



Tantalum Mining Corporation of Canada – Bernic Lake Mine

External Ore Processing Notice of Alteration Amendment (2023)



Date:

November 22, 2023



Tantalum Mining Corporation of Canada, Limited
Bernic Lake
Box 2000
Lac du Bonnet, Manitoba
MB R0E 1A0
Canada

November 22, 2023

Ms. Jennifer Winsor
Environmental Approvals Branch
Manitoba Environment and Climate Change
Box 35, 14 Fultz Blvd.
Winnipeg, MB.
R3Y 0L6

Re: Tantalum Mining Corporation of Canada Bernic Lake Mine – External Ore Processing Notice of Alteration Amendment (2023)

Dear Ms. Winsor:

Tantalum Mining Corporation of Canada (TANCO) submitted a Notice of Alteration (NoA) Application and Report on August 2, 2023 describing proposed changes at the Bernic Lake Mine (BLM) which included accepting lithium-bearing ores for processing at the BLM from junior mining companies which do not currently have milling capabilities.

In the NoA Report, TANCO described the process that would be used to determine if the ore from external sources posed any significant risk to effluent quality or tailings stored in the BLM's Tailings Management Area (TMA). The process was developed in collaboration with SGS Mining and Mineral Services (SGS; Lakefield ON) and included static testing to identify the chemical characteristics of the external ore and its tailings. If static tests identified any potential for external ore to affect effluent quality or tailings storage in the BLM Tailings Management Areas (TMAs), then the samples were to be subjected to kinetic test work to better quantify these effects. Once any potential additional environmental effects above pre-alteration levels were identified either a mitigation plan would be developed to address these effects which would be sent to the Environmental Approvals Branch (EAB) for approval prior to accepting the ore or the ore would be refused for processing and sent back to the supplier.

In your email on October 20, 2023, you requested additional details that would be used to determine if external ore posed a significant risk to operations at the BLM and limitations or criteria that would be considered acceptable.

After receiving your question we reached out to SGS to aid in defining criteria for evaluating the acceptability of external ore. In our discussions with SGS, it was discovered that they were unaware that we would be conducting bench scale tests to determine the efficacy of the milling process on external ore prior to accepting it and that this process would be producing milling wastes (tailings and effluent) which could be used to better and more cost effectively evaluate the external ore's overall effect on the TMA.



Tantalum Mining Corporation of Canada, Limited
Bernic Lake
Box 2000
Lac du Bonnet, Manitoba
MB R0E 1A0
Canada

SGS noted that they commonly use this approach at their facility in Lakefield, ON before accepting ore which would pose a risk to their treatment ponds and their ability to discharge effluent.

Based on this new approach, TANCO has amended its original plan regarding vetting external ore for acceptance at the BLM. The proposed changes to the original plan will result in no additional risk to the operation of the TMAs at the BLM and it still anticipated that the potential environmental effects from this alteration will be insignificant.

Please find enclosed, the information required for the regulatory process that details amendments to the assessment process for the proposed alteration. TANCO would like to reiterate that no external ore will be accepted for processing at the BLM if there are any significant risks identified during our test plan that cannot be mitigated.

If you have any questions, or require further information on the report, please do not hesitate to contact me.

Sincerely,



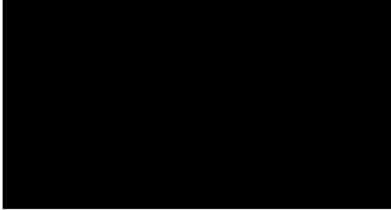
Date: November 22, 2023

Joey Champagne
Operations Director
Tantalum Mining Corporation of Canada Limited



**TANCO Bernic Lake Mine
External Ore Processing Notice of Alteration Amendment (2023)**

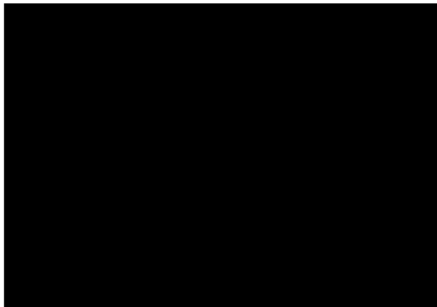
Prepared and reviewed by:



Date: November 22, 2023

Jerry White, B. Sc., M.Sc.
Environmental Specialist
Tantalum Mining Corporation of Canada

Prepared and reviewed by:



Date: November 22 2023

Claude Deveau, P.Eng
Head Metallurgist
Technical/ Ore Reserve Manager
Tantalum Mining Corporation of Canada



Executive Summary

This Notice of Alteration Amendment is intended to provide the Director with sufficient information to access the environmental effects associated with proposed changes to the process in which TANCO will determine acceptance of ore from external suppliers.

