

April 30, 2021

Sent by e-mail

Superintendent of Professional Governance
Province of British Columbia
E-mail: OSPGENquiries@gov.bc.ca

Dear Mr. Craven

Re: Duty to report ethical concerns related to systemic issues with the regulation of mining in British Columbia specific to Gibraltar Mine (M-40) Permit Amendments and cleanup costs for mine closure securities.

1. Summary

As EGBC professionals, we are writing to the Office of the Superintendent of Professional Governance (OSPG)¹ to express our ethical concern related to the regulation of the Gibraltar Mine in British Columbia. We are concerned that high level regulatory decisions have elevated the risk of significant environmental consequences. Our letter follows an initial inquiry call with the EGBC complaints office.

We are concerned that the Gibraltar Mine closure bond is significantly under-funded and has been for many years. Currently, the closure cost is estimated at \$41.3 M and the Province of BC holds a closure bond of \$50 M. The current closure bond does not include any provision for long term water treatment. Long term water treatment for acid rock drainage is known to be required at the site and is estimated to have a net present cost of \$250 M to \$360 M. As the Gibraltar Mine is in the Fraser River watershed, lack of closure bonding for water treatment represents a major environmental and financial risk to local First Nations and communities as well as the broader public in BC.

This risk has been elevated with the recent permit amendment application submitted by Gibraltar Mine. In late 2020, the Gibraltar Mine submitted an Application to amend the M-40 Mines Act Permit to revise and expand the approved mine plan (with mining expected to take place in 2021-2024)². This proposed plan involves changes to the site water management strategy that will bring forward the time when treatment and discharge would be required from approximately 2055 to as soon as 2024. This greatly increases the urgency of requiring a closure bond that accounts for long term water treatment.

Updates to the closure bond and financial security posted by the mine owner have been repeatedly delayed by decision makers at the Ministry of Energy Mines and Low Innovation Carbon (EMLI) to satisfy the mine owner. EMLI has not shown sufficient consideration of the

¹ <https://professionalgovernancebc.ca/home/complaints-concerns/>

² MA permit amendments are based on the proposed mine plan submitted in the Application for the amount and location of ore removed (and are not based on the timeframe of the mining activity)

environmental and financial risk that the lack of bond represents. EMLI is proposing to defer an update of the closure bond for water treatment at the request of the company. Ostensibly, this request for additional time is to allow the company to conduct further analysis, but this proposed deferral follows a long record of deferrals of the closure costs. While the update is required every 5 years, the last update was in 2007. We are concerned that EMLI's proposed approach to further defer an update to the required closure bond is inconsistent with the requirements of the Mines Act Code to secure closure bonds to match the existing liabilities at a site and is unethical.

First Nations governments have requested the closure bond be updated at the same time as approval of the M-40 Permit Amendment for the proposed expanded mine plan. This application is scheduled to be referred to the decision maker for approval on May 6, 2021 for approval on May 7, 2021. Decision makers at EMLI are indicating the closure bond update will be further delayed, repeating a pattern of satisfying the company's request for deferment. While EMLI is looking at dates for updating the closure bond to reflect both the 2017 5-year review and for the expected 2022 5-year review, there is no reason to believe further delays and deferments will not occur. There is no set deadline for the proposed "catch-up" for the closure bond required for water treatment in the M-40 permit.

Prior to approval of the revised mine plan on May 7th, we suggest the previously required closure bond updates be completed and the permit amendment include an increase to the closure bond that will contribute towards the cost of long-term water treatment in perpetuity. If this cannot be accomplished, we suggest a closure bond update be completed on an urgent basis in 2021 with OSPG oversight of decision making for potential deferment requests.

2. Additional Information

This section comprises additional background and supporting information related to the closure cost and bond estimate.

Historic Lack of Compliance

Previous requirements to update the closure cost estimate for the Gibraltar Mine and the lack of progress in this area are summarized in Table 1.

