2020 ANNUAL HYDROLOGY REPORT

SAGE CREEK MINE

PERMIT C-2009-087

February 2021

Submitted To: Colorado Division of Reclamation, Mining and Safety
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Denver, CO 80203

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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 Peabody Sage Creek Mining, LLC's Peabody Sage Creek Mine (PSCM). The AHR fulfills the reporting requirements under the Colorado Division of Reclamation, Mining, and Safety (CDRMS) Permit No. C-2009-087.

1.1 BACKGROUND

The PSCM is an underground coal mine located in Routt County, approximately nine miles southeast of Hayden, Colorado. PSCM Permit No. C-2009-087was approved by CDRMS in May 2010. The PSCM permit area encompasses the majority of the former Seneca II Mine (State Permit No. C-1980-005) which is a reclaimed surface mine that extracted coal from 1968 through 1999. Many of the PSCM hydrologic monitoring sites were previously utilized for the Seneca II Mine. Excavation of the PSCM portal began in June 2011 and underground mining proceeded until the fall of 2012 when it was suspended. The PSCM remains in a care and maintenance state. No coal extraction occurred in 2020.

In 2012 the Water Quality Control Division (WQCD) issued PSCM a violation for elevated selenium in the mine discharges. In response, PSCM completed an extensive monitoring effort to evaluate the source and fate of selenium in these watersheds. In 2014 the Water Quality Control Commission (WQCC) granted a temporary modification of the chronic selenium TVS in both Cow Camp Creek and Grassy Creek to current conditions to allow PSCM to collect additional biologic and water quality data needed to develop site-specific standards. In 2017, the WQCC extended the selenium temporary modification for Grassy Creek to 12/31/2022 and the temporary modification to Cow Camp Creek to 12/31/2023. In May 2019 the WQCD incorporated the extension of the selenium temporary modification into NPDES Permit No. CO0048275. PSCM is continuing to collect biologic and water quality data necessary for the final development of a site-specific selenium standard. This AHR will only discuss data relevant to the requirements of the CDRMS permit.

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 PSCM groundwater monitoring program includes seven monitoring wells. The following table includes the wells monitored, the water bearing unit they are screened in, the frequency they are monitored, and their required parameter list. The monitoring well locations are shown on Figure 1. Groundwater monitoring was completed by experienced personnel in accordance with the practices described in Section 2.04.7 of Permit No. C-2009-087. All samples were analyzed by ACZ Laboratories.

Site	Unit	Monitoring Frequency		Parameter List
		Water Level	Water Quality	
SGAL70	Grassy Creek Alluvium	SA	SA	GW Long
SCAL69	Cow Camp Creek Alluvium	SA	SA	GW Short
SSP61	Spoil	SA	SA	GW Short
SSP62	Spoil	SA	SA	GW Short
COV2702	Wadge Overburden	A	A	GW Long
SOV42	Wadge Overburden	A	A	GW Short
CW2701	Wadge Coal	A	A	GW Long

Note
A: Annual
SA: Semi-Annually
GW Long: Field conductivity, field pH, field temperature, dissolved aluminum, dissolved arsenic, bicarbonate, dissolved boron, dissolved cadmium, calcium, carbonate, chloride, dissolved chromium, dissolved copper, fluoride, hardness, dissolved iron, dissolved lead, magnesium, dissolved manganese, dissolved mercury, dissolved nickel, nitrate, nitrite, potassium, dissolved selenium, sodium, Sodium Adsorption Ratio, sulfide, total suspended solids, dissolved zinc, Cation/Anion Balance, total dissolved solids, total dissolved solids calculated
GW Short: Field conductivity, field pH, field temperature, fluoride, dissolved iron, dissolved manganese, nitrate, nitrite, dissolved selenium, sulfate, 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 provided in Appendix C. The static water levels measured at all wells this year were within their respective historic range. Water levels in most of the water bearing units at PSCM exhibit seasonal fluctuations. The water table in the shallow alluvial and spoil 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. The water level in spoil wells SSP61 and SSP62 indicate only the downslope highwall portions of the spoil are significantly saturated.

3.2 Groundwater Quality

The PSCM Groundwater Point of Compliance (GWPOC) is SGAL70. SGAL70 was previously used as the GWPOC at the Seneca II Mine and has a long historical record of water level and water quality data. SGAL70 is screened within the Grassy Creek alluvium downgradient of the PSCM surface effects. Bedrock GWPOC wells were deemed unnecessary due to the low hydraulic conductivity of the bedrock units, their low yields which are insufficient to support domestic or agricultural use, and because downgradient attenuation and dilution will further limit water quality impacts only to bedrock in close proximity to the mine. See Section 2.04, pg 103 of Permit No. C-2009-087 and Technical Revision 47 (TR-47) of Seneca II Permit No. C-1980-005 for further justification for the GWPOC.

Table B.1 of Appendix B includes the analytical results for the samples collected from GWPOC well SGAL70 during the 2020 water year and provides a comparison to the Grassy Creek Alluvial GWPOC water quality standards. Technical Revision 47 (TR-47) of Seneca II Permit No. C-1980-005 describes how the standards were established. Table B.2 provides the analytical results for the remaining monitoring wells however no comparisons to water quality standards were made as these wells are not GWPOC. Water quality samples were collected from all wells except for SOV42 which did not have enough water in its casing to sample. The groundwater quality at SGAL70 complies with all TR-47 water quality standards except for dissolved cadmium. This

exceedance was not associated with a measurable value of cadmium but is the result of the lab detection limit exceeding the water quality standard. Water quality samples analyzed at commercial labs are often run in groups that include samples from unrelated locations and the detection limit for the batch of samples can be increased above the normal detection threshold in response to high concentrations in one or more samples within the batch or from unrelated instrument interference. Cadmium has not been detected at SGAL70 since 2001 and the measured value was 3 μg/L. Since cadmium has not historically been a chemical of concern at this well its unlikely that that the elevated detection limit is censoring a concentration above the water quality standard.

4.0 SURFACE WATER

The PSCM lies within the headwaters of Grassy Creek and Fish Creek. The following table lists the PSCM surface water monitoring points from upstream to downstream, the stream they are associated with, the frequency they are monitored, and their required parameter list. See Figure 1 for the location of the surface water monitoring points. Surface water monitoring was completed by experienced personnel in accordance with the practices described in Section 2.04.7 of Permit No. C-2009-087. All samples were analyzed by ACZ Laboratories.

Site	Type	Stream	Monitoring Frequency		Parameter List
			Flow	Water Quality	
NPDES5	NPDES	Fish Creek	SM	SM	NPDES
NPDES6	NPDES	Fish Creek	SM	SM	NPDES
SSC10	Surface Water	Fish Creek	SA	SA	SW Short
YSGF5	Surface Water	Grassy Creek	TA	TA	SW Short
SSG1	Surface Water	Grassy Creek	TA	TA	SW Short
SSLG5	Surface Water	Little Grassy Creek	TA	TA	SW Short
NPDES2	NPDES	Little Grassy Creek	SM	SM	NPDES
NPDES3	NPDES	Grassy Creek	SM	SM	NPDES
NPDES7	NDPES	Grassy Creek	SM	SM	NPDES
SSG2	Surface Water	Grassy Creek	TA	TA	SW Short
YSG5	Surface Water	Grassy Creek	TA	TA	SW Long

Note

TA: Triannually during snowmelt runoff, post runoff, and baseflow (usually April, June, and September)
SA: Semiannually in June and July
SM: Semimonthly

SW Long: Field conductivity, field pH, field temperature, total recoverable arsenic, bicarbonate, dissolved boron, dissolved cadmium, calcium, carbonate, chloride, dissolved chromium, dissolved copper, hardness, total recoverable iron, dissolved lead, magnesium, dissolved manganese, total mercury, dissolved nickel, ammonia, nitrate, nitrite, potassium, dissolved selenium, dissolved silver, sodium, Sodium Adsorption Ratio, sulfate, sulfide, total suspended solids, dissolved zinc, Cation/Anion Balance, total dissolved solids, total dissolved solids calculated

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

NPDES: See NPDES Permit No. CO-0048275

The Colorado WQCC has established segment specific aquatic life water quality standards for Grassy Creek (Segment 13i and 13j) and Fish Creek (Segment 13g) of the Yampa River. The water quality standards for these segments are included in Colorado Department of Public Health & Environment (CDPHE) Regulation 33. Therefore, the following surface water quality discussion has been organized by drainage basin and then segment. 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 CDPHE surface water agricultural use standards (CDPHE, Reg. 31) and the appropriate segment specific aquatic life water quality standards (CDPHE, Reg. 33). 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 Fish Creek

Analytical results for the 2020 surface water monitoring completed at Cow Camp Creek (tributary to Fish Creek) stream point SSC10 is provided in Table D.1 of Appendix D. Analytical results for Outfalls 005 and 006, which report to Cow Camp Creek, are included in Table D.2 and D.3. An extended list of parameters were also analyzed for the Outfalls 005 and 006 samples collected specifically for the NPDES Permit NO. CO0048275 renewal application. These results are found in Table D.12. The temporary modification of the chronic aquatic life selenium standard to current conditions has been extended through 12/31/2022 for Yampa Segment 13g, which includes Cow Camp Creek down to its confluence with Fish Creek (CDPHE, Reg. 33). A report only monthly average limit at Outfalls 005 and 006 was also incorporated into NPDES Permit No. CO0048275. Surprisingly when WQCD extended the selenium temporary modification in the NPDES permit they did not extend the flow limit compliance schedule despite the direct relationship between the seasonal flow limits and seasonal selenium limits at the site. The flow limits became effective on 10/1/2019.

There were no exceedances of the water quality based NPDES permit limits or the Yampa Segment 13g water quality standards at Outfalls 005 or 006 in 2020. However, there were three monthly average flow limit exceedances (April, May, June) at

Outfall 005 and two monthly average flow limit exceedances at Outfall 006 (May, June). Outfalls 005 and 006 are associated with spoil spring discharges and the flows are the result of natural hydrologic processes which can not be practically controlled. A request to increase the seasonal flow limits at the site to address the flow range measured historically at these outfalls was submitted to CDPHE in February 2020 and the permit modification became effective July 1, 2020. Had this modification been approved prior to the spring snowmelt season no exceedances of the monthly average limits would have occurred.

The water quality at downstream monitoring point SSC10 was compliant with all Yampa Segment 13g aquatic life standards except for sulfide and mercury. Both exceedances were related to the laboratories method detection limit being greater than the standard. The method detection limit for the sulfide analysis (MDL: 0.02 mg/L) conducted by PSCM's lab exceeds the water quality standard for un-ionized sulfide (H_2S: 0.002 mg/L) by an order of magnitude. This method detects both dissolved sulfides and acid-soluble metallic sulfides that are present in suspended matter and provides a single cumulative concentration. 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. The toxic un-ionized hydrogen sulfide is dominant at low pH however in alkaline waters, like those present at PSCM, most of the dissolved sulfide is present as non-toxic ionized sulfide. Dissolved sulfide is also rarely present in oxygenated surface waters as it typically oxidizes to sulfate very quickly. Therefore, it is unlikely that that the elevated detection limit is censoring a concentration above the water quality standard and this result is an actual exceedance of the standard.

The method detection limit for mercury (0.02 μg/L) used by PSCM's lab is above the 0.01 μg/L aquatic life standard. PSCM's lab follows EPA method 245.1 which utilizes cold vapor atomic adsorption and follows the CDRMS Guidelines for the Collection of Water Quality and Overburden Geochemistry Data. At the time that the PSCM NPDES permit was established the WQCD performed a reasonable potential analysis and determined that there was no potential for the discharges to exceed the mercury standard and the monitoring requirements were removed. There is no reason to believe that the mercury detection limit is censoring a measurable value above the water quality standard.

