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# J. E. STOVER & ASSOCIATES, INC.

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MINE ENGINEERING  
MINE RECLAMATION

CIVIL ENGINEERING  
CONST. MANAGEMENT

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March 1, 2022

Mr. Clayton Wein  
Division of Reclamation, Mining and Safety  
1313 Sherman Street, Room 215  
Denver, CO 80203

RE: Snowcap Coal Company, Inc.  
Annual Hydrology Report – 2021WY  
Permit No. C-1981-041

Dear Mr. Wein:

On behalf of Snowcap Coal Company, Inc., enclosed is a copy of its annual hydrology report for the 2021 water year. This submission is designed to supplement previous submissions and should be added to the 3-ring binder provided in 1993. The index pages should replace the previous index pages; the report, diagrams, tables and map should be inserted following the 2021 tab page; and the data pages should be added to or replace existing pages in the data pages binder.

Sincerely,

*Tonya K. Hammond*

Tonya K. Hammond  
Owner's Representative  
Snowcap Coal Company, Inc.

Enclosures

cc: SCC File

**SNOWCAP COAL COMPANY, INC.**  
**ANNUAL HYDROLOGY REPORT INDEX**

<b><u>Item</u></b>	<b><u>Description</u></b>
	Location Map - Location of surface and ground water monitoring locations.
1986	1986 Annual Hydrologic Report and Mine Inflows Study
1987	1987 Annual Hydrologic Report and Mine Inflows Study
1988	1988 Annual Hydrologic Report and Mine Inflows Study
1989	1989 Annual Hydrologic Report and Mine Inflows Study
1990	1990 Annual Hydrologic Report and Mine Inflows Study
1991	1991 Annual Hydrologic Report and Mine Inflows Study
1992	1992 Annual Hydrologic Report and Mine Inflows Study
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2011	2011 Annual Hydrologic Report
2012	2012 Annual Hydrologic Report
2013	2013 Annual Hydrologic Report
2014	2014 Annual Hydrologic Report
2015	2015 Annual Hydrologic Report
2016	2016 Annual Hydrologic Report
2017	2017 Annual Hydrologic Report
2018	2018 Annual Hydrologic Report
2019	2019 Annual Hydrologic Report
2020	2020 Annual Hydrologic Report
2021	2021 Annual Hydrologic Report

## **Surface Water**

SA-# - Rapid Creek, quality monitored near SWGS-04 (Discontinued 1986)  
SB-# - Upper Colorado River, quality (Discontinued 1993)  
SC-# - Lower Colorado River, quality (Discontinued 1993)  
SD-# - Outfall 001, weekly and monthly field and lab data (Discontinued 2002)  
SE-# - Outfall 002, weekly and monthly field and lab data (Discontinued 2002)  
SF-# - Outfall 004, weekly and monthly field and lab data (Discontinued 2001)  
SG-# - SWSG-01, Lower Rapid Creek, daily flows and hydrograph (Discontinued 2016)  
SH-# - SWGS-02, Cottonwood Creek, daily flows and hydrographs (Discontinued 2016)  
SI-# - SWGS-03, Upper Rapid Creek, daily flows and hydrographs (Discontinued 2016)  
SJ-# - SWGS-04, Lower Rapid Creek, daily flows and hydrographs (Discontinued 1986)  
SK-# - SWGS-05, Upper Cottonwood Creek, daily flows and hydrographs (Discontinued 1998)  
SL-# - Outfalls 001, 002 & 016, WET test (Discontinued 2005)  
SM-# - Outfall 004, WET test (Discontinued 1999)  
SN-# - Outfall 001, quality (Discontinued 2001)  
SO-# - Outfall 002, quality (Discontinued 2001)  
SP-# - Outfall 004, quality (Discontinued 1999)  
SQ-# - Colorado River, USGS station 09095500 data  
SR-# - Coal Canyon Drainage, SWGS-06 & -07, flows (Discontinued 2016)  
SS-# - Jerry Creek, SWGS-08 & -09, flows (Discontinued 2011)  
ST-# - Spring and Seep Surveys (Discontinued 2005)  
SU-# - Outfall 016, quality  
SV-# - Outfall 016, Weekly and monthly field and laboratory data

