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Thursday, February 4, 2021

Our ref.: OF15-4-126

Your ref.: 80005

Véronique Lalande  
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Send by email only to "[veronique.lalande@canada.ca](mailto:veronique.lalande@canada.ca)"

**Subject:** Response to your request for final expert advices<sup>1</sup> regarding the environmental assessment of the Rose Lithium-Tantalum Mining Project (file number 80005)<sup>2</sup>

Dear Ms. Lalande,

As requested in your letter of January 13, 2021, the following is our final expert report on the valued components "Health of Indigenous peoples" and, to a lesser extent, "Current use of lands and resources for traditional purposes by Indigenous peoples (perception of food contamination and avoidance of the resource)."

Given the request of the Joint Assessment Committee (JAC), the nature of the project, Health Canada's (HC) expertise,<sup>3</sup> and the environment in which this project would take place, Health Canada's analysis focused on the potential impacts of the project on human health that would result from changes to **air quality, noise (sound environment), chemical contamination of country foods, and accidents and malfunctions.**

However, Health Canada would like to point out that health is not only defined by the absence of disease or infirmity caused by the physical environment but also by a state of physical, mental and social well-being.

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<sup>1</sup> Email from the Agency to Health Canada received January 13, 2021 with the subject line: "Request for Final Expert Advices Regarding the Environmental Assessment of the Rose Lithium-Tantalum Mining Project (File Number 80005)"

<sup>2</sup> For more details on the project, please go to: <https://www.acee-ceaa.gc.ca/050/evaluations/proj/80005?&culture=en-CA>

<sup>3</sup> Please refer to the Health Canada 2015 web page.

Local relevant authorities in these other health determinants should be consulted.

Answers to the questions in your request can be found in **Appendices 1 to 4**. Background is provided in **Appendix 5** and references are listed in **Appendix 6**.

This advice report is complementary to all advices reports transmitted to the JAC by HC as part of the environmental assessment process for this project.

We hope that everything will meet your expectations.

Yours sincerely,

<Original signed by>

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<Original signed by>

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Att.:

Appendix 1: Air Quality  
Appendix 2: Noise (Sound Environment)  
Appendix 3: Country Foods  
Appendix 4: Accidents and Malfunctions  
Appendix 5: Background  
Appendix 6: References

c.c.: [by email]

Isabelle Lampron, Regional Manager, Environmental Health Program – Quebec Region, Health Canada  
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## APPENDIX 1 – Air Quality

### Existing Environment and Baseline Conditions

1 – Has the proponent submitted information that adequately describes and documents air quality and its relation to the health of Cree Nations located in close proximity to the project? Please explain your response and identify any information gaps or areas where uncertainty remains. Explain the extent to which these may influence the project analysis.

There would be very little industrial activity in the vicinity of the project (WSP 2019a, p. 6-142) and current air quality is considered very good (WSP 2019a, p. 6-14).

The initial crystalline silica concentrations recommended by the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC)<sup>1</sup> were used (WSP 2019a, p. 6-147).

For nitrogen dioxide (NO<sub>2</sub>), the initial concentration used by the proponent was 29.4 µg/m<sup>3</sup>. This concentration is the three-year average of the 99<sup>th</sup> percentile of hourly data measured at the Saint-Anicet station of the Réseau de surveillance de la qualité de l'air du Québec, or RSQAQ [Quebec air quality monitoring networks] (WSP 2020c, p. 12).

For fine particulate matter (PM<sub>2.5</sub>), the initial annual average concentration used by the proponent was 4,5 µg/m<sup>3</sup>. This was based on measurements made at the Pémonca station (WSP 2019a, p. 6-148).

**Advice No.1** – Baseline levels of major contaminants that may have health effects in the context of this project (e.g., crystalline silica, nitrogen dioxide and fine particulate matter) were presented.

It should be noted that Health Canada relies on Environment and Climate Change Canada and the Ministère de l'Environnement et de la Lutte contre les changements climatiques for their expertise in determining whether the initial concentrations selected by the proponent are representative of the existing environment.

### Potential Impacts

2 – Has the proponent adequately identified and documented the potential health impacts on the Cree Nations located near the project due to changes in air quality? Please explain your answer and identify any gaps or areas where uncertainty remains. Please describe any potential impacts that may have been misidentified or unidentified.

<sup>1</sup> Initial concentrations for northern projects that are in remote sites.

## Human Receptors

Since some land users are concerned about the project’s potential impacts on air quality, it has been identified by the proponent as a valued component:

*“Concerns about **air quality** were raised during meetings with the Indigenous communities, particularly those related to **dust and the fear of these emissions on the health of the people and workers at the site**. In addition, air quality degradation related to contaminant emissions into the atmosphere remains an important issue to consider, both in terms of the potential impact on human health and on wildlife. For these reasons, air quality is considered a valued component.”* (WSP, 2019a, p. 6-142)

Distances between the project site and potential human receptors in the areas affected by the project were established using geographic maps and the different land uses were presented. The main receptor considered by the proponent is Camp C2 located 4.5 km from the facilities (WSP, 2019a, p. 6-149). Other camps would also be located along the roads that will be used to transport the ore (WSP 2019e – CEEA Appendix 2; WSP 2020c – Appendix CCE-70). Community members would use the area adjacent to the mine site for various activities (hunting, fishing, etc.) (WSP 2019a, p. 6-95, p. 8-44; WSP 2020c – Appendix CCE-70).

**Advice No. 2** – Potential human receptors have been adequately identified with particular attention to Indigenous peoples.

## Air Contaminant Dispersion Modelling

The air contaminant dispersion models presented (WSP 2019a – Vol.2 RS-6; WSP, 2019e – Appendix 60) allow for the project’s potential impact on air quality to be estimated. They are accompanied by maps showing estimated contaminant concentrations and the location of sensitive receptors in the vicinity of the site. Assessment scenarios and hypotheses are described and consist of baseline conditions, the project alone, and baseline conditions plus the project. All phases of the project have been considered (construction, operations and closure), and all sources of contaminant emissions related to project activities appear to have been identified (WSP 2019a, pp. 5-13, 6-150, 6-156, and 6-163; WSP 2019e, p. 5). The proponent indicates that it has taken into account worst-case emission scenarios in its modelling, i.e., scenarios likely to emit a maximum amount of contaminants into the air. This is a good approach.

**Advice No. 3** – The air contaminant dispersion models presented can help assess the project’s potential impacts on air quality and health. It should be noted that Health Canada relies on Environment and Climate Change Canada and the Ministère de l’Environnement et de la Lutte contre les changements climatiques for their expertise in judging the quality of the models.

## Assessment of Health Effects Based on Projections from Air Contaminant Dispersion Modelling

Potential health impacts on the Cree Nations located near the project due to changes in air quality were identified and documented by comparing projected concentrations with MELCC standards and criteria and Canadian Ambient Air Quality Standards (CAAQS):

*"The effects are assessed on the normative basis of Quebec's air quality standards and criteria and the CAAQS using air quality modelling. Scenarios for both construction and operations were modelled.*

- *For the construction scenario, all the considered standards and criteria are met in the field of application, i.e., beyond 300m from the infrastructures and at sensitive receptors.*
- *For the operations scenario, exceedances of the RAA [Clean Air Regulation] total particulate matter standard are modelled in proximity to the operations.*

*However, these exceedances are contained in the periphery of the site and do not reach any area of land use. Exceedances of the crystalline silica criteria are also modelled near the site. However, with the application of mitigation measures, no significant exceedances of crystalline silica criteria are modelled at sensitive receptors. For all other modelled components, all standards and criteria are met in the field of application and at sensitive receptors." (WSP 2019a, p. 6-143)*

**Advice No. 4** – In the context of this project, the comparison of projected concentrations with the standards and criteria of the Ministère de l'Environnement et de la Lutte contre les changements climatiques and the Canadian Ambient Air Quality Standards is an appropriate method for assessing health impacts due to changes in air quality.

However, it is important to note that, for some contaminants (e.g., nitrogen dioxide and fine particulate matter), a threshold below which no adverse health effects occur has yet to be identified. Any increase in concentration, no matter how small, can lead to adverse health effects.

### Contaminants of Interest for Air Quality and Health

In the context of this project, the main contaminants of interest concerning air quality and health have been taken into account by the proponent:

- 1) crystalline silica
- 2) nitrogen dioxide (NO<sub>2</sub>)
- 3) fine and respirable particles (PM<sub>2.5</sub> and PM<sub>10</sub>)

## 1) Crystalline silica

Crystalline silica can cause silicosis, an incurable lung disease. It can occur after a period of 15 to 20 years of low to moderate exposure<sup>2</sup>. Therefore, it is generally very important to consider this substance when protecting the health of mine workers.

However, exceedances of crystalline silica criteria were modelled at the sensitive receptor (Cree camp) despite the application of the mitigation measure to use low silica aggregate on roads:

*"In the field of application, the modelled crystalline silica concentrations of the mitigation scenario again show exceedances of the 1-hour and annual criteria. At sensitive receptors, modelled concentrations also show exceedances of the 1-hour criterion, but now meet the annual criterion. The maximum concentration modelled over a 1-hour period represents 766% of the criterion in the field of application and 117% of the criterion at sensitive receptors.*

*Although exceedances are still being modelled, the mitigation measure is particularly effective in reducing concentrations at sensitive receptors where a significant 40% improvement is observed. In addition, these modelled maximums occurred during a day of waste rock blasting operations, a situation that actually occurs only one day in five". (WSP 2019a— vol.2 – RS6, p. 34)*

However, the proponent has not described the health effects that could result from exceeding the criteria. Where predicted contaminant concentrations approach or exceed air quality guidelines and standards, the environmental assessment must include a discussion of the potential impacts of these exceedances on human health (HC 2016b, p. 18).

**Advice No. 5** – Since exceedances of the criteria for crystalline silica were modelled at sensitive receptors, it would have been appropriate for the proponent to have included an analysis of the potential impacts of these exceedances on human health. Monitoring actual crystalline silica concentrations at sensitive receptors could partially fill this gap. Therefore, measures to minimize crystalline silica emissions would be very important.

## 2) Nitrogen dioxide (NO<sub>2</sub>)

NO<sub>2</sub> can reduce lung function and worsen asthma symptoms. Prolonged exposure to low levels of nitrogen dioxide can increase the risk of respiratory symptoms such as coughing and wheezing<sup>3</sup>.

<sup>2</sup> Canadian Centre for Occupational Health and Safety – <https://www.ccohs.ca/oshanswers/diseases/silicosis.html>

<sup>3</sup> Health Canada "Nitrogen Dioxide": <https://www.canada.ca/en/health-canada/services/air-quality/indoor-air-contaminants/nitrogen-dioxide.html>

NO<sub>2</sub> is a non-threshold substance, i.e., a threshold below which no adverse health effects occur has yet to be identified. Concentrations of NO<sub>2</sub> should therefore be kept as low as possible.

Modelling results for NO<sub>2</sub> would comply with Canadian **Ambient Air Quality Standards (CAAQS)** during **the construction and operation phase**:

*“Based on this new initial concentration, the modelling results, therefore, indicate maximum modelled concentrations at the Cree camp of 52,4 µg/m<sup>3</sup>, or 66% of the 1-hour CAAQS standard for NO<sub>2</sub>, for the construction scenario and 59,8 µg/m<sup>3</sup>, or 76% of the standard for the operation scenario.” (WSP 2019e— Appendix 60, p. 12)*

### 3) Fine and respirable particles (PM<sub>2.5</sub> and PM<sub>10</sub>)

**According to the World Health Organization (WHO) and Health Canada (HC), long-term exposure to particulate matter increases the risk of developing cardiovascular disease, respiratory disease and lung cancer.<sup>4,5</sup> PM<sub>2.5</sub> is a non-threshold substance, that is, a threshold below which no adverse health effects occur has yet to be identified.** Concentrations of fine and respirable particles should therefore be kept as low as possible.

