data observation was not reported.

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	04	01	62	33	54	0.00		0.0		0.0								
2020	04	02	54	23	26	0.32		4.0		4.0								
2020	04	03	39	6	37	0.00		0.0		0.0								
2020	04	04	54	20	50	0.00		0.0		0.0								
2020	04	05	60	32	56	0.00		0.0		0.0								
2020	04	06	63	30	57	0.00		0.0		0.0								
2020	04	07	63	29	58	0.00		0.0		0.0								
2020	04	08	63	27	59	0.00		0.0		0.0								
2020	04	09	69	32	66	0.00		0.0		0.0								
2020	04	10	66	34	55	0.00		0.0		0.0								
2020	04	11	62	26	52	0.00		0.0		0.0								
2020	04	12	52	21	31	0.31		1.0		0.0								
2020	04	13	31	15	27	T		T		0.0								
2020	04	14	40	10	38	0.00		0.0		0.0								
2020	04	15	42	28	35	0.04		T		0.0								
2020	04	16	35	25	29	0.42		4.0		2.0								
2020	04	17	44	8	42	0.00		0.0		0.0								
2020	04	18	51	28	40	0.07		0.0		0.0								
2020	04	19	56	28	42	0.02		0.0		0.0								
2020	04	20	59	29	56	0.00		0.0		0.0								
2020	04	21	64	29	56	0.00		0.0		0.0								
2020	04	22	62	28	58	0.00		0.0		0.0								
2020	04	23	59	34	44	0.10		0.0		0.0								
2020	04	24	55	36	53	0.25		0.5		0.0								
2020	04	25	61	34	58	0.00		0.0		0.0								
2020	04	26	58	34	54	0.06		0.0		0.0								
2020	04	27	71	36	67	0.16		0.0		0.0								
2020	04	28	67	43	64	T		0.0		0.0								
2020	04	29	73	40	73	0.00		0.0		0.0								
2020	04	30	77	41	72	0.00		0.0		0.0								
Summary			57	28		1.75		9.5										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests. "At Obs." = Temperature at time of observation

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	05	01	74	43	70	0.08		0.0		0.0								
2020	05	02	70	42	54	0.14		0.0		0.0								
2020	05	03	68	40	61	0.01		0.0		0.0								
2020	05	04	61	33	54	0.30		T		0.0								
2020	05	05	64	26	61	0.00		0.0		0.0								
2020	05	06	72	34	69	0.00		0.0		0.0								
2020	05	07	69	36	54	0.00		0.0		0.0								
2020	05	08	63	27	59	0.00		0.0		0.0								
2020	05	09	63	29	59	0.00		0.0		0.0								
2020	05	10	70	27	65	0.00		0.0		0.0								
2020	05	11	65	41	52	0.55		0.5		0.0								
2020	05	12	71	41	67	0.00		0.0		0.0								
2020	05	13	67	41	57	0.00		0.0		0.0								
2020	05	14	63	40	55	0.17		0.0		0.0								
2020	05	15	62	42	45	0.24		0.0		0.0								
2020	05	16	62	38	60	0.00		0.0		0.0								
2020	05	17	77	39	74	0.00		0.0		0.0								
2020	05	18	81	45	79	0.00		0.0		0.0								
2020	05	19	79	39	74	0.00		0.0		0.0								
2020	05	20	74	51	61	0.00		0.0		0.0								
2020	05	21	65	30	64	0.00		0.0		0.0								
2020	05	22	73	36	71	0.00		0.0		0.0								
2020	05	23	71	37	52	0.03		0.0		0.0								
2020	05	24	57	33	53	0.10		T		0.0								
2020	05	25	63	29	62	0.00		0.0		0.0								
2020	05	26	73	31	68	0.00		0.0		0.0								
2020	05	27	76	41	70	0.00		0.0		0.0								
2020	05	28	80	43	78	0.00		0.0		0.0								
2020	05	29	85	46	80	0.00		0.0		0.0								
2020	05	30	80	48	63	0.00		0.0		0.0								
2020	05	31	79	47	77	0.01		0.0		0.0								
Summary			70	38		1.63		0.5										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests. "At Obs." = Temperature at time of observation

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	06	01	85	52	83	T		0.0		0.0								
2020	06	02	83	45	81	0.00		0.0		0.0								
2020	06	03	81	42	75	0.00		0.0		0.0								
2020	06	04	83	47	73	0.00		0.0		0.0								
2020	06	05	89	47	84	0.00		0.0		0.0								
2020	06	06	84	49	61	0.17		0.0		0.0								
2020	06	07	74	42	69	0.00		0.0		0.0								
2020	06	08	69	39	43	0.00		0.0		0.0								
2020	06	09	60	36	57	0.53		0.0		0.0								
2020	06	10	70	35	68	0.00		0.0		0.0								
2020	06	11	76	40	73	0.00		0.0		0.0								
2020	06	12	84	43	81	0.00		0.0		0.0								
2020	06	13	82	56	71	0.00		0.0		0.0								
2020	06	14	79	49	78	0.00		0.0		0.0								
2020	06	15	84	39	81	0.00		0.0		0.0								
2020	06	16	83	45	80	0.00		0.0		0.0								
2020	06	17	80	36	68	0.00		0.0		0.0								
2020	06	18	71	34	70	0.00		0.0		0.0								
2020	06	19	74	43	71	0.00		0.0		0.0								
2020	06	20	76	36	71	0.00		0.0		0.0								
2020	06	21	77	42	70	0.00		0.0		0.0								
2020	06	22	81	43	78	0.00		0.0		0.0								
2020	06	23	83	47	82	0.00		0.0		0.0								
2020	06	24	87	49	86	0.00		0.0		0.0								
2020	06	25	86	50	69	0.00		0.0		0.0								
2020	06	26	81	45	69	0.00		0.0		0.0								
2020	06	27	84	45	82	0.03		0.0		0.0								
2020	06	28	84	48	81	0.00		0.0		0.0								
2020	06	29	81	54	67	0.00		0.0		0.0								
2020	06	30	67	40	64	0.04		0.0		0.0								
		Summary	79	44		0.77		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	07	01	80	39	80	T		0.0		0.0								
2020	07	02	85	44	82	0.00		0.0		0.0								
2020	07	03	88	48	82	0.00		0.0		0.0								
2020	07	04	89	51	79	0.00		0.0		0.0								
2020	07	05	90	53	84	0.00		0.0		0.0								
2020	07	06	88	44	84	0.00		0.0		0.0								
2020	07	07	90	50	87	0.00		0.0		0.0								
2020	07	08	87	43	86	0.00		0.0		0.0								
2020	07	09	89	44	86	0.00		0.0		0.0								
2020	07	10	91	45	87	0.00		0.0		0.0								
2020	07	11	92	46	87	0.00		0.0		0.0								
2020	07	12	87	47	66	0.19		0.0		0.0								
2020	07	13	87	55	70	0.08		0.0		0.0								
2020	07	14	88	52	82	0.00		0.0		0.0								
2020	07	15	87	47	83	0.00		0.0		0.0								
2020	07	16	87	47	73	0.00		0.0		0.0								
2020	07	17	84	52	77	0.00		0.0		0.0								
2020	07	18	90	52	80	0.00		0.0		0.0								
2020	07	19	88	55	78	0.00		0.0		0.0								
2020	07	20	88	45	85	0.00		0.0		0.0								
2020	07	21	88	46	87	0.00		0.0		0.0								
2020	07	22	87	50	63	0.03		0.0		0.0								
2020	07	23	79	50	77	0.04		0.0		0.0								
2020	07	24	77	53	75	0.05		0.0		0.0								
2020	07	25	75	54	70	0.01		0.0		0.0								
2020	07	26	87	50	84	0.00		0.0		0.0								
2020	07	27	89	53	87	0.00		0.0		0.0								
2020	07	28	87	56	64	0.31		0.0		0.0								
2020	07	29	84	49	81	0.00		0.0		0.0								
2020	07	30	83	46	82	0.00		0.0		0.0								
2020	07	31	89	50	86	0.00		0.0		0.0								
Summary			86	49		0.71		0.0										

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Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
Station: **HAYDEN, CO US USC00053867**

Record of Climatological Observations

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Generated on 02/02/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	08	01	91	53	81	0.00		0.0		0.0								
2020	08	02	91	55	86	0.00		0.0		0.0								
2020	08	03	93	57	89	0.00		0.0		0.0								
2020	08	04	91	55	82	0.00		0.0		0.0								
2020	08	05	89	57	83	0.00		0.0		0.0								
2020	08	06	90	56	86	0.00		0.0		0.0								
2020	08	07	88	46	83	0.00		0.0		0.0								
2020	08	08	88	43	82	0.00		0.0		0.0								
2020	08	09	88	44	85	0.00		0.0		0.0								
2020	08	10	89	45	87	0.00		0.0		0.0								
2020	08	11	89	52	84	0.00		0.0		0.0								
2020	08	12	87	48	81	0.00		0.0		0.0								
2020	08	13	89	50	87	0.00		0.0		0.0								
2020	08	14	88	44	86	0.00		0.0		0.0								
2020	08	15	87	42	84	0.00		0.0		0.0								
2020	08	16	90	45	89	0.00		0.0		0.0								
2020	08	17	92	50	89	0.00		0.0		0.0								
2020	08	18	94	50	89	0.00		0.0		0.0								
2020	08	19	91	54	82	0.00		0.0		0.0								
2020	08	20	87	50	75	0.00		0.0		0.0								
2020	08	21	88	52	85	0.00		0.0		0.0								
2020	08	22	91	48	87	0.00		0.0		0.0								
2020	08	23	93	52	83	0.00		0.0		0.0								
2020	08	24	91	54	82	0.00		0.0		0.0								
2020	08	25	91	56	84	0.00		0.0		0.0								
2020	08	26	90	57	88	0.00		0.0		0.0								
2020	08	27	88	55	84	0.00		0.0		0.0								
2020	08	28	85	53	81	0.00		0.0		0.0								
2020	08	29	81	52	58	0.30		0.0		0.0								
2020	08	30	83	46	76	0.13		0.0		0.0								
2020	08	31	76	41	66	0.00		0.0		0.0								
Summary			89	50		0.43		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

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Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
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National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Observation Time Temperature: 1800 Observation Time Precipitation: 1800

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)			Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2020	09	01	70	41	69	0.06		0.0		0.0								
2020	09	02	80	38	78	0.00		0.0		0.0								
2020	09	03	85	41	81	0.00		0.0		0.0								
2020	09	04	88	43	84	0.00		0.0		0.0								
2020	09	05	92	47	87	0.00		0.0		0.0								
2020	09	06	90	44	85	0.00		0.0		0.0								
2020	09	07	85	41	78	0.00		0.0		0.0								
2020	09	08	78	31	40	0.28		0.5		0.0								
2020	09	09	51	31	44	0.00		0.0		0.0								
2020	09	10	46	30	43	0.04		T		0.0								
2020	09	11	64	36	62	0.02		0.0		0.0								
2020	09	12	75	34	72	0.00		0.0		0.0								
2020	09	13	78	37	73	0.00		0.0		0.0								
2020	09	14	79	43	74	0.00		0.0		0.0								
2020	09	15	80	39	75	0.00		0.0		0.0								
2020	09	16	80	40	75	0.00		0.0		0.0								
2020	09	17	81	39	76	0.00		0.0		0.0								
2020	09	18	82	40	75	0.00		0.0		0.0								
2020	09	19	79	50	64	0.00		0.0		0.0								
2020	09	20	73	41	70	0.02		0.0		0.0								
2020	09	21	80	43	75	0.00		0.0		0.0								
2020	09	22	78	42	64	0.01		0.0		0.0								
2020	09	23	77	43	71	0.00		0.0		0.0								
2020	09	24	82	41	78	0.00		0.0		0.0								
2020	09	25	82	40	74	0.00		0.0		0.0								
2020	09	26	74	39	70	0.00		0.0		0.0								
2020	09	27	70	44	53	0.00		0.0		0.0								
2020	09	28	70		50	0.00		0.0		0.0								
2020	09	29	72	28	69	0.00		0.0		0.0								
2020	09	30	75	29	68	0.00		0.0		0.0								
Summary			77	39		0.43		0.5										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests. "At Obs." = Temperature at time of observation

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

APPENDIX B

GROUNDWATER QULITY DATA

Table B.1. Groundwater analytical results for Point of Compliance (POC) well DCAL-02 during water year 2020.

