

Federal Authority Advice Record (FAAR)**FAAR Response must be submitted by March 5, 2025**

Shaakichiuwaanaan Mining Project – Patriot Battery Metals.

Registry File: 89271

Department/Agency	Natural Resources Canada
Lead Contact	
Full Address	
Email	
Telephone	
Alternate Contact	

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1. a) 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?

If yes, specify the Act of Parliament and that power, duty or function.

NRCAN, through its role in the administration of the *Explosives Act*, may exercise a power or perform a duty or function that would enable the project to proceed.

- b) Please describe any Indigenous or public consultation that will be undertaken in relation to the exercise of that power, duty or function, including when it would take place.

In the event that an explosives license is required, NRCAN may consult the Indigenous communities potentially affected by the project.

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

Specify the specialist or expert information or knowledge.

- Mining economics (expertise to review the potential economic and socioeconomic impacts; regional, national, and international markets; project economics)
- Expertise in the assessment of acid rock drainage and metal leaching. More specifically, the characterization of ore, mine waste rock, rock use for construction/infrastructure, tailings overburden and exposed open-pit walls. NRCAN also has expertise in the evaluation of potential alternatives for managing mine waste and in the treatment of mine water.
- Upon ECCC's request, NRCAN can provide expertise related to greenhouse gases (GHG) emissions mitigation, including Best Available Techniques (BAT)/ Best Environmental Practices (BEP), and energy policy, which includes:
 - An expertise related to the mitigation of GHG emissions, including BAT and BEP during the assessment of mining projects

- Hydrogeology
- Seismicity

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3. 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.

No

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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: an enquiry about methodology, guidance, or data; introduction to the project)

Provide an overview of the information or advice exchanged.

No

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5. Does your department or agency have additional information or knowledge on the project not specified above, including information on the geographic, environmental, economic or social context of the project? (e.g. location of protected or sensitive areas, previous history between local communities and proponent or similar projects, local or regional social or economic concerns)?

Specify as appropriate.

NRCan is collaborating with numerous provincial and federal contributors to provide access to data, scientific publications and information on development activities through the Open Science and Data Platform ([OSDP](#)). The goal of the platform is to help Canadians learn about cumulative effects. It is therefore possible that relevant information relating to the project's implementation area may be available on the OSDP.

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6. Based on the mandate and area(s) of expertise of your department or agency, what are the key issues related to the project?

For each key issue:

- Describe the potential effect or the nature of the issue, including any relevant context ;
- Provide the rationale and/or evidence for why it is a key issue;
- Provide advice on how to address the issue, including any information or studies that should be required in the Tailored Impact Statement Guidelines, potential mitigation measures, and/or regulatory requirements relevant to the issue;
- Provide a concise, plain-language summary of the issue for inclusion in the Summary of Issues.

The information provided will be considered by IAAC and may be used to inform its decision on whether an impact assessment is required and, where appropriate, for next steps in the impact assessment process including to develop project-specific draft Tailored Impact Statement Guidelines.

Please use Table 1 to respond to this question.

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7. Where possible, identify any additional information the proponent could include in their response to the Summary of Issues, and, if IAAC requires it, in their Detailed Project Description, that would:

- Give confidence that minor issues or effects could be addressed and managed by clear measures, existing guidelines, other regulatory processes or other existing tools;
- Inform the decision as to whether an impact assessment is required; or
- Aid in tailoring the Tailored Impact Statement Guidelines, if IAAC decides an impact assessment is required.

These clarifications and additional information will be included as specific questions in the Summary of Issues provided to the proponent.

Please use Table 2 to respond to this question.