4.2 GRASSY CREEK

Analytical results for the monitoring conducted at upper Grassy Creek Segment 13i stream points SSLG5, YSGF5, SSG1, and SSG2 are provided in Tables D.4 through D.7 of Appendix D and the analytical results for downstream monitoring point YSG5 located in lower Grassy Creek Segment 13j are found in Table D.8. Analytical results for PSCM Outfalls 002, 003, and 007, which report to upper Grassy Creek Segment 13.i, are found in Table D.9 through D.11. An extended list of parameters were also analyzed for the Outfalls 002 and 003 samples collected specifically for the NPDES Permit NO. CO0048275 renewal application. These results are found in Table D.12. The PSCM does not have any outfalls that discharge to Grassy Creek Segment 13j. As is described in CDPHE Regulation 33, a current conditions temporary modification of the chronic total recoverable iron and chronic dissolved selenium standard are in place for Yampa Segment 13i which includes Grassy Creek from its headwaters to immediately above the confluence with Scotchmans Gulch. A current conditions temporary modification of the chronic dissolved selenium standard is also in place for Yampa River Segment 13j however the chronic iron standard in this segment is 1 mg/L.

One exceedance of the NPDES permit limits at the PSCM upper Grassy Creek Outfalls occurred in 2020. The monthly average iron limit was exceeded at Outfall 003 in January. The January 22nd sample contained 2.67 mg/L of iron. The iron had returned to compliance levels by the next monitoring event (2/2/2020: 0.43 mg/L). PSCM is in a care and maintenance state and the January result appears to have been an anomaly as there have been no other exceedances of the total recoverable iron limit at Outfall 003 during the last five years. No other exceedances of the NPDES discharge limits occurred at Outfall 003 and there were no exceedances of any of the NPDES permit limits at Outfalls 002 and 007. The effluent at these three outfalls also met all Yampa Segment 13i aquatic life and agricultural use standards except for a single potentially dissolved copper result at Outfall 002. This was not a measured value and was the result of the method detection limit exceeding the chronic aquatic life standard. Copper was measured quarterly at Outfall 002 and none of the other samples had measured values above the chronic aquatic life standard.

Stream points SSLG5, YSGF5, SSG1, and SSG2, located in Yampa Segment 13i, were compliant with all aquatic life standards and agriculture use standards except for sulfide and mercury. As was discussed in Section 4.1, the lab used by PSCM has a method detection limit for mercury and sulfide that are above the Segment 13i water quality standards. None of the mercury samples exceeded the labs detection limit and all sulfide analysis except for two were below the sulfide method detection limit as well. The two sulfide detections were at SSG2 and YSGF5. Both occurred during the June 2nd monitoring event and both coincided with elevated TSS concentrations (YSGF5: 52 mg/L; SSG2: 174 mg/L). The detections were likely the result of acid-soluble metallic sulfides present on suspended matter and not dissolved sulfide as any dissolved sulfide present in oxygenated surface waters would be oxidized to sulfate quickly.

An exceedance of the lower Grassy Creek Segment 13j total recoverable chronic iron standard (1 mg/L) occurred at downstream point YSG5 on June 2nd. Iron samples were collected at all Grassy Creek surface water monitoring points on June 2nd as part of a synoptic watershed monitoring event. There were no exceedances of the Segment 13j iron standard at Outfalls 002, 003, and 007 (Table D.13). However, the standard was exceeded at stream points YSGF5 and SSG1, located in Grassy Creek upstream of the PSCM outfalls. Grassy Creek also receives drainage from Yoast Mine (Yoast) Outfall 010 and 011, upstream of YSG5. Yoast has been reclaimed and vegetated for over 10 years and the total recoverable iron measured in the June 2nd discharges from Outfalls 010 and 011 ranged from <0.06 to <0.1 mg/L (see Table D.2 and D.4 in Appendix D of the Permit No. C-1994-082 2020 AHR). Total recoverable iron at the Grassy Creek stream points is strongly correlated with suspended solids (r^2: 0.90) which become naturally elevated during rain and snow melt runoff events (Figure D.1). This indicates the elevated iron in Grassy Creek is unrelated to the runoff from the reclaimed mine and is likely the result of natural erosional processes that are occurring within the unmined portions of the watershed.

Sulfide and mercury also exceeded the Yampa Segment 13j standards. As has been discussed in prior sections these exceedances are the result of the labs method detection limits being above the standards. A measured value of sulfide and mercury did not occur at YSG5 in 2020.

CDPHE Regulation 31 specifies that the manganese agricultural use standard of 0.2 mg/L standard is only applicable when irrigation water is applied to soils with pH lower than 6.0. The soils at PSCM are alkaline and the 0.2 mg/L standard is therefore not applicable. Dissolved manganese at YSG5 is significantly less than the CHPHE Yampa Segment 13j acute and chronic manganese standards.

5.0 SPRINGS

The PSCM monitoring program includes five springs. The following table lists the springs, the frequency they are monitored, and the parameter list. See Figure 1 for the location of the spring points. Spring monitoring was completed by experienced personnel and samples were collected in accordance with the practices described in Section 2.04.7 of Permit No. C-2009-087. All samples were analyzed by ACZ Laboratories.

Site	Type	Unit	Monitoring Frequency		Parameter List
			Discharge	Water Quality	
SSSPG3	Spring	Spoils	A	A	SW Short
SSSPG4	Spring	Spoils	A	A	SW Short
SSSPG5	Spring	Spoils	A	A	SW Short
SSSPG6A	Spring	Spoils	A	A	SW Long
SSSPG10	Spring	Spoils	A	A	SW Short

Note

A: Annual

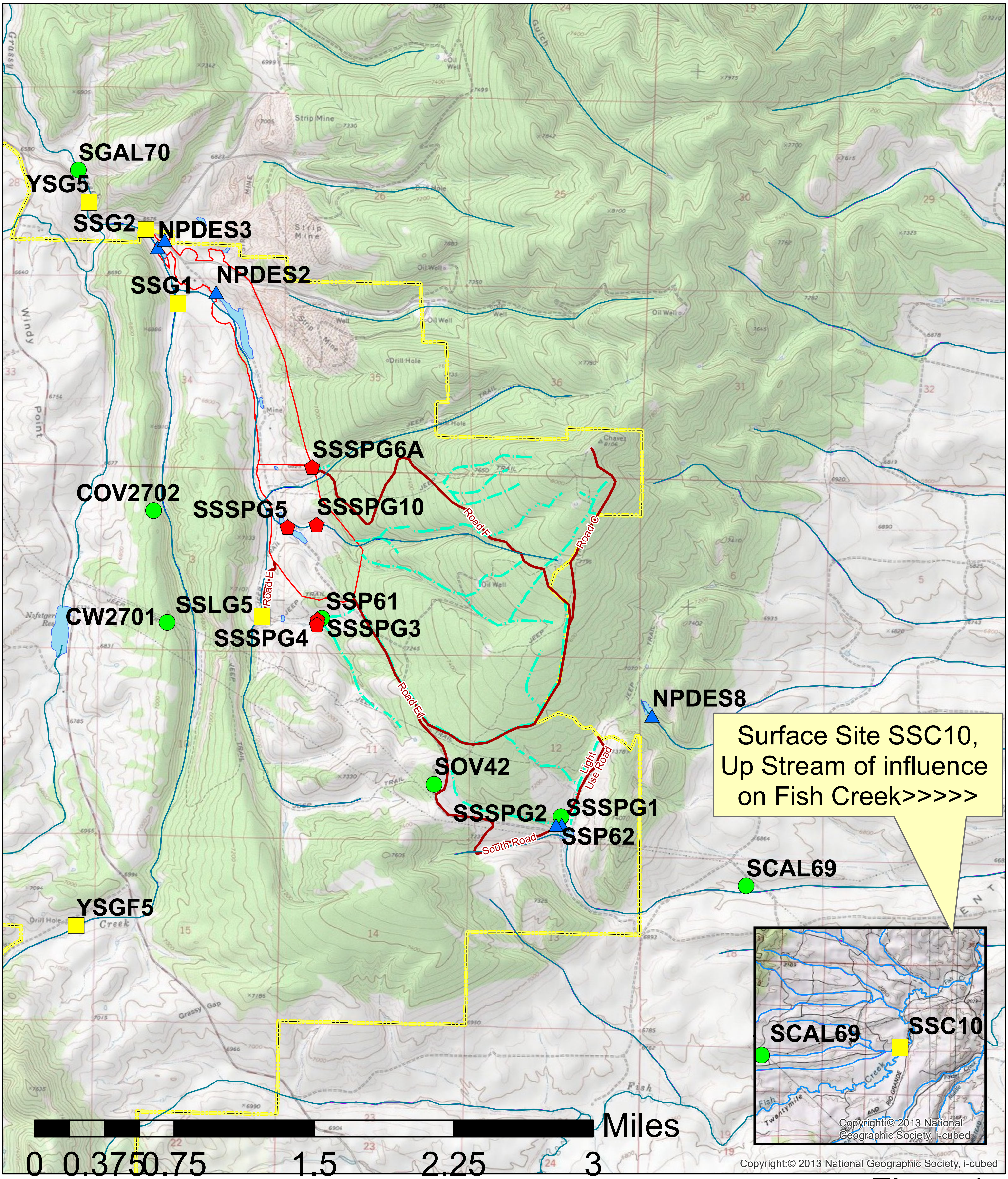
SW Long: Field conductivity, field pH, field temperature, total recoverable arsenic, bicarbonate, dissolved boron, dissolved cadmium, calcium, carbonate, chloride, dissolved chromium, dissolved copper, hardness, total recoverable iron, dissolved lead, magnesium, dissolved manganese, total mercury, dissolved nickel, ammonia, nitrate, nitrite, potassium, dissolved selenium, dissolved silver, sodium, Sodium Adsorption Ratio, sulfate, sulfide, total suspended solids, dissolved zinc, Cation/Anion Balance, total dissolved solids, total dissolved solids calculated

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

Table E.1 in Appendix E includes the analytical results for samples collected from the spoil springs in 2020. Samples were collected from all springs except for SSSPG6A which was dry. The primary post-mine land use in this area is livestock grazing and wildlife habitat. Therefore, the water quality collected from the spoil springs is compared to the CWQCC Agricultural Use standards established in CDPHE Regulation 31. There were no exceedances of the Agricultural Use surface water quality standards at the springs in 2020.

6.0 SUMMARY

No significant hydrologic impacts, attributable to activities at PSCM, 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. Although an exceedances of the Yampa Segment 13j total recoverable iron chronic aquatic life standards occurred at downstream stream monitoring point YSG5, synoptic watershed monitoring conducted during the same event confirmed that the iron was unrelated to the discharges from the PSCM outfalls. It is likely that the iron at YSG5 is the result of natural erosional processes that are occurring within the unmined portions of the watershed.



SGAL70
YSG5
SSG2
NPDES3
SSG1
NPDES2
SSSPG6A
COV2702
SSSPG5
SSSPG10
Road F
Road C
Road E
SSLG5
CW2701
SSP61
SSSPG3
SSSPG4
NPDES8
Surface Site SSC10, Up Stream of influence on Fish Creek>>>>>
SOV42
Light Use Road
SSSPG2
SSSPG1
SSP62
South Road
SCAL69
YSGF5
SCAL69
SSC10
Copyright:© 2013 National Geographic Society, i-cubed
Miles
0 0.375 0.75 1.5 2.25 3
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Figure 1

Legend

▲	NPDES		Segement_13g Bond Creek
■	Surface Water		Segement_13i Grassy Creek
⬟	SPRING		Sage Creek Mine Permit Boundary
●	Ground Water		PSCM Current Disturbance

N E S W

Peabody Sage Creek Mine

Peabody

36600 RCR #27
Hayden, CO 81639

Annual Hydrology Report
2020

DESIGNED BY: MLK DRAWN BY: MLK APPROVED BY:	COUNTRY: USA STATE/PROVINCE: COLORADO GSC: 5N 86W, 6N 86W
DATE: 2020-06-24	DRAWING/SHEET: 1 of 1 C.I.: 0'

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

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	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

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	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

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

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										

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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	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										

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Current Location: Elev: 6467 ft. Lat: 40.4926° N Lon: -107.2548° W
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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	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										

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U.S. Department of Commerce
National Oceanic & Atmospheric Administration
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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	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
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Record of Climatological Observations

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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	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										

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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 SGAL70 during water year 2020.