According to the proponent’s projections, CAAQS standards will be met at sensitive receptors during the **construction and operation** phases:

*(Construction) “The maximum total fine particle concentration modelled in the field of application is 5.14 µg/m<sup>3</sup>, when considering the initial concentration, which is 58% of the annual CAAQS standard of 8.8 µg/m<sup>3</sup>.” (WSP 2019a – Vol. 2 – RS6, p. 29).*

*(Operation) “The modelled daily concentration corresponding to the maximum annual 98th percentile is 21,9 µg/m<sup>3</sup>, when considering the initial concentration, which is 81% of the 24-hour CAAQS standard. Operations contribute approximately 31% of the total modelled concentration in ambient air. At sensitive receptors, the maximum modelled concentration represents 59% of the standard. [...]*

*The annual CAAQS standard is also met. The maximum total fine particle concentration modelled in the field of application is 5.93µg/m<sup>3</sup>, when considering the initial concentration, which is 67% of the annual CAAQS standard of 8.8µg/m<sup>3</sup>. Operations contribute approximately 24% of the total modelled concentration in ambient air. At sensitive receptors, the maximum modelled concentration represents 53% of the standard. The isoconcentration curves are shown on Map 17.” (WSP 2019a – Vol. 2. –RS6, p. 32).*

The proponent also compared the results of PM<sub>10</sub> modelling with the criteria of **the WHO**. These criteria would be met at sensitive receptors:

<sup>4</sup> WHO “Particulate matter – Definition and principal sources”: [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health)

<sup>5</sup> Government of Canada “Health effects of air pollution”: <https://www.canada.ca/en/health-canada/services/air-quality/health-effects-indoor-air-pollution.html>

*"In the field of application, modelled  $PM_{10}$  concentrations exceed the 24-hour WHO guideline but meet the annual guideline. Nevertheless, the results show compliance with WHO guidelines at all sensitive receptors for both time periods.*

*Maximum  $PM_{10}$  concentrations are modelled south and north of the site where exceedances of the 24-hour limit value extend to within 575 m of the application limit.*

*At sensitive receptors, the maximum concentrations modelled when considering initial concentrations are 60% and 32% of the limit values for the 24-hour and annual periods, respectively." (WSP 2019f, p. 7)*

It should be noted, however, that the proponent applied a relatively high dust reduction factor in its modelling:

*"...] an emission factor of 0.25 was applied to the routing volume sources to take into account a 75% reduction in particulate matter emitted, mainly due to regular road watering." (WSP 2019a – Vol. 2 – RS6, p. 20).*

This reduction rate is generally considered overly optimistic by Environment and Climate Change Canada (ECCC 2020, p. 18; R. Chabot, personal communication, January 2020).

#### Effects of Traffic (off the mine site)

The proponent presented a summary analysis of project-related off-site road traffic and its potential impacts on air quality. The proponent points out that this traffic would generate particulate matter (PM) and combustion gases [carbon monoxide (CO), nitrogen oxide (NO<sub>x</sub>), and sulphur dioxide (SO<sub>2</sub>)] along the roads. The proponent concludes that:

*"The increase in AADT due to the project therefore translates to an increase in particulate matter suspension of about 45% on the Nemiscau-Eastmain-1 road and the Route du Nord towards Matagami and about 62% on the James Bay Highway. For the portion of the Route du Nord towards Chibougamau, the increase is minimal." (WSP 2020c, p. 24)*

<p><b>Advice No. 6</b> – Given the concerns of some land users, a more detailed analysis of the potential impact of off-site road transport on air quality would have been appropriate. The proponent does not seem to have analyzed the project’s potential health impacts due to the increase in particulate matter.</p>
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#### Comment – Principles of Keeping Clean Areas Clean and Continuously Improving Air Quality

It would have been appropriate for the proponent to address in its impact statement how the CAAQS principles of “keeping clean areas clean” and “continuously improving air quality” would be considered in the design of its mitigation measures, monitoring, and follow-up activities.



To the Agency's question:

*“Explain how the CAAQS principles of keeping clean areas clean and continuously improving air quality will be considered in the design of mitigation measures, monitoring, and follow-up activities for air quality,”*

the proponent simply responded:

*“According to the document clarifying the roles and responsibilities of governments in the implementation and operation of the Air Quality Management System<sup>9</sup> and Table 5 of the Guidance Document on Air Zone Management<sup>10</sup>, the provincial government, not the proponent, is responsible for ensuring that good air quality is maintained through proactive air management measures and protecting unpolluted areas.” (WSP 2020c, p. 19)*

### Mitigation Measures

3 – Among the mitigation measures proposed by the proponent, please identify those that you consider essential<sup>6</sup>. Please propose any required corrective measures or recommend any measures not proposed by the proponent that you consider essential for preventing or mitigating impacts.

In addition to compliance with environmental regulations, the objective of mitigation measures should be to minimize the release of pollutants in the air, consistent with CAAQS principles of keeping clean areas clean and continuously improving air quality.

**Advice No. 7** – Given the concerns expressed by Indigenous people regarding the project's potential impacts on air quality and land use (frequent hunting, fishing, etc.), as well as the importance of protecting air quality (principle of keeping clean areas clean), all mitigation measures aimed at reducing effects on air quality presented in the impact statement (WSP 2019a, p. 6-164, p. 13-6; WSP 2020c, p. 16) may prove to be crucial.

It should be noted that Health Canada relies on Environment and Climate Change Canada and the Ministère de l'Environnement et de la Lutte contre les changements climatiques for their expertise regarding “technical” effectiveness and the uncertainty surrounding the effectiveness of mitigation measures to protect air quality.

**Advice No. 8** – If required and as planned by the proponent, additional mitigation measures should be implemented in collaboration with the follow-up committee, land users (WSP 2019a, p. 4-21), and the Cree Board of Health and Social Services of James Bay.

**Advice No. 9:** In this project, to protect health associated to air quality, the most important mitigation measures would be those to limit emissions of crystalline silica, nitrogen dioxide, and fine and respirable particles.

<sup>6</sup> Key Measures: Mitigation measures that are essential to avoid or mitigate potential impacts and that could be turned into conditions under the CEA Act, 2012

## Crystalline Silica

The proponent has committed to using amphibolite as an aggregate to limit crystalline silica emissions:

*“To limit crystalline silica emissions from routing, amphibolite will be used as an aggregate on the roads. Amphibolite is in effect a waste rock lithology that contains little crystalline silica (< 1%).” (WSP 2019e— Appendix CEAA-58, p. 7)*

**Advice No. 10** – Given the health effects of crystalline silica, the modelling results, and the general mitigation measures to limit dust emissions from routing, using materials with low silica content (<1%) as aggregate on roads, as proposed by the proponent, would be a key mitigation measure.

Regarding crystalline silica emissions during blasting, the proponent states that

*“To prevent dust dispersion (especially of crystalline silica) from the mine site, if necessary, blasting will be restricted during periods of high winds or when prevailing winds can carry dust to sensitive areas (workcamp at kilometer 37 of the Nemiscau-Eastmain-1 road), particularly for waste rock blasting. The blasted areas will be watered to prevent the dispersion of dry and fine materials deposited on the surface by drilling activities.” (WSP 2019e – Appendix CEAA-58, p. 6)*

*“CEC undertakes to limit waste rock blasting as much as possible when winds are blowing towards the workcamp at kilometre 37 of the Nemiscau-Eastmain-1 road. (QC 5, 2nd series of MELCC)” (WSP 2020c - Appendix CCE-80 - p. 9/25).*

**Advice No. 11** – As proposed by the proponent, a key mitigation measure would be to restrict blasting during periods of high winds to prevent the dispersion of dust (including crystalline silica) to sensitive areas of the mine site (e.g., camp at km 37) (WSP 2019e – Appendix CEAA-58, p. 6).

## Nitrogen dioxide (NO<sub>2</sub>)

**Advice No. 12**– Since it is a non-threshold substance, any measures to minimize nitrogen dioxide emissions would be essential.

According to the proponent: “[...] machinery exhaust gases account for 94% of the maximum modelled concentrations for the project in the operational phase.” (WSP, 2020c, p. 11). The proponent’s following mitigation measures would therefore be important:

*“[...] for operations purposes, the proponent undertakes to purchase only Tier 4 -certified mobile equipment, where available. As discussed in response CCE-10-B, this has the effect of reducing exhaust emissions by 43% compared to what was considered in the modelling.” (WSP, 2020c, p. 19)*

*“unused electrical or mechanical equipment must be turned off, including trucks waiting for more than five minutes for loading” (WSP 2019a, p. 13-5).*

**Advice No. 13** – Purchasing Tier- 4-certified mobile equipment where available, as planned by the proponent, would be a key mitigation measure.

**Advice No. 14** – Turning off trucks waiting for more than five minutes for loading, as planned by the proponent, would be a key mitigation measure.

Concerning NO<sub>2</sub> emissions due to blasting, the proponent states:

*“If sub-optimal detonation conditions are observed or forecasted, the following measures may be used, if necessary, in the definition of blasting plans:*

- Use of dual detonators;*
- Use of electronic detonators;*
- Formulation of explosives adapted to the conditions and the blasting site;*
- Adapted firing procedure;*
- Use of an adapted type of explosive such as water-resistant explosives.” (WSP 2019e – Appendix CEAA-58, p. 14)*

**Advice No. 15** – If detonation conditions are sub-optimal during blasting, the implementation of these mitigation measures would be important. However, it would have been useful if the proponent had specified the criteria that would lead to their implementation.

#### Fine and respirable particles (PM<sub>2.5</sub> and PM<sub>10</sub>)

**Advice No. 16** – Since dust (PM<sub>2.5</sub> and PM<sub>10</sub>) is a substance with non-threshold health effects, any measures to minimize dust emissions are highly important.

The proponent states that:

*“Dust generation during the transport of various materials on the unpaved road network is usually the major contributor of particulate matter among the fugitive sources of a mine complex.” (WSP 2019a – Vol. 2. – RS6, p. 19);*

*“Transportation of materials on unpaved roads is the project’s largest source of particulate matter emissions” (WSP 2019e – Appendix CEAA-58, p. 7).*

**Advice No. 17** – The proponent plans to reduce dust emissions by 75% through regular road watering (WSP 2019a – Vol. 2. – RS6, p. 20). Applying water as a dust suppressant (WSP 2019e – Appendix CEAA-58, p. 9) would be a key mitigation measure. However, the proponent should specify the criteria for identifying the most appropriate times to apply dust suppressants.

**Advice No. 18** – *“The use of non-friable materials with good abrasion resistance will be prioritized for road construction and maintenance.”* (WSP 2019e – Appendix CEAA-58, p. 7). This is a key mitigation measure proposed by the proponent.

For this project, the proponent plans to set the speed limit for mining vehicles on the site at 40 km/h (WSP 2019e – Appendix ACEE-58, p. 9). According to *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities*<sup>7</sup>, the speed limit for vehicles travelling on unpaved roads should be 16–24 km/hour and speed limit signs should be posted in appropriate locations.

**Advice No. 19** – Lowering the speed limit for vehicles on the site and posting speed limit signs in appropriate locations could further reduce dust emissions. This could be a key mitigation measure.

With respect to the increase in off-site traffic, the proponent believes that setting up a system for receiving and resolving complaints, including those that are traffic-related, would reduce the impact.