Table 1. Summary of the Mines Act Permit Amendment Requirements for Updating the Closure Cost Estimate

Permit Amendment ³	Requirement in the Mines Act Permit
M-40, dated Feb 14, 2013	The review of the 5-year Closure Plan and updated cost estimate occurred in March 2012. A closure bond update did not occur for this review (and is still outstanding). This permit amendment (2013) includes a clause requiring an update of the closure cost estimate by May 31, 2013. This deadline was not met (and it appears the company was out of compliance with this permit condition until October 2015).
M-40 Dated Oct 27, 2015	The M-40 permit amendment dated October 27, 2015 includes a deadline for the closure cost estimate set for June 30, 2016.

³ <https://mines.nrs.gov.bc.ca/p/5fa1e4094635c865df00caab/authorizations>

	This deadline was not met. While it appears that the company is currently out of compliance with this permit condition, EMLI staff have stated the company is not out of compliance. No details have been provided to explain this compliance assessment. As the update to the closure bond has not occurred, it is not clear how the company is in compliance with this permit requirement ⁴ .
M-40 Dated March 10, 2017	The most recent permit amendment for the approved mine plan occurred in March 2017 and did not refer to an update to the closure bond or the closure cost estimate.
2017 5-year review	The review of the 2017 5-year closure plan was started in 2018. This review was not completed because the company refused to respond to information requested in the review such as requests for costing information. The M-40 permit should have been updated by now to reflect the water treatment requirements and the increased closure bond requirements.
M-40 Dated Feb 4, 2019	In 2019 an update was approved for the TSF design titled "Approving 2017 Tailings Storage Facility Design Update." While requests were made to update the closure bond for water treatment, this amendment did not include an update to the required closure bond.

Closure Plan Should Reflect the Mine Plan from 2021-2024

The current closure plan includes filling up Granite pit (a mined-out pit) over a period of 35-40 years prior to water treatment and release. In contrast, the new mine plan includes filling up Granite pit in much less time, on the order of 6-8 years, with 3 years under the worst-case scenario (no discharge from the TSF). This change in the mine plan significantly accelerates the timing and need for water treatment. However, the closure plan and mine plan will be out of sync if the new mine plan is approved with no corresponding update to the closure plan.

At this stage of the mine life and development, there is an urgent need to complete the update to the mine water treatment closure cost estimate regardless of the requests from Gibraltar Mines to delay further. EMLI's approach to permitting Gibraltar Mine is not typical and not reflective of the Mines Act Code requirements. With other mine approval permitting projects (e.g., current permitting of the Ascot Premier Gold Mine), the approved mine plan and the current RCP are required by EMLI to be aligned for permitting expansion applications. For this project, an unfortunate situation has been occurring where the mine plan is approved with a delay in the update to the closure plan / cost estimate and corresponding lack of resolution of the required closure bond.

⁴ EMLI has a policy that information submitted by companies related to closure cost estimates can be provided on a confidential basis. For transparency, we recommend it would be more appropriate to provide high level costing information during reviews for closure activities such as water treatment, covers, contingency, etc. Detailed breakdowns of closure cost estimates could be provided in confidence to EMLI when there is a demonstrated need for confidentiality of the costing information. Currently, this policy serves to reduce transparency for reviewers and typically does not appear to serve any other purpose.

Mine Ownership

Gibraltar Mines Ltd., a copper-molybdenum mine located in south-central British Columbia, is primarily owned and operated by Taseko Mines Ltd (75% ownership). While Taseko is working on development of additional assets, the company currently has no additional revenue generating assets such as other operating mines. This is important from the perspective of the inability of the company to cover the costs of long-term water treatment once the mine shuts down or enters periods of Care and Maintenance. If funds are not set aside while the company is profitable, there is no alternate source of revenue. The Province may need to step in and fund the required water treatment and additional closure activities at the site. This could happen quickly if copper prices were to fall, and the Province may not be prepared to cover the costs without the closure bond in place. The potential lack of preparedness at the Gibraltar site, the changes proposed for water management, and the current challenges with mine water discharge are all factors we feel are important in assessing the risk status of the site in relation to the unfunded closure liability.