Well	Date	Depth to Water ft btoc	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N DEG-C	Aluminum D MG/L	Arsenic D UG/L	Boron D UG/L	Cadmium D UG/L	Chloride N MG/L	Chromium D UG/L	Copper D UG/L	Fluoride N MG/L
SGAL70	5/19/2020	9.78	3930	7.22	9	< 0.1	< 0.4	90	**< 20**	37.2	< 20	< 20	0.3
SGAL70	9/19/2020	10.62	3610	7.3	10.5								0.1
GWPOC Water Quality Standards*				6.5 - 8.5	-	**5**	**50**	**750**	**5**	**250**	**100**	**200**	**2**

Well	Date	Iron D MG/L	Lead D UG/L	Manganese D MG/L	Mercury D UG/L	Nickel D UG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	Zinc D MG/L
SGAL70	5/19/2020	< 0.1	< 60	0.15	< 0.2	< 20	< 0.02	< 0.01	< 2	2250	< 0.02	3660	< 0.04
SGAL70	9/19/2020	< 0.1		0.26			0.03	< 0.01	< 2	2200		3600	
GWPOC Water Quality Standards*		**14.1**	**70**	**2.44**	**2**	**100**	**10**	**1**	**20**	**2517**	-	**5038**	**2**

Well	Date	Alkalinity, Bicarbonate N MG/L	Calcium D MG/L	SpC, Lab N UMS/CM	Hardness N MG/L	Magnesium D MG/L	Potassium D MG/L	Sodium D MG/L	SAR N NONE	Cation / Anion Balance %	TDS (Calc) N MG/L	TSS N MG/L
SGAL70	5/19/2020	405	413	3760	2200	283	5.9	202	1.9	-2.8	3440	32
SGAL70	9/19/2020											
GWPOC Water Quality Standards*		-	-	-	-	-	-	-	-	-	-	

Notes

* See Part 2.04 page 103 of Permit C-2009-087 and TR-47 of Permit C-1980-005.

Bold Analyte exceeds GWPOC Standard

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

Well	Date	Depth to Water ft btoc	SPC, Field N UMHOS/CM	pH, Field N S.U.	Temp., Field N DEG-C	Aluminum D MG/L	Arsenic D UG/L	Boron D UG/L	Cadmium D UG/L	Chloride N MG/L	Chromium D UG/L	Copper D UG/L	Fluoride N MG/L
SCAL69	5/19/2020	5.27	2570	7.39	8.1								0.3
SCAL69	9/19/2020	6.35	2500	7.26	13.4								
SSP61	5/19/2020	3.19	3520	6.98	11								0.4
SSP61	9/19/2020	10.41	3730	7.01	11.8								
SSP62	5/19/2020	14.26	3280	6.89	11.2								0.3
SSP62	9/19/2020	17.06	3610	6.99	11.3								
COV2702	5/20/2020	143.86	1090	9.48	9.9	< 0.05	0.3	130	< 8	4.5	< 10	< 10	1.8
SOV42*	5/19/2020	150.71											
CW2701	5/20/2020	157.21	1520	9.73	10.8	< 0.05	< 0.2	270	< 8	7.2	< 10	< 10	2.4

Well	Date	Iron D MG/L	Lead D UG/L	Manganese D MG/L	Mercury D UG/L	Nickel D UG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Selenium D UG/L	Sulfates N MG/L	Sulfide N MG/L	TDS, Lab N MG/L	Zinc D MG/L
SCAL69	5/19/2020	< 0.1		0.31			< 0.02	< 0.01	< 2	1220		2150	
SCAL69	9/19/2020	< 0.1		0.11								2200	
SSP61	5/19/2020	< 0.1		0.13			0.03	9	9.4	2090		3340	
SSP61	9/19/2020	< 0.06		0.32								3900	
SSP62	5/19/2020	0.5		7.67			0.13	0.64	2.5	1820		3050	
SSP62	9/19/2020	0.2		5.79								3680	
COV2702	5/20/2020	< 0.06	< 30	< 0.01	< 0.2	< 8	< 0.02	< 0.01	< 2	< 20	0.16	584	0.95
SOV42*	5/19/2020												
CW2701	5/20/2020	< 0.06	< 30	< 0.01	< 0.2	< 8	< 0.02	0.03	< 2	60	25	860	0.36

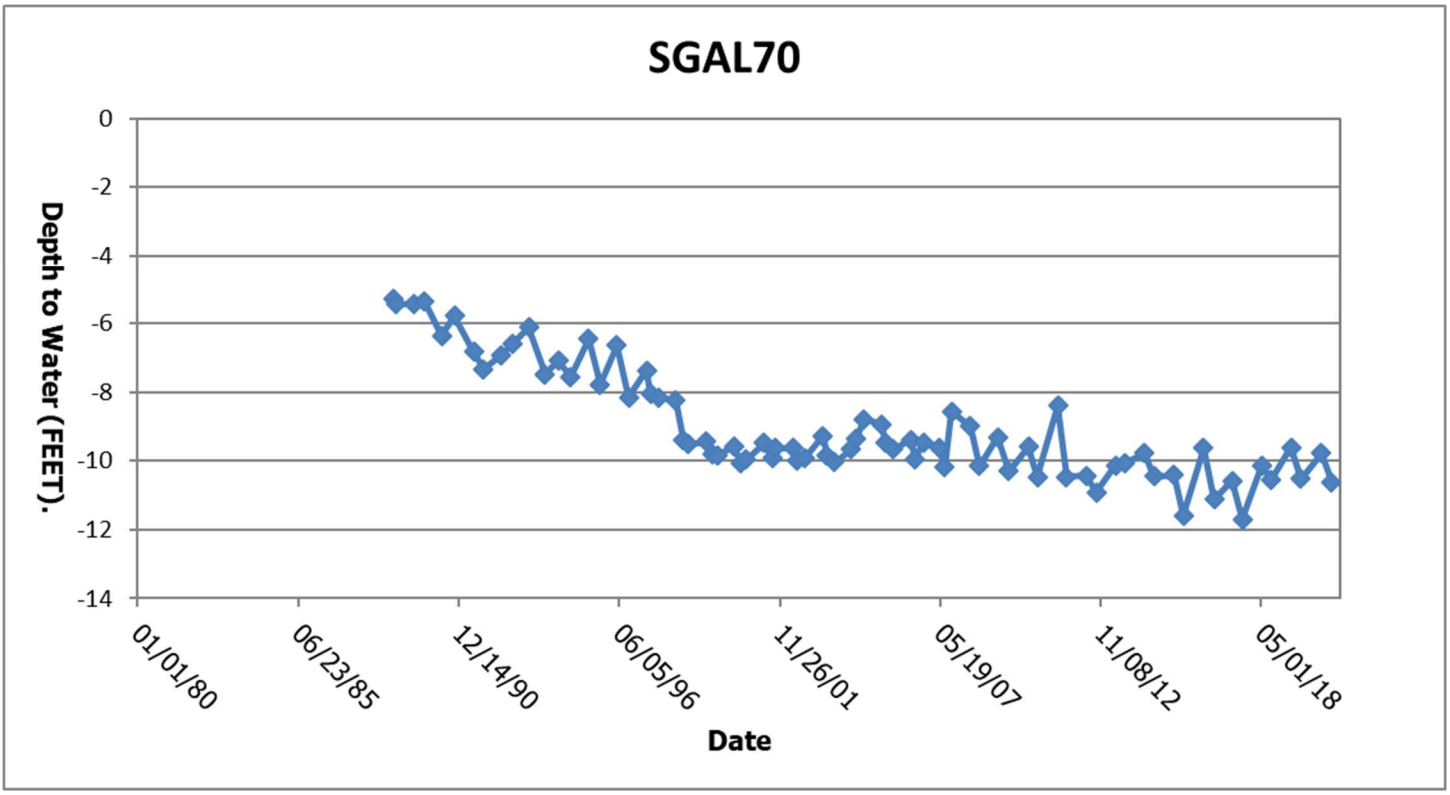
Well	Date	Alkalinity, Bicarbonate N MG/L	Calcium D MG/L	SpC, Lab N UMS/CM	Hardness N MG/L	Magnesium D MG/L	Potassium D MG/L	Sodium D MG/L	SAR N NONE	Cation / Anion Balance %	TDS (Calc) N MG/L	TSS N MG/L
SCAL69	5/19/2020											
SCAL69	9/19/2020											
SSP61	5/19/2020											
SSP61	9/19/2020											
SSP62	5/19/2020											
SSP62	9/19/2020											
COV2702	5/20/2020	408	1.3	1010	4.1	0.2	1.6	247	54	-4.3	608	29
SOV42*	5/19/2020											
CW2701	5/20/2020	297	0.8	1480	2	< 0.2	3	354	110	-3	901	128