## **Ground Water**

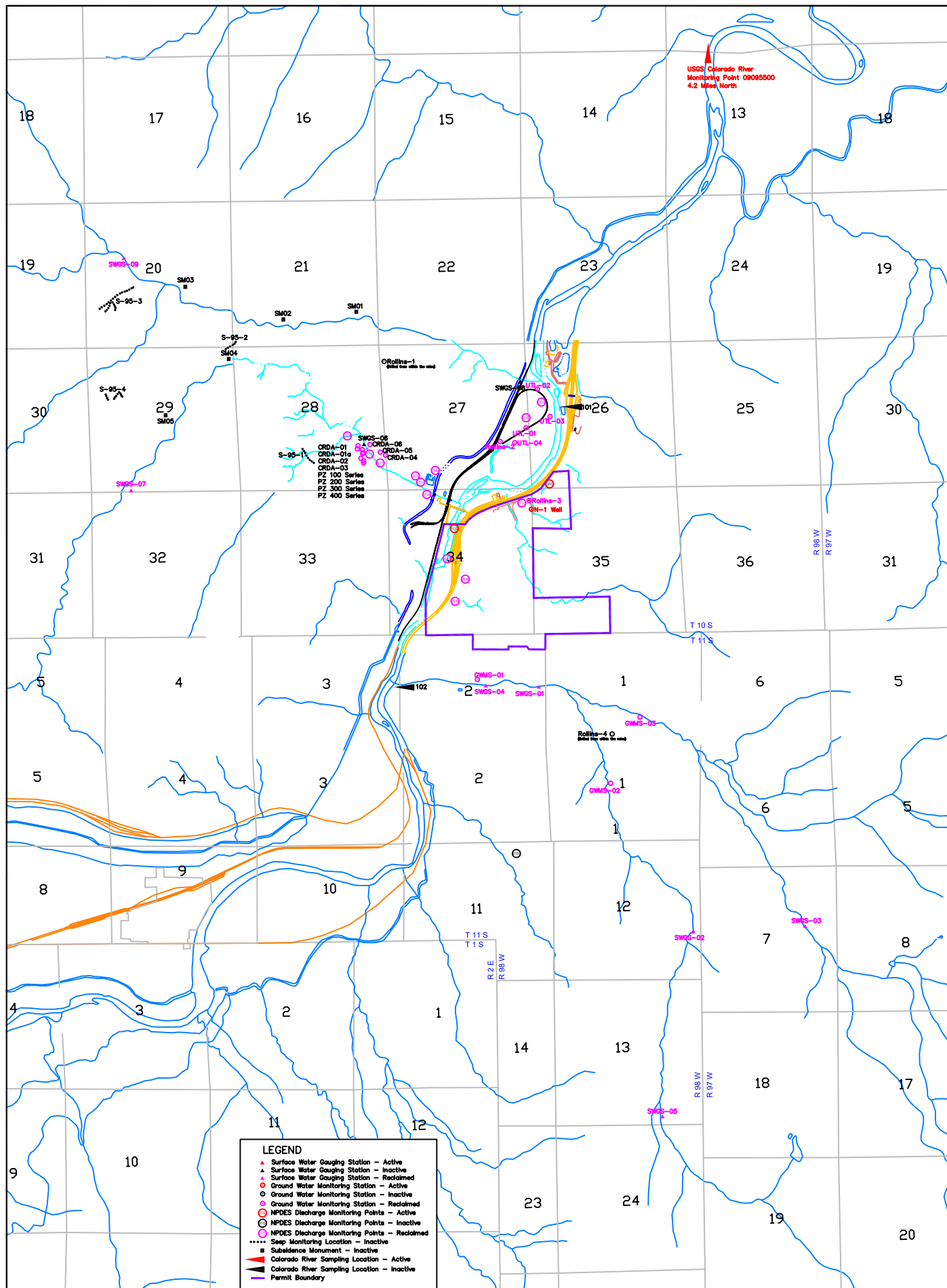
GA-# - Cottonwood Creek and Rapid Creek Groundwater Levels GWMS 01A, 01B, 02A, 02, 03A, 03B (Discontinued 2016)  
GB-# - Unit Train Loadout Groundwater Level UTL-01, 02, 03, 04 (Discontinued 2011)  
GC-# - Cameo Refuse Disposal Area Ground Water CRDA & PZ #s (Discontinued 2016)  
GD-# - Water Quality Data UTL-02 UTL-04 (Discontinued 2010)  
GE-# - Rollins Sandstone Wells depth to water and water quality Rollins-1, 2, 3, 4 (Discontinued 2011)


## **Mine Inflows**

MA-# - South Portal inflow and quality data (Discontinued 1999)  
MB-# - North Portal inflow and quality data (Discontinued 1999)

## **Consumptive Use**

CA-# - Palisade Domestic Water and Preparation Plant, meter readings (Discontinued 2000)



PROJECT: SNOWCAP COAL COMPANY, INC.		PREPARED FOR: SNOWCAP COAL COMPANY, INC. P.O. Box 1430 Palisade, CO 81526 (970) 241-8118		 DIGITIZED: TKH 03/03/04 DRAWN: JES 03/03/04 CHECKED: JES 03/03/04		By: _____ Date: _____ 1 2021 Annual Hydrologic Map (Oct 2020 thru Sept 2021) TRH 02/28	
TITLE: ROADSIDE NORTH AND SOUTH MINES MONITORING LOCATION MAP		PREPARED BY: J. B. STOVER & ASSOCIATES 1000 N. 1st St., Suite 300 Grand Jct., CO 81502 (970) 241-8118				REFERENCES C:\Vp_Dev\Updat\Map-D-Drive\FoodstomCoal\Foodstom\yahr\2021\MonitoringLocationMap	
DWG. NAME: 2021 AHR	DRMS I.D. No. C-1981-041	SCALE: NTS					

**SNOWCAP COAL COMPANY, INC.**  
**2021 ANNUAL HYDROLOGY REPORT**  
**OCTOBER 1, 2020 THROUGH SEPTEMBER 30, 2021**

**Introduction**

During the 2021 Water Year, the Year, the mines were idle. Mining ceased at the Roadside Portals on December 2, 1999. The North Mine was sealed on February 10, 2000. The Roadside South Mine was sealed on April 12, 2000. The South Fan was sealed May 22, 2000. The 2 West Portals were sealed on April 24, 2000. Production at the Roadside North utilized room and pillar mining with continuous miners and shuttle cars.

Reclamation of CRDA-2 was completed in 2002. The sediment retained by the drop structures in Coal Canyon was harvested for cover material. Material excavated during construction of the upper diversion ditch was also used as cover material. A small amount of cover material was obtained from CBA-1. Topsoil was obtained from Topsoil Stockpiles 2, 7, 8 and 9. Reclamation of CRDA-1 was also completed in 2002. Cover material was obtained from CBA-2. The road to CRDA-1 was left open to accept coal and refuse material from other ongoing reclamation activities. The road begins at the west end of Haul Rd No. 5 and extends to the top of CRDA-1.

The North Portal was regraded to approximate original contour during 2002. Backfill material came from areas filled near Coal Creek and around the coal stockpile area.

During 2002 the RSRDA was graded to final contours. The existing cover was graded off of the slope and used as cover below the first bench. Refuse material was cut from the pile to establish two 10' - 15' wide benches on 30' to 40' elevation intervals. This refuse material was placed in an extension of the pile to the north. Cover material was obtained from the RSRDA borrow area.

During 2003, a portion of the conveyor corridor was regraded and seeded. This work extended from the culvert under Excel's frontage road to the culvert under the railroad loop. The conveyor bridge over the Colorado River was removed during the year.

During 2004, the conveyor corridor, from the Xcel culvert south to Transfer Building #2 and east of the Colorado River where the conveyor tube crossed the river, was graded to approximate original contours and seeded.

