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JUN 20 2017

DIVISION OF RECLAMATION MINING AND SAFETY

Mr. Michael Cunningham
Division of Reclamation, Mining and Safety -- Denver Office

June 20, 2017

RE: Notice of Deficiencies in NOI File No. P2016-020 (MD01)

Dear Mr. Cunningham,

Thank you for your letter of June 19, 2017 which contained a detailed review of the NOI Amendment submitted May 23rd and noted deficiencies in the NOI. We appreciate and welcome your review as this process assists us in achieving a better quality outcome from the work program. For clarity of our response, I have excerpted each deficiency and provided or referenced our response as appropriate, within the text, below:

1. The Applicant is proposing to construct two dewatering wells in an effort to prevent water intrusion into the London Mine. Please describe how the dewatering wells will facilitate the investigation of mineral deposits at the London Mine. Will the dewatering wells allow access to portions of the mine which are currently inaccessible? If so, describe the type of mineral investigation which will occur in these areas. In the event the Applicant submits any future modifications to the NOI, it will need to be conclusively demonstrated that the modification is being done to facilitate the searching or investigation of a mineral deposit as it relates to the pursuit of a Reclamation Permit. Any additional activities related strictly to water development would not be appropriate under an NOI or a Reclamation Permit.

   At the present time the Galloway and related U-breccia deposit is underwater. Drill intercepts through the U-breccia in the 1980s show 0.5 – 1.5 oz/ton gold intercepts beneath and to the west of the main level of the water tunnel but these were not followed up because of the increased cost of dewatering at the time and the non-compliant status of the discharge since the 1980s through 2016. Water upwells at the present time from the Galloway workings into the Water Tunnel and a full program of underground or surface based drilling could not be conducted unless the water flow potential was reduced or eliminated. We cannot drill out the resource without posing the risk of dispersed artesian flow through the mineralization zone into the mine workings, all of which flow would pass through pyritic Belden Shale and could degrade the water quality in the Water Tunnel level. Both of the large diameter holes proposed will intercept the mineralization and allow for extraction of a larger sample for evaluation and processing. Cuttings recovered from the mineralized area will be evaluated for gold content and geochemistry characteristics (Acid/Base accounting, base metal content, and deportment under flotation or gravity separation as appropriate), and small test samples will be provided to a potential partner with a processing facility in Colorado for consideration for processing in their mill circuit.

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Any further drilling of the potential breccia deposit will be proposed in a subsequent modification to the NOI once we understand the results of this phase of drilling and ensure that the dewatering is effectively decreasing the potential for artesian conditions.

2. The Applicant has provided a copy of a letter from the U.S. Environmental Protection Agency (EPA) which provided an authorization by rule for injections of mine water back into the mine workings for pilot test remediation. Please clarify if the pumping of water from the proposed dewatering wells into the mine workings will require any further authorization under the EPA's Underground Injection Control (UIC) Program. In addition, the Division requests a copy of the application which was submitted to the EPA's UIC Program.

   The EPA Application has been provided electronically by copy of the emailed application and supporting addenda to EPA.

   In our view no further authorization is required. This conclusion is based on EPA's statement in their approval letter that no permit is required to undertake the proposed activities, but under our "no surprises" policy with all regulatory agencies, we will reach out to EPA and update Mr. Boomgaard on our progress and request his written concurrence once we have completed one year of in-mine full scale treatment.

3. Please indicate what type of well permit will be obtained for the dewatering wells and confirm the wells will be constructed in accordance with the Office of State Engineer's Water Well Construction Rules.

   Our counsel has conveyed to DWR (Ms. Tracy Kosloff) our request to issue a permit under C.R.S. 37-90-137(2) for a general well permit. The email to DWR was provided to DRMS under separate cover by email.

4. The NOI Application references trenching from the drill pads to control and direct developed water to the Ophir Tunnel. Please provide additional detail on how the developed water will be conveyed from the wells into the London Mine workings. Will the water gravity flow from the drill pads into the mine? Will the water flow through open trenches or through pipes placed in the trenches?