*“However, traffic on an unpaved road has considerably higher emissions than on a paved road and additional traffic on these roads could have a potential effect on air quality. The samples of air quality monitoring that were analyzed, although imperfect, show that exceedances of standards would not necessarily be expected near roads. Nevertheless, additional traffic due to the project remains low in terms of absolute number of trips. In addition, CEC will set up a system for receiving and resolving complaints that will include traffic-related complaints, thereby reducing the impact of additional traffic on these roads.”* (WSP 2020c, p. 26).

**Advice No. 20** – Although the “system for receiving and resolving complaints that will include traffic-related complaints” is not a mitigation measure as such, it may identify additional measures to mitigate the impacts of road transport off the project site. Examples of potential measures to mitigate impacts of additional road traffic on air quality would have been useful. For example, a truck-wash station could be planned to ensure that trucks leaving the site are clean.

To limit the impacts of additional road traffic, the proponent would shuttle workers between the mine site and the airport:

<sup>7</sup> <http://www.bv.transports.gouv.qc.ca/mono/1173259.pdf>

*“Employees will be shuttled from the mine site to the airport by bus, requiring a maximum of two trips per day.” (WSP 2020b, p. 4).*

**Advice No. 21** – Transporting employees from the mine site to the airport by bus could be a key mitigation measure.

### Comment – Compliance with Laws and Regulations

On several occasions, the proponent refers to complying with various regulations as being a mitigation measure. For example, mitigation measure T8 states that: *“Dust emissions from access and traffic routes, as well as from the handling of aggregates, must be controlled in accordance with the Clean Air Regulation (CQLR, chapter Q-2, r. 4.1).”* (WSP 2019a, p. 5-23). Compliance with laws and regulations should not be considered a mitigation measure. It is a legal obligation.

### Comment – Communication of Environmental Follow-Up

In its list of health-related air quality mitigation measures, the proponent indicates that it intends to: *“– Inform Cree land users and members of Cree communities of environmental follow-up results;”* (WSP 2019a, p. 8-60). However, to *“Inform Cree land users and members of Cree communities of environmental follow-up results”* (WSP 2019a, p. 8-60) is not a mitigation measure for protecting air quality.

### Comment - Burning Wood Waste and Debris

The proponent’s mitigation measure D8 states that: *“During deforestation operations, wood waste and debris may be disposed of in an authorized area or may be shredded or burned.”* (WSP 2019a, p. 5-18). To protect air quality, it is suggested, whenever possible, not to burn wood waste and debris during deforestation operations.

### **Residual Effects**

4—Were the residual effects (after implementation of mitigation measures) on air quality adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe any residual effects that may have been misidentified or unidentified.

Residual effects on air quality have been identified and documented by the proponent.

**Advice No. 22** – For this project, the comparison of projected concentrations (taking mitigation measures into account) to the standards and criteria of the Ministère de l'Environnement et de la Lutte contre les changements climatiques and the Canadian Ambient Air Quality Standards is an adequate method to assess the potential residual health impacts of changes in air quality.

Refer to the answer to question 2 for more information.

5 – Do the mitigation measures, including follow-up plans proposed by the proponent (if applicable), address the remaining uncertainties? Please explain your answer and propose any other measures you believe are essential to prevent, mitigate, monitor or follow up residual effects.

**Advice No. 23** – The mitigation measures and environmental follow-up proposed in the *Dust Emission Management Plan* (WSP 2019e) should be able to address the uncertainties. It should be noted that Health Canada relies on Environment and Climate Change Canada and the Ministère de l'Environnement et de la Lutte contre les changements climatiques for their expertise regarding "technical" effectiveness and uncertainty surrounding the effectiveness of mitigation measures to protect air quality.

Refer to the answer to question 3 for more information.

### Cumulative Effects

6—Have cumulative effects<sup>8</sup> on air quality for which a residual effect remains been adequately documented? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which these may influence the project analysis.

The proponent has determined that there will be no cumulative impacts on air quality and that no additional mitigation measures will be required:

*“The cumulative impacts on six Valued components was assessed. The conclusion is that **the project will only cause insignificant cumulative impacts on the Eastmain and Nemaska Cree Communities**, woodland caribou, migratory bird species, bird species at risk, and chiroptera in the study area (spatial scope) over the selected time periods (temporal scope).*

*As a result, **no additional mitigation measures or environmental follow-up programs (different from those proposed in the specific assessment of this project) are required.**”* (WSP 2019a, p. 10-56)

The environmental follow-up program planned by the proponent could verify this conclusion.

<sup>8</sup> Cumulative Effects: Cumulative effects are defined as changes to the environment caused by the project in combination with other past, present and reasonably foreseeable future work or projects.

7—Has the proponent proposed adequate measures to prevent or mitigate cumulative effects? If not, please explain and propose alternative measures.

Not applicable.

8—Among the mitigation measures proposed by the proponent to reduce cumulative effects, please identify those that you consider essential. Please propose any required corrective measures or recommend any measures not proposed by the proponent that you consider essential for preventing or mitigating cumulative effects.

Not applicable.

### Monitoring<sup>9</sup> and Follow-Up Programs<sup>10</sup>

9 – Does the monitoring program verify and control the implementation of mitigation measures and ensure that they are appropriate to reduce, prevent or mitigate potential impacts on each of the components? Please justify your answer.

#### Contaminants of Health Concern

**Advice No. 24** – For health protection, it is important to monitor crystalline silica, nitrogen dioxide, and fine and respirable particles at sensitive receptors and locations.

#### Air Quality at Sensitive Receptors

**Advice No. 25** – The follow-up program should provide an adequate picture of air quality in sensitive areas such as the work camp at kilometre 37 of the Nemiscau-Eastmain-1 road, and the measurements should be compared with the relevant Canadian Ambient Air Quality Standards (e.g., for fine particles and nitrogen dioxide) and any other relevant standards or criteria that may apply to health effects.

#### Verification of the Proponent’s Conclusions and the Effectiveness of Mitigation Measures

**Advice No. 26** – It would be very important for the follow-up program to be able to: (1) verify the proponent’s conclusions regarding impacts on air quality during the construction and operation phases, (2) measure the real effectiveness of the mitigation measures, and (3) modify, if necessary, some mitigation measures and/or implement additional mitigation measures to ensure health protection, in close collaboration with the follow-up committee, land users, and the Cree Board of Health and Social Services of James Bay.

<sup>9</sup> **Monitoring Program:** The goal of a monitoring program is to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety.

<sup>10</sup> **Follow-Up Program:** A follow-up program is designed to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

### Follow-up Committee and Additional Mitigation Measures

A follow-up committee would be created by the proponent to identify solutions to potential impacts of mine activities:

*"Finally, the establishment of an "information exchange and consultation committee" made up of members of the Eastmain and Nemaska communities and mine personnel will make it possible, through regular meetings, to discuss and propose solutions to the various issues related to the mine's activities." (WSP 2019a, p. 8-69).*

**Advice No. 27** – Creating a follow-up committee to identify possible solutions for reducing air emissions would be very important.

### Communication of Follow-Up Results

The proponent plans to: *"– Inform Cree land users and members of Cree communities of environmental follow-up results;" (WSP 2019a, p. 8-60) and that "[...] frequent and regular contact will be maintained between the tallyman of the RE1 trapline and the CEC to ensure that mine activities do not interfere with the activities of land users, and to make any required adjustments." (WSP, 2019a, p. 8-62).*

The proponent also commits to: *"[...] share its monitoring data to allow a more accurate assessment of the air quality in the project's atmospheric zone, determine possible solutions to reduce emissions and apply, where possible, new mitigation measures to its operations. (CCE-15)" (WSP 2020c – Appendix CCE-80, p. 9/25).*

**Advice No. 28** – Given the concerns expressed by some members of the community regarding the project's potential impacts on air quality, it would be very important to share the results of the environmental follow-up with the community, especially with the tallyman of trapline RE1 and, if required, all land users (including users located along transportation routes).

Should exceedances of the various health protection standards/criteria be anticipated or measured through air quality monitoring, it is imperative that the community be notified promptly and that community-specific risk management and communication strategies be quickly developed and implemented by the proponent.



## Complaints Management

**Advice No. 29** – The proponent’s planned complaints management mechanism (refer to WSP 2019a, p. 14-3) would be very important. This could allow certain mitigation measures to be modified and/or additional mitigation measures to be implemented in close collaboration with the follow-up committee, land users (including users located along transport routes), and the Cree Board of Health and Social Services of James Bay.

## Monitoring Station

The proponent states:

*“The plan sets forth that the position of the sampling station will be determined to provide an adequate picture of the air quality moving toward the sensitive areas, namely the camp at kilometre 37 of the Nemiscau-Eastmain-1 Highway. The exact positioning will be defined from site-specific prevailing wind directions, which will be obtained from meteorological data from the station that will be installed at the site. Prior to this, the planned location will be submitted to the MELCC for approval.” (WSP 2019e – Appendix 58, p. 10)*

However, to reassure users to minimize avoidance of the land, the Joint Assessment Committee requested the proponent to consider adding an air quality monitoring station at a location representative of the use of the RE1 trapline, even in the absence of a camp:

*“The proponent provided an air quality monitoring program in Appendix Q-7Bis of the Responses to the Ministère de l’Environnement et de la Lutte contre les changements climatiques (February 2019), which considers following up on a receptor deemed sensitive, namely the workers’ camp. However, users of the RE1 trapline use the area occasionally, especially for moose hunting in winter and goose hunting in the spring. That said, no Cree camps have been identified as sensitive receptors. Exposure is nevertheless likely and it seems important to reassure users to minimize avoidance of the territory.*

THE JOINT ASSESSMENT COMMITTEE REQUESTS CRITICAL ELEMENTS LITHIUM CORPORATION (THE PROPONENT) TO:

*Consider adding an air quality monitoring station at a location representative of the use of the RE1 trapline, even in the absence of a camp. If not, justify the choice of worker camp as the only air quality monitoring station.”(WSP 2020c, p. 10)*

The proponent replied:

*“Field experience has shown that the degree of confidence and serenity of the user is not directly proportional to the quantity of measures and follow-ups. It can even have the opposite effect if too much follow-up is done, raising concern that there are risk situations where there are none.*

*The stations were placed according to the scientific evaluation of risks. CEC believes that the best way to reassure the population is by means of clear and frequent communication adapted to the audience.” (WSP 2020c, pp. 10 and 11)*

**Advice No. 30** – Health Canada considers that the proponent’s approach in determining the position of the air quality sampling station is adequate\*, i.e. to position it so that it can provide an adequate picture of the air quality moving towards sensitive areas, namely the camp at kilometre 37 of the Nemiscau-Eastmain-1 road. However, all land users should be considered “sensitive receptors.”

Given the community’s concerns about air quality and the importance of minimizing avoidance of the land, the follow-up program should also include air quality follow-up where modelling predicts that the project’s impact would be the greatest and where it predicts that it would be negligible. This would allow a more accurate comparison of the results with the modelled data as well as verification of the actual effectiveness of the mitigation measures. Follow-up should also begin prior to construction so that temporal variability can be assessed.

\*Note that Health Canada relies on Environment and Climate Change Canada and the Ministère de l’Environnement et de la Lutte contre les changements climatiques for their technical expertise in positioning the sampling station(s).

To justify not adding a monitoring station on the territory, the proponent refers to *“The field experiment”* (WSP 2020c, p. 10). This assertion should have been supported by references.

The proponent also mentions that carrying out too many follow-ups could raise public concern: *“It can even have the opposite effect if too much follow-up is done, raising concern that there are risk situations where there are none.”* (WSP 2020c – pp. 10 and 11). This type of unfounded generalization should be avoided. The follow-up should be adapted to the local context and be carried out in collaboration with the follow-up committee and the Cree Board of Health and Social Services of James Bay.