No reclamation was performed in 2005 or 2006.

During 2007, a permit revision (PR3) was approved to change the land use at the South Portal from Fish and Wildlife to Industrial/Commercial. Final grading was completed for the approved reclamation plan.

During 2008, seeding was completed at the South Portal and the "G" Substation was removed, graded to approximate original contours and seeded.

During 2009, the rail spur lying south of I.9 Road was reclaimed, graded and seeded. A phase III bond release (SL5) was approved on the reclaimed conveyor corridor lying south of I.9 Road, and a permit revision (PR4) was approved to change the land use at the Unit Train Loadout from Fish and Wildlife to Industrial/Commercial. Halliburton Energy Services purchased the UTL and began construction of their commercial sand plant operations.

During 2010 coal fines from the UTL were hauled to CRDA-1 and reclamation of CRDA-1 road was finalized in September. Ponds 1 and 2, sewage lagoons, topsoil pile 4 along with other areas of the UTL were reclaimed, regraded and reseeded. A phase III bond release (SL6) was approved for the Commercial/Industrial portion of the South Portal.

During 2011 Pond 7, sumps and ditches at the North Decline and Pond 8 at the South Portal were reclaimed, regraded and reseeded. A phase III bond release (SL7) was approved for the UTL, Railroad Loop, the remainder of the conveyor corridor and the permanent flood control dike.

During 2012 Ponds 6, 10, 11 and 13, CBA#1 Sump and miscellaneous sedimentation control features at the North Portal and along Coal Creek were reclaimed, regraded and reseeded. A permit revision (PR5) was approved allowing Coal Creek and Coal Gulch to remain in their present alignment and allows for the North Portal upper diversion ditch and a portion of Topsoil Pile 2 to remain as permanent features.

During 2013 Pond 9 was reclaimed, regraded and reseeded.

No reclamation was performed in 2014.

No reclamation was performed in 2015.

No reclamation was performed in 2016. Bond release application SL8 was approved on November 14, 2015. With this approval 128 surface disturbed acres achieved Phase III release; 136.5 surface disturbed acres achieved Phase II release and 22.2 surface disturbed acres achieved Phase I release. Also released with SL-8 were 1288.9 unaffected acres and 744 undisturbed acres overlying underground workings.

No reclamation was performed in 2017. A permit revision (PR6) was approved to change the land use at the Roadside North Portal Area from Fish and Wildlife to Industrial/Commercial. Bond release applications SL9 and SL10 were approved releasing 13.1 acres from Phase II liability and 13.6 acres from Phase III liability. Also released were 0.2 acres of undisturbed acres overlying underground workings.

No reclamation was performed in 2018.

During 2019 a hydrologic communication repair above the South Portal Mine was completed as approved by TR69. This repair generated a disturbance of 0.4 acres which was regraded, seeded and mulched.

No reclamation was performed in 2020. Bond release application SL11 was approved releasing 2.4 acres from Phase II liability and 10.4 acres from Phase III liability. Also released with SL11 were 291.3 undisturbed acres overlying underground workings.

No reclamation was performed in 2021.

The general format of this report is the same as in previous years.

## **Surface Water**

Water flow and quality on the Colorado River is monitored by the U.S. Geologic Survey (USGS) at various locations. The closest location is Station No. 09095500, which is located upstream approximately 7 miles north east of the mine site. Water quality and flow from this site are used as a general representation of the Colorado River up gradient of the mining operation. There is a diversion to the Government Highline Canal, the addition of Plateau Creek and the addition of other minor drainages between the monitoring site and the mine site. Data Pages SQ-122 through SQ-125 includes information supplied by USGS on this site during the 2021 Water Year. The total flow at this site for the Year was 1,382,850 acre-feet which is 50% of the normal average flow for the period 1934 - 2021 (2,743,293). The estimated TDS load for the Year was 1.01 million tons. This estimate is made by converting values for conductivity reported on page SQ-125 to TDS per acre feet and multiplying by the monthly flow in acre feet. The low flow for the Year was recorded as 870 CFS on December 26, 2020. The river was carrying approximately 1.14 tons of TDS per acre-foot on December 26, 2020. This flow and TDS load equates to approximately 1975 tons of Total Dissolved Solids, TDS, being carried by the river past the mine that day. The mine discharge on January 4, 2021 (the closest monthly analysis), was 113.6 gpm @ 1260 mg/l TDS; resulting in approximately 0.86 tons of TDS being discharged. Comparing the calculated TDS load in the River at low flow and the mine discharge near the same date, the maximum increase in the River's TDS as a result of mine discharge would have been 0.04%.

The surface water monitoring points on Cottonwood and Rapid Creeks were suspended from monitoring with the approval of TR67 on February 23, 2016 therefore no current or future monitored will be conducted. Past monitoring of these points can be found on data pages SG-61, SG-62, SH-28 and SI-28. The Cottonwood and Rapid Creek flumes associated with SWGS 01, SWGS 02 and SWGS 03 were removed in August 2016.

Monitoring on Coal Creek and Jerry Creek started in 1995. The crest stage gages installed in Coal Canyon drainage and Jerry Creek in 1996 were destroyed by a storm in the summer of 1998. Discussions with DRMS indicated there was no need to monitor the upstream locations SWGS 07 and 09. The creeks were then only monitored at the lower monitoring points. The ephemeral flow in Coal Creek was measured at culverts located between the two refuse disposal areas, SWGS 06. These culverts provided a stable cross section and were accessible throughout the year. The intermittent flow in Jerry Creek was measured at the culvert near the

Highline Canal, SWGS 08. Beginning July 1999, instantaneous flows were monitored monthly. Monitoring was suspended for Jerry Creek (SWGS 08) with the approval of TR62 on 11/8/11. Monitoring was suspended for Coal Creek (SWGS 06) with the approval of TR67 on February 23, 2016. Therefore, no monitoring was performed during the Year.