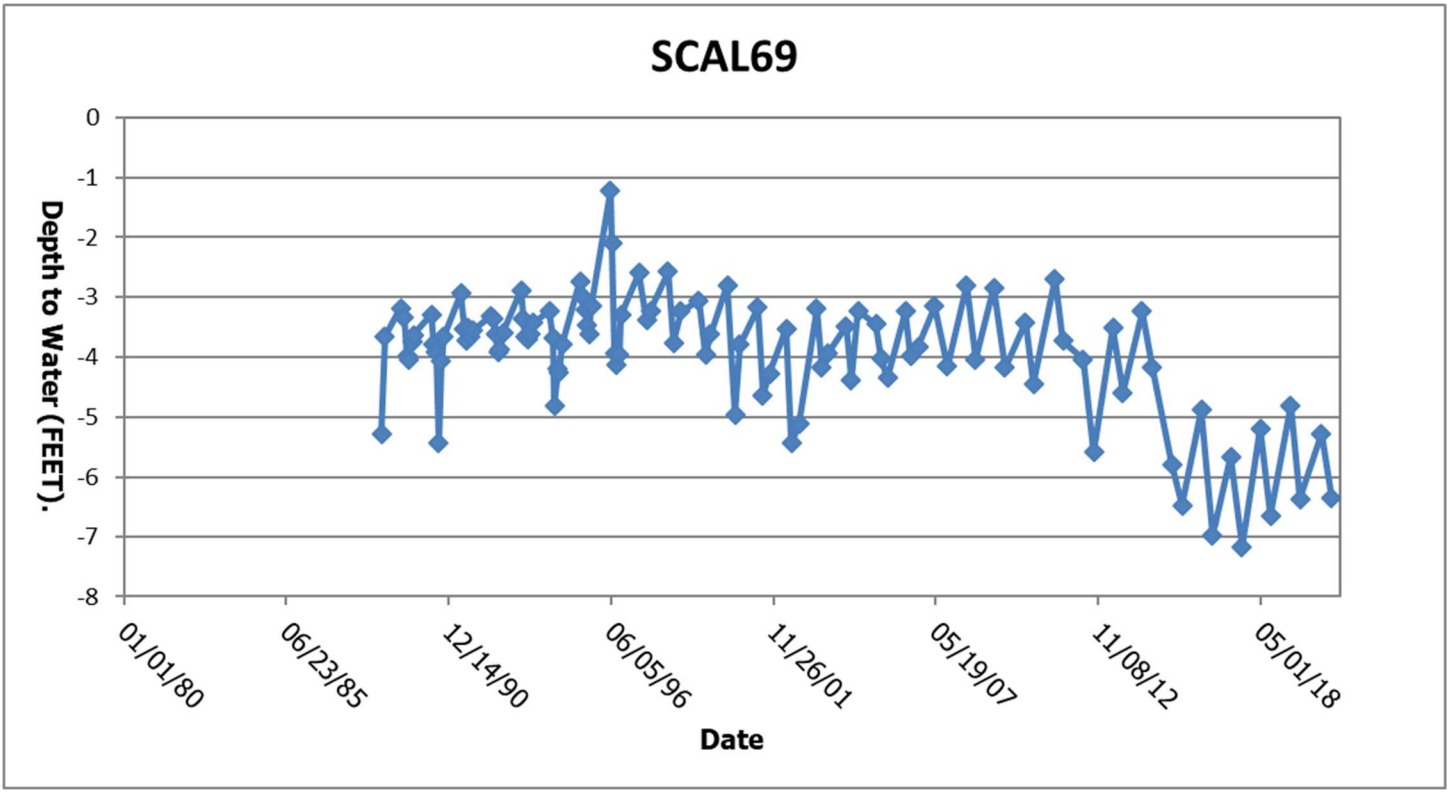
Notes

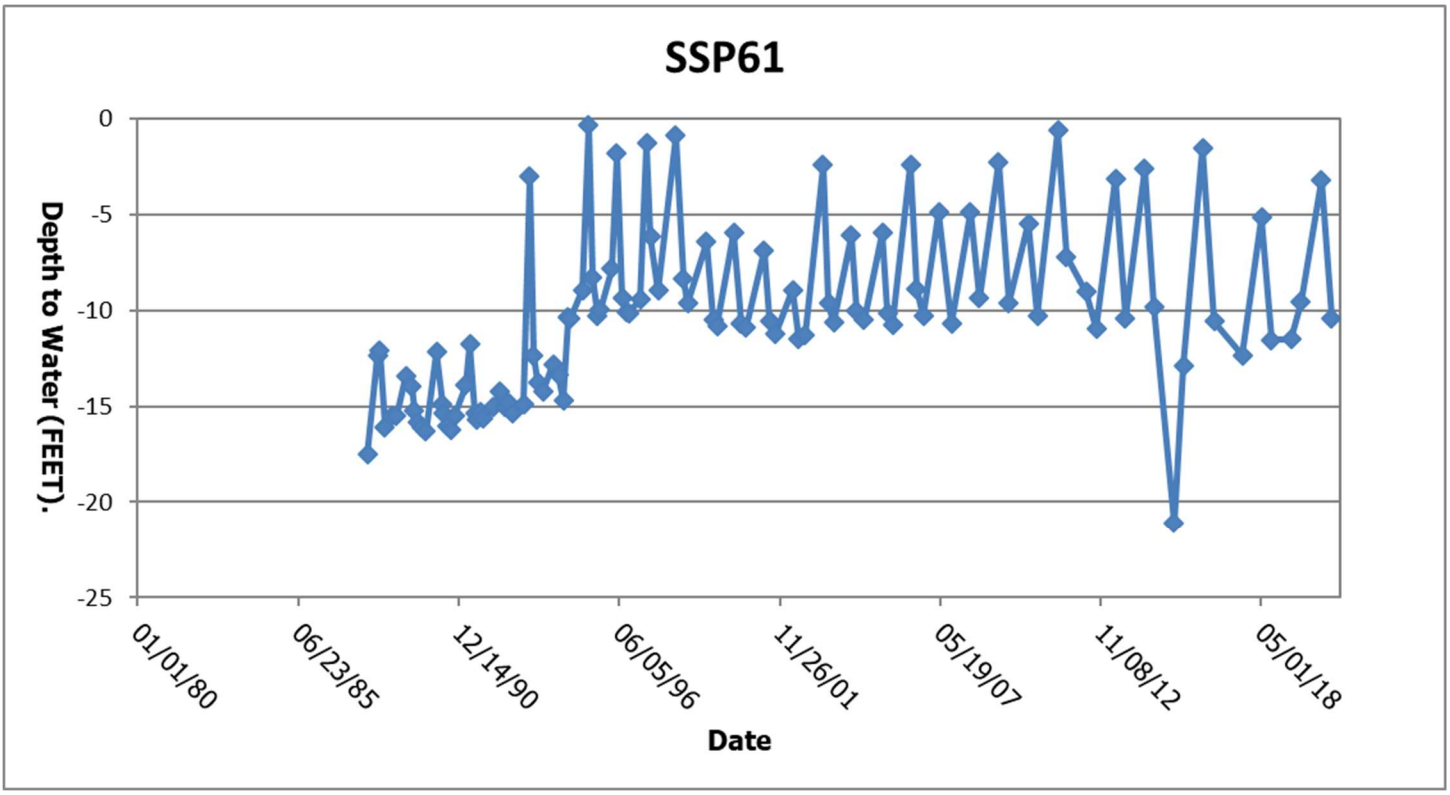
*Insufficient volume for water quality sample.