Location	Date	Static Water Level FT BTOC	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N DEG-C	Fluoride N MG/L	Iron D MG/L	Manganese D MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L	Sulfates N MG/L	TDS, Lab N MG/L
DCAL-02	5/19/2020	9.11	2160	7.24	11.6	0.3	0.31	1.38	< 0.02	0.01	< 2	660	1590
Groundwater Quality Standards		-	-	6.5 - 8.5[2]	-	2[1]	8.06[3]	2.55[3]	10[2]	1[2]	20[1]	1511[3]	3195[4]

Notes

1 - Colorado Regulation 41 Agricultural Use Groundwater Quality Standard
2 - Colorado Regulation 41 Domestic Use Groundwater Quality Standard
3 - Technical Revision 63 Ambient Groundwater Quality Standard
4 - Regulation 41 Table 4 TDS Groundwater Quality Standard
Bold Exceeds groundwater quality standard

Table B.2. Groundwater analytical results for Non-Point of Compliance wells during water year 2020.

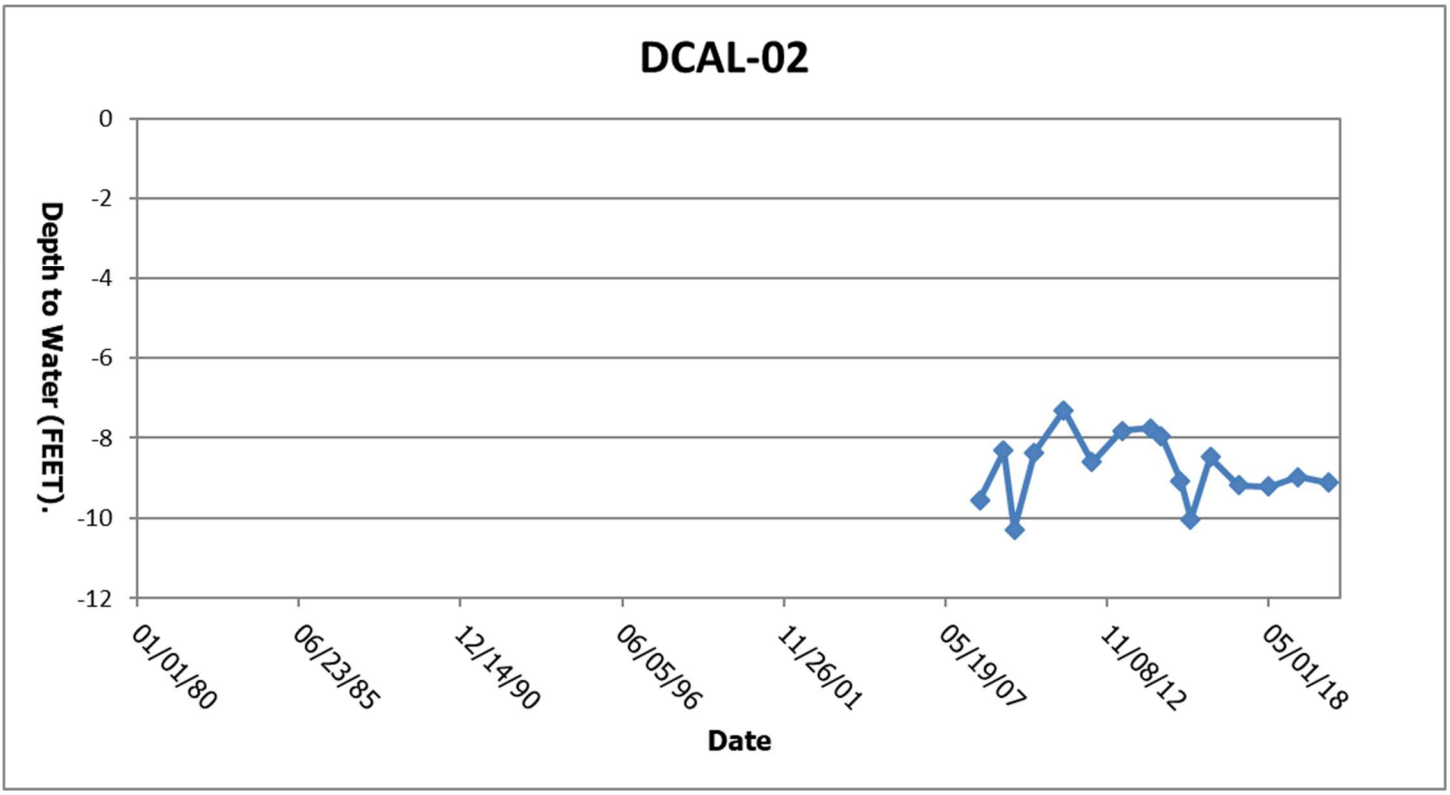
Location	Date	Static Water Level FT BTOC	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N DEG-C	Fluoride N MG/L	Iron D MG/L	Manganese D MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L	Sulfates N MG/L	TDS, Lab N MG/L
WHAL7-2	5/19/2020	5.07	1540	7.27	11.3	0.3	0.27	1.02	< 0.02	0.01	< 2	370	1070
WOV14	5/19/2020	6.67	3990	6.97	10.7	0.6	< 0.1	1.16	< 0.02	0.01	< 2	2430	3830
WOV17	5/19/2020	36.99	5670	6.92	11.1	-	< 0.3	0.06	-	-	-	-	4700
WOV25	5/20/2020	23.15	1960	7.18	9.6	0.2	< 0.06	0.05	< 0.02	< 0.01	< 2	750	1520
WSC25	5/20/2020	-	1090	7.26	8.9	0.2	0.47	< 0.01	0.11	0.02	< 2	270	758
WSOV25	5/20/2020	13.86	2120	7.2	9.9	0.2	0.31	0.17	< 0.02	< 0.01	< 2	790	1720
WW14	5/19/2020	4.71	4610	6.57	10.6	1.2	9.8	1.13	0.18	< 0.01	< 2	2760	4530
WW17	5/19/2020	7.43	1170	7.81	11.3		< 0.06	< 0.01	-	-	-	-	648
WW25	5/20/2020	20.26	660	8.1	9.5	0.7	< 0.06	< 0.01	5.20	< 0.01	< 2	120	404
WWC17	5/19/2020	1.2	-	-	-	-	-	-	-	-	-	-	-
WWC25	5/20/2020	11.55	1420	8.4	9.7	0.6	< 0.06	< 0.01	< 0.02	< 0.01	< 2	190	896
WWCOV25	5/20/2020	94.71	2310	6.97	9.1	0.2	0.29	0.21	< 0.02	< 0.01	< 2	940	1990
WWCU25	5/20/2020	100.81	1090	8.86	9.9	1.3	0.16	< 0.01	< 0.02	< 0.01	< 2	70	666