There were four seeps included in the hydrologic monitoring in 1995. The locations of the seeps are shown on the Hydrologic Monitoring Map. They are located adjacent to Coal Canyon drainage and Jerry Creek. They are primarily evident by the white staining on the hillsides from evaporation of the seeps. None of them flow to the creek channel but generally evaporate within a couple of hundred feet of the source. On April 19, 2006, Snowcap Coal Company submitted a technical revision, TR50, requesting to discontinue seep monitoring. The request was approved by the Division on July 25, 2006. Therefore, no monitoring was performed during the Year.

There was no discharge from CDPS discharge points 005 thru 015 during the Year. These outfalls cover sediment pond discharges. Discharge point 015, now inactive, was permitted to allow pumping water from the south end of the Roadside South Portal out the 2 West portals. Discharge point 016 is permitted for gravity discharge from the northwest intake pool. It replaced outfalls 001 and 002 on March 31, 2002.

Discharge point 001 was primarily used as an overflow to a mine water system for the preparation plant during mine operations. During March and April 2000, a discharge pipe was installed from the No. 2 South Mains sump to outfall 001. The routing of this 4-inch diameter pipe is presented on permit Figure 14-6. The capacity of this discharge pipe was about 75 gpm. Flow ceased at discharge point 001 on March 31, 2002. Discharge point 001 was reclaimed during the 1<sup>st</sup> quarter of 2008 and is no longer operational.

Discharge point 002 was water siphoned from the reclaimed Northwest Intake Portal at the Roadside South Portals. Mine inflows that were not pumped to the preparation plant were routed to an abandoned portion of the mine for discharge from this point. The preparation plant was shut down during December 1999 so all mine inflows in excess of those handled by outfall 001, flow north to the lower portion of the mine where they were handled by the siphon, outfall 002. Flow ceased at discharge point 002 on March 31, 2002.

The following table presents the total dissolved solids concentration in Outfall 002.

Average TDS from Pages SE-8 = SE-11 Outfall 002				
Water Year	1999	2000	2001	2002
TDS (mg/l)	1558	1560	1500	1500



Discharge point 016 was put into service April 1, 2002. Discharge began April 3, 2002. This gravity discharge point handles all of the water that flows into the sealed South Portal. Since it is a gravity discharge point, the flow discharged will equal the flow into the mine. Table M20-1 presents a summary of the monthly flow from the mine. Data page SV-19 presents a listing of flow and water quality monitoring performed at this site during the Year. Data page SU-6 includes a full suite analysis performed on a sample collected during the Year. The average TDS value at discharge point 016 for the Year was 1235 mg/l.

Whole Effluent Toxicity (WET) tests were not performed during the Year. On May 3, 2005, Snowcap Coal Company requested, via letter to the CDPHE, the WET tests be terminated. This request was granted and the CDPS Permit was amended on June 27, 2005, becoming effective on August 1, 2005.

### **Ground Water**

The ground water monitoring points on Cottonwood and Rapid Creeks were suspended from monitoring with the approval of TR67 on February 23, 2016, therefore no monitoring was conducted for the Year. The monitoring wells associated with GWMS01 A&B, GWMS02 A&B, and GWMS03 A&B were plugged and abandoned on August 24, 2016. A copy of the abandonment report was included in the 2016 AHR.

Piezometers CRDA-01 thru 06 at the Cameo Refuse Disposal Areas (CRDA) No. 1 and No. 2 were not monitored during the Year. The monitoring was suspended for these piezometers with the approval of TR67 on February 23, 2016. The piezometers were removed and backfilled in May 2016 as specified on page 14-31 of SCC's permit document. Past monitoring shows the water levels in the piezometers were consistently below their critical depths and information can be found on data pages GC-1 through GC-25.

The past results of water level measurements at the unit train loadout are listed on Data page GB-2. Monitoring of these piezometers was discontinued with the approval of SL7 in April 2011 and the UTL-01, UTL-02, UTL-03 and UTL-04 piezometers were sealed and reclaimed on May 17, 2011. The Well Abandonment Reports were included in DRMS's quarterly report dated July 7, 2011. No monitoring was performed during the Year.

A former mine dewatering hole (N-1) located at the North Decline area of the mine is used to monitor the water level in the abandoned portions of the Roadside South Portal. Since discharge point 016 was put into service, the water level in N-1 is virtually constant and it is expected to stay at an elevation of about 4758. The results of monitoring N-1 are presented in Table M20-2.

In order to characterize the Rollins Sandstone two surface and two underground wells were installed during June 1997. The surface wells, Rollins-2 and Rollins-3, were installed at the unit

train loadout and the north decline respectively. The underground wells, Rollins-1 and Rollins-4, were installed in the North and South Portals respectively. Depth to water ranged from 56.5 feet below grade in the North Decline well to artesian in the North Portal well. Monitoring of these wells was performed in accordance with permit requirements. Prior depth to water data is presented on data page GE-1-1. Rollins-1 was sealed in December 1999 and Rollin-4 was sealed in April 2000. Rollins-2 and 3, with the approval of SL-7, were sealed in May 2011. The Well Abandonment Reports were included in DRMS's quarterly report dated July 7, 2011. No monitoring was performed during the Year.

### **Mine Water**

There was no annual mine inflow study performed during the Year since the North and South Portals have been sealed. The last annual mine inflow was performed during December 1999 and reported in the 1999 report.

### **Discharge Monitoring Reports (DMRs)**

DMRs are submitted monthly to the Colorado Department of Public Health and Environment with copies to the Division of Reclamation Mining and Safety and are included herein by reference.

### **Consumptive Use**

There was no consumptive use during the Year.

### **Impacts**

The average total dissolved solids for the mine discharges calculated with total flow for the Year yields the tons of TDS discharged for the year. Outfall 016 discharged a total of 331 tons of TDS to the river during the Year.

The 2021 TDS discharge represents 0.033% of the 1.01 million tons calculated to be carried by the River. At the Roadside South Portal, water is expected to perpetually discharge through outfall 016.

Based on flume monitoring from 1985 to 2016, no effects of mining were detected on flows in Cottonwood and Rapid Creeks. Mining ceased at the Roadside Portals on December 2, 1999. No further mining from either portal is anticipated in the foreseeable future.