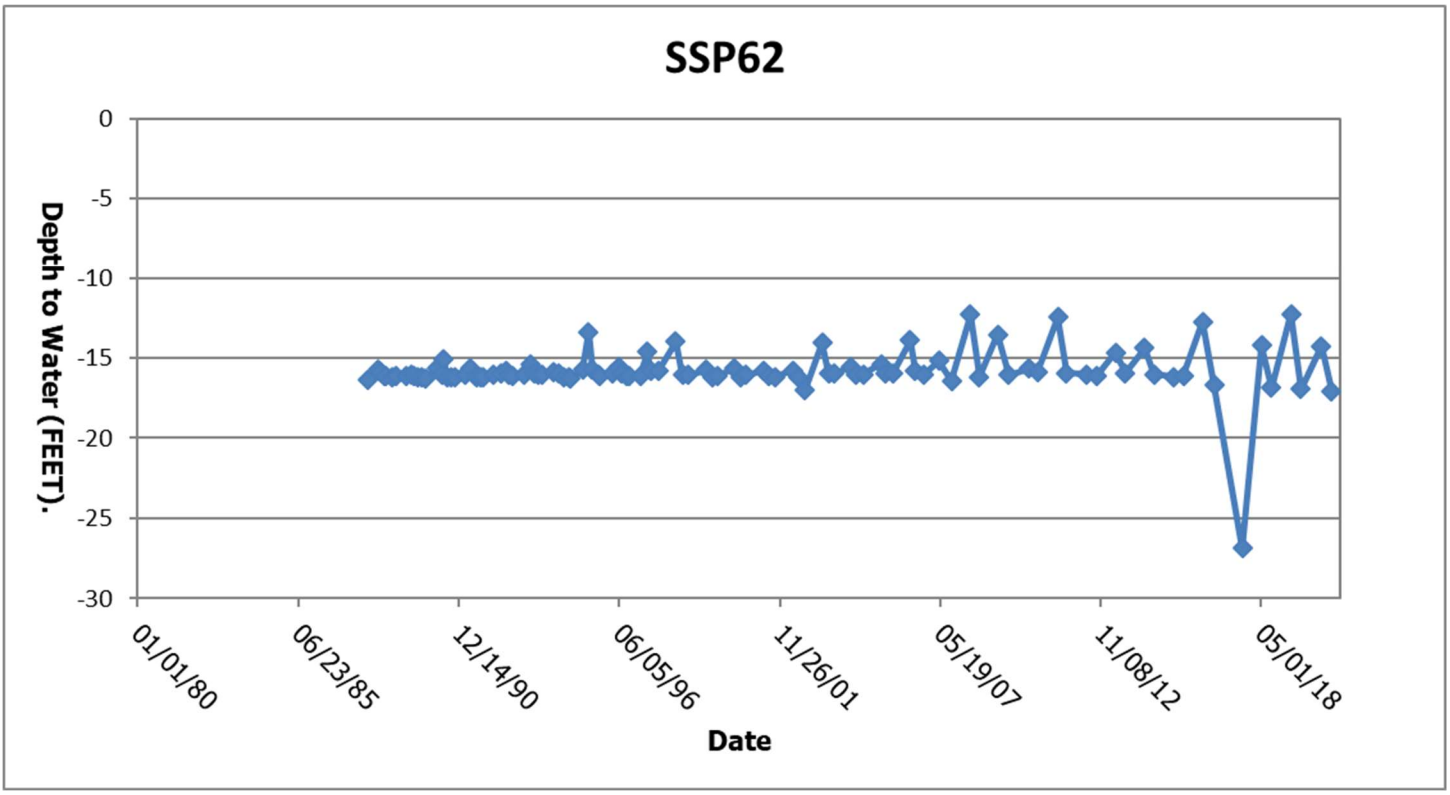
APPENDIX C

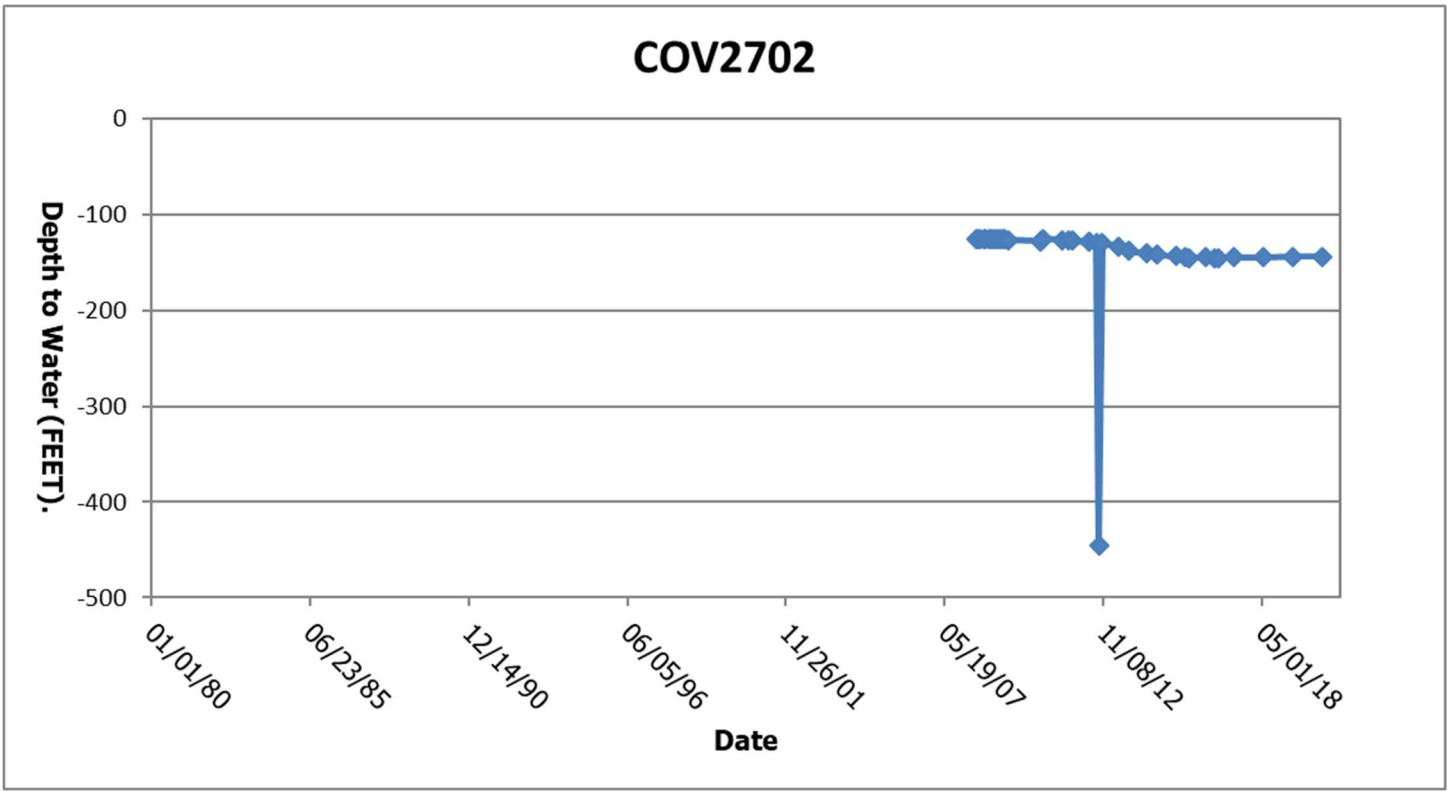
GROUNDWATER HYDROGRAPHS

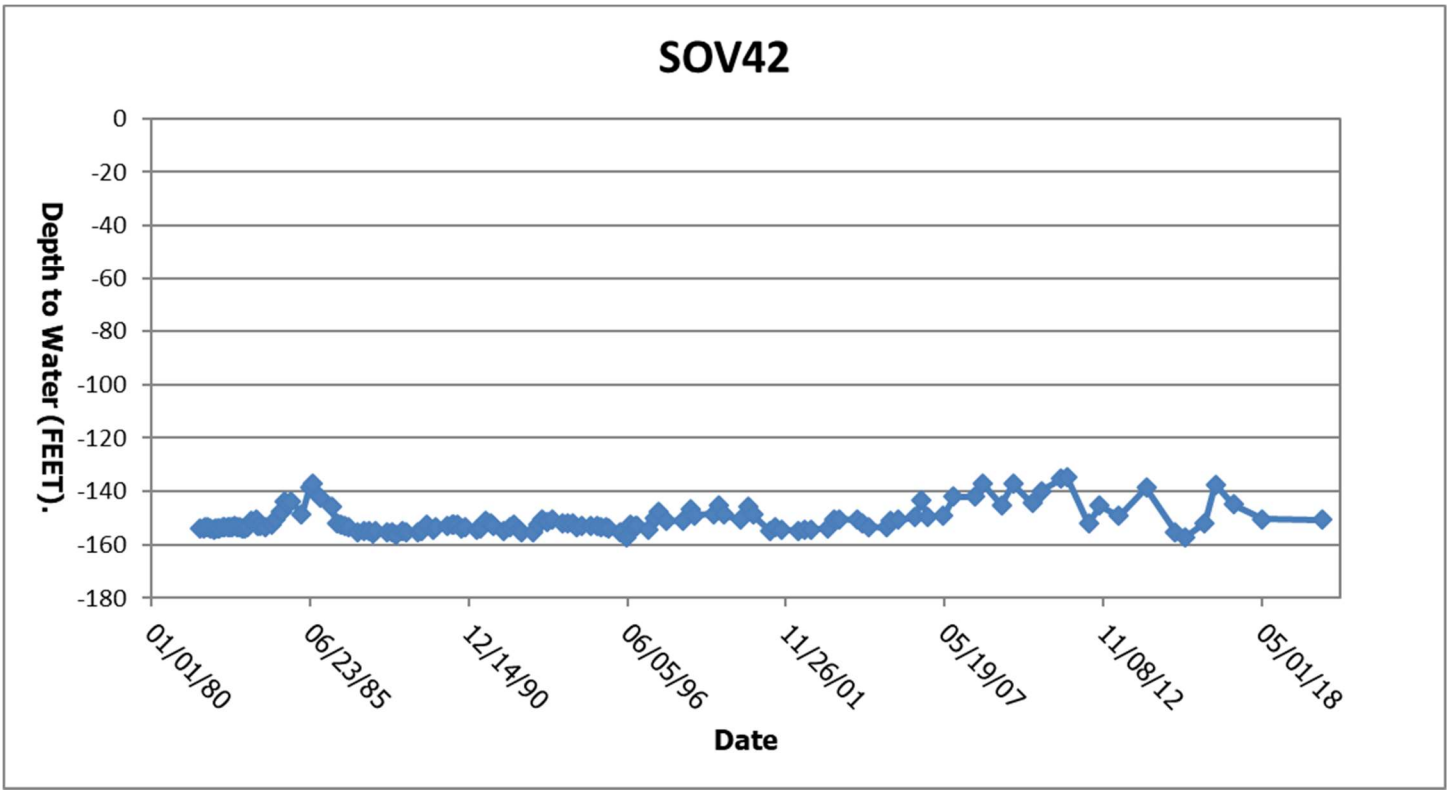

SGAL70
Depth to Water (FEET).
0
-2
-4
-6
-8
-10
-12
-14
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date

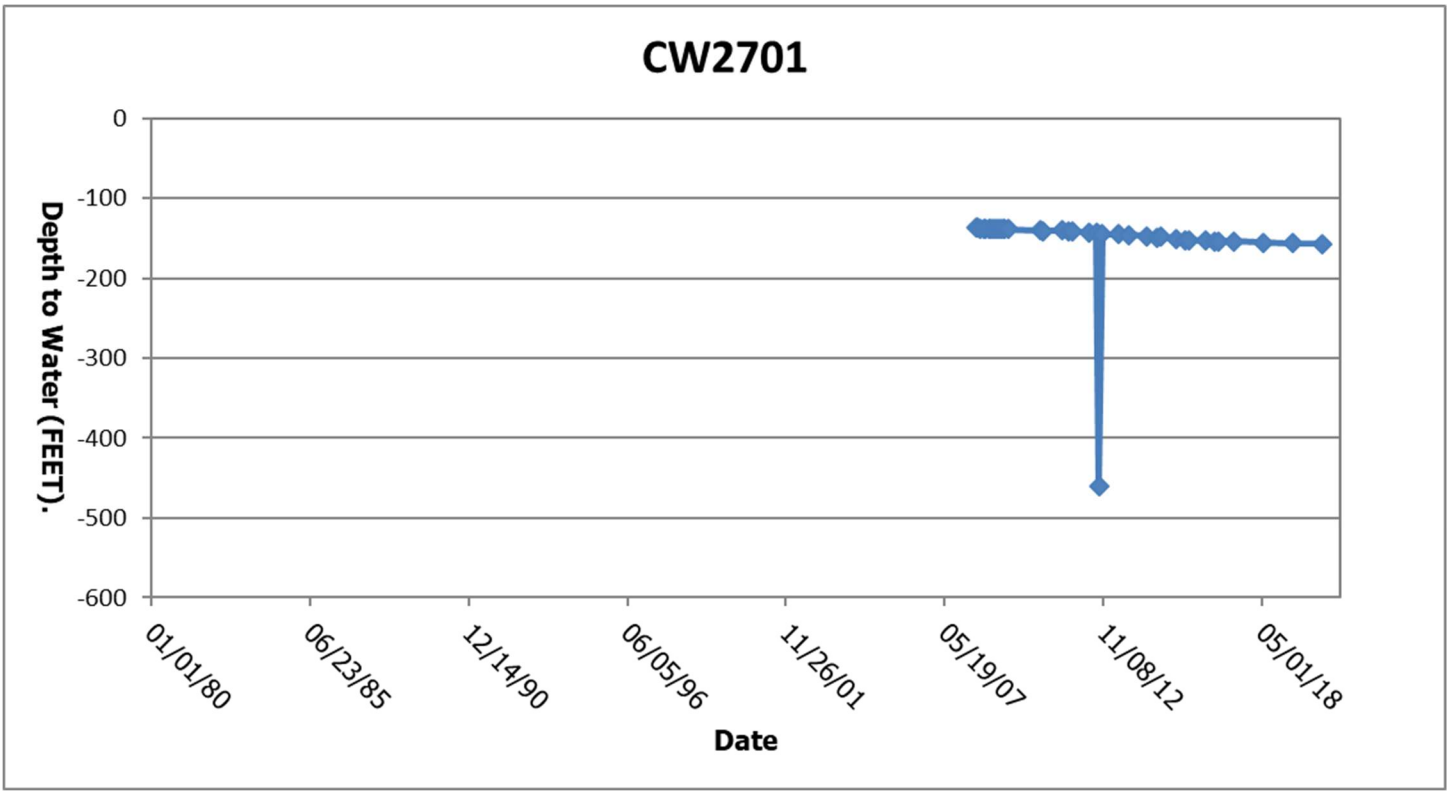

SCAL69
Depth to Water (FEET).
0
-1
-2
-3
-4
-5
-6
-7
-8
01/01/80
06/23/85
12/14/90
06/05/96
11/26/01
05/19/07
11/08/12
05/01/18
Date


SSP61
Depth to Water (FEET).
0
-5
-10
-15
-20
-25
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


SSP62
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


COV2702
0
-100
-200
-300
-400
-500
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


SOV42
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
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


CW2701
0
-100
-200
-300
-400
-500
-600
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

APPENDIX D

SURFACE WATER QUALITY DATA

Table D.1 Fish Creek Yampa Segment 13g 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 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
SSC10	6/2/2020	1.3	3802	8.1	26.2	0.6	0.0487	**< 0.2**	< 0.05	< 0.02	< 0.01	1.5
SSC10	7/20/2020	0										
Yampa Segment 13g Standards - Acute		-	-	6.5 - 9.0	-	-	4.738	0.01***	0.5	100	0.05	18.4
Yampa Segment 13g 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
SSC10	6/2/2020	1.6	1.8	2120	**< 0.02**	3600	18
SSC10	7/20/2020						
Yampa Segment 13g Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13g Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

Notes

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

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

*** The standard is an order of magnitude less than the laboratories detection limit.

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

Table D.2 Fish Creek Yampa Segment 13g NPDES Outfall 005 analytical data for water year 2020.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	Iron TR MG/L	Selenium* D UG/L	Selenium PD UG/L	Selenium* TR UG/L	TDS, Lab N MG/L	TSS* N MG/L	Manganese* D MG/L	Manganese PD MG/L
SSSPG2 (NPDES5)	1/8/2020	0										
SSSPG2 (NPDES5)	1/22/2020	0										
SSSPG2 (NPDES5)	2/3/2020	0										
SSSPG2 (NPDES5)	2/17/2020	0										
SSSPG2 (NPDES5)	3/2/2020	0										
SSSPG2 (NPDES5)	3/23/2020	0.0020	7.97	N	0.08		3	2.9	4170			< 0.05
SSSPG2 (NPDES5)	4/7/2020	**0.0962**	7.27	N	< 0.06		10	9.2	3540			0.03
SSSPG2 (NPDES5)	4/21/2020	**0.1463**	7.22	N	< 0.1		6.7	5.6	3540			
SSSPG2 (NPDES5)	4/21/2020	**0.1463**	7.22	N		5.7		5.9	3520			
SSSPG2 (NPDES5)	5/5/2020	**0.1709**	7.87	N	< 0.06		6.1	4.8	3590			
SSSPG2 (NPDES5)	5/19/2020	**0.1853**	7.01	N	0.06		3.7	3.3	3960			
SSSPG2 (NPDES5)	6/2/2020	**0.1017**	7.88	N	0.3	1.9	2.5	2.3	4280	15	0.072	
SSSPG2 (NPDES5)	6/2/2020	**0.1017**	7.88	N	0.3		2.6	2.3	4260			
SSSPG2 (NPDES5)	6/15/2020	**0.0683**	8.02	N	< 0.3		2.1	2.3	4350			
SSSPG2 (NPDES5)	7/9/2020	0.0177	8.05	N	< 0.3		1.3	1.1	4670			0.05
SSSPG2 (NPDES5)	7/20/2020	0.0030	8.04	N	0.34		1.1	1.4	4790			
SSSPG2 (NPDES5)	7/20/2020	0.0030	8.04	N		1		1	4810			
SSSPG2 (NPDES5)	8/3/2020	0.0026	7.99	N	< 0.3		0.9	1	4690			
SSSPG2 (NPDES5)	8/20/2020	0.0026	8.04	N	< 0.06		1.1	0.8	4790			
SSSPG2 (NPDES5)	9/1/2020	0.0024	7.96	N	0.08		0.6	0.6	4870			
SSSPG2 (NPDES5)	9/18/2020	0.0024	7.94	N	< 0.06		< 0.5	< 0.5	4820			
SSSPG2 (NPDES5)	10/11/2019	0.0037	8.32	N	< 0.2		0.8	0.7	4540			0.446
SSSPG2 (NPDES5)	10/23/2019	0.0039	8.38	N	< 0.2		0.8	0.7	4660			
SSSPG2 (NPDES5)	11/11/2019	0.0020	8.23	N	< 0.2		0.8	0.7	4800			
SSSPG2 (NPDES5)	11/22/2019	0.0017	8.05	N	1.2		0.6	0.8	4490			
SSSPG2 (NPDES5)	12/3/2019	0.0016	8.01	N	0.5		0.6	0.7	4540			
SSSPG2 (NPDES5)	12/16/2019	0										
NPDES Limit	Daily Max	Report	6.5 - 9.0	Report	-	-	18.4	-	-	-	-	Report
	Monthly Avg.	Varies**	-	-	1	-	Report	-	Varies**	-	-	Report
Yampa Segment 13g Standards - Acute		-	6.5 - 9.0	-	-	18.4	-	-	-	-	4.738	-
Yampa Segment 13g Standards - Chronic		-	-	-	1	TM***	-	-	-	-	2.618	-
Agricultural Use Standards		-	-	-	-	20	-	-	-	-	0.2****	-

Notes

An NPDES permit renewal application sample was collected on 6/11/2020 for an extended list of paramaters that are not required for the permits standard discharge monitoring requirements. See Table D.12 for the analytical results from this sample.