The proponent states that: *“CEC believes that the best way to reassure people is by means of clear and frequent communication that is tailored to the audience.”* (WSP 2020c, p. 11). This *“clear, frequent and tailored communication”* should be supported by evidence.

### Crystalline silica

**Advice No. 31** – Given the potential exceedances of crystalline silica criteria and the dust concerns of land users, follow-up of crystalline silica at sensitive receptors would be beneficial. Refer to the answer to question 2 for more details.

## Nitrogen dioxide (NO<sub>2</sub>)

The proponent indicates that it has added CAAQS to its air quality follow-up program:

*“The Canadian Ambient Air Quality Standards (CAAQS) were added to the air quality follow-up program presented in the updated Plan de gestion des poussières (Dust Management Plan) in Appendix CCE-10.” (WSP 2020c, p. 11)*

However, the proponent seems to be indicating that it will only compare the results for fine particulate matter (PM<sub>2.5</sub>) to the CAAQS standards:

*“The objective of the follow-up program is to measure the impact of mining activities on local and regional air quality, and then to determine the compliance and acceptability of the mining activities in relation to the applicable standards and criteria set out in the MELCC’s Quebec Atmospheric Quality Standards and Criteria, Version 6 (2018), and the Canadian Ambient Air Quality Standard for Fine Particulate Matter.” (WSP 2019e – Appendix CEAA-58, p. 9)*

Concerning the NO<sub>2</sub> modelling results, the proponent stated that no NO<sub>2</sub> monitoring is planned:

*“This concentration then represents 85% of the standard. Thus, even considering the initial MELCC concentration for projects in remote areas, no exceedance of the standard is modelled at the Cree camp for the construction and operation phases of the project. Consequently, no NO<sub>2</sub> monitoring is proposed.” (WSP 2020c, p. 7)*

**Advice No. 32** – Given the health effects of nitrogen dioxide and the 1-hour modelled concentrations, if the proponent is unable to purchase only Tier 4\* certified mobile equipment, it would be advisable to track this substance at sensitive receptors. The results should then be compared to the 1-hour CAAQS standard.

\* To limit NO<sub>2</sub> emissions: *“the proponent agrees to purchase only Tier 4-certified mobile equipment for operations purposes, where available.” (WSP 2020c, p. 19)*

For NO<sub>2</sub> monitoring during blasting, the proponent states:

*“If sub-optimal detonation conditions are observed or forecasted, the following measures may be used, if necessary, in the definition of blasting plans:*

- Use of dual detonators;*
- Use of electronic detonators;*
- Formulation of explosives adapted to the conditions and the blasting site;*
- Adapted firing procedure;*
- Use of an adapted type of explosive such as water-resistant explosives.” (WSP 2019e – Appendix CEAA-58, p. 14)*

**Advice No. 33** – It would be important to monitor nitrogen dioxide during blasting as proposed in the proponent’s Dust Management Plan (WSP 2019e – Appendix CEAA-58, p. 14). However, the manner in which this monitoring would be carried out is not indicated in this Plan. Clarification is required.

### Fine and Respirable Particulate Matter

“The monitoring of PM<sub>2.5</sub> and PM<sub>10</sub> would be done once every 6 days but then adjusted based on the results obtained” (WSP 2019e – Appendix CEAA-58, p. 12). The proponent also states that:

*“Continuous particle monitoring is not considered in the first instance. Indeed, monitoring by the sampling of particulate matter (PMT, PM<sub>10</sub> and PM<sub>2.5</sub>) is first considered. Nevertheless, continuous monitoring will be implemented if the monitoring by sampling shows concentrations higher than the air quality standards.”*  
(WSP 2020c, p. 15)

**Advice No. 33** – Health Canada agrees with the proponent’s follow-up approach for particulate matter, as long as an adequate profile of air quality in sensitive areas can be provided, especially at the camp located at kilometre 37 of the Nemiscau-Eastmain-1 road. For fine particulate matter, monitoring results should be compared to CAAQS standards.

10 – Identify the essential measures in the monitoring program to verify and control the implementation of mitigation measures and to ensure that they can reduce, prevent or mitigate the impact on each of the elements. Please propose corrective measures (if necessary) or any other measures you consider essential.

For air quality and health protection, it would be important to follow up on crystalline silica, NO<sub>2</sub>, PM<sub>2.5</sub>, and PM<sub>10</sub> at sensitive receptors/locations. Refer to the answer to question 9 for more details.

11 – Will the follow-up program determine the effectiveness of the measures put in place to mitigate the project’s impacts? Please justify your answer.

Refer to the answer to question 9.

12 – Please identify the measures in the follow-up program that will determine the effectiveness of the mitigation measures implemented to address the project’s impact on each element. Please propose corrective measures (if necessary) or recommend any other measures you consider essential.

Refer to the answer to question 9.

**APPENDIX 2 – Noise (Sound Environment)****Existing Environment and Baseline Conditions**

1 – Has the proponent submitted information that adequately describes and documents the effects on the sound environment and their relation to the health of the Cree Nations in close proximity to the project? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which these may influence the project analysis.

The impact study contains baseline noise levels (pre-project) in section 6.7.6.2. Baseline noise would generally be less than 40 dBA (A-weighted decibels) and would mainly come from users of the Nemiscau-Eastmain-1 road, the wind, and the natural environment (WSP 2019a, pp. 6-96 and 6-102). The times and the exact locations at which the measurements were taken are presented in Technical Note 1 (TN-1) on noise levels (WSP 2019a, Vol. 2). Weather conditions and a description of the surrounding physical environment are provided. Noise sources contributing to the baseline noise level have been identified in Appendix 4 of TN-1. Noise types have not been described (continuous, intermittent, impulse, etc.).

Comment—Discussion of Uncertainties

It would have been useful to include a rationale for the choices considered representative (locations and times of measurement). Any uncertainties regarding day and night levels measured at receptor locations should be provided.

**Advice No. 1** – Health Canada is of the opinion that the baseline condition of the sound environment has been adequately described and documented for the purposes of the environmental assessment.

Public Concerns

The proponent states:

"The sound environment is not considered a VC according to CEAA guidelines, nor is it one of the concerns raised by the Cree communities we met with." (WSP 2019a, p. 6-95).

However, concerns were raised regarding the peace and quiet around the Nemiscau-Eastmain-1 road by Cree land users in Nemaska and Waswanipi (see Appendix 5 – Background) Moose hunting would take place along the Nemiscau-Eastmain-1 road (WSP 2019a, p. 8-45).

**Potential Impacts**

2—Has the proponent adequately identified and documented the potential health impacts on the Cree Nations located near the project site as a result of changes to the sound environment?

Please explain your response and identify any gaps or areas where uncertainty remains. Please describe the potential impacts that may have been misidentified or unidentified.

Health Canada's (HC) preferred approach for assessing the potential human health impacts of project-related noise is to obtain the best possible characterization of the acoustical exposure at human receptors and to estimate the effects by comparing to relevant human health baseline criteria (HC 2017).

#### Comment – Health Canada Guide

The proponent referred to the HC document published in 2010 for the input used in the effects analysis. It would have been preferable if the following most recent guide dealing with noise had been used (particularly the checklist in Appendix B): *Health Canada 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise* [Online] <http://publications.gc.ca/site/eng/9.832515/publication.html> 55 pp.

#### Human Receptors

The identification of human receptors was essentially done in the closest existing camps, i.e., the camp at km 42 (assessment point C1) and the camp at km 37 (C2). Camp C1 would be relocated.

HC also believes that land users could move around in areas for hunting, fishing and gathering medicinal plants surrounding the proposed site (WSP 2019a – Map 8-4).

<b>Advice No. 2</b> – Potential human receptors have been adequately identified with particular attention to Indigenous peoples.
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For the effects assessment, the proponent estimated future noise thresholds by mathematical modelling during the construction and operation/maintenance phases (see Maps 6-11 to 6-15, WSP 2019a). These predictions were compared to relevant provincial government recommendations (WSP 2019a, p. 6-99):

(Construction) *Guidelines for noise levels from an industrial construction site* of the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC)

(Operation) *Instruction Note 98-01* of the MDDELCC

In addition, a health effect indicator was calculated, the percentage of people who are highly annoyed with noise (% HA<sup>1</sup>). The penalty of +10 dbA (quiet environment) was applied.

<sup>1</sup> Refer to Michaud D.S., S.H.P. Bly and S.E. Keith, 2008.

The techniques and assumptions used (for the construction and operation phase) are provided in TN-1 (WSP 2019a, Vol. 2).

Blasting is also considered in section 7 of TN-1 (WSP 2019a, Vol. 2) and compared to the limit of 128 linear decibels of Directive 019 (MELCC 2012). The proponent concludes:

“This would make it possible to blast three holes simultaneously and still remain below the noise limit, even if C1 continues to be used.” (TN-1 in WSP 2019a, Vol. 2, p. 18)

**Advice No. 3** – A more complete description of the tonal, regular impulsive, highly impulsive, or high-energy impulsive noises that receptors would hear during the construction, operation and closure phases would have been helpful. Failure to discuss all noise sources leads to uncertainty in the presented forecasts. That being said, blasting would be carried out only once every 5 days, compliance with Directive 019 is planned, and complaints and inconvenience are to be mitigated by the proponent’s proactive communication of the blasting schedule to land users.

#### Comment – Sensitive Receptor

The proponent uses the term "sensitive receptor" in its assessment of the sound environment. According to HC, the term should be closest human receptors. Nuances are important when it comes to human health. Some individuals are more susceptible to contamination exposure for various reasons, such as physiology, health status, behaviour or lifestyle. These characteristics were not documented in the impact statement.

#### Effect of the Proposed Mine Site on the Sound Environment

**Advice No. 4** – Health Canada is of the opinion that if the noise levels measured in the field during mine operations are found to be similar to the modelled levels presented in the proponent’s impact statement (WSP2019a, section 6.7) and Technical Note 1 (WSP 2019a Vol.2), noise emissions from the proposed site are not expected to cause adverse health effects to the Indigenous people in the area. However, this advice is subject to the proponent’s rigorous application of all mitigation measures aimed at limiting project-generated noise, as presented in the impact statement.

**Advice no. 5** – Health Canada would like to point out, however, that compliance with the standards and criteria used by the proponent to evaluate the project’s impact on the sound environment (e.g., the increase in % HA—*percentage highly annoyed with noise*<sup>2</sup> of less than 6.5%) does not necessarily guarantee the absence of health effects. In this very low-noise environment, an increase in noise levels of about ten decibels, as predicted by the proponent’s modelling (Maps 6-11 to 6-15, WSP 2019a), in certain moose-hunting, goose-hunting and fishing areas used by the Cree (Map 8-4, WSP 2019a) could still affect them, even though the standards and criteria are met.

<sup>2</sup> Please refer to Michaud D.S., S.H.P. Bly and S.E. Keith, 2008.

Noise impacts are thus highly dependent on the interference of noise with what one is trying to do (e.g., hunting and trapping) and the expectation of peace and quiet during these activities (HC 2017).

### Effects of Road Transport on the Sound Environment

The proponent has calculated the increase in noise levels at the Cree workcamp closest to the Nemiscau-Eastmain-1 road (at 80 metres):

*“At 80 metres, which represents the distance from the workcamp closest to the Nemiscau-Eastmain-1 road, the variations in road noise levels (between the existing and projected situation) are calculated to be 6.2 dBA and 4.4 dBA in the operating phase for the day and night periods respectively. While for the construction phase, the variations are 2.5 dBA and 0 dBA.” (WSP 2020d, p. 14)*

The proponent also calculated the increase of % HA, making sure that a 10 dB adjustment was applied during the period between 10pm and 7am. The increase at 80 metres from the road would be 1.2% in the operating phase and 0.7% in the construction phase (WSP 2020d, p.13).