Price of Copper

The price of copper is currently high (Figure 1). It is relevant that the proposed deferment is planned during a period of high profitability, as periods of high profitability are the most likely time for mines to be able to afford increases with the closure bond. The current approval for mine expansion is critical timing for addressing the update to the required closure bond.

According to Taseko's 2020 annual financial reporting⁵, Gibraltar's total operating cost was \$1.92 USD per pound of copper produced in 2020. During this time, the average copper price was approximately \$3 USD/lb. The current price of copper is over \$4 USD/lb.



Figure 1. Price of copper from 2000 to 2021.⁶

⁵ Taseko Mines news release February 24, 2021. Retrieved: <https://www.tasekomines.com/investors/news-releases/taseko-reports-cad108-million-of-adjusted-ebitda-for-2020>

⁶ <https://www.macrotrends.net/1476/copper-prices-historical-chart-data>

EMLI Closure Cost Estimate

We have been informed that EMLI technical staff within the Ministry have developed an updated closure cost estimate that includes water treatment⁷. This can be directly confirmed with the technical staff. Currently the required closure bond does not have any provision for long-term water treatment despite our understanding that technical staff at EMLI have provided cost estimate information to the decision makers following the 2017 closure plan review. While EMLI's closure cost estimate may be refined in future and discussed further with the company, requiring some increase in 2021 for the closure bond (for water treatment) is appropriate.

Closure Cost Estimate for Water Treatment

Source developed a high-level cost estimate for water treatment in closure. Source estimates that the closure cost associated with water treatment alone is approximately \$360 M CAD. This estimate includes \$80 M CAD capital cost for water treatment systems, \$220 M CAD net present cost of long-term water treatment operation, and 20% contingency to reflect lack of project definition. This estimate is considered conservative. With more optimistic assumptions, Source arrived at a cost estimate of \$250 M CAD. In any case, the unfunded liability is in the range of hundreds of millions.

Source's estimate includes the following components:

- Treatment and discharge of excess water in TSF
- Treatment and discharge of excess water from mine site
- Pump-back and treatment of contaminated groundwater

This estimate excludes the capital cost of groundwater pump-back infrastructure and any water conveyance infrastructure required for discharge. All contact water is assumed to be treated for acidity and metals using lime neutralization. Half of the total volume of contact water is assumed to be treated for sulphate and nitrate using nanofiltration, with retentate disposed of in the pit lake.

The total volume of water requiring treatment was estimated at 10 Mm³/a, including 3.2 Mm³/a of excess water from the TSF, 6.3 Mm³/a of water from the mine site, and 0.5 Mm³/a of contaminated groundwater. Volumes of water from the TSF and mine site were drawn from the 2019 Gibraltar Mine Site Wide Water Management Plan⁸. The volume of contaminated groundwater was estimated by factoring discharge from the TSF and mine site by 5%. Water quality was estimated using data from the Gibraltar Long-Term Water Quality Prediction Model⁹. Water quality estimates informed the estimated consumption of lime in lime neutralization, which is a dominant operating cost for long term treatment.

⁷ We note that there are two types of water treatment required for the Gibraltar site. This letter is primarily focused on the treatment for acid rock drainage (high acidity and metals). Treatment for sulphate and nitrate is required to allow for TSF discharge, and while it may be important for long-term treatment, it is not the focus of our key concerns with the update to the closure cost estimate for known long-term acidity.

⁸ Updated Gibraltar Mine Site Wide Water Management Plan, December 23, 2019, SRK Consulting.

⁹ Updated Gibraltar Mine Conceptual Long-Term Water Quality Prediction Model, December 23, 2019, SRK Consulting.