* Outfall 005 does not have a dissolved selenium, total recoverable selenium, TSS, or dissolved mangenese monitoring requirement

** See permit CO0048275 for variable monthly average flow and TDS limits. Note that the flow limits were revised effective July 1 2020

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

**** The manganese agricultural use standard is only applicable to areas with acidic soils. These are not present at Sage Creek Mine.

Bold Analyte exceeds the NPDES Daily Max limit, Segment 13g aquatic life standard, or Agricultural Use standard

Bold Analyte exceeds the NPDES Monthly Average limit

Table D.3 Fish Creek Yampa Segment 13g NPDES Outfall 006 analytical data for water year 2020.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	Iron TR MG/L	Selenium* D UG/L	Selenium PD UG/L	Selenium* TR UG/L	TDS, Lab N MG/L	TSS* N MG/L	Manganese* D MG/L
SSSPG1 (NPDES6)	1/8/2020	0.0386	7.46	N	< 0.06		3.4	2.8	3880		
SSSPG1 (NPDES6)	1/22/2020	0.0393	7.28	N	0.06		3.1	2.8	3980		
SSSPG1 (NPDES6)	2/3/2020	0.0357	7.51	N	< 0.2		2.9	2.4	3900		
SSSPG1 (NPDES6)	2/17/2020	0.0364	7.48	N	< 0.03		3.3	2.9	3970		
SSSPG1 (NPDES6)	3/2/2020	0.0384	7.51	N	< 0.03		2.8	2.6	4040		
SSSPG1 (NPDES6)	3/23/2020	0.0413	7.53	N	< 0.03		4.5	4.6	3720		
SSSPG1 (NPDES6)	4/7/2020	0.1421	7.01	N	< 0.06		11.6	10.6	3530		
SSSPG1 (NPDES6)	4/21/2020	0.3077	7.04	N	< 0.1		13.6	11.6	3260		
SSSPG1 (NPDES6)	4/21/2020	0.3077	7.04	N		11.7		11.3	3250		
SSSPG1 (NPDES6)	5/5/2020	**0.3063**	6.74	N	< 0.06		14.1	11.1	3290		
SSSPG1 (NPDES6)	5/19/2020	**0.3511**	6.95	N	< 0.1		9.6	8.7	3470		
SSSPG1 (NPDES6)	6/2/2020	**0.1617**	6.89	N	< 0.1	6.8	7.6	7	3660	6	0.0071
SSSPG1 (NPDES6)	6/2/2020	**0.1617**	6.89	N	< 0.1		7.1	6.9	3600		
SSSPG1 (NPDES6)	6/15/2020	**0.1623**	6.98	N	< 0.1		5.5	6.4	3590		
SSSPG1 (NPDES6)	7/9/2020	0.1266	7.11	N	< 0.1		5.4	5	3750		
SSSPG1 (NPDES6)	7/20/2020	0.0989	7.41	N		5		4.8	3740		
SSSPG1 (NPDES6)	7/20/2020	0.0989	7.41	N	< 0.1		4.7	4.8	3700		
SSSPG1 (NPDES6)	8/3/2020	0.0844	7.08	N	< 0.1		4.9	4.9	3680		
SSSPG1 (NPDES6)	8/20/2020	0.0841	7.2	N	< 0.06		5	5.2	3760		
SSSPG1 (NPDES6)	9/1/2020	0.0685	7.11	N	< 0.06		4.2	3.8	3790		
SSSPG1 (NPDES6)	9/18/2020	0.0680	7.14	N	< 0.06		3.7	3	3860		
SSSPG1 (NPDES6)	10/11/2019	0.0523	7.69	N	< 0.06		3.6	3.7	3870		
SSSPG1 (NPDES6)	10/23/2019	0.0534	7.75	N	< 0.06		3.3	3.4	3950		
SSSPG1 (NPDES6)	11/11/2019	0.0516	7.74	N	< 0.06		3.3	3.4	3990		
SSSPG1 (NPDES6)	11/22/2019	0.0465	7.31	N	< 0.06		3	3.1	3900		
SSSPG1 (NPDES6)	12/3/2019	0.0429	7.36	N	< 0.06		3	3	3840		
SSSPG1 (NPDES6)	12/16/2019	0.0435	7.27	N	< 0.06		2.7	3.1	3840		
NPDES Limit	Daily Max	Report	6.5 - 9.0	Report	-	-	18.4	-	-	-	-
	Monthly Avg.	Varies**	-	-	1	-	Report	-	Varies**	-	-
Yampa Segment 13g Standards - Acute		-	6.5 - 9.0	-	-	18.4	-	-	-	-	4.738
Yampa Segment 13g Standards - Chronic		-	-	-	1	TM***	-	-	-	-	2.618
Agricultural Use Standards		-	-	-	-	20	-	-	-	-	0.2****

Notes

An NPDES permit renewal application sample was collected on 6/11/2020 for an extended list of paramaters that are not required for the permits standard discharge monitoring requirements. See Table D.12 for the analytical results from this sample.

* Outfall 006 does not have a dissolved selenium, total recoverable selenium, TSS, or mangenese monitoring requirement

** See permit CO0048275 for variable monthly average flow and TDS limits. Note that the flow limits were revised effective July 1 2020

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

**** The manganese agricultural use standard is only applicable to areas with acidic soils. These are not present at Sage Creek Mine.

Bold Analyte exceeds the NPDES Daily Max limit, Segment 13g aquatic life standard, or Agricultural Use standard

Bold Analyte exceeds the NPDES Monthly Average limit

Table D.4 Upper Grassy Creek Yampa Segment 13i stream point SSLG5 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
SSLG5	4/21/2020	312.6	624	7.73	8.8	< 0.06	0.28	4.48						
SSLG5	4/21/2020	312.6	624	7.73	8.8			4.41	0.0128	**< 0.2**	< 0.05	0.46	< 0.01	1.4
SSLG5	6/2/2020	0												
SSLG5	7/20/2020	0												
SSLG5	9/1/2020	0												
Yampa Segment 13i Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01***	0.5	100	0.05	18.4
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-	TM*	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
SSLG5	4/21/2020					480	29
SSLG5	4/21/2020	1.3	1.2	184	**< 0.02**	472	28
SSLG5	6/2/2020						
SSLG5	7/20/2020						
SSLG5	9/1/2020						
Yampa Segment 13i Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

Notes

* A current conditions temporary modification is in place for the Segment 13i chronic iron and selenium standard.

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

*** The standard is an order of magnitude less than the laboratories detection limit.

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

Table D.5 Upper Grassy Creek Yampa Segment 13i stream point YSGF5 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
YSGF5	4/21/2020	3217	1245	6.93	10.4	< 0.06	0.29	0.79						
YSGF5	4/21/2020	3217	1245	6.93	10.4			0.75	0.113	**< 0.2**	< 0.05	0.02	< 0.01	0.7
YSGF5	6/2/2020	366	1011	7.51	14.1			1.56	0.0686	**< 0.2**	0.08	< 0.02	0.01	0.5
YSGF5	7/20/2020	143	1337	8.44	25	< 0.06	0.48	1.06						
YSGF5	9/1/2020	1	1225	8.46	16.3			0.45	0.224	**< 0.2**	< 0.05	< 0.02	< 0.01	0.2
Yampa Segment 13i Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01***	0.5	100	0.05	18.4
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-	TM*	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
YSGF5	4/21/2020					938	23
YSGF5	4/21/2020	0.7	0.6	463	**< 0.02**	946	18
YSGF5	6/2/2020	0.4	0.5	429	**0.02**	924	52
YSGF5	7/20/2020					1020	38
YSGF5	9/1/2020	0.2	0.2	496	**< 0.02**	1160	13
Yampa Segment 13i Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

Notes

* A current conditions temporary modification is in place for the Segment 13i chronic iron and selenium standard.

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

*** The standard is an order of magnitude less than the laboratories detection limit.

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

Table D.6 Upper Grassy Creek Yampa Segment 13i stream point SSG1 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
SSG1	4/21/2020	3917	1066	7.6	8.7	< 0.06	0.41	2.08						
SSG1	4/21/2020	3917	1066	7.6	8.7			2.04	0.0458	**< 0.2**	< 0.05	0.1	< 0.01	0.5
SSG1	6/2/2020	437.6	1195	8.22	24.8			8.25	0.0553	**< 0.2**	0.08	0.07	0.02	0.5
SSG1	7/20/2020	47.8	1295	8.18	20.7	0.24	0.61	1.67						
SSG1	9/1/2020	0												
Yampa Segment 13i Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01***	0.5	100	0.05	18.4
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-	TM*	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
SSG1	4/21/2020					740	37
SSG1	4/21/2020	0.5	0.6	353	**< 0.02**	736	34
SSG1	6/2/2020	0.4	0.8	505	**< 0.02**	890	291
SSG1	7/20/2020					1040	39
SSG1	9/1/2020						
Yampa Segment 13i Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

Notes

An NPDES permit renewal application sample was collected on 6/11/2020 for an extended list of paramaters that are not required to be monitored under the current stream monitoring program. See Table D.13 for the analytical results from this sample.

* A current conditions temporary modification is in place for the Segment 13i chronic iron and selenium standard.

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

*** The standard is an order of magnitude less than the laboratories detection limit.

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

Table D.7 Upper Grassy Creek Yampa Segment 13i stream point SSG2 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
SSG2	4/21/2020	4023	2539	7.45	14.5	< 0.06	0.25	1.3						3
SSG2	4/21/2020	4023	2539	7.45	14.5			1.3	0.0631	**< 0.2**	< 0.05	1.31	< 0.01	3
SSG2	6/2/2020	577.6	2551	7.98	22			4.7	0.134	**< 0.2**	< 0.05	0.22	0.03	1.8
SSG2	7/20/2020	114	3728	8.12	18.7	< 0.1	0.3	0.6						2
SSG2	9/1/2020	17.4	3267	8.27	19.5			0.28	0.0693	**< 0.2**	< 0.05	< 0.02	< 0.01	1.3
Yampa Segment 13i Standards - Acute		-	-	6.5 - 9.0	-	-	-	-	4.738	0.01***	0.5	100	0.05	18.4
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-	TM*	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
SSG2	4/21/2020		3.1	1300		2210	40
SSG2	4/21/2020	3.3	2.9	1320	**< 0.02**	2240	30
SSG2	6/2/2020	1.8	2	1360	**0.05**	2470	174
SSG2	7/20/2020		2.2	2140		3660	49
SSG2	9/1/2020	1.2	1.3	2270	**< 0.02**	3790	12
Yampa Segment 13i Standards - Acute		-	-	-	0.002***	-	-
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	-

Notes

* A current conditions temporary modification is in place for the Segment 13i chronic iron and selenium standard.