Natural Resources Canada

Name of Departmental / Agency
Responder

Office of the Chief Scientist, Impact
Assessment Division

Title of Responder

March 5th, 2025

Date

Table 1: Key Issues to inform the impact assessment process

IAAC asks that federal authorities align expert advice with IAAC’s approach to tailoring by project, which focuses on key project issues, clearly focused on the prevention of adverse effects within federal jurisdiction. In identifying key issues, federal authorities should be mindful of the project’s context (size, scope, location), Indigenous Knowledge and perspectives, and public concerns. Key issues that may be relevant to the decision include:

- adverse effects within federal jurisdiction and direct or incidental adverse effects that may be to some extent significant, based on federal experts’ knowledge and experience with past projects;
- potential impacts on Indigenous Peoples and their rights, based on Indigenous Knowledge and perspectives or experience with past projects;
- effects on key species or habitats (e.g. at risk, important to Indigenous communities, commercial importance, provide important ecosystem function);
- issues or effects that may result from novel project activities, components or technology;
- effects with large uncertainties, including in the effectiveness of mitigation measures;
- adverse effects within federal jurisdiction or direct or incidental adverse effects where mitigation measures are limited;
- positive effects, including where project may support other governmental priorities, including reconciliation with Indigenous Peoples; and
- key concerns raised by Indigenous groups or local communities.

Effects that are anticipated to be minor or which can be managed using well understood mitigation, existing guidance, and/or other regulatory processes may have simplified information requirements or may be removed entirely. Measured advice from federal authorities on key issues and solutions —and on the scope and detail of any required information and studies — will enable IAAC to focus assessments on issues that are important to participants and to decision-makers.

Comment ID	Relevant section of the Initial Project Description	Valued Component or Factor to Consider	Description of Key Issue (Context and Rationale)	Advice	Plain language summary for inclusion in Summary of Issues
<p><i>Please identify comments by organization and comment number.</i></p> <p>e.g.: IAAC-01</p>	<p><i>If the comment is related to a specific section of the Initial Project Description, please include that reference.</i></p>	<p><i>Identify valued component(s) or factor to consider—within the mandate of your department or agency—to which the potential effect or issue applies.</i></p>	<p><i>Provide a brief description of the issue and rationale for being a key issue.</i></p> <p><i>Include, where relevant,:</i></p> <ul style="list-style-type: none"> • <i>the pathway of effects;</i> • <i>relevant context on why it is a key issue;</i> • <i>key uncertainties that should be addressed in the impact assessment;</i> • <i>Indigenous or public concerns or perspective;</i> • <i>potential for differential effects among diverse subgroups;</i> • <i>scientific evidence or Indigenous Knowledge, including from past project experience, which supports inclusion as a key issue.</i> 	<p><i>Where applicable, briefly provide solutions on how to address the potential issue or effects including:</i></p> <ul style="list-style-type: none"> • <i>Information or studies required to describe and characterize the potential effect; including any guidance for data collection and/or analysis or existing data sources to inform the assessment;</i> • <i>Any means, including any powers, duties or functions, that your department or agency has that may mitigate, manage, or set conditions related to the issue or effect;</i> • <i>Guidance or policies for mitigating effects or any standard and well-understood mitigation measures that would address the effect, including follow-up monitoring activities; and/or</i> • <i>Commitments the proponent could make to respond to the issue.</i> <p><i>Where available, please refer to existing text in the Tailored Impact Statement Guidelines template.</i></p>	<p><i>For issues to be included in the Summary of Issues, provide a concise, plain language synopsis of the key issue and any questions or directions for the proponent.</i></p>
NRCan-01	IPD 14.1.5 Hydrogeology	Groundwater	<p>Some general information is provided on work that has been carried out to obtain groundwater levels, groundwater samples, hydraulic conductivities, and it is mentioned that a 3D groundwater flow model has been developed to predict drawdown cones when pumping for dewatering, but NRCan has not seen any report yet on this work (none of the appendices deal with this work).</p> <p>Considering that Lake 001 is very shallow over much of its surface, NRCan has concerns about the effect of dewatering on the hydrological/groundwater</p> <p>Related questions include the following:</p> <ul style="list-style-type: none"> • How deep will the open-pit mine be? • Have pressure transducers been installed in the 6 observation wells? • How has aquifer recharge been estimated (for the 3D model and drawdown cone prediction)? 	<p>NRCan recommends to provide more details (characteristics) on the hydrogeological study, including on: the 6 observation wells available (e.g. location, depth, water level), the results of slug tests and upcoming long-term pumping tests, as well as on the 3D model developed (e.g. different layers/units, hydrogeological property values, boundary conditions, software/code, steady-state or transient conditions, confined or unconfined) and the different scenarios used to predict drawdown cones (different stages and different K values).</p> <p>NRCan recommends providing access to well hydrographs and the methods used to estimate recharge, as well as any other information related to wells, field tests and conceptual/numerical models.</p>	