The proponent also provided the minimum distance to be maintained between the area’s users and the road to prevent interference with speech comprehension and sleep disturbance (CCE 18 ii, WSP 2020d). In addition to confirming that no camps are currently located within this critical health zone, this information can be useful for relocating camps if necessary (WSP 2019a, p. 8-60), and for preventing negative effects of users travelling on Cree territory.

**Advice No. 6** – Health Canada believes that if measured noise levels in the area along Nemiscau-Eastmain-1 road during mine operations are found to be similar to the modelled levels indicated in response CCE 68, interference with speech comprehension for land users should not occur when they are 18 metres or more from the road in the construction phase and 25 metres or more in the operating phase. To prevent sleep disturbance, new camps should be set up more than 68 metres from the road (WSP 2020d).

### Comment – % HA

The proponent states: *“With regard to the high level of long-term discomfort, the maximum recommended level is a variation in the percentage of people with severe discomfort of 6.5% HA.” (WSP 2020d, p. 13).* However, this statement is false. According to HC, the increase in % HA is an indicator of the negative effects of noise on health. Significant negative health effects occur when the % HA increases by more than 6.5%.



## Mitigation Measures

3 – Among the mitigation measures proposed by the proponent, please identify those that you consider essential<sup>3</sup>. Please propose any required corrective measures or recommend any measures not proposed by the proponent that you consider essential for preventing or mitigating impacts.

**Advice No. 7** – Given that noise can have harmful health effects (particularly due to sleep disturbance or high levels of long-term discomfort), and that the analysis of the project’s effects on the proponent’s sound environment seems to take mitigation measures into account, rigorous implementation of all mitigation measures presented in the impact assessment to protect the sound environment would be crucial.

### Construction

Standard mitigation measures M1, M6, M9 to M12, and T1

Specific measures:

- All equipment found on job sites, excluding transient equipment or equipment used for short periods of time, will be equipped with white noise back-up alarms. (similar to M11 but with exclusion)
- All unused electrical or mechanical equipment must be turned off, including trucks waiting for more than five minutes for loading.
- The use of engine brakes shall be prohibited within the work area.
- CEC will take into consideration the Guidelines for noise levels from an industrial construction site to minimize negative health effects. (CEAA-77)

(WSP 2019a – Table 5-6; WSP 2020c – Appendix CCE-80)

CEC will set up a system for receiving and resolving noise-related complaints to ensure that the sound environment does not have negative effects on land users. (CEAA-79)

(WSP 2019f, p. 1028/1033)

### Operation

The same standard mitigation measures as in the construction phase.

Specific measures:

- All equipment found on job sites, excluding transient equipment (e.g., ten-wheel craft trucks) or equipment used for short periods of time, will be equipped with white noise back-up alarms. (similar to M11, but with exclusion)
- All unused electrical or mechanical equipment must be turned off, including trucks waiting for more than five minutes for loading. (CEAA-78)
- The use of engine brakes shall be prohibited within the work area. (CEAA-78) – The noise limit imposed by Directive 019 for blasting will be respected. (CEAA-89) – Machinery and truck traffic will be restricted to the right-of-way of access roads and work areas. Plastic fencing will clearly identify work area boundaries. (CCE-51)
- The worksite supervisor will ensure that noisy equipment is properly maintained, and that machinery mufflers and catalysts are in good condition. (CCE-51) (similar to M6)

<sup>3</sup> Key measures: Mitigation measures that are essential to avoid or mitigate potential impacts and that could be turned into conditions under the CEA Act, 2012

- Comply with the noise standards outlined in MELCC Instruction Note 98-01 on noise. (CCE-51)
- Take all necessary measures to limit noise at source. (CCE-51)
- Ensure that mufflers and any other equipment that may be a source of noise pollution are regularly maintained and in good condition. (CCE-51)
- Fit mobile equipment with a wideband audio beeper to signal reverse movements. (CCE-51) (similar to M11).

(WSP 2020c—Appendix CCE-80, p. 7/25)

**Advice No. 8** – During the construction phase, the proponent will take into consideration the Guidelines for noise levels from an industrial construction site of the Ministère du Développement durable, de l'Environnement et de la lutte au Changement climatique . Health Canada recommends that these Guidelines be implemented, including planning/communicating to land users any loud activities that would temporarily exceed the limits. It has been shown that fewer complaints are reported when accurate information that does not underestimate noise is provided.

**Advice No. 9** – As a standard M12 measure, the proponent proposes to “*Develop an awareness program for machinery users so that they avoid bucket slamming, dropping objects from a great height, and optimize work methods.*” (WSP 2019a; WSP 2020c; Appendix CCE-80). Health Canada recommends a ban on bucket slamming.

It is important to note that if the project were to generate noise within allowable limits, the study would not present the project’s potential impacts on human receptors.

**Advice No. 10** – It is always advisable that the proponent commit to assessing the need for additional mitigation measures when actual project-related noise levels are higher than expected or if the community responds more strongly than anticipated. This may be the case when projects are located in very quiet areas, where land users have high expectations of maintaining this peace and quiet.

**Advice No. 11** – These specific mitigation measures proposed in the section "Current Use of Lands and Resources for Traditional Purposes" would also be important for the sound environment:

*"Inform Cree users of the territory of the calendar of the activities of construction, operation and maintenance and closure of the mine"*

*"Measures to limit disturbance caused by mine activities during spring waterfowl hunting and fall moose hunting"*

(WSP 2019a, p. 8-60)

## Residual Effects

4 – Were the residual effects on the sound environment (after the implementation of mitigation measures) adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe any residual effects that may have been misidentified or unidentified.

The proponent concludes that there is a small and insignificant residual effect for the construction phase:

“This assessment considers the reduced degree of disturbance to the component due to the project’s overall optimization and mitigation measures, as well as compliance with the MDDELCC’s sector policy regarding noise levels from a construction site and the limits proposed by Health Canada. According to the scenarios studied, exceedance occurs only at one sensitive receptor point (C1). However, considering that the Cree camp at this location would no longer be used when the Rose mining project is initiated, a **low degree of disturbance** can be established. Furthermore, the magnitude of the effect takes into account a **low valuation** of the component on the **ecological level**, as well as a **low valuation** on the **social level (low overall value)** due to the localized nature of the work, the very few human sensitive receptor points (very rarely frequented region, except for occasional hunting and fishing), and compliance with current standards and regulations.” (WSPa, p. 6-120).

The proponent concludes that there is a small and insignificant residual effect for the operational and maintenance phases:

"The **magnitude** (intensity) of the effects on noise is considered **low** due to the degree of disturbance being similar to that of the construction phase and below the limits established by the MDDELCC and Health Canada. Due to the nature of the work, however, the **duration** is expected to **belong**. The geographic **extent** of the residual effects in the operating phase is considered **local** as it may lie beyond the restricted study area. The **duration** of the effect will extend over the life of the project and is therefore considered to **belong**. The **probability of occurrence** is considered **high**. In short, the residual effect on the “sound environment component is considered to be **small and insignificant**” (WSPa, p. 6-121).

The proponent concludes that the residual effect is small and insignificant for the dismantling phase.

“In the closure phase, the probable residual effects on noise are related to the dismantling of mining infrastructure on the site. Noise emissions during the dismantling of the mine will be significantly lower than the noise emissions anticipated for the construction and operating phases, and therefore lower than the MDDELCC IN 98-01 noise criteria and the change in the percentage of people highly annoyed (% HA). The assessment of its significance is similar to the construction phase. Therefore, the **residual effect** in the dismantling phase is defined as **small and insignificant** (WSPa, p.6-121).”

**Advice No. 13** – Health Canada notes that the assessment of the effect size is based, in part, on low land use. Health Canada does not believe that this approach is conservative. It is highly recommended that the Cree people reclaim their territory despite industrial projects and that they continue, and even increase, their consumption of country foods (see Appendix 3).

5 – Do the mitigation measures, including follow-up plans proposed by the proponent (if applicable), address the remaining uncertainties? Please explain your answer and propose any other measures that you consider essential to prevent, mitigate, monitor or follow up residual effects.

Communities that are consulted are more likely to be understanding and accepting of noise than those that are not. This is especially true when the information provided is accurate and does not attempt to understate the likely noise level, and when commitments made by the proponent to limit noise during specific hours are respected (HC 2017).

**Advice No. 13** – Health Canada supports the proponent’s initiative to consult with the community and land users throughout the project. Blasting or other noisy activities should not only be made known to the public, but also be planned in consultation with land users and the relevant committees.

The proponent states:

"The ore concentration plant was designed to have a nominal capacity of approximately 4,900 tonnes of ore per day and will operate 24 hours a day, 7 days a week, 52 weeks a year." (WSP 2019a, p. 3-14).

In operation, only the trucks carrying the concentrate (22 trucks per day) will have a 24-hour schedule. The remaining trucks will operate during the daytime period. During the construction phase, trucks will operate during the daytime period only." (WSP 2020d, p. 13)

**Advice No. 14** – Concerning road noise along the Nemiscau-Eastmain-1 road, it is recommended to: 1) maximize transportation during the day and 2) educate truckers on the use of engine braking, if applicable, in areas where camps and/or areas of more intensive land use for hunting and fishing are located.

It would be advisable to consider adding signage for this purpose in collaboration with the relevant committee and authorities (municipalities, Ministère des Transports du Québec, etc.).

### Cumulative Effects

6 – Have the cumulative effects<sup>4</sup> on the sound environment for which there is a residual effect been adequately documented? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which these may influence the project analysis.

The impact assessment includes a summary of the cumulative effects assessment. The proponent concludes that there would be no significant cumulative impact:

*“Noise, brightness, dust, increased traffic, and loss of wildlife habitat and related traditional activities will affect an increasing number of users with each new project on the territory, especially since the number of users is expected to continue to grow.*

*Therefore, the potential cumulative effects of the Rose lithium-tantalum mining project on the current use of lands and resources by the Cree are considered to be of moderate magnitude, limited scope, and long duration. Thus, the cumulative effect is deemed not significant (see Chapter 5).” (WSP 2019a, p. 10-55)*

7 – Has the proponent proposed adequate measures to prevent or mitigate cumulative effects? If not, please explain and propose alternative measures.

Not applicable.

8 – Among the mitigation measures proposed by the proponent to reduce cumulative effects, please identify those that you consider essential. Please propose any required corrective measures or recommend any measures not proposed by the proponent that you consider essential for preventing or mitigating cumulative effects.

The proponent has determined that there will be no cumulative impacts and that no additional mitigation measures will be required:

*“The cumulative impacts on six Valued components was assessed. The conclusion is that **the project will only cause insignificant cumulative impacts on the Eastmain and Nemaska Cree Communities**, woodland caribou, migratory bird species, bird species at risk, and chiroptera in the study area (spatial scope) over the selected time periods (temporal scope).*

*Consequently, **no additional mitigation measures or environmental follow-up program (different from those proposed in the project-specific assessment of this project) are required.**” (WSP 2019a, p. 10-56)*

The environmental follow-up program planned by the proponent could verify this conclusion.

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<sup>4</sup> Cumulative Effects: Cumulative effects are defined as changes to the environment caused by the project in combination with other past, present and reasonably foreseeable future work or projects.

### Monitoring<sup>5</sup> and Follow-Up Programs<sup>6</sup>

9 – Does the monitoring program verify and control the implementation of mitigation measures and ensure that they are appropriate to reduce, prevent or mitigate potential impacts on each of the elements? Please justify your answer.

Refer to question 10.

10 – Please identify the measures in the monitoring program that are essential to verify and control the implementation of mitigation measures and ensure that they are appropriate in reducing, preventing or mitigating the impacts on each of the elements. Please propose corrective measures (if necessary) or any other measures you consider essential.

