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June 08, 2023

Emily Koide  
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Sent by email to: [info@nirb.ca](mailto:info@nirb.ca)

**Subject: Health Canada's response to the Comment Request for Agnico Eagle Mines Limited's Meliadine Project 2022 Annual Monitoring Report**

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Dear Emily Koide:

Thank you for your letter dated April 26, 2023, requesting comments on the Meliadine Project 2022 Annual Monitoring Report provided by Agnico Eagle Mines Limited.

Health Canada (HC) participates in environmental assessments as a federal authority under the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14 (*NuPPAA*). HC makes available specialist or expert information or knowledge in its possession to review panels and responsible authorities, among others.

The objective and scope of HC's review is to verify that the potential health impacts of the project are properly identified and to support Responsible Authorities to prevent, reduce, and mitigate the potential health impacts of project activities.

HC has reviewed the 2022 Annual Monitoring Report and has provided its comments in the attachment. These pertain to results from the Proponent's Air Quality Monitoring, Noise Monitoring, and Terrestrial Environment Management and Monitoring Plan reports.

Should you have any questions concerning HC's response, please contact Julie Anderson at [julie.c.anderson@hc-sc.gc.ca](mailto:julie.c.anderson@hc-sc.gc.ca).

Sincerely,

David Kitchen  
Regional Manager, MB/SK/NU Region, EHP  
ROEB, Health Canada

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cc: Heather Jones-Otazo, A/Manager, Environmental Assessment and Contaminated Sites (EACS) Division, Healthy Environments and Consumer Safety Branch (HECSB), Health Canada  
Julie Anderson, Impact Assessment Specialist, EHP, ROEB, Health Canada  
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Wendy Wilson, Environmental Assessment Coordinator, EACS, HECSB, Health Canada

# Meliadine Project 2022 Annual Monitoring Report

## Health Canada Comments

<b>Comment Number:</b>	HC-01
<b>Subject/Topic:</b>	Elevated arsenic concentrations in soil and vegetation
<b>References:</b>	<p>2022 Annual Monitoring Report, Section 7.1.2 – Peninsula Lake Study (PDF pg. 77)</p> <p>Section 7.8.1 – TEMMP, Soil and Vegetation Monitoring (PDF pg. 101)</p> <p>Appendix 27: 2022 Terrestrial Environment Monitoring and Mitigation Program (TEMMP) Annual Report, Appendix D – Vegetation and Soil Samples Data Tables (PDF pg. 246-252)</p> <p>Government of Canada Comments on Agnico Eagle’s Meliadine Extension Project Proposal (February 28, 2023, PRI: 343104)</p> <p>2017 Terrestrial Environment Monitoring and Mitigation Program (TEMMP) Annual Report (PRI: 316740)</p> <p>2019 Terrestrial Environment Monitoring and Mitigation Program (TEMMP) Annual Report (PRI: 329355)</p>
<b>Comment:</b>	<p><b>HC encourages continued arsenic monitoring in soil and vegetation and analysis of trends over time.</b></p> <p>As stated in HC’s review comment HC-CF-02 in the February 28, 2023, Government of Canada submission for the Meliadine Extension Project Proposal, arsenic in soil and water under current mine site conditions may warrant further monitoring and scrutiny. In that submission, HC noted that some measured concentrations of arsenic in soil reported in the 2017 and 2019 TEMMP reports were in exceedance of the Canadian Soil Quality Guideline (results were reported up to 110 mg/kg compared to the guideline of 12 mg/kg). In the 2022 Annual Monitoring Report, some arsenic concentrations reported at waste rock storage area sampling locations were greater than levels reported in the 2017 and 2019 TEMMP reports, up to 1,100 mg/kg (Appendix 27, PDF pg. 248). It was also noted that several vegetation tissue samples collected in 2022 (primarily lichen and birch leaves) had elevated concentrations of arsenic (up to 884 mg/kg in one sample – Appendix 27, PDF pg. 259).</p> <p>Similarly, Section 7.1.2 of the 2022 Annual Monitoring Report (PDF pg. 77) indicates that since 2019, arsenic concentrations have increased four-fold in Lake A8 and eight-fold in Lake B7. The Tailings Storage Facility (TSF) was identified as the probable source</p>