Consumptive use will be insignificant in the future because mining and washing of coal has ceased. Consumptive use will be for hydro-seeding and dust control during reclamation operations.

## ROADSIDE SOUTH PORTAL DISCHARGE

2021 WATER YEAR

## OUTFALL 016

DATE	DAYS	METER	K-GAL.	GPM
9/14/20		417,135		
10/5/20	21	420,855	3720	123.0
10/13/20	8	422,202	1347	116.9
11/2/20	20	425,409	3207	111.4
11/10/20	8	426,648	1239	107.6
12/7/20	27	431,065	4417	113.6
12/15/20	8	432,421	1356	117.7
1/4/21	20	435,694	3273	113.6
1/12/21	8	437,045	1351	117.3
2/1/21	20	440,792	3747	130.1
2/9/21	8	442,349	1557	135.2
3/1/21	20	446,187	3838	133.3
3/9/21	8	447,775	1588	137.8
4/5/21	27	452,991	5216	134.2
4/13/21	8	454,517	1526	132.5
5/4/21	21	458,335	3818	126.3
5/17/21	13	460,669	2334	124.7
6/7/21	21	464,273	3604	119.2
6/15/21	8	465,578	1305	113.3
7/6/21	21	468,835	3257	107.7
7/14/21	8	470,042	1207	104.8
8/2/21	19	473,041	2999	109.6
8/11/21	9	474,728	1687	130.2
9/7/21	27	479,740	5012	128.9
9/15/21	8	481,094	1354	117.5
<b>Total</b>	<b>366</b>		<b>63959</b>	<b>121.1</b>

File TM3

Snowcap Coal Company, Inc.

N-1 Monitoring Well  
North Decline  
2021

N-1 Top of Pipe - Elevation 4833

Date	Depth to Water	Elevation
10/5/2020	75.40	4757.60
10/13/2020	75.41	4757.59
11/2/2020	75.42	4757.58
11/10/2020	75.43	4757.57
12/7/2020	75.40	4757.60
12/15/2020	75.40	4757.60
1/4/2021	75.41	4757.59
1/12/2021	75.40	4757.60
2/1/2021	75.36	4757.64
2/9/2021	75.34	4757.66
3/1/2021	75.38	4757.62
3/9/2021	75.32	4757.68
4/5/2021	75.35	4757.65
4/13/2021	75.37	4757.63
5/4/2021	75.38	4757.62
5/17/2021	75.40	4757.60
6/7/2021	75.38	4757.62
6/15/2021	75.40	4757.60
7/6/2021	75.41	4757.59
7/14/2021	75.44	4757.56
8/2/2021	75.37	4757.63
8/10/2021	75.30	4757.70
8/17/2021	75.33	4757.67
9/7/2021	75.39	4757.61
9/15/2021	75.40	4757.60
Min	75.30	4757.56
Max	75.44	4757.70
Average	75.38	4757.62
Desired Range	4755 to 4762	

Water-Data Report 2021

09095500 COLORADO RIVER NEAR CAMEO, CO -- Continued

**DISCHARGE, CUBIC FEET PER SECOND****YEAR 2020-10-01 to 2021-09-30****DAILY MEAN VALUES**

[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2020	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021
1	1,710	1,430	1,160	e1,030	1,140	1,030	1,270	2,290	4,420	2,510	2,480	1,960
2	1,650	1,410	1,190	e1,080	1,100	1,040	1,230	2,570	4,390	2,610	2,400	2,050
3	1,620	1,390	1,120	e1,090	1,160	1,090	1,270	2,840	4,430	2,530	2,510	2,150
4	1,600	1,390	1,010	e1,180	1,220	1,120	1,540	2,880	5,010	2,490	2,390	2,220
5	1,610	1,400	1,020	e1,230	1,170	1,080	1,730	2,580	5,940	2,270	2,900	2,220
6	1,600	1,390	1,060	e1,180	1,140	1,110	1,930	2,180	6,350	2,190	2,400	2,200
7	1,600	1,370	1,080	e1,120	1,170	1,090	2,160	2,050	6,110	2,340	2,260	2,140
8	1,600	1,480	1,090	e1,100	1,150	1,130	2,010	2,210	e6,080	2,220	2,130	2,040
9	1,620	1,500	1,060	e1,090	1,130	1,150	1,850	2,680	5,940	2,060	2,050	2,010
10	1,620	1,450	1,020	e1,090	1,150	1,230	1,780	2,700	5,520	1,900	1,990	2,000
11	1,610	1,360	1,020	e1,030	1,200	1,260	1,740	2,540	5,160	1,890	1,950	1,990
12	1,630	1,370	1,170	e895	1,210	1,140	1,910	2,250	4,890	1,880	1,930	2,040
13	1,650	1,380	1,030	e1,060	1,320	1,170	1,970	2,120	4,580	1,880	1,950	2,030
14	1,640	1,370	990	e1,160	1,300	1,270	1,980	2,020	4,350	2,060	1,930	1,950
15	1,600	1,400	1,030	e1,130	1,210	1,220	1,910	1,940	e4,070	2,190	1,980	1,900
16	1,580	1,320	1,100	e1,220	1,110	1,190	1,960	2,220	e3,890	2,320	1,940	1,890
17	1,580	1,310	1,100	e1,250	1,200	1,140	1,970	2,710	3,760	2,220	2,060	1,840
18	1,600	1,360	1,140	e1,250	1,140	1,140	1,990	3,110	3,640	2,020	2,040	1,810
19	1,640	1,340	1,190	e1,220	1,100	1,120	2,010	3,100	e3,510	1,960	2,160	1,840
20	1,610	1,350	1,170	e1,150	1,070	1,170	2,050	3,400	3,390	1,780	2,350	1,800
21	1,610	1,370	1,140	e1,160	1,190	1,260	2,020	3,910	3,160	1,800	2,470	1,710
22	1,650	1,350	1,210	e1,180	1,170	1,360	1,960	4,140	2,970	1,940	2,340	1,690
23	1,610	1,320	1,200	e1,260	1,170	1,360	2,020	4,150	2,840	2,160	2,240	1,650
24	1,580	1,350	e1,050	1,250	1,140	1,290	1,990	4,460	2,650	2,340	2,130	1,570
25	1,650	1,320	892	1,190	1,180	1,260	1,990	4,050	2,820	2,270	2,050	1,540
26	1,740	1,310	870	1,150	1,190	1,270	1,980	4,170	3,080	2,140	2,030	1,510
27	1,750	1,270	1,010	1,080	1,130	1,250	1,940	4,240	3,040	2,000	2,030	1,480
28	1,570	1,260	1,200	1,090	1,170	1,190	1,890	4,120	2,880	1,950	2,040	1,510
29	1,560	1,190	1,200	1,150		1,170	2,030	4,530	2,610	1,990	2,040	2,380
30	1,590	1,130	e1,070	1,180		1,170	2,070	4,670	2,500	1,970	1,980	1,930
31	1,490		984	1,190		1,250		4,610		2,300	1,940	
<b>Total</b>	50,170	40,640	33,580	35,430	32,729	36,720	56,150	97,440	124,000	66,180	67,090	57,050
<b>Mean</b>	1,618	1,355	1,083	1,143	1,169	1,185	1,872	3,143	4,133	2,135	2,164	1,902
<b>Max</b>	1750	1500	1210	1260	1320	1360	2160	4670	6350	2610	2900	2380
<b>Min</b>	1490	1130	870	895	1070	1030	1230	1940	2500	1780	1930	1480
<b>Ac-ft</b>	99,510	80,610	66,600	70,280	64,920	72,830	111,400	193,300	245,900	131,300	133,100	113,200