			<ul style="list-style-type: none"> • Has borehole geophysics been carried out in these wells to determine fracture characteristics (e.g. frequency, orientation, dip) and potential changes in stratigraphy/composition? • Was a conceptual model (or 2D cross-section) developed before building the model? • Are other wells available in the area (from previous studies)? If so, where? 	NRCan recommends providing access to at least one 2D cross-section showing the topography (land surface), stratigraphy, the wells (location, depth, water level, and location of packers and associated K values), water levels in wetlands and the lakes, and the estimated recharge.	
NRCan-02	<p>Section 7. Rationale, need, and potential benefits of the project</p> <p>Benefits During the development phase and when the Project goes into production, positive spin-offs will be created for local communities. From mineral exploration to production, the need for goods and services is many and varied. This creates business opportunities and jobs for local communities, and enables individuals and companies to develop new expertise, thereby contributing to the development of Québec's regions. In fact, since the exploration phase in 2023, the Shaakichiuwaanaan Project has employed more than 200 workers, at least 27 of them from First Nations communities, the majority of them Cree. This number continues to grow as exploration activities increase and Patriot prioritizes working with local Cree communities. On a broader scale, the Project will generate economic spin-offs in Québec and Canada and will contribute to the supply of spodumene concentrate to lithium hydroxide conversion plants and may potentially produce a tantalum concentrate as a by-product for the high-tech</p>	Economic conditions – project feasibility	<p>The lack of information on the positive economic effects of the project.</p> <p>The proponent could provide a detailed assessment of the positive economic impacts of their lithium project by conducting an economic impact analysis.</p>	<p>NRCan recommends including a quantitative and qualitative evaluation of how the project will contribute to the local, regional, and national economy. Specifically, NRCan invites the project proponent to consider aspects such as job creation (direct, indirect, and induced employment), local business opportunities, government revenues (taxes and royalties), and infrastructure development.</p> <p>NRCan also recommends assessing the long-term economic sustainability of the project, including potential economic diversification. To support the analysis, the project proponent could use models such as StatCan's public input-output model to estimate the broader economic effects. Additionally, it would be valuable for the project proponent to compare the findings with similar lithium projects in other regions and provide insights into how the project aligns with market demand, global supply chains, and Canada's critical minerals strategy.</p> <p>Proponent can leverage Input-Output (IO) models to assess and quantify the positive economic impacts of its initiative, such as job creation, contributions to GDP, and overall economic activity. By providing key data—such as capital and operational expenditures, industry classification, supply chain details, and expected production or service output—they can generate insights into direct, indirect, and induced economic effects. IO models use this information to estimate how spending circulates through the economy, affecting employment levels, labour income, and tax revenues at local, regional, and national levels. This analysis helps stakeholders and decision-makers understand the broader economic benefits of the project.</p>	Conducting economic analyses to inform better understanding of project feasibility