   We will use a pitless adapter to connect the column pipe to a 12" HDPE pipe which will be conveyed in a buried trench from the well to the entrance of the Ophir Tunnel. In the Ophir, that 12" pipe will traverse the workings and discharge into the main Water Tunnel level at the decline ramp that connects the Ophir workings with the Water Tunnel. Water flow will be pumped to surface and flow into the workings without any additional pumps. The water flow from well LM – 1.0 will flow completely by gravity to the release point in the mine, whereas LM-2.5 flow will still flow slightly uphill until it crests within the Ophir tunnel and then flow by gravity thereafter. All flow will be in pipes until entering the mine, and within pipes in the mine until it is conveyed to a point where it will gravity flow to the sedimentation/treatment and monitoring discharge location WT001.

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5. Please provide a map which shows the location of all proposed surface disturbance (drill pads, trenching, road improvements, portal rehabilitation) relative to the London Mine. In addition, provide a map of the London Mine workings which illustrates the pathway water will take from the Ophir Tunnel to the discharge location.

This figure shows in black outline the area of disturbance for the drill pads, in red the line of the trenching planned from the wells to the Ophir Portal, in blue the road improvement area, and in green the portal rehabilitation as proposed.

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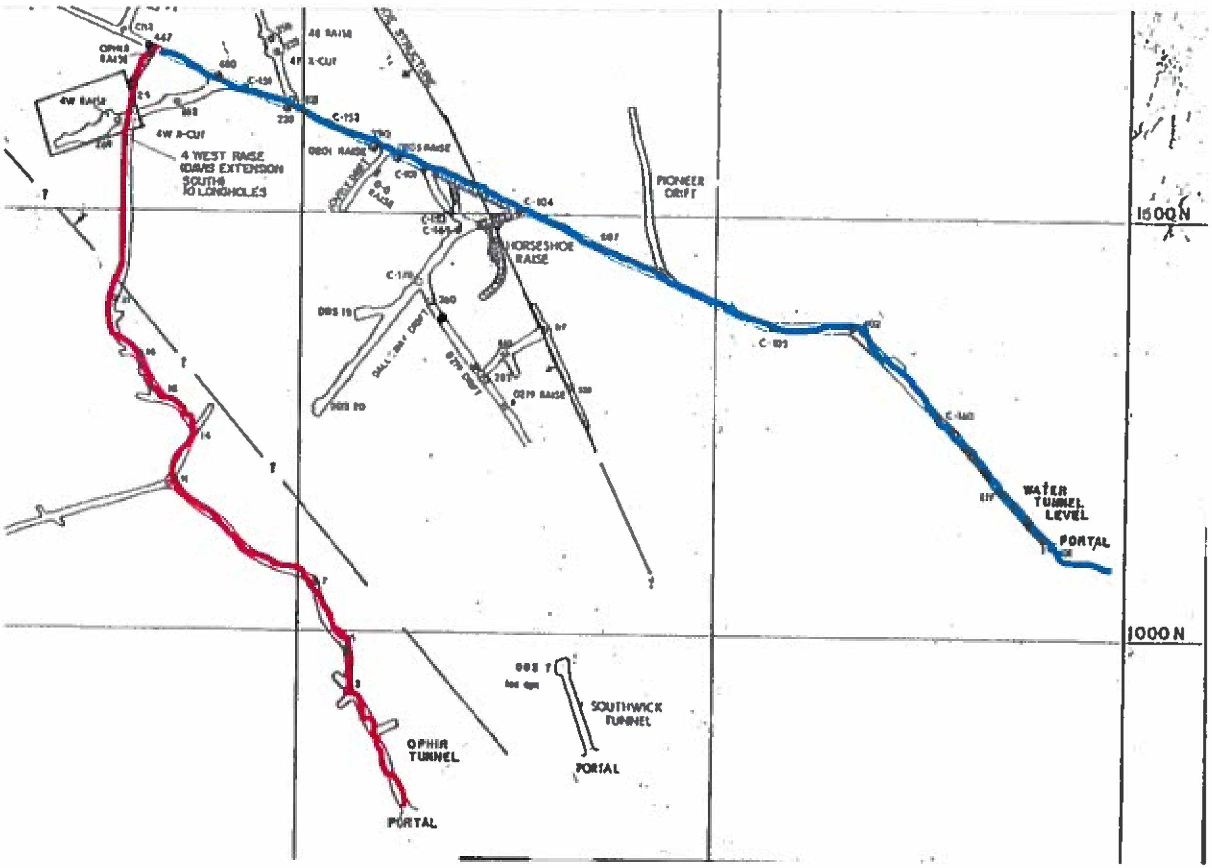