As part of the environmental monitoring program, the proponent is planning:

*"noise level monitoring (construction and during activities, for a certain period of time after start-up)." (WSP 2019a, p. 14-5).*

**Advice No. 15** – This monitoring should have been more detailed since the proponent considers respecting the *Guidelines for noise levels from an industrial construction site*, and adhering to Instruction Note 98-01 (noise) and Directive 019 (blasting), to be mitigation measures.

Given the importance of these “mitigation measures,” Health Canada recommends that the proponent provide a more detailed noise monitoring plan to the Agency.

As indicated in **Advice No. 5**, compliance with the standards and criteria used by the proponent to evaluate the project’s impact on the sound environment does not necessarily guarantee the absence of health effects. The complaints management mechanism can be considered a monitoring of the noise environment. In fact, HC considers that noise complaints can be an indicator of potential adverse effects on human health (HC 2017).

**Advice No. 16** – A complaints management mechanism proposed by the proponent (refer to WSP 2019a, p.14-3) would be very important. This could allow for the modification of certain mitigation measures, or the implementation of additional ones, in close collaboration with the relevant committee(s), land users, and the Cree Board of Health and Social Services of James Bay.

<sup>5</sup> **Monitoring Program:** The goal of a monitoring program is to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety.

<sup>6</sup> **Follow-Up Program:** A follow-up program is designed to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

It is recommended that the complaints management mechanism be implemented throughout the life of the project and be promoted to land user or even individuals (if possible) when a small number of users are affected.

The proponent can set up a committee to identify solutions for potential impacts of the mine’s activities:

*"Finally, the establishment of an "information exchange and consultation committee" made up of members of the Eastmain and Nemaska communities and mine personnel will make it possible, through regular meetings, to discuss and propose solutions to the various issues related to the mine’s activities." (WSP 2019a, p. 8-69).*

**Advice No. 17** – The creation of such a committee to identify possible solutions for reducing noise emissions would be very important.

### Communication of Complaints Management Results

The proponent plans to: *"Inform Cree land users and members of Cree communities of environmental follow-up results;"* (WSP 2019a, p. 8-60), and that *"[...] frequent and regular contact will be maintained between the tallyman of the RE1 trapline and the CEC to ensure that mine activities do not interfere with the activities of land users, and to make any required adjustments."* (WSP 2019a, pp. 4-20 and 8-62).

**Advice No. 18** – Given the concerns expressed by some members of the community regarding the project’s potential impacts on the sound environment, the number of noise complaints and how they are handled should be shared with the community, especially with the tallymen of traplines RE1 and R16 (road noise) and, if required, all land users.

11 – Will the follow-up program determine the effectiveness of the measures implemented to mitigate the project’s impacts? Please justify your answer.

Not applicable. The proponent provides no follow-up measures for the sound environment (WSP 2019a, p. 6-121).

12—Please identify the measures in the follow-up program that will help determine the effectiveness of the measures implemented to mitigate the project’s impacts on each of the elements. Please propose corrective measures (if necessary) or recommend any other measures you consider essential.

HC is not in a position to comment on the effectiveness of these mitigation measures.

## APPENDIX 3 – Country Foods

The mandate and expertise held by Health Canada (HC) regarding country foods is limited to the methodology for assessing the health effects that could result from chemical contamination. The following advice does not dispute the importance of continuing to consume country foods, not only for their nutrient intakes, but also for the maintenance of Cree social and cultural values (INSPQ, 2015).

We have retained the numbering of the questions contained in the January 13, 2021 letter from the Impact Assessment Agency of Canada (IAAC) to HC. To facilitate reading, however, the order has been changed.

### Existing Environment and Baseline Conditions

1 – Is the information presented by the proponent regarding the consumption of country foods and the health of the Cree people located in the vicinity of the project adequately described and documented? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which these may influence the project analysis.

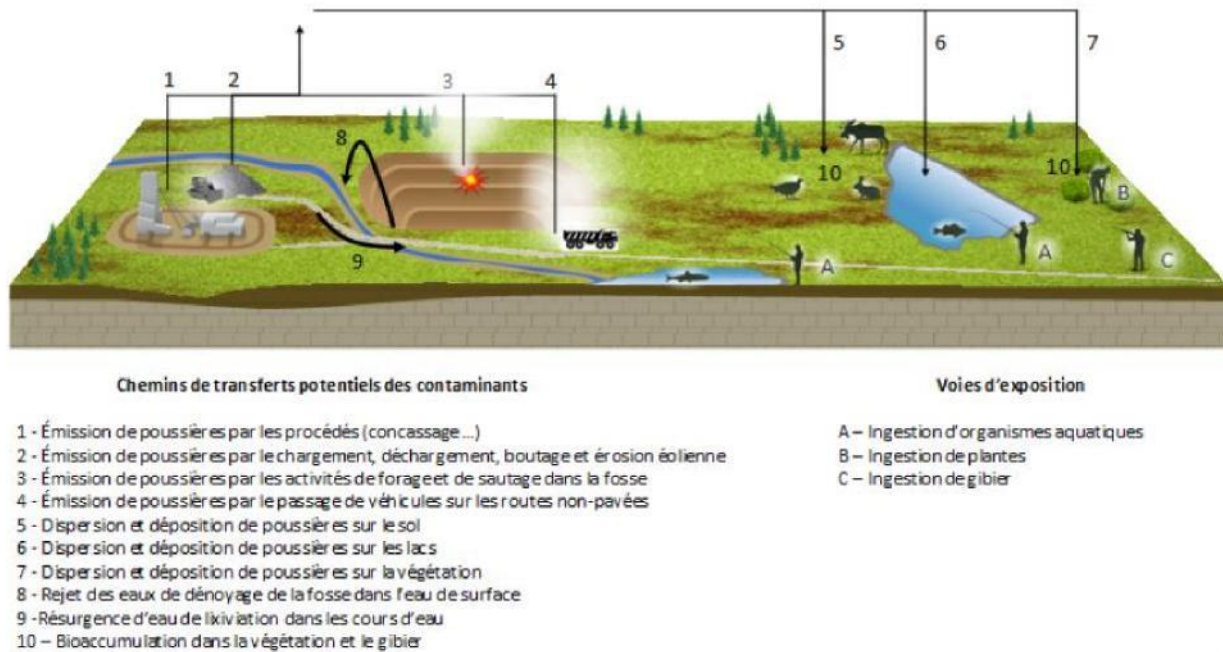
HC recommends identifying all potential contaminants related to project activities and determining all possible contaminant transfer pathways into country foods. Exposure estimates should be based on local information validated by the communities concerned (HC 2018).

The proponent has first provided a summary assessment of the potential for contamination of country foods based on compliance with environmental regulations and the infrequent land use (WSP 2019d). Given the importance of the concerns expressed by the Cree communities and the perception of contamination that could lead to the avoidance of a healthy resource (see Appendix 5), HC recommended to IAAC that a more in-depth and evidence-based assessment be provided. **In our opinion, compliance with environmental regulations does not guarantee the protection of human health in the case of country food consumption.** In addition, current land use and use in the foreseeable future was not adequately considered.

In response, the proponent provided a “Country Foods Contamination Risk Assessment” [Évaluation du risque de contamination de l’alimentation traditionnelle], conducted by SNC-Lavalin in December 2019 (CEAA-136 Appendix A, WSP 2019e), that meets the needs of the environmental assessment. HC notes that the proponent and its consultant did not use the HC 2018 checklist (Appendix A). Doing so would have helped reduce the number of requests for information. A conceptual site model was provided and is shown in Figure 1.



Figure 1 Modèle conceptuel



**Figure 1.** Conceptual Model. Source: SNC-Lavalin (2019). Évaluation du risque de contamination de l'alimentation traditionnelle – Future mine de lithium et tantale. Appendix CEAA-136, WSP 2019e. 44 pages and Appendices.

HC noted that baseline (pre-project) data for foods (plants, aquatic organisms, and game) do not appear to have been documented in the impact statement. They were estimated based on modelling from soil, water and air concentrations.

**Advice No. 1** – Health Canada is of the opinion that the information provided by the proponent to assess the potential contamination of country foods is sufficient in the context of this project.

### Potential Impacts

2 – Have the potential impacts on the human health of the Cree Nations in the vicinity of the project (resulting from changes to the quality of country foods) been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe the potential impacts that may have been misidentified or unidentified.

The methodological approach differs from that recommended by HC. Justifications have been provided. The level of effort was deemed sufficient for this type of project and context.

The Country Foods Contamination Risk Assessment (ÉRCNT) concluded that:

*“On the basis of the data compiled as part of the environmental impact assessment and the risk estimates obtained during this assessment, it is not expected that dust emissions and water resurgence in the environment of the mine site will have an impact on the consumption of plants and animals. The calculated risk indices considering the expected contaminant emissions from the mine site are not or only marginally higher than those estimated on the basis of the initial state of the site’s environment.”*

#### Known Bioaccumulative Substances: Arsenic, Cadmium, Mercury and Lead

The main uncertainty of the study seems to lie in the predictions of contaminant concentrations in different foods, since they are based on modelling. This is particularly important for contaminants with high bioaccumulation potential such as arsenic, cadmium, mercury and lead:

*“it would be recommended that plans be made to track the presence of several contaminants that have a higher potential to bioaccumulate in some country foods and that were difficult to estimate in the absence of site-specific data. Although the available data does not indicate their presence in emission sources at levels significantly above ambient levels, arsenic, cadmium, mercury and lead are elements that have a higher potential to bioaccumulate and biomagnify in the food chain, particularly in certain country foods such as animal liver or kidneys. Monitoring the concentrations of these elements in animal organs harvested in the study area provides evidence of their higher potential to bioaccumulate.” (WSP 2019e, Appendix 136).*

The health risk depends on the concentration of the chemical substance already present in the plant or animal tissue consumed (i.e. the initial/baseline concentration) plus the project’s contribution, if any. Some substances may accumulate in organisms more than others. In this case, the initial and predicted concentrations based on water, air, and soil levels may not be representative and may underestimate the risk.

The proponent may be required to measure mercury in fish flesh (based on effluent concentrations) under the *Metal and Diamond Mining Effluent Regulations* of Environment and Climate Change Canada and if requested by the provincial legislator.

HC believes that it may be appropriate to consider a follow-up program when “there is uncertainty about the modelling of COPC emissions, release, mobilization or deposition in the environment and uptake in country food sources.” Monitoring should be considered when Indigenous populations are present and when concerns have been raised about the health effects of potentially contaminated country foods (HC 2019).

**Advice No. 2** – Health Canada is of the opinion that potential health impacts to the Cree communities in the project area due to chemical modifications to country foods have been adequately considered, except for contaminants with high bioaccumulation potential, for which the assessment method would give highly uncertain results.

It would be advisable to collaborate with land users to reduce this uncertainty through a follow-up or monitoring program for arsenic, cadmium, mercury and lead in country foods adapted to the local context (availability of the resource, resources most consumed and/or exposed, duration depending on the objective).

In such cases, to ensure that results are properly interpreted, Health Canada recommends that the follow-up committee responsible for interpreting country food results be trained in human health risk assessment and the target criteria selected.

#### Emerging Substance: Tantalum

The Joint Assessment Committee (JAC) pointed out in question CCE-25 of WSP 2020d that little is known about the toxicity and mobility of tantalum. According to Espejo et al. (2018), tantalum may have the potential to bioaccumulate and biomagnify in aquatic food chains. The proponent mentions that “The toxicity associated with this accumulation has not been demonstrated but caution should be exercised since no studies demonstrate the effect of this accumulation.” and “it is even an element that goes into the composition of prostheses and it is used in dentistry (Filella, 2017). However, knowledge about its safety is limited.” (WSP 2020d, CCE-25c).