In the original submission in August 2023, it was initially proposed that external ore samples be subjected to a set of static tests with the results compared to similar tests completed on ore from the BLM. If the comparison identified any potential risk to the TMAs, then the external ore would be subjected to a second set of kinetic tests to further assess the risk. Once the assessment was completed and it was determined that the environmental effects were negligible or could be mitigated, then a notification would be sent to the EAB regarding the proposed plan to mill material from the external source. If the assessment proved that the effects to the TMAs would be significant and could not be mitigated, then the external ore would be refused for processing at the BLM.

In October, EAB requested clarification on the limits or criteria that would be used to determine whether external ore would have a significant effect on the TMAs. While working with SGS in developing limits or criteria for accepting ore, it was realized that assessing ore based on the waste material generated during bench tests would be more reflective of the load placed on the TMAs plus the approach would be more cost effective. SGS noted that when initially considering an evaluation process, they were unaware that TANCO would have access to the waste materials from bench tests to conduct these tests. SGS also noted that this was a similar process that SGS used prior to accepting any ore into their test facility in Lakefield ON that may affect the operation of their treatment ponds and their ability to discharge.

The amended qualifying process will simply compare chemical characteristics of effluent and tailings solids from the milling of external ore to effluent and tailings solids generated from BLM ore. Once the assessment is completed and it is determined that the environmental effects are negligible or can be mitigated, a notification will be sent to the EAB regarding the proposed plan to mill material from the external source along with a report interpreting the results of the tests and the risk to the BLM TMAs with regard to the tailings produced from the external ore.

Environmental effects associated with the physical environment, emissions, water resources and ecological aspects remain virtually unchanged with this amendment as external ore sources will still not be accepted for milling at the BLM unless laboratory tests confirm that potential effects are negligible or they can be mitigated. Once the risk has been assessed, effluent quality will continue to be monitored to ensure it remains within regulatory limits outlined in the *Metal and Diamond Mining Effluent Regulations* ((MDMER) Government of Canada 2002) and the Mine's current *Environmental Act Licence (EAL)* through treatment in the TMAs at the facility.

The proposed amendment to the original Notice of Alteration for accepting external ore is believed to be minor in nature because the potential negative environmental effects resulting from the alteration as amended will be thoroughly assessed prior to accepting any external ore at the facility to ensure that any effects are insignificant when compared to pre-alteration conditions.



Table of Contents

1. Introduction	1
1.1 Objectives	1
1.2 Alteration Amendments	1
2. Environmental Assessment	3
3. Conclusions	3
4. References	4

Appendices

None

List of Figures

No table of figures entries found.

List of Tables

No table of figures entries found.



1. Introduction

1.1 Objectives

This report provides details regarding an amendment to the initial plan for characterizing the ore from external suppliers which will be used to determine the environmental impact that processing this ore would have on the operation of the TMAs at the BLM. It remains TANCO's goal to ensure that accepting external ore for processing has no significant impact on tailings storage or effluent quality at the BLM.

1.2 Alteration Amendments

It is expected that lithium-bearing ores from external sources will be from the same general mineralization as the BLM and the granitic pegmatites are expected to have a similar mineral composition as the TANCO Pegmatite Deposit. External ore will undergo a number of tests to confirm this assumption prior to processing including bench-scale processing tests to ensure the milling process utilized at the BLM is capable of extracting the elements of interest efficiently without requiring any significant alterations to the current processing circuit. These bench-scale processing tests will produce waste materials (tailings and effluent) similar to those produced during production that can be used to ensure that the acceptance of external ore to its facility will not have an adverse effect on the TMAs after the material has been subjected to processing to extract the minerals of interest and the milling waste is transferred for storage.

The milling waste from three (3) bench-scale tests on each external ore will be collected and shipped to SGS's Facility in Lakefield ON where it will undergo characterization tests. The samples will be processed following a standard protocol where on receipt the sample of whole waste slurry at discharge pulp density will be homogenized at high shear (200 rpm) using an HDPE Rushton disc impeller for a period of one hour to bring the solution to equilibrium, ensuring the solids are suspended and homogenized. Once the one hour has elapsed, a representative sample of slurry will be transferred to a Buchner filter equipped with a Whatman #3 filter to collect the solids (filter cake). The mixer will be removed. The appropriate dosage of dilute flocculant will be added into the suspended slurry, manually mixed with a paddle to distribute the flocculant throughout the slurry and allowed to settle for two hours. Once two hours has elapsed, two litres of supernatant liquid effluent will be decanted from above the mud line by siphon.

Liquid effluent analysis will be conducted to quantify elemental concentrations (total and dissolved) that report to the primary tailings pond. Decanted solution will be placed into appropriate bottles, preserved as necessary, and analyzed for pH, conductivity, E_H , TDS, TSS, alkalinity, acidity, Cl, F, NO_3 , NO_2 , SO_4 , NH_3 , thiosalts, ^{226}Ra and total metals (including Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, Sr, Th, Ti, U, V, W, Y and Zn).