This figure depicts the pathway of the water through the Ophir Tunnel workings (in red) to join with the main flow on the Water Tunnel level (in blue) which emerges at the Portal and is treated using flocculation (as needed), sedimentation, and pH adjustment pursuant to our Consent Decree with CDPHE and the discharge permit CO-0038334.

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6. The NOI Application states the drill cuttings from the dewatering boreholes will be disposed of in the existing sludge storage area. Please specify the final fate of the sludge contained in the storage area.

As the sludge is principally iron-hydroxide with excess lime and CKD residuals from ineffective mixing pursuant to the Division of Mines and Geology testing program (using 319 funds from EPA granted in 1997) it is MineWater's view that the sludge is geochemically stable and will therefore be permanently stored in its present location. Drill cuttings will be amended with lime and also stored in a similar manner. At high pH the exposed silica from the cuttings will tend to react as a pozzolan with metal hydroxides, and cause interlocking of minerals and will exhibit cementitious characteristics. The sludge is beneficial to water quality unless a source of acid is introduced that would be excess over the amount of lime residual. To avoid pyrite from the cuttings causing a long-term source of acid, more lime than pyrite (on a stoichiometric basis) will be provided with the cuttings.

7. The Applicant is proposing to inject hydrochloric acid (HCL) into the dewatering wells to eliminate lime scale from the water bearing crossfaults. Please provide a detailed description of how HCL will be injected into the dewatering wells to target the Leadville Limestone and lower formations.

Upon completion of the pilot borehole (8" well) each well will be geophysically logged and downhole testing performed to verify strata encountered and permeability of the formation. If the permeability is lower than needed to cause dewatering of the surrounding workings and gradient reversal from the water course faults entering the main mine workings, then we will isolate the Belden Shale sections containing pyrite intrusive mineralization (after drilling the full diameter hole and setting the casing) overlying the Leadville using acid-resistant grout. Once this zone is isolated, we will inject initially low concentrations of HCl (around 1-5%) and measure the effect on the adjacent monitoring well(s) by measuring pH and electrical conductivity. As voids open up due to acid intrusion, we will refill the sand pack around the well screen using a permanently installed tremie pipe. We will increase the acid concentration in the injected solution stepwise, and inject sufficient solution to contact the isolated section of strata to a volume equal to about 10 well volumes, before increasing the injection concentration. Observations of pH and Ec will be made at the 10^{th} volume prior to adding increased concentration acid solution. When the pH decreases below 6, or electrical conductivity spikes above twice the background level at the closest monitoring well, we will cease injection (we may stop injection before reaching those endpoints). Each proposed well is located within 50 feet of an adjacent monitoring well or a well that will be converted to a monitoring well. After injection is completed, a sample of the well water will be analyzed for analytes of concern (zinc and cadmium) and if treatment is required pH adjustment will be implemented pursuant to the Consent Order with CDPHE § 41 (6) "Amending with worst water with NaOH and polymer flocculant at the treatment system headworks to enhance precipitation and settling of contaminants" to maintain compliance with the permitted discharge limits.

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8. Please describe how the HCL injected into the wells will be disposed of or detoxified. In addition, please describe the emergency response procedures in place which would be used in the event of a spill of HCL.

As stated in Response #7, water will be pumped from the well and treated prior to discharge in compliance with the Consent Order using NaOH and polymer flocculant to achieve discharge standards as long as treatment is needed.