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 2021, BY WATER YEAR  
(WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	2,196	1,927	1,666	1,566	1,583	1,802	3,111	8,707	12,060	5,672	2,826	2,259
Max	3,731	3,253	3,002	2,621	2,775	3,365	8,615	20,290	25,829	17,430	6,571	4,271
(WY)	(1985)	(1985)	(1985)	(1985)	(1986)	(1986)	(1962)	(1984)	(1984)	(1957)	(1984)	(1984)
Min	1,084	1,038	1,004	940	941	1,019	1,428	2,536	2,606	1,515	1,332	1,243
(WY)	(1935)	(1935)	(1935)	(1964)	(1935)	(1935)	(2013)	(1977)	(2002)	(1934)	(1940)	(1934)

Water-Data Report 2021  
09095500 COLORADO RIVER NEAR CAMEO, CO -- Continued

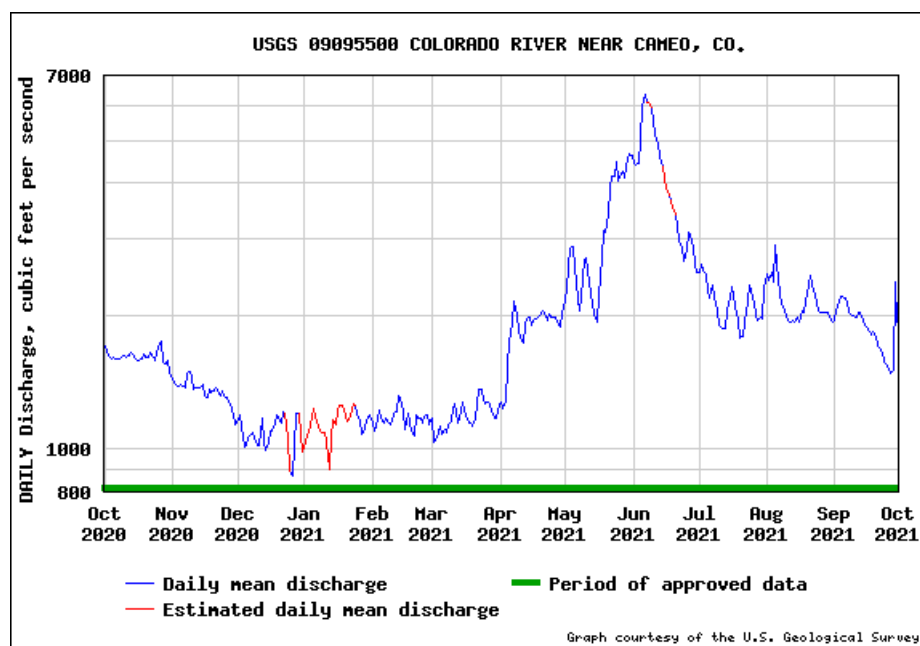
**SUMMARY STATISTICS**

	<b>Water Year 2021</b>		<b>Water Years 1934 - 2021</b>	
<b>Annual total</b>	697,200			
<b>Annual mean</b>	1,910		3,787	
<b>Highest annual mean</b>			7,605	1984
<b>Lowest annual mean</b>			1,751	2002
<b>Highest daily mean</b>	6,350	Jun 06	38,000	May 26, 1984
<b>Lowest daily mean</b>	870.0	Dec 26	608.0	Dec 23, 2012
<b>Annual 7-day minimum</b>	1,032	Dec 25	852.4	Dec 24, 1939
<b>Maximum peak flow</b>	6,610 <sup>a</sup>	Jun 06	39,300 <sup>a</sup>	May 26, 1984
<b>Maximum peak stage</b>	8.65 <sup>b,c</sup>	Jan 04	14.36	May 26, 1984
<b>Annual runoff (cfsm)</b>	0.239		0.474	
<b>Annual runoff (inches)</b>	3.25		6.44	
<b>10 percent exceeds</b>	3,056		9,020	
<b>50 percent exceeds</b>	1,640		2,160	
<b>90 percent exceeds</b>	1,100		1,360	

<sup>a</sup> Discharge affected to unknown degree by Regulation or Diversion

<sup>b</sup> Gage height affected by backwater

<sup>c</sup> Max gage height not associated with peak discharge



Water-Data Report 2021

09095500 COLORADO RIVER NEAR CAMEO, CO -- Continued

**SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25  
DEGREES CELSIUS  
YEAR 2020-10-01 to 2021-09-30  
DAILY MEAN VALUES**