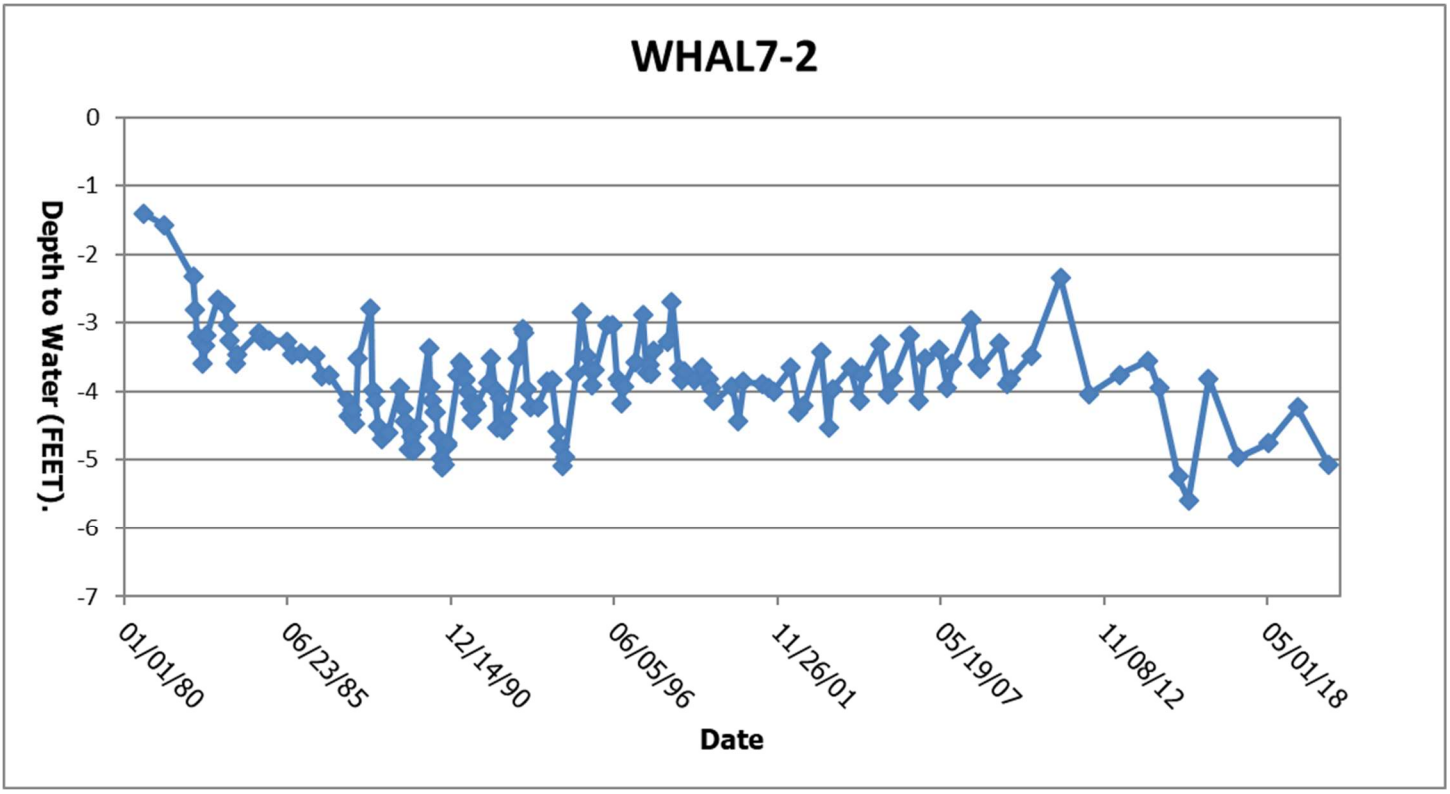
Note

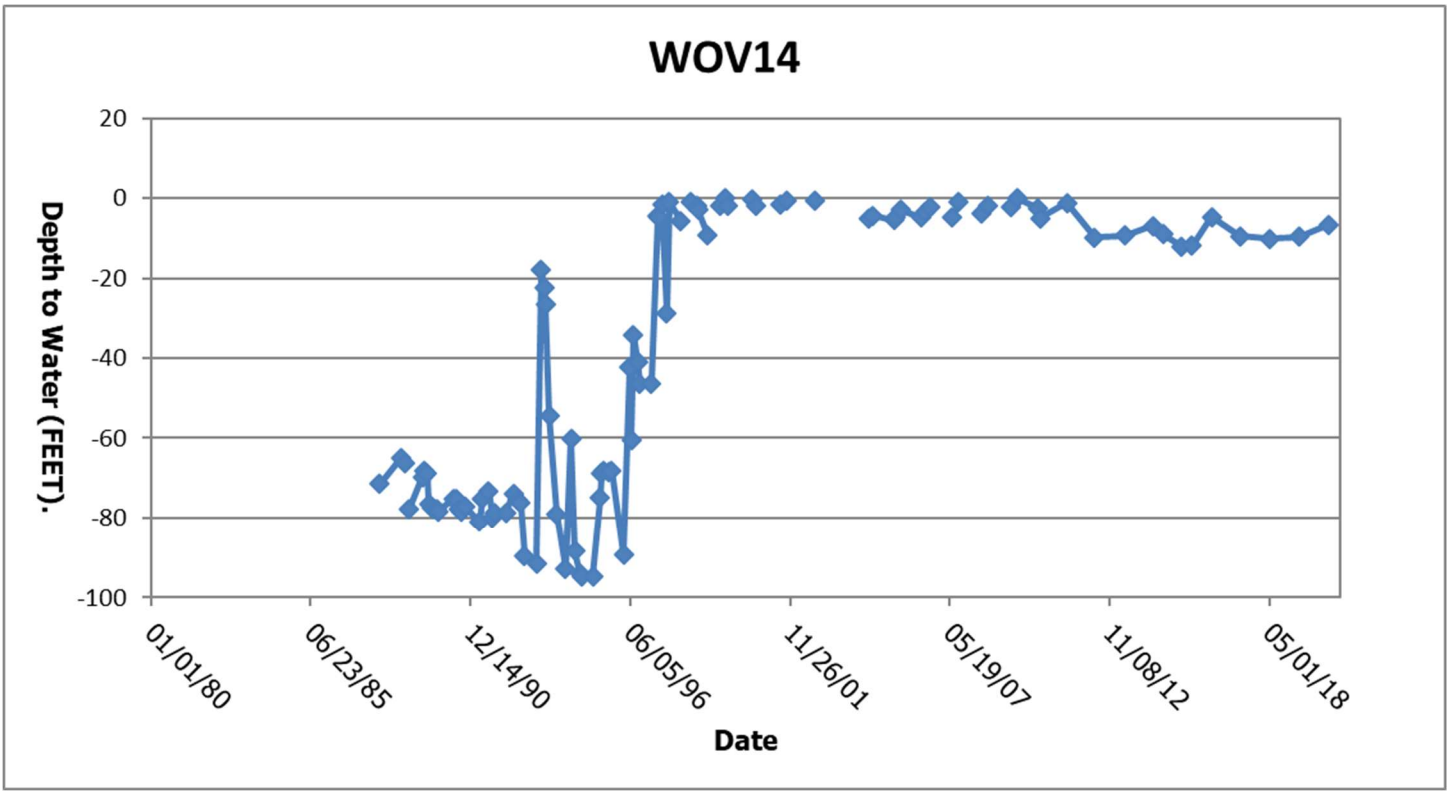
The well casing at WSC25 was damaged and the static water level could not be measured