HCl will be maintained in totes on-site until mixed with fresh water at the wellhead for injection. All totes will be kept on a bermed and plastic lined area with sufficient freeboard to contain a complete loss of all totes. Personnel will don acid gas respirators and full face shields prior to mixing of acid with fresh water and in the area of the injection work (within 100 feet). Totes will be maintained in a locked area in the Quonset building prior to delivery to the injection area using a skidster forklift and the area will be secured from trespasser access with warning tape at a safe distance of at least 100 feet from the totes. Eyewash station will be available at all times. In the event of a spill, acid will be neutralized on the containment using hydrated lime and sodium bicarbonate (as an indicator).

9. Pursuant to Rule 3.1.6(1)(b), describe how you will remain in compliance with applicable federal and Colorado water quality laws and regulations as it relates to the injection of HCL into the dewatering wells.

The London Mine was a serious, large scale violator of its discharge permit until MineWater purchased the site. While we have been compliant with our monthly discharge limits in each month since purchase in November 2016, we are operating under the terms of the Consent Order which suspended the 24 month trailing average limit for zinc, without which we would otherwise be unable to comply due to past monthly violations which occurred prior to our ownership. Pursuant to the Consent Order, we have been in communication with CDPHE and intend that prior to any HCl injection we will have their agreement and approval by letter modification to the Consent Order, for any such injection activities. We will also communicate with EPA UIC program prior to initiating any injection activities and gain their concurrence prior to HCl injection.

10. Pursuant to Rule 3.1.6(1), disturbances to the prevailing hydrologic balance of the affected land and of the surrounding areas and to the quantity or quality of water in surface and groundwater systems both during and after prospecting shall be minimized. Please describe the hydrologic connection between South Mosquito Creek, No Name Creek and the dewatering wells. What is the potential, if any, that dewatering activities could dry up South Mosquito Creek and No Name Creek?

There is no potential that dewatering could dry up or reduce the flow in the creeks in any way, as the creeks are demonstrably not connected to the Paleozoic Aquifer. The Belden Shale overlies the Paleozoic Aquifer and is a confining unit that prevents hydrologic connection. It is in view of the certainty of the lack of hydrologic connection that the water rights were decreed non-tributary in W8314-76.

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11. The NOI Application references a leach well. Please clarify if the leach well is connected with the proposed prospecting activities.

The Leach Well (formerly owned by Frank and Jean Leach) is now owned by THF, and is on the western end of the drill pad that will be used to construct LM1.0 under this NOI Amendment. It is not connected with these proposed prospecting activities. There was a monitoring well constructed when the Leach Well was drilled, which is 47 feet due east of the Leach Well. We intend to use that monitoring well in our monitoring of the HCl injection if such injection is approved and subsequently conducted.

Sincerely,

MineWater Finance LLC

Joseph G. Harrington, President.

Copy: Steve Bain and Jim Noble, Welborn Sullivan Meck & Tooley

The drawdown, s_w, is equal to the increase in head above the water table in the injection well. A steady injection pressure can be achieved by continuously filling the injection tube to maintain the appropriate height. Using a packer for sealing off flow into the confining formations, the injection well can be pressured to heads above the ground surface with an injection pump of sufficient pressure rating and capacity. The drawdown, s_w, at the producing well is related to the distance between wells, $2x_0$, by the following equation:

$$s_w = \left(\frac{Q}{4\pi Kb}\right)\ln\left[\frac{(2x_0 - r_w)^2}{r_w^2}\right] \tag{11.6}$$

and when $x_0 \gg r_w$, then:

$$s_w = \left(\frac{Q}{2\pi Kb}\right)\ln\left[\frac{2x_0}{r_w}\right]. \tag{11.7}$$

However, it is worth noting that if a tracer is injected, less than the amount of tracer injected will return in a finite period because of some lateral flow outside the region following streamlines that loop away over great distances. This loss is indicated in Fig. 11.2 by the streamlines that do not converge within the illustrated area of the figure, and it was discussed in the preceding chapter.