<b>Day</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>
	<b>2020</b>	<b>2020</b>	<b>2020</b>	<b>2021</b>	<b>2021</b>	<b>2021</b>	<b>2021</b>	<b>2021</b>	<b>2021</b>	<b>2021</b>	<b>2021</b>	<b>2021</b>
<b>1</b>	1,010	1,230	1,430	1,500	1,350	1,340	1,270	851	496	826	946	947
<b>2</b>	1,030	1,260	1,420	1,550	1,330	1,370	1,240	795	508	830	1,290	943
<b>3</b>	1,050	1,280	1,430	1,520	1,360	1,410	1,240	748	516	824	988	939
<b>4</b>	1,070	1,280	1,420	1,490	1,360	1,450	1,230	729	495	854	900	903
<b>5</b>	1,100	1,280	1,510	1,470	1,350	1,330	1,110	699	431	838	845	889
<b>6</b>	1,100	1,270	1,560	1,410	1,350	1,370	1,020	748	383	889	750	888
<b>7</b>	1,110	1,260	1,550	1,380	1,360	1,370	939	830	380	893	840	888
<b>8</b>	1,110	1,260	1,510	1,390	1,370	1,380	870	867	389	880	877	902
<b>9</b>	1,100	1,260	1,540	1,420	1,360	1,360	902	812	398	891	912	933
<b>10</b>	1,100	1,230	1,550	1,430	1,360	1,330	937	724	417	925	935	935
<b>11</b>	1,100	1,220	1,530	1,460	1,360	1,310	969	718	440	962	947	940
<b>12</b>	1,110	1,260	1,520	1,490	1,320	1,270	983	757	460	966	951	938
<b>13</b>	1,110	1,260	1,520	1,530	1,300	1,310	933	823	481	964	952	925
<b>14</b>	1,100	1,250	1,500	1,640	1,290	1,310	911	859	502	967	941	935
<b>15</b>	1,110	1,270	1,540	1,520	1,300	1,280	906	893	526	---	938	989
<b>16</b>	1,130	1,260	1,560	1,440	1,310	1,270	918	899	544	---	928	956
<b>17</b>	1,140	1,290	1,540	1,420	1,360	1,310	905	822	557	875	929	969
<b>18</b>	1,150	1,320	1,480	1,340	1,370	1,320	906	699	570	884	898	988
<b>19</b>	1,130	---	1,450	1,300	1,380	1,340	897	655	589	925	908	1,000
<b>20</b>	1,130	---	1,410	1,300	1,360	1,350	891	644	609	934	906	1,010
<b>21</b>	1,130	---	1,380	1,300	1,420	1,330	904	587	632	978	854	1,030
<b>22</b>	1,130	---	1,400	1,340	1,370	1,280	893	529	657	987	847	1,060
<b>23</b>	1,110	---	1,370	1,330	1,330	1,220	894	526	694	948	867	1,070
<b>24</b>	1,130	1,270	1,370	1,340	1,330	1,200	891	505	721	917	873	1,080
<b>25</b>	1,140	1,280	1,420	1,310	1,340	1,230	898	505	767	870	902	1,130
<b>26</b>	1,130	1,290	1,510	1,320	1,330	1,240	902	531	741	880	930	1,140
<b>27</b>	1,130	1,290	1,610	1,380	1,320	1,260	902	514	872	900	932	1,150
<b>28</b>	1,110	1,320	1,580	1,390	1,330	1,260	926	525	778	934	926	1,170
<b>29</b>	1,180	1,330	1,430	1,390		1,280	936	509	785	963	926	1,080
<b>30</b>	1,190	1,360	1,430	1,360		1,310	876	485	809	921	925	1,110
<b>31</b>	1,180		1,440	1,350		1,310		476		914	942	
<b>Max</b>	1190		1610	1640	1420	1450	1270	899	872		1290	1170
<b>Min</b>	1010		1370	1300	1290	1200	870	476	380		750	888

Mean 1115 1275 1490 1413 1345 1313 967 686 572 908 920 995



Snowcap Coal Company, Inc.  
2021 Water Year

**NPDES POINT 016**

**Chemical Analysis**

**SU-6**

**Field Parameters**

		8/20/2018	8/26/2019	8/17/2020	8/17/2021
pH	SU	7.18	7.32	7.06	7.09
Conductivity	umhos/cm	2000	2100	2000	1960
Temperature	(C)	20.9	21.2	21.1	20.9

**Laboratory Results**

		8/20/2018	8/26/2019	8/17/2020	8/17/2021
Carbonate ( $\text{CO}_3^{-2}$ )	mg/l	54.3	14.6	40.1	<2.0
Aluminum, Dissolved	mg/l	<0.03	<0.05	<0.05	<0.05
Arsenic, Dissolved	mg/l	<0.0002	<0.0002	<0.0002	0.00037
Barium, Dissolved	mg/l	1.14	1.52	1.46	1.44
Boron, Dissolved	mg/l	0.82	0.86	0.83	0.798
Cadmium, Dissolved	mg/l	<0.0001	<0.00005	<0.00005	<0.00005
Calcium, Dissolved	mg/l	11.1	11	11.2	10.5
Chloride, Dissolved	mg/l	26.9	23.6	24.7	20.1
Chromium, Dissolved	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Copper, Dissolved	mg/l	<0.01	<0.01	<0.01	<0.01
Fluoride, Dissolved	mg/l	1.8	1.6	1.7	1.75
Hardness, (as Ca Co3)	mg/l	28.0	28.0	28.0	26.0
Iron, Dissolved	mg/l	<0.02	<0.03	<0.06	<0.06
Lead, Dissolved	mg/l	<0.0001	0.0006	0.0001	<0.0001
Magnesium, Dissolved	mg/l	5.6	5.4	5.40	5.07
Manganese, Dissolved	mg/l	0.027	0.03	0.04	0.041
Mercury, Dissolved	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum, Dissolved	mg/l	<0.02	<0.02	<0.02	<0.02
Nickel, Dissolved	mg/l	<0.008	<0.008	<0.008	<0.008
Nitrate ( $\text{NO}_3^{-1}$ )	mg/l	<0.02	<0.02	<0.02	<0.02
Phosphate ( $\text{PO}_4^{-3}$ , as P)	mg/l	0.5	0.47	0.43	0.45
Potassium, Dissolved	mg/l	3.0	3.2	3.1	2.92
Selenium, Dissolved	mg/l	<0.0001	0.0001	<0.0001	<0.0001
Sodium, Dissolved	mg/l	495	511	464	439
Solids, Total Dissolved	mg/l	1250	1240	1230	1220
Solids, Total Suspended	mg/l	<5.0	<5.0	<5.0	<5.0
Sulfate, $\text{SO}_4$	mg/l	38.6	5.3	15.80	<1.0
Zinc, Dissolved	mg/l	<0.01	<0.01	<0.02	0.039
Ammonia, Nitrogen, $\text{NH}_3$	mg/l	0.66	0.64	0.64	0.538
Bicarbonate ( $\text{HCO}_3^{-1}$ )	mg/l	1060	1100	1140	1090
SAR	Ratio	31.0	32.0	29.0	28.0