	industry.				
NRCan-03	Appendix A6	Fish and Fish Habitat	<p>Large amounts of geological material will be disturbed, generated, or transported on site creating the potential for the release of deleterious substances (e.g., metal leaching (ML) and acid rock drainage (ARD)), which can degrade water quality and harm fish and fish habitat (protected under section 36 of the <i>Fisheries Act</i>). This issue is common to metal mines in Canada (MEND 1.20.1).</p> <p>To predict how mining activities might affect water quality and fish habitats, it is necessary to study how materials from the mine might release deleterious substances or create acidic drainage. This informs planning of how to manage waste and reduce risks to the environment. Comprehensive and representative geochemical testing of all geological material to be disturbed and mine waste managed on site is essential for generating conservative release rate estimates of deleterious substances (i.e., source terms). In the EIS stage, these source terms are foundational inputs to water quality predictions, waste storage facility design, and the waste management plans. Any gaps in the characterisation program introduce uncertainty about how the mine might affect nearby water and fish.</p> <p>Both ML and ARD have been identified as potential issues at this site based on the preliminary geochemical test work done on a small number of drill core samples. In particular, lab testing demonstrated the release of arsenic at elevated concentrations as well as acid generation from some units. However, the preliminary testing program is insufficient to determine the full potential extent of ML and ARD. In addition, the IPD does not identify measures for source control and mine waste management to manage the potential release of deleterious substances.</p>	<p>The issue is best addressed by providing a comprehensive and demonstrably representative geochemical characterization program for all geologic material to be disturbed, generated, or brought to the site.</p> <p>The rigor of the geochemical characterization program determines the reliability of the resultant source terms used in the water quality model, which in turn is used to develop informed site waste and water management plans.</p>	<p>The project involves disturbing large amounts of rock, which could release harmful substances like metals and acid drainage into nearby water bodies. This could degrade water quality and harm fish and fish habitat, which are protected under the Fisheries Act.</p> <p>Early testing has shown elevated arsenic levels and acid generation, but the current testing is too limited to fully understand the risk. There is also no clear plan in the Initial Project Description (IPD) for controlling or managing these harmful materials.</p> <p>To reduce uncertainty, the proponent must conduct more thorough and representative geochemical testing to better predict contamination risks. A detailed plan for waste management and water protection should also be provided to ensure effective pollution control.</p>

Please insert additional rows as necessary.

Table 2. Clarifications or additional information the Proponent could include in the response to Summary of Issues

Comment ID	Relevant section of the Initial Project Description	Description of Issue, Concern or Uncertainty	Clarification or additional information	Plain language summary for inclusion in Summary of Issues
<p><i>Please identify comments by organization and comment number.</i></p> <p><i>e.g.: IAAC-01</i></p>	<p><i>If the comment is related to a specific section of the Initial Project Description, please provide a reference.</i></p> <p><i>You may also choose to copy the relevant text here.</i></p>	<p><i>Provide a description of the issue, concern or uncertainty the proponent could address in their response to Summary of Issues and, if IAAC requires it, in their Detailed Project Description that would give confidence that the issue will be addressed and managed, by clear measures, existing guidelines, regulatory processes or other existing tools, and thus be the subject of simplified information requests in the guidelines, or simply be removed.</i></p>	<p><i>Provide recommended clarification or additional information to be included in their response to the Summary of Issues and, if IAAC requires it, in their Detailed Project Description to address the issue, concern or uncertainty, for example:</i></p> <ul style="list-style-type: none"> <i>• Clarifications to elements of the project description (e.g. components, activities, locations or alternatives);</i> <i>• Proposed project design changes that could avoid effects;</i> <i>• Evidence that could be presented to demonstrate there is no effect pathway of effect or that effects would be negligible;</i> <i>• Evidence that standard mitigations will address potential effects</i> <i>• Commitments the proponent could make to respond to the issue, including the implementation of federal operational policies or guidance documents.</i> 	<p><i>For issues to be included in the Summary of Issues, provide a concise, plain language synopsis of the issue and of the question or direction for the proponent.</i></p>
NRCan-01	Appendix 6	<p>The geochemical testing plan follows Directive 019 from the Quebec Ministry of the Environment. Consistent with this, CEAEQ Method MA. 200 is used for the 'extractable metals content' analysis, and these results are used for identifying metal enrichment relative to typical continental crust. This method uses an aqua regia digestion, which is a partial digestion that targets the most reactive mineral phases (e.g., sulphides) but is not intended to target silicate phases, such as those common to this deposit. As noted in the preliminary geochemical testing report, metal enrichments measured following the partial digestion by aqua regia likely represent only a portion of the total available metal content. Enrichment relative to terrestrial crustal averages might include more elements, in greater amounts, and in more samples than captured by the current preliminary tests. As a result, it is possible that the metal-leaching behaviour of the samples during kinetic testing will not reconcile with the results obtained during static testing, because the minerals and the elements they host may differ in reactivity than captured by the aqua regia digestion method. Without this reconciliation, it will not be possible to have confidence that the samples selected for kinetic testing represent the likely and worst-case scenario outcomes, as required by the TISG.</p>	<p>NRCan recommends that the Proponent ensures that the results of their future kinetic testing program can be explained by and reconciled with sample characteristics identified during the static testing program. To achieve this, NRCan recommends that the Proponent includes in the static testing program a method better suited for identifying the source of potential ML, such as a more complete digestion method or quantitative mineralogical analysis combined with element deportment data.</p>	<p>The current geochemical testing method uses a sample digestion method that only extracts metals from some minerals and does not fully capture elements bound in silicate minerals, which are common to this deposit. This means the test results likely underestimate the total metal content in the rock, leading to uncertainty in predicting metal leaching (ML) risks. Because of this limitation, the static testing results may not align with the kinetic testing results, making it difficult to confidently assess the worst-case scenario for metal leaching, as required by the Environmental Impact Statement (EIS) Tailored Impact Statement Guidelines (TISG). To improve confidence in the results, the proponent should use a more complete digestion method or quantitative mineralogical analysis to better identify potential sources of metal leaching. This will ensure that kinetic testing results accurately reflect the materials' reactivity and provide a stronger</p>