WELL RADIUS AND SKIN EFFECTS IN HORIZONTALLY CONFINED AQUIFERS

The well radius, r_w, has a major influence on the flow rate that can be achieved with the same head. As an example, consider an injection well and a production well, each with a 40 mm well radius, separated by 64 m. If the well radius is expanded, for example, by well stimulation or by drilling the hole at a larger diameter, then the drawdown, s_w, at constant flow rate, Q (given by eqn 11.7) will decrease. The resulting drawdown change as a function of well radius change is plotted in Fig. 11.3. The drawdown change is expressed as a percentage of the drawdown at $r_{w(0)} = 40$ mm. Doubling the well radius provides a 10% decrease in drawdown.

Conversely, if the drawdown, s_w, is held constant the flow rate, Q, will increase with borehole radius, as shown in Fig. 11.4.

The "skin effect" is a zone surrounding the well with a substantially different permeability than the aquifer permeability. In many cases it has been found that the permeability of the formation near the well bore is reduced as a result of drilling and well completion. Invasion by drilling

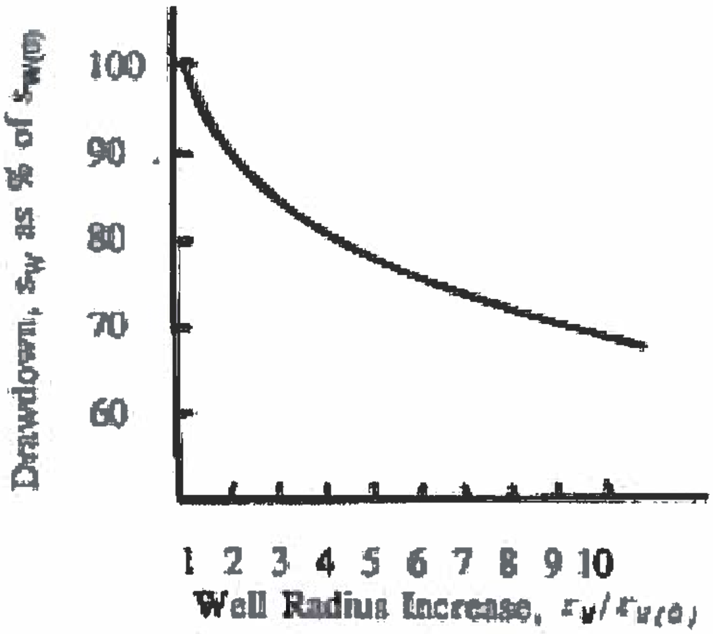

Figure 11.3. Drawdown lowering, at constant Q, by increasing the well bore radius, $r_{w(0)} = 40$ mm, $x_0 = 32$ m.

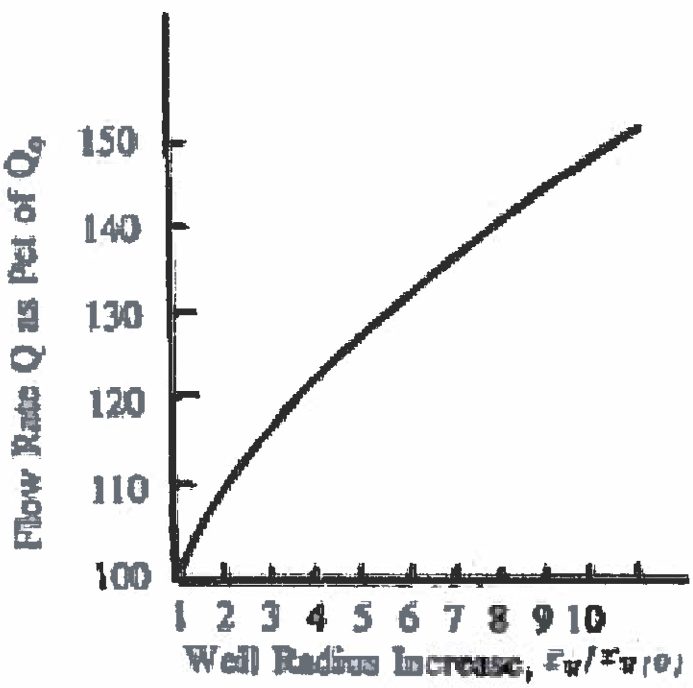

Figure 11.4. Increase in flow rate at constant drawdown, s_w, with increasing well bore radius, $r_{w(0)} = 40$ mm, $x_0 = 32$ m.

fluids, dispersion of clays, presence of mud cake and cement, partial well penetration, limited perforation of the injection/production casing, and plugging of the perforations are some of the occurrences that can lower permeability adjacent to the borehole.

