

MEMORANDUM

VIA EMAIL

TO: LES SIMMS, EPA
WENDY NAUGLE, CDPHE

FROM: DAVE HINRICHS, NEWFIELDS
KERRI SITLER, NEWFIELDS

SUBJECT: SURFACE WATER AND GROUNDWATER MONITORING IN 2015
EAGLE RIVER MINE SITE

DATE: DECEMBER 19, 2014

CC: JEFF GROY, CBS OPERATIONS INC.
RUSS CEPKO, CBS OPERATIONS INC.

This Memorandum describes the monitoring program that CBS Operations Inc. (CBS) proposes for 2015.

In the spring, typically described as March and April prior to snowmelt that generates flows greater than 150 cubic feet per second, copper, cadmium, and zinc concentrations within Segment 5 of the Eagle River has at times exceeded the Water Quality Standards 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 Water Quality Standards, true compliance monitoring will not commence at the Site until additional remedial activities have been completed.

The objective of the groundwater level monitoring near the East Trench is to insure that the trench is functioning as designed to capture groundwater before it enters the Eagle River.

Monitoring Program

The proposed monitoring program focuses on Segment 5 of the Eagle River.

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.

Surface Water 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.

Surface Water Analyte List

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

- Specific Conductance, field
- Temperature, field
- Arsenic, total recoverable
- 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 an equation for flow in a 72- inch diameter pipe. The estimate requires two measurements, the depth of water at the invert and the velocity of flow in feet/second (the culvert length of 95 feet divided by the time in seconds). Flow for Cross Creek station T-18 will be made using the USGS gage at Cross Creek near Minturn (USGS 09056100).

Underground Mill Pumping and Sampling

The pool of water that accumulates in the underground Mill is measured with a dedicated staff gauge periodically and pumped out to the treatment plant as necessary to maintain a low Mill pool level. If water is pumped from the Mill level, at least one sample will be collected and tested for total arsenic, cadmium, copper and zinc in order to estimate the metal load captured by pumping. An estimate of the gallons pumped will be made.

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 U20 loggers automatically record 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.