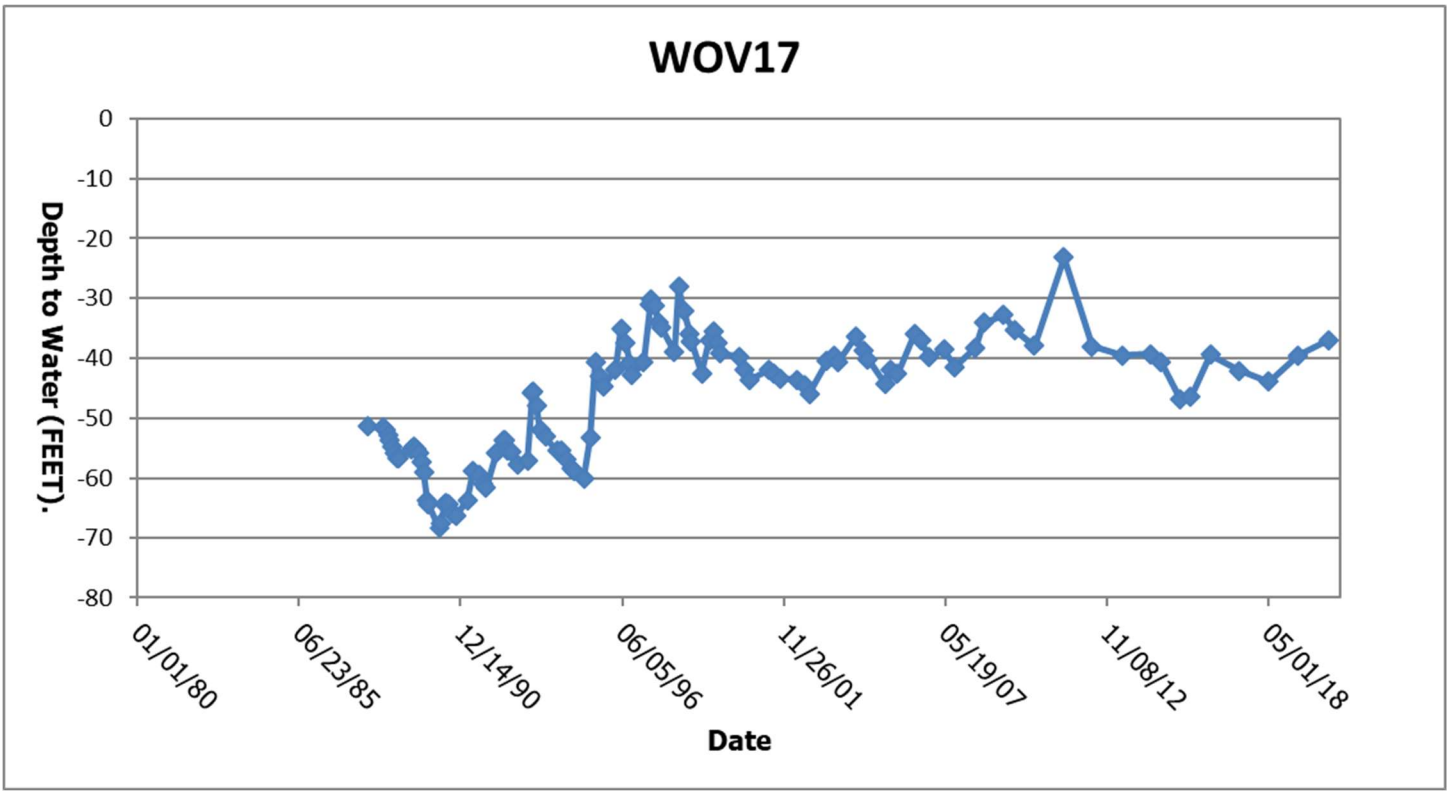
APPENDIX C

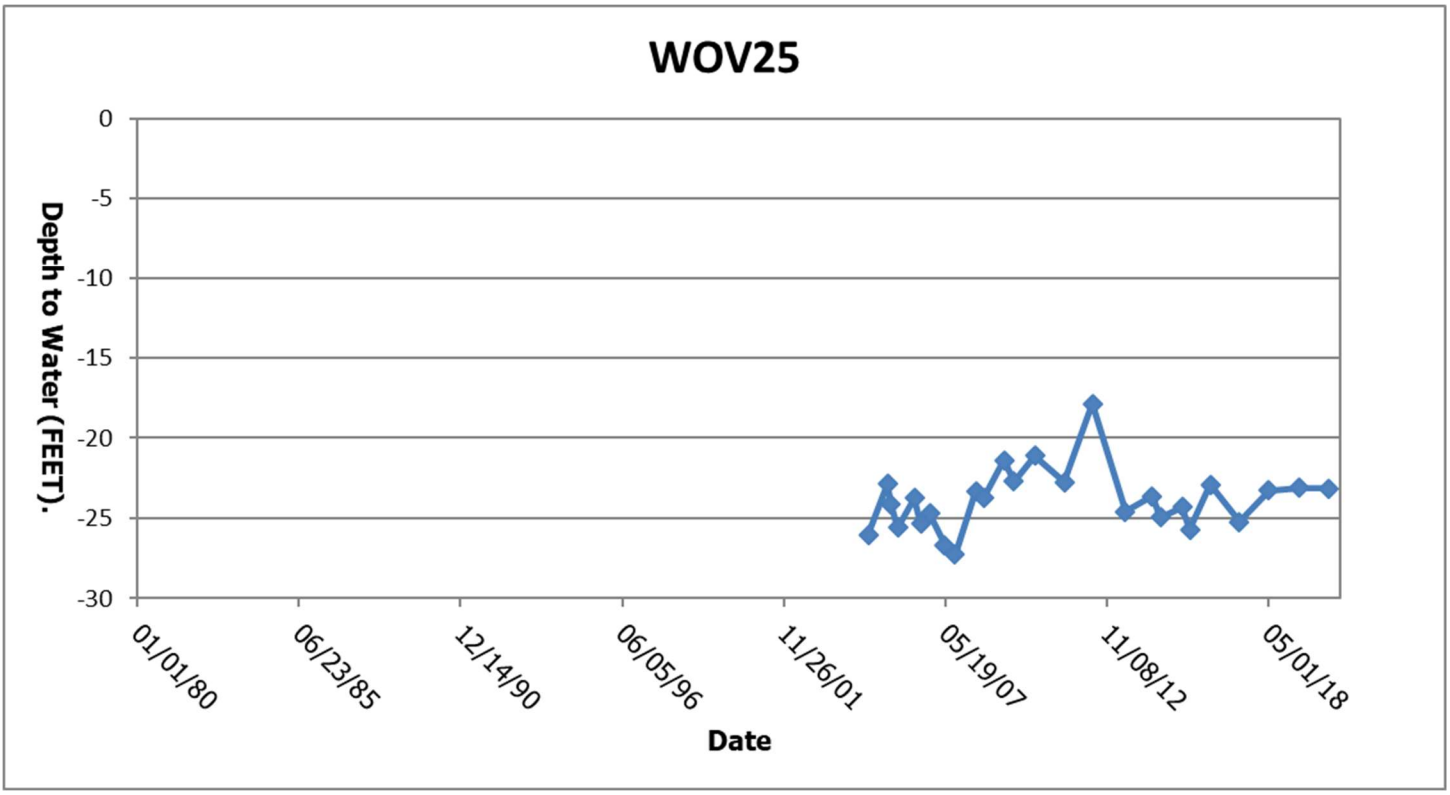
GROUNDWATER HYDROGRAPHS

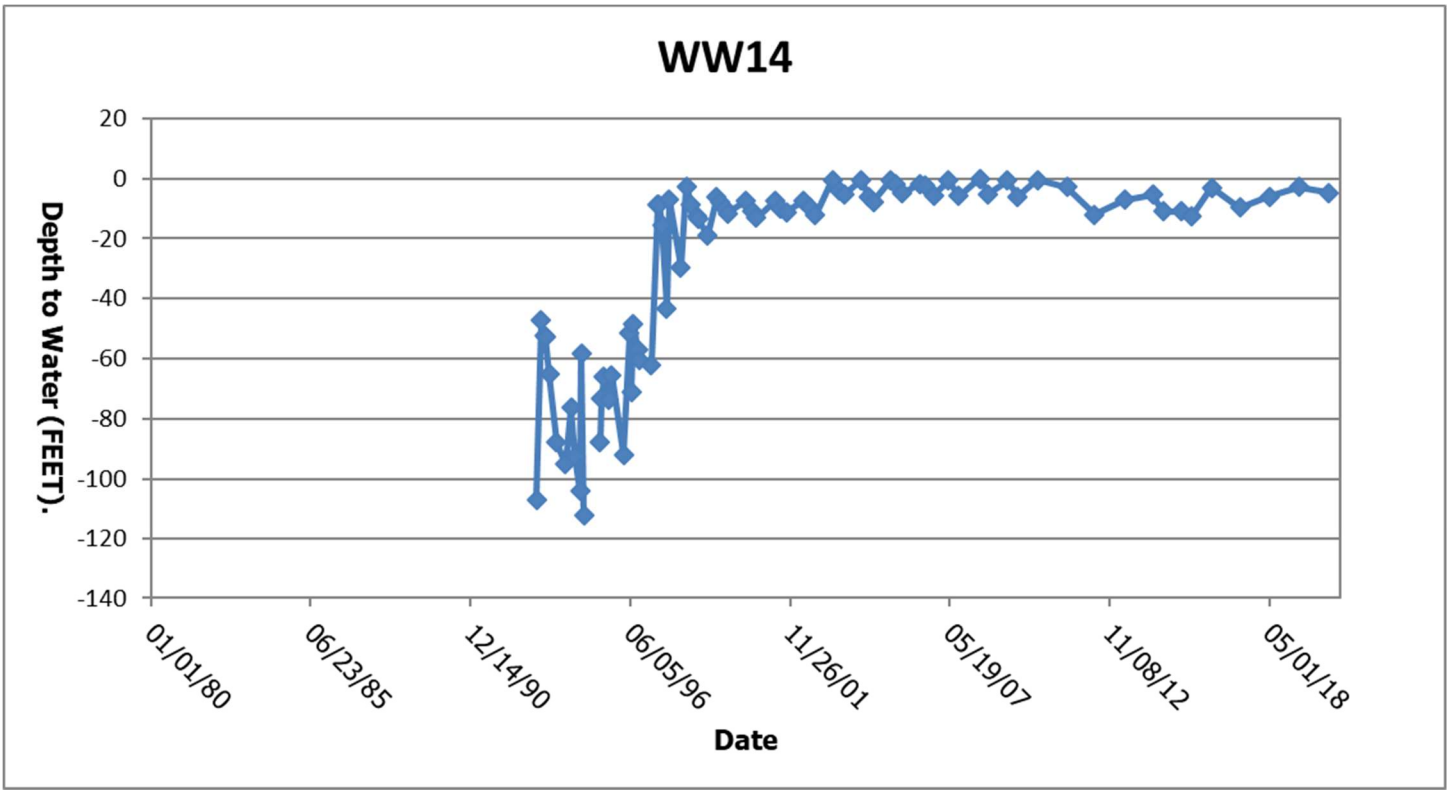

DCAL-02
Depth to Water (FEET).
0
-2
-4
-6
-8
-10
-12
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

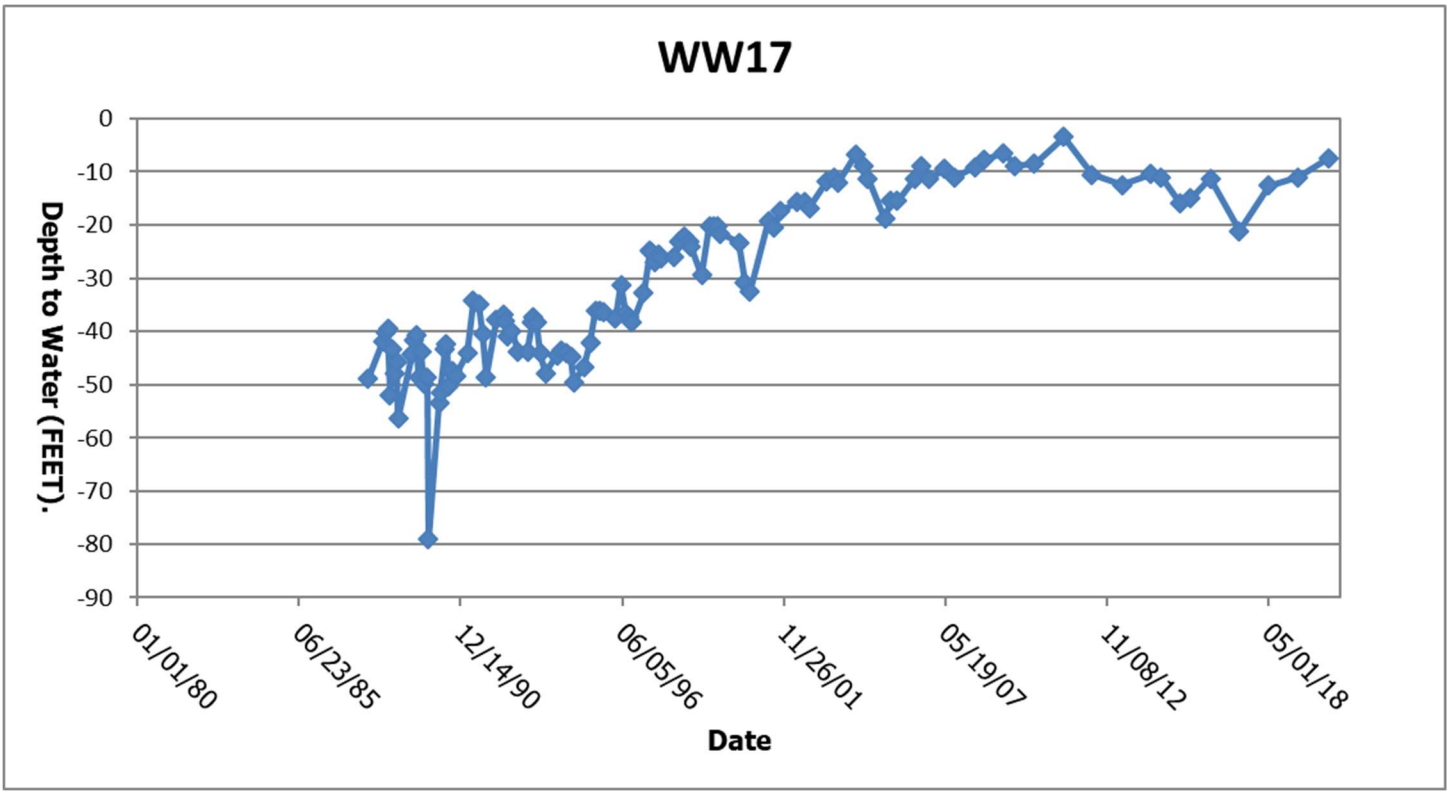

WHAL7-2
Depth to Water (FEET).
0
-1
-2
-3
-4
-5
-6
-7
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

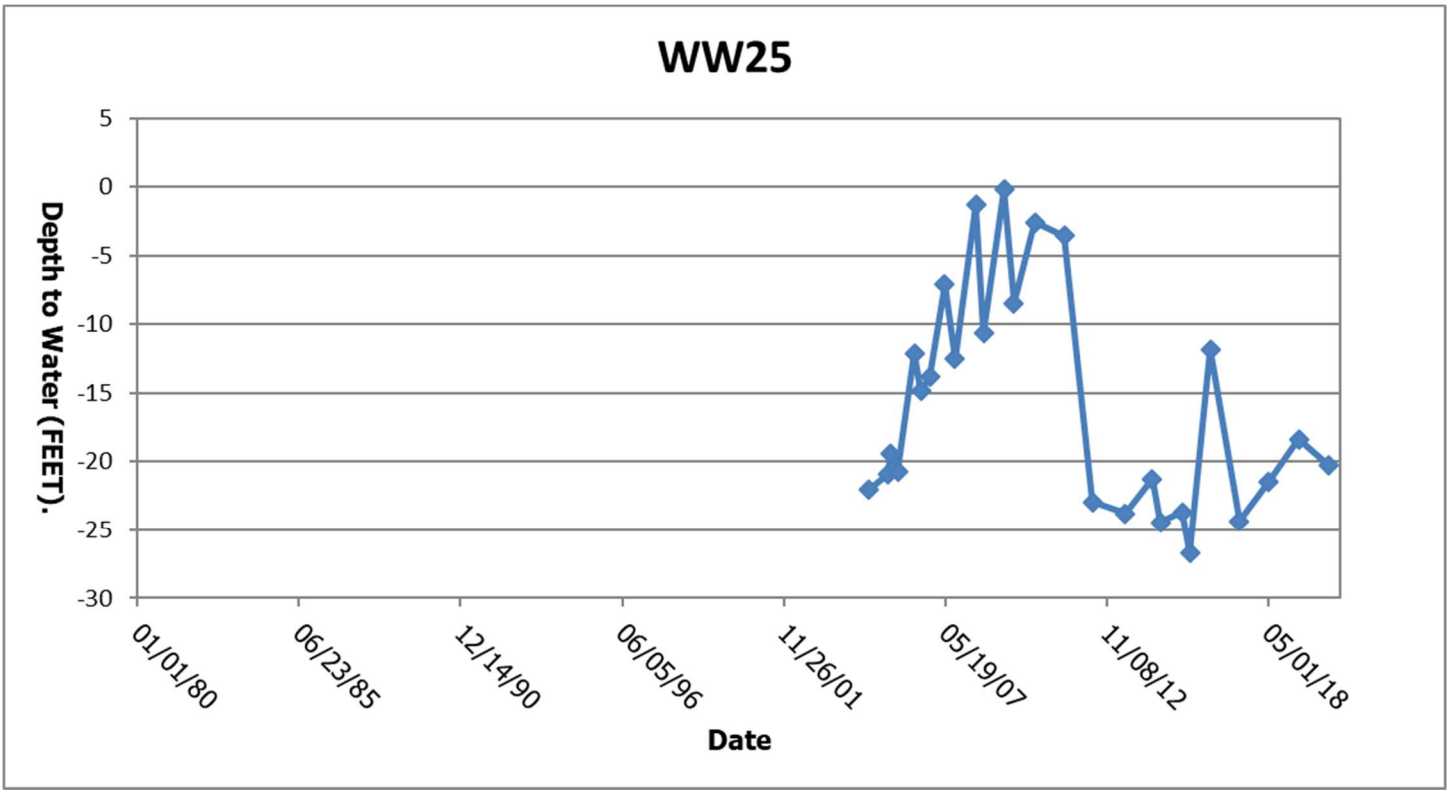

WOV14
Depth to Water (FEET).
20
0
-20
-40
-60
-80
-100
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

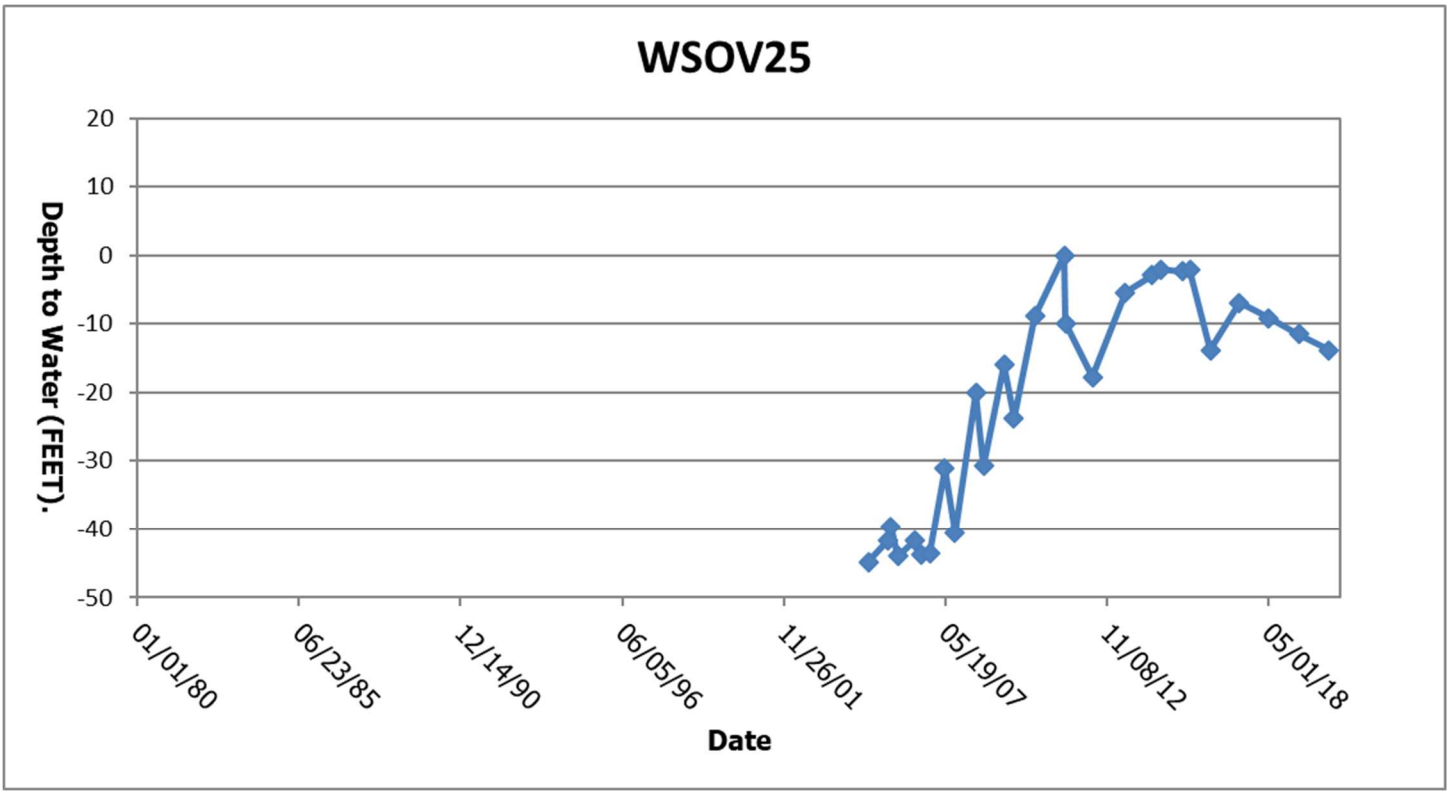

WOV17
Depth to Water (FEET).
0
-10
-20
-30
-40
-50
-60
-70
-80
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