The effect of a reduction in permeability near the well is illustrated in Fig. 11.5. The skin effect is usually accounted for as an additional pressure drop that is proportional to the flow rate, Q. Consequently, for a horizontally confined aquifer,

$$s_w = \left(\frac{Q}{4\pi Kb}\right)\left[\ln\left(\frac{(2x_0 - r_w)^2}{r_w^2}\right) + 2s_s\right] \tag{11.8}$$

and when $x_0 \gg r_w$, then,

$$s_w = \left(\frac{Q}{2\pi Kb}\right)\left[\ln\left(\frac{2x_0}{r_w}\right) + s_s\right]. \tag{11.9}$$

The radius, r_s, of the skin zone around the well and the hydraulic conductivity, K_s, in this zone are related to the skin factor s_s by:

$$s_s = \left(\frac{K}{K_s} - 1\right)\ln\left(\frac{r_s}{r_w}\right). \tag{11.10}$$

Thus, if the skin hydraulic conductivity is less than in the formation, s_s will be positive, and if the hydraulic conductivities are equal, $s_s = 0$. But, if the hydraulic conductivity in the skin is greater than that in the formation (for example, if caused by well stimulation), then s_s is negative. Hydraulically fractured petroleum wells often show values of s_s ranging from -3 to -5.

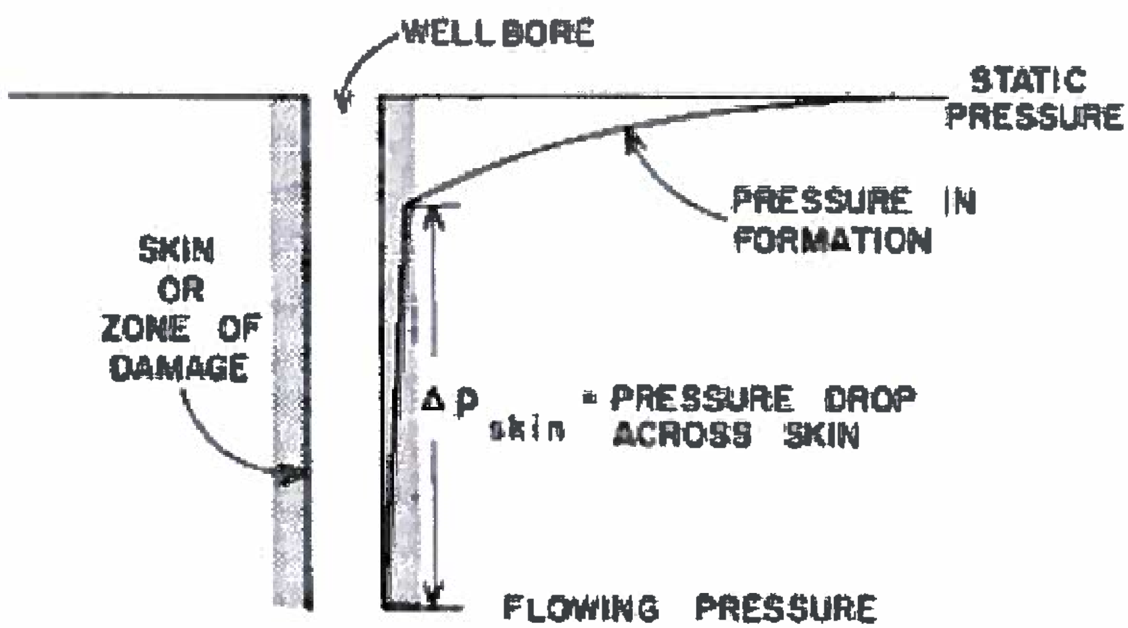

Figure 11.5. Pressure distribution near a well with a skin effect, $s_s > 0$.