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

*** The standard is an order of magnitude less than the laboratories detection limit.

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

Table D.8 Lower Grassy Creek Yampa Segment 13j stream point YSG5 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	Arsenic TR UG/L	Alkalinity, Bicarbonate N MG/L	Boron D UG/L	Cadmium D UG/L	Calcium D MG/L	Carbonate as CO3 N MG/L	Chloride N MG/L	Chromium D UG/L	Copper D UG/L
YSG5	4/21/2020	4112	2388	7.87	15.2									
YSG5	4/21/2020	4112	2388	7.87	15.2	0.9	226	150	< 0.1	197	15.8	15	< 1	< 2
YSG5	6/2/2020	422	2460	7.96	19.4	1.3	324	200	< 0.1	268	< 2	15.9	< 1	< 2
YSG5	7/20/2020	176	3254	8	17.3									
YSG5	9/1/2020	11.7	2868	7.93	17.3	1.1	354	280	< 0.1	336	< 2	24	< 1	< 2
Yampa Segment 13j Standards - Acute		-	-	6.5 - 9.0	-	340	-	750	9.2	-	-	-	1773	50
Yampa Segment 13j Standards - Chronic		-	-	-	-	7.6	-		1.2	-	-	-	231	29
Agricultural Use Standards		-	-	-	-	100	-	750	10	-	-	-	100	200

Location	Date	Hardness N MG/L	Iron TR MG/L	Lead D UG/L	Magnesium D MG/L	Manganese D MG/L	Mercury T UG/L	Nickel D UG/L	Ammonia N. N MG/L	Nitrate N. N MG/L	Nitrite N. N MG/L	Potassium D MG/L	Selenium D UG/L	Selenium TR UG/L
YSG5	4/21/2020												4	4.5
YSG5	4/21/2020	1250	0.9	< 0.2	185	0.06	**< 0.2**	< 8	< 0.05	1.1	0.01	5.9	4.2	4.5
YSG5	6/2/2020	1600	**2.2**	< 0.2	225	0.47	**< 0.2**	< 20	0.07	0.19	0.03	6.8	1.3	1.6
YSG5	7/20/2020												1	1.4
YSG5	9/1/2020	2180	0.6	< 0.2	326	0.23	**< 0.2**	< 20	< 0.05	< 0.02	< 0.01	9.9	0.7	0.6
Yampa Segment 13j Standards - Acute		-	-	281	-	4.738	0.01***	1513	0.5	100	0.05	-	18.4	-
Yampa Segment 13j Standards - Chronic		-	1	11	-	2.618	-	168	-	-	-	-	TM*	-
Agricultural Use Standards		-	-	100	-	0.2**	-	200	-	100	10	-	20	-

Location	Date	Silver D UG/L	Sodium D MG/L	SAR N RATIO	Sulfates N MG/L	Sulfide N MG/L	Zinc D MG/L	Cation / Anion Balance N %	TDS, Lab N MG/L	TDS Calc. N MG/L	TSS N MG/L
YSG5	4/21/2020				1150				2020		
YSG5	4/21/2020	< 0.2	114	1.4	1140	**< 0.02**	< 0.02	0	2020	1820	20
YSG5	6/2/2020	< 0.2	85.3	0.94	1400		< 0.04	0	2470	2200	64
YSG5	7/20/2020				1790				3010		
YSG5	9/1/2020	< 0.2	110	1	1920	**< 0.02**	< 0.04	1	3320	2940	14
Yampa Segment 13j Standards - Acute		22	-	-	-	0.002***	0.565	-	-	-	-
Yampa Segment 13j Standards - Chronic		3.5	-	-	-	-	0.428	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	2	-	-	-	-

Notes

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

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

*** The standard is an order of magnitude less than the laboratories detection limit.

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

Table D.9. Upper Grassy Creek Segment 13i NPDES Outfall 002 analytical data for water year 2020.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	Iron* D MG/L	Iron* PD MG/L	Iron TR MG/L	Selenium* D UG/L	Selenium PD UG/L	Selenium* TR UG/L	TDS, Lab N MG/L	TSS N MG/L	Copper PD UG/L
NPDES2	1/8/2020	0.0397	8.08	N			< 0.2		1.1	0.9	4140	< 5	< 10
NPDES2	1/22/2020	0.0409	7.87	N					0.9	1.1		< 5	
NPDES2	2/3/2020	0.0428	7.89	N			0.12		1.2	1.1		< 5	
NPDES2	2/17/2020	0.0415	7.56	N					1.5	1.4		< 5	
NPDES2	3/2/2020	0.0428	7.58	N			0.04		1.1	1.4		< 5	
NPDES2	3/23/2020	0.1117	7.58	N					3	3.1		< 5	
NPDES2	4/7/2020	0.3177	7.57	N			0.37		3.3	3.4	2650	7	1
NPDES2	4/21/2020	0.3277	7.24	N	< 0.06	0.08	0.2	5		5.1	3200	< 5	
NPDES2	4/21/2020	0.3277	7.24	N					5.7	5.4		< 5	
NPDES2	5/5/2020	0.3408	7.38	N			0.07		5.2	4.5		< 5	
NPDES2	5/19/2020	0.5005	6.74	N					3.9	3.8		9	
NPDES2	6/2/2020	0.3004	8.05	N			0.07		3.5	3.8		10	
NPDES2	6/15/2020	0.2186	8.16	N					3.1	3		7	
NPDES2	7/9/2020	0.1979	8.22	N			< 0.3		2	2.3	4070	12	**< 50**
NPDES2	7/20/2020	0.0744	8.15	N	< 0.06	< 0.06	0.11	2.3		2.4	4180	9	
NPDES2	7/20/2020	0.0744	8.15	N					2.5	2.3		10	
NPDES2	8/3/2020	0.0742	8.15	N			0.18		2.2	2.4		18	
NPDES2	8/20/2020	0.0744	8.24	N					2.1	2.3		6	
NPDES2	9/1/2020	0.0757	8.11	N			0.09		1.6	1.6		8	
NPDES2	9/18/2020	0.0743	8.08	N					1.5	1.2		< 5	
NPDES2	10/11/2019	0.0397	8.51	N			< 0.2		1	1.1	4020	< 5	< 0.8
NPDES2	10/23/2019	0.0485	8.45	N					0.9	0.9		< 5	
NPDES2	11/11/2019	0.0465	8.52	N			0.04		1	1.1		< 5	
NPDES2	11/22/2019	0.0413	8.07	N					0.9	0.9		6	
NPDES2	12/3/2019	0.0409	8.22	N			0.04		0.8	0.9		5	
NPDES2	12/16/2019	0.0413	8.16	N					1	1.2		7	
NPDES Limit	Daily Max	Report	6.5 - 9.0	Report	-	-	6	-	18.4	-	Report	70	Report
	Monthly Avg.	Varies**	-	-	-	-	1	-	Report	-	Report	35	Report
Yampa Segment 13i Standards - Acute		-	6.5 - 9.0	-	-	-	-	18.4	-	-	-	-	50
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	TM***	TM***	-	-	-	-	29
Agricultural Use Standards		-	-	-	-	-	-	20	-	-	-	-	200

Notes

An NPDES permit renewal application sample was collected on 6/11/2020 for an extended list of paramaters that are not required for the permits standard discharge monitoring requirements. See Table D.12 for the analytical results from this sample.

* Outfall 002 does not have a dissolved iron, potentially dissolved iron, dissolved selenium, or total recoverable selenium monitoring requirement

** See permit CO0048275 for variable monthly average flow limit. Note that the flow limits were revised effective July 1 2020

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

Bold Analyte exceeds the NPDES Daily Max limit, Segment 13i aquatic life standard, or Agricultural Use standard

Bold Analyte exceeds the NPDES Monthly Average limit

Table D.10. Upper Grassy Creek Segment 13i NPDES Outfall 003 analytical data for water year 2020.

Location	Date	Flow N MGD	pH, Field N S.U.	Oil & Grease Y / N	Iron* D MG/L	Iron* PD MG/L	Iron TR MG/L	Selenium* D UG/L	Selenium PD UG/L	Selenium* TR UG/L	TDS, Lab* N MG/L	TSS N MG/L	Manganese PD MG/L
NPDES3	1/8/2020	0.0027	7.56	N			**0.29**		0.7	0.7		< 5	0.85
NPDES3	1/22/2020	0.0024	7.45	N			**2.67**		1.5	1.4		18	
NPDES3	2/3/2020	0.0023	7.62	N			0.43		1.8	1.8		< 5	
NPDES3	2/17/2020	0.0024	7.73	N			0.64		3.1	3.1		5	
NPDES3	3/2/2020	0.0027	7.78	N			0.38		2.7	2.6		6	
NPDES3	3/23/2020	0.0053	7.79	N			0.2		1.7	1.9		< 5	
NPDES3	4/7/2020	0.0060	7.57	N			0.23		1.4	1.5		7	
NPDES3	4/21/2020	0.0210	7.5	N			0.23		1.3	1.1		9	
NPDES3	4/21/2020	0.0210	7.5	N	< 0.06	0.14	0.27	1.1		1.1	1840	11	
NPDES3	5/5/2020	0.0556	7.47	N			0.2		1	1		8	
NPDES3	5/19/2020	0.0701	7.49	N			0.17		1	1		9	
NPDES3	6/2/2020	0.0528	8	N			0.24		1	1		11	
NPDES3	6/15/2020	0.0311	8.12	N			0.28		1	1		< 5	
NPDES3	7/9/2020	0.0196	8.14	N			0.4		0.8	1		17	0.63
NPDES3	7/20/2020	0.0049	8.11	N	< 0.06	0.14	0.3	0.9		0.8	1930	12	
NPDES3	7/20/2020	0.0049	8.11	N			0.28		0.8	0.9		8	
NPDES3	8/3/2020	0.0040	8.17	N			0.36		0.8	1		42	
NPDES3**	8/17/2020						0.28		0.9	0.8		15	
NPDES3**	8/20/2020	0.0037	8.27	N									
NPDES3	9/1/2020	0.0042	8.17	N			0.25		0.7	0.8		20	
NPDES3	9/18/2020	0.0039	8.11	N			0.23		0.7	0.6		5	
NPDES3	10/11/2019	0.0035	8.5	N			0.21		0.7	0.8		14	
NPDES3	10/23/2019	0.0039	8.56	N			0.15		0.7	0.7		5	
NPDES3	11/11/2019	0.0036	8.28	N			0.17		0.6	0.7		10	
NPDES3	11/22/2019	0.0033	7.87	N			0.08		0.6	0.6		5	
NPDES3	12/3/2019	0.0035	7.83	N			0.12		0.6	0.6		6	
NPDES3	12/16/2019	0.0026	7.85	N			0.16		0.5	0.5		7	
NPDES Limit	Daily Max	Report	6.5 - 9.0	Report	-	-	6	-	18.4	-	-	70	Report
	Monthly Avg.	0.1195	-	-	-	-	1	-	Report	-	-	35	Report
Yampa Segment 13i Standards - Acute		-	6.5 - 9.0	-	-	-	-	18.4	-	-	-	-	4.738
Yampa Segment 13i Standards - Chronic		-	-	-	-	-	TM***	TM***	-	-	-	-	2.618
Agricultural Use Standards		-	-	-	-	-	-	20	-	-	-	-	0.2****

Notes

An NPDES permit renewal application sample was collected on 6/11/2020 for an extended list of paramaters that are not required for the permits standard discharge monitoring requirements. See Table D.12 for the analytical results from this sample.

* Outfall 003 does not have a dissolved iron, potentially dissolved iron, dissolved selenium, total recoverable selenium, or TDS monitoring requirement

** Sampler did not have field meter when collecting sample on 8/17/2020. Field paramaters collected on 8/20/2020

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

**** The manganese agricultural use standard is only applicable to areas with acidic soils. These are not present at Sage Creek Mine.

Bold Analyte exceeds the NPDES Daily Max limit, Segment 13i aquatic life standard, or Agricultural Use standard

Bold Analyte exceeds the NPDES Monthly Average limit

Table D.11. Upper Grassy Creek Segment 13i NPDES Outfall 007 analytical data for water year 2020.