The capital cost of treatment, cost of lime, power, operating labour, monitoring, and maintenance were estimated using the MEND 3.50.1 BATEA study¹⁰ as well as recent relevant reference site data from western Canadian projects. NPV modeling used discount rates of 1.5% (year 1-5), 2% (year 6-30) and 3% (year 31-100). The impact of inflation/cost escalation was not included in this estimate.

Two Types of Water Treatment

There are two types of water treatment required for the mine. The first is long-term treatment for acidity following mine operations (the mill currently removes some metals and adjusts pH as required in the permit). Once the mill is no longer operating, copper concentrations will increase as well as other parameters (as occurred prior to the pH adjustment in the mill). Treatment for acidity (lime treatment) is essentially the same process as is currently occurring in the mill with some modifications (i.e. filtration is typically used in treatment plants). The second type of treatment is for sulphate and nitrate and this is needed urgently to allow for discharge at the required volume to avoid dangerous water surplus (as is currently occurring) and infringing on freeboard in the TSF.

BC Closure Cost Estimates

At a broader level, the issue of unfunded closure costs is well documented in BC. The difference with the Gibraltar Mine and other BC mine sites with unfunded liabilities is that transparency exists in that at least the unfunded costs are known (as there is a gap between the amount required by the Mines Act Permit and the amount posted). While there are several BC mines with unfunded closure costs, the Gibraltar Mine has the appearance of no unfunded liability.

Provinces Current Proposed Path

We hope the Province changes course and updates the requirements for the closure bond in the current amendment. However, the current proposed path is to complete two closure bond updates, one later in 2021 for the completion of the 2017 Closure Plan and one later in 2022 as part of the 2022 submission of the 5-year closure plan. The 2021 update is to start soon, following the permit approval. No final date has been provided to complete this update. The 2021 update would cover the costs associated with the submitted 2017 Mine Closure Plan while the 2022 update would cover the costs of the 2022 Mine Closure Plan submitted. While these ideas are interesting, the company may request further deferment. It is unclear when the Province will cease to grant the deferment requests. There is a significant probability that reasons for deferment will be provided by the company in future to further delay the update to the closure bond.

Closure Bond Updates to Other Mines

We have observed over time that significant updates to the required closure bonds for BC mines typically coincide with applications/ approvals for mine expansion (e.g. Line Creek Phase II). For this reason, it appears significant that the Gibraltar Mine continues to have their mine plan expansion approved without updating the closure bond required.

¹⁰ BATEA for the Management and Control of Effluent Quality from Mines, MEND Report 3.50.1, September 2014, Hatch. Retrieved <http://mend-nedem.org/wp-content/uploads/MEND3.50.1BATEAAppAD.pdf>

Consultation Requirements

Compared with the Mine Permit Expansion Referrals, the Province has less requirements for consultation, engagement and seeking consensus with the First Nation communities during the 5-year closure plan reviews. ?Esdilagh First Nation and Tsilhqot'in National Government (TNG) have requested the completion of the update to the required closure bond occur now. Several emails and letters have been written by TNG/?Esdilagh on the closure cost estimate update and required closure bond. Comprehensive letters on this topic were sent to EMLI in April 2021 and July 2019.

EMLI Regulatory Authority

EMLI has regulatory authority for requirements in closure bonds, and no other ministry has overlapping authority. The Mines Act Code stipulates reviews will occur every 5 years including the security estimate and closure bond requirements including for water treatment.

Environmental Assessment

There is no recourse from BC EAC conditions as there was never an EA for the mine. The mine pre-dates the EA Act. The mine has been able to operate and profit for many years with relatively short-term permit amendments for expansion, without addressing critical liabilities.

3. Our Previous Experience with Gibraltar, Professional Practise Areas and Qualifications

In 2021, ?Esdilagh First Nation retained Source Environmental Associates (Source) to assist with the review of the M-40 Permit Amendment. Both Dr. Rina Freed (Ph.D., P.Eng) and Dr. Patrick Littlejohn, (Ph.D., P.Eng) participated in the review. In addition, J.P. Laplante retained Source in his role as TNG mining referrals coordinator from 2016-2019.

