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Safeguards for Well Owners and the Idaho-Maryland Mine December 1, 2021

Introduction

An application for a Use Permit to reopen the Idaho-Maryland Mine (IMM) has been submitted to the Nevada County Planning Department. The applicant, Rise Gold Corp (DBA Rise Grass Valley, a wholly owned subsidiary) proposes to dewater the existing mine to depths of over 3000 feet, and to then maintain the dewatered state by pumping out the water for the remainder of the 80-year project.

The mineral rights of IMM encompass 2585 acres and allow mining to within 200 feet of the surface. There are numerous domestic wells directly over the mineral rights area, but the dewatering impacts on the groundwater and wells may extend well beyond the boundaries of the mineral rights. The potential dewatering impacts on the region include, but are not limited to, reduction in well water levels, reduction in well yield, degradation of water quality, well failure, impacts to land values, habitat, and personal property.

Safeguards are needed to protect all property owners, renters and the community at large from all potential harm due to mine dewatering and operations. In particular, safeguards in the form of mitigations and conditions of approval on the project are needed that will protect well owners and others who rely upon wells and groundwater for their water needs. Useful ideas can be considered by looking at what safeguards were required in the past.

Recent Permitting History

1996 Dewatering Permit

In January of 1996, a Conditional Use Permit was granted by the Nevada County Board of Supervisors to dewater the mine for exploration. It was not a permit to mine, although ore sampling was allowed. In that permit, extensive preparatory work was required to assure that local residences would be able to get potable water immediately if a well problem was detected. Specifically, the applicant, Emperor Gold, was required to “Obtain and document all necessary permits and approvals, and identify all right-of-way, variances, easements, and agreements necessary to guarantee installation and delivery of water service from NID [Nevada Irrigation District] to any and all residences in the study area.”[1] The “Study Area” was specifically identified in an area map.[2] The applicant was also required to provide cash, bonds and/or securities to pay for all construction costs, including meters, connection fees, running lateral lines, and related expenses or damages associated with a replacement water service.[3] The dewatering permit was limited to 5 years.

The Study Area ultimately included 101 wells.[4] In addition to wells in the area of East Bennett Road, the Study Area included a large portion of Cedar Ridge neighborhoods north of Colfax Highway, including wells as far west as Union Hill and as far east as Bellview Rd. and substantial areas East of Brunswick Road in the Greenhorn Rd neighborhoods to beyond Anchor Ln and to the north end of Glenn Pine Rd.[5][6]

Emperor Gold did not initiate work before the permit expired.

2008 Emgold Mine Application

In 2008, Emgold Mining Corporation applied for a Use Permit with the City of Grass Valley to dewater, open and operate the mine. Instead of the New Brunswick site on Brunswick Road, the main processing facilities and mine access were to be located at the historic site of the mine on Idaho-Maryland Road and Centennial Drive, which was in the City's near-term plans for annexation. For this reason, the City chose to be the lead agency. The application was for a 20 year Use Permit.

A Draft Environmental Impact Report (DEIR) was completed in 2008 but major project revisions were necessary, so a revised DEIR was required.

To address well-owner concerns, impact zones were established by calculating an estimated groundwater cone of depression similar to the Study Areas from the 1996 reports. These resulted in an area defined by a 710 foot radius and a 1356 foot radius from any mine workings to determine "High Risk" and "Moderate Risk" groups respectively.[7] Well owners were invited to join a well monitoring program and Emgold conducted monitoring of approximately 78 wells in order to establish baselines.

In this application a new water main was proposed to be run along East Bennett Road in advance of dewatering so that at least the High Risk well owners in the area could be provided water service quickly if a problem emerged. However, in the DEIR, the consultant Environmental Science Associates (ESA) wrote: "The analysis conducted in this EIR has determined that the applicant's proposed measures (APMs) do not adequately reduce the impact of potential well dewatering to a less than significant impact level." [8]

Additional mitigation measures were proposed, including provisions that the risk groups be redefined, that all wells in both the High and Moderate Risk groups received a permanent NID connection in a timely manner, full financial assurances, and several other criteria. Because the revised DEIR was never completed, the precise mitigations were not established, but the indications were that protections would be required for wells up to 1356 feet horizontally from any mine works.[9]

2019 Rise Gold Application

In the current application by Rise [10], the proposal is similar to the one made by Emgold: To install a water main and laterals to provide connection of NID water to 31 properties having wells in the area of East Bennett Road. However, Rise proposes actually connecting all these properties prior to dewatering.