	<p>of arsenic via “off-site migration of fine particulate dust from the TSF” (PDF pg. 78). While measured concentrations of arsenic in these lakes remained below aquatic environment action levels, these observed changes in water quality were attributed to mining activities and suggest potential deposition of arsenic onto other environmental media (i.e., soil and vegetation) via particulate dust.</p> <p>The most recent soil and vegetation monitoring results demonstrate the value in continued monitoring of arsenic during the life of the mine and in doing trend analyses to confirm that concentrations are not increasing over time, particularly in locations already elevated under baseline conditions. Monitoring data could help to inform community outreach initiatives and closure mitigation and/or institutional controls during site closure.</p> <p>The annual monitoring report offers an opportunity for proactive risk communication in advance of the closure and post-closure phases and HC encourages accessible and transparent presentation of data in future annual monitoring reports.</p>
<b>Conclusion/Request:</b>	<ol style="list-style-type: none"> <li>1. Annual monitoring reports demonstrate increasing arsenic concentrations in exceedance of health-based guidelines. HC supports the continued monitoring of arsenic during all project phases.</li> <li>2. To facilitate review and observe trends, HC requests that future TEMMP reports compare arsenic results for each sampling location over time in order to determine whether additional mitigation or adaptive management is needed.</li> </ol>

<b>Comment Number:</b>	HC-02
<b>Subject/Topic:</b>	Non-threshold air contaminants
<b>References:</b>	2022 Annual Monitoring Report, Appendix 25: 2022 Air Quality Monitoring Report
<b>Comment:</b>	<p><b>HC encourages the use of the Canadian Ambient Air Quality Standards (CAAQS) in effect at the time of monitoring, and ongoing efforts to limit emissions of non-threshold air contaminants to the extent possible.</b></p> <p>Appendix 25 of the 2022 Annual Monitoring Report (PDF pg. 40), indicates annual mean concentrations of nitrogen dioxide (NO<sub>2</sub>) at both monitoring stations were “well below the Government of Nunavut Ambient Air Quality Standard of 32 ppb.” HC recommends using the CAAQS value in effect at the time of monitoring for future reporting purposes.</p>

	<p>HC also notes that NO<sub>2</sub> is a non-threshold air contaminant, meaning that associations with different health outcomes have been demonstrated throughout the range of concentrations. Therefore, any increase in exposure will result in an increased health risk. The applicable air quality standards, such as the CAAQS, should not be considered as “pollute up-to” levels and the Proponent is encouraged to strive for continuous improvement.</p>
<b>Conclusion/Request:</b>	<ol style="list-style-type: none"> <li>1. HC recommends using the most stringent federal, provincial, or territorial air quality standards applicable to the given area. In many cases, although they are not based on health effects alone, the CAAQS will be the most stringent levels for key air pollutants, especially for longer-term projects with emissions after 2025.</li> <li>2. HC supports implementing all economically and technologically feasible mitigation measures to limit emissions of non-threshold air contaminants to the extent possible.</li> </ol>

<b>Comment Number:</b>	HC-03
<b>Subject/Topic:</b>	Noise monitoring at locations protective of off-duty workers
<b>References:</b>	<p>2022 Annual Monitoring Report, Appendix 24 – 2022 Noise Monitoring Report</p> <p>Meliadine Extension Project FEIS Addendum. Section 1.1.1 – Scope of Meliadine Extension Components and Activities, Figure 1.1-4, PDF pg. 49.</p>
<b>Comment:</b>	<p><b>HC encourages noise monitoring in locations that are protective of off-duty workers.</b></p> <p>Based on Figure 1 of the 2022 Noise Monitoring Report (Appendix 24, PDF pg. 11), noise monitoring stations are located on the production lease boundary or just outside of it. It is unclear whether these locations are representative of conditions experienced by off-duty workers, particularly at the on-site camp location (as shown in the 2023 FEIS Addendum, Figure 1.1-4). Adverse health impacts on sleep may begin when average sound levels inside sleeping quarters exceed 30 dBA for continuous noise sources, or 45 dBA (max) for discrete noise events (WHO, 1999). The only <math>L_{eq}</math> (nighttime) values (28.6 dBA and 40.1 dBA) reported for 2022 were at station NPOR008, which is located approximately 2 km from the mine lease (Appendix 24, Figure 1, Table 7). Additional noise monitoring stations located closer to the camp accommodations could be considered to</p>

	<p>characterize noise exposure for the closest human receptors.</p> <p><i>World Health Organization (WHO). 1999. Guidelines for community noise. Geneva: World Health Organization.</i></p>
<b>Conclusion/Request:</b>	<ol style="list-style-type: none"> <li>1. HC encourages locating noise monitoring stations where they can monitor future noise levels (particularly night-time levels) experienced inside of dwelling spaces (i.e., sleeping quarters) and inform the need for additional mitigations should measured levels exceed noise guidelines.</li> <li>2. HC supports the implementation of additional mitigations under the Proponent's noise abatement plan (Project Certificate Condition 10) should monitoring results indicate potential adverse noise-related health impacts for off-duty workers.</li> </ol>