From a human health perspective, tantalum would not be an a priori concern according to a literature review conducted by the proponent’s consultant:

*“Tantalum does not have a TRV [toxicological reference value] established by these institutions. However, a review of the literature has indicated that tantalum is minimally absorbed by the human body through ingestion or inhalation (Schulz, 2017) and is of very low toxicity (Reimann, 1998). Because of this relatively biologically inert property, tantalum is used in a variety of medical devices and surgical implants (Divine, 2004; Kabata-Pendias, 2007).”*

**Advice No. 3** – Health Canada is of the opinion that a reasonable effort has been made by the proponent to assess the impact of tantalum on human health (through the ingestion of country foods).

Since the available information on tantalum toxicity and environmental fate or mobility (bioaccessibility/bioaccumulation) is too limited to conduct a human health risk assessment, it is suggested that:

- the proponent’s commitment to “implement an action plan to ensure the safety of the final effluent on the receiving environment” also aims to protect human health in a preventive manner (to protect the exposure pathway through the ingestion of country food) (WSP 2020d, CCE-25c). This is important because environmental follow-up will not necessarily provide information on the accumulation of the substance in organisms potentially consumed by the Cree (now or in the future).
- the follow-up committee is supported by a human health risk assessment or human toxicology professional to help members interpret the follow-up results and their limitations, and to report the risks to the public. The Cree Board of Health and Social Services of James Bay could offer support in this regard and it would be important that it be consulted.
- the proponent collaborates on academic or institutional research initiatives aimed at improving knowledge of tantalum and human health.

### Mitigation Measures

3 – Of the mitigation measures proposed by the proponent, please identify those that you consider essential<sup>1</sup>. Please propose any required corrective measures or recommend any measures not proposed by the proponent that you consider essential for preventing or mitigating impacts.

Given that the ÉRCNT has considered controlling emissions in environmental media (source reduction strategy), the rigorous implementation of all mitigation measures presented in the impact study to protect these environments would prove to be very important (WSP 2019e Annexe-136, p.ii).

**Advice No. 4** – Based on the major contaminant sources identified in the risk assessment for country food contamination and the mitigation measures cited by the proponent “to prevent the dispersion of contaminants into the environment” in WSP 2019a (p. 8-51), these mitigation measures are considered to be key:

- Minimizing dust generation during the transportation of materials on unpaved roads built with waste rock, which is considered to be the main contributor of suspended solids from the mine complex.
- Minimizing wind erosion at material storage sites.
- Continuous recovery and treatment of runoff water by metal precipitation, clarification and pH correction. This includes maintaining the recirculation system to prevent non-compliant discharge of the final effluent and conducting regular inspections to detect any problems.

<sup>1</sup> Key Measures: Mitigation measures that are essential to avoid or mitigate potential impacts and that could be turned into conditions under the CEA Act, 2012

- An emergency and intervention plan to reduce the impact of any accidental leaks (see Appendix 4 – Accidents and Malfunctions).
- Standard mitigation measures identified in Table 5-6 (WSP 2019a).
- The key air quality mitigation measures identified in Appendix 1.

Note that Health Canada relies on Environment and Climate Change Canada and the Ministère de l'Environnement et de la Lutte contre les changements climatiques for their expertise in "technical" effectiveness and the uncertainty surrounding the effectiveness of mitigation measures to protect air quality, water and soil.

### Residual Effects

4 – Were the residual effects for country foods (after the implementation of mitigation measures) adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe any residual effects that may have been misidentified or unidentified.

Refer to question 2.

5 – Do the mitigation measures, including the follow-up plans proposed by the proponent (if applicable), address the remaining uncertainties? Please explain your answer and propose any other measures that you consider essential to prevent, mitigate, monitor or follow up residual effects.

### Regarding Chemical Contamination of Country Foods

Health Canada believes that if the mitigation and follow-up measures are implemented by the proponent and the follow-up program is enhanced (see Advices No. 2, 7, 8, and 9), it would address the key uncertainties associated with the chemical contamination of country foods and the potential effects on the health of Indigenous people.

### Regarding Risk Perception and Food Safety

The perception of a health risk could persist in local communities and lead to avoidance of such a healthy food resource. The scientific literature on the subject is clear: intake of many nutrients is enhanced when Indigenous people eat country foods, even in small quantities. Given the high level of food insecurity in First Nations communities (Chan et al., 2016), especially in areas where the price of food in stores is high, access to country food should be valued and protected. Country foods are also important from a social and cultural perspective (INSPQ 2015).

**Advice No. 5** – Health Canada recommends to the Agency that the proponent’s plan for communicating the results of environmental follow-up studies should aim at responding to the communities’ concerns regarding country foods so as to minimize the avoidance of this resource. Therefore, Health Canada believes that engaging the affected communities through dialogue is the best approach to adopt at each stage of the mine’s life, including closure. In fact, the *Pikhuutaau* Agreement, signed between the proponent and the Cree Nations concerned, seems to provide for this approach. It would be important that the Cree Board of Health and Social Services of James Bay have a say in the communication plan prior to its implementation.

To contribute to public health efforts aimed at promoting country foods (INSPQ 2014), as outlined in the EIA (WSP 2019a – Table 4-6, p. 4-19), the following is advised:

**Advice No. 6** – It is recommended that the proponent implement the following measures:

- Prohibit or supervise the sport hunting and fishing activities of non-Indigenous workers to ensure that Cree access to country foods is protected;
- Allow flexible vacation schedules for Cree workers to encourage fishing and hunting;
- Limit industrial activities that may affect hunting during Goose Break;
- Allow Cree workers to have access to country foods on the work site (e.g., leave space in the freezer for country foods);
- Make workers aware of the importance of country foods for Cree communities.

### Monitoring <sup>2</sup> and Follow-Up Programs<sup>3</sup>

9 – Does the monitoring program verify and control the implementation of mitigation measures and ensure that they are appropriate to reduce, prevent or mitigate potential impacts on each of the elements? Please justify your answer.

To our knowledge, human health-based criteria for country food intake were not considered in the development of the monitoring program. Rather, mitigation measures would act as general preventive barriers.

<sup>2</sup> **Monitoring Program:** The goal of a monitoring program is to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety.

<sup>3</sup> **Follow-Up Program:** A follow-up program is designed to verify the accuracy of the environmental assessment predictions and to determine the effectiveness of the measures implemented to mitigate the project’s adverse environmental effects. A follow-up program is designed to verify the accuracy of the environmental assessment predictions and to determine the effectiveness of the measures implemented to mitigate the project’s adverse environmental effects.

10—Please identify the measures in the monitoring program that are essential to verify and control the implementation of mitigation measures and ensure that they are appropriate in reducing, preventing or mitigating the impacts on each of the elements. Please propose corrective measures (if necessary) or suggest any other measures you consider essential.

To our knowledge, human health-based criteria for country food intake were not considered in the development of the monitoring program. Rather, mitigation measures would act as general preventive barriers.

11 – Will the follow-up program determine the effectiveness of the measures implemented to mitigate the project’s impacts? Please justify your answer.

The proponent indicated that the follow-up plan would not contain measures specifically addressing the country food human exposure pathway. The proponent specifies that it “will rely on the follow-up committee resulting from the Pikhuutaau Agreement, signed with the Crees in July 2019, and on the expertise of the Cree Trapper’s Association or the [Cree Board of Health and Social Services of James Bay](#) to manage the follow-up protocols. CEC will offer its full collaboration to the Cree organizations involved in this file/concern.” (CEC 2020).

HC believes that an exhaustive follow-up of all contaminants in country foods (study or full characterization in flesh/tissue) is not necessary. **However, additional efforts should be made for substances with high bioaccumulation potential such as arsenic, cadmium, mercury, and lead (see Advice No. 2 above for more details).**

Generally, the proponent relies on environmental media monitoring and environmental protection criteria. This approach seems reasonable given the conclusions of the risk assessment for contamination of country foods (WSP 2019e, Appendix ACEE-136). **However, it would be very important to verify the values predicted and used as inputs in the ÉRCNT.**

In fact, more than simply complying with standards, “follow-up on impacts involves systematic analysis (which require resources), coordination efforts, and integration of the data generated before and after the change” (INSPQ 2014).

As a matter of fact, the ÉRCNT was based on major assumptions and the author stressed that these should be validated (CCE-53, WSP 2020c).

*“It is recommended that environmental follow-up during mine activities include validation of the assumptions and estimates made as part of this assessment. This information would ensure that the assessment of anticipated risks is consistent with the actual conditions during mine operations.*”

*The rate of dust deposition, concentrations in the aquatic environment in areas with a higher resurgence potential, and concentrations in soil and certain country foods in areas highly exposed to dust deposition would therefore be important factors to validate.”*

Uncertainty remains as to what will actually be validated by the proponent (Response CCE-62, WSP 2020c).

**Advice No. 7** – Health Canada recommends that the follow-up plan be enhanced to confirm that the predicted levels of chemical contaminants in air, water and soil used in the risk assessment of country food contamination were accurate and, therefore, that the mitigation measures in place are actually effective for human health.

HC pointed out that mine effluent emissions were not considered in the ÉRCNT. To address the uncertainty associated with mine effluent for which the proponent cannot predict acceptable concentrations in the receiving environment, this recommendation is important (Response EAC 52b, WSP 2020c):

**Advice No. 8** – Environmental discharge objectives should be developed to set the performance level of the final effluent treatment system so that contaminant concentrations in watercourses do not exceed surface water quality criteria intended to protect the consumption of aquatic organisms.

Several sources of contaminants were not considered in the ÉRCNT. To address this uncertainty, it is suggested that this recommendation in response to EAC52 of WSP 2020c be followed:

**Advice No. 9** – The monitoring program should be designed to identify any unanticipated sources of contamination that may arise during the construction and operational phases of the mine site.

**Advice No. 10** – As access to traditional resources is an important prerequisite for consumption, Health Canada considers the proponent’s proposed follow-up of the current use of lands and resources for traditional purposes to be essential (WSP 2019a, p. 4-18). The results should be presented to the follow-up committee and land users.

12—Please identify the measures in the follow-up program that will help determine the effectiveness of the measures implemented to mitigate the project’s impacts on each of the elements. Please propose corrective measures (if necessary) or recommend any other measures you consider essential.

Refer to question 11.



## Cumulative Effects

6 – Have cumulative effects on country foods for which a residual effect remains been adequately documented? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which these may influence the project analysis.

Not applicable. The proponent did not include the contamination of country foods in its cumulative effects assessment.

7—Has the proponent proposed adequate measures to prevent or mitigate cumulative effects? If not, please explain and propose alternative measures.

Not applicable. The proponent did not include the contamination of country foods in its cumulative effects assessment.

8 – Among the mitigation measures proposed by the proponent to reduce cumulative effects, please identify those that you consider to be essential. Please propose any required corrective measures or recommend any measures not proposed by the proponent that you consider essential for preventing or mitigating cumulative effects.

Not applicable. The proponent did not include the contamination of country foods in its cumulative effects assessment.

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<sup>4</sup> Cumulative Effects: Cumulative effects are defined as changes to the environment caused by the project in combination with other past, present and reasonably foreseeable future work or projects.

## APPENDIX 4—Accidents and Malfunctions

We have retained the numbering of the questions contained in the January 13, 2021 letter from the Impact Assessment Agency of Canada (IAAC) to HC.

### Impacts Arising from Accidents or Malfunctions

13 – Has the proponent identified the sensitive elements of the human environment that could be affected by potential accidents and malfunctions? According to your expertise and based on available information, should other sensitive elements have been identified? Please elaborate on these elements and describe the uncertainties arising from not taking them into account.

