Natural Resources Canada | Ressources naturelles Canada

December 16, 2021
Agency File No: 005760
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Re: Federal Authority Advice Record for the Tent Mountain Mine Redevelopment Project

On November 25, 2021, the Impact Assessment Agency of Canada (the Agency) requested that Natural Resources Canada (NRCan) provide a Federal Authority Advice Record for the Impact Assessment of the the Tent Mountain Mine Redevelopment Project (the Project) from Montem Resources Alberta Operations Ltd. Please find the completed Federal Authority Advice Record below. Should you have any questions related to NRCan's Federal Authority Advice Record, please do not hesitate to contact Maximilien Genest at maximilien.genest@nrcan-rncan.gc.ca.

Thank you,

<original signed by>

Peter Unger

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Canada

ATTACHMENT: November 25, 2021
Federal Authority Advice Record
Response due by December 15, 2021
Tent Mountain Mine Redevelopment Project – Montem Resources Alberta Operations Ltd.
Agency File: 005760

Department/Agency	Natural Resources Canada
Lead Contact	Maximilien Genest
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1. Is it probable that your department or agency may be required to exercise a power or perform a duty or function related to the Project to enable it to proceed?

NRCan may be required to exercise a power or perform a duty or function pursuant to the Department's regulatory role under the *Explosives Act*.

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2. Is your department or agency in possession of specialist or expert information or knowledge that may be relevant to the conduct of an impact assessment of the Project?

Mining Waste:

- Mine waste alternatives, coal mining effluent, environmental dispersion of metals including selenium, physiochemical wastewater treatment, passive treatment of selenium, geotechnical stability related to dam and post-closure mine operation
- Acid rock drainage-metals leaching, environmental dispersion of metals including selenium, selenium toxicity.

Forestry:

- Biodiversity & ecology (including forest vegetation and Species at Risk such as Whitebark Pine);
- Forest soils (e.g. quality, loss, compaction, erosion, productivity);
- Socio-economic impacts linked to forestry;
- Hydrology (e.g. impacts of mining activities on hydrology on surrounding watersheds (e.g. surface water));
- Land use change (e.g. how land use change could be impacted by mining activities, potential impacts, and identification of mitigation measures);

- Impacts on cumulative effects of multiple anthropogenic disturbances on the forested landscape (including modelling potential impact and risk assessment);
- Forest pests (impact on spread and/or mitigation measures);
- Invasive species;
- Forest pathogens;
- Forest management;
- Reclamation/restoration (e.g. post-closure, including selection of resilient trees for reforestation etc.);
- Wildfire (e.g. impact on fire risk and mitigation measures).
- How to mitigate impacts of climate change on mine closure activities (e.g. site and species selection)

Geology

- Terrain hazards (landslides);
- Seismic hazards;
- Groundwater quantity & flow.

Socioeconomics

- Employment (rate, type);
- Labour force details (education, composition);
- Business structure and ownership;
- Market intelligence,
- Demand and supply information, and forecasts;
- Export and import statistics and forecasts;
- Mitigation measures (impact benefits, contracting agreements, training);
- Potential impact of mitigation measures on project economics.

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3. (a) Has your department or agency considered the Project; exercised a power or performed a duty or function under any Act of Parliament in relation to the Project; or taken any course of action that would allow the Project to proceed in whole or in part?

   Specify as appropriate.

   (b) Please include a description of consultation activities that would occur with Indigenous groups if your department or agency has to exercise a power or perform a duty or function related to the Project, and how potential impacts to Indigenous groups are addressed by your department or agency.

   (c) Please include a description of opportunities for public participation if your department or agency has to exercise a power, or perform a duty or function related to the Project.

   N/A

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4. Has your department or agency had previous contact or involvement with the proponent or other party in relation to the Project? (for example, enquiry about methodology, guidance, or data; introduction to the project)

   NRCan has not had previous contact or involvement with the proponent or other parties in relation to the Project.

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5. Does your department or agency have additional information or knowledge not specified, above?

   NRCan works with the Ktunaxa Nation and its resource management firm Nupqu on forest management of the federal Dominion Coal Blocks (DCB). The DCB are located approximately 2.5 km west of this proposed project and are acknowledged as an area of interest in modern treaty negotiations.

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6. From the perspective of the mandate and area(s) of expertise of your department or agency:

I. Indicate whether the description of potential effects presented in the Initial Project Description sufficiently characterizes potential project effects— including direct and incidental effects, and effects within federal jurisdiction. Provide advice on whether these effects may be adverse and whether your regulatory instruments could be used to address these effects.

II. Identify any additional potential adverse effects of the Project that are not described in the Initial Project Description and their linkage to effects, effects within federal jurisdiction, and direct and incidental effects

III. Indicate any issues that should be addressed in the detailed project description that would inform a full understanding of how the Project's potential effects to areas of federal jurisdiction are effectively being mitigated and managed. Please be as specific as possible and include a description of any anticipated residual and/or potential significant adverse effects.

IV. Indicate the issues that should be addressed in the impact assessment of the Project, should the Agency determine that an impact assessment is required.