No monitoring of actual existing domestic wells is proposed and there are no indications of a delineated Study Area or impact zone for consideration of potential impacts. Rather, Rise depends upon a computer model of the hydrogeology and an estimated groundwater contour map showing predicted draw down areas. Ground water monitoring would be done by drilling paired monitoring wells at 15 specific

locations, one well to 100 feet depth and one well to 300 feet. Rise Gold proposes that monitoring these wells will provide validation of the computer model and suggests that impacts to existing private wells can be determined by this.[11]

What Would Be Acceptable?

There has been no indication that either of the proposed mitigations from the 2008 Emgold proposal or the 2019 Rise Gold proposal would be acceptable to the community or Nevada County. Neither project has completed the Draft EIR process to date. The 1996 Emperor Gold project, on the other hand, was approved by the County and a Use Permit was granted, and this project provides a precedent and some good ideas as to a workable solution. However, a strong argument can be made that the approved mitigations and conditions from the 1996 permit would now be, at best, a minimal starting point for any acceptable protection for well owners in the region because the Rise proposal has a much greater potential impact over a wider region. This is due to number of reasons:

1. The 1996 Use Permit was only for dewatering. No additional tunneling would take place, so the risk of impacting ground water was less than the subsequent proposals in which tunneling would extend into new areas and consequently expand the area of impact. The addition of new mine works exposes additional surfaces which would also increase the amounts of ground water transmission, plus there would be an increased risk of encountering unexpected geologic conditions that could invalidate the hydrological predictions.
2. The 1996 Use Permit was only for 5 years, whereas the current proposal is for 80 years. Due to the slow movement of water at depths and a number of other variables, maintaining the dewatered state beyond just a few years could expand the draw down region or change the degree of draw down.
3. Climate change and the impacts of drought further threaten ground water. Global warming will likely cause reduced annual precipitation on average, and precipitation events, when they do occur, are more likely to be extreme with proportionally more runoff. In addition, longer, dryer summers increase transpiration. Taken together, these factors mean less groundwater recharge. The modeling of net impacts on groundwater levels needs to take this into consideration.
4. Additional development has taken place, adding more wells and putting more demands upon the groundwater.
5. The current ground water model produced for the Rise Gold application is limited in many ways. It focuses on the first 25 years of mining, assumes the mining will be confined to a very limited portion of their mineral rights, makes simplifying assumptions about the geology, and omits other factors. Yet even this model shows that ground water levels will drop 1-10 feet in 152 area wells.
6. The risks that the predicted impacts by Rise may be incorrect are demonstrably real. Local disasters such as the draining of the groundwater and resulting damage to wells on the San Juan Ridge Mine (Siskon)[12] demonstrate that every model has a degree of uncertainty, and the consequences of guessing wrong can be devastating.

Key Aspects of an Acceptable Safeguard

A. Expand The Potential Study Area - Statements that “the risk is low” for outlying properties are not sufficient grounds to exclude them from guaranteed protections. The risk is real. The groundwater models are not that reliable and the consequences of failure are too dire. As pointed out in the 2007 Hy-

dro-geologic Assessments by Todd Engineers, “...it is difficult to prove that aberrations in the system do not exist.”[13] Also, in consideration of points 1-6 above, a much larger Study Area than was approved in 1996 is needed. A potential Study Area exceeding 1356 feet beyond the mineral rights zone, as considered in the Todd analysis, would be a minimum to safeguard the more than 300 wells in the area.

B. Effective Monitoring and Assessment of Well and Groundwater Impacts – The 1996 Permit provided a number of oversight elements. It required that a third party consultant be hired to interpret ongoing monitoring results. The consultant would be chosen by a representative team including a community liaison, the county, and the mine operator. All County monitoring, inspections and fees were to be paid by the operator. Provisions for communications of issues and redress were outlined.[14] However, because the project had such a short lifespan, the problem was simpler.

Due to the increased duration of the Rise project and the potential for problems to emerge, a community relations program with defined actions should be established. It should include a community oversight committee which would review the project regularly and have authority to respond to issues. In addition, the Use Permit should be reviewed by County staff and the Planning Commission regularly, and the authority of the Board of Supervisors to revoke the Use Permit due to non-compliance issues should be established.