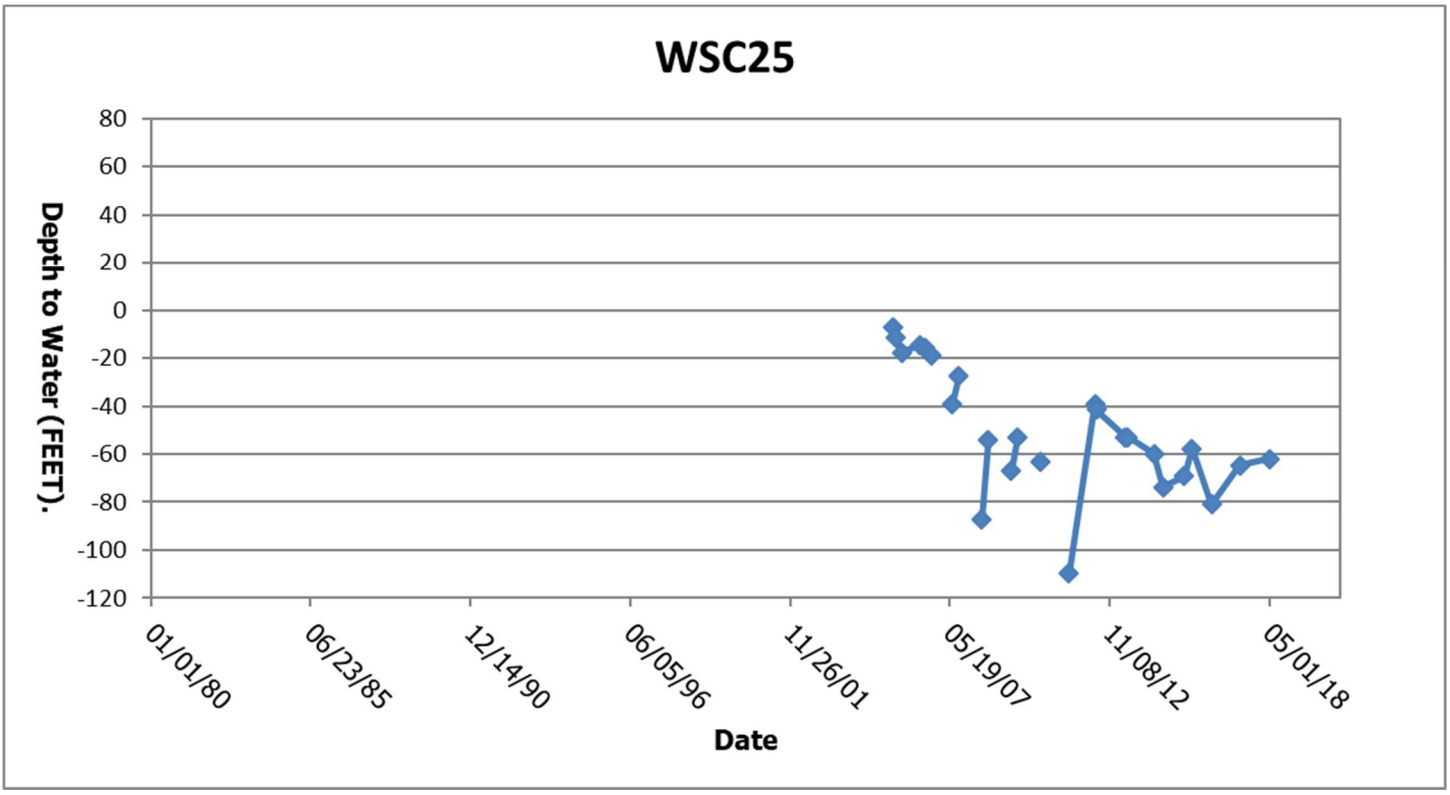

WOV25
Depth to Water (FEET).
0
-5
-10
-15
-20
-25
-30
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

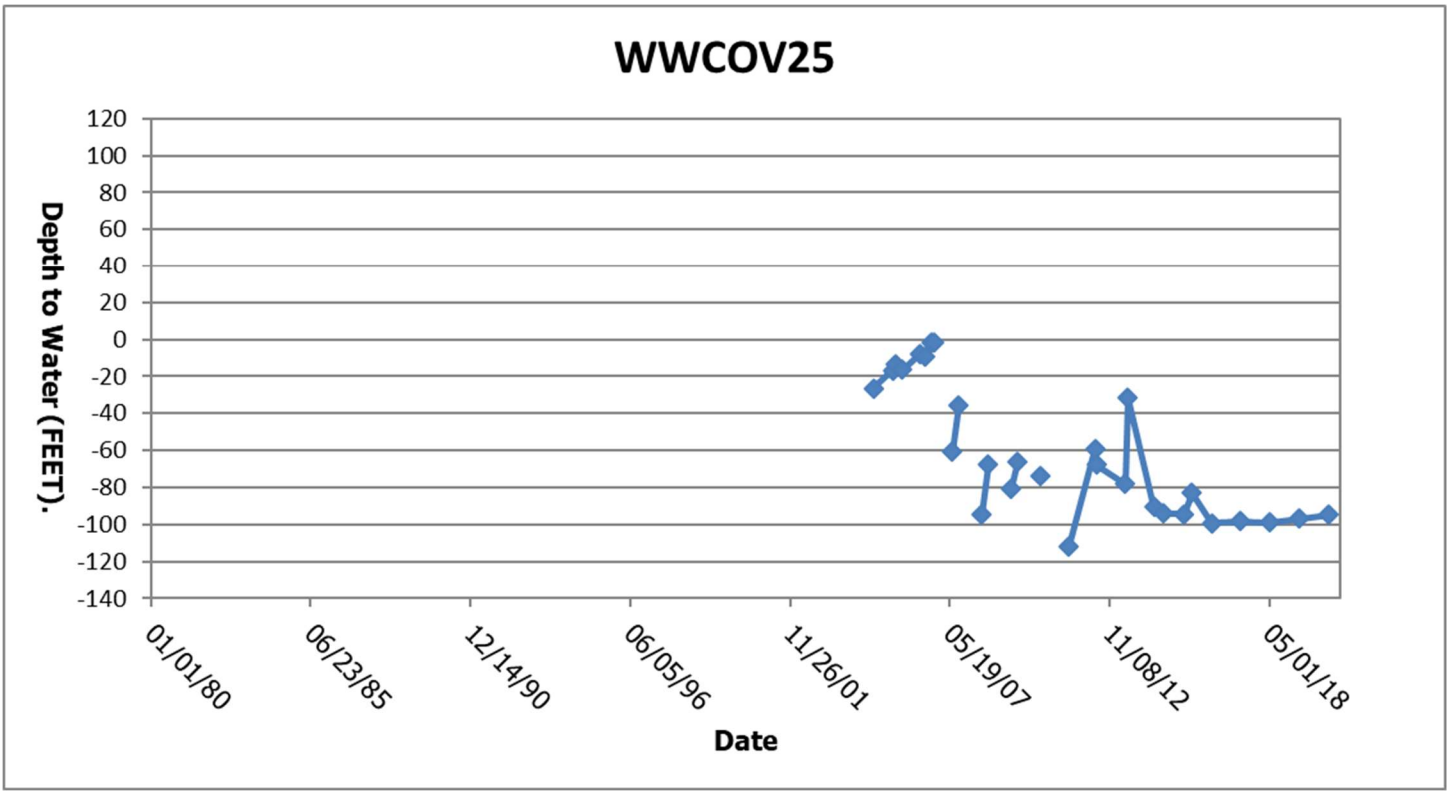

WW14
Depth to Water (FEET).
20
0
-20
-40
-60
-80
-100
-120
-140
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

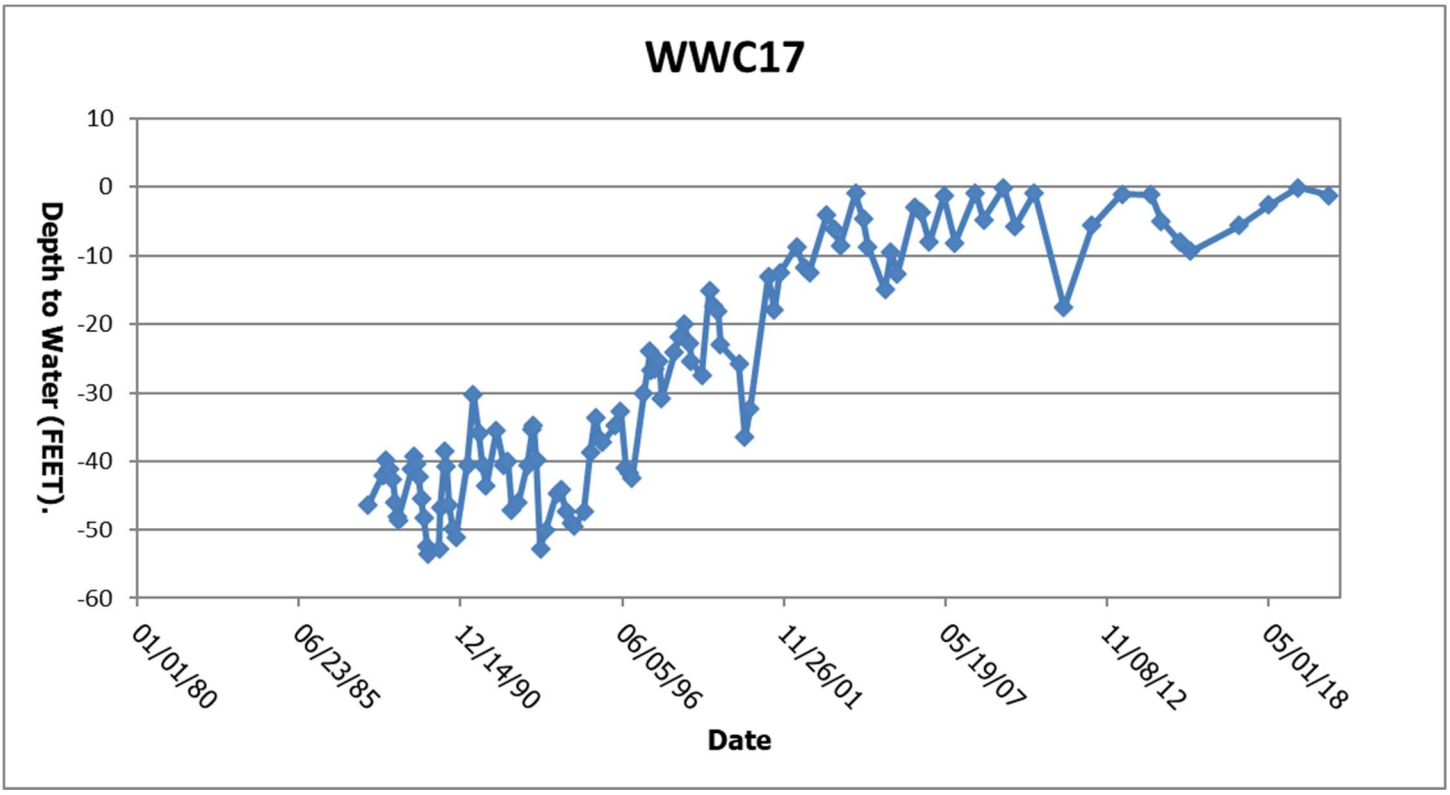

WW17
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Depth to Water (FEET).
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