				basis for environmental risk assessment.
NRCan-02	Appendix 6	<p>Kinetic tests evaluate the weathering of geological materials over time and are used to develop element release rates (i.e., source terms) for water quality predictions.</p> <p>The samples that were subjected to kinetic testing in the preliminary geochemical tests presented in the IPD were not subjected to static testing. As a result, it is not possible to interpret the kinetic test results in terms of their acid-generating and metal-leaching potential nor is it possible to determine whether the presented kinetic test results represent best case, expected, or worst-case scenarios for each mine rock type. This information is necessary to ensure that the test program is designed to support robust and conservative source terms and inform waste management planning</p>	<p>Samples that are subjected to kinetic testing need to demonstrate that they represent expected and worst-case scenarios for ML/ARD. To do this, all samples that undergo kinetic testing need to also undergo static testing and their performance during kinetic testing needs to be interpreted in the context of the static test results of the unit they represent.</p>	<p>Kinetic test samples were not first tested using static methods, making it unclear if they represent worst-case (90th percentile) scenarios for metal leaching and acid generation. Without this comparison, the results lack context and may not provide accurate source terms for water quality predictions. To ensure robust and conservative assessments, all kinetic test samples must first undergo static testing, allowing their results to be properly interpreted and used in informing effective waste management planning.</p>
NRCan-03	Appendix 6	<p>Sample selection in the preliminary geochemical test work is based on the approximate abundance of waste rock units in the logged lithologies. This might differ significantly from the proportion of different waste rock lithologies to be disturbed by the Project.</p>	<p>Provide a comprehensive and demonstrably representative geochemical sampling and analysis plan. See NRCan-03 in Table 1.</p>	<p>The current test work may not accurately reflect the actual proportions of waste rock types that will be disturbed. To ensure representative results, the proponent should develop a comprehensive geochemical sampling and analysis plan that aligns with the expected distribution of waste rock lithologies.</p>
NRCan-04	Appendix 6	<p>Preliminary geochemical test work indicates the existence of potentially acid generating (PAG) units and units that are at significant risk of metal leaching (ML). The IPD identifies that all waste rock and tailings will be stockpiled on site without any indications of individual unit management or seepage collection and treatment. This introduces risk to the surrounding fish and fish habitat</p>	<p>Provide information on how the Project will manage problematic units, control, monitor and treat seepage</p>	<p>Preliminary testing shows that some waste rock and tailings may generate acid or leach metals, but the IPD lacks details on how these materials will be managed. The proponent must clarify how problematic units will be identified, controlled, monitored, and how seepage will be collected and treated to prevent environmental contamination.</p>

Please insert additional rows as necessary.