Since the project is located in a remote area, the number of sensitive elements in the human environment is minimal. On the other hand, it is necessary to fully understand how the land is used to properly identify all users (workers, Indigenous communities, villages, and individuals who come near the mining project site to hunt, fish, and trap).

The natural and human environments are shown on Map 3 of WSP 2019d (p. 20):

*“Map 3 shows the planned infrastructure as well as the main components of the natural and human environments. The storage of petroleum and chemical products will be done in the industrial section shown on the map.*

*The proponent states that the following accident scenarios could have an impact on the natural or human environment off the Rose Project site or in areas of the site lacking infrastructure:*

- *Spills of hazardous materials (petroleum products and non-petroleum chemicals).*
- *Fires, including forest fires.*
- *Explosions of explosive materials.*
- *Non-compliant discharges of final effluent.*
- *Breach of Lake 3 dike.*
- *Breach of Hydro-Quebec’s LE-20A dike.*
- *Extreme weather conditions.”*

**Advice No. 1** – The proponent appears to have adequately and generally identified the sensitive elements of the human environment. On the other hand, it is recommended to fully understand how the land is used to properly identify all users (workers, Indigenous communities, villages, and individuals who come near the mining project site to hunt, fish, and trap).

14 – Does Health Canada have any concerns about the impacts that may be caused by accidents and malfunctions? If so, please explain your concerns and identify any gaps or areas where uncertainty remains.

The approach outlined by the proponent identifies the risks of accidents and malfunctions based on historical data on accidents worldwide. The proponent was asked to justify the probability of the described incidents occurring. The proponent provided additional information to justify its choices.

A gap in the proponent’s analysis may be the uncertainty surrounding the completion of the emergency measures plan and the resulting agreements with external partners (Indigenous communities and local and provincial first responders). The availability and response time of external partners in remote area emergencies remains a major concern.

Emergency preparedness communication with Indigenous communities is a key element. Certain statements in the response document to IAAC’s second request for information (Question CCE-87, WSP 2020c) suggest the need for additional consultation on the involvement of Indigenous communities in emergency response.

**Advice No. 2** – The following commitments by the proponent provide sound consultation practices that should be implemented:

*"CEC is committed to consulting first responders in the community of Nemaska regarding the emergency measures plan and to assess the possibility of their participation. CEC undertakes to invite first responders from Nemaska to participate in emergency simulation exercises."*

15 – Among the proposed measures to reduce the risk of accidents and malfunctions or their consequences, please identify those you consider to be essential. Please propose any required corrective measures or recommend any measures not proposed by the proponent that you consider essential.

HC has no additional measures to propose. Chapter 11 of the Impact Statement (WSP 2019a) presents the plausible scenarios resulting from the risk analysis. For each type of scenario, prevention and mitigation measures are proposed. Most scenarios include an up-to-date emergency response plan that includes a scenario-specific response procedure, which is a key measure.

As for specific threat response plans, the proponent indicates on several occasions that the details will be worked out at a later stage in the project as shown in the excerpt below:

*“This draft provides an outline of the information that will be included in the site’s final emergency response plan. This draft plan should be finalized before the project is launched, at which time project details will be more complete. Because of its remoteness, the Rose mining project’s facilities must have the resources to respond to emergency situations. Mutual assistance agreements should also be developed with other businesses in the area and the Cree community of Nemaska.”* (WSP 2019a, p. 11-37).

**Advice No. 3** – The emergency response plan that will be developed with the participation of the Cree communities through the Environment Committee and that will include threat-specific response plans (according to the scenarios identified in the risk analysis) should be sufficiently detailed before the start of the project.

Furthermore, the proponent states in standard mitigation measure M5 (machinery) that:

*“Any accidental spillage must be reported immediately to the person in charge of the project’s emergency plan, which will have been developed and approved prior to the work. The affected area must be immediately cordoned off and cleaned. Contaminated soil must be removed and disposed of in an authorized site and a characterization must be conducted according to the guidelines of the MDDELCC’s Soil Protection and Contaminated Sites Rehabilitation Policy. In the event of an oil spill or release of any other harmful substance, the Environment Canada (1-866-283-2333) or MDDELCC (1-866-694-5454) alert network should be notified without delay”* (WSP 2019a, p. 5-20).

**Advice No. 4** – Health Canada stresses the importance of harmonizing emergency procedures to facilitate their implementation and the training of employees. It is recommended to clarify which authorities should be contacted depending on the type of substance spilled. Alternatively, both organizations, Environment and Climate Change Canada and the Ministère de l’Environnement et de la lutte contre les Changements climatiques (formerly MDDELCC), could be contacted regardless of the nature of the spill to simplify the notification process and training of employees.

## APPENDIX 5—BACKGROUND

### The Project

As specified on the Agency's Registry:

*Critical Elements Corporation (CEC) is proposing the construction, operation and decommissioning of an open pit lithium and tantalum mine located approximately 38 kilometres north of Nemaska, in Quebec. As proposed, the project includes the operation of an open pit, waste and tailings impoundment area, an industrial ore processing facility and the option of transforming concentrate off-site. The mine would produce about 4,500 tonnes of ore per day over a 17-year life span.<sup>1</sup>*

The Impact Statement also indicates that:

*The extracted ore will be transported and processed at the mill, which is the heart of an industrial complex located in the same area as the pit, a few kilometres from the Nemiscau-Eastmain-1 roadway. At the planned rate of production, the mine is expected to operate for approximately 19 years and will need to hire 290 workers for commercial production, with a peak of 575 workers during construction. Workers will be housed in a private commercial camp located more than 25 kilometres from the mine complex. (WSP 2019b, p. 3-1)*

The closest Indigenous community to the site would be Nemaska, about 40 km to the south:

*The mining property is located on the territory of Eeyou Istchee James Bay, on Category III lands within the community of Eastmain. About 40 km further south is the Cree village of Nemaska, located about 300 km north-west of Chibougamau. The site is accessible by the Route du Nord, which is usable all year round from Chibougamau, or from Matagami, via Route 109 and Route du Nord. (WSP 2019, p. 3-1)*

### Human Receptors

According to the impact statement, the area near the project site would be rarely frequented and few fishing activities would be practiced there. In the sound environment section, the proponent points out that:

*The territory is rarely visited, except for casual hunters and users of the Nemiscau-Eastmain-1 road.*

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<sup>1</sup> <https://ceaa-acee.gc.ca/050/evaluations/proj/80005?&culture=en-CA>

*Only one settlement is located near the study area (at km 42 of the Nemiscau-Eastmain-1 road). (WSP 2019a, p. 6-95)*

*Not much fishing is done in the study area. On the RE1 trapline, a few users have indicated that they frequent only one lake, which is about two kilometres west of the camp at km 42 of the Nemiscau-Eastmain-1 road. (WSP 2019a, p. 6-95)*

However, the project would be located on RE1 trapline land and in the vicinity of three other traplines. There are camps on these traplines where trapping, hunting, fishing and gathering is practiced. At least one source of drinking water would also be present:

*The study area overlaps four traplines: R16 and R19 in the community of Nemaska, R10 in the community of Waskaganish, and RE1 in the community of Eastmain. All project infrastructures and facilities are located within RE1 land. The territory considered for the project and its surroundings are currently used by members of the tallyman's family for moose and goose hunting, fishing, and gathering of medicinal plants. There is also a camp with two settlements. (WSP 2019a, p. 8-44)*

*On the RE1 trapline, a few users have indicated that they frequent only one lake, which is about two kilometres west of the camp at km 42 of the Nemiscau-Eastmain-1 road (Lake 2 shown in Figure 7-1). The lake is considered a good fishing spot, especially by Elders. In addition, users of the camp at km 42 obtain drinking water from a nearby lake located to the south of the camp (Lake 3 shown in Figure 7-1). They therefore attach particular value to this water body. According to available information, the only current uses of water bodies that will be directly affected by the project are fishing and water withdrawal. (WSP 2019a, p. 8-52)*

This water source would probably be abandoned by land users because a 500-metre buffer zone would be created around the proponent's proposed site, including part of Lake 3, and the camp at km 42 would be dismantled. The tallyman plans to relocate his activities to his camp at km 51 (IAAC 2020; WSP 2019a, p. 8-56). In short, a Cree camp and a source of drinking water on the RE1 trapline would be lost. However, the camp would be relocated.

### Concerns

The proponent's consultation activities have revealed the high degree of concern regarding the project's potential impacts on human health (WSP 2019a, p. 8-76). Meetings were also held with several stakeholders and tallymen to hear their concerns (WSP 2019a, p. 4-2).

The protection of the quantity and quality of the land's food resources, the protection of air and water quality, and potential dust emissions are all major issues for the communities for all phases of the potential project:

*The vast majority of stakeholders who were consulted expressed concerns about the potential effects of mining activities on the environment. This is a major and widespread concern. Fears of an environmental disaster are high. The contamination of the territory's surface and ground water due to the use of chemical and toxic products during mining activities is of particular concern. There are also concerns about health effects on local people and workers related to dust and air quality near the mine site, and about the effects on fish, animals and plants. (WSP 2019a, p. 4-9)*

*Seven stakeholders are concerned about the effects of mining on traditional activities practiced on the territory, which could be disrupted by changes in the territory, the displacement of animal populations, and changes in the quality of resources. (WSP 2019a, p. 4-9)*

*The R10 and R16 tallymen of Waskaganish expressed their concerns about the quality of water discharged. They are concerned about the overflowing of ditches during extreme weather events and the efficiency and availability of the treatment plant, especially since the water discharged by the mine will be dumped on their territory. (WSP 2019a, p. 4-12)*

*Concerns about air quality were raised during meetings with Indigenous communities, particularly with respect to dust emissions and how they may affect the health of local people and workers at the site. (WSP 2019a, p. 6-142)*

*Many members of the Eastmain and Nemaska communities are highly aware of the potential environmental risks of this project. There are concerns about the potential contamination of lakes and streams surrounding the mine and its effect on resources (fish, wildlife, plants and other natural resources) used for traditional purposes, as well as its impact on human health. Also, some people are concerned about these potential effects on future generations. (WSP 2019a, p. 8-69)*

The potential impacts of heavy machinery traffic on the access roads to the proposed site also appear to be of significant concern:

*Nemaska stakeholders, who are more concerned, in the context of this project, by heavy machinery traffic on the roads used by community members (route du Nord and the Nemiscau-Eastmain-1 road), expressed concern about the increased risk of road accidents during mine operations.*

*According to them, these accident risks are not only related to the presence of heavy machinery on the roads, which could lead to collisions, but also to the damage caused to roads. Some Eastmain stakeholders also raised these concerns, but they were more concerned about traffic on the James Bay Highway. (WSP 2019a, p. 4-9)*

Tallymen from Waswanipi stressed the issue of losing their peace and quiet at the camps due to the noise and vibrations associated with truck traffic (IAAC 2020b).

IAAC has summarized the main health-related concerns raised by the Cree during their consultation sessions as follows:

- *Water, air and soil contamination;*
  - *Subsequent contamination of wildlife for food purposes, mainly beaver, moose and fish, through poor quality water from mine processes (mine effluent) and water bodies on the periphery of the mine;*
  - *Lack of confidence in the proponents' ability to control water quality as a result of Hydro-QC's past record;*
  - *Effects of mine development on the quality and taste of beaver meat;*
  - *Effects of mine development on the health of pregnant women (Nemaska).*
  - *Effects of noise, dust and vibration due to increased road traffic on the health of users of moose hunting camps on the periphery of the Route du Nord (Nemaska).*
  - *Stress and anxiety of land users related to the possible contamination of resources, even if the resources are not contaminated.*
- (IAAC 2020c).



**APPENDIX 6 – REFERENCES**

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