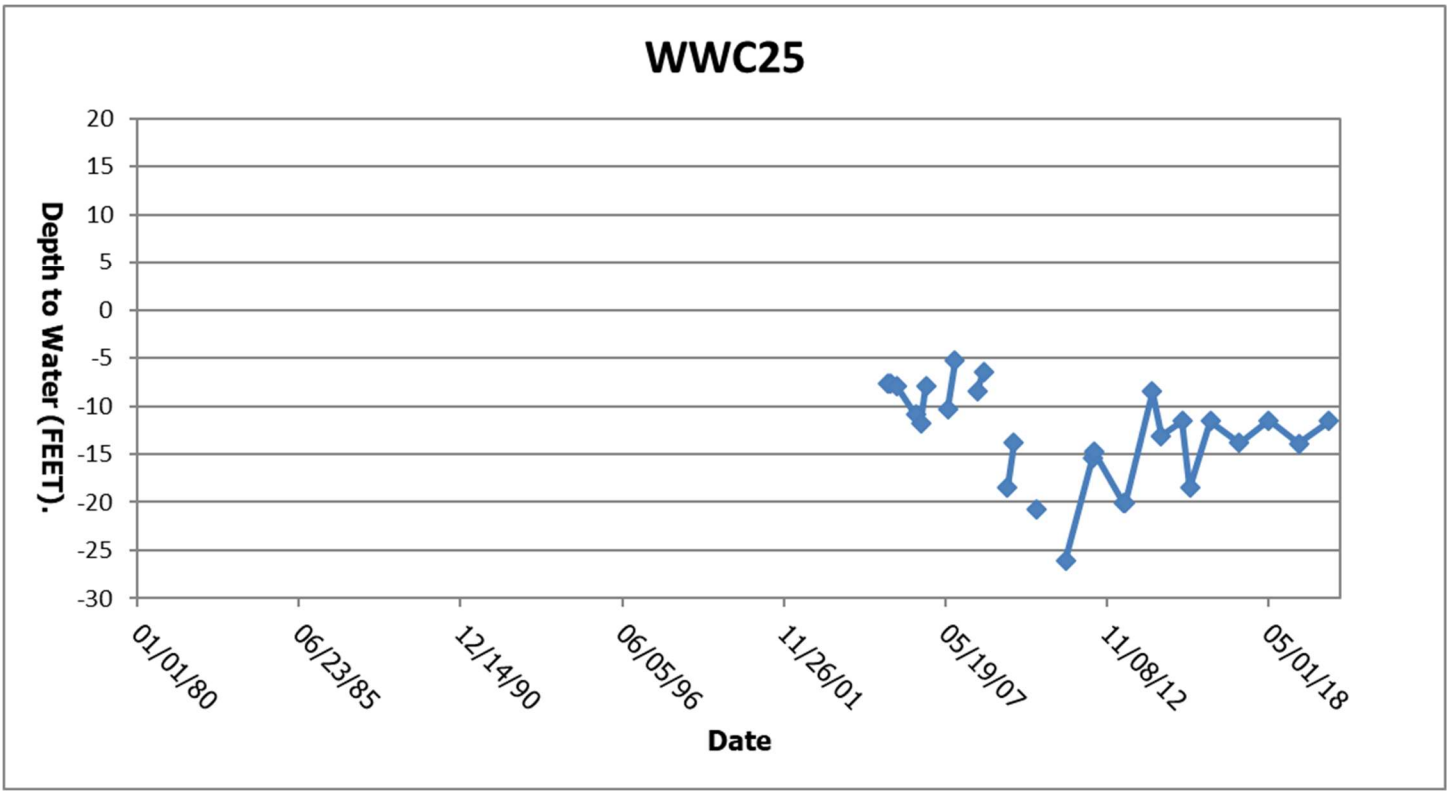

WW25
5
0
-5
-10
-15
-20
-25
-30
Depth to Water (FEET).
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

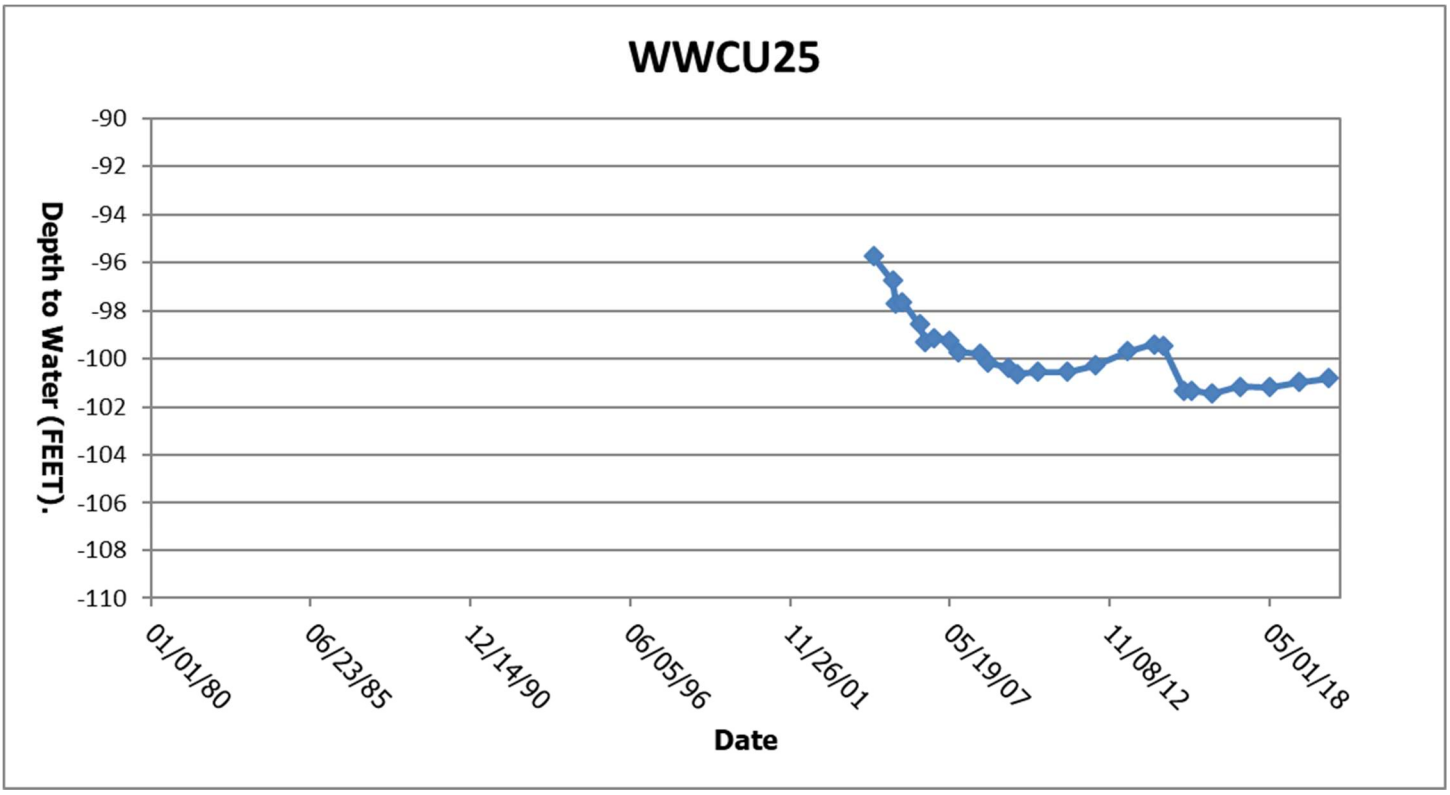

WSOV25
Depth to Water (FEET).
20
10
0
-10
-20
-30
-40
-50
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date


WSC25
Depth to Water (FEET).
80
60
40
20
0
-20
-40
-60
-80
-100
-120
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date


WWCOV25
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
Depth to Water (FEET).
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date


WWC17
10
0
-10
-20
-30
-40
-50
-60
Depth to Water (FEET).
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date


WWC25
Depth to Water (FEET).
20
15
10
5
0
-5
-10
-15
-20
-25
-30
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date


WWCU25
Depth to Water (FEET).
-90
-92
-94
-96
-98
-100
-102
-104
-106
-108
-110
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

APPENDIX D

SURFACE WATER QUALITY DATA

Table D.1 Dry Creek Yampa Segment 13d stream point analytical data for water year 2020.

Location	Date	Flow N GPM	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N C	Iron D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese D MG/L	Mercury T UG/L	Ammonia N. N MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L
WSH9	4/22/2020	302	675	7.03	8.5	< 0.06	0.79	2.27						
WSH9	6/2/2020	200	569	7.87	16.4			0.85	0.0141					0.3
WSH9	7/21/2020	7.6	1045	8.28	18.9	0.07	0.61	0.67						
WSH9	9/1/2020	0												
WSH7	4/22/2020	2128	1303	7.72	9.9			2.62	0.0637					1.2
WSH7	4/22/2020	2128	1303	7.72	9.9	< 0.06	0.42	2.63						
WSH7	6/2/2020	786	1179	8.2	17.3			**4.32**	0.0151					1
WSH7	7/21/2020	12.7	1375	8.45	15.8	< 0.06	0.84	**3.15**						
WSH7	9/1/2020	0												
WSHF1	4/22/2020	943	1815	7.61	11.3			2.76	0.0378	**< 0.2**	< 0.05	0.64	0.01	1.4
WSHF1	4/22/2020	943	1815	7.61	11.3	< 0.06	0.58	2.73						1.5
WSHF1	6/2/2020	1427	848	8.22	17.8			**5.6**	0.023	**< 0.2**	< 0.05	0.12	0.02	0.7
WSHF1	7/21/2020	34.3	2368	8.38	15.9	< 0.1	0.85	**2.1**						0.2
WSHF1	9/1/2020	27.6	3466	8.32	21.8			**1.89**	0.269					0.2
WSD5	4/22/2020	1543	2010	7.43	9.4			0.29	0.0341	**< 0.2**	< 0.05	0.04	< 0.01	0.9
WSD5	4/22/2020	1543	2010	7.43	9.4	< 0.06	0.12	0.33						0.9
WSD5	6/2/2020	704	1710	8.06	16.4			0.66	0.368	**< 0.2**	< 0.05	< 0.02	< 0.01	0.4
WSD5	7/21/2020	8.6	2192	7.99	17.3	< 0.1	0.73	1.0						0.2
WSD5	9/1/2020	0												
Yampa Segment 13d Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01	0.05	100	0.05	18.4
Yampa Segment 13d Standards - Chronic		-	-	-	-	-	-	1.11 (May-Feb) 3.04 (Mar-Apr)	2.618	-	-	-	-	4.6
Agricultural Use Standards		-	-	-	-	-	-	-	0.2*	-	-	100	10	20

Location	Date	Selenium PD UG/L	Selenium TR UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	TSS N MG/L
WSH9	4/22/2020					450	40.0
WSH9	6/2/2020	0.4	0.4			344	17.0
WSH9	7/21/2020					866	5.0
WSH9	9/1/2020						
WSH7	4/22/2020	1.1	1.1			980	61.0
WSH7	4/22/2020					980	69.0
WSH7	6/2/2020	0.9	0.9			1050	142
WSH7	7/21/2020					1340	121
WSH7	9/1/2020						
WSHF1	4/22/2020	1.2	1.1	782	**< 0.08**	1450	67.0
WSHF1	4/22/2020		1.1	778		1460	77.0
WSHF1	6/2/2020	0.7	0.9	928	**0.05**	1610	180
WSHF1	7/21/2020		0.4	1520		2580	64.0
WSHF1	9/1/2020	< 0.2	0.2			3710	53.0
WSD5	4/22/2020	0.8	1.1	846	**< 0.02**	1640	6.0
WSD5	4/22/2020		0.8	860		1640	7.0
WSD5	6/2/2020	0.3	0.4	906	**< 0.02**	1650	12.0
WSD5	7/21/2020		0.3	1140		2170	18.0
WSD5	9/1/2020						
Yampa Segment 13d Standards - Acute		-	-	-	0.002**	-	-
Yampa Segment 13d Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

Notes

* The manganese agricultural use standard is only applicable for areas with acidic soils. This areas soils are alkaline.