The filter cake which will be representative of the tailings solids, will be collected and dried to constant weight at 60°C. The filter cake will be subjected to acid base accounting (ABA) and net acid generation (NAG) for confirmation. The modified ABA test will quantify total sulphur, sulphide sulphur, and sulphate concentrations present and the potential acid generation (AP) related to the oxidation of the sulphide sulphur concentration. The test method will determine the neutralization potential (NP) of the sample by initiating a reaction with excess acid, then back titrating to pH 8.3 with NaOH. Carbonate concentrations will also be analyzed, and Carbonate NP values will be determined. The balance between the AP and NP assists in defining the potential of the sample to generate acid drainage.

Pre-alteration conditions will be defined by subjecting representative samples of tailings from the TANCO Pegmatite Deposit to the same process as the waste materials generated from externally supplied ore. Initially, three (3) weekly samples of tailings will be collected from the Mill prior to mixing with additional effluent streams in the Mill Tailings Box for testing at SGS. The results from these tests on effluent will be used to develop a relationship between effluent quality at the end-of-pipe and effluent quality at the final discharge point after treatment in the TMA.

At the same time tailings are collected from the waste stream at the Mill, a representative sample of ore will be collected from the Mill feed line. These three (3) samples will be subjected to the same bench-scale processing tests as the external ore. The waste material from the tests will be collected and sent to SGS for characterization following the same protocols as previously outlined. The data collected from the tests will be compared to the results from tailings collected directly from the Mill to ensure that bench-scale tests are representative of the production process.

The BLM is regulated under the *MDMER* and the Mine's *EAL* and could potentially discharge effluent up to the prescribed limits in the regulations and the Mine's *EAL* as long as the effluent is not found to be acutely lethal. The BLM is currently under reduced sampling frequency for all deleterious substances listed in Schedule 4 of the *MDMER* except for suspended solids. In order for the BLM to maintain its reduced sampling frequency, total concentrations of arsenic, copper, lead, nickel, zinc, radium 226 and un-ionized ammonia in mine effluent must remain less than 10% of the maximum authorized monthly mean concentration allowed in Column 2 of Table 2 in Schedule 4 of the regulations. It is TANCO's goal to remain on a reduced sampling frequency for these metals, un-ionized ammonia and radium 226 and would use these criteria for determining acceptance of external ore which is conservative when looking at the maximum authorized concentrations in grab samples allowed by the *MDMER* (Schedule 4, Table 2, Column 4). These limits are prescribed for the final discharge point after treatment and therefore, the relationship developed between effluent quality at the final discharge point and waste from the milling process currently must be used to model the concentrations in the waste from milling of external ore to remain below limits that would allow the mine to remain on a reduced sampling frequency. Any ore that has the potential to increase the concentration of deleterious substances (except for suspended solids) above concentrations that would require the BLM to conduct sampling at a regular frequency will not be accepted for milling at the facility.

The criteria based on *MDMER* deleterious substances that TANCO is proposing to use in the evaluation process is conservative and should be protective of the environment but TANCO will also model a list of



parameters including those parameters that are part of Effluent Characterization Studies in the Environmental Effects Monitoring Program (Schedule 5, Section 4(1) of the *MDMER*). These data will be used to identify any parameters that are greater in effluent produced from the processing of external ore that could potentially cause toxicological effects in freshwater organisms. Any parameter with criteria listed in Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME 1999) that is modelled to be greater at the final discharge point in external ore effluent compared to TANCO ore effluent will be compared to published toxicological data (LC_{50} values) for *Daphnia magna* and rainbow trout to ensure that concentrations are not acutely lethal as defined by the *MDMER*. Any ore that produces an effluent which could be potentially acutely lethal will not be accepted for milling at the facility.

The BLM will also not accept any ore in which the tailings from the milling process are found to be potentially acid generating to protect the TMAs from acid generation that could exacerbate contaminant mobility within the tailings storage area

2. Environmental Assessment

There are no physical or process changes at the Mine as a result of the amended alteration that would require a reassessment of environmental effects from the original submission.

3. Conclusions

There is no anticipated increase in environmental effects expected with regard to effluent quality as a result of this amendment. Effluent quality will continue to be monitored and will remain within regulatory limits outlined in the Mine's current *Environmental Act* Licence and the *MDMER* (Government of Canada 2002) through treatment in the TMAs at the facility and therefore, possess no additional potential environmental effects to the receiving environment.



4. References

Canadian Council of Ministers of the Environment (CCME). 2001. Canadian water quality guidelines for the protection of aquatic life: In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

Government of Canada. 2002. *Metal and Diamond Mining Effluent Regulations*. Retrieved November 16, 2023 from <https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html>.