There is a potential for disagreements to the determination of impact, such as a well exhibiting occasional or partial dewatering or damage. This problem will be exacerbated by the fact that the project would run for 80 years, and factors such as drought may come into play. In the 1996 Permit, even the partial dewatering of a well could trigger the remediation actions, but the determination was left to a third party consultant. More specific criteria should be developed to assure that each well owner is fairly compensated for any well or ground water impacts without having to overcome the burden of proof. I.e. the burden of proof that there has been “no impact” should rest upon the mine operator.

C. Temporary Water Provisions - Once a well has been impacted, it is important that a replacement source of water be provided quickly. And while some of the details would need change, the 1996 Permit provided a fairly good approach to the problem.

In that plan, before dewatering could begin, locations for temporary water storage tanks had to be pre-determined and plans for the location and size of the temporary water systems were to be completed and submitted to the County.[15] With the emergency water plans in place, an impacted parcel could have water service quickly. The temporary water source was required to be in place within 24 hours of notification. Daily fines were to be imposed upon the mine operator for failure to meet this requirement, and all added costs were to be born by the operator.[16]

D. Permanent Water Provisions – The 1996 Permit required that prior to dewatering, all necessary permits and approvals, rights-of-way, variances, easements, and agreements for water service from NID to any and all residences in the Study Area were to be completed. All costs were to be borne by the mine operator, and performance timelines were defined with penalties for meeting an acceptable completion time.[17]

While this approach may work for a project that lasts for only 5 years, the notion that contractors, permits, plans, and entitlements would be kept in readiness, that costs would remain stable, and that conditions would remain unchanged for 80 years is implausible. Development in the area could completely

change the conditions on the ground. Additional dwellings could be built. Policy and capacity changes could affect NID and connection viability. Therefore, the water mains and laterals up to the property boundaries necessary to service all parcels in the area of impact should to be installed prior to dewatering. In addition, the mine operator will need to complete all steps necessary to guarantee that a permanent actual potable water connection from the streets to the residences will be available for the entire lifespan of the Use Permit (80 years), plus an adequate equilibration time following the refilling of the mine with water.

E. Hold Harmless - Financial Assurances and Long Term Issues – The 1996 Use Permit included detailed requirements for performance bonds and securities to cover all costs of providing a water service to all of the properties within the Study Area. Among the numerous assurances, a cash reserve of not less than \$100,000 was required to be set aside for county use to allow for rapid deployment of emergency water provisions in the event that a well was impacted and the operator failed to respond within 24 hours. It also contained provisions granting, “...in addition to the rights of the County, an independent right of action against the security deposit of bond in favor of any of the owners..whose water supply may be deemed to be adversely impacted by the dewatering...”[18]

One would anticipate that the cash reserves and securities would need to be much greater today, considering inflation and the larger potential impact area. And because of the long operational time frame of the proposed Mine, financial assurances will need to be regularly updated to account for changes in costs.

Finally, a provision was included for suspending the Use Permit in event of failure by the operator to maintain the full securities or bonds.

Conclusion

Providing safeguards for well owners in the area of the proposed mine is challenging and requires careful and detailed consideration. The points considered herein identified many but certainly not all of the issues. If the Use Permit is approved, it is critical that any and all damages and costs associated with impacts of the mining operations are completely born by the mine operators and not the property owners and residents of the community. This is made difficult because of the long duration of the proposed project and the many unknowns. Establishing adequate conditions, mitigations, and oversight would require a concerted effort on the part of the County, Rise Gold, and the at-risk community.

Footnotes

[1] County of Nevada Planning Dept., Jan 26,1996, U94-017 “Use Permit Emperor Gold Dewatering.pdf”, MM 4.3.5(e), p 12.

[2] County of Nevada Planning Dept. May 1995, U94-017 Draft EIR, Section 4.3 Hydro-geology, Figure 4.3 -1 (Willdan Associates map).

[3] County of Nevada, Use Permit, op. cit., MM 4.3.6, p12-13.

[4] Memo to Willdan Associates, “Hydrogeological Study of 37 Additional Domestic Water Wells”, Sierra-Pacific Groundwater Consultants, Inc., September 22, 1995.