** Detection limit is an order of magnitude lower than 0.002 mg/L standard for un-ionized sulfide.

Bold Analyte exceeds the Yampa Segment 13d or Agricultural Use Standards

Table D.2. Dry Creek Segment 13d NPDES Outfall 017 analytical data for water year 2020.

Location	Date	Flow N GPM	pH, Field N S.U.	Oil & Grease Y/N	Temp., Field N C	SPC, Field N UMHOS/CM	Iron D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese PD MG/L	Selenium D UG/L	Selenium PD UG/L	Selenium TR UG/L	TSS N MG/L	TDS, Lab N MG/L
NPDES17	1/8/2020	2.8	8.3	N	0.6	1691			0.08			1.3	1.3		1260
NPDES17	2/17/2020	2.5	8.19	N	0.7	1755			0.07			2.1	1.8		1270
NPDES17	3/2/2020	2.7	8.1	N	0.4	1662			0.09			2	2.1		1210
NPDES17	4/22/2020	280.4	7.43	N	10.7	964			0.61			1.6	1.4		668
NPDES17	4/22/2020	280.4	7.43	N	10.7	964	< 0.06	0.15	0.59		1.8		1.5	10.0	660
NPDES17	5/5/2020	304.1	7.07	N	12.6	505			0.47			0.9	0.9		304
NPDES17	6/1/2020	154.6	7.38	N	18.6	638			0.26			0.8	0.8		472
NPDES17	7/21/2020	9.8	8.64	N	23.2	1583			0.14			2.7	3		1300
NPDES17	7/21/2020	9.8	8.64	N	23.2		< 0.06	0.08	0.10		2.9		3	6.0	1280
NPDES17	8/3/2020	4.3	8.67	N	23	1793			0.31			3.2	2.5		1450
NPDES17	9/1/2020	0													
NPDES17	10/24/2019	3.7	8.91	N	3.9	2646			0.18			2.5	2.3		2200
NPDES17	11/11/2019	2.8	8.74	N	3.5	1441			0.07			0.7	0.7		1060
NPDES17	12/3/2019	2.4	8.34	N	2.4	1971			0.07			1.4	1.2		1500
NPDES	Daily Max		6.5 - 9.0	10*	-	-	-	-	Report	Report	-	Report	-	-	Report
Limit	Monthly Avg.		NA	NA	-	-	-	-	1	Report	-	4.6	-	-	Report
Yampa Segment 13d Standards - Acute			6.5 - 9.0	-	-	-	-	-	-	4.738	18.4	-	-	-	-
Yampa Segment 13d Standards - Chronic			-	-	-	-	-	-	Mar-Apr 3.040 May-Feb 1.110	2.618	4.6	-	-	-	-

Note

* Limit only applicable if presence of oil or grease is detected

Settleable solids data only submitted to SCC database if result exceeds limit. No exceedances occurred during this time period.

Bold Analyte exceeds the NPDES limit or Yampa Segment 13d Standard

Table D.3. Dry Creek Segment 13d NPDES Outfall 016 analytical data for water year 2020.

Location	Date	Flow N GPM	pH, Field N S.U.	Oil & Grease Y/N	Temp., Field N C	SPC, Field N UMHOS/CM	Iron D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese PD MG/L	Selenium D UG/L	Selenium PD UG/L	Selenium TR UG/L	TSS N MG/L	TDS, Lab N MG/L
NPDES16	1/8/2020	53.2	8.17	N	0.3	2805			0.04			2.1	2		2420
NPDES16	2/17/2020	52.7	7.98	N	0.6	2825			< 0.06			2.4	2.1		2480
NPDES16	3/2/2020	53.6	8.01	N	0.3	2727			0.07			2.6	2.7		2440
NPDES16	4/22/2020	340.7	7.74	N	11.2	1665			0.42			1.4	1.3		1290
NPDES16	4/22/2020	340.7	7.74	N	11.2	1665	< 0.06	0.09	0.48		1.5		1.3	8.0	1270
NPDES16	5/5/2020	397.4	7.36	N	13.2	2061			0.09			1.4	1.3		1650
NPDES16	6/1/2020	152.1	7.82	N	17.6	2145			< 0.1			1.4	1.4		2050
NPDES16	7/21/2020	98.9	8.17	N	22.4	2481			< 0.1			1.7	1.3		2290
NPDES16	7/21/2020	98.9	8.17	N	22.4	2481	< 0.1	0.10	0.1		1.1		1.2	10.0	2270
NPDES16	8/3/2020	89.4	8.18	N	23.6	2539			0.07			1.2	1		2310
NPDES16	9/1/2020	74.8	8.12	N	20.1	2334			0.07			0.8	0.9		2390
NPDES16	10/23/2019	84.4	8.86	N	3.3	2707			< 0.06			1.3	1.1		2380
NPDES16	11/11/2019	80.7	8.63	N	4.9	2682			< 0.06			1.4	1.2		2340
NPDES16	12/3/2019	77.6	8.24	N	2.4	2854			< 0.06			1.6	1.5		2470
NPDES Limit	Daily Max		6.5 - 9.0	10*	-	-	-	-	Report	Report	-	Report	-	-	Report
	Monthly Avg.		NA	NA	-	-	-	-	1	Report	-	4.6	-	-	Report
Yampa Segment 13d Standards - Acute			6.5 - 9.0	-	-	-	-	-	-	4.738	18.4	-	-	-	-
Yampa Segment 13d Standards - Chronic			-	-	-	-	-	-	Mar-Apr 3.040 May-Feb 1.110	2.618	4.6	-	-	-	-

Note

* Limit only applicable if presence of oil or grease is detected

Settleable solids data only submitted to SCC database if result exceeds limit. No exceedances occurred during this time period.

Bold Analyte exceeds the NPDES limit or Yampa Segment 13d Standard

Table D.4. Dry Creek Segment 13d NPDES Outfall 006 analytical data for water year 2020.

Location	Date	Flow N GPM	pH, Field N S.U.	Oil & Grease Y/N	Temp., Field N C	SPC, Field N UMHOS/CM	Iron D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese PD MG/L	Selenium D UG/L	Selenium PD UG/L	Selenium TR UG/L	TSS N MG/L	TDS, Lab N MG/L
NPDES6	1/8/2020	48.7	7.96	N	0.4	4227			0.11	1.56		0.2	0.1		3870
NPDES6	2/17/2020	47.9	8.08	N	0.6	4085			0.15			0.9	0.2		3900
NPDES6	3/2/2020	48.6	8.05	N	0.3	3958			0.13			1.2	0.2		3760
NPDES6	4/22/2020	497.6	7.26	N	11.7	2705			< 0.1			2	1.9		2380
NPDES6	4/22/2020	497.6	7.26	N	11.7	2705	< 0.1	< 0.06	< 0.1		2.2		2	< 5	2400
NPDES6	5/5/2020	387.6	7.79	N	13.4	3423			0.11	0.19		1.7	1.5		3140
NPDES6	6/1/2020	192.3	7.8	N	18.5	3587			< 0.3			0.6	0.5		4020
NPDES6	7/21/2020	84.2	8.04	N	22.3	3979			< 0.3			3.6	< 0.5		4190
NPDES6	7/21/2020	84.2	8.04	N	22.3	3979	< 0.3	0.13	< 0.3		< 0.5		< 0.5	10.0	4090
NPDES6	8/3/2020	83.7	8.03	N	24.8	4236			0.08	0.133		0.2	0.3		4190
NPDES6	9/1/2020	80.6	8.08	N	19.6	3758			0.09			0.2	0.1		4310
NPDES6	10/23/2019	74.3	8.66	N	3.3	4234			< 0.2	0.05		3.8	< 0.5		4020
NPDES6	11/11/2019	70.4	8.42	N	5.7	3910			0.08			0.3	0.2		3810
NPDES6	12/3/2019	68.7	8.02	N	2.4	4424			< 0.2			0.1	0.1		4260
NPDES	Daily Max		6.5 - 9.0	10*	-	-	-	-	Report	Report	-	Report	-	-	Report
Limit	Monthly Avg.		NA	NA	-	-	-	-	1	Report	-	4.6	-	-	Report
Yampa Segment 13d Standards - Acute			6.5 - 9.0	-	-	-	-	-	-	4.738	18.4	-	-	-	-
Yampa Segment 13d Standards - Chronic			-	-	-	-	-	-	Mar-Apr 3.040 May-Feb 1.110	2.618	4.6	-	-	-	-

Note

* Limit only applicable if presence of oil or grease is detected

Settleable solids data only submitted to SCC database if result exceeds limit. No exceedances occurred during this time period.

Bold Analyte exceeds the NPDES limit or Yampa Segment 13d Standard

Table D.5. Dry Creek Segment 13d NPDES Outfall 005 analytical data for water year 2020.

Location	Date	Flow N GPM	pH, Field N S.U.	Oil & Grease Y/N	Temp., Field N C	SPC, Field N UMHOS/CM	Iron D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese PD MG/L	Selenium D UG/L	Selenium PD UG/L	Selenium TR UG/L	TSS N MG/L	TDS, Lab N MG/L	Cadmium PD UG/L
NPDES5	1/8/2020	0														
NPDES5	2/4/2020	0														
NPDES5	3/2/2020	0														
NPDES5	4/22/2020	90.6	7.64	N	11.4	3336	< 0.06	< 0.06	< 0.1		0.7		0.5	< 5	3090	
NPDES5	4/22/2020	90.6	7.64	N	11.4	3336			< 0.1			0.6	0.4		3140	< 0.1
NPDES5	5/5/2020	97.4	7.6	N	14.6	3804			0.07						3690	
NPDES5	6/1/2020	53.8	7.81	N	21.3	4035			< 0.3						4390	
NPDES5	7/21/2020	0														
NPDES5	8/4/2020	0														
NPDES5	9/2/2020	0														
NPDES5	10/23/2019	0														
NPDES5	11/12/2019	0														
NPDES5	12/3/2019	0														
NPDES Limit	Daily Max		6.5 - 9.0	10*	-	-	-	-	Report	Report	-	Report	-	-	Report	Report
	Monthly Avg.		NA	NA	-	-	-	-	1	Report	-	4.6	-	-	Report	Report
Yampa Segment 13d Standards - Acute			6.5 - 9.0	-	-	-	-	-	-	4.738	18.4	-	-	-	-	9.2
Yampa Segment 13d Standards - Chronic			-	-	-	-	-	-	Mar-Apr 3.040 May-Feb 1.110	2.618	4.6	-	-	-	-	1.2

Location	Date	Chromium PD UG/L	Copper PD UG/L	Lead PD UG/L	Mercury T UG/L	Nickel PD UG/L	Silver PD UG/L	Zinc PD MG/L
NPDES5	1/8/2020							
NPDES5	2/4/2020							
NPDES5	3/2/2020							
NPDES5	4/22/2020							
NPDES5	4/22/2020	< 1	< 2	< 0.2	0.0012	18	< 0.2	< 0.02
NPDES5	5/5/2020							
NPDES5	6/1/2020							
NPDES5	7/21/2020							
NPDES5	8/4/2020							
NPDES5	9/2/2020							
NPDES5	10/23/2019							
NPDES5	11/12/2019							
NPDES5	12/3/2019							
NPDES Limit	Daily Max	Report	Report	Report	Report	Report	Report	Report
	Monthly Avg.	Report	Report	Report	Report	Report	Report	Report
Yampa Segment 13d Standards - Acute		1773	50	281	-	1513	22	0.565
Yampa Segment 13d Standards - Chronic		231	29	11	0.01	168	3.5	0.428

Note

* Limit only applicable if presence of oil or grease is detected

Settleable solids data only submitted to SCC database if result exceeds limit. No exceedances occurred during this time period.