Mining Waste

- As presented here, the predicted impacts from selenium are not presented specifically. A preliminary selenium management plan is provided. Selenium will be released to surface water and then will accumulate in sediments and a portion of the selenium couldl transfer to the aquatic food chain through biofilm or periphyton up to fish. This needs to be adequately described in the detailed project description (i.e. Conceptual model) and conservative predictions should be presented in the EIS (Detailed Risk Assessment). CMIN (dept within NRCan) can assist the Agency in reviewing this issue and is currently comparing active options for selenium removal from mining effluent and building passive rock fills. CMIN is also developing bioaccumulation test to quantify potential transfer of selenium through aquatic food chains. CMIN would be well positioned to review the predicted effects from selenium releases and whether waste management is likely to limit selenium releases to the environment.
- Section 9.7 on water management indicates that mining will avoid areas with high sulfidic minerals to reduce selenium release. The proponent should confirm that selenium is not going to be released with neutral drainage as well. Neutral drainage is a source of selenium at Uranium mines and mills. Neutral drainage containing selenium could also increase loading and so it is important to plan the management of waste containing selenium by first contemplating a waste segregation program.
- The proponent should also discuss the use of biotreatment (Bioreactors and treatment wetlands). Use of microbial communities can transform the redox state of selenium and form organic selenium that is highly bioaccumulative. The proponent should also be clear on what type of treatment wetlands they plan to use. Surface-flow open water wetlands will attract fish and birds and perhaps exacerbate selenium risks. Saturated rock fills in open pits seem like a more promising treatment option. However, several have questioned their life expectancy as pore space fill with minerals overtime (See the USEPA review).
- The proponent should provide a conceptual model pertaining to selenium, including all important sources of selenium, mitigation measures to limit these releases throughout the mining cycle (i.e. waste segregation, backfill, covering, active and passive water treatment etc…) then how residual selenium is released to water, how it builds up in sediment and taken up by biofilm and transferred up the food chain to fish and birds where maternal transfer to young occur leading to malformation.
- Considering the risk of selenium and the regulatory scrutinity across Canada, every possible means to limit mobilisation of selenium, whether it is in acid or neutral drainage should be carefully presented using conservative assumptions. The proponent already proposes a selenium management plan in this initial project description. In the EIS, the selenium management plan should be based on an adequate waste characterisation program that sufficiently (i.e. enough samples are analysed when the mean and standard deviation do not change within one lithology; should be characterised for all lithologies) measure the sulphur content, neutralisation potential, selenium and other metals of concern in waste and then provide sufficient number of static, kinetic and/or column experiments that will yield reasonable conservative (mean +/- 95th percentile confidence interval) release rates that will then be used to assess the need for water treatment. Conservative treated effluent predictions should then feed into the environmental (groundwater/surface water) dispersion model to predict selenium and other metals concentration in water, their accumulation in sediment/biofilm and potential transfer to flesh of fish and bird eating insects; transfer to ovary tissue and to larvae. Predicted selenium accumulation in fish flesh and ovary should be used to assess residual risks. These predictions will then inform on proper waste management decisions.
- Considering that the Coal Mining Effluent regulations are still in draft form. The proponent should provide in the EIS a detailed monitoring program. This monitoring program should first used the predicted selenium concentrations in water, fish flesh and tissue as compliance measures. The proponent should then provide a detailed water quality monitoring program that may include total, dissolved, speciation and organic form of

selenium. The EIS should also provide a detailed fish monitoring program that would include a water and sediment triggers at which fish flesh and ovary monitoring would be required to determine the extent of selenium impacts.

- Additional caution should also be presented in the EIS regarding any proposed biological treatment systems that could remove selenium, but also transform it to organic forms that are highly bioaccumulative. As such, saturated rock fills, because they do not have open water, may reduce exposure to fish and birds.

Forestry/Terrestrial Environment:

- **Description of the potential effect (context and rationale):** Details of potential impacts of the project on forest vegetation and biodiversity, change of use and recovery of forested land, and the forest industry in the region, have not been provided. Additional clarification is needed to assess potential impact(s)/effect(s) on valued components and potential need for any mitigation and/or monitoring measures, if applicable.
    - **Hydrology in forested areas**: Description of the potential impacts of the project on the hydrology of surrounding watersheds (i.e. wetlands, surface water) and description of mitigation measures.
    - **Forest vegetation and biodiversity**: Description of the potential changes in soil quality, loss, compaction, erosion etc. that could result in reduce soil productivity. Description of methods used for tree clearing and potential impacts on biodiversity and species with cultural values.
    - **Forested land use change**: Description of how land use change will be impacted by the project, potential impacts and identification of mitigation measures.
    - **Forested land reclamation:** Description of how forested land impacted by project activities will be reclaimed in the future.

Geology

- Seismic hazard assessment, landslides/slope stability assessment as it relates to the project activities.
- Project activities have the potential to affect groundwater and groundwater-surface water interactions. Changes to groundwater and surface water environments have the potential to influence fish and fish habitat.

Socioeconomics

- NRCan looks forward to reviewing additional information from the proponent on the baseline economic environment (including more detailed demographic information), project financial and economic information, potential positive and negative economic and socioeconomic impacts of the project, and any proposed mitigation measures related to identified negative economic impacts.

Peter Unger

Name of Departmental / Agency Responder

Team Leader, Impact Assessment Division

Title of Responder

December 16, 2021

Date