Location	Date	Flow N GPM	pH, Field N S.U.	Oil & Grease Y / N	Iron TR MG/L	Selenium PD UG/L	Selenium* TR UG/L	TSS N MG/L	Copper PD UG/L	Manganese PD MG/L
NPDES7	1/8/2020	0								
NPDES7	1/22/2020	0								
NPDES7	2/3/2020	0								
NPDES7	2/17/2020	0								
NPDES7	3/2/2020	0								
NPDES7	3/23/2020	0								
NPDES7	4/7/2020	0.0062	6.97	N	0.11	0.7	0.9	< 5	< 0.8	0.02
NPDES7	4/21/2020	0.0147	6.91	N	0.71	0.5	0.5	20		
NPDES7	5/5/2020	0.0212	7.51	N	0.32	0.3	0.3	9		
NPDES7	5/19/2020	0.0340	7.22	N	0.54	0.2	0.2	17		
NPDES7	6/2/2020	0								
NPDES7	6/15/2020	0.0039	7.97	N	0.12	0.7	0.7	< 5		
NPDES7	7/9/2020	0.0046	8.05	N	< 0.06	0.4	0.4	< 5		0.07
NPDES7	7/20/2020	0.0068	8.09	N	< 0.06	0.3	0.4	< 5		
NPDES7	8/3/2020	0.0063	8.01	N	0.15	0.3	0.3	6		
NPDES7	8/20/2020	0.0058	8.1	N	0.19	0.3	0.3	< 5		
NPDES7	9/1/2020	0.0053	8.02	N	< 0.06	0.2	0.3	< 5		
NPDES7	9/18/2020	0.0049	8	N	0.19	0.1	0.1	< 5		
NPDES7	10/11/2019	0								
NPDES7	10/24/2019	0								
NPDES7	11/12/2019	0								
NPDES7	11/22/2019	0								
NPDES7	12/3/2019	0								
NPDES7	12/16/2019	0								
NPDES Limit	Daily Max	Report	6.5 - 9.0	Report	6	Report	-	70	Report	Report
	Monthly Avg.	Report	-	-	1	Report	-	35	Report	Report
Yampa Segment 13i Standards - Acute		-	6.5 - 9.0	-	-	18.4	-	-	50	4.738
Yampa Segment 13i Standards - Chronic		-	-	-	TM**	TM**	-	-	29	2.618
Agricultural Use Standards		-	-	-	-	20	-	-	200	0.2***

Notes

* Outfall 007 does not have a total recoverable selenium monitoring requirement

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

*** The manganese agricultural use standard is only applicable to areas with acidic soils. These are not present at Sage Creek Mine.

Bold Analyte exceeds the NPDES Daily Max limit, Segment 13i aquatic life standard, or Agricultural Use standard

Bold Analyte exceeds the NPDES Monthly Average limit

Table D.12. Sage Creek CPDS Permit No. CO-0048275 Renewal Application Samples.

Location	Date	SpC, Lab N UMHOS/CM	Copper D UG/L	Copper PD UG/L	Hardness N MG/L	Iron TR MG/L	Lead D UG/L	Lead PD UG/L	Magnesium D MG/L	Manganese D MG/L	Manganese PD MG/L
Outfall 002 (NPDES2)	6/11/2020	3750	< 2	< 2	2520	0.06	< 0.2	< 0.2	385	0.03	0.07
Outfall 003 (NPDES3)	6/11/2020	2150	< 2	< 2	1160	0.29	< 0.2	< 0.2	151	0.55	0.87
Outfall 005 (SSSPG2)	6/11/2020	4140	< 2	< 2	2950	0.22	< 0.2	< 0.2	474	0.06	0.15
Outfall 006 (SSSPG1)	6/11/2020	3550	< 2	< 2	2570	< 0.06	< 0.2	< 0.2	396	< 0.01	< 0.01
SSG1	6/11/2020	1180	< 2	6	610	4.34	< 0.2	2.3	65	0.15	0.33
Yampa Segment 13i/13g Standards - Acute			50	-	-	-	281	-	-	4.738	-
Yampa Segment 13i/13g Standards - Chronic			29	-	-	Varies*	11	-	-	2.618	-
Agricultural Use Standards			200	-	-	-	100	-	-	0.2**	-

Location	Date	Mercury T UG/L	Nickel D UG/L	Nickel PD UG/L	Ammonia_N N MG/L	Nitrate_N N MG/L	Nitrite_N N MG/L	Phosphorus T MG/L	Potassium D MG/L	Selenium D UG/L	Selenium PD UG/L
Outfall 002 (NPDES2)	6/11/2020	**< 0.2**	< 8	3.3	< 0.05	0.51	0.02	0.02	9.5	3	3.1
Outfall 003 (NPDES3)	6/11/2020	**< 0.2**	< 8	1.6	< 0.05	< 0.02	< 0.01	0.03	5.2	0.9	0.9
Outfall 005 (SSSPG2)	6/11/2020	**< 0.2**	< 8	1.5	< 0.05	0.32	< 0.01	0.02	8	2.5	2.3
Outfall 006 (SSSPG1)	6/11/2020	**< 0.2**	< 8	1.6	< 0.05	2.22	< 0.01	< 0.01	6.5	7	6.6
SSG1	6/11/2020	**< 0.2**	< 8	5.4	< 0.05	0.07	0.02	0.16	4.2	0.4	0.4
Yampa Segment 13i/13g Standards - Acute		0.01***	1513	-	0.5	100	-	-	-	18.4	-
Yampa Segment 13i/13g Standards - Chronic		-	168	-	-	-	0.05	0.17	-	TM****	-
Agricultural Use Standards		-	200	-	-	100	10	-	-	20	-

Location	Date	Selenium TR UG/L	Silver D UG/L	Silver PD UG/L	Sodium D MG/L	SAR N RATIO	Sulfide N MG/L	Zinc D MG/L	Zinc PD MG/L	TDS, Lab N MG/L	TSS N MG/L
Outfall 002 (NPDES2)	6/11/2020	3.4	< 0.2	< 0.2	119	1	**< 0.02**	< 0.02	< 0.02	3860	7
Outfall 003 (NPDES3)	6/11/2020	1	< 0.2	< 0.2	99.7	1.3	**< 0.02**	< 0.02	< 0.02	1880	11
Outfall 005 (SSSPG2)	6/11/2020	2.4	< 0.2	< 0.5	114	0.92	**< 0.02**	< 0.02	< 0.02	4370	16
Outfall 006 (SSSPG1)	6/11/2020	5.9	< 0.2	< 0.2	50.3	0.44	**< 0.02**	< 0.02	< 0.02	3650	< 5
SSG1	6/11/2020	0.5	< 0.2	< 0.2	33.6	0.6	**< 0.02**	< 0.02	< 0.02	910	141
Yampa Segment 13i/13g Standards - Acute		-	22	-	-	-	0.002***	0.565	-	-	-
Yampa Segment 13i/13g Standards - Chronic		-	3.5	-	-	-	-	0.428	-	-	-
Agricultural Use Standards		-	-	-	-	-	-	2	-	-	-

Note

* A current conditions temporary modification is in place for the Segment 13i chronic iron standard. The Segment 13g standard which is applicable to Outfalls 005 and 006 is 1 mg/L.

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

*** The standard is an order of magnitude less than the laboratories detection limit.

**** A current conditions temporary modification is in place for the Segment 13 g and 13i chronic selenium standard.

Bold Analyte exceeds the Yampa Segment 13i/13g or Agricultural Use Standards

Table D.13. Total Recoverable Iron results from synoptic watershed monitoring at Grassy Creek surface water points in 2020.

Stream	Location	Total Recoverable Iron (mg/L)			
		4/21/2020	6/2/2020	7/20/2020	9/1/2020
Grassy Creek	YSGF5	0.77*	**1.56**	**1.06**	0.45
Grassy Creek	SSG1	**2.06***	**8.25**	**1.67**	NF
Little Grassy Creek	SSLG5	**4.45***	NF	NF	NF
Little Grassy Creek	NPDES2	0.2	0.07	0.11	0.09
Grassy Creek	NPDES3	0.25*	0.24	0.29*	0.25
Grassy Creek	NPDES7	0.71	NF	< 0.06	< 0.06
Grassy Creek	SSG2	**1.3***	**4.7**	0.6	0.28
Grassy Creek	YSG5	0.9*	**2.2**	NS	0.6

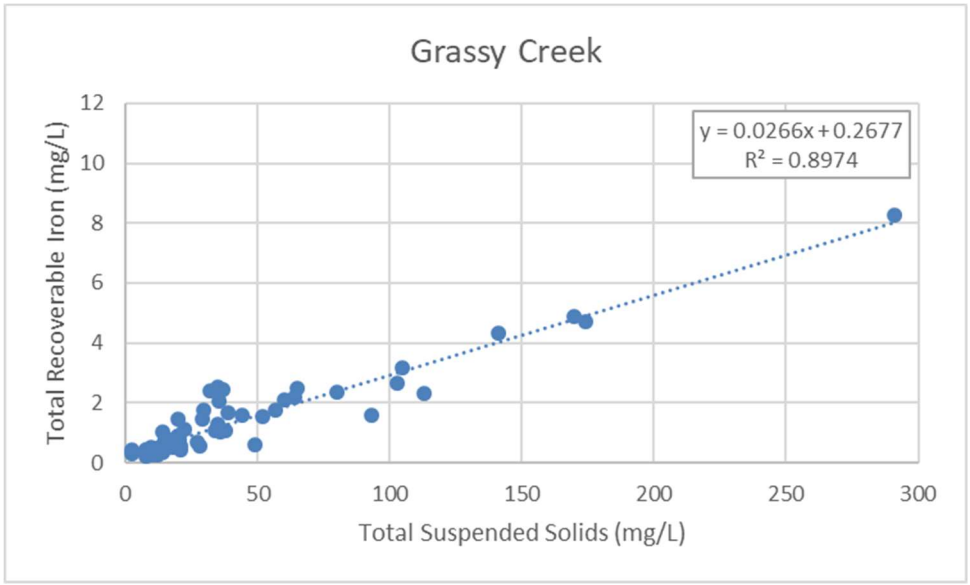
Notes

*Total recoverable iron is the average of the duplicate samples collected on that date

NF: Not flowing

Bold Analyte exceeds the Segment 13j chronic aquatic life standard of 1 mg/L

Figure D.1. Suspended solids vs total recoverable iron at Grassy Creek stream points YSGF5, SSG1, SSG2 and YSG5 for samples collected from October 1, 2015 through September 30, 2020.



APPENDIX E

SPRING WATER QUALITY DATA

Table E.1. Analytical data for spoil 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
SSSPG10	6/3/2020	1.8	3738	7.98	23	< 0.06	0.0095	< 0.2	< 0.05	< 0.02	< 0.01
SSSPG3	6/3/2020	28.7	3459	7.41	21.6	0.2	0.0869	< 0.2	< 0.05	5.55	0.02
SSSPG4	6/3/2020	176.1	3444	7.6	17.8	0.3	0.034	< 0.2	< 0.05	9.4	0.01
SSSPG5	6/3/2020	106.7	3689	7.55	21.7	0.07	0.011	< 0.2	< 0.05	0.63	< 0.01
SSSPG6A	6/2/2020	0	-	-	-	-	-	-	-	-	-
Agricultural Use Standards		-	-	-	-	-	0.2*	-	-	100	10

Location	Date	Selenium D UG/L	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
SSSPG10	6/3/2020	< 0.2	< 0.1	0.3	2310	< 0.02	3980	< 5
SSSPG3	6/3/2020	6.1	6	6.4	2200	< 0.02	3790	8
SSSPG4	6/3/2020	13.5	14.3	14.8	2460	< 0.02	4140	17
SSSPG5	6/3/2020	1.7	1.9	2	2280	< 0.02	4000	< 5
SSSPG6A	6/2/2020	-	-	-	-	-	-	-
Agricultural Use Standards		20	-	-	-	-	-	-

Notes

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

Bold Analyte exceeds the Agricultural Use Standards