Bold Analyte exceeds the NPDES limit or Yampa Segment 13d Standard

Table D.6. Statistical summary of pre-mine total recoverable iron at SIIW stream monitoring points.

Watershed	Dates	Location	Total Recoverable Iron (mg/L)			
			N	Mean	Min	Max
Dry Creek / Hubberson	Apr 1987 - Sept 1989	WSH7	8	1.90	0.21	7.8
	Apr 1979 - Sept 1989	WSHF1	89	9.10	0.15	240
	Mar 1983 - Sept 1989	WSD5	46	6.18	0.21	106
Sage Creek	May 1991 - Sept 1995	WSSF3	25	0.22	< 0.02	1.09

Note
Non-detect value applied to all censored data for statistical calculations

Table D.7. Sage Creek Segment 13e stream point analytical data for water year 2020.

Location	Date	Flow N GPM	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N C	Iron D MG/L	Iron PD MG/L	Iron TR MG/L	Manganese D MG/L	Mercury T UG/L	Ammonia N. N MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L
WSSF3	4/22/2020	6796	1353	7.26	4.4									0.6
WSSF3	4/22/2020	6796	1353	7.26	4.4			**1.04**	0.0363	**< 0.2**	< 0.05	< 0.02	< 0.01	0.6
WSSF3	6/2/2020	429	962	8.06	13.1			**1.47**	0.0177	**< 0.2**	< 0.05	< 0.02	0.01	0.3
WSSF3	7/21/2020	0												
WSSF3	9/1/2020	0												
Yampa Segment 13e Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01	0.05	100	0.05	18.4
Yampa Segment 13e Standards - Chronic		-	-	-	-	-	-	1	2.618	-	-	-	-	TM**
Agricultural Use Standards		-	-	-	-	-	-	-	0.2*	-	-	100	10	20

Location	Date	Selenium PD UG/L	Selenium TR UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	TSS N MG/L
WSSF3	4/22/2020		0.6	504		998	
WSSF3	4/22/2020	0.6	0.6	497	**< 0.02**	998	31.0
WSSF3	6/2/2020	0.2	0.3	398	**< 0.02**	892	44.0
WSSF3	7/21/2020						
WSSF3	9/1/2020						
Yampa Segment 13e Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13e Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

Notes

* The manganese agricultural use standard is only applicable for areas with acidic soils. This areas soils are alkaline.

** A current condtions temporary modification is in place for the Segment 13e chronic selenium standard.

*** Detection limit is an order of magnitude lower than 0.002 mg/L standard for un-ionized sulfide.

Bold Analyte exceeds the Yampa Segment 13e or Agricultural Use Standards

Table D.8. Sage Creek Segment 13e NPDES Outfall 009 and 015 analytical data for water year 2020.

Location	Date	Flow N GPM	pH, Field N S.U.	Oil & Grease Y/N	Temp., Field N C	SPC, Field N UMHOS/CM	TDS, Lab N MG/L
NPDES15	1/8/2020	3.9	8.24	N	1.7	916	510
NPDES15	2/3/2020	2.7	8.13	N	0.1	941	570
NPDES15	3/2/2020	3.4	8.11	N	0.2	481	526
NPDES15	4/22/2020	87.7	7.27	N	8.3	627	410
NPDES15	5/19/2020	94.3	8.13	N	14.5	628	330
NPDES15	6/1/2020	77.2	7.13	N	19.4	607	378
NPDES15	7/21/2020	8.3	8.44	N	16.6	527	418
NPDES15	8/3/2020	7.9	8.47	N	23.5	635	434
NPDES15	9/1/2020	6.7	8.48	N	19.5	610	434
NPDES15	10/23/2019	8.7	8.7	N	4.2	817	472
NPDES15	11/11/2019	6.1	8.87	N	3.9	783	466
NPDES15	12/16/2019	4.3	8.1	N	0.8	886	488
NPDES9	1/8/2020	0					
NPDES9	2/3/2020	0					
NPDES9	3/2/2020	0					
NPDES9	4/21/2020	0					
NPDES9	5/5/2020	0					
NPDES9	6/1/2020	0					
NPDES9	7/21/2020	0					
NPDES9	8/3/2020	0					
NPDES9	9/1/2020	0					
NPDES9	10/23/2019	0					
NPDES9	11/11/2019	0					
NPDES9	12/3/2019	0					
NPDES Limit	Daily Max		6.5 - 9.0	10*	-	-	Report
	Monthly Avg.		NA	NA	-	-	Report
Yampa Segment 13e Standards - Acute			6.5 - 9.0	-	-	-	-
Yampa Segment 13e Standards - Chronic			-	-	-	-	-

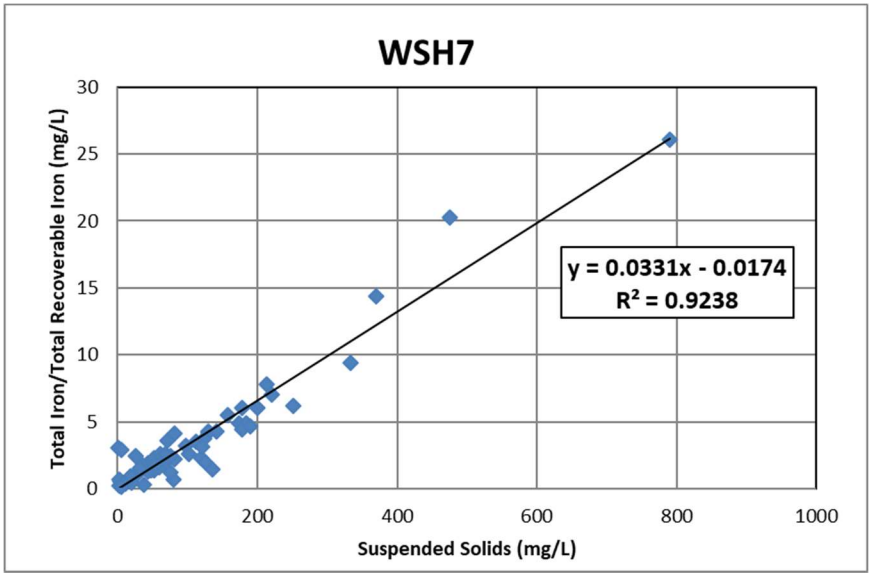
Note

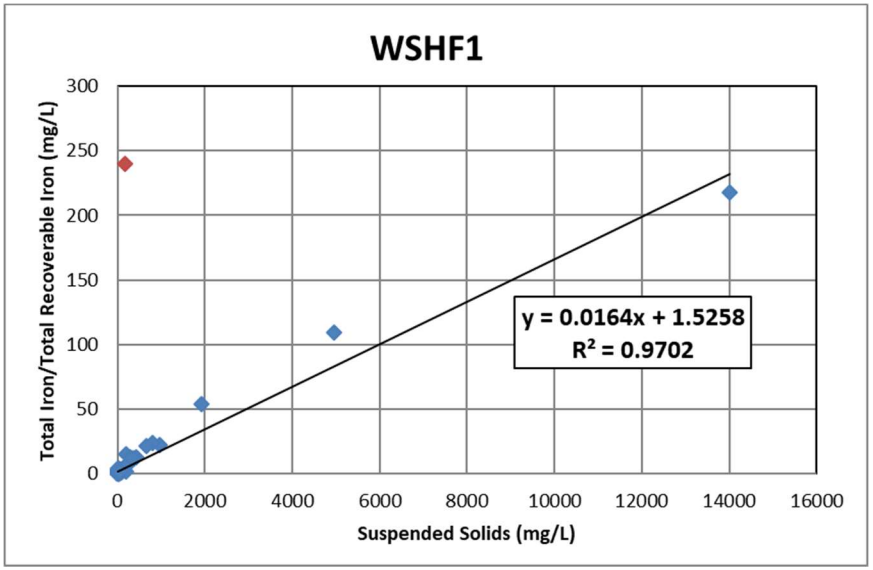
* Limit only applicable if presence of oil or grease is detected

Settleable solids data only submitted to SCC database if result exceeds limit. No exceedances occurred during this time period.

Bold Analyte exceeds the NPDES limit or Yampa Segment 13d Standard

Figure D.1. Suspended solids vs total iron/total recoverable iron at Dry Creek stream points WSH7 and WSHF1. Note that a single sample from WSHF1 collected on April 27, 1979 was determined to be a statistical outlier. This sample is designated in red on the WSHF1 plot and was not included in the correlation analysis.





APPENDIX E

SPRING WATER QUALITY DATA

Table E.1. Analytical data for springs sampled during the 2020 water year.

Location	Date	Flow N GPM	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N C	Iron TR MG/L	Manganese D MG/L	Mercury T UG/L	Ammonia N. N MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L
WSPG7	6/3/2020	2.9	1158	7.16	13.8	0.50	0.0515	< 0.2	< 0.05	1.14	< 0.01	0.4
WSPG46	6/3/2020	0	2859	7.15	11.2	10.3	0.947	< 0.2	0.08	< 0.02	< 0.01	< 0.2
WSPG47	6/3/2020	4.1	1548	7.28	12.1	8.92	0.157					< 0.1
WSPG50	6/3/2020	2.4	1771	6.83	12.2	0.7	1.13	< 0.2	0.48	< 0.02	< 0.01	< 0.2
WSSPG1	6/3/2020	9.7	3396	7.86	13.4	0.3	0.125					< 0.5
WSSPG2	6/3/2020	19.1	2537	8.12	14.2	0.9	0.0301	< 0.2	0.06	3.21	0.02	1.7
WSSPG3	6/3/2020	31.9	3586	6.58	13.8	0.4	1.58	< 0.2	0.17	0.20	< 0.01	< 0.5
WSSPG4	6/3/2020	40.7	3203	7.96	15	0.4	0.780	< 0.2	0.11	0.57	0.03	0.3
WSSPG5	6/3/2020	369.8	1836	6.91	13.1	0.7	1.16	< 0.2	0.43	< 0.02	< 0.01	< 0.2
Agricultural Use Standards		-	-	-	-	-	0.2*	-	-	100	10	20

Location	Date	Selenium PD UG/L	Selenium TR UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	TSS N MG/L
WSPG7	6/3/2020	0.9	0.4	506	< 0.02	1080	5.0
WSPG46	6/3/2020	7.4	< 0.2	2050	1.46	3560	345
WSPG47	6/3/2020	0.1	0.1			1620	18.0
WSPG50	6/3/2020	< 0.1	< 0.2	915	< 0.02	2020	8.0
WSSPG1	6/3/2020	< 0.5	< 0.5			4420	6.0
WSSPG2	6/3/2020	2.1	2	1480	< 0.02	2930	88.0
WSSPG3	6/3/2020	0.4	0.4	2660	< 0.02	4620	< 5
WSSPG4	6/3/2020	0.5	0.3	2260	< 0.02	3870	31.0
WSSPG5	6/3/2020	0.1	< 0.2	988	< 0.02	2000	5.0
Agricultural Use Standards		-	-	-	-	-	-

Notes

* The manganese agricultural use standard is only applicable where irrigation water is applied to soils with a pH value less than 6.0. The soils in this area are alkaline.

Bold Analyte exceeds the Agricultural Use Water Quality Standard