## Page SV-20

DATE	METER	FLOW GPM	PH SU	COND. umhos/cm	TEMP C	TSS		TDS		Iron (TR)		Arsenic (T)		Cadmium (PD)		Copper (PD)		Cyanide (WAD)		Lead (PD)		Selenium (PD)		Silver (PD)		Sulfide (H2S)												
						Month	Unit	Qrtly	Unit	Qrtly	Unit	2/Mo	Unit	2/Mo	Unit	2/Mo	Unit	2/Mo	Unit	2/Mo	Unit	2/Mo	Unit	2/Mo	Unit	2/Mo	Unit	2/Mo	Unit									
9/14/2020	417,135,000																																					
10/5/2020	420,855,000	123.0	7.3	2000	20.1	<	5.0	mg/l	=	1250	mg/l	=	18.5	ug/l	<	0.20	ug/l	<	0.05	ug/l	<	0.8	ug/l	<	0.10	ug/l	<	0.10	ug/l	=	0.23	mg/l						
10/13/2020	422,202,000	116.9	7.0	2000	19.7										<	0.20	ug/l	<	0.05	ug/l	<	0.8	ug/l	<	0.10	ug/l	<	0.10	ug/l	<	0.30	mg/l						
11/2/2020	425,409,000	111.4	7.4	2000	20.6	<	5.0	mg/l							<	0.20	ug/l	<	0.05	ug/l	<	0.8	ug/l	<	0.10	ug/l	<	0.10	ug/l	<	0.50	mg/l						
11/10/2020	426,648,000	107.6	7.4	2000	18.9										<	0.20	ug/l	<	0.05	ug/l	<	0.8	ug/l	<	0.30	ug/l	=	0.11	ug/l	=	0.26	mg/l						
12/7/2020	431,065,000	113.6	7.0	2000	18.7	=	6.0	mg/l							<	0.20	ug/l	<	0.05	ug/l	<	0.8	ug/l	<	0.30	ug/l	=	0.10	ug/l	=	0.66	mg/l						
12/15/2020	432,421,000	117.7	7.3	2000	17.6										<	0.20	ug/l	<	0.05	ug/l	<	0.8	ug/l	=	5.4	ug/l	=	0.39	ug/l	=	0.11	ug/l	=	0.57	mg/l			
1/4/2021	435,694,000	113.6	7.1	2000	16.7	<	5.0	mg/l	=	1260.0	mg/l	=	17.4	ug/l	<	0.20	ug/l	<	0.05	ug/l	=	3.4	ug/l	<	3.00	ug/l	=	0.17	ug/l	=	0.12	ug/l	<	0.10	ug/l	=	0.31	mg/l
1/12/2021	437,045,000	117.3	7.1	2000	16.9										<	0.20	ug/l	<	0.05	ug/l	=	3.7	ug/l	<	3.00	ug/l	=	0.32	ug/l	=	0.30	ug/l	<	0.10	ug/l	=	0.49	mg/l
2/1/2021	440,792,000	130.1	7.0	2000	16.9	<	5.0	mg/l							<	0.20	ug/l	<	0.05	ug/l	=	4.1	ug/l	<	3.00	ug/l	=	0.16	ug/l	<	0.10	ug/l	<	0.10	ug/l	=	0.53	mg/l
2/9/2021	442,349,000	135.2	7.0	2000	18.1										<	0.20	ug/l	<	0.05	ug/l	=	3.0	ug/l	<	3.00	ug/l	=	0.21	ug/l	<	0.10	ug/l	<	0.10	ug/l	=	0.49	mg/l
3/1/2021	446,187,000	133.3	7.1	2000	19.8	<	5.0	mg/l							<	0.20	ug/l	<	0.05	ug/l	=	3.0	ug/l	<	3.00	ug/l	<	0.10	ug/l	<	0.10	ug/l	<	0.10	ug/l	=	0.48	mg/l
3/9/2021	447,775,000	137.8	7.1	2000	20.5										<	0.20	ug/l	<	0.05	ug/l	=	5.8	ug/l	<	3.00	ug/l	=	0.42	ug/l	=	0.19	ug/l	<	0.10	ug/l	=	0.51	mg/l
4/5/2021	452,991,000	134.2	7.1	2000	19.2	<	5.0	mg/l	=	1240.0	mg/l	=	20.3	ug/l	<	0.20	ug/l	<	0.05	ug/l	<	0.8	ug/l	<	3.00	ug/l	<	0.10	ug/l	<	0.10	ug/l	<	0.10	ug/l	=	0.37	mg/l
4/13/2021	454,517,000	132.5	7.0	2000	19.5																																	

Arsenic, Cadmium, Copper, Cyanide, Lead, Selenium, Silver & Sulfide - 2 Days/Month