

## MEMORANDUM

VIA EMAIL

TO: JAMIE MILLER, EPA  
DUSTIN MCNEIL, CDPHE

FROM: DAVE HINRICHS, NEWFIELDS  
KERRI SITLER, NEWFIELDS

SUBJECT: SURFACE WATER AND GROUNDWATER MONITORING IN 2020  
EAGLE MINE SITE

DATE: FEBRUARY 13, 2020

CC: JEFF GROY, VIACOMCBS INC.  
RUSS CEPKO, VIACOMCBS INC.

---

This Memorandum describes the surface water and groundwater monitoring program that ViacomCBS Inc/TCI Pacific Communications, LLC proposes for 2020. This plan presents the combined summary of the sampling and analyses requirements under the existing remedy and the Preliminary Design Investigation Field Sampling Plan (PDI FSP, NewFields April 2019). The monitoring objectives and the reporting requirements of the PDI FSP are not repeated in this monitoring plan but rather are included by reference. All samples will be obtained in accordance with the Quality Assurance Project Plan (QAPP, NewFields March 2019) and the project Standard Operating Procedures (SOPs) attached to the QAPP.

In the spring, typically described as March and April prior to snowmelt that generates flows greater than 150 cubic feet per second (cfs), copper, cadmium, and zinc concentrations within Segment 5 of the Eagle River has at times exceeded the Water Quality Standards (WQS) that were made effective January 1, 2009. Numerous studies and zinc loading estimates have identified a seasonal metal load that enters Segment 5a of the Eagle River in the Belden area between stations E-3 and E-10 and at Rock Creek, Station T-10.

### Monitoring Objectives

The objectives of the surface water monitoring are to assess the timing and duration of spring metals loading to the river, to provide data for monitoring long-term water quality trends, and to assess the on-going functionality of the remedy in Segment 5b. While data will be compared to the WQS, true compliance monitoring will not commence at the site until additional remedial activities have been completed or pursuant to a Consent Decree (in prep) for long-term operation and maintenance.

Groundwater sampling in Belden and Rock Creek and additional surface water sampling will be conducted pursuant to the PDI FSP and will be coordinated with the existing remedy surface water monitoring.

The objective of the groundwater level monitoring near the East Trench is to ensure that the trench is functioning as designed.



## Surface Water Monitoring

### Locations

The Eagle River will be monitored at:

- E-3, Eagle River above Belden, Segment 2 – **when ice/snow conditions allow**
- E-10, Eagle River above Rock Creek, Segment 5a
- E-12A, Eagle River below Old Tailings Pile and Rex Flats, Segment 5a
- E-15, Eagle River below Cross Creek, Segment 5b
- E-22, Eagle River below Minturn, Segment 5c.

Eagle River tributaries will be monitored at:

- T-10, Rock Creek at mouth
- T-18, Cross Creek at culvert near mouth.

### Monitoring Frequency

Water quality samples will be collected at each of the above-listed Surface Water Monitoring locations every other week in March and April, terminating when river flow exceeds approximately 150 cfs. An additional round of water quality samples will be collected from all listed locations in September or October.

Additionally in accordance with the PDI FSP, annual spring (March and April) river surface water monitoring program at surface water stations E-3, E-10, E-12A, and T-10 will be expanded from bi-weekly (every other week) to weekly. This weekly sampling will be coordinated with the groundwater sampling (see below). Samples will be collected, if at all possible, in the morning to reduce the effects of snowmelt dilution.

### Analyte List

The following field parameters and analyses will be measured in surface water samples:

- Specific Conductance, field
- Temperature, field
- Arsenic, total
- Cadmium, dissolved
- Calcium, dissolved
- Copper, dissolved
- Magnesium, dissolved
- Zinc, dissolved.

### Flow Measurements

Flow estimates for the river will be made using the USGS gage at station E-12A and the correlation curves for other main stem stations established in the 2007 Eagle Mine Site Annual Report. Flow for Rock Creek station T-10 will be estimated during each sampling event using a Manning roughness equation for pipe flow in a 72-inch diameter pipe. The estimate requires a measurement of the depth of water at the invert. Equation constants for flow in the Rock Creek culvert are the slope of the pipe (0.0121 ft/ft) and a manning roughness factor of 0.009. Flow



estimates for Cross Creek at station T-18 will be made using the USGS gage at Cross Creek near Minturn (USGS 09056100).

## **Preliminary Design Investigation Groundwater Monitoring**

### ***Locations***

Each sampling location will be sampled and flow measured via methods described in the PDI FSP. Specific wells and discharge locations are provided here only in summary.

The groundwater in Belden will be sampled and pump rate monitored, via the well discharge pipe to the pipeline, at:

- Pumping wells BW-10, BW-3R, and BW-9R
- Copper Trench from access port/well BTS-1.

The groundwater in the Rock Creek canyon will be sampled and flow/pump rate monitored at:

- Well RX-3, from the discharge pipe in the Pumpback shed
- Well EDS-3, from the discharge pipe at the Rock Creek manhole.

### ***Monitoring Frequency***

Water quality samples will be collected at each of the above-listed groundwater monitoring locations every week in March and April during the PDI proof-of-concept test as specified in the PDI FSP. Sampling, coordinated with the surface water sampling (as discussed above), will be conducted on the same day as the surface water monitoring.

Sampling will begin the first week of March or when groundwater appears in the well BTS-1 if dry in the first week of March. Sampling will terminate when river flow exceeds approximately 150 cfs at the E-12A gage or when pumping slows due to insufficient groundwater recharge.

### ***Analyte List***

The following field parameters and analyses will be measured in groundwater samples:

- Specific Conductance, field
- Temperature, field
- Arsenic, total
- Cadmium, total
- Copper, total
- Zinc, total.

## **Underground Mill Pumping**

The pool of water that accumulates in the underground Mill Level at Belden is periodically pumped out to the treatment plant to maintain a low Mill pool level. If the Mill Level pump is operated during the test period, it will be sampled at a discharge location underground on the Mill Level. The analyte list for the Mill Level sample will be the same as groundwater (see above). See the PDI FSP for sampling methodology.



## **East Trench Groundwater Level Monitoring**

A HOBO water level logger was installed in the ET-1 monitoring well at the East Trench in January 2013. The HOBO logger automatically records water levels at 18-hour intervals. Data from the data logger will be downloaded periodically and used to monitor the effect of maintenance activities on the East Trench groundwater collection system. The ET-1 water level data are presented in the Annual Report.

## **Other samples**

Other sampling may be conducted in 2020 pursuant to the Consent Decree (in prep). This sampling would include but is not limited to: the mine water discharge at the vault in Rock Creek (MDD vault) and groundwater collected by the East Trench and North Trench at the respective sumps. Schedule and methodology for any additional sampling will be approved by EPA and CDPHE prior to collection.