We have provided short bios of our professional practise area below. Our CVs and additional information can be provided upon request.

Rina Freed, Ph.D., P.Eng.

Dr. Freed is an environmental engineer with over 20 years of experience in mining related to mitigation designs for water quality management. Her expertise includes various phases of mining including EA and initial permitting approvals, life-of-mine permitting and closure planning. She has experience in mining with Best Achievable Technology (BAT) studies for mitigation planning, water balance and load modelling, surface water quality impact assessment, geochemistry, and contaminant hydrogeology. In 2020, Dr. Freed acted as an expert for Environment Canada (ECCC) and Public Prosecution Service of Canada (PPSC) for potential charges related to selenium and calcite mitigation measures associated with the upper Fording River Operation in the Elk Valley.

Patrick Littlejohn, Ph.D., P.Eng

Dr. Patrick Littlejohn is a chemical engineer and qualified professional in the field of water treatment with a demonstrated history of developing and implementing innovative solutions in the

mining sector. He has a wide range of senior experience on issues related to mine water, including water treatment development, design and costing, water quality predictions, water management planning, regulatory engagement, and First Nations independent technical review.

4. Other Sources of Information

Several registered professionals and First Nations staff members listed below have knowledge of the closure bond and cost estimate for the Gibraltar site. In addition, experts in closure cost estimation are listed because of their expertise in BC with similar sites. Should the OSPG wish to contact people listed, contact information can be provided upon request.

Bill Price. Mr. Price has developed the 5-year closure cost estimate for the Equity Silver Mine and has published papers on this topic. Equity Silver is a good analogue site for Gibraltar Mine. Bill is with NRCAN and is located in Smithers, BC.

Crystal Verhaeghe. Staff member with ?Esdilagh First Nation. OSPG may consider requesting the April 2021 submissions to the Province on this topic.

Gord McKenna, Ph.D., P.Eng. McKenna Geotechnical. Gord has experience with a review of the closure plan for the Gibraltar Mine and he is a well known mine closure expert.

J.P. Laplante. Former mining coordinator with TNG and current staff member with TNG. OSPG may consider requesting the July 2019 letter sent to the Province from TNG which requested resolution of the deferment of the closure cost estimate.

Kosta Sainis, P. Eng. Environmental Superintendent at the Gibraltar Mine.

Lois Boxill, Ph.D., P.Eng. Lois has extensive experience with mine closure cost estimate and geotechnical considerations at mine sites.

Lowell Constable, P.Eng. Deputy Chief Permitting Officer, EMLI.

Sean Shaw, Ph.D., P.Geo. Director, Technical Operations, Major Mines Office, EMLI.

Soren Jenson, P.Eng. Mine Water Mitigations and Water Treatment specialist at SRK Consulting working on the Gibraltar Mine.

5. Conclusion

We are concerned with the significantly overdue update to the closure bond required by the M-40 mine permit. EMLI appears to be willing to accept ongoing requests from Gibraltar Mine to defer requiring closure bond updates. It appears this practise increases profits for Gibraltar Mines at the expense of long-term environmental costs to society and impacts to First Nations communities. This is concerning because of the significant potential risks to the environment from acidic mine drainage. Without funding in the closure bond for water treatment, the impacts could be severe from the Gibraltar Mine. We are raising this ethical concern with regulation of mine closure securities in the Province of BC under our duty to report to the OSPG.

Given the mine has already been through the 2012-2016 5-year Closure Plan Review and the 2017-2021 5-year Closure, the current approval for a mine expansion is the appropriate timing to update the required closure bond for water treatment in the M-40 permit amendment.

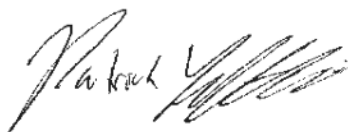
Both Dr. Freed and Dr. Littlejohn can provide additional information and can be reached via email or phone as follows.

Yours sincerely,

Source Environmental Associates Inc.
per:



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