[5] County of Nevada Planning Dept, October 1995, Final EIR, Appendix 3, Revised Figure 4.3-3 (Willdan Associates map).

[6] Despite the fact that there are substantial mineworks and near-surface features extending into the Wolf Creek watershed, the Study Area established in 1995 looked primarily at the South Fork Wolf

Creek watershed. This was apparently because a 1992 hydro-geologic study by Vector Engineering maintained that the two watersheds were separated by a groundwater divide. (Vector Engineering, Inc., “Hydrogeologic Study for the Idaho-Maryland Mine”, 1992, pg 3). It has since been re-established that the mineworks are connected, and that groundwater in the South Fork Wolf Creek watershed finds its way to Wolf Creek, where the mine drains into Wolf Creek near Centennial Drive.

[7] Todd Engineers, “Hydrogeologic Assessment Idaho-Maryland Mine”, August 2007, p23.

[8] “Idaho-Maryland Mine 2008 DEIR, Executive-summary.pdf”, p15-16.

[9] Todd, op. cit., p22-23

[10] Based on use permit application documents available on the County website as of Nov 1, 2021.

[11] Itasca Denver Inc., “Groundwater Monitoring Plan”, December 2020, p1.

[12] “A brief History of the San Juan Ridge Mine”, Liese Greensfelder, Kurt Lorenz, et al, <https://www.sjrtaxpayers.org/history/>.

[13] Todd, op. cit., p27.

[14] Todd, op.cit., p9-11.

[15] County of Nevada, Use Permit, op. cit., PD12, p11.

[16] Ibid., MM4.3.9, PD16, MM 4.3.9A, MM 4.3.9B; p15.

[17] Ibid., MM 4.3.5, 4.3.6; p16, MM4.3.10; PD 17, p12.

[18] Ibid., MM4.3.6, p12.

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“Use Permit Emperor Gold Dewatering.pdf,” County of Nevada Planning Department, U94-017, EIR94-003, Jan 6, 1996, <https://www.cea-nc.org/wp-content/uploads/2021/12/Use-Permit-Emperor-Gold-Dewatering.pdf>

County of Nevada Planning Department, Technical Appendices of the 1996 Use Permit U94-017:

- Appendix 1, “Mineral Exploration and Environmental Assessment for the Idaho-Maryland Mine Project,” Vector Engineering, June 1994.

- Appendix 2, “Geologic and Hydrologic Background Report for the Idaho-Maryland Gold Mine,” Sierra-Pacific Groundwater Consultants, Inc., March 1995.

- Appendix 3, “Hydrogeologic Study for the IdahoMaryland Mine,” Vector Engineering, January 1992.

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“Preliminary Geotechnical Engineering Report for Idaho-Maryland Mining Corporation Property,” From Draft EIR, “AppenG_Geotechnical Report.pdf,” Holdrege & Kull, Oct 25, 2004.

“Geologic Evaluation for the Idaho-Maryland Mine Project,” Geosolutions, April 15, 2008.

“Hydrogeological Overview of the Idaho-Maryland Mine for the 2008 Environmental Impact Review Process”, Geosolutions, April 17, 2008.

“Hydrogeologic Assessment Idaho-Maryland Mine,” Todd Engineers, August 2007.

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“Groundwater Hydrology and Water Quality Analysis Report-03-31-2020.pdf”, EMKO Environmental, March 2020, <https://www.mynevadacounty.com/DocumentCenter/View/34132/Groundwater-Hydrology-and-Water-Quailty-Analysis-Report---ADDED-4242020> 151 pgs.

“Groundwater Hydrology and Water Quality Analysis Report-Appendices-03-31-2020.pdf”, EMKO Environmental, March 2020, <https://www.mynevadacounty.com/DocumentCenter/View/34133/Groundwater-Hydrology-and-Water-Quailty-Analysis-Report---Appendices---ADDED-4242020> 558 pgs.

“Groundwater Model Report”, Itasca Denver Inc, March 2020 , <https://www.mynevadacounty.com/DocumentCenter/View/34136/Groundwater-Model-Report---ADDED-4242020> , 93 pgs.

“Groundwater Modeling Plan, Idaho-Maryland Mine Project”, Itasca Denver Inc., December